

Wild Juvenile Salmonid Monitoring Program 2022 Clio Channel and Chatham Channel, BC

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Summary

Beach seine sampling was conducted on behalf of Grieg Seafood at ten sites in Clio Channel and Chatham Channel, BC in 2022. Sampling was completed on behalf of Grieg Seafood Ltd. to provide data on sea lice abundance, prevalence and intensity on juvenile wild salmon within the specified area. This data report represents the fourth year of wild juvenile salmonid monitoring in Clio Channel and Chatham Channel completed as part of wild juvenile salmon data collection for existing and potential aquaculture sites nearby. Three existing finfish aquaculture tenures are present in the sampling area near the east end of Clio Channel.

Four sampling events were completed, with sampling dates selected to coincide with the estimated peak outmigration period of juvenile salmonids.

Thirty individuals from each target fish species (Pacific salmonids) or the total number of captured individuals from each target species (if less than 30 were captured) were collected from each of the ten sites during the sampling events. Total catch numbers of each species were recorded. Temperature and salinity at the surface, 1 m and 5 m depths if possible were recorded at each site during each sampling event.

Collected sample fish were frozen and analyzed in the lab for the presence of sea lice by Mainstream Biological Consulting. Sea lice observed on the individual fish specimens during laboratory analysis were identified as either *Lepeophtheirus* spp. (*L. salmonis*) or *Caligus* sp. (*C. clemensi*). These lice are assumed to be *L. salmonis* and *C. clemensi* due to the lack of documented infestation of Pacific salmon by other species. The lice were recorded by life stage and the sex of pre-adult or adult motile lice was determined.

This data summary report documents the observed sea lice infestation rate on retained wild juvenile coho, chum and pink salmon collected from Clio Channel and Chatham Channel in 2022. A total of 122 fish samples underwent lab analysis for sea lice infestation in 2022 including 43 chum salmon, 78 pink salmon and one coho salmon. A single threespine stickleback was captured but was not retained for analysis. A total of nine individuals were found to be infested with sea lice in the total sample population, resulting in a calculated sea lice prevalence of 7.4 % in 2022. A total of 10 sea lice were identified during laboratory analysis resulting in an abundance of 0.08 and an average intensity of 1.1 for the sample population.

A total of 47 chum salmon were captured, representing 30.1 % of the capture total. Of the 47 chum salmon captured, 43 were retained for lab analysis for sea lice infestation. A total of three chum salmon smolts were infested with three *L. salmonis* lice of various life stages and no *C. clemensi* resulting in a calculated prevalence of 7.0 %, abundance of 0.07 and an average intensity of 1.0 for the chum salmon sample population.

The number of pink salmon captured was greater than the number of chum salmon captured. A total of 107 pink salmon were captured, representing 68.6 % of all captured fish. Of the 107 pink captured, 78 were retained for lab analysis. A total of five pink salmon smolts were found to be infested with six *L. salmonis* lice of various life stages and no *C. clemensi* resulting in a calculated prevalence of 6.4 %, abundance of 0.08 and an average intensity of 1.2 lice per infested fish for the pink salmon sample population.

A single coho salmon was captured and found to be infested with a single *C. clemensi* sea louse.

A total of nine *L. salmonis* sea lice of various life stages were identified on eight juvenile salmon and one *C. clemensi* sea louse was found on the single coho juvenile salmon analyzed in the lab.

A comparison of the prevalence and abundance of sea lice species found on juvenile salmon was completed for sample data from 2019 to 2022 collected in Clio Channel and Chatham Channel, BC. This data is presented in a summary table in Appendix IV.

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1.0 Introduction

In March, April and May 2022, beach seine sampling was conducted at ten sites in Clio Channel and Chatham Channel, BC to capture wild juvenile salmon on behalf of Grieg Seafood BC Ltd. (Figure 1). Captured fish were analyzed in the lab for sea lice infestation. Four sampling events were completed, with sampling dates selected to coincide with the estimated peak outmigration period of juvenile salmonids.

Parasitic copepods from the family Caligidae (sea lice) found in the coastal waters of British Columbia are divided into two genera: *Lepeophtheirus* and *Caligus*. Eleven species of *Lepeophtheirus* have been identified infesting fish in the Pacific Ocean, while only one species of *Caligus* (*Caligus clemensi*) has been identified (Margolis and Arthur 1979; McDonald and Margolis, 1995). *C. clemensi* infest a wide range of natural salmonid and non-salmonid hosts in the marine environment, while *L. salmonis* natural hosts on the Pacific coast have been found to include Pacific salmon, threespine stickleback and Pacific herring. During this analysis, *Lepeophtheirus* spp. sea lice found on salmonid specimens were assumed to be *L. salmonis* due to the lack of documented infestations of Pacific salmon by other *Lepeophtheirus* lice species (Jones and Nemec, 2004).

Both Caligidae genera have similar life histories and developmental stages (Kabata, 1972; Johnson and Albright, 1991a). The sea lice hatch from eggs and go through two free-swimming naupilii stages before developing into an infectious free-swimming copepodid. The copepodids attach to their host and develop through several chalimus stages. The chalimus are non-motile and are attached to their host by a frontal filament. The final chalimus stage terminates as the sea lice detach from the host and become motile. The sea lice can then move freely on the fish as they develop through a pre-adult stage before becoming reproductively viable adults.

Water temperature and salinity are two environmental variables known to influence sea lice development, growth, survival and reproductive rate. In British Columbia, surface seawater temperatures range from approximately 6 °C to 13 °C. Research on sea lice abundance conducted in the Broughton Archipelago and elsewhere on the coast of British Columbia indicates that surface water temperature during the winter months does not appear to hinder the seasonal abundance of *L. salmonis* (Saksida et al. 2007a, b). The rate of development and the generation times for *C. elongates* are strongly temperature dependent (Tully 1992) and although this research has not been conducted, similar relationships with temperature are to be expected for *C. clemensi* (Jones and Johnson, 2015). Survival and development of *L. salmonis* is optimal in high salinity seawater. Under laboratory conditions copepodid survival was limited to conditions where salinity was greater than 10 ppt (Johnson and Albright, 1991b).

Grieg Seafood BC Ltd. requested monitoring of sea lice abundance, prevalence and intensity on juvenile wild salmon in Clio Channel and Chatham Channel, BC as part of the data collection for existing and potential aquaculture sites within the area. Existing finfish aquaculture sites within or near the sampling area included Noo-la, Wa-kwa and Tsa-ya fish farms near the eastern end of Clio Channel (Figure 2). This data summary report documents the observed sea lice infestation rates on retained juvenile salmonids collected at the ten sample sites in Clio Channel and Chatham Channel in 2022. This is the fourth year of wild juvenile salmonid monitoring conducted at this location by Grieg Seafood BC Ltd.



Figure 1: An overview map showing the location of Clio Channel and Chatham Channel north of Vancouver Island, BC.

2.0 Methods

The fish inspected for sea lice infestation were collected from ten sites in Clio Channel and Chatham Channel, BC. These sites were chosen based on their locations relative to active and potential new Grieg Seafood finfish aquaculture tenures (Figure 2). The ten sites were each sampled four times in 2022 on March 31/ April 1, April 20/21, May 3/4, and May 19.

2.1 Site Locations

The approximate locations of the ten beach seine sites are shown in Figure 2, with existing aquaculture sites shown for reference. GPS coordinates collected in the field for the sites are presented in Table 1.

Table 1: The site number and location of the ten beach seine sites where fish were collected for sea lice analysis in Clio Channel and Chatham Channel, BC in 2022.

Site #	Latitude North (DDM)	Longitude West (DDM)
1	50 35.422	126 27.088
2	50 34.352	126 26.025
3	50 35.312	126 21.501
4	50 36.542	126 22.111
5	50 36.114	126 20.614
6	50 36.797	126 19.553
7	50 37.493	126 17.565
8	50 36.321	126 16.158
9	50 33.799	126 12.584
10	50 33.550	126 11.218

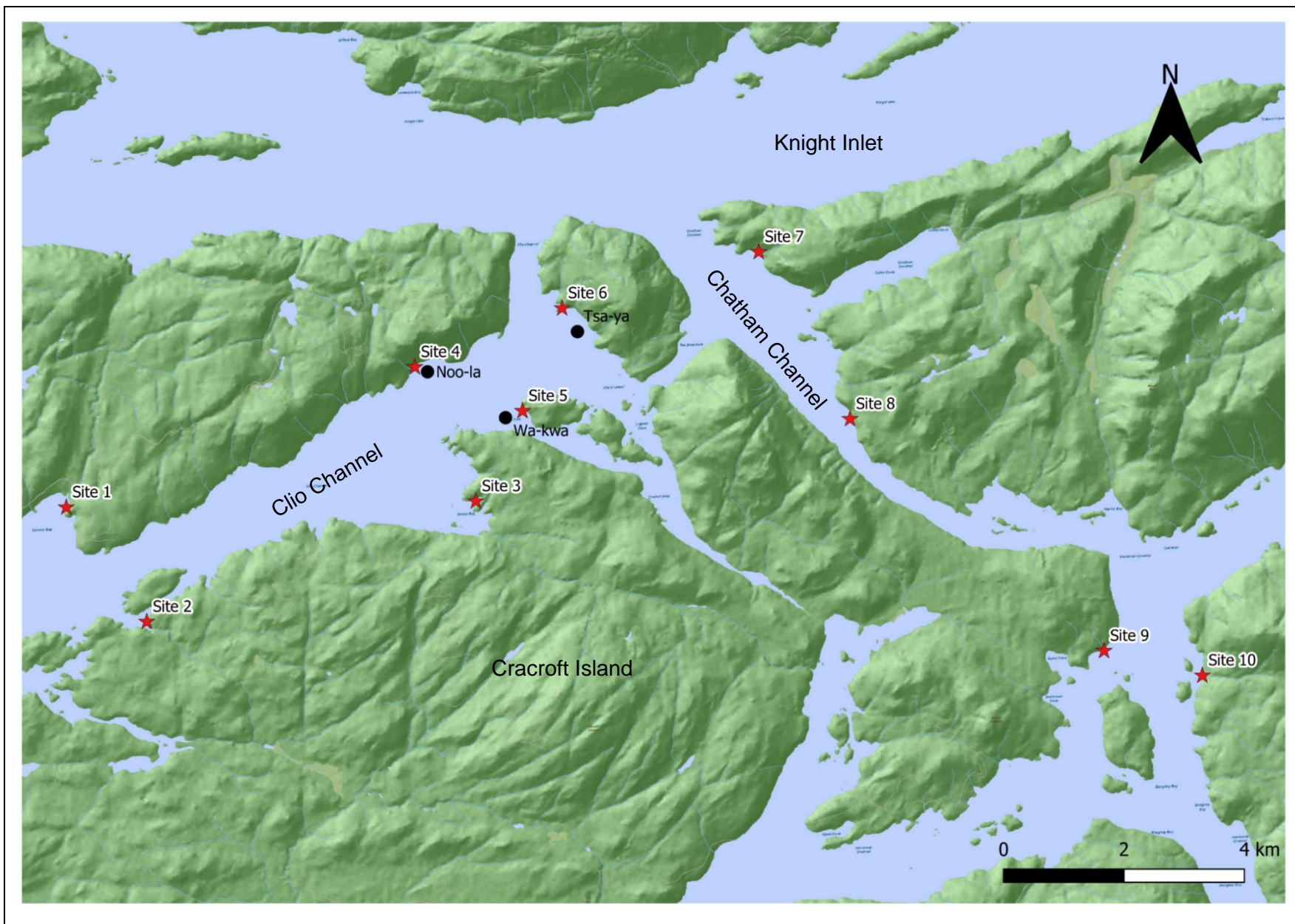


Figure 2: The locations of the ten Clio Channel and Chatham Channel, BC beach seine sites sampled in 2022.

2.2 Field Procedures

Procedures used for beach seining, fish collection and field data recording were adapted from those utilized by Fisheries and Oceans Canada.

An 18 ft Boston Whaler powered by a 70 horsepower outboard motor was used to access the beach seine sites. A 150 ft (45.7 m) long by 12 ft (3.7 m) deep beach seine net was used to capture specimens. The net was constructed in three 50 ft (15.2 m) sections, with the centre bunt consisting of one-quarter inch diameter diamond mesh, and two side panels (wings) consisting of half-inch diameter diamond mesh. Floats were attached every 30 cm along the top-line and a lead line provided weight along the bottom of the net.

A three person crew conducted the beach seine sets. All sample sites were approached slowly by boat and one crewmember was put ashore with one end of the net towline. The onshore crewmember held the towline at one side of the sample site, while the second crewmember ensured the net deployed smoothly off the bow of the boat as the third crewmember backed the boat in a wide semicircle towards the opposite side of the sample site. When the net was fully deployed, the second crewmember stepped into the shallow water with the towline or tossed it to the awaiting crewmember on shore. A slow retrieval of the net began immediately.

As the net was retrieved, the probe of a YSI Professional Plus multiparameter meter was used to collect salinity, dissolved oxygen and water temperature data at the surface (0.2 m), 1 m and 5 m. The surface parameters were always measured and additional depths were measured if the depth at the site during the tide cycle permitted.

Crewmembers retrieved the net evenly from opposite ends, ensuring that the lead line remained as close to the bottom as possible. Retrieved netting was piled on the beach above the water level. As the retrieval reached the net bunt, the lead line was pulled at a faster rate than the floats to allow the netting of the bunt to form a bag under any captured fish. The lead line was then pulled up onto the beach above the water level. One crewmember worked their way around the outside of the net in the shallow water to ensure the floats stayed above the surface of the water. In this manner a small, shallow bag formed from the bunt of the net contained the captured fish in the water so that they could be sampled.

The two shore crew members collected individual fish from the bunt to ensure that captured fish remained in the net for as short a period of time as possible. The net was manipulated as necessary in response to changing tides to ensure the captured fish remained in sufficient water to minimize contact with the net or with other fish.

Where possible, a total of 30 individuals from each target species were retained for sea lice infestation analysis. If less than 30 individuals of a target species were captured, all the captured fish were retained. Individual fish were randomly “swam” into an appropriately sized Whirl-pak bag. Handling of fish was kept to a minimum.

Once all the fish for retention were collected, a total catch number was recorded for each species. Any fish remaining in the net were counted or estimated (if more than 500 individuals were present) and released. The total of fish remaining in the net was added to the number of retained individuals to calculate a total capture number for a given species.

A standardized field form was used to record the following information for each beach seine set:

- Site number;
- Date;
- Time at the end of the individual fish collection;
- Comments on weather and oceanic conditions;
- Total capture and retention fish numbers for each species; and
- Water temperature (°C), dissolved oxygen (mg/l) and salinity (ppt) to one decimal place.

Retained fish from each site were packaged separately in re-sealable bags and labelled with the site number and the date. Sample bags were stored on ice in a cooler while on board the boat and transferred to a portable freezer immediately upon return to shore.

Following each set the net was reloaded onto the bow of the boat. Crewmembers scanned the net for obvious holes, which were repaired immediately if found. Sampling procedures were repeated at each of the ten sample sites.

2.3 Laboratory Procedures

Laboratory procedures for sea lice analysis were adapted from procedures demonstrated by Sheila Dawe and Eliah Kim at the Pacific Biological Station in Nanaimo, BC, during sea lice identification training conducted on April 1, 2004. Additional sea lice identification training by Paul Callow was conducted at the Pacific Biological Station in September 2007.

Fish samples were thawed immediately prior to lab analysis, and individual fish were identified to species and counted. Results were compared to the reported data found on the field data sheets to identify any errors.

A standardized data sheet was used to record sea lice analysis results from each site. The site and week number, sample date and number of fish were recorded. The date and time of the start of the analysis was also noted on the data sheet. Data from individual fish was recorded as the analysis proceeded.

Once thawed, individual fish were removed from their bag using a pair of forceps at the caudal peduncle and placed in a petri dish. Each bag was labelled chronologically with an individual identification number (1 – 122). Each fish was then scanned for the presence of sea lice under a stereoscopic dissection microscope. The microscope was set at a magnification of 20X for the preliminary survey of each fish, and magnification was increased to up to 40X during individual sea lice identification.

Microscopic analysis of each fish began at the anterior end of the right side of the specimen. The head was examined first, after which a scan was made along the dorsal half of the specimen working towards the posterior end. The dorsal fin and caudal fin were lifted and expanded with a pair of forceps to check for lice. From the posterior end a return scan was made along the ventral half of the specimen back to the head. The anal fin, pelvic fin and pectoral fin were lifted and expanded, and the operculum was lifted. The fish was then flipped using a pair of forceps at the caudal peduncle and the procedure was repeated on the opposite side of the specimen. Additional scans were made longitudinally down the fish if the entire depth of the fish could not be seen in a single pass. Any sea lice observed on the fish were removed and placed in a petri dish of saline solution.

Each Whirl-pak bag was inspected after the removal of the fish for any pre-adult or adult sea lice that may have become dislodged during handling. These “loose” sea lice were recorded on the data sheet with the data for the corresponding specimen and it was assumed that the lice had come from that individual.

Sea lice were identified using characteristics outlined by Kabata (1972) and Johnson and Albright (1991a). Sea lice observed on individual fish were identified as either non-motile chalimus (including copepodid), or motile pre-adults and adults. Non-motile sea lice were identified as either of the two chalimus stages for *Lepeophtheirus salmonis* (Hamre et al., 2013) or four chalimus stages for *Caligus clemensi*. Motile lice, either pre-adults or adults, were identified as either *Lepeophtheirus salmonis* or *Caligus clemensi* and the sex of the louse was determined.

Chalimus were identified to species primarily by characteristics of the frontal filament. Size, shape, genital development, and leg development were used as secondary identifying characteristics for speciation as well as primary indicators for life stage identification. Motile sea lice were identified to species by the presence or absence of lunules. If lunules were absent the louse was identified as *Lepeophtheirus spp.* The louse was identified as *Caligus clemensi* if lunules were present. Sea lice found on captured specimens have been assumed to be either *L. salmonis* or *C. clemensi* due to the lack of documented infestations of Pacific salmon by other species of sea lice (Jones and Nemec, 2004).

Following microscopic analysis, individual fish specimens were measured (fork length for salmonids, total length for non-salmonids) in millimetres and weighed to the nearest tenth of a gram. Lengths and weights were recorded on the data sheet with the specimen's corresponding sea lice analysis results. The fish were then returned to their respective individual bags and repackaged in the large re-sealable bags by site before being refrozen.

To allow for quality assurance of sea lice identification, all sea lice were placed in labelled vials and preserved in 70% isopropyl alcohol. Ten percent of the deloused fish specimens were randomly selected by specimen number and retained. Both the preserved lice and retained deloused fish specimens will be kept at the office of Mainstream Biological Consulting in Campbell River for five years.

2.4 Data Analysis

Surface, 1 m and 5 m depth water temperature, dissolved oxygen and salinity measured at each site was summarized to report the minimum and maximum values as well as the calculated averages for each sample week.

Beach seine fish sample composition was summarized by species and site for each week. The fork lengths and weights of the samples were summarized to present minimum and maximum values as well as averages. Sea lice infestation rates, including the overall number of infested fish and the number of sea lice identified, were determined for the sample population, and prevalence and abundance of sea lice were calculated. Prevalence was defined as the number of samples found to have one or more sea lice compared to the total number of samples examined, while abundance was defined as the total number of sea lice observed compared to the total number of samples examined. The intensity of sea lice infestation, as described by the number of sea lice found on a single sample was summarized. Average intensity was calculated by dividing the total number of sea lice identified by the number of infested samples.

Statistical analysis of the spatial and temporal distribution of sea lice was not conducted. Spatial and temporal analysis has been limited to the presentation and discussion of the number of sea lice found on samples collected from each site during each of the sampling events.

3.0 Results

The following sections outline the results of beach seine collection and inspection of juvenile salmonids from Clio Channel and Chatham Channel, BC in 2022. Water quality field data is presented in Appendix I, beach seine fish capture data is included in Appendix II and data on the juvenile salmon sample population including sea lice lab analysis results are located in Appendix III.

3.1 Water Quality Parameters

Water temperature and salinity taken at the surface, 1 m and 5 m during beach seining at each of the ten sites during the four sampling events are presented in Tables 2, 3 and 4 and the complete dataset is included in Appendix I.

Recorded surface water temperatures ranged from a low of 7.7 °C at Site 2 on April 1, 2022 and Site 7 on April 21, 2022, to a high of 9.4 °C at Site 2 on May 19, 2022 (Table 2; Appendix I). Calculated weekly average surface water temperatures were similar throughout the sampling period (Table 2).

Recorded surface water salinity ranged from a low of 27.9 ppt at Site 2 on May 19, 2022, to a high of 30.6 ppt at Site 9 on March 31, 2022 and May 19, 2022 (Table 2; Appendix I). The weekly average surface water salinity was relatively stable during sampling in 2022 ranging between 29.7 ppt and 30.4 ppt (Table 2).

Recorded surface water dissolved oxygen ranged from a low of 8.3 mg/L at Site 7 on April 21, 2022, to a high of 12.4 mg/L at Site 1 on April 20, 2022 (Table 2; Appendix I). The weekly average surface dissolved oxygen was stable during sampling in 2022 ranging between 9.8 mg/L and 10.3 mg/L (Table 2).

Water temperatures at 1 m depth ranged from a low of 7.7 °C recorded at Site 7 on April 21, 2022, to a high of 8.9 °C recorded at Site 4 and Site 6 on May 19, 2022 (Table 3; Appendix I). Calculated weekly average water temperatures at 1 m depth were similar throughout the sampling period and to the surface measurements (Table 3).

Recorded salinity at 1 m ranged from a low of 29.6 ppt at Site 3 on April 1, 2022, to a high of 30.6 ppt recorded six times throughout the sampling period (Table 3; Appendix I). The weekly average water salinity at 1 m depth was stable during sampling in 2022 ranging between 30.1 ppt and 30.4 ppt (Table 3).

Dissolved oxygen recorded at 1 m ranged from a low of 8.0 mg/L at Site 9 on March 31, 2022 to a high of 11.9 mg/L at Site 6 on March 31, 2022 (Table 3; Appendix I). The weekly average dissolved oxygen at 1 m depth was relatively stable during sampling in 2022 ranging between 9.5 mg/L and 10.8 mg/L (Table 3).

Recorded water temperatures at 5 m depth ranged from a low of 7.7 °C at Site 2 on April 20, 2022 and Site 7 on April 21, 2022, to a high of 8.8 °C at Site 8 on March 31, 2022 (Table 4; Appendix I). Calculated weekly average water temperatures at 5 m ranged from 7.9 °C to 8.4 °C throughout the sampling period (Table 4).

Recorded water salinity at 5 m depth ranged from a low of 29.9 ppt at Site 8 on March 31, 2022, to a high of 30.6 ppt at Site 1 on May 4, 2022 and Site 9 on May 3, 2022 (Table 4; Appendix I). The weekly average water salinity at 5 m was stable during sampling in 2022 ranging between 30.1 ppt and 30.5 ppt (Table 4).

Dissolved oxygen at the 5 m depth ranged from a low of 8.9 mg/L recorded at Site 2 on April 20, 2022, to a high of 11.9 mg/L recorded at Site 6 on March 31, 2022 (Table 4; Appendix I). The weekly average dissolved oxygen at 5 m depth during sampling in 2022 ranged between 9.5 mg/L and 10.9 mg/L (Table 4).

Table 2: Surface depth (0.2 m) water quality parameters collected in Clio Channel and Chatham Channel, BC beach seine sites in 2022.

Site	March 31/ April 1, 2022			April 20/21, 2022			May 3/4, 2022			May 19, 2022		
	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)
1	29.6	7.8	9.8	29.4	8.8	12.4	29.7	8.2	10.2	29.8	8.9	11.3
2	29.3	7.7	10.6	29.9	8.0	9.9	30.6	8.2	9.4	27.9	9.4	11.9
3	29.7	8.6	9.1	30.3	8.2	9.4	31.6	8.8	8.8	30.3	8.7	10.1
4	30.0	8.4	10.4	30.1	8.0	10.3	30.4	8.3	10.9	29.7	8.9	10.3
5	30.0	8.0	11.2	30.3	8.0	10.2	30.4	8.4	10.9	30.1	8.6	10.4
6	29.9	7.9	11.5	30.5	8.1	9.3	29.4	8.5	11.2	28.0	9.2	10.9
7	30.1	8.6	11.3	30.4	7.7	8.3	30.2	8.4	11.1	30.2	8.4	10.0
8	29.9	8.9	10.1	30.4	7.9	8.7	30.4	8.4	10.8	30.2	8.3	10.0
9	30.6	8.4	8.4	30.4	8.0	9.1	30.5	8.3	9.6	30.6	8.5	9.3
10	30.2	8.5	8.6	30.1	8.3	10.7	30.5	8.4	10.2	30.2	8.6	9.3
Average	29.9	8.3	10.1	30.2	8.1	9.8	30.4	8.4	10.3	29.7	8.8	10.3

Table 3: Water quality parameters collected at 1 m depth in Clio Channel and Chatham Channel, BC beach seine sites in 2022.

Site	March 31/ April 1, 2022			April 20/21, 2022			May 3/4, 2022			May 19, 2022		
	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)
1	30.1	7.9	10.3	-	-	-	30.6	8.2	10.4	30.3	8.6	10.1
2	30.1	7.8	10.9	30.3	7.8	9.2	30.6	8.2	9.9	29.8	8.8	10.7
3	29.6	8.6	9.1	-	-	-	-	-	-	30.3	8.6	10.0
4	30.1	8.4	10.5	30.2	8.0	10.1	30.5	8.3	11.1	30.1	8.9	10.3
5	30.2	7.9	10.8	30.3	7.9	9.8	30.4	8.4	11.1	30.2	8.5	10.1
6	30.0	7.8	11.9	-	-	-	29.9	8.5	11.3	30.1	8.9	10.8
7	30.0	8.5	11.3	30.5	7.7	8.5	30.3	8.4	11.2	30.2	8.4	10.0
8	29.9	8.8	11.2	30.4	7.9	8.8	30.3	8.5	11.0	30.3	8.3	9.9
9	30.6	8.4	8.0	30.4	8.0	9.2	30.6	8.3	10.6	30.6	8.5	9.2
10	30.6	8.4	8.6	30.1	8.3	10.7	-	-	-	30.4	8.6	9.3
Average	30.1	8.3	10.3	30.3	7.9	9.5	30.4	8.4	10.8	30.2	8.6	10.0

Table 4: Water quality parameters collected at 5 m depth in Clio Channel and Chatham Channel, BC beach seine sites in 2022.

Site	March 31/ April 1, 2022			April 20/21, 2022			May 3/4, 2022			May 19, 2022		
	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)	Salinity (ppt)	Temp. (°C)	DO (mg/L)
1	30.1	7.9	10.0	-	-	-	30.6	8.3	9.9	-	-	-
2	30.2	7.8	10.9	30.4	7.7	8.9	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	30.4	8.6	10.2
4	-	-	-	30.0	7.9	9.9	30.5	8.3	11.3	30.4	8.3	9.7
5	30.2	7.9	10.5	30.3	7.9	9.9	30.5	8.5	11.5	30.2	8.4	9.8
6	30.0	7.8	11.9	-	-	-	30.4	8.4	11.2	-	-	-
7	30.1	8.4	11.2	30.5	7.7	9.1	30.5	8.3	11.5	-	-	-
8	29.9	8.8	11.1	30.5	7.8	9.0	30.5	8.4	11.0	30.3	8.3	9.8
9	-	-	-	30.4	8.2	9.2	30.6	8.3	9.9	-	-	-
10	-	-	-	30.1	8.2	10.4	-	-	-	-	-	-
Average	30.1	8.1	10.9	30.3	7.9	9.5	30.5	8.4	10.9	30.3	8.4	9.9

3.2 Fish Sample Composition

A total of 156 fish were captured during 2022 beach seine sampling in Clio Channel and Chatham Channel with 122 individuals (78.2 %) retained for sea lice analysis (Table 5). Pink salmon were the most common species captured. A total of 107 pink salmon were captured, representing 68.6 % of the captured fish. Of the 107 captured pink salmon, 78 individuals (72.9 %) were retained and underwent lab analysis (Table 5). A total of 47 chum salmon were captured, representing 30.1 % of the captured fish; of these, a total of 43 individuals (91.5 %) were retained and analyzed in the lab. One coho salmon was captured and retained for lab analysis and a single threespine stickleback was captured and released during 2022 sampling. No other Pacific salmon species and no Atlantic salmon were captured during sampling events in 2022.

A summary of the total number of fish samples captured and collected at each site during the four sampling events can be found in Table 6. Total fish captured and collected at each site over the entire collection period can be found in Appendix II.

Table 5: The total of collected individuals of each fish species captured in Clio Channel and Chatham Channel, BC between March 31 and May 19, 2022, and the percentage of the total capture population that they represent.

Common Name	Capture Total (% of total capture population)	Collection Totals	Collection %
Chum salmon	47 (30.1 %)	43	91.5 %
Pink salmon	107 (68.6 %)	78	72.9 %
Coho salmon	1 (0.6 %)	1	100.0 %
Threespine Stickleback	1 (0.6 %)	0	0.0 %
Atlantic salmon	0 (0.0 %)	0	0.0 %
All species	156	122	78.2 %

Table 6: The number of captured fish (Capture Total) and the number of individual fish collected (Sample Total) from each of the ten sample sites in Clio Channel and Chatham Channel, BC in 2022.

Site	Chum		Pink		Coho		Threespine Stickleback		Capture Totals	Sample Totals
	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total		
1	2	2	0	0	0	0	0	0	2	2
2	2	2	1	1	0	0	0	0	3	3
3	1	1	12	12	0	0	0	0	13	13
4	0	0	0	0	1	1	0	0	1	1
5	2	2	0	0	0	0	0	0	2	2
6	3	3	44	30	0	0	0	0	47	33
7	33	29	46	31	0	0	1	0	80	60
8	1	1	3	3	0	0	0	0	4	4
9	0	0	0	0	0	0	0	0	0	0
10	3	3	1	1	0	0	0	0	4	4
Total	47	43	107	78	1	1	1	0	156	122

3.3 Fish Sample Size Statistics

Summary statistics for the sample populations of chum and pink salmon were completed for length (Table 7) and weight (Table 8). The single coho salmon retained for analysis was 104 mm long and weighted 14.7 g.

Chum Salmon

The length of the 43 chum smolts collected during the four sampling events in 2022 ranged from 30 mm to 45 mm and averaged 36 mm (SD = 3.5). The weight of chum salmon smolts collected in 2022 ranged from 0.1 g to 1.1 g and averaged 0.5 g (SD = 0.2). Chum salmon length data (Table 7) and weight data (Table 8) were summarized by sampling event.

Pink Salmon

The length of the 78 pink salmon smolts collected during the four sampling events in 2022 ranged from 29 mm to 46 mm and averaged 33 mm (SD = 3.3). The weight of pink salmon smolts collected in 2022 ranged from 0.2 g to 0.9 g and averaged 0.3 g (SD = 0.1). Pink salmon length data (Table 7) and weight data (Table 8) were summarized by sampling event.

Table 7: Average lengths of chum and pink salmon captured in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling event.

Species	Length (mm)			
	March 31/ April 1	April 20/21	May 3/4	May 19
Chum	35 (n=5)	36 (n=30)	39 (n=6)	43 (n=2)
Pink	32 (n=30)	34 (n=43)	39 (n=5)	- (n=0)

Table 8: Average weights of chum and pink salmon captured in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling event.

Species	Weight (g)			
	March 31/ April 1	April 20/21	May 3/4	May 19
Chum	0.3 (n=5)	0.4 (n=30)	0.6 (n=6)	1.0 (n=2)
Pink	0.2 (n=30)	0.3 (n=43)	0.6 (n=5)	- (n=0)

3.4 Sea Lice Infestation Rates

The results of the laboratory analysis for the presence of sea lice on the sample population collected in Clio Channel and Chatham Channel in 2022 are presented in Table 9. A complete dataset is included in Appendix III. A total of 122 samples were collected at ten sites and were inspected for sea lice infestation. A total of nine individuals in the sample population were found to be infested with 10 sea lice (Table 9). This data reflects the identification of sea lice of either species (*L. salmonis* and *C. clemensi*) on all retained species.

The sea lice prevalence in the sample population collected at the Clio Channel and Chatham Channel sites in 2022 was 7.4 % and the abundance was 0.08 (Table 9). Sea lice counts of both species observed (*L. salmonis* and *C. clemensi*) were added together for the prevalence and abundance calculations for the sample population.

The intensity of sea lice infestation, as defined as the number of sea lice on a single sample, ranged from no lice found on 113 individuals to a maximum of two lice found on one individual. The average intensity was 1.1 for the sample population collected in Clio Channel and Chatham Channel in 2022 (Table 9).

Table 9: Results of analysis for sea lice infestation on the sample population collected from Clio Channel and Chatham Channel, BC beach seine sites in 2022.

Species	Sample size (n)	Total number of lice observed	Total number of fish infested	Prevalence (%)	Abundance	Average Intensity
Chum	43	3	3	7.0	0.07	1.0
Pink	78	6	5	6.4	0.08	1.2
Coho	1	1	1	100	1.00	1.0
Total	122	10	9	7.4	0.08	1.1

Infestation Rates on Coho Salmon

A single coho salmon was captured at Site 4 on May 3, 2022 and was retained for lab analysis. The coho was infested with a single chalimus stage *C. clemensi* sea louse.

Infestation Rates on Chum Salmon

The results of the laboratory analysis for sea lice infestation on the chum salmon sample population are presented by site in Table 10 and Table 11. A total of three chum salmon were found to be infested with three sea lice. The largest number of chum salmon samples infested with sea lice (3 chum) were collected at Site 7 and the greatest number of sea lice per site (3 lice) were also on samples collected at Site 7 (Table 10). No chum salmon samples were captured at Sites 4 and 9. Chum salmon samples were retained during each sampling period.

Sea lice counts of both sea lice species observed (*L. salmonis* and *C. clemensi*) were added together for the presentation of sea lice infestation by site (Table 10) as well as for the calculation of sea lice prevalence, abundance and intensity by site for the chum salmon sample population (Table 11).

A total of three chum salmon were found to be infested with at least one sea louse. The prevalence of sea lice on the chum salmon sample population (n=43) collected from Clio Channel and Chatham Channel in 2022 was 7.0 %. Sea lice prevalence calculated by site for

chum salmon is presented in Table 11. Infested chum salmon were only captured at Site 7. The highest sea lice prevalence (10.3 %) was therefore at Site 7 on April 21, 2022. Sea lice prevalence calculated by site for the total chum sample population was 0 % with the exception of Site 7 (Table 11). Sea lice prevalence summarized by sample week was highest on 30 chum salmon collected on April 20 and April 21, 2022 (10.0 %).

A total of three sea lice were identified during laboratory analysis of retained chum salmon. The abundance of sea lice on the chum salmon sample population (n=43) collected from Clio Channel and Chatham Channel in 2022 was 0.07 (Table 11). Sea lice abundance was calculated by week and by site and is presented in Table 11. The highest sea lice abundance (0.10) was at Site 7 on April 21, 2022. Sea lice abundance calculated by site for the total chum sample population was 0.00, with the exception of Site 7.

The average intensity for the chum salmon sample population in Clio Channel and Chatham Channel in 2022 was 1.0. The highest sea lice intensity (1.0) was at Site 7 on April 21, 2022. Sea lice intensity calculated by site for the total chum sample population was 0.0 except for Site 7.

The percentage of the chum salmon sample population with the number of sea lice per sample was graphed and is presented in Figure 3. As shown in this graph, 93.0 % of the chum sample population were not infested with sea lice. The remaining 7.0 % of the chum salmon sample population were infested with one louse.

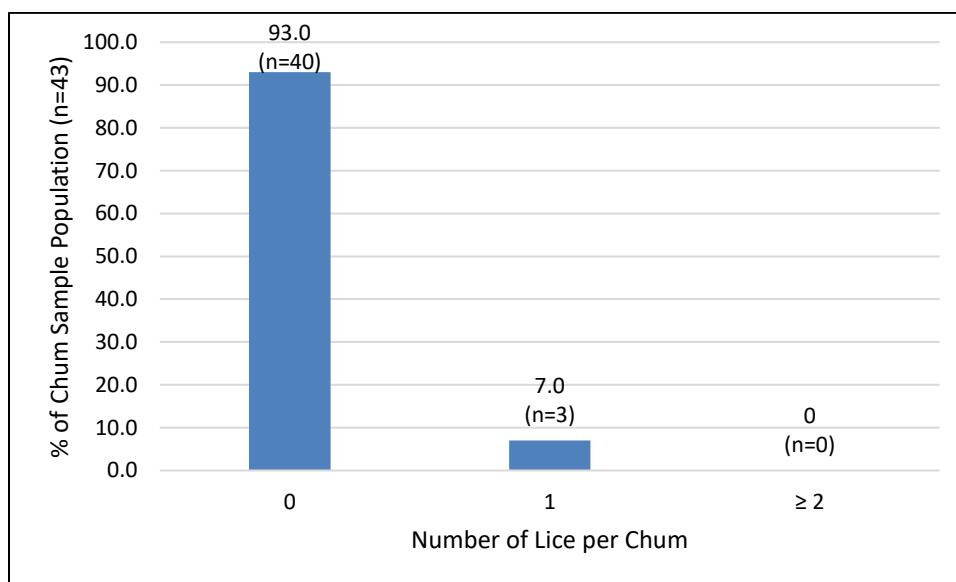


Figure 3: The number of sea lice per chum salmon specimen graphed as a percentage of the total chum sample population collected in Clio Channel and Chatham Channel in 2022.

Table 10: Total number of sea lice on chum salmon collected in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling site.

Site	Sample Week												TOTAL		
	March 31/ April 1			April 20/21			May 3/4			May 19					
	# of Chum Analyzed	# of Infested Chum	# of Lice	# of Chum Analyzed	# of Infested Chum	# of Lice	# of Chum Analyzed	# of Infested Chum	# of Lice	# of Chum Analyzed	# of Infested Chum	# of Lice	# of Chum Analyzed	# of Infested Chum	# of Lice
1	0	-	-	0	-	-	1	0	0	1	0	0	2	0	0
2	0	-	-	0	-	-	2	0	0	0	-	-	2	0	0
3	0	-	-	1	0	0	0	-	-	0	-	-	1	0	0
4	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
5	2	0	0	0	-	-	0	-	-	0	-	-	2	0	0
6	3	0	0	0	-	-	0	-	-	0	-	-	3	0	0
7	0	-	-	29	3	3	0	-	-	0	-	-	29	3	3
8	0	-	-	0	-	-	1	0	0	0	-	-	1	0	0
9	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
10	0	-	-	0	-	-	2	0	0	1	0	0	3	0	0
TOTAL	5	0	0	30	3	3	6	0	0	2	0	0	43	3	3

Table 11: The calculated sea lice prevalence, abundance and intensity by site and week as determine for chum salmon collected in Clio Channel and Chatham Channel, BC in 2022.

Site	Sample Week												TOTAL		
	March 31/ April 1			April 20/21			May 3/4			May 19					
	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity
1	-	-	-	-	-	-	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0
2	-	-	-	-	-	-	0.0	0.00	0.0	-	-	-	0.0	0.00	0.0
3	-	-	-	0.0	0.00	0.0	-	-	-	-	-	-	0.0	0.00	0.0
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	0.0	0.00	0.0	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0
6	0.0	0.00	0.0	-	-	-	-	-	-	-	-	-	0.0	0.00	0.0
7	-	-	-	10.3	0.10	1.0	-	-	-	-	-	-	10.3	0.10	1.0
8	-	-	-	-	-	-	0.0	0.00	0.0	-	-	-	0.0	0.00	0.0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.0
TOTAL	0.0	0.00	0.0	10.0	0.10	1.0	0.0	0.00	0.0	0.0	0.00	0.0	7.0	0.07	1.0

Infestation Rates on Pink Salmon

The results of the laboratory analysis for sea lice infestation on the pink salmon sample population are presented by site in Table 12. A total of five pink salmon were found to be infested with six sea lice. The largest number of pink salmon infested with sea lice (3 pink) and the greatest number of sea lice (4 lice) were on samples collected at Site 3. No pink salmon were captured at Site 1, 4, 5 and 9 (Table 12). No pink salmon were captured during the May 19, 2022 sampling period.

Sea lice counts of both sea lice species observed (*L. salmonis* and *C. clemensi*) were added together for the presentation of sea lice infestation by site (Table 12) as well as for the calculation of sea lice prevalence and abundance by site for the pink salmon sample population (Table 13).

A total of five pink salmon were found to be infested with at least one sea louse. The prevalence of sea lice on the pink salmon sample population (n=78) collected from Clio Channel and Chatham Channel in 2022 was 6.4 %. Sea lice prevalence calculated by site for pink salmon is presented in Table 13. The highest sea lice prevalence (25.0 %) was at Site 3 on April 20, 2022. Sea lice prevalence calculated by site for the total pink sample population was 0.0 % at all sites where pink salmon were captured except, Site 3 (25.0 %) and Site 6 (6.7 %) (Table 13). Sea lice prevalence summarized by sample week was highest on pink salmon collected on April 20/21, 2022 (7.0 %).

A total of six sea lice were identified during laboratory analysis of retained pink salmon. The abundance of sea lice on the pink salmon sample population (n=78) collected from Clio Channel and Chatham Channel in 2022 was 0.08. The highest sea lice abundance (0.33) was at Site 3 on April 20, 2022 (Table 13). Sea lice abundance calculated by site for the total pink sample population was generally 0.00 with an abundance of 0.33 at Site 3 and 0.07 at Site 6. Sea lice abundance summarized by sample week was highest on pink salmon collected on April 20/21 (0.09).

The average intensity for the pink salmon sample population in Clio Channel and Chatham Channel in 2022 was 1.2. The highest sea lice intensity (1.3) was at Site 3 on April 20, 2022 (Table 13). Sea lice intensity calculated by site for the total pink sample population was 0.0 except for Site 3 (1.3) and Site 6 (1.0). Sea lice intensity summarized by sample week was highest on pink salmon collected on April 20 and 21, 2022 (1.3).

The percentage of the pink salmon sample population with the number of sea lice per sample was graphed and is presented in Figure 4. As shown in this graph, 93.6 % of the pink sample population were not infested with sea lice. A total of 5.1 % of the pink salmon sample population were infested with one louse and 1.3 % were infested with two sea lice. No pink salmon samples were infested with more than two lice.

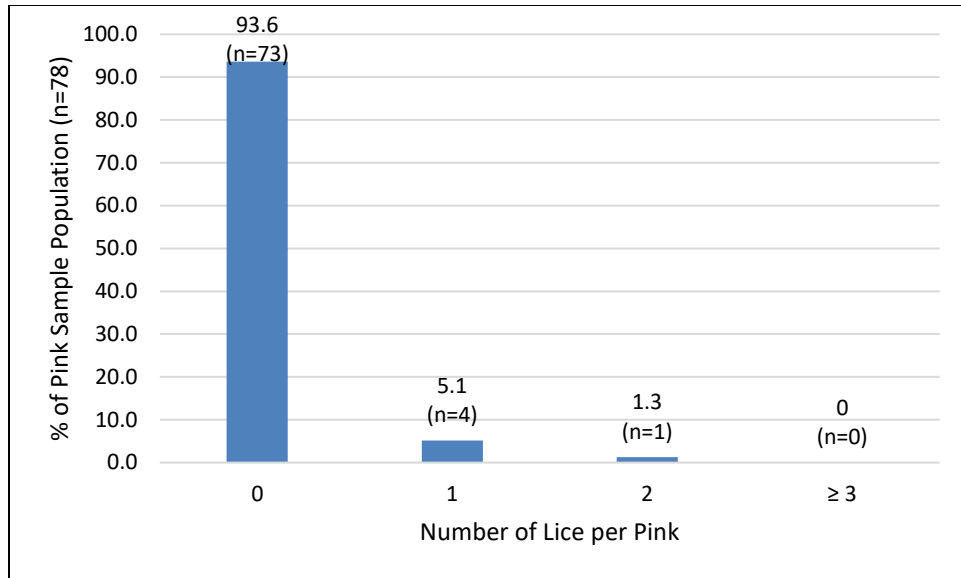


Figure 4: The number of sea lice per pink salmon specimen graphed as a percentage of the total pink sample population collected in Clio Channel and Chatham Channel in 2022.

Table 12: Total number of sea lice on pink salmon collected in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling site.

Site	Sample Week												TOTAL		
	March 31/ April 1			April 20/21			May 3/4			May 19					
	# of Pink Analyzed	# of Infested Pink	# of Lice	# of Pink Analyzed	# of Infested Pink	# of Lice	# of Pink Analyzed	# of Infested Pink	# of Lice	# of Pink Analyzed	# of Infested Pink	# of Lice	# of Pink Analyzed	# of Infested Pink	# of Lice
1	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
2	0	-	-	0	-	-	1	0	0	0	-	-	1	0	0
3	0	-	-	12	3	4	0	-	-	0	-	-	12	3	4
4	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
5	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
6	30	2	2	0	-	-	0	-	-	0	-	-	30	2	2
7	0	-	-	31	0	0	0	-	-	0	-	-	31	0	0
8	0	-	-	0	-	-	3	0	0	0	-	-	3	0	0
9	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
10	0	-	-	0	-	-	1	0	0	0	-	-	1	0	0
TOTAL	30	2	2	43	3	4	5	0	0	0	-	-	78	5	6

Table 13: The calculated sea lice prevalence, abundance and intensity by site and week as determine for pink salmon collected in Clio Channel and Chatham Channel, BC in 2022.

Site	Sample Week												TOTAL		
	March 31/ April 1			April 20/21			May 3/4			May 19					
	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity	Sea Lice Prevalence (%)	Sea Lice Abundance	Sea Lice Intensity
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	0.0	0.00	0.0	-	-	-	0.0	0.00	0.0
3	-	-	-	25.0	0.33	1.3	-	-	-	-	-	-	25.0	0.33	1.3
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	6.7	0.07	1.0	-	-	-	-	-	-	-	-	-	6.7	0.07	1.0
7	-	-	-	0.0	0.00	0.0	-	-	-	-	-	-	0.0	0.00	0.0
8	-	-	-	-	-	-	0.0	0.00	0.0	-	-	-	0.0	0.00	0.0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	0.0	0.00	0.0	-	-	-	0.0	0.00	0.0
TOTAL	6.7	0.07	1.0	7.0	0.09	1.3	0.0	0.00	0.0	-	-	-	6.4	0.08	1.2

3.5 Infestation by Sea Lice Species

A total of nine *Lepeophtheirus salmonis* sea lice of various life stages were identified on eight samples (chum and pink salmon) and one chalimus stage *Caligus clemensi* was identified on the coho salmon sample (Appendix III).

Infestation by Life Stage on Chum Salmon

A total of three *Lepeophtheirus salmonis* sea lice of various life stages were identified on 3 chum salmon (Appendix III).

An analysis of the species of sea lice identified on the three infested chum salmon collected from Clio Channel and Chatham Channel is presented in Table 14. The sea lice species identified on chum salmon are presented by site in Table 15.

Table 14: The number of *Lepeophtheirus salmonis* and *Caligus clemensi* in each life stage identified on the chum salmon sample population from Clio Channel and Chatham Channel, BC in 2022. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage ¹	March 31/ April 1	April 20/21	May 3/4	May 19
LEP Co	0	3	0	0
LEP C1	0	0	0	0
LEP C2	0	0	0	0
LEP PAM	0	0	0	0
LEP PAF	0	0	0	0
LEP AM	0	0	0	0
LEP AF	0	0	0	0
TOTAL LEP	0	3	0	0
CAL Co	0	0	0	0
CAL C1	0	0	0	0
CAL C2	0	0	0	0
CAL C3	0	0	0	0
CAL C4	0	0	0	0
CAL PAM	0	0	0	0
CAL PAF	0	0	0	0
CAL AM	0	0	0	0
CAL AF	0	0	0	0
TOTAL CAL	0	0	0	0

¹ Lice life stage codes: Co = copepodid, C1-4 = chalimus 1-4, PAM = pre-adult male, PAF = pre-adult female, AM = adult male, AF = adult female.

Table 15: The number of sea lice found on chum salmon collected in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling site and lice species. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	Sample Week																TOTAL		
	March 31/ April 1				April 20/21				May 3/4				May 19						
	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of Lice
1	0	-	-	-	0	-	-	-	1	0	0	0	1	0	0	0	2	0	0
2	0	-	-	-	0	-	-	-	2	0	0	0	0	-	-	-	2	0	0
3	0	-	-	-	1	0	0	0	0	-	-	-	0	-	-	-	1	0	0
4	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
5	2	0	0	0	0	-	-	-	0	-	-	-	0	-	-	-	2	0	0
6	3	0	0	0	0	-	-	-	0	-	-	-	0	-	-	-	3	0	0
7	0	-	-	-	29	3	3	0	0	-	-	-	0	-	-	-	29	3	3
8	0	-	-	-	0	-	-	-	1	0	0	0	0	-	-	-	1	0	0
9	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
10	0	-	-	-	0	-	-	-	2	0	0	0	1	0	0	0	3	0	0
TOTAL	5	0	0	0	30	3	3	0	6	0	0	0	2	0	0	0	43	3	3

Infestation by Life Stage on Pink Salmon

A total of six *Lepeophtheirus salmonis* sea lice of various life stages were identified on five pink salmon (Appendix III).

An analysis of the species of sea lice identified on the five infested pink salmon collected from Clio Channel and Chatham Channel in 2022 is presented in Table 16. The sea lice species identified on pink salmon are also presented by site in Table 17.

Table 16: The number of *Lepeophtheirus salmonis* and *Caligus clemensi* in each life stage identified on the pink salmon sample population from Clio Channel and Chatham Channel, BC in 2022. LEP = *Lepeophtheirus salmonis* CAL= *Caligus clemensi*

Life Stage¹	March 31/ April 1	April 20/21	May 3/4	May 19
LEP Co	2	3	0	0
LEP C1	0	1	0	0
LEP C2	0	0	0	0
LEP PAM	0	0	0	0
LEP PAF	0	0	0	0
LEP AM	0	0	0	0
LEP AF	0	0	0	0
TOTAL LEP	2	4	0	0
CAL Co	0	0	0	0
CAL C1	0	0	0	0
CAL C2	0	0	0	0
CAL C3	0	0	0	0
CAL C4	0	0	0	0
CAL PAM	0	0	0	0
CAL PAF	0	0	0	0
CAL AM	0	0	0	0
CAL AF	0	0	0	0
TOTAL CAL	0	0	0	0

¹ Lice life stage codes: Co = copepodid, C1-4 = chalimus 1-4, PAM = pre-adult male, PAF = pre-adult female, AM = adult male, AF = adult female.

Table 17: The number of sea lice found on pink salmon collected in Clio Channel and Chatham Channel, BC in 2022 summarized by sampling site and lice species. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	Sample Week																TOTAL		
	March 31/ April 1				April 20/21				May 3/4				May 19				# of Pink Analyzed	# of Infested Pink	# of Lice
	# of Pink Analyzed	# of Infested Pink	# of LEP	# of CAL	# of Pink Analyzed	# of Infested Pink	# of LEP	# of CAL	# of Pink Analyzed	# of Infested Pink	# of LEP	# of CAL	# of Pink Analyzed	# of Infested Pink	# of LEP	# of CAL			
1	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
2	0	-	-	-	0	-	-	-	1	0	0	0	0	-	-	-	1	0	0
3	0	-	-	-	12	3	4	0	0	-	-	-	0	-	-	-	12	3	4
4	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
5	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
6	30	2	2	0	0	-	-	-	0	-	-	-	0	-	-	-	30	2	2
7	0	-	-	-	31	0	0	0	0	-	-	-	0	-	-	-	31	0	0
8	0	-	-	-	0	-	-	-	3	0	0	0	0	-	-	-	3	0	0
9	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-
10	0	-	-	-	0	-	-	-	1	0	0	0	0	-	-	-	1	0	0
TOTAL	30	2	2	0	43	3	4	0	5	0	0	0	0	-	-	-	78	5	6

4.0 Conclusions

This report presents the data from the fourth year of beach seining and sea lice analysis conducted for wild juvenile salmonid monitoring in Clio Channel and Chatham Channel, BC by Grieg Seafood BC Ltd. Reporting is limited to the summary and presentation of the 2022 collected data.

A total of 122 fish samples underwent lab analysis for sea lice infestation in 2022 including 43 chum salmon, 78 pink salmon and one coho salmon. A total of nine individuals were found to be infested with sea lice in the total sample population, resulting in a calculated sea lice prevalence of 7.4 % in 2022. A total of 10 sea lice were found during laboratory analysis resulting in an abundance of 0.08 and an average intensity of 1.1 for the sample population.

Chum salmon, pink salmon and coho salmon smolts were the only salmonids retained during 2022 sampling. A total of 47 chum salmon were captured, representing 30.1 % of all captured fish samples. Of the 47 chum salmon captured, 43 were retained for lab analysis. A total of 3 chum smolts were found to be infested with a total of three *Lepeophtheirus salmonis* lice of various life stages and no *Caligus clemensi* resulting in a calculated prevalence of 7.0 %, abundance of 0.07 and an average intensity of 1.0 for the chum salmon sample population.

Pink salmon were the most abundant species captured during the 2022 sampling. A total of 107 pink salmon were captured, representing 68.6 % of the capture total. Of the 107 pink salmon captured, 78 were retained for lab analysis for sea lice infestation. A total of five pink salmon smolts were infested with six *Lepeophtheirus salmonis* lice of various life stages and no *Caligus clemensi* resulting in a calculated prevalence of 6.4 %, abundance of 0.08 and an average intensity of 1.2 for the pink salmon sample population.

A single coho salmon was captured and retained for analysis. The coho was infested with a single *Caligus clemensi* sea louse.

A comparison of the prevalence and abundance of sea lice species found on juvenile salmon was completed for sample data from 2019 to 2022 collected in Clio Channel and Chatham Channel, BC. This data is presented in a summary table in Appendix IV.

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Appendix I – Field Data

Date	Time	Site Name	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)
			0.2m	0.2m	0.2m	1.0m	1.0m	1.0m	5.0m	5.0m	5.0m
1-Apr-22	8:56	1	29.6	7.8	9.8	30.1	7.9	10.3	30.1	7.9	10.0
1-Apr-22	8:37	2	29.3	7.7	10.6	30.1	7.8	10.9	30.2	7.8	10.9
1-Apr-22	8:05	3	29.7	8.6	9.1	29.6	8.6	9.1	-	-	-
1-Apr-22	16:40	4	30.0	8.4	10.4	30.1	8.4	10.5	-	-	-
1-Apr-22	7:40	5	30.0	8.0	11.2	30.2	7.9	10.8	30.2	7.9	10.5
31-Mar-22	16:11	6	29.9	7.9	11.5	30.0	7.8	11.9	30.0	7.8	11.9
31-Mar-22	15:45	7	30.1	8.6	11.3	30.0	8.5	11.3	30.1	8.4	11.2
31-Mar-22	15:30	8	29.9	8.9	10.1	29.9	8.8	11.2	29.9	8.8	11.1
31-Mar-22	14:14	9	30.6	8.4	8.4	30.6	8.4	8.0	-	-	-
31-Mar-22	14:26	10	30.2	8.5	8.6	30.6	8.4	8.6	-	-	-
20-Apr-22	11:25	1	29.4	8.8	12.4	-	-	-	-	-	-
20-Apr-22	11:51	2	29.9	8.0	9.9	30.3	7.8	9.2	30.4	7.7	8.9
20-Apr-22	12:16	3	30.3	8.2	9.4	-	-	-	-	-	-
20-Apr-22	12:55	4	30.1	8.0	10.3	30.2	8.0	10.1	30.0	7.9	9.9
20-Apr-22	12:40	5	30.3	8.0	10.2	30.3	7.9	9.8	30.3	7.9	9.9
20-Apr-22	8:15	6	30.5	8.1	9.3	-	-	-	-	-	-
21-Apr-22	7:43	7	30.4	7.7	8.3	30.5	7.7	8.5	30.5	7.7	9.1
21-Apr-22	7:26	8	30.4	7.9	8.7	30.4	7.9	8.8	30.5	7.8	9.0
21-Apr-22	13:35	9	30.4	8.0	9.1	30.4	8.0	9.2	30.4	8.2	9.2
20-Apr-22	15:55	10	30.1	8.3	10.7	30.1	8.3	10.7	30.1	8.2	10.4
4-May-22	6:45	1	29.7	8.2	10.2	30.6	8.2	10.4	30.6	8.3	9.9
4-May-22	7:00	2	30.6	8.2	9.4	30.6	8.2	9.9	-	-	-
4-May-22	7:29	3	31.6	8.8	8.8	-	-	-	-	-	-
3-May-22	15:33	4	30.4	8.3	10.9	30.5	8.3	11.1	30.5	8.3	11.3
3-May-22	15:17	5	30.4	8.4	10.9	30.4	8.4	11.1	30.5	8.5	11.5
3-May-22	15:05	6	29.4	8.5	11.2	29.9	8.5	11.3	30.4	8.4	11.2
3-May-22	14:45	7	30.2	8.4	11.1	30.3	8.4	11.2	30.5	8.3	11.5
3-May-22	14:28	8	30.4	8.4	10.8	30.3	8.5	11.0	30.5	8.4	11.0

Date	Time	Site Name	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)	Salinity (ppt)	Temperature (deg C.)	Dissolved Oxygen (mg/L)
			0.2m	0.2m	0.2m	1.0m	1.0m	1.0m	5.0m	5.0m	5.0m
3-May-22	10:59	9	30.5	8.3	9.6	30.6	8.3	10.6	30.6	8.3	9.9
3-May-22	13:34	10	30.5	8.4	10.2	-	-	-	-	-	-
19-May-22	10:44	1	29.8	8.9	11.3	30.3	8.6	10.1	-	-	-
19-May-22	11:08	2	27.9	9.4	11.9	29.8	8.8	10.7	-	-	-
19-May-22	11:30	3	30.3	8.7	10.1	30.3	8.6	10.0	30.4	8.6	10.2
19-May-22	12:11	4	29.7	8.9	10.3	30.1	8.9	10.3	30.4	8.3	9.7
19-May-22	11:51	5	30.1	8.6	10.4	30.2	8.5	10.1	30.2	8.4	9.8
19-May-22	16:08	6	28.0	9.2	10.9	30.1	8.9	10.8	-	-	-
19-May-22	15:52	7	30.2	8.4	10.0	30.2	8.4	10.0	-	-	-
19-May-22	15:39	8	30.2	8.3	10.0	30.3	8.3	9.9	30.3	8.3	9.8
19-May-22	12:43	9	30.6	8.5	9.3	30.6	8.5	9.2	-	-	-
19-May-22	14:46	10	30.2	8.6	9.3	30.4	8.6	9.3	-	-	10.0

Appendix II – Capture and Collection Sample Totals

Date	Time	Site Name	Weather Comments	Tide Stage	Pink Captured	Pink Retained	Chum Captured	Chum Retained	Coho Captured	Coho Retained	Stickleback Captured	Stickleback Retained	Salmonid Mortalities	Comments
1-Apr-22	8:56	1	Calm	Low	0	0	0	0	0	0	0	0	0	2 flat fish
1-Apr-22	8:37	2	Calm	Low	0	0	0	0	0	0	0	0	0	1 juvenile lingcod, 2 pipefish and 1 flat fish
1-Apr-22	8:05	3	Calm	Low	0	0	0	0	0	0	0	0	0	750 shiner perch, 3 flat fish and 12 pipefish
1-Apr-22	16:40	4	Calm	High	0	0	0	0	0	0	0	0	0	
1-Apr-22	7:40	5	Calm	Low	0	0	2	2	0	0	0	0	0	
31-Mar-22	16:11	6	Calm	High	44	30	3	3	0	0	0	0	0	1 sculpin
31-Mar-22	15:45	7	Calm	High	0	0	0	0	0	0	0	0	0	1 juvenile steelhead
31-Mar-22	15:30	8	Calm	High	0	0	0	0	0	0	0	0	0	
31-Mar-22	14:14	9	Calm	High	0	0	0	0	0	0	0	0	0	Good set
31-Mar-22	14:26	10	Calm	High	0	0	0	0	0	0	0	0	0	Set on shell beach
20-Apr-22	11:25	1	Overcast, windy	Low	0	0	0	0	0	0	0	0	0	1 shiner perch, 1 starry flounder, 1 tubesnout, 1 pipefish, 1 hooded nudibranch
20-Apr-22	11:51	2	Overcast, windy	Low	0	0	0	0	0	0	0	0	0	1 pipefish, abundant hooded nudibranch
20-Apr-22	12:16	3	Overcast	Low	12	12	1	1	0	0	0	0	0	12 flatfish, 20 sculpin, abundant hooded nudibranch, juvenile greenling, gunnels
20-Apr-22	12:55	4	Overcast, windy	Low	0	0	0	0	0	0	0	0	0	
20-Apr-22	12:40	5	Overcast, windy	Low	0	0	0	0	0	0	0	0	0	1 white spotted greenling, 1 shiner perch
20-Apr-22	8:15	6	Calm, overcast	Mid	0	0	0	0	0	0	0	0	0	
21-Apr-22	7:43	7	Calm, overcast	Mid	46	31	33	29	0	0	0	0	0	
21-Apr-22	7:26	8	Calm, overcast	Mid	0	0	0	0	0	0	0	0	0	
21-Apr-22	13:35	9	Overcast, windy	Mid	0	0	0	0	0	0	0	0	0	1 sculpin, 1 gunnel
20-Apr-22	15:55	10	Overcast	Mid	0	0	0	0	0	0	0	0	0	
4-May-22	6:45	1	Calm, Overcast	High	0	0	1	1	0	0	0	0	0	sculpins, 1 starry flounder, 2 pipefish
4-May-22	7:00	2	Calm, Overcast	High	1	1	2	2	0	0	0	0	0	sculpins, pipefish, juvenile lingcod, 1 shiner perch
4-May-22	7:29	3	Calm, Overcast	High	0	0	0	0	0	0	0	0	0	1 hooded nudibranch, sandlances
3-May-22	15:33	4	Calm, rain	High	0	0	0	0	1	1	0	0	0	
3-May-22	15:17	5	Calm, rain	High	0	0	0	0	0	0	0	0	0	1 juvenile greenling
3-May-22	15:05	6	Calm, rain	Mid	0	0	0	0	0	0	0	0	0	1 sculpin
3-May-22	14:45	7	Calm, rain	Mid	0	0	0	0	0	0	0	0	0	
3-May-22	14:28	8	Calm, rain	Mid	3	3	1	1	0	0	0	0	0	
3-May-22	10:59	9	Calm, rain	Low	0	0	0	0	0	0	0	0	0	gunnels, 2 kelp greenlings
3-May-22	13:34	10	Calm, light rain	Low	1	1	2	2	0	0	0	0	0	
19-May-22	10:44	1	Overcast, calm	Low	0	0	1	1	0	0	0	0	0	1 Dolly Varden, abundant seaweed, hooded nudibranch, flounder, pipefish, gunnels
19-May-22	11:08	2	Light wind, overcast	Low	0	0	0	0	0	0	0	0	0	4 shiner perch, 3 kelp perch, gunnels, 3 sea cucumbers
19-May-22	11:30	3	Light wind, overcast	Low	0	0	0	0	0	0	0	0	0	sea cucumber, 1 staghorn, 1 buffalo sculpin, gunnels
19-May-22	12:11	4	Calm, overcast	Low	0	0	0	0	0	0	0	0	0	
19-May-22	11:51	5	Calm, overcast	Low	0	0	0	0	0	0	0	0	0	10 gunnels, 5 sculpins

Date	Time	Site Name	Weather Comments	Tide Stage	Pink Captured	Pink Retained	Chum Captured	Chum Retained	Coho Captured	Coho Retained	Stickleback Captured	Stickleback Retained	Salmonid Mortalities	Comments
19-May-22	16:08	6	Waves, overcast	High	0	0	0	0	0	0	0	0	0	
19-May-22	15:52	7	Wind, overcast	Mid	0	0	0	0	0	0	1	0	0	
19-May-22	15:39	8	Light wind, overcast	Mid	0	0	0	0	0	0	0	0	0	12 stickleback
19-May-22	12:43	9	Overcast, calm	Low	0	0	0	0	0	0	0	0	0	
19-May-22	14:46	10	Overcast, calm	Low	0	0	1	1	0	0	0	0	0	1 flounder

Appendix III – Sea Lice Analysis Data

SITE	DATE COLLECTED	FISH SPECIES	LENGTH IN MM	WEIGHT IN G	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	CAL Co	CAL C1	CAL C2	CAL C3	CAL C4	CAL PAM	CAL PAF	CAL AM	CAL AF	TOT LICE ID	TOT LEP	TOT CAL
6	31-Mar-22	Pink	33	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	34	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	29	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	31	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
6	31-Mar-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	30	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
6	31-Mar-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	29	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	37	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	33	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	36	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Chum	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Chum	37	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	31-Mar-22	Chum	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	01-Apr-22	Chum	34	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	01-Apr-22	Chum	39	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Chum	43	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	40	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	38	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	DATE COLLECTED	FISH SPECIES	LENGTH IN MM	WEIGHT IN G	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	CAL Co	CAL C1	CAL C2	CAL C3	CAL C4	CAL PAM	CAL PAF	CAL AM	CAL AF	TOT LICE ID	TOT LEP	TOT CAL
3	20-Apr-22	Pink	38	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	38	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	34	0.4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
3	20-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	37	0.5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
3	20-Apr-22	Pink	38	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20-Apr-22	Pink	35	0.4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
7	21-Apr-22	Chum	35	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	36	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	30	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	37	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	36	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	36	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	39	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	34	0.4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7	21-Apr-22	Chum	36	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	39	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	34	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	37	0.4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7	21-Apr-22	Chum	38	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	45	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	36	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Chum	35	0.3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7	21-Apr-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	DATE COLLECTED	FISH SPECIES	LENGTH IN MM	WEIGHT IN G	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	CAL Co	CAL C1	CAL C2	CAL C3	CAL C4	CAL PAM	CAL PAF	CAL AM	CAL AF	TOT LICE ID	TOT LEP	TOT CAL
7	21-Apr-22	Pink	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	40	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	29	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	29	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	37	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	31	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	35	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	34	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	32	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	38	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	31	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	21-Apr-22	Pink	30	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	03-May-22	Coho	104	14.7	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
8	03-May-22	Chum	37	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	03-May-22	Pink	33	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	03-May-22	Pink	44	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	03-May-22	Pink	46	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	03-May-22	Chum	40	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	03-May-22	Chum	37	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	03-May-22	Pink	32	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	04-May-22	Chum	35	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	04-May-22	Chum	44	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	04-May-22	Chum	41	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	04-May-22	Pink	40	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	DATE COLLECTED	FISH SPECIES	LENGTH IN MM	WEIGHT IN G	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	CAL Co	CAL C1	CAL C2	CAL C3	CAL C4	CAL PAM	CAL PAF	CAL AM	CAL AF	TOT LICE ID	TOT LEP	TOT CAL
1	19-May-22	Chum	43	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	19-May-22	Chum	43	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix IV – Historical Comparison (2019-2022)

A comparison of the historical results of analysis for sea lice infestation on all retained juvenile salmon collected by beach seine in Clio Channel and Chatham Channel, BC from 2019 to 2022.

Year	Sample size	Total # of fish infested	Total # of lice observed	Prevalence (%)	Abundance	Average Intensity
2019	76	29	97	38.2	1.28	3.3
2020	263	41	48	15.6	0.18	1.2
2021	357	124	216	34.7	0.61	1.7
2022	122	9	10	7.4	0.08	1.1
Total	818	203	371	24.8	0.45	1.8