Wild Juvenile Salmonid Monitoring Program 2021
Broughton Archipelago, BC

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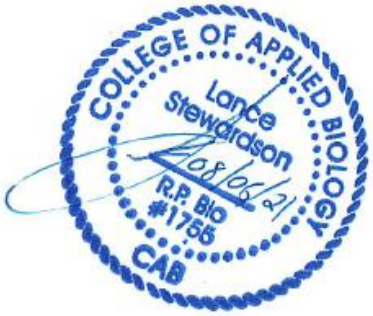

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Summary

Beach seine sampling was conducted on behalf of MOWI Canada West and Cermaq Canada in the Broughton Archipelago, BC in 2021. Sampling was completed to monitor sea lice abundance, prevalence and intensity on juvenile wild salmon within the Broughton Archipelago in support of the Aquaculture Stewardship Council process for finfish aquaculture sites in the area.

Sampling was conducted during two separate sampling events in April and May of 2021, selected to roughly coincide with the estimated peak outmigration period of juvenile salmonids. A total of 45 sites were selected for sampling in 2021.

Fifteen individuals from each target fish species or the total number of captured individuals from each target species (if less than 15 were captured) were collected from each of the sites during the sampling events. Total catch numbers of each species were recorded. Surface water temperature and salinity were recorded at each site during each sampling event.

Collected sample fish were frozen and delivered to the Center for Aquatic Health Sciences (CAHS) for laboratory analysis. Sea lice infestation data was tabulated by CAHS and provided to Mainstream Biological Consulting for reporting. Sea lice observed on the individual fish specimens during laboratory analysis were identified as either *Lepeophtheirus spp.* or *Caligus sp*. 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 salmon collected in the Broughton Archipelago in 2021. A total of 558 individual samples underwent lab analysis for sea lice infestation including 249 chum salmon (*Oncorhynchus keta*) and 309 pink salmon (*Oncorhynchus gorbuscha*). No chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*Oncorhynchus nerka*), Atlantic salmon (*Salmo salar*) or threespine stickleback (*Gasterosteus aculeatus*) were captured during sampling in 2021. A total of 159 coho salmon (*Oncorhynchus kisutch*) were captured during the sampling but none were retained for analysis.

From the total sample population 135 individuals were infested with 196 sea lice. The calculated sea lice prevalence for the total sample population was 24.2 %, average intensity was 1.5 and the sea lice abundance was 0.35 for the sample population collected in the Broughton Archipelago in 2021.

A total of 1928 chum salmon were captured, representing 56.0 % of all captured samples. Of the 1928 chum captured, 249 were kept for lab analysis for sea lice infestation. A total of 64 chum smolts were found to be infested with 100 lice resulting in a calculated sea lice prevalence of 25.7 %, an average intensity of 1.6 and an abundance of 0.40 for the chum salmon sample population.

A total of 1514 pink salmon were captured, representing 44.0 % of all captured samples. Of the 1514 pinks captured, 309 were kept for lab analysis for sea lice infestation. A total of 71 pink salmon were found to be infested with 96 lice resulting in a calculated sea lice prevalence of 23.0 %, an average intensity of 1.4 and an abundance of 0.31 for the pink salmon sample population.

A total of 117 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 95 individuals and 79 *Caligus clemensi* sea lice were found on 60 of the samples analyzed in the lab. There were 20 samples that were infested with both *L. salmonis* and *C. clemensi* sea lice.

For the chum salmon sample population, a total of 60 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 44 juvenile chum salmon and 40 *Caligus clemensi* sea lice were found on 29 of the juvenile chum salmon analyzed in the lab. There were nine juvenile chum salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice.

For the pink salmon sample population, a total of 57 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 51 juvenile pink salmon and 39 *Caligus clemensi* sea lice were found on 31 of the juvenile pink salmon analyzed in the lab. There were eleven juvenile pink salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice.

The 2021 sampling represents the sixth consecutive year of monitoring in this area. A comparison of the prevalence, abundance and average intensity of sea lice infestation by sea lice species found on chum and pink salmon was completed for sample data collected in the Broughton Archipelago between 2016 and 2021. This data is presented in the following summary tables with additional yearly comparisons of juvenile wild salmon monitoring results presented in Appendix IV.

Chum by Year	***Caligus clemensi***			***Lepeophtheirus salmonis***		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=512)	20.3 %	0.32	1.6	13.3 %	0.19	1.4
2017 (n=562)	17.4 %	0.31	1.8	11.0 %	0.14	1.3
2018 (n=281)	12.5 %	0.16	1.3	10.3 %	0.11	1.1
2019 (n=246)	16.3 %	0.28	1.7	14.2 %	0.22	1.5
2020 (n=497)	18.1 %	0.27	1.5	7.4 %	0.10	1.3
2021 (n=249)	11.7%	0.16	0.6	17.7%	0.24	1.4

Pink by Year	*Caligus clemensi*			*Lepeophtheirus salmonis*		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=430)	24.4 %	0.33	1.3	15.3 %	0.24	1.5
2017 (n=411)	15.1 %	0.23	1.5	6.6 %	0.09	1.4
2018 (n=356)	11.5 %	0.16	1.4	5.6 %	0.06	1.1
2019 (n=230)	13.5 %	0.20	1.5	11.7 %	0.24	2.1
2020 (n=402)	15.9 %	0.19	1.2	8.7 %	0.11	1.2
2021 (n=309)	10.0%	0.13	1.3	16.5%	0.18	1.1

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1.0 Introduction

During the spring of 2021, Mainstream Biological Consulting conducted beach seine sampling at sites in the Broughton Archipelago, BC to capture wild juvenile salmon (Figure 1). Sampling was completed on behalf of MOWI Canada West and Cermaq Canada in support of the Aquaculture Stewardship Council certification process for their aquaculture sites in the Broughton Archipelago. Sample collection occurred on April 13, 14, 15, 16 and May 18, 19, 20, 2021. These dates were selected to roughly coincide with 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). *Caligus clemensi* infest an extremely wide range of natural hosts in the marine environment including salmonids and non-salmonids; while *L. salmonis* natural hosts on the Pacific coast have been found to include Pacific salmon, threespine stickleback and Pacific herring. *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 these Caligidae genera have similar life histories and developmental stages (Kabata, 1972; Johnson and Albright, 1991a). Sea lice hatch from eggs and go through two free-swimming naupilii stages before developing into an infectious free-swimming copepodid. At this point, the sea lice attach to their host and develop through several chalimus stages. The chalimus are non-motile and attach to their host by a frontal filament. The final chalimus stage terminates as the sea lice become motile and detach from their host. The sea lice 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 that 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).

MOWI Canada West and Cermaq Canada requested monitoring of sea lice abundance, prevalence and intensity on juvenile wild salmon within the Broughton Archipelago in support of Aquaculture Stewardship Certification for their aquaculture sites within the area. This data summary report documents the observed sea lice infestation rates on retained juvenile salmonids collected in the Broughton Archipelago in 2021.

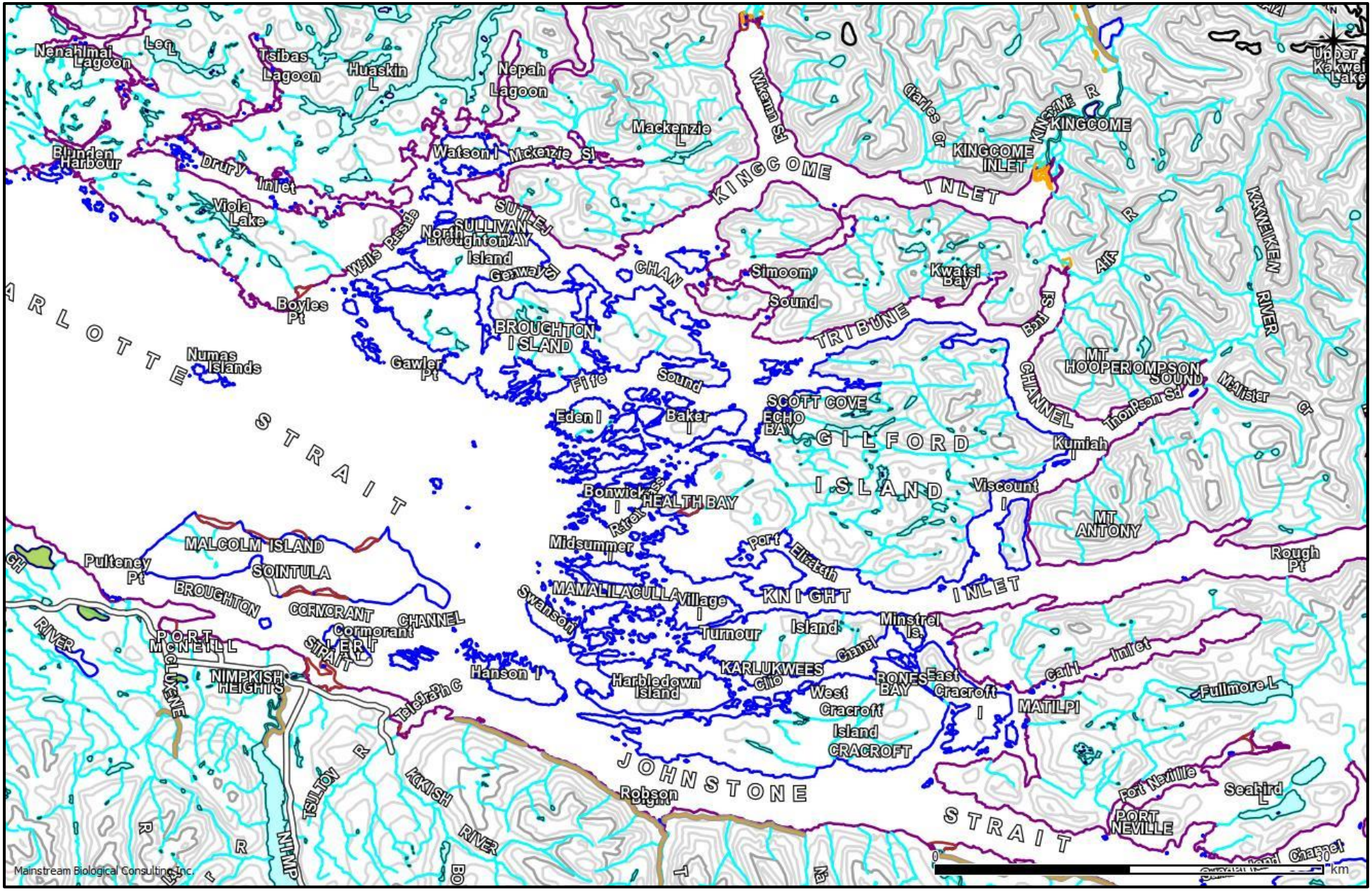


Figure 1: An overview map showing the location of the Broughton Archipelago northeast of Port McNeill, BC.

2.0 Methods

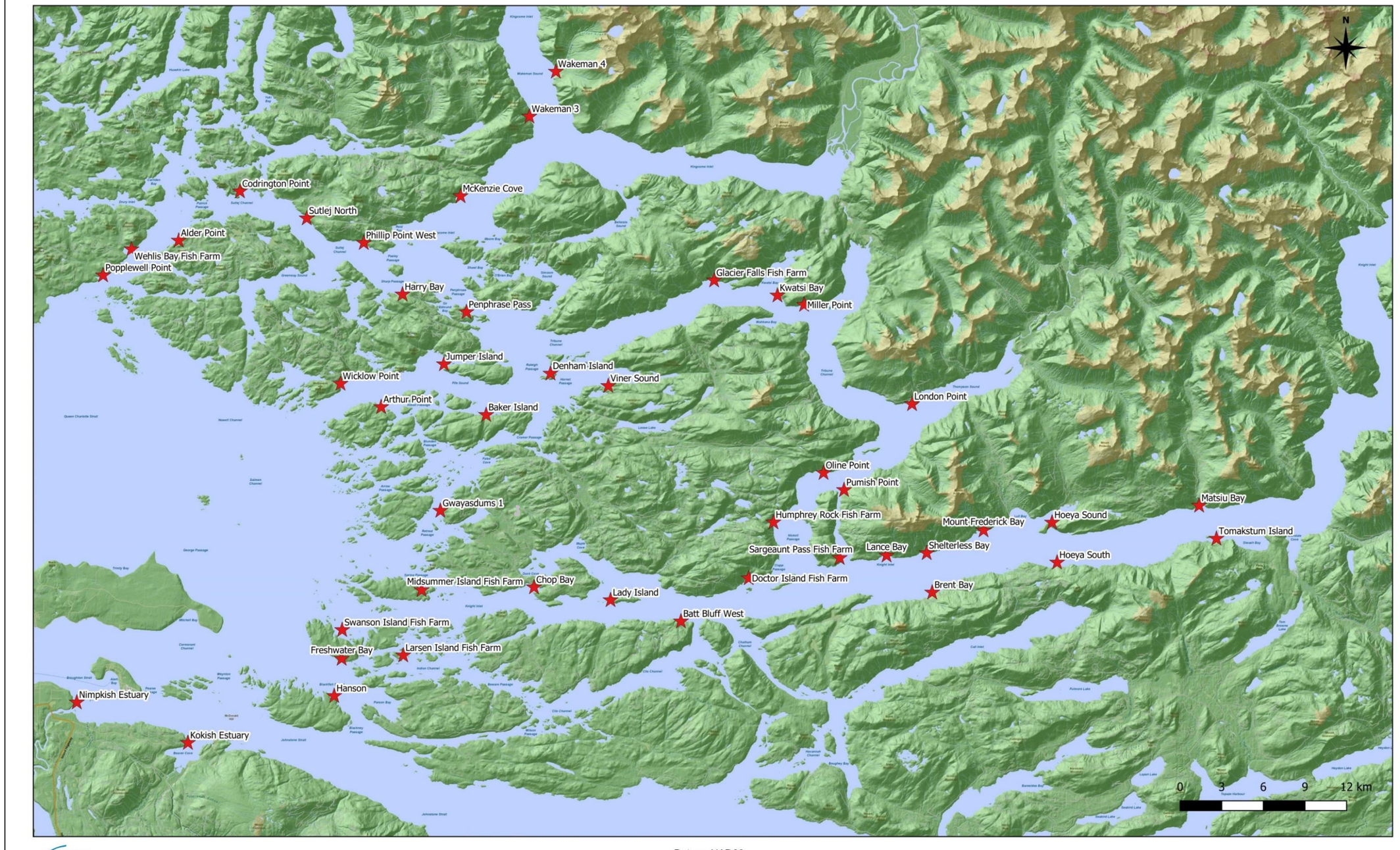
The fish inspected for sea lice infestation were collected from sampling sites in the Broughton Archipelago, BC adapted from a series of sites originally sampled in 2010-2012 (Figure 2). For the 2021 sampling year, sites were chosen based on their locations relative to existing aquaculture sites in the area operated by MOWI Canada West and Cermaq Canada, as well as on consultation with local First Nations. Sampling was completed at 45 sites

2.1 Site Locations

The approximate locations of the sampling sites are shown in Figure 2. GPS coordinates collected in the field for the sites are presented in Table 1 as well as the dates when sampling was completed at each site.

Table 1: The name and location of the beach seine sampling sites where fish were collected for sea lice analysis in the Broughton Archipelago in 2021.

Site Name	Sampled April 13-16	Sampled May 18-20	Latitude	Longitude
Alder Point	✓	✓	50 52.348	126 52.439
Arthur Point	✓	✓	50 45.921	126 39.807
Baker Island	✓	✓	50 45.721	126 33.411
Batt Bluff West	✓	✓	50 37.741	126 21.417
Brent Bay	✓	✓	50 38.676	126 06.374
Chop Bay	✓	✓	50 39.040	126 30.490
Codrington Point	✓	✓	50 54.298	126 48.710
Denham Island	✓	✓	50 47.314	126 29.511
Doctor Islets	✓	✓	50 39.368	126 17.220
Freshwater Bay	✓	✓	50 36.174	126 42.116
Glacier Falls Fish Farm	✓	✓	50 50.945	126 19.427
Gwayasdums 1	✓	✓	50 41.465	126 35.918
Hanson Island	✓	✓	50 34.587	126 43.293
Harry Bay	✓	✓	50 50.342	126 38.647
Hoeya Sound	✓	✓	50 41.610	125 58.746
Hoeya South	✓	✓	50 39.867	125 58.889
Humphrey Rock	✓	✓	50 41.616	126 15.775
Jumper Island	✓	✓	50 47.666	126 36.029
Kokish Estuary	✓	✓	50 32.667	126 51.831
Kwatsi Point	✓	✓	50 50.467	126 15.575
Lady Islets	✓	✓	50 38.556	126 25.731
Lance Bay	✓	✓	50 40.325	126 08.848
Larsen Island Fish Farm	✓	✓	50 36.302	126 38.405
London Point	✓	✓	50 46.201	126 07.305
Matsui	✓	✓	50 42.256	125 45.719
McKenzie Cove	✓	✓	50 54.172	126 35.145
Midsummer Island Fish Farm (Potts Bay)	✓	✓	50 38.872	126 37.306
Miller Point	✓	✓	50 50.045	126 13.962
Mount Frederick	✓	✓	50 41.348	126 02.601
Nimpkish Estuary	✓	✓	50 33.614	126 56.667
Oline Point	✓	✓	50 43.526	126 12.727
Penphrase Pass	✓	✓	50 49.683	126 34.671
Phillip Point West	✓	✓	50 52.340	126 41.091
Poppelwell Point	✓	✓	50 50.952	126 57.047
Pumish Point	✓	✓	50 43.001	126 11.327
Sargeaunt Pass	✓	✓	50 40.309	126 11.782
Shelterless Point	✓	✓	50 40.424	126 06.544
Sutlej North	✓	✓	50 53.287	126 44.592
Swanson Island Fish Farm	✓	✓	50 37.224	126 42.097
Tomakstum Island	✓	✓	50 40.950	125 48.678
Viner Sound	✓	✓	50 46.832	126 26.067
Wakeman 3	✓	✓	50 59.184	126 29.421
Wakeman 4	✓	✓	50 57.321	126 30.862
Whelis Bay Fish Farm	✓	✓	50 51.993	126 55.362
Wicklow Point	✓	✓	50 46.843	126 42.571



Datum: NAD83
Projection: BC Albers
Map Base: British Columbia Base Cache

Map created:
07/22/2019

Figure 2: The approximate locations of beach seine sites (red stars) in the Broughton Archipelago.

2.2 Field Procedures

Procedures used by Mainstream Biological Consulting during 2021 sampling were adapted from procedures for beach seining, fish collection and field data recording utilized by the Department of Fisheries and Oceans (DFO).

An 18 ft Boston Whaler powered by a 60 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 section 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 beaches 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 or side 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 an Oakton Salt 6+ meter was placed just below the water surface at the stern end of the boat to collect salinity and water temperature data. The meter was calibrated weekly with de-ionized water while traveling to the sample sites.

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 retrieved 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 15 individuals from each target species were retained for sea lice infestation analysis. If less than 15 individuals of a target species were captured, all the captured fish were retained. Individual fish were scooped into an appropriately sized whirlpac bag. Handling of fish was kept to a minimum.

When all the fish for retention were collected, a total catch number for each species was recorded. The fish remaining in the net were counted out of the seine net, or an estimate of the remaining fish was made (estimates were used when it appeared that more than 500 individuals from any given species remained in the net). 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 name;
- Date;
- Time at the end of the individual fish collection;
- Comments on weather and oceanic conditions;
- Total capture and retained fish numbers for each specimen group; and
- Water temperature (°C) and salinity (ppt) to one decimal place.

The retained fish from each site were packaged separately in re-sealable bags and labelled with the site name and the date. Site sample bags were stored in a portable freezer connected to the boat's battery. The specimens were transferred to a freezer immediately upon return from the field.

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 sample site.

2.3 Laboratory Procedures

Collected sample fish were frozen and delivered to the Center for Aquatic Health Sciences (CAHS) for laboratory analysis. Sea lice observed on the individual fish specimens during laboratory analysis were identified as either non-motile chalimus, or motile pre-adults and adults. Lice were identified as one of 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. Sea lice infestation data was tabulated by CAHS and provided to Mainstream Biological Consulting for reporting.

Data provided by CAHS also included measured fork length in millimetres and weight (recorded to the nearest tenth of a gram). Lengths and weights were recorded with the specimen's corresponding sea lice analysis results.

2.4 Data Analysis

Surface water quality data collected for temperature and salinity was summarized to report the minimum and maximum values as well as the calculated averages for each sample period.

Beach seine fish sample composition was summarized by species and site for each sampling period. The recorded fork lengths and weights of the juvenile chum and pink salmon sample populations were summarized to present minimum and maximum values as well as calculated averages. Sea lice infestation rates, including the number of infested fish and the number of sea lice identified, were determined for the sample population. Prevalence, as defined as the number of host fish found to have one or more sea lice compared to the total number of host fish examined, was determined for the sample population and for chum and pink salmon. Abundance, as defined as the total number of sea lice observed compared to the total number of host fish examined, was also determined for the sample population and chum, and pink salmon. The intensity of sea lice infestation, as described by the number of sea lice found on a single

salmon was summarized. Average intensity was calculated by dividing the total number of sea lice identified by the number of infested fish

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

3.0 Results

The following sections outline results of beach seine collection and subsequent sea lice infestation analysis of juvenile salmonids collected from the Broughton Archipelago, BC, in 2021. Water quality field data is presented in Appendix I, beach seine fish capture data is included in Appendix II and data on the sample population including sea lice lab analysis results provided by CAHS are in Appendix III.

3.1 Water Quality Parameters

Surface measurements of water temperature and salinity collected during 2021 beach seining activities are presented in Table 2. The field data recorded at each site is included in Appendix I.

Recorded surface water temperatures ranged from a low of 6.7 °C recorded at Hoeya South on April 13, 2021, to a high of 13.7 °C recorded at McKenzie Cove on May 20, 2021 (Table 2; Appendix I). Calculated average surface water temperatures increased from 10.4 ° C for April 13-16, 2021, to 11.2 °C for May 18-20, 2021.

Recorded surface water salinity ranged from a low of 2.9 ppt recorded at Wakeman 4 on May 20, 2021, to a high of 30.3 ppt recorded at Kwatsi Point on April 15, 2021 (Table 2; Appendix I). The calculated weekly average surface water salinity decreased during the sampling period from 24.9 ppt for April 13-16, 2021 to 18.2 ppt for May 18-20, 2021.

Table 2: Surface water quality parameters collected at beach seine sites in the Broughton Archipelago in 2021.

Site Name	April 13-16, 2021		May 18-20, 2021	
	Temp. (°C)	Salinity (ppt)	Temp. (°C)	Salinity (ppt)
Alder Point	10.4	29.6	13.0	20.0
Arthur Point	11.1	29.9	11.3	27.0
Baker Island	11.8	28.9	12.3	15.3
Batt Bluff West	10.4	29.8	9.6	20.1
Brent Bay	6.8	27.9	10.2	24.2
Chop Bay	8.8	30.1	11.0	28.4
Codrington Point	13.0	22.9	12.5	11.2
Denham Island	12.0	27.4	13.3	13.7
Doctor Islets	11.5	28.5	11.4	27.7
Freshwater Bay	8.8	30.2	10.4	14.9
Glacier Falls Fish Farm	8.9	29.6	11.2	9.4
Gwayasdums 1	11.4	30.0	12.8	26.8
Hanson Island	10.4	22.6	9.3	21.2
Harry Bay	9.8	21.4	11.4	5.5
Hoeya Sound	9.6	13.2	9.7	7.8
Hoeya South	6.7	25.6	11.4	21.4
Humphrey Rock	10.9	29.3	11.2	27.7
Jumper Island	13.3	29.2	12.2	22.5
Kokish Estuary	7.2	16.3	13.0	18.7
Kwatsi Point	7.4	30.3	12.0	23.1
Lady Islets	9.2	29.6	11.1	23.7
Lance Bay	10.4	25.5	9.9	18.5
Larsen Island Fish Farm	11.8	29.3	-	-
London Point	11.9	28.4	10.3	14.6
Matsui	10.7	24.2	9.9	15.4
McKenzie Cove	12.4	20.6	13.7	4.0
Midsummer Island Fish Farm (Potts Bay)	9.0	28.5	-	-
Miller Point	7.2	29.6	10.6	23.2
Mount Frederick	10.9	25.3	10.7	20.6
Nimpkish Estuary	6.8	25.1	13.6	17.3
Oline Point	10.9	29.4	9.7	28.6
Penphrase Pass	10.8	23.5	11.8	6.7
Phillip Point West	13.4	13.2	12.4	5.9
Poppelwell Point	9.9	30.1	12.3	17.0
Pumish Point	10.9	28.8	9.7	27.7
Sargeaunt Pass	12.2	12.8	9.6	27.6
Shelterless Point	12.4	12.2	9.7	23.2
Sutlej North	13.0	22.8	12.2	9.5
Swanson Island Fish Farm	10.6	29.3	9.5	-
Tomakstum Island	10.5	12.2	10.4	16.3
Viner Sound	11.0	28.8	10.1	12.5
Wakeman 3	9.4	9.8	10.8	11.7
Wakeman 4	12.4	11.4	9.9	2.9
Whelis Bay Fish Farm	10.5	27.8	11.8	24.9
Wicklow Point	10.1	29.1	11.7	25.0
Average	**10.4**	**24.9**	**11.2**	**18.2**

3.2 Fish Sample Composition

A total of 3442 fish were captured during beach seine sampling conducted in the Broughton Archipelago in 2021. Of those, 558 individual fish (16.2 %) were collected as sample specimens and underwent analysis for sea lice infestation (Table 3). The collection totals and percentage for each species are presented in Table 3. Pink salmon were the most common species captured during sampling in 2021. Of the 1514 pink salmon captured, 309 individuals (20.4 %) were retained and underwent lab analysis. Of the 1928 chum salmon captured, 249 individuals (12.9 %) were retained and underwent lab analysis. No chinook salmon, sockeye salmon, Atlantic salmon or threespine stickleback were captured during sampling in 2021.

A summary of the total number of fish captured and collected as specimens at each site over the collection period can be found in Table 4. Totals of fish captured and collected specimens at each site over the entire collection period can be found in Appendix II. There were 17 sites where no fish were captured during 2021 sampling (Table 4).

Table 3: The total of collected individuals of each fish species captured in the Broughton Archipelago, BC during sampling periods in 2021, and the percentage of the total capture population that they represent.

Common Name	Capture Totals (% of total capture population)	Collection Totals	Collection %
chum salmon	1928 (56.0%)	249	12.9
pink salmon	1514 (44.0%)	309	20.4
All species	**3442**	**558**	**16.2**

Table 4: The number of captured fish (Capture Total) and the number of individual fish collected (Sample Total) from sample sites in the Broughton Archipelago, BC in 2021.

Site Name	Pink		Chum		Total	
	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total
Alder Point	0	0	0	0	0	0
Arthur Point	0	0	0	0	0	0
Baker Island	178	28	37	17	215	45
Batt Bluff West	178	15	22	15	200	30
Brent Bay	3	3	0	0	3	3
Chop Bay	29	14	9	9	38	23
Codrington Point	5	5	0	0	5	5
Denham Island	12	12	33	16	45	28
Doctor Islets	230	15	21	15	251	30
Freshwater Bay	8	8	0	0	8	8
Glacier Falls Fish Farm	0	0	0	0	0	0
Gwayasdums 1	81	30	5	5	86	35
Hanson Island	35	18	11	11	46	29
Harry Bay	0	0	0	0	0	0
Hoeya Sound	0	0	0	0	0	0
Hoeya South	0	0	0	0	0	0
Humphrey Rock	0	0	0	0	0	0
Jumper Island	0	0	1	1	1	1
Kokish Estuary	0	0	0	0	0	0
Kwatsi Point	1	1	0	0	1	1
Lady Islets	78	30	25	18	103	48
Lance Bay	90	16	75	14	165	30
Larsen Island Fish Farm	0	0	0	0	0	0
London Point	39	13	15	19	54	32
Matsui	0	0	0	0	0	0
McKenzie Cove	2	2	32	15	34	17
Midsummer Island Fish Farm (Potts Bay)	34	15	2	2	36	17
Miller Point	0	0	0	0	0	0
Mount Frederick	210	19	190	11	400	30
Nimpkish Estuary	5	5	1204	19	1209	24
Oline Point	17	14	1	1	18	15
Penphrase Pass	4	4	1	1	5	5
Phillip Point West	0	0	0	0	0	0
Poppelwell Point	0	0	0	0	0	0
Pumish Point	0	0	0	0	0	0
Sargeaunt Pass	85	15	18	15	103	30
Shelterless Point	180	17	165	13	345	30
Sutlej North	1	1	0	0	1	1
Swanson Island Fish Farm	0	0	0	0	0	0
Tomakstum Island	0	0	28	16	28	16
Viner Sound	9	9	31	14	40	23
Wakeman 3	0	0	1	1	1	1
Wakeman 4	0	0	1	1	1	1
Whelis Bay Fish Farm	0	0	0	0	0	0
Wicklow Point	0	0	0	0	0	0
TOTAL	**1514**	**309**	**1928**	**249**	**3442**	**558**

3.3 Fish Sample Size Statistics

Summary statistics for the sample population of juvenile salmonids were completed for weight and fork length.

3.3.1 Chum Salmon

The weight of 249 chum smolts collected during the two sampling events in the Broughton Archipelago in 2021 ranged from 0.14 g to 6.88 g and averaged 1.12 g (SD = 1.04). The fork length of the chum smolts ranged from 26 mm to 83 mm and averaged 44 mm (SD = 11). Chum salmon weight and length data was summarized by sampling period which shows an increase in both parameters in the sample population from April to May, 2021 (Table 5).

3.3.2 Pink Salmon

The weight of 309 pink smolts collected during the two sampling events in the Broughton Archipelago in 2021 ranged from 0.21 g to 4.67 g and averaged 1.00 g (SD = 0.92). The fork length of the pink smolts ranged from 29 mm to 77 mm and averaged 41 mm (SD = 12). Pink salmon weight and length data was summarized by sampling period which shows the increase in both parameters in the sample population from April to May, 2021 (Table 5).

Table 5: Average weights and lengths summarized by month of chum, pink and coho salmon collected in the Broughton Archipelago in 2021.

Species	Average Weight (g)		Average Length (mm)	
	April 13-16	May 18-20	April 13-16	May 18-20
chum	0.60	2.09	39	55
pink	0.55	1.95	34	56

3.4 Sea Lice Infestation Rates

The results of the laboratory analysis for the presence of sea lice on the sample population collected in the Broughton Archipelago in 2021 are presented in Table 6. The data recorded for each fish in the sample population during lab analysis is included in Appendix III. A total of 558 samples were collected during sampling in the Broughton Archipelago in 2021. A total of 135 individuals in the sample population were found to be infested with 196 sea lice (Table 6). A total of 64 chum and 71 pink salmon were found to be infested with sea lice. This data reflects the identification of sea lice of either species (*L. salmonis and C. clemensi*) on inspected juvenile salmon.

The sea lice prevalence in the sample population collected in the Broughton Archipelago in 2021 was 24.2 % and the abundance was 0.35 (Table 6). Sea lice counts of both species observed (*L. salmonis and C. clemensi*) were added together for the prevalence and abundance calculations.

The intensity of sea lice infestation, as defined as the number of sea lice on a single infested salmon, ranged from one louse found on 88 individuals to a maximum of five lice found on one individual. The average intensity (1.5) was calculated by dividing the total number of sea lice by the number of infested fish of each species (Table 6).

Table 6: Results of analysis for sea lice infestation on salmonid smolts collected by beach seine in the Broughton Archipelago, BC in 2021.

Species	Sample size (n)	Total number of lice observed	Total number of fish infested	Prevalence (%)	Abundance	Average Intensity
chum	249	100	64	25.7	0.40	1.6
pink	309	96	71	23.0	0.31	1.4
Total	**558**	**196**	**135**	**24.2**	**0.35**	**1.5**

3.4.1 Infestation Rates on Chum Salmon

A total of 64 chum salmon were found to be infested with 100 sea lice (Table 6). The results of the laboratory analysis for sea lice infestation for the chum salmon sample population are presented by site in Table 7. Individual sites with a total capture of more than 10 chum salmon are shown separately in Table 7, while sites with a capture total of less than 10 chum salmon are lumped together and presented at the bottom of the table.

Sea lice counts of both sea lice species observed (*L. salmonis and C. clemensi*) were added together for the presentation of sea lice infestation, prevalence and abundance on the chum salmon sample population (Table 6 and 7). For the chum salmon sample population (n=249), the number of samples collected in each sampling period were decreased from 161 chum for the week of April 13-16 to 88 chum for the week of May 18-20, 2021. The highest sea lice infestation prevalence was observed in chum salmon collected between May 18-20, 2021(Table 7). The highest sea lice infestation intensity was observed in chum salmon collected between April 13-16, 2021.

A total of 64 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=249) collected in the Broughton Archipelago in 2021 was 25.7 %. The highest sea lice prevalence at an individual site (100.0 %) was at Baker Island, Lady Island and Tomakstum Island on May 18-20, 2021. Sea lice prevalence calculated by site for the total chum sample population was highly variable with the lowest prevalence of 0 % at Mount Frederick Bay and Hanson Island.

A total of 100 sea lice were identified during laboratory analysis of retained chum salmon. The abundance of sea lice on the chum salmon sample population (n=249) collected in the Broughton Archipelago in 2021 was 0.40. Sea lice abundance was calculated by week and by site and is presented in Table 7. Sea lice abundance on chum salmon was highest during the May 18-20, 2021, sampling period (0.80). The highest sea lice abundance at an individual site (1.50) was at Lady Island on May 18-20, 2021. Sea lice abundance calculated by site for the total chum sample population was also highly variable ranging from 0.00 at Hanson Island, Mount Frederick Bay and Nimpkish Estuary to a high of 1.00 at Denham Island (Table 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 the graph, 74.3 % of the chum sample population were not infested with sea lice. For the chum salmon sample population infested with sea lice, 14.9 % were infested with one louse and 7.2 % of the chum salmon sample population were infested with two lice and 3.6 % were infested with three lice (Figure 3).

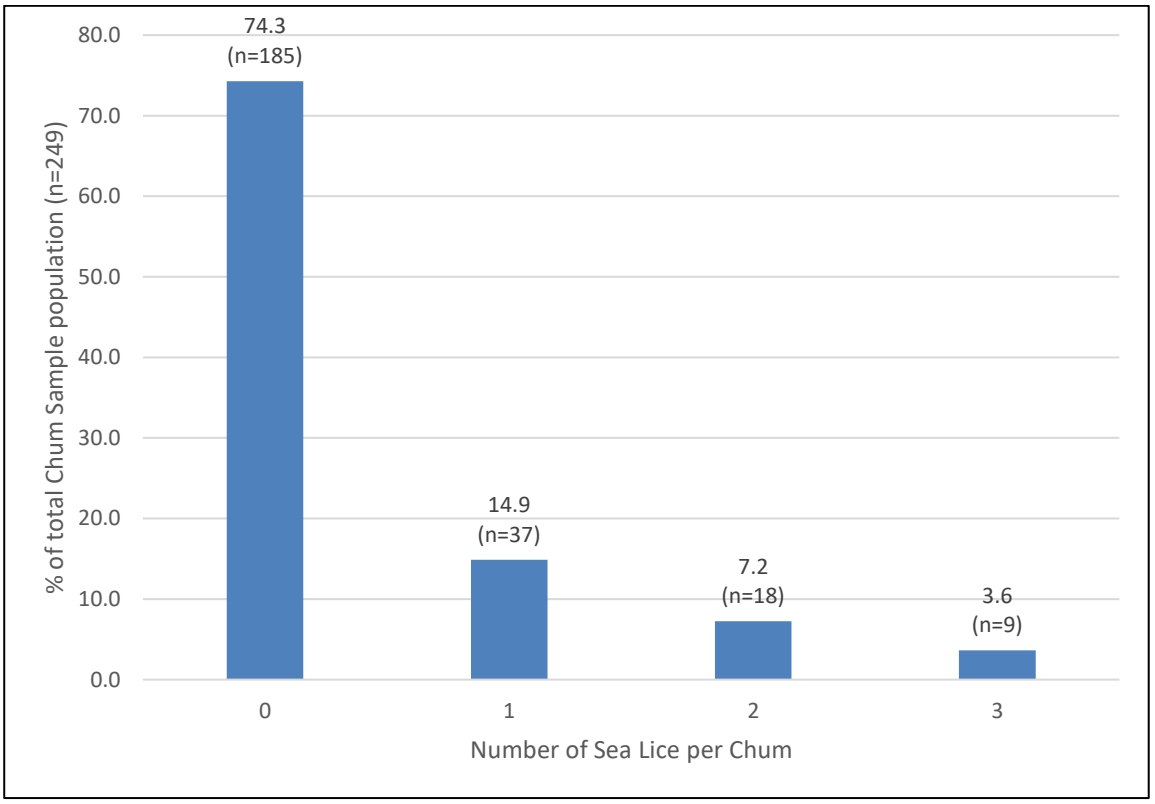


Figure 3: The number of sea lice per chum salmon specimen graphed as a percentage of the total chum sample population collected in the Broughton Archipelago in 2021.

Table 7: The number of sea lice, prevalence, abundance, and intensity of infestation on chum salmon collected in the Broughton Archipelago in 2021 summarized by site. Sites with a capture total of 10 chum salmon or more are shown and sites with capture totals of less than 10 chum salmon are lumped together.

Site	Sample Week (2021)														Total Chum Sample Population		
	April 13-16							May 18-20									
	# of Chum Analyzed	# of Infested Chum	Average Weight of Chum (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity	# of Chum Analyzed	# of Infested Chum	Average Weight of Chum (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity	Prevalence (%)	Abundance	Average Intensity
Baker Island	15	4	0.65	10	26.7	0.67	2.5	2	2	1.85	2	100.0	1.00	1.0	**35.3**	**0.71**	**2.0**
Batt Bluff West	15	3	0.47	3	20.0	0.20	1.0	0				-	-	-	**20.0**	**0.20**	**1.0**
Denham Island	0				-!	-	-	16	9	1.16	16	56.3	1.00	1.8	**56.3**	**1.00**	**1.8**
Doctor Island Fish Farm	15	4	0.57	5	26.7	0.33	1.3	0				-	-	-	**26.7**	**0.33**	**1.3**
Hanson Island	7	0	0.92	0	0.0	0.00	0.0	4	0	1.10	0	0.0	0.00	0.0-	**0.0**	**0.00**	**0.0**
Lady Island	14	3	0.46	5	21.4	0.36	1.7	4	4	2.7	6	100.0	1.50	1.5	**38.9**	**0.61**	**1.6**
Lance Bay	14	1	0.56	1	7.1	0.07	1.0	0				-	-	-	**7.1**	**0.07**	**1.0**
London Point	0				-	-	-	19	7	3.2	15	36.8	0.79	2.1	**36.8**	**0.79**	**2.1**
McKenzie Cove	15	1	0.97	1	6.7	0.07	1.0	0				-	-	-	**6.7**	**0.07**	**1.0**
Mount Frederick Bay	11	0	0.61	0	0.0	0.00	0.0	0				-	-	-	**0.0**	**0.00**	**0.0**
Nimpkish Estuary	4	0	0.19	0	0.0	0.00	0.0	15	2	2	3	13.3	0.20	1.5	**10.5**	**0.16**	**1.5**
Sargeaunt Pass Fish Farm	15	2	0.46	2	13.3	0.13	1.0	0				-	-	-	**13.3**	**0.13**	**1.0**
Shelterless Bay	13	1	0.66	1	7.7	0.08	1.0	0				-	-	-	**7.7**	**0.08**	**1.0**
Tomakstum Island	15	1	0.43	1	6.7	0.07	1.0	1	1	0.97	1	100.0	1.00	1.0	**12.5**	**0.13**	**1.0**
Viner Sound	0				-	-	-	14	6	1.79	7	42.9	0.50	1.2	**42.9**	**0.50**	**1.2**
Lumped Sites[1]	8	1	0.75	2	12.5	0.25	2.0	13	12	2.26	20	92.3	1.54	1.7	**61.9**	**1.05**	**1.7**
Total	**161**	**21**	**0.60**	**31**	**13.0**	**0.19**	**1.5**	**88**	**43**	**2.09**	**70**	**48.9**	**0.80**	**1.6**	**25.7**	**0.41**	**1.6**

[1]Lumped sites (n=31) include: Alder Point*, Arthur Point*, Brent Bay*, Chop Bay, Codrington Point*, Freshwater bay, Glacier Falls Fish Farm*, Gwayasdums 1, Harry Bay, Hoeya Sound*, Hoeya South*, Humphrey Rock*, Jumper Island, Kokish Estuary*, Kwatsi Point*, Larsen island Fish Farm*, Matsui*, Midsummer Island Fish Farm*, Miller Point*, Oline Point, Penphrase Pass, Phillip Point West*, Poppelwell Point*, Pumish Point*, Sutlej North*, Swanson Island Fish Farm*, Wakeman3, Wakeman 4, Whelis Bay Fish Farm*, Wicklow Point*. Sites where no chum salmon were captured are indicated with an asterisk.

3.4.2 Infestation Rates on Pink Salmon

A total of 71 pink salmon were found to be infested with 96 sea lice (Table 6). The results of the laboratory analysis for sea lice infestation for the pink salmon sample population are presented by site in Table 8. Individual sites with a total capture of more than 10 pink salmon are shown in Table 8, while sites with a capture total of less than 10 pink salmon are lumped together and presented at the bottom of the table.

Sea lice counts of both sea lice species observed (*L. salmonis and C. clemensi*) were added together for the presentation of sea lice infestation, prevalence and abundance on the pink salmon sample population (Table 6 and 8). For the pink salmon sample population (n=309) 36 pink salmon were found to be infested each sampling period and the amount of sea lice found was comparable for the two sampling dates (Table 8).

A total of 71 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=309) collected in the Broughton Archipelago in 2021 was 23.0 %. Sea lice prevalence on pink salmon was highest on May 18-20 during the 2021 sampling period. The highest sea lice prevalence at an individual site (66.7 %) was at Baker Island on April 14, 2021 (Table 8). Sea lice prevalence calculated by site for the total pink sample population was highly variable ranging from 0.0 % at Hanson Island, Mount Frederick, Sargeaunt Pass and Shelterless Point to a high of 57.1 % at Baker Island (Table 8).

A total of 96 sea lice were identified during laboratory analysis of retained pink salmon. The abundance of sea lice on the pink salmon sample population (n=309) collected in the Broughton Archipelago in 2021 was 0.31. Sea lice abundance was calculated by week and by site and is presented in Table 8. Sea lice abundance on pink salmon was highest (0.45) on May 18-20 in 2021. The highest sea lice abundance at an individual site (1.13) was Baker Island on April 14, 2021. Sea lice abundance calculated by site for the total pink sample population was also highly variable ranging from 0.00 at Hanson Island, Mount Frederick, Sargeaunt Pass and Shelterless Point to a high of 0.82 at Baker Island (Table 8).

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 show in the graph, 77.0 % of the pink salmon sample population were not infested with sea lice. For the pink salmon infested with sea lice, 16.5 % were infested with one louse and 6.5 % of the sample population were infested with two, three or five lice (Figure 4).

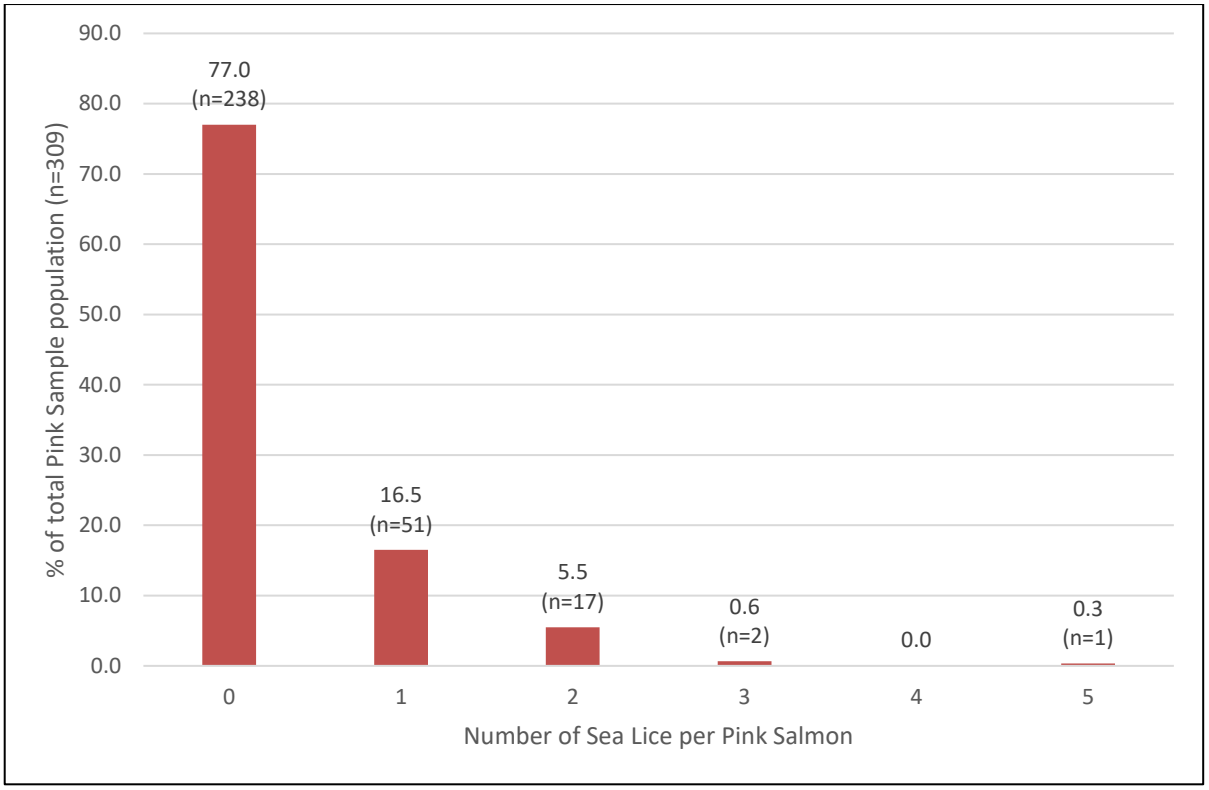


Figure 4: The number of sea lice per pink salmon specimen graphed as a percentage of the total pink salmon sample population collected in the Broughton Archipelago in 2021.

Table 8: The number of sea lice, prevalence, abundance, and intensity of infestation on pink salmon collected in the Broughton Archipelago in 2021 summarized by site. Sites with a capture total of 10 pink salmon or more are shown and sites with capture totals of less than 10 pink salmon are lumped together.

Site	Sample Week (2021)													Total Pink Sample Population		
	April 13-16							May 18-20								
	# of Pink Analyzed	# of Infested Pink	Average Weight of Pink (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity	# of Pink Analyzed	# of Infested Pink	Average Weight of Pink (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity	Prevalence (%)	Abundance	Average Intensity
Baker Island	15	10	0.52	17	66.7	1.13	1.7	13	6	1.28	6	46.2	0.46	1.0	**57.1**	**0.82**	**1.4**
Batt Bluff West	15	6	0.32	6	40.0	0.40	1.0	0				-	-	-	**40.0**	**0.40**	**1.0**
Doctor Islets	15	1	0.33	2	6.7	0.13	2.0	0				-	-	-	**6.7**	**0.13**	**2.0**
Gwayasdums	15	6	0.49	6	40.0	0.40	1.0	15	3	3.39	3	20.0	0.20	1.0	**30.0**	**0.30**	**1.0**
Hanson Island	17	0	0.46	0	0.0	0.00	0.0	1	0	1.06	0	0.0	0.00	-	**0.0**	**0.00**	**0.0**
Lady Island	15	1	0.31	1	6.7	0.07	1.0	15	8	2.41	11	53.3	0.73	1.4	**30.0**	**0.40**	**1.3**
Lance Bay	16	1	0.3	1	6.3	0.06	1.0	0	-			-	-	-	**6.3**	**0.06**	**1.0**
Midsummer Island Fish Farm	15	5	0.34	4	33.3	0.27	0.8	0	-			-	-	-	**33.3**	**0.27**	**0.8**
Mount Frederick Bay	19	0	0.39	0	0.0	0.00	0.0	0	-			-	-	-	**0.0**	**0.00**	**0.0**
Oline Point	14	3	0.46	4	21.4	0.29	1.3	0	-			-	-	-	**21.4**	**0.29**	**1.3**
Sargeaunt Pass	15	0	0.32	0	0.0	0.00	0.0	0	-			-	-	-	**0.0**	**0.00**	**0.0**
Shelterless Point	17	0	0.44	0	0.0	0.00	0.0	0	-			-	-	-	**0.0**	**0.00**	**0.0**
Lumped Sites[1]	27	3	0.36	3	11.1	0.11	1.0	50	19	1.57	22	38.0	0.44	1.2	**28.6**	**0.32**	**1.1**
Total	**215**	**36**	**0.39**	**44**	**16.7**	**0.20**	**1.2**	**94**	**36**	**1.95**	**42**	**38.3**	**0.45**	**1.2**	**23.3**	**0.28**	**1.2**

[1]Lumped sites (n=31) include: Alder Point*, Arthur Point*, Brent Bay*, Chop Bay, Codrington Point, Denham Island, Freshwater Bay*, Glacial Falls Fish Farm*, Harry Bay*, Hoeya Sound*, Hoeya South*, Humphrey Rock Fish Farm*, Jumper Island*, Kokish Estuary*, Kwatsi Point*, Larsen Island Fish Farm*, London Point, Matsiu Bay*, McKenzie Cove, Midsummer Island Fish Farm*, Millar Point*, Nimpkish Estuary, Penphrase Pass, Phillip Point West*, Poppelwell point*, Pumish Point*, Sutlej North, Swanson island Fish Farm*, Tomakstum Island, Viner Sound, Wakeman 3*, Wakeman 4*, Whelis bay Fish Farm*, Wicklow Bay* Sites where no pink salmon were captured are indicated with an asterisk.

3.5 Infestation by Sea Lice Species

A total of 117 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 95 individuals and 79 *Caligus clemensi* sea lice were found on 60 of the samples analyzed in the lab (Appendix III). There were 20 samples that were infested with both *L. salmonis* and *C. clemensi* sea lice.

3.5.1 Infestation by Sea Lice Species on Chum Salmon

An analysis of the species of sea lice identified on the 249 chum salmon collected in the Broughton Archipelago is presented in Table 9. A total of 60 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 44 juvenile chum salmon and 40 *Caligus clemensi* sea lice were found on 29 of the juvenile chum salmon analyzed in the lab (Appendix III). There were 9 juvenile chum salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice. The sea lice species identified on chum salmon are also presented by site by week in Table 10. Individual sites with a total capture of more than 10 chum salmon are shown in Table 10. Sites with a capture total of less than 10 chum salmon are lumped together and presented at the bottom of the table.

For the chum salmon sample population infested with *Caligus clemensi* sea lice (n=29) there were 20 samples infested with one louse, seven samples infested with two sea lice, two samples with three lice. For the chum salmon sample population infested with *Lepeophtheirus salmonis* sea lice (n=44) there were 30 samples infested with one louse, 12 with two lice and two chum were infested with three lice.

Table 9: The number of sea lice in each life stage by species identified on the chum salmon sample population from the Broughton Archipelago in 2021. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage[1]	April 13-16	May 18-20	Total
LEP Co	13	4	**17**
LEP C1	6	7	**13**
LEP C2	0	23	**23**
LEP PAM	0	5	**5**
LEP PAF	0	1	**1**
LEP AM	0	1	**1**
LEP AF	0	0	**0**
TOTAL LEP	**19**	**41**	**60**
CAL Co	5	3	**8**
CAL C1	6	9	**15**
CAL C2	1	5	**6**
CAL C3	0	4	**4**
CAL C4	0	3	**3**
CAL PAM	0	1	**1**
CAL PAF	0	1	**1**
CAL AM	0	1	**1**
CAL AF	0	1	**1**
TOTAL CAL	**12**	**28**	**40**

[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 10: The species of sea lice found on chum salmon collected in the Broughton Archipelago in 2021 summarized by site. Sites with a total capture of more than 10 chum salmon are shown. Sites with a capture total of less than 10 chum salmon are lumped. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	Sample Week (2021)								**TOTAL**		
	April 13-16				May 18-20						
	# 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**
Baker Island	15	4	4	6	2	2	1	1	17	6	12
Batt Bluff West	15	3	3	0	0				15	3	3
Denham Island	0				16	9	15	0	16	9	15
Doctor Island Fish Farm	15	4	2	3	0				15	4	5
Hanson Island	7	0	0	0	4	0	0	0	11	0	0
Lady Island	14	3	4	1	4	4	5	1	18	7	11
Lance Bay	14	1	0	1	0				14	1	1
London Point	0				19	7	9	6	19	7	15
McKenzie Cove	15	1	1	0	0				15	1	1
Mount Frederick Bay	11	0	0	0	0				11	0	0
Nimpkish Estuary	4	0			15	2	0	3	19	2	3
Sargeaunt Pass Fish Farm	15	2	2	0	0				15	2	2
Shelterless Bay	13	1	0	1	0				13	1	1
Tomakstum Island	15	1	1	0	1	1	0	1	16	2	2
Viner Sound	0				14	6	6	1	14	6	7
Lumped Sites[1]	8	1	2	0	13	12	5	15	21	13	22
Total	**161**	**21**	**19**	**12**	**88**	**43**	**41**	**28**	**249**	**64**	**100**

[1]Lumped sites (n=31) include: Alder Point*, Arthur Point*, Brent Bay*, Chop Bay, Codrington Point*, Freshwater bay, Glacier Falls Fish Farm*, Gwayasdums 1, Harry Bay, Hoeya Sound*, Hoeya South*, Humphrey Rock*, Jumper Island, Kokish Estuary*, Kwatsi Point*, Larsen island Fish Farm*, Matsui*, Midsummer Island Fish Farm*, Miller Point*, Oline Point, Penphrase Pass, Phillip Point West*, Poppelwell Point*, Pumish Point*, Sutlej North*, Swanson Island Fish Farm*, Wakeman3, Wakeman 4, Whelis Bay Fish Farm*, Wicklow Point*. Sites where no chum salmon were captured are indicated with an asterisk.

3.5.2 Infestation by Sea Lice Species on Pink Salmon

An analysis of the species of sea lice identified on the 309 pink salmon collected in the Broughton Archipelago is presented in Table 11. A total of 57 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 39 juvenile pink salmon and 39 *Caligus clemensi* sea lice were found on 31 of the juvenile pink salmon analyzed in the lab (Appendix III). There were 11 juvenile pink salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice. The sea lice species identified on pink salmon are also presented by site and week in Table 12. Individual sites with a total capture of more than 10 pink salmon are shown in Table 12. Sites with a capture total of less than 10 pink salmon are lumped together and shown at the bottom of the table.

For the pink salmon sample population infested with *Caligus clemensi* sea lice (n=31) there were 25 samples infested with one louse, five pink with two lice and one sample infested with five lice. For the pink salmon sample population infested with *Lepeophtheirus salmonis* sea lice (n=51) there were 45 samples infested with one louse, and six with two lice.

Table 11: The number of sea lice in each life stage by species identified on the pink salmon sample population from the Broughton Archipelago in 2021. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage[1]	April 13-16	May 18-20	Total
LEP Co	17	6	**23**
LEP C1	10	2	**12**
LEP C2	2	7	**9**
LEP PAM	0	9	**9**
LEP PAF	0	4	**4**
LEP AM	0	0	**0**
LEP AF	0	0	**0**
TOTAL LEP	**29**	**28**	**57**
CAL Co	3	0	**3**
CAL C1	9	10	**19**
CAL C2	2	0	**2**
CAL C3	2	3	**5**
CAL C4	0	5	**5**
CAL PAM	0	0	**0**
CAL PAF	0	1	**1**
CAL AM	0	3	**3**
CAL AF	0	1	**1**
TOTAL CAL	**16**	**23**	**39**

[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 12: The species of sea lice found on pink salmon collected in the Broughton Archipelago in 2021 summarized by site. Sites with a total capture of more than 10 pink salmon are shown. Sites with a capture total of less than 10 pink salmon are lumped.
LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	Sample Week (2021)								TOTAL		
	April 13-16				May 18-20						
	# 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 Lice**
Baker Island	15	10	8	9	13	6	3	3	**28**	**16**	**23**
Batt Bluff West	15	6	6	0	0				**15**	**6**	**6**
Doctor Islets	15	1	2	0	0				**15**	**1**	**2**
Gwayasdums	15	6	4	2	15	3	3	0	**30**	**9**	**9**
Hanson Island	17	0	0	0	1	0	0	0	**18**	**0**	**0**
Lady Island	15	1	0	1	15	8	8	3	**30**	**9**	**12**
Lance Bay	16	1	1	0	0				**16**	**1**	**1**
Midsummer Island Fish Farm	15	4	3	2	0				**15**	**4**	**5**
Mount Frederick Bay	19	0	0	0	0				**19**	**0**	**0**
Oline Point	14	3	2	2	0				**14**	**3**	**4**
Sargeaunt Pass	15	0	0	0	0				**15**	**0**	**0**
Shelterless Point	17	0	0	0	0				**17**	**0**	**0**
Lumped Sites[1]	27	3	3	0	50	19	14	17	**77**	**22**	**34**
Total	**215**	**35**	**29**	**16**	**94**	**36**	**28**	**23**	**309**	**71**	**96**

[1]Lumped sites (n=31) include: Alder Point*, Arthur Point*, Brent Bay*, Chop Bay, Codrington Point, Denham Island, Freshwater Bay*, Glacial Falls Fish Farm*, Harry Bay*, Hoeya Sound*, Hoeya South*, Humphrey Rock Fish Farm*, Jumper Island*, Kokish Estuary*, Kwatsi Point*, Larsen Island Fish Farm*, London Point, Matsiu Bay*, McKenzie Cove, Midsummer Island Fish Farm*, Millar Point*, Nimpkish Estuary, Penphrase Pass, Phillip Point West*, Poppelwell point*, Pumish Point*, Sutlej North, Swanson island Fish Farm*, Tomakstum Island, Viner Sound, Wakeman 3*, Wakeman 4*, Whelis bay Fish Farm*, Wicklow Bay* Sites where no pink salmon were captured are indicated with an asterisk.

4.0 Conclusions

This report presents the data from the sixth consecutive year of wild juvenile salmonid beach seining and sea lice analysis conducted for ASC certification purposes in the Broughton Archipelago, BC. This report is limited to the summary and presentation of the data collected in 2021 on behalf of MOWI Canada West and Cermaq Canada. A tabular comparison of sea lice infestation data for chum and pink salmon for 2016 through 2021 is presented in Appendix IV.

In 2021, a total of 558 individual samples underwent lab analysis for sea lice infestation including 249 chum salmon and 309 pink salmon. From the total sample population 135 individuals were infested with 196 sea lice. The calculated sea lice prevalence for the total sample population was 24.2 %, the sea lice abundance was 0.35 and the average intensity was 1.5 for the sample population collected in the Broughton Archipelago in 2021.

A total of 1928 chum salmon were captured, representing 56.0 % of all captured samples. Of the 1928 chum captured, 249 were kept for lab analysis for sea lice infestation. A total of 64 chum smolts were found to be infested with 100 lice resulting in a calculated sea lice prevalence of 25.7 %, an abundance of 0.40 and an average intensity of 1.6 for the chum salmon sample population.

A total of 1514 pink salmon were captured, representing 44.0 % of all captured samples. Of the 1514 pinks captured, 309 were kept for lab analysis for sea lice infestation. A total of 71 pink salmon were found to be infested with 96 lice resulting in a calculated sea lice prevalence of 23.0 %, an abundance of 0.31 and an average intensity of 1.4 for the pink salmon sample population.

A total of 117 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 95 individuals and 79 *Caligus clemensi* sea lice were found on 60 of the samples analyzed in the lab. There were 20 samples that were infested with both *L. salmonis* and *C. clemensi* sea lice.

For the chum salmon sample population, a total of 60 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 44 juvenile chum salmon and 40 *Caligus clemensi* sea lice were found on 29 of the juvenile chum salmon analyzed in the lab. There were nine juvenile chum salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice.

For the pink salmon sample population, a total of 57 *Lepeophtheirus salmonis* sea lice of various life stages were identified on 51 juvenile pink salmon and 39 *Caligus clemensi* sea lice were found on 31 of the juvenile pink salmon analyzed in the lab. There were 11 juvenile pink salmon that were infested with both *L. salmonis* and *C. clemensi* sea lice.

A comparison of the prevalence, abundance and average intensity of sea lice infestation by sea lice species found on chum and pink salmon was completed for 2016 – 2021 sample data collected in the Broughton Archipelago. This data is presented in the following summary tables with additional yearly comparisons of juvenile wild salmon monitoring results presented in Appendix IV.

Chum by Year	*Caligus clemensi*			*Lepeophtheirus salmonis*		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=512)	20.3 %	0.32	1.6	13.3 %	0.19	1.4
2017 (n=562)	17.4 %	0.31	1.8	11.0 %	0.14	1.3
2018 (n=281)	12.5 %	0.16	1.3	10.3 %	0.11	1.1
2019 (n=246)	16.3 %	0.28	1.7	14.2 %	0.22	1.5
2020 (n=497)	18.1 %	0.27	1.5	7.4 %	0.10	1.3
2021 (n=249)	11.7%	0.16	0.6	17.7%	0.24	1.4

Pink by Year	*Caligus clemensi*			*Lepeophtheirus salmonis*		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=430)	24.4 %	0.33	1.3	15.3 %	0.24	1.5
2017 (n=411)	15.1 %	0.23	1.5	6.6 %	0.09	1.4
2018 (n=356)	11.5 %	0.16	1.4	5.6 %	0.06	1.1
2019 (n=230)	13.5 %	0.20	1.5	11.7 %	0.24	2.1
2020 (n=402)	15.9 %	0.19	1.2	8.7 %	0.11	1.2
2021 (n=309)	10.0%	0.13	1.3	16.5%	0.18	1.1

5.0 References

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Appendix I – Field Data

Date	Site Name	Salinity (ppt) 0.2m	Temperature (°C) 0.2m
2021-04-15	Alder Point	29.6	10.4
2021-04-14	Arthur Point	29.9	11.1
2021-04-14	Baker Island	28.9	11.8
2021-04-13	Batt Bluff West	29.8	10.4
2021-04-13	Brent Bay	27.9	6.8
2021-04-14	Chop Bay	30.1	8.8
2021-04-15	Codrington Point	22.9	13.0
2021-04-14	Denham Island	27.4	12.0
2021-04-13	Doctor Islets	28.5	11.5
2021-04-14	Freshwater Bay	30.2	8.8
2021-04-15	Glacier Falls Fish Farm	29.6	8.9
2021-04-14	Gwayasdums 1	30.0	11.4
2021-04-14	Hanson Island	22.6	10.4
2021-04-15	Harry Bay	21.4	9.8
2021-04-13	Hoeya Sound	13.2	9.6
2021-04-13	Hoeya South	25.6	6.7
2021-04-13	Humphrey Rock	29.3	10.9
2021-04-14	Jumper Island	29.2	13.3
2021-04-16	Kokish Estuary	16.3	7.2
2021-04-15	Kwatsi Point	30.3	7.4
2021-04-14	Lady Islets	29.6	9.2
2021-04-13	Lance Bay	25.5	10.4
2021-04-14	Larsen Island Fish Farm	29.3	11.8
2021-04-13	London Point	28.4	11.9
2021-04-13	Matsui	24.2	10.7
2021-04-15	McKenzie Cove	20.6	12.4
2021-04-14	Midsummer Island Fish Farm (Potts Bay)	28.5	9.0
2021-04-15	Miller Point	29.6	7.2
2021-04-13	Mount Frederick	25.3	10.9
2021-04-16	Nimpkish Estuary	25.1	6.8
2021-04-13	Oline Point	29.4	10.9
2021-04-15	Penphrase Pass	23.5	10.8
2021-04-15	Phillip Point West	13.2	13.4
2021-04-15	Poppelwell Point	30.1	9.9
2021-04-13	Pumish Point	28.8	10.9
2021-04-13	Sargeaunt Pass	12.8	12.2
2021-04-13	Shelterless Point	12.2	12.4
2021-04-15	Sutlej North	22.8	13.0
2021-04-14	Swanson Island Fish Farm	29.3	10.6
2021-04-13	Tomakstum Island	12.2	10.5
2021-04-14	Viner Sound	28.8	11.0
2021-04-15	Wakeman 3	9.8	9.4
2021-04-15	Wakeman 4	11.4	12.4
2021-04-15	Whelis Bay Fish Farm	27.8	10.5
2021-04-14	Wicklow Point	29.1	10.1
2021-05-20	Alder Point	20.0	13.0
2021-05-19	Arthur Point	27.0	11.3
2021-05-19	Baker Island	15.3	12.3

Date	Site Name	Salinity (ppt) 0.2m	Temperature (°C) 0.2m
2021-05-18	Batt Bluff	20.1	9.6
2021-05-19	Brent Bay	24.2	10.2
2021-05-18	Chop Bay	28.4	11.0
2021-05-20	Codrington Point	11.2	12.5
2021-05-19	Denham Island	13.7	13.3
2021-05-18	Doctor Islets Fish Farm	27.7	11.4
2021-05-18	Freshwater Bay	14.9	10.4
2021-05-19	Glacial Falls Fish Farm	9.4	11.2
2021-05-20	Gwayasdums 1	26.8	12.8
2021-05-18	Hansen Island	21.2	9.3
2021-05-20	Harry Bay	5.5	11.4
2021-05-19	Hoeya Sound	7.8	9.7
2021-05-19	Hoeya South	21.4	11.4
2021-05-18	Humphrey Rock Fish Farm	27.7	11.2
2021-05-19	Jumper Island	22.5	12.2
2021-05-20	Kokish Estuary	18.7	13.0
2021-05-19	Kwatsi Point	23.1	12.0
2021-05-18	Lady Islets	23.7	11.1
2021-05-18	Lance Bay	18.5	9.9
2021-05-18	Larsen Island Fish Farm	-	-
2021-05-19	London Point	14.6	10.3
2021-05-19	Matsiu Bay	15.4	9.9
2021-05-20	McKenzie Cove	4.0	13.7
2021-05-18	Midsummer Island Fish Farm	-	-
2021-05-19	Millar Point	23.2	10.6
2021-05-19	Mount Frederick	20.6	10.7
2021-05-20	Nimpkish Estuary	17.3	13.6
2021-05-18	Oline Point	28.6	9.7
2021-05-20	Penphrase Pass	6.7	11.8
2021-05-20	Phillip Point West	5.9	12.4
2021-05-20	Poppelwell Point	17.0	12.3
2021-05-18	Pumish Point	27.7	9.7
2021-05-18	Sargeaunt Pass Fish Farm	27.6	9.6
2021-05-18	Shelterless Bay	23.2	9.7
2021-05-20	Sutlej North	9.5	12.2
2021-05-18	Swanson Island Fish Farm	-	9.5
2021-05-19	Tomakstum Island	16.3	10.4
2021-05-19	Viner Sound	12.5	10.1
2021-05-20	Wakeman 3	11.7	10.8
2021-05-20	Wakeman 4	2.9	9.9
2021-05-20	Wehlis Bay Fish Farm	24.9	11.8
2021-05-19	Wicklow Bay	25.0	11.7

Appendix II – Capture and Collection Sample Totals

Date	Site Name	Weather Comments	Tide Stage	Pink Captured	Pink Retained	Chum Captured	Chum Retained
2021-04-15	Alder Point	Clear, calm	Mid	0	0	0	0
2021-04-14	Arthur Point	Slight chop	High	0	0	0	0
2021-04-14	Baker Island	Clear, calm	High	165	15	35	15
2021-04-13	Batt Bluff West	Clear, calm	High	178	15	22	15
2021-04-13	Brent Bay	Clear, calm	Low	0	0	0	0
2021-04-14	Chop Bay	Clear, calm	Low	0	0	0	0
2021-04-15	Codrington Point	Clear, calm	Low	5	5	0	0
2021-04-14	Denham Island	Clear, calm	High	0	0	0	0
2021-04-13	Doctor Islets	Clear, calm	High	230	15	21	15
2021-04-14	Freshwater Bay	Clear, calm	Low	8	8	0	0
2021-04-15	Glacier Falls Fish Farm	Clear, calm	Low	0	0	0	0
2021-04-14	Gwayasdums 1	Slight chop	Mid	55	15	3	3
2021-04-14	Hanson Island	Clear, calm	Low	34	17	7	7
2021-04-15	Harry Bay	Clear, calm	Low	0	0	0	0
2021-04-13	Hoeya Sound	Clear, calm	Low	0	0	0	0
2021-04-13	Hoeya South	Clear, calm	Low	0	0	0	0
2021-04-13	Humphrey Rock	Clear, calm	High	0	0	0	0
2021-04-14	Jumper Island	One foot chop onto beach	High	0	0	1	1
2021-04-16	Kokish Estuary	Clear, calm	Low	0	0	0	0
2021-04-15	Kwatsi Point	Clear, calm	Mid	0	0	0	0
2021-04-14	Lady Islets	Clear, calm	Low	57	15	21	14
2021-04-13	Lance Bay	Clear, calm	Mid	90	16	75	14
2021-04-14	Larsen Island Fish Farm	Clear, calm	Low	0	0	0	0
2021-04-13	London Point	Clear, calm	High	1	1	0	0
2021-04-13	Matsui	Clear, calm	Low	0	0	0	0
2021-04-15	McKenzie Cove	Clear, calm	Low	2	2	32	15
2021-04-14	Midsummer Island Fish Farm (Potts Bay)	Clear, calm	Low	34	15	2	2
2021-04-15	Miller Point	Clear, calm	Mid	0	0	0	0
2021-04-13	Mount Frederick	Clear, calm	Low	210	19	190	11
2021-04-16	Nimpkish Estuary	Clear, calm	Mid	5	5	4	4
2021-04-13	Oline Point	Clear, calm	High	17	14	1	1
2021-04-15	Penphrase Pass	Clear, calm	Low	0	0	0	0
2021-04-15	Phillip Point West	Clear, calm	Low	0	0	0	0
2021-04-15	Poppelwell Point	Clear, calm	Mid	0	0	0	0
2021-04-13	Pumish Point	Clear, calm	High	0	0	0	0
2021-04-13	Sargeaunt Pass	Clear, calm	Mid	85	15	18	15
2021-04-13	Shelterless Point	Clear, calm	Low	180	17	165	13
2021-04-15	Sutlej North	Clear, calm	Low	1	1	0	0
2021-04-14	Swanson Island Fish Farm	Clear, calm	Low	0	0	0	0
2021-04-13	Tomakstum Island	Clear, calm	Low	0	0	27	15
2021-04-14	Viner Sound	Slight chop at site	High	5	5	0	0
2021-04-15	Wakeman 3	Clear, calm	Low	0	0	1	1
2021-04-15	Wakeman 4	Clear, calm	Low	0	0	0	0
2021-04-15	Whelis Bay Fish Farm	Slight chop	Low	0	0	0	0
2021-04-14	Wicklow Point	Clear, calm	High	0	0	0	0
2021-05-20	Alder Point	Sun and light wind	Low	0	0	0	0
2021-05-19	Arthur Point	Slight chop, sunny	Low	0	0	0	0

Date	Site Name	Weather Comments	Tide Stage	Pink Captured	Pink Retained	Chum Captured	Chum Retained
2021-05-19	Baker Island	Clear, calm	Low	13	13	2	2
2021-05-18	Batt Bluff	Rain, light wind	Low	0	0	0	0
2021-05-19	Brent Bay	Heavy chop	High	3	3	0	0
2021-05-18	Chop Bay	Rain, light wind	Mid	29	14	9	9
2021-05-20	Codrington Point	Calm, sun and cloud	Mid	0	0	0	0
2021-05-19	Denham Island	Clear, calm	Low	12	12	33	16
2021-05-18	Doctor Islets Fish Farm	Sun, light wind	Low	0	0	0	0
2021-05-18	Freshwater Bay	Calm, sunny	Mid	0	0	0	0
2021-05-19	Glacial Falls Fish Farm	Choppy and windy	Low	0	0	0	0
2021-05-20	Gwayasdums 1		Low	26	15	2	2
2021-05-18	Hansen Island	Calm, sunny	Mid	1	1	4	4
2021-05-20	Harry Bay	Calm, overcast	Mid	0	0	0	0
2021-05-19	Hoeya Sound	Calm in sound	Mid	0	0	0	0
2021-05-19	Hoeya South	Heavy chop	Mid	0	0	0	0
2021-05-18	Humphrey Rock Fish Farm	Overcast, choppy	Low	0	0	0	0
2021-05-19	Jumper Island	Choppy	Low	0	0	0	0
2021-05-20	Kokish Estuary		Low	0	0	0	0
2021-05-19	Kwatsi Point	Choppy, clear	Low	1	1	0	0
2021-05-18	Lady Islets	Sunny, calm	Low	21	15	4	4
2021-05-18	Lance Bay	Heavy rain, light wind	Low	0	0	0	0
2021-05-18	Larsen Island Fish Farm	Calm, light rain	Mid	0	0	0	0
2021-05-19	London Point	Clear, calm	Low	38	12	15	19
2021-05-19	Matsiu Bay	Calm in lee of point	Mid	0	0	0	0
2021-05-20	McKenzie Cove	Calm, sunny	Mid	0	0	0	0
2021-05-18	Midsummer Island Fish Farm	Calm, overcast	Mid	0	0	0	0
2021-05-19	Millar Point	Light chop, overcast	Low	0	0	0	0
2021-05-19	Mount Frederick	Heavy chop	Low	0	0	0	0
2021-05-20	Nimpkish Estuary		Low	0	0	1200	15
2021-05-18	Oline Point	Hail, rain, chop	Low	0	0	0	0
2021-05-20	Penphrase Pass	Calm, overcast	Mid	4	4	1	1
2021-05-20	Phillip Point West	Calm, overcast	Mid	0	0	0	0
2021-05-20	Poppelwell Point	Calm, sunny	Mid	0	0	0	0
2021-05-18	Pumish Point	Rain, light wind	Low	0	0	0	0
2021-05-18	Sargeaunt Pass Fish Farm	Rain, chop	Low	0	0	0	0
2021-05-18	Shelterless Bay	Heavy rain, calm	Mid	0	0	0	0
2021-05-20	Sutlej North	Calm, sun and cloud	Mid	0	0	0	0
2021-05-18	Swanson Island Fish Farm	Calm, light rain	Mid	0	0	0	0
2021-05-19	Tomakstum Island	Heavy chop	Mid	0	0	1	1
2021-05-19	Viner Sound	Choppy	Low	4	4	31	14
2021-05-20	Wakeman 3	Calm, sunny	Mid	0	0	0	0
2021-05-20	Wakeman 4	Calm, sunny	Mid	0	0	1	1
2021-05-20	Wehlis Bay Fish Farm	Calm, just sun	Mid	0	0	0	0
2021-05-19	Wicklow Bay	Choppy	Low	0	0	0	0

Appendix III – Sea Lice Analysis Data

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
14-Apr-21	Jumper Island	chum	1000	38	0.48								0										0
15-Apr-21	Sutlej North	pink	1001	33	0.28								0										0
15-Apr-21	Wakeman 3	chum	1002	39	0.54								0										0
14-Apr-21	Freshwater Bay	pink	1003	33	0.24								0										0
14-Apr-21	Freshwater Bay	pink	1004	32	0.22								0										0
14-Apr-21	Freshwater Bay	pink	1005	33	0.29	1							1										0
14-Apr-21	Freshwater Bay	pink	1006	34	0.31								0										0
14-Apr-21	Freshwater Bay	pink	1007	34	0.26								0										0
14-Apr-21	Freshwater Bay	pink	1008	34	0.32								0										0
14-Apr-21	Freshwater Bay	pink	1009	32	0.26								0										0
14-Apr-21	Freshwater Bay	pink	1010	32	0.26								0										0
13-Apr-21	Batt Bluff West	pink	1011	32	0.28	1							1										0
13-Apr-21	Batt Bluff West	pink	1012	41	0.71								0										0
13-Apr-21	Batt Bluff West	pink	1013	31	0.27								0										0
13-Apr-21	Batt Bluff West	pink	1014	31	0.24	1							1										0
13-Apr-21	Batt Bluff West	pink	1015	34	0.30								0										0
13-Apr-21	Batt Bluff West	pink	1016	35	0.36								0										0
13-Apr-21	Batt Bluff West	pink	1017	34	0.34								0										0
13-Apr-21	Batt Bluff West	pink	1018	35	0.34								0										0
13-Apr-21	Batt Bluff West	pink	1019	32	0.27								0										0
13-Apr-21	Batt Bluff West	pink	1020	32	0.24	1							1										0
13-Apr-21	Batt Bluff West	pink	1021	34	0.29								0										0
13-Apr-21	Batt Bluff West	pink	1022	33	0.29	1							1										0
13-Apr-21	Batt Bluff West	pink	1023	33	0.27	1							1										0
13-Apr-21	Batt Bluff West	pink	1024	32	0.25	1							1										0
13-Apr-21	Batt Bluff West	pink	1025	35	0.34								0										0
13-Apr-21	Batt Bluff West	chum	1026	39	0.54								0										0
13-Apr-21	Batt Bluff West	chum	1027	36	0.36								0										0
13-Apr-21	Batt Bluff West	chum	1028	38	0.42								0										0
13-Apr-21	Batt Bluff West	chum	1029	42	0.68	1							1										0
13-Apr-21	Batt Bluff West	chum	1030	39	0.60	1							1										0
13-Apr-21	Batt Bluff West	chum	1031	35	0.42								0										0
13-Apr-21	Batt Bluff West	chum	1032	36	0.45								0										0
13-Apr-21	Batt Bluff West	chum	1033	39	0.51								0										0
13-Apr-21	Batt Bluff West	chum	1034	37	0.48								0										0
13-Apr-21	Batt Bluff West	chum	1035	40	0.64								0										0
13-Apr-21	Batt Bluff West	chum	1036	36	0.36								0										0
13-Apr-21	Batt Bluff West	chum	1037	35	0.35								0										0
13-Apr-21	Batt Bluff West	chum	1038	38	0.43								0										0
13-Apr-21	Batt Bluff West	chum	1039	37	0.41								0										0
13-Apr-21	Batt Bluff West	chum	1040	38	0.46	1							1										0
13-Apr-21	Shelterless Point	pink	1041	45	0.76								0										0
13-Apr-21	Shelterless Point	pink	1042	33	0.31								0										0
13-Apr-21	Shelterless Point	pink	1043	41	0.56								0										0
13-Apr-21	Shelterless Point	pink	1044	35	0.35								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
13-Apr-21	Shelterless Point	pink	1045	32	0.29								0										0
13-Apr-21	Shelterless Point	pink	1046	34	0.32								0										0
13-Apr-21	Shelterless Point	pink	1047	33	0.25								0										0
13-Apr-21	Shelterless Point	pink	1048	47	0.85								0										0
13-Apr-21	Shelterless Point	pink	1049	34	0.31								0										0
13-Apr-21	Shelterless Point	pink	1050	38	0.52								0										0
13-Apr-21	Shelterless Point	pink	1051	34	0.32								0										0
13-Apr-21	Shelterless Point	pink	1052	38	0.40								0										0
13-Apr-21	Shelterless Point	pink	1053	37	0.43								0										0
13-Apr-21	Shelterless Point	pink	1054	33	0.23								0										0
13-Apr-21	Shelterless Point	pink	1055	40	0.53								0										0
13-Apr-21	Shelterless Point	pink	1056	43	0.73								0										0
13-Apr-21	Shelterless Point	pink	1057	33	0.32								0										0
13-Apr-21	Shelterless Point	chum	1058	34	0.32								0										0
13-Apr-21	Shelterless Point	chum	1059	52	1.28								0										0
13-Apr-21	Shelterless Point	chum	1060	48	1.20								0										0
13-Apr-21	Shelterless Point	chum	1061	54	1.53								0										0
13-Apr-21	Shelterless Point	chum	1062	36	0.47								0	1									1
13-Apr-21	Shelterless Point	chum	1063	33	0.29								0										0
13-Apr-21	Shelterless Point	chum	1064	37	0.39								0										0
13-Apr-21	Shelterless Point	chum	1065	39	0.49								0										0
13-Apr-21	Shelterless Point	chum	1066	38	0.43								0										0
13-Apr-21	Shelterless Point	chum	1067	35	0.35								0										0
13-Apr-21	Shelterless Point	chum	1068	35	0.34								0										0
13-Apr-21	Shelterless Point	chum	1069	45	1.03								0										0
13-Apr-21	Shelterless Point	chum	1070	37	0.48								0										0
13-Apr-21	Oline Point	chum	1071	37	0.47								0										0
13-Apr-21	Oline Point	pink	1072	44	0.77								0										0
13-Apr-21	Oline Point	pink	1074	35	0.36								0										0
13-Apr-21	Oline Point	pink	1075	40	0.54		1						1										0
13-Apr-21	Oline Point	pink	1076	34	0.36								0										0
13-Apr-21	Oline Point	pink	1077	32	0.31								0										0
13-Apr-21	Oline Point	pink	1078	37	0.44								0										0
13-Apr-21	Oline Point	pink	1079	44	0.89								0										0
13-Apr-21	Oline Point	pink	1080	35	0.36								0	1	1								2
13-Apr-21	Oline Point	pink	1081	36	0.42		1						1										0
13-Apr-21	Oline Point	pink	1082	32	0.27								0										0
13-Apr-21	Oline Point	pink	1083	38	0.48								0										0
13-Apr-21	Oline Point	pink	1084	37	0.49								0										0
13-Apr-21	Oline Point	pink	1085	33	0.30								0										0
13-Apr-21	Oline Point	pink	1087	35	0.47								0										0
14-Apr-21	Lady Islets	pink	1088	30	0.22								0										0
14-Apr-21	Lady Islets	pink	1089	33	0.25								0										0
14-Apr-21	Lady Islets	pink	1090	32	0.28								0										0
14-Apr-21	Lady Islets	pink	1091	34	0.36								0										0
14-Apr-21	Lady Islets	pink	1092	32	0.29								0										0
14-Apr-21	Lady Islets	pink	1093	35	0.38								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
14-Apr-21	Lady Islets	pink	1094	34	0.31								0										0
14-Apr-21	Lady Islets	pink	1095	35	0.31								0										0
14-Apr-21	Lady Islets	pink	1096	33	0.30								0										0
14-Apr-21	Lady Islets	pink	1097	34	0.31								0										0
14-Apr-21	Lady Islets	pink	1098	34	0.29								0										0
14-Apr-21	Lady Islets	pink	1099	33	0.38								0										0
14-Apr-21	Lady Islets	pink	1100	33	0.34								0	1									1
14-Apr-21	Lady Islets	pink	1101	34	0.34								0										0
14-Apr-21	Lady Islets	pink	1102	34	0.32								0										0
14-Apr-21	Lady Islets	chum	1103	37	0.50								0										0
14-Apr-21	Lady Islets	chum	1104	36	0.36	1	1						2										0
14-Apr-21	Lady Islets	chum	1105	39	0.60								0										0
14-Apr-21	Lady Islets	chum	1106	36	0.40	1							1		1								1
14-Apr-21	Lady Islets	chum	1107	35	0.44								0										0
14-Apr-21	Lady Islets	chum	1108	36	0.44								0										0
14-Apr-21	Lady Islets	chum	1109	38	0.44	1							1										0
14-Apr-21	Lady Islets	chum	1110	39	0.56								0										0
14-Apr-21	Lady Islets	chum	1111	38	0.54								0										0
14-Apr-21	Lady Islets	chum	1112	32	0.22								0										0
14-Apr-21	Lady Islets	chum	1113	38	0.51								0										0
14-Apr-21	Lady Islets	chum	1114	37	0.45								0										0
14-Apr-21	Lady Islets	chum	1115	35	0.44								0										0
14-Apr-21	Lady Islets	chum	1116	36	0.53								0										0
14-Apr-21	Baker Island	pink	1117	33	0.37	1							1		1								1
14-Apr-21	Baker Island	pink	1118	37	0.52		1						1										0
14-Apr-21	Baker Island	pink	1119	36	0.55								0		1								1
14-Apr-21	Baker Island	pink	1120	36	0.47		1						1										0
14-Apr-21	Baker Island	pink	1121	39	0.63		1						1										0
14-Apr-21	Baker Island	pink	1122	36	0.47								0		1								1
14-Apr-21	Baker Island	pink	1123	35	0.46								0										0
14-Apr-21	Baker Island	pink	1124	41	0.70		1	1					2										0
14-Apr-21	Baker Island	pink	1125	38	0.53		1						1	1	1	1	1						4
14-Apr-21	Baker Island	pink	1126	34	0.38								0										0
14-Apr-21	Baker Island	pink	1127	38	0.56								0										0
14-Apr-21	Baker Island	pink	1128	37	0.47								0										0
14-Apr-21	Baker Island	pink	1129	39	0.66		1						1										0
14-Apr-21	Baker Island	pink	1130	38	0.53								0										0
14-Apr-21	Baker Island	pink	1131	37	0.50								0		2								2
14-Apr-21	Baker Island	chum	1132	39	0.67								0										0
14-Apr-21	Baker Island	chum	1133	41	0.68								0										0
14-Apr-21	Baker Island	chum	1134	40	0.68								0		1								1
14-Apr-21	Baker Island	chum	1135	39	0.72		1						1										0
14-Apr-21	Baker Island	chum	1136	39	0.66								0										0
14-Apr-21	Baker Island	chum	1137	39	0.65		1						1		1	1							2
14-Apr-21	Baker Island	chum	1138	41	0.75								0										0
14-Apr-21	Baker Island	chum	1139	36	0.40								0										0
14-Apr-21	Baker Island	chum	1140	36	0.53								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
14-Apr-21	Baker Island	chum	1141	34	0.34								0										0
14-Apr-21	Baker Island	chum	1142	37	0.56								0										0
14-Apr-21	Baker Island	chum	1143	36	0.52								0										0
14-Apr-21	Baker Island	chum	1144	42	0.83		1						1		1								1
14-Apr-21	Baker Island	chum	1145	42	0.88								0										0
14-Apr-21	Baker Island	chum	1146	43	0.95	1							1	1	1								2
13-Apr-21	Mount Frederick	pink	1147	32	0.33								0										0
13-Apr-21	Mount Frederick	pink	1148	31	0.27								0										0
13-Apr-21	Mount Frederick	pink	1149	33	0.30								0										0
13-Apr-21	Mount Frederick	pink	1150	31	0.22								0										0
13-Apr-21	Mount Frederick	pink	1151	31	0.29								0										0
13-Apr-21	Mount Frederick	pink	1152	37	0.55								0										0
13-Apr-21	Mount Frederick	pink	1153	36	0.37								0										0
13-Apr-21	Mount Frederick	pink	1154	33	0.33								0										0
13-Apr-21	Mount Frederick	pink	1155	31	0.25								0										0
13-Apr-21	Mount Frederick	pink	1156	34	0.35								0										0
13-Apr-21	Mount Frederick	pink	1157	37	0.57								0										0
13-Apr-21	Mount Frederick	pink	1158	36	0.36								0										0
13-Apr-21	Mount Frederick	pink	1159	32	0.30								0										0
13-Apr-21	Mount Frederick	pink	1160	34	0.36								0										0
13-Apr-21	Mount Frederick	pink	1161	39	0.52								0										0
13-Apr-21	Mount Frederick	pink	1162	43	0.65								0										0
13-Apr-21	Mount Frederick	pink	1163	37	0.48								0										0
13-Apr-21	Mount Frederick	pink	1164	34	0.37								0										0
13-Apr-21	Mount Frederick	pink	1165	40	0.56								0										0
13-Apr-21	Mount Frederick	chum	1166	39	0.43								0										0
13-Apr-21	Mount Frederick	chum	1167	42	0.80								0										0
13-Apr-21	Mount Frederick	chum	1168	37	0.55								0										0
13-Apr-21	Mount Frederick	chum	1169	35	0.41								0										0
13-Apr-21	Mount Frederick	chum	1170	38	0.59								0										0
13-Apr-21	Mount Frederick	chum	1171	46	1.08								0										0
13-Apr-21	Mount Frederick	chum	1172	41	0.76								0										0
13-Apr-21	Mount Frederick	chum	1173	36	0.49								0										0
13-Apr-21	Mount Frederick	chum	1174	37	0.59								0										0
13-Apr-21	Mount Frederick	chum	1175	39	0.61								0										0
13-Apr-21	Mount Frederick	chum	1176	35	0.40								0										0
13-Apr-21	Lance Bay	chum	1177	40	0.64								0										0
13-Apr-21	Lance Bay	chum	1178	35	0.45								0										0
13-Apr-21	Lance Bay	chum	1179	34	0.39								0										0
13-Apr-21	Lance Bay	chum	1180	38	0.51								0										0
13-Apr-21	Lance Bay	chum	1181	38	0.58								0										0
13-Apr-21	Lance Bay	chum	1182	42	0.80								0										0
13-Apr-21	Lance Bay	chum	1183	36	0.51								0										0
13-Apr-21	Lance Bay	chum	1184	36	0.46								0										0
13-Apr-21	Lance Bay	chum	1185	40	0.64								0										0
13-Apr-21	Lance Bay	chum	1186	39	0.58								0										0
13-Apr-21	Lance Bay	chum	1187	45	0.92								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
13-Apr-21	Lance Bay	chum	1188	35	0.37								0										0
13-Apr-21	Lance Bay	chum	1189	37	0.54								0	1									1
13-Apr-21	Lance Bay	chum	1190	37	0.47								0										0
13-Apr-21	Lance Bay	pink	1191	32	0.25								0										0
13-Apr-21	Lance Bay	pink	1192	31	0.27								0										0
13-Apr-21	Lance Bay	pink	1193	31	0.22								0										0
13-Apr-21	Lance Bay	pink	1194	32	0.38								0										0
13-Apr-21	Lance Bay	pink	1195	31	0.21								0										0
13-Apr-21	Lance Bay	pink	1196	31	0.30								0										0
13-Apr-21	Lance Bay	pink	1197	32	0.36								0										0
13-Apr-21	Lance Bay	pink	1198	33	0.26								0										0
13-Apr-21	Lance Bay	pink	1199	35	0.43								0										0
13-Apr-21	Lance Bay	pink	1200	32	0.35								0										0
13-Apr-21	Lance Bay	pink	1201	30	0.29	1							1										0
13-Apr-21	Lance Bay	pink	1202	31	0.29								0										0
13-Apr-21	Lance Bay	pink	1203	31	0.30								0										0
13-Apr-21	Lance Bay	pink	1204	32	0.28								0										0
13-Apr-21	Lance Bay	pink	1205	33	0.33								0										0
13-Apr-21	Lance Bay	pink	1206	32	0.29								0										0
13-Apr-21	Sargeaunt Pass	pink	1207	31	0.29								0										0
13-Apr-21	Sargeaunt Pass	pink	1208	33	0.33								0										0
13-Apr-21	Sargeaunt Pass	pink	1209	32	0.32								0										0
13-Apr-21	Sargeaunt Pass	pink	1210	35	0.45								0										0
13-Apr-21	Sargeaunt Pass	pink	1211	34	35.00								0										0
13-Apr-21	Sargeaunt Pass	pink	1212	34	0.29								0										0
13-Apr-21	Sargeaunt Pass	pink	1213	32	0.27								0										0
13-Apr-21	Sargeaunt Pass	pink	1214	32	0.26								0										0
13-Apr-21	Sargeaunt Pass	pink	1215	30	0.22								0										0
13-Apr-21	Sargeaunt Pass	pink	1216	33	0.34								0										0
13-Apr-21	Sargeaunt Pass	pink	1217	37	0.49								0										0
13-Apr-21	Sargeaunt Pass	pink	1218	32	0.27								0										0
13-Apr-21	Sargeaunt Pass	pink	1219	31	0.34								0										0
13-Apr-21	Sargeaunt Pass	pink	1220	34	0.34								0										0
13-Apr-21	Sargeaunt Pass	pink	1221	32	0.28								0										0
13-Apr-21	Sargeaunt Pass	chum	1222	35	0.39								0										0
13-Apr-21	Sargeaunt Pass	chum	1223	36	0.39								0										0
13-Apr-21	Sargeaunt Pass	chum	1224	41	0.71								0										0
13-Apr-21	Sargeaunt Pass	chum	1225	34	0.38								0										0
13-Apr-21	Sargeaunt Pass	chum	1226	34	0.37								0										0
13-Apr-21	Sargeaunt Pass	chum	1227	41	0.65								0										0
13-Apr-21	Sargeaunt Pass	chum	1228	38	0.54								0										0
13-Apr-21	Sargeaunt Pass	chum	1229	35	0.37	1							1										0
13-Apr-21	Sargeaunt Pass	chum	1230	36	0.40								0										0
13-Apr-21	Sargeaunt Pass	chum	1231	36	0.41								0										0
13-Apr-21	Sargeaunt Pass	chum	1232	41	0.60								0										0
13-Apr-21	Sargeaunt Pass	chum	1233	39	0.50	1							1										0
13-Apr-21	Sargeaunt Pass	chum	1234	36	0.39								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
13-Apr-21	Sargeaunt Pass	chum	1235	35	0.35								0										0
13-Apr-21	Sargeaunt Pass	chum	1236	38	0.49								0										0
16-Apr-21	Nimpkish Estuary	pink	1237	34	0.28								0										0
16-Apr-21	Nimpkish Estuary	pink	1238	32	0.29								0										0
16-Apr-21	Nimpkish Estuary	pink	1239	34	0.31								0										0
16-Apr-21	Nimpkish Estuary	pink	1240	33	0.26								0										0
16-Apr-21	Nimpkish Estuary	pink	1241	35	0.36								0										0
16-Apr-21	Nimpkish Estuary	chum	1242	29	0.21								0										0
16-Apr-21	Nimpkish Estuary	chum	1243	29	0.22								0										0
16-Apr-21	Nimpkish Estuary	chum	1244	26	0.14								0										0
16-Apr-21	Nimpkish Estuary	chum	1245	27	0.18								0										0
13-Apr-21	Doctor Islets	chum	1247	35	0.34								0										0
13-Apr-21	Doctor Islets	chum	1248	37	0.48								0										0
13-Apr-21	Doctor Islets	chum	1249	42	0.70								0										0
13-Apr-21	Doctor Islets	chum	1250	37	0.49								0										0
13-Apr-21	Doctor Islets	chum	1251	45	0.96								0		1								1
13-Apr-21	Doctor Islets	chum	1252	38	0.48	1							1										0
13-Apr-21	Doctor Islets	chum	1253	39	0.65								0										0
13-Apr-21	Doctor Islets	chum	1254	37	0.43								0										0
13-Apr-21	Doctor Islets	chum	1255	37	0.42								0										0
13-Apr-21	Doctor Islets	chum	1256	46	1.01								0	2									2
13-Apr-21	Doctor Islets	chum	1257	38	0.55								0										0
13-Apr-21	Doctor Islets	chum	1258	36	0.41								0										0
13-Apr-21	Doctor Islets	chum	1259	36	0.51								0										0
13-Apr-21	Doctor Islets	chum	1260	37	0.49								0										0
13-Apr-21	Doctor Islets	chum	1261	37	0.59	1							1										0
13-Apr-21	Doctor Islets	pink	1262	32	0.29								0										0
13-Apr-21	Doctor Islets	pink	1263	31	0.26								0										0
13-Apr-21	Doctor Islets	pink	1264	33	0.31								0										0
13-Apr-21	Doctor Islets	pink	1265	33	0.31								0										0
13-Apr-21	Doctor Islets	pink	1266	29	0.24								0										0
13-Apr-21	Doctor Islets	pink	1267	33	0.31								0										0
13-Apr-21	Doctor Islets	pink	1268	31	0.30								0										0
13-Apr-21	Doctor Islets	pink	1269	34	0.40								0										0
13-Apr-21	Doctor Islets	pink	1270	34	0.38								0										0
13-Apr-21	Doctor Islets	pink	1271	32	0.31								0										0
13-Apr-21	Doctor Islets	pink	1272	32	0.32	2							2										0
13-Apr-21	Doctor Islets	pink	1273	33	0.36								0										0
13-Apr-21	Doctor Islets	pink	1274	34	0.42								0										0
13-Apr-21	Doctor Islets	pink	1275	35	0.40								0										0
13-Apr-21	Doctor Islets	pink	1276	32	0.32								0										0
15-Apr-21	McKenzie Cove	pink	1277	42	0.74								0										0
15-Apr-21	McKenzie Cove	pink	1278	45	0.93								0										0
15-Apr-21	McKenzie Cove	chum	1279	41	0.66								0										0
15-Apr-21	McKenzie Cove	chum	1280	42	1.10								0										0
15-Apr-21	McKenzie Cove	chum	1281	47	1.17								0										0
15-Apr-21	McKenzie Cove	chum	1282	43	0.82								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
15-Apr-21	McKenzie Cove	chum	1283	45	0.98								0										0
15-Apr-21	McKenzie Cove	chum	1284	41	0.72								0										0
15-Apr-21	McKenzie Cove	chum	1285	48	1.27								0										0
15-Apr-21	McKenzie Cove	chum	1286	46	1.04								0										0
15-Apr-21	McKenzie Cove	chum	1287	45	0.96								0										0
15-Apr-21	McKenzie Cove	chum	1288	45	0.93								0										0
15-Apr-21	McKenzie Cove	chum	1289	50	1.26								0										0
15-Apr-21	McKenzie Cove	chum	1290	45	0.94		1						1										0
15-Apr-21	McKenzie Cove	chum	1291	46	1.08								0										0
15-Apr-21	McKenzie Cove	chum	1292	40	0.75								0										0
15-Apr-21	McKenzie Cove	chum	1293	41	0.80								0										0
13-Apr-21	Tomakstum Island	chum	1294	35	0.38								0										0
13-Apr-21	Tomakstum Island	chum	1295	37	0.46								0										0
13-Apr-21	Tomakstum Island	chum	1296	35	0.42								0										0
13-Apr-21	Tomakstum Island	chum	1297	38	0.48								0										0
13-Apr-21	Tomakstum Island	chum	1298	32	0.33								0										0
13-Apr-21	Tomakstum Island	chum	1299	37	0.38								0										0
13-Apr-21	Tomakstum Island	chum	1300	33	0.34								0										0
13-Apr-21	Tomakstum Island	chum	1301	35	0.41								0										0
13-Apr-21	Tomakstum Island	chum	1302	35	0.39								0										0
13-Apr-21	Tomakstum Island	chum	1303	39	0.55								0										0
13-Apr-21	Tomakstum Island	chum	1304	35	0.44								0										0
13-Apr-21	Tomakstum Island	chum	1305	34	0.45	1							1										0
13-Apr-21	Tomakstum Island	chum	1306	38	0.56								0										0
13-Apr-21	Tomakstum Island	chum	1307	33	0.32								0										0
13-Apr-21	Tomakstum Island	chum	1308	36	0.50								0										0
14-Apr-21	Midsummer Island	chum	1309	46	0.97	1	1						2										0
14-Apr-21	Midsummer Island	chum	1310	40	0.70								0										0
14-Apr-21	Midsummer Island	pink	1311	33	0.29								0										0
14-Apr-21	Midsummer Island	pink	1312	32	0.32	1							1		1								1
14-Apr-21	Midsummer Island	pink	1313	34	0.37								0										0
14-Apr-21	Midsummer Island	pink	1314	32	0.28	1							1										0
14-Apr-21	Midsummer Island	pink	1315	33	0.30								0										0
14-Apr-21	Midsummer Island	pink	1316	34	0.32								0										0
14-Apr-21	Midsummer Island	pink	1317	34	0.36								0										0
14-Apr-21	Midsummer Island	pink	1318	32	0.32	1							1										0
14-Apr-21	Midsummer Island	pink	1319	34	0.33								0										0
14-Apr-21	Midsummer Island	pink	1320	32	0.30								0										0
14-Apr-21	Midsummer Island	pink	1321	34	0.32								0										0
14-Apr-21	Midsummer Island	pink	1322	33	0.39								0										0
14-Apr-21	Midsummer Island	pink	1323	35	0.45								0										0
14-Apr-21	Midsummer Island	pink	1324	34	0.37								0			1							1
14-Apr-21	Midsummer Island	pink	1325	33	0.36								0										0
14-Apr-21	Hanson Island	pink	1326	34	0.30								0										0
14-Apr-21	Hanson Island	pink	1327	35	0.44								0										0
14-Apr-21	Hanson Island	pink	1328	32	0.25								0										0
14-Apr-21	Hanson Island	pink	1329	32	0.32								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
14-Apr-21	Hanson Island	pink	1330	32	0.30								0										0
14-Apr-21	Hanson Island	pink	1331	38	0.55								0										0
14-Apr-21	Hanson Island	pink	1332	39	0.59								0										0
14-Apr-21	Hanson Island	pink	1333	33	0.29								0										0
14-Apr-21	Hanson Island	pink	1334	34	0.32								0										0
14-Apr-21	Hanson Island	pink	1335	33	0.27								0										0
14-Apr-21	Hanson Island	pink	1336	37	0.59								0										0
14-Apr-21	Hanson Island	pink	1337	34	0.42								0										0
14-Apr-21	Hanson Island	pink	1338	47	1.15								0										0
14-Apr-21	Hanson Island	pink	1339	33	0.33								0										0
14-Apr-21	Hanson Island	pink	1340	35	0.51								0										0
14-Apr-21	Hanson Island	pink	1341	37	0.57								0										0
14-Apr-21	Hanson Island	chum	1342	49	1.15								0										0
14-Apr-21	Hanson Island	chum	1343	45	1.05								0										0
14-Apr-21	Hanson Island	chum	1344	37	0.48								0										0
14-Apr-21	Hanson Island	chum	1345	49	1.27								0										0
14-Apr-21	Hanson Island	chum	1346	35	0.48								0										0
14-Apr-21	Hanson Island	chum	1347	43	0.90								0										0
14-Apr-21	Hanson Island	chum	1348	46	1.11								0										0
14-Apr-21	Hanson Island	pink	1349	39	0.69								0										0
14-Apr-21	Gwayasdums 1	pink	1350	34	0.47			1					1										0
14-Apr-21	Gwayasdums 1	pink	1351	35	0.41								0		1								1
14-Apr-21	Gwayasdums 1	pink	1352	36	0.42								0										0
14-Apr-21	Gwayasdums 1	pink	1353	33	0.39								0										0
14-Apr-21	Gwayasdums 1	pink	1354	37	0.57								0										0
14-Apr-21	Gwayasdums 1	pink	1355	35	0.42	1							1										0
14-Apr-21	Gwayasdums 1	pink	1356	33	0.41		1						1										0
14-Apr-21	Gwayasdums 1	pink	1357	41	0.76		1						1										0
14-Apr-21	Gwayasdums 1	pink	1358	40	0.58								0				1						1
14-Apr-21	Gwayasdums 1	pink	1359	35	0.40								0										0
14-Apr-21	Gwayasdums 1	pink	1360	34	0.45								0										0
14-Apr-21	Gwayasdums 1	pink	1361	37	0.58								0										0
14-Apr-21	Gwayasdums 1	pink	1362	36	0.45								0										0
14-Apr-21	Gwayasdums 1	pink	1363	41	0.63								0										0
14-Apr-21	Gwayasdums 1	pink	1364	34	0.37								0										0
14-Apr-21	Gwayasdums 1	chum	1365	46	1.05								0										0
14-Apr-21	Gwayasdums 1	chum	1366	45	1.02								0										0
14-Apr-21	Gwayasdums 1	chum	1367	41	0.75								0										0
14-Apr-21	Viner Sound	pink	1368	33	0.35								0										0
14-Apr-21	Viner Sound	pink	1369	33	0.39	1							1										0
14-Apr-21	Viner Sound	pink	1370	37	0.58								0										0
14-Apr-21	Viner Sound	pink	1371	32	0.41								0										0
14-Apr-21	Viner Sound	pink	1372	32	0.28								0										0
13-Apr-21	London Point	pink	1374	30	0.23								0										0
15-Apr-21	Codrington Point	pink	1375	32	0.34								0										0
15-Apr-21	Codrington Point	pink	1376	33	0.26	1							1										0
15-Apr-21	Codrington Point	pink	1377	35	0.41								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
15-Apr-21	Codrington Point	pink	1378	33	0.28								0										0
15-Apr-21	Codrington Point	pink	1379	35	0.46								0										0
20-May-21	Nimpkish Estuary	chum	1380	57	2.04								0										0
20-May-21	Nimpkish Estuary	chum	1381	57	1.95								0										0
20-May-21	Nimpkish Estuary	chum	1382	52	1.68								0										0
20-May-21	Nimpkish Estuary	chum	1383	57	2.11								0										0
20-May-21	Nimpkish Estuary	chum	1384	54	1.76								0										0
20-May-21	Nimpkish Estuary	chum	1385	53	1.58								0										0
20-May-21	Nimpkish Estuary	chum	1386	56	1.85								0										0
20-May-21	Nimpkish Estuary	chum	1387	60	2.05								0										0
20-May-21	Nimpkish Estuary	chum	1388	53	1.58								0										0
20-May-21	Nimpkish Estuary	chum	1389	52	1.45								0										0
20-May-21	Nimpkish Estuary	chum	1390	56	2.04								0										0
20-May-21	Nimpkish Estuary	chum	1391	65	3.10								0		1								1
20-May-21	Nimpkish Estuary	chum	1392	58	2.29								0										0
20-May-21	Nimpkish Estuary	chum	1393	57	2.13								0										0
20-May-21	Nimpkish Estuary	chum	1394	60	2.42								0		2								2
20-May-21	Wakeman 4	chum	1417	57	1.81								0										0
19-May-21	Tomakstum Island	chum	1445	44	0.97								0					1					1
19-May-21	Kwatsi Point	pink	1446	56	1.46								0										0
19-May-21	Brent Bay	pink	1447	56	2.09								0										0
19-May-21	Brent Bay	pink	1448	56	1.70								0										0
19-May-21	Brent Bay	pink	1449	40	0.56								0										0
18-May-21	Lady Islets	pink	1450	54	1.64	1			1				2										0
18-May-21	Lady Islets	pink	1451	71	3.46	1							1										0
18-May-21	Lady Islets	pink	1452	68	3.17								0										0
18-May-21	Lady Islets	pink	1453	55	1.85								0		1								1
18-May-21	Lady Islets	pink	1454	57	1.99								0										0
18-May-21	Lady Islets	pink	1455	64	2.67								0								1		1
18-May-21	Lady Islets	pink	1456	62	2.29	1							1										0
18-May-21	Lady Islets	pink	1457	69	3.78			1					1										0
18-May-21	Lady Islets	pink	1458	64	2.86								0										0
18-May-21	Lady Islets	pink	1459	58	1.96								0										0
18-May-21	Lady Islets	pink	1460	59	2.15								0										0
18-May-21	Lady Islets	pink	1461	54	1.68								0										0
18-May-21	Lady Islets	pink	1462	55	2.09					1			1									1	1
18-May-21	Lady Islets	pink	1463	60	2.43								0										0
18-May-21	Lady Islets	pink	1464	57	2.09	1				1			2										0
18-May-21	Lady Islets	chum	1465	60	2.41	1		1					2										0
18-May-21	Lady Islets	chum	1466	55	2.31			1					1										0
18-May-21	Lady Islets	chum	1467	72	4.56	1							1								1		1
18-May-21	Lady Islets	chum	1468	51	1.52		1						1										0
18-May-21	Hanson Island	chum	1469	39	0.68								0										0
18-May-21	Hanson Island	chum	1470	36	0.62								0										0
18-May-21	Hanson Island	chum	1471	49	1.45								0										0
18-May-21	Hanson Island	chum	1472	49	1.64								0										0
18-May-21	Hanson Island	pink	1473	44	1.06								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
19-May-21	Denham Island	chum	1474	48	1.50			1					1										0
19-May-21	Denham Island	chum	1475	44	1.25			1	1				2										0
19-May-21	Denham Island	chum	1476	50	1.60								0										0
19-May-21	Denham Island	chum	1477	44	0.90			2					2										0
19-May-21	Denham Island	chum	1478	47	1.18		1	2					3										0
19-May-21	Denham Island	chum	1479	45	1.25								0										0
19-May-21	Denham Island	chum	1480	52	1.64			1					1										0
19-May-21	Denham Island	chum	1481	45	0.97			2					2										0
19-May-21	Denham Island	chum	1482	40	0.59								0										0
19-May-21	Denham Island	chum	1483	51	1.75								0										0
19-May-21	Denham Island	chum	1484	42	0.75						1		1										0
19-May-21	Denham Island	chum	1485	43	0.81		1	1					2										0
19-May-21	Denham Island	chum	1486	48	1.33								0										0
19-May-21	Denham Island	chum	1487	51	1.36								0										0
19-May-21	Denham Island	chum	1488	45	1.10			1					1										0
19-May-21	Denham Island	chum	1489	35	0.51								0										0
19-May-21	Denham Island	pink	1490	35	0.44								0										0
19-May-21	Denham Island	pink	1491	54	1.66								0										0
19-May-21	Denham Island	pink	1492	53	1.38								0										0
19-May-21	Denham Island	pink	1493	40	0.60								0				1						1
19-May-21	Denham Island	pink	1494	46	1.80								0										0
19-May-21	Denham Island	pink	1495	44	0.88				1				1								1		1
19-May-21	Denham Island	pink	1496	47	1.11								0		1					1			2
19-May-21	Denham Island	pink	1497	38	0.50								0										0
19-May-21	Denham Island	pink	1498	48	1.24								0										0
19-May-21	Denham Island	pink	1499	54	1.72								0										0
19-May-21	Denham Island	pink	1500	53	1.91								0										0
19-May-21	Denham Island	pink	1501	45	1.00			1	1				2										0
19-May-21	Viner Sound	chum	1504	54	1.78								0										0
19-May-21	Viner Sound	chum	1505	46	1.09			1					1										0
19-May-21	Viner Sound	chum	1506	71	4.08								0										0
19-May-21	Viner Sound	chum	1507	61	2.57			1					1										0
19-May-21	Viner Sound	chum	1508	42	0.72								0										0
19-May-21	Viner Sound	chum	1509	66	3.20								0										0
19-May-21	Viner Sound	chum	1510	53	1.74								0										0
19-May-21	Viner Sound	chum	1511	54	1.78								0										0
19-May-21	Viner Sound	chum	1512	46	0.96								0							1			1
19-May-21	Viner Sound	chum	1513	39	0.64								0										0
19-May-21	Viner Sound	chum	1514	54	1.81				1				1										0
19-May-21	Viner Sound	chum	1515	48	1.24			2					2										0
19-May-21	Viner Sound	chum	1516	59	2.39								0										0
19-May-21	Viner Sound	chum	1517	48	1.05	1							1										0
19-May-21	Viner Sound	pink	1518	55	1.74				1				1										0
19-May-21	Viner Sound	pink	1519	71	3.93								0					1					1
19-May-21	Viner Sound	pink	1520	63	2.26								0										0
19-May-21	Viner Sound	pink	1521	58	2.07								0										0
19-May-21	Baker Island	chum	1523	56	1.71								0		1								1

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
19-May-21	Baker Island	chum	1524	58	1.99		1						1										0
19-May-21	Baker Island	pink	1525	47	0.95								0		1								1
19-May-21	Baker Island	pink	1526	56	1.61								0										0
19-May-21	Baker Island	pink	1527	54	1.60								0		1								1
19-May-21	Baker Island	pink	1528	44	0.96								0										0
19-May-21	Baker Island	pink	1529	53	1.30								0										0
19-May-21	Baker Island	pink	1530	56	1.99								0										0
19-May-21	Baker Island	pink	1531	53	1.64								0										0
19-May-21	Baker Island	pink	1532	56	1.45								0										0
19-May-21	Baker Island	pink	1533	42	0.74								0		1								1
19-May-21	Baker Island	pink	1534	43	0.85			1					1										0
19-May-21	Baker Island	pink	1535	45	0.99		1						1										0
19-May-21	Baker Island	pink	1536	48	1.00			1					1										0
19-May-21	Baker Island	pink	1537	56	1.62								0										0
19-May-21	London Point	pink	1538	62	2.10					1			1										0
19-May-21	London Point	pink	1539	58	2.03								0										0
19-May-21	London Point	pink	1540	62	2.53								0										0
19-May-21	London Point	pink	1541	55	1.77					1			1		1								1
19-May-21	London Point	pink	1542	61	2.15								0										0
19-May-21	London Point	pink	1543	64	2.32								0										0
19-May-21	London Point	pink	1544	60	2.02								0										0
19-May-21	London Point	pink	1545	61	2.05								0										0
19-May-21	London Point	pink	1546	61	2.25								0										0
19-May-21	London Point	pink	1547	70	3.30								0										0
19-May-21	London Point	pink	1548	49	1.25								0										0
19-May-21	London Point	pink	1549	52	1.37	1							1										0
19-May-21	London Point	chum	1550	82	5.43								0										0
19-May-21	London Point	chum	1551	65	2.83								0				1						1
19-May-21	London Point	chum	1552	67	2.97								0										0
19-May-21	London Point	chum	1553	62	2.24								0										0
19-May-21	London Point	chum	1554	75	4.80								0		1								1
19-May-21	London Point	chum	1555	58	2.05								0										0
19-May-21	London Point	chum	1556	67	2.98			1		1			2		1								1
19-May-21	London Point	chum	1557	64	2.61								0										0
19-May-21	London Point	chum	1558	67	3.23		2						2										0
19-May-21	London Point	chum	1559	68	3.62								0										0
19-May-21	London Point	chum	1560	64	2.96								0										0
19-May-21	London Point	chum	1561	66	3.25			2					2			1							1
19-May-21	London Point	chum	1562	53	1.65	1			1				2										0
19-May-21	London Point	chum	1563	62	2.52								0										0
19-May-21	London Point	chum	1564	59	2.15		1						1			2							2
19-May-21	London Point	chum	1565	58	1.88								0										0
19-May-21	London Point	chum	1566	64	2.64								0										0
19-May-21	London Point	chum	1567	80	6.20								0										0
19-May-21	London Point	chum	1568	75	4.73								0										0
20-May-21	Gwayasdums 1	pink	1574	58	1.90			1					1										0
20-May-21	Gwayasdums 1	pink	1575	72	4.08								0										0

Date of seine	Location	Fish Species	Fish #	Length (mm)	Weight (g)	LEP Co	LEP C1	LEP C2	LEP PAM	LEP PAF	LEP AM	LEP AF	LEP Total	Cal Co	Cal C1	Cal C2	Cal C3	Cal C4	CAL PAM	CALP AF	CAL AM	CAL AF	CAL Total
20-May-21	Gwayasdums 1	pink	1576	77	4.31	1							1										0
20-May-21	Gwayasdums 1	pink	1577	70	3.56								0										0
20-May-21	Gwayasdums 1	pink	1578	65	2.77								0										0
20-May-21	Gwayasdums 1	pink	1579	71	3.89								0										0
20-May-21	Gwayasdums 1	pink	1580	76	4.67								0										0
20-May-21	Gwayasdums 1	pink	1581	74	4.65								0										0
20-May-21	Gwayasdums 1	pink	1582	58	2.02		1						1										0
20-May-21	Gwayasdums 1	pink	1583	71	3.49								0										0
20-May-21	Gwayasdums 1	pink	1584	65	3.01								0										0
20-May-21	Gwayasdums 1	pink	1585	64	2.67								0										0
20-May-21	Gwayasdums 1	pink	1586	68	3.25								0										0
20-May-21	Gwayasdums 1	pink	1587	66	2.97								0										0
20-May-21	Gwayasdums 1	pink	1588	70	3.55								0										0
20-May-21	Gwayasdums 1	chum	1589	71	4.15								0			1							1
20-May-21	Gwayasdums 1	chum	1590	83	6.88								0										0
18-May-21	Chop Bay	pink	1592	41	0.93								0										0
18-May-21	Chop Bay	pink	1593	46	1.07				1				1		1								1
18-May-21	Chop Bay	pink	1594	48	1.21				1				1										0
18-May-21	Chop Bay	pink	1595	44	0.97								0								1		1
18-May-21	Chop Bay	pink	1596	39	0.73								0					1					1
18-May-21	Chop Bay	pink	1597	42	0.82								0		1			1					2
18-May-21	Chop Bay	pink	1598	43	0.98								0					1					1
18-May-21	Chop Bay	pink	1599	48	1.26								0										0
18-May-21	Chop Bay	pink	1600	45	1.05				1				1				1						1
18-May-21	Chop Bay	pink	1601	40	0.75			1					1				1	1					2
18-May-21	Chop Bay	pink	1602	42	0.78			1	1				2		1								1
18-May-21	Chop Bay	pink	1603	43	0.86								0										0
18-May-21	Chop Bay	pink	1604	37	0.55								0										0
18-May-21	Chop Bay	pink	1605	43	0.79				1				1		1								1
18-May-21	Chop Bay	chum	1606	57	2.48			1	2				3										0
18-May-21	Chop Bay	chum	1607	49	1.42								0	2				1					3
18-May-21	Chop Bay	chum	1608	42	0.78			1					1		1								1
18-May-21	Chop Bay	chum	1609	45	1.07								0		2		1						3
18-May-21	Chop Bay	chum	1610	39	0.80								0				1						1
18-May-21	Chop Bay	chum	1611	49	1.49								0				1		1				2
18-May-21	Chop Bay	chum	1612	60	2.46								0	1								1	2
18-May-21	Chop Bay	chum	1613	48	1.14								0			1							1
18-May-21	Chop Bay	chum	1614	56	2.07								0					1					1
20-May-21	Penphrase Pass	pink	1615	61	2.05								0										0
20-May-21	Penphrase Pass	pink	1616	69	3.32								0										0
20-May-21	Penphrase Pass	pink	1617	61	2.10								0										0
20-May-21	Penphrase Pass	pink	1618	70	3.17								0										0
20-May-21	Penphrase Pass	chum	1619	61	2.86			1					1										0

Appendix IV - 2016 – 2021 Comparisons

A comparison of sea lice infestation rates on chum and pink salmon collected in the Broughton Archipelago between 2016 and 2021.

Chum by Year	*Caligus clemensi*			*Lepeophtheirus salmonis*		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=512)	20.3 %	0.32	1.6	13.3 %	0.19	1.4
2017 (n=562)	17.4 %	0.31	1.8	11.0 %	0.14	1.3
2018 (n=281)	12.5 %	0.16	1.3	10.3 %	0.11	1.1
2019 (n=246)	16.3 %	0.28	1.7	14.2 %	0.21	1.5
2020 (n=497)	18.1 %	0.27	1.5	7.4 %	0.10	1.3
2021 (n=249)	11.7%	0.16	0.6	17.7%	0.24	1.4

Pink by Year	*Caligus clemensi*			*Lepeophtheirus salmonis*		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2016 (n=430)	24.4 %	0.33	1.3	15.3 %	0.24	1.5
2017 (n=411)	15.1 %	0.23	1.5	6.6 %	0.09	1.4
2018 (n=356)	11.5 %	0.16	1.4	5.6 %	0.06	1.1
2019 (n=230)	13.5 %	0.20	1.5	11.7 %	0.24	2.1
2020 (n=402)	15.9 %	0.19	1.2	8.7 %	0.11	1.2
2021 (n=309)	10.0%	0.13	1.3	16.5%	0.18	1.1

The number of sea lice in each life stage by species identified on the chum salmon sample population from the Broughton Archipelago between 2016 and 2021.
LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage[1]	Number of Lice					
	2016	2017	2018	2019	2020	2021[2]
LEP Co	16	21	11	5	22	17
LEP C1	21	28	13	27	7	13
LEP C2	39	29	8	7	14	23
LEP PAM	8	2	0	5	2	5
LEP PAF	4	1	0	1	3	1
LEP AM	6	0	0	5	1	1
LEP AF	4	0	0	3	0	0
TOTAL LEP	**98**	**81**	**32**	**53**	**49**	**60**
CAL Co	7	27	9	2	15	8
CAL C1	111	103	22	50	74	15
CAL C2	15	33	5	9	18	6
CAL C3	8	9	4	4	15	4
CAL C4	11	2	2	2	2	3
CAL PAM	0	0	0	0	1	1
CAL PAF	0	0	1	0	0	1
CAL AM	3	1	1	0	8	1
CAL AF	9	1	1	2	1	1
TOTAL CAL	**164**	**176**	**45**	**69**	**134**	**40**

[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

[2] A maximum of 15 individual were captured at each sample location instead of the usual maximum of 30.

The number of sea lice in each life stage by species identified on the pink salmon sample population from the Broughton Archipelago between 2016 and 2021.
LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage[1]	Number of Lice					
	2016	2017	2018	2019	2020	2021[2]
LEP Co	11	13	9	9	16	23
LEP C1	17	11	7	18	9	12
LEP C2	51	12	5	9	6	9
LEP PAM	7	0	0	1	4	9
LEP PAF	2	1	1	2	4	4
LEP AM	7	0	0	9	2	0
LEP AF	8	0	0	8	2	0
TOTAL LEP	**103**	**37**	**22**	**56**	**43**	**57**
CAL Co	1	8	4	2	16	3
CAL C1	74	50	43	35	36	19
CAL C2	26	21	9	6	6	2
CAL C3	16	6	2	1	8	5
CAL C4	6	3	0	0	3	5
CAL PAM	0	0	0	0	1	0
CAL PAF	0	2	0	0	3	1
CAL AM	5	3	0	1	3	3
CAL AF	12	0	0	0	1	1
TOTAL CAL	**140**	**93**	**58**	**45**	**77**	**39**

[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

[2] A maximum of 15 individual were captured at each sample location instead of the usual maximum of 30.

A comparison of the results of analysis for sea lice infestation on samples collected by beach seine in the Broughton Archipelago between 2016 and 2021.

Species	Sample size (n)						Total # of fish infested						Prevalence (%)					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
chum	512	562	281	246	497	249	152	131	55	58	114	64	29.7	23.3	19.6	23.6	22.9	25.7
pink	430	411	356	230	402	309	146	77	52	49	90	71	34.0	18.7	14.6	21.3	22.4	23.0
Total	**942**	**973**	**637**	**476**	**899**	**558**	**298**	**208**	**107**	**107**	**204**	**135**	**31.6**	**21.4**	**16.8**	**22.5**	**22.7**	**24.2**

Species	Sample size (n)						Total # of lice observed						Abundance					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
chum	512	562	281	246	497	249	262	257	77	122	183	100	0.51	0.46	0.27	0.50	0.37	0.40
pink	430	411	356	230	402	309	242	130	80	101	120	96	0.56	0.32	0.22	0.44	0.30	0.31
Total	**942**	**973**	**637**	**476**	**899**	**558**	**504**	**387**	**157**	**223**	**303**	**196**	**0.54**	**0.40**	**0.25**	**0.47**	**0.34**	**0.35**

Species	Total # of fish infested						Total # of lice observed						Intensity					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
chum	152	131	55	58	114	64	262	257	77	122	183	100	1.72	1.96	1.40	2.10	1.61	1.56
pink	146	77	52	49	90	71	242	130	80	101	120	96	1.66	1.69	1.54	2.06	1.33	1.35
Total	**298**	**208**	**107**	**107**	**204**	**135**	**504**	**387**	**157**	**223**	**303**	**196**	**1.69**	**1.86**	**1.47**	**2.08**	**1.49**	**1.45**