

Wild Juvenile Salmonid Monitoring Program Quatsino Sound, BC 2019

Prepared for

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June 2019

Summary

Beach seine sampling was conducted on behalf of MOWI Canada West in Quatsino Sound, BC in 2019. Sampling was completed to monitor sea lice abundance, prevalence and intensity on juvenile wild salmon within Quatsino Sound in support of the Aquaculture Stewardship Certification process for MOWI Canada West finfish aquaculture sites in the area.

This data report represents the fifth year of wild juvenile salmonid monitoring within Quatsino Sounds and Holberg Inlet.

Sampling was conducted during two separate sampling events in April and May 2019, selected to coincide with the peak outmigration period of juvenile salmonids. Sampling was completed at 10 sites within Quatsino Sound and Holberg Inlet, BC. The sites were selected based on their locations relative to existing aquaculture sites located in the area. Sampling was completed with the support of the G̓usgimukw people of the Quatsino First Nation.

Thirty individuals from each target fish species (Pacific salmonids and threespine stickleback) or the total number of captured individuals from each target species (if less than 30 were captured) were collected from each of the 10 sites during the sampling events. Total catch numbers of each species were recorded. Water quality measurements including surface 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 Quatsino Sound and Holberg Inlet in 2019. A total of 491 wild juvenile salmonids underwent lab analysis for sea lice infestation including 441 chum salmon, 35 coho salmon, seven pink salmon, six chinook salmon and two sockeye salmon. No Atlantic salmon (*Salmo salar*) were captured during sampling completed in Quatsino Sound and Holberg Inlet in 2019. From the total sample population 52 samples were infested with 95 sea lice. The calculated prevalence for the total sample population was 10.6 % and the sea lice abundance was 0.19 for the sample population collected in Quatsino Sound and Holberg Inlet in 2019.

Chum salmon smolts were captured in significantly greater numbers than any other species. A total of 4939 chum salmon were captured, representing 99.0 % of all captured salmonids. Of the 4939 chum captured, 441 were kept for lab analysis for sea lice infestation. A total of 43 chum smolts were found to be infested with a total of 55 lice resulting in a calculated prevalence of 9.8 %, abundance of 0.12 and an average intensity of 1.3 for the chum salmon sample population.

A total of 35 coho salmon were captured, representing 0.7 % of all captured samples. All 35 coho salmon captured were kept for lab analysis for sea lice infestation. A total of five coho smolts were found to be infested with a total of 33 lice resulting in a calculated prevalence of 14.3 %, abundance of 0.94 and an average intensity of 6.6 for the coho salmon sample population.

A total of seven pink salmon were captured, representing 0.1 % of all captured samples. All of the pink salmon captured were kept for lab analysis for sea lice infestation. One sea louse was found on one pink salmon resulting in a calculated prevalence of 14.3 %, abundance of 0.14 and an average intensity of 1.0 for the pink salmon sample population.

A total of six chinook salmon were captured, representing 0.1 % of all captured samples. All of the chinook salmon captured were kept for lab analysis for sea lice infestation. One sea louse was found on one chinook salmon resulting in a calculated prevalence of 16.7 %, abundance of 0.17 and an average intensity of 1.0 for the chinook salmon sample population.

Two sockeye salmon were captured, representing 0.04 % of all captured samples. Both of the sockeye salmon captured were kept for lab analysis for sea lice infestation. Five sea lice were found on the two sockeye salmon resulting in a calculated prevalence of 100.0 %, abundance of 2.50 and an average intensity of 2.5 for the sockeye salmon sample population.

A total of ten *Lepeophtheirus salmonis* sea lice of various life stages were identified on nine juvenile salmon and 85 *Caligus clemensi* sea lice were found on 43 of the samples analyzed in the lab. There were no juvenile salmon that were infested with both a *L. salmonis* and a *C. clemensi* sea louse.

For the chum salmon sample population, a total of nine *L. salmonis* sea lice of various life stages were identified on eight juvenile chum salmon and 46 *C. clemensi* sea lice were found on 35 of the juvenile chum salmon analyzed in the lab.

For the coho salmon sample population, a total of 33 *C. clemensi* sea lice were identified on five juvenile coho salmon. All of the sea lice identified were *C. clemensi*, no *L. salmonis* sea lice were identified on any of the juvenile coho salmon analyzed in the lab. All of the infested coho salmon samples were collected from Site 3 on May 2, 2019.

A comparison of the prevalence, abundance and average intensity of sea lice species found on chum salmon was completed for sample data between 2015 and 2019 collected in Quatsino Sound and Holberg Inlet. This data is presented in the following summary table with additional yearly comparisons of juvenile wild salmon monitoring results presented in Appendix IV.

Year	<i>Caligus clemensi</i>			<i>Lepeophtheirus salmonis</i>		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2015	13.6 %	0.24	1.75	12.4 %	0.21	1.72
2016	8.6 %	0.11	1.32	8.9 %	0.10	1.09
2017	1.7 %	0.02	1.00	1.7 %	0.02	1.00
2018	2.5 %	0.02	1.00	3.1 %	0.03	1.00
2019	7.9 %	0.10	1.31	1.8 %	0.02	1.13

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1.0 Introduction

At the request of MOWI Canada West, beach seine sampling to capture wild juvenile salmon to be analyzed for sea lice infestation took place at 10 sites located in Quatsino Sound and Holberg Inlet, BC (Figure 1). The sample collection occurred during two sample events in 2019 on April 8 and May 2. These weeks were selected to coincide with the estimated peak outmigration dates of juvenile salmonids. Sampling was completed with the support of the G̓usgimukw people of the Quatsino First Nation.

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*) have been identified (Margolis and Arthur 1979; McDonald and Margolis, 1995). *Caligus clemensi* infest a 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 of these genera have similar life histories and developmental stages (Kabata, 1972; Johnson and Albright, 1991a). The sea lice hatch from eggs and develop 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 four chalimus stages. The chalimus are “non-motile” and are attached to their host by a frontal filament. The final chalimus stage terminates as the sea lice become “motile” and are no longer attached to their hosts by the frontal filament. The sea lice can now 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 requested monitoring of sea lice abundance, prevalence and intensity on juvenile wild salmon within Quatsino Sound and Holberg Inlet 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 Quatsino Sound and Holberg Inlet in 2019. This represents the fifth year of wild juvenile salmonid monitoring in Quatsino Sound and Holberg Inlet conducted by MOWI Canada West, formerly Marine Harvest Canada. No Atlantic salmon have been captured or observed during sampling for juvenile salmonids at the 10 beach seine sites in Quatsino Sound completed in 2015, 2016, 2017, 2018 and 2019.

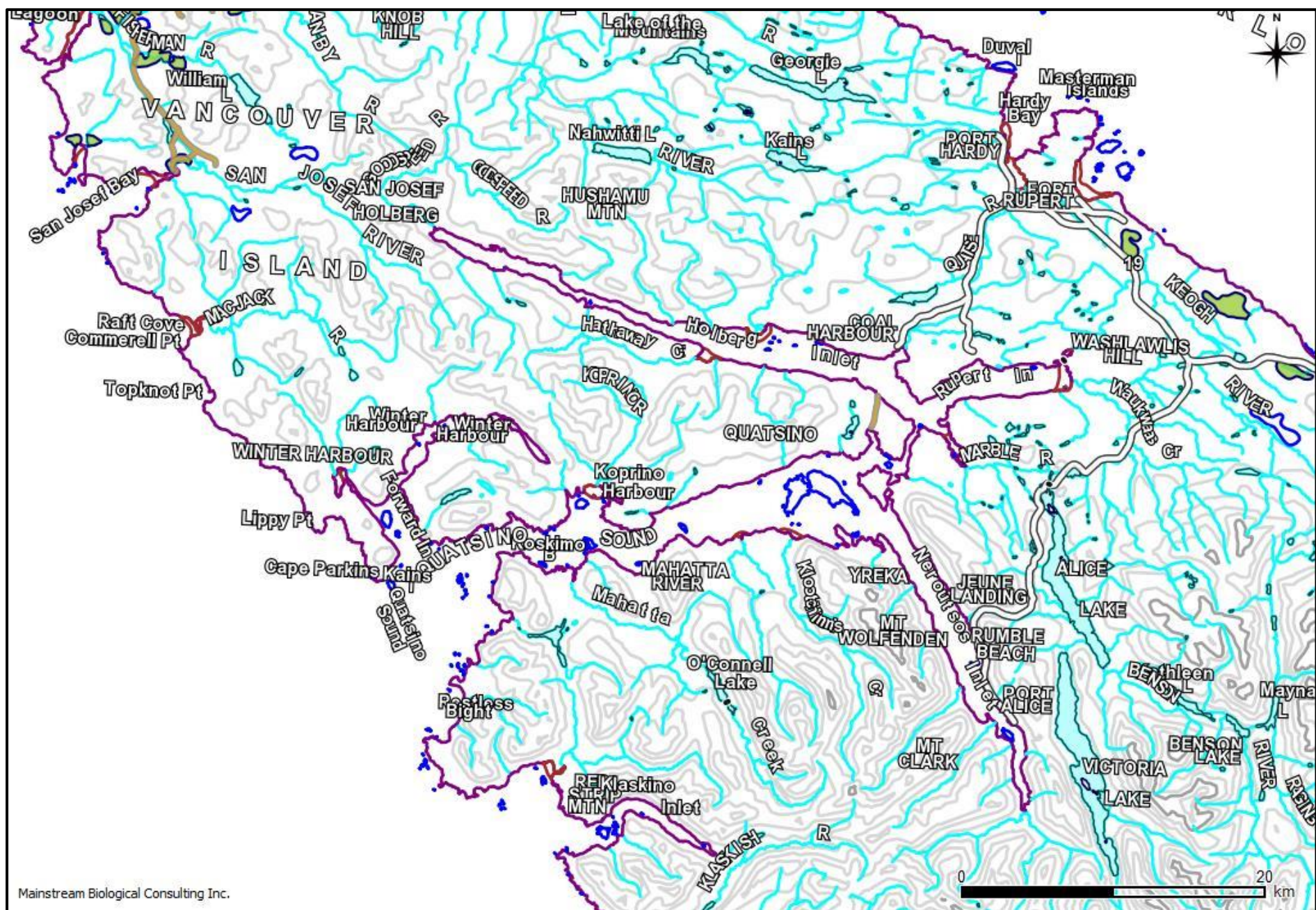


Figure 1: An overview map showing the location of Quatsino Sound and Holberg Inlet on the west coast of northern Vancouver Island, BC.

2.0 Methods

The fish inspected for sea lice infestation were collected from 10 sites in Quatsino Sound and Holberg Inlet, BC. These sites were chosen based on their locations relative to existing MOWI Canada West aquaculture sites in the area (Figure 2). The sites were sampled twice in 2019 on April 8 and May 2.

2.1 Site Locations

The 10 sites at which beach seining was conducted to collect specimens for sea lice analysis consisted of three sites in Holberg Inlet (Sites 1, 2 and 3) and seven sites in Quatsino Sound. The approximate locations of the 10 beach seine sites are shown in Figure 2. GPS coordinates collected in the field for the sites are presented in Table 1.

Table 1: The site number and location of the 10 beach seine sites where fish were collected for sea lice analysis in Quatsino Sound and Holberg Inlet in 2019.

Site #	UTM Coordinates (NAD 83)		
	UTM Zone	Easting	Northing
1	9	594113	5604358
2	9	598764	5603542
3	9	599381	5603384
4	9	586996	5592794
5	9	585851	5591387
6	9	581818	5591805
7	9	580210	5590249
8	9	578392	5590120
9	9	578608	5592552
10	9	579737	5594278

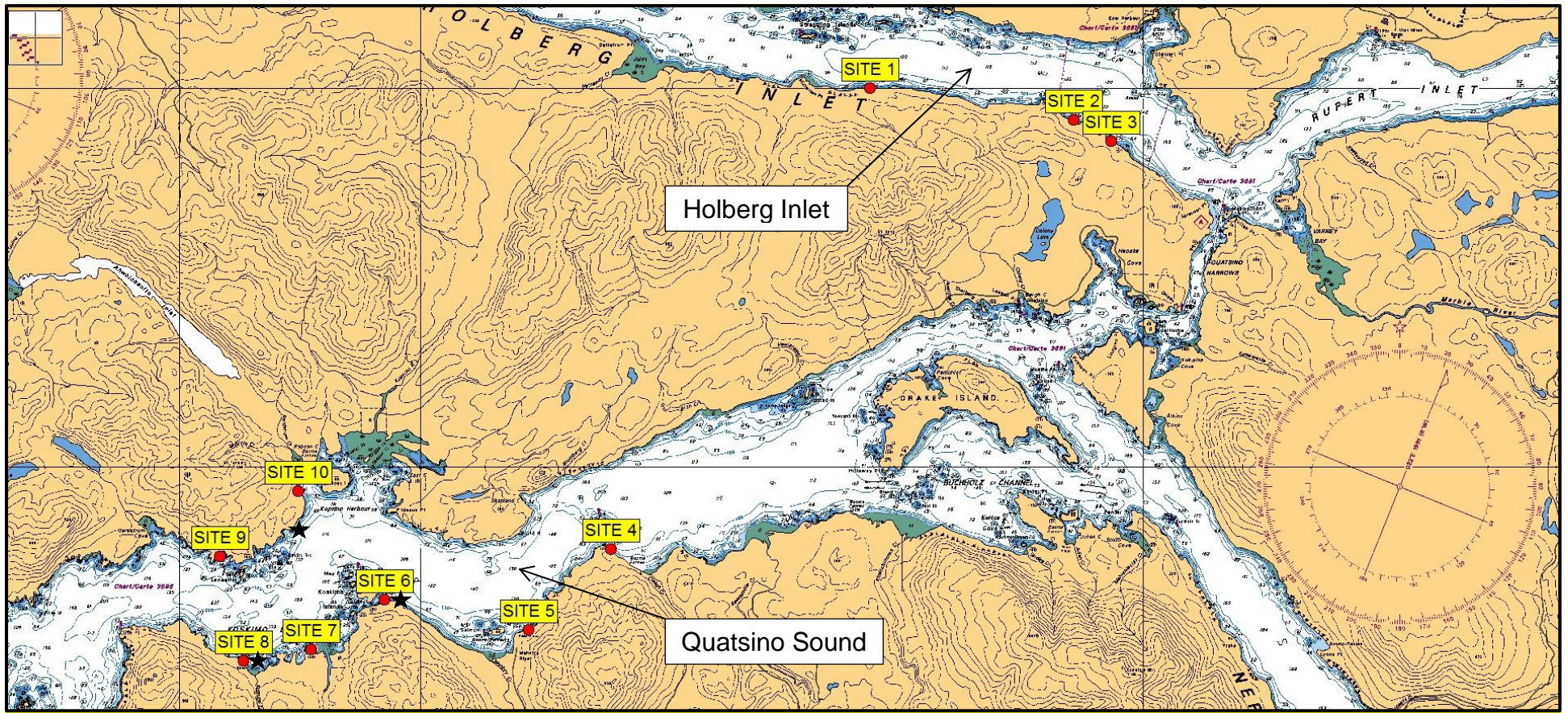


Figure 2: The locations of the 10 beach seine sites in Quatsino Sound and Holberg Inlet sampled in 2019. MOWI Canada West active aquaculture site locations are indicated with a black star.

2.2 Field Procedures

Procedures for beach seining, fish collection and field data recording adapted from procedures utilized by the Department of Fisheries and Oceans (DFO) were used for juvenile salmon sampling by Mainstream Biological Consulting staff during sampling in Quatsino Sound and Holberg Inlet in 2019.

An 18ft 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. The centre bunt section consists of one-quarter inch diameter diamond mesh, while the two side panels (wings) consist of half-inch diameter diamond mesh. Floats were located every 30 cm along the top-line and a lead line weighted the bottom of the net.

A four person crew was utilized to conduct the beach seine sets and retrieve samples in a consistent manner at each of the 10 selected sites. All beaches were approached slowly by boat and one crewmember was put ashore with the towline from one end of the beach seine net. The onshore crewmember held the towline at one side of the sample site, while the second and third crewmembers ensured the net deployed smoothly off the bow or side of the boat. The fourth crewmember, the boat operator, backed the boat in a wide semicircle towards the opposite side of the sample site and remained on the boat. When the net was fully deployed, the second and third crewmembers 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 slowly retrieved, the probe of a water 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.

The crewmembers retrieved the net evenly from opposite ends ensuring that the lead line remained as close to the bottom as possible. All 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 the 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 held the captured fish in the water.

The three shore crew members participated in the collection of individual fish to ensure that captured fish remained in the net for as short a period of time as possible. The net was manipulated, if necessary, in response to rising or falling tides in order to ensure the captured fish remained in the net and were held in sufficient water to minimize stress. The level of sufficient water was dependant on the size and numbers of captured fish, but was generally thought of as enough water to minimize fish contact with the net or with other fish.

A total of 30 individuals from each target species captured or all of the individuals present (if less than 30) were collected as samples for sea lice infestation analysis. Individual fish were “swam” into an appropriately sized whirlpac bag. All 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 crewmember recorded all the information from each beach seine set in a standardized field form. The information recorded included the following:

- The site number (Site 1-10);
- The date;
- The 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 number (Site 1-10) and the week number (Week 1 or 2). Site

sample bags were placed in a portable freezer, which was plugged into the boat's battery. The specimens were transferred to a freezer immediately upon return from the field.

The beach seine net was reloaded onto the bow of the boat. Crewmembers scanned the net for obvious holes, which were repaired immediately if found. The YSI85 meter was shut off and stored, and all gear and coolers were reloaded into the boat.

The above procedures for beach seine net deployment and retrieval, as well as those described for fish collection, were repeated at all 10 sample sites.

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 either of the two chalimus stages for *Lepeophtheirus salmonis* (Hamre et al., 2013) or four chalimus stages for *Caligus clemensi*. Motile lice, either pre-adults or adults, were identified as either *Lepeophtheirus salmonis* or *Caligus clemensi* and the sex of the louse was determined. 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 week.

Beach seine fish sample composition was summarized by species and site for each week. The recorded fork lengths and weights of the juvenile salmon sample population 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 juvenile salmon 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 chum salmon and coho 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 chum salmon and coho 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 the results of beach seine collection and subsequent sea lice inspection of juvenile salmonids collected from Quatsino Sound and Holberg Inlet, BC, in 2019. Water quality field data is presented in Appendix I, beach seine fish capture data is included in Appendix II and data on the juvenile salmon sample population including sea lice lab analysis results provided by CAHS are located in Appendix III.

3.1 Water Quality Parameters

Surface measurements of water temperature and salinity, taken during beach seining at each of the 10 sites during the two sample periods, 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 8.5 °C recorded at Site 3 on April 8, 2019, to a high of 17.4 °C recorded at Site 6 on May 2, 2019 (Table 2; Appendix I). Calculated weekly average surface water temperatures increased from 10.3 °C for April 8, 2019, to 14.0 °C for May 2, 2019.

Recorded surface water salinity ranged from a low of 13.4 ppt recorded at Site 10 on April 8, 2019, to a high of 32.6 ppt recorded at Site 7 on April 8, 2019 (Table 2; Appendix I). The calculated weekly average surface water salinity was 24.7 ppt for both sampling periods in April and May, 2019.

Table 2: Water quality parameters collected at beach seine sites in Quatsino Sound and Holberg Inlet in 2019.

Site	April 8, 2019		May 2, 2019	
	Temp. (°C)	Salinity (ppt)	Temp. (°C)	Salinity (ppt)
1	9.3	27.3	14.4	28.3
2	8.7	26.2	11.5	28.2
3	8.5	23.5	13.4	23.3
4	9.2	18.1	11.3	31.0
5	9.4	30.5	13.1	23.1
6	9.8	25.2	17.4	26.1
7	11.1	32.6	14.6	24.5
8	10.6	26.3	16.2	28.6
9	11.2	24.3	11.8	16.6
10	13.7	13.4	16.2	17.2
Average	10.3	24.7	14.0	24.7

3.2 Fish Sample Composition

A total of 4989 fish were captured during beach seine sampling conducted in Quatsino Sound and Holberg Inlet, BC in 2019 with 491 retained for sea lice analysis (Table 3). 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. Of the 4939 chum salmon captured, 441 individual chum salmon (8.9 %) were retained and underwent lab analysis. All of the 35 coho salmon, seven pink salmon, six chinook salmon and two sockeye salmon captured underwent lab analysis (Table 3). No threespine stickleback and no Atlantic salmon were captured during the two sampling events in April and May 2019 (Table 3).

Chum salmon smolts were captured in significantly greater numbers than any other species. A total of 4939 chum salmon were captured, representing 99.0 % of all captured salmonids (Table 3).

Table 3: The total of collected individuals of each fish species captured in Quatsino Sound and Holberg Inlet, BC in April and May 2019, and the percentage of the total capture population that they represent.

Common Name	Capture Totals (% of total capture population)	Collection Totals	Collection %
chum salmon	4939 (99.0 %)	441	8.9
coho salmon	35 (0.7 %)	35	100.0
chinook salmon	6 (0.1 %)	6	100.0
pink salmon	7 (0.1 %)	7	100.0
sockeye salmon	2 (0.04 %)	2	100.0
threespine stickleback	0 (0.0 %)	0	-
All species	4989	491	9.8

Table 4: The number of captured fish (Capture Total) and the number of individual fish collected (Sample Total) from each of the 10 sample sites in Quatsino Sound and Holberg Inlet, BC in April and May 2019.

SITE	Chum		Pink		Coho		Chinook		Sockeye		Capture Total	Sample Total
	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total	Capture Total	Sample Total		
1	626	58	2	2	0	0	0	0	0	0	628	60
2	1380	60	2	2	0	0	2	2	0	0	1384	64
3	2300	60	0	0	6	6	0	0	0	0	2306	66
4	39	30	0	0	0	0	0	0	0	0	39	30
5	132	60	0	0	0	0	0	0	2	2	134	62
6	101	41	0	0	0	0	0	0	0	0	101	41
7	27	27	2	2	29	29	4	4	0	0	62	62
8	16	16	0	0	0	0	0	0	0	0	16	16
9	60	29	1	1	0	0	0	0	0	0	61	30
10	258	60	0	0	0	0	0	0	0	0	258	60
Total	4939	441	7	7	35	35	6	6	2	2	4989	491

3.3 Fish Sample Size Statistics

Summary statistics for the sample population of juvenile salmonids were completed for weight and fork length. This analysis was completed for chum salmon and coho salmon only as the sample population of pink salmon, sockeye salmon and chinook salmon was not of sufficient size to warrant this analysis.

3.3.1 Chum Salmon

Analysis of weight and fork length data was completed for the chum salmon sample population collected in Quatsino Sound and Holberg Inlet in 2019. The weight of 441 chum smolts collected during the two sample events ranged from 0.25 g to 3.37 g and averaged 0.64 g (SD = 0.3). The fork length of the chum smolts ranged from 31 mm to 67 mm and averaged 38 mm (SD = 4.3). Chum salmon weight and length data was summarized by month which shows an increase in both parameters in the sample population from April to May (Table 5).

3.3.2 Coho Salmon

Analysis of weight and fork length data was completed for the coho salmon sample population collected in Quatsino Sound and Holberg Inlet in 2019. The weight of 35 coho smolts collected ranged from 0.28 g to 11.51 g and averaged 2.89 g (SD = 3.7). The fork length of the coho smolts ranged from 31 mm to 100 mm and averaged 53 mm (SD = 24.9). Coho salmon weight and length data was summarized by month which shows an increase in both parameters in the sample population from April to May (Table 5).

Table 5: Average weights and lengths summarized by month of chum and coho salmon collected in Quatsino Sound and Holberg Inlet in 2019.

Species	Weight (g)		Length (mm)	
	April	May	April	May
Chum	0.59 (n=210)	0.68 (n=231)	38	39
Coho	1.50 (n=28)	8.46 (n=7)	44	86

3.4 Sea Lice Infestation Rates

The results of the laboratory analysis for the presence of sea lice on the sample population collected in Quatsino Sound and Holberg Inlet in 2019 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 491 samples were collected at 10 sites in Quatsino Sound and Holberg Inlet in 2019 and were inspected for sea lice infestation. A total of 52 individuals in the sample population were found to be infested with 95 sea lice (Table 6). A total of 43 chum smolts, five coho salmon, two sockeye salmon, one chinook salmon and one pink salmon were found to be infested with sea lice (Table 6). This data reflects the identification of sea lice of either species (*L. salmonis* and *C. clemensi*) on inspected juvenile salmon.

Prevalence was defined as the number of fish found to be infested with one or more sea louse compared to the total number of fish. Abundance was defined as the total number of sea lice observed compared to the total number of fish. The sea lice prevalence in the sample population collected in Quatsino Sound and Holberg Inlet in 2019 was 10.6 % and the abundance was 0.19 (Table 6). Sea lice counts of both species observed (*L. salmonis* and *C. clemensi*) were added together for the prevalence and abundance calculations for the entire sample population.

The intensity of sea lice infestation, as defined as the number of sea lice on a single sample, ranged from one louse found on 40 individuals to a maximum of nine lice found on one individual. There were two samples infested with two lice, four infested by three lice, one infested with four lice, one found to have five lice, and three found to have seven lice. The average intensity was calculated by dividing the total number of sea lice by the number of infested fish which was 1.3 for chum salmon, 6.6 for coho salmon, 1.0 for pink salmon, 1.0 for chinook salmon and 2.5 for sockeye salmon (Table 6).

Table 6: Results of analysis for sea lice infestation on the sample population collected by beach seine in Quatsino Sound and Holberg Inlet, BC in 2019.

Species	Sample size (n)	Total number of lice observed	Total number of fish infested	Prevalence (%)	Abundance	Average Intensity
chum	441	55	43	9.8	0.12	1.3
coho	35	33	5	14.3	0.94	6.6
pink	7	1	1	14.3	0.14	1.0
chinook	6	1	1	16.7	0.17	1.0
sockeye	2	5	2	100.0	2.50	2.5
Total	491	95	52	10.6	0.19	1.8

3.4.1 Infestation Rates on Chum Salmon

The results of the laboratory analysis for sea lice infestation for chum salmon are presented by site in Table 7. A total of 43 chum salmon were found to be infested with 55 sea lice. 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 7).

The chum salmon sample population sea lice infestation rates were summarized by site. A total of 43 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=441) collected in Quatsino Sound and Holberg Inlet in 2019 was 9.8 %. Sea lice prevalence calculated by site and week for chum salmon is presented in Table 7. Sea lice prevalence was higher in chum salmon collected in May (14.7 %) than in April (4.3 %) 2019. The highest sea lice prevalence (33.3 %) was at Site 5 on May 2, 2019. Sea lice prevalence calculated by site for the total chum sample population was variable ranging from 0.0 % at Site 4 to a high of 21.7 % at Site 5.

A total of 55 sea lice were identified during laboratory analysis of retained chum salmon. The abundance of sea lice on the chum salmon sample population (n=441) collected in Quatsino Sound and Holberg Inlet in 2019 was 0.12. Sea lice abundance was calculated by week and by site and is presented in Table 7. Sea lice abundance was higher in chum salmon collected in May (0.20) than in April (0.04) 2019. The highest sea lice abundance (0.50) was at Site 3 on May 2, 2019. Sea lice abundance calculated by site for the total chum sample population was also variable ranging from 0.00 at Site 4 to a high of 0.30 at Site 3.

Table 7: The number of sea lice found on chum salmon collected in Quatsino Sound and Holberg Inlet in 2019 summarized by the 10 sites where beach seining was conducted. Calculated sea lice prevalence, abundance and average intensity is also included by site.

Site	Sample Week														Total Chum Sample Population		
	April 8, 2019							May 2, 2019							Prevalence (%)	Abundance	Average Intensity
	# of Chum Analyzed	# of Infested Chum	Average Weight of Infested Chum (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity	# of Chum Analyzed	# of Infested Chum	Average Weight of Infested Chum (g)	# of Lice	Prevalence (%)	Abundance	Average Intensity			
1	28	0	-	0	0	0	0	30	1	0.55	1	3.3	0.03	1.0	1.7	0.02	1.0
2	29	0	-	0	0	0	0	31	3	0.63	3	9.7	0.10	1.0	5.0	0.05	1.0
3	30	3	1.07	3	10.0	0.10	1.0	30	9	1.4	15	30.0	0.50	1.7	20.0	0.30	1.5
4	30	0	-	0	0	0	0	0	-	-	-	-	-	-	0.0	0.00	0.0
5	30	3	0.54	3	10.0	0.10	1.0	30	10	0.78	13	33.3	0.43	1.3	21.7	0.27	1.2
6	11	1	0.59	1	9.1	0.09	1.0	30	7	0.72	10	23.3	0.33	1.4	19.5	0.27	1.4
7	21	1	0.83	1	4.8	0.05	1.0	6	0	-	0	0.0	0.00	0.0	3.7	0.04	1.0
8	0	-	-	-	-	-	-	16	1	0.62	1	6.3	0.06	1.0	6.3	0.06	1.0
9	0	-	-	-	-	-	-	29	1	0.74	1	3.4	0.03	1.0	3.4	0.03	1.0
10	31	1	1.72	1	3.2	0.03	1.0	29	2	0.53	2	6.9	0.07	1.0	5.0	0.05	1.0
TOTAL	210	9	0.88	9	4.3	0.04	1.0	231	34	0.89	46	14.7	0.20	1.4	9.8	0.12	1.3

3.4.2 Infestation Rates on Coho Salmon

A total of five coho salmon were found to be infested with 33 sea lice in the coho salmon sample population (n=35). 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 coho salmon sample population. All five of the infested coho salmon samples were collected at Site 3 on May 2, 2019 (n=6). The only other site where coho salmon were collected during sampling in 2019 in Quatsino Sound and Holberg Inlet was Site 7 and no sea lice were found on those individuals (n=29).

A total of five coho salmon were found to be infested with at least one sea louse. The prevalence of sea lice on the coho salmon sample population (n=35) collected in Quatsino Sound and Holberg Inlet in 2019 was 14.3 %. Sea lice prevalence as calculated by site and by sampling week ranged from 0.0 % at Site 7 on April 8, 2019 (n=28) and May 2, 2019 (n=1) to a high of 83.3 % at Site 3 on May 2, 2019 (n=6).

A total of 33 sea lice were identified during laboratory analysis of retained coho salmon. The abundance of sea lice on the coho salmon sample population (n=35) collected in Quatsino Sound and Holberg Inlet in 2019 was 0.94. Sea lice abundance was 0.00 at Site 7 during both sampling periods and was 5.50 at Site 3 on May 2, 2019.

3.4.3 Infestation Rates on Other Species

A total of seven pink salmon were collected in Quatsino Sound and Holberg Inlet in 2019. One pink salmon was found to be infested with one sea louse resulting in a species prevalence of 14.3 % and an abundance of 0.14 (Table 6). The infested pink salmon was collected at Site 9 on May 2, 2019.

A total of six chinook salmon were collected in Quatsino Sound and Holberg Inlet in 2019. One chinook salmon was found to be infested with one sea louse resulting in a species prevalence of 16.7 % and an abundance of 0.17 (Table 6). The infested chinook salmon was collected at Site 2 on April 8, 2019.

Two sockeye salmon samples were collected in Quatsino Sound and Holberg Inlet in 2019. Both samples were collected at Site 5 on May 2, 2019. Both sockeye salmon samples were infested with sea lice: one with one sea louse and one with four sea lice. The prevalence of sea lice on the sockeye salmon sample population (n=2) collected in Quatsino Sound and Holberg Inlet in 2019 was 100.0 % and the abundance was 2.50 (Table 6).

3.5 Infestation Rates by Sea Lice Species

A total of 10 *Lepeophtheirus salmonis* sea lice of various life stages were identified on nine juvenile salmon and 85 *Caligus clemensi* sea lice were found on 43 of the samples analyzed in the lab (Appendix III). There were no juvenile salmon that were infested with both a *L. salmonis* and a *C. clemensi* sea louse.

3.5.1 Infestation Rates by Sea Lice Species on Chum Salmon

An analysis of the species of sea lice identified on the 43 infested chum salmon collected in Quatsino Sound and Holberg Inlet was completed and is presented in Table 8. A total of nine *Lepeophtheirus salmonis* sea lice of various life stages were identified on eight juvenile chum salmon and 46 *Caligus clemensi* sea lice were found on 35 of the juvenile chum salmon analyzed in the lab (Appendix III). The sea lice species identified on chum salmon are also presented by site in Table 9.

Table 8: The number of sea lice in each life stage by species identified on the chum salmon sample population from Quatsino Sound and Holberg Inlet in 2019.
LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage ¹	April 8, 2019	May 2, 2019
LEP Co	3	1
LEP C1	0	2
LEP C2	3	0
LEP PAM	0	0
LEP PAF	0	0
LEP AM	0	0
LEP AF	0	0
TOTAL LEP	6	3
CAL Co	0	6
CAL C1	2	23
CAL C2	1	3
CAL C3	0	5
CAL C4	0	2
CAL PAM	0	1
CAL PAF	0	1
CAL AM	0	2
CAL AF	0	0
TOTAL CAL	3	43

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 9: The species of sea lice found on chum salmon collected in Quatsino Sound and Holberg Inlet in 2019 summarized by the 10 sites where beach seining was conducted. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	Sample Week								TOTAL		
	April 8, 2019				May 2, 2019						
	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of LEP	# of CAL	# of Chum Analyzed	# of Infested Chum	# of Lice
1	28	0	0	0	30	1	0	1	58	1	1
2	29	0	0	0	31	3	1	2	60	3	3
3	30	3	3	0	30	9	0	15	60	12	18
4	30	0	0	0	0	-	-	-	30	0	0
5	30	3	2	1	30	10	2	11	60	13	16
6	11	1	1	0	30	7	0	10	41	8	11
7	21	1	0	1	6	0	0	0	27	1	1
8	0	-	-	-	16	1	0	1	16	1	1
9	0	-	-	-	29	1	0	1	29	1	1
10	31	1	0	1	29	2	0	2	60	3	3
TOTAL	210	9	6	3	231	34	3	43	441	43	55

3.5.2 Infestation Rates by Sea Lice Species on Coho Salmon

The sea lice species found on the five infested coho salmon are presented in Table 10. No coho salmon infested with sea lice were captured during the April sampling event therefore Table 10 presents data collected on retained coho salmon collected on May 2, 2019. No *Lepeophtheirus salmonis* sea lice were identified on any of the juvenile coho salmon analyzed in the lab (Appendix III). A total of 33 *Caligus clemensi* sea lice were found on 5 juvenile coho salmon analyzed in the lab (Appendix III). All of the coho salmon samples infested with sea lice were collected from Site 3 on May 2, 2019.

Table 10: The number of sea lice in each life stage by species identified on coho salmon from Quatsino Sound and Holberg Inlet in 2019. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage ¹	May 2, 2019
LEP Co	0
LEP C1	0
LEP C2	0
LEP PAM	0
LEP PAF	0
LEP AM	0
LEP AF	0
TOTAL LEP	0
CAL Co	0
CAL C1	17
CAL C2	9
CAL C3	4
CAL C4	2
CAL PAM	1
CAL PAF	0
CAL AM	0
CAL AF	0
TOTAL CAL	33

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.

3.5.3 Infestation Rates by Sea Lice Species on Other Species

The one sea louse found on a pink salmon collected in Quatsino Sound and Holberg Inlet was a CAL C2 and the infested sample was collected at Site 9 on May 2, 2019. The one sea louse found on a chinook salmon was a LEP C2 and the infested sample was collected at Site 2 on April 8, 2019. Five *Caligus clemensi* were identified on two sockeye salmon during lab analysis. The two sample fish were both collected at Site 5 on May 2, 2019. One sockeye was infested with one CAL AF and one was infested with three CAL C1 and one CAL C2.

4.0 Conclusions

This report presents the data from the fifth year of beach seining and sea lice analysis conducted for wild juvenile salmonid monitoring in Quatsino Sound and Holberg Inlet, BC by MOWI Canada West. This report is limited to the summary and presentation of the data collected in 2019. A tabular comparison of water quality data and chum sea lice infestation data from 2015 to 2019 is presented in Appendix IV.

A total of 491 samples underwent lab analysis for sea lice infestation in 2019 including 441 chum, 35 coho, seven pink, six chinook and two sockeye salmon. Sea lice were found on each of the species analyzed in the lab. A total of 52 juvenile salmonids were found to be infested with sea lice in the total sample population, resulting in a calculated sea lice prevalence of 10.6 % in 2019. A total of 95 sea lice were found during laboratory analysis resulting in an abundance of 0.19 for the sample population.

Chum salmon smolts were captured in significantly greater numbers than any other species. A total of 4939 chum salmon were captured, representing 99.0 % of all captured samples. Of the 4939 chum captured, 441 were kept for lab analysis for sea lice infestation. A total of 43 chum smolts were found to be infested with a total of 55 lice resulting in a calculated prevalence of 9.8 %, abundance of 0.12 and an average intensity of 1.3 for the chum salmon sample population.

A total of 35 coho salmon were captured, representing 0.7 % of all captured samples. All 35 coho salmon captured were kept for lab analysis for sea lice infestation. A total of five coho smolts were found to be infested with a total of 33 lice resulting in a calculated prevalence of 14.3 %, abundance of 0.94 and an average intensity of 6.6 for the coho salmon sample population.

A total of seven pink salmon were captured, representing 0.1 % of all captured samples. All of the pink salmon captured were kept for lab analysis for sea lice infestation. One sea louse was found on one pink salmon resulting in a calculated prevalence of 14.3 %, abundance of 0.14 and an average intensity of 1.0 for the pink salmon sample population.

A total of six chinook salmon were captured, representing 0.1 % of all captured samples. All of the chinook salmon captured were kept for lab analysis for sea lice

infestation. One sea louse was found on one chinook salmon resulting in a calculated prevalence of 16.7 %, abundance of 0.17 and an average intensity of 1.0 for the chinook salmon sample population.

Two sockeye salmon were captured, representing 0.04 % of all captured samples. Both of the sockeye salmon captured were kept for lab analysis for sea lice infestation. Five sea lice were found on the two sockeye salmon resulting in a calculated prevalence of 100.0 %, abundance of 2.50 and an average intensity of 2.5 for the sockeye salmon sample population.

A total of 10 *Lepeophtheirus salmonis* sea lice of various life stages were identified on nine juvenile salmon and 85 *Caligus clemensi* sea lice were found on 43 of the samples analyzed in the lab. There were no juvenile salmon that were infested with both a *L. salmonis* and a *C. clemensi* sea louse.

For the chum salmon sample population, a total of nine *Lepeophtheirus salmonis* sea lice of various life stages were identified on eight juvenile chum salmon and 46 *Caligus clemensi* sea lice were found on 35 of the juvenile chum salmon analyzed in the lab.

For the coho salmon sample population, a total of 33 *Caligus clemensi* sea lice were found on five juvenile coho salmon analyzed in the lab. All of the sea lice identified were *C. clemensi*, no *L. salmonis* sea lice were identified on any of the juvenile coho salmon analyzed in the lab.

A comparison of the prevalence, abundance and average intensity of sea lice species found on chum salmon was completed for sample data from 2015 and 2019 collected in Quatsino Sound and Holberg Inlet. This data is presented in the following summary table with additional yearly comparisons of juvenile wild salmon monitoring results presented in Appendix IV.

Year	<i>Caligus clemensi</i>			<i>Lepeophtheirus salmonis</i>		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2015	13.6 %	0.24	1.75	12.4 %	0.21	1.72
2016	8.6 %	0.11	1.32	8.9 %	0.10	1.09
2017	1.7 %	0.02	1.00	1.7 %	0.02	1.00
2018	2.5 %	0.02	1.00	3.1 %	0.03	1.00
2019	7.9 %	0.10	1.31	1.8 %	0.02	1.13

5.0 References

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Appendix I – Field Data

Date	Time	Site	Salinity (ppt) 0.2m	Temperature (° C) 0.2m
04/08/19	09:47	Site 1	27.3	9.3
04/08/19	10:09	Site 2	26.2	8.7
04/08/19	10:30	Site 3	23.5	8.5
04/08/19	11:22	Site 4	18.1	9.2
04/08/19	11:44	Site 5	30.5	9.4
04/08/19	12:10	Site 6	25.2	9.8
04/08/19	12:28	Site 7	32.6	11.1
04/08/19	12:57	Site 8	26.3	10.6
04/08/19	13:17	Site 9	24.3	11.2
04/08/19	13:40	Site 10	13.4	13.7
05/02/19	09:40	Site 1	28.3	14.4
05/02/19	10:00	Site 2	28.2	11.5
05/02/19	10:24	Site 3	23.3	13.4
05/02/19	11:22	Site 4	31.0	11.3
05/02/19	11:33	Site 5	23.1	13.1
05/02/19	12:14	Site 6	26.1	17.4
05/02/19	12:43	Site 7	24.5	14.6
05/02/19	13:11	Site 8	28.6	16.2
05/02/19	13:43	Site 9	16.6	11.8
05/02/19	14:00	Site 10	17.2	16.2

Appendix II – Capture and Collection Sample Totals

Date	Time	Site Name	Weather Comments	Tide Stage	Pink Captured	Pink Retained	Chum Captured	Chum Retained	Coho Captured	Coho Retained	Chinook Captured	Chinook Retained	Sockeye Captured	Sockeye Retained	Salmonid Mortalities	Comments
04/08/19	09:47	Site 1	Foggy, calm	Low	2	2	176	28	0	0	0	0	0	0	0	2 sculpin, 1 gunnel
04/08/19	10:09	Site 2	Calm	Low	2	2	380	29	0	0	2	2	0	0	2	3 pipefish, 2 shiner perch, 2 sculpin
04/08/19	10:30	Site 3	Calm, sunny	Low	0	0	1500	30	0	0	0	0	0	0	0	10 sculpin, 1 flounder, 3 tubesnouts, 1 striped perch
04/08/19	11:22	Site 4	Calm, sunny	Low	0	0	39	30	0	0	0	0	0	0	0	3 sculpin
04/08/19	11:44	Site 5	Calm, sunny	Low	0	0	32	30	0	0	0	0	0	0	1	2 gunnel, 12 sand dab, 1 juvenile lingcod
04/08/19	12:10	Site 6	Calm, sunny	Low	0	0	11	11	0	0	0	0	0	0	0	6 greenling, 12 tubesnouts, 1 juvenile lingcod
04/08/19	12:28	Site 7	Calm, sunny	Low	2	2	21	21	28	28	4	4	0	0	0	2 pipefish, 3 sculpin, 1 gunnel
04/08/19	12:57	Site 8	Calm, sunny	Low	0	0	0	0	0	0	0	0	0	0	0	1 striped perch, 1 gunnel, 4 sculpin, 1 greenling
04/08/19	13:17	Site 9	Calm, sunny	Mid	0	0	0	0	0	0	0	0	0	0	0	2 gunnel
04/08/19	13:40	Site 10	Calm, clear	Mid	0	0	78	31	0	0	0	0	0	0	0	2 green crab
05/02/19	09:40	Site 1	Overcast, calm	Mid	0	0	450	30	0	0	0	0	0	0	0	5 pipefish
05/02/19	10:00	Site 2	Overcast, calm	Mid	0	0	1000	31	0	0	0	0	0	0	0	4 pipefish
05/02/19	10:24	Site 3	Overcast, calm	Mid	0	0	800	30	6	6	0	0	0	0	0	2 pipefish
05/02/19	11:22	Site 4	Overcast, flat calm	Mid	0	0	0	0	0	0	0	0	0	0	0	No fish caught
05/02/19	11:33	Site 5	Overcast, flat clam	Mid	0	0	100	30	0	0	0	0	2	2	0	1 perch
05/02/19	12:14	Site 6	Overcast, flat calm	Mid	0	0	90	30	0	0	0	0	0	0	0	2 sculpin
05/02/19	12:43	Site 7	Overcast, flat calm`	Mid	0	0	6	6	1	1	0	0	0	0	0	35 sand dab, 1 sculpin
05/02/19	13:11	Site 8	Overcast, flat calm	Mid	0	0	16	16	0	0	0	0	0	0	0	1 sculpin, large rock in net
05/02/19	13:43	Site 9	Overcast, calm	Mid	1	1	60	29	0	0	0	0	0	0	0	1 gunnel
05/02/19	14:00	Site 10	Overcast, calm	High	0	0	180	29	0	0	0	0	0	0	3	20 sculpin

Appendix III – Sea Lice Analysis Data

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 1	CM	35	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	36	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	37	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	37	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	40	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	34	0.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	39	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	36	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	37	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	39	0.73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	39	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	67	3.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	37	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	CM	35	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	PK	37	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 1	PK	35	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	PK	34	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	42	0.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	38	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	32	0.34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 2	CM	37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	36	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	40	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	38	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	37	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	36	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	31	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	36	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	33	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	34	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	32	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	34	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	33	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CM	35	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CH	73	4.92	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	CH	40	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 2	PK	36	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	44	0.91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	41	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	39	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	35	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	40	0.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	35	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	32	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	38	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	35	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	39	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	38	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	36	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	41	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	38	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	35	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	39	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	50	1.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 3	CM	50	1.32	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	38	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	48	1.06	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	37	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	34	0.31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	32	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	38	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	37	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	44	0.83	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 3	CM	43	0.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	36	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	35	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	38	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	36	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	36	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	36	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	35	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	40	0.72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	40	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	43	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	40	0.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	35	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	44	0.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	34	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	35	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	42	0.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	41	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	37	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	40	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	39	0.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	35	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	38	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	38	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	33	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	48	1.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	38	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 4	CM	38	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	40	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 5	CM	34	0.39	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8-Apr-19	Site 5	CM	35	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	35	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	39	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	36	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	35	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	40	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	40	0.86	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	36	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	36	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	40	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.36	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	36	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	34	0.31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	36	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	34	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	40	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	38	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	37	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 5	CM	35	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	38	0.59	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	38	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	50	1.13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	36	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	35	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	37	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	42	0.87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	35	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 6	CM	38	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	PK	37	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	PK	30	0.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 7	CO	36	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	35	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	37	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	43	0.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	34	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	34	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	36	0.28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	34	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	31	0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	90	8.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	75	4.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	34	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	94	8.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	93	6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	35	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	33	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	36	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	75	4.94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	34	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	36	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	35	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	36	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	37	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	35	0.34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CH	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CH	38	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CH	35	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	38	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	38	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	35	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CH	34	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	35	0.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	37	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	35	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	43	0.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	39	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	38	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CO	33	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	42	0.83	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
8-Apr-19	Site 7	CM	41	0.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	36	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	40	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	36	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	36	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	37	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	38	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	40	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	41	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	41	0.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 7	CM	36	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	47	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	55	1.72	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8-Apr-19	Site 10	CM	34	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	37	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	48	1.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	40	1.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	45	1.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	50	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	44	0.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	38	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	44	0.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	39	0.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	38	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	45	0.98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	34	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	38	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	35	0.35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	40	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	43	0.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	50	1.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	52	1.72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	50	1.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	36	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Apr-19	Site 10	CM	55	3.20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 1	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	38	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	34	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	33	0.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	36	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	36	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	40	0.81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	36	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	38	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	41	0.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	38	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	40	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	37	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	34	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	37	0.55	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2-May-19	Site 1	CM	36	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	36	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	41	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	38	0.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	37	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	43	1.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	35	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 1	CM	36	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	40	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.66	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 2	CM	35	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	38	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	34	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	38	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	34	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	34	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	40	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	39	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	38	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 2	CM	34	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	37	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	39	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	41	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	39	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	35	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	37	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	34	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.55	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	38	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	37	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	36	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 2	CM	39	0.67	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 3	CM	51	1.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	49	1.68	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 3	CM	50	1.69	0	0	0	0	0	0	0	0	0	2	0	1	2	0	0	0	0	5
2-May-19	Site 3	CM	31	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	50	1.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	51	1.74	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
2-May-19	Site 3	CM	38	0.62	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 3	CM	36	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	42	0.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	39	0.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	35	0.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	39	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	36	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	39	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	40	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	36	0.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	41	0.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	46	1.23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	42	0.74	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2-May-19	Site 3	CM	38	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	37	0.68	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2-May-19	Site 3	CM	51	1.66	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	3
2-May-19	Site 3	CM	52	1.87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 3	CM	38	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	50	1.56	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 3	CM	44	0.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	35	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	35	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CM	55	2.19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 3	CO	100	10.84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 3	CO	94	11.51	0	0	0	0	0	0	0	0	0	5	2	0	0	0	0	0	0	7
2-May-19	Site 3	CO	75	5.99	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	7
2-May-19	Site 3	CO	81	7.35	0	0	0	0	0	0	0	0	0	4	2	1	0	0	0	0	0	7
2-May-19	Site 3	CO	91	10.17	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3
2-May-19	Site 3	CO	86	8.98	0	0	0	0	0	0	0	0	0	1	3	2	2	1	0	0	0	9
2-May-19	Site 5	SK	78	5.85	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	4
2-May-19	Site 5	SK	74	5.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2-May-19	Site 5	CM	47	1.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	38	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	39	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	38	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	40	0.75	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	45	1.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	35	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	43	0.99	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	40	0.93	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	39	0.82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	39	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	35	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	35	0.58	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	36	0.53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	38	0.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	38	0.61	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	37	0.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	39	0.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	40	0.98	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	3
2-May-19	Site 5	CM	35	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	37	0.65	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	43	1.02	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	38	0.65	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	40	0.65	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 5	CM	40	0.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	36	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	40	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 5	CM	45	1.23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	40	0.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 5	CM	37	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	39	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	35	0.55	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 6	CM	40	0.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	44	1.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	36	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	38	0.56	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 6	CM	46	1.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	37	0.55	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 6	CM	44	1.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	39	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	39	0.72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	42	0.72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	44	0.98	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 6	CM	38	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	38	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	43	1.01	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
2-May-19	Site 6	CM	38	0.73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	40	0.75	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3
2-May-19	Site 6	CM	38	0.66	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2-May-19	Site 6	CM	36	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	37	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	36	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	38	0.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	39	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	38	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	42	0.94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	44	0.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	38	0.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	36	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 6	CM	36	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	37	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	36	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	38	0.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	40	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	38	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CM	42	0.73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 7	CO	75	4.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	35	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	38	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 8	CM	36	0.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	47	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	33	0.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	38	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	40	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	38	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	48	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	35	0.41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	36	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	35	0.40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	42	0.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	40	0.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 8	CM	39	0.62	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2-May-19	Site 9	CM	38	0.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	36	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	36	0.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	43	1.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	38	0.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	40	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	38	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	37	0.49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	35	0.52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	38	0.55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	PK	40	0.75	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2-May-19	Site 9	CM	41	0.74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
2-May-19	Site 9	CM	36	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	35	0.54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	34	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	40	0.89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	37	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	43	0.94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	39	0.84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	41	0.82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	36	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	41	0.87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	35	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	37	0.68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	39	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	37	0.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	40	0.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Sample Date	Site	Fish Species	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	CAL PAF	CAL AM	CAL AF	CAL Total
2-May-19	Site 9	CM	34	0.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 9	CM	37	0.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	42	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	45	1.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	42	1.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	42	0.97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	41	0.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	35	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	38	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	37	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	40	0.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	35	0.48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	36	0.45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	36	0.47	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2-May-19	Site 10	CM	39	0.60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	35	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	50	1.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	36	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	40	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	38	0.58	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2-May-19	Site 10	CM	36	0.62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	42	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	43	0.85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	40	0.65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	36	0.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	37	0.64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	38	0.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	38	0.63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	35	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	40	0.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-May-19	Site 10	CM	40	0.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix IV – 2015-2019 Comparisons

Surface water temperature comparison between data collected in Quatsino Sound and Holberg Inlet between 2015 and 2019.

Site	April Temp. (°C)					May Temp. (°C)				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	8.7	11.1	9.2	11.8	9.3	11.6	10.8	12.3	10.0	14.4
2	8.0	11.2	8.5	11.8	8.7	11.9	11.1	12.5	10.0	11.5
3	8.4	11.0	8.5	10.0	8.5	12.5	11.2	12.4	11.8	13.4
4	9.7	9.8	8.9	11.6	9.2	11.6	11.0	12.5	10.4	11.3
5	9.6	10.0	9.1	9.8	9.4	11.2	11.2	13.1	9.9	13.1
6	10.5	9.9	9.1	11.3	9.8	12.1	11.6	12.8	11.3	17.4
7	10.1	9.9	9.0	10.1	11.1	12.3	11.0	12.9	12.6	14.6
8	10.0	9.6	9.0	9.5	10.6	12.7	11.1	12.5	11.7	16.2
9	10.0	9.3	9.0	9.3	11.2	11.9	11.2	12.9	12.1	11.8
10	10.4	8.1	8.5	9.6	13.7	13.5	11.1	12.7	14.2	16.2
Average	9.5	10.0	8.8	10.5	10.3	12.1	11.1	12.7	11.4	14.0

Surface water salinity comparison between data collected in Quatsino Sound and Holberg Inlet between 2015 and 2019.

Site	April Salinity (ppt)					May Salinity (ppt)				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	14.0	22.3	21.9	23.0	27.3	27.5	27.9	22.1	30.4	28.3
2	13.8	21.0	23.7	23.1	26.2	28.4	27.8	21.7	30.1	28.2
3	18.1	21.0	22.3	21.0	23.5	28.0	27.7	21.1	27.9	23.3
4	26.2	26.6	28.8	25.7	18.1	30.2	29.5	25.5	32.0	31.0
5	26.5	27.7	29.0	28.5	30.5	29.8	29.3	24.5	30.4	23.1
6	27.2	27.8	28.6	25.9	25.2	30.3	29.6	25.2	32.4	26.1
7	24.3	27.5	28.4	27.5	32.6	29.9	29.0	24.9	17.0	24.5
8	20.2	24.2	28.3	28.4	26.3	30.4	29.4	23.8	32.4	28.6
9	26.5	13.8	28.1	26.4	24.3	30.4	29.5	24.4	32.3	16.6
10	26.3	9.2	21.0	27.1	13.4	29.8	25.5	20.1	29.7	17.2
Average	22.3	22.1	26.0	25.7	24.7	29.5	28.5	23.3	29.5	24.7

A comparison of the results of analysis for sea lice infestation on samples collected by beach seine in Quatsino Sound and Holberg Inlet, BC between 2015 and 2019.

Species	Sample size (n) 2015	Sample size (n) 2016	Sample size (n) 2017	Sample size (n) 2018	Sample size (n) 2019	Total # of fish infested 2015	Total # of fish infested 2016	Total # of fish infested 2017	Total # of fish infested 2018	Total # of fish infested 2019	Prevalence (%) 2015	Prevalence (%) 2016	Prevalence (%) 2017	Prevalence (%) 2018	Prevalence (%) 2019
chum	177	235	479	325	441	37	36	16	18	43	20.9	15.3	3.3	5.5	9.8
coho	21	1	58	37	35	7	0	6	13	5	33.3	0.0	10.3	35.1	14.3
pink	1	2	0	0	7	0	1	0	0	1	0.0	50.0	-	-	14.3
chinook	12	19	0	6	6	2	9	0	0	1	16.7	47.4	-	0.0	16.7
sockeye	0	0	0	31	2	0	0	0	2	2	-	-	-	6.5	100.0
TSB	7	0	1	0	0	4	0	1	0	0	57.1	-	100.0	-	-
Total	218	257	538	399	491	50	46	23	33	52	22.9	17.9	4.3	8.3	10.6

Species	Sample size (n) 2015	Sample size (n) 2016	Sample size (n) 2017	Sample size (n) 2018	Sample size (n) 2019	Total # of lice observed 2015	Total # of lice observed 2016	Total # of lice observed 2017	Total # of lice observed 2018	Total # of lice observed 2019	Abundance 2015	Abundance 2016	Abundance 2017	Abundance 2018	Abundance 2019
chum	177	235	479	325	441	80	54	16	18	55	0.45	0.23	0.03	0.06	0.12
coho	21	1	58	37	35	12	0	11	54	33	0.57	0.00	0.19	1.46	0.94
pink	1	2	0	0	7	0	1	0	-	1	0.00	0.50	-	-	0.14
chinook	12	19	0	6	6	2	14	0	0	1	0.17	0.74	-	0.00	0.17
sockeye	0	0	0	31	2	0	0	0	2	5	-	-	-	0.06	2.50
TSB	7	0	1	0	0	5	0	2	-	-	0.71	-	2.0	-	-
Total	218	257	538	399	491	99	69	29	74	95	0.45	0.27	0.05	0.19	0.19

A comparison of the calculated sea lice prevalence and abundance by site and by week as determined for chum salmon collected in Quatsino Sound and Holberg Inlet, BC between 2015 and 2019.

Site	Sample Month									
	April									
	Prevalence (%) 2015	Prevalence (%) 2016	Prevalence (%) 2017	Prevalence (%) 2018	Prevalence (%) 2019	Abundance 2015	Abundance 2016	Abundance 2017	Abundance 2018	Abundance 2019
1	6.6	0	0	0	0	0.07	0	0	0	0
2	0	3.3	3.3	0	0	0	0.03	0.3	0	0
3	3.3	0	0	0	10.0	0.03	0	0	0	0.10
4	40.0	-	3.3	0	0	0.80	-	0.03	0	0
5	-	0	0	10.0	10.0	-	0	0	0.1	0.10
6	-	-	0	0	9.1	-	-	0	0	0.09
7	0	26.7	0	-	4.8	0	0.40	0	-	0.05
8	41.9	-	0	-	-	1.10	-	0	-	-
9	-	10.0	3.3	0	-	-	0.17	0.03	0	-
10	-	3.3	0	0	3.2	-	0.03	0	0	0.03
TOTAL	17.1	6.9	1.5	2.8	4.3	0.39	0.10	0.01	0.3	0.04

Site	Sample Month									
	May									
	Prevalence (%) 2015	Prevalence (%) 2016	Prevalence (%) 2017	Prevalence (%) 2018	Prevalence (%) 2019	Abundance 2015	Abundance 2016	Abundance 2017	Abundance 2018	Abundance 2019
1	31.3	20.0	0	0	3.3	0.50	0.33	0	0	0.03
2	0	33.3	3.3	0	9.7	0	0.03	0.03	0	0.10
3	17.2	-	0	12.9	30.0	0.17	-	0	0.13	0.50
4	-	-	3.3	-	-	-	-	0.03	-	-
5	-	-	3.3	0	33.3	-	-	0.03	0	0.43
6	-	-	0	9.4	23.3	-	-	0	0.09	0.33
7	-	-	3.2	-	0.0	-	-	0.03	-	0.00
8	50.0	-	23.3	9.7	6.3	2.50	-	0.23	0.10	0.06
9	60.0	65.5	0	10.0	3.4	2.60	1.00	0	0.10	0.03
10	-	-	6.7	6.7	6.9	-	-	0.07	0.07	0.07
TOTAL	26.4	48.9	4.7	6.9	14.7	0.54	0.74	0.05	0.07	0.20

The number of sea lice in each life stage by species identified on the chum salmon sample population from Quatsino Sound and Holberg Inlet in 2015, 2016, 2017, 2018 and 2019.

LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Life Stage ¹	Number of Lice 2015	Number of Lice 2016	Number of Lice 2017	Number of Lice 2018	Number of Lice 2019
LEP Co	2	3	6	3	4
LEP C1	12	6	2	2	2
LEP C2	21	9	0	5	3
LEP PAM	0	6	0	0	0
LEP PAF	2	0	0	0	0
LEP AM	1	1	0	0	0
LEP AF	0	0	0	0	0
TOTAL LEP	38	25	8	10	9
CAL Co	2	3	1	0	6
CAL C1	24	18	6	6	25
CAL C2	7	4	1	1	4
CAL C3	4	2	0	0	5
CAL C4	5	2	0	0	2
CAL PAM	0	0	0	1	1
CAL PAF	0	0	0	0	1
CAL AM	0	0	0	0	2
CAL AF	0	0	0	0	0
TOTAL CAL	42	29	8	8	46

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.

The species of sea lice found on chum salmon collected in Quatsino Sound and Holberg Inlet between 2015 and 2019 summarized by the 10 sites where beach seining was conducted. LEP = *Lepeophtheirus salmonis* CAL = *Caligus clemensi*

Site	April									
	# of LEP 2015	# of LEP 2016	# of LEP 2017	# of LEP 2018	# of LEP 2019	# of CAL 2015	# of CAL 2016	# of CAL 2017	# of CAL 2018	# of CAL 2019
1	0	0	0	0	0	2	0	0	0	0
2	0	1	1	0	0	0	0	0	0	0
3	1	0	0	0	3	0	0	0	0	0
4	2	-	1	0	2	2	-	0	0	0
5	-	0	0	2	1	-	0	0	1	1
6	-	-	0	0	0	-	-	0	0	0
7	0	2	0	-	0	0	10	0	-	1
8	23	-	0	-	-	11	-	0	-	-
9	-	2	0	0	-	-	3	1	0	-
10	-	1	0	0	0	-	0	0	0	1
TOTAL	26	6	2	2	6	15	13	1	1	3

Site	May									
	# of LEP 2015	# of LEP 2016	# of LEP 2017	# of LEP 2018	# of LEP 2019	# of CAL 2015	# of CAL 2016	# of CAL 2017	# of CAL 2018	# of CAL 2019
1	1	3	0	0	0	15	2	0	0	1
2	0	0	1	0	1	0	1	0	0	2
3	3	-	0	0	0	2	-	0	4	15
4	-	-	1	-	-	-	-	0	-	-
5	-	-	1	0	2	-	-	0	0	11
6	-	-	0	3	0	-	-	0	0	10
7	-	-	1	-	0	-	-	0	-	0
8	2	-	1	1	0	3	-	6	2	1
9	6	16	0	3	0	7	13	0	0	1
10	-	-	1	1	0	-	-	1	1	2
TOTAL	12	19	6	8	3	27	16	7	7	43

A comparison of sea lice infestation rates on chum salmon collected in Quatsino Sound and Holberg Inlet between 2015 and 2019.

Year	<i>Caligus clemensi</i>			<i>Lepeophtheirus salmonis</i>		
	Prevalence	Abundance	Average Intensity	Prevalence	Abundance	Average Intensity
2015	13.6 %	0.24	1.75	12.4 %	0.21	1.72
2016	8.6 %	0.11	1.32	8.9 %	0.10	1.09
2017	1.7 %	0.02	1.00	1.7 %	0.02	1.00
2018	2.5 %	0.02	1.00	3.1 %	0.03	1.00
2019	7.9 %	0.10	1.31	1.8 %	0.02	1.13