

Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf, July 1 - 16, 2025

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CONTINENTAL SHELF, JULY 1 - 16, 2025

by

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ABSTRACT

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Fisheries and Oceans Canada's mandated ecosystem based approach to fisheries management requires a comprehensive understanding of factors that affect species' distribution, abundance, and interdependencies. The Integrated Pelagic Ecosystem Survey (IPES) is the only broad-scale survey in the Pacific Region that collects this information for the pelagic ecosystem. The IPES is an annual, random stratified survey on Vancouver Island's continental shelf, 2017-present, with comprehensive biological, stomach content, and physical- and biological-oceanographic sampling. The goal of the IPES is to understand factors affecting the distribution, abundance, and food web linkages of pelagic fish species (e.g., Pacific Herring, juvenile Pacific Salmon). The 2025 IPES was conducted on the CCGS *Sir John Franklin* from July 1 - July 16, 2025, which was half of the expected survey time; the second half of the survey was unexpectedly cancelled due to ship staffing shortages. In the 69 usable midwater trawl tows, there were 51 species caught in 16,009 kg of catch; the highest catch weights were 6,630.31 kg of Pacific Herring (*Clupea pallasii*, 41% of total catch weight), 4,040.59 kg of Lions Mane (*Cyanea capillata*), and 1,625.42 kg of Water Jellyfish (*Aequorea* sp.). Juvenile Pacific Salmon (*Oncohynchus* spp.) made up 1% (185.2 kg) of the total catch weight, and the relative abundance of species (by count), in decreasing catch count, were: Chum Salmon (*O. keta*), Sockeye Salmon (*O. nerka*), Coho Salmon (*O. kisutch*), Pink Salmon (*O. gorbuscha*), and Chinook Salmon (*O. tshawytscha*), with catch distribution varied based on species. There were 6,824 individual lengths and 6,012 individual weights recorded from 42 species. Biological samples collected included: tissue for genetic stock composition, otoliths, energy density, and coded wire tags. These samples are archived at the Pacific Biological Station, Fisheries and Oceans Canada (Nanaimo, BC). Associated information on the physical oceanography (36 locations), water samples for chemistry and chlorophyll *a* along with zooplankton samples (34 locations) were returned to the Institute of Ocean Sciences (DFO, Sidney, BC). The IPES supports research into 1) linkages between oceanographic conditions and fish abundance and distribution; 2) Pacific Salmon ocean ecology; 3) forecasted adult fish returns, and 4) food-web dynamics. IPES data are required for ecosystem monitoring and modelling, support for SARA-listed species, DFO's State of the Pacific Ocean reporting, and the State of the Salmon program.

RÉSUMÉ

Tabata, A.M., Boldt, J.L., Flynn, K.L., Dennis-Bohm, H., and King, J.R. 2026. Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf, July 1 - 16, 2025. Can. Tech. Rep. Fish. Aquat. Sci. 3779: vii + 74 p. <https://doi.org/10.60825/7zp1-ty59>

L'approche écosystémique de la gestion des pêches mandatée par Pêches et Océans Canada exigent une compréhension approfondie des facteurs qui influent sur la répartition, l'abondance et les interdépendances des espèces. Les relevés intégrés des écosystèmes pélagiques (RIEP) sont la seule étude à grande échelle de l'écosystème pélagique dans la région du Pacifique qui recueille ces informations pour l'écosystème pélagique. Les RIEP est une étude annuelle par échantillonnage aléatoire stratifié menée sur le plateau continental de l'île de Vancouver depuis 2017, comprenant des prélèvements biologiques complets, des analyses du contenu stomacal ainsi que des échantillonnages en océanographie physique et biologique. Le but des RIEP est de comprendre les facteurs ayant une incidence sur la distribution, l'abondance et les liens du réseau trophique des espèces de poissons pélagiques (par exemple le hareng du Pacifique et le saumon du Pacifique jeune). Les RIEP 2025 a été menée à bord du NGCC *Sir John Franklin* du 1 au 16 juillet 2025, soit la moitié de la durée prévue ; la seconde moitié de l'étude a été annulée de manière imprévue en raison d'un manque de personnel à bord. Des 69 traits de chalut pélagique exploitables, 51 espèces ont été capturées pour un total de 16 009 kg; les poids de capture les plus élevés ont été de 6 630,31 kg de hareng du Pacifique (*Clupea pallasii*, 41 % du poids total des captures), 4 040,59 kg de crinière de lion (*Cyanea capillata*) et 1 625,42 kg de méduse *Aequorea* (*Aequorea* sp.). Les saumon du Pacifique juvéniles (*Oncorhynchus* spp.) représentaient 1 % (185,2 kg) du poids total des prises, et l'abondance relative des espèces (en nombre), par ordre décroissant du nombre de prises, était la suivante : saumon keta (*O. keta*), saumon rouge (*O. nerka*), saumon coho (*O. kisutch*), le saumon rose (*O. gorbuscha*) et le saumon quinnat (*O. tshawytscha*), avec la répartition des prises variant selon les espèces. On a enregistré 6 824 longueurs et 6 012 poids individuels pour 42 espèces. Les échantillons biologiques prélevés comprenaient: des tissus pour l'analyse génétique de la composition des stocks, des otolithes, des mesures de densité énergétique et des micromarques magnétisées codées. Ces échantillons sont archivés à la Station biologique du Pacifique, Pêches et Océans Canada (Nanaimo, C.-B.). Les données connexes sur l'océanographie physique (36 sites), les échantillons d'eau destinés à l'analyse chimique et à la mesure de la chlorophylle *a*, ainsi que les échantillons de zooplancton (34 sites) ont été renvoyés à l'Institut des sciences de la mer, Pêches et Océans Canada (Sidney, C.-B.). Les RIEP soutient la recherche sur 1) les liens entre les conditions océanographiques et l'abondance et la répartition des poissons; 2) l'écologie océanique du saumon du Pacifique ; 3) les prévisions de remontées de poissons adultes; et 4) la dynamique du réseau trophique. Les données des RIEP sont nécessaires à la surveillance et à la modélisation des écosystèmes, à la protection des espèces inscrites à la LEP, aux rapports du MPO sur l'état de l'océan Pacifique et au programme sur l'état du saumon.

1 INTRODUCTION

In British Columbia (BC), Canada, the Vancouver Island (VI) continental shelf (< 200 m) is a productive ecosystem found off the Island's west and north coasts from Juan de Fuca Strait in the south, northward through the Scott Islands and eastward to include southern Queen Charlotte Sound (QCS, Figure 1). Off the west coast, the continental shelf ecosystem is the northern extent of the California Current upwelling system, with a typical northern boundary around Brooks Peninsula (Figure 1). The ecosystem supports important First Nations, commercial, and recreational fisheries, namely for Pacific Salmon (*Onchorhynchus* spp.) and Pacific Herring (*Clupea pallasii*).

The region has been a focus for pelagic fish research surveys for decades. Most notable were the 1) Pacific Sardine (*Sardinops sagax*) ecology trawl survey, conducted annually in July/August from 1997 to 2010, which was then adapted to the annual nighttime pelagic ecosystem trawl survey, 2010-2014 (DFO 2012; Flostrand et al. 2015), 2) the annual juvenile Pacific Salmon trawl survey conducted in June/July, 1998-2015 (for example see Welch et al. 2003), and 3) the annual La Perouse acoustic-trawl pelagic fish and ecosystem survey conducted during 2011-2015 (Boldt et al. 2016). The Pacific Sardine ecology trawl survey conducted sub-surface trawls (15 m headrope depths) along transects during the daytime from 1997 to 2005, then during the nighttime from 2006 to 2009. In 2010, the survey was redesigned as a nighttime pelagic ecosystem survey, with nighttime surface (4 m headrope depths) trawling using a random stratified survey design instead of transects. The juvenile Pacific Salmon surveys conducted daytime surface trawling (0 m, 15 m and 30 m headrope depths) along transects. The La Perouse acoustic-trawl survey included the collection of acoustic data along parallel transects in a core survey area; acoustic echosign was verified using a midwater trawl net and cameras and biological data were collected from net samples.

The DFO Pelagic Integrated Ecosystem Science (PIES) team was formed to address challenges and implement collaborative monitoring and integrated research plans on pelagic ecosystems in BC. Challenges included limited resources and vessel time; therefore, one recommendation was to combine multiple surveys while trying to address all survey goals and objectives. The three above-mentioned surveys were integrated into the Integrated Pelagic Ecosystem Survey [IPES; King, Boldt, Dennis-Bohm, et al. (2019)], initiated in July 2017, and repeated since then. No survey was conducted in 2020 due to COVID-19 restrictions, and the 2021 survey was cancelled due to mechanical failure of the research vessel. The nighttime pelagic ecosystem and the juvenile Pacific Salmon surveys have been integrated and the La Perouse acoustic-trawl survey has been partly integrated. The three surveys previously deployed the same trawl gear, with some overlaps in survey timing and locations that provided an opportunity for collaborative research. The goal of the IPES is to understand factors affecting the distribution, abundance, and food web linkages of pelagic fish species, such as juvenile Pacific Salmon and Pacific Herring. To accomplish this goal, specific objectives of the survey are to: 1) examine species distribution, composition, and abundance; 2) collect morphometric data, diet data, and biological samples; 3) examine the prey environment by sampling zooplankton (vertical bongo net hauls) and conducting oceanographic monitoring (temperature, salinity, fluorescence). The IPES is currently the only broad-scale pelagic ecosystem survey in the Pacific Region, providing comprehensive biological sampling and stomach content analyses of all caught species, along with physical and biological oceanographic sampling. The survey produces data required for ecosystem

monitoring and modelling, data for SARA-listed species (e.g., Tope Sharks, *Galeorhinus galeus*), and supports State of the Pacific Ocean reporting and the State of the Salmon program of DFO. Data generated from the survey supports research into 1) linkages between oceanographic conditions and fish abundance, distribution, and community composition; 2) Pacific Salmon and ocean ecology; 3) forecasts of adult fish returns, and 4) food-web dynamics. The objectives of this report are to summarize methods used and data collected during the 2025 IPES to address research goals.

2 METHODS

2.1 Survey Area and Design

The survey was conducted on the continental shelf, west and north of Vancouver Island, between the 50 and 200 m isobaths (Figure 1).

2.1.1 Survey strata and blocks

A random, stratified survey design was used. The survey area was divided into 8 distinct strata, based on bathymetry (50-100; 100-200 m) and known ecosystem distinctions (Figure 1). The survey area was divided into a contiguous grid of 4 km² blocks, representing possible trawl tow locations. For each survey year, random blocks are selected within each stratum, with the number of blocks based on stratum area so that the total number of blocks is about 70 (i.e. the estimated total number of stations that could be completed given the number of fishing days available assuming 6 tows per day) (Table 1; Figure 2). Within a stratum, an equal number of tows with the headrope at 0 m (surface) and at 15 m were randomly selected.

2.2 Vessel and Fishing Gear

In 2025, the survey was conducted on the CCGS *Sir John Franklin*, a 35 m stern trawler. Tows were conducted with a two-bridle LFS Trawl LFS 7742 mid-water trawl net (LFS Net Systems, Bellingham, USA; Appendix A Figure A.1) with a codend liner. The front end consists of a 252 foot headline of 5/8 inch coated spectra rope. The next section is 512 inch diamond mesh of 13 mm, and 10 mm synthetic rope. A tapered net body consists of 256 inch, 128 inch, 64 inch, 32 inch, 16 inch, 8 inch, and then 4 inch meshes. The intermediate section of the net is 4 inch mesh with 1 inch 8 strand rib lines. The cod end has a 4 inch web with a 0.5 inch (12.7 mm) mesh insert.

The LFS 7742 Midwater trawl was setup on the CCGS *Sir John Franklin* using a dual door leg hookup: a door leg from the top of the door was directly connected to the top link of the net and a bottom door leg directly to the bottom link of the net. Two large chain clumps, approximately 204 kg (450 lbs) each, were placed on the lower wingtips, one on each side to increase the weight of the bottom of the net. There was an adjustable setback hookup system in place; on surface tows

there was a reduced setback of approximately 18 chain links (Viking Links on the setback chain hooked together), and at 15 m depth tows, the setback was increased to 36 chain links (full chain length, Viking Links unhooked). The CCGS *Sir John Franklin* uses a third wire connected to the center of the kite to increase lift at both surface and 15 m depth tows. Surface tows also had two A-6 floats 86.4 cm x 118.1 cm (34" x 46.5") attached to the headrope, at the 4th splice from the kite where the 13 mm twine meets the headline. The trawl doors were Thyboron type 15, 4.5 m² pelagic doors approximately 798 kg each (Thyboron Trawl door, Thyboron, Denmark). For surface tows, 200 to 230 m of warp were used and at 15 m depth tows, 220 to 330 m of warp were used.

The vessel was equipped with a SCANMAR Trawl System, wireless SS4 Catch Sensor and door sensors in each door, that provided real time door spread, headline depth and net opening values (SCANMAR, Åsgårdstrand, Norway). Vessel speed, direction, bottom depth, weather conditions (Appendix B) were also recorded for each tow. In addition, two RBR duet temperature and depth sensors (RBR Ltd., Ottawa, ON, Canada) recording depth at 10 second intervals (0.1 Hz) were mounted inside protective housings with one attached to the kite at the center of the headrope and one attached to the center of the footrope using stainless steel shackles. These sensors were attached to the net by the deck crew at the start of each day, and retrieved by the crew at the end of the day and downloaded by science crew at regular intervals during the survey. The vertical net opening was calculated from the difference in the headrope and footrope depth sensors after the doors were locked. The horizontal net opening was calculated from the door spread and the net dimensions (Appendix A, Table A.1) using trigonometry.

2.3 Fishing Operations

2.3.1 Time and duration of tows

To provide a continuous time series for both the former juvenile Pacific Salmon survey (fishing conducted during daytime hours) and the former nighttime pelagic ecosystem survey (fishing conducted during nighttime hours), each selected block was fished once during daytime hours and a second time during nighttime hours. Fishing operations began at approximately 16:00 and ended at approximately 04:00 the following day. The net was towed at 4 to 5 knots for a target duration of 20 minutes (with a minimum acceptable tow duration of 5 minutes; note the minimal acceptable tow duration was shortened from 15 minutes in 2018 to 10 minutes in 2019 to 5 minutes in 2022 to minimize the frequency of anomalously large catches). The start time and location of the tow was recorded when the doors were locked, and the end time and location when the retrieval of the doors was initiated.

2.4 Acoustic Transects

In 2025, continuous acoustic data were collected and recorded when fishing was not occurring (i.e., usually between approximately 06:30 and 15:00). Acoustic data were collected with a SIMRAD EK80 scientific echo sounder operating at 38 kHz and 120 kHz. Data were collected along predetermined parallel transects, which were selected based on DFO's biennial Pacific Hake (*Merluccius productus*) survey and spaced 10 nautical miles apart [Figure 3; Edwards et

al. (2018)]. Data were collected from the 50 m to the 1,500 m isobath. Although there were no trawl tows conducted to verify species composition of the echosign, the echosign patterns and trawl catches from this standardized survey were used to determine the spatial distribution of euphausiids, coastal pelagic fish (primarily Pacific Herring), and Pacific Hake. Previous surveys have validated echosigns for these three taxonomic groupings.

2.5 Oceanographic Data

Within each selected block, a vertical conductivity-temperature-depth (CTD) cast was conducted to 250 m or to within 10 m of the bottom with a Sea-Bird SBE-911plus (Sea-Bird Electronics Bellevue Washington, USA) equipped with transmissometer, fluorometer, pH, salinity and dissolved oxygen sensors. One CTD cast was conducted per block, unless blocks were located next to each other or sampling time was limited. 10 L Niskin bottles in a rosette system were used for the collection of water samples at 5 m from the surface. Nitrate, phosphate, and silicate samples were placed in acid-washed glass test tubes and frozen. Seawater for chlorophyll *a* (chl *a*) estimation were filtered with GF/F glass fibre filter disks. Filter disks were then placed in polypropylene scintillation vials and frozen. Seawater and chl *a* samples and CTD data are processed, analyzed and archived by the Institute of Ocean Sciences (Fisheries and Oceans Canada, Sidney, BC).

2.6 Zooplankton Sampling

Within each selected block, vertical zooplankton tows were conducted to approximately 250 m or within 10 m of the bottom with two paired 60 cm diameter, 253 μ m Nitex zooplankton nets mounted in a bongo-drum style black frame. Zooplankton tows were conducted immediately following the CTD cast. A RBR duet temperature and depth logger (RBR Ltd., Ottawa, ON) was attached to the bongo frame at the start of the survey, and retrieved periodically and at the end of the survey to estimate velocity and depth of the net. A flowmeter was attached inside one net to record the water volume sampled. Zooplankton collected from the net without the flowmeter were preserved in 10% buffered formalin and sent to the zooplankton laboratory at DFO's Institute of Ocean Sciences, for species classification and enumeration (Galbraith and Young 2019). Zooplankton collected from the flowmeter-side net were sorted into four size fractions by successively sieving through 8.0, 1.7, 1.0, and 0.25 mm screens. Each size fraction was individually frozen in a pre-weighed Ziploc bag for future stable isotopes, bomb calorimetry, and proximate analyses.

2.7 Catch Processing

At the end of each trawl tow, the net was retrieved and the catch transferred via a hopper or baskets to the fish processing lab for sorting on a conveyor belt. Large catches were randomly subsampled prior to sorting. The catch was sorted to the lowest taxonomic group possible. Juvenile Pacific Salmon (<300 mm total length) were recorded separately from adult Pacific Salmon. The total catch (or the subsample) of each species or taxonomic group, was weighed

using Marel Model M2200 dual range motion-compensating electronic scales (30/60 kg capacity, 0.01/0.02 kg resolution or 300/600 kg capacity, 0.1/0.2 kg resolution). For catches of a species or taxonomic group which totalled less than 0.01 kg, “trace” weight was recorded. Where practical, the number of individuals was recorded. Jellyfish species catch weights include both whole and incomplete pieces, while counts are only inclusive of specimens with intact bells.

2.8 Biological Sampling

Time permitting, all fish species captured were measured for length (nearest mm) and, if the specimen was large enough, weight (Marel Model M2200 dual range motion-compensating electronic scales, 3/6 kg capacity, 0.001/0.002 kg resolution or 6/15 kg capacity, 0.002/0.005 kg resolution), and stomach contents were recorded. For each species, a pre-determined, target number of randomly selected specimens were sampled per tow, with 10 random specimens selected for stomach content analyses. If the catch count was less than the target number, all specimens in that tow were sampled. Additional biological sampling occurred for Pacific Salmon, Pacific Herring, Pacific Sardine (Appendix C) and Eulachon (*Thaleichthys pacificus*), as outlined below. When collected, tissue for genetic stock identification was stored on Whatman paper. All sharks were sampled as per DFO survey sampling protocol (Appendix D). The bell diameters (nearest mm) of intact jellyfish specimens were recorded.

2.8.1 Pacific Salmon

Biological sampling was done separately for juvenile and adult Pacific Salmon. The target number of juvenile or adult Pacific Salmon specimens per tow was 10 for full biological sampling, an additional 20 specimens with length, weight, adipose clip and CWT status recorded and a fin clip for DNA collected, and up to an additional 100 specimens with only length, weight and adipose clip and CWT status recorded. Full biological samples included: measuring fork length and weight, collecting otoliths, taking a caudal fin clip for genetic stock identification, noting if the adipose fin was clipped (denoting hatchery released fish), retaining heads if a coded wire tag (CWT) was detected with a CWT wand, analyzing stomach contents, and collecting whole body (as per below).

2.8.2 Pacific Herring

The target number of specimens per tow for biological samples was 10, with up to 140 additional specimens measured for length and weight. The number of samples required for multinomial sampling (length, weight, age) was determined using power analyses (not shown) and guidance from the literature (Gerritsen and McGrath 2007; Hulson, Hanselman, and Shotwell 2017; Pennington, Burmeister, and Hjellvik 2002). Biological samples included: measuring standard length and weight, analyzing stomach contents, and collecting whole body (as per below). Scales were collected for age determination in the laboratory. Based on the limited number of herring that could be aged in the laboratory and based upon recommendations in Pennington, Burmeister, and Hjellvik (2002) and Hulson, Hanselman, and Shotwell (2017), a small number

of herring scales were collected from as many tows as possible to quantify the age, length, weight characteristics of Pacific Herring. Scales from up to 30 specimens per tow were collected and mounted on glass slides using a diluted glue solution. If there were < 25 individual fish in the sample, a target of 5 scales were collected; if there were 25-49 fish, 10 scales were collected; if there were 50-149 fish, 20 scales were collected; if there were ≥ 150 fish, 30 scales were collected. Scales were collected from the preferred area just posterior to pectoral fin insertion point, skin and mucous was removed by lightly rubbing away (Hamer 1989). Scales with evidence of resorption at the focus were rejected for collection. One scale was collected per specimen, if preferred scales were available. In many cases, herring did not have a preferred scale (particularly for small herring) and so the target number of scales could not be collected.

2.8.3 Pacific Sardine

The target number of specimens per tow was 100. Full biological samples included recording fork length, weight, sex, and maturity stage (Appendix C, Table C.1). An additional 100 specimens were to be frozen for laboratory stomach analyses. Due to the microscopic size of many Pacific Sardine prey, no stomachs were sampled at sea, therefore if catches of Pacific Sardine were less than the target number, all specimens were to be frozen for laboratory analyses.

2.8.4 Eulachon

The target number of specimens per tow was 50. Full biological sampling included measuring standard length and weight, collecting a caudal fin clip for genetic stock identification, analyzing stomach contents, and collecting whole body (as per below).

2.8.5 Other fish

For all other species, the target number of specimens per tow was 50. Full biological sampling included measuring length (standard for smelt species, fork or total for other species) and weight, analyzing stomach contents, and collecting whole body (as per below).

2.9 Stomach Contents Sampling

Stomach contents were analyzed for the first 10 random specimens or for all specimens for catches with fewer than 10 individuals. Stomach content sampling followed the recommended at-sea protocol for DFO Pacific Region surveys (*King, Boldt, and King 2018*):

1. The stomach was removed from the anterior end of the esophagus to the pyloric sphincter.
2. Empty stomachs were identified and recorded.

3. Any specimens with everted, regurgitated stomachs, or in-net feeding were identified, recorded and rejected for further sampling.
4. The bolus was removed from pyloric and cardiac parts of the stomach to a petri dish and prey taxa were sorted.
5. Prey were identified to lowest taxonomic level that the sampler was comfortable with using their naked eye or a hand lens.
6. The volume of each prey category was measured to the nearest 0.1 cm³ using a volume measuring tool made of plexiglass (see Figure 5 in King, Boldt, and King 2018). The tool has a ruler (mm) embedded on one side of a trench that is 1 cm wide and 1 cm deep. Prey items were placed in the trench, and packed such that they filled the trench evenly and did not extend past 1 cm high. Once packed, the volume (cm³) was measured as the length along the ruler and recorded. Digestion state for each prey category was estimated as Fresh, Partial, or Well digested as per King, Boldt, and King (2018).

Once stomach contents were enumerated, the empty stomach was placed back in the fish body. Up to five whole bodies per tow were frozen for future energy density estimation.

2.10 Biomass Estimates

Design-based biomass estimates were produced for each juvenile Pacific Salmon species (based on daytime fishing events) and for Pacific Herring (based on nighttime fishing events). The annual biomass estimate (B) is the sum of the product of catch per unit effort densities (CPUE; kg·km³) and the volume (km³) of each stratum across m strata:

$$B = \sum_{i=1}^m V_i \delta_i$$

where δ_i is the mean CPUE density (kg·km³) for stratum i

V_i is the volume (km³) of the upper 30 m of stratum i

and m is the number of strata.

Individual CPUE values were adjusted for catchability, prior to analysis. Catchability for juvenile Pacific Salmon was assumed to be 0.4 (Volvenko 2003) and 1.0 for Pacific Herring. When calculating CPUE, if net opening data were not available, the survey mean width (m) or height (m) at that depth was used instead. Variance of the annual biomass estimate was estimated as per Thompson (1992):

$$\sigma^2 = \sum_{i=1}^m V_i (V_i - v_i) \frac{s^2}{n_i}$$

where V_i is the volume (km³) of the upper 30 m of stratum i

v_i is the total swept volume (km^3) of tows in stratum i

n_i is the total number of tows in stratum i

s^2 is the sample variance of δ_i from stratum i

and m is the number of strata.

3 RESULTS

3.1 Fishing Operations

The survey was divided into two legs: July 01 to July 16; and July 16 to July 30, 2025. The first and last days were used for loading, unloading and travelling; sampling began on July 02 and ended on July 16. A Coastguard crew change occurred on July 08 and a science crew change was on July 16. After the Science crew change, science was informed that a Coast Guard staffing shortage would result in the cancellation of the remainder of the survey, resulting in the loss of the entire second half of the survey, a loss of 15 fishing days. In total there were 15 sampling dates, 15 during the first leg and 0 during the second leg. A total of 70 tows were completed, of which 69 were useable (Table E.1).

A total of 36 survey blocks were successfully fished during the day, and 33 during the night (Table 1, Figure 2). Weather or high densities of marine mammals precluded sampling in some blocks, during both day and nighttime. Planned sampling effort was proportionally distributed across stratum, however the late notice of the early termination of the survey meant that strata were unevenly impacted; the percentage of successful tows was between 16.7% and 100% of each stratum's target blocks (Table 1). There were, however, >1 trawl tows conducted in all strata.

3.1.1 Gear Sensors

Net mensuration data from the Scanmar trawl sensors were collected for doorspread. The doorspread was used to calculate the horizontal net opening width. Vertical net mouth opening dimensions and depth were calculated using data from RBR duet sensors mounted on the headrope and footrope. Tows with missing sensor data used tow depth-specific averages when required (i.e., an average height of 18 m and average width of 46 m for surface tows and an average height of 12 m and average width of 51 m for 15 m target depth tows; Table E.1).

3.2 Acoustic Transects

During non-fishing hours, acoustic backscatter data attributed to coastal pelagic species were collected. Transects were completed as time and logistics allowed, and the reduction of survey

time also resulted in a reduction of completed acoustic transects. Data are processed and stored at the Institute of Ocean Sciences.

3.3 Oceanographic Data

Oceanographic data from CTD data and Niskin bottle samples for nitrate, phosphate, silicate, and chl *a*, were processed, analyzed, and archived in the Ocean Sciences Data Inventory at the Institute of Ocean Sciences. Rosette casts (CTD and Niskin bottle) were conducted until a July 12 equipment failure, after which a standalone CTD and Niskin bottle were launched from the side science winch. A total of 36 blocks were completed (Table F.1). Ocean operations were not conducted at one fished block due to the close proximity of oceanography completed in an adjacent block, and one blocked had oceanography completed, but was unable to be fished due to the presence of dolphins in the area. Depths of CTD casts ranged from 50 to 250 m. One rosette cast was performed outside of the IPES survey design (Event 83, Block 8163), with no associated trawl or bongo events, to enable a deep water cast to 750 m for the calibration of instruments and analysis.

3.4 Zooplankton Samples

Vertical zooplankton tows were successfully conducted in 34 blocks where CTD casts were completed (1 zooplankton tow was unsuccessful due a winch failure; no zooplankton tow was done at the deep CTD calibration site; Table F.1) at depths ranging from 53 to 189 m (Appendix Table F.1). Formalin-preserved zooplankton samples are being enumerated at the Institute of Ocean Sciences and data will be archived in the DFO zooplankton database. Frozen zooplankton samples are being processed at the Pacific Biological Station and results are not reported here.

3.5 Catch Composition

Catch composition for each usable fishing tow was recorded (Table G.1). Fifty-one identified species or taxonomic groups were identified, of which 38 were fish (Table 2), and 13 were invertebrates (Table 3). The mean catch weight per tow was 232 kg per usable tow (Table 2 and 3). The total survey catch weight from usable tows was 16,009 kg, excluding species for which only count data were collected (e.g., large sharks ($n = 2$)); the highest proportion of the total catch weight was Pacific Herring (6,630 kg; Tables 2 and 3).

For each captured species the total count of specimens, total catch weight, maximum and mean catch weight per tow and the number of tows in which the species occurred is reported in Tables 2 & 3. Pacific Herring represented the most abundant catch by weight, with 41% of the total survey catch weight, including one catch >1,000 kg, and an additional ten catches >200 kg. Pacific Herring were also the most frequently caught fish species; they were present in 64% of total tows, (100% of night tows and 31% of daytime tows), however Lions Mane jelly fish and *Aequorea* spp jelly fish were the most frequently caught species overall, occurring in 96% and

74% of tows respectively. followed by Lions Mane jellyfish (*Cyanea capillata*) at 25% of the total measured catch weight.

Four species of adult Pacific Salmon (Pink Salmon (*O. gorbuscha*), Chum Salmon (*O. keta*), Coho Salmon (*O. kisutch*) and Chinook Salmon (*O. tshawytscha*)), were the next most abundant species by weight and catch frequency. Based on catch count estimates, juvenile Rockfish (n=9,948, *Sebastes*), juvenile Codfishes (n=6,418; *Gadidae*), and juvenile Chum Salmon (n=4,558) were also important catch species in this survey (Table 2 and Table 3). In addition to North Pacific Spiny Dogfish (*Squalus suckleyi*, n=3), 1 other shark species, Blue Shark (n=2, *Prionace glauca*), was encountered during the survey (Table 2).

Pacific Salmon (adults and juveniles) were caught in 67% of usable tows; juvenile Pacific Salmon were caught in 46% of the tows. The dominant species of juvenile Pacific Salmon was Chum Salmon (n=4,558); they were caught in 48% of the tows (Table 2). Juvenile Sockeye (n=470), Coho (n=195), Pink (n=135), and Chinook (n=37) Salmon were caught in 10%, 31%, 7%, and 20% of the tows, respectively (Table 2).

Figures 4-11 provide relative catch per unit effort by tow for juvenile Pacific Salmon, Pacific Herring, and other frequently caught species including jellyfish species.

3.6 Catch Distribution

Pacific Herring were captured mainly at night and throughout the survey area, with large catches north of Nootka Sound and off Barkley Sound on LaPerouse Bank (Figure 9). It is worth noting that the southern strata could not be fully sampled and this is typically where large concentrations of herring are observed. Juvenile Pacific Salmon were mainly captured during the day and throughout the survey area (Figures 4 - 8). Catches of juvenile Coho Salmon occurred mainly in Queen Charlotte Sound and along the northern portion of the west coast of Vancouver Island (Figure 6). Chinook Salmon juveniles were caught infrequently, but throughout the survey area (Figure 4). Juvenile Chum Salmon, Pink Salmon and Sockeye Salmon were captured mainly in Queen Charlotte Sound (Figure 7 and 8) with the juvenile Chum Salmon also being found in a few catches along the west coast of Vancouver Island. Eulachon were caught mainly at night, with catches in Queen Charlotte Sound and west of Barkley Sound (Figure 10). Juvenile gadids were caught throughout the survey area south of Brooks Peninsula (Figure 10), while the largest catchest of juvenile Rockfish were caught to the north and south of Brooks Peninsula (Figure 10). Lions Mane, Moon Jellyfish, Fried Egg Jellyfish (*Phacellophora camtschatica*), and water jellyfish (*Aequorea* spp.), were caught throughout the survey area (Figure 11).

3.7 Biological Samples

3.7.1 Samples

Biological samples were collected from 42 species or groups and included 6,828 individual specimens (Table 4). Sample sizes and statistics of length and weight are presented in Table 4 for each species sampled.

3.7.2 Length and Weight

Length frequencies and length-weight relationships were examined for all Pacific Salmon and Pacific Herring (Figures 12-17), and length frequencies for other fish species with at least 50 individuals measured (Figure 18). Length frequency plots for Pacific Salmon (Figures 12-16), illustrate that this survey encounters both juveniles (<300 mm) and adults, with the exception that no adult Sockeye Salmon were caught. Pacific Herring standard lengths ranged from 91 to 255 mm, with a mean length of 173 mm. Based on lengths, three or four size classes of Pacific Herring were sampled by this survey; however, this does not imply the same number of age classes, since there is overlap in lengths among age classes (Figure 17). Length frequencies for Speckled Sanddab (*Citharichthys stigmaeus*), Opalescent Inshore Squid (*Doryteuthis opalescens*), Cods/Hakes/Grenadiers (*Gadiformes*), Rockfishes (*Sebastes*), and Eulachon (*Thaleichthys pacificus*), (i.e. species with over 50 length measurements) can be found in Figure 18 with minimum, maximum and mean lengths of these species found in Table 4. Bell diameters of frequently measured jellyfish are shown in Figure 19.

3.8 Stomach Content Samples

A total of 1,403 stomach specimens were processed at sea from 27 species (Table 5). Of the stomachs examined, on average 26% of each species' stomachs were empty (Table 5). Diets per species were examined in 50-100% of the tows in which they were caught and numbers of fish ranged from 1 to 355. Other species were either released alive (e.g., shark species) or were too small to have their diets examined at sea. Subsamples of small fish, such as young of the year Codfishes and Rockfishes (*Sebastes* spp.), were frozen for later laboratory analyses.

3.8.1 Diet Summaries

Unidentifiable remains and teleosts were the most frequently observed prey in non-empty stomachs examined (36% and 34% respectively). The next most frequently consumed and identifiable prey items across predators were Euphausiids (*Euphausiacea*), crabs, and amphipods (Table 6). Most teleost fish prey were unidentifiable to species, but the most frequently occurring species was Pacific Herring, with small amounts of juvenile Rockfishes (*Sebastes* spp.), Pacific Sandlance (*Ammodytes personatus*), larval flatfish (*Pleuronectiformes*), and juvenile codfish (*Gadiformes*) (Table 6). Teleost fish prey, primarily Pacific Herring, contributed the largest average volume to diets, followed by crabs and Euphausiids.

3.9 Biomass Estimates

The 2025 Pacific Herring biomass was 89,589 t (CV=0.28; Table 7). In 2025, the juvenile Chum Salmon biomass was 314 t (CV=0.54), juvenile Coho Salmon biomass estimate was 72 t (CV=0.39), juvenile Chinook Salmon biomass estimate was 38 t (CV=0.11), juvenile Sockeye Salmon biomass estimate was 35 t (CV=0.78) and the biomass of juvenile Pink Salmon was 7.8 t (CV=0.77; Table 7).

4 DISCUSSION

The IPES data generated in 2025 cover physical and biological oceanographic conditions, fish abundance and composition of the pelagic community, along with comprehensive sampling and stomach content analyses of all caught species. With a combination of day and night time fishing, the IPES extends long-term time series of the relative abundance of juvenile Pacific Salmon, Pacific Herring, and other important pelagic fish species. If Pacific Sardine re-establish high migratory rates into Canadian waters to feed in summer, the IPES will provide documentation and also extend the long-term time series of that species' relative abundance. Acoustic data on Pacific Herring and Pacific Hake distributional patterns have also been reported in the State of the Pacific Ocean report (Boldt et al. 2019). IPES 2017-2025 relative catch rates and condition of juvenile Pacific Salmon have extended a 20-year time series off the west coast of Vancouver Island and have been reported in State of the Pacific Ocean reports (King and Tucker 2018; King, Anderson, et al. 2019; King et al. 2023) and in the Fraser River Sockeye Salmon Forecasting Supplement (Macdonald et al. 2019). It is important to maintain the long-term time series of juvenile Pacific Salmon relative abundance along the continental shelf, since linking the IPES results to similar surveys from Oregon north to the Gulf of Alaska and Bering Sea provide indication of broad-scale responses to regional drivers (King, Boldt, Burke, et al. 2019). The IPES also provides the opportunity to document unusual occurrences, such as the unprecedented, and broad-scale Pyrosome bloom in 2017, reduced bloom in 2018, an absence of Pyrosomes in 2019 (IPES data reported in Brodeur et al. 2018; Boldt and Chandler 2019) and reoccurrence in 2022. Other interesting results include abundant juvenile Rockfish catches in 2018 and 2019 (Boldt and Chandler 2019). The IPES is conducted annually and is a key platform supporting ecosystem research and empirical-based linkages of climate and ocean variability to fish abundance or community composition, which is fundamental to ecosystem-based fisheries management.

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7 TABLES

Table 1. Survey strata, strata sizes, target number of blocks to sample, and actual blocks sampled during the Integrated Pelagic Ecosystem Survey July 1 - July 16, 2025 aboard the CCGS *Sir John Franklin*. Actual bottom depths during the survey may differ from the depth (bathymetry for strata designation) of any given block; actual tow depth during the survey may differ from the targeted depth.

Stratum			Stratum Size		Target No. Blocks			No. Blocks Successfully Fished			
Location	Bottom Depth Range (m)		Total Blocks	Proportion	0 m	15 m	Total	0 m	15 m	Total	Proportion
2025 Daytime											
504	QCS	50-100	98	0.098	3	3	6	3	2	5	0.139
505	QCS	100-200	153	0.153	5	5	10	5	5	10	0.278
506	NWVI	50-100	52	0.052	2	2	4	2	2	4	0.111
507	NWVI	100-200	84	0.084	3	3	6	3	2	5	0.139
508	CWVI	50-100	79	0.079	3	3	6	2	1	3	0.083
509	CWVI	100-200	93	0.093	3	3	6	2	1	3	0.083
510	SWVI	50-100	190	0.189	7	7	14	1	2	3	0.083
511	SWVI	100-200	254	0.252	9	9	18	2	1	3	0.083
TOTAL			1003	1.000	35	35	70	20	16	36	1.000
2025 Nighttime											
504	QCS	50-100	98	0.098	3	3	6	3	2	5	0.152
505	QCS	100-200	153	0.153	5	5	10	4	5	9	0.273
506	NWVI	50-100	52	0.052	2	2	4	2	2	4	0.121
507	NWVI	100-200	84	0.084	3	3	6	3	2	5	0.152
508	CWVI	50-100	79	0.079	3	3	6	2	1	3	0.091
509	CWVI	100-200	93	0.093	3	3	6	0	1	1	0.030
510	SWVI	50-100	190	0.189	7	7	14	1	2	3	0.091
511	SWVI	100-200	254	0.252	9	9	18	2	1	3	0.091
TOTAL			1003	1.000	35	35	70	17	16	33	1.000

Table 2. All captured fish species (or taxonomic groups), ordered by total catch weight, showing number of tows in which the species occurred, count of individuals, total catch weight, maximum catch weight, and mean catch weight per tow for usable tows from the Integrated Pelagic Ecosystem Survey, July 1 - July 16, 2025 aboard the CCGS *Sir John Franklin*. Blank catch weights indicates specimens could not be weighed accurately with Marel platform scale (e.g., larval fish and sharks).

Scientific Name	Common Name	Tows	Count	Catch Weight (kg)		
				Total	Max	Mean
<i>Clupea pallasii</i>	Pacific Herring	44	307912	6630.31	1394.00	151
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Adults)	42	777	1268.69	299.63	30
<i>Oncorhynchus keta</i>	Chum Salmon (Adults)	38	268	848.84	114.28	22
<i>Oncorhynchus kisutch</i>	Coho Salmon (Adults)	34	219	530.43	91.75	16
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Adults)	39	191	404.96	42.82	10
<i>Oncorhynchus keta</i>	Chum Salmon (Juveniles)	34	4558	132.89	52.65	4
<i>Oncorhynchus kisutch</i>	Coho Salmon (Juveniles)	22	195	30.22	8.46	1
<i>Sebastes</i>	Rockfishes	33	9948	25.46	12.13	2
<i>Citharichthys stigmaeus</i>	Speckled Sanddab	4	140	20.91	14.62	5
<i>Thaleichthys pacificus</i>	Eulachon	6	588	15.11	8.74	3
<i>Gadiformes</i>	Cods/Hakes/Grenadiers	54	6418	13.02	6.86	0
<i>Oncorhynchus nerka</i>	Sockeye Salmon (Juveniles)	7	470	11.34	9.71	2
<i>Sebastes melanops</i>	Black Rockfish	7	7	9.40	1.98	1
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Juveniles)	14	37	8.70	2.42	1
<i>Squalus suckleyi</i>	North Pacific Spiny Dogfish	3	3	7.14	2.82	2
<i>Ophiodon elongatus</i>	Lingcod	1	1	3.99	3.99	4
<i>Gadus chalcogrammus</i>	Walleye Pollock	1	51	3.19	3.19	3
<i>Trachurus symmetricus</i>	Jack Mackerel	2	3	2.72	2.06	1
<i>Anarrhichthys ocellatus</i>	Wolf Eel	16	26	2.26	0.54	0
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Juveniles)	5	135	2.05	1.57	0
<i>Engraulis mordax</i>	Northern Anchovy	3	47	1.47	1.30	0
<i>Atheresthes stomias</i>	Arrowtooth Flounder, Turbot	2	5	1.29	1.20	1
<i>Alosa sapidissima</i>	American Shad	5	6	0.65	0.28	0
<i>Sebastes flavidus</i>	Yellowtail Rockfish	1	1	0.44	0.44	0
<i>Citharichthys sordidus</i>	Pacific Sanddab	2	6	0.40	0.36	0
<i>Zaprora silenus</i>	Prowfish	7	7	0.31	0.06	0
<i>Osmeridae</i>	Smelts	1	18	0.22	0.22	0
<i>Larval Fish</i>	Larval Fish	7	153	0.07	0.07	0
<i>Diaphus theta</i>	California Headlightfish	2	35	0.07	0.07	0
<i>Bathymasteridae</i>	Ronquils	1	1	0.07	0.07	0
<i>Pleuronectiformes</i>	Flatfishes	13	114	0.03	0.03	0
<i>Ammodytes personatus</i>	Pacific Sand Lance	6	68	0.02	0.02	0
<i>Microstomus pacificus</i>	Dover Sole	1	1	0.02	0.02	0
<i>Prionace glauca</i>	Blue Shark	2	2			
<i>Trichodon trichodon</i>	Pacific Sandfish	1	1			
<i>Ptilichthys goodei</i>	Quillfish	1	1			
<i>Liparidae</i>	Snailfishes	1	1			
<i>Psychrolutes sigalutes</i>	Soft Sculpin	1	5			

Table 3. All captured invertebrate species (or taxonomic groups), ordered by total catch weight, showing number of tows in which the species occurred, count of individuals, total catch weight, maximum catch weight, and mean catch weight per tow for usable tows from the usable tows from the Integrated Pelagic Ecosystem Survey, July 1 - July 16, 2025 aboard the CCGS *Sir John Franklin*. Jellyfish weights include all identifiable pieces, but only those with intact bells were included in the counts. Euphausiacea were not counted due to their small size. Blank weights indicate specimens which could not be weighed accurately on the Marel platform scale.

Scientific Name	Common Name	Tows	Count	Catch Weight (kg)		
				Total	Max	Mean
<i>Cyanea capillata</i>	Lions Mane	67	240	4,040.59	206.98	60
<i>Aequorea</i>	Water Jellyfish	52		1,625.42	506.38	31
<i>Chrysaora fuscescens</i>	Pacific Sea Nettle	12	18	156.25	73.01	13
<i>Phacellophora camtschatica</i>	Fried Egg Jellyfish	21	18	91.82	25.99	4
<i>Aurelia labiata</i>	Moon Jellyfish	25	94	68.15	16.55	3
<i>Euphausiacea</i>	Euphausiids	4		37.52	19.92	9
<i>Doryteuthis opalescens</i>	Opalescent Inshore Squid	9	452	8.25	3.14	1
<i>Chrysaora melanaster</i>	Northern Sea Nettle	5	5	4.02	1.58	1
<i>Onychoteuthis borealijaponicus</i>	Boreal Clubhook Squid	2	2	0.54	0.46	0
<i>Ctenophora</i>	Comb Jellyfish	5	5	0.12	0.03	0
<i>Octopoda</i>	Octopus	1		0.07	0.07	0
<i>Clytia</i>	Clytia	2	2			
<i>Pandalus jordani</i>	Pink Shrimp (Smooth)	2	10			

Table 4. Lengths and weights for each measured species, ordered by the number of length measurements sampled during the 2025 Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf. (Tows = number of tows, N = number of measurements).

Scientific Name	Common Name	Tows	Length (mm)				Weight (g)			
			N	Min	Max	Mean	N	Min	Max	Mean
<i>Clupea pallasii</i>	Pacific Herring	41	3072	91	255	173	3070	7	726	74
<i>Oncorhynchus keta</i>	Chum Salmon (Juveniles)	33	776	92	183	140	770	8	75	31
<i>Gadiformes</i>	Cods/Hakes/Grenadiers	17	545	32	89	61	145	1	6	2
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Adults)	41	478	393	603	498	476	924	2484	1599
<i>Doryteuthis opalescens</i>	Opalescent Inshore Squid	8	278	42	119	74	278	4	48	14
<i>Oncorhynchus keta</i>	Chum Salmon (Adults)	37	229	353	819	609	229	534	8362	3231
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Adults)	39	187	289	940	492	187	318	9410	2116
<i>Oncorhynchus kisutch</i>	Coho Salmon (Juveniles)	22	186	149	309	223	185	36	352	151
<i>Oncorhynchus kisutch</i>	Coho Salmon (Adults)	34	185	270	682	567	185	264	4114	2387
<i>Cyanea capillata</i>	Lions Mane	38	170	79	721	317				
<i>Thaleichthys pacificus</i>	Eulachon	6	116	69	176	145	116	2	60	27
<i>Sebastes</i>	Rockfishes	6	102	26	62	46	19	1	5	2
<i>Oncorhynchus nerka</i>	Sockeye Salmon (Juveniles)	7	98	105	160	135	98	8	53	27
<i>Citharichthys stigmaeus</i>	Speckled Sanddab	3	83	73	316	242	83	2	386	183
<i>Aequorea</i>	Water Jellyfish	4	70	56	132	80				
<i>Aurelia labiata</i>	Moon Jellyfish	15	53	63	357	184				
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Juveniles)	14	27	119	369	246	27	20	689	238
<i>Anarrhichthys ocellatus</i>	Wolf Eel	16	26	334	580	475	26	14	142	68
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Juveniles)	5	25	108	148	125	25	4	40	19
<i>Osmeridae</i>	Smelts	1	18	95	110	103	18	8	13	10
<i>Phacellophora camtschatica</i>	Fried Egg Jellyfish	9	13	121	794	361				
<i>Engraulis mordax</i>	Northern Anchovy	3	10	141	175	151	10	26	36	30
<i>Ammodytes personatus</i>	Pacific Sand Lance	3	8	74	91	85	8	1	3	2
<i>Sebastes melanops</i>	Black Rockfish	7	7	272	488	416	7	354	1974	1301
<i>Gadus chalcogrammus</i>	Walleye Pollock	1	7	187	226	202	7	44	78	61
<i>Citharichthys sordidus</i>	Pacific Sanddab	2	6	167	227	199	6	42	111	74
<i>Zaprora silenus</i>	Prowfish	6	6	126	162	143	6	31	66	45
<i>Citharichthys</i>	Sanddabs	1	6	269	344	291	6	218	482	298
<i>Alosa sapidissima</i>	American Shad	4	5	219	231	226	5	104	132	120
<i>Atheresthes stomias</i>	Arrowtooth Flounder, Turbot	2	5	165	405	289	5	32	520	258
<i>Chrysaora melanaster</i>	Northern Sea Nettle	5	5	206	322	257				
<i>Liparidae</i>	Snailfishes	1	5	33	44	38				
<i>Trachurus symmetricus</i>	Jack Mackerel	2	3	349	458	418	3	640	992	869
<i>Squalus suckleyi</i>	North Pacific Spiny Dogfish	3	3	801	900	843	3	1886	2996	2547
<i>Chrysaora fuscescens</i>	Pacific Sea Nettle	3	3	176	472	339				

Table 4. Lengths and weights for each measured species, ordered by the number of length measurements sampled during the 2025 Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf. (Tows = number of tows, N = number of measurements). (continued)

Scientific Name	Common Name	Tows	Length (mm)				Weight (g)			
			N	Min	Max	Mean	N	Min	Max	Mean
<i>Prionace glauca</i>	Blue Shark	2	2	1350	1530	1440				
<i>Onychoteuthis borealijaponicus</i>	Boreal Clubhook Squid	1	1	248	248	248	1	350	350	350
<i>Microstomus pacificus</i>	Dover Sole	1	1	98	98	98	1	6	6	6
<i>Ophiodon elongatus</i>	Lingcod	1	1	780	780	780	1	3968	3968	3968
<i>Trichodon trichodon</i>	Pacific Sandfish	1	1	95	95	95	1	10	10	10
<i>Bathymasteridae</i>	Ronquils	1	1	99	99	99	1	1	1	1
<i>Sebastes flavidus</i>	Yellowtail Rockfish	1	1	314	314	314	1	462	462	462

Table 5. Number of tows with stomach samples (Tows), number of stomachs examined (Stomachs), and number of empty stomachs (Empty) for each species, ordered by number of tows, during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025.

Scientific Name	Common Name	Tows	Stomachs	Empty
<i>Clupea pallasii</i>	Pacific Herring	41	355	84
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Adults)	36	120	5
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Adults)	34	155	19
<i>Oncorhynchus keta</i>	Chum Salmon (Juveniles)	33	196	14
<i>Oncorhynchus keta</i>	Chum Salmon (Adults)	30	111	19
<i>Oncorhynchus kisutch</i>	Coho Salmon (Adults)	30	99	10
<i>Oncorhynchus kisutch</i>	Coho Salmon (Juveniles)	22	96	3
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon (Juveniles)	13	26	2
<i>Anarrhichthys ocellatus</i>	Wolf Eel	11	17	0
<i>Doryteuthis opalescens</i>	Opalescent Inshore Squid	8	51	31
<i>Oncorhynchus nerka</i>	Sockeye Salmon (Juveniles)	7	35	0
<i>Oncorhynchus gorbuscha</i>	Pink Salmon (Juveniles)	5	23	1
<i>Thaleichthys pacificus</i>	Eulachon	5	35	16
<i>Zaprora silenus</i>	Prowfish	5	5	2
<i>Sebastes melanops</i>	Black Rockfish	5	5	0
<i>Alosa sapidissima</i>	American Shad	4	5	1
<i>Engraulis mordax</i>	Northern Anchovy	3	10	2
<i>Trachurus symmetricus</i>	Jack Mackerel	2	3	1
<i>Citharichthys sordidus</i>	Pacific Sanddab	2	6	4
<i>Citharichthys stigmaeus</i>	Speckled Sanddab	2	19	14
<i>Atheresthes stomias</i>	Arrowtooth Flounder, Turbot	2	5	0
<i>Citharichthys</i>	Sanddabs	1	6	3
<i>Osmeridae</i>	Smelts	1	10	5
<i>Gadus chalcogrammus</i>	Walleye Pollock	1	7	3
<i>Sebastes flavidus</i>	Yellowtail Rockfish	1	1	1
<i>Microstomus pacificus</i>	Dover Sole	1	1	0
<i>Onychoteuthis borealijaponicus</i>	Boreal Clubhook Squid	1	1	0

Table 6. Prey items (Prey) identified in the stomach contents of predator species (Species) sampled (alphabetical by Species) during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025. Volume is the mean volume in cm³; frequency of occurrence (FO) is the proportion of non-empty stomachs containing that prey item.

Species	Prey	Volume	FO
American Shad	Unidentified Fishes	5.200	0.250
American Shad	Unidentified Remains	0.500	0.250
American Shad	Euphausiids	0.200	0.250
American Shad	Crabs	0.100	0.250
Arrowtooth Flounder, Turbot	Euphausiids	1.033	0.600
Arrowtooth Flounder, Turbot	Unidentified Remains	0.010	0.400
Black Rockfish	Unidentified Fishes	19.050	0.400
Black Rockfish	Pacific Herring	11.000	0.200
Black Rockfish	Pacific Sand Lance	5.000	0.200
Black Rockfish	Crabs	2.000	0.200
Black Rockfish	Unidentified Remains	0.500	0.200
Black Rockfish	Shrimp	0.500	0.200
Boreal Clubhook Squid	Unidentified Remains	0.400	1.000
Boreal Clubhook Squid	Crabs	0.010	1.000
Chinook Salmon (Adults)	Pacific Herring	37.023	0.270
Chinook Salmon (Adults)	Rockfishes	31.879	0.122
Chinook Salmon (Adults)	Unidentified Fishes	13.758	0.696
Chinook Salmon (Adults)	Euphausiids	7.280	0.043
Chinook Salmon (Adults)	Squid	3.400	0.017
Chinook Salmon (Adults)	Crabs	2.320	0.104
Chinook Salmon (Adults)	Octopus	2.167	0.052
Chinook Salmon (Adults)	Unidentified Remains	1.635	0.052
Chinook Salmon (Adults)	Flatfishes	0.675	0.035
Chinook Salmon (Adults)	Shrimp	0.100	0.009
Chinook Salmon (Juveniles)	Unidentified Fishes	2.050	0.833
Chinook Salmon (Juveniles)	Octopus	1.950	0.083
Chinook Salmon (Juveniles)	Flatfishes	0.555	0.083
Chinook Salmon (Juveniles)	Crabs	0.433	0.125
Chinook Salmon (Juveniles)	Copepods	0.300	0.083
Chinook Salmon (Juveniles)	Euphausiids	0.255	0.083
Chinook Salmon (Juveniles)	Unidentified Remains	0.233	0.125
Chinook Salmon (Juveniles)	Amphipods	0.010	0.042
Chum Salmon (Adults)	Pacific Herring	16.229	0.076
Chum Salmon (Adults)	Unidentified Fishes	12.863	0.087
Chum Salmon (Adults)	Jellyfish	7.644	0.076
Chum Salmon (Adults)	Unidentified Remains	7.114	0.674
Chum Salmon (Adults)	Crabs	6.787	0.087
Chum Salmon (Adults)	Comb Jellyfish	4.169	0.141
Chum Salmon (Adults)	Euphausiids	3.682	0.185
Chum Salmon (Adults)	Cods/Hakes/Grenadiers	3.000	0.011
Chum Salmon (Juveniles)	Unidentified Fishes	0.852	0.033
Chum Salmon (Juveniles)	Euphausiids	0.737	0.308
Chum Salmon (Juveniles)	Amphipods	0.413	0.220
Chum Salmon (Juveniles)	Unidentified Remains	0.412	0.731
Chum Salmon (Juveniles)	Crabs	0.303	0.016

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Species	Prey	Volume	FO
Chum Salmon (Juveniles)	Copepods	0.170	0.033
Chum Salmon (Juveniles)	Pteropods	0.107	0.055
Chum Salmon (Juveniles)	Comb Jellyfish	0.087	0.033
Chum Salmon (Juveniles)	Arrow Worms	0.010	0.011
Chum Salmon (Juveniles)	Cephalopods	0.010	0.005
Coho Salmon (Adults)	Pacific Herring	28.278	0.101
Coho Salmon (Adults)	Crabs	11.321	0.348
Coho Salmon (Adults)	Rockfishes	10.929	0.079
Coho Salmon (Adults)	Unidentified Fishes	8.859	0.652
Coho Salmon (Adults)	Unidentified Remains	4.214	0.079
Coho Salmon (Adults)	Amphipods	4.000	0.011
Coho Salmon (Adults)	Euphausiids	2.388	0.169
Coho Salmon (Adults)	Squid	0.300	0.011
Coho Salmon (Juveniles)	Euphausiids	5.000	0.054
Coho Salmon (Juveniles)	Unidentified Fishes	3.208	0.763
Coho Salmon (Juveniles)	Pacific Herring	2.125	0.043
Coho Salmon (Juveniles)	Crabs	1.587	0.290
Coho Salmon (Juveniles)	Pteropods	1.147	0.097
Coho Salmon (Juveniles)	Amphipods	0.426	0.237
Coho Salmon (Juveniles)	Copepods	0.283	0.043
Coho Salmon (Juveniles)	Unidentified Remains	0.180	0.054
Coho Salmon (Juveniles)	Cephalopods	0.100	0.011
Coho Salmon (Juveniles)	Shrimp	0.100	0.022
Dover Sole	Unidentified Remains	0.010	1.000
Eulachon	Amphipods	0.200	0.053
Eulachon	Euphausiids	0.194	0.579
Eulachon	Unidentified Remains	0.072	0.316
Eulachon	Unidentified Fishes	0.055	0.105
Jack Mackerel	Euphausiids	7.050	1.000
Jack Mackerel	Unidentified Remains	0.010	0.500
Northern Anchovy	Euphausiids	0.800	0.125
Northern Anchovy	Shrimp	0.150	0.250
Northern Anchovy	Unidentified Remains	0.103	0.875
Opalescent Inshore Squid	Unidentified Fishes	0.200	0.050
Opalescent Inshore Squid	Unidentified Remains	0.051	0.800
Opalescent Inshore Squid	Squid	0.010	0.050
Opalescent Inshore Squid	Crabs	0.010	0.100
Pacific Herring	Copepods	5.095	0.052
Pacific Herring	Euphausiids	1.961	0.542
Pacific Herring	Arrow Worms	0.900	0.004
Pacific Herring	Unidentified Fishes	0.671	0.037
Pacific Herring	Fish Eggs	0.467	0.011
Pacific Herring	Shrimp	0.400	0.004
Pacific Herring	Amphipods	0.355	0.177
Pacific Herring	Crabs	0.222	0.140
Pacific Herring	Unidentified Remains	0.210	0.402
Pacific Herring	Flatfishes	0.200	0.004
Pacific Sanddab	Arthropoda	0.010	0.500
Pacific Sanddab	Crabs	0.010	0.500

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Species	Prey	Volume	FO
Pink Salmon (Adults)	Rockfishes	13.608	0.088
Pink Salmon (Adults)	Crabs	8.243	0.662
Pink Salmon (Adults)	Unidentified Fishes	5.576	0.397
Pink Salmon (Adults)	Pacific Herring	4.200	0.037
Pink Salmon (Adults)	Unidentified Remains	4.156	0.081
Pink Salmon (Adults)	Jellyfish	3.000	0.007
Pink Salmon (Adults)	Euphausiids	2.461	0.250
Pink Salmon (Adults)	Amphipods	2.165	0.118
Pink Salmon (Adults)	Comb Jellyfish	0.250	0.015
Pink Salmon (Adults)	Shrimp	0.105	0.015
Pink Salmon (Juveniles)	Euphausiids	0.420	0.273
Pink Salmon (Juveniles)	Amphipods	0.211	0.455
Pink Salmon (Juveniles)	Unidentified Remains	0.202	0.500
Pink Salmon (Juveniles)	Pteropods	0.010	0.045
Pink Salmon (Juveniles)	Copepods	0.010	0.091
Prowfish	Unidentified Remains	1.203	1.000
Prowfish	Amphipods	0.010	0.333
Sanddabs	Unidentified Remains	0.600	0.333
Sanddabs	Euphausiids	0.600	0.667
Smelts	Euphausiids	0.102	1.000
Sockeye Salmon (Juveniles)	Euphausiids	0.935	0.657
Sockeye Salmon (Juveniles)	Unidentified Remains	0.267	0.086
Sockeye Salmon (Juveniles)	Cephalopods	0.203	0.086
Sockeye Salmon (Juveniles)	Amphipods	0.161	0.257
Sockeye Salmon (Juveniles)	Crabs	0.080	0.114
Sockeye Salmon (Juveniles)	Unidentified Fishes	0.078	0.114
Speckled Sanddab	Jellyfish	11.000	0.200
Speckled Sanddab	Unidentified Remains	1.667	0.600
Speckled Sanddab	Crabs	0.400	0.200
Walleye Pollock	Euphausiids	0.400	0.250
Walleye Pollock	Unidentified Remains	0.100	0.750
Wolf Eel	Unidentified Fishes	1.600	0.176
Wolf Eel	Flatfishes	1.350	0.118
Wolf Eel	Crabs	0.617	0.353
Wolf Eel	Shrimp	0.300	0.059
Wolf Eel	Unidentified Remains	0.168	0.353
Wolf Eel	Amphipods	0.055	0.118

Table 7. Biomass estimates (tonnes), coefficient of variance (CV), standard error (SE), and 95% confidence intervals (CI) in the upper 30 m pelagic layer for Pacific Salmon (daytime tows only) and Pacific Herring (nighttime tows only) during the Integrated Pelagic Ecosystem Survey, July 1 - July 16, 2025, aboard the CCGS *Sir John Franklin*. If estimated lower confidence interval (CI) was negative, it was reported as zero.

Species	Time of Day	Biomass (t)	CV	SE	Lower CI (t)	Upper CI (t)
Pacific Herring	Night	87,589.38	0.28	4,278.89	39,411.84	135,766.92
Pink Salmon (Juveniles)	Day	7.78	0.77	3.45	0.00	19.48
Chum Salmon (Juveniles)	Day	314.90	0.54	44.29	0.00	651.10
Coho Salmon (Juveniles)	Day	72.30	0.39	6.49	16.89	127.72
Sockeye Salmon (Juveniles)	Day	34.98	0.78	10.32	0.00	88.48
Chinook Salmon (Juveniles)	Day	38.81	0.11	1.27	30.54	47.09

8 FIGURES

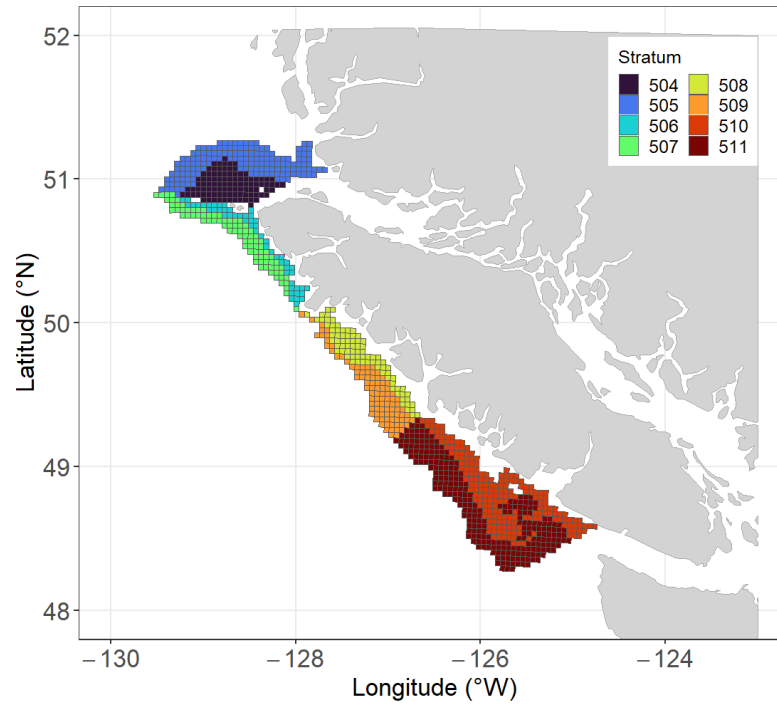


Figure 1. Survey area and strata for the Integrated Pelagic Ecosystem Survey on the Vancouver Island continental shelf.

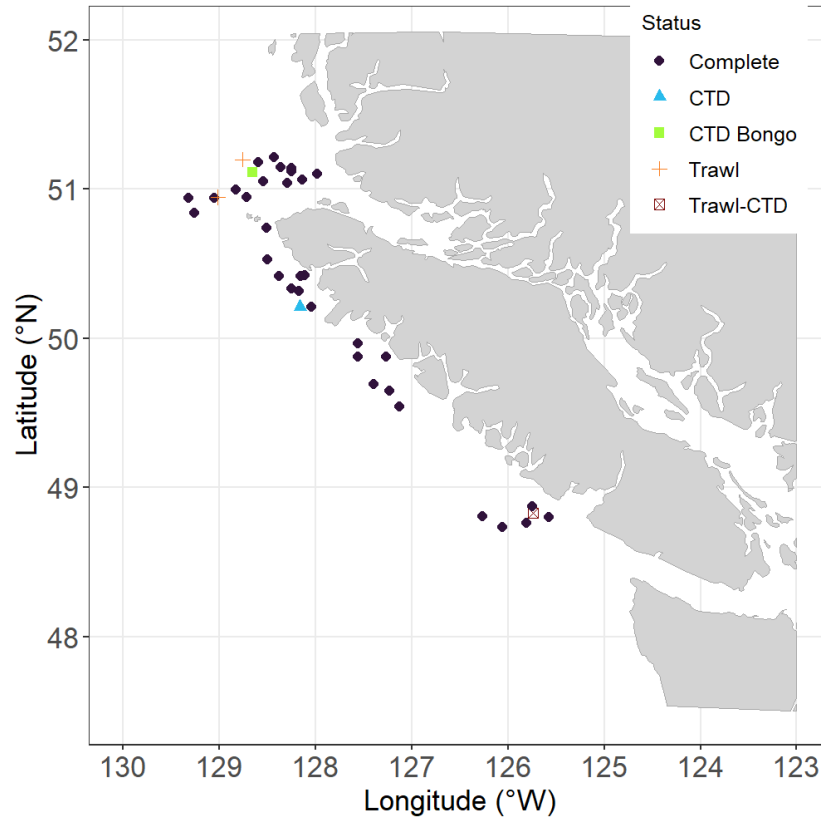


Figure 2. Trawl and oceanographic locations from the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf from July 1 - July 16, 2025 on the CCGS *Sir John Franklin*. Complete indicates that a midwater trawl haul, a CTD cast and a zooplankton tow were all completed in this block.

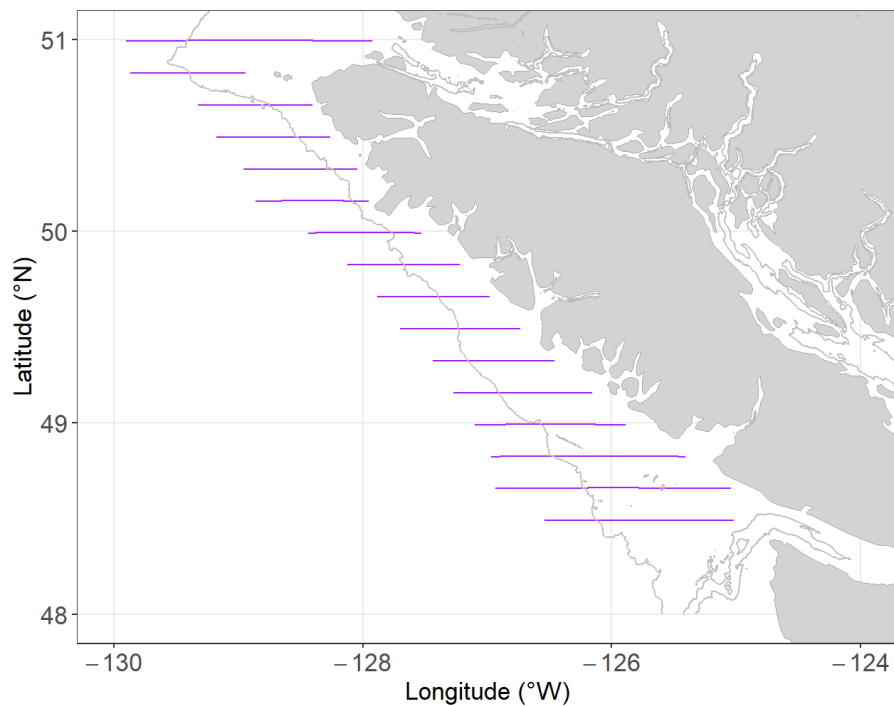


Figure 3. Transects for acoustic data collection during daylight, non-fishing hours for the 2025 Integrated Pelagic Ecosystem Survey, based on DFO's Pacific Hake survey acoustic transects. Contour line indicates the 200 m depth contour (GEBCO 2024).

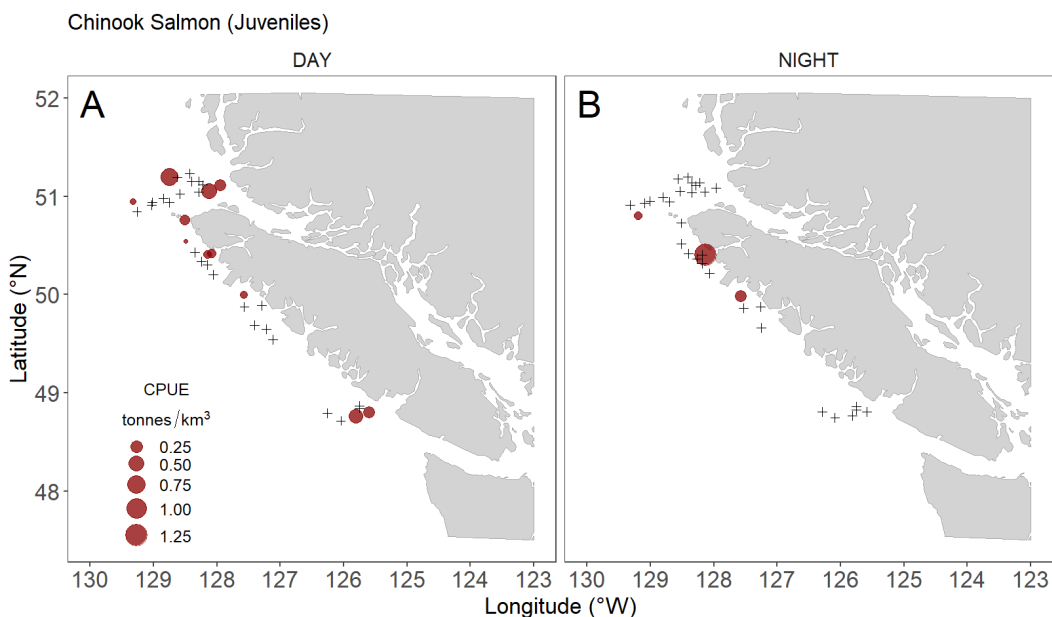


Figure 4. Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

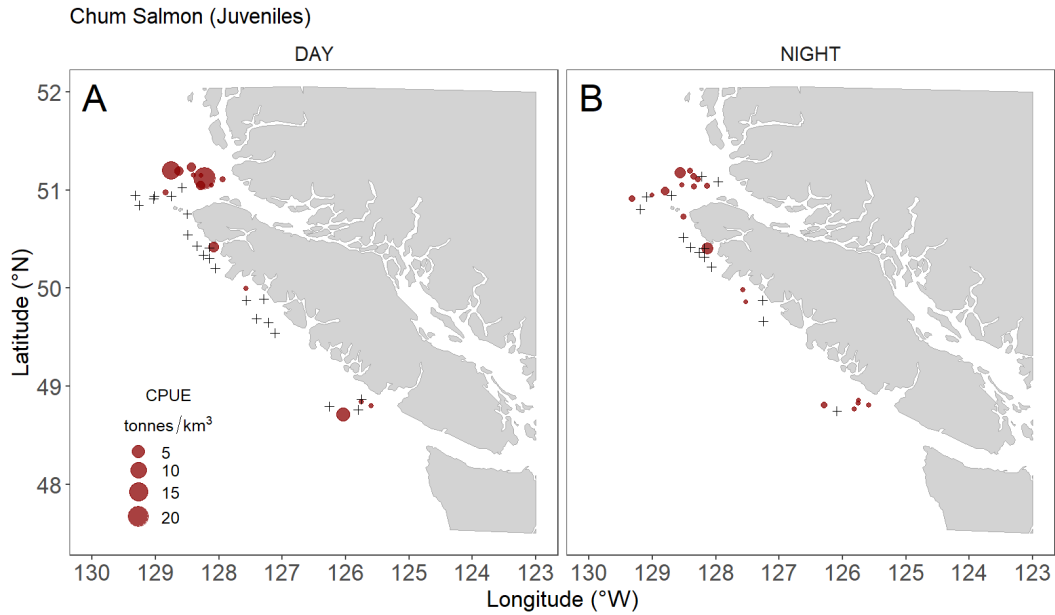


Figure 5. Juvenile Chum Salmon (*Oncorhynchus keta*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

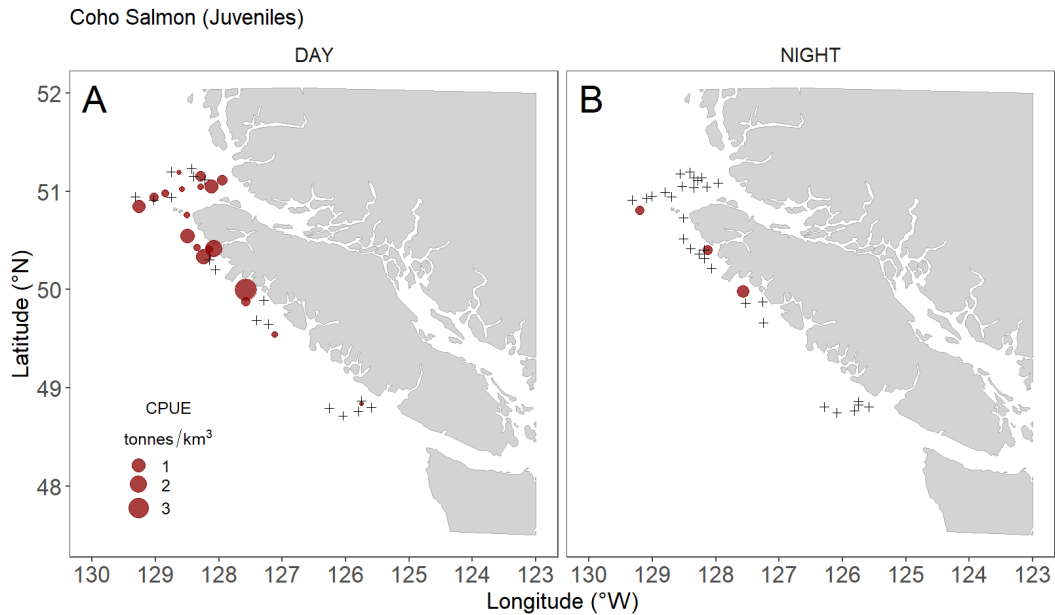


Figure 6. Juvenile Coho Salmon (*Oncorhynchus kitsutch*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

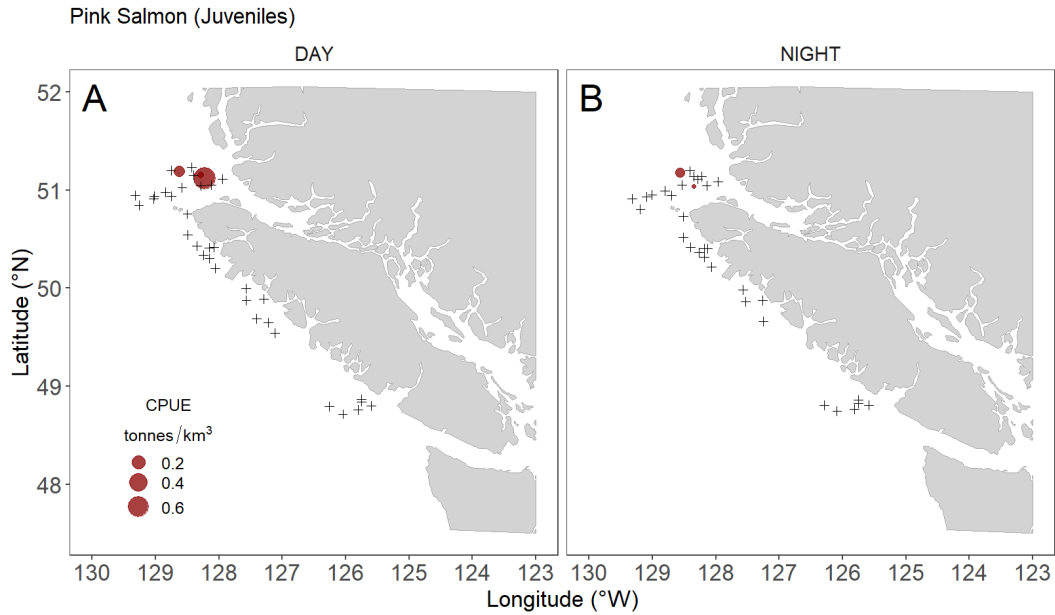


Figure 7. Juvenile Pink Salmon (*Oncorhynchus gorbusha*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

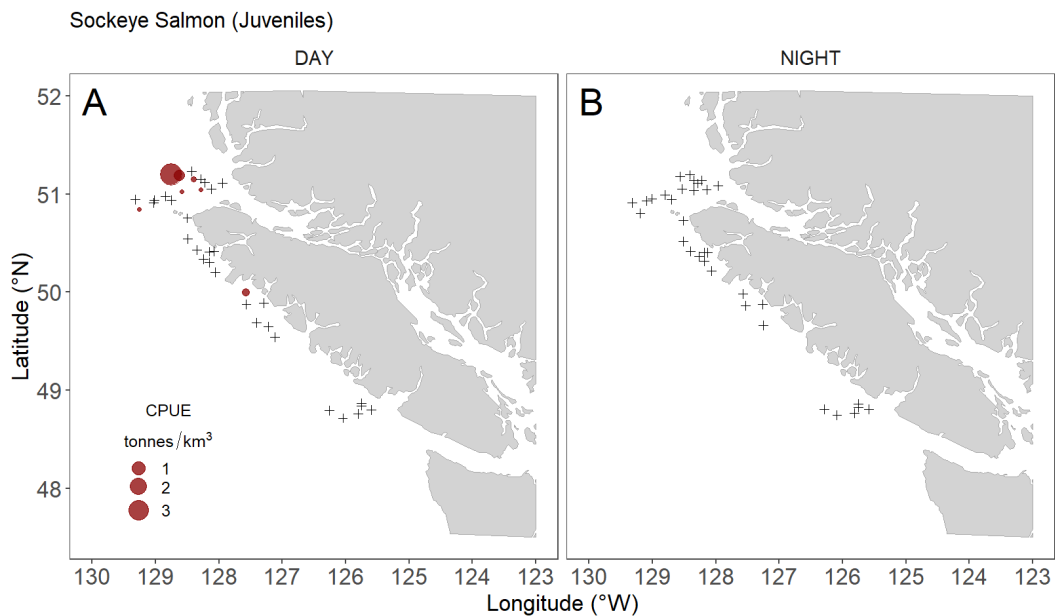


Figure 8. Juvenile Sockeye Salmon (*Oncorhynchus nerka*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

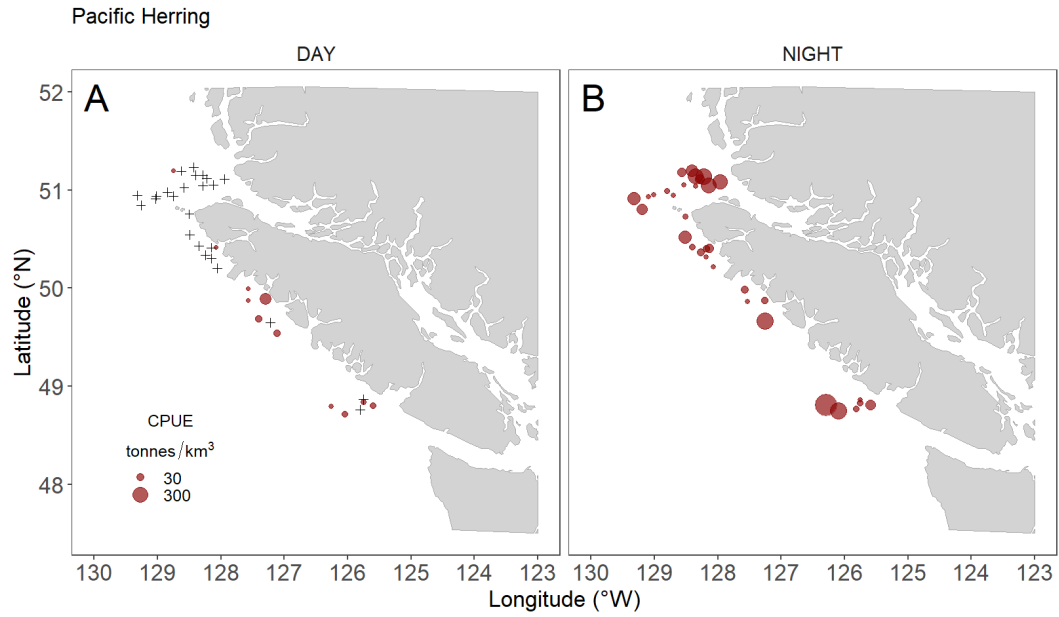


Figure 9. Pacific Herring (*Clupea pallasii*) catch per unit effort (CPUE; tonnes/km³) during (A) daytime and (B) nighttime tows. Circles are proportional to catch abundance, and zero catches are shown with a cross (+).

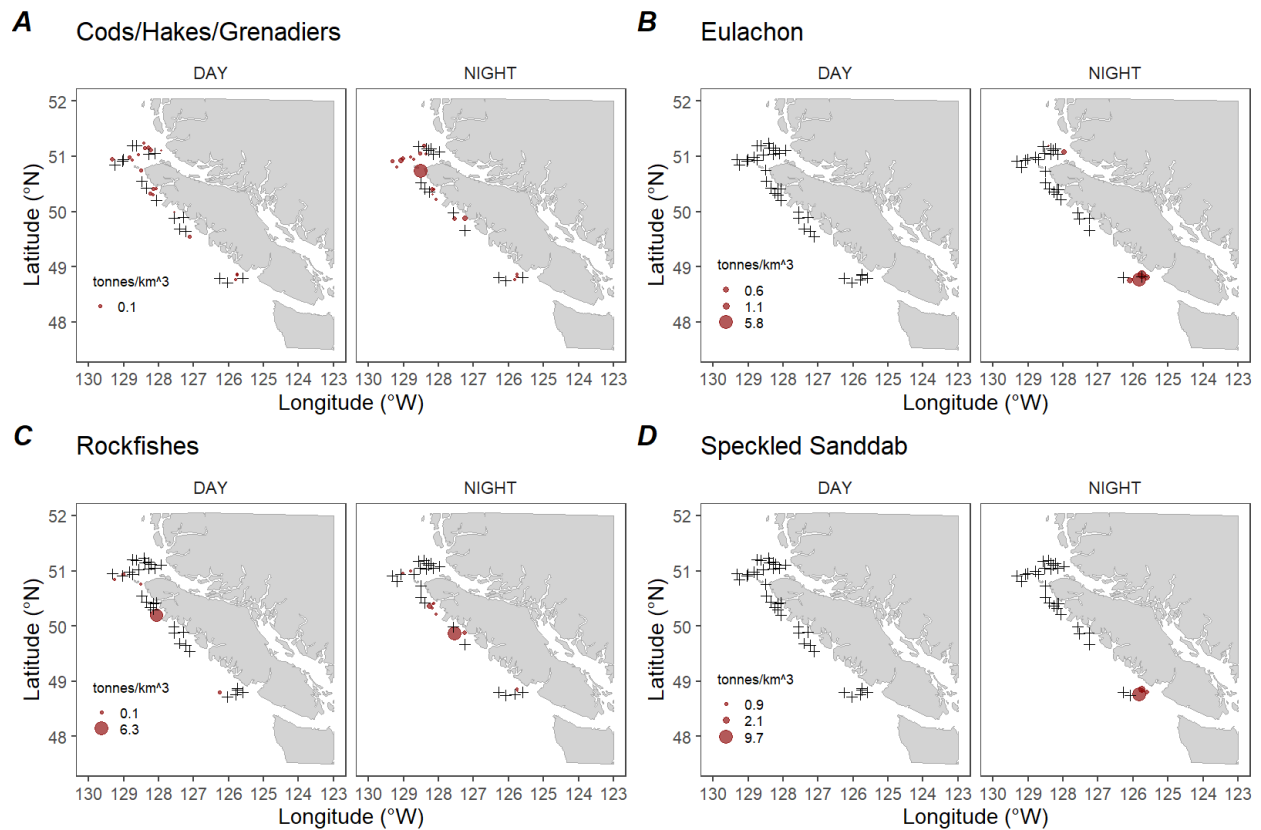


Figure 10. Catch per unit effort (CPUE; tonnes/km³) for frequently caught, non-salmonid, fish species, during daytime and nighttime tows: (A) Cods/Hakes/Grenadiers (*Gadiformes*), (B) Eulachon (*Thaleichthys pacificus*), (C) Rockfishes (*Sebastes*), (D) Speckled Sanddab (*Citharichthys stigmaeus*). Circles are proportional to CPUE, and zero catches are shown with a cross (+).

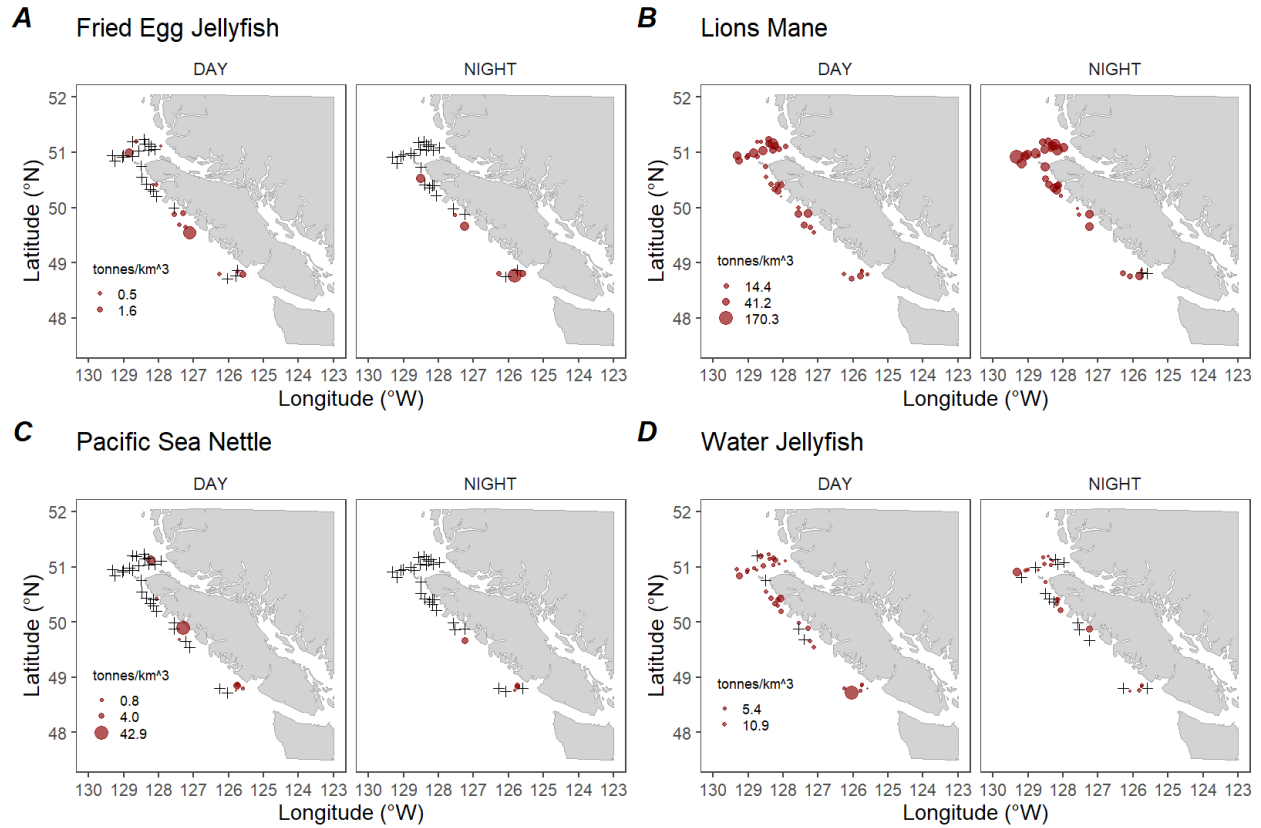


Figure 11. Catch per unit effort (CPUE; tonnes/km³) for frequently caught jellyfish species, during daytime and nighttime tows: (A) Fried Egg Jellyfish (*Phacellophora camtschatica*), (B) Lions Mane (*Cyanea capillata*), (C) Pacific Sea Nettle (*Chrysaora fuscescens*), and (D) Water Jellyfish (*Aequorea*). Circles are proportional to CPUE, and zero catches are shown with a cross (+).

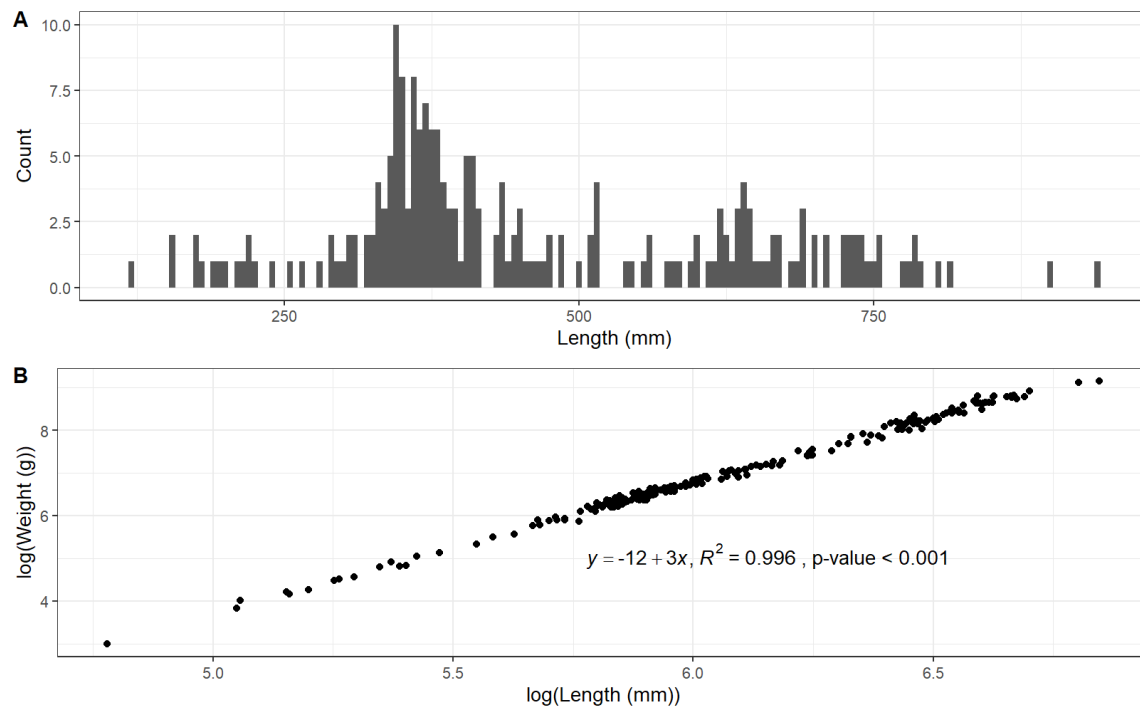


Figure 12. Chinook Salmon (*Oncorhynchus tshawytscha*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

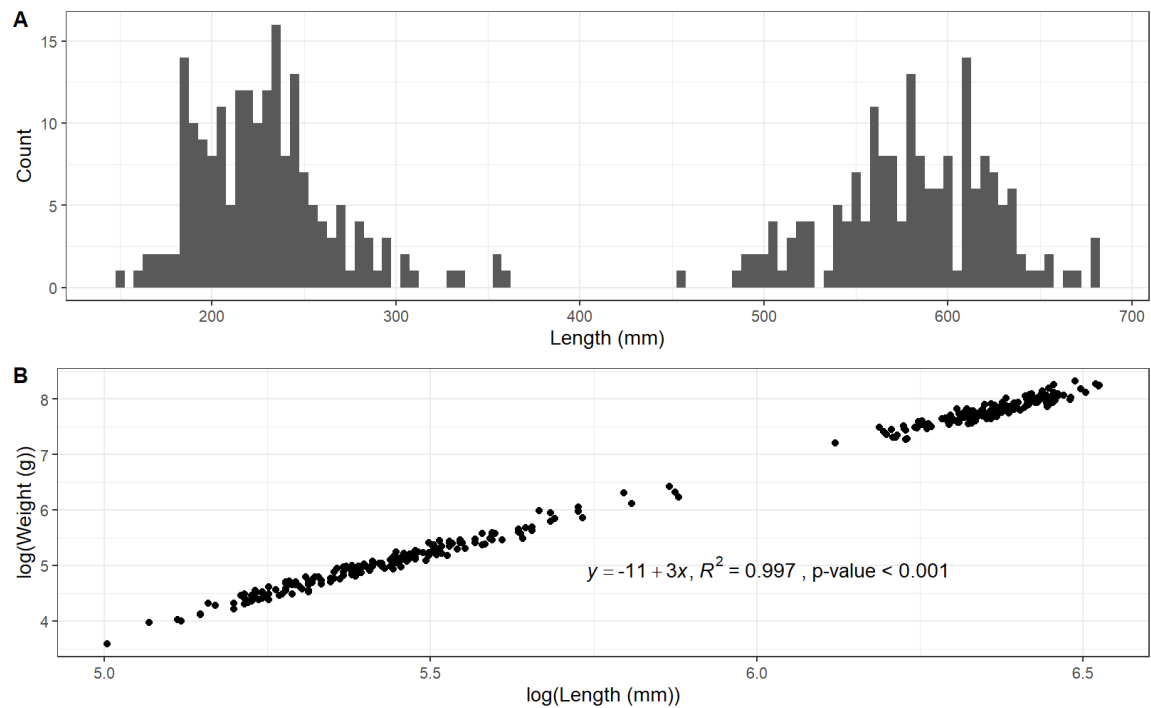


Figure 13. Coho Salmon (*Oncorhynchus kisutch*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

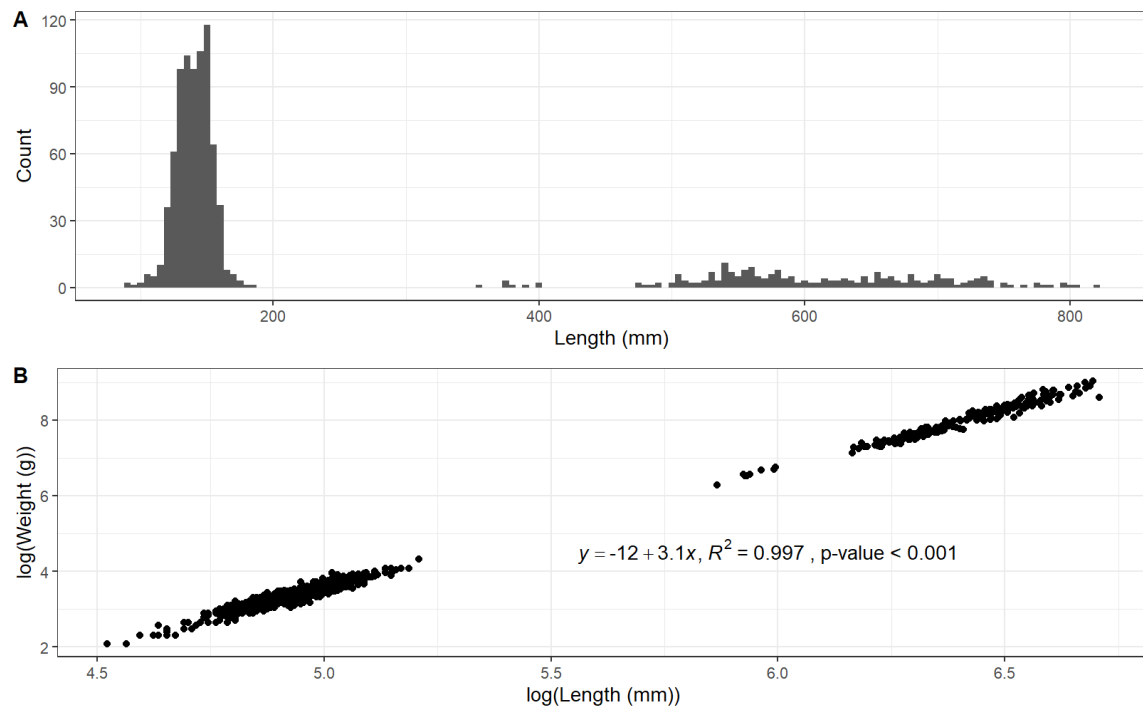


Figure 14. Chum Salmon (*Oncorhynchus keta*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

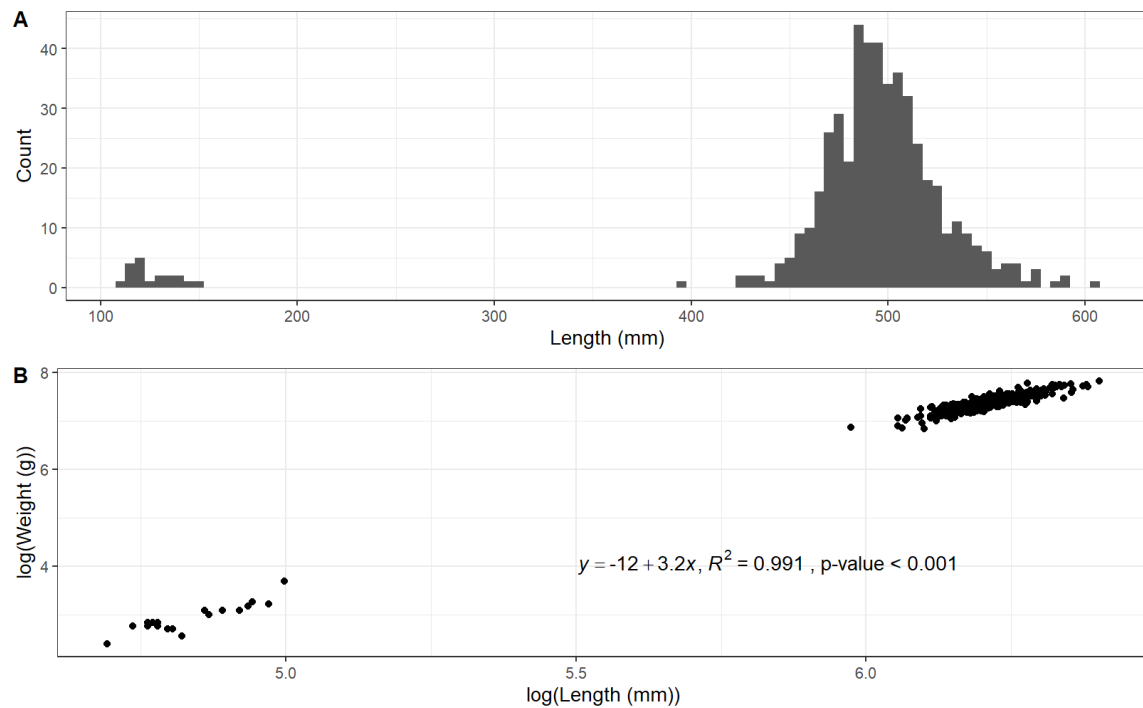


Figure 15. Pink Salmon (*Oncorhynchus gorbusha*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

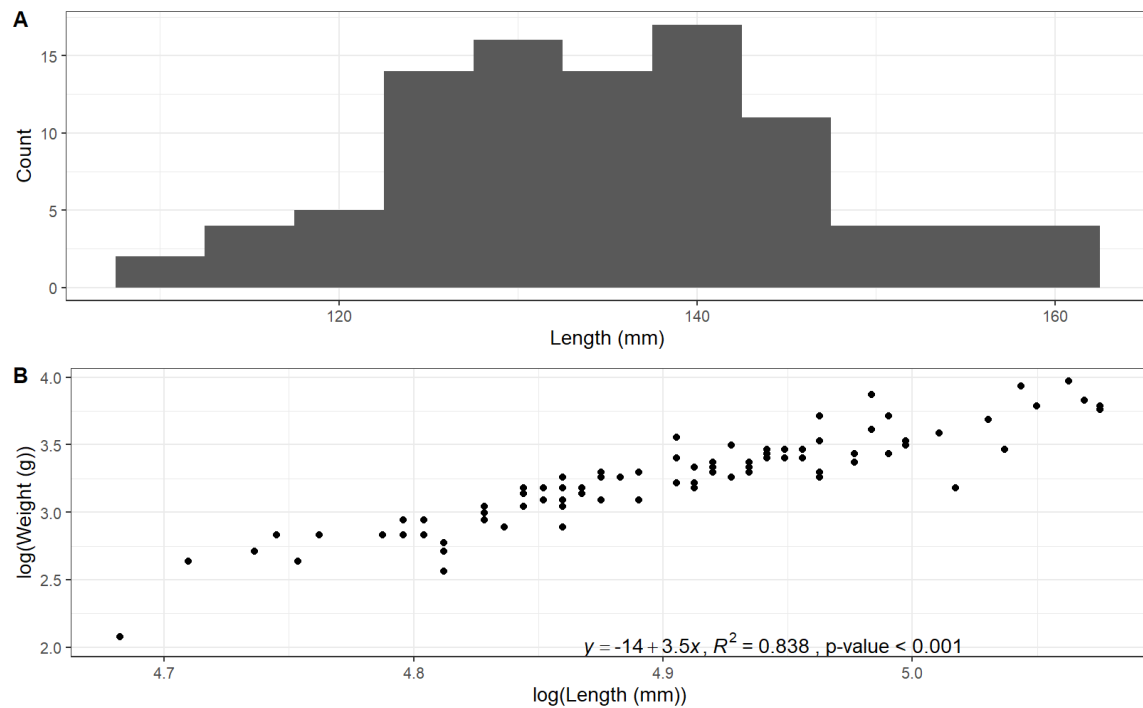


Figure 16. Sockeye Salmon (*Oncorhynchus nerka*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

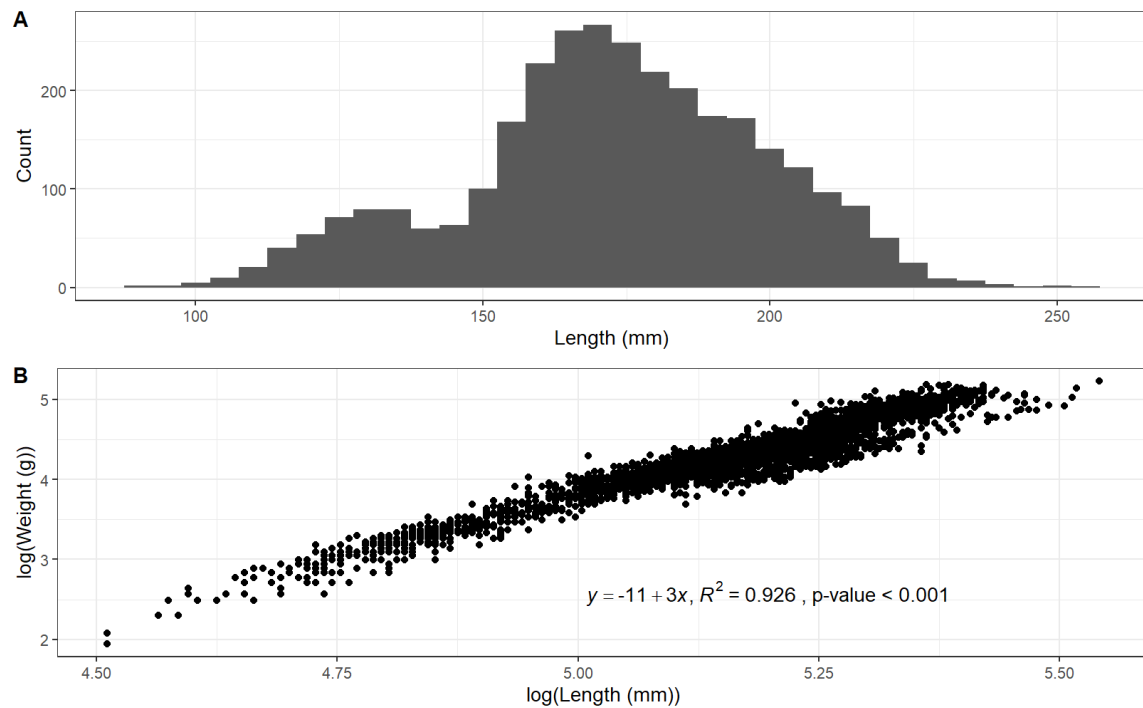


Figure 17. Pacific Herring (*Clupea pallasii*) length frequency plot as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025 (A). Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test (B).

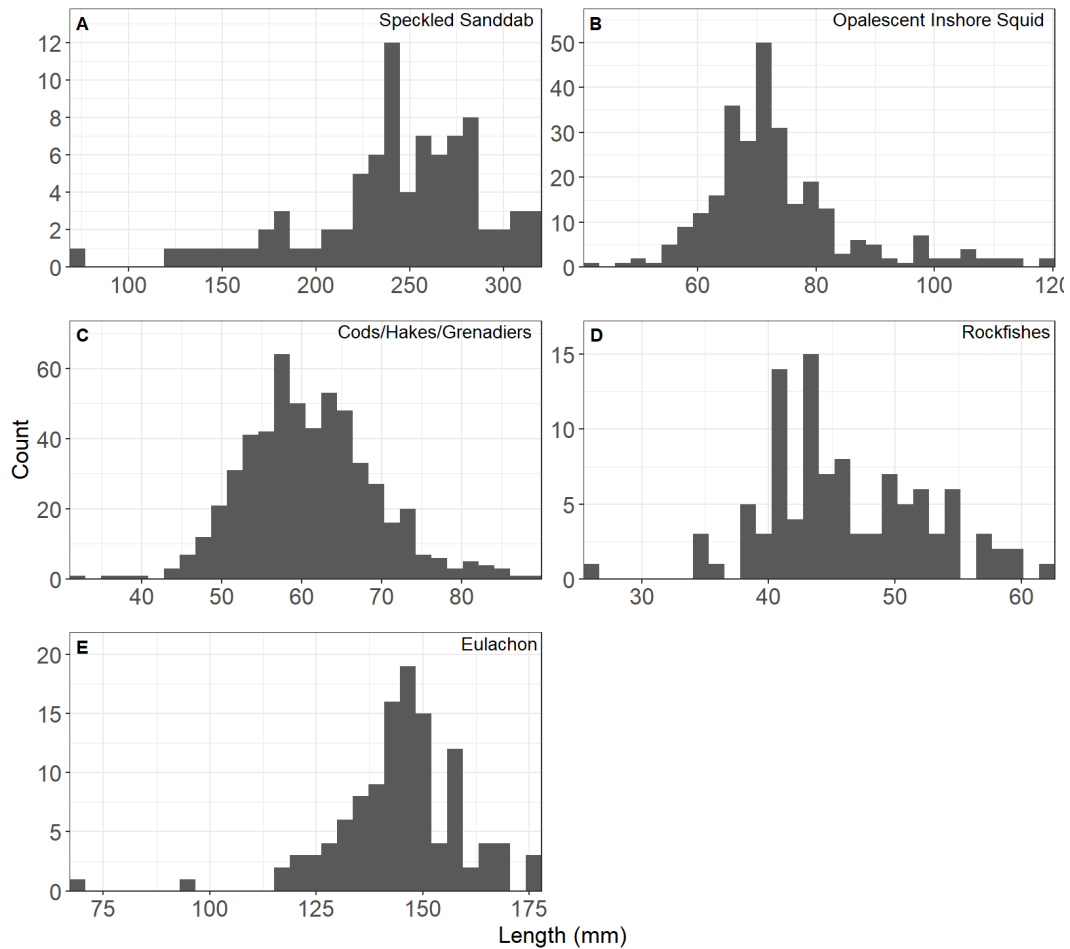


Figure 18. Length (mm) frequency plots for common species sampled ($n > 50$ samples) during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025. (A) Speckled Sanddab (*Citharichthys stigmaeus*), length = Total Length, (B) Opalescent Inshore Squid (*Doryteuthis opalescens*), length = Mantle Length, (C) Cods/Hakes/Grenadiers (*Gadiformes*), length = Fork Length, (D) Rockfishes (*Sebastes*), length = Fork Length, (E) Eulachon (*Thaleichthys pacificus*), length = Standard Length.

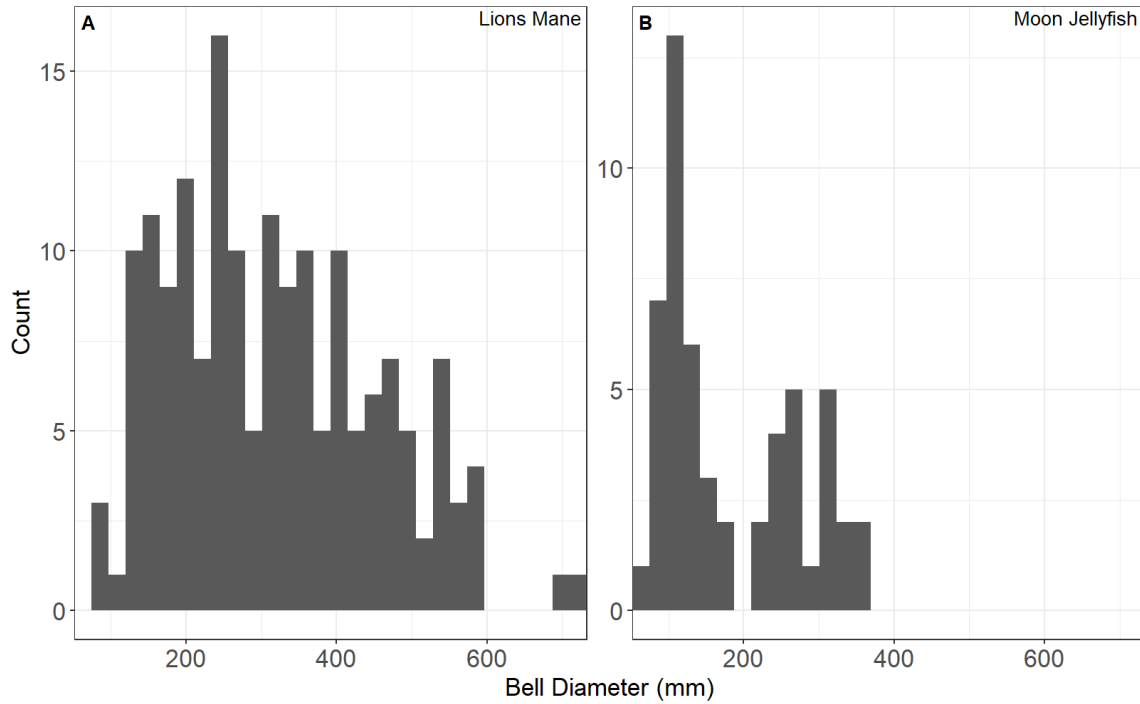


Figure 19. Bell diameter (mm) frequency plots as sampled during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025. (A) Lions Mane (*Cyanea capillata*), (B) Moon Jellyfish (*Aurelia labiata*).

APPENDIX A Net utilized during the 2025 Integrated Pelagic Ecosystem Survey

Table A.1. Net specifications for the LFS 7742 mid-water Trawl Net used during the Integrated Pelagic Ecosystem Survey aboard the CCGS *Sir John Franklin*, July 01 to July 30, 2025.

Part	Size	Material
Doors	4.5 m ² (798 kg each)	Thyboron Type 15
Door Legs	12.2 m (40 ft)	1 inch coated Spectra rope,
Bridles	45.7 m (150 ft)	3/4 inch coated Spectra rope
Mini Bridle Extensions	25.9 m (85 ft)	5/8 inch (top) and 9/16 inch (bottom) coated Spectra rope
Head Rope	75.8 m (252 ft)	5/8 inch coated Spectra Rope
Foot Rope	75.8 m (252 ft)	9/16 inch coated Spectra rope with 13 mm chain
Codend	10.2 cm (4 inch)	Knotted nylon
Codend Liner	12.7 mm (0.5 inch)	210/20 knotless liner

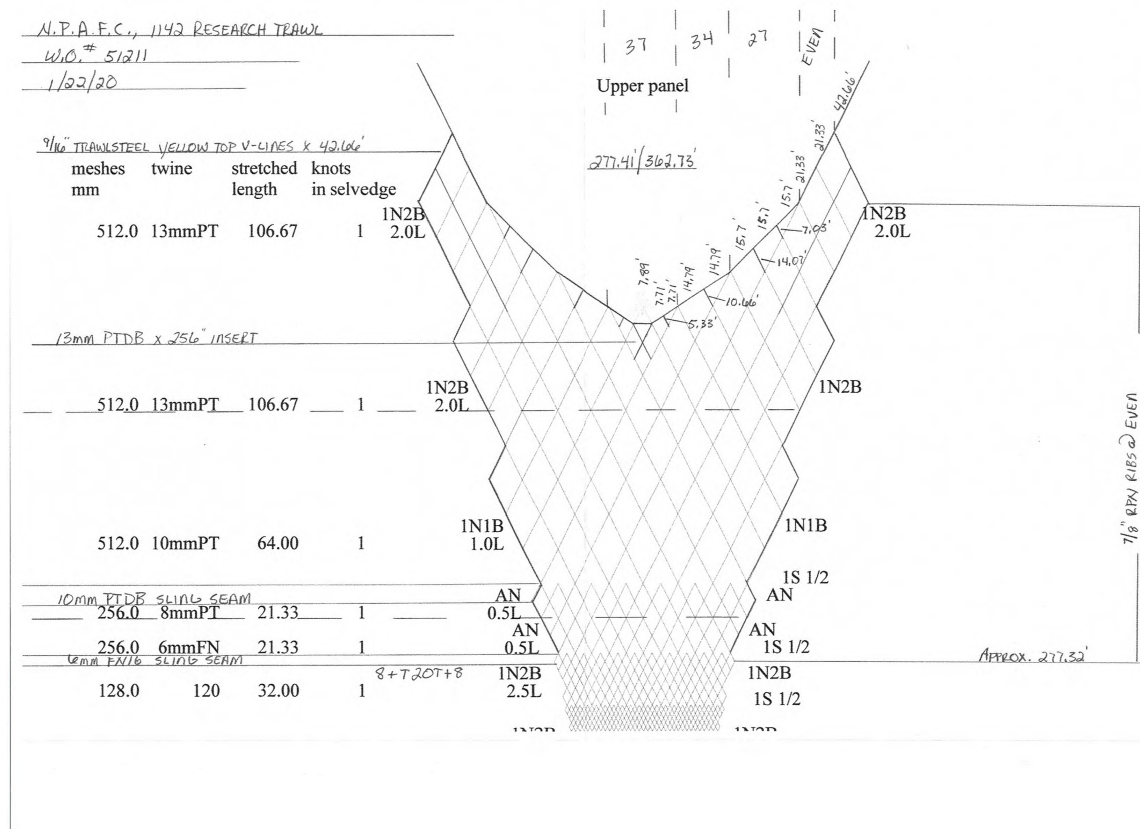


Figure A.1. Diagram of LFS 7742 mid-water Trawl Net used during the Integrated Pelagic Ecosystem Survey, July 01 to July 30, 2025, aboard the CCGS *Sir John Franklin*.

APPENDIX B The Beaufort Scale

Table B.1. The Beaufort Scale used to describe weather conditions.

Force	Description	Wind Speed (knots)	Sea State
0	Calm	<1	Sea like mirror
1	Light Air	1-3	Ripples; no foam crests
2	Light Breeze	4-6	Small wavelets
3	Gentle Breeze	7-10	Crests breaking
4	Moderate Breeze	11-16	Whitecaps
5	Fresh Breeze	17-21	Moderate waves - spray
6	Strong Breeze	22-27	Large waves
7	Moderate Gale	28-33	Sea heaps up
8	Fresh Gale	34-40	Moderately high waves
9	Strong Gale	41-47	High waves; spray
10	Whole Gale	48-55	Overhanging crests; sea white
11	Storm	56-63	Exceptionally high waves
12	Hurricane	64-118	Sea white

APPENDIX C Sardine Maturity Convention

Table C.1. Description of maturity stages for Pacific sardine maturity determination.

Code	Appearance	Maturity	Description
1	torpedo-shaped	F - immature	Clearly Immature: oocytes not visible, ovary is very small, translucent/clear, and thin but with rounded edges (torpedo shape).
2	oocytes not visible	F - intermediate	Intermediate: Individual oocytes are not visible to unaided eye (no visible yolk or hydrate oocytes in the ovaries) and ovary is not clearly immature. Includes possible maturing and regressed ovaries.
3	oocytes visible	F - active	Active: Yolked oocytes visible, any size or amount as long as you can see them by the unaided eye in ovaries. This includes the smaller opaque oocytes (around 0.4-0.5 mm) to the large yellowish oocytes (about 0.6-0.8mm). If hydrated oocytes are also present
4	hydrated oocytes	F - mature	Hydrated oocytes present, yolked oocytes may, or not, also be seen; any amount of hydrated oocytes (large and transparent) qualifies for this class from few to many or even if loose or "oozing/running" from ovary.
5	knife-shaped	M - immature	Clearly Immature: testes is very small, knife-shaped, translucent/clear, thin with a flat ventral edge
6	no milt present	M - intermediate	Intermediate: no milt evident and is not clearly immature; includes maturing or regressed testes
7	milt present	M - mature	Milt is present: either oozing from pore, in the duct, or when testes is cut with a knife
8	unknown	unknown	Unknown

APPENDIX D Shark Sampling Protocol for use on DFO Research Surveys

DFO SHARK SAMPLING PROTOCOL

When handling live sharks be careful. They will normally calm down when their eyes are covered.

FOR LIVE OR DEAD SHARKS:

1. TAKE PHOTOS (ONE PER SPECIES PER TOW)

Side views of:

- whole shark alongside measuring tape
- head & gill openings
- tail fin

Ventral views of:

- claspers of males

TO KEEP TRACK OF PHOTOS

Include a piece of paper in the photo with:

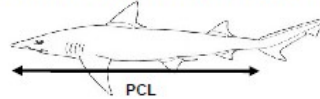
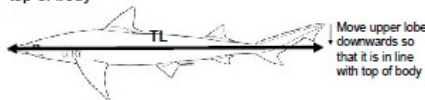
- Species
- Tow

2. RECORD LENGTHS

- Total length: tip of snout to tip of upper lobe of caudal fin with fin in a straight line with top of body

AND

- Pre-caudal length: tip of snout to caudal fin

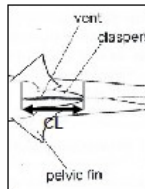


3. RECORD SEX

- Males have claspers associated with pelvic fin

IF TIME PERMITS ALSO RECORD:

- Clasper length (CL) and note if they are rigid or red



- OR • Females do not have claspers

4. COLLECT DNA TISSUE SAMPLE

- clip 1 cm of tissue from any fin tip
- place in vials with ethanol and record vial number

FOR DEAD SHARKS (Can be subsampled if > 20 sharks in tow):

5. PRESENCE AND SAMPLING OF PUPS

- number of pups

IF TIME PERMITS RECORD OR COLLECT:

- total length (cm) of pups
- muscle tissue from pups (see 7 below)—can be subsampled if there are >10 pups
- Pup numbers can be Mother's fish number + P1, P2, etc.

6. SAMPLE AND RECORD STOMACH CONTENTS

- Sort and identify to lowest taxonomic group you feel confident with
- For each prey group or item measure a) volume (L) and/or length (mm)
- For each prey group or item record digestion state as Fresh, Partial or Well

7. COLLECT MUSCLE TISSUE

- the size of an ice cube (about 1 cm³)
- freeze in a small ziploc provided and label

LABEL ALL FROZEN SAMPLES

- Species
- Fish number (P1, P2 etc if pups)
- Date collected
- Tow number

APPENDIX E Bridge Data from the 2025 Integrated Pelagic Ecosystem Survey

Table E.1. Bridge log information for trawl tows from the Integrated Ecosystem Pelagic Survey aboard the CCGS *Sir John Franklin*, July 1 - July 16, 2025. Beaufort Scale code for sea state definitions are provided in Table B.1.

Tow Number	1	2	3	4	5	6	7	8
Event Number	3	6	7	8	9	12	13	16
Stratum	505	507	507	505	504	504	504	504
Block Number	10642	10269	10269	10642	10647	10648	10901	10901
Date (Pacific)	2025-07-02	2025-07-02	2025-07-02	2025-07-03	2025-07-03	2025-07-03	2025-07-03	2025-07-03
Start Time (Pacific)	16:59	19:12	22:58	01:02	16:16	17:47	19:03	22:43
Day or Night	Day	Day	Night	Night	Day	Day	Day	Night
Duration (min)	20	20	20	7	20	21	20	20
Start Latitude	50° 56' 44" N	50° 50' 31" N	50° 48' 19" N	50° 54' 44" N	50° 54' 45" N	50° 56' 27" N	50° 58' 48" N	50° 59' 21" N
Start Longitude	129° 19' 07" W	129° 15' 44" W	129° 11' 28" W	129° 19' 13" W	129° 01' 47" W	129° 00' 55" W	128° 50' 38" W	128° 48' 03" W
End Latitude	50° 56' 02" N	50° 49' 35" N	50° 49' 02" N	50° 55' 04" N	50° 56' 12" N	50° 55' 27" N	51° 00' 02" N	51° 00' 02" N
End Longitude	129° 20' 43" W	129° 13' 59" W	129° 13' 00" W	129° 19' 58" W	129° 02' 36" W	128° 58' 53" W	128° 49' 57" W	128° 50' 27" W
Direction of Tow (deg)	236	130	307	305	340	128	019	294
Vessel Speed (km/h)	6.8	8.0	6.6	9.4	8.5	9.0	7.2	9.0
Distance Towed (km)	2.27	2.67	2.23	1.08	2.85	3.02	2.44	3.07
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	51	44	45	43	44	57	43	41
Net Opening Height (m)	13	20	20	12	12	18	20	22
Warp Length (m)	240	200	200	240	220	200	200	200
Target Headrope Depth (m)	15	0	0	15	15	0	0	0
Median Headrope Depth (m)	20	8	6	21	17	6	6	8
Median Temp at Headrope °C)	9.9	11.1	11.7	11.6	10.1	13.4	11.6	12.6
Start Bottom Depth (m)	161	124	113	150	66	73	72	69
End Bottom Depth (m)	167	112	105	157	76	65	68	67
Beaufort Scale	3	2	2	2	2	2	2	2
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	9	10	11	12	13	14	15	16
Event Number	17	18	19	22	23	28	29	30
Stratum	504	504	504	504	504	504	504	505
Block Number	10648	10647	10653	11031	11279	11031	10653	11658
Date (Pacific)	2025-07-03	2025-07-04	2025-07-04	2025-07-04	2025-07-04	2025-07-04	2025-07-04	2025-07-05
Start Time (Pacific)	00:21	01:38	16:14	17:55	19:05	22:43	00:05	16:14
Day or Night	Night	Night	Day	Day	Day	Night	Night	Day
Duration (min)	20	19	20	20	4	20	20	20
Start Latitude	50° 57' 01" N	50° 55' 58" N	50° 56' 08" N	51° 01' 23" N	51° 05' 50" N	51° 03' 04" N	50° 56' 39" N	51° 14' 03" N
Start Longitude	129° 00' 19" W	129° 05' 27" W	128° 44' 58" W	128° 34' 50" W	128° 37' 40" W	128° 32' 06" W	128° 41' 51" W	128° 25' 41" W
End Latitude	50° 55' 38" N	50° 56' 27" N	50° 56' 36" N	51° 02' 13" N	51° 06' 02" N	51° 01' 55" N	50° 55' 39" N	51° 12' 37" N
End Longitude	129° 00' 36" W	129° 03' 41" W	128° 42' 46" W	128° 33' 11" W	128° 38' 01" W	128° 33' 39" W	128° 43' 49" W	128° 25' 48" W
Direction of Tow (deg)	188	067	072	051	313	220	231	182
Vessel Speed (km/h)	8.0	6.9	8.1	7.4	7.9	8.4	8.8	8.0
Distance Towed (km)	2.57	2.25	2.72	2.48	0.56	2.81	2.94	2.68
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	41	44	49	44	51	45	51	53
Net Opening Height (m)	21	11	12	20	13	21	12	13
Warp Length (m)	200	240	240	200	240	200	240	240
Target Headrope Depth (m)	0	15	15	0	15	0	15	15
Median Headrope Depth (m)	6	16	17	6	16	6	17	18
Median Temp at Headrope °C)	12.1	9.9	9.3	13.1	12.5	13.6	9.0	12.0
Start Bottom Depth (m)	74	87	86	88	107	110	86	171
End Bottom Depth (m)	64	83	93	99	107	96	91	185
Beaufort Scale	2	3	3	3	2	3	4	4
Usable	Y	Y	Y	Y	N	Y	Y	Y

Tow Number	17	18	19	20	21	22	23	24
Event Number	33	34	37	38	39	42	45	46
Stratum	505	505	505	505	505	505	505	505
Block Number	11652	11409	11409	11658	11530	11411	11286	11286
Date (Pacific)	2025-07-05	2025-07-05	2025-07-05	2025-07-06	2025-07-06	2025-07-06	2025-07-06	2025-07-06
Start Time (Pacific)	18:47	21:39	23:07	00:44	16:27	18:41	20:20	22:36
Day or Night	Day	Day	Night	Night	Day	Day	Day	Night
Duration (min)	20	20	20	20	20	20	20	20
Start Latitude	51° 11' 53" N	51° 08' 59" N	51° 08' 14" N	51° 11' 44" N	51° 11' 41" N	51° 09' 17" N	51° 06' 55" N	51° 06' 30" N
Start Longitude	128° 45' 19" W	128° 23' 59" W	128° 20' 41" W	128° 24' 37" W	128° 37' 49" W	128° 16' 58" W	128° 13' 19" W	128° 17' 10" W
End Latitude	51° 13' 09" N	51° 08' 43" N	51° 08' 28" N	51° 12' 57" N	51° 10' 51" N	51° 08' 59" N	51° 06' 53" N	51° 06' 24" N
End Longitude	128° 45' 46" W	128° 21' 38" W	128° 22' 43" W	128° 25' 05" W	128° 36' 01" W	128° 14' 49" W	128° 15' 22" W	128° 14' 52" W
Direction of Tow (deg)	348	100	280	346	126	102	268	093
Vessel Speed (km/h)	7.3	8.3	7.1	6.9	7.7	7.6	7.1	8.1
Distance Towed (km)	2.42	2.79	2.41	2.31	2.60	2.57	2.39	2.69
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	48	52	49	47	44	49	44	44
Net Opening Height (m)	21	12	13	12	20	13	22	19
Warp Length (m)	200	240	240	240	200	240	200	200
Target Headrope Depth (m)	0	15	15	15	0	15	0	0
Median Headrope Depth (m)	6		16	16	8	15	6	5
Median Temp at Headrope °C)	13.7		12.5	11.8	14.0	12.7	14.3	14.2
Start Bottom Depth (m)	145	194	189	189	180	164	159	179
End Bottom Depth (m)	178	190	192	177	177	149	170	170
Beaufort Scale	5	4	3	2	2	1	2	2
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	25	26	27	28	29	30	31	32
Event Number	49	50	51	54	57	58	61	62
Stratum	505	505	505	505	505	505	505	505
Block Number	11411	11530	11291	11038	11035	11035	11038	11291
Date (Pacific)	2025-07-07	2025-07-07	2025-07-07	2025-07-07	2025-07-07	2025-07-07	2025-07-08	2025-07-08
Start Time (Pacific)	00:23	02:02	16:14	17:53	19:28	22:32	00:25	01:56
Day or Night	Night	Night	Day	Day	Day	Night	Night	Night
Duration (min)	11	20	20	20	20	20	18	16
Start Latitude	51° 08' 18" N	51° 10' 49" N	51° 06' 41" N	51° 03' 15" N	51° 02' 31" N	51° 02' 10" N	51° 02' 41" N	51° 05' 00" N
Start Longitude	128° 13' 28" W	128° 33' 59" W	127° 56' 24" W	128° 07' 00" W	128° 17' 15" W	128° 20' 42" W	128° 08' 46" W	127° 58' 09" W
End Latitude	51° 08' 20" N	51° 10' 52" N	51° 06' 34" N	51° 02' 30" N	51° 02' 36" N	51° 02' 10" N	51° 01' 25" N	51° 05' 58" N
End Longitude	128° 14' 42" W	128° 36' 12" W	127° 58' 44" W	128° 09' 05" W	128° 19' 24" W	128° 18' 22" W	128° 08' 52" W	127° 58' 04" W
Direction of Tow (deg)	272	272	265	240	273	089	182	4
Vessel Speed (km/h)	7.6	7.7	8.1	8.3	7.5	8.2	8.0	6.9
Distance Towed (km)	1.43	2.58	2.74	2.79	2.52	2.73	2.34	1.79
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	50	45	52	49	51	50	44	47
Net Opening Height (m)	13	22	21	21	13	12	20	20
Warp Length (m)	240	200	200	200	240	240	200	200
Target Headrope Depth (m)	15	0	0	0	15	15	0	0
Median Headrope Depth (m)	16	6	6	7	17	16	5	5
Median Temp at Headrope °C)	12.2	14.0	10.3	11.5	12.2	12.3	11.1	10.4
Start Bottom Depth (m)	153	186	137	151	151	124	167	159
End Bottom Depth (m)	162	176	116	170	146	135	154	124
Beaufort Scale	2	2	3	3	4	5	4	4
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	33	34	35	36	37	38	39	40
Event Number	63	64	67	70	71	74	75	78
Stratum	506	507	507	506	506	506	507	507
Block Number	10032	9282	9282	10032	8914	8913	8909	8909
Date (Pacific)	2025-07-09	2025-07-09	2025-07-09	2025-07-10	2025-07-10	2025-07-10	2025-07-10	2025-07-10
Start Time (Pacific)	19:24	21:16	23:16	01:56	16:19	17:56	19:32	22:53
Day or Night	Day	Day	Night	Night	Day	Day	Day	Night
Duration (min)	20	20	20	21	20	20	20	20
Start Latitude	50° 45' 16" N	50° 32' 43" N	50° 31' 05" N	50° 43' 39" N	50° 24' 55" N	50° 24' 46" N	50° 25' 50" N	50° 24' 59" N
Start Longitude	128° 29' 52" W	128° 29' 35" W	128° 30' 34" W	128° 30' 48" W	128° 04' 36" W	128° 08' 53" W	128° 21' 03" W	128° 24' 04" W
End Latitude	50° 43' 59" N	50° 31' 00" N	50° 32' 28" N	50° 44' 48" N	50° 25' 35" N	50° 25' 32" N	50° 25' 00" N	50° 25' 49" N
End Longitude	128° 30' 15" W	128° 28' 58" W	128° 30' 25" W	128° 30' 32" W	128° 06' 46" W	128° 10' 52" W	128° 22' 51" W	128° 22' 45" W
Direction of Tow (deg)	190	167	004	008	295	301	234	045
Vessel Speed (km/h)	7.1	9.7	7.7	6.2	8.5	8.2	7.9	6.6
Distance Towed (km)	2.40	3.26	2.58	2.13	2.85	2.74	2.65	2.18
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	54	49	46	49	42	56	50	54
Net Opening Height (m)	12	14	13	11	16	12	12	12
Warp Length (m)	290	200	210	280	220	280	280	280
Target Headrope Depth (m)	15	0	0	15	0	15	15	15
Median Headrope Depth (m)	14	5	5	15	6	16	17	15
Median Temp at Headrope °C)	9.3	12.5	12.8	10.3	13.5	10.0	10.4	11.4
Start Bottom Depth (m)	73	186	192	91	68	91	187	204
End Bottom Depth (m)	89	190	189	81	73	107	196	193
Beaufort Scale	4	4	4	4	2	2	2	2
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	41	42	43	44	45	46	47	48
Event Number	79	82	84	87	90	91	94	95
Stratum	506	506	506	507	507	507	507	506
Block Number	8913	8914	8165	8538	8661	8661	8538	8165
Date (Pacific)	2025-07-10	2025-07-11	2025-07-11	2025-07-11	2025-07-11	2025-07-11	2025-07-12	2025-07-12
Start Time (Pacific)	00:40	02:19	17:14	19:34	21:21	22:37	00:43	02:28
Day or Night	Night	Night	Day	Day	Day	Night	Night	Night
Duration (min)	20	20	20	21	11	18	21	17
Start Latitude	50° 24' 19" N	50° 24' 18" N	50° 12' 07" N	50° 18' 06" N	50° 20' 06" N	50° 21' 42" N	50° 19' 04" N	50° 12' 56" N
Start Longitude	128° 10' 54" W	128° 07' 42" W	128° 03' 41" W	128° 09' 11" W	128° 14' 50" W	128° 15' 44" W	128° 10' 49" W	128° 04' 04" W
End Latitude	50° 24' 57" N	50° 25' 08" N	50° 11' 55" N	50° 19' 12" N	50° 20' 53" N	50° 20' 25" N	50° 19' 46" N	50° 13' 09" N
End Longitude	128° 08' 53" W	128° 05' 51" W	128° 01' 06" W	128° 10' 23" W	128° 15' 19" W	128° 16' 18" W	128° 08' 32" W	128° 01' 57" W
Direction of Tow (deg)	063	054	096	324	337	195	064	080
Vessel Speed (km/h)	7.9	8.0	9.2	7.3	8.2	8.2	8.9	9.1
Distance Towed (km)	2.65	2.67	3.10	2.48	1.55	2.46	3.00	2.56
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	50	46	47	55	49	44	50	47
Net Opening Height (m)	11	16	15	12	16	14	11	14
Warp Length (m)	330	215	214	325	230	220	325	225
Target Headrope Depth (m)	15	0	0	15	0	0	15	0
Median Headrope Depth (m)	18	6	5	17	5	6	18	5
Median Temp at Headrope °C)	10.1	14.0	14.9	10.9	13.3	13.8	12.1	14.7
Start Bottom Depth (m)	123	77	96	159	189	178	169	83
End Bottom Depth (m)	91	76	102	164	182	194	139	87
Beaufort Scale	2	2	3	3	2	2	3	4
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	49	50	51	52	53	54	55	56
Event Number	96	99	100	103	104	107	110	113
Stratum	508	508	508	508	508	508	509	509
Block Number	7424	7049	7054	7054	7049	7424	5932	6305
Date (Pacific)	2025-07-12	2025-07-12	2025-07-12	2025-07-12	2025-07-13	2025-07-13	2025-07-13	2025-07-13
Start Time (Pacific)	16:45	18:45	20:52	22:38	00:35	02:36	16:35	18:41
Day or Night	Day	Day	Day	Night	Night	Night	Day	Day
Duration (min)	21	20	20	20	21	20	20	20
Start Latitude	49° 59' 40" N	49° 52' 36" N	49° 53' 28" N	49° 52' 29" N	49° 51' 45" N	49° 58' 51" N	49° 32' 24" N	49° 38' 59" N
Start Longitude	127° 34' 12" W	127° 34' 00" W	127° 17' 31" W	127° 15' 43" W	127° 31' 52" W	127° 34' 25" W	127° 06' 52" W	127° 13' 22" W
End Latitude	49° 58' 00" N	49° 51' 29" N	49° 52' 35" N	49° 53' 33" N	49° 52' 37" N	49° 58' 36" N	49° 33' 32" N	49° 40' 12" N
End Longitude	127° 33' 41" W	127° 31' 59" W	127° 15' 50" W	127° 17' 36" W	127° 33' 21" W	127° 32' 21" W	127° 08' 33" W	127° 14' 47" W
Direction of Tow (deg)	168	129	128	310	311	100	315	322
Vessel Speed (km/h)	9.3	9.5	7.7	8.9	7.1	7.5	8.6	8.4
Distance Towed (km)	3.16	3.17	2.60	2.99	2.38	2.52	2.92	2.84
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	46	49	44	44	58	47	45	54
Net Opening Height (m)	15	12	15	17	13	15	18	13
Warp Length (m)	212	280	210	230	275	220	212	260
Target Headrope Depth (m)	0	15	0	0	15	0	0	15
Median Headrope Depth (m)	5	17	5	8	20	5	6	20
Median Temp at Headrope °C)	12.2	10.0	12.8	12.0	10.0	12.1	12.6	9.3
Start Bottom Depth (m)	64	80	57	54	83	71	136	132
End Bottom Depth (m)	65	78	54	58	90	57	138	131
Beaufort Scale	5	5	3	3	3	3	3	7
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	57	58	59	60	61	62	63	64
Event Number	116	117	120	121	124	125	126	128
Stratum	509	509	510	510	511	511	510	510
Block Number	6427	6305	3708	3583	3461	3461	3583	3708
Date (Pacific)	2025-07-13	2025-07-13	2025-07-14	2025-07-14	2025-07-14	2025-07-14	2025-07-15	2025-07-15
Start Time (Pacific)	21:16	22:41	16:40	18:13	20:58	22:36	00:48	03:08
Day or Night	Day	Night	Day	Day	Day	Night	Night	Night
Duration (min)	21	20	20	18	21	19	20	20
Start Latitude	49° 41' 13" N	49° 39' 42" N	48° 52' 02" N	48° 50' 31" N	48° 47' 53" N	48° 48' 19" N	48° 49' 27" N	48° 51' 25" N
Start Longitude	127° 24' 27" W	127° 15' 14" W	125° 44' 56" W	125° 45' 14" W	125° 35' 47" W	125° 35' 20" W	125° 45' 03" W	125° 45' 03" W
End Latitude	49° 40' 33" N	49° 38' 48" N	48° 51' 40" N	48° 50' 12" N	48° 47' 14" N	48° 47' 58" N	48° 49' 04" N	48° 51' 13" N
End Longitude	127° 22' 01" W	127° 13' 34" W	125° 42' 40" W	125° 43' 07" W	125° 33' 43" W	125° 33' 12" W	125° 42' 48" W	125° 43' 04" W
Direction of Tow (deg)	112	129	101	101	113	101	102	096
Vessel Speed (km/h)	9.0	7.9	8.6	9.1	8.4	8.3	8.5	7.3
Distance Towed (km)	3.19	2.63	2.85	2.66	2.80	2.69	2.85	2.44
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	52	50	55	43	48	46	44	52
Net Opening Height (m)	16	11	12	17	17	16	15	12
Warp Length (m)	210	300	275	213	218	205	210	276
Target Headrope Depth (m)	0	15	15	0	0	0	0	15
Median Headrope Depth (m)	6	15	17	10	5	5	5	15
Median Temp at Headrope °C)	12.2	10.9	8.7	10.1	10.7	10.5	10.8	9.8
Start Bottom Depth (m)	147	134	60	58	67	77	54	56
End Bottom Depth (m)	156	133	51	56	134	117	58	52
Beaufort Scale	6	5	3	3	1	2	2	3
Usable	Y	Y	Y	Y	Y	Y	Y	Y

Tow Number	65	66	67	68	69	70
Event Number	131	132	135	138	139	140
Stratum	510	511	511	511	511	510
Block Number	3332	3202	3448	3448	3202	3332
Date (Pacific)	2025-07-15	2025-07-15	2025-07-15	2025-07-15	2025-07-16	2025-07-16
Start Time (Pacific)	16:29	18:48	21:22	23:10	00:38	02:24
Day or Night	Day	Day	Day	Night	Night	Night
Duration (min)	20	20	21	21	21	21
Start Latitude	48° 45' 36" N	48° 42' 54" N	48° 47' 37" N	48° 48' 15" N	48° 44' 37" N	48° 45' 53" N
Start Longitude	125° 48' 18" W	126° 02' 43" W	126° 15' 24" W	126° 17' 09" W	126° 05' 17" W	125° 48' 42" W
End Latitude	48° 45' 12" N	48° 43' 57" N	48° 48' 40" N	48° 47' 24" N	48° 43' 50" N	48° 45' 12" N
End Longitude	125° 46' 05" W	126° 03' 27" W	126° 16' 05" W	126° 15' 00" W	126° 03' 20" W	125° 46' 58" W
Direction of Tow (deg)	103	333	335	118	119	119
Vessel Speed (km/h)	8.4	6.5	6.3	9.2	8.1	7.4
Distance Towed (km)	2.82	2.15	2.10	3.07	2.80	2.47
Net	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742	LFS 7742
Net Opening Width (m)	50	47	55	51	49	53
Net Opening Height (m)	11	19	13	11	16	12
Warp Length (m)	285	200	250	275	217	280
Target Headrope Depth (m)	15	0	15	15	0	15
Median Headrope Depth (m)	15	6	19	16	5	17
Median Temp at Headrope °C)	11.4	12.0	11.9	12.7	12.0	10.8
Start Bottom Depth (m)	78	110	161	166	114	73
End Bottom Depth (m)	101	109	158	159	108	90
Beaufort Scale	4	5	5	5	3	3
Usable	Y	Y	Y	Y	Y	Y

APPENDIX F CTD CAST AND ZOOPLANKTON TOW BRIDGE LOG DATA

Table F.1. CTD casts and vertical bongo tow times and depths during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf from July 1 - July 16, 2025 on the CCGS *Sir John Franklin*. CTD without Stratum indicates the deep cast performed outside of the survey design strata for instrument calibration purposes.

Date (Pacific)	Stratum	Block	Latitude	Longitude	CTD				BONGO			
					Event #	Start Time (Pacific)	Bottom Depth (m)	Gear Depth (m)	Event #	Start Time (Pacific)	Bottom Depth (m)	Gear Depth (m)
2025-07-02	505	10642	50° 56' 38" N	129° 18' 26" W	1	16:09	153	145	2	16:27	154	145
2025-07-02	507	10269	50° 51' 05" N	129° 16' 54" W	4	18:41	126	116	5	18:53	127	116
2025-07-03	504	10647	50° 57' 08" N	129° 02' 22" W	10	17:20	84	74	11	17:31	84	74
2025-07-03	504	10901	51° 00' 35" N	128° 49' 40" W	14	19:46	64	54	15	19:55	64	54
2025-07-04	504	10653	50° 56' 57" N	128° 42' 04" W	20	16:57	89	78	21	17:07	88	78
2025-07-04	504	11279	51° 06' 44" N	128° 39' 00" W	24	19:40	108	98	25	19:52	109	99
2025-07-04	504	11031	51° 04' 00" N	128° 30' 57" W	26	21:39	121	111	27	21:51	121	111
2025-07-05	505	11658	51° 12' 31" N	128° 25' 48" W	31	17:04	185	176	32	17:18	186	176
2025-07-05	505	11409	51° 08' 42" N	128° 20' 30" W	35	22:21	188	178	36	22:38	189	178
2025-07-06	505	11530	51° 10' 25" N	128° 35' 10" W	40	17:10	174	164	41	17:24	174	165
2025-07-06	505	11286	51° 07' 01" N	128° 14' 25" W	43	19:38	163	154	44	19:50	163	153
2025-07-06	505	11411	51° 07' 56" N	128° 14' 15" W	47	23:35	162	152	48	23:48	163	152
2025-07-07	505	11291	51° 06' 27" N	127° 59' 47" W	52	17:00	109	99	53	17:09	109	99
2025-07-07	505	11035	51° 02' 26" N	128° 15' 33" W	55	18:56	152	142	56	19:10	152	142
2025-07-07	505	11038	51° 04' 14" N	128° 08' 43" W	59	23:46	161	151	60	23:59	161	151
2025-07-09	507	9282	50° 31' 08" N	128° 29' 28" W	65	22:15	191	181	66	22:32	191	181
2025-07-10	506	10032	50° 43' 50" N	128° 29' 55" W	68	01:07	92	81	69	01:19	92	82
2025-07-10	506	8914	50° 25' 44" N	128° 07' 17" W	72	17:08	71	61	73	17:22	71	64
2025-07-10	507	8909	50° 24' 52" N	128° 23' 13" W	76	20:37	199	189	77	20:55	200	189
2025-07-11	506	8913	50° 25' 21" N	128° 07' 52" W	80	01:32	76	66	81	01:44	78	66
2025-07-11		8163	50° 12' 38" N	128° 09' 30" W	83	15:51	900	750				
2025-07-11	506	8165	50° 12' 18" N	128° 01' 14" W	85	18:17	73	63	86	18:28	76	63
2025-07-11	507	8661	50° 18' 56" N	128° 14' 27" W	88	20:40	192	181	89	20:57	188	180
2025-07-11	507	8538	50° 19' 15" N	128° 10' 56" W	92	23:43	169	159	93	00:00	167	159
2025-07-12	508	7424	49° 56' 20" N	127° 32' 32" W	97	17:48	65	54	98	18:00	66	54

Date (Pacific)	Stratum	Block	Latitude	Longitude	CTD				BONGO			
					Event #	Start Time (Pacific)	Bottom Depth (m)	Gear Depth (m)	Event #	Start Time (Pacific)	Bottom Depth (m)	Gear Depth (m)
2025-07-12	508	7054	49° 52' 09" N	127° 15' 07" W	102	21:56	61	51	101	21:42	61	53
2025-07-13	508	7049	49° 53' 08" N	127° 33' 37" W	105	01:24	80	70	106	01:35	81	70
2025-07-13	509	5932	49° 32' 14" N	127° 08' 11" W	109	15:51	142	131	108	15:38	142	131
2025-07-13	509	6305	49° 38' 08" N	127° 12' 45" W	111	17:58	134	125	112	18:12	134	125
2025-07-13	509	6427	49° 41' 16" N	127° 23' 15" W	115	20:30	135	119	114	20:09	126	125
2025-07-14	510	3708	48° 52' 54" N	125° 44' 39" W	118	15:45	79	67	119	15:59	73	66
2025-07-14	511	3461	48° 47' 57" N	125° 33' 19" W	123	20:11	115	105	122	19:59	116	105
2025-07-15	510	3583	48° 48' 56" N	125° 42' 20" W	127	01:37	60	50				
2025-07-15	510	3332	48° 45' 34" N	125° 47' 57" W	130	15:50	79	71	129	15:37	79	71
2025-07-15	511	3202	48° 44' 04" N	126° 02' 44" W	133	19:39	104	94	134	19:53	104	94
2025-07-15	511	3448	48° 48' 41" N	126° 14' 58" W	137	22:23	153	143	136	22:12	153	143

APPENDIX G CATCH DATA

Table G.1. Weight (kg) and counts per station of caught species (or taxa) during the Integrated Pelagic Ecosystem Survey on the Vancouver Island Continental Shelf from July 1 - July 16, 2025 on the CCGS *Sir John Franklin*. Jellyfish weights include all identified pieces but only counted if bells were intact. Euphausiacea were not counted due to small size. Counts with blank weights indicate catches too big or small to be weighed accurately.

Common Name	Scientific Name	EVENT NUMBER		3		6		7		8		9	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>												
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>												
Black Rockfish	<i>Sebastes melanops</i>												
Blue Shark	<i>Prionace glauca</i>												
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>												
California Headlightfish	<i>Diaphus theta</i>												
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>			4.35	3								
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>	0.05	1			0.17	1						
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>			28.44	7					2.93	1		
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>									0.14	2		
Clytia	<i>Clytia</i>												
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.32	185		4	0.05	22			0.06	25		6
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>												
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>			2.33	18	0.54	3						
Comb Jellyfish	<i>Ctenophora</i>											0.02	1
Dover Sole	<i>Microstomus pacificus</i>												
Eulachon	<i>Thaleichthys pacificus</i>												
Euphausiids	<i>Euphausiacea</i>												
Flatfishes	<i>Pleuronectiformes</i>		6										1
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>												
Jack Mackerel	<i>Trachurus symmetricus</i>												
Larval Fish	<i>Larval Fish</i>		1										
Lingcod	<i>Ophiodon elongatus</i>												
Lions Mane	<i>Cyanea capillata</i>	67.53		96.00		172.75				93.15		21.89	
Moon Jellyfish	<i>Aurelia labiata</i>	0.53	6	0.25								1.17	1
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>												
Northern Anchovy	<i>Engraulis mordax</i>												
Northern Sea Nettle	<i>Chrysaora melanaster</i>												
Octopus	<i>Octopoda</i>												
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>												
Pacific Herring	<i>Clupea pallasii</i>					229.25	3,440			95.58	1,396		
Pacific Sand Lance	<i>Ammodytes personatus</i>												
Pacific Sanddab	<i>Citharichthys sordidus</i>												
Pacific Sandfish	<i>Trichodon trichodon</i>												
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>												
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>			1.29	1	1.75	1						
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>												
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>												
Prowfish	<i>Zaprora silenus</i>	0.03	1	0.06	1								
Quillfish	<i>Ptilichthys goodei</i>												
Rockfishes	<i>Sebastes</i>		1	0.05	15		5				3		1
Ronquils	<i>Bathymasteridae</i>												
Smelts	<i>Osmeridae</i>												
Snailfishes	<i>Liparidae</i>												
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>			0.02	1								
Soft Sculpin	<i>Psychrolutes sigalutes</i>												
Speckled Sanddab	<i>Citharichthys stigmaeus</i>												
Walleye Pollock	<i>Gadus chalcogrammus</i>												
Water Jellyfish	<i>Aequorea</i>	14.26		96.00						39.27		6.20	
Wolf Eel	<i>Anarrhichthys ocellatus</i>												
Yellowtail Rockfish	<i>Sebastes flavidus</i>												
TOTAL		82.72	201	228.79	50	404.51	3,472	231.13	1,427	29.28	10		

Common Name	Scientific Name	12		13		16		17		18	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>					0.93	1	1.58	1		
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	6.52	1	0.49	1	2.31	1				
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>										
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	9.16	2	4.61	1	26.29	5	18.42	3	4.18	1
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>			0.21	4	3.09	80	0.02	1		
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>		13	0.14	69	0.14	47	0.47	319	0.52	300
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	2.84	1	2.94	1	2.23	1				
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>	0.86	11	0.37	1						
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>										
Flatfishes	<i>Pleuronectiformes</i>		1								
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>			10.33	3						
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>		1								
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	39.14		136.80		206.98		137.57		75.80	
Moon Jellyfish	<i>Aurelia labiata</i>	1.98	13								
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>										
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>					12.69	211	3.20	43	0.76	11
Pacific Sand Lance	<i>Ammodytes personatus</i>				1						
Pacific Sanddab	<i>Citharichthys sordidus</i>							0.04	1		
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>										
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>										
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>	0.24	257		14	0.09	28	0.04	28		
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>										
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>	34.00		15.20				15.92		3.26	
Wolf Eel	<i>Anarrhichthys ocellatus</i>	0.08	1	0.14	1						
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		94.82	301	171.23	96	254.75	374	177.26	396	84.52	312

Common Name	Scientific Name	19		22		28		29		30	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>										
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>										
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>										
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>							17.00	3		
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>					0.04	1			2.89	78
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.09	73	0.10	19	0.20	47	0.10	61	0.06	11
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>										
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>			0.16	1						
Comb Jellyfish	<i>Ctenophora</i>									0.02	1
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>										
Flatfishes	<i>Pleuronectiformes</i>	0.03	60								
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>										
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>										
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	20.10		136.25	10	144.17		3.47	1	52.73	3
Moon Jellyfish	<i>Aurelia labiata</i>			2.34	15	16.55	13			1.20	10
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>										
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>					0.92	15	0.44	8		
Pacific Sand Lance	<i>Ammodytes personatus</i>										
Pacific Sanddab	<i>Citharichthys sordidus</i>							0.36	5		
Pacific Sandfish	<i>Trichodon trichodon</i>						1				
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>										
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>							1.51	1		
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>				15					3	
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>			0.03	1						
Soft Sculpin	<i>Psychrolutes sigalutes</i>										5
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>	0.88		34.32		24.08		3.22		6.16	
Wolf Eel	<i>Anarrhichthys ocellatus</i>										
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		21.10	133	173.20	61	185.96	77	26.10	82	63.06	108

Common Name	EVENT NUMBER Scientific Name	33		34		37		38		39	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>										
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	1.68	1	2.66	4						
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>	1.70	3								
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>					10.38	4				
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	32.91	1,414	0.06	1	0.33	14	0.12	5	3.72	105
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>		21	0.14	29		21	0.10	31		1
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>										
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>									0.12	1
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>							0.02	1		
Euphausiids	<i>Euphausiacea</i>										
Flatfishes	<i>Pleuronectiformes</i>								1		
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>									1.28	2
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>										
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	5.88		68.52	4	44.29		44.36		10.21	
Moon Jellyfish	<i>Aurelia labiata</i>	3.26	3								
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>										
Octopus	<i>Octopoda</i>			0.07							
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>	0.04	1			454.97	6,633	206.84	3,134		
Pacific Sand Lance	<i>Ammodytes personatus</i>										
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>										
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>										
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>									0.25	12
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>					0.04	1				
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>				4				1		
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>	9.71	411	0.06	3					1.22	46
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>			10.27		3.74		3.16		57.86	
Wolf Eel	<i>Anarrhichthys ocellatus</i>					0.02	1	0.02	1		
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		55.18	1,854	81.78	45	513.77	6,674	254.62	3,174	74.66	167

Common Name	Scientific Name	EVENT NUMBER		42		45		46		49		50	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>												
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>												
Black Rockfish	<i>Sebastes melanops</i>							1.65	1				
Blue Shark	<i>Prionace glauca</i>												
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>												
California Headlightfish	<i>Diaphus theta</i>												1
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>			3.14	1	5.89	4	0.68	1				
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>												
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>					1.49	1						
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	0.02	1	52.65	1,699	0.22	7					7.64	245
Clytia	<i>Clytia</i>												
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.40	129	0.45	11								
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>												
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>	0.75	3										
Comb Jellyfish	<i>Ctenophora</i>												
Dover Sole	<i>Microstomus pacificus</i>												
Eulachon	<i>Thaleichthys pacificus</i>												
Euphausiids	<i>Euphausiacea</i>												
Flatfishes	<i>Pleuronectiformes</i>												
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>												
Jack Mackerel	<i>Trachurus symmetricus</i>												
Larval Fish	<i>Larval Fish</i>												
Lingcod	<i>Ophiodon elongatus</i>												
Lions Mane	<i>Cyanea capillata</i>	141.64		95.17	34	152.05				91.24		80.70	
Moon Jellyfish	<i>Aurelia labiata</i>												
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>												
Northern Anchovy	<i>Engraulis mordax</i>												
Northern Sea Nettle	<i>Chrysaora melanaster</i>			0.76	1								
Octopus	<i>Octopoda</i>												
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>												
Pacific Herring	<i>Clupea pallasii</i>					158.57	2,529	314.00	4,645	136.91	318		
Pacific Sand Lance	<i>Ammodytes personatus</i>												
Pacific Sanddab	<i>Citharichthys sordidus</i>												
Pacific Sandfish	<i>Trichodon trichodon</i>												
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>			36.22	11								
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>					1.67	1						
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>	0.03	1	1.57	112							0.18	9
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>												6
Prowfish	<i>Zaprora silenus</i>												
Quillfish	<i>Ptilichthys goodei</i>												
Rockfishes	<i>Sebastes</i>												
Ronquils	<i>Bathymasteridae</i>												
Smelts	<i>Osmeridae</i>												
Snailfishes	<i>Liparidae</i>												
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>												
Soft Sculpin	<i>Psychrolutes sigalutes</i>												
Speckled Sanddab	<i>Citharichthys stigmaeus</i>												
Walleye Pollock	<i>Gadus chalcogrammus</i>												
Water Jellyfish	<i>Aequorea</i>	25.97		64.35		3.75						7.27	
Wolf Eel	<i>Anarrhichthys ocellatus</i>	0.03	1									0.02	1
Yellowtail Rockfish	<i>Sebastes flavidus</i>												
TOTAL		168.84	135	254.31	1,869	325.29	2,543	405.92	4,646	232.72	580		

Common Name	Scientific Name	EVENT NUMBER		51		54		57		58		61	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>											0.12	1
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>												
Black Rockfish	<i>Sebastes melanops</i>												
Blue Shark	<i>Prionace glauca</i>												
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>												
California Headlightfish	<i>Diaphus theta</i>												
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	17.66	5							0.78	1	0.62	1
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>	0.61	2	1.41	3								
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>											6.74	1
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	0.39	20	0.02	1	2.64	87	0.30	12	0.36	18		
Clytia	<i>Clytia</i>												
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.03	12		2		12	0.06	23				
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	2.52	1	3.24	2							6.96	3
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>	1.31	8	3.05	19	0.14	1						
Comb Jellyfish	<i>Ctenophora</i>	0.03	1	0.03	1								
Dover Sole	<i>Microstomus pacificus</i>												
Eulachon	<i>Thaleichthys pacificus</i>												
Euphausiids	<i>Euphausiacea</i>												
Flatfishes	<i>Pleuronectiformes</i>												
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	0.37											
Jack Mackerel	<i>Trachurus symmetricus</i>												
Larval Fish	<i>Larval Fish</i>												
Lingcod	<i>Ophiodon elongatus</i>												
Lions Mane	<i>Cyanea capillata</i>	34.21	6	45.41	9	64.80	11	12.22	1	189.39			
Moon Jellyfish	<i>Aurelia labiata</i>	0.28	2	0.19									
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>												
Northern Anchovy	<i>Engraulis mordax</i>												
Northern Sea Nettle	<i>Chrysaora melanaster</i>												
Octopus	<i>Octopoda</i>												
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>												
Pacific Herring	<i>Clupea pallasii</i>									2.33	35	638.91	9,197
Pacific Sand Lance	<i>Ammodytes personatus</i>												
Pacific Sanddab	<i>Citharichthys sordidus</i>												
Pacific Sandfish	<i>Trichodon trichodon</i>												
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>												
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>									1.74	1	3.40	2
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>									0.02	1		
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>												
Prowfish	<i>Zaprora silenus</i>							0.04	1				
Quillfish	<i>Ptilichthys goodei</i>												
Rockfishes	<i>Sebastes</i>												
Ronquils	<i>Bathymasteridae</i>												
Smelts	<i>Osmeridae</i>												
Snailfishes	<i>Liparidae</i>												
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>							0.02	1				
Soft Sculpin	<i>Psychrolutes sigalutes</i>												
Speckled Sanddab	<i>Citharichthys stigmaeus</i>												
Walleye Pollock	<i>Gadus chalcogrammus</i>												
Water Jellyfish	<i>Aequorea</i>	1.60		5.39		9.50		10.87					
Wolf Eel	<i>Anarrhichthys ocellatus</i>												
Yellowtail Rockfish	<i>Sebastes flavidus</i>												
TOTAL		59.01	57	58.74	37	77.14	113	28.32	74	846.50	9,223		

Common Name	Scientific Name	EVENT NUMBER		62		63		64		67		70	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>												
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>												
Black Rockfish	<i>Sebastes melanops</i>												
Blue Shark	<i>Prionace glauca</i>												
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>									0.46	1		
California Headlightfish	<i>Diaphus theta</i>												
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>			0.72	1	10.80	3	5.52	1				
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>			0.24	2	0.04	1						
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	1.64	1	78.06	22	15.86	6	4.64	2			56.24	12
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>											0.12	4
Clytia	<i>Clytia</i>												
Cods/Hakes/Grenadiers	<i>Gadiformes</i>		16	0.10	45							6.86	3,612
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	4.28	3	3.44	1	10.84	6	19.82	7				
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>			0.14	2	2.70	13						
Comb Jellyfish	<i>Ctenophora</i>												
Dover Sole	<i>Microstomus pacificus</i>												
Eulachon	<i>Thaleichthys pacificus</i>	0.79	56										
Euphausiids	<i>Euphausiacea</i>												
Flatfishes	<i>Pleuronectiformes</i>												
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>							7.34	1				
Jack Mackerel	<i>Trachurus symmetricus</i>												
Larval Fish	<i>Larval Fish</i>						3						
Lingcod	<i>Ophiodon elongatus</i>												
Lions Mane	<i>Cyanea capillata</i>	95.88		18.52	1	17.34		45.52	7			81.58	14
Moon Jellyfish	<i>Aurelia labiata</i>					0.12							
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>											1.90	1
Northern Anchovy	<i>Engraulis mordax</i>												
Northern Sea Nettle	<i>Chrysaora melanaster</i>												
Octopus	<i>Octopoda</i>												
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>												
Pacific Herring	<i>Clupea pallasii</i>	444.32	1,032							280.00	2,091	2.74	44
Pacific Sand Lance	<i>Ammodytes personatus</i>												
Pacific Sanddab	<i>Citharichthys sordidus</i>												
Pacific Sandfish	<i>Trichodon trichodon</i>												
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>												
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	5.06	3	28.50	16	73.74	47	54.19	34			8.82	5
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>												
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>												
Prowfish	<i>Zaprora silenus</i>											0.04	1
Quillfish	<i>Ptilichthys goodei</i>												
Rockfishes	<i>Sebastes</i>			0.04	29		9						
Ronquils	<i>Bathymasteridae</i>												
Smelts	<i>Osmeridae</i>												
Snailfishes	<i>Liparidae</i>												
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>												
Soft Sculpin	<i>Psychrolutes sigalutes</i>												
Speckled Sanddab	<i>Citharichthys stigmaeus</i>												
Walleye Pollock	<i>Gadus chalcogrammus</i>												
Water Jellyfish	<i>Aequorea</i>					17.02						8.48	
Wolf Eel	<i>Anarrhichthys ocellatus</i>					0.02	1	0.03	1				
Yellowtail Rockfish	<i>Sebastes flavidus</i>												
TOTAL		551.97	1,111	129.76	119	148.48	89	417.52	2,145	166.78	3,693		

Common Name	EVENT NUMBER	71		74		75		78		79	
	Scientific Name	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>	0.96	1								
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	1.58	3	3.68	1						
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>	0.20	1	0.14	2						
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	13.08	4	22.49	6	2.23	1	13.88	7	62.10	16
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	4.42	154								
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.08	29	0.15	74		9			0.30	
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	8.77	4	13.14	5						
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>	3.94	32	0.30	2	0.22	1				
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>							19.92			
Flatfishes	<i>Pleuronectiformes</i>										3
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	1.14		0.30							
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>										
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	52.96		34.82		19.08		60.61	2	34.34	
Moon Jellyfish	<i>Aurelia labiata</i>	4.30	5	1.94	6					0.06	
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>									0.44	1
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>	0.34	4					18.22	140	25.52	268
Pacific Sand Lance	<i>Ammodytes personatus</i>										
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>	1.76	1								
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	4.19	2	7.24	4	7.16	5	34.02	22	3.66	2
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>				1					0.02	25
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>										
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>	112.92		30.60		27.24				18.26	
Wolf Eel	<i>Anarrhichthys ocellatus</i>	0.16	2								
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		210.80	242	114.80	101	55.93	16	146.65	171	144.70	315

Common Name	EVENT NUMBER Scientific Name	82		84		87		90		91	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>										
Blue Shark	<i>Prionace glauca</i>				1						
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>									0.07	34
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	12.44	5			3.89	1	23.94	7	9.83	7
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>	2.42	9								
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	34.62	16			3.50	1				
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	7.69	277								
Clytia	<i>Clytia</i>						1				
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.04	60			0.10	67	0.10	54		7
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	22.68	10			18.18	8	38.86	14	91.75	34
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>	0.78	4					1.68	6		
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>									4.34	
Flatfishes	<i>Pleuronectiformes</i>						13		2		
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>										
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>										
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	76.31	22	0.28		43.86		24.22	15	81.95	
Moon Jellyfish	<i>Aurelia labiata</i>	16.07						0.74	5		
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>	0.42	1								
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>	101.72	2,031							35.65	
Pacific Sand Lance	<i>Ammodytes personatus</i>										
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>										
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	2.80	2	90.98	56	18.52	12	20.80	13	106.73	67
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>	0.04	30	12.13	5,366		11		2	0.60	191
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>										
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>	20.91		41.72		13.10		24.86			
Wolf Eel	<i>Anarrhichthys ocellatus</i>										
Yellowtail Rockfish	<i>Sebastes flavidus</i>	0.44	1								
TOTAL		299.38	2,468	145.11	5,423	101.15	114	135.20	118	330.92	340

EVENT NUMBER		94		95		96		99		100	
Common Name	Scientific Name	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>	1.20	3								
Black Rockfish	<i>Sebastes melanops</i>										
Blue Shark	<i>Prionace glauca</i>				1						
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>			0.08	1						
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	9.41	1	0.94	1	7.15	7			21.44	6
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>					0.16	2				
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	9.41	3	8.08	3	114.28	38	24.41	4	20.08	6
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>					0.12	4				
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.02	16	0.04	3	0.02	10				19
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	2.89	1	3.04	1	42.98	15			24.20	10
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>					8.46	56	0.54	3		
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>	12.66									
Flatfishes	<i>Pleuronectiformes</i>		9				1				
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	0.10	1					1.50	4	2.62	
Jack Mackerel	<i>Trachurus symmetricus</i>	0.66	1								
Larval Fish	<i>Larval Fish</i>										
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	112.56		7.28		18.72		74.37		85.74	
Moon Jellyfish	<i>Aurelia labiata</i>			0.12	2	1.06					
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>										
Northern Sea Nettle	<i>Chrysaora melanaster</i>	1.58	1								
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>										
Pacific Herring	<i>Clupea pallasii</i>	0.43	3	1.70	15	0.18	93	0.04	1	219.79	137,378
Pacific Sand Lance	<i>Ammodytes personatus</i>										
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>									73.01	
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	9.74	5	16.26	11	82.63	50	209.90	115	8.98	5
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>	0.08	57	0.06	23						19
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>					0.28	7				
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>	12.66		48.76		6.76				28.83	
Wolf Eel	<i>Anarrhichthys ocellatus</i>					0.48	6			0.54	4
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		173.40	101	86.36	61	283.28	289	310.76	127	485.23	137,447

Common Name	Scientific Name	EVENT NUMBER		103		104		107		110		113	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>							0.10	1				
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>												
Black Rockfish	<i>Sebastes melanops</i>	1.98	1										
Blue Shark	<i>Prionace glauca</i>												
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>												
California Headlightfish	<i>Diaphus theta</i>												
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	15.84	3					11.54	2	15.38	7	15.80	11
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>							0.40	4				
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	8.20	3	15.18	5			34.62	12			26.58	8
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>			0.02	1			0.08	4				
Clytia	<i>Clytia</i>												
Cods/Hakes/Grenadiers	<i>Gadiformes</i>	0.82	470	0.44	177					0.17	103		6
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	9.72	4	3.24	1			22.54	11	83.94	35	8.34	3
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>							1.54	8	0.22	1		
Comb Jellyfish	<i>Ctenophora</i>												
Dover Sole	<i>Microstomus pacificus</i>												
Eulachon	<i>Thaleichthys pacificus</i>												
Euphausiids	<i>Euphausiacea</i>												
Flatfishes	<i>Pleuronectiformes</i>												
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>			0.46						25.99		0.82	
Jack Mackerel	<i>Trachurus symmetricus</i>												
Larval Fish	<i>Larval Fish</i>												
Lingcod	<i>Ophiodon elongatus</i>									3.99	1		
Lions Mane	<i>Cyanea capillata</i>	117.17		10.06				2.92		15.78		27.08	3
Moon Jellyfish	<i>Aurelia labiata</i>			1.10				0.64				1.00	
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>												
Northern Anchovy	<i>Engraulis mordax</i>												
Northern Sea Nettle	<i>Chrysaora melanaster</i>												
Octopus	<i>Octopoda</i>												
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>												
Pacific Herring	<i>Clupea pallasii</i>	31.84	35,335	1.10	346			40.29	20,338	42.46	17,636		
Pacific Sand Lance	<i>Ammodytes personatus</i>	0.02	20										
Pacific Sanddab	<i>Citharichthys sordidus</i>												
Pacific Sandfish	<i>Trichodon trichodon</i>												
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>												
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	2.80	2	1.42	1			34.98	21	12.14	8	32.87	20
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>												
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>												
Prowfish	<i>Zaprora silenus</i>												
Quillfish	<i>Ptilichthys goodei</i>												
Rockfishes	<i>Sebastes</i>	0.41	286	11.47	3,199								
Ronquils	<i>Bathymasteridae</i>												
Smelts	<i>Osmeridae</i>												
Snailfishes	<i>Liparidae</i>												
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>												
Soft Sculpin	<i>Psychrolutes sigalutes</i>												
Speckled Sanddab	<i>Citharichthys stigmatæus</i>												
Walleye Pollock	<i>Gadus chalcogrammus</i>												
Water Jellyfish	<i>Aequorea</i>	96.76								32.85		20.69	
Wolf Eel	<i>Anarrhichthys ocellatus</i>	0.20	1										
Yellowtail Rockfish	<i>Sebastes flavidus</i>												
TOTAL		285.76	36,125	44.49	3,730	149.65	20,401	232.92	17,791	133.18	51		

Common Name	Scientific Name	116		117		120		121		124	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>										
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>										
Black Rockfish	<i>Sebastes melanops</i>			0.36	1						
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>			5.00	3			3.80	1	37.30	18
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>									0.52	3
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	93.67	43	19.22	5						
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>							0.07	4	0.14	9
Clytia	<i>Clytia</i>										
Cods/Hakes/Grenadiers	<i>Gadiformes</i>				10	0.04	19	0.04	16		7
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	17.98	11	1.90	1	2.73	1	5.52	2		
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>							0.07	1		
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>										
Euphausiids	<i>Euphausiacea</i>										
Flatfishes	<i>Pleuronectiformes</i>						9		7		
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	1.72	5	6.90				0.64		4.40	
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>								11		8
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>	78.38		63.52	14	2.46		3.38	1	9.28	
Moon Jellyfish	<i>Aurelia labiata</i>	4.09	5	7.64	6	0.50	1				
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>										
Northern Anchovy	<i>Engraulis mordax</i>									0.04	1
Northern Sea Nettle	<i>Chrysaora melanaster</i>			0.82	1						
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>	0.22	11					3.14	185	1.58	154
Pacific Herring	<i>Clupea pallasii</i>	35.85	361	595.00	6,813			6.26	3,913	15.86	9,226
Pacific Sand Lance	<i>Ammodytes personatus</i>								5		2
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>	0.65	5	10.18		5.47		17.86		1.50	
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	299.63	194	21.36	14					1.90	1
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>				4						
Prowfish	<i>Zaprora silenus</i>			0.06	1						
Quillfish	<i>Ptilichthys goodei</i>										
Rockfishes	<i>Sebastes</i>										
Ronquils	<i>Bathymasteridae</i>										
Smelts	<i>Osmeridae</i>										
Snailfishes	<i>Liparidae</i>										
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>										
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>										
Walleye Pollock	<i>Gadus chalcogrammus</i>										
Water Jellyfish	<i>Aequorea</i>					8.03		3.46		0.68	
Wolf Eel	<i>Anarrhichthys ocellatus</i>	0.02	1								
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		532.21	636	731.96	6,873	19.23	30	44.24	4,146	73.20	9,429

Common Name	EVENT NUMBER Scientific Name	125		126		128		131		132	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>			0.15	1	0.28	2				
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>	0.09	2								
Black Rockfish	<i>Sebastes melanops</i>										
Blue Shark	<i>Prionace glauca</i>										
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>										
California Headlightfish	<i>Diaphus theta</i>										
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>	33.40	11	20.21	3	10.71	2	42.82	47	8.40	3
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>							0.64	3		
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>	4.02	2	18.19	7			10.46	4	4.46	2
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>	0.14	7	0.09	7	0.01	1			11.78	275
Clytia	<i>Clytia</i>				1						
Cods/Hakes/Grenadiers	<i>Gadiformes</i>		7	0.03	13	0.08	13	0.10	34		
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>	21.52	8					4.58	2	8.84	5
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>										
Comb Jellyfish	<i>Ctenophora</i>										
Dover Sole	<i>Microstomus pacificus</i>										
Eulachon	<i>Thaleichthys pacificus</i>	1.16	36			2.71	97				
Euphausiids	<i>Euphausiacea</i>					0.60					
Flatfishes	<i>Pleuronectiformes</i>										
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	3.77		0.18							
Jack Mackerel	<i>Trachurus symmetricus</i>										
Larval Fish	<i>Larval Fish</i>	0.07	116				13				
Lingcod	<i>Ophiodon elongatus</i>										
Lions Mane	<i>Cyanea capillata</i>					1.52	1	41.12	2	31.40	79
Moon Jellyfish	<i>Aurelia labiata</i>										
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>							2.42	1		
Northern Anchovy	<i>Engraulis mordax</i>	1.30	43	0.13	3						
Northern Sea Nettle	<i>Chrysaora melanaster</i>										
Octopus	<i>Octopoda</i>										
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>	0.43	22	1.85		0.07	3	0.92	70		
Pacific Herring	<i>Clupea pallasii</i>	174.94	4,967	14.03	8,492	1.94	1,293			21.98	6,124
Pacific Sand Lance	<i>Ammodytes personatus</i>						1				39
Pacific Sanddab	<i>Citharichthys sordidus</i>										
Pacific Sandfish	<i>Trichodon trichodon</i>										
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>			5.07		3.83		0.22	1		
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	1.44	1	7.21	4	1.86	1	1.74	1	18.46	12
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>										
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>										
Prowfish	<i>Zaprora silenus</i>										
Quillfish	<i>Ptilichthys goodei</i>										1
Rockfishes	<i>Sebastes</i>			0.02	11	0.07	17				39
Ronquils	<i>Bathymasteridae</i>					0.07	1				
Smelts	<i>Osmeridae</i>					0.22	18				
Snailfishes	<i>Liparidae</i>				1						
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>										
Soft Sculpin	<i>Psychrolutes sigalutes</i>										
Speckled Sanddab	<i>Citharichthys stigmaeus</i>	1.82	6	1.28	8	3.19	14				
Walleye Pollock	<i>Gadus chalcogrammus</i>	3.19	51								
Water Jellyfish	<i>Aequorea</i>			1.17		9.60		11.34		506.38	
Wolf Eel	<i>Anarrhichthys ocellatus</i>									0.02	1
Yellowtail Rockfish	<i>Sebastes flavidus</i>										
TOTAL		247.29	5,279	69.61	8,551	36.76	1,477	116.36	165	611.72	6,580

Common Name	Scientific Name	135		138		139		140	
		Weight	Count	Weight	Count	Weight	Count	Weight	Count
American Shad	<i>Alosa sapidissima</i>						1		
Arrowtooth Flounder, Turbot	<i>Atheresthes stomias</i>								
Black Rockfish	<i>Sebastes melanops</i>					1.94	1		
Blue Shark	<i>Prionace glauca</i>								
Boreal Clubhook Squid	<i>Onychoteuthis borealijaponicus</i>								
California Headlightfish	<i>Diaphus theta</i>								
Chinook Salmon (Adults)	<i>Oncorhynchus tshawytscha</i>					10.16	8	16.48	4
Chinook Salmon (Juveniles)	<i>Oncorhynchus tshawytscha</i>								
Chum Salmon (Adults)	<i>Oncorhynchus keta</i>								
Chum Salmon (Juveniles)	<i>Oncorhynchus keta</i>			0.36	12			0.08	4
Clytia	<i>Clytia</i>								
Cods/Hakes/Grenadiers	<i>Gadiformes</i>							0.06	29
Coho Salmon (Adults)	<i>Oncorhynchus kisutch</i>					11.40	6	2.58	1
Coho Salmon (Juveniles)	<i>Oncorhynchus kisutch</i>								
Comb Jellyfish	<i>Ctenophora</i>	0.02	1						
Dover Sole	<i>Microstomus pacificus</i>							0.02	1
Eulachon	<i>Thaleichthys pacificus</i>					1.69	42	8.74	356
Euphausiids	<i>Euphausiacea</i>								
Flatfishes	<i>Pleuronectiformes</i>								1
Fried Egg Jellyfish	<i>Phacellophora camtschatica</i>	0.70		2.06				19.20	2
Jack Mackerel	<i>Trachurus symmetricus</i>					2.06	2		
Larval Fish	<i>Larval Fish</i>								
Lingcod	<i>Ophiodon elongatus</i>								
Lions Mane	<i>Cyanea capillata</i>	11.38		34.94		43.94		75.90	
Moon Jellyfish	<i>Aurelia labiata</i>					1.02	1		
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>							2.82	1
Northern Anchovy	<i>Engraulis mordax</i>								
Northern Sea Nettle	<i>Chrysaora melanaster</i>								
Octopus	<i>Octopoda</i>								
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>						4	0.04	3
Pacific Herring	<i>Clupea pallasii</i>	2.18	23	1,394.00	12,157	851.08	3,596	15.44	2,576
Pacific Sand Lance	<i>Ammodytes personatus</i>								
Pacific Sanddab	<i>Citharichthys sordidus</i>								
Pacific Sandfish	<i>Trichodon trichodon</i>								
Pacific Sea Nettle	<i>Chrysaora fuscescens</i>							0.48	
Pink Salmon (Adults)	<i>Oncorhynchus gorbuscha</i>	3.36	2			20.20	11	2.04	1
Pink Salmon (Juveniles)	<i>Oncorhynchus gorbuscha</i>								
Pink Shrimp (Smooth)	<i>Pandalus jordani</i>								
Prowfish	<i>Zaprora silenus</i>			0.04	1				
Quillfish	<i>Ptilichthys goodei</i>								
Rockfishes	<i>Sebastes</i>	0.10	250		2				6
Ronquils	<i>Bathymasteridae</i>								
Smelts	<i>Osmeridae</i>								
Snailfishes	<i>Liparidae</i>								
Sockeye Salmon (Juveniles)	<i>Oncorhynchus nerka</i>								
Soft Sculpin	<i>Psychrolutes sigalutes</i>								
Speckled Sanddab	<i>Citharichthys stigmatæus</i>							14.62	112
Walleye Pollock	<i>Gadus chalcogrammus</i>								
Water Jellyfish	<i>Aequorea</i>	8.42				4.23		13.19	
Wolf Eel	<i>Anarrhichthys ocellatus</i>					0.18	2	0.30	1
Yellowtail Rockfish	<i>Sebastes flavidus</i>								
TOTAL		26.16	276	1,431.40	12,172	947.90	3,674	171.99	3,098