Juvenile Pacific Salmon (*Oncorhynchus* spp.) Trawl Survey on the South Coast of British Columbia, October 16 – November 8, 2013

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2026

Canadian Data Report of
Fisheries and Aquatic Sciences 1487

Canadian Data Report of Fisheries and Aquatic Sciences

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Les numéros 1 à 25 de cette série ont été publiés à titre de Records statistiques, Service des pêches et de la mer. Les numéros 26-160 ont été publiés à titre de Rapports statistiques du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom de la série a été modifié à partir du numéro 161.

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JUVENILE PACIFIC SALMON (*ONCORHYNCHUS* SPP.) TRAWL SURVEY ON THE SOUTH COAST OF BRITISH COLUMBIA, OCTOBER 16 - NOVEMBER 8, 2013

by

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Cat. No. Fs97-13/1487E-PDF ISBN 978-0-660-99703-2 ISSN 1488-5395

Correct citation for this publication:

Jung, Y., Tabata, A.M., and King, J.R. 2026. Juvenile Pacific Salmon (*Oncorhynchus* spp.) Trawl Survey on the South Coast of British Columbia, October 16 - November 8, 2013. Can. Data Rep. Fish. Aquat. Sci. 1487: vi + 52 p.

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ABSTRACT

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Fisheries and Oceans Canada (DFO) conducted a surface trawl survey from October 16 - November 8, 2013 on the CCGS *W.E. Ricker*. This study targeted juvenile Pacific Salmon (*Oncorhynchus* spp.) in southern British Columbia (BC). There were 38,230 individuals caught from 30 species in 99 tows. Opalescent Inshore Squid was the most abundant species with 63% of the total catch. Juvenile salmon species caught in decreasing abundance by count were: Chum Salmon, Chinook Salmon, Pink Salmon, Coho Salmon and Sockeye Salmon, with catch distribution varied based on species. Biological samples for genetic stock composition, otoliths, and coded wire tags were returned to the Pacific Biological Station (DFO, Nanaimo, BC). Associated information on the physical oceanography (67 locations), water samples for chemistry and chlorophyll *a* along with zooplankton samples (66 locations) were returned to the Institute of Ocean Sciences (DFO, Sidney, BC).

RÉSUMÉ

Jung, Y., Tabata, A.M., and King, J.R. 2026. Juvenile Pacific Salmon (*Oncorhynchus* spp.) Trawl Survey on the South Coast of British Columbia, October 16 - November 8, 2013. Can. Data Rep. Fish. Aquat. Sci. 1487: vi + 52 p.

Pêches et Océans Canada a effectué un relevé au chalut de surface entre octobre 16 to novembre 8, 2013 sur le CCGS *W.E. Ricker*. Cette étude ciblait le saumon du Pacifique juvénile (*Oncorhynchus* spp.) dans le sud de la Colombie-Britannique (C.-B.). 38,230 individus de 30 espèces ont été capturés au cours de 99 traits. Le calmars opales était l'espèce la plus abondante avec 63% de la prise totale. Les espèces de saumon juvénile capturées par ordre décroissant d'abondance par comptage étaient les seuivantes: saumon kéta juvéniles, saumon quinnat juvéniles, saumon rose juvéniles, saumon coho juvéniles et saumon rouge juvéniles, avec la répartition des prises variait selon les espèces. Les échantillons biologiques pour la composition génétique des stocks, les otolithes, et les micromarques magnétisées codées ont été retournés à la Station biologique du Pacifique (MPO, Nanaimo, C.-B.). Les informations associées sur l'océanographie physique (67 sites) les échantillions d'eau pour la chimie et la chlorophylle *a* ainsi que les échantillons de zooplancton (66 sites) ont été retournés à l'Institut des sciences de la mer (MPO, Sidney, C.-B.).

1 INTRODUCTION

Fisheries and Oceans Canada (DFO) conducted a trawl survey, targeting juvenile Pacific Salmon (*Oncorhynchus* spp.) from October 16 to November 08, 2013 on the CCGS *W.E. Ricker*. The main objectives of this survey were:

1. to determine the abundance, condition, distribution, and genetic stock composition of juvenile Pacific Salmon present off the north and west coast of Vancouver Island;
2. the associated physical oceanography; and
3. the distribution and biomass of zooplankton.

This survey was part of an ongoing suite of surveys (1997-2016) which was led by the High Seas Salmon Program at the Pacific Biological Station, Nanaimo, British Columbia (BC) in support of research on Pacific Salmon ocean ecology. These surveys were conducted annually since 1997 (Welch et al. 2002), initially from the Gulf of Alaska to the southern continental shelf of BC, albeit with differences in location, survey area and timing each year.The survey is focused on juvenile Pacific Salmon, specifically Chum Salmon (*O. keta*), Chinook Salmon (*O. tshawytscha*), Coho Salmon (*O. kisutch*), Pink Salmon (*O. gorbuscha*) and Sockeye Salmon (*O. nerka*). This data report documents the biological, oceanographic, and zooplankton data and samples collected.

2 METHODS

2.1 SURVEY LOCATIONS

Fishing, oceanographic, and zooplankton sampling occurred off the north and east coast of Vancouver Island, including northern Strait of Georgia, Discovery Islands, Johnstone Strait, Queen Charlotte Strait, the west coast of Vancouver Island and Juan de Fuca Strait of British Columbia (Figure 1).

2.2 FISHING OPERATIONS

The CCGS *W.E. Ricker* deployed a Cantrawl model 250 midwater trawl net (approximately 90 m long x 30 m wide x 15 m high; (Cantrawl Nets Ltd., Richmond, Canada; Appendix Table A and Appendix Figure B). This three-bridle midwater net had a codend liner with 12.7 mm mesh (stretched) to retain smaller species. On this survey, the mean trawl net opening was 36 m wide by 14 m high, or an area of 504 m^2.

Tow speed averaged 8.3 km/hr, and varied between 4.3 to 14.3 km/hr speed over ground, depending on the wind, tide, and current. The target headrope depths were 0 m, 15 m, and 30 m. Warp length was 150 m (Appendix C). Tow duration was 15 - 30 min, with the time starting when the Jet 5 m^2 trawls doors were locked and the net started fishing.

2.3 CATCH PROCESSING

All fish were sorted to species and counted. If the catch of a species was too large to effectively count within a reasonable time frame, the species' catch was weighed (kg) and a subsample was counted and weighed to extrapolate an estimated catch count. The catch (count) of juvenile Pacific Salmon by species was divided by swept volume (km^3) to calculate catch per unit effort (CPUE).

2.4 BIOLOGICAL SAMPLING

All salmon species were measured for fork length (mm) and weight (g), and sex determined. Pacific Salmon were divided into juveniles and adults based on their fork lengths. All Pacific Salmon species that were less than 300 mm in length were considered juveniles except for Coho and Chinook Salmon whose length threshold as juveniles was 370 mm. Additional collections included: fin clips for genetic stock identification (GSI), additional salmon tissues for molecular identification of pathogens, muscle tissue for energy density estimation, stable isotope analyses or proximate analyses, otoliths, adipose fin status (i.e. clipped vs. non-clipped), and coded wire tags (CWTs). Other fish species were measured for length (mm) and weight (g) as time permitted.

2.5 OCEANOGRAPHY

A Sea-Bird 911plus CTD (conductivity-temperature-depth; Sea-Bird Scientific, Bellevue, WA) was used for oceanographic profiles at 67 locations (Figure 1, Appendix D). A Niskin bottle at 10 m from the surface was used for nutrient and chlorophyll (chl *a*) collections. Seawater samples for chl *a* estimation were filtered with 25 mm GF/F glass fibre filter disks under vacuum, not exceeding 5 inHg (inch of mercury). Filter disks were then placed in polypropylene scintillation vials and frozen. Both the nutrient and chl *a* samples were frozen and maintained at -18°C. Nutrient and chl *a* samples were sent for analyses at the Institute of Ocean Sciences (DFO, Sidney, BC).

2.6 ZOOPLANKTON

At 66 locations (Figure 1, Appendix D), vertical tows to sample zooplankton were conducted to approximately 150 m or within 10 m of the bottom with two 60 cm diameter, 253 micrometer mesh nets mounted in a bongo-drum style frame, one of which was equipped with a flow meter. Zooplankton collected from one bongo net were preserved in 10% formalin and sent to the zooplankton laboratory at the Institute of Ocean Sciences (DFO, Sidney, BC) for species enumeration. The zooplankton sample from the other bongo net was sorted into four size fractions by successively sieving through 8.0, 1.7, 1.0, and 0.25 mm screens. Individual size fractions were frozen for future stable isotope, energy density, or proximate analyses and sent to the Pacific Biological Station (DFO, Nanaimo, BC) for processing or archiving.

3 RESULTS

3.1 FISHING OPERATIONS

This survey conducted 100 trawl net tows off the north and west coast of Vancouver Island (Figure 1, Appendix C) with 99 trawls completed successfully. There was 1 unusable tow which was aborted due to whales detected in the area and is identified by Usable = N in Appendix C.

3.2 CATCH COMPOSITION

Total catch for the survey from usable tows was 38,230 fish, with 1,874 (or 5%) juvenile Pacific Salmon. Detailed catch composition for each tow is included in Appendix E. For each species captured during the survey, the number of tows in which the species was present, total catch count, maximum tow catch count, and mean tow catch count in usable tows is presented in Table 1. The top three abundant species caught by count were Opalescent Inshore Squid (n=23,933), Pacific Sand Lance (n=6,611), then Pacific Herring (n=2,559; Table 1). Juvenile Pacific Salmon species caught, in order of abundance by count, were: Chum Salmon, Chinook Salmon, Pink Salmon, Coho Salmon and Sockeye Salmon. The survey targeted juvenile Pacific Salmon so the catches of adult Pacific Salmon should be interpreted with care.

The location and catch per unit effort (CPUE, count/km^3) of juvenile salmon is shown in Figure 2. Juvenile Chinook Salmon and juvenile Coho Salmon were caught throughout the survey area, with the exception of no encounters of Coho Salmon off Clayoquot Sound. Chum Salmon were encountered in large numbers in Queen Charlotte Strait and Juan de Fuca Strait. Juvenile Pink Salmon were caught primarily in Queen Charlotte Strait and the northwestern Vancouver Island, and to a lesser degree in northern Strait of Georgia and Juan de Fuca Strait. Juvenile Sockeye Salmon were the least abundant salmon species caught only in Queen Charlotte Strait.

3.3 BIOLOGICAL SAMPLES

Samples were collected for GSI (n=661), otoliths (n=626), pathogen analyses (n=361), energy density and stable isotope analyses (n=925). CWTs (n=26) when present and detected were retained. These biological samples were archived at the Pacific Biological Station, Fisheries and Oceans Canada (Nanaimo, BC).

3.4 LENGTH AND WEIGHT

Length frequencies and length-weight relationships are presented for juvenile Pacific Salmon species in Figures 3 to 6. Double log transformed length-weight regressions coefficients were large in Chinook Salmon, Chum Salmon and Pink Salmon. Coho Salmon had a slightly smaller coefficient. Sockeye Salmon figure was excluded because its sampling size was less than 30, which is considered insufficient data for the analysis. A larger coefficient typically represents

better condition, whereas a smaller coefficient typically represents worse condition. Lengths and weights of 27 species were recorded (Table 2). The length frequencies for species with greater than 100 length measurements (Pacific Herring, Opalescent Inshore Squid, Whitebait Smelt, Walleye Pollock, Lions Mane, Pacific Saury, Pacific Sand Lance and Soft Sculpin) are presented in Figure 7.

Within juvenile Pacific salmon, Coho Salmon had the largest maximum length (367 mm) and weight (685 g), whereas Sockeye Salmon had the smallest maximum length (205 mm) and weight (91 g).

3.5 OCEANOGRAPHY

CTD casts and water samples were completed at 67 sites with cast depths ranging from 15 m to 250 m (Appendix D). Oceanographic data from the CTD casts and nutrient analysis of the water samples are archived online within the Water Properties Data Inventory (Institute of Ocean Sciences, DFO, Sidney, BC) under cruise number 201365.

3.6 ZOOPLANKTON

Vertical bongo tows were conducted at 66 stations to depths ranging from 30 m to 150 m (Appendix D). Zooplankton enumeration data are archived in the zooplankton database (Institute of Ocean Sciences, DFO, Sidney, BC) under cruise number 201365.

4 DISCUSSION

This juvenile Pacific Salmon trawl survey collected valuable information on distribution, abundance, condition, and genetic stock composition for juvenile Pacific Salmon off the north and west coast of Vancouver Island. Overall, juvenile Chum Salmon and juvenile Chinook Salmon were most abundant, whereas juvenile Sockeye Salmon were least abundant. Distributions varied by species and life stage. This survey data supplements historical juvenile Pacific Salmon surveys that have been reported in Fisheries and Oceans Canada's State of the Pacific Ocean, and are being incorporated into longer term and broader scope research projects.

5 ACKNOWLEDGEMENTS

We would like to thank the Captain and crew of the CCGS *W.E. Ricker*. Marc Trudel was the High Seas Salmon Program Lead in 2013, and John Morris was Chief Scientist on this survey. We appreciate the expertise of the following science staff who participated in the survey: Cameron Freshwater, George William Shelswell, Jaime Morrison, Louise de Mestral Bezanson, Mary Thiess, Simon Hertlein, Strahan Tucker, Tyler Zubkowski and, Hugh Maclean who conducted oceanographic sampling.

6 REFERENCES

Welch, D.W., Morris, J.F.T., and Demers, E. 2002. *CCGS W.E. Ricker* Gulf of Alaska salmon survey, March - April, 1997. Can. Data Rep. Fish. Aquat. Sci. 1101: 19 p.

7 TABLES

Table 1. All captured species (or taxonomic group), ordered by total catch count, showing number of tows in which the species occurred, total catch count, maximum catch count, and mean catch count per tow for usable tows during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013.

Common Name	Scientific Name	Tows	Count	Max	Mean
Opalescent Inshore Squid	*Doryteuthis opalescens*	19	23,933	14,370	1,260
Pacific Sand Lance	*Ammodytes personatus*	3	6,611	6,590	2,204
Pacific Herring	*Clupea pallasii*	29	2,559	580	88
Walleye Pollock	*Gadus chalcogrammus*	10	2,396	1,390	240
Chum Salmon (Juveniles)	*Oncorhynchus keta*	25	945	197	38
Chinook Salmon (Juveniles)	*Oncorhynchus tshawytscha*	63	489	57	8
Pink Salmon (Juveniles)	*Oncorhynchus gorbuscha*	16	226	86	14
Coho Salmon (Juveniles)	*Oncorhynchus kisutch*	35	205	36	6
Whitebait Smelt	*Allosmerus elongatus*	6	198	79	33
Soft Sculpin	*Psychrolutes sigalutes*	5	171	160	34
Chum Salmon (Adults)	*Oncorhynchus keta*	29	129	26	4
Lions Mane	*Cyanea capillata*	40	126	12	3
Pacific Saury	*Cololabis saira*	4	62	31	16
Sablefish	*Anoplopoma fimbria*	12	48	23	4
Moon Jellyfish	*Aurelia*	25	44	6	2
Pacific Sea Nettle	*Chrysaora fuscescens*	10	31	8	3
Fried Egg Jellyfish	*Phacellophora camtschatica*	6	11	5	2
Sockeye Salmon (Juveniles)	*Oncorhynchus nerka*	5	9	5	2
Threespine Stickleback	*Gasterosteus aculeatus*	5	9	5	2
Prowfish	*Zaprora silenus*	6	8	2	1
Chinook Salmon (Adults)	*Oncorhynchus tshawytscha*	6	6	1	1
Pacific Spiny Lumpsucker	*Eumicrotremus orbis*	3	4	2	1
North Pacific Spiny Dogfish	*Squalus suckleyi*	2	2	1	1
Rockfishes	*Sebastes*	2	2	1	1
Flatfishes	*Pleuronectiformes*	1	2	2	2
Kelp Greenling	*Hexagrammos decagrammus*	1	1	1	1
Ocean Sunfish	*Mola mola*	1	1	1	1
Pipefishes	*Syngnathidae*	1	1	1	1
Shiner Perch	*Cymatogaster aggregata*	1	1	1	1
Water Jellyfish	*Aequorea*	21			

Table 2. Lengths and weights for each species (arranged descending by the number of length measurements for each by species) sampled during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. Tows = number of tows. Type = Type of length measurement (FL = Fork Length, TL = Total Length, SL = Standard Length, ML = Mantle Length, BD = Bell Diameter). Measured = number of length measurements. Weighed = number of weight measurements.

		Length (mm)					Weight (g)			
Common Name	Tows	Type	Measured	Min	Max	Mean	Weighed	Min	Max	Mean
Pacific Herring	29	FL	1,284	73	214	106				
Opalescent Inshore Squid	18	ML	1,108	15	160	47				
Chum Salmon	49	FL	1,077	156	810	261	329	43	6,980	1,516
Chinook Salmon	66	FL	495	128	555	202	431	25	1,379	117
Whitebait Smelt	6	FL	380	56	185	95				
Walleye Pollock	9	TL	292	25	348	44				
Pink Salmon	16	FL	226	140	267	175	101	30	180	65
Coho Salmon	35	FL	204	204	367	277	198	93	685	271
Lions Mane	39	BD	127	140	660	335				
Pacific Saury	4	FL	124	145	312	271				
Pacific Sand Lance	3	FL	122	49	73	62				
Soft Sculpin	5	TL	122	17	36	27				
Sablefish	12	FL	96	236	290	263				
Moon Jellyfish	17	BD	37	170	390	291				
Pacific Sea Nettle	10	BD	31	115	320	197				
Threespine Stickleback	5	TL	18	41	80	71				
Prowfish	6	TL	16	91	284	148				
Fried Egg Jellyfish	6	BD	11	200	600	388				
Sockeye Salmon	5	FL	9	131	205	153	9	21	91	38
Pacific Spiny Lumpsucker	3	TL	8	23	39	29				
North Pacific Spiny Dogfish	2	TL	4	773	788	780				
Flatfishes	1	TL	2	34	35	34				
Ocean Sunfish	1	TL	2	384	384	384				
Pipefishes	1	TL	2	130	130	130				
Rockfishes	2	TL	2	38	60	49				
Kelp Greenling	1	FL	1	316	316	316				
Shiner Perch	1	FL	1	125	125	125				

8 FIGURES

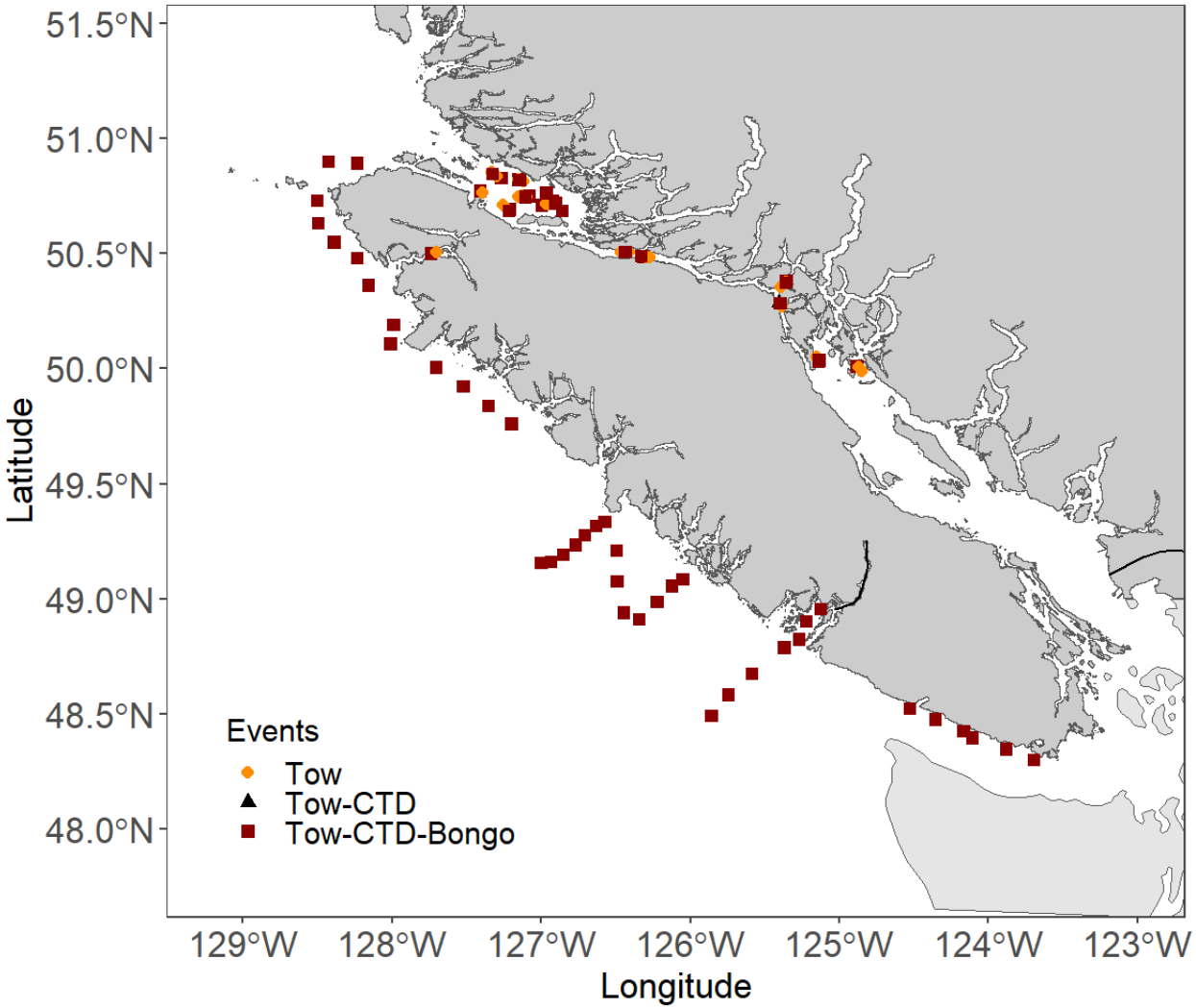

Figure 1. Location of survey events (fishing tows, CTD casts and zooplankton bongo casts) during the juvenile Pacific Salmon trawl survey from October 16 to November 08, 2013 on the CCGS *W.E. Ricker*.

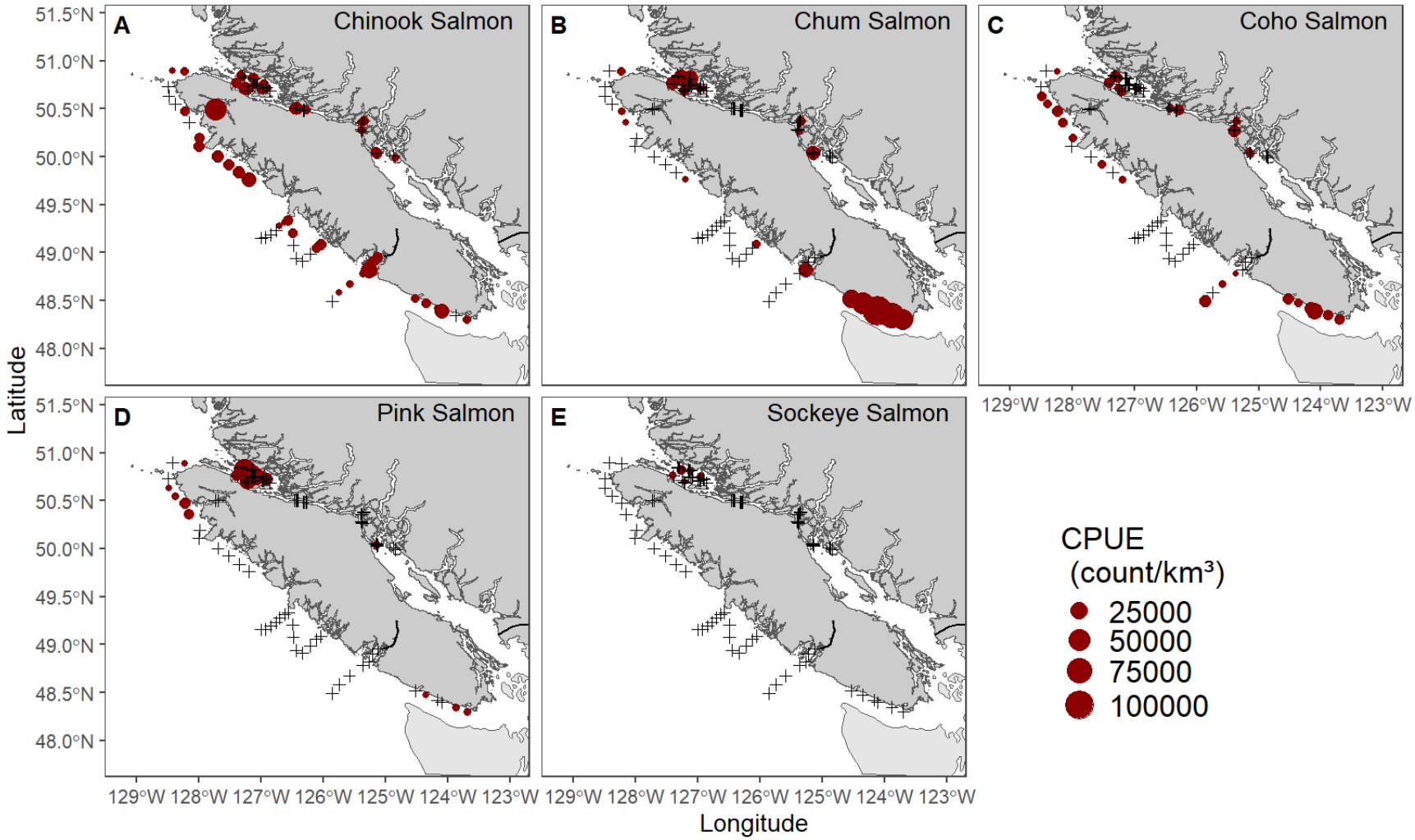

Figure 2. Juvenile Pacific Salmon (*Oncorhynchus* spp.) catch (count) per unit effort (CPUE; count/km^3) for each tow. Circles are proportional to maximum abundance, and zero catches are shown with a cross (+). **A.** juvenile Chinook Salmon. **B.** juvenile Chum Salmon. **C.** juvenile Coho Salmon. **D.** juvenile Pink Salmon. **E.** juvenile Sockeye Salmon.

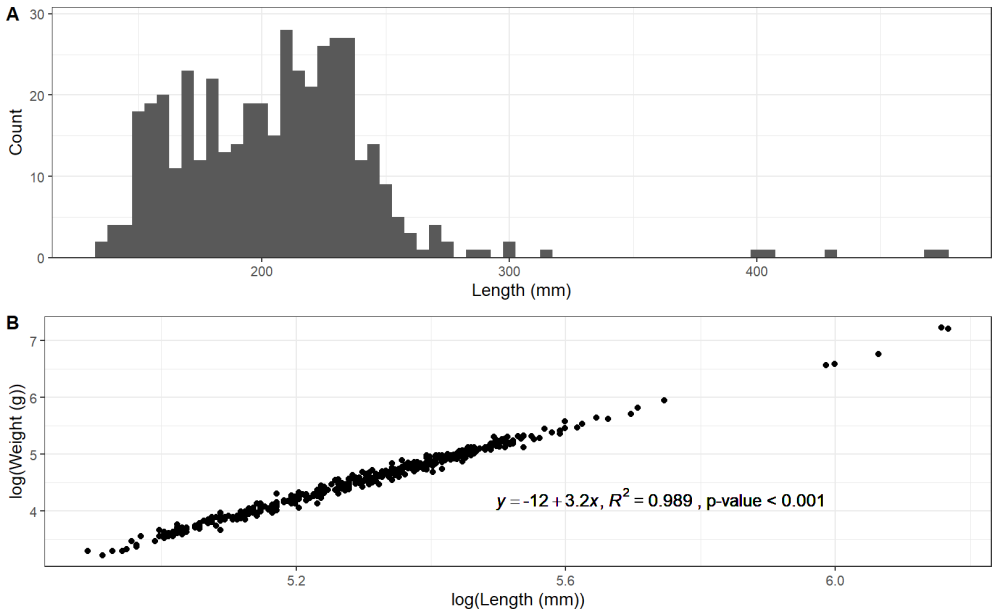

Figure 3. **A.** Chinook Salmon (*Oncorhynchus tshawytscha*) length frequency plot as sampled during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. **B.** Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test.

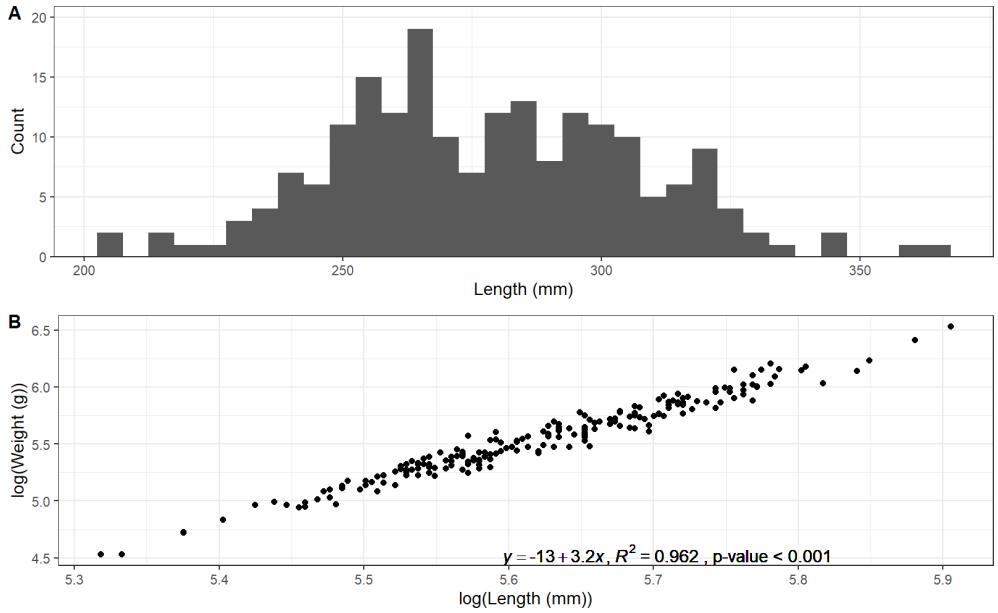

Figure 4. **A.** Coho Salmon (*Oncorhynchus kisutch*) length frequency plot as sampled during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. **B.** Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test.

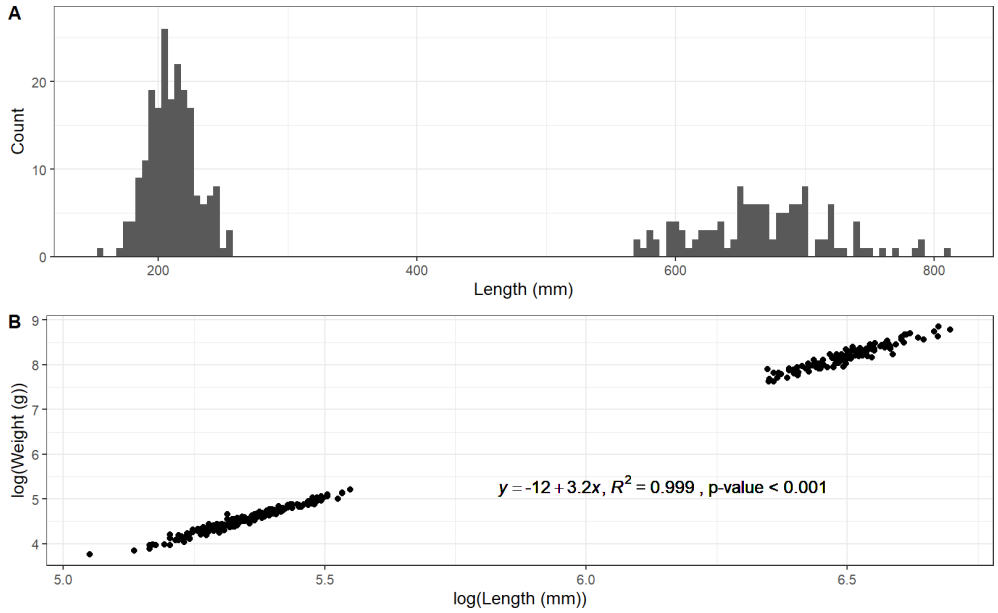

Figure 5. **A.** Chum Salmon (*Oncorhynchus keta*) length frequency plot as sampled during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. **B.** Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test.

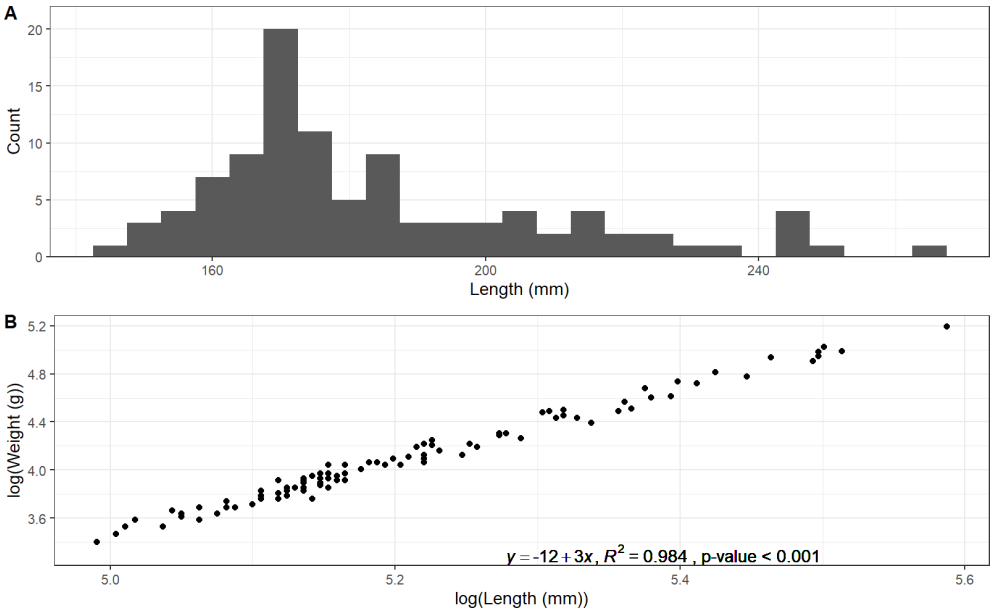

Figure 6. **A.** Pink Salmon (*Oncorhynchus gorbusha*) length frequency plot as sampled during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. **B.** Double log-transformed length-weight regression with outliers removed, using a Bonferroni outlier test.

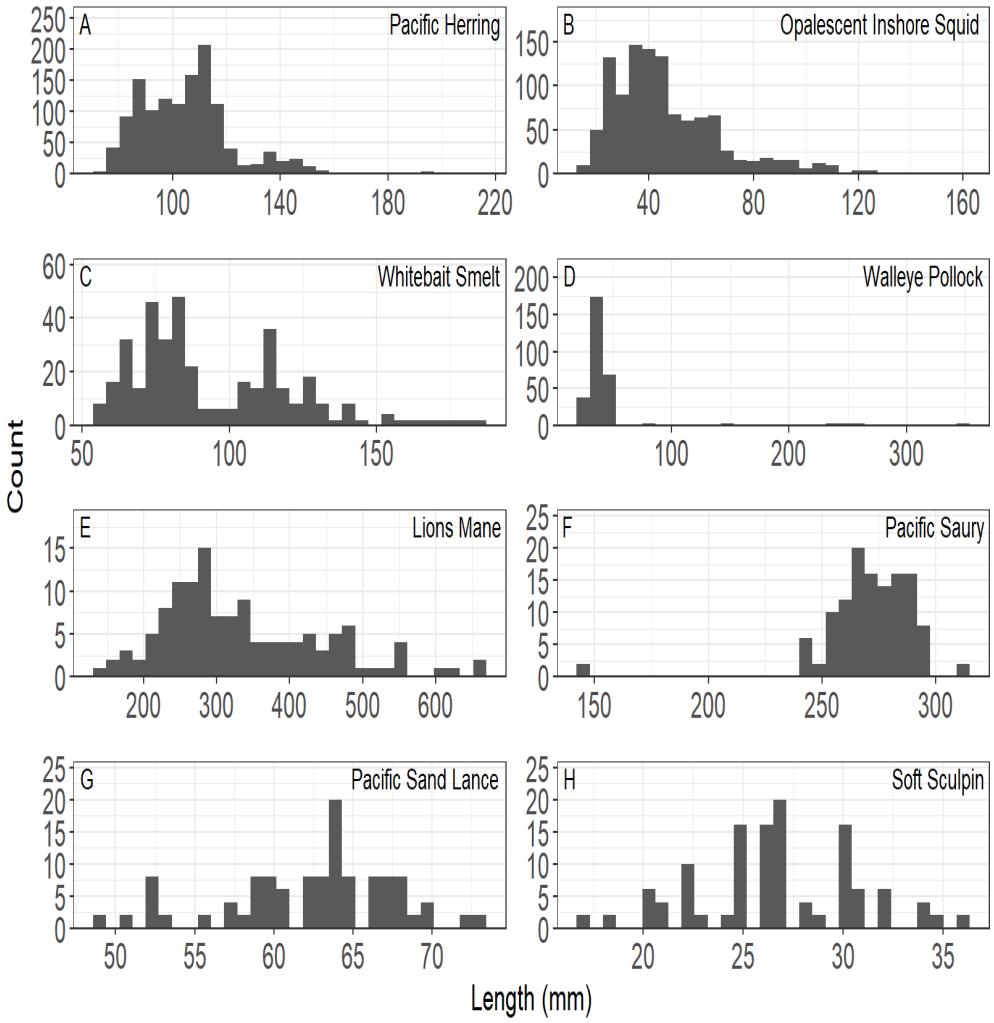

Figure 7. Length (mm) frequency plots for common species sampled (n > 100 samples) during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013. **A.** Pacific Herring (*Clupea pallasii*), length = Fork Length, **B.** Opalescent Inshore Squid (*Doryteuthis opalescens*), length = Mantle Length, **C.** Whitebait Smelt (*Allosmerus elongatus*), length = Fork Length, **D.** Walleye Pollock (*Gadus chalcogrammus*), length = Total Length, **E.** Lions Mane (*Cyanea capillata*), length = Bell Diameter, **F.** Pacific Saury (*Cololabis saira*), length = Fork Length, **G.** Pacific Sand Lance (*Ammodytes personatus*), length = Fork Length, **H.** Soft Sculpin (*Psychrolutes sigalutes*), length = Total Length.

APPENDIX A CANTRAWL 250 NET SPECIFICATIONS

Table A.1. Net specifications for the CanTrawl 250 net used during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013.

Part	Size	Material
Doors	2 m^2	Heavy-duty steel
Door Legs	12.2 m (6.67 fm)	1 inch Spectra rope
Bridles	45.72 m (25 fm)	5/8 Wire Rope
Head Line	76.2 m (41.7 fm)	1 1/8 inch Tenex
Foot Rope	76.2 (41.7 fm)	1/2 chain
Mesh incl. Codend	3.8 cm (1.5 inch)	Knotted nylon
Codend Liner	12.7 mm (0.5 inch)	210/20 knotless liner

APPENDIX B CANTRAWL 250 NET DIAGRAM

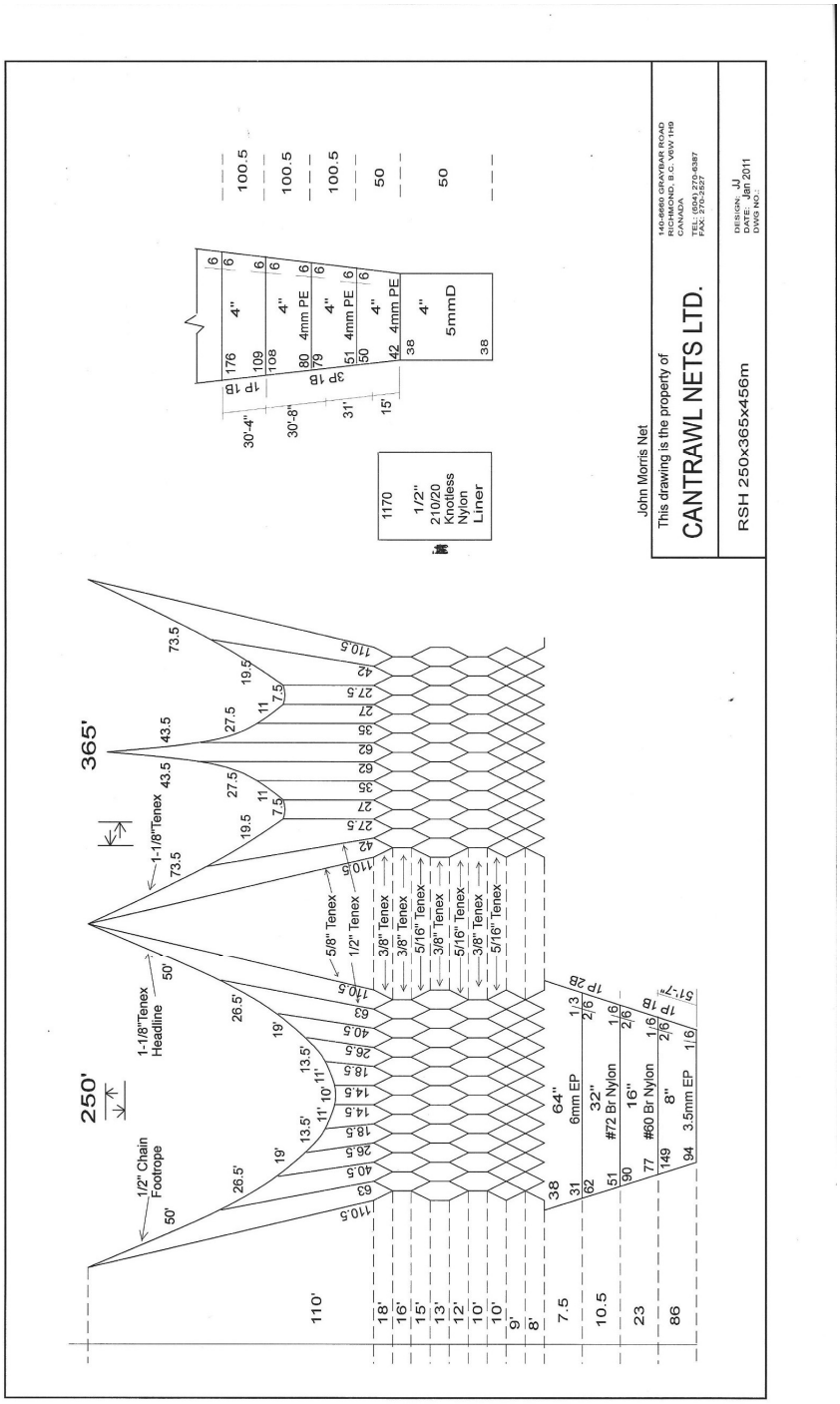

Figure B.1. Net diagram for CanTrawl 250 trawl net used during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013.

APPENDIX C TRAWL BRIDGE LOG DATA

Table C.1. Bridge log information for trawl tows during the juvenile Pacific Salmon trawl survey aboard the CCGS *W.E. Ricker*, October 16 to November 08, 2013.

Station Name	JF01	JF02	JF03	JF04	JF05	JF06
Tow	1	2	3	4	5	6
Date (Pacific)	2013-10-16	2013-10-16	2013-10-16	2013-10-16	2013-10-16	2013-10-16
Start Time (Pacific)	07:46:00	09:10:00	11:13:00	13:14:00	15:00:00	16:42:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	48° 17' 56" N	48° 20' 46" N	48° 23' 46" N	48° 25' 23" N	48° 28' 30" N	48° 31' 19" N
Start Longitude	123° 41' 35" W	123° 52' 37" W	124° 06' 14" W	124° 09' 50" W	124° 21' 18" W	124° 31' 37" W
End Latitude	48° 18' 47" N	48° 21' 22" N	48° 24' 58" N	48° 25' 52" N	48° 29' 02" N	48° 32' 13" N
End Longitude	123° 46' 23" W	123° 56' 56" W	124° 08' 17" W	124° 12' 36" W	124° 24' 07" W	124° 35' 49" W
Direction of Tow (deg)	284	282	311	284	286	287
Vessel Speed (km/h)	12.2	10.7	6.7	6.9	7.0	10.7
Distance Towed (km)	6.11	5.43	3.35	3.50	3.61	5.43
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	0	15	0	15	0
Start Bottom Depth (m)	162	918	103	80	96	96
End Bottom Depth (m)	168	120	61	84	122	
Usable	Y	Y	Y	Y	Y	Y

Station Name	IVI01	IVI02	VI01	VI02	VI03	VI04
Tow	7	8	9	10	11	12
Date (Pacific)	2013-10-17	2013-10-17	2013-10-17	2013-10-17	2013-10-17	2013-10-17
Start Time (Pacific)	07:39:00	09:00:00	10:25:00	12:26:00	14:27:00	16:08:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	48° 57’ 14" N	48° 54’ 07" N	48° 49’ 23" N	48° 47’ 13" N	48° 40’ 26" N	48° 34’ 59" N
Start Longitude	125° 07’ 19" W	125° 13’ 08" W	125° 16’ 05" W	125° 22’ 08" W	125° 35’ 10" W	125° 44’ 38" W
End Latitude	48° 55’ 19" N	48° 52’ 08" N	48° 46’ 44" N	48° 44’ 20" N	48° 38’ 46" N	48° 32’ 53" N
End Longitude	125° 10’ 37" W	125° 14’ 35" W	125° 16’ 12" W	125° 26’ 06" W	125° 37’ 34" W	125° 47’ 06" W
Direction of Tow (deg)	228	205	181	222	223	217
Vessel Speed (km/h)	10.7	8.0	9.6	14.3	8.5	9.8
Distance Towed (km)	5.37	4.07	4.91	7.20	4.28	4.93
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	0	0	15	0
Start Bottom Depth (m)	93	101	96	90	198	67
End Bottom Depth (m)	88	92	77	110	80	79
Usable	Y	Y	Y	Y	Y	Y

Station Name	VI05	VI06	VI07	VI08	VI09	VI10
Tow	13	14	15	16	17	18
Date (Pacific)	2013-10-17	2013-10-18	2013-10-18	2013-10-18	2013-10-18	2013-10-18
Start Time (Pacific)	17:29:00	07:38:00	09:31:00	11:04:00	12:41:00	14:28:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	48° 29' 24" N	49° 05' 06" N	49° 03' 14" N	48° 59' 06" N	48° 54' 32" N	48° 56' 20" N
Start Longitude	125° 51' 25" W	126° 02' 53" W	126° 07' 16" W	126° 13' 08" W	126° 20' 31" W	126° 26' 42" W
End Latitude	48° 31' 19" N	49° 03' 22" N	49° 01' 44" N	48° 57' 40" N	48° 52' 23" N	48° 58' 01" N
End Longitude	125° 51' 50" W	126° 05' 53" W	126° 08' 56" W	126° 15' 50" W	126° 22' 41" W	126° 27' 25" W
Direction of Tow (deg)	351	228	216	230	213	344
Vessel Speed (km/h)	7.0	9.6	6.9	8.3	9.4	6.3
Distance Towed (km)	3.59	4.87	3.44	4.24	4.80	3.24
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	15	0	15	30	0	15
Start Bottom Depth (m)	108	52	59	107	148	161
End Bottom Depth (m)	84	52	69		165	156
Usable	Y	Y	Y	Y	Y	Y

Station Name	VI11	VI12	EP01	EP02	EP03	EP04
Tow	19	20	21	22	23	24
Date (Pacific)	2013-10-18	2013-10-18	2013-10-19	2013-10-19	2013-10-19	2013-10-19
Start Time (Pacific)	16:16:00	17:35:00	07:33:00	08:49:00	10:05:00	11:21:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	49° 04’ 26" N	49° 12’ 32" N	49° 20’ 02" N	49° 18’ 54" N	49° 16’ 34" N	49° 14’ 02" N
Start Longitude	126° 29’ 20" W	126° 29’ 35" W	126° 34’ 12" W	126° 37’ 48" W	126° 42’ 25" W	126° 46’ 08" W
End Latitude	49° 07’ 12" N	49° 15’ 25" N	49° 18’ 43" N	49° 17’ 17" N	49° 15’ 07" N	49° 12’ 54" N
End Longitude	126° 30’ 00" W	126° 29’ 13" W	126° 37’ 16" W	126° 40’ 59" W	126° 44’ 46" W	126° 48’ 07" W
Direction of Tow (deg)	351	5	236	232	227	228
Vessel Speed (km/h)	10.2	10.6	8.7	9.6	7.8	6.3
Distance Towed (km)	5.19	5.35	4.43	4.87	3.89	3.20
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	0	0	15	15
Start Bottom Depth (m)	135	97	59	100	115	126
End Bottom Depth (m)	121	75	92	111	115	
Usable	Y	Y	Y	Y	Y	Y

Station Name	EP05	EP06	EP07	VI13	VI14	VI15
Tow	25	26	27	28	29	30
Date (Pacific)	2013-10-19	2013-10-19	2013-10-19	2013-10-20	2013-10-20	2013-10-20
Start Time (Pacific)	12:37:00	14:02:00	15:31:00	07:28:00	08:55:00	10:33:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	49° 11’ 28" N	49° 09’ 32" N	49° 09’ 18" N	49° 45’ 36" N	49° 50’ 13" N	49° 55’ 23" N
Start Longitude	126° 50’ 56" W	126° 56’ 02" W	126° 59’ 56" W	127° 11’ 46" W	127° 21’ 04" W	127° 31’ 16" W
End Latitude	49° 09’ 50" N	49° 08’ 28" N	49° 11’ 31" N	49° 47’ 31" N	49° 51’ 40" N	49° 55’ 48" N
End Longitude	126° 54’ 00" W	126° 58’ 41" W	127° 00’ 29" W	127° 15’ 47" W	127° 23’ 56" W	127° 36’ 04" W
Direction of Tow (deg)	231	238	351	306	307	277
Vessel Speed (km/h)	9.4	7.4	8.3	11.9	8.7	11.5
Distance Towed (km)	4.78	3.78	4.17	5.98	4.35	5.78
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	30	0	0	15	0
Start Bottom Depth (m)	150	223	450	56	78	68
End Bottom Depth (m)	188	410	277	43	73	59
Usable	Y	Y	Y	Y	Y	Y

Station Name	VI16	VI17	VI18	VI19	QCSD01	QCSD02
Tow	31	32	33	34	35	36
Date (Pacific)	2013-10-20	2013-10-20	2013-10-20	2013-10-20	2013-10-21	2013-10-21
Start Time (Pacific)	12:16:00	13:29:00	15:45:00	17:34:00	07:30:00	09:13:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	30	30
Start Latitude	50° 00’ 14" N	50° 06’ 25" N	50° 11’ 20" N	50° 21’ 36" N	50° 53’ 28" N	50° 53’ 56" N
Start Longitude	127° 42’ 04" W	128° 00’ 32" W	127° 59’ 17" W	128° 09’ 18" W	128° 13’ 52" W	128° 25’ 23" W
End Latitude	50° 00’ 36" N	50° 09’ 07" N	50° 13’ 55" N	50° 23’ 42" N	50° 52’ 41" N	50° 54’ 11" N
End Longitude	127° 47’ 06" W	128° 00’ 25" W	127° 58’ 23" W	128° 11’ 10" W	128° 18’ 07" W	128° 28’ 44" W
Direction of Tow (deg)	276	1	12	330	254	277
Vessel Speed (km/h)	12.0	10.0	9.6	8.9	10.4	7.8
Distance Towed (km)	6.04	5.00	4.91	4.46	5.19	3.94
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	0	15	0	15
Start Bottom Depth (m)	164	160	74	132	53	54
End Bottom Depth (m)	124	91	50	127	53	
Usable	Y	Y	Y	Y	Y	Y

Station Name	VI20	VI21	VI22	VI23	IVI03	IVI04
Tow	37	38	39	40	41	42
Date (Pacific)	2013-10-21	2013-10-21	2013-10-21	2013-10-21	2013-10-22	2013-10-22
Start Time (Pacific)	11:36:00	13:09:00	14:50:00	16:22:00	07:41:00	08:25:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	30	30	30	30	15	15
Start Latitude	50° 43’ 41" N	50° 37’ 48" N	50° 32’ 53" N	50° 28’ 41" N	50° 29’ 56" N	50° 30’ 22" N
Start Longitude	128° 29’ 56" W	128° 29’ 31" W	128° 23’ 13" W	128° 13’ 55" W	127° 44’ 10" W	127° 42’ 00" W
End Latitude	50° 41’ 46" N	50° 35’ 49" N	50° 31’ 16" N	50° 27’ 07" N	50° 30’ 22" N	50° 29’ 53" N
End Longitude	128° 29’ 24" W	128° 27’ 43" W	128° 20’ 24" W	128° 12’ 32" W	127° 42’ 18" W	127° 43’ 55" W
Direction of Tow (deg)	170	150	132	150	70	248
Vessel Speed (km/h)	7.2	8.3	8.9	6.5	9.3	9.6
Distance Towed (km)	3.61	4.24	4.48	3.32	2.33	2.43
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	0	15	0	15
Start Bottom Depth (m)	86	126	122	100	117	119
End Bottom Depth (m)	89	139				117
Usable	Y	Y	Y	Y	Y	Y

Station Name	QCST01	QCST02	QCST03	QCST04	QCST05	QCST06
Tow	43	44	45	46	47	48
Date (Pacific)	2013-11-03	2013-11-03	2013-11-03	2013-11-03	2013-11-03	2013-11-03
Start Time (Pacific)	07:35:00	09:10:00	09:55:00	10:39:00	11:56:00	12:40:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	2	20	20	20	20	20
Start Latitude	50° 41’ 06" N	50° 43’ 37" N	50° 42’ 36" N	50° 42’ 50" N	50° 42’ 29" N	50° 42’ 54" N
Start Longitude	126° 51’ 29" W	126° 55’ 12" W	126° 58’ 37" W	126° 57’ 22" W	126° 59’ 35" W	126° 57’ 54" W
End Latitude		50° 42’ 43" N	50° 43’ 08" N	50° 42’ 25" N	50° 43’ 05" N	50° 42’ 25" N
End Longitude		126° 58’ 05" W	126° 56’ 24" W	126° 59’ 20" W	126° 57’ 43" W	126° 59’ 38" W
Direction of Tow (deg)		244	69	251	63	246
Vessel Speed (km/h)		11.3	8.5	7.4	7.2	6.7
Distance Towed (km)		3.78	2.82	2.46	2.43	2.22
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	0	15	30	45	60
Start Bottom Depth (m)	177	129	167	131	195	126
End Bottom Depth (m)		160	124	194	118	195
Usable	N	Y	Y	Y	Y	Y

Station Name	QCST07	QCST08	QCST09	QCST10	QCST11	QCST22
Tow	49	50	51	52	53	54
Date (Pacific)	2013-11-03	2013-11-03	2013-11-03	2013-11-03	2013-11-03	2013-11-04
Start Time (Pacific)	14:09:00	14:51:00	15:34:00	16:17:00	17:29:00	07:36:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	20	20
Start Latitude	50° 44’ 56" N	50° 45’ 00" N	50° 44’ 53" N	50° 44’ 42" N	50° 44’ 38" N	50° 46’ 12" N
Start Longitude	127° 04’ 52" W	127° 07’ 59" W	127° 05’ 56" W	127° 09’ 07" W	127° 06’ 11" W	127° 24’ 18" W
End Latitude	50° 44’ 53" N	50° 44’ 53" N	50° 44’ 42" N	50° 44’ 31" N	50° 44’ 28" N	50° 45’ 22" N
End Longitude	127° 08’ 10" W	127° 06’ 04" W	127° 08’ 24" W	127° 07’ 19" W	127° 08’ 17" W	127° 22’ 48" W
Direction of Tow (deg)	268	96	263	99	262	132
Vessel Speed (km/h)	11.7	6.9	8.7	6.5	7.4	7.0
Distance Towed (km)	3.87	2.26	2.91	2.13	2.48	2.35
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	30	45	60	0
Start Bottom Depth (m)	140	181	181	168	193	252
End Bottom Depth (m)	176	185	164	150	177	284
Usable	Y	Y	Y	Y	Y	Y

Station Name	QCST12	QCST13	QCST23	QCST14	QCST15	QCST16
Tow	55	56	57	58	59	60
Date (Pacific)	2013-11-04	2013-11-04	2013-11-04	2013-11-04	2013-11-04	2013-11-04
Start Time (Pacific)	07:39:00	08:26:00	08:36:00	09:08:00	09:58:00	10:33:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	20	20
Start Latitude	50° 41’ 28" N	50° 42’ 40" N	50° 45’ 43" N	50° 41’ 53" N	50° 42’ 40" N	50° 41’ 02" N
Start Longitude	127° 12’ 40" W	127° 15’ 14" W	127° 23’ 24" W	127° 13’ 55" W	127° 15’ 07" W	127° 12’ 47" W
End Latitude	50° 42’ 36" N	50° 41’ 49" N	50° 45’ 00" N	50° 42’ 40" N	50° 41’ 49" N	50° 42’ 25" N
End Longitude	127° 15’ 07" W	127° 13’ 30" W	127° 22’ 05" W	127° 15’ 22" W	127° 13’ 16" W	127° 14’ 28" W
Direction of Tow (deg)	306	127	131	310	125	322
Vessel Speed (km/h)	10.7	7.8	6.1	6.7	8.0	9.6
Distance Towed (km)	3.57	2.57	2.04	2.22	2.69	3.22
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	15	30	45	60
Start Bottom Depth (m)	79	161	322	89	159	89
End Bottom Depth (m)	155	85	199	167	89	86
Usable	Y	Y	Y	Y	Y	Y

Station Name	QCST24	QCST17	QCST18	QCST19	QCST20	QCST21
Tow	61	62	63	64	65	66
Date (Pacific)	2013-11-04	2013-11-04	2013-11-04	2013-11-04	2013-11-04	2013-11-04
Start Time (Pacific)	10:38:00	13:07:00	13:50:00	14:32:00	15:16:00	16:00:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	30	20
Start Latitude	50° 49’ 08" N	50° 49’ 37" N	50° 50’ 42" N	50° 50’ 13" N	50° 51’ 07" N	50° 50’ 42" N
Start Longitude	127° 09’ 14" W	127° 15’ 58" W	127° 18’ 25" W	127° 17’ 56" W	127° 19’ 52" W	127° 19’ 30" W
End Latitude	50° 48’ 32" N	50° 50’ 46" N	50° 50’ 02" N	50° 51’ 07" N	50° 50’ 06" N	50° 51’ 36" N
End Longitude	127° 06’ 43" W	127° 18’ 18" W	127° 16’ 55" W	127° 19’ 48" W	127° 18’ 58" W	127° 20’ 56" W
Direction of Tow (deg)	111	308	125	307	151	315
Vessel Speed (km/h)	9.4	10.4	6.5	8.1	4.3	7.0
Distance Towed (km)	3.15	3.46	2.15	2.74	2.17	2.37
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	0	15	30	45	60
Start Bottom Depth (m)	148	67	132	130	135	133
End Bottom Depth (m)	165	134	108	140	150	143
Usable	Y	Y	Y	Y	Y	Y

Station Name	QCST25	QCST26	QCST27	QCST28	QCST29	QCST30
Tow	67	68	69	70	71	72
Date (Pacific)	2013-11-05	2013-11-05	2013-11-05	2013-11-05	2013-11-05	2013-11-05
Start Time (Pacific)	11:19:00	12:08:00	12:49:00	13:32:00	15:42:00	16:35:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	30	30
Start Latitude	50° 48’ 54" N	50° 49’ 16" N	50° 48’ 47" N	50° 49’ 05" N	50° 45’ 40" N	50° 43’ 05" N
Start Longitude	127° 07’ 12" W	127° 09’ 07" W	127° 07’ 16" W	127° 08’ 31" W	126° 57’ 47" W	126° 54’ 00" W
End Latitude	50° 49’ 48" N	50° 48’ 50" N	50° 49’ 16" N	50° 48’ 32" N	50° 44’ 17" N	50° 40’ 59" N
End Longitude	127° 08’ 53" W	127° 06’ 50" W	127° 08’ 53" W	127° 06’ 32" W	126° 54’ 54" W	126° 52’ 34" W
Direction of Tow (deg)	310	106	295	113	127	156
Vessel Speed (km/h)	7.8	8.3	6.3	7.6	8.3	8.3
Distance Towed (km)	2.57	2.78	2.09	2.52	4.24	4.24
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	15	30	45	60	0	0
Start Bottom Depth (m)	157	149	164	160	145	143
End Bottom Depth (m)	155	159	151	164	157	190
Usable	Y	Y	Y	Y	Y	Y

Station Name	JS01	JS02	JS03	JS04	JS05	JS06
Tow	73	74	75	76	77	78
Date (Pacific)	2013-11-06	2013-11-06	2013-11-06	2013-11-06	2013-11-06	2013-11-06
Start Time (Pacific)	07:34:00	08:17:00	08:59:00	09:40:00	10:18:00	12:40:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	30	20
Start Latitude	50° 30’ 18" N	50° 30’ 14" N	50° 30’ 22" N	50° 30’ 14" N	50° 30’ 18" N	50° 29’ 10" N
Start Longitude	126° 25’ 52" W	126° 25’ 34" W	126° 24’ 43" W	126° 27’ 43" W	126° 26’ 02" W	126° 18’ 50" W
End Latitude	50° 30’ 18" N	50° 30’ 14" N	50° 30’ 18" N	50° 30’ 22" N	50° 30’ 14" N	50° 28’ 48" N
End Longitude	126° 24’ 18" W	126° 24’ 07" W	126° 27’ 18" W	126° 26’ 20" W	126° 23’ 53" W	126° 16’ 23" W
Direction of Tow (deg)	90	90	268	82	92	103
Vessel Speed (km/h)	5.6	5.0	9.1	4.8	5.0	8.9
Distance Towed (km)	1.83	1.70	3.04	1.65	2.56	2.98
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	0	15	30	45	60	0
Start Bottom Depth (m)	341	339	324	375	359	367
End Bottom Depth (m)	328	332	375	347	358	310
Usable	Y	Y	Y	Y	Y	Y

Station Name	JS07	JS08	JS09	JS10	JS11	JS12
Tow	79	80	81	82	83	84
Date (Pacific)	2013-11-06	2013-11-06	2013-11-06	2013-11-06	2013-11-07	2013-11-07
Start Time (Pacific)	13:25:00	14:10:00	14:53:00	15:38:00	07:32:00	08:15:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	20	20
Start Latitude	50° 28’ 55" N	50° 29’ 13" N	50° 28’ 55" N	50° 29’ 13" N	50° 22’ 48" N	50° 21’ 18" N
Start Longitude	126° 16’ 26" W	126° 18’ 50" W	126° 17’ 24" W	126° 19’ 37" W	125° 21’ 11" W	125° 23’ 24" W
End Latitude	50° 29’ 06" N	50° 28’ 55" N	50° 29’ 06" N	50° 28’ 55" N	50° 21’ 29" N	50° 22’ 01" N
End Longitude	126° 19’ 01" W	126° 16’ 44" W	126° 19’ 12" W	126° 16’ 30" W	125° 23’ 31" W	125° 21’ 40" W
Direction of Tow (deg)	276	103	279	99	228	57
Vessel Speed (km/h)	9.3	7.6	6.5	11.1	11.1	7.4
Distance Towed (km)	3.06	2.54	2.15	3.72	3.69	2.44
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	15	30	45	60	0	15
Start Bottom Depth (m)	326	352	338	348	210	279
End Bottom Depth (m)	371	333	340	330	271	224
Usable	Y	Y	Y	Y	Y	Y

Station Name	JS13	JS14	JS15	JS16	JS17	JS18
Tow	85	86	87	88	89	90
Date (Pacific)	2013-11-07	2013-11-07	2013-11-07	2013-11-07	2013-11-07	2013-11-07
Start Time (Pacific)	09:01:00	09:41:00	10:26:00	12:29:00	13:11:00	13:56:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	20	20
Start Latitude	50° 22’ 41" N	50° 21’ 32" N	50° 22’ 19" N	50° 17’ 06" N	50° 16’ 05" N	50° 16’ 59" N
Start Longitude	125° 21’ 18" W	125° 22’ 59" W	125° 21’ 29" W	125° 24’ 11" W	125° 23’ 02" W	125° 24’ 04" W
End Latitude	50° 21’ 40" N	50° 22’ 12" N	50° 21’ 36" N	50° 15’ 50" N	50° 17’ 31" N	50° 15’ 54" N
End Longitude	125° 22’ 55" W	125° 21’ 40" W	125° 23’ 10" W	125° 23’ 13" W	125° 24’ 29" W	125° 23’ 17" W
Direction of Tow (deg)	225	52	236	154	327	155
Vessel Speed (km/h)	8.1	5.9	7.2	7.8	9.4	6.7
Distance Towed (km)	2.69	1.98	2.39	2.59	3.17	2.20
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	30	45	60	0	15	30
Start Bottom Depth (m)	208	284	208	208	205	205
End Bottom Depth (m)	270	207	286	244	182	244
Usable	Y	Y	Y	Y	Y	Y

Station Name	JS19	JS20	DI01	DI02	DI03	DI04
Tow	91	92	93	94	95	96
Date (Pacific)	2013-11-07	2013-11-07	2013-11-08	2013-11-08	2013-11-08	2013-11-08
Start Time (Pacific)	14:38:00	15:21:00	07:43:00	08:23:00	09:03:00	09:45:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20	20	20
Start Latitude	50° 16’ 16" N	50° 16’ 55" N	50° 01’ 44" N	50° 03’ 04" N	50° 02’ 06" N	50° 02’ 31" N
Start Longitude	125° 23’ 17" W	125° 23’ 46" W	125° 08’ 17" W	125° 09’ 04" W	125° 08’ 17" W	125° 08’ 49" W
End Latitude	50° 17’ 28" N	50° 15’ 36" N	50° 03’ 22" N	50° 01’ 55" N	50° 03’ 25" N	50° 01’ 44" N
End Longitude	125° 24’ 14" W	125° 22’ 55" W	125° 09’ 18" W	125° 08’ 02" W	125° 09’ 00" W	125° 08’ 13" W
Direction of Tow (deg)	333	158	125	150	341	154
Vessel Speed (km/h)	7.4	8.0	9.8	7.2	7.8	4.8
Distance Towed (km)	2.50	2.65	3.24	2.44	2.59	1.61
Net Opening Height (m)	14	14	14	14	14	14
Net Opening Width (m)	36	36	36	36	36	36
Warp Length (m)	150	150	150	150	150	150
Target Headrope Depth (m)	45	60	0	15	30	45
Start Bottom Depth (m)	232	206	185	172	200	179
End Bottom Depth (m)	140	242	161	209	174	191
Usable	Y	Y	Y	Y	Y	Y

Station Name	DI05	DI06	DI07	DI08
Tow	97	98	99	100
Date (Pacific)	2013-11-08	2013-11-08	2013-11-08	2013-11-08
Start Time (Pacific)	10:27:00	13:23:00	14:04:00	14:45:00
Net	CanTrawl 250	CanTrawl 250	CanTrawl 250	CanTrawl 250
Duration (min)	20	20	20	20
Start Latitude	50° 02’ 10" N	50° 00’ 29" N	49° 59’ 24" N	50° 00’ 29" N
Start Longitude	125° 08’ 06" W	124° 52’ 48" W	124° 50’ 49" W	124° 52’ 19" W
End Latitude	50° 03’ 22" N	49° 59’ 20" N	50° 00’ 25" N	49° 59’ 35" N
End Longitude	125° 08’ 35" W	124° 50’ 56" W	124° 52’ 26" W	124° 51’ 00" W
Direction of Tow (deg)	346	134	314	137
Vessel Speed (km/h)	6.9	9.3	8.1	6.9
Distance Towed (km)	2.30	3.06	2.70	2.30
Net Opening Height (m)	14	14	14	14
Net Opening Width (m)	36	36	36	36
Warp Length (m)	150	150	150	150
Target Headrope Depth (m)	60	0	15	30
Start Bottom Depth (m)	213	271	253	273
End Bottom Depth (m)	209	258	271	260
Usable	Y	Y	Y	Y

APPENDIX D CTD CASTS AND ZOOPLANKTON TOWS

Table D.1. CTD casts and vertical bongo tow times and depths during the juvenile Pacific Salmon trawl survey from October 16 to November 08, 2013 on the CCGS *W.E. Ricker*.

				CTD			BONGO		
Date	Station	Latitude	Longitude	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)
2013-10-16	JF01	48° 17' 24" N	123° 39' 54" W	07:10	165	150	07:24	165	150
2013-10-16	JF02	48° 20' 28" N	123° 51' 00" W	08:48	129	120	09:00	129	120
2013-10-16	JF03	48° 23' 20" N	124° 04' 59" W	10:42	108	95	10:53	105	95
2013-10-16	JF04	48° 25' 41" N	124° 11' 53" W	12:23	90	80	12:32	85	75
2013-10-16	JF05	48° 28' 26" N	124° 20' 38" W	14:38	77	70	14:47	68	55
2013-10-16	JF06	48° 31' 12" N	124° 30' 36" W	16:17	99	90	16:22	100	90
2013-10-17	IVI01	48° 57' 50" N	125° 06' 54" W	07:11	93	85	07:21	93	85
2013-10-17	IVI02	48° 54' 43" N	125° 12' 32" W	08:32	96	85	08:42	96	85
2013-10-17	VI01	48° 50' 17" N	125° 16' 01" W	09:56	99	90	10:06	100	90
2013-10-17	VI02	48° 47' 13" N	125° 22' 08" W	11:55	92	90	12:04	90	80
2013-10-17	VI03	48° 41' 02" N	125° 34' 19" W	13:54	175	165	14:05	175	150
2013-10-17	VI04	48° 35' 31" N	125° 43' 37" W	15:42	64	55	15:50	64	55
2013-10-17	VI05	48° 31' 34" N	125° 51' 40" W	18:13	85	75	18:21	85	75
2013-10-18	VI06	49° 05' 42" N	126° 01' 37" W	07:13	41	35	07:20	43	35
2013-10-18	VI07	49° 03' 18" N	126° 06' 29" W	08:32	58	50	08:41	58	50
2013-10-18	VI08	48° 59' 20" N	126° 12' 54" W	10:38	98	90	10:46	96	85
2013-10-18	VI09	48° 55' 08" N	126° 19' 37" W	12:11	141	130	12:22	141	130
2013-10-18	VI10	48° 55' 52" N	126° 26' 06" W	13:57	158	150	14:07	160	150
2013-10-18	VI11	49° 03' 43" N	126° 28' 55" W	15:47	135	125	15:56	135	125
2013-10-18	VI12	49° 15' 50" N	126° 29' 20" W	18:25	71	60	18:33	72	60
2013-10-19	EP01	49° 20' 31" N	126° 32' 56" W	07:10	44	35	07:17	44	35
2013-10-19	EP02	49° 18' 50" N	126° 37' 01" W	08:23	90	80	08:30	89	80
2013-10-19	EP03	49° 16' 44" N	126° 41' 31" W	09:37	113	105	09:46	114	105
2013-10-19	EP04	49° 14' 46" N	126° 45' 22" W	10:54	122	115	11:02	122	110
2013-10-19	EP05	49° 12' 11" N	126° 49' 19" W	12:05	146	135	12:15	146	135

				CTD			BONGO		
Date	Station	Latitude	Longitude	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)
2013-10-19	EP06	49° 09' 47" N	126° 54' 58" W	13:30	199	189	13:42	198	150
2013-10-19	EP07	49° 08' 46" N	126° 59' 35" W	14:57	435	250	15:10	437	150
2013-10-20	VI13	49° 45' 00" N	127° 10' 19" W	07:04	70	60	07:11	70	60
2013-10-20	VI14	49° 49' 48" N	127° 19' 55" W	08:33	78	70	08:40	77	65
2013-10-20	VI15	49° 55' 16" N	127° 30' 04" W	10:08	50	62	10:16	66	55
2013-10-20	VI16	50° 00' 00" N	127° 40' 23" W	11:49	85	75	11:57	89	80
2013-10-20	VI17	50° 04' 52" N	127° 59' 56" W	13:52	179	170	14:03	179	150
2013-10-20	VI18	50° 10' 19" N	127° 59' 53" W	15:20	86	76	15:28	86	75
2013-10-20	VI19	50° 24' 00" N	128° 11' 38" W	18:19	126	115	18:28	128	120
2013-10-21	QCSD01	50° 53' 31" N	128° 13' 01" W	07:08	41	35	07:15	41	30
2013-10-21	QCSD02	50° 53' 42" N	128° 24' 25" W	08:40	54	45	08:57	55	45
2013-10-21	VI20	50° 44' 20" N	128° 30' 14" W	11:09	93	75	11:16	83	75
2013-10-21	VI21	50° 38' 13" N	128° 29' 53" W	12:41	123	115	12:49	122	115
2013-10-21	VI22	50° 33' 04" N	128° 23' 46" W	14:19	146	135	14:30	145	135
2013-10-21	VI23	50° 29' 17" N	128° 14' 20" W	16:05	47	38	16:12	47	35
2013-10-21	IVI03	50° 29' 38" N	127° 45' 07" W	07:13	110	100	07:21	108	100
2013-11-03	QCST01	50° 41' 06" N	126° 56' 10" W	07:51	173	165	07:11	173	150
2013-11-03	QCST02	50° 43' 55" N	126° 54' 18" W	09:39	140	130	08:49	142	130
2013-11-03	QCST05	50° 42' 25" N	126° 59' 56" W	12:33	194	15	11:16	194	150
2013-11-03	QCST07	50° 44' 42" N	127° 03' 36" W	14:37	138	130	13:47	146	135
2013-11-03	QCST11	50° 44' 28" N	127° 09' 22" W	19:08	170	160	18:19	170	150
2013-11-04	QCST12	50° 40' 59" N	127° 11' 49" W	08:11	89	80	07:20	70	60
2013-11-04	QCST16	50° 42' 43" N	127° 15' 00" W	12:21	153	140	11:30	148	140
2013-11-04	QCST17	50° 49' 08" N	127° 15' 43" W	13:37	132	120	12:46	136	125
2013-11-04	QCST21	50° 52' 23" N	127° 22' 05" W	17:39	150	140	16:51	153	143

				CTD			BONGO		
Date	Station	Latitude	Longitude	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)	Start Time (PDT)	Bottom Depth (m)	Gear Depth (m)
2013-11-05	QCST22	50° 46' 16" N	127° 24' 50" W	07:58	273	250	07:12	273	150
2013-11-05	QCST24	50° 49' 16" N	127° 10' 34" W	11:04	161	150	10:16	168	150
2013-11-05	QCST28	50° 48' 07" N	127° 06' 18" W	15:08	178	170	14:19	176	150
2013-11-05	QCST29	50° 46' 08" N	126° 58' 59" W	16:11	206	195	15:22	205	150
2013-11-05	QCST30	50° 40' 55" N	126° 52' 41" W	18:45	188	175	17:57	190	150
2013-11-06	JS01	50° 30' 22" N	126° 26' 13" W	07:59	344	250	07:13	354	150
2013-11-06	JS05	50° 30' 14" N	126° 24' 14" W	12:09	330	250	23:22	332	150
2013-11-06	JS06	50° 29' 20" N	126° 19' 59" W	13:07	363	250	12:20	363	150
2013-11-06	JS10	50° 29' 06" N	126° 15' 58" W	17:20	363	250	16:33	361	150
2013-11-07	JS11	50° 22' 16" N	125° 21' 00" W	07:56	209	200	07:09	209	150
2013-11-07	JS15	50° 21' 25" N	125° 23' 53" W	12:04	266	250	23:19	266	150
2013-11-07	JS16	50° 17' 28" N	125° 24' 22" W	13:10	174	165			
2013-11-07	JS20	50° 15' 14" N	125° 22' 48" W	17:01	235	225	16:13	240	150
2013-11-08	DI01	50° 01' 16" N	125° 07' 55" W	08:13	174	165	07:23	178	150
2013-11-08	DI05	50° 03' 47" N	125° 08' 42" W	12:03	192	180	23:14	193	150
2013-11-08	DI06	50° 00' 43" N	124° 53' 56" W	13:49	183	175	13:00	190	150
2013-11-08	DI10	50° 00' 50" N	124° 53' 10" W	17:14	256	245	16:28	253	150

APPENDIX E CATCH DATA

Table E.1. Catch (counts) of species (or taxonomic groups where species identification could not be made with certainty) captured during the juvenile Pacific Salmon trawl survey from October 16 to November 08, 2013 on the CCGS *W.E. Ricker*.

Tow	1	2	3	4	5	6	7
Station ID	JF01	JF02	JF03	JF04	JF05	JF06	IVI01
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	6		26	1	4	4	10
Chum Salmon (Adults)			15	1	3		
Chum Salmon (Juveniles)	140	197	183	80	90	86	
Coho Salmon (Juveniles)	11	12	36	16	3	16	
Pink Salmon (Juveniles)	2	2			1		
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane							
Moon Jellyfish				1	0		1
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid	2						2
Pacific Herring			1	1			
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							
Rockfishes							
Sablefish							
Shiner Perch							
Soft Sculpin							
Threespine Stickleback	5			1		1	
Walleye Pollock	2						
Water Jellyfish							
Whitebait Smelt							
TOTAL	168	211	261	101	101	107	13

Tow	8	9	10	11	12	13	14
Station ID	IVI02	VI01	VI02	VI03	VI04	VI05	VI06
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	10	55	3	2	1		15
Chum Salmon (Adults)			1			13	1
Chum Salmon (Juveniles)		40					4
Coho Salmon (Juveniles)			1	2		15	
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes	2						
Fried Egg Jellyfish		1					
Kelp Greenling							
Lions Mane		1					
Moon Jellyfish		3	1	3	1		1
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid	89						240
Pacific Herring		1					23
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle				2	2		
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							2
Rockfishes							
Sablefish							
Shiner Perch							
Soft Sculpin							
Threespine Stickleback					1		
Walleye Pollock							
Water Jellyfish							
Whitebait Smelt							
TOTAL	101	101	6	9	5	28	286

Tow	15	17	18	19	20	21	22
Station ID	VI07	VI09	VI10	VI11	VI12	EP01	EP02
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	5				6	8	1
Chum Salmon (Adults)	8	4		5	5	1	3
Chum Salmon (Juveniles)							
Coho Salmon (Juveniles)							
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane							
Moon Jellyfish	0		2	3	0	2	6
North Pacific Spiny Dogfish							
Ocean Sunfish		1					
Opalescent Inshore Squid	1060				1000	1420	1180
Pacific Herring	3			1		61	
Pacific Sand Lance	6590						
Pacific Saury					31		
Pacific Sea Nettle			1	4	2	1	8
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							1
Rockfishes							
Sablefish							1
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock		160		130			
Water Jellyfish				0			
Whitebait Smelt					43		
TOTAL	7666	165	3	143	1087	1493	1200

Tow	23	24	25	26	28	29	30
Station ID	EP03	EP04	EP05	EP06	VI13	VI14	VI15
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	1				42	18	14
Chum Salmon (Adults)		6			3	2	2
Chum Salmon (Juveniles)					1		
Coho Salmon (Juveniles)					2		4
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish			5	1			
Kelp Greenling							
Lions Mane							
Moon Jellyfish	2			1			
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid					14370		
Pacific Herring					70		
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle	1		5				
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish	1						
Rockfishes							
Sablefish							3
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock		260	450	1390			
Water Jellyfish		0			0		
Whitebait Smelt							
TOTAL	5	266	460	1392	14488	20	23

Tow	31	32	33	34	35	36	37
Station ID	VI16	VI17	VI18	VI19	QCSD01	QCSD02	VI20
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	23	16	8		5	1	
Chum Salmon (Adults)	10		26				
Chum Salmon (Juveniles)				1	5		
Coho Salmon (Juveniles)			5	7	1		
Pink Salmon (Juveniles)				8	1		
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish						2	
Kelp Greenling							
Lions Mane						1	
Moon Jellyfish		4	3			2	
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid					750	2990	
Pacific Herring			2				
Pacific Sand Lance							
Pacific Saury		1					
Pacific Sea Nettle		5					
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish	1	2					
Rockfishes							
Sablefish	2						23
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock							
Water Jellyfish							
Whitebait Smelt							
TOTAL	36	28	44	16	762	2996	23

Tow	38	39	40	41	42	44	45
Station ID	VI21	VI22	VI23	IVI03	IVI04	QCST02	QCST03
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)			4	57	28		
Chum Salmon (Adults)		1			1		
Chum Salmon (Juveniles)			1				1
Coho Salmon (Juveniles)	6	4	10				
Pink Salmon (Juveniles)	1	2	8				
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish		1					
Kelp Greenling							
Lions Mane				1	1	4	1
Moon Jellyfish			1				
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid				680			
Pacific Herring				473			
Pacific Sand Lance							
Pacific Saury		3	27				
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							
Rockfishes							
Sablefish	6						
Shiner Perch							
Soft Sculpin						1	
Threespine Stickleback							
Walleye Pollock							
Water Jellyfish							
Whitebait Smelt							
TOTAL	13	11	51	1211	30	5	2

Tow	46	47	48	49	50	51	52
Station ID	QCST04	QCST05	QCST06	QCST07	QCST08	QCST09	QCST10
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)	1	5	3			2	
Chum Salmon (Adults)							
Chum Salmon (Juveniles)				7			
Coho Salmon (Juveniles)	2						
Pink Salmon (Juveniles)				48			
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane	4	2	4	3	2	2	3
Moon Jellyfish							
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid							
Pacific Herring			3			1	49
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							
Rockfishes							
Sablefish	1						
Shiner Perch							
Soft Sculpin	2						
Threespine Stickleback							
Walleye Pollock							
Water Jellyfish							
Whitebait Smelt							
TOTAL	10	7	10	58	2	5	52

Tow	53	54	55	56	57	58	59
Station ID	QCST11	QCST22	QCST12	QCST13	QCST23	QCST14	QCST15
Chinook Salmon (Adults)			1				
Chinook Salmon (Juveniles)		4		14	2	3	4
Chum Salmon (Adults)							
Chum Salmon (Juveniles)		11	6				
Coho Salmon (Juveniles)		5	4	2		1	
Pink Salmon (Juveniles)		7	34	1			
Sockeye Salmon (Juveniles)		1	1				
Flatfishes							
Fried Egg Jellyfish	1						
Kelp Greenling							
Lions Mane	6					3	8
Moon Jellyfish							
North Pacific Spiny Dogfish	1						
Ocean Sunfish							
Opalescent Inshore Squid	2						
Pacific Herring	75	2					
Pacific Sand Lance	20						
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							1
Rockfishes	1						
Sablefish		2					
Shiner Perch							
Soft Sculpin	7						
Threespine Stickleback							
Walleye Pollock	1						
Water Jellyfish			0	0			
Whitebait Smelt	79						
TOTAL	193	32	46	17	2	7	13

Tow	60	61	62	63	64	65	66
Station ID	QCST16	QCST24	QCST17	QCST18	QCST19	QCST20	QCST21
Chinook Salmon (Adults)						1	1
Chinook Salmon (Juveniles)	1	1			2	2	
Chum Salmon (Adults)							
Chum Salmon (Juveniles)		2	38	1			
Coho Salmon (Juveniles)			5	5			
Pink Salmon (Juveniles)			86				
Sockeye Salmon (Juveniles)			5				
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane	3	2		4	4	10	12
Moon Jellyfish							
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid	140					1	
Pacific Herring						5	16
Pacific Sand Lance						1	
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							
Rockfishes							
Sablefish		5	2				
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock							1
Water Jellyfish		0	0				
Whitebait Smelt							
TOTAL	144	10	136	10	6	20	30

Tow	67	68	69	70	71	72	73
Station ID	QCST25	QCST26	QCST27	QCST28	QCST29	QCST30	JS01
Chinook Salmon (Adults)							
Chinook Salmon (Juveniles)		2	4	1	6	4	6
Chum Salmon (Adults)							2
Chum Salmon (Juveniles)	27	1				1	
Coho Salmon (Juveniles)							1
Pink Salmon (Juveniles)	6					17	
Sockeye Salmon (Juveniles)	1				1		
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling		1					
Lions Mane	2		1	4	2	2	
Moon Jellyfish							
North Pacific Spiny Dogfish				1			
Ocean Sunfish							
Opalescent Inshore Squid						2	
Pacific Herring				5	1		
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker						1	
Pipefishes							
Prowfish							
Rockfishes							
Sablefish	1				1		
Shiner Perch							
Soft Sculpin						160	1
Threespine Stickleback							
Walleye Pollock			1				
Water Jellyfish	0		0	0	0	0	0
Whitebait Smelt					1	50	
TOTAL	37	4	6	11	12	237	10

Tow	74	75	76	77	78	79	80
Station ID	JS02	JS03	JS04	JS05	JS06	JS07	JS08
Chinook Salmon (Adults)	1						
Chinook Salmon (Juveniles)	6	8	5			3	
Chum Salmon (Adults)						2	
Chum Salmon (Juveniles)							
Coho Salmon (Juveniles)		3			1	5	
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane		1	2	7	6		1
Moon Jellyfish							
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid							3
Pacific Herring				31			
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker							
Pipefishes							
Prowfish							
Rockfishes							1
Sablefish					1		
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock							
Water Jellyfish			0			0	
Whitebait Smelt							
TOTAL	7	12	7	38	8	10	5

Tow	81	82	83	84	85	86	87
Station ID	JS09	JS10	JS11	JS12	JS13	JS14	JS15
Chinook Salmon (Adults)							1
Chinook Salmon (Juveniles)	1			1	3		2
Chum Salmon (Adults)	3		1		2	1	
Chum Salmon (Juveniles)			4				
Coho Salmon (Juveniles)	1				1		
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane	4	2				3	3
Moon Jellyfish							
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid							1
Pacific Herring	31	180		1	2	220	440
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker				1			
Pipefishes							
Prowfish							
Rockfishes							
Sablefish							
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock							
Water Jellyfish	0			0			
Whitebait Smelt					1		24
TOTAL	40	182	5	3	9	224	471

Tow	88	89	90	91	92	93	94
Station ID	JS16	JS17	JS18	JS19	JS20	DI01	DI02
Chinook Salmon (Adults)		1					
Chinook Salmon (Juveniles)			1	1	1	5	4
Chum Salmon (Adults)				3			3
Chum Salmon (Juveniles)		1					
Coho Salmon (Juveniles)		12			1	1	2
Pink Salmon (Juveniles)							
Sockeye Salmon (Juveniles)							
Flatfishes							
Fried Egg Jellyfish							
Kelp Greenling							
Lions Mane	4		0	1	0		
Moon Jellyfish					1	0	2
North Pacific Spiny Dogfish							
Ocean Sunfish							
Opalescent Inshore Squid							
Pacific Herring				280	580	1	
Pacific Sand Lance							
Pacific Saury							
Pacific Sea Nettle							
Pacific Spiny Lumpsucker			2				
Pipefishes							
Prowfish							
Rockfishes							
Sablefish							
Shiner Perch							
Soft Sculpin							
Threespine Stickleback							
Walleye Pollock						1	
Water Jellyfish						0	0
Whitebait Smelt							
TOTAL	4	14	3	285	583	8	11

Tow	95	97	98	99
Station ID	DI03	DI05	DI06	DI07
Chinook Salmon (Adults)				
Chinook Salmon (Juveniles)	5	1		1
Chum Salmon (Adults)		1		
Chum Salmon (Juveniles)	17			
Coho Salmon (Juveniles)	2			
Pink Salmon (Juveniles)	2			
Sockeye Salmon (Juveniles)				
Flatfishes				
Fried Egg Jellyfish				
Kelp Greenling				
Lions Mane				
Moon Jellyfish	3		1	
North Pacific Spiny Dogfish				
Ocean Sunfish				
Opalescent Inshore Squid	1			
Pacific Herring				
Pacific Sand Lance				
Pacific Saury				
Pacific Sea Nettle				
Pacific Spiny Lumpsucker				
Pipefishes			1	
Prowfish				
Rockfishes				
Sablefish				
Shiner Perch			1	
Soft Sculpin				
Threespine Stickleback			1	
Walleye Pollock				
Water Jellyfish	0			0
Whitebait Smelt				
TOTAL	30	2	4	1