Summary of the Queen Charlotte Sound Synoptic Bottom Trawl Survey, July 4 - 31, 2011

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by

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ABSTRACT

Williams, D. C., Nottingham, M. K., Olsen, N. and Wyeth, M. R. 2018. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 4 to 31, 2011. Can. Manuscr. Rep. Fish. Aquat. Sci. 3127: viii + 69 p.

A bottom trawl survey of Queen Charlotte Sound and southern Hecate Strait was conducted on the fishing vessel Nordic Pearl between July 4 and July 31, 2011. The survey was jointly conducted and funded by the Canadian Groundfish Research and Conservation Society (CGRCS) and Fisheries and Oceans Canada (DFO). It was the sixth in a series of surveys that began in 2003. The survey was conducted annually between 2003 and 2005 and biennially on the odd-numbered years after that. This survey is one of a set of long-term and coordinated surveys that together cover the continental shelf and upper slope of most of the British Columbia coast. The objectives of these surveys are to provide fishery independent abundance indices of all demersal fish species available to bottom trawling, as well as to collect biological samples of selected species.

The survey follows a random depth-stratified design and the sampling units are 2 km by 2 km blocks. Two hundred and fifty two (83.7%) of the 301 blocks assessed in 2011 were successfully fished. The mean catch per tow was 317 kg with between 3 and 23 species per tow. The average number of species per tow was 19. The most abundant fish species encountered was Arrowtooth Flounder (*Atheresthes stomias)*, followed by Pacific Ocean Perch (*Sebastes alutus)*, Silvergray Rockfish (*Sebastes brevispinus)*, Yellowmouth Rockfish *(Sebastes reedi*) and Walleye Pollock (*Theragra chalcogramma)*. Biological data including individual length, weight, sex, maturity, and ageing structures were collected from selected species. Biological samples were collected from a total of 62 different species of fish. Oceanographic and fishing gear data including water temperature, depth, salinity, dissolved oxygen, trawl net opening dimensions and doorspread were also recorded for most tows.

RÉSUMÉ

Williams, D. C., Nottingham, M. K., Olsen, N. and Wyeth, M. R. 2018. Sommaire du relevé synoptique au chalut de fond effectué entre le 4 et 31 juillet 2011 dans le détroit de la Reine Charlotte. Rapp. manus. can. sci. halieut. aquat. 3127: viii + 69 p.

Un relevé au chalut de fond a été effectué par le navire de pêche *Nordic Pearl* dans le détroit de la Reine Charlotte et dans le sud du détroit d'Hécate entre le 4 et le 31 juillet 2011. Le relevé a été réalisé et financé conjointement par la Canadian Groundfish Research and Conservation Society (CGRCS) et Pêches et Océans Canada (MPO). Il s'agit du sixième relevé d'une série qui a commencé en 2003. Le relevé a été effectué chaque année entre 2003 et 2005, et aux deux ans, lors des années impaires, par la suite. Ce relevé fait partie d'un ensemble de relevés à long terme coordonnés qui couvre le plateau continental et le haut du talus de la majorité de la côte de la Colombie-Britannique. Ces relevés servent à obtenir des indices d'abondance indépendants de la pêche pour toutes les espèces de poissons démersaux pouvant être pêchées au chalut de fond, ainsi qu'à prélever des échantillons biologiques d'espèces précises.

Ce relevé est réalisé selon un plan d'échantillonnage aléatoire stratifié, et les unités d'échantillonnage sont des blocs de deux kilomètres carrés. Parmi les 301 blocs évalués en 2011, 252 (83.7 %) ont fait l'objet d'une pêche. La moyenne de prises par trait était de 317 kg, avec entre 3 et 23 espèces par trait. Le nombre moyen d'espèces par trait était de 19. Les espèces de poissons capturées le plus fréquemment étaient la plie à grande bouche (*Atheresthes stomias)*, suivi par le sébaste à longue mâchoire (*Sebastes alutus)*, le sébaste argenté (*Sebastes brevispinus)*, le sébaste à bouche jaune (*Sebastes Reedi*) et le Goberge de l'Alaska (*Theragra chalcogramma*). On a recueilli des données biologiques sur certaines espèces, notamment la longueur, le poids, le sexe, la maturité et l'âge. Les échantillons ont été prélevés sur un total de 62 espèces de poissons différentes. Les données océanographiques et sur les engins de pêche, notamment la température de l'eau, la profondeur, la salinité et la teneur en oxygène dissous, ont également été consignées pour la plupart des traits.

INTRODUCTION

In 2003, a report by the Pacific Scientific Advice Review Committee recommended development of fishery-independent relative abundance indices using bottom trawl surveys in British Columbia waters (Sinclair et al., 2003). The report recommended that a pilot survey be conducted in Queen Charlotte Sound (Figure 1). The survey design was synoptic in that is was intended to provide indices for as many species as possible rather than focusing on a limited number of target species.

In February 2003, funding was committed by the Canadian Groundfish Research and Conservation Society for the principal portion of the required vessel and net costs in addition to a significant portion of the scientific staff needed to conduct the survey and analyze the results. Funding by the Science Branch of Fisheries and Oceans Canada (DFO) was committed for additional scientific and sampling staff and to provide the scientific sampling equipment.

The first Queen Charlotte Sound synoptic bottom trawl survey (QCS) was successfully completed in the summer of 2003 (Olsen et al., 2007). Following that, additional surveys were planned for the west coast of Vancouver Island (WCVI) beginning in 2004, Hecate Strait (HS) beginning in 2005, and the west coast of Haida Gwaii (WCHG) (previously Queen Charlotte Islands) beginning in 2006. These surveys are conducted on a rotating biennial schedule with the Queen Charlotte Sound and Hecate Strait surveys conducted in odd-numbered years and the West Coast Vancouver Island and West Coast Haida Gwaii surveys conducted in even-numbered years. These four synoptic bottom trawl surveys provide comprehensive coverage of the continental shelf and upper slope of the British Columbia coast (Figure 1). Surveys are conducted on both chartered commercial fishing vessels as well as Canadian Coast Guard research trawlers.

The QCS survey was conducted annually from 2003 to 2005 (Olsen et al. 2007a, 2007b, and 2007c) and has since been scheduled to occur every second year. This document provides a brief summary of the results and methods from the sixth QCS synoptic bottom trawl survey which occurred between July 5 and July 31, 2011. It is not intended as a comprehensive review of the survey, nor does it provide interpretive analysis of the survey results. Summaries of the previous Queen Charlotte Sound surveys are given in Olsen et al. 2007a, Olsen et al. 2007b, Olsen et al. 2007c, Olsen et al. 2007d, and Olsen et al., 2009.

METHODS

SURVEY DESIGN

The survey area is Queen Charlotte Sound and the southern part of Hecate Strait excluding near-shore waters and inlets, areas closed to fishing, and protected sponge reef areas (Figure 1). The southern portion of Hecate Strait was included in order to provide coverage contiguous with the Hecate Strait synoptic bottom trawl survey.

Depth strata

All of the synoptic bottom trawl surveys along the British Columbia coast have followed the same random depth-stratified design. Each survey area is divided into 2 km by 2 km blocks and each block is assigned one of four depth strata based on the average bottom depth in the block. The four depth strata vary between areas. The depth strata for the QCS synoptic bottom trawl survey are 50-125m, 125-200m, 200-330m, and 330-500m (Table 1). Unlike the other synoptic survey areas where there is only a single spatial stratum, the QCS survey area was split along the Mitchell and Reed Troughs creating northern and southern areas (Figure 2). The combination of two spatial strata and four depth strata yields a total of eight strata (Table 1). For each survey in the QCS series, blocks are randomly selected within each stratum.

Block allocation

Following the methods in Sinclair et al. (2003), commercial fishery catch data were used to model the expected groundfish catches prior to the first survey in each area. The target number of tows in each stratum was based on providing the most precise catch rate indices for as many species as possible. However, in any given year, not all of the randomly selected blocks will be fishable. Further, after the inaugural survey, a block that has been fished in a previous year may be re-selected. The results of previous surveys in each area are used to estimate both the expected proportion of blocks in each stratum that would not result in a useable tow (predicted failure rate) as well as the expected probability of returning to a block that was successfully fished in a previous survey (predicted revisit rate). The predicted failure and revisit rates are combined into a single probability for each survey area and depth stratum (predicted adjustment). These probabilities are then used to calculate the anticipated number of blocks per stratum required to complete the target number of tows.

When a synoptic bottom trawl survey is conducted on a chartered commercial fishing vessel the contract has been structured such that the survey will continue until the entire set of blocks that have been selected are assessed. Assuming that the predicted failure and revisit rates prove to be accurate, at the end of the survey the final distribution of tows in each strata should match the initial target allocation that was modeled based on the commercial fishing data.

Charter vessel time is planned based on completion of a pre-determined number of assessed blocks. However, unforeseen circumstances such as bad weather or mechanical breakdowns may prevent a survey from being completed. If the entire set of

blocks is started, but the survey cannot be completed, some areas may be missed. To avoid such a situation, the selected blocks are divided into a primary set and a secondary set. The primary set consists of three-quarters of the total blocks and is visited first. The secondary set is visited once the primary set of blocks is completed. The secondary set can be adjusted for the number of remaining target tows by randomly adding or removing blocks.

For the 2011 QCS survey, 301 blocks were randomly selected based on a target of 240 useable tows (Table 1).

VESSEL

The survey was conducted aboard the F/V Nordic Pearl, a 35 m commercial stern trawler (Figure 3).

FISHING GEAR

The research trawl was an Atlantic Western IIA box trawl net connected to Thyboron Type II 104 doors (Figure 4). The net was thoroughly cleaned between tows to prevent cross-contamination of catches. The net was also inspected for damage after every tow. If the net was damaged, it was repaired and restored to its original dimensions prior to resuming fishing. Two nets were rigged at the start of the survey so that if one net was damaged beyond what could be immediately repaired, the second one could be used.

The net includes a main body (wing and belly sections), two lengthening pieces and a codend with liner (Figure 5 and Figure 6). The main body of the net has an 11 mm long-link steel chain frame and is constructed from a mix of double 4.5 mm strand 5 inch web, single 3.5 mm strand 5 inch web, and single 3.5 mm strand 4 ½ inch web (Figure 7). The intermediate sections are constructed from single 4.5 mm strand 4 ½ inch web (Figure 8). All web in the main body and lengthening pieces is constructed from a compacted strand braided polyethylene (Euroline Premium). The codend is constructed from double 5 mm strand 4 inch regular braided polyethylene web with a ½ inch 210/20 knotless nylon liner (Figure 8).

The Rockhopper footgear includes flying wing, mid wing, bunt wing and bosom sections (Figure 9). The bosom section is built from 16 inch diameter (worn 18 inch) aircraft tires while the bunt and mid wing sections have 16 inch Rockhopper disks. The flying wings have 5 inch rubber disks with swivel center 16 inch solid bunt bobbins at each end.

The specifications of net and footgear components are shown in Table 2 and dimensions for the assembled trawl pieces are shown in Figure 7 through Figure 9.

SCHEDULE

The survey was split into four sections or “legs” of six to nine days in duration with five science staff each. Science crew changes were on July 12, 20 and 26 (Table 3).

FISHING PROTOCOL

Fishing was carried out during daylight hours, commencing approximately 30 minutes after sunrise and ending 30 minutes before sunset each day. An average working day length of 15 hours, starting at approximately 0600 hrs in the morning and ending at 2100 hrs in the evening was typical.

Prior to fishing, the selected blocks were reviewed by the fishing master and chief scientist to determine a candidate set to visit throughout each day. During this review process, one or more blocks might be determined not fishable by the captain based on his experience and knowledge of the area. In such cases the blocks were marked as "rejected based on prior knowledge". After compiling a list of blocks to be visited, the most efficient route of travel between blocks would be planned.

The captain was asked to inspect each selected block and find a suitable tow location using the following criteria:

1. All tows should follow a depth contour.
2. If a block had been fished in a previous year, follow the same track so as to minimize the survey footprint.
3. If a block had not been fished in a previous year, make a tow entirely within the block and pass through the center point of the block.
4. If it is not possible to make a tow through the center of the block, make a tow entirely within the block that passes as close to the center as possible.
5. If it is not possible to make a tow entirely within the block, make a tow such that at least 50 % of the tow is within the block.

The target tow length was 20 minutes long. The tow start was defined as the time at which the net mensuration data indicated stable bottom contact and the headline collapsed to 3-4 m above the bottom. Approximately one minute before the target tow length was completed, net haul back was initiated. The extra minute was intended to account for uptake of slack in the main warps. Although the target on-bottom time was 20 minutes, tows that were at least 14 minutes in length were accepted. This was a pragmatic decision that allowed for retention of many tows that would otherwise have been unusable due to hang-ups or early haul-backs.

Tows were conducted at a target speed of 2.8 to 3.0 nautical miles per hour (5.2 - 5.6 km/hr). When retrieving the net, the captain was asked to maintain a water velocity through the net that was consistent with the rest of the tow.

Tows were made in the target depth stratum of the block. However, if the only possible tow was in a different depth stratum than that assigned to the block, then the tow was conducted and the block reassigned to the appropriate depth stratum.

If it was not possible to find a suitable tow location then the block was marked as "rejected based on on-ground inspection." The vessel would move on to the next selected block.

The result of trawling was either a useable or unusable tow. The most common reasons for deeming a tow unusable were a hang-up of the fishing gear, tear-up of the

trawl net or not achieving the minimum bottom contact time. In the event of an unusable tow, additional attempts to fish the block could be made at either the same location or a different location within the block. Alternatively, the block could be deemed unfishable, in which case it was rejected.

If fishing was attempted in a block, the final status of the block would be either "successfully fished on first attempt", "successfully fished after multiple attempts", or "rejected after last attempt failed". Rejected blocks were removed from the sampling frame for all future surveys. This will increase the efficiency of subsequent surveys, as less time will be spent inspecting blocks that cannot be fished. Some selected blocks may not have been successfully fished but may also not have been rejected. This could occur when a temporary obstacle (e.g. trap fishing gear, another vessel, or strong tidal currents) prevents fishing, or when there was insufficient time available to fish a block without spending another day in the area, or if fishing was attempted and although the tow was not successful, the block was not rejected. These blocks would be considered unassessed at the end of the survey and have a final status of "block not fished but remains in sampling frame" or "not rejected but last attempt failed".

Fishing data

The start and end positions, times, and bottom depths, as well as the direction, vessel speed, weather and environmental conditions, and warp length were recorded for every tow. In addition, global positioning system (GPS) data and bottom sounder data were logged continuously for the duration of the survey.

CATCH PROCESSING

At the end of each tow, the net was retrieved and the catch dumped into a hopper in a lab below the trawl deck. Catch was sorted by species into separate baskets as it moved along a conveyor system. The catch from all tows, including both useable and unusable tows was recorded. Whenever possible, the catch was completely sorted and weighed. However, for large catches in excess of 2000 kg or large numbers of small individuals, some method of total catch estimation and sub-sampling for species composition was conducted. The specific method of catch estimation and sub-sampling varied based on the total weight and volume of the catch being subsampled as well as the composition of the catch. Large catches were typically visually estimated although volumetric estimates were sometimes used. In all cases a representative sample of the catch was sorted to determine species composition and to provide individuals for biological sampling.

Baskets of species were weighed to the nearest 0.02 kg using a motion-compensating electronic balance. For small catches the number of individuals was often recorded in addition to the weight. Weights less than 0.02 kg were recorded as trace amounts. Catch was sorted to the lowest taxonomic group possible. For most fishes this was to the level of species although small and fragile species such as snailfish, lantern fish, or young-of-the-year rockfish may have only been identified to genus or family. In some cases a few representative individuals may have been frozen for later identification. Invertebrates may have only been identified to phylum or order.

BIOLOGICAL SAMPLING

While the primary purpose of the survey was to generate fishery-independent indices of relative abundance, the secondary goal was to collect biological information to characterize the size, sex, and age-composition of each species caught. Two types of biological samples were conducted: "Length" samples, consisting of individual fish length and sex, and "Age" samples, consisting of length, sex, weight, maturity, and age structure. In an effort to maintain a manageable workload, each species had a minimum catch level that had to be exceeded in the tow before biological samples would be collected. For rare species or species of special conservation concern the minimum number could be one fish, whereas for common and abundant species the number might be 25 or 50. The choice of the species to collect age samples from depended on the size of the catch of the species and the "desirability" of the species. The size of the catch was considered because the intent was to collect age structures from the largest catches of each species in each stratum over the survey. The "desirability" of the species was based on any conservation concerns and whether or not the species is commercially exploited. Biological samples were typically not collected from unusable tows.

Individual fish were measured to fork length, total length, standard length or other length depending on the species. Length measurements were collected to the nearest 1 cm for length samples, and 0.5 cm for age samples using an electronic fish measuring board. Fish were weighed using a motion-compensating electronic balance. Measurements were to the nearest 1, 2, or 5 grams depending on the size of the fish as well as the model and weight range of the scale in use.

There are a variety of hard parts of a fish that can be used to determine the age of the fish (Chilton and Beamish 1982). The specific structure that provides the most accurate and efficient estimate of age varies by species but all the structures have the common trait of a series of annular rings that can be counted. Sagittal otoliths (calcareous accretions of the inner ear) were collected from rockfish and flatfish species while fin rays were taken from Walleye Pollock (*Theragra chalcogramma*), Lingcod (*Ophiodon elongates*) and Pacific Cod (*Gadus macrocephalus*). Dorsal spines were collected from North Pacific Spiny Dogfish (*Squalus suckleyi*). All age samples collected on this survey were submitted to the Sclerochronology Lab located at the Pacific Biological Station in Nanaimo, BC for storage and future analysis. In addition to the biological sampling described above, specific data, specimens or tissue samples are routinely collected following requests from other institutions or researchers. In 2011, exceptionally small and exceptionally large whole Brown Catsharks (*Apristurus brunneus*) and Spotted Ratfish (*Hydrolagus colliei*) were collected.

Until the mid-2000s, Rougheye Rockfish (*Sebastes aleutianus*) was considered to be a single, highly variable species with light and dark colour morphs. Genetic and morphological analysis has confirmed that there are two distinct species (Orr and Hawkins 2008): Rougheye Rockfish (*S. aleutianus*) and Blackspotted Rockfish (*S. melanostictus*). Historical biological and catch information for *S. aleutianus* must now be considered to be the aggregate of both species. During the 2008 WCHG survey an attempt was made to differentiate between the two species. That preliminary work showed that the two species cannot be reliably distinguished in the field because the morphological characteristics overlap. Further, there is evidence that the two species

hybridize (Gharrett et al. 2005). Given that the historical data is recorded as *S. aleutianus* and that attempting to separate the species at the catch level is both time consuming and unreliable, beginning with the 2010 WCHG survey, biological samples were collected from every catch that included both a visual assessment of the species (*S. aleutianus* or *S. melanostictus*) as well as a tissue sample for genetic confirmation of the species. The survey catch data, which continues to be recorded as *S. aleutianus*, can then be partitioned into the two species using either the visual assessment or the results of genetic analyses. We do not attempt to partition the catch data for this report.

NET-MOUNTED SENSORS AND DATA RECORDERS

The F/V Nordic Pearl is equipped with a Notus trawl mensuration system. Sensors attached to the net use acoustic signals to communicate with each other and the vessel and provide real-time net geometry. The Notus system only included doorspread sensors so a Furuno CN24 net sounder was used for headline height above bottom and depth. The sensor output was logged continuously during the survey and monitored in real-time during fishing operations.

A Mac Marine Industries Bottom Contact Sensor (BCS) was attached to the footrope to record contact with the sea floor. The BCS consists of a pressure housing with an Onset Hobo data recorder in a stainless steel sled that trails behind the footrope. The Hobo recorder measures acceleration in three axes which can then be converted into angles. The recorder is mounted in the sled such that the x-axis tilt indicates the angle of the steel sled. When the footgear contacts the bottom, the sled angle is approximately 80 degrees. When the footrope is off the bottom, the sled hangs down and the angle is approximately 40 degrees. These data are used to determine the exact times in each tow that the trawl net first and last contacted the sea floor, thus providing an accurate measure of total bottom contact time.

A Seabird SBE39 temperature and pressure recorder (TDR) was attached to the starboard wing of the trawl. A Seabird SBE19plus recorder (CTD) equipped with a SBE43 dissolved oxygen sensor was attached to the center of the headline. The SBE19plus recorded conductivity, temperature and pressure data with derived values for salinity (Seabird 1989) and depth (Seabird 2002). The SBE43 recorded oxygen voltage output data with calculated values for dissolved oxygen (ml/l) using temperature, pressure, and salinity data (Seabird 2012). The SBE39 was activated prior to the first tow of the day and turned off after the last tow of the day, while the SBE19plus and SBE43 were turned on and off manually before and after each tow. All data recorders were downloaded at the end of each day.

DATA RECORDING

All the fishing, catch, and biological data were recorded directly into a Microsoft SQL server database through a Microsoft Access interface. Details of the electronic data acquisition system used for this survey can be found in Olsen (2010).

All the data from the survey are archived in an Oracle relational database called "GFBio", the Groundfish Biological Samples database maintained by the Groundfish Data Unit (Fisheries and Oceans Canada, Science Branch, Pacific Region) located at the Pacific Biological Station in Nanaimo, BC.

RESULTS

FISHING

The 2011 QCS synoptic bottom trawl survey was divided into four legs of six to nine days each. From a total of 27 survey days, two days were required for travel and loading at the start of the survey and two days at the end of the survey, about two full days were required for offloading catch and changing crews. Thus, there was a total of about 21 full fishing days (Table 3).

From a total of 301 blocks assessed during the 2011 survey, 252 were successfully fished, 36 were blocks rejected based on on-ground inspection and 13 blocks were rejected after one or more failed fishing attempts (Table 4 and Figure 10).

A total of 280 tows, of which 252 were useable, were completed during the 21 days that fishing occurred. Table 5 shows tow results by stratum for this survey. The scope (ratio of warp length to bottom depth) used for tows in 2011 is shown in Table 6 and Figure 11. Complete information for each tow including date, duration, location, average depth, average speed, warp, total catch weight and usability is presented in Appendix A.

CATCH

A total of 83,786 kg of fish and invertebrates was caught during the 2011 QCS synoptic bottom trawl survey. The total catch weight for useable tows was typically less than 500 kg per tow, and averaged 317 kg per tow (Figure 12). The majority of the catch (82,027 kg, 97.9%) consisted of 101 different species of fish, including 27 rockfish and 13 flatfish species. The remainder (1,759 kg) consisted of 131 invertebrate groups. The average number of species identified in useable tows was 19 and ranged from 3 to 23 per tow (Figure 13). The frequency of occurrence, maximum catch weight, mean catch weight per tow and total survey catch weight of each species are shown in Table 7. Of the fish species caught, Arrowtooth Flounder (*Atheresthes stomias)* was the most dominant by weight, followed by Pacific Ocean Perch (*Sebastes alutus)*, Silvergray Rockfish (*Sebastes brevispinus)*, Yellowmouth Rockfish *(Sebastes reedi*) and Walleye Pollock (*Theragra chalcogra)*. Catch weights by tow for the 50 most commonly encountered species in this survey are included in Appendix B.

Commercially marketable fish were retained and sold with the proceeds going to the Canadian Groundfish Conservation and Research Society (Table 8).

BIOLOGICAL SAMPLES AND SPECIMENS

Biological samples were collected from a total of 31,637 individuals of 62 species of fish during the 2011 QCS synoptic bottom trawl survey. The number of samples and recorded biological attributes per species is shown in Table 9. A summary of the biological data collected for each species is shown in Table 10.

NET-MOUNTED SENSORS AND DATA RECORDERS

Headline height and depth information (trawl net opening dimensions) were recorded from the Furuno CN24 system on 275 tows and door spread information was collected using Notus net sensors on 240 tows (Table 11).

Seabird SBE39 data (water temperature and depth) were collected from 251 tows (Table 11 and Figure 14) while Seabird SBE19plus and SBE43 data (conductivity, water temperature, depth and dissolved oxygen) were collected from 258 tows (Table 11 and Figure 14).

BCS data were collected from 257 tows (Table 11). An example of the type of data collected by the BCS is shown in Figure 15.

Global positioning system (GPS) data and bottom sounder data are available for all 280 tows.

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Table 1. 2011 QCS synoptic bottom trawl survey design showing block allocation per stratum based on the target tow allocation and the predicted failure and revisit rates.

Area	Depth Stratum (m)	Target Tows	Predicted Adjustment	Total Block Allocation
South	50 - 125	32	0.24	42
	125 - 200	63	0.16	75
	200 - 330	27	0.21	34
	330 - 500	8	0.20	10
North	50 - 125	11	0.48	21
	125 - 200	49	0.22	63
	200 - 330	43	0.10	48
	330 - 500	7	0.13	8
Total		**240**		**301**

Table 2. Atlantic Western IIa box trawl net specifications on the 2011 QCSI synoptic bottom trawl survey.

Component	Dimension
Wings, square, and bottom belly netting	combination of 5 inch double strand 4.5mm Euroline Premium and 5 inch single strand 3.5 mm Euroline Premium
Belly netting	4 ½ inch single strand 3.5mm Euroline Premium
Lengthening piece netting	4 ½ inch single strand 4.5 mm Euroline Premium
Codend	4 inch double 5 mm orange braided polyethylene
Codend liner	½ inch 210/20 knotless nylon
Floats	8 inch diameter center hole rated to 2000 m
Net frame chain	11 mm long link (64 mm inner length) grade 80 steel chain
Net frame rope	1 inch 3-strand twisted Polysteel
Net frame rope to chain lashing	3/8 inch 3-strand twisted Esterpro
Riblines	1 ¼ inch 3-strand twisted Polysteel
Footgear bosom	16 inch diameter tires (worn 18 inch aircraft tires)
Rubber spacers	4 inch, 5 inch, and 6 inch diameter disks cut from tires
Footgear wing center chain	16 mm mid link (65 mm inner length) grade 80 steel chain
Footgear wing top chain	11 mm long link (64 mm inner length) grade 80 steel chain
Rockhopper disk	16 inch diameter
Solid rubber bunt bobbin with steel tube center	16 inch diameter by 10 inch
Steel toggles	5 inch diameter by 3 inch long with 13 inches of chain (from center of toggle)

Table 3. Summary of survey operations during the 2011 QCS synoptic bottom trawl survey.

	Fishing				Tows			
Date	Start	End	Hours	Blocks Assessed	Useable	Not Useable	Total	Notes
07/04/2011	-	-	-	-	-	-	-	load and set up
07/05/2011	-	-	-	-	-	-	-	travel
07/06/2011	10:24	21:21	11	8	8	0	8	
07/07/2011	6:09	20:55	14	14	13	0	13	
07/08/2011	6:26	20:35	14	16	14	0	14	
07/09/2011	6:12	21:10	15	15	12	1	13	
07/10/2011	6:06	21:10	15	17	12	3	15	
07/11/2011	6:02	21:08	15	17	15	1	16	
07/12/2011	6:17	13:35	7	7	6	0	6	crew change
07/13/2011	6:06	20:30	14	15	15	1	16	
07/14/2011	6:06	19:52	13	15	14	1	15	
07/15/2011	6:09	20:56	14	16	15	2	17	
07/16/2011	6:10	20:14	14	14	14	0	14	
07/17/2011	6:07	20:58	14	16	10	3	13	
07/18/2011	6:14	20:48	14	18	10	1	11	
07/19/2011	6:14	20:33	14	12	11	2	13	
07/20/2011	-	-	-	-	-	-	-	crew change/ offload
07/21/2011	7:09	19:55	12	13	12	0	12	
07/22/2011	6:27	20:41	14	13	12	0	12	
07/23/2011	7:01	21:06	14	14	12	3	15	
07/24/2011	6:28	20:23	14	15	12	1	13	
07/25/2011	6:34	20:48	14	14	13	1	14	
07/26/2011	7:02	7:21	0	1	1	0	1	crew change/ offload
07/27/2011	6:49	20:18	14	13	8	3	11	
07/28/2011	7:07	20:53	13	12	8	3	11	
07/29/2011	6:43	18:14	12	6	5	2	7	
07/30/2011	-	-	-	-	-	-	-	offload and travel
07/31/2011	-	-	-	-	-	-	-	unload
Total				**301**	**252**	**28**	**280**	
Average Per Day				**13.1**	**11.0**	**1.2**	**12.2**	

Table 4. Block results by stratum for the 2011 QCS synoptic bottom trawl survey.

Area	Depth Stratum (m)	Successful	Rejected Prior	Rejected Inspected	Rejected Failed	Total
South	50 - 125	38	0	4	0	42
	125 - 200	67	0	6	2	75
	200 - 330	25	0	6	3	34
	330 - 500	8	0	1	1	10
North	50 - 125	10	0	9	2	21
	125 - 200	51	0	8	4	63
	200 - 330	45	0	2	1	481
	330 - 500	8	0	0	0	8
Total		**252**	**0**	**36**	**13**	**301**

Table 5. Tow results by stratum for the 2011 QCS synoptic bottom trawl survey.

Area	Depth Stratum (m)	Usable	Not Usable
South	50 - 125	38	1
	125 - 200	67	5
	200 - 330	25	6
	330 - 500	8	1
North	50 - 125	10	2
	125 - 200	51	9
	200 - 330	45	4
	330 - 500	8	0
Total		**252**	**28**

Table 6. Mean warp length and scope by 50 meter depth interval for the 2011 QCS synoptic bottom trawl survey.

Depth (m)	Mean Warp (m)	Mean Scope
0-50	165	3.45
50-100	229	2.95
100-150	359	2.75
150-200	424	2.50
200-250	525	2.38
250-300	624	2.28
300-350	721	2.20
350-400	823	2.12
400-450	914	2.11
450-500	1097	2.26
500-550	1097	2.17
550-600	1120	1.97

Table 7. Frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species captured during the 2011 QCS synoptic bottom trawl survey. Trace amounts (<0.02 kg) are entered as -.

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Rockfishes	**Family Scorpaenidae**				
Silvergray Rockfish	*Sebastes brevispinis*	177	1128.2	33.2	5871.2
Pacific Ocean Perch	*Sebastes alutus*	166	2924.3	101.0	16261.8
Redbanded Rockfish	*Sebastes babcocki*	118	202.4	10.1	1185.6
Sharpchin Rockfish	*Sebastes zacentrus*	104	864.1	27.4	2742.3
Shortspine Thornyhead	*Sebastolobus alascanus*	99	67.9	11.6	1149.2
Greenstriped Rockfish	*Sebastes elongatus*	86	31.3	3.7	317.8
Redstripe Rockfish	*Sebastes proriger*	75	1021.5	47.7	3526.3
Yellowmouth Rockfish	*Sebastes reedi*	63	775.6	62.6	3945.8
Rougheye Rockfish	*Sebastes aleutianus*	60	1650.3	42.3	2539.6
Yellowtail Rockfish	*Sebastes flavidus*	55	812.4	38.2	2100.8
Canary Rockfish	*Sebastes pinniger*	52	279.6	28.1	1459.2
Splitnose Rockfish	*Sebastes diploproa*	41	1368.4	45.5	1818.7
Rosethorn Rockfish	*Sebastes helvomaculatus*	40	14.4	2.6	100.1
Yelloweye Rockfish	*Sebastes ruberrimus*	26	166.5	13.6	352.5
Darkblotched Rockfish	*Sebastes crameri*	25	79.8	7.5	180.7
Pygmy Rockfish	*Sebastes wilsoni*	21	5.1	0.9	18.6
Quillback Rockfish	*Sebastes maliger*	16	33.1	6.8	108.3
Shortraker Rockfish	*Sebastes borealis*	11	187.8	32.2	354.7
Widow Rockfish	*Sebastes entomelas*	10	22.9	4.9	49.0
Bocaccio	*Sebastes paucispinis*	10	16.5	5.1	51.1
Harlequin Rockfish	*Sebastes variegatus*	6	52.5	12.6	75.7
Longspine Thornyhead	*Sebastolobus altivelis*	6	27.9	10.5	63.2
Aurora Rockfish	*Sebastes aurora*	5	20.5	6.5	32.5
Copper Rockfish	*Sebastes caurinus*	2	6.8	4.5	9.0
Puget Sound Rockfish	*Sebastes emphaeus*	2	-	-	-
Stripetail Rockfish	*Sebastes saxicola*	2	0.8	0.8	1.7
Shortbelly Rockfish	*Sebastes jordani*	1	2.9	2.9	2.9
Unidentified Rockfishes (juveniles)	*Sebastes* (Genus)	1	-	-	-
Scorpionfishes	Scorpaenidae (Family)	1	-	-	-
Flatfishes	**Order Pleuronectiformes**				
Arrowtooth Flounder	*Atheresthes stomias*	242	1819.6	68.6	16589.8
Rex Sole	*Glyptocephalus zachirus*	220	99.6	10.0	2160.3
Dover Sole	*Microstomus pacificus*	174	114.9	12.9	2250.6
Slender Sole	*Lyopsetta exilis*	132	12.8	1.0	128.3
Petrale Sole	*Eopsetta jordani*	110	215.9	5.7	627.1
Flathead Sole	*Hippoglossoides elassodon*	93	31.8	5.4	485.5
English Sole	*Parophrys vetulus*	67	182.7	11.8	788.8
Pacific Halibut	*Hippoglossus stenolepis*	57	76.2	12.3	701.7
Southern Rock Sole	*Lepidopsetta bilineata*	49	122.8	15.9	777.1
Pacific Sanddab	*Citharichthys sordidus*	33	46.6	6.0	197.7
Curlfin Sole	*Pleuronichthys decurrens*	19	2.6	0.9	17.7
Butter Sole	*Isopsetta isolepis*	3	1.3	0.6	1.7
Sand Sole	*Psettichthys melanostictus*	1	-	-	-
Cod-Like Fishes	**Order Gadiformes**				
Walleye Pollock	*Theragra chalcogramma*	113	2127.4	33.9	3793.6
Pacific Cod	*Gadus macrocephalus*	104	125.5	12.4	1290.9
Pacific Hake	*Merluccius productus*	63	469.5	27.0	1703.7
Giant Grenadier	*Albatrossia pectoralis*	4	17.8	6.1	24.4
Pacific Tomcod	*Microgadus proximus*	2	0.6	-	0.7

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Cartilaginous Fish	**Class Chondrichthyes**				
Spotted Ratfish	*Hydrolagus colliei*	221	253.1	8.4	1857.3
North Pacific Spiny Dogfish	*Squalus suckleyi*	129	296.4	12.5	1618.1
Longnose Skate	*Raja rhina*	71	24.9	7.0	493.0
Sandpaper Skate	*Bathyraja interrupta*	16	3.3	1.1	15.1
Big Skate	*Raja binoculata*	5	12.8	3.9	19.3
Aleutian Skate	*Bathyraja aleutica*	4	12.1	8.7	34.8
Brown Cat Shark	*Apristurus brunneus*	4	7.1	2.4	9.8
Alaska Skate	*Bathyraja parmifera*	2	1.3	1.2	2.3
Greenlings	**Family Hexagrammidae**				
Lingcod	*Ophiodon elongatus*	79	169.5	9.3	735.3
Kelp Greenling	*Hexagrammos decagrammus*	4	-	-	-
Eelpouts	**Family Zoarcidae**				
Blackbelly Eelpout	*Lycodes pacificus*	84	20.2	2.3	155.5
Black Eelpout	*Lycodes diapterus*	26	0.7	0.1	2.2
Bigfin Eelpout	*Lycodes cortezianus*	16	1.0	0.4	5.2
Wattled Eelpout	*Lycodes palearis*	9	0.8	0.3	2.7
Shortfin Eelpout	*Lycodes brevipes*	5	-	-	-
Pallid Eelpout	*Lycodapus mandibularis*	2	-	-	-
Sculpins	**Family Cottidae**				
Darkfin Sculpin	*Malacocottus zonurus*	38	1.7	0.3	8.8
Threadfin Sculpin	*Icelinus filamentosus*	17	1.8	0.7	11.2
Slim Sculpin	*Radulinus asprellus*	9	-	-	-
Spotfin Sculpin	*Icelinus tenuis*	5	0.2	0.1	0.2
Roughspine Sculpin	*Triglops macellus*	5	-	-	-
Roughback Sculpin	*Chitonotus pugetensis*	4	1.8	1.1	4.4
Blackfin Sculpin	*Malacocottus kincaidi*	4	-	-	-
Tadpole Sculpin	*Psychrolutes paradoxus*	3	-	-	-
Dusky Sculpin	*Icelinus burchami*	3	-	-	-
Northern Sculpin	*Icelinus borealis*	2	4.0	2.8	5.7
Grunt Sculpin	*Rhamphocottus richardsonii*	2	0.2	0.2	0.3
Bigmouth Sculpin	*Hemitripterus bolini*	2	-	-	-
Brown Irish Lord	*Hemilepidotus spinosus*	1	-	-	-
Sculpins	Cottidae (Family)	1	0.1	0.1	0.1
Poachers	**Family Agonidae**				
Bigeye Poacher	*Bathyagonus pentacanthus*	30	0.0	0.0	0.1
Smootheye Poacher	*Xeneretmus leiops*	7	0.2	0.1	0.4
Gray Starsnout	*Bathyagonus alascanus*	4	-	-	-
Lanternfishes	**Family Myctophidae**				
Northern Lampfish	*Stenobrachius leucopsarus*	6	-	-	-
California Headlightfish	*Diaphus theta*	2	-	-	-
Blue Lanternfish	*Tarletonbeania crenularis*	1	-	-	-
Other Fish					
Sablefish	*Anoplopoma fimbria*	117	52.7	8.5	989.7
Eulachon	*Thaleichthys pacificus*	44	24.1	2.7	101.2
Pacific Herring	*Clupea pallasii*	14	0.9	0.5	6.5
Northern Ronquil	*Ronquilus jordani*	14	0.1	0.0	0.3
Pacific Sand Lance	*Ammodytes hexapterus*	13	21.9	8.2	73.9
Pacific Lamprey	*Lampetra tridentata*	7	0.1	0.1	0.2
Chum Salmon	*Oncorhynchus keta*	3	-	-	-
Pacific Viperfish	*Chauliodus macouni*	3	6.2	4.7	14.2
Whitebarred Prickleback	*Poroclinus rothrocki*	3	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Other Fish					
Dwarf Wrymouth	*Cryptacanthodes aleutensis*	2	-	-	-
Pearly Prickleback	*Bryozoichthys marjorius*	2	0.3	0.1	0.3
Snake Prickleback	*Lumpenus sagitta*	2	-	-	-
Pacific Hagfish	*Eptatretus stoutii*	2	-	-	-
Black Hagfish	*Eptatretus deani*	1	0.1	0.1	0.1
Rainbow Smelt	*Osmerus mordax dentex*	1	0.4	0.4	0.4
Pricklebacks	Stichaeidae (Family)	1	-	-	-
Ribbed Sculpin	*Triglops pingelii*	1	0.02	0.02	0.02
Northern Spearnose Poacher	*Agonopsis vulsa*	1	0.3	0.3	0.3
Blackfin Poacher	*Bathyagonus nigripinnis*	1	-	-	-
Blacktail Snailfish	*Careproctus melanurus*	1	-	-	-
Pacific Spiny Lumpsucker	*Eumicrotremus orbis*	1	-	-	-
Snailfishes	*Liparis* (Genus)	1	-	-	-
Humpback Snailfish	*Elassodiscus caudatus*	1	-	-	-
Crabs and Shrimp	**Class Malacostraca**				
Pink Shrimp (Smooth)	*Pandalus jordani*	112	34.2	3.6	350.5
Sidestripe Shrimp	*Pandalopsis dispar*	85	5.0	0.7	47.6
Prawn	*Pandalus platyceros*	82	1.5	0.4	27.2
Common Two-spined Crangon	*Neocrangon communis*	19	-	-	-
Squat Lobster	*Munida quadrispina*	14	0.1	0.0	0.1
Dungeness Crab	*Metacarcinus magister*	14	128.4	17.8	249.7
Glass Shrimp	*Pasiphaea pacifica*	9	2.9	1.1	3.2
Isopods	Isopoda (Order)	8	-	-	-
Yellowleg Shrimp	*Pandalus tridens*	7	-	-	-
Spike Shrimp (Horned Shrimp)	*Paracrangon echinata*	6	-	-	-
Brown Box Crab	*Lopholithodes foraminatus*	6	0.3	0.1	0.3
Redclaw Crab	*Chorilia longipes*	5	-	-	-
Common Argid	*Argis alaskensis*	5	-	-	-
Northern Crangon	*Crangon alaskensis*	5	-	-	-
Northern Argid	*Argis lar*	4	-	-	-
-	Crangonidae (Family)	3	-	-	-
Right-handed Hermits	Paguridae (Family)	3	0.0	0.0	0.0
Golden King Crab	*Lithodes aequispinus*	3	3.8	2.5	7.4
Decorator Crabs	*Oregonia* (Genus)	2	2.2	2.0	3.9
Graceful Decorator Crab	*Oregonia gracilis*	2	-	-	-
Brown King Crab	*Paralithodes brevipes*	2	-	-	-
Lithodio Crabs	Lithodidae (Family)	2	-	-	-
Crangons	*Crangon* (Genus)	2	0.0	0.0	0.0
Coonstripe Shrimp	*Pandalus danae*	2	0.0	0.0	0.0
Shrimp	Dendrobranchiata (Sub Order)	1	-	-	-
Split-eye Argid	*Argis ovifer*	1	-	-	-
Bristly Crab	*Acantholithodes hispidus*	1	0.1	0.1	0.1
Deepsea Eualid	*Eualus biunguis*	1	0.4	0.4	0.4
Inshore Tanner Crab	*Chionoecetes bairdi*	1	0.3	0.3	0.3
Sea Stars	**Class Asteroidea**				
-	*Henricia* (Genus)	21	0.0	0.0	0.0
Mud Star	*Ctenodiscus crispatus*	19	4.7	0.8	5.5
Rose Star	*Crossaster papposus*	18	0.2	0.1	0.4
Sand Star	*Luidia foliolata*	14	0.7	0.2	2.2
Cushion Star	*Pteraster tesselatus*	14	0.7	0.3	1.0

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Sea Stars	**Class Asteroidea**				
-	*Poraniopsis inflatus inflatus*	12	1.3	0.3	2.7
Vermillion Star	*Mediaster aequalis*	11	0.0	0.0	0.1
-	*Cheiraster dawsoni*	10	0.1	0.0	0.2
Fish-eating Star	*Stylasterias forreri*	10	0.3	0.2	1.2
Long-armed Sea Star	*Orthasterias koehleri*	10	0.4	0.2	1.2
Spiny Red Sea Star	*Hippasteria spinosa*	8	0.3	0.2	1.4
Sea Stars	Asteroidea (Class)	8	0.7	0.4	1.5
-	*Lophaster furcilliger vexator*	5	-	-	-
-	*Hippasteria californica*	2	0.0	0.0	0.0
-	*Hippasteria* (Genus)	2	0.1	0.1	0.1
-	*Diplopteraster multipes*	2	0.1	0.1	0.1
-	*Crossaster* (Genus)	2	0.3	0.2	0.4
-	*Dipsacaster* (Genus)	2	-	-	-
-	*Leptychaster arcticus*	2	0.7	0.4	0.8
Sunflower Star	*Pycnopodia helianthoides*	2	0.1	0.1	0.1
Cookie Star	*Ceramaster patagonicus*	1	0.0	0.0	0.0
-	*Solaster* (Genus)	1	-	-	-
-	*Tarsaster alaskanus*	1	0.1	0.1	0.1
-	*Gephyreaster swifti*	1	-	-	-
-	*Lophaster furcilliger*	1	-	-	-
-	*Acanthasteridae* (Family)	1	0.1	0.1	0.1
Morning Sun Star	*Solaster dawsoni*	1	0.1	0.1	0.1
-	*Solaster paxillatus*	1	-	-	-
Brittle Stars	Class Ophiuroidea				
Basket Star	*Gorgonocephalus eucnemis*	43	1.0	0.2	8.2
-	*Ophiura sarsi*	16	-	-	-
-	*Ophiacantha* (Genus)	7	0.2	0.2	0.2
-	*Amphiophiura ponderosa*	6	0.1	0.1	0.2
-	Ophiacanthidae (Family)	5	0.1	0.1	0.1
-	Ophiuroidea (Class)	4	-	-	-
-	*Ophiopholis aculeata japonica*	3	-	-	-
-	*Ophiura* (Genus)	3	-	-	-
-	*Ophiopholis longispina*	2	-	-	-
-	*Ophiacantha bathybia*	1	-	-	-
-	*Ophiopthalmus normani*	1	-	-	-
-	*Ophiosphalma jolliense*	1	-	-	-
Sea Cucumbers	**Class Holothuroidea**				
Whitespotted Sea Cucumber	*Parastichopus leukothele*	45	15.0	1.5	57.2
Soft Sea Cucumber	*Pseudostichopus mollis*	13	1.0	0.2	1.2
Papillose Sea Cucumber	*Synallactes challengeri*	10	0.1	0.0	0.1
Sea Cucumbers	Holothuroidea (Class)	6	0.8	0.5	1.1
Giant Red Sea Cucumber	*Parastichopus californicus*	6	1.5	0.5	2.8
Sweet Potato Sea Cucumber	*Molpadia intermedia*	3	0.2	0.1	0.3
-	Psolidae (Family)	1	-	-	-
Scaly Sea Cucumber	*Psolus squamatus*	1	-	-	-
Octopuses and Squid	**Class Cephalopoda**				
Pacific Bobtail Squid	*Rossia pacifica*	86	1.6	0.1	6.1
Schoolmaster Gonate Squid	*Berryteuthis magister*	34	9.0	1.9	63.9
Giant Pacific Octopus	*Enteroctopus dofleini*	5	2.2	0.8	4.2
Smoothskin Octopus	*Benthoctopus leioderma*	3	0.5	0.2	0.5
Octopus	*Octopus* (Genus)	2	0.2	0.1	0.3

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Octopuses and Squid	***Class Cephalopoda***				
Octopus	Octopoda (Order)	1	0.0	0.0	0.0
-	*Loligo* (Genus)	1	1.0	1.0	1.0
-	*Gonatus* (Genus)	1	-	-	-
East Pacific Red Octopus	*Octopus rubescens*	1	-	-	-
Sea Urchins	**Super Order Echinacea**				
Fragile Urchin	*Allocentrotus fragilis*	103	7.3	0.8	71.1
Pallid Urchin	*Strongylocentrotus pallidus*	22	0.2	0.1	0.3
Sea Urchins	Echinacea (Super Order)	1	0.9	0.9	0.9
Jellyfish	**Phylum Cnidaria**				
Lions Mane	*Cyanea capillata*	41	8.7	1.7	56.6
Moon Jelly	*Aurelia aurita*	4	0.7	0.7	0.7
-	*Periphylla periphylla*	3	-	-	-
Jellyfish	Scyphozoa (Class)	2	0.2	0.2	0.2
Fried Egg Jellyfish, Egg Yolk Jelly	*Phacellophora camtschatica*	2	0.0	0.0	0.0
Anemones and Corals	**Class Anthozoa**				
Anemone	Actiniaria (Order)	28	2.1	0.3	5.6
Sea Whip	*Balticina septentrionalis*	27	4.0	0.3	7.6
-	*Primnoa* (Genus)	12	46.8	12.5	137.6
-	*Metridium* (Genus)	11	3.2	1.0	10.6
Bubble Gum Coral	*Paragorgia arborea*	9	6.1	2.6	18.2
Sea Pen	*Ptilosarcus gurneyi*	3	0.1	0.1	0.1
Gorgonian Corals	Gorgonacea (Order)	2	48.7	25.8	51.5
-	*Isidella* (Genus)	1	-	-	-
Snails and Slugs	**Class Gastropoda**				
Oregontriton	*Fusitriton oregonensis*	18	0.3	0.1	0.9
-	Doridiidae (Family)	5	0.0	0.0	0.0
Gastropods	Gastropoda (Class)	4	-	-	-
Adams Spiny Margarite	*Cidarina cidaris*	4	-	-	-
-	*Neptunea* (Genus)	2	0.1	0.1	0.1
-	*Tritonia* (Genus)	1	-	-	-
Silvery Topsnail	*Calliostoma platinum*	1	-	-	-
Other Species					
Sponges	Porifera (Phylum)	90	129.3	4.4	374.6
Glass Sponges	Hexactinellida (Class)	33	24.1	3.9	133.5
Salp	*Cyclosalpa affinis*	16	0.2	0.1	0.4
Heart Urchins	Atelostomata (Super Order)	9	0.7	0.2	1.0
Pink Scallop, (aka Reddish Scallop)	*Chlamys rubida*	8	1.2	0.6	3.7
Peanutworms	Sipuncula (Phylum)	7	-	-	-
-	Tunicata (Sub Phylum)	5	0.0	0.0	0.0
Sea Mouse	*Aphrodita* (Genus)	5	1.4	0.7	2.0
Spiny Scallop	*Chlamys hastata*	4	0.1	0.1	0.1
-	*Halocynthia* (Genus)	4	0.8	0.4	1.5
Sea Lilies and Feather Stars	Crinoidea (Class)	3	-	-	-
Bath Sponges	Demospongiae (Class)	2	-	-	-
-	*Hydrallmania* (Genus)	2	16.0	11.6	23.1
Polychaete Worms	Polychaeta (Class)	2	-	-	-
Scallop	Pectinidae (Family)	1	-	-	-
Ascidians and Tunicates	Ascidiacea (Class)	1	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Other Species					
Proboscis Worm	Nemertea (Phylum)	1	-	-	-
-	Antedonidae (Family)	1	-	-	-
-	Echiura (Phylum)	1	-	-	-
Branchiopods	Branchiopoda (Class)	1	-	-	-
Salps	Thaliacea (Class)	1	-	-	-
Salps	Salpida (Order)	1	-	-	-

Table 8. Offloaded catch weight by species for the 2011 QCS synoptic bottom trawl survey.

Species	Weight (kg)
Canary Rockfish	689.88
Darkblotched Rockfish	75.91
Dover Sole	165.59
English Sole	280.13
Flathead Sole	1.33
Greenstriped Rockfish	30.19
Lingcod	11.99
Pacific Cod	4.88
Pacific Ocean Perch	11870.07
Petrale Sole	145.17
Quillback Rockfish	7.99
Redbanded Rockfish	201.99
Redstripe Rockfish	1971.09
Rosethorn Rockfish	2.22
Rougheye Rockfish	2153.55
Sablefish	305.08
Sharpchin Rockfish	812.85
Shortraker Rockfish	44.39
Shortspine Thornyhead	578.01
Silvergray Rockfish	2679.18
Southern Rock Sole	82.57
Splitnose Rockfish	1384.65
Widow Rockfish	29.74
Yellowmouth Rockfish	3205.69
Yellowtail Rockfish	136.73
Total	**26,870.9**

Table 9. Species sampled during the 2011 QCS synoptic bottom trawl survey. The number of samples and number of recorded biological attributes are shown for each species.

Common Name	Scientific Name	Number of Samples	Number of Recorded Biological Attributes				
			Length	Weight	Sex	Maturity	Age
Alaska Skate	*Bathyraja parmifera*	2	2	2	2	0	0
Aleutian Skate	*Bathyraja aleutica*	4	6	6	6	0	0
Arrowtooth Flounder	*Atheresthes stomias*	160	3858	3857	3857	2546	2549
Aurora Rockfish	*Sebastes aurora*	5	52	52	52	45	45
Big Skate	*Raja binoculata*	5	5	5	5	0	0
Bigmouth Sculpin	*Hemitripterus bolini*	1	1	0	0	0	0
Black Eelpout	*Lycodes diapterus*	1	22	0	22	0	0
Blackbelly Eelpout	*Lycodes pacificus*	14	411	0	0	0	0
Bocaccio	*Sebastes paucispinis*	10	14	14	14	14	14
Brown Cat Shark	*Apristurus brunneus*	4	29	29	29	0	0
Butter Sole	*Isopsetta isolepis*	2	2	2	2	0	0
Canary Rockfish	*Sebastes pinniger*	45	310	308	310	203	203
Chum Salmon	*Oncorhynchus keta*	3	3	3	3	0	0
Copper Rockfish	*Sebastes caurinus*	2	6	6	6	0	0
Curlfin Sole	*Pleuronichthys decurrens*	18	49	49	49	0	0
Darkblotched Rockfish	*Sebastes crameri*	24	126	126	126	60	60
Dover Sole	*Microstomus pacificus*	83	1829	1829	1829	836	837
English Sole	*Parophrys vetulus*	29	684	684	684	514	515
Eulachon	*Thaleichthys pacificus*	13	459	0	0	0	0
Flathead Sole	*Hippoglossoides elassodon*	47	1102	1101	1102	53	53
Giant Grenadier	*Albatrossia pectoralis*	4	8	8	8	0	0
Greenstriped Rockfish	*Sebastes elongatus*	40	696	695	696	150	152
Harlequin Rockfish	*Sebastes variegatus*	5	68	68	68	53	53
Kelp Greenling	*Hexagrammos decagrammus*	3	8	8	8	0	0
Lingcod	*Ophiodon elongatus*	74	212	212	212	104	104
Longnose Skate	*Raja rhina*	69	117	98	114	0	0
Longspine Thornyhead	*Sebastolobus altivelis*	6	120	120	119	28	28
North Pacific Spiny Dogfish	*Squalus suckleyi*	37	345	344	316	133	103
Pacific Cod	*Gadus macrocephalus*	98	905	905	905	662	354
Pacific Hake	*Merluccius productus*	22	551	551	551	157	158
Pacific Halibut	*Hippoglossus stenolepis*	55	121	28	14	0	0
Pacific Ocean Perch	*Sebastes alutus*	106	2528	2528	2519	1832	1833
Pacific Sand Lance	*Ammodytes hexapterus*	2	74	24	0	0	0
Pacific Sanddab	*Citharichthys sordidus*	19	413	413	413	104	104
Petrale Sole	*Eopsetta jordani*	110	505	505	505	243	244
Puget Sound Rockfish	*Sebastes emphaeus*	2	15	15	7	0	0
Pygmy Rockfish	*Sebastes wilsoni*	17	157	157	157	68	95
Quillback Rockfish	*Sebastes maliger*	15	108	108	108	82	82
Redbanded Rockfish	*Sebastes babcocki*	53	522	522	522	343	343
Redstripe Rockfish	*Sebastes proriger*	36	890	889	880	566	578
Rex Sole	*Glyptocephalus zachirus*	104	2501	2501	2503	638	639
Rosethorn Rockfish	*Sebastes helvomaculatus*	20	250	250	250	0	0
Rougheye Rockfish	*Sebastes aleutianus*	59	362	361	362	362	361
Sablefish	*Anoplopoma fimbria*	112	593	594	594	133	133
Sand Sole	*Psettichthys melanostictus*	1	1	1	1	0	0
Sandpaper Skate	*Bathyraja interrupta*	14	18	18	18	0	0
Sharpchin Rockfish	*Sebastes zacentrus*	46	883	883	865	271	272
Shortbelly Rockfish	*Sebastes jordani*	1	22	22	22	0	0

Common Name	Scientific Name	Number of Samples	Number of Recorded Biological Attributes				
			Length	Weight	Sex	Maturity	Age
Shortraker Rockfish	*Sebastes borealis*	11	88	88	88	88	88
Shortspine Thornyhead	*Sebastolobus alascanus*	65	1693	1690	1689	439	445
Silvergray Rockfish	*Sebastes brevispinis*	101	1612	1608	1612	848	840
Slender Sole	*Lyopsetta exilis*	55	809	807	809	0	0
Southern Rock Sole	*Lepidopsetta bilineata*	48	618	617	618	558	556
Splitnose Rockfish	*Sebastes diploproa*	23	427	427	427	197	197
Spotted Ratfish	*Hydrolagus colliei*	105	2430	2428	2429	0	0
Stripetail Rockfish	*Sebastes saxicola*	2	6	6	6	0	0
Threadfin Sculpin	*Icelinus filamentosus*	1	13	13	0	0	0
Walleye Pollock	*Theragra chalcogramma*	55	1014	1014	1018	375	375
Widow Rockfish	*Sebastes entomelas*	6	10	10	10	0	0
Yelloweye Rockfish	*Sebastes ruberrimus*	24	92	92	92	91	92
Yellowmouth Rockfish	*Sebastes reedi*	32	496	496	495	325	343
Yellowtail Rockfish	*Sebastes flavidus*	18	366	366	366	237	237
	Total	**2148**	**31637**	**30563**	**30494**	**13358**	**13085**

Table 10. Summary of biological data collected during the 2011 QCS synoptic bottom trawl survey. For each species the number of samples and specimens, the minimum, maximum, and mean length, the minimum, maximum, and mean weight, and female proportion is shown. Weights less than 0.1 kg are entered as <0.1 and no data collected is -.

		Number of			Length (cm)			Weight (kg)			Female
Common Name	Scientific Name	Samples	Specimens	Length Type	Min.	Max.	Mean	Min.	Max.	Mean	Proportion
Alaska Skate	*Bathyraja parmifera*	2	2	Total	53	61	57	0.9	1.3	1.1	0.5
Aleutian Skate	*Bathyraja aleutica*	4	6	Total	92	1125	273	4.2	7.0	5.7	0.5
Arrowtooth Flounder	*Atheresthes stomias*	160	3858	Fork	12	75	35	<0.1	5.0	0.5	0.6
Aurora Rockfish	*Sebastes aurora*	5	52	Fork	29	38	33	0.4	0.9	0.6	0.4
Big Skate	*Raja binoculata*	5	5	Total	42	123	69	0.7	12.8	3.8	0.6
Bigmouth Sculpin	*Hemitripterus bolini*	1	1	Total	61	61	61	-	-	-	N/A
Black Eelpout	*Lycodes diapterus*	1	22	Total	12	38	19	-	-	-	N/A
Blackbelly Eelpout	*Lycodes pacificus*	14	411	Total	8	27	17	-	-	-	N/A
Bocaccio	*Sebastes paucispinis*	10	14	Fork	54	77	66	1.7	5.4	3.6	0.2
Brown Cat Shark	*Apristurus brunneus*	4	29	Total	38	70	46	0.2	1.0	0.3	0.2
Butter Sole	*Isopsetta isolepis*	2	2	Total	26	34	30	0.1	0.3	0.2	0.5
Canary Rockfish	*Sebastes pinniger*	45	310	Fork	16	65	46	0.1	3.9	1.7	0.5
Chum Salmon	*Oncorhynchus keta*	3	3	Fork	67	77	71	3.8	6.3	4.8	0.3
Copper Rockfish	*Sebastes caurinus*	2	6	Fork	37	47	42	1.0	2.4	1.6	0.8
Curlfin Sole	*Pleuronichthys decurrens*	18	49	Total	16	37	28	0.1	0.7	0.4	0.5
Darkblotched Rockfish	*Sebastes crameri*	24	126	Fork	11	50	33	<0.1	2.0	0.8	0.4
Dover Sole	*Microstomus pacificus*	83	1829	Total	15	59	37	<0.1	2.2	0.5	0.4
English Sole	*Parophrys vetulus*	29	684	Total	18	48	32	<0.1	1.1	0.3	0.6
Eulachon	*Thaleichthys pacificus*	13	459	Standard	8	20	16	-	-	-	N\A
Flathead Sole	*Hippoglossoides elassodon*	47	1102	Total	10	39	25	<0.1	0.6	0.2	0.5
Giant Grenadier	*Albatrossia pectoralis*	4	8	-	-	-	-	0.7	11.4	3.0	0.6
Greenstriped Rockfish	*Sebastes elongatus*	40	696	Fork	9	40	27	<0.1	1.1	0.3	0.5
Harlequin Rockfish	*Sebastes variegatus*	5	68	Fork	17	29	25	0.1	0.3	0.2	0.6
Kelp Greenling	*Hexagrammos decagrammus*	3	8	Fork	27	31	29	0.2	0.4	0.3	0.4
Lingcod	*Ophiodon elongatus*	74	212	Fork	49	105	65	0.9	11.6	2.8	0.7
Longnose Skate	*Raja rhina*	69	117	Total	19	1135	97	<0.1	14.7	3.7	0.5
Longspine Thornyhead	*Sebastolobus altivelis*	6	120	Total	12	31	22	<0.1	0.4	0.1	0.4
North Pacific Spiny Dogfish	*Squalus suckleyi*	37	345	Total	45	658	72	0.4	7.3	1.5	0.4
Pacific Cod	*Gadus macrocephalus*	98	905	Fork	22	88	48	0.1	9.1	1.3	0.5
Pacific Hake	*Merluccius productus*	22	551	Fork	18	72	51	<0.1	2.4	0.8	0.6
Pacific Halibut	*Hippoglossus stenolepis*	55	121	Fork	57	1200	84	2.0	21.7	6.2	0.5

Common Name	Scientific Name	Number of Samples	Number of Specimens	Length Type	Length (cm) Min.	Length (cm) Max.	Length (cm) Mean	Weight (kg) Min.	Weight (kg) Max.	Weight (kg) Mean	Female Proportion
Pacific Ocean Perch	*Sebastes alutus*	106	2528	Fork	8	57	33	<0.1	2.0	0.6	0.5
Pacific Sand Lance	*Ammodytes hexapterus*	2	74	Total	13	18	15	<0.1	<0.1	<0.1	N\A
Pacific Sanddab	*Citharichthys sordidus*	19	413	Total	12	32	20	<0.1	0.4	0.1	0.5
Petrale Sole	*Eopsetta jordani*	110	505	Total	22	60	39	0.1	2.9	0.7	0.4
Puget Sound Rockfish	*Sebastes emphaeus*	2	15	Fork	10	17	12	<0.1	0.1	<0.1	1.0
Pygmy Rockfish	*Sebastes wilsoni*	17	157	Fork	8	25	16	<0.1	0.2	0.1	0.7
Quillback Rockfish	*Sebastes maliger*	15	108	Fork	19	46	36	0.1	2.0	1.0	0.5
Redbanded Rockfish	*Sebastes babcocki*	53	522	Fork	11	60	38	<0.1	3.7	1.2	0.5
Redstripe Rockfish	*Sebastes proriger*	36	890	Fork	7	41	28	<0.1	1.0	0.3	0.5
Rex Sole	*Glyptocephalus zachirus*	104	2503	Total	12	45	30	<0.1	0.7	0.2	0.4
Rosethorn Rockfish	*Sebastes helvomaculatus*	20	250	Fork	16	36	26	<0.1	0.7	0.3	0.5
Rougheye Rockfish	*Sebastes aleutianus*	59	362	Fork	11	62	39	<0.1	4.6	1.1	0.4
Sablefish	*Anoplopoma fimbria*	112	594	Fork	34	93	53	0.3	10.4	1.6	0.5
Sand Sole	*Psettichthys melanostictus*	1	1	Total	27	27	27	0.1	0.1	0.1	0.0
Sandpaper Skate	*Bathyraja interrupta*	14	18	Total	19	62	48	<0.1	1.3	0.8	0.8
Sharpchin Rockfish	*Sebastes zacentrus*	46	883	Fork	4	40	23	<0.1	1.1	0.2	0.5
Shortbelly Rockfish	*Sebastes jordani*	1	22	Fork	20	25	23	0.1	0.2	0.1	0.4
Shortraker Rockfish	*Sebastes borealis*	11	88	Fork	40	97	58	0.9	14.1	3.4	0.6
Shortspine Thornyhead	*Sebastolobus alascanus*	65	1693	Total	4	58	27	<0.1	2.6	0.3	0.5
Silvergray Rockfish	*Sebastes brevispinis*	101	1612	Fork	17	65	50	0.1	3.6	1.7	0.4
Slender Sole	*Lyopsetta exilis*	55	809	Total	10	34	23	<0.1	0.3	0.1	0.6
Southern Rock Sole	*Lepidopsetta bilineata*	48	618	Total	14	57	31	<0.1	2.5	0.5	0.7
Splitnose Rockfish	*Sebastes diploproa*	23	427	Fork	12	38	25	<0.1	0.9	0.3	0.4
Spotted Ratfish	*Hydrolagus colliei*	105	2430	2nd Dorsal	8	60	27	<0.1	1.8	0.3	0.5
Stripetail Rockfish	*Sebastes saxicola*	2	6	Fork	22	31	26	0.1	0.4	0.2	1.0
Threadfin Sculpin	*Icelinus filamentosus*	1	13	Total	13	27	20	<0.1	0.3	0.1	N\A
Walleye Pollock	*Theragra chalcogramma*	55	1018	Fork	19	61	35	0.1	1.7	0.4	0.7
Widow Rockfish	*Sebastes entomelas*	6	10	Fork	33	55	46	0.5	2.6	1.6	0.3
Yelloweye Rockfish	*Sebastes ruberrimus*	24	92	Fork	32	70	56	0.5	6.7	3.7	0.6
Yellowmouth Rockfish	*Sebastes reedi*	32	514	Fork	6	52	38	<0.1	2.2	1.1	0.5
Yellowtail Rockfish	*Sebastes flavidus*	18	366	Fork	30	59	47	0.4	3.3	1.6	0.4

Table 11. Summary of data from net-mounted recorders during the 2011 QCS synoptic bottom trawl survey, showing the number of tows and total number of records. A total of 280 survey tows were conducted, of which 252 were useable.

		Number of	
Data Recorder	**Attribute**	**Tows**	**Records**
Mac Marine Industries Bottom Contact Sensor	Bottom contact sensor tilt angle	257	86,121
Seabird SBE19plus Seacat Profiler	Conductivity of sea water (S/m)/ salinity (PSU)	258	52,282
	Pressure (db)/ depth (m)	258	52,282
	Water temperature (^{o}C)	258	52,282
Seabird SBE43	Oxygen voltage (V)/ dissolved oxygen (ml/L)	258	52,282
Seabird SBE39 Temperature and Pressure Recorder	Pressure (db)/ depth (m)	251	90,827
	Water temperature (^{o}C)	251	90,827
Furuno Cn24	Headline depth (m)	275	1,278
	Headline height above bottom (m)	277	1,277
Notus Sensor System	Doorspread (m)	240	12,771

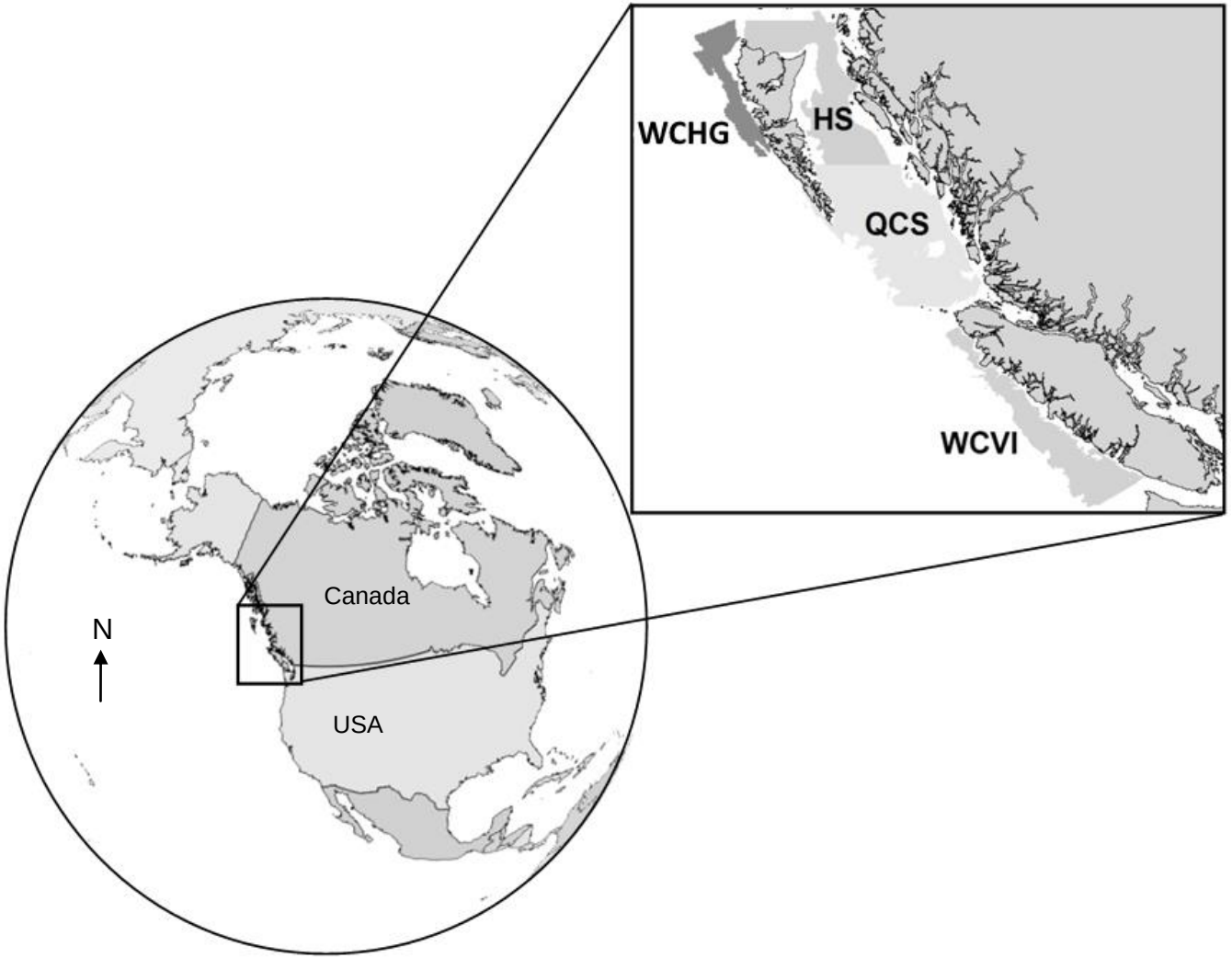

Figure 1. Locations of the current synoptic bottom trawl surveys on the coast of British Columbia, Canada. WCHG = West Coast Haida Gwaii; HS = Hecate Strait; QCS = Queen Charlotte Sound; WCVI = West Coast Vancouver Island.

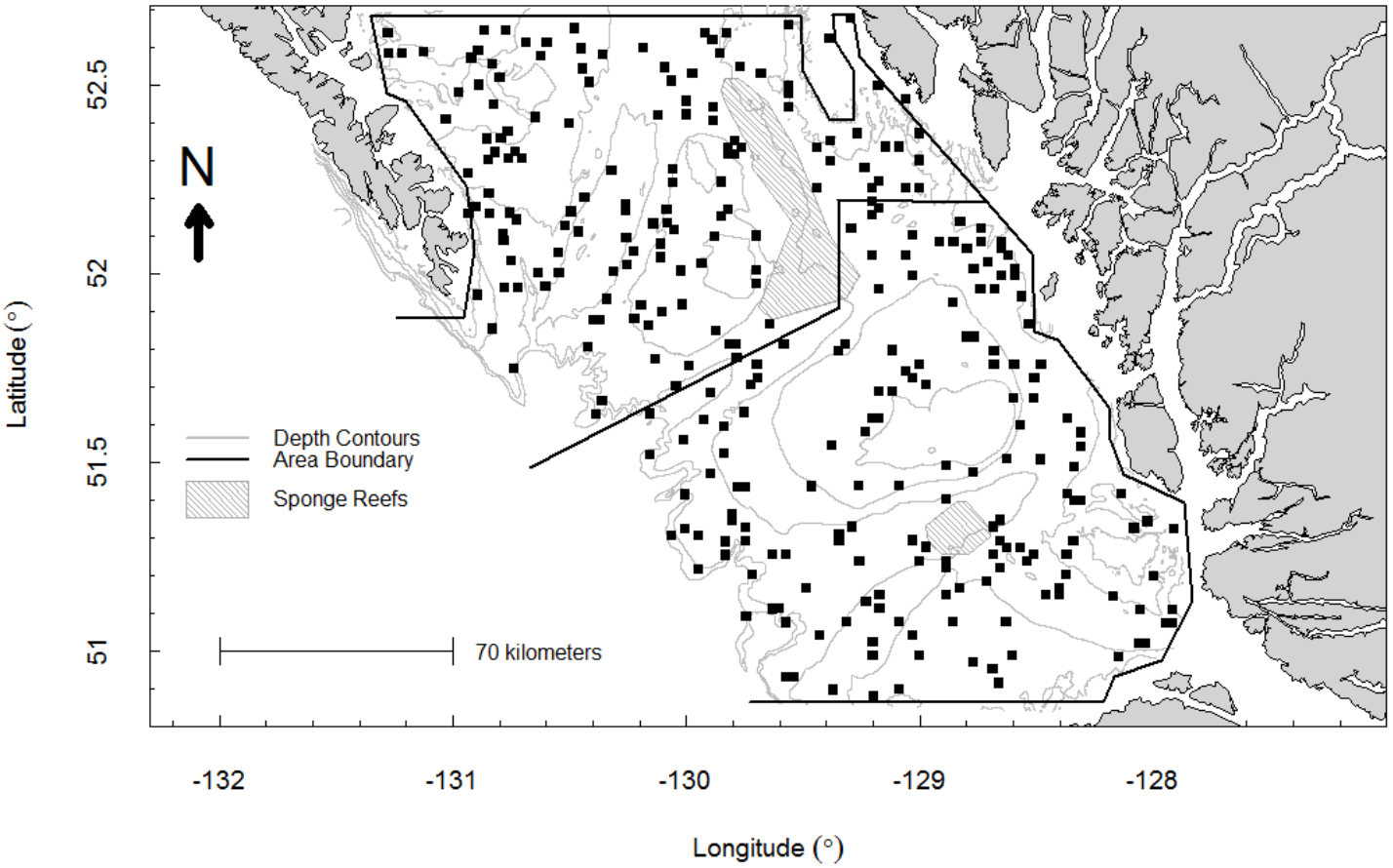

Figure 2. The QCS synoptic bottom trawl survey area showing the 301 randomly selected blocks with area boundary of the north and south subareas, sponge reef protected area, and depth contours for the 2011 survey.

Figure 3. The commercial stern trawler F/V Nordic Pearl used for the 2011 QCS synoptic bottom trawl survey.

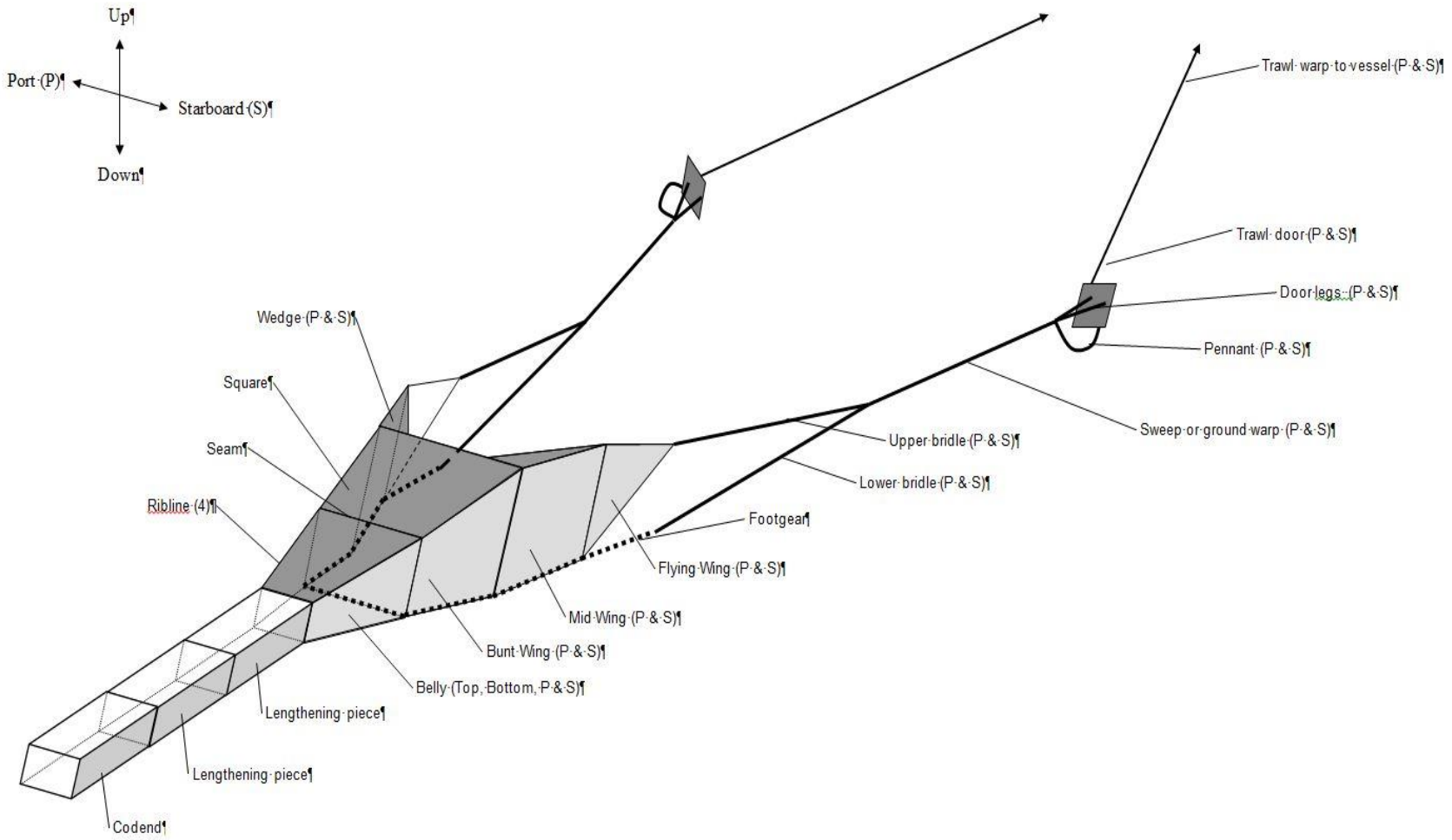

Figure 4. Overview diagram of the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey.

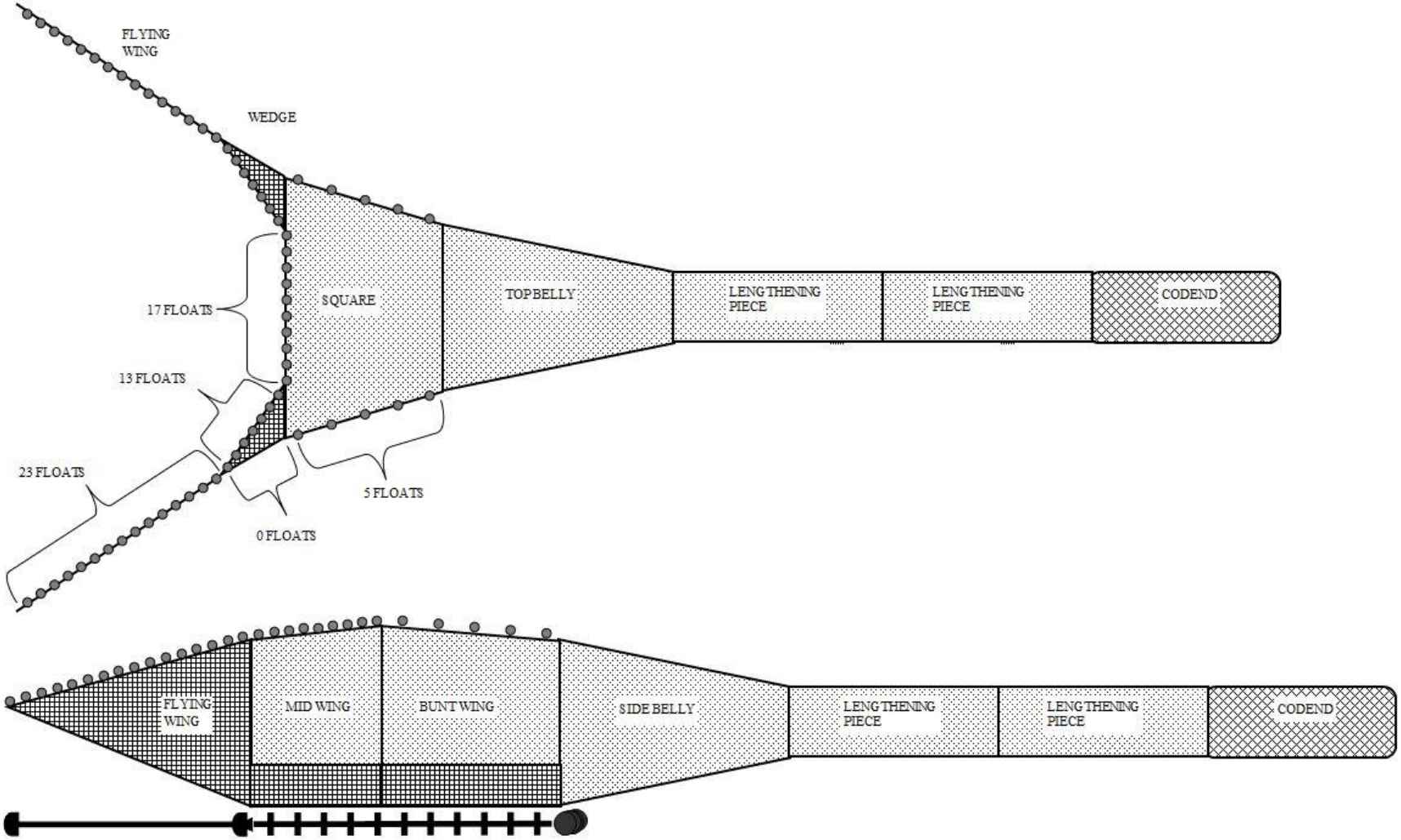

Figure 5. Top and side view of the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey.

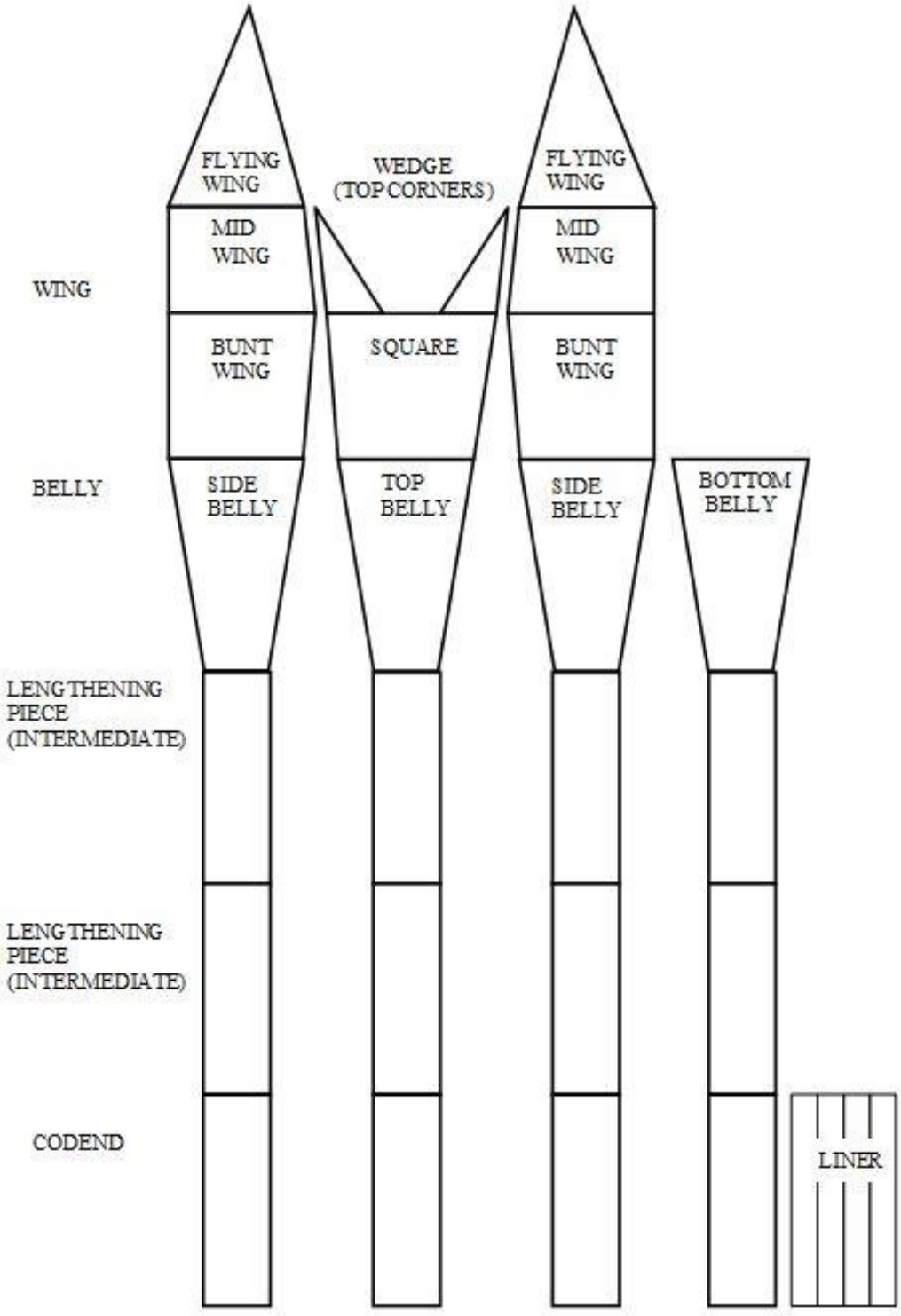

Figure 6. Diagram of the net panels with section names for the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey.

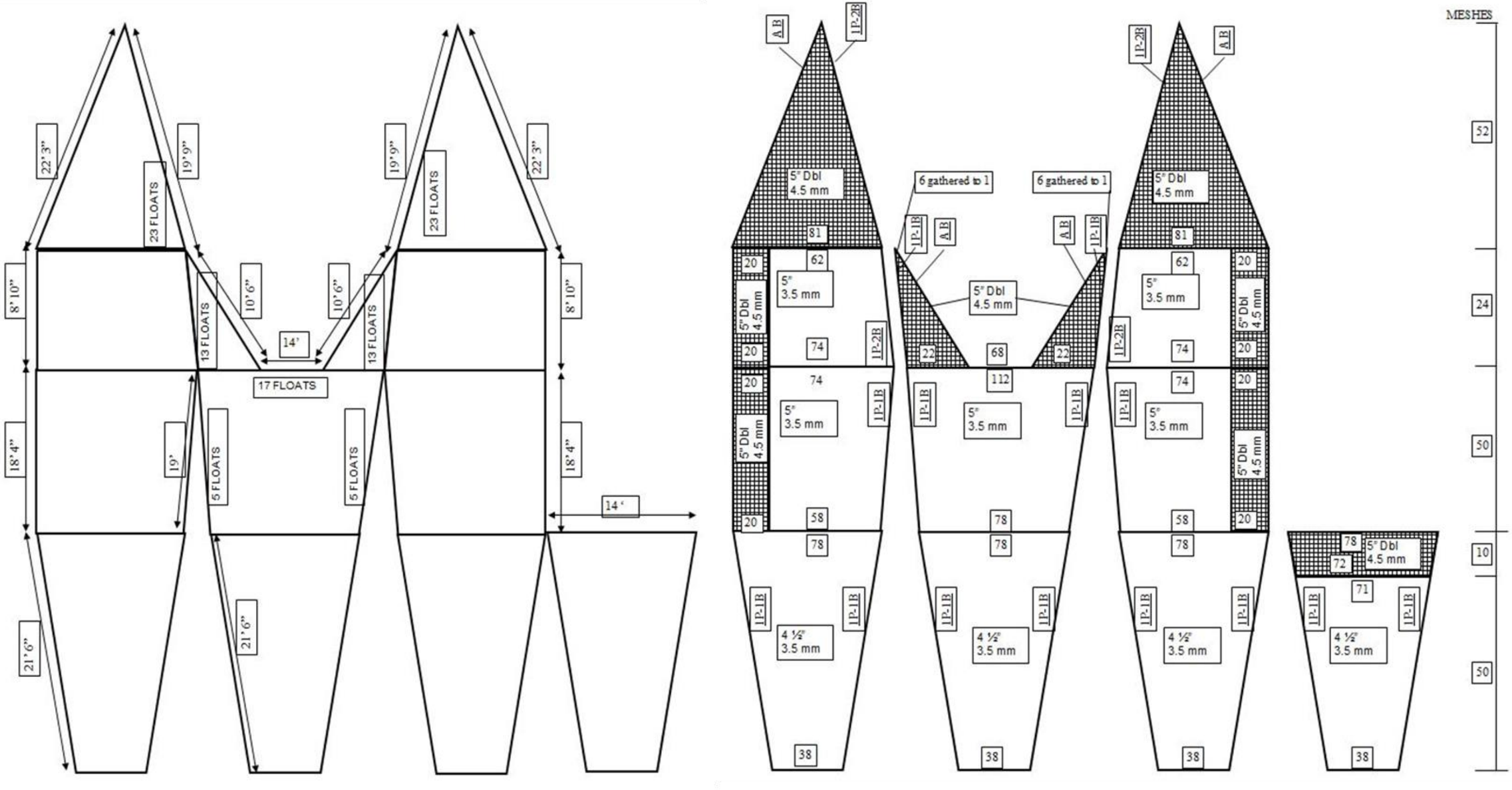

Figure 7. Schematics of the wing, bunt and belly segments of the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey. Dimensions/ float arrangement are shown on the left and mesh details/ net joins are shown on the right side of the diagram.

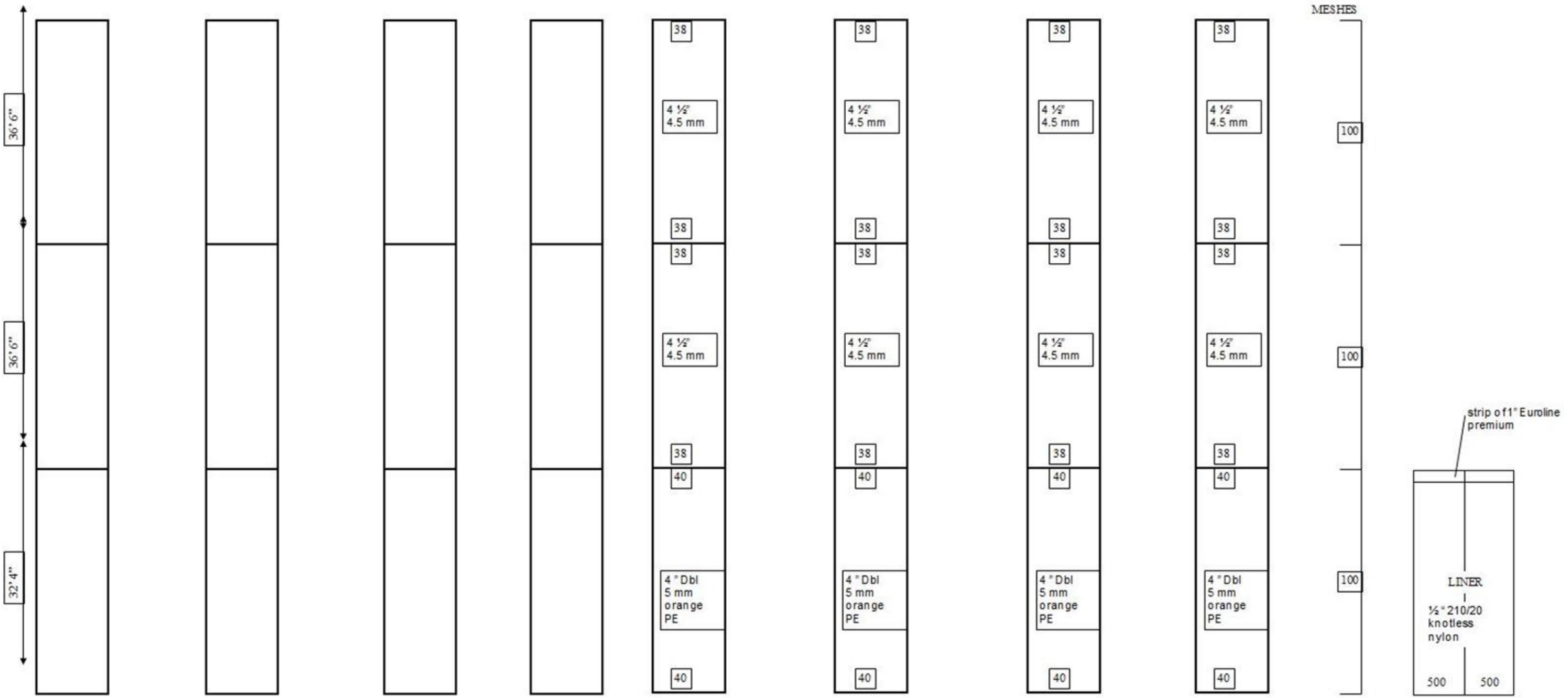

Figure 8. Schematics of lengthening (intermediate) pieces and codend segments of the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey. Dimensions are shown on the left and mesh details including the liner inside the codend are shown on the right side of the diagram.

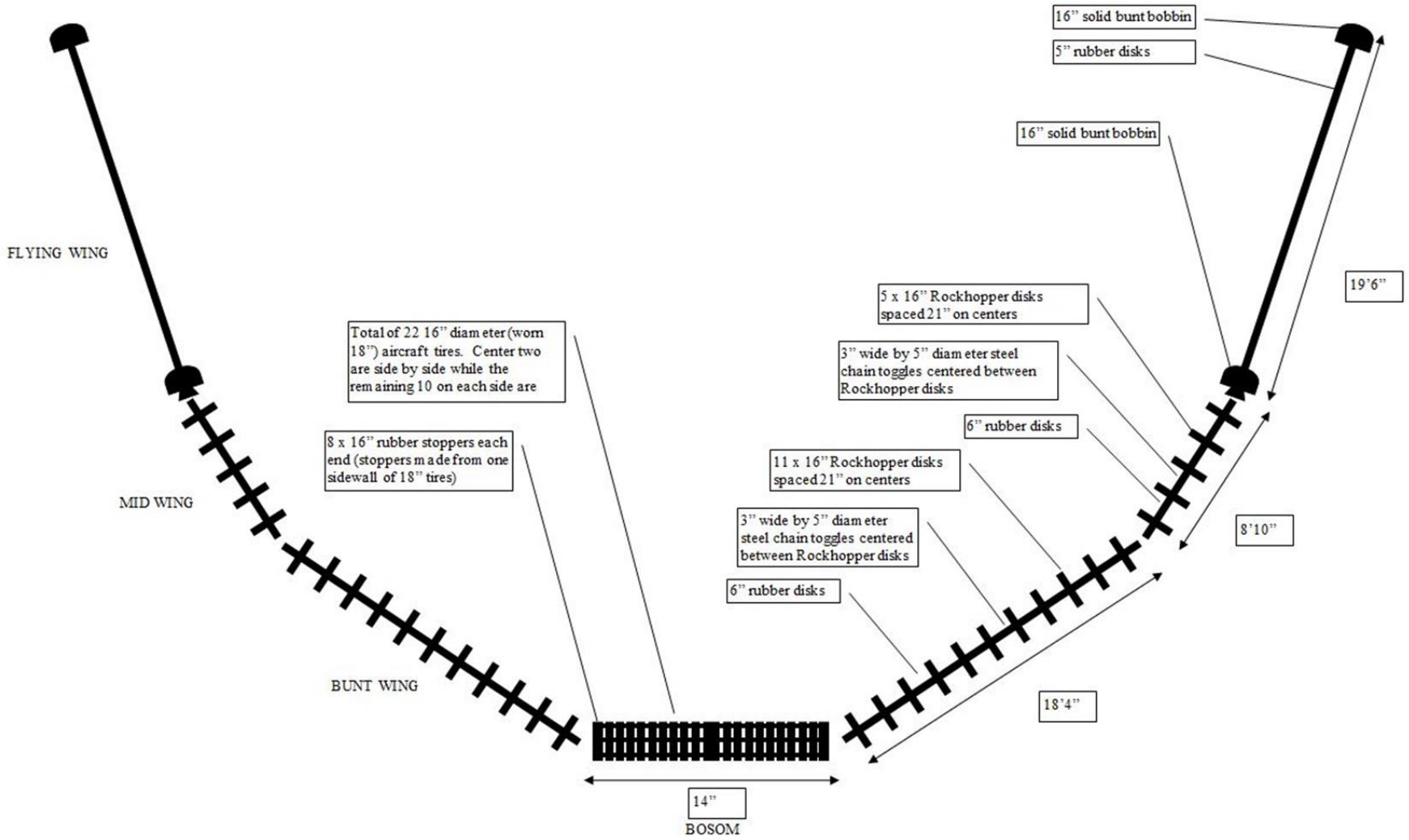

Figure 9. Design specifications of the trawl net Rockhopper foot gear for the Atlantic Western IIa box trawl used on the 2011 QCS synoptic bottom trawl survey.

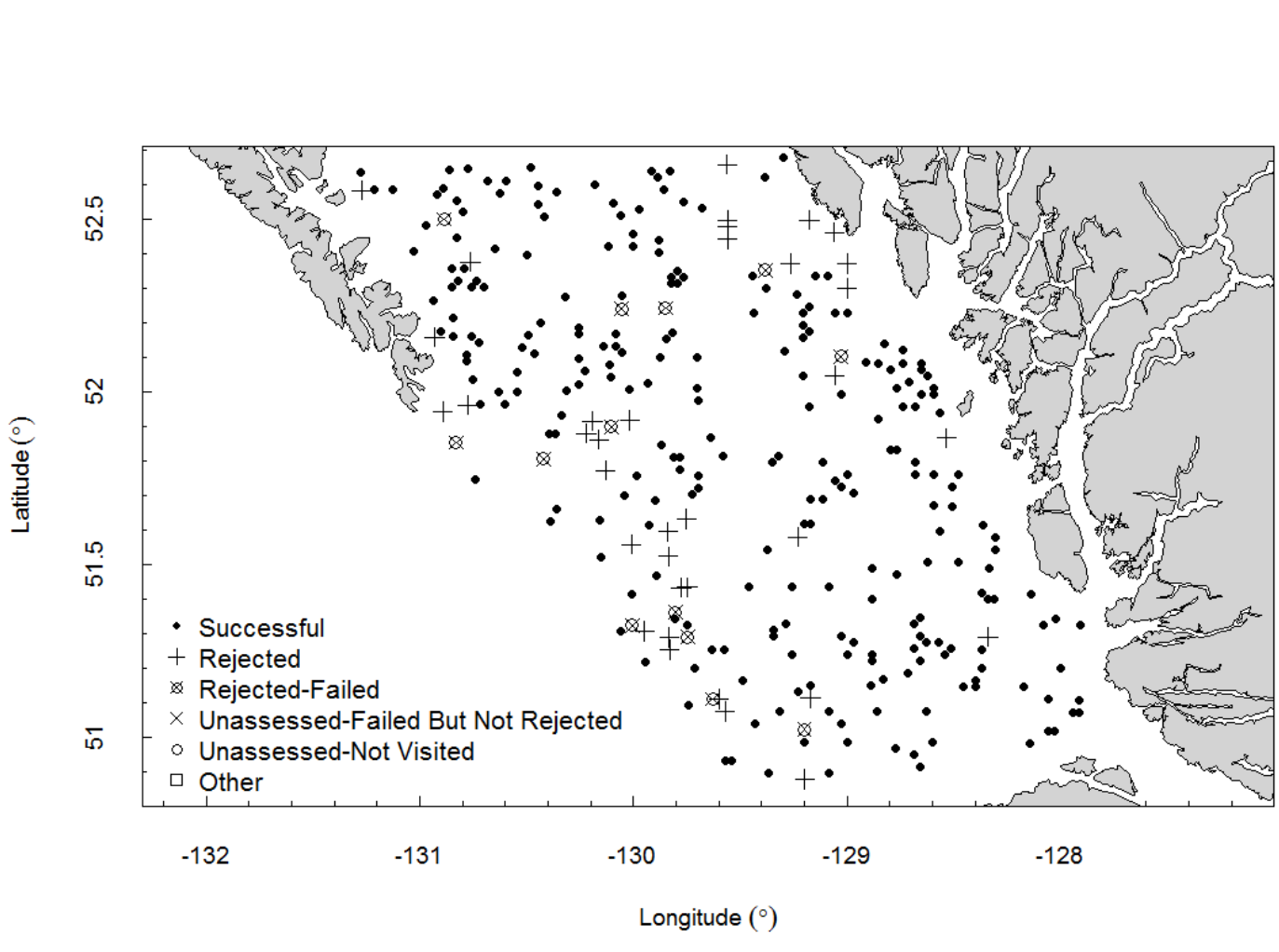

Figure 10. Final status of the 2011 QCS synoptic bottom trawl survey showing 252 successfully fished blocks (Successful), 36 blocks rejected after inspection (Rejected) and 13 blocks that were rejected after one or more failed fishing attempts (Rejected-Failed). No blocks remained unassessed at the end of the survey.

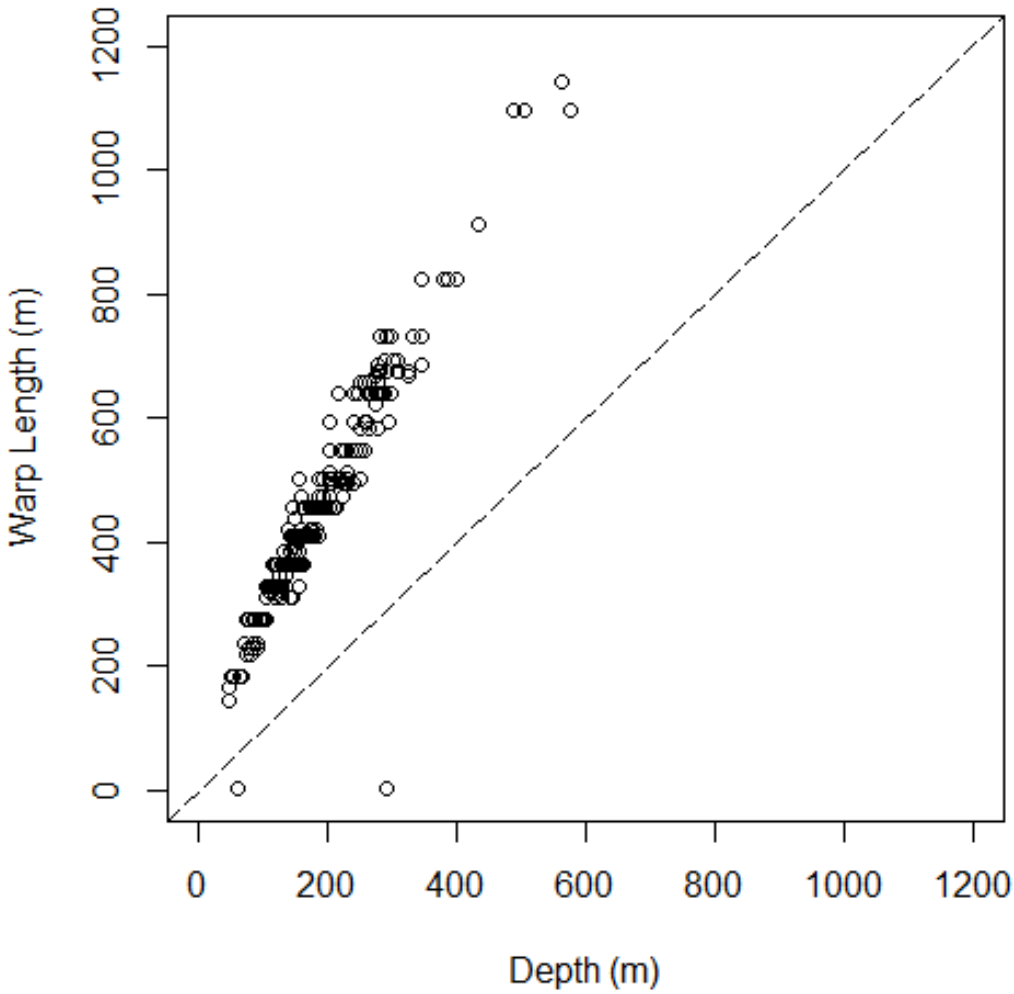

Figure 11. Warp length versus starting depth for each tow during the 2011 QCS synoptic bottom trawl survey.

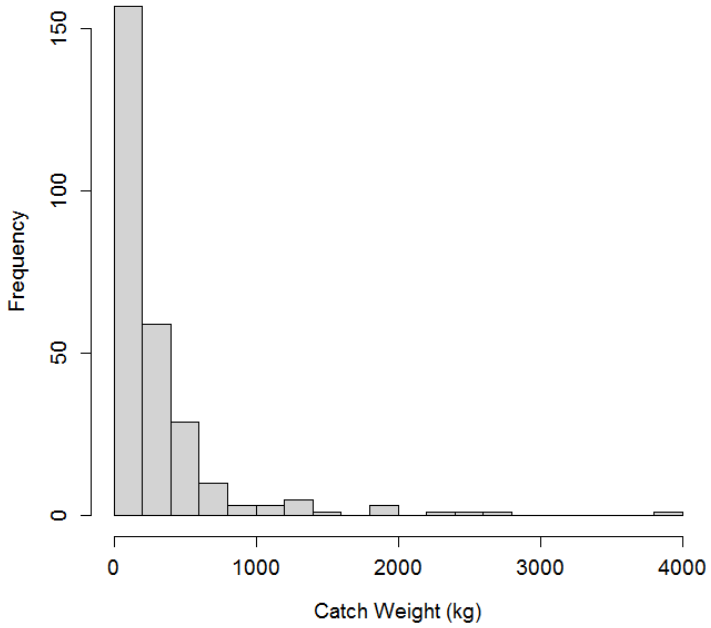

Figure 12. Histogram of catch weight in useable tows during the 2011 QCS synoptic bottom trawl survey.

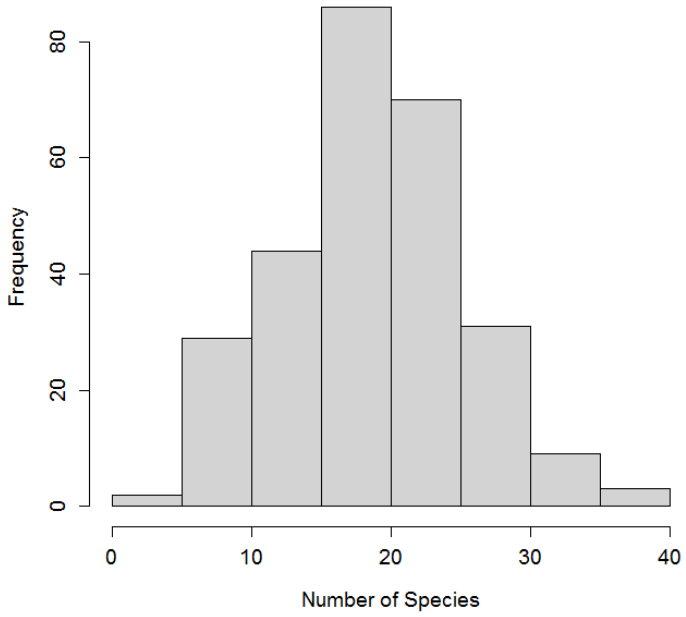

Figure 13. Histogram of the number of species caught in useable tows during the 2011 QCS synoptic bottom trawl survey.

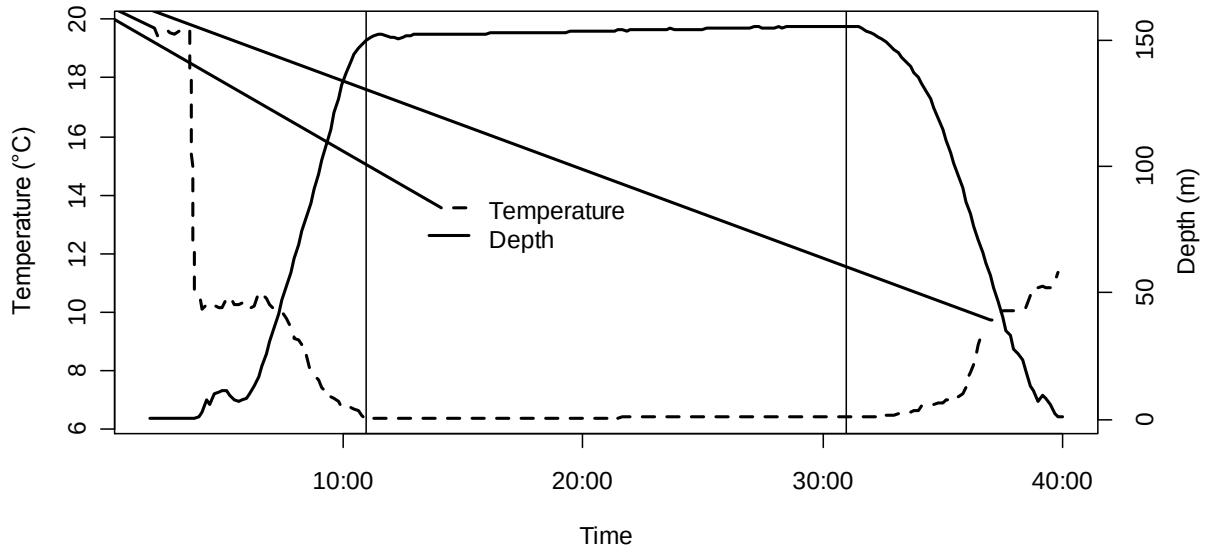

Figure 14. Example of a Seabird 39 temperature and depth profile collected during a synoptic bottom trawl survey. The vertical lines indicate the start and end of net contact with the sea floor.

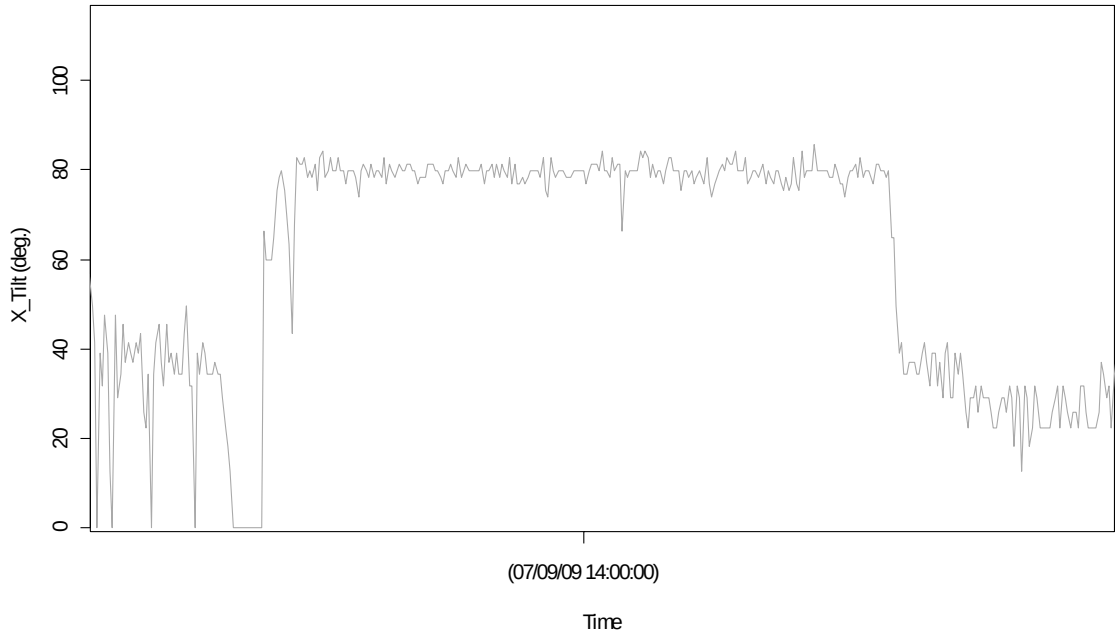

Figure 15. Example of a Mac Marine Industries bottom contact sensor profile collected during a bottom trawl survey. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

APPENDIX A: QCS 2011 SURVEY BRIDGE LOG

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
1	Jul-06	10:19	51.0157	128.0624	146	20		263	415.4	Yes
2	Jul-06	11:21	51.0188	128.0438	147	20		269	2369.2	Yes
3	Jul-06	12:38	51.0680	127.9560	156	20		289	519.3	Yes
4	Jul-06	15:01	51.0967	127.9011	130	20		238	485.4	Yes
5	Jul-06	16:50	51.2021	128.0123	95	20		170	32.2	Yes
6	Jul-06	18:44	51.3286	127.9117	122	16	2.9	214	97.1	Yes
7	Jul-06	19:49	51.3368	128.0342	188	15		348	309.7	Yes
8	Jul-06	20:55	51.3193	128.0883	121	20		225	124.8	Yes
9	Jul-07	6:05	51.4107	128.1516	115	19	5.4	209	166.1	Yes
10	Jul-07	7:59	51.3908	128.3226	119	20	5.4	218	1979.8	Yes
11	Jul-07	8:52	51.4086	128.3419	126	19	6.8	225	525.9	Yes
12	Jul-07	9:39	51.4031	128.3661	126	19	5.5	234	608.9	Yes
13	Jul-07	10:40	51.4785	128.3423	167	20	5.5	300	491.5	Yes
14	Jul-07	11:32	51.5267	128.3169	156	20	5.3	287	344.0	Yes
15	Jul-07	13:41	51.5727	128.2924	152	19	5.2	278	757.3	Yes
16	Jul-07	14:39	51.6064	128.3506	158	19	5.3	291	375.8	Yes
17	Jul-07	15:47	51.6625	128.4966	141	19	5.5	256	946.3	Yes
18	Jul-07	16:43	51.7153	128.5070	148	19	5.4	271	338.1	Yes
19	Jul-07	17:30	51.7548	128.4830	144	20	5.1	263	241.6	Yes
20	Jul-07	19:33	51.9457	128.5624	145	19	5.5	263	128.8	Yes
21	Jul-07	20:30	51.9549	128.6638	156	19	5.4	285	553.8	Yes
22	Jul-08	6:14	51.9559	128.7524	157	20	5.6	289	591.8	Yes
23	Jul-08	8:03	52.0050	128.7760	174	22	5.3	320	153.5	Yes
24	Jul-08	8:53	52.0229	128.7162	175	20	5.6	331	477.6	Yes
25	Jul-08	9:48	52.0014	128.6585	160	19	5.2	293	434.1	Yes
26	Jul-08	10:52	51.9857	128.5905	155	19	5.5	282	271.6	Yes
27	Jul-08	11:42	52.0203	128.6065	157	19	5.5	285	255.6	Yes
28	Jul-08	13:01	52.0373	128.6107	153	20	5.4	284	429.1	Yes
29	Jul-08	13:52	52.0751	128.6435	170	20	5.5	309	279.8	Yes
30	Jul-08	14:39	52.0750	128.6567	174	20	5.5		371.8	Yes
31	Jul-08	15:30	52.0826	128.7214	184	20	5.3	338	175.7	Yes
32	Jul-08	16:21	52.1170	128.7346	196	20	5.3	360	129.7	Yes
33	Jul-08	17:16	52.1358	128.8113	214	19	5.2	391	82.5	Yes
34	Jul-08	19:18	52.2397	129.0015	180	19	5.3	340	108.0	Yes
35	Jul-08	20:10	52.2254	129.0711	170	19	5.3	311	112.2	Yes
36	Jul-09	6:04	52.6748	129.2965	147	20	5.7	263	210.2	Yes
37	Jul-09	7:37	52.6322	129.3666	125	19	5.1	221	599.7	Yes
38	Jul-09	10:29	52.5230	129.6883	146	19	5.5	267	26.6	Yes
39	Jul-09	11:12	52.5456	129.7523	158	20	5.5	278	108.0	Yes
40	Jul-09	12:10	52.5803	129.8605	216	20	5.3	393	378.3	Yes
41	Jul-09	13:33	52.6455	129.8250	150	22	5.6	267	78.0	Yes
42	Jul-09	14:24	52.6237	129.8938	249	19	5.7	457	166.4	Yes
43	Jul-09	15:31	52.6364	129.9195	260	20	6.1	476	76.7	Yes
44	Jul-09	17:07	52.5607	130.0867	272	2	2.6	496	0	No
45	Jul-09	17:33	52.5559	130.0904	275	20	5.3	505	144.9	Yes
46	Jul-09	18:34	52.5100	130.0590	279	19	5.1	512	82.9	Yes
47	Jul-09	19:47	52.5325	129.9728	262	19	5.3	481	111.6	Yes
48	Jul-09	20:41	52.4708	129.9967	254	20	5.2	466	109.0	Yes
49	Jul-10	6:00	52.2225	129.4496	154	20	5.6	293	76.9	Yes
50	Jul-10	7:16	52.2946	129.3761	157	20	11.5	285	903.4	Yes
51	Jul-10	8:28	52.3281	129.4262	161	17	5.5	293	175.1	Yes
52	Jul-10	9:29	52.3444	129.3696	117	6	6.1	210	7.1	No

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
53	Jul-10	11:52	52.3430	129.0999	150	19	5.8	282	71.6	Yes
54	Jul-10	12:40	52.3304	129.1387	139	19	5.6	249	88.3	Yes
55	Jul-10	13:27	52.2924	129.2254	155	15	5.7	280	75.1	No
56	Jul-10	14:07	52.2859	129.2445	171	21	5.3	311	67.1	Yes
57	Jul-10	15:25	52.2398	129.1583	168	19	5.6	311	53.2	Yes
58	Jul-10	16:12	52.2340	129.2005	169	19	6.1	309	48.6	Yes
59	Jul-10	16:58	52.1941	129.2067	161	12	5.0	296	26.1	No
60	Jul-10	17:33	52.1892	129.2061	161	21	5.6	291	49.2	Yes
61	Jul-10	18:25	52.1864	129.1619	163	20	5.3	293	108.5	Yes
62	Jul-10	19:18	52.1532	129.2087	172	20	5.7	311	148.1	Yes
63	Jul-10	20:45	52.1276	129.3055	166	20	5.2	304	89.4	Yes
64	Jul-11	5:54	52.0393	129.1929	166	19	5.5	302	136.6	Yes
65	Jul-11	7:09	51.9560	129.1854	188	20	5.7	348	217.3	Yes
66	Jul-11	8:10	51.9916	129.0497	170	19	5.7	313	174.6	Yes
67	Jul-11	10:01	52.1003	129.0242	165	13	5.5	305	419.8	No
68	Jul-11	10:54	52.0855	128.9227	179	18	5.8	329	73.9	Yes
69	Jul-11	11:44	52.0821	128.8531	179	20		327	117.8	Yes
70	Jul-11	12:30	52.0746	128.8129	179	20	14.0	327	183.6	Yes
71	Jul-11	14:04	51.9246	128.8473	87	19	5.8	165	80.4	Yes
72	Jul-11	14:54	51.8493	128.8089	73	21	9.2	134	28.9	Yes
73	Jul-11	15:35	51.8373	128.7827	74	20	5.1	134	23.8	Yes
74	Jul-11	16:24	51.8027	128.6961	76	19	5.6	135	17.7	Yes
75	Jul-11	17:01	51.7686	128.6846	73	20	5.7	132	19.3	Yes
76	Jul-11	17:47	51.7667	128.6086	146	19	5.5	265	416.5	Yes
77	Jul-11	18:44	51.6818	128.5971	81	19	10.3	165	252.8	Yes
78	Jul-11	19:34	51.6082	128.5691	139	20	5.3	252	1207.2	Yes
79	Jul-11	20:38	51.5139	128.4927	189	20	5.9	342	426.9	Yes
80	Jul-12	6:09	51.2724	128.3798	96	19	10.3	172	59.1	Yes
81	Jul-12	7:22	51.2032	128.3849	167	19	5.6	309	415.4	Yes
82	Jul-12	8:53	51.1367	128.1642	138	16	5.7	254	171.5	Yes
83	Jul-12	10:06	51.1042	128.0546	143	15	5.5	262	342.6	Yes
84	Jul-12	11:22	51.0790	127.9286	157	19	5.8	289	992.6	Yes
85	Jul-12	13:11	50.9862	128.1682	78	21	5.5	145	273.0	Yes
86	Jul-13	6:03	50.9598	128.7857	66	19	6.1	115	67.4	Yes
87	Jul-13	6:51	50.9643	128.7017	80	19	5.6	141	119.7	Yes
88	Jul-13	7:32	50.9247	128.6581	85	19	5.5	154	32.6	Yes
89	Jul-13	8:37	50.9766	128.6142	68	16	5.7	119	184.5	Yes
90	Jul-13	9:31	51.0667	128.6217	92	20	5.4	155	90.9	Yes
91	Jul-13	10:37	51.1423	128.4707	175	20	5.7	329	286.5	Yes
92	Jul-13	11:23	51.1538	128.4189	184	20	6.1	349	269.9	Yes
93	Jul-13	12:15	51.1579	128.3820	182	20	5.8	349	400.8	Yes
94	Jul-13	13:36	51.2477	128.5093	170	6	5.5	318	41.5	No
95	Jul-13	14:16	51.2498	128.5187	175	20	6.0	329	115.1	Yes
96	Jul-13	15:04	51.2468	128.5396	185	19	5.4	351	70.7	Yes
97	Jul-13	16:17	51.2170	128.6548	177	20	5.5	337	304.7	Yes
98	Jul-13	17:20	51.2557	128.6941	183	19	6.0	348	254.4	Yes
99	Jul-13	18:21	51.2920	128.6689	169	16	5.3	326	1276.9	Yes
100	Jul-13	19:05	51.2835	128.6459	170	16	5.7	320	108.1	Yes
101	Jul-13	20:06	51.2790	128.5831	170	17	6.0	327	60.4	Yes
102	Jul-14	5:58	51.5114	128.6108	161	20	6.0	296	1113.5	Yes
103	Jul-14	7:08	51.4812	128.7578	87	21	5.3	152	137.5	Yes
104	Jul-14	8:07	51.4924	128.8648	53	20	5.6	95	48.6	Yes
105	Jul-14	9:29	51.4413	129.0703	96	19	5.1	188	345.1	Yes
106	Jul-14	10:41	51.4352	129.2434	86	19	5.9	161	1148.6	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
107	Jul-14	11:53	51.5305	129.3544	69	19	5.6	124	61.9	Yes
108	Jul-14	13:18	51.6214	129.1919	53	20	6.3	101	340.7	Yes
109	Jul-14	14:01	51.6002	129.1652	47	12	5.2	84	268.9	No
110	Jul-14	14:35	51.5998	129.1515	48	20	5.7	84	152.4	Yes
111	Jul-14	15:32	51.6813	129.1897	55	20	5.9	99	320.2	Yes
112	Jul-14	16:14	51.6871	129.1323	50	19	5.8	91	86.8	Yes
113	Jul-14	17:02	51.7327	129.0751	96	19	5.3	174	64.0	Yes
114	Jul-14	17:52	51.7653	129.0016	84	20	6.1	150	77.3	Yes
115	Jul-14	18:31	51.7343	129.0276	91	20	5.8	166	36.4	Yes
116	Jul-14	19:26	51.7111	128.9656	66	20	5.4	119	61.2	Yes
117	Jul-15	6:03	51.7957	129.1002	108	20	5.2	196	61.5	Yes
118	Jul-15	7:22	51.8169	129.3127	129	19	5.9	236	66.4	Yes
119	Jul-15	8:06	51.7942	129.3320	129	19	5.5	232	37.8	Yes
120	Jul-15	9:21	51.8052	129.5676	258	20	5.7	470	172.6	Yes
121	Jul-15	10:11	51.8605	129.6262	252	19	5.4	463	770.9	Yes
122	Jul-15	11:22	51.9660	129.6931	179	20	5.6	327	227.4	Yes
123	Jul-15	12:05	52.0013	129.7118	150	19	6.2	269	38.9	Yes
124	Jul-15	13:04	52.0959	129.6990	203	20	5.6	373	57.8	Yes
125	Jul-15	14:21	52.0964	129.8607	122	19	5.2	225	270.6	Yes
126	Jul-15	15:09	52.1413	129.8508	184	20	5.6	326	222.0	Yes
127	Jul-15	15:54	52.1603	129.8170	202	20	5.4	368	248.0	Yes
128	Jul-15	16:51	52.2316	129.8411	142	0	3.0	260	0	No
129	Jul-15	17:19	52.2450	129.8506	141	9	5.2	256	7.8	No
130	Jul-15	18:21	52.3082	129.8190	197	19	5.6	358	77.7	Yes
131	Jul-15	19:03	52.3253	129.8189	202	20	5.1	368	99.6	Yes
132	Jul-15	19:46	52.3202	129.7917	203	19	5.3	373	196.5	Yes
133	Jul-15	20:30	52.3227	129.7629	208	19	5.2	379	342.3	Yes
134	Jul-16	6:02	52.3470	129.7839	210	19	5.4	384	320.6	Yes
135	Jul-16	6:57	52.3969	129.8800	211	19	5.5	384	147.5	Yes
136	Jul-16	7:40	52.4348	129.8817	220	19	5.3	402	229.3	Yes
137	Jul-16	8:40	52.4260	129.9855	249	19	5.0	452	81.7	Yes
138	Jul-16	9:38	52.4220	130.1067	291	20	5.2	534	85.3	Yes
139	Jul-16	11:22	52.5933	130.1856	257	19	5.8	476	154.1	Yes
140	Jul-16	12:43	52.5857	130.3509	190	20	5.3	358	202.4	Yes
141	Jul-16	13:35	52.5902	130.4399	163	16	5.8	302	159.7	Yes
142	Jul-16	14:30	52.6502	130.4780	152	16	5.7	280	55.0	Yes
143	Jul-16	15:39	52.6237	130.5923	145	19	5.9	265	166.5	Yes
144	Jul-16	17:00	52.6188	130.6999	132	19	6.0	240	204.6	Yes
145	Jul-16	17:42	52.5834	130.6415	132	20	5.6	241	152.6	Yes
146	Jul-16	19:03	52.5499	130.4565	185	19	5.2	335	291.9	Yes
147	Jul-16	19:49	52.5127	130.4157	191	21	5.3	349	511.9	Yes
148	Jul-17	5:59	52.2865	130.0561	208	20	5.3	380	237.9	Yes
149	Jul-17	6:45	52.2480	130.0638	156	17	12.8	282	66.6	No
150	Jul-17	7:57	52.1814	130.0796	205	19	5.6	364	593.2	Yes
151	Jul-17	8:47	52.1391	130.1342	249	19	5.3	455	133.8	Yes
152	Jul-17	9:57	52.1382	130.0845	181	20	7.4	329	166.8	Yes
153	Jul-17	10:55	52.1262	130.0507	172	20	5.6	313	308.8	Yes
154	Jul-17	12:01	52.0787	130.1214	134	2	8.7	285	0	No
155	Jul-17	12:21	52.0873	130.1119	170	19	5.3	289	28.9	Yes
156	Jul-17	13:23	52.0357	130.1056	143	21	5.3	262	48.6	Yes
157	Jul-17	14:45	52.0214	130.0351	144	19		263	245.6	Yes
158	Jul-17	15:56	52.0362	129.9210	128	20	5.8	229	63.1	Yes
159	Jul-17	18:00	51.8948	130.1149	171	9	5.0	313	26.9	No
160	Jul-17	20:00	51.9209	130.3524	293	20	5.0	543	406.3	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
161	Jul-18	6:02	51.8370	129.8839	149	21	4.6	269	696.1	Yes
162	Jul-18	7:12	51.8115	129.8226	278	20	5.1	505	279.8	Yes
163	Jul-18	8:02	51.8083	129.7956	296	20	5.3	541	145.0	Yes
164	Jul-18	8:57	51.7832	129.7697	324	20	5.4	591	252.8	Yes
165	Jul-18	10:18	51.7517	129.7083	295	20	5.1	545	128.8	Yes
166	Jul-18	11:11	51.7303	129.6853	275	19	5.0	499	76.6	Yes
167	Jul-18	12:04	51.7098	129.7164	287	20	5.4	525	84.0	Yes
168	Jul-18	14:36	51.6058	129.9352	240	21	5.1	441	3950.9	Yes
169	Jul-18	18:17	51.3428	129.8167	237	19	5.1	437	146.4	Yes
170	Jul-18	19:03	51.3597	129.7962	197	15	11.3	417	182.8	No
171	Jul-18	20:20	51.3301	129.7285	226	19	5.5	408	768.3	Yes
172	Jul-19	6:05	51.2831	129.7343	245	5	4.5	457	137.3	No
173	Jul-19	6:39	51.2956	129.7358	238	9	5.0	439	1412.4	No
174	Jul-19	8:24	51.2570	129.6184	254	15	14.3	463	517.6	Yes
175	Jul-19	9:23	51.2571	129.5669	264	20	5.5	487	229.8	Yes
176	Jul-19	10:58	51.2943	129.3614	277	20	5.6	507	183.1	Yes
177	Jul-19	11:54	51.3146	129.3500	247	20	5.3	450	218.2	Yes
178	Jul-19	12:47	51.3321	129.3031	218	20	5.7	395	211.7	Yes
179	Jul-19	14:00	51.2402	129.2636	285	19	5.2	523	458.4	Yes
180	Jul-19	15:36	51.2321	129.0091	205	20	5.4	375	224.1	Yes
181	Jul-19	16:26	51.2712	128.9682	223	19	5.6	402	257.2	Yes
182	Jul-19	17:14	51.2886	129.0219	242	20	4.8	443	578.2	Yes
183	Jul-19	18:40	51.3972	128.9006	216	22	5.6	395	388.9	Yes
184	Jul-19	20:08	51.3482	128.6764	207	20	5.4	380	530.2	Yes
185	Jul-21	7:03	51.1797	128.7026	116	20	5.4	218	381.1	Yes
186	Jul-21	8:22	51.2354	128.8778	182	19	5.7	327	294.7	Yes
187	Jul-21	9:06	51.2247	128.9004	148	20	4.9	280	197.4	Yes
188	Jul-21	10:03	51.1755	128.8285	116	19	6.0	223	72.0	Yes
189	Jul-21	10:45	51.1528	128.8691	109	21	5.6	198	81.8	Yes
190	Jul-21	12:11	51.0858	128.8376	70	19	5.4	124	124.8	Yes
191	Jul-21	13:46	50.9762	129.0003	74	20	5.7	143	232.1	Yes
192	Jul-21	14:30	51.0307	129.0155	97	19	5.8	177	107.0	Yes
193	Jul-21	15:33	51.0785	129.0757	128	17	5.7	238	149.7	Yes
194	Jul-21	16:58	51.1416	129.1782	162	17	5.0	294	1888.9	Yes
195	Jul-21	18:02	51.1388	129.2209	182	19	5.6	338	630.5	Yes
196	Jul-21	19:30	51.0766	129.3167	197	14	5.5	366	457.2	Yes
197	Jul-22	6:17	52.1281	130.5251	271	20	5.1	479	52.6	Yes
198	Jul-22	7:08	52.1535	130.5074	261	19	5.2	477	140.0	Yes
199	Jul-22	8:02	52.1954	130.4463	277	20	5.2	494	59.7	Yes
200	Jul-22	9:49	52.3873	130.4852	151	19	5.9	276	404.3	Yes
201	Jul-22	10:52	52.4096	130.6233	139	19	5.7	254	43.2	Yes
202	Jul-22	12:31	52.5291	130.7884	126	19	5.7	221	136.2	Yes
203	Jul-22	13:31	52.5572	130.8140	118	19	5.6	218	42.3	Yes
204	Jul-22	14:35	52.6349	130.7877	113	21	5.4	207	83.7	Yes
205	Jul-22	15:27	52.6524	130.8480	100	20	5.7	183	38.9	Yes
206	Jul-22	17:23	52.5829	131.1368	129	19	5.8	238	192.3	Yes
207	Jul-22	18:50	52.5872	131.1935	136	19	5.2	251	233.5	Yes
208	Jul-22	20:16	52.6471	131.2932	146	20	5.7	263	518.6	Yes
209	Jul-23	6:56	52.5973	130.8785	104	20	5.8	188	76.2	Yes
210	Jul-23	7:44	52.5762	130.9044	103	19	5.6	187	30.0	Yes
211	Jul-23	8:46	52.5118	130.8840	97	16	5.1	172	81.9	No
212	Jul-23	10:14	52.4733	130.9793	169	4	4.2	287	0	No
213	Jul-23	10:43	52.4880	130.9641	149	19	5.8	260	204.8	Yes
214	Jul-23	11:39	52.4120	131.0135	119	22		214	57.1	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
215	Jul-23	13:24	52.4599	130.8235	113	19	6.0	203	23.4	Yes
216	Jul-23	15:03	52.3640	130.8049	126	20	5.3	232	6.9	Yes
217	Jul-23	15:58	52.3573	130.8590	137	20	5.5	251	97.3	Yes
218	Jul-23	16:55	52.3156	130.8141	152	19	5.7	276	109.9	Yes
219	Jul-23	17:42	52.3069	130.8608	158	19	5.8	293	93.5	Yes
220	Jul-23	18:25	52.3024	130.7594	155	19	5.6	278	236.2	Yes
221	Jul-23	19:27	52.3052	130.6977	156	16	5.8	284	46.5	Yes
222	Jul-23	20:13	52.3227	130.7417	145	7	4.7	265	11.3	No
223	Jul-23	20:49	52.3201	130.7356	145	18		265	45.1	Yes
224	Jul-24	6:21	52.2598	130.9455	172	22	5.4	316	1315.1	Yes
225	Jul-24	7:21	52.2228	130.8560	201	20	5.0	364	153.3	Yes
226	Jul-24	8:14	52.1814	130.9084	200	20	5.7	362	116.1	Yes
227	Jul-24	9:07	52.1648	130.8370	225	19	5.5	412	167.4	Yes
228	Jul-24	9:53	52.1596	130.7709	207	20	5.5	384	140.5	Yes
229	Jul-24	10:43	52.1543	130.7109	219	19	5.6	395	174.5	Yes
230	Jul-24	11:33	52.1164	130.7651	234	21	5.4	424	530.0	Yes
231	Jul-24	12:21	52.1018	130.7804	252	20	5.7	448	720.8	Yes
232	Jul-24	13:11	52.0432	130.7480	265	19	5.7	481	284.7	Yes
233	Jul-24	14:51	51.9618	130.7157	306	16	5.7	565	100.9	Yes
234	Jul-24	15:57	51.9703	130.6054	294	20	5.4	529	106.0	Yes
235	Jul-24	18:35	51.8606	130.8237	192	15	5.1	355	638.9	No
236	Jul-24	19:55	51.7513	130.7472	304	19	5.0	525	489.9	Yes
237	Jul-25	6:24	52.0122	130.6252	283	19	5.4	518	68.6	Yes
238	Jul-25	7:36	51.9986	130.5563	268	20	6.2	525	187.0	Yes
239	Jul-25	8:25	52.0508	130.5522	289	19	5.5	541	247.0	Yes
240	Jul-25	9:24	52.1015	130.4725	378	20	5.3	693	145.5	Yes
241	Jul-25	11:06	52.2651	130.3183	387	20	5.0	711	241.0	Yes
242	Jul-25	12:31	52.1891	130.2597	427	19	5.6	781	163.2	Yes
243	Jul-25	13:26	52.1725	130.2463	442	21	5.3	812	174.3	Yes
244	Jul-25	14:34	52.1083	130.2503	348	20	5.0	638	251.4	Yes
245	Jul-25	15:35	52.0666	130.2117	291	19	5.8	529	169.5	Yes
246	Jul-25	16:27	52.0304	130.2398	304	20	5.3	551	85.4	Yes
247	Jul-25	17:16	52.0105	130.2976	340	19	5.0	620	71.4	Yes
248	Jul-25	18:54	51.8878	130.3642	227	20	5.4	415	113.8	Yes
249	Jul-25	19:41	51.8890	130.3797	239	20	5.7	435	123.5	Yes
250	Jul-25	20:38	51.8195	130.4234	266	3	4.4	552	20.2	No
251	Jul-26	6:53	51.3355	128.6886	194	21	3.0	177	2711.0	Yes
252	Jul-27	6:44	51.0330	129.1947	149	4	4.4	267	0	No
253	Jul-27	6:57	51.0274	129.1979	145	1	3.2	267	33.6	No
254	Jul-27	7:34	50.9971	129.1963	142	19	5.4	258	58.0	Yes
255	Jul-27	9:02	50.9030	129.0682	64	19	5.5	121	33.8	Yes
256	Jul-27	10:36	50.8936	129.3575	168	17	5.3	307	612.5	Yes
257	Jul-27	11:49	50.9255	129.5382	226	19	5.3	413	183.3	Yes
258	Jul-27	12:41	50.9418	129.5590	237	19	5.8	432	187.7	Yes
259	Jul-27	14:12	51.0344	129.4299	226	21	5.5	419	589.4	Yes
260	Jul-27	15:39	51.1617	129.4842	282	21	5.5	518	122.6	Yes
261	Jul-27	17:09	51.1161	129.6210	303	20	5.1	540	79.7	No
262	Jul-27	19:51	51.0979	129.7303	486	24	4.9	902	280.6	Yes
263	Jul-28	6:59	51.7069	130.0450	330	23	5.2	602	159.2	Yes
264	Jul-28	7:50	51.7505	129.9984	290	18	5.6	541	149.7	Yes
265	Jul-28	9:15	51.6941	129.8829	344	20	5.4	629	227.4	Yes
266	Jul-28	12:13	51.4564	129.8931	230	19	5.3	421	1312.8	Yes
267	Jul-28	13:51	51.4061	129.9940	551	16	4.6	955	118.3	Yes
268	Jul-28	15:08	51.3159	130.0552	344	20	5.4	625	655.2	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (ftm)	Catch (kg)	Useable
269	Jul-28	16:10	51.3160	130.0137	281	3	3.4	510	0	No
270	Jul-28	16:33	51.3221	130.0157	277	5	5.0	505	22.6	No
271	Jul-28	17:04	51.3379	130.0194	271	2	5.4	497	120.8	No
272	Jul-28	18:30	51.2286	129.9530	318	22	5.8	574	1214.6	Yes
273	Jul-28	20:19	51.1974	129.7123	540	19	4.7	1000	264.0	Yes
274	Jul-29	6:29	51.7994	130.4328	295	8	4.2	499	66.1	No
275	Jul-29	7:15	51.8008	130.4195	263	13	5.1	483	254.0	No
276	Jul-29	9:10	51.6669	130.3539	274	17	5.4	507	1992.6	Yes
277	Jul-29	10:10	51.6259	130.3928	415	21		788	2421.1	Yes
278	Jul-29	11:41	51.6334	130.1608	518	19	4.9	958	219.1	Yes
279	Jul-29	13:37	51.5165	130.1490	421	20	4.6	764	1140.7	Yes
280	Jul-29	17:48	51.4296	129.4474	130	19	12.0	236	70.4	Yes

APPENDIX B: CATCH BY TOW (KG).<0.1 KG ENTERED AS –

Common Name	Scientific Name	Total Weight (Kg)	1	2	3	4	5	6	7
Aleutian Skate	*Bathyraja aleutica*	34.8							
Arrowtooth Flounder	*Atheresthes stomias*	16589.8	115.0	123.3	148.1	169.4	11.4	33.4	94.1
Aurora Rockfish	*Sebastes aurora*	32.5							
Big Skate	*Raja binoculata*	19.3							
Blackbelly Eelpout	*Lycodes pacificus*	155.5	5.0	0.4	0.3	4.7		0.1	
Bocaccio	*Sebastes paucispinis*	51.1	4.4						
Canary Rockfish	*Sebastes pinniger*	1459.2					2.4	0.8	
Curlfin Sole	*Pleuronichthys decurrens*	17.7							
Darkblotched Rockfish	*Sebastes crameri*	180.7							
Dover Sole	*Microstomus pacificus*	2250.6	24.9	29.3	114.9	12.5		2.6	26.6
English Sole	*Parophrys vetulus*	788.8	0.6	0.5	0.5				
Eulachon	*Thaleichthys pacificus*	101.2	0.3	-	-	0.2		-	2.2
Flathead Sole	*Hippoglossoides elassodon*	485.5	16.2	17.5	4.3	1.1	2.8	2.7	0.5
Giant Grenadier	*Albatrossia pectoralis*	24.4							
Greenstriped Rockfish	*Sebastes elongatus*	317.8			1.4	0.8		0.7	
Harlequin Rockfish	*Sebastes variegatus*	75.7							
Lingcod	*Ophiodon elongatus*	735.3							
Longnose Skate	*Raja rhina*	493.0							0.4
Longspine Thornyhead	*Sebastolobus altivelis*	63.2							
North Pacific Spiny Dogfish	*Squalus suckleyi*	1618.1							1.1
Pacific Cod	*Gadus macrocephalus*	1290.9	2.5			1.5		7.5	3.6
Pacific Hake	*Merluccius productus*	1703.7							
Pacific Halibut	*Hippoglossus stenolepis*	701.7			2.4				
Pacific Ocean Perch	*Sebastes alutus*	16261.8			0.2	0.2			
Pacific Sand Lance	*Ammodytes hexapterus*	73.9							
Pacific Sanddab	*Citharichthys sordidus*	197.7							
Petrale Sole	*Eopsetta jordani*	627.1		0.6		1.6	4.7		
Pygmy Rockfish	*Sebastes wilsoni*	18.6						0.1	
Quillback Rockfish	*Sebastes maliger*	108.3						5.3	
Redbanded Rockfish	*Sebastes babcocki*	1185.6			0.9				0.5
Redstripe Rockfish	*Sebastes proriger*	3526.3		35.0	0.7	12.9		5.0	
Rex Sole	*Glyptocephalus zachirus*	2160.3	57.8	20.9	45.5	16.0	0.8		8.2
Rosethorn Rockfish	*Sebastes helvomaculatus*	100.1							
Rougheye Rockfish	*Sebastes aleutianus*	2539.6							0.7
Sablefish	*Anoplopoma fimbria*	989.7	5.3	5.7	6.6	2.3			
Sandpaper Skate	*Bathyraja interrupta*	15.1							
Sharpchin Rockfish	*Sebastes zacentrus*	2742.3	0.1		0.3			0.7	-
Shortraker Rockfish	*Sebastes borealis*	354.7							
Shortspine Thornyhead	*Sebastolobus alascanus*	1149.2							
Silvergray Rockfish	*Sebastes brevispinis*	5871.2		1.6	0.8			9.3	
Slender Sole	*Lyopsetta exilis*	128.3	1.0	0.7	3.3	1.7	0.2		0.4
Southern Rock Sole	*Lepidopsetta bilineata*	777.1							
Splitnose Rockfish	*Sebastes diploproa*	1818.7							
Spotted Ratfish	*Hydrolagus colliei*	1857.3	2.1	3.7	25.7	34.4	9.8	8.0	23.5
Threadfin Sculpin	*Icelinus filamentosus*	11.2						0.5	
Walleye Pollock	*Theragra chalcogramma*	3793.6	177.4	2127.4	151.9	202.6		7.2	135.8
Widow Rockfish	*Sebastes entomelas*	49.0							
Yelloweye Rockfish	*Sebastes ruberrimus*	352.5				5.6		3.4	
Yellowmouth Rockfish	*Sebastes reedi*	3945.8							
Yellowtail Rockfish	*Sebastes flavidus*	2100.8			1.2	0.9			
Other		1839.7	2.9	2.5	10.1	17.2	0.1	9.8	12.1
Total		**83785.7**	**415.4**	**2369.2**	**519.3**	**485.4**	**32.2**	**97.1**	**309.7**

Common Name	8	9	10	11	12	13	14	15	16	17	18	19
Aleutian Skate												
Arrowtooth Flounder	16.4	44.3	1819.6	334.8	342.3	232.5	188.7	599.9	258.5	78.7	216.4	153.4
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	20.2	7.4		0.3	0.1	5.2	13.9	19.1	8.3	1.6	1.8	6.1
Bocaccio												
Canary Rockfish				46.4	9.7							
Curlfin Sole												
Darkblotched Rockfish								0.1	0.5			
Dover Sole	17.0	4.9		18.7	15.6	26.8	49.7	42.2	11.6	11.0	24.0	25.7
English Sole	12.8	14.2	0.4	0.4						1.4	0.4	0.9
Eulachon	0.8	2.9		-		14.0	10.3	1.5	6.3			2.0
Flathead Sole	14.5	16.9		7.4	2.7	0.7	20.1	18.4	31.8	6.6	21.4	21.4
Giant Grenadier												
Greenstriped Rockfish			4.5	1.7	3.6	3.7	0.9					
Harlequin Rockfish												
Lingcod		11.6	5.3	2.5	15.8	2.9	2.8				4.6	
Longnose Skate				3.2		24.8	6.4	3.9	5.2			7.0
Longspine Thornyhead												
North Pacific Spiny Dogfish		2.1	1.6				2.5	0.9	2.1	1.9	8.7	1.3
Pacific Cod		9.1	125.5	2.6	6.1	7.7						
Pacific Hake		0.1				4.4	-	0.1	4.7		1.4	
Pacific Halibut	9.1	2.7								8.9		
Pacific Ocean Perch		-		0.4	-	2.1	0.4	0.5	0.1			-
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole	1.7	0.5	5.3	1.2	0.5	5.2	0.5	2.7			0.8	1.4
Pygmy Rockfish			0.1									
Quillback Rockfish		0.4										
Redbanded Rockfish						1.1	0.2	-	0.3			
Redstripe Rockfish				6.0	175.7	9.0						
Rex Sole	12.8	4.8		6.7	12.0	6.6	3.0	3.9	2.1	7.2	3.4	3.8
Rosethorn Rockfish												
Rougheye Rockfish							0.1	-	-			
Sablefish	0.9	1.5		2.4	2.9	3.6	1.4	5.5		0.4	3.6	2.8
Sandpaper Skate				0.2								
Sharpchin Rockfish					0.2	0.2						
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish			1.7	34.3	9.0		1.6			2.5	6.2	
Slender Sole	0.3	0.4		3.3	0.3	0.4	1.7	0.6	2.4	0.6	1.6	1.4
Southern Rock Sole		0.3			0.1							
Splitnose Rockfish												
Spotted Ratfish	10.2	5.6	15.0	47.8	9.7	4.3	13.4	29.4	8.2	12.8	7.4	8.1
Threadfin Sculpin		0.3				1.0		-				
Walleye Pollock	4.3	14.7					1.4				0.1	0.3
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish	1.7	0.9			0.4	118.3	2.8			812.4	27.6	2.4
Other	2.2	20.5	0.9	5.6	2.3	17.1	22.2	28.7	33.7	0.3	8.8	3.8
Total	**124.8**	**166.1**	**1979.8**	**525.9**	**608.9**	**491.5**	**344.0**	**757.3**	**375.8**	**946.3**	**338.1**	**241.6**

Common Name	20	21	22	23	24	25	26	27	28	29	30	31
Aleutian Skate									6.2			
Arrowtooth Flounder	43.9	497.7	204.3	120.3	170.4	335.7	219.1	226.8	246.6	204.3	303.0	120.8
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	0.2	0.4		0.1	0.2	1.2	0.1	1.0	0.2	0.3	0.3	1.6
Bocaccio												
Canary Rockfish									1.2			
Curlfin Sole												
Darkblotched Rockfish						0.1					0.1	0.4
Dover Sole	2.4	4.8	8.0	5.3	11.4	8.7	1.3	1.0	0.9	2.9	6.6	
English Sole	19.7		7.4									
Eulachon	1.4											
Flathead Sole	19.6	14.7	10.4	2.4	10.1	29.5	2.9	1.9	1.2	0.4		0.5
Giant Grenadier												
Greenstriped Rockfish								0.5	6.1			
Harlequin Rockfish												
Lingcod	1.8	1.0			6.9				7.0			
Longnose Skate					6.3		9.9			5.8	8.5	15.4
Longspine Thornyhead												
North Pacific Spiny Dogfish	7.7	10.6	8.9	2.0	3.5	3.8	4.1	3.9	5.7			2.2
Pacific Cod	1.2		5.8				0.6		16.1	4.1		
Pacific Hake	12.9											
Pacific Halibut	3.3											
Pacific Ocean Perch									4.0	1.6	0.3	0.2
Pacific Sand Lance							-	-				
Pacific Sanddab												
Petrale Sole	2.9	1.1	1.4		1.6	1.9		1.9	0.7			
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish					11.8	5.3	1.8					
Redstripe Rockfish									65.7	2.2	0.5	
Rex Sole	2.7	5.3	7.8	0.2	1.5	1.2	0.2	0.4	3.7	1.1	0.5	
Rosethorn Rockfish												
Rougheye Rockfish				-	0.8							1.4
Sablefish	3.3	0.8								3.3	1.2	
Sandpaper Skate											0.1	
Sharpchin Rockfish				0.2	1.0			0.1	0.2		0.1	
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish			13.7	2.0	189.6	22.3			23.0	17.1	3.3	3.1
Slender Sole	0.3			0.3	1.0		0.2	0.6	0.3	0.1	0.4	
Southern Rock Sole												
Splitnose Rockfish												
Spotted Ratfish	4.5	6.1	3.3	12.4	44.3	17.3	6.6	9.0	26.2	20.0	23.4	10.7
Threadfin Sculpin									1.8	0.3		
Walleye Pollock		0.2	0.1	0.1		0.1			0.8			
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish			0.1									
Yellowtail Rockfish		2.1	313.5	5.5	2.4		21.5	2.1				
Other	0.9	9.0	7.2	2.6	14.8	7.0	3.3	6.4	11.5	16.1	23.4	19.4
Total	**128.8**	**553.8**	**591.8**	**153.5**	**477.6**	**434.1**	**271.6**	**255.6**	**429.1**	**279.8**	**371.8**	**175.7**

Common Name	32	33	34	35	36	37	38	39	40	41	42	43
Aleutian Skate												
Arrowtooth Flounder	63.4	28.0	21.7	43.9	73.5	142.5	6.1	4.3	19.7	3.0	27.0	44.3
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	2.1	6.1	0.1			1.1						
Bocaccio												
Canary Rockfish								3.0				
Curlfin Sole												
Darkblotched Rockfish						0.2						
Dover Sole	0.3	1.4	0.6	1.8	5.8	5.6			7.8		2.4	3.2
English Sole					16.6	182.7				0.2		
Eulachon	-	1.8		0.1		0.3						6.5
Flathead Sole	0.8	4.4	0.1			13.4						0.4
Giant Grenadier												
Greenstriped Rockfish			0.8				2.4	3.5	2.1	5.4	0.3	
Harlequin Rockfish												
Lingcod							1.8		1.8	9.4	1.2	
Longnose Skate	20.5	9.4	5.4	3.9	0.5	7.2	0.5		15.5		2.1	3.0
Longspine Thornyhead												
North Pacific Spiny Dogfish	0.9		1.4	3.8	7.4	65.1	7.6	27.1	14.0	38.5	9.3	
Pacific Cod					15.1	41.6		6.9		0.2		
Pacific Hake												2.5
Pacific Halibut												
Pacific Ocean Perch	3.0	7.5	1.8		2.0		0.3		172.3	0.2	3.6	1.6
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole				0.3	0.7	10.4				0.4		
Pygmy Rockfish										0.7		
Quillback Rockfish												
Redbanded Rockfish	7.9	3.3	40.5	14.7				13.5	9.2		21.2	2.4
Redstripe Rockfish								0.4	4.2	5.5		
Rex Sole	0.1	0.7	6.6	10.4	4.5	18.3	0.5	1.8	22.3	0.1	1.7	1.6
Rosethorn Rockfish	0.5											
Rougheye Rockfish	0.1	2.0									10.2	0.9
Sablefish			1.1		1.9	3.0			5.7		3.1	5.3
Sandpaper Skate		0.5										
Sharpchin Rockfish	0.7	-	1.5	1.3			-	1.3	2.1	0.3	14.5	0.1
Shortraker Rockfish												
Shortspine Thornyhead									2.4		9.2	0.8
Silvergray Rockfish	3.0		5.0	9.6			2.7	10.7	28.4	8.2	6.0	
Slender Sole	0.3	0.9	0.4	2.7	0.8	2.8			0.4			0.1
Southern Rock Sole												
Splitnose Rockfish		0.2			0.9							
Spotted Ratfish	6.4	1.6	4.2	5.5	15.0	50.6	2.8	2.9	1.7	3.9		
Threadfin Sculpin												
Walleye Pollock			1.7		64.8	51.9			30.5		1.8	
Widow Rockfish												
Yelloweye Rockfish			3.3					6.5				
Yellowmouth Rockfish								1.5	32.8	0.5		
Yellowtail Rockfish												
Other	19.7	14.8	11.8	14.3	0.9	3.0	1.9	24.7	5.7	1.5	52.8	4.1
Total	**129.7**	**82.5**	**108.0**	**112.2**	**210.2**	**599.7**	**26.6**	**108.0**	**378.3**	**78.0**	**166.4**	**76.7**

Common Name	44	45	46	47	48	49	50	51	52	53	54	55
Aleutian Skate												
Arrowtooth Flounder		22.1	11.9	48.4	20.0	16.9	820.7	111.8	3.3	19.9	31.7	13.2
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout			-	0.1	-					-		-
Bocaccio												
Canary Rockfish												1.0
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole		2.3	24.6	14.2	26.1		0.7	2.2				
English Sole				0.2								
Eulachon		0.2	0.7	4.8	0.5	0.2						-
Flathead Sole			1.0	0.5	2.0					1.4		-
Giant Grenadier												
Greenstriped Rockfish						1.2	2.0	1.6		0.1	5.6	4.4
Harlequin Rockfish												
Lingcod						6.2	39.3	5.5	1.9		3.7	
Longnose Skate											4.8	
Longspine Thornyhead												
North Pacific Spiny Dogfish			1.4	5.8	7.8			9.8				2.2
Pacific Cod						17.9	9.6	5.1	1.1	5.0	13.3	3.6
Pacific Hake		29.6	1.2									
Pacific Halibut												
Pacific Ocean Perch		22.7	12.3	7.0	22.0	2.4	11.9	3.6		2.2	0.8	1.5
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole				1.0		0.7		0.5			0.7	
Pygmy Rockfish											0.2	-
Quillback Rockfish												
Redbanded Rockfish		8.0	7.0	6.3	3.3	5.7	4.5	0.9		0.5	3.5	
Redstripe Rockfish										1.8		3.7
Rex Sole		6.6	3.5	3.5	8.0	1.1	0.4	10.3	0.1	4.0	2.0	1.2
Rosethorn Rockfish												
Rougheye Rockfish		2.9	1.8									
Sablefish			7.3	5.6	8.0							
Sandpaper Skate												
Sharpchin Rockfish						0.8	0.7	0.7		0.3	0.5	3.1
Shortraker Rockfish												
Shortspine Thornyhead		14.0	3.2	3.3	0.4							
Silvergray Rockfish			3.9	8.6	5.6	4.7	5.6	13.3		31.5	14.9	35.4
Slender Sole		0.1	1.8	1.1	0.7			0.4		0.6	0.1	
Southern Rock Sole												
Splitnose Rockfish												
Spotted Ratfish						3.5	0.7	0.2	0.1	0.3	4.7	
Threadfin Sculpin												
Walleye Pollock		4.5				1.3	1.8	2.0	-	1.4	0.5	0.7
Widow Rockfish												
Yelloweye Rockfish						0.8						2.2
Yellowmouth Rockfish							0.3			0.5	0.4	
Yellowtail Rockfish												2.0
Other		31.9	1.4	1.3	4.7	13.6	5.1	7.1	0.6	2.0	1.0	1.0
Total	**0.0**	**144.9**	**82.9**	**111.6**	**109.0**	**76.9**	**903.4**	**175.1**	**7.1**	**71.6**	**88.3**	**75.1**

Common Name	56	57	58	59	60	61	62	63	64	65	66	67
Aleutian Skate												
Arrowtooth Flounder	29.1	29.7	18.8	13.5	7.8	12.4	37.8	16.2	4.5	108.4	52.2	7.9
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	2.0	1.1	0.9	0.2	0.2		0.2					
Bocaccio												
Canary Rockfish							2.5		0.7			221.2
Curlfin Sole												
Darkblotched Rockfish	-											
Dover Sole	5.3			0.6	0.4	0.4		3.1	0.4	22.0	5.5	
English Sole										15.9	6.5	
Eulachon	0.3	0.1	0.3	0.1	0.1			-				
Flathead Sole	0.5	0.5	0.4	0.4	0.8	0.1	1.1	-		0.1	-	
Giant Grenadier												
Greenstriped Rockfish				0.1	0.4	1.1		5.6	9.7	2.8	5.0	1.7
Harlequin Rockfish												
Lingcod			3.9					1.3				
Longnose Skate	6.5	6.5	6.2		1.3				6.5			
Longspine Thornyhead												
North Pacific Spiny Dogfish	2.7	1.4	1.1		2.5	2.0				3.3	1.4	
Pacific Cod					1.2	5.1		9.5	24.1	1.5	2.2	10.6
Pacific Hake												
Pacific Halibut												
Pacific Ocean Perch	0.5			0.1		-	-	3.9	3.1	0.6	-	
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole					2.6				6.7	3.7	4.4	
Pygmy Rockfish												1.5
Quillback Rockfish												
Redbanded Rockfish			-	0.6	3.8	2.5	78.7	13.4	3.2	2.5		
Redstripe Rockfish						50.8	3.0	1.0				50.0
Rex Sole	0.8	-	0.1	1.8	2.8	4.8	0.4	15.9	11.9	38.6	13.8	4.4
Rosethorn Rockfish									0.8		0.5	
Rougheye Rockfish												
Sablefish					1.6		1.3	1.2	6.8		0.6	11.4
Sandpaper Skate										0.1		
Sharpchin Rockfish	0.2		-	0.5	0.8	0.7	0.7	0.2	0.6	0.2	1.8	6.4
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish	2.2	2.0			3.7	10.9	2.0	1.0	44.5	9.3	64.6	20.5
Slender Sole	2.2	0.3	0.4	0.1	0.5	0.5	0.9	0.4	0.3	1.2	0.7	0.2
Southern Rock Sole												
Splitnose Rockfish			-									
Spotted Ratfish	2.1	1.3	1.7	2.0	5.1	4.5	16.1	2.0	3.3	3.6	0.8	1.9
Threadfin Sculpin												
Walleye Pollock	0.2				0.5	0.2	0.1	1.5	0.7			2.0
Widow Rockfish												
Yelloweye Rockfish					2.9	7.2		2.6	3.2		6.5	12.7
Yellowmouth Rockfish									0.8	0.3		66.8
Yellowtail Rockfish						1.4				2.1	6.4	
Other	12.6	10.4	14.9	6.1	10.4	3.7	3.5	10.7	4.9	1.1	1.4	0.7
Total	**67.1**	**53.2**	**48.6**	**26.1**	**49.2**	**108.5**	**148.1**	**89.4**	**136.6**	**217.3**	**174.6**	**419.8**

Common Name	68	69	70	71	72	73	74	75	76	77	78	79
Aleutian Skate		9.4										7.1
Arrowtooth Flounder	30.2	48.8	127.1	13.4	2.0				290.7	35.0	1103.0	98.5
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	4.7	3.3	2.8								0.1	0.9
Bocaccio												
Canary Rockfish											5.9	
Curlfin Sole					0.3	1.2	1.4	0.3		2.6		
Darkblotched Rockfish		1.2										
Dover Sole	0.9	3.4	1.8						5.4		10.6	97.3
English Sole				0.2			-	0.1	17.4	0.4	9.2	
Eulachon									-			24.1
Flathead Sole	0.8	0.8	0.7						0.5		1.2	5.1
Giant Grenadier												
Greenstriped Rockfish												
Harlequin Rockfish												
Lingcod	1.2		1.7		2.6				1.7	3.9		
Longnose Skate			5.8	3.7							4.2	17.4
Longspine Thornyhead												
North Pacific Spiny Dogfish		3.2	1.1	1.4					12.3		1.4	
Pacific Cod											26.8	
Pacific Hake												6.8
Pacific Halibut				3.0	12.4		7.6		9.5	5.8	9.0	
Pacific Ocean Perch	-											22.1
Pacific Sand Lance												
Pacific Sanddab				1.4	0.2	0.5	0.3	0.3	1.1	20.3	0.8	
Petrale Sole				3.0	3.2	1.6	1.1	1.2	51.0	4.0	18.9	
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish												122.6
Redstripe Rockfish												
Rex Sole	0.5	0.1	-	0.1		-			15.0	0.1	10.4	2.4
Rosethorn Rockfish												
Rougheye Rockfish												0.7
Sablefish												4.6
Sandpaper Skate												-
Sharpchin Rockfish												0.2
Shortraker Rockfish												
Shortspine Thornyhead												2.1
Silvergray Rockfish	3.5	2.5	4.9		2.1						1.4	
Slender Sole	0.2	0.1	0.1						0.3		0.9	0.2
Southern Rock Sole				51.7		0.1	3.4	12.0		10.9		
Splitnose Rockfish												
Spotted Ratfish	9.5	4.5	15.1	2.5	6.1	20.5	2.8	2.2	2.4	41.3	3.4	0.9
Threadfin Sculpin												
Walleye Pollock		-							0.2		-	
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												
Other	22.2	40.6	22.7				1.0	3.3	8.9	128.4	0.1	13.8
Total	**73.9**	**117.8**	**183.6**	**80.4**	**28.9**	**23.8**	**17.7**	**19.3**	**416.5**	**252.8**	**1207.2**	**426.9**

Common	80	81	82	83	84	85	86	87	88	89	90	91
Aleutian Skate												
Arrowtooth Flounder	26.3	82.7	39.4	85.5	441.9	12.5		0.7		5.1	50.1	117.1
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout		7.3		6.6	4.8					-		0.3
Bocaccio												
Canary Rockfish						1.8			3.7	5.5		
Curlfin Sole						1.3			0.6	0.5	1.6	
Darkblotched Rockfish				0.4								
Dover Sole	0.3	100.7	15.1	23.1	105.2	4.2					0.5	25.1
English Sole	4.0					1.7		18.8		2.8	17.0	
Eulachon				0.1								
Flathead Sole		11.2	0.7	8.9	0.5							1.7
Giant Grenadier												
Greenstriped Rockfish		2.2	0.6									
Harlequin Rockfish												
Lingcod						7.6			1.4		1.1	5.5
Longnose Skate		0.3										
Longspine Thornyhead												
North Pacific Spiny Dogfish		1.6										
Pacific Cod	0.7	6.7	3.7	3.6		4.8		0.5	0.5			12.2
Pacific Hake												
Pacific Halibut	4.7						8.8			9.8		
Pacific Ocean Perch		3.3		0.2								47.0
Pacific Sand Lance										-		
Pacific Sanddab	0.4	0.3				46.6		27.7	0.8	15.2	2.4	
Petrale Sole	9.6	0.9				1.9		1.2	2.4	1.1	7.5	
Pygmy Rockfish			0.1	-			-			1.6		
Quillback Rockfish						33.1			2.3	5.6		
Redbanded Rockfish		3.4										
Redstripe Rockfish		61.3	35.1	2.2	0.4	107.3	1.3		0.2	4.3		
Rex Sole	0.6	84.1	23.9	75.1	52.1	0.6		0.4			2.4	42.0
Rosethorn Rockfish												
Rougheye Rockfish				0.6								
Sablefish		4.6		16.9	30.0							
Sandpaper Skate	1.2											
Sharpchin Rockfish		1.8		0.3	0.2							
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish		5.0										3.3
Slender Sole		6.4	0.1	8.2	1.9	-						1.7
Southern Rock Sole	1.4					6.7	8.9	52.8	1.3	104.0	3.0	
Splitnose Rockfish												
Spotted Ratfish	9.8	7.6	2.8	14.4	18.2	31.6	45.6	17.7	15.8	20.6	4.9	14.9
Threadfin Sculpin												
Walleye Pollock		6.6	48.9	93.6	335.0				0.6			14.1
Widow Rockfish						1.5						
Yelloweye Rockfish						3.4						
Yellowmouth Rockfish												
Yellowtail Rockfish		7.2			1.2	3.5						
Other	0.2	10.4	1.3	2.8	1.1	2.9	2.9		3.2	8.5	0.3	1.6
Total	**59.1**	**415.4**	**171.5**	**342.6**	**992.6**	**273.0**	**67.4**	**119.7**	**32.6**	**184.5**	**90.9**	**286.5**

Common Name	92	93	94	95	96	97	98	99	100	101	102	103
Aleutian Skate												
Arrowtooth Flounder	54.8	106.8		13.3	20.4	218.0	97.3	21.2	5.4	5.5	223.9	1.2
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	0.7	0.8			0.2	0.1					0.6	
Bocaccio									2.5			
Canary Rockfish								1.5				
Curlfin Sole												
Darkblotched Rockfish						0.2						
Dover Sole	16.4	85.4		18.8	14.1	9.7	6.9	0.8			104.9	
English Sole						2.0					6.9	0.2
Eulachon					0.1							
Flathead Sole	3.7	2.3		0.7		10.2	0.2				30.8	
Giant Grenadier												
Greenstriped Rockfish	0.3			4.3	0.2		7.2	11.7	4.6	4.4	0.7	
Harlequin Rockfish												
Lingcod							9.2	19.5				33.5
Longnose Skate	1.6	6.6	3.5					7.5			24.9	
Longspine Thornyhead												
North Pacific Spiny Dogfish				2.1		2.0						
Pacific Cod	2.0		2.0	3.1			1.8	12.4		3.4		
Pacific Hake	0.1											
Pacific Halibut							9.1					13.1
Pacific Ocean Perch	138.7	57.2			2.7	1.1	0.8				642.5	
Pacific Sand Lance												
Pacific Sanddab												2.1
Petrale Sole						2.2	3.1				2.9	6.1
Pygmy Rockfish										0.1		
Quillback Rockfish												
Redbanded Rockfish		7.0		0.8		0.4	3.2	2.9	0.6		2.0	
Redstripe Rockfish			11.2	7.3			21.9	803.5	7.9	6.3	1.0	
Rex Sole	25.2	99.6	1.6	30.9	20.8	32.4	7.1	2.4	2.4	2.8	35.2	
Rosethorn Rockfish			0.5				7.6	4.6	1.9			
Rougheye Rockfish						0.9						
Sablefish				2.1				4.2	2.5		1.0	
Sandpaper Skate												
Sharpchin Rockfish			2.6	2.1		0.7	43.7	291.1	42.3	8.8		
Shortraker Rockfish												
Shortspine Thornyhead				0.3			0.9	0.2	2.0	0.6		
Silvergray Rockfish	0.9		2.0	1.1	2.2	6.0	21.0	29.3	8.1	8.3	9.8	
Slender Sole	1.2	5.3	0.2	5.6	0.6					0.3	2.2	
Southern Rock Sole												14.7
Splitnose Rockfish												
Spotted Ratfish	12.7	22.2	3.8	12.2	4.3	10.4	4.2	3.1	2.1	0.7		66.7
Threadfin Sculpin			-	-	0.1			0.3	1.7	1.3		
Walleye Pollock	6.7	1.1	0.4			4.5			0.8	4.2	2.2	
Widow Rockfish												
Yelloweye Rockfish			8.8					3.7	4.7			
Yellowmouth Rockfish								1.5	1.8	6.6		
Yellowtail Rockfish		1.4	4.4	1.5	2.3	2.5		30.3		3.2	20.7	
Other	4.8	4.9	0.6	8.9	2.7	1.3	9.2	25.1	17.0	4.0	1.4	
Total	**269.9**	**400.8**	**41.5**	**115.1**	**70.7**	**304.7**	**254.4**	**1276.9**	**108.1**	**60.4**	**1113.5**	**137.5**

Common Name	104	105	106	107	108	109	110	111	112	113	114	115
Aleutian Skate												
Arrowtooth Flounder		13.5	754.8	14.6						0.1		
Aurora Rockfish												
Big Skate		3.2						0.7				
Blackbelly Eelpout	-										-	
Bocaccio												
Canary Rockfish				0.5						1.9	7.4	
Curlfin Sole	0.4		0.5		1.1	0.5			1.5	0.8		0.2
Darkblotched Rockfish												
Dover Sole												
English Sole			1.8							0.8		0.4
Eulachon												
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish												
Harlequin Rockfish												
Lingcod	7.2	61.9	169.5	3.8	1.9				8.9			
Longnose Skate												
Longspine Thornyhead												
North Pacific Spiny Dogfish			2.5	2.7	273.3	153.5	81.7	296.4	48.6	3.6		2.0
Pacific Cod												
Pacific Hake												
Pacific Halibut		53.7	76.2	22.5	22.5			8.5	8.0	15.5		9.9
Pacific Ocean Perch												
Pacific Sand Lance	21.9	21.7	6.3	0.1	2.8			4.1	3.7	0.2		
Pacific Sanddab	0.9	0.7	0.3					0.6	1.6	5.5	1.0	5.3
Petrale Sole		6.6	6.9							2.0		
Pygmy Rockfish											0.1	
Quillback Rockfish				2.4							15.6	
Redbanded Rockfish												
Redstripe Rockfish				0.1							35.4	0.4
Rex Sole			1.1								-	0.1
Rosethorn Rockfish												
Rougheye Rockfish												
Sablefish												
Sandpaper Skate												
Sharpchin Rockfish											0.2	
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish			2.3	1.9								
Slender Sole												
Southern Rock Sole	12.7	78.3	122.8	0.9	33.9		0.9	7.3	14.0	19.4	0.5	12.2
Splitnose Rockfish												
Spotted Ratfish	5.4			11.1	0.5	82.5	69.8	2.7	0.6	12.6	3.4	4.6
Threadfin Sculpin												
Walleye Pollock												
Widow Rockfish												
Yelloweye Rockfish					4.7						5.4	
Yellowmouth Rockfish												
Yellowtail Rockfish												
Other		105.7	3.6	1.5		32.4				1.5	8.1	1.3
Total	**48.6**	**345.1**	**1148.6**	**61.9**	**340.7**	**268.9**	**152.4**	**320.2**	**86.8**	**64.0**	**77.3**	**36.4**

Common	116	117	118	119	120	121	122	123	124	125	126	127
Aleutian Skate												
Arrowtooth Flounder		7.4	41.0	3.6	28.4	23.8	18.2	0.6	48.4		23.2	10.3
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout									-		-	
Bocaccio												
Canary Rockfish	0.5			2.5			4.1	5.0				3.3
Curlfin Sole	0.1											
Darkblotched Rockfish						2.1						
Dover Sole			0.8		1.3				1.4			
English Sole		9.0	6.9	0.6								
Eulachon									0.1			
Flathead Sole									-			
Giant Grenadier												
Greenstriped Rockfish							21.4	0.5			3.6	
Harlequin Rockfish												
Lingcod	1.1	1.9				9.8	11.6	6.5				
Longnose Skate					2.0				1.4			3.1
Longspine Thornyhead												
North Pacific Spiny Dogfish	1.1			2.7		1.7	11.7			4.9	22.2	54.6
Pacific Cod							105.8	1.1			103.0	
Pacific Hake					0.9							
Pacific Halibut		10.7					2.1	15.0		4.3		
Pacific Ocean Perch					102.9	665.8	20.2		0.3			4.6
Pacific Sand Lance												
Pacific Sanddab	0.3	22.0										
Petrale Sole		4.2	6.0				3.1	2.9		4.9	1.0	
Pygmy Rockfish	0.1											
Quillback Rockfish	26.7	1.1										
Redbanded Rockfish					8.3	6.7						1.2
Redstripe Rockfish	0.6											
Rex Sole		0.4	0.5	0.3		0.5	-		0.5		7.6	4.8
Rosethorn Rockfish						7.3						
Rougheye Rockfish					4.3	1.0						
Sablefish					9.0	1.7						
Sandpaper Skate					1.3	1.5						
Sharpchin Rockfish						1.6	-					0.2
Shortraker Rockfish												
Shortspine Thornyhead					4.6	12.5	0.6					0.7
Silvergray Rockfish			6.4	13.8		1.3	17.1	3.6		2.7	38.6	26.4
Slender Sole		0.1							-		0.3	0.2
Southern Rock Sole	1.5	0.1	1.0	13.5				2.3				
Splitnose Rockfish									0.1			
Spotted Ratfish	26.5	3.4	3.8	0.8		0.6	7.0	0.5	0.5	253.1	11.9	3.8
Threadfin Sculpin												
Walleye Pollock		0.4				26.7	0.8				3.5	
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish					1.4	2.5				0.7		
Yellowtail Rockfish												
Other	2.8	0.9			8.2	3.9	3.8	1.0	5.0		7.0	135.0
Total	**61.2**	**61.5**	**66.4**	**37.8**	**172.6**	**770.9**	**227.4**	**38.9**	**57.8**	**270.6**	**222.0**	**248.0**

Common Name	128	129	130	131	132	133	134	135	136	137	138	139
Aleutian Skate												
Arrowtooth Flounder			6.9	16.3	20.3	12.2	8.5	8.8	21.1	6.8	5.4	13.8
Aurora Rockfish												
Big Skate									12.8			
Blackbelly Eelpout				0.1	0.2	-	-	3.0	0.1	-		
Bocaccio												
Canary Rockfish												
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole						4.2				4.8	18.6	1.3
English Sole			0.3	1.6			0.7	1.5	3.0	0.8		
Eulachon										-	5.1	0.3
Flathead Sole			-	0.5	0.6	0.9	2.7			1.4		
Giant Grenadier												
Greenstriped Rockfish												
Harlequin Rockfish												
Lingcod			2.7			16.8	1.5					
Longnose Skate												
Longspine Thornyhead												
North Pacific Spiny Dogfish		3.4	3.4	5.3	10.1	7.3	14.1	4.9	20.1	8.1	6.9	
Pacific Cod			2.0		1.8							1.6
Pacific Hake											8.3	6.0
Pacific Halibut				9.3	2.6			5.8			2.1	
Pacific Ocean Perch			0.2	0.1	0.2		0.1	0.5	96.8	32.2	6.1	12.4
Pacific Sand Lance												
Pacific Sanddab		0.2										
Petrale Sole			1.1	1.7	1.6	1.9	1.0					
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish						202.4	95.2	2.4	2.9	2.7	1.2	12.0
Redstripe Rockfish					0.5	1.5			0.7			
Rex Sole			0.2	1.2	5.0	19.0	6.7	7.1	15.4	8.7	8.9	7.0
Rosethorn Rockfish												
Rougheye Rockfish												4.6
Sablefish						0.7			3.3		8.1	3.0
Sandpaper Skate											1.1	0.8
Sharpchin Rockfish			-	0.1	0.1		0.1					
Shortraker Rockfish												
Shortspine Thornyhead										0.6	8.6	20.0
Silvergray Rockfish			59.1	60.5	130.7	70.2	179.3	111.8	25.9	14.4	2.4	2.9
Slender Sole			0.1	0.1		0.3	0.3	0.2	1.0	0.7	0.8	
Southern Rock Sole												
Splitnose Rockfish												
Spotted Ratfish		1.4	0.5	0.6	1.3	2.6	2.0	0.7	2.0			
Threadfin Sculpin												
Walleye Pollock			0.4				1.0	0.6	5.1			14.1
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish				0.3	1.0	1.6			18.9	0.5		
Yellowtail Rockfish					11.5		1.8					
Other		2.8	0.8	1.9	9.2	0.9	5.7	0.3	0.2		1.6	54.5
Total	**0.0**	**7.8**	**77.7**	**99.6**	**196.5**	**342.3**	**320.6**	**147.5**	**229.3**	**81.7**	**85.3**	**154.1**

Common Name	140	141	142	143	144	145	146	147	148	149	150	151
Aleutian Skate												
Arrowtooth Flounder	7.8	12.4	2.3	10.6	4.9	2.3	19.5	72.7	73.9	6.6	10.4	69.6
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout				-	-		-					-
Bocaccio												
Canary Rockfish			7.4		14.5	6.7	2.3		1.9	24.0		
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole	0.4	2.1	0.3				71.3	0.8	5.4			12.9
English Sole					3.9	0.5						
Eulachon	-											
Flathead Sole	1.1	1.0	0.7	1.9	0.2		20.1	2.1				
Giant Grenadier												
Greenstriped Rockfish	1.2	2.4						1.0		7.9	13.2	
Harlequin Rockfish												
Lingcod					8.5				7.9	1.1	2.5	
Longnose Skate							4.0	7.4				
Longspine Thornyhead												
North Pacific Spiny Dogfish	10.1	7.1	8.6	7.9	8.2	17.9		1.6	20.9	7.0	1.7	4.7
Pacific Cod	10.8	33.2	2.0		0.2		0.8	13.1	31.4	6.5	17.4	
Pacific Hake												
Pacific Halibut		2.9			4.7	2.4						
Pacific Ocean Perch	18.0	1.1					0.2	276.6	4.4	0.1	46.1	25.2
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole	0.3	1.8	1.0	8.2	3.2	3.1			3.4			
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish	15.3						16.6	4.6			8.2	-
Redstripe Rockfish								1.2			34.8	1.8
Rex Sole	17.8	14.4	2.8	35.5	5.4	9.3	94.3	26.5	12.7		2.4	4.3
Rosethorn Rockfish								0.6				
Rougheye Rockfish	3.2											
Sablefish	3.5							10.2				1.1
Sandpaper Skate									-			
Sharpchin Rockfish	1.1									1.1	9.9	1.4
Shortraker Rockfish												
Shortspine Thornyhead	1.2		1.4								1.5	0.9
Silvergray Rockfish	79.5	57.3	20.6	95.1	143.7	104.2	53.7	49.1	39.8	4.2	193.9	6.0
Slender Sole	0.1	0.2	0.1	-	0.1		3.2		0.2		-	1.0
Southern Rock Sole												
Splitnose Rockfish												2.4
Spotted Ratfish	2.1	3.6	2.7	1.8	6.0	3.3	0.8		10.5	3.2	2.1	0.3
Threadfin Sculpin												
Walleye Pollock	26.3	16.7	0.3					23.8	13.1		1.3	0.5
Widow Rockfish												
Yelloweye Rockfish								10.1				
Yellowmouth Rockfish												
Yellowtail Rockfish				4.3					9.3	2.5	247.2	1.8
Other	2.4	3.4	4.8	1.2	1.2	2.8	5.0	10.7	3.1	2.3	0.6	
Total	**202.4**	**159.7**	**55.0**	**166.5**	**204.6**	**152.6**	**291.9**	**511.9**	**237.9**	**66.6**	**593.2**	**133.8**

Common	152	153	154	155	156	157	158	159	160	161	162	163
Aleutian Skate												
Arrowtooth Flounder	50.6	6.8		2.5	3.6	0.5	1.0		41.6		18.5	8.0
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout												
Bocaccio										4.0		
Canary Rockfish		118.1		20.7		236.6	56.9	13.8	2.5	101.3	16.2	
Curlfin Sole												
Darkblotched Rockfish												1.1
Dover Sole	0.4								9.3		3.6	4.5
English Sole												
Eulachon												
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish	6.7	2.6			0.9	0.4		-		1.3		
Harlequin Rockfish										13.0		
Lingcod										12.1		
Longnose Skate	13.3										3.6	0.8
Longspine Thornyhead												
North Pacific Spiny Dogfish	16.9	8.4		1.9	6.2	1.9			3.9		2.4	
Pacific Cod												
Pacific Hake											1.0	
Pacific Halibut					18.3					11.7		
Pacific Ocean Perch	5.8			-					266.2		174.7	105.7
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole	2.7	3.4			1.7	0.4	1.6					
Pygmy Rockfish								0.4		5.1		
Quillback Rockfish												
Redbanded Rockfish									2.7		10.8	5.2
Redstripe Rockfish					-			0.7	1.8	140.2		
Rex Sole	4.6	1.5						0.2	5.2		-	0.5
Rosethorn Rockfish										12.5		
Rougheye Rockfish											0.8	0.6
Sablefish									6.3		11.5	6.3
Sandpaper Skate												
Sharpchin Rockfish								0.6	-	57.9		
Shortraker Rockfish									5.7			
Shortspine Thornyhead									0.3		13.8	9.4
Silvergray Rockfish	65.3	167.7		2.2		5.0		7.0	15.2	25.3		
Slender Sole	-								-		0.4	
Southern Rock Sole												
Splitnose Rockfish									38.8		11.6	2.2
Spotted Ratfish	0.4	0.4		1.6	12.1	0.9	3.6	0.1		0.5	1.0	
Threadfin Sculpin												
Walleye Pollock					0.4				0.5			
Widow Rockfish												
Yelloweye Rockfish										166.5	4.5	
Yellowmouth Rockfish								0.5	4.3	132.0		
Yellowtail Rockfish												
Other	0.2	-		-	5.3		-	3.9	2.0	12.7	5.4	0.7
Total	**166.8**	**308.8**	**0.0**	**28.9**	**48.6**	**245.6**	**63.1**	**26.9**	**406.3**	**696.1**	**279.8**	**145.0**

Common Name	164	165	166	167	168	169	170	171	172	173	174	175
Aleutian Skate												
Arrowtooth Flounder	6.5	21.9	20.8	22.8	18.1	1.4	1.0	1.3			0.7	2.9
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout												
Bocaccio												
Canary Rockfish												
Curlfin Sole												
Darkblotched Rockfish												4.5
Dover Sole	17.5	5.9	4.1	5.2	7.4	2.4	3.2	19.4			1.0	37.3
English Sole												
Eulachon		-										
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish					11.4	0.4	2.3	4.6			0.2	
Harlequin Rockfish												
Lingcod												
Longnose Skate	1.9		3.6	7.5					8.2			0.9
Longspine Thornyhead												
North Pacific Spiny Dogfish	1.2			1.0	1.1	7.8	0.8	1.6				
Pacific Cod					28.6							
Pacific Hake	30.5			0.1	1.0			1.0				6.5
Pacific Halibut					5.6			6.5				
Pacific Ocean Perch	153.0	41.4	27.1	26.2	2924.3	78.4	90.2	606.8	43.4	618.5	395.6	95.9
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole												
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish		3.2		2.1	14.5	4.9	13.0	5.3		1.6	1.6	
Redstripe Rockfish							0.5	0.5				
Rex Sole					2.1	0.7	2.3	24.1	1.1		1.3	16.8
Rosethorn Rockfish					14.4	0.5	3.6			2.7	0.8	
Rougheye Rockfish	8.9	1.1	0.4	1.3								
Sablefish	22.4	25.7	2.4	5.0	4.6			6.3	11.6		1.5	2.4
Sandpaper Skate								1.2				
Sharpchin Rockfish					90.7	32.4	42.5	3.5	15.4	76.4	5.9	
Shortraker Rockfish												
Shortspine Thornyhead	9.7	29.6	16.9	10.2	24.4	5.5	9.3	10.8	1.4	3.8	6.5	9.8
Silvergray Rockfish					10.8			4.1		2.2		2.2
Slender Sole					0.4	0.4						0.2
Southern Rock Sole												
Splitnose Rockfish			1.0	0.3		0.5	-	50.7	16.0	2.3	42.7	45.0
Spotted Ratfish	0.6				4.5			1.8	0.7	0.7		
Threadfin Sculpin												
Walleye Pollock					9.2		1.3	4.3			0.6	
Widow Rockfish					2.0					22.9		
Yelloweye Rockfish												
Yellowmouth Rockfish			0.3	1.8	775.6	5.5	5.2	13.7	39.4	676.6	57.7	5.3
Yellowtail Rockfish												
Other	0.6	-	-	0.4	-	5.6	7.6	0.9	-	4.7	1.6	
Total	**252.8**	**128.8**	**76.6**	**84.0**	**3950.9**	**146.4**	**182.8**	**768.3**	**137.3**	**1412.4**	**517.6**	**229.8**

Common Name	176	177	178	179	180	181	182	183	184	185	186	187
Aleutian Skate												
Arrowtooth Flounder	10.1	74.3	89.7	27.1	45.5	24.5	85.1	41.7	47.7	75.0	27.9	35.4
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout					0.3	0.4		0.2				
Bocaccio												
Canary Rockfish				1.8								
Curlfin Sole												
Darkblotched Rockfish		0.9		1.4								
Dover Sole	9.2	20.2	7.0	1.5	17.8	20.9	26.1	81.9	14.3		2.3	
English Sole			1.6		2.3					1.8	0.5	8.1
Eulachon												
Flathead Sole		0.5	2.9		0.7	3.7	2.3	11.1	10.7			
Giant Grenadier												
Greenstriped Rockfish											0.8	2.1
Harlequin Rockfish												
Lingcod			1.5			2.3	2.0		7.9	16.3		
Longnose Skate			14.5	1.8				3.7				
Longspine Thornyhead												
North Pacific Spiny Dogfish						2.8			2.6		0.9	
Pacific Cod					10.8	8.2	16.1		36.4	64.5	38.1	8.8
Pacific Hake		2.9		3.2		3.5	2.0		1.1			
Pacific Halibut							6.4			12.9		
Pacific Ocean Perch	99.3	48.4	36.1	342.6	86.9	150.4	389.4	102.6	372.5		36.3	2.2
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole			1.8		0.6	0.4		2.7	1.9	1.0	4.7	3.6
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish		2.3	7.8	1.8	1.4	2.0	5.1	2.8	7.1			
Redstripe Rockfish						0.5					0.4	
Rex Sole	1.7	15.0	20.0	1.5	27.7	27.1	24.6	81.3	10.1		30.1	2.1
Rosethorn Rockfish												
Rougheye Rockfish	0.7			20.8				2.7	3.3			
Sablefish	1.1	2.5	1.4	7.0	1.3		5.1	16.0	3.4			
Sandpaper Skate		0.7	1.1									
Sharpchin Rockfish	0.3	0.2			0.5							
Shortraker Rockfish												
Shortspine Thornyhead	24.0	4.3	0.3	29.9	0.9	4.2	7.9	9.4	2.1			
Silvergray Rockfish	4.1		5.3		13.3		2.1	1.9		188.6	45.8	13.0
Slender Sole	0.3	3.1	4.1	0.1	2.5	0.7	0.7	12.8	1.3		1.2	
Southern Rock Sole										3.1		0.7
Splitnose Rockfish	28.7	38.9	2.2	3.4				0.4				
Spotted Ratfish			0.3	1.4	0.4	3.8	2.1		2.0	17.8	1.6	2.6
Threadfin Sculpin												
Walleye Pollock					1.0							
Widow Rockfish			0.6									2.9
Yelloweye Rockfish												
Yellowmouth Rockfish	1.5	1.6	12.2	7.6	8.2	1.6		17.0	4.9		38.9	17.7
Yellowtail Rockfish											64.8	98.3
Other	2.2	2.4	1.4	5.7	1.8	0.1	1.1	0.8	0.8	-	0.4	-
Total	**183.1**	**218.2**	**211.7**	**458.4**	**224.1**	**257.2**	**578.2**	**388.9**	**530.2**	**381.1**	**294.7**	**197.4**

Common Name	188	189	190	191	192	193	194	195	196	197	198	199
Aleutian Skate												
Arrowtooth Flounder	33.6	17.5	1.5	15.8	19.5	22.8	1.1	12.6	5.0	3.7	6.4	1.8
Aurora Rockfish												
Big Skate				0.9	1.7							
Blackbelly Eelpout									0.2			
Bocaccio							16.5	4.2	3.3			
Canary Rockfish							101.6	12.7				
Curlfin Sole			0.4	2.5								
Darkblotched Rockfish												
Dover Sole					1.6	2.2	0.6	3.9	20.9	6.7	2.6	3.1
English Sole	0.5		1.4	97.7	36.5	2.8	0.9					
Eulachon												
Flathead Sole						0.4						
Giant Grenadier												
Greenstriped Rockfish						7.3	2.6	6.4	5.1			
Harlequin Rockfish												
Lingcod	8.4				10.8	7.2						
Longnose Skate										1.0		
Longspine Thornyhead												
North Pacific Spiny Dogfish			1.3					1.5				
Pacific Cod	1.1	2.7				7.7	8.2	1.7				
Pacific Hake										1.3		4.1
Pacific Halibut							10.0					
Pacific Ocean Perch								144.4	214.0	10.2	50.2	19.3
Pacific Sand Lance												
Pacific Sanddab			0.3	30.8	2.6							
Petrale Sole		1.4		14.0	3.0			0.5				
Pygmy Rockfish						2.7	0.7					
Quillback Rockfish												
Redbanded Rockfish									1.6	0.4	9.6	4.3
Redstripe Rockfish			0.1			47.7	1021.5	72.9				
Rex Sole	0.2			1.5	26.5	32.7	5.0	15.0	57.1	2.2	1.8	3.4
Rosethorn Rockfish						0.1	1.0		3.6	0.3		
Rougheye Rockfish											2.1	0.5
Sablefish							6.6	5.6	1.3	4.4	0.9	1.0
Sandpaper Skate												
Sharpchin Rockfish							570.4	2.6	27.9			
Shortraker Rockfish												
Shortspine Thornyhead							0.4		3.3	3.7	3.6	8.6
Silvergray Rockfish		42.1	7.0	2.3		13.8	61.3	117.7	43.6	13.4	25.8	9.5
Slender Sole					0.3	1.0	0.1	0.4	2.1			
Southern Rock Sole	13.2	11.7	74.3	64.1	3.9							
Splitnose Rockfish										3.4	28.7	2.1
Spotted Ratfish	1.3	2.4	38.5	2.1	0.5	0.1		0.9	0.4			
Threadfin Sculpin						1.1	0.7	0.2				
Walleye Pollock								1.1		0.7	6.3	1.6
Widow Rockfish												
Yelloweye Rockfish							53.1					
Yellowmouth Rockfish							21.3	223.9	66.2			
Yellowtail Rockfish	13.7	3.7					4.5	2.0				
Other		0.3	0.1	0.4	-	0.1	0.8	0.4	1.8	1.2	1.9	0.3
Total	**72.0**	**81.8**	**124.8**	**232.1**	**107.0**	**149.7**	**1888.9**	**630.5**	**457.2**	**52.6**	**140.0**	**59.7**

Common Name	200	201	202	203	204	205	206	207	208	209	210	211
Aleutian Skate												
Arrowtooth Flounder	5.3	0.1	0.7	0.4	0.7	0.3	26.1	73.0	118.4		0.1	
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout							0.1	0.1	1.8			
Bocaccio												
Canary Rockfish	279.6	23.3	1.8	5.1								51.8
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole							0.4	6.5	21.6			
English Sole		0.7	3.7		18.0	0.9	83.7	34.5	76.1			
Eulachon												
Flathead Sole								2.7	7.3			
Giant Grenadier												
Greenstriped Rockfish		0.3		0.6								
Harlequin Rockfish												
Lingcod		1.7	1.2	10.5		4.5				6.5		7.7
Longnose Skate					3.6		4.0					
Longspine Thornyhead												
North Pacific Spiny Dogfish	1.8	2.7			1.3	7.5			2.2	4.2	1.5	
Pacific Cod	23.0	1.1	5.1	0.8	0.2		5.0	22.9	21.1	2.6	2.5	
Pacific Hake												
Pacific Halibut						4.7				35.9	9.0	
Pacific Ocean Perch	1.9		0.2			0.1		0.2	0.2			
Pacific Sand Lance												
Pacific Sanddab			0.2		4.5	0.4						
Petrale Sole	0.3	1.7	4.3	0.5	10.8	0.3	36.5	30.1	215.9	1.6		
Pygmy Rockfish												
Quillback Rockfish				2.4		0.5		0.8			1.2	8.7
Redbanded Rockfish	0.9											
Redstripe Rockfish												
Rex Sole		6.1	1.2	0.8	2.5	0.2	23.7	36.0	15.7			
Rosethorn Rockfish												
Rougheye Rockfish												
Sablefish												
Sandpaper Skate												
Sharpchin Rockfish												
Shortraker Rockfish												
Shortspine Thornyhead	0.8											
Silvergray Rockfish	84.8	3.7	107.6	13.7	31.6	13.1	2.4	15.4	17.4	16.2	2.6	10.4
Slender Sole							-	1.2	0.6			
Southern Rock Sole			0.8	0.8	3.5	0.9	0.3			2.8	0.8	0.4
Splitnose Rockfish												
Spotted Ratfish	1.5	1.2	3.2	1.6	6.6	3.5	1.6	1.8	2.2	5.6	12.3	1.8
Threadfin Sculpin									0.2			
Walleye Pollock	1.2		0.1				1.9	0.6	8.6	0.2	0.1	
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish	2.6											
Other	0.4	0.7	6.1	5.3	0.5	2.1	6.7	7.7	9.4	0.4		1.1
Total	**404.3**	**43.2**	**136.2**	**42.3**	**83.7**	**38.9**	**192.3**	**233.5**	**518.6**	**76.2**	**30.0**	**81.9**

Common Name	212	213	214	215	216	217	218	219	220	221	222	223
Aleutian Skate												
Arrowtooth Flounder		70.0	16.3		0.3	47.1	42.2	33.6			0.2	1.1
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout												
Bocaccio										1.7		
Canary Rockfish		3.0										
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole		0.1					0.5	0.7	0.4	0.3		0.2
English Sole												
Eulachon												
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish					0.1		0.8	0.6	0.2	0.8		0.1
Harlequin Rockfish									52.5	2.7		
Lingcod		3.4	6.7									5.3
Longnose Skate												
Longspine Thornyhead												
North Pacific Spiny Dogfish		5.1	1.4			4.9						
Pacific Cod		67.8	1.3	0.9	0.3	1.0	10.2	1.1	2.7	3.8		5.2
Pacific Hake												
Pacific Halibut		6.0		2.9		17.0						
Pacific Ocean Perch		2.5			-	0.1	0.9	0.6	0.1			
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole		1.2		3.2		3.4	0.8	0.6				
Pygmy Rockfish									0.2	0.1		0.2
Quillback Rockfish					0.5							
Redbanded Rockfish												
Redstripe Rockfish									89.9	15.1	1.7	10.8
Rex Sole		0.3				3.9	1.5	1.1	2.2	2.2		0.5
Rosethorn Rockfish									0.4			
Rougheye Rockfish												
Sablefish								1.0				
Sandpaper Skate												
Sharpchin Rockfish					-	0.1	0.1		5.8	0.9	0.2	0.6
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish		29.7	17.2	1.6	1.9	17.5	8.1	14.4	29.5	5.1	1.1	9.3
Slender Sole												
Southern Rock Sole				2.4	1.1							
Splitnose Rockfish												
Spotted Ratfish		6.1	1.8	9.9	2.0	1.9	1.9	0.6	0.3		0.3	1.1
Threadfin Sculpin												
Walleye Pollock		4.5	6.7		0.1	0.4	0.4	0.4				
Widow Rockfish												
Yelloweye Rockfish									8.2			2.5
Yellowmouth Rockfish									2.8			1.3
Yellowtail Rockfish							34.7	38.6	34.2	9.7	2.4	
Other		5.2	5.6	2.5	0.5	-	7.8	0.3	6.9	4.1	5.5	6.9
Total		**204.8**	**57.1**	**23.4**	**6.9**	**97.3**	**109.9**	**93.5**	**236.2**	**46.5**	**11.3**	**45.1**

Common	224	225	226	227	228	229	230	231	232	233	234	235
Aleutian Skate												
Arrowtooth Flounder	60.1	11.6	32.8	10.4	1.2	9.2	3.2	16.9	23.6	8.7	5.1	
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout	0.2											
Bocaccio												
Canary Rockfish								3.5				2.7
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole	48.0	3.2	4.1	15.8	1.9	1.8	2.7	4.6	0.3	5.7	8.1	
English Sole	9.2											
Eulachon												
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish	0.3				1.0							
Harlequin Rockfish												7.1
Lingcod		6.2	10.7					3.1				12.8
Longnose Skate								9.8		9.6		
Longspine Thornyhead												
North Pacific Spiny Dogfish			7.1			2.5						
Pacific Cod		1.1	8.8		2.4							
Pacific Hake		3.6	2.3	0.9	1.0		350.9	469.5	2.3	7.9		
Pacific Halibut				25.2					16.5			29.0
Pacific Ocean Perch	0.9	19.1	4.4	22.5	54.4	61.4	93.5	89.6	183.5	34.7	41.6	5.6
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole	0.6				0.9	1.8						
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish	1.3	2.6	0.5	2.5	2.2	1.3	1.5	16.1	4.6	3.3	3.3	
Redstripe Rockfish	0.7				0.7							147.9
Rex Sole	59.0	5.5	0.9	16.1	3.5	4.3	4.0	3.1	0.4	2.9	14.0	0.7
Rosethorn Rockfish											0.0	0.6
Rougheye Rockfish									0.5	1.5	1.6	
Sablefish	1.1	4.7		13.7	13.2	7.3	1.7	18.3	5.0	2.6	6.7	
Sandpaper Skate												
Sharpchin Rockfish		0.1								0.1	0.1	54.8
Shortraker Rockfish												
Shortspine Thornyhead					0.2	0.6	0.9	21.4	12.8	13.3	14.3	
Silvergray Rockfish	1128.2	91.7	24.2	47.1	42.8	62.5	64.2	47.8	30.6	7.4	5.5	254.9
Slender Sole		0.2			0.2	0.2				0.1	0.2	
Southern Rock Sole												
Splitnose Rockfish									0.4		1.4	
Spotted Ratfish	0.1	1.5	4.1	0.3	1.4	1.5	1.4	0.3			0.4	
Threadfin Sculpin												
Walleye Pollock		0.7	10.9	1.8	13.0	18.6	5.9	16.0	3.9		3.3	
Widow Rockfish			0.6									6.2
Yelloweye Rockfish												16.6
Yellowmouth Rockfish												92.2
Yellowtail Rockfish			3.2									
Other	5.5	1.6	1.8	11.1	0.5	1.4	0.1	0.8	0.3	3.2	0.5	7.8
Total	**1315.1**	**153.3**	**116.1**	**167.4**	**140.5**	**174.5**	**530.0**	**720.8**	**284.7**	**100.9**	**106.0**	**638.9**

Common Name	236	237	238	239	240	241	242	243	244	245	246	247
Aleutian Skate												
Arrowtooth Flounder	21.2	3.3	2.1	0.8	5.4	7.5	6.1	10.7	162.4	92.8	30.9	15.7
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout					0.2							
Bocaccio												
Canary Rockfish			2.0									
Curlfin Sole												
Darkblotched Rockfish			5.7	0.5							2.3	
Dover Sole	10.8	4.6	2.4	4.5	3.3	81.0		3.7	20.3	2.1	12.8	2.2
English Sole												
Eulachon										11.2	2.4	
Flathead Sole												
Giant Grenadier												
Greenstriped Rockfish												
Harlequin Rockfish	0.3											
Lingcod	4.9		2.3									
Longnose Skate					3.7	14.2	3.1	16.6	7.1	6.9		
Longspine Thornyhead												
North Pacific Spiny Dogfish				4.6							2.0	
Pacific Cod			1.2									
Pacific Hake		0.9		12.3	37.1	78.0	62.8	68.5	26.8	2.7		12.8
Pacific Halibut	7.9											
Pacific Ocean Perch	184.5	18.5	41.0	133.1	19.2	16.9	15.3	5.9	2.3	7.1	5.2	7.1
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole												
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish	112.9	4.3	7.5	9.8		1.6	1.2		1.7	3.3		
Redstripe Rockfish	5.1											
Rex Sole	0.7	1.7	0.3	3.1	0.1	1.5		-	14.6	1.0	1.4	8.0
Rosethorn Rockfish	4.0	0.4	2.3		0.7							
Rougheye Rockfish	23.7		1.4	1.7	1.9	0.3	2.2	1.3	0.3	19.0	9.2	1.8
Sablefish		19.5	4.6	6.5	13.2	29.1	45.4	51.8	8.3		4.0	4.5
Sandpaper Skate												
Sharpchin Rockfish	3.7											
Shortraker Rockfish	9.5		14.3	11.8	2.5							
Shortspine Thornyhead	59.6	8.2	38.4	40.3	14.3	6.3	17.8	10.1	3.3	9.1	11.6	10.8
Silvergray Rockfish	32.4	5.0	35.7	5.7								
Slender Sole												
Southern Rock Sole												
Splitnose Rockfish	0.7	0.7	17.7	6.1						13.6		
Spotted Ratfish		0.9	4.4	0.4	1.1		2.4	2.9			0.3	
Threadfin Sculpin												
Walleye Pollock	1.8		3.0	1.6					0.8	0.5		0.4
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish	3.1											
Yellowtail Rockfish												
Other	3.1	0.7	0.9	4.2	42.8	4.5	6.9	3.0	3.5	0.1	3.3	8.1
Total	**489.9**	**68.6**	**187.0**	**247.0**	**145.5**	**241.0**	**163.2**	**174.3**	**251.4**	**169.5**	**85.4**	**71.4**

Common Name	248	249	250	251	252	253	254	255	256	257	258	259
Aleutian Skate												
Arrowtooth Flounder	5.2	1.1		30.8		1.3	12.9		17.8	1.0	3.8	8.5
Aurora Rockfish												
Big Skate												
Blackbelly Eelpout							1.1		0.2			-
Bocaccio							4.2		5.8			
Canary Rockfish						1.5			12.0			
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole	0.3	0.2		4.9					5.4	0.8	4.1	
English Sole							0.5					
Eulachon												
Flathead Sole				1.0			0.3		0.3			
Giant Grenadier												
Greenstriped Rockfish	1.2			31.3		0.1		0.9	23.7	5.6	4.7	10.4
Harlequin Rockfish	0.2											
Lingcod	15.5								3.9			
Longnose Skate												17.2
Longspine Thornyhead												
North Pacific Spiny Dogfish				5.0					5.6		2.3	2.7
Pacific Cod	11.0	1.7		25.3					43.7			
Pacific Hake			0.7	3.7						1.0		
Pacific Halibut	3.7			5.6								
Pacific Ocean Perch	30.4	71.5	9.7	1683.5						30.1	33.2	194.7
Pacific Sand Lance								13.1				-
Pacific Sanddab												
Petrale Sole	0.9			2.0								
Pygmy Rockfish									4.7			
Quillback Rockfish								1.7				
Redbanded Rockfish		5.4		13.9					0.4	1.9	1.8	10.0
Redstripe Rockfish	14.3	7.2		44.1		9.3	1.0	-	293.6	9.7	4.0	
Rex Sole	3.4	0.5		8.9		3.0	23.0		22.6	0.6	4.0	7.5
Rosethorn Rockfish				7.0						0.2	0.9	5.5
Rougheye Rockfish	4.2											
Sablefish	3.9	0.9	0.9						1.4			
Sandpaper Skate												
Sharpchin Rockfish	3.2	0.5	3.1	19.1		1.0			24.4	37.4	43.8	257.6
Shortraker Rockfish												
Shortspine Thornyhead	0.6	4.1	1.9	30.8						1.7	9.2	5.0
Silvergray Rockfish	10.8	19.3	2.7	33.2		15.9	12.7	3.1	22.6	10.9	8.4	7.6
Slender Sole	0.3						1.2		0.8	0.2	0.5	0.3
Southern Rock Sole								0.1				
Splitnose Rockfish												
Spotted Ratfish	1.8	3.6		4.4			0.8	11.7				
Threadfin Sculpin				1.6								
Walleye Pollock	2.4	6.6										1.2
Widow Rockfish									6.3			
Yelloweye Rockfish				3.3								
Yellowmouth Rockfish				724.0					18.7	79.3	62.4	55.1
Yellowtail Rockfish				4.5		1.0			97.7			1.2
Other	0.6	1.0	1.1	23.1		0.4	0.3	3.2	1.1	3.0	4.7	4.9
Total	**113.8**	**123.5**	**20.2**	**2711.0**		**33.6**	**58.0**	**33.8**	**612.5**	**183.3**	**187.7**	**589.4**

Common Name	260	261	262	263	264	265	266	267	268	269	270	271
Aleutian Skate												
Arrowtooth Flounder	2.9	1.3		7.6	11.0	6.9	14.5	18.2	13.8			
Aurora Rockfish			6.9									
Big Skate												
Blackbelly Eelpout												
Bocaccio		4.4										
Canary Rockfish												
Curlfin Sole												
Darkblotched Rockfish		7.9	1.2						5.5			
Dover Sole	0.2	0.4	24.0	9.6	2.9	5.4	17.8	15.5	9.7			
English Sole												
Eulachon												
Flathead Sole												
Giant Grenadier			1.1					17.8				
Greenstriped Rockfish	0.4						3.0					
Harlequin Rockfish												
Lingcod					7.5							
Longnose Skate					6.5	15.9	4.5					
Longspine Thornyhead			27.9					4.7				
North Pacific Spiny Dogfish	0.8			6.5	6.3	2.1	1.7					
Pacific Cod												
Pacific Hake	3.1		30.7	19.3	34.5	13.1	1.5	15.6	88.8			
Pacific Halibut			39.4									
Pacific Ocean Perch	71.3	50.4	5.9	30.5	51.6	106.3	158.6		440.2		7.3	7.1
Pacific Sand Lance												
Pacific Sanddab												
Petrale Sole												
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish	0.3	0.7		1.9	2.2	2.9	14.3		3.4			
Redstripe Rockfish							2.3					
Rex Sole		0.3		0.4	-		20.0	2.9	11.2		0.3	
Rosethorn Rockfish	0.4	0.6					0.4		0.9		0.2	0.4
Rougheye Rockfish	0.1		17.4	46.8	5.7	40.6			2.0			
Sablefish	4.1	5.0	41.3	18.4	2.8	12.0	6.1	13.2	25.8		1.7	
Sandpaper Skate						2.2						
Sharpchin Rockfish	9.6						864.1					1.9
Shortraker Rockfish			23.6						4.3			
Shortspine Thornyhead	14.1	7.0	49.7	11.6	9.7	15.1	4.8	19.8	33.5		0.6	0.9
Silvergray Rockfish	2.6						11.5					
Slender Sole					0.1		0.3		0.8			
Southern Rock Sole												
Splitnose Rockfish		1.1		0.9	1.5				8.2		11.0	42.1
Spotted Ratfish	1.0		0.6		1.0	1.0	1.2		0.7			
Threadfin Sculpin												
Walleye Pollock							2.1					
Widow Rockfish												3.8
Yelloweye Rockfish												
Yellowmouth Rockfish	4.1						176.2		2.9			64.5
Yellowtail Rockfish												
Other	7.7	0.6	10.7	5.7	6.5	4.0	8.0	10.6	3.3		1.5	0.2
Total	**122.6**	**79.7**	**280.6**	**159.2**	**149.7**	**227.4**	**1312.8**	**118.3**	**655.2**	**0.0**	**22.6**	**120.8**

Common Name	272	273	274	275	276	277	278	279	280
Aleutian Skate								12.1	
Arrowtooth Flounder	9.7	13.9	5.7	0.6	1.9	54.7	12.6	10.4	1.6
Aurora Rockfish		1.6				20.5	1.9	1.6	
Big Skate									
Blackbelly Eelpout									
Bocaccio									
Canary Rockfish									1.8
Curlfin Sole									
Darkblotched Rockfish	61.5				79.8	2.4		0.6	
Dover Sole	0.5	35.5	2.0	0.7	0.7	21.7	10.6	15.3	0.2
English Sole									13.8
Eulachon									
Flathead Sole									
Giant Grenadier		4.1					1.4		
Greenstriped Rockfish									9.1
Harlequin Rockfish									
Lingcod									
Longnose Skate		19.7						-	
Longspine Thornyhead		1.0				4.4	18.5	6.7	
North Pacific Spiny Dogfish	2.1								11.0
Pacific Cod			2.1						
Pacific Hake	101.4	14.0		0.5	2.4	47.9	9.1	39.2	
Pacific Halibut	21.7								8.1
Pacific Ocean Perch	883.0	24.6	37.1	184.7	127.4	478.5		185.5	
Pacific Sand Lance									
Pacific Sanddab									
Petrale Sole									5.2
Pygmy Rockfish									
Quillback Rockfish									
Redbanded Rockfish	15.9			2.5		6.5		6.2	
Redstripe Rockfish				0.6					
Rex Sole	0.9	3.6	0.6		1.2	4.0	0.2	4.1	10.8
Rosethorn Rockfish	3.2		0.3	4.1	4.1				
Rougheye Rockfish	5.7	2.5	1.7		-	1650.3	37.9	579.0	
Sablefish	17.9	37.7			3.1	52.7	51.4	40.1	
Sandpaper Skate								3.3	
Sharpchin Rockfish			0.1	23.8	6.4				
Shortraker Rockfish		27.7				48.8	18.6	187.8	
Shortspine Thornyhead	61.3	67.9	10.2	21.0	20.0	24.7	39.2	35.5	
Silvergray Rockfish			4.7	10.6					8.4
Slender Sole	0.3								0.1
Southern Rock Sole									
Splitnose Rockfish	22.2			0.3	1368.4				
Spotted Ratfish	0.6	2.4		1.6	1.3	1.1		2.1	0.2
Threadfin Sculpin									
Walleye Pollock	0.7								0.1
Widow Rockfish				2.2					
Yelloweye Rockfish									
Yellowmouth Rockfish	3.0		0.5		374.4				
Yellowtail Rockfish									
Other	3.0	2.5	1.0	1.0	1.5	2.9	17.8	11.1	
Total	**1214.6**	**258.7**	**66.1**	**254.0**	**1992.6**	**2421.1**	**219.1**	**1140.7**	**70.4**