

Summary of the Queen Charlotte Sound Synoptic Bottom Trawl Survey, July 4-August 1, 2017

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Nanaimo, BC
V9T 6N7

2018

Canadian Manuscript Report of Fisheries and Aquatic Sciences 3150



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Canadian Manuscript Report of
Fisheries and Aquatic Sciences 3150

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by

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Cat. No. 97-4/3150E-PDF ISBN 978-0-660-24697-0 ISSN 1488-5387

Correct citation for this publication:

Nottingham, M. K., Williams, D. C., Wyeth, M. R. and Olsen, N. 2018. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 4-August 1, 2017. Can. Manuscr. Rep. Fish. Aquat. Sci. 3150: viii + 67 p.

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ABSTRACT

Nottingham, M. K., Williams, D. C., Wyeth, M. R. and Olsen, N. 2018. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 4-August 1, 2017. Can. Manuscr. Rep. Fish. Aquat. Sci. 3150: viii + 67 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 August 1, 2017. The survey was jointly conducted and funded by the Canadian Groundfish Research and Conservation Society (CGRCS) and Fisheries and Oceans Canada (DFO), and was the ninth 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 since 2005. 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 and 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 forty (82.5%) of the 291 blocks assessed in 2017 were successfully fished. The mean catch per tow was 445 kg, with between 7 and 43 species per tow. The average number of species per useable tow was 25. The most abundant fish species encountered was Pacific Ocean Perch (*Sebastes alutus*), followed by Arrowtooth Flounder (*Atheresthes stomias*), Yellowmouth Rockfish (*Sebastes reedi*), Silvergray Rockfish (*Sebastes brevispinus*) and Sablefish (*Anoplopoma fimbria*). Biological data including individual length, weight, sex, maturity, and ageing structures (for certain species) were collected from 43 different species of fish. Oceanographic and fishing gear data including water temperature, depth, salinity, footrope to headline distance and dissolved oxygen were also recorded for most tows.

RÉSUMÉ

Nottingham, M. K., Williams, D. C., Wyeth, M. R. and Olsen, N. 2018. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 4-August 1, 2017. Can. Manuscr. Rep. Fish. Aquat. Sci. 3150: viii + 67 p.

Un relevé au chalut de fond a été effectué par le navire de pêche Frosti dans le détroit de la Reine Charlotte et dans le sud du détroit d'Hécate entre le 4 juillet et le 1 août, 2017. 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 neuvième 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 291 blocs évalués en 2017, 240 (82.5%) ont fait l'objet d'une pêche. La moyenne des prises par trait était de 445 kg, avec une moyenne de 25 espèces différentes de poissons et d'invertébrés par trait. Les espèces de poissons capturées le plus fréquemment étaient, le sébaste à longue mâchoire (*Sebastes alutus*), suivi par la plie à grande bouche (*Atheresthes stomias*), le sébaste à bouche jaune (*Sebastes reedi*), le sébaste argenté (*Sebastes brevispinus*), et morue charbonnière (*Anoplopoma fimbria*). 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 43 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 it 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 (QCS) synoptic bottom trawl survey was successfully completed in the summer of 2003 (Olsen et al. 2007a). 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 QCS and HS surveys conducted in odd-numbered years and the WCVI and WCHG 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 ninth QCS synoptic bottom trawl survey, which occurred between July 4 and August 1, 2017. 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), Olsen et al. (2009), Williams et al. (2018a), Nottingham et al. (2018) and Williams et al. (2018b).

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 is included and provides 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. 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.

For the 2017 QCS survey, 291 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 1,500 kg Thyboron Type II 107 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 included 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 had an 11 mm long-link steel chain frame and was 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 were constructed from single 4.5 mm strand 4 ½ inch web (Figure 8). All web in the main body and lengthening pieces was constructed from a compacted strand braided polyethylene (Euroline Premium). The codend was 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 included flying wing, mid wing, bunt wing and bosom sections (Figure 9). The bosom section was built from 16 inch diameter (worn 18 inch) aircraft tires while the bunt and mid wing sections had 16 inch Rockhopper disks. The flying wings had 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 two sections or “legs” of 15 days in duration with five or six science staff on each leg and one day allotted for a crew change.

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 based on the fishing master’s 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 was planned.

The fishing master 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 was fished in a previous year, then follow the same track so as to minimize the survey footprint.
3. If a block was not fished in a previous year, then make a tow entirely within the block and pass through the center of the block.
4. If it was not possible to make a tow through the center of the block, then make a tow entirely within the block that passes as close to the center as possible.
5. If it was not possible to make a tow entirely within the block, then make a tow such that at least 50 % of the tow is within the block.

The target tow duration 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. After 20 minutes had elapsed, net haul back was initiated. Although the target on-bottom time was 20 minutes, tows that were at least 15 minutes in duration were accepted. This pragmatic approach allowed for the 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 fishing master 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. 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 was 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” and the vessel moved 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 and rejected.

If fishing was attempted in a block, the final status of the block would be recorded as “successfully fished on first attempt”, “successfully fished after multiple attempts”, or “rejected after last attempt failed”. Rejected blocks are removed from the sampling frame for all future surveys to increase the survey efficiency as less time will be spent inspecting blocks that cannot be fished. Some selected blocks were neither successfully fished nor rejected. This result occurred 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 were 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. Unusable tows, although not sampled for biological data, were recorded to track catch amounts. Whenever possible, the catch was completely sorted and weighed. However, for large catches in excess of 2,000 kg or large numbers of small individuals, some method of total catch estimation and sub-sampling for species composition was conducted and the method used was recorded. 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, a minimum catch threshold was established for each species that triggered biological sampling. For rare species or species of special conservation concern the minimum catch could be one fish, whereas for common and abundant species the number might be 25 or 50. The choice of the

species from which age samples were collected depended on the weight caught and the “desirability” of the species. The weight 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 knowledge of conservation concerns and whether or not the species was commercially exploited. Biological samples were typically not collected from unusable tows.

There are some species that are unlikely to ever be assessed using age-structured models. This list includes species such as North Pacific Spiny Dogfish (*Squalus suckleyi*) where the cost of ageing the spines is prohibitive. Other species such as Flathead Sole (*Hippoglossoides elassodon*), Pacific Sanddab (*Citharichthys sordidus*), Greenstriped Rockfish (*Sebastes elongatus*), or Pygmy Rockfish (*Sebastes wilsoni*) are also unlikely candidates for an age-structured assessment as they are not exploited by the commercial fishery. Starting in 2016, a new length-stratified age sample protocol was implemented for these species. The intent of the new protocol was to ensure that the data could be used to construct age-at-maturity or growth curves. There were roughly twenty species identified for the length-stratified ageing protocol and in each survey year three or four species are targeted for data collected using this protocol (Table 3). Given the rotating schedule of the surveys, each species is targeted for one or two years at a time and then will not be targeted for another nine years. The species targeted in the 2017 synoptic bottom trawl surveys were North Pacific Spiny Dogfish (*Squalus suckleyi*), Splitnose Rockfish (*Sebastes diploproa*), Puget Sound Rockfish (*Sebastes emphaeus*) and Sand Sole (*Psettichthys melanostictus*).

Individual fish were measured to fork length, total length, standard length or other length depending on the species. All length measurements were collected to the nearest 0.5 cm 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 that can be used to determine the age of a 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 2017, tissue for DNA analysis was collected from Eulachon (*Thaleichthys pacificus*), Pacific Hake, (*Merluccius productus*), Lingcod (*Ophiodon elongates*), Yelloweye (*Sebastes ruberrimus*) and Quillback Rockfish (*Sebastes maliger*) as well as tissue for DNA analysis from Blackspotted (*Sebastes melanostictus*) /Rougheye Rockfish (*Sebastes aleutianus*).

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 since 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* is now considered to be the aggregate of both species. During the 2008 WCHG survey an attempt was made to differentiate between the two species visually. 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 identification 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 did not attempt to partition the catch data for *S. aleutianus* in this report.

NET-MOUNTED SENSORS AND DATA RECORDERS

The F/V Nordic Pearl was equipped with a Scanmar 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 including headline height and depth, as well as doorspread which is used to calculate swept area. The Scanmar 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 consisted of a pressure housing with an Onset Hobo data recorder in a stainless steel sled that trailed behind the footrope. The Hobo recorder measured acceleration in three axes which was then converted into angles. The recorder was mounted in the sled such that the x-axis tilt indicated the angle of the steel sled. When the footgear contacted the bottom, the sled angle was approximately 80 degrees. When the footrope was off the bottom, the sled hung down and the angle was approximately 40 degrees. These data were 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. The Hobo recorder was activated prior to the first tow of the day and downloaded at the end of each day.

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. Both the SBE39 and SBE19plus 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 2017 QCS synoptic bottom trawl survey was divided into two legs each of two weeks in duration. From a total of 29 survey days, two days were required for travel and loading at the start of the survey and 2 days at the end of the survey, two days were required for offloading catch and changing crews. Thus, there was a total of about 23 full fishing days (Table 4).

From a total of 291 blocks selected for the 2017 survey, 240 blocks were successfully fished, one was rejected based on prior knowledge, 32 were rejected based on on-ground inspection and 18 blocks were rejected after one or more failed fishing attempts (Table 5 and Figure 10).

A total of 268 tows, of which 240 were useable and 28 were not useable were completed during the 23 days that some fishing occurred. Table 6 shows tow results by stratum for this survey. The initial scope (ratio of warp length to bottom depth) used for tows in 2017 is shown in Table 7 and Figure 11. The F/V Nordic Pearl had an autotrawl system that adjusted the warp length to maintain net shape, so the recorded value was the initial length when fishing began. Complete information for each tow including date, duration, location, average depth, average speed, warp, total catch weight and usability is presented in Appendix A. An entry was made for set number 72 before the block was rejected. The entry was not updated and remains as a skipped tow number.

CATCH

A total of 119,374 kg of fish and invertebrates was caught during the 2017 QCS survey. The total catch weight for tows was typically less than 1,000 kg per tow, and averaged 445.4 kg per tow (Figure 12). The majority of the catch (117,253 kg, 98.2 %) consisted of 102 different species of fish, including 30 rockfish and 11 flatfish species. The remainder (2,121 kg) consisted of 134 invertebrate groups. The average number of species identified in useable tows was 25 with a minimum species count of seven and a maximum count of 43 (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 8. Of the fish species caught, Pacific Ocean Perch (*Sebastes alutus*) was the most dominant by weight, followed by Arrowtooth Flounder (*Atheresthes*

stomias), Yellowmouth Rockfish (*Sebastes reedi*), Silvergray Rockfish (*Sebastes brevispinus*) and Sablefish (*Anoplopoma fimbria*). 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 Research and Conservation Society (Table 9).

BIOLOGICAL SAMPLING

Biological samples were collected from a total of 19,907 individuals of 43 species of fish. The number of samples and recorded biological attributes per species is shown in Table 10. A summary of the biological data collected for each species is shown in Table 11.

NET-MOUNTED SENSORS AND DATA RECORDERS

Net mensuration and doorspread information was collected using Scanmar net sensors. Net headrope to bottom distance, net depth and door spread was collected from 268 tows (Table 12).

Seabird SBE39 data (water temperature and depth) were collected from 248 tows while Seabird SBE19plus and SBE43 data (conductivity, water temperature, depth, and dissolved oxygen) were collected from 268 tows (Table 12 and Figure 14).

BCS data were collected from 240 tows (Table 12). An example of data collected by the BCS is show in Figure 15.

Global positioning system (GPS) data and bottom sounder data are available for all 268 tows.

ACKNOWLEDGEMENTS

Thank-you to the captain and crew of the F/V Nordic Pearl and the science staff that participated in the survey. In addition, thank-you to the Canadian Groundfish Research and Conservation Society for their support in this survey.

REFERENCES

- Chilton D.E., and R.J. Beamish. 1982. Age determination methods for fishes studied by the Groundfish Program at the Pacific Biological Station. Can. Spec. Publ. Fish. Aquat. Sci. 60: 102p.
- Gharrett, A. J., A. P. Matala, E. L. Peterson, A. K. Gray, Z. Li, and J. Heifetz. 2005. Two genetically distinct forms of rougheye rockfish (*Sebastes aleutianus*) are different species. Trans. Amer. Fish. Soc. 134: 242–260 p.
- Nottingham, M. K., Williams, D. C., Wyeth, M. R., and Olsen, N. 2018. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 2 - 28, 2013. Can. Manuscr. Rep. Fish. Aquat. Sci. 3135: viii + 71 p.

- Olsen, N. 2010. A user's guide to GFBioField: The Pacific Region's at-sea data acquisition system for groundfish trawl surveys. Can. Tech. Rep. Fish. Aquat. Sci. 2887: x + 77 p.
- Olsen, N., Rutherford, K. L., Stanley, R. D., and Wyeth, M. R. 2009. Queen Charlotte Sound groundfish bottom trawl survey, July 7th to August 8th, 2009. Can. Manuscr. Rep. Fish. Aquat. Sci. 2899: vi + 60 p.
- Olsen, N., Workman, G. D., and Stanley, R. D. 2007a. Queen Charlotte Sound groundfish bottom trawl survey, July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: 58 p.
- Olsen, N., Workman, G. D., and Stanley, R. D. 2007b. Queen Charlotte Sound groundfish bottom trawl survey, July 5th to August 19th, 2004. Can. Manuscr. Rep. Fish. Aquat. Sci. 2783: 60 p.
- Olsen, N., Workman, G. D., and Stanley, R. D. 2007c. Queen Charlotte Sound groundfish bottom trawl survey, July 5th to August 9th, 2005. Can. Manuscr. Rep. Fish. Aquat. Sci. 2784: 58 p.
- Olsen, N., Workman, G. D., and Stanley, R. D. 2007d. Queen Charlotte Sound groundfish bottom trawl survey, July 3rd to August 3rd, 2007. Can. Manuscr. Rep. Fish. Aquat. Sci. 2820: vi + 60 p.
- Orr, J.W., and S. Hawkins. 2008. Species of the Rougheye Rockfish complex: resurrection of *Sebastes melanostictus* (Matsubara, 1934) and a redescription of *Sebastes aleutianus* (Jordan and Evermann, 1898) (Teleostei: Scorpaeniformes). Fisheries Bulletin. 106: 111-134 p.
- Sea-Bird Electronics, Inc. 1989. Application Note 14: 1978 Practical Salinity Scale. Available from <http://www.seabird.com> (accessed 16 November, 2016).
- Sea-Bird Electronics, Inc. 2002. Application Note 69: Conversion of pressure to depth. Available from <http://www.seabird.com> (accessed 16 November, 2016).
- Sea-Bird Electronics, Inc. 2012. Application Note 64-2: SBE 43 Dissolved oxygen sensor calibration and data corrections. Available from <http://www.seabird.com> (accessed 16 November, 2016).
- Sinclair, A., Schnute, J., Haigh, R., Starr, P., Stanley, R. D., Fargo, J., and Workman, G. D. 2003. Feasibility of multispecies groundfish bottom trawl surveys on the BC coast. Can. Stock Assess. Sec. Res. Doc. 2003/049.
- Williams, D. C., Nottingham, M. K., Wyeth, M. R. and Olsen, N. 2018a. Queen Charlotte Sound synoptic bottom trawl survey, July 4 to July 31, 2011. Can. Manuscr. Rep. Fish. Aquat. Sci. 3127: viii + 69 p.

Williams, D. C., Nottingham, M. K., Olsen, N. and Wyeth, M. R. 2018b. Summary of the Queen Charlotte Sound synoptic bottom trawl survey, July 6-August 8, 2015. Can. Manuscr. Rep. Fish. Aquat. Sci. 3136: viii + 52 p.

Table 1. 2017 synoptic bottom trawl survey design showing block allocation per stratum based on the target allocation and the combined predicted failure and revisit rates (predicted adjustment).

Area	Depth Stratum (m)	Target Tows	Predicted Adjustment	Total Block Allocation
South	50 - 125	32	0.20	40
	125 - 200	63	0.13	72
	200 - 330	27	0.21	34
	330 - 500	8	0.20	10
North	50 - 125	11	0.45	20
	125 - 200	49	0.18	60
	200 - 330	43	0.09	47
	330 - 500	7	0.13	8
Total		240		291

Table 2. Atlantic Western Ila box trawl net specifications on the 2017 QCS 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. Length-stratified species age sample schedule by year for all Pacific synoptic bottom trawl surveys.

Species	Scientific Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Butter Sole	<i>Isopsetta isolepis</i>						x				
Curlfin Sole	<i>Pleuronichthys decurrens</i>			x	x						
Darkblotched Rockfish	<i>Sebastes crameri</i>							x	x		
Flathead Sole	<i>Hippoglossoides elassodon</i>					x	x				
Giant Grenadier	<i>Albatrossia pectoralis</i>	x									
Greenstriped Rockfish	<i>Sebastes elongatus</i>			x	x						
Harlequin Rockfish	<i>Sebastes variegatus</i>					x	x				
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	x	x								
Pacific Flatnose	<i>Antimora microlepis</i>			x							
Pacific Grenadier	<i>Coryphaenoides acrolepis</i>					x					
Pacific Sanddab	<i>Citharichthys sordidus</i>									x	x
Pacific Tomcod	<i>Microgadus proximus</i>			x	x						
Popeye Grenadier	<i>Coryphaenoides cinereus</i>							x			
Puget Sound Rockfish	<i>Sebastes emphaeus</i>	x	x								
Pygmy Rockfish	<i>Sebastes wilsoni</i>					x	x				
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>							x	x		
Sand Sole	<i>Psettichthys melanostictus</i>		x								
Sharpchin Rockfish	<i>Sebastes zacentrus</i>									x	x
Shortbelly Rockfish	<i>Sebastes jordani</i>			x	x						
Slender Sole	<i>Lyopsetta exilis</i>							x	x		
Splitnose Rockfish	<i>Sebastes diploproa</i>	x	x								
Stripetail Rockfish	<i>Sebastes saxicola</i>									x	x

Table 4. Summary of operations during the 2017 QCS synoptic bottom trawl survey.

Date	Fishing			Blocks Assessed	Tows			Notes
	Start	End	Hours		Useable	Not Useable	Total	
07/04/2017	-	-	-	-	-	-	-	load, set-up and travel
07/05/2017	19:35	20:58	1	1	2	0	2	travel
07/06/2017	06:12	19:40	13	13	12	0	12	
07/07/2017	06:27	19:19	13	13	13	0	13	
07/08/2017	06:23	18:07	12	16	11	1	12	
07/09/2017	06:30	20:14	14	11	11	1	12	
07/10/2017	06:33	19:46	13	11	11	0	11	
07/11/2017	06:23	19:32	13	13	11	1	12	
07/12/2017	06:25	19:39	13	12	12	0	12	
07/13/2017	06:30	19:17	13	13	12	0	12	
07/14/2017	06:41	18:54	12	15	11	2	13	
07/15/2017	06:38	19:36	13	10	10	0	10	
07/16/2017	06:39	18:26	12	15	13	1	14	
07/17/2017	06:31	14:19	8	6	6	2	8	travel
07/18/2017	17:56	19:31	2	2	2	0	2	offload and science crew change
07/19/2017	06:28	19:56	13	12	13	0	13	
07/20/2017	07:05	19:51	12	17	10	0	10	
07/21/2017	06:30	16:14	10	10	8	0	8	
07/22/2017	07:52	19:57	12	13	11	1	12	
07/23/2017	06:29	19:54	13	12	11	1	12	
07/24/2017	06:35	13:14	7	8	8	0	8	offload
07/25/2017	06:22	19:25	13	14	9	3	12	
07/26/2017	06:40	19:06	13	11	6	3	9	
07/27/2017	06:36	19:39	13	10	7	3	10	
07/28/2017	06:29	18:55	12	16	6	4	10	
07/29/2017	06:33	20:18	14	11	9	3	12	
07/30/2017	06:38	14:45	8	6	5	2	7	
07/31/2017	-	-	-	-	-	-	-	offload and travel
08/01/2017	-	-	-	-	-	-	-	travel and unload
Total				291	240	28	268	
Average Per Day				13	10	1	12	

Table 5. Block results by stratum for the 2017 QCS synoptic bottom trawl survey.

Area	Depth Stratum (m)	Successful	Rejected Prior	Rejected Inspected	Rejected Failed	Not Assessed	Total
South	50 - 125	36	0	2	2	0	40
	125 - 200	57	0	10	5	0	72
	200 - 330	29	0	2	3	0	34
	330 - 500	8	0	2	0	0	10
North	50 - 125	12	0	7	1	0	20
	125 - 200	51	1	3	5	0	60
	200 - 330	40	0	5	2	0	47
	330 - 500	7	0	1	0	0	8
Total		240	1	32	18	0	291

Table 6. Tow results by stratum for the 2017 QCS synoptic bottom trawl survey.

Area	Depth Stratum (m)	Usable	Not Usable
South	50 - 125	36	3
	125 - 200	57	8
	200 - 330	29	6
	330 - 500	8	1
North	50 - 125	12	1
	125 - 200	51	6
	200 - 330	40	2
	330 - 500	7	1
Total		240	28

Table 7. Mean warp length and scope by 50 meter depth interval for the 2017 QCS synoptic bottom trawl survey.

Depth (m)	Mean Warp (m)	Mean Scope
0-50	183	3.72
50-100	261	3.45
100-150	395	3.04
150-200	521	2.98
200-250	628	2.83
250-300	743	2.68
300-350	826	2.50
350-400	924	2.48
400-450	997	2.33
450-500	1079	2.35
500-550	1061	2.06

Table 8. Frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species captured during the 2017 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				
Pacific Ocean Perch	<i>Sebastes alutus</i>	157	2863.0	172.7	27292.8
Silvergray Rockfish	<i>Sebastes brevispinis</i>	152	3818.0	66.1	10113.0
Redbanded Rockfish	<i>Sebastes babcocki</i>	124	243.0	13.5	1650.4
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	114	114.5	17.7	2014.1
Redstripe Rockfish	<i>Sebastes proriger</i>	98	347.4	16.4	1602.9
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	97	1226.0	29.7	2823.0
Greenstriped Rockfish	<i>Sebastes elongatus</i>	94	38.8	2.7	254.1
Yellowmouth Rockfish	<i>Sebastes reedi</i>	78	3837.8	130.6	10183.2
Rougheye/Blackspotted Rockfish Complex	<i>Sebastes aleutianus/melanostictus</i> complex	76	190.1	13.1	983.4
Canary Rockfish	<i>Sebastes pinniger</i>	75	125.9	11.6	866.0
Yellowtail Rockfish	<i>Sebastes flavidus</i>	60	560.9	25.8	1550.4
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	57	37.1	3.9	216.0
Bocaccio	<i>Sebastes paucispinis</i>	56	20.4	2.3	127.1
Rockfishes	<i>Sebastes</i> (Genus)	44	1.6	0.3	7.5
Shortbelly Rockfish	<i>Sebastes jordani</i>	42	63.3	3.3	121.4
Quillback Rockfish	<i>Sebastes maliger</i>	42	25.3	4.2	177.6
Splitnose Rockfish	<i>Sebastes diploproa</i>	40	1432.6	159.2	6209.1
Darkblotched Rockfish	<i>Sebastes crameri</i>	39	214.9	10.1	382.2
Pygmy Rockfish	<i>Sebastes wilsoni</i>	33	13.1	1.0	30.8
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	30	26.5	5.9	175.9
Widow Rockfish	<i>Sebastes entomelas</i>	28	34.2	5.2	135.2
Harlequin Rockfish	<i>Sebastes variegatus</i>	15	86.3	6.5	90.3
Shortraker Rockfish	<i>Sebastes borealis</i>	6	31.9	12.9	77.3
Longspine Thornyhead	<i>Sebastolobus altivelis</i>	3	25.6	15.8	47.2
Aurora Rockfish	<i>Sebastes aurora</i>	3	8.2	3.5	10.4
Puget Sound Rockfish	<i>Sebastes emphaeus</i>	2	2.4	1.2	2.4
Copper Rockfish	<i>Sebastes caurinus</i>	2	0.9	0.7	1.3
Black Rockfish	<i>Sebastes melanops</i>	1	1.8	1.8	1.8
China Rockfish	<i>Sebastes nebulosus</i>	1	0.4	0.4	0.4
Blackgill Rockfish	<i>Sebastes melanostomus</i>	1	0.2	0.2	0.2
Flatfishes	Order Pleuronectiformes				
Arrowtooth Flounder	<i>Atheresthes stomias</i>	215	2713.8	79.1	16934.8
Rex Sole	<i>Glyptocephalus zachirus</i>	208	138.8	15.2	3168.5
Dover Sole	<i>Microstomus pacificus</i>	185	152.9	15.4	2846.5
Slender Sole	<i>Lyopsetta exilis</i>	130	8.7	1.2	151.4
Petrale Sole	<i>Eopsetta jordani</i>	119	142.3	5.8	678.5
Flathead Sole	<i>Hippoglossoides elassodon</i>	116	194.5	15.7	1808.5
English Sole	<i>Parophrys vetulus</i>	113	114.4	11.2	1261.4
Pacific Halibut	<i>Hippoglossus stenolepis</i>	74	48.2	10.2	767.2
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	70	51.0	6.0	416.7
Pacific Sanddab	<i>Citharichthys sordidus</i>	57	20.8	3.1	177.0
Curlfin Sole	<i>Pleuronichthys decurrens</i>	32	4.6	1.2	38.1
Cod-Like Fishes	Order Gadiformes				
Walleye Pollock	<i>Gadus chalcogrammus</i>	170	567.3	14.0	2305.6
Pacific Hake	<i>Merluccius productus</i>	135	416.1	36.4	4881.4
Pacific Cod	<i>Gadus macrocephalus</i>	98	76.8	8.0	771.0
Pacific Tomcod	<i>Microgadus proximus</i>	6	1.4	0.4	2.6
Codfishes	Gadidae (Family)	2	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Giant Grenadier	<i>Albatrossia pectoralis</i>	1	1.2	1.2	1.2
Cartilaginous Fishes	Class Chondrichthyes				
Spotted Ratfish	<i>Hydrolagus collieri</i>	235	389.5	11.6	2713.8
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	134	402.1	14.0	1875.6
Longnose Skate	<i>Raja rhina</i>	88	23.4	7.0	613.1
Sandpaper Skate	<i>Bathyraja interrupta</i>	32	7.1	1.6	49.5
Big Skate	<i>Beringraja binoculata</i>	12	31.3	7.8	93.4
Brown Cat Shark	<i>Apristurus brunneus</i>	4	1.5	0.8	3.1
Aleutian Skate	<i>Bathyraja aleutica</i>	1	6.9	6.9	6.9
Greenlings	Family Hexagrammidae				
Lingcod	<i>Ophiodon elongatus</i>	75	412.9	10.7	800.6
Kelp Greenling	<i>Hexagrammos decagrammus</i>	5	1.6	0.9	4.5
Sculpins	Family Cottidae				
Darkfin Sculpin	<i>Malacocottus zonurus</i>	36	0.8	0.2	6.3
Threadfin Sculpin	<i>Icelinus filamentosus</i>	16	1.1	0.4	5.8
Roughback Sculpin	<i>Chitonotus pugetensis</i>	14	0.5	0.2	1.9
Slim Sculpin	<i>Radulinus asprellus</i>	12	-	-	-
Bigmouth Sculpin	<i>Hemitripterus bolini</i>	10	6.2	4.0	39.5
Roughspine Sculpin	<i>Triglops macellus</i>	5	-	-	-
Blackfin Sculpin	<i>Malacocottus kincaidi</i>	3	0.3	0.2	0.5
Spotfin Sculpin	<i>Icelinus tenuis</i>	3	-	-	-
Ribbed Sculpin	<i>Triglops pingelii</i>	2	-	-	-
Thornback Sculpin	<i>Paricelinus hopliticus</i>	1	0.1	0.1	0.1
Brown Irish Lord	<i>Hemilepidotus spinosus</i>	1	0.1	0.1	0.1
Sailfin Sculpin	<i>Nautichthys oculofasciatus</i>	1	-	-	-
Eelpouts	Family Zoarcidae				
Blackbelly Eelpout	<i>Lycodes pacificus</i>	78	59.5	4.7	256.8
Bigfin Eelpout	<i>Lycodes cortezianus</i>	29	2.7	0.6	17.4
Black Eelpout	<i>Lycodes diapterus</i>	28	0.9	0.3	5.7
Pallid Eelpout	<i>Lycodapus mandibularis</i>	4	0.2	0.1	0.4
Wattled Eelpout	<i>Lycodes palearis</i>	3	0.4	0.4	0.7
Shortfin Eelpout	<i>Lycodes brevipes</i>	3	0.1	0.1	0.1
Lanternfishes	Family Myctophidae				
Lanternfish	<i>Tarletonbeania</i> (Genus)	9	0.3	0.2	0.4
Northern Lampfish	<i>Stenobrachius leucopsarus</i>	1	-	-	-
Lanternfishes	Myctophidae (Family)	1	0.1	0.1	0.1
Pinpoint Lampfish	<i>Nannobrachium regale</i>	1	0.1	0.1	0.1
Other Fish					
Sablefish	<i>Anoplopoma fimbria</i>	181	1580.2	40.2	7278.8
Pacific Herring	<i>Clupea pallasii</i>	55	7.7	0.7	32.9
Eulachon	<i>Thaleichthys pacificus</i>	46	10.7	1.4	52.7
Bigeye Poacher	<i>Bathyagonus pentacanthus</i>	44	0.1	-	0.7
Northern Ronquil	<i>Ronquilus jordani</i>	17	0.4	0.1	0.5
Pacific Sand Lance	<i>Ammodytes personatus</i>	8	3.8	1.4	5.4
Prowfish	<i>Zaprora silenus</i>	7	3.1	1.1	6.5
Black Hagfish	<i>Eptatretus deani</i>	6	0.3	0.2	1.5
Smootheye Poacher	<i>Xeneretmus leiops</i>	5	0.1	0.1	0.1
Whitebarred Prickleback	<i>Poroclinus rothrocki</i>	5	-	-	-
Pacific Lamprey	<i>Entosphenus tridentatus</i>	4	-	-	0.1
Blackfin Poacher	<i>Bathyagonus nigripinnis</i>	4	-	-	-
Northern Spearnose Poacher	<i>Agonopsis vulsa</i>	4	-	-	-
Wolf Eel	<i>Anarrhichthys ocellatus</i>	3	6.1	3.5	10.4
Snailfishes	Liparidae (Family)	3	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
American Shad	<i>Alosa sapidissima</i>	2	0.5	0.5	1.0
Pacific Viperfish	<i>Chauliodus macouni</i>	2	-	-	-
Pacific Sardine	<i>Sardinops sagax</i>	1	-	-	-
Coho Salmon	<i>Oncorhynchus kisutch</i>	1	4.7	4.7	4.7
Chum Salmon	<i>Oncorhynchus keta</i>	1	3.7	3.7	3.7
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	1	0.2	0.2	0.2
Pearly Prickleback	<i>Bryozoichthys marjorius</i>	1	0.1	0.1	0.1
Tubeshoulders	Platyroctidae (Family)	1	-	-	-
Longsnout Prickleback	<i>Lumpenella longirostris</i>	1	-	-	-
Crabs and Shrimp		Class Malacostraca			
Pink Shrimp (smooth)	<i>Pandalus jordani</i>	118	10.5	1.4	99.9
Prawn	<i>Pandalus platyceros</i>	77	2.2	0.4	23.5
Sidestripe Shrimp	<i>Pandalopsis dispar</i>	57	1.1	0.2	8.5
Isopods	Isopoda (Order)	21	-	-	-
Brown Box Crab	<i>Lopholithodes foraminatus</i>	19	3.6	0.8	15.7
Crangons	Crangon (Genus)	18	-	-	-
Squat Lobster	<i>Munida quadrispina</i>	16	-	-	-
Glass Shrimp	<i>Pasiphaea pacifica</i>	13	0.7	0.4	1.7
Redclaw Crab	<i>Chorilia longipes</i>	12	-	-	-
Dungeness Crab	<i>Metacarcinus magister</i>	8	2.4	1.3	10.3
Spike Shrimp (horned Shrimp)	<i>Paracrangon echinata</i>	6	-	-	-
Bristly Crab	<i>Acantholithodes hispidus</i>	5	0.8	0.3	1.2
Yellowleg Shrimp	<i>Pandalus tridens</i>	5	0.1	0.1	0.1
-	<i>Argis</i> (Genus)	5	-	-	-
Right-handed Hermits	<i>Paguridae</i> (Family)	4	-	-	-
-	<i>Primno</i> (Genus)	3	4.4	2.3	6.9
Golden King Crab	<i>Lithodes aequispinus</i>	3	2.3	1.8	5.3
-	Crangonidae (Family)	3	-	-	-
Pandalid Shrimp	Pandalidae (Family)	2	-	-	-
Common Argid	<i>Argis alaskensis</i>	2	-	-	-
Spider Crabs	Majidae (Family)	2	-	-	-
Large Eyed Eualid	<i>Eualus macrophthalmus</i>	2	-	-	-
Left-handed Hermits	Diogenidae (Family)	1	-	-	-
Northern Crangon	<i>Crangon alaskensis</i>	1	-	-	-
-	Crangonyctidae (Family)	1	-	-	-
Starfish		Class Asteroidea			
-	<i>Cheiraster dawsoni</i>	26	0.2	0.1	0.7
Rose Starfish	<i>Crossaster papposus</i>	25	-	-	0.1
Sand Star	<i>Luidia foliolata</i>	23	0.8	0.4	4.4
Mud Star	<i>Ctenodiscus crispatus</i>	21	6.2	1.9	7.5
-	<i>Henricia</i> (Genus)	21	0.4	0.4	0.4
Fish-eating Star	<i>Stylasterias forreri</i>	19	0.4	0.2	2.1
-	<i>Poraniopsis inflatus inflatus</i> (Sub Species)	18	2.7	0.6	9.0
Cushion Star	<i>Pteraster tessellatus</i>	16	0.4	0.3	0.8
Vermillion Starfish	<i>Mediaster aequalis</i>	12	0.3	0.1	0.6
Cookie Star	<i>Ceramaster patagonicus</i>	11	0.2	0.1	0.6
Spiny Red Sea Star	<i>Hippasteria spinosa</i>	9	0.4	0.2	1.6
-	Goniasteridae (Family)	6	0.2	0.2	0.2
-	<i>Dipsacaster</i> (Genus)	6	0.4	0.3	1.5
Sunflower Starfish	<i>Pycnopodia helianthoides</i>	4	2.9	1.1	3.4
Striped Sun Starfish	<i>Solaster stimpsoni</i>	3	0.1	0.1	0.3
-	<i>Diplopteraster multipes</i>	2	0.4	0.3	0.5
Starfish	Asteroidea (Class)	2	0.3	0.3	0.3
-	<i>Hippasteria</i> (Genus)	2	0.2	0.2	0.3

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
-	<i>Gephyreaster swifti</i>	1	0.8	0.8	0.8
Winged Sea Star	<i>Pteraster militaris</i>	1	0.1	0.1	0.1
-	<i>Dipsacaster borealis</i>	1	0.2	0.2	0.2
-	<i>Lophaster furcilliger</i>	1	0.2	0.2	0.2
-	Solasteridae (Family)	1	0.2	0.2	0.2
-	<i>Solaster paxillatus</i>	1	0.1	0.1	0.1
Long-armed Sea Star	<i>Orthasterias koehleri</i>	1	-	-	-
-	<i>Leptychaster arcticus</i>	1	-	-	-
-	<i>Mediaster</i> (Genus)	1	-	-	-
-	<i>Henricia aspera</i>	1	-	-	-
-	Pterasteridae (Family)	1	-	-	-
Morning Sun Starfish	<i>Solaster dawsoni</i>	1	-	-	-
Brittle Stars		Class Ophiuroidea			
Basket Star	<i>Gorgonocephalus eucnemis</i>	37	0.8	0.2	4.1
-	Ophiuridae (Family)	26	-	-	-
-	<i>Amphiophiura ponderosa</i>	15	1.5	1.5	1.5
-	<i>Ophiura sarsi</i>	10	-	-	-
-	Ophiuroidea (Class)	9	-	-	-
-	<i>Ophiacantha</i> (Genus)	5	-	-	-
-	Ophiurida (Order)	2	-	-	-
-	Ophiacanthidae (Family)	2	-	-	-
-	<i>Ophiopholis</i> (Genus)	1	-	-	-
Sea Cucumbers		Class Holothuroidea			
Whitespotted Sea Cucumber	<i>Apostichopus leukothele</i>	44	5.6	0.9	34.0
Soft Sea Cucumber	<i>Pseudostichopus mollis</i>	30	4.0	0.6	11.6
Papillose Sea Cucumber	<i>Synallactes challengerii</i>	14	0.2	0.1	0.6
Giant Red Sea Cucumber	<i>Parastichopus californicus</i>	9	1.5	0.6	5.2
Sea Cucumbers	Holothuroidea (Class)	5	0.6	0.6	0.6
Black Sea Cucumber	<i>Cucumaria frondosa japonica</i>	3	0.8	0.4	1.2
Peppered Sea Cucumber	<i>Cucumaria piperata</i>	2	-	-	-
Octopuses and Squid		Class Cephalopoda			
Pacific Bobtail Squid	<i>Rossia pacifica</i>	39	0.1	-	0.5
Schoolmaster Gonate Squid	<i>Berryteuthis magister</i>	34	13.0	4.1	129.5
Giant Pacific Octopus	<i>Enteroctopus dofleini</i>	7	9.1	1.8	14.3
Smoothskin Octopus	<i>Benthoctopus leioderma</i>	5	0.1	0.1	0.3
Opalescent Inshore Squid	<i>Doryteuthis opalescens</i>	5	0.3	0.1	0.6
Octopus	<i>Octopus</i> (Genus)	2	0.4	0.4	0.4
-	Octopodidae (Family)	1	0.1	0.1	0.1
-	<i>Stigmatoteuthis dofleini</i>	1	0.7	0.7	0.7
Giant Squid	<i>Architeuthis martensi</i>	1	30.7	30.7	30.7
Sea Urchins		Super Order Echinacea			
Fragile Urchin	<i>Allocentrotus fragilis</i>	136	4.7	0.8	83.9
Green Urchin	<i>Strongylocentrotus droebachiensis</i>	15	0.6	0.2	1.5
Pallid Urchin	<i>Strongylocentrotus pallidus</i>	11	2.7	0.8	3.9
Red Urchin	<i>Strongylocentrotus franciscanus</i>	2	10.8	10.8	10.8
Jellyfish		Class Scyphozoa			
Lions Mane	<i>Cyanea capillata</i>	129	10.5	1.6	185.6
Jellyfish	Scyphozoa (Class)	109	3.5	0.5	23.3
Fried Egg Jellyfish, Egg					
Yolk Jelly	<i>Phacellophora camtschatica</i>	22	9.1	2.0	41.4
Moon Jelly	<i>Aurelia aurita</i>	3	0.2	0.2	0.3

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
-	<i>Periphylla periphylla</i>	2	-	-	-
Anemone	Actiniaria (Order)				
Anemone	Actiniaria (Order)	33	3.0	0.7	12.7
Sea Whip	<i>Balticina septentrionalis</i>	18	0.1	-	0.1
-	<i>Metridium</i> (Genus)	16	9.9	2.4	38.9
-	<i>Primnoa</i> (Genus)	15	25.0	5.4	70.0
-	<i>Paragorgia pacifica</i>	2	0.3	0.2	0.4
Swimming Anemone	<i>Stomphia coccinea</i>	2	-	-	-
-	<i>Paragorgia</i> (Genus)	1	1.0	1.0	1.0
Bubble Gum Coral	<i>Paragorgia arborea</i>	1	0.1	0.1	0.1
Sea Pen	<i>Ptilosarcus gurneyi</i>	1	0.1	0.1	0.1
Sea Pens	Pennatulacea (Order)	1	-	-	-
-	Hormathiidae (Family)	1	-	-	-
Snails and Slugs	Class Gastropoda				
Oregontriton	<i>Fusitriton oregonensis</i>	29	1.5	0.3	2.0
Seaslugs	Nudibranchia (Order)	5	0.3	0.3	0.3
Gastropods	Gastropoda (Class)	4	0.2	0.2	0.2
-	Archidorididae (Family)	2	-	-	-
White Night Doris	<i>Doris odhneri</i>	1	-	-	-
-	<i>Anisodoris</i> (Genus)	1	-	-	-
California Armina	<i>Armina californica</i>	1	-	-	-
Adams Spiny Margarite	<i>Cidarina cidaris</i>	1	-	-	-
Silvery Topsnail	<i>Calliostoma platinum</i>	1	-	-	-
-	<i>Neptunea</i> (Genus)	1	-	-	-
Other Species					
-	<i>Pyrosoma</i> (Genus)	167	38.1	2.2	245.9
Sponges	Porifera (Phylum)	63	320.1	15.7	816.2
Salps	Thaliacea (Class)	30	0.6	0.3	3.8
Glass Sponges	Hexactinellida (Class)	21	15.2	2.3	45.7
Bath Sponges	Demospongiae (Class)	20	12.1	2.5	49.6
Heart Urchin	<i>Brisaster latifrons</i>	15	0.4	0.2	1.5
Sea Mouse	<i>Aphrodita</i> (Genus)	10	-	-	-
Spiny Scallop	<i>Chlamys hastata</i>	8	2.0	0.6	3.7
-	Antedonidae (Family)	7	-	-	-
Peanutworms	Sipuncula (Phylum)	5	-	-	-
-	Tunicata (Sub Phylum)	5	0.2	0.2	0.2
Salps	Salpida (Order)	4	0.3	0.3	0.3
Pink Scallop, (aka Reddish Scallop)	<i>Chlamys rubida</i>	4	0.1	0.1	0.1
Scallop	Pectinidae (Family)	3	3.7	2.0	6.0
Polychaete Worms	Polychaeta (Class)	3	-	-	-
Lampshells	Brachiopoda (Phylum)	2	0.1	0.1	0.1
-	<i>Boltenia villosa</i>	2	-	-	-
-	<i>Halocynthia</i> (Genus)	2	-	-	-
-	<i>Chlamys</i> (Genus)	1	27.1	27.1	27.1
Storm-petrels	Oceanitidae (Family)	1	0.1	0.1	0.1
Bivalve Molluscs	Bivalvia (Class)	1	-	-	-
-	Echiura (Phylum)	1	-	-	-
Ascidians And Tunicates	Asciacea (Class)	1	-	-	-
Salp	<i>Cyclosalpa affinis</i>	1	-	-	-

Table 9. Offloaded catch weight by species by the F/V Nordic Pearl during the 2017 QCS synoptic bottom trawl survey.

Species	Weight (kg)
Aurora Rockfish	4.4
Canary Rockfish	350.7
Darkblotched Rockfish	331.2
English Sole	22.6
Greenstriped Rockfish	3.6
Lingcod	213.1
Pacific Cod	35.1
Pacific Ocean Perch	22,231.6
Petrale Sole	212.6
Quillback Rockfish	18.2
Redbanded Rockfish	691.7
Redstripe Rockfish	206.9
Rosethorn Rockfish	20.4
Rougheye/Blackspotted Rockfish Complex	277.9
Sablefish	514.5
Sharpchin Rockfish	1,644.9
Shortspine Thornyhead	1,002.9
Silvergray Rockfish	7,745.0
Southern Rock Sole	10.2
Splitnose Rockfish	2,470.5
Widow Rockfish	27.1
Yelloweye Rockfish	4.4
Yellowmouth Rockfish	9,253.9
Yellowtail Rockfish	586.4
Total	47,879.9

Table 10. Species sampled during the 2017 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
Arrowtooth Flounder	<i>Atheresthes stomias</i>	68	1847	1397	1847	513	514
Big Skate	<i>Beringraja binocularata</i>	52	211	59	209	0	0
Bocaccio	<i>Sebastes paucispinis</i>	9	48	48	48	48	48
Butter Sole	<i>Isopsetta isolepis</i>	16	316	109	316	0	0
Canary Rockfish	<i>Sebastes pinniger</i>	5	70	70	70	50	50
Copper Rockfish	<i>Sebastes caurinus</i>	5	62	55	62	55	54
Curlfin Sole	<i>Pleuronichthys decurrens</i>	12	158	76	158	0	0
Dover Sole	<i>Microstomus pacificus</i>	45	1210	863	1210	665	665
English Sole	<i>Parophrys vetulus</i>	66	1876	1597	1876	1005	905
Eulachon	<i>Thaleichthys pacificus</i>	32	984	0	0	0	0
Flathead Sole	<i>Hippoglossoides elassodon</i>	14	367	245	367	0	0
Greenstriped Rockfish	<i>Sebastes elongatus</i>	3	38	38	38	0	0
Kelp Greenling	<i>Hexagrammos decagrammus</i>	3	60	28	60	0	0
Lingcod	<i>Ophiodon elongatus</i>	41	310	258	302	222	222
Longnose Skate	<i>Raja rhina</i>	32	90	0	90	0	0
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	66	383	311	383	311	275
Pacific Cod	<i>Gadus macrocephalus</i>	62	821	716	821	602	602
Pacific Hake	<i>Merluccius productus</i>	12	267	180	267	83	83
Pacific Halibut	<i>Hippoglossus stenolepis</i>	84	516	25	5	0	0
Pacific Ocean Perch	<i>Sebastes alutus</i>	19	435	349	435	222	224
Pacific Sanddab	<i>Citharichthys sordidus</i>	23	585	254	585	0	0
Pacific Tomcod	<i>Microgadus proximus</i>	11	332	128	332	0	0
Petrale Sole	<i>Eopsetta jordani</i>	27	305	288	305	212	212
Pygmy Rockfish	<i>Sebastes wilsoni</i>	3	25	16	25	0	0
Quillback Rockfish	<i>Sebastes maliger</i>	19	339	307	339	250	250
Redbanded Rockfish	<i>Sebastes babcocki</i>	16	206	206	206	206	205
Redstripe Rockfish	<i>Sebastes proriger</i>	4	95	95	95	59	59
Rex Sole	<i>Glyptocephalus zachirus</i>	61	1556	1048	1555	402	402
Rougheye/Blackspotted Rockfish Complex	<i>Sebastes aleutianus/melanostictus</i> complex	16	49	49	49	49	49
Sablefish	<i>Anoplopoma fimbria</i>	47	821	641	821	379	377
Sand Sole	<i>Psettichthys melanostictus</i>	20	372	343	372	324	295
Sandpaper Skate	<i>Bathyraja interrupta</i>	13	26	0	26	0	0
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	2	57	17	56	0	0
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	16	390	262	390	0	130
Silvergray Rockfish	<i>Sebastes brevispinis</i>	12	115	87	115	0	0
Slender Sole	<i>Lyopsetta exilis</i>	6	115	15	115	0	0
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	46	1170	973	1170	838	838
Spotted Ratfish	<i>Hydrolagus colliei</i>	61	2092	0	2092	0	0
Starry Flounder	<i>Platichthys stellatus</i>	15	118	118	118	117	0
Walleye Pollock	<i>Gadus chalcogrammus</i>	40	899	475	899	172	172
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	7	12	12	12	12	12
Yellowmouth Rockfish	<i>Sebastes reedi</i>	1	35	0	35	0	0
Yellowtail Rockfish	<i>Sebastes flavidus</i>	8	124	110	124	51	51
Total		1,120	19,907	11,868	18,400	6,847	6,694

Table 11. Summary of biological data collected during the 2017 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 -.

Common Name	Scientific Name	Number of		Length Type	Length (cm)			Weight (kg)			Female Proportion
		Samples	Specimens		Min.	Max.	Mean	Min.	Max.	Mean	
Arrowtooth Flounder	<i>Atheresthes stomias</i>	68	1847	Fork	12	72	42	<0.1	3.1	0.8	0.61
Big Skate	<i>Beringraja binocularata</i>	52	211	Total	19	180	82	0.4	19.9	2.4	0.51
Bocaccio	<i>Sebastes paucispinis</i>	9	48	Fork	21	37	25	0.1	0.5	0.2	0.60
Butter Sole	<i>Isopsetta isolepis</i>	16	316	Total	17	41	29	0.1	0.5	0.2	0.62
Canary Rockfish	<i>Sebastes pinniger</i>	5	70	Fork	15	52	31	<0.1	2.3	0.7	0.49
Copper Rockfish	<i>Sebastes caurinus</i>	5	62	Fork	28	47	36	0.3	2.1	1	0.45
Curlfin Sole	<i>Pleuronichthys decurrens</i>	12	158	Total	18	43	29	0.1	1.4	0.5	0.39
Dover Sole	<i>Microstomus pacificus</i>	45	1210	Total	14	62	37	0.1	2.4	0.5	0.58
English Sole	<i>Parophrys vetulus</i>	66	1876	Total	12	49	30	<0.1	1.3	0.3	0.57
Eulachon	<i>Thaleichthys pacificus</i>	32	984	Standard	7	21	15	-	-	-	-
Flathead Sole	<i>Hippoglossoides elassodon</i>	14	367	Total	16	41	31	<0.1	0.7	0.3	0.53
Greenstriped Rockfish	<i>Sebastes elongatus</i>	3	38	Fork	18	37	27	0.1	0.8	0.3	0.50
Kelp Greenling	<i>Hexagrammos decagrammus</i>	3	60	Fork	19	39	31	0.1	0.8	0.4	0.67
Lingcod	<i>Ophiodon elongatus</i>	41	310	Fork	23	115	34	0.1	9.7	0.4	0.58
Longnose Skate	<i>Raja rhina</i>	32	90	Total	38	169	90	-	-	-	0.57
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	66	383	Total	25	109	71	0.1	8.2	1.8	0.55
Pacific Cod	<i>Gadus macrocephalus</i>	62	821	Fork	20	84	45	0.1	7.8	1.4	0.48
Pacific Hake	<i>Merluccius productus</i>	12	267	Fork	18	68	51	0.1	2.2	1	0.82
Pacific Halibut	<i>Hippoglossus stenolepis</i>	84	516	Fork	37	141	71	1.6	4.8	2.9	0.60
Pacific Ocean Perch	<i>Sebastes alutus</i>	19	435	Fork	10	48	30	<0.1	1.7	0.4	0.44
Pacific Sanddab	<i>Citharichthys sordidus</i>	23	585	Total	9	35	20	<0.1	0.5	0.1	0.56
Pacific Tomcod	<i>Microgadus proximus</i>	11	332	Fork	13	30	21	<0.1	0.2	0.1	0.52
Petrale Sole	<i>Eopsetta jordani</i>	27	305	Total	15	60	39	<0.1	2.5	0.8	0.56
Pygmy Rockfish	<i>Sebastes wilsoni</i>	3	25	Fork	12	23	19	<0.1	0.2	0.1	0.92
Quillback Rockfish	<i>Sebastes maliger</i>	19	339	Fork	12	45	31	<0.1	1.9	0.7	0.52
Redbanded Rockfish	<i>Sebastes babcocki</i>	16	206	Fork	21	61	44	0.1	4.4	1.6	0.35
Redstripe Rockfish	<i>Sebastes proriger</i>	4	95	Fork	21	40	28	0.1	1.0	0.3	0.48
Rex Sole	<i>Glyptocephalus zachirus</i>	61	1556	Total	11	53	31	<0.1	1.2	0.2	0.59
Roughye/Blackspotted Rockfish Complex	<i>Sebastes aleutianus/melanostictus</i> complex	16	49	Fork	17	51	31	0.1	2.3	0.6	0.49
Sablefish	<i>Anoplopoma fimbria</i>	47	821	Fork	27	77	39	0.2	4.4	0.7	0.49

Common Name	Scientific Name	Number of		Length Type	Length (cm)			Weight (kg)			Female Proportion
		Samples	Specimens		Min.	Max.	Mean	Min.	Max.	Mean	
Sand Sole	<i>Psettichthys melanostictus</i>	20	372	Total	14	47	34	<0.1	1.4	0.5	0.75
Sandpaper Skate	<i>Bathyraja interrupta</i>	13	26	Total	49	90	61	-	-	-	0.46
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	2	57	Fork	9	32	23	<0.1	0.2	0.1	0.40
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	16	390	Total	9	55	28	<0.1	2.5	0.4	0.43
Silvergray Rockfish	<i>Sebastes brevispinis</i>	12	115	Fork	23	64	47	0.2	3.6	1.5	0.28
Slender Sole	<i>Lyopsetta exilis</i>	6	115	Total	13	32	24	<0.1	0.1	<0.1	0.62
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	46	1170	Total	12	48	29	<0.1	1.6	0.4	0.68
Spotted Ratfish	<i>Hydrolagus colliei</i>	61	2092	2nd Dorsal	8	52	32	-	-	-	0.44
Starry Flounder	<i>Platichthys stellatus</i>	15	118	Total	47	74	61	1.3	5.5	3.3	0.98
Walleye Pollock	<i>Gadus chalcogrammus</i>	40	899	Fork	13	71	37	<0.1	2.2	0.7	0.59
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	7	12	Fork	29	67	54	0.4	6.0	3.7	0.58
Yellowmouth Rockfish	<i>Sebastes reedi</i>	1	35	Fork	30	40	32	-	-	-	0.34
Yellowtail Rockfish	<i>Sebastes flavidus</i>	8	124	Fork	17	55	40	0.1	3.1	1.1	0.36

Table 12. Data collected from net sensors during the 2017 QCS bottom trawl survey, showing the number of tows from which each data type was collected (total number of survey tows is 268; 240 successful).

Sensor	Attribute	Number of	
		Tows	Records
Hobo Pendant Acceleration Data Logger	Bottom Contact Sensor Tilt Angle	260	1293992
Seabird SBE19plus Seacat Profiler	Conductivity Of Sea Water (S/m)	268	644561
	Pressure (db)/ depth (m)	268	644561
	Salinity (PSU)	268	644561
	Water temperature (°C)	268	644561
Seabird SSBE43	Oxygen Voltage (V)/ Dissolved Oxygen (ml/L)	268	644561
Seabird SBE39 Temperature And Pressure Sensor S/N	Pressure (db)/ depth (m)	248	1186760
	Water Temperature (°C)	248	1186760
Scanmar Net Sensors	Net Depth	268	
	Trawl Net Doorspread	268	
	Trawl Net Headrope To Bottom Distance	268	

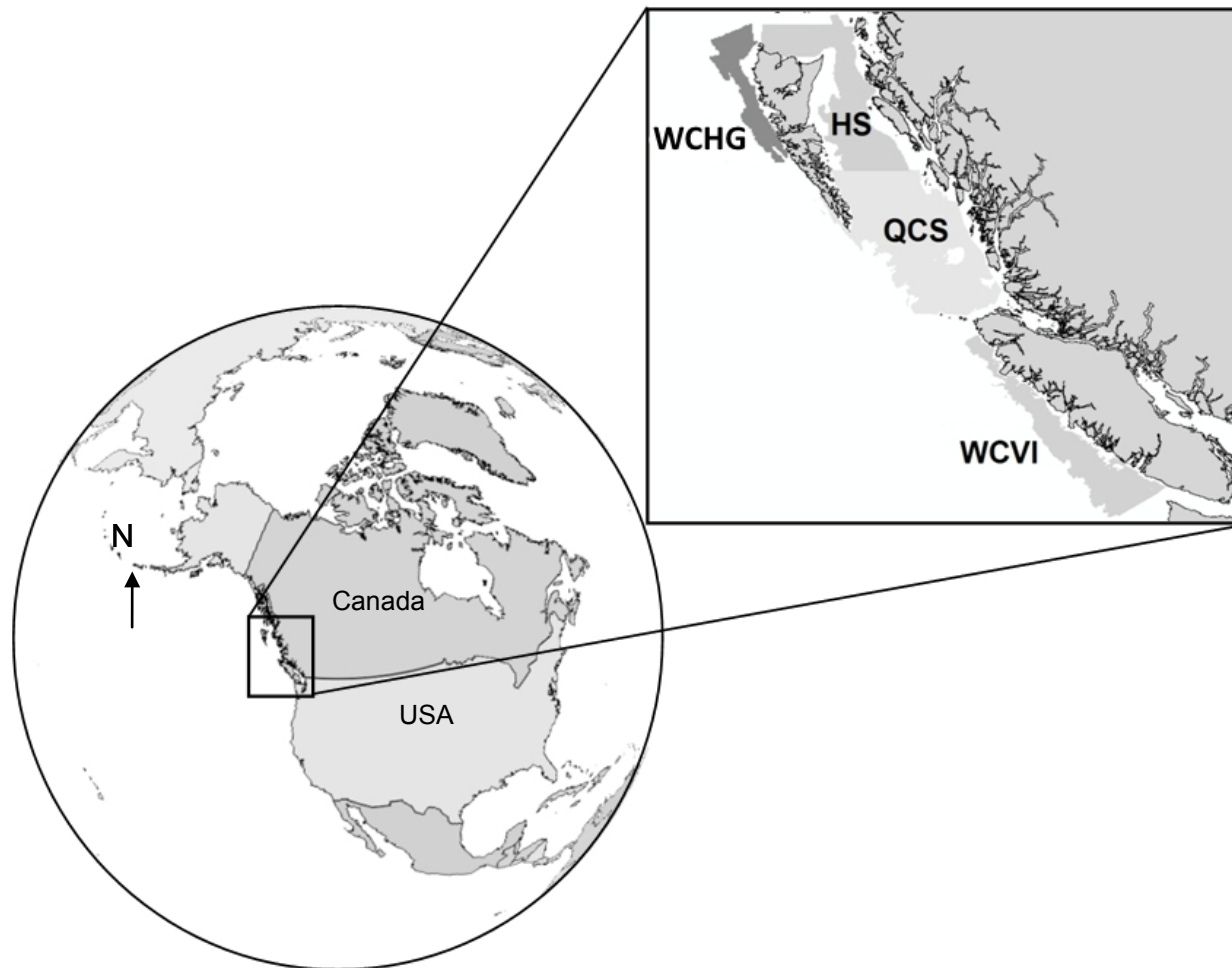


Figure 1. Locations of the current synoptic bottom trawl surveys on the coast of British Columbia, Canada. WCHG = West Coast Haida Gwaii; HS = Hecate Strait; QCS = Queen Charlotte Sound; WCVI = West Coast Vancouver Island.

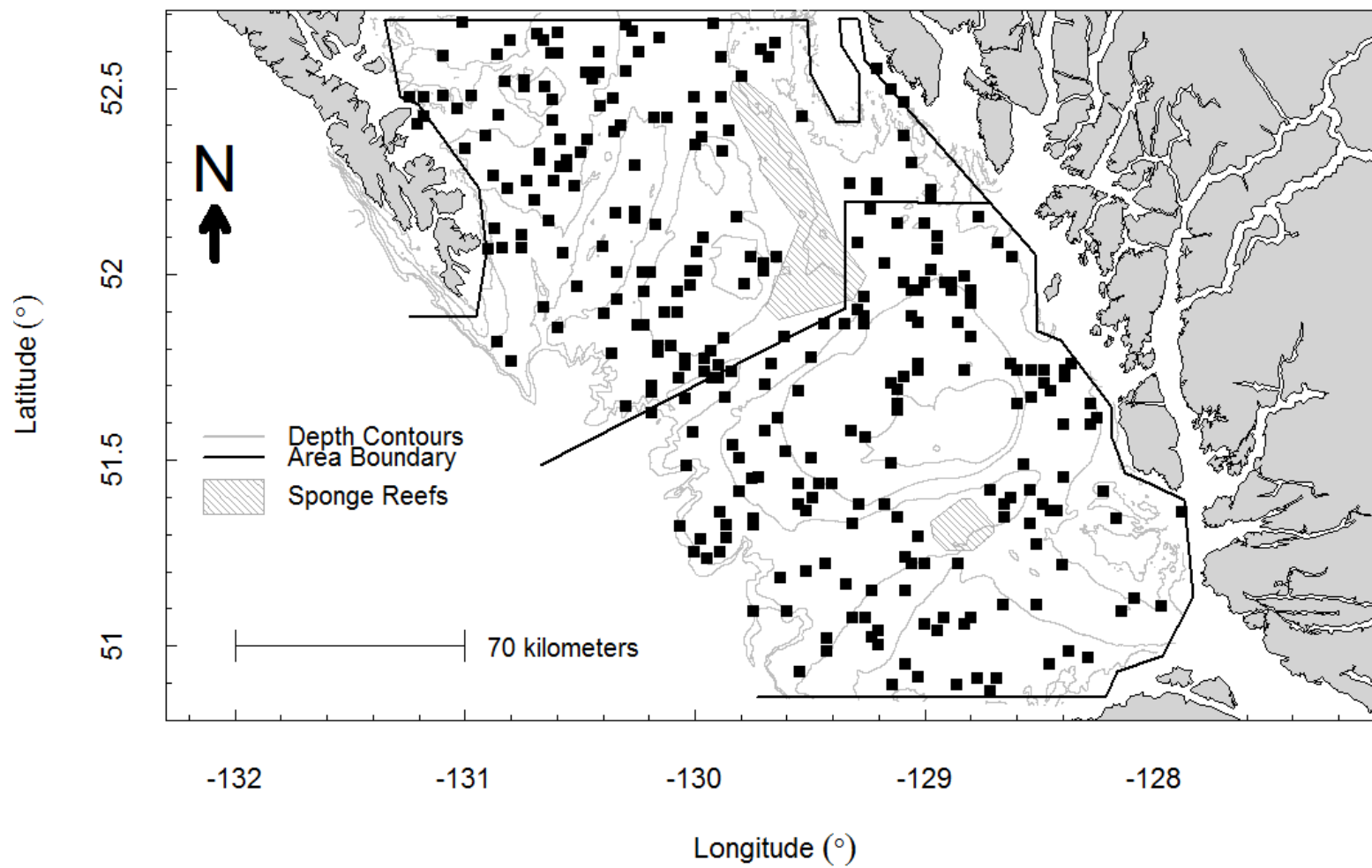


Figure 2. The QCS synoptic bottom trawl survey area showing the 291 randomly selected blocks with area boundary of the north and south subareas, sponge reef protected area, and depth contours for the 2017 survey.



Figure 3. The commercial stern trawler F/V Nordic Pearl used for the 2017 QCS synoptic bottom trawl survey. (Photo: Schon Acheson).

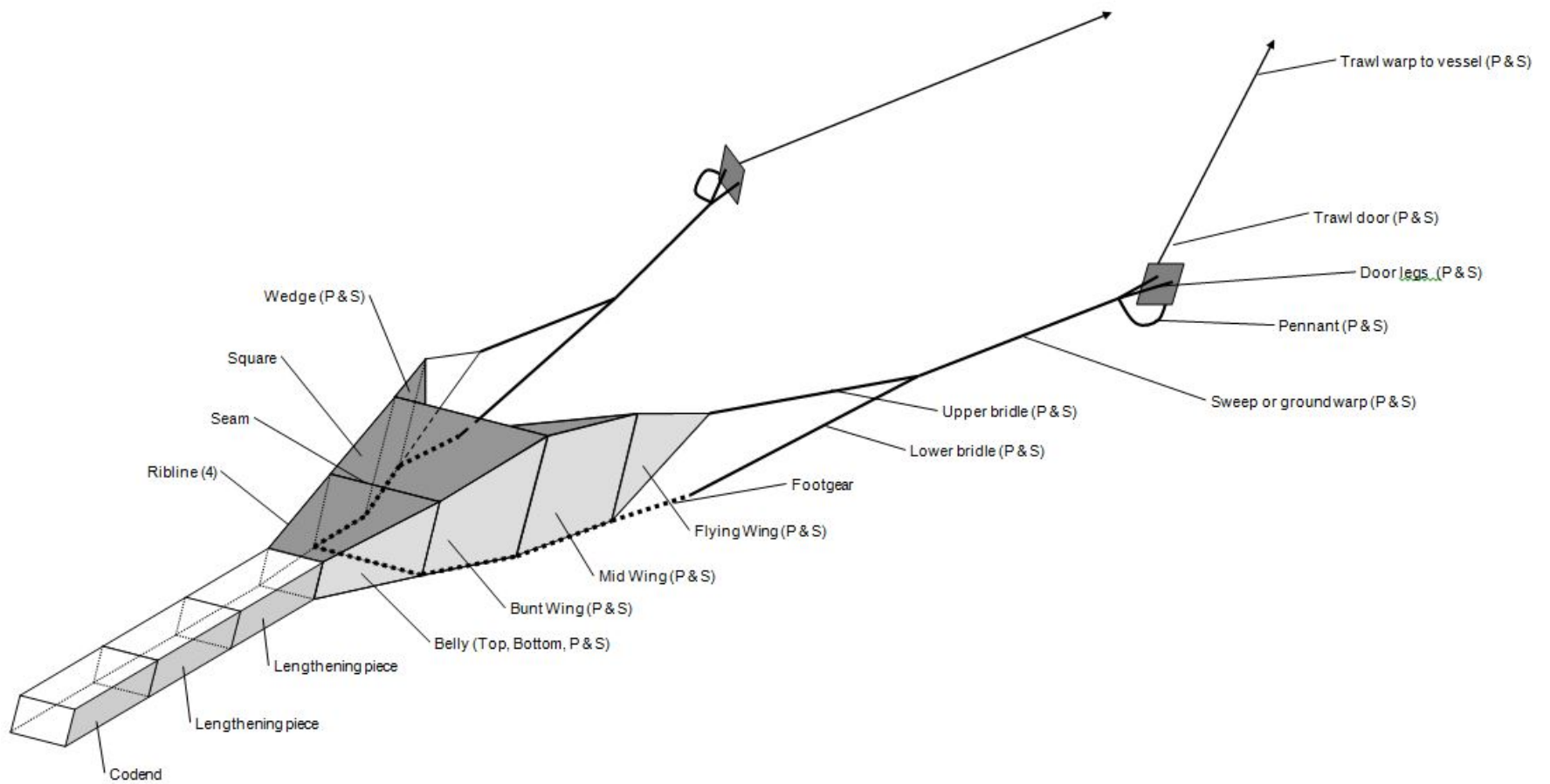


Figure 4. Overview diagram of the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl survey.

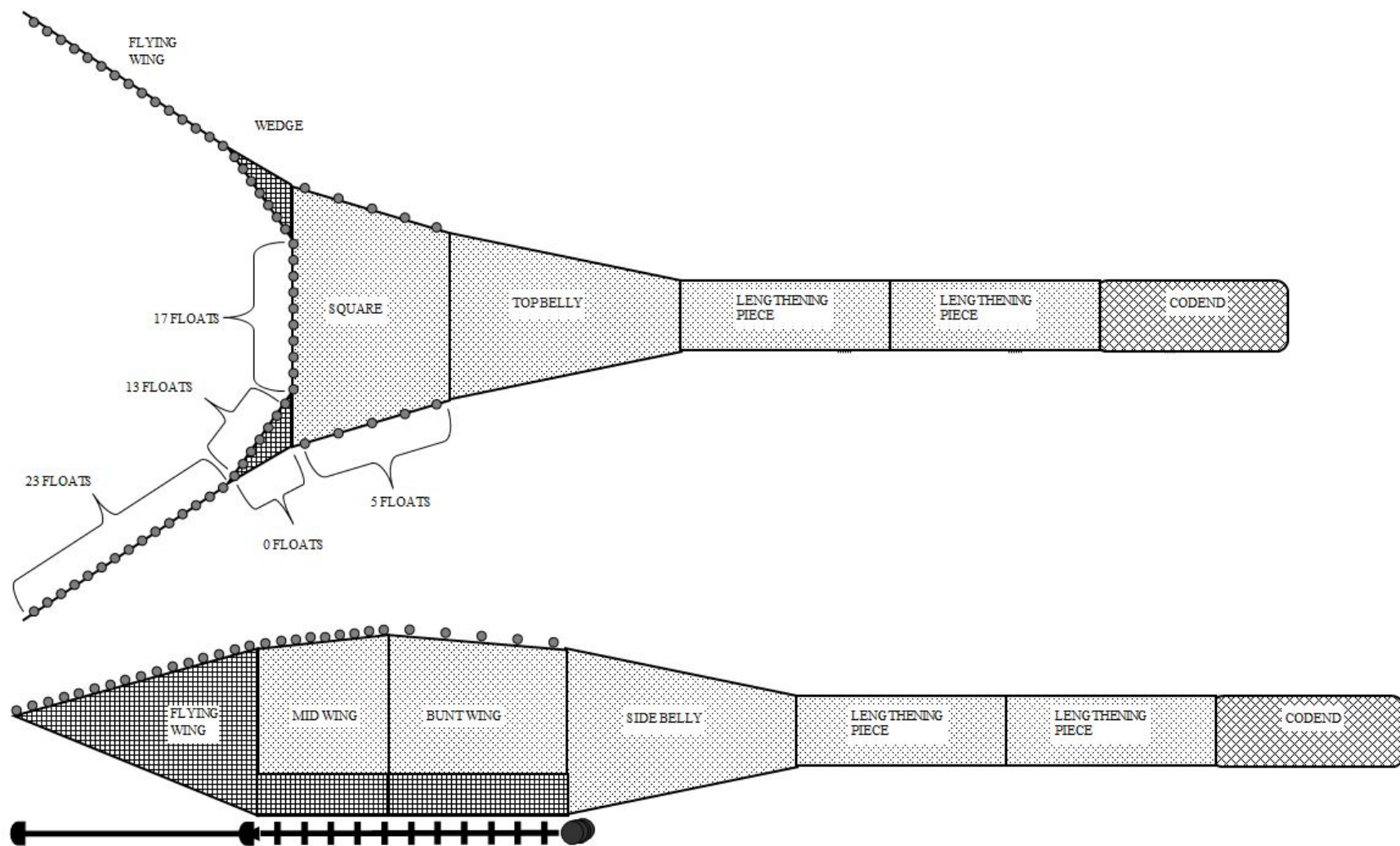


Figure 5. Top and side view of the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl survey.

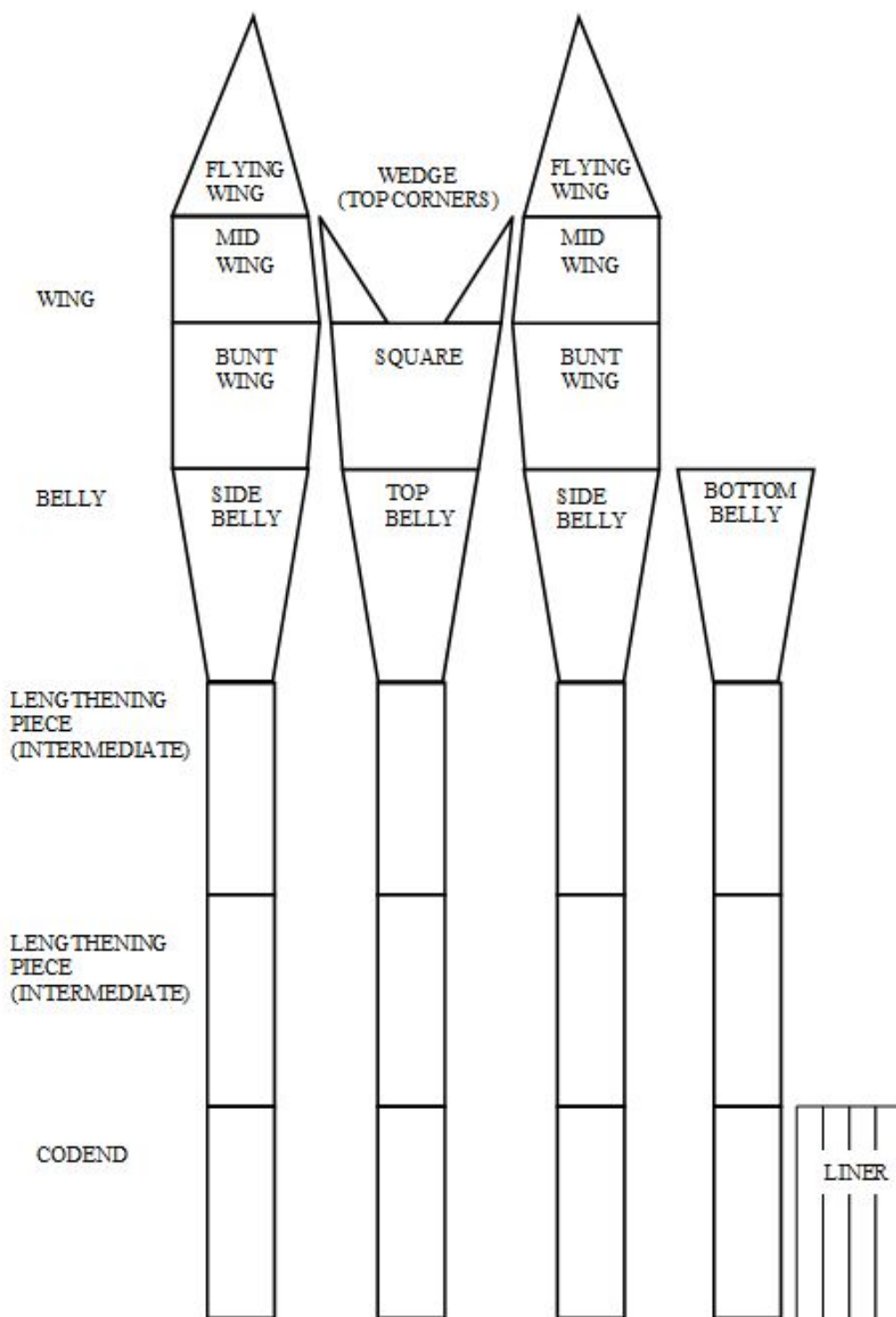


Figure 6. Diagram of the net panels with section names for the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl survey.

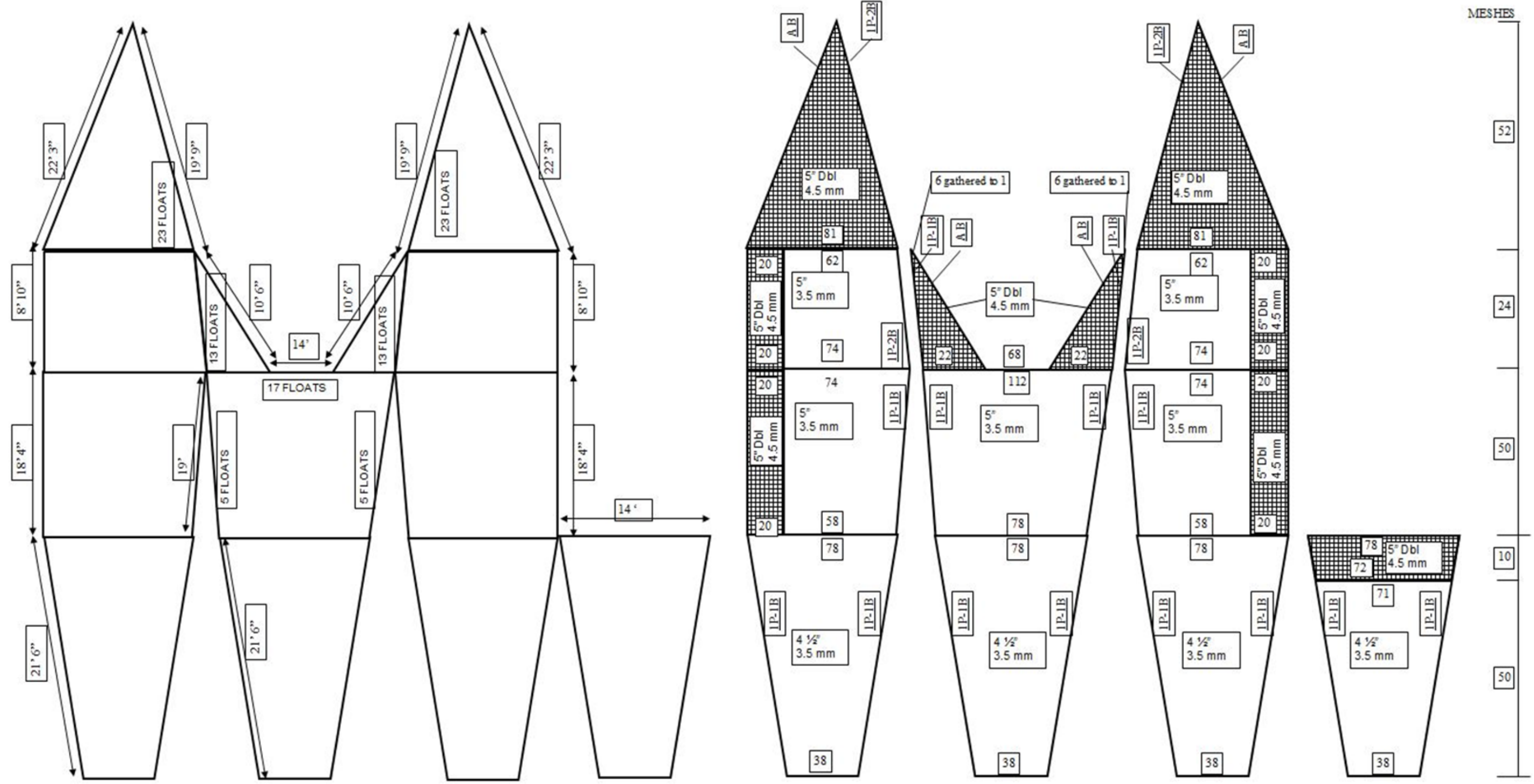


Figure 7. Schematics of the wing and belly sections of the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl survey. Dimensions and the float arrangement are shown on the left while netting details, mesh counts, and mesh cuts are shown on the right side of the diagram.

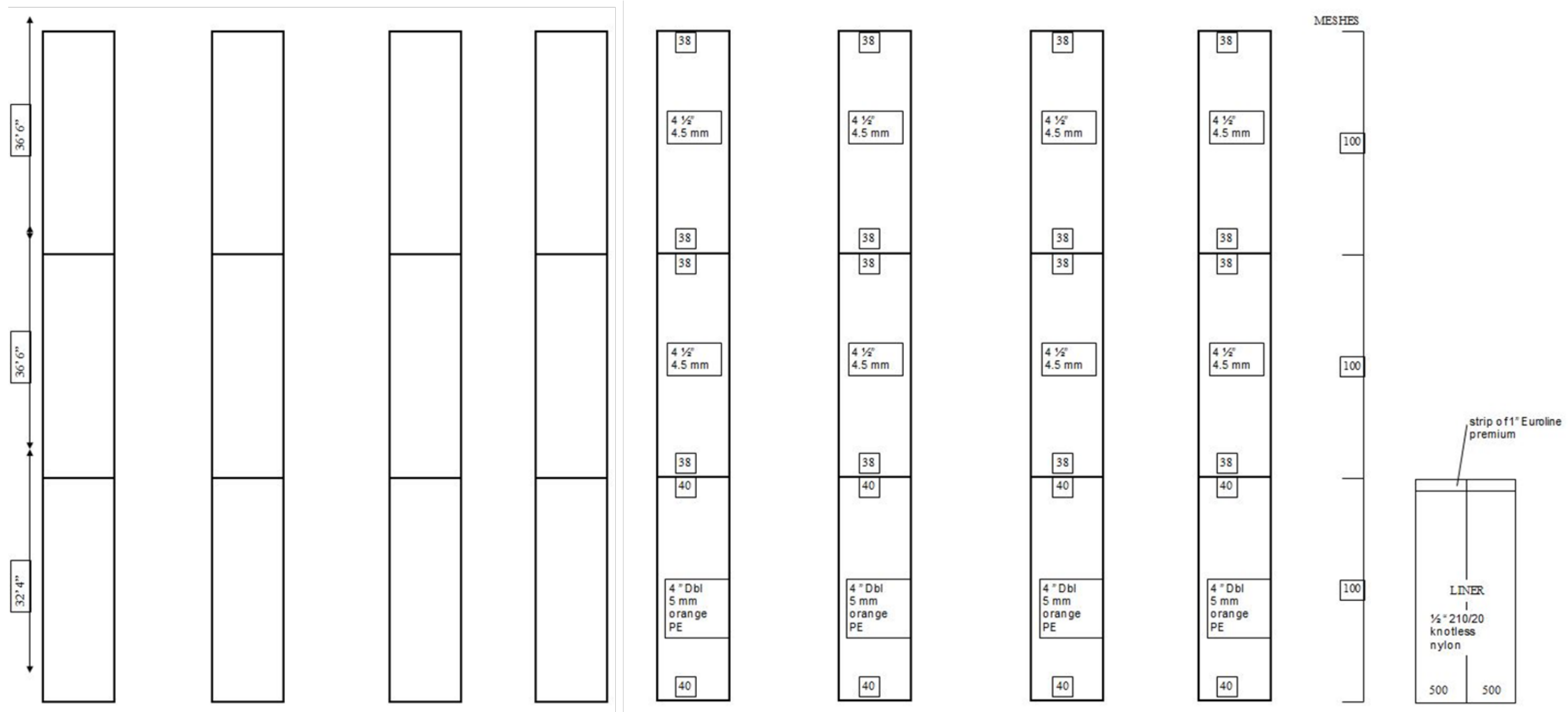


Figure 8. Details of the lengthening (intermediate) pieces and codend sections of the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl survey. Dimensions are shown on the left while netting details, mesh counts, and mesh cuts including the codend liner are shown on the right side of the diagram

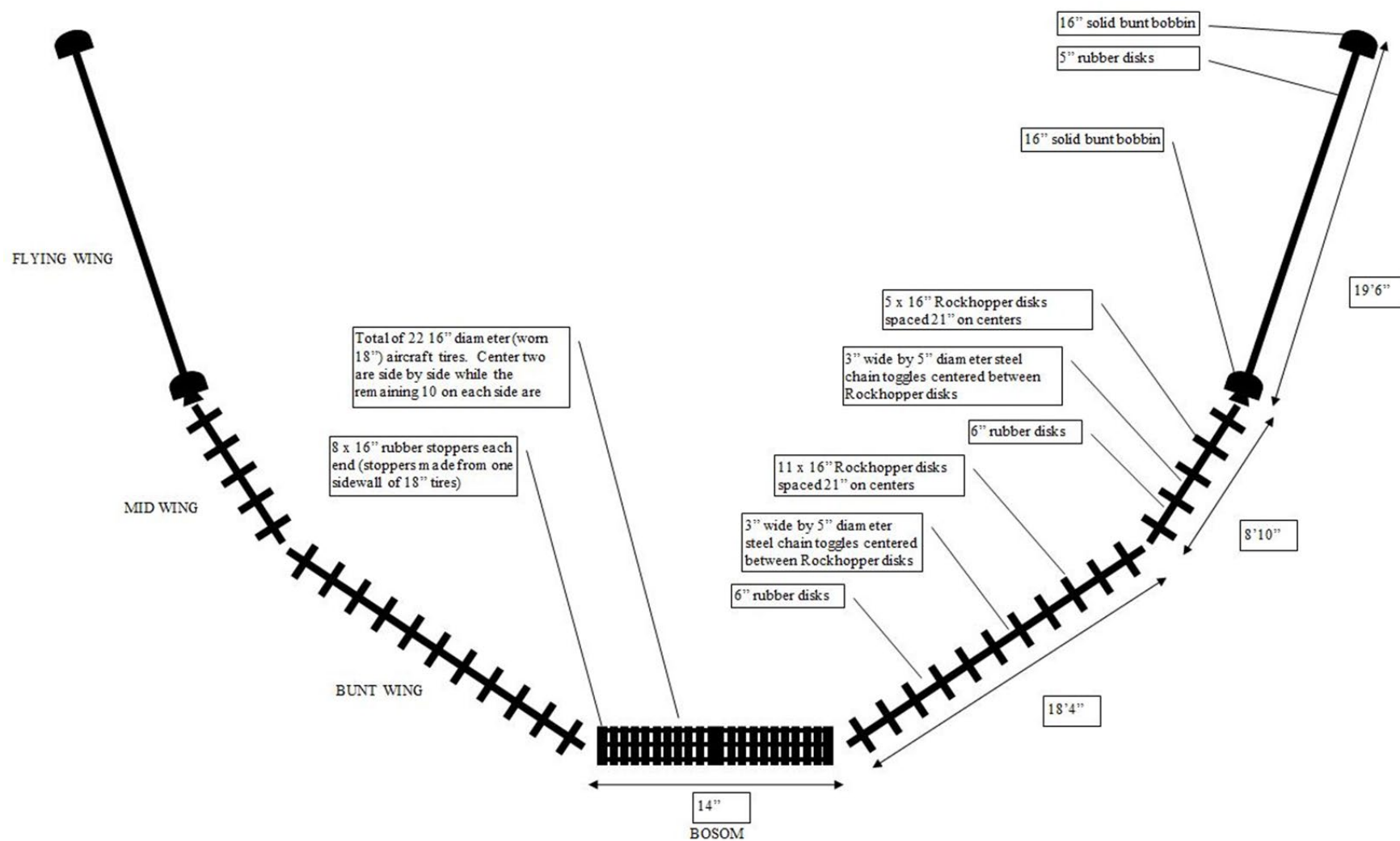


Figure 9. Details of the Rockhopper foot gear for the Atlantic Western Ila box trawl used on the 2017 QCS synoptic bottom trawl.

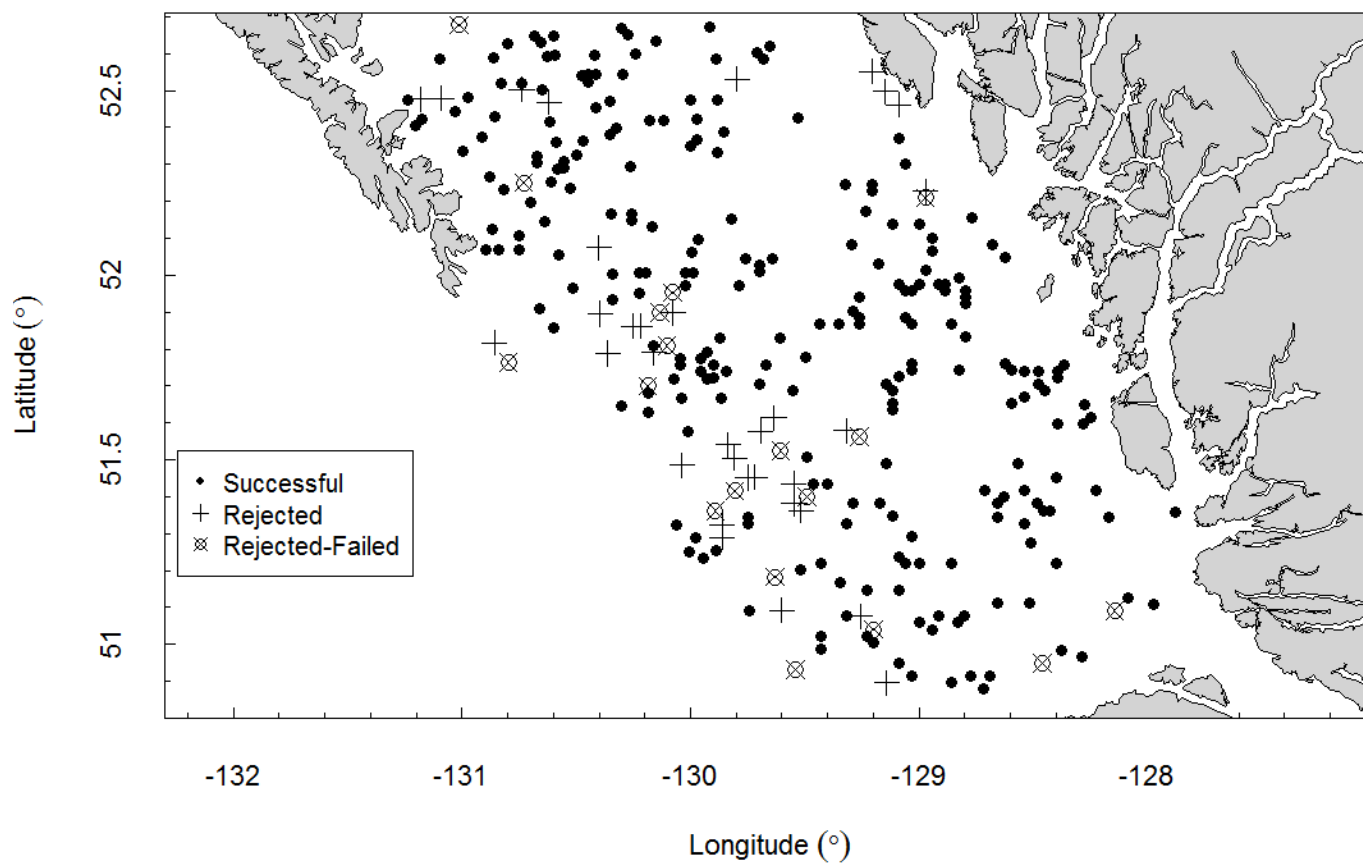


Figure 10. Final status of the 2017 QCS synoptic bottom trawl survey showing 240 successfully fished blocks (Successful), 33 blocks rejected after inspection or based on prior knowledge (Rejected), 18 blocks rejected after one or more failed fishing attempts (Rejected-Failed).

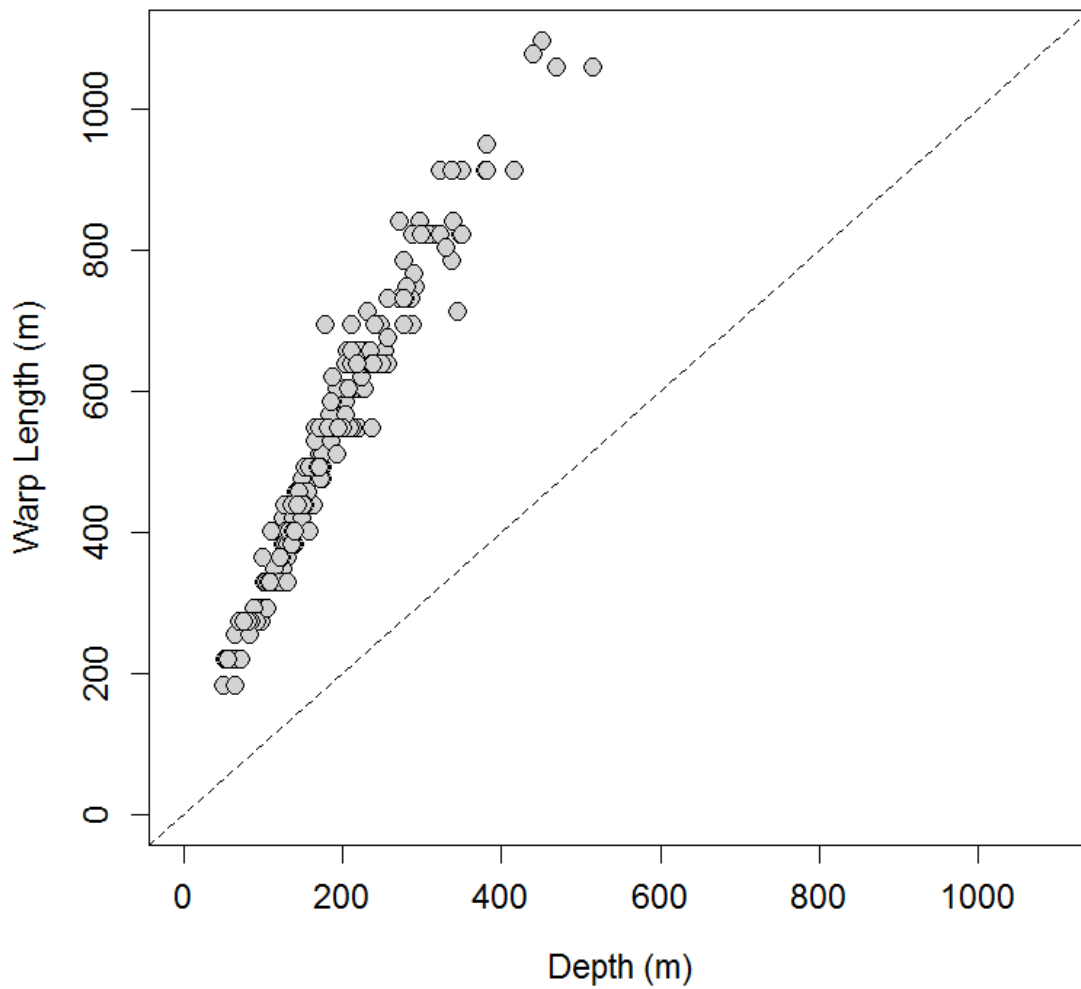


Figure 11. Warp length versus starting depth for each tow during the 2017 QCS synoptic bottom trawl survey

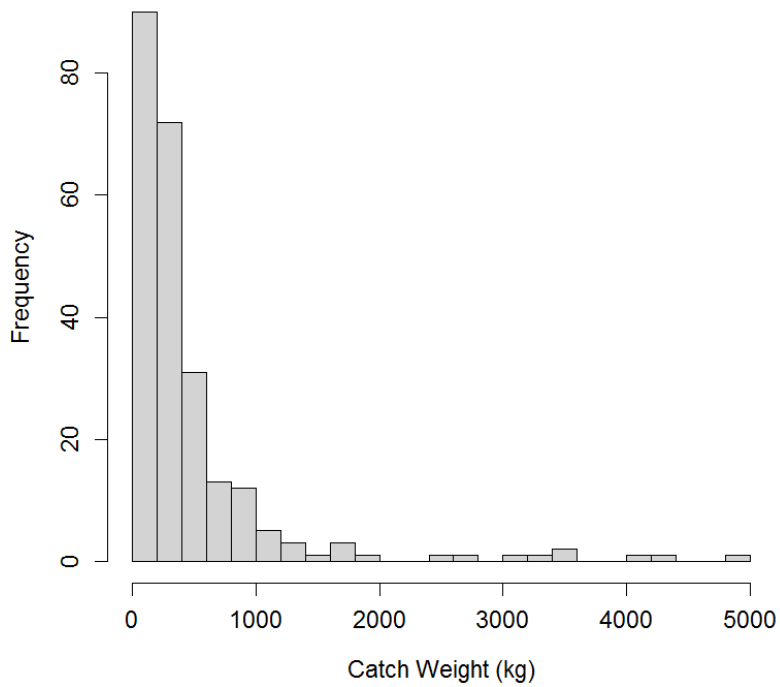


Figure 12. Histogram of catch weight (kg) per useable tow during the 2017 QCS synoptic bottom trawl survey.

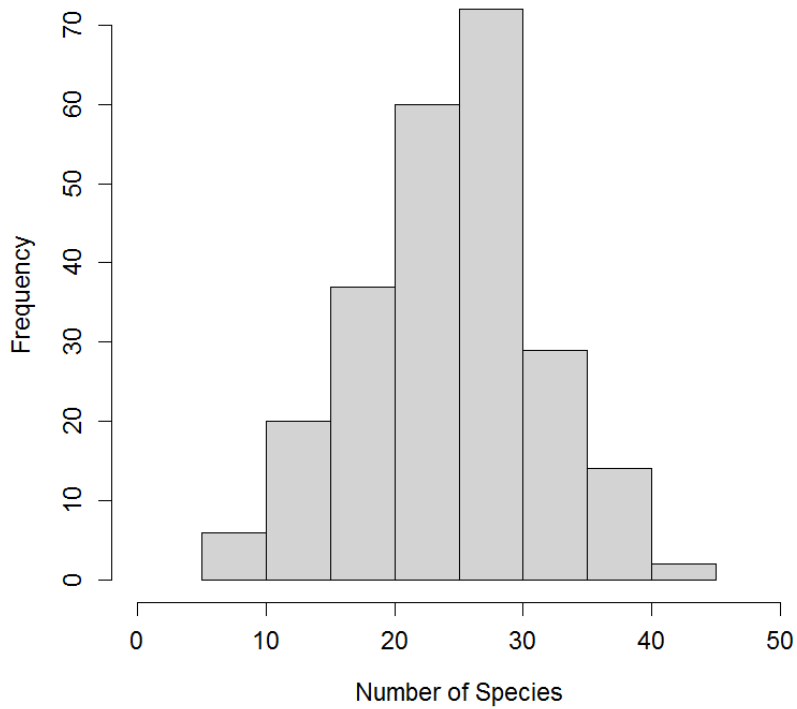


Figure 13. Histogram of the number of species caught per useable tow during the 2017 QCS synoptic bottom trawl survey.

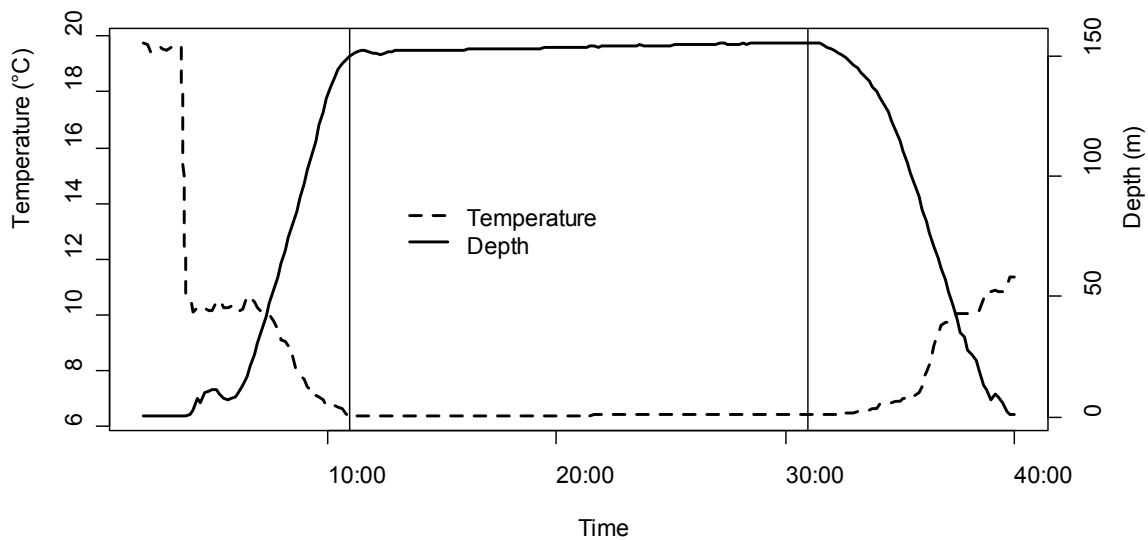


Figure 14. Example of a Seabird 39 temperature and depth profile collected during a synoptic bottom trawl survey. The vertical lines indicate the start and end of net contact with the sea floor.

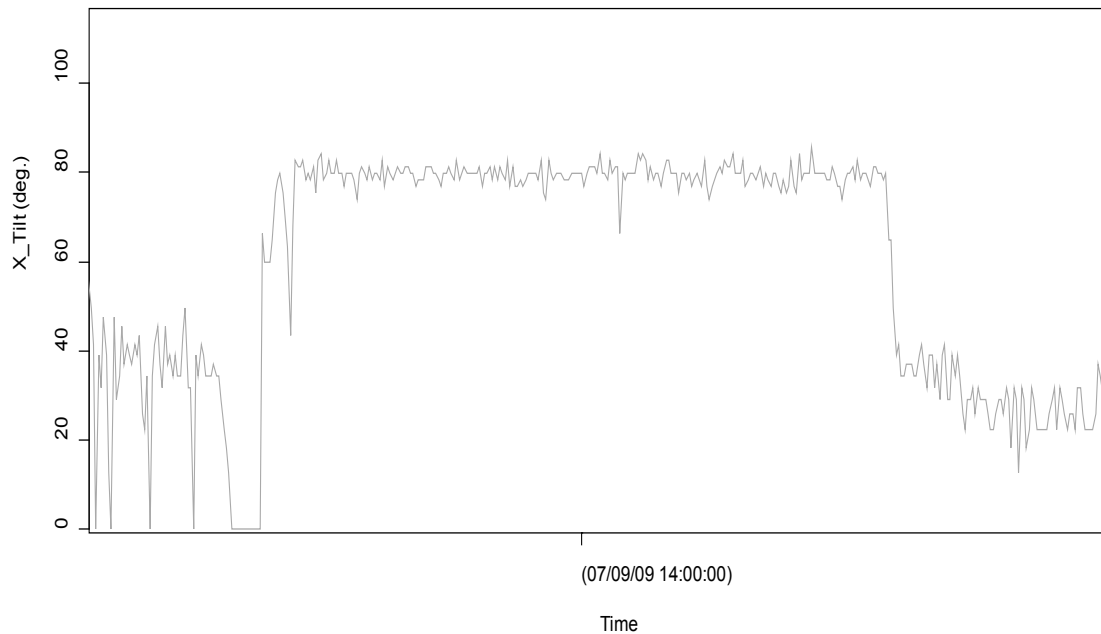


Figure 15. Example of a Mac Marine Industries bottom contact sensor profile collected during a bottom trawl survey. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

APPENDIX A: QCS 2017 SURVEY BRIDGE LOG

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
1	Jul-05	19:30	51.115	127.956	130.5	19	5.6	366	525.1	Yes
2	Jul-05	20:25	51.125	128.066	122.3	19	5.2	366	223.4	Yes
3	Jul-06	06:07	51.368	127.892	124.3	21	5.5	348	392.9	Yes
4	Jul-06	07:57	51.342	128.179	105.3	24	5.4	293	216.8	Yes
5	Jul-06	08:56	51.409	128.211	127.0	21	5.3	439	113.4	Yes
6	Jul-06	10:19	51.446	128.407	173.8	21	5.6	549	426.5	Yes
7	Jul-06	11:39	51.588	128.399	166.1	22	5.0	494	613.5	Yes
8	Jul-06	12:50	51.588	128.277	147.8	22	5.2	476	616.3	Yes
9	Jul-06	13:36	51.602	128.255	135.2	21	5.4	439	583.3	Yes
10	Jul-06	15:00	51.660	128.284	136.3	20	5.0	439	367.1	Yes
11	Jul-06	16:17	51.679	128.443	143.0	21	5.1	439	419.3	Yes
12	Jul-06	17:02	51.697	128.475	143.4	22	5.2	439	339.4	Yes
13	Jul-06	17:47	51.722	128.405	142.6	22	5.7	-	513.4	Yes
14	Jul-06	19:12	51.732	128.409	143.6	21	5.0	439	469.7	Yes
15	Jul-07	06:21	51.644	128.591	65.2	24	4.9	183	19.1	Yes
16	Jul-07	07:08	51.664	128.537	132.0	21	5.6	402	144.6	Yes
17	Jul-07	08:35	51.752	128.353	141.8	23	5.8	457	246.6	Yes
18	Jul-07	09:36	51.753	128.476	142.3	20	5.1	457	980.9	Yes
19	Jul-07	10:30	51.735	128.530	147.1	20	5.5	457	233.1	Yes
20	Jul-07	11:22	51.748	128.591	145.5	20	5.1	457	125.5	Yes
21	Jul-07	12:51	51.749	128.621	96.6	21	5.4	293	15.7	Yes
22	Jul-07	14:28	51.738	128.844	64.7	20	5.3	220	59.9	Yes
23	Jul-07	15:25	51.823	128.794	72.3	20	5.7	220	23.4	Yes
24	Jul-07	16:06	51.857	128.838	56.0	21	5.5	220	57.6	Yes
25	Jul-07	17:00	51.914	128.806	112.8	20	5.1	329	111.9	Yes
26	Jul-07	17:38	51.935	128.796	131.8	22	5.2	384	200.8	Yes
27	Jul-07	18:53	51.956	128.794	152.2	20	5.1	439	879.5	Yes
28	Jul-08	06:15	52.165	128.766	221.2	21	5.8	658	155.4	Yes
29	Jul-08	07:19	52.088	128.685	210.4	21	5.4	658	506.5	Yes
30	Jul-08	08:08	52.053	128.633	160.0	22	5.7	476	1088.0	Yes
31	Jul-08	09:34	51.997	128.813	178.1	21	5.1	549	1001.6	Yes
32	Jul-08	10:21	51.977	128.866	137.1	21	5.3	421	558.7	Yes
33	Jul-08	11:07	51.960	128.898	97.8	22	5.7	274	99.9	Yes
34	Jul-08	12:49	51.976	128.896	120.4	21	5.3	329	112.3	Yes
35	Jul-08	13:33	52.011	128.969	167.5	20	5.4	494	501.8	Yes
36	Jul-08	14:44	52.076	128.933	174.0	21	5.7	494	484.5	Yes
37	Jul-08	15:46	52.102	128.959	184.3	21	5.5	530	124.3	Yes
38	Jul-08	16:38	52.133	128.990	170.0	19	5.7	549	222.1	Yes
39	Jul-08	17:55	52.211	128.967	148.4	5	3.7	439	1.4	No
40	Jul-09	06:18	52.364	129.094	147.2	23	5.7	439	411.2	Yes
41	Jul-09	07:25	52.300	129.065	162.9	20	5.5	439	183.6	Yes
42	Jul-09	08:34	52.247	129.203	164.8	22	5.4	494	126.3	Yes
43	Jul-09	09:20	52.234	129.204	168.2	22	-	494	213.3	Yes
44	Jul-09	10:38	52.254	129.337	133.4	21	5.4	384	907.5	Yes
45	Jul-09	11:48	52.177	129.241	170.6	22	5.7	512	252.4	Yes
46	Jul-09	13:39	52.143	129.102	126.8	21	5.3	384	650.3	Yes
47	Jul-09	14:56	52.091	129.295	169.0	12	4.9	494	103.1	No
48	Jul-09	16:29	52.076	129.284	172.8	20	5.2	494	299.3	Yes
49	Jul-09	17:30	52.033	129.172	169.8	20	5.5	494	157.1	Yes
50	Jul-09	19:00	51.973	129.064	150.0	23	5.8	439	620.9	Yes
51	Jul-09	19:44	51.953	129.068	128.3	22	5.8	384	289.8	Yes
52	Jul-10	06:25	52.431	129.535	136.4	20	5.9	384	298.7	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
53	Jul-10	08:27	52.592	129.678	172.4	21	5.7	549	343.2	Yes
54	Jul-10	09:25	52.632	129.632	164.6	21	5.4	549	1739.2	Yes
55	Jul-10	10:15	52.613	129.701	180.1	22	5.1	549	945.4	Yes
56	Jul-10	11:41	52.668	129.923	256.3	22	6.0	677	119.7	Yes
57	Jul-10	13:09	52.647	130.159	237.5	20	5.0	640	308.4	Yes
58	Jul-10	14:07	52.646	130.263	241.1	23	5.6	640	260.3	Yes
59	Jul-10	14:57	52.675	130.298	235.1	21	5.4	640	599.9	Yes
60	Jul-10	15:57	52.606	130.233	256.2	23	5.4	640	351.7	Yes
61	Jul-10	16:59	52.546	130.309	238.8	20	5.5	640	577.3	Yes
62	Jul-10	19:20	52.549	130.472	181.1	20	5.4	549	1120.6	Yes
63	Jul-11	06:20	52.689	131.006	58.3	7	5.3	183	136.5	No
64	Jul-11	07:45	52.576	131.097	124.5	20	5.6	421	39.1	Yes
65	Jul-11	09:33	52.590	130.840	107.9	20	5.8	329	14.1	Yes
66	Jul-11	10:31	52.636	130.788	110.0	20	5.4	329	34.0	Yes
67	Jul-11	11:28	52.635	130.694	131.1	21	5.8	329	263.1	Yes
68	Jul-11	12:10	52.644	130.657	135.0	22	5.2	384	111.4	Yes
69	Jul-11	13:03	52.657	130.596	151.8	20	5.0	494	327.9	Yes
70	Jul-11	13:52	52.600	130.593	143.9	17	5.1		202.6	Yes
71	Jul-11	14:36	52.600	130.616	142.3	21	5.2	439	202.5	Yes
72										
73	Jul-11	16:03	52.516	130.663	103.4	21	5.4	329	110.0	Yes
74	Jul-11	17:34	52.530	130.718	139.2	24	5.5	402	238.9	Yes
75	Jul-11	19:06	52.529	130.839	131.7	21	5.3	402	112.8	Yes
76	Jul-12	06:20	52.607	130.431	174.8	22	6.3	494	254.0	Yes
77	Jul-12	07:08	52.549	130.451	186.1	19	6.3	549	620.6	Yes
78	Jul-12	08:00	52.541	130.406	193.9	21	5.6	549	386.7	Yes
79	Jul-12	08:48	52.531	130.447	191.5	18	5.8	549	344.5	Yes
80	Jul-12	09:39	52.478	130.355	217.3	20	5.5	640	3500.0	Yes
81	Jul-12	12:32	52.450	130.413	204.2	24	5.3	640	640.8	Yes
82	Jul-12	13:38	52.411	130.310	315.9	22	5.3	823	267.6	Yes
83	Jul-12	14:31	52.386	130.353	299.2	21	5.4	823	194.6	Yes
84	Jul-12	15:26	52.369	130.454	213.4	21	6.1	640	442.0	Yes
85	Jul-12	16:35	52.332	130.482	184.2	21	5.6	567	1339.0	Yes
86	Jul-12	17:22	52.314	130.536	170.0	20	5.6	494	452.3	Yes
87	Jul-12	19:07	52.278	130.586	174.1	20	5.8	476	110.7	Yes
88	Jul-13	06:21	52.587	129.893	247.3	20	5.8	695	1710.0	Yes
89	Jul-13	07:41	52.482	129.883	225.8	25	5.6	658	729.5	Yes
90	Jul-13	08:54	52.480	129.995	249.9	21	5.9	640	153.5	Yes
91	Jul-13	09:40	52.430	129.971	239.8	20	5.6	695	109.6	Yes
92	Jul-13	10:43	52.395	129.863	209.4	20	5.9	604	194.8	Yes
93	Jul-13	11:48	52.326	129.870	177.6	21	5.6	695	86.7	Yes
94	Jul-13	12:42	52.360	129.958	174.3	21	5.7	512	643.1	Yes
95	Jul-13	13:37	52.346	130.011	193.2	20	6.1	512	421.7	Yes
96	Jul-13	14:37	52.425	130.105	289.3	20	5.4	768	331.8	Yes
97	Jul-13	15:27	52.423	130.172	322.1	19	5.9	823	367.1	Yes
98	Jul-13	17:09	52.297	130.256	378.5	21	5.8	914	144.5	Yes
99	Jul-13	18:45	52.168	130.336	380.6	22	5.2	951	222.2	Yes
100	Jul-14	06:31	51.961	129.780	120.2	21	5.3	366	66.2	Yes
101	Jul-14	07:25	52.003	129.712	146.7	20	5.2	439	22.9	Yes
102	Jul-14	08:10	52.036	129.701	154.7	20	5.3	439	64.4	Yes
103	Jul-14	08:58	52.037	129.647	203.5	21	5.8	585	374.5	Yes
104	Jul-14	10:05	52.037	129.757	108.1	20	5.8	329	126.4	Yes
105	Jul-14	11:24	52.159	129.807	198.6	21	5.0	549	225.3	Yes
106	Jul-14	12:36	52.107	129.954	149.8	23	5.2	439	92.3	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
107	Jul-14	13:16	52.075	129.986	135.2	22	5.2	-	77.9	Yes
108	Jul-14	14:03	52.018	130.028	140.0	22	5.4	384	32.3	Yes
109	Jul-14	15:04	52.015	129.980	133.0	21	5.7	402	7.1	Yes
110	Jul-14	15:50	51.985	130.011	137.7	18	5.8	402	53.5	Yes
111	Jul-14	16:33	51.958	130.064	142.7	18	5.3	366	38.3	No
112	Jul-14	18:32	51.908	130.145	175.8	14	4.9	476	209.0	No
113	Jul-15	06:31	51.839	129.848	180.7	23	4.8	549	149.7	Yes
114	Jul-15	07:27	51.765	129.886	322.7	24	5.5	914	386.5	Yes
115	Jul-15	08:29	51.738	129.843	338.0	21	5.1	914	255.9	Yes
116	Jul-15	09:41	51.699	129.708	272.0	21	5.5	732	257.5	Yes
117	Jul-15	10:33	51.748	129.681	279.0	20	5.7	732	224.1	Yes
118	Jul-15	11:42	51.830	129.609	277.1	20	5.5	732	559.1	Yes
119	Jul-15	13:28	51.869	129.446	235.5	21	5.4	640	213.2	Yes
120	Jul-15	16:46	51.861	129.355	205.2	21	6.0	658	1737.6	Yes
121	Jul-15	17:38	51.898	129.299	203.2	21	5.9	-	460.5	Yes
122	Jul-15	19:09	51.872	129.245	129.5	20	5.4	384	361.2	Yes
123	Jul-16	06:31	51.884	129.277	158.3	21	5.4	402	432.9	Yes
124	Jul-16	07:23	51.933	129.268	188.9	21	5.8	549	191.9	Yes
125	Jul-16	08:35	51.955	129.046	124.6	20	5.7	384	3500.0	Yes
126	Jul-16	09:56	51.966	129.012	113.7	21	6.1	348	700.7	Yes
127	Jul-16	10:58	51.896	129.040	108.3	19	6.0	329	226.4	Yes
128	Jul-16	11:36	51.873	129.030	105.9	21	6.1	329	146.7	Yes
129	Jul-16	12:55	51.769	129.026	92.5	20	5.1	293	22.3	Yes
130	Jul-16	13:34	51.750	129.028	91.3	21	5.1	293	28.1	Yes
131	Jul-16	14:14	51.723	129.072	88.8	18	5.9	293	9.9	Yes
132	Jul-16	14:57	51.709	129.134	81.3	20	5.5	274	38.5	Yes
133	Jul-16	15:36	51.690	129.139	51.4	21	5.1	220	19.7	Yes
134	Jul-16	16:12	51.663	129.112	52.9	21	5.6	220	28.5	Yes
135	Jul-16	16:50	51.646	129.107	51.0	20	5.9	220	37.3	Yes
136	Jul-16	18:12	51.553	129.277	52.0	10	5.4	220	18.8	No
137	Jul-17	06:24	51.486	128.554	193.4	21	5.4	549	886.3	Yes
138	Jul-17	07:33	51.421	128.532	200.6	21	5.7	549	432.8	Yes
139	Jul-17	08:39	51.390	128.478	158.6	23	5.3	494	1082.3	Yes
140	Jul-17	09:29	51.363	128.472	151.7	22	5.9	494	374.9	Yes
141	Jul-17	10:17	51.359	128.413	148.2	21	5.7	439	167.2	Yes
142	Jul-17	11:47	51.224	128.406	165.4	20	5.1	494	296.6	Yes
143	Jul-17	13:34	51.087	128.161	154.2	15	5.2	494	230.4	No
144	Jul-17	14:10	51.084	128.142	151.0	1	1.4	494	11.7	No
145	Jul-18	17:51	50.972	128.276	79.3	21	5.6	274	39.1	Yes
146	Jul-18	19:07	50.990	128.396	79.6	21	6.0	274	147.4	Yes
147	Jul-19	06:21	51.263	128.493	149.4	20	5.9	439	123.9	Yes
148	Jul-19	07:28	51.334	128.529	143.8	21	5.4	439	272.2	Yes
149	Jul-19	08:23	51.344	128.646	202.3	22	5.5	549	332.4	Yes
150	Jul-19	09:10	51.380	128.657	213.3	22	5.0	549	261.4	Yes
151	Jul-19	09:56	51.394	128.618	209.2	21	5.0	549	549.4	Yes
152	Jul-19	10:44	51.414	128.686	213.7	21	5.9	640	257.7	Yes
153	Jul-19	12:37	51.297	129.019	240.1	21	5.5	640	397.5	Yes
154	Jul-19	13:49	51.344	129.114	236.3	22	5.0	640	383.5	Yes
155	Jul-19	14:49	51.377	129.165	188.7	21	5.7	567	806.1	Yes
156	Jul-19	15:53	51.390	129.301	119.7	21	6.1	348	174.3	Yes
157	Jul-19	16:39	51.335	129.301	211.1	22	5.9	640	191.5	Yes
158	Jul-19	17:59	51.430	129.392	115.6	21	6.4	329	100.7	Yes
159	Jul-19	19:30	51.489	129.165	49.2	21	6.2	183	77.8	Yes
160	Jul-20	07:00	51.682	129.561	109.8	22	6.3	329	79.0	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
161	Jul-20	08:14	51.780	129.485	195.2	20	6.4	549	1400.1	Yes
162	Jul-20	10:10	51.669	129.859	319.6	23	5.2	823	299.3	Yes
163	Jul-20	11:08	51.719	129.901	348.0	21	6.0	823	575.2	Yes
164	Jul-20	12:36	51.716	129.929	349.9	21	5.5	823	601.3	Yes
165	Jul-20	13:29	51.733	129.944	336.8	21	6.5	786	450.5	Yes
166	Jul-20	14:27	51.766	129.971	276.1	21	5.9	786	312.5	Yes
167	Jul-20	15:24	51.796	129.922	234.0	22	6.2	658	3266.4	Yes
168	Jul-20	16:26	51.761	130.028	220.6	21	5.9	658	4952.7	Yes
169	Jul-20	19:20	51.928	130.345	291.0	22	5.9	750	317.7	Yes
170	Jul-21	06:25	52.332	130.973	132.7	20	6.2	439	144.2	Yes
171	Jul-21	07:19	52.367	130.925	128.3	21	5.8	439	109.3	Yes
172	Jul-21	08:12	52.422	130.855	110.9	22	5.9	402	169.1	Yes
173	Jul-21	09:53	52.436	131.016	103.8	21	5.8	329	41.0	Yes
174	Jul-21	10:47	52.491	130.965	141.0	21	5.5	439	76.9	Yes
175	Jul-21	12:56	52.482	131.256	82.4	21	5.6	274	355.3	Yes
176	Jul-21	15:13	52.393	131.216	77.5	21	5.0	274	79.4	Yes
177	Jul-21	15:50	52.415	131.187	76.1	21	5.3	274	415.0	Yes
178	Jul-22	07:47	52.402	130.618	137.3	21	5.5	384	60.1	Yes
179	Jul-22	08:51	52.354	130.601	151.5	21	6.5	439	148.5	Yes
180	Jul-22	09:46	52.332	130.661	147.0	21	5.0	439	27.2	Yes
181	Jul-22	10:28	52.316	130.675	152.6	22	5.4	439	352.3	Yes
182	Jul-22	11:35	52.301	130.557	171.9	20	5.4	476	208.0	Yes
183	Jul-22	12:23	52.251	130.516	192.1	22	5.0	549	392.4	Yes
184	Jul-22	13:15	52.254	130.591	179.3	22	5.5	549	244.9	Yes
185	Jul-22	14:10	52.256	130.710	175.7	8	4.9	549	-	No
186	Jul-22	15:58	52.262	130.886	184.8	22	5.3	585	933.2	Yes
187	Jul-22	16:56	52.235	130.829	186.8	21	5.7	585	297.2	Yes
188	Jul-22	18:09	52.198	130.710	187.6	22	5.1	549	199.0	Yes
189	Jul-22	19:29	52.141	130.648	199.2	21	5.2	604	265.7	Yes
190	Jul-23	06:21	52.124	130.866	226.7	22	5.4	604	443.5	Yes
191	Jul-23	07:14	52.072	130.885	201.0	3	3.0	549	35.0	No
192	Jul-23	08:00	52.060	130.880	222.8	20	5.4	622	151.1	Yes
193	Jul-23	09:11	52.081	130.824	236.6	21	5.1	640	300.1	Yes
194	Jul-23	10:19	52.064	130.750	287.3	23	5.5	823	252.5	Yes
195	Jul-23	11:31	52.119	130.773	231.0	21	5.0	658	285.7	Yes
196	Jul-23	13:08	52.065	130.579	253.4	20	5.5	658	495.6	Yes
197	Jul-23	15:01	52.139	130.262	451.5	22	5.4	1097	252.6	Yes
198	Jul-23	16:01	52.160	130.253	439.8	22	5.1	1079	200.1	Yes
199	Jul-23	17:12	52.138	130.169	281.0	22	5.3	750	241.9	Yes
200	Jul-23	18:35	52.015	130.186	213.9	21	5.1	604	106.4	Yes
201	Jul-23	19:24	52.000	130.224	257.3	21	5.1	732	146.9	Yes
202	Jul-24	06:29	51.152	129.094	139.0	21	5.1	439	166.8	Yes
203	Jul-24	07:31	51.073	129.009	101.0	20	4.8	329	49.6	Yes
204	Jul-24	08:28	51.031	128.944	82.0	20	5.4	274	41.5	Yes
205	Jul-24	09:11	51.065	128.920	84.0	18	6.0	274	66.2	Yes
206	Jul-24	09:54	51.065	128.840	58.0	19	5.3	220	17.5	Yes
207	Jul-24	10:43	51.083	128.814	64.0	21	5.6	256	57.5	Yes
208	Jul-24	11:41	51.121	128.674	99.0	20	5.3	366	64.9	Yes
209	Jul-24	12:46	51.122	128.526	148.0	21	5.3	421	818.3	Yes
210	Jul-25	06:18	50.960	128.437	67.4	3	3.6	293	-	No
211	Jul-25	07:42	50.903	128.696	83.7	21	5.2	274	126.2	Yes
212	Jul-25	08:34	50.874	128.729	84.2	22	5.4	274	140.8	Yes
213	Jul-25	09:42	50.908	128.794	69.8	22	5.9	274	80.0	Yes
214	Jul-25	10:45	50.894	128.873	82.4	21	5.9	256	61.2	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
215	Jul-25	12:22	50.923	129.004	60.6	22	5.9	220	29.7	Yes
216	Jul-25	13:50	50.939	129.083	86.9	21	5.2	274	38.9	Yes
217	Jul-25	14:55	50.992	129.211	145.5	21	5.6	439	97.8	Yes
218	Jul-25	15:37	51.016	129.234	155.9	22	5.5	457	319.4	Yes
219	Jul-25	16:25	51.047	129.203	152.5	3	4.7	457	-	No
220	Jul-25	18:24	51.083	129.308	194.6	8	5.4	549	160.4	No
221	Jul-25	18:57	51.077	129.319	196.3	18	5.5	549	358.4	Yes
222	Jul-26	06:32	51.760	130.779	254.9	17	5.6	658	1809.1	No
223	Jul-26	08:27	51.854	130.589	286.6	20	5.2	732	600.6	Yes
224	Jul-26	09:30	51.913	130.662	333.5	12	5.1	841	513.7	No
225	Jul-26	10:15	51.908	130.662	329.2	21	5.3	805	530.0	Yes
226	Jul-26	11:20	51.958	130.526	415.2	21	6.0	914	295.2	Yes
227	Jul-26	12:51	52.010	130.356	382.0	22	5.3	914	186.9	Yes
228	Jul-26	14:06	51.962	130.221	186.8	21	5.8	622	156.6	Yes
229	Jul-26	17:45	51.798	130.135	203.3	21	5.3	567	619.6	Yes
230	Jul-26	18:37	51.793	130.114	201.5	21	5.4	549	338.7	No
231	Jul-27	06:20	51.632	130.164	498.9	6	4.7	1061	39.8	No
232	Jul-27	07:08	51.632	130.162	514.2	21	5.1	1061	157.4	Yes
233	Jul-27	08:24	51.657	130.290	276.6	22	5.2	732	1871.2	Yes
234	Jul-27	09:56	51.691	130.174	280.6	22	5.2	732	987.3	Yes
235	Jul-27	11:01	51.714	130.172	225.0	8	4.7	658	416.8	No
236	Jul-27	11:49	51.711	130.087	307.4	23	5.6	823	412.5	Yes
237	Jul-27	13:07	51.764	130.038	211.2	24	5.5	695	4108.0	Yes
238	Jul-27	14:30	51.669	130.049	350.6	24	5.1	914	351.2	Yes
239	Jul-27	16:20	51.585	129.991	236.8	21	5.6	549	1329.3	Yes
240	Jul-27	19:30	51.404	129.805	201.7	2	4.5	585	38.5	No
241	Jul-28	06:23	51.537	129.620	130.5	4	4.5	384	-	No
242	Jul-28	07:04	51.518	129.513	87.4	4	5.7	274	19.6	No
243	Jul-28	07:45	51.495	129.474	92.0	17	6.0	274	45.5	Yes
244	Jul-28	08:49	51.428	129.450	128.1	22	6.0	402	55.3	Yes
245	Jul-28	10:17	51.394	129.487	148.2	14	5.4	457	20.3	No
246	Jul-28	13:53	51.332	129.726	219.3	21	5.8	549	648.5	Yes
247	Jul-28	14:43	51.335	129.754	230.1	22	5.0	713	914.0	Yes
248	Jul-28	15:51	51.371	129.879	233.9	2	4.6	658	119.0	No
249	Jul-28	17:22	51.246	129.879	272.0	23	5.7	841	3015.5	Yes
250	Jul-28	18:26	51.244	129.958	297.7	26	5.6	841	2641.0	Yes
251	Jul-29	06:22	51.335	130.056	338.6	21	5.8	841	412.5	Yes
252	Jul-29	07:19	51.294	129.989	275.6	19	5.2	732	1369.8	Yes
253	Jul-29	08:16	51.253	129.999	343.9	21	5.7	713	1146.4	Yes
254	Jul-29	10:23	51.100	129.729	469.2	22	5.4	1061	273.8	Yes
255	Jul-29	12:39	51.178	129.630	262.0	5	4.8	695	236.8	No
256	Jul-29	13:17	51.190	129.632	261.7	7	5.0	677	574.1	No
257	Jul-29	14:17	51.198	129.529	281.5	22	5.4	-	206.6	Yes
258	Jul-29	14:54	51.214	129.445	288.5	22	5.3	695	210.3	Yes
259	Jul-29	15:55	51.177	129.357	290.4	15	5.3	695	274.8	No
260	Jul-29	16:50	51.161	129.328	277.5	21	4.8	695	978.9	Yes
261	Jul-29	19:02	50.979	129.439	207.4	23	5.8	604	861.3	Yes
262	Jul-29	19:49	51.018	129.439	221.2	21	5.3	604	423.4	Yes
263	Jul-30	06:23	50.933	129.538	225.6	11	5.5	604	334.1	No
264	Jul-30	07:09	50.927	129.538	224.8	15	5.3	604	439.1	No
265	Jul-30	10:00	51.139	129.238	193.4	25	5.4	604	2537.4	Yes
266	Jul-30	11:13	51.226	129.105	228.5	21	5.2	640	385.9	Yes
267	Jul-30	12:01	51.223	129.071	213.9	21	5.5	640	485.9	Yes
268	Jul-30	12:48	51.220	129.020	174.2	20	6.2	530	294.4	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
269	Jul-30	14:16	51.228	128.836	164.7	23	5.7	530	4200.0	Yes

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

Common Name	Scientific Name	Total	1	2	3	4	5	6	7
Arrowtooth Flounder	<i>Atheresthes stomias</i>	16606.8	155.8	62.4	149.0	22.1	4.4	211.2	343.9
Aurora Rockfish	<i>Sebastes aurora</i>	10.4							
Big Skate	<i>Beringraja binoculata</i>	93.4							
Bigfin Eelpout	<i>Lycodes cortezianus</i>	15.7						0.2	
Bigmouth Sculpin	<i>Hemitripterus bolini</i>	39.5							
Blackbelly Eelpout	<i>Lycodes pacificus</i>	256.7	5.8	1.4	0.3	-	7.9	1.4	2.5
Bocaccio	<i>Sebastes paucispinis</i>	126.0	0.3				0.6	1.1	
Canary Rockfish	<i>Sebastes pinniger</i>	844.5							
Curlfin Sole	<i>Pleuronichthys decurrens</i>	33.9							
Darkblotched Rockfish	<i>Sebastes crameri</i>	373.9							
Dover Sole	<i>Microstomus pacificus</i>	2745.9	32.9	19.6	34.6	5.5	10.4	58.5	48.0
English Sole	<i>Parophrys vetulus</i>	1248.1	0.7			56.4	7.6		1.3
Eulachon	<i>Thaleichthys pacificus</i>	52.7	0.6	0.2	10.7	2.6	0.9		0.1
Flathead Sole	<i>Hippoglossoides elassodon</i>	1763.2	11.1	13.9	77.5	11.3	17.2	16.6	35.6
Greenstriped Rockfish	<i>Sebastes elongatus</i>	247.2		1.3	1.1	0.2	0.4	0.1	
Harlequin Rockfish	<i>Sebastes variegatus</i>	90.3							
Lingcod	<i>Ophiodon elongatus</i>	794.6				3.9			
Longnose Skate	<i>Raja rhina</i>	601.7			4.8			-	23.4
Longspine Thornyhead	<i>Sebastolobus altivelis</i>	47.2							
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	1849.6	5.4			2.2		0.3	
Pacific Cod	<i>Gadus macrocephalus</i>	743.1	0.8	4.9		2.7			
Pacific Hake	<i>Merluccius productus</i>	4614.7	0.6	0.4	1.5	0.8	4.7	16.4	12.4
Pacific Halibut	<i>Hippoglossus stenolepis</i>	738.0				15.2			
Pacific Ocean Perch	<i>Sebastes alutus</i>	24682.0	0.2		-	0.1		-	18.6
Pacific Sanddab	<i>Citharichthys sordidus</i>	173.1				15.6	0.3		0.1
Petrale Sole	<i>Eopsetta jordani</i>	657.4			2.9	1.4	1.6		1.4
Pygmy Rockfish	<i>Sebastes wilsoni</i>	30.3		0.3	0.1		0.1		
Quillback Rockfish	<i>Sebastes maliger</i>	169.6					0.2		
Redbanded Rockfish	<i>Sebastes babcocki</i>	1551.4					0.4	11.5	3.7
Redstripe Rockfish	<i>Sebastes proriger</i>	1449.1	24.2	7.8	7.1	1.4	2.7	1.3	
Rex Sole	<i>Glyptocephalus zachirus</i>	3042.0	48.2	51.4	13.1	18.4	24.4	34.3	23.6
Rockfishes	<i>Sebastes</i>	7.4							
Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	195.4							
Rougheye/Blackspotted Rockfish Complex	<i>Sebastes aleutianus/melanostictus</i> complex	728.5						0.6	0.8
Sablefish	<i>Anoplopoma fimbria</i>	7020.0	33.5	1.7	43.1	16.9	2.7	27.4	2.4
Sandpaper Skate	<i>Bathyraja interrupta</i>	46.8							0.3
Sharpchin Rockfish	<i>Sebastes zacentrus</i>	1567.1	1.5	1.6	1.7	0.5			0.1
Shortraker Rockfish	<i>Sebastes borealis</i>	67.2							
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	1853.6						1.4	25.4
Silvergray Rockfish	<i>Sebastes brevispinis</i>	9633.7						1.7	0.9
Slender Sole	<i>Lyopsetta exilis</i>	147.2	8.7	1.4	4.2	0.5	1.1	0.9	4.3
Southern Rock Sole	<i>Lepidopsetta bilineata</i>	399.4				1.6			
Splitnose Rockfish	<i>Sebastes diploproa</i>	6194.2							
Spotted Ratfish	<i>Hydrolagus colliei</i>	2439.7	28.0	13.3	14.7	32.2	7.0	23.2	14.3
Walleye Pollock	<i>Gadus chalcogrammus</i>	2204.2	159.0	21.3	14.1	3.9	1.1	7.1	33.1
Widow Rockfish	<i>Sebastes entomelas</i>	131.9							2.0
Wolf Eel	<i>Anarrhichthys ocellatus</i>	10.4							
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	169.2	0.6				0.2		4.4
Yellowmouth Rockfish	<i>Sebastes reedi</i>	10067.0						1.1	
Yellowtail Rockfish	<i>Sebastes flavidus</i>	1513.2		15.9	8.1		4.7	2.7	
Other		2346.5	7.1	4.6	4.3	1.4	12.6	7.5	10.8
Total		119373.9	525.1	223.4	392.9	216.8	113.4	426.5	613.5

Common Name	8	9	10	11	12	13	14	15	16	17	18	19
Arrowtooth Flounder	260.2	129.9	96.6	191.1	166.4	220.3	178.3		39.6	52.0	143.7	113.9
Aurora Rockfish												
Big Skate												
Bigfin Eelpout												
Bigmouth Sculpin												
Blackbelly Eelpout	19.8	9.5	0.5	0.6	0.3	48.6	44.4			59.5	25.0	0.2
Bocaccio				0.6	0.8			-	0.5	0.4	0.6	
Canary Rockfish			2.0									
Curlfin Sole								2.3				
Darkblotched Rockfish	0.6					0.1				0.1		
Dover Sole	111.9	49.6	68.2	21.3	28.9	59.6	67.3		2.8	22.8	150.1	22.5
English Sole			4.5	0.6	0.7	0.1	-	1.2	50.5	2.4	0.3	8.5
Eulachon	0.4	0.4	0.1	0.5	0.3	2.6	3.3		2.8	6.5	1.5	
Flathead Sole	26.3	33.8	34.3	41.0	39.2	30.9	32.5		3.5	18.7	194.5	22.5
Greenstriped Rockfish			0.4	0.3								
Harlequin Rockfish												
Lingcod				0.5								
Longnose Skate	12.0	2.6		2.3	3.4	11.5	13.1			0.7	11.4	3.3
Longspine Thornyhead												
North Pacific Spiny Dogfish	0.5	2.1	0.4		0.3				1.0	1.4		
Pacific Cod		2.1			3.6							
Pacific Hake	89.0	271.8	116.2	93.7	45.7	98.5	78.8		0.5	50.1	416.1	26.9
Pacific Halibut				6.9					3.3			
Pacific Ocean Perch	5.6	0.6	0.1		0.1	1.1					0.2	
Pacific Sanddab				0.1				5.5	0.5			0.2
Petrale Sole								0.1	2.3			
Pygmy Rockfish												
Quillback Rockfish			1.8	0.8								
Redbanded Rockfish											1.0	
Redstripe Rockfish	0.6	6.9	11.5	5.4							-	
Rex Sole	33.0	8.4	13.4	9.7	15.0	2.4	2.1		18.2	2.1	2.7	10.7
Rockfishes											-	
Rosethorn Rockfish												
Rougheye/Blackspotted Rockfish Complex						0.2	1.8			0.4	0.5	
Sablefish	2.8	2.3	2.3	8.3	3.9	1.6	1.5		1.1		4.1	7.1
Sandpaper Skate												
Sharpchin Rockfish				0.3								
Shortraker Rockfish												
Shortspine Thornyhead	8.9											
Silvergray Rockfish			4.8	3.7	4.0				1.5			
Slender Sole	1.9	1.1	1.1	2.2	2.3	2.0	3.8		0.4	3.3	5.1	1.0
Southern Rock Sole								3.3				
Splitnose Rockfish												
Spotted Ratfish	13.3	5.6	5.2	8.1	10.5	8.9	17.7	1.4	9.1	18.5	6.8	8.5
Walleye Pollock	22.1	55.3	2.4	17.8	10.6	22.2	18.4		3.8	5.3	13.8	5.7
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish	1.7			2.1	1.9							1.7
Other	5.9	1.3	1.2	1.5	1.4	2.9	6.7	5.3	3.1	2.3	3.4	0.4
Total	616.3	583.3	367.1	419.3	339.4	513.4	469.7	19.1	144.6	246.6	980.9	233.1

Common Name	20	21	22	23	24	25	26	27	28	29	30	31
Arrowtooth Flounder	19.6					16.9	58.9	121.1	74.2	209.2	779.1	236.5
Aurora Rockfish												
Big Skate	1.7					31.3						
Bigfin Eelpout										2.1	0.3	
Bigmouth Sculpin												
Blackbelly Eelpout									0.5	0.4	3.9	0.2
Bocaccio								2.4				0.3
Canary Rockfish			6.3	2.8	1.0						5.5	
Curlfin Sole		0.4	1.1	0.9								
Darkblotched Rockfish										0.8		0.5
Dover Sole	3.8					2.4	1.0	0.7	1.6	42.8	23.6	18.9
English Sole	22.1			0.1		4.9	10.4	25.8			4.2	8.0
Eulachon	2.3								0.7			
Flathead Sole	1.8						0.6	1.9	16.3	26.0	98.9	39.9
Greenstriped Rockfish							0.1				0.6	
Harlequin Rockfish												
Lingcod	0.5		3.6	0.6			2.5				4.4	
Longnose Skate									10.0	19.6	20.6	13.7
Longspine Thornyhead												
North Pacific Spiny Dogfish	3.0		1.7		2.3	1.1	4.8	9.6	2.4	4.6	0.1	13.7
Pacific Cod	3.2					21.5	44.6				8.2	
Pacific Hake								2.4	2.7	6.7	5.7	6.2
Pacific Halibut	3.8	6.9		8.8	4.7	5.3	3.8					12.8
Pacific Ocean Perch									0.2	3.5	8.1	0.9
Pacific Sanddab	16.7	1.3	1.4	3.5	1.2	10.3	2.3					
Petrale Sole	1.6	0.3			1.3	6.5	10.2	3.1				3.0
Pygmy Rockfish												
Quillback Rockfish			12.8	0.9	0.9							
Redbanded Rockfish										33.9	3.7	2.9
Redstripe Rockfish					6.0	0.7			0.6		38.8	
Rex Sole	25.6					0.7	8.6	16.0	5.6	1.3	13.5	17.9
Rockfishes	-											
Rosethorn Rockfish										-		
Rougheye/Blackspotted Rockfish Complex									1.4	3.6	1.5	1.3
Sablefish	4.6	0.3						4.9	8.2	18.1	23.9	40.3
Sandpaper Skate									1.7	1.1		
Sharpchin Rockfish										1.6		
Shortraker Rockfish												
Shortspine Thornyhead									1.1	3.4	0.3	
Silvergray Rockfish	2.8						5.1	11.2		1.1	2.4	1.7
Slender Sole	1.8							1.3	1.5	0.6	1.8	0.9
Southern Rock Sole	0.5	1.1	0.3	2.0	15.7		0.9					
Splitnose Rockfish									0.2			
Spotted Ratfish	4.4	0.8	27.5	1.2	16.7	7.1	43.6	5.5	12.7	20.7	13.5	14.1
Walleye Pollock	4.2	-					3.4	110.4		1.3	18.3	567.3
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish										0.9	0.5	
Yellowtail Rockfish								560.9			1.3	
Other	1.5	4.6	5.3	2.4	7.7	3.2		2.3	13.9	103.3	5.4	0.5
Total	125.5	15.7	59.9	23.4	57.6	111.9	200.8	879.5	155.4	506.5	1088.0	1001.6

Common Name	32	33	34	35	36	37	38	39	40	41	42	43
Arrowtooth Flounder	301.2		3.0	226.6	274.4	60.9	30.9	0.8	279.9	75.2	50.6	98.1
Aurora Rockfish												
Big Skate			7.5									
Bigfin Eelpout										0.3		0.1
Bigmouth Sculpin					3.3							
Blackbelly Eelpout					2.0	0.1			0.7	0.5	0.2	6.9
Bocaccio					0.5							0.2
Canary Rockfish							2.8					
Curlfin Sole		0.4										
Darkblotched Rockfish					0.7					1.2		1.0
Dover Sole	15.7			2.2	33.3	6.3	10.0		9.6	0.9	2.2	15.6
English Sole	82.6		1.7	0.7			0.2			0.3		
Eulachon						0.9	0.3		1.5	0.3	-	4.8
Flathead Sole	12.8				60.3	28.2	35.9	0.1	27.7	28.3	10.6	18.3
Greenstriped Rockfish				3.6	0.3	0.4	2.3			1.6	1.2	0.3
Harlequin Rockfish											0.1	
Lingcod									5.3			
Longnose Skate	4.0						3.9		5.4	8.0	10.0	10.8
Longspine Thornyhead												
North Pacific Spiny Dogfish	22.9		8.0	29.6	22.1	10.6	9.6		2.1	11.3	6.9	20.9
Pacific Cod	1.2		0.3	2.7	6.6				6.2			
Pacific Hake				154.1	1.3		1.0		13.2	3.1	2.4	
Pacific Halibut		46.7										
Pacific Ocean Perch	0.3			2.0	7.9	5.0	7.3			0.1	0.4	
Pacific Sanddab	13.2	0.4	1.4									
Petrale Sole	4.5	15.2	13.3	1.0			3.2				1.2	
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish				1.7	4.0	0.6	5.2		11.8	14.5	4.3	4.9
Redstripe Rockfish				2.1			3.6				0.2	
Rex Sole	32.8			15.7	21.7	3.8	18.8	0.1	17.6	7.9	4.2	3.5
Rockfishes									0.4	0.2	-	0.2
Rosethorn Rockfish					0.9							
Rougheye/Blackspotted												
Rockfish Complex					1.5		2.4			1.1	0.6	0.1
Sablefish	1.5				3.8	2.1	5.1	0.4	20.8	11.7	11.0	6.5
Sandpaper Skate												
Sharpchin Rockfish				3.7	3.2	0.2	2.4			1.1	3.5	0.3
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish	3.9		15.2	18.3	6.2		7.1				1.6	1.0
Slender Sole	0.4				1.4	-	1.3		1.1	1.1	0.2	1.9
Southern Rock Sole	1.0	18.9	21.7	0.7								
Splitnose Rockfish												-
Spotted Ratfish	31.7	16.8	37.1	12.3	10.3	4.3	5.9		1.5	2.5	1.6	3.1
Walleye Pollock	18.7		0.1	15.1	5.6	0.3	15.0		3.0	1.2	1.6	0.1
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish				3.2	4.4		23.0					
Yellowmouth Rockfish				2.5	3.7		3.9					
Yellowtail Rockfish	4.2						4.9				8.7	3.3
Other	6.2	1.5	2.9	4.2	5.0	0.7	16.3		3.5	11.1	2.8	11.5
Total	558.7	99.9	112.3	501.8	484.5	124.3	222.1	1.4	411.2	183.6	126.3	213.3

Common Name	44	45	46	47	48	49	50	51	52	53	54	55
Arrowtooth Flounder	168.7	116.7	107.7	18.0	133.8	52.2	178.8	61.0	171.8	149.9	1131.0	214.8
Aurora Rockfish												
Big Skate								12.1		3.2		
Bigfin Eelpout		0.2										
Bigmouth Sculpin												
Blackbelly Eelpout	-	1.8			0.2							
Bocaccio	20.4	0.4					0.2					
Canary Rockfish	23.3	2.2					40.0	7.8	1.5			2.7
Curlfin Sole												
Darkblotched Rockfish	-	1.0										
Dover Sole		7.2		5.1	12.6	14.9	3.2	1.8	1.2	4.3	2.6	1.6
English Sole	1.8	0.3	1.5				22.5	52.3	2.0	0.5	0.4	0.4
Eulachon		1.3	-									
Flathead Sole		35.7		2.1	12.0		20.1	8.6	0.5			
Greenstriped Rockfish	2.6		1.9	1.6	0.3		5.1	0.3				
Harlequin Rockfish	86.3	1.5							0.2			
Lingcod	7.5		9.9						8.7			
Longnose Skate	4.3	4.6									12.8	21.2
Longspine Thornyhead												
North Pacific Spiny Dogfish	10.7	14.5	402.1	10.3	43.3	23.8	47.3	58.9	20.9	101.7	183.5	63.2
Pacific Cod	31.3		20.5				0.9		37.1		13.4	0.6
Pacific Hake		2.5									1.4	1.0
Pacific Halibut	10.0		11.1					3.6	19.5		12.2	
Pacific Ocean Perch	3.0				2.0		1.0			2.3		1.2
Pacific Sanddab												
Petrale Sole	6.7		7.9	2.3	5.0	3.7	3.7	8.3	2.3	0.9	2.9	3.1
Pygmy Rockfish	13.1	0.2					0.2					
Quillback Rockfish			0.5						2.1			
Redbanded Rockfish	6.1				3.1	1.8				1.7		2.8
Redstripe Rockfish	347.4	11.2		0.5			0.3		0.1			16.2
Rex Sole	1.7	2.9		19.1	26.9	46.0	32.5	8.6	1.7	7.6	9.6	4.3
Rockfishes				-	0.1		-		0.2	0.1	0.1	
Rosethorn Rockfish	0.9						-					
Rougheye/Blackspotted												
Rockfish Complex		1.0		0.7						1.0		0.6
Sablefish		4.7		4.9	21.9	4.6	6.4			7.7	85.9	243.8
Sandpaper Skate											0.6	
Sharpchin Rockfish	4.2	0.3		0.2	0.4	0.2	4.4	1.0		0.6		1.1
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish	88.6	21.5	20.1	12.5	6.5	2.0	233.2	40.0	18.1	1.6	6.6	14.0
Slender Sole		1.4		0.5	1.0	0.4					0.2	
Southern Rock Sole								0.6				
Splitnose Rockfish												
Spotted Ratfish	7.8	3.8	48.9	2.7	3.4	4.7	8.6	22.1	4.3	2.7	14.2	2.3
Walleye Pollock	0.2	0.3	13.6	2.1	0.5	0.3	1.4	0.2	1.6	1.9	4.3	5.8
Widow Rockfish	22.4	0.5										
Wolf Eel												
Yelloweye Rockfish	-			0.8								
Yellowmouth Rockfish	33.3	1.3	0.6	0.1			5.3					0.5
Yellowtail Rockfish		7.7	2.8	12.3	7.1		1.4					9.5
Other	5.3	5.6	1.2	7.3	19.2	2.7	4.6	2.5	5.0	55.4	257.6	334.6
Total	907.5	252.4	650.3	103.1	299.3	157.1	620.9	289.8	298.7	343.2	1739.2	945.4

Common Name	56	57	58	59	60	61	62	63	64	65	66	67
Arrowtooth Flounder	30.9	11.9	92.6	418.0	63.11	51.2	206.7					6.6
Aurora Rockfish												
Big Skate												
Bigfin Eelpout			0.4	0.6								
Bigmouth Sculpin												
Blackbelly Eelpout							0.9					
Bocaccio								0.8				1.9
Canary Rockfish								0.9				23.1
Curlfin Sole								0.9	0.4		0.5	
Darkblotched Rockfish												
Dover Sole	4.6		5.4	10.0	10.94	9.9	77.7		0.5			4.9
English Sole							0.4		6.2	4.6	6.2	34.6
Eulachon	0.4											1.1
Flathead Sole	8.7	0.7	1.5	2.8	0.28	2.6	24.8					1.9
Greenstriped Rockfish												
Harlequin Rockfish												
Lingcod								16.3	1.3			10.7
Longnose Skate	4.8	5.9		3.6			2.6					
Longspine Thornyhead												
North Pacific Spiny Dogfish	8.7	4.9	4.7	3.8	1.96		12.6		1.8		2.3	25.5
Pacific Cod		4.9				2.7			2.3		0.6	2.2
Pacific Hake	29.8	5.4	0.9		0.79		4.3					
Pacific Halibut												
Pacific Ocean Perch		69.0	39.6	13.9	35.88	90.5	56.3					
Pacific Sanddab										1.0	2.1	1.1
Petrale Sole					1.3				3.1			4.5
Pygmy Rockfish												
Quillback Rockfish								23.3			0.6	0.4
Redbanded Rockfish	1.9	9.0		9.5	16.16	46.4	5.0					
Redstripe Rockfish	1.4							41.3				
Rex Sole	3.5	7.1	1.1	9.0	12.74	19.8	84.0		10.2	0.9	2.5	45.2
Rockfishes										-		
Rosethorn Rockfish		2.3			1.46	3.6	3.2					
Rougheye/Blackspotted												
Rockfish Complex		8.1	0.5	7.1	4.96	3.6						
Sablefish	5.5	10.6	55.7	57.0	91.76	218.4	589.1		2.1			0.5
Sandpaper Skate			1.1	1.2	0.14							
Sharpchin Rockfish	0.2	1.9	1.6				0.5					0.4
Shortraker Rockfish												
Shortspine Thornyhead	6.3	28.3	6.9	8.8	40.76	51.1	2.2					
Silvergray Rockfish	2.2	113.5	31.2	43.6	49.3	17.5	11.1	4.2	2.7	2.1		76.4
Slender Sole	0.7	0.5	0.3	0.9		0.2	3.4	0.3			0.3	0.2
Southern Rock Sole									0.9	3.4	5.5	1.0
Splitnose Rockfish												
Spotted Ratfish	1.8		0.5	1.0	2.24	5.8	0.8	2.7	0.3	0.3	1.2	4.4
Walleye Pollock	1.0	14.2		1.5	7.8	11.1	29.4				0.2	6.4
Widow Rockfish								34.2				
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish	1.8		0.4									
Yellowtail Rockfish	1.5							8.8				0.6
Other	3.9	10.0	16.0	7.7	10.15	43.1	5.7	2.8	7.3	1.7	12.0	9.4
Total	119.7	308.4	260.3	599.9	351.7	577.3	1120.6	136.5	39.1	14.1	34.0	263.1

Common Name	68	69	70	71	72	73	74	75	76	77	78
Arrowtooth Flounder	6.3	25.7	17.8	22.1		1.3	11.4	2.4	62.7	217.9	190.0
Aurora Rockfish											
Big Skate											
Bigfin Eelpout											
Bigmouth Sculpin											
Blackbelly Eelpout		-	-	-			0.4			-	
Bocaccio	0.6	0.1				0.1					
Canary Rockfish	7.9	2.6							2.3	2.1	
Curlfin Sole							0.1				
Darkblotched Rockfish				0.1							
Dover Sole	1.8	5.5	3.5	1.8			5.2		8.6	52.8	19.5
English Sole	27.0	24.2	27.5	78.6			106.1	43.0	3.0		
Eulachon	-	-									
Flathead Sole	1.6	5.8	2.0	2.2			4.6	2.4	14.3	47.0	11.7
Greenstriped Rockfish		0.3	1.2						0.4		0.5
Harlequin Rockfish									0.1		
Lingcod	1.3	0.5		2.5		3.2	5.6	0.3			
Longnose Skate		0.9		14.8				1.7			
Longspine Thornyhead											
North Pacific Spiny Dogfish	1.3	11.7	8.0	5.0		4.8	5.9	8.8	5.5	3.8	4.4
Pacific Cod	10.0	76.8	13.1	1.7				0.3	6.1		2.9
Pacific Hake			0.3							4.4	0.8
Pacific Halibut			3.8			15.5	11.4	8.5			
Pacific Ocean Perch									0.5	0.2	3.2
Pacific Sanddab								0.2			
Petrale Sole	4.0		0.8	9.9		4.5	12.2	5.9	1.2		1.8
Pygmy Rockfish						0.4	-				
Quillback Rockfish	0.8	0.2		0.3		5.7	1.6				
Redbanded Rockfish									45.1	10.8	6.0
Redstripe Rockfish						0.3					
Rex Sole	19.5	78.8	39.0	33.3			45.5	25.9	31.8	53.8	37.4
Rockfishes		-					-	-			
Rosethorn Rockfish											
Rougheye/Blackspotted Rockfish Complex											
Sablefish		1.4	2.6	3.7		0.5	3.5	2.9	7.6	153.6	16.0
Sandpaper Skate											
Sharpchin Rockfish	0.6	0.4									
Shortraker Rockfish											
Shortspine Thornyhead										0.8	
Silvergray Rockfish	22.4	68.0	74.7	11.9		25.6	1.9		33.5	18.9	16.5
Slender Sole	0.5	2.3	0.8	0.7			1.4	0.7	0.7	4.0	0.3
Southern Rock Sole						4.9	2.1	0.5			
Splitnose Rockfish											
Spotted Ratfish	0.6	2.8	0.5	1.2		41.3	6.5	3.5	4.5	1.5	3.7
Walleye Pollock	1.6	4.8	0.4	4.1			7.1	5.4	8.0	32.5	39.2
Widow Rockfish						0.2	1.0				
Wolf Eel											
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish									8.8		3.6
Other	3.5	15.0	6.7	8.6		1.7	5.43	0.4	9.4	16.4	29.3
Total	111.4	327.9	202.6	202.5		110.0	238.9	112.8	254.0	620.6	386.7

Common Name	80	81	82	83	84	85	86	87	88	89	90	91
Arrowtooth Flounder	14.0	46.0	9.7	14.8	95.8	90.7	15.3	11.1	41.6	59.6	58.6	37.8
Aurora Rockfish												
Big Skate												
Bigfin Eelpout		0.4							0.3			
Bigmouth Sculpin				3.9								
Blackbelly Eelpout					-				-	-	-	-
Bocaccio							0.3					
Canary Rockfish	2.9				6.6	34.5	9.3					
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole		9.1	3.8	19.5	1.4	10.9	1.1	0.6	23.7	15.6	0.4	4.5
English Sole						9.8	3.2					
Eulachon			-						0.1		3.5	-
Flathead Sole	-				1.2	1.6			7.7	5.4	16.6	11.5
Greenstriped Rockfish	-	1.6					1.9	0.3		1.5		
Harlequin Rockfish												
Lingcod						8.8	0.5	3.8		7.4		
Longnose Skate		10.1				1.2			4.4	9.8	10.6	13.9
Longspine Thornyhead												
North Pacific Spiny Dogfish	0.7	2.9				5.2	1.6		19.3	6.3	2.6	1.7
Pacific Cod	6.5	0.5				1.8	16.5	2.8				
Pacific Hake	2.0	2.4	35.9	7.5	24.1	67.8			12.3	43.7	7.2	0.2
Pacific Halibut		5.6				48.2	5.4			14.7		
Pacific Ocean Perch	1561.6	173.8	45.9	36.3	7.8	4.0	0.3	0.1	2.7	321.3	24.5	3.8
Pacific Sanddab												
Petrale Sole					0.6		1.6	4.5				0.5
Pygmy Rockfish							0.3					
Quillback Rockfish												
Redbanded Rockfish	48.7	23.8	22.9	16.4	8.8	1.5				14.3	0.8	9.5
Redstripe Rockfish	30.6	5.2				1.0	48.6	2.8		0.6		
Rex Sole	12.7	19.6	2.6	12.8	38.3	3.6	4.3	4.4	6.2	18.6	9.6	4.9
Rockfishes						0.8		0.1				
Rosethorn Rockfish	6.0	1.4								7.8	0.6	0.8
Rougheye/Blackspotted												
Rockfish Complex	-		3.7	12.2	0.7					1.1		
Sablefish	131.2	14.6	7.9	11.2	102.0	21.9	0.3	1.1	1580.2	37.8	7.3	8.4
Sandpaper Skate												
Sharpchin Rockfish	1226.0	8.6					2.4			99.3	1.6	
Shortraker Rockfish												
Shortspine Thornyhead	22.7	29.1	60.2	36.3	1.3				7.3	17.0	1.8	1.2
Silvergray Rockfish	232.9	185.1	38.5	6.9	102.5	792.1	231.3	25.3		28.9	3.9	4.6
Slender Sole		0.1			0.2				1.8	0.4	1.4	0.8
Southern Rock Sole												
Splitnose Rockfish				1.0								
Spotted Ratfish	4.3	2.5	1.8		2.4	15.4	4.4	3.0	1.8	1.1		2.3
Walleye Pollock	88.8	94.2	0.7		37.7	55.7	0.9	2.7		6.1		0.7
Widow Rockfish							1.3					
Wolf Eel												
Yelloweye Rockfish							3.1					
Yellowmouth Rockfish	105.3	0.5								1.4		
Yellowtail Rockfish						155.7	91.9	38.8				
Other	-	3.8	33.9	15.9	10.5	6.7	6.3	9.3	0.8	10.1	2.6	2.5
Total	3500.0	640.8	267.6	194.6	442.0	1339.0	452.3	110.7	1710.0	729.5	153.5	109.6

Common Name	92	93	94	95	96	97	98	99	100	101	102	103
Arrowtooth Flounder	79.3	5.1	0.8	16.9	21.4	16.6	1.4	0.6		0.1	9.3	32.8
Aurora Rockfish												
Big Skate												
Bigfin Eelpout					0.7							
Bigmouth Sculpin												
Blackbelly Eelpout	-											
Bocaccio												
Canary Rockfish												
Curlfin Sole									0.4			
Darkblotched Rockfish												
Dover Sole	0.8				3.9	1.7	0.6	10.9				3.4
English Sole	3.0			0.4								
Eulachon					0.3	0.6						
Flathead Sole	4.6											0.5
Greenstriped Rockfish				1.8					-	-	0.4	0.5
Harlequin Rockfish												
Lingcod								7.1	23.8	1.9	2.0	
Longnose Skate		7.7		9.3		10.2	11.3	16.6	6.7			
Longspine Thornyhead												
North Pacific Spiny Dogfish	10.7	2.9	6.6	4.7	1.7				2.4	2.2	6.1	2.0
Pacific Cod		5.3	0.6	2.6							1.3	
Pacific Hake					7.9	13.8	12.3	25.2		1.0		289.7
Pacific Halibut	5.4		2.3						4.0	8.6	2.8	
Pacific Ocean Perch	0.4	0.4		3.3	0.9	77.0	43.8	31.2	7.5			
Pacific Sanddab									0.7	0.5		
Petrale Sole	2.7	4.0	0.7		0.8				0.9	0.2	1.5	3.5
Pygmy Rockfish									0.1	0.2		
Quillback Rockfish									0.3			
Redbanded Rockfish	2.5				243.0	187.9	22.7	1.4				7.4
Redstripe Rockfish												
Rex Sole	17.1			1.7	6.5	8.9						10.7
Rockfishes					0.2				1.6	0.4		
Rosethorn Rockfish						0.6						
Rougheye/Blackspotted												
Rockfish Complex						6.0	1.9					
Sablefish	22.5	1.2				6.5	14.0	73.3				0.6
Sandpaper Skate							1.2	4.9	2.5			
Sharpchin Rockfish				0.2								
Shortraker Rockfish						8.9						
Shortspine Thornyhead					12.8	18.0	23.7	18.1	1.6	1.4		
Silvergray Rockfish	41.8	53.1	598.0	122.7	5.7					2.3	2.2	1.5
Slender Sole	0.4				1.5							0.2
Southern Rock Sole			0.6						2.0	1.3	1.7	
Splitnose Rockfish						0.7						
Spotted Ratfish	2.4	0.3	5.5	16.5	0.7		1.6	0.7	1.8	1.3	33.0	6.6
Walleye Pollock	1.1	3.3	4.8	9.5	0.2	1.2				0.7	4.0	4.3
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish		0.5	0.5			0.6						
Yellowtail Rockfish			22.2	231.2	17.3							9.1
Other	-	2.9	0.4	0.8	6.2	7.9	10.0	32.3	9.9	1.0	0.2	1.5
Total	194.8	86.7	643.1	421.7	331.8	367.1	144.5	222.2	66.2	22.9	64.4	374.5

Common Name	104	105	106	107	108	109	110	111	112	113	114	115
Arrowtooth Flounder	2.5	89.5	4.8		0.1				13.7	28.2	11.4	19.2
Aurora Rockfish												
Big Skate												
Bigfin Eelpout		0.2										
Bigmouth Sculpin												
Blackbelly Eelpout		-										
Bocaccio								0.2				
Canary Rockfish		8.0	6.2	17.1	6.3			2.7	4.3			
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole		1.5								1.3	12.2	1.1
English Sole			4.7	0.4								
Eulachon												
Flathead Sole	0.6	4.5	0.1		0.7							
Greenstriped Rockfish	0.1	0.8	0.1			1.0	0.6		1.3	5.3	6.1	
Harlequin Rockfish									0.6			
Lingcod								11.3				
Longnose Skate		0.4								1.7	5.4	
Longspine Thornyhead												
North Pacific Spiny Dogfish	2.8	2.1	2.1		1.9					2.2		
Pacific Cod			0.9						4.3	5.0		
Pacific Hake	12.8				0.7						39.2	24.4
Pacific Halibut	3.4	10.4		6.7			10.9			35.8		
Pacific Ocean Perch		0.6									148.4	130.9
Pacific Sanddab	-				0.2							
Petrale Sole	5.0	3.7	1.1	10.9	2.6	1.0	4.9			2.1		
Pygmy Rockfish							1.2	0.5	0.3			
Quillback Rockfish		0.2										
Redbanded Rockfish	3.7	0.1									22.5	9.3
Redstripe Rockfish		0.6							28.5	5.0		
Rex Sole	0.6	5.8	1.4	0.4					1.0	1.2	0.3	0.3
Rockfishes	0.1	0.7	1.3	-	-		0.2	0.3	0.1			
Rosethorn Rockfish								0.1	1.9			
Rougheye/Blackspotted Rockfish Complex											25.7	15.0
Sablefish		4.1								2.6	36.8	17.1
Sandpaper Skate		0.3	1.0								0.9	1.2
Sharpchin Rockfish		0.2					0.6	2.3	6.2			
Shortraker Rockfish												
Shortspine Thornyhead											45.0	32.6
Silvergray Rockfish	4.0	8.9	3.6	18.7	12.1			9.5	62.3	30.9	20.2	
Slender Sole		2.0	0.1									
Southern Rock Sole	0.7			0.9								
Splitnose Rockfish											1.4	0.2
Spotted Ratfish	87.1	7.8	4.3	18.4	3.0	3.9	6.1	0.5	0.1	26.0	3.4	
Walleye Pollock		0.2	10.2	0.1	1.5				0.6	0.4		
Widow Rockfish		2.5										
Wolf Eel												
Yelloweye Rockfish									18.5			
Yellowmouth Rockfish		38.0	7.0									
Yellowtail Rockfish		15.3	2.6									
Other	2.9	16.9	41.0	4.5	3.2	1.2	29.0	10.8	65.4	2.1	7.6	4.6
Total	126.4	225.3	92.3	77.9	32.3	7.1	53.5	38.3	209.0	149.7	386.5	255.9

Common Name	116	117	118	119	120	121	122	123	124	125	126	127
Arrowtooth Flounder	13.8	15.1	28.3	83.0	32.1	37.0	4.8	322.6	52.1	2713.8	383.7	29.5
Aurora Rockfish												
Big Skate												
Bigfin Eelpout	0.2	-		0.7	0.1							
Bigmouth Sculpin			3.4									
Blackbelly Eelpout				-		-			-			
Bocaccio							0.2					4.1
Canary Rockfish							125.9	19.3	2.3	9.0	1.6	2.0
Curlfin Sole												
Darkblotched Rockfish		0.6	0.6	3.4	6.1	1.2						
Dover Sole	19.2	16.0	26.3	16.1	0.4	0.4		1.5	8.7	2.9		
English Sole					0.3	2.6	13.3	6.1	1.4	114.4	11.8	1.3
Eulachon				-					0.1			
Flathead Sole	0.1				0.3	2.4			17.4	5.9		
Greenstriped Rockfish						1.0		6.4	2.3			
Harlequin Rockfish					0.3							-
Lingcod							37.5			7.9	6.4	4.4
Longnose Skate				1.1					2.6			
Longspine Thornyhead												
North Pacific Spiny Dogfish				0.8	8.8	6.5	40.2	17.1	5.2	181.5	14.3	23.4
Pacific Cod							0.5	18.4		4.1		
Pacific Hake	85.9	51.8	21.2	5.1	12.6	9.4		4.4	2.5	4.8		
Pacific Halibut									10.9	34.4	5.0	
Pacific Ocean Perch	93.3	80.5	393.1	56.2	1473.0	313.3	26.6		1.9	5.7	0.2	
Pacific Sanddab												1.0
Petrable Sole						0.8	2.4	1.1	2.0	68.0	142.3	14.4
Pygmy Rockfish												1.0
Quillback Rockfish										0.5	2.6	10.0
Redbanded Rockfish	4.5	15.8	28.4	10.8	34.4	12.9			5.4	1.1		
Redstripe Rockfish												77.6
Rex Sole		0.2	2.6	1.0	5.9	33.5	2.8	6.4	31.0	6.7	0.4	0.4
Rockfishes												
Rosethorn Rockfish												0.4
Rougheye/Blackspotted												
Rockfish Complex	11.8	7.6	13.2	1.2		1.8						
Sablefish	10.5	11.0	8.9	8.5	4.7	11.2		1.3	19.3	156.4		
Sandpaper Skate	1.2											
Sharpchin Rockfish					0.3		0.2		0.3	0.3		0.1
Shortraker Rockfish												
Shortspine Thornyhead	11.4	19.0	24.6	6.7	0.6	0.5						
Silvergray Rockfish			1.3		3.3	2.0	87.9	12.5	8.7	54.2	13.8	10.0
Slender Sole					0.2	3.5	0.3	0.1	0.4			
Southern Rock Sole										6.6	8.1	0.8
Splitnose Rockfish	0.5		0.2									
Spotted Ratfish	0.3	0.2	1.8	6.9	1.5	0.5	13.0	6.0	1.4	112.8	105.8	6.0
Walleye Pollock				1.6	5.2	10.6		0.6	3.0	1.2		
Widow Rockfish												0.5
Wolf Eel												
Yelloweye Rockfish										7.2	3.5	26.5
Yellowmouth Rockfish				6.9	145.1	7.3		3.6	3.9			8.9
Yellowtail Rockfish								5.2				
Other	4.8	6.2	5.4	3.3	2.2	1.8	5.4	0.4	9.0	0.6	1.4	4.2
Total	257.5	224.1	559.1	213.2	1737.6	460.5	361.2	432.9	191.9	3500.0	700.7	226.4

Common Name	128	129	130	131	132	133	134	135	136	137	138	139
Arrowtooth Flounder	16.2	1.3	2.3							360.3	50.9	14.5
Aurora Rockfish												
Big Skate												
Bigfin Eelpout										2.7		
Bigmouth Sculpin												
Blackbelly Eelpout										-	0.8	-
Bocaccio	0.6									0.1		9.4
Canary Rockfish	2.5										1.3	70.8
Curlfin Sole			0.2		1.6	0.4	0.4	0.8				
Darkblotched Rockfish										1.1	0.5	
Dover Sole										125.0	99.8	26.8
English Sole	1.4									0.4	0.2	
Eulachon											0.1	
Flathead Sole										45.3	39.5	9.9
Greenstriped Rockfish												3.7
Harlequin Rockfish	0.1											
Lingcod				3.5	2.1							412.9
Longnose Skate			2.8				5.2			9.6	4.0	3.6
Longspine Thornyhead												
North Pacific Spiny Dogfish	8.3			1.7	13.7	5.9		5.6	7.6	1.2	0.5	
Pacific Cod												
Pacific Hake											2.4	
Pacific Halibut		12.9	15.8	3.1		1.8	5.8	3.7				20.4
Pacific Ocean Perch										195.7	113.2	283.2
Pacific Sanddab	0.9	0.2	0.3	0.2	0.5	6.0	6.0	20.8				
Petrale Sole		1.2	2.2		3.1							
Pygmy Rockfish	0.2	0.2										8.8
Quillback Rockfish	7.9	0.8							1.5			
Redbanded Rockfish										5.4	7.5	1.8
Redstripe Rockfish	72.4	1.6										27.9
Rex Sole										59.5	59.3	23.1
Rockfishes									-			
Rosethorn Rockfish	0.2											6.5
Rougheye/Blackspotted												
Rockfish Complex										1.1	7.3	
Sablefish										9.2	4.2	
Sandpaper Skate												1.0
Sharpchin Rockfish												28.2
Shortraker Rockfish												
Shortspine Thornyhead										55.2	26.9	0.3
Silvergray Rockfish	14.2											25.3
Slender Sole										2.4	1.3	0.3
Southern Rock Sole	0.9		0.6		2.6	1.6	0.6	1.1				
Splitnose Rockfish											0.2	
Spotted Ratfish	7.9	1.0	3.4	1.4	10.6	0.5			9.3	4.2	7.8	27.8
Walleye Pollock	0.1									4.4		
Widow Rockfish									-			2.6
Wolf Eel												
Yelloweye Rockfish	4.5											22.7
Yellowmouth Rockfish	2.8											
Yellowtail Rockfish												46.9
Other	5.7	3.1	0.4	0.1	4.3	3.6	10.6	5.4	0.4	3.4	5.1	3.8
Total	146.7	22.3	28.1	9.9	38.5	19.7	28.5	37.3	18.8	886.3	432.8	1082.3

Common Name	140	141	142	143	144	145	146	147	148	149	150	151
Arrowtooth Flounder	79.6	44.4	57.2	50.4	1.6	0.1	2.6	30.0	108.3	54.7	26.9	55.8
Aurora Rockfish												
Big Skate							1.2					
Bigfin Eelpout										0.3	0.5	0.3
Bigmouth Sculpin												
Blackbelly Eelpout	-	0.9	2.8	0.4						0.2	0.3	0.5
Bocaccio	0.4	0.7				0.2	0.3					
Canary Rockfish	14.0		2.2				0.5		11.7	3.8		
Curlfin Sole							4.2					
Darkblotched Rockfish						0.3		0.1	1.2		0.4	
Dover Sole	8.2	5.2	56.3	25.0		0.9	0.8	1.8	0.8	21.6	44.6	96.3
English Sole		0.8				1.0	103.0	0.1	0.6			
Eulachon	-	0.1	0.1									
Flathead Sole	8.3	13.6	17.3	0.8		1.5	0.5	1.7	0.6	24.8	22.9	39.4
Greenstriped Rockfish	2.8		1.3	3.2		0.5		10.2	7.8			
Harlequin Rockfish												
Lingcod	2.9					0.7	1.2		1.9			
Longnose Skate		2.5		2.2								
Longspine Thornyhead												
North Pacific Spiny Dogfish		0.6								2.3	2.1	2.3
Pacific Cod	3.1			1.2		3.0	1.5	20.8	16.0	8.4		
Pacific Hake		0.3	1.0							0.1		43.5
Pacific Halibut												
Pacific Ocean Perch	6.7			0.2				1.7	0.1	113.3	66.0	139.9
Pacific Sanddab						11.1	4.9	0.7				
Petrals Sole	2.6	0.5	0.7				0.5	4.1	10.9	5.6	3.7	1.7
Pygmy Rockfish	0.2		0.2									
Quillback Rockfish								1.1				
Redbanded Rockfish			-	0.2						14.1	12.8	9.2
Redstripe Rockfish	49.4	16.1	9.4	59.7	3.8	1.3	1.5	4.0	0.9	1.5		0.5
Rex Sole	10.8	39.6	103.5	58.0	0.5	1.2	7.1	27.2	1.3	30.7	30.5	92.0
Rockfishes		0.2										
Rosethorn Rockfish				0.2								
Rougheye/Blackspotted												
Rockfish Complex												0.9
Sablefish	1.3	3.5	4.5	4.2			0.8	0.3	0.6	9.2	10.7	14.8
Sandpaper Skate												
Sharpchin Rockfish	2.7	0.4	3.2	7.6	0.2							
Shortraker Rockfish												
Shortspine Thornyhead										2.0	23.2	34.7
Silvergray Rockfish	138.6	6.8	1.3					1.5	61.0	18.6	4.4	
Slender Sole	0.5	4.0	3.5	1.1			0.1	0.3		1.0	1.5	2.4
Southern Rock Sole						3.6	6.1	1.6				
Splitnose Rockfish												
Spotted Ratfish	4.7	15.9	3.9	2.2	0.2	10.2	8.7	7.1	43.7	10.7	3.9	7.8
Walleye Pollock	1.3	0.6	17.4	3.1		0.4	0.1	0.5	1.5	2.1	2.2	4.3
Widow Rockfish												
Wolf Eel							0.2					
Yelloweye Rockfish	0.7			6.0	5.4							
Yellowmouth Rockfish										1.9		
Yellowtail Rockfish	34.13	6.8	1.4					1.6	1.0	1.9		
Other	2.1	3.9	9.3	4.7	-	3.3	1.4	7.7	2.5	3.7	4.9	3.1
Total	374.9	167.2	296.6	230.4	11.7	39.1	147.4	123.9	272.2	332.4	261.4	549.4

Common Name	152	153	154	155	156	157	158	159	160	161	162	163
Arrowtooth Flounder	25.4	8.0	8.6	25.8	38.9	7.3	4.4		0.1	62.7	5.7	12.2
Aurora Rockfish												
Big Skate					5.0		17.5	3.6				
Bigfin Eelpout	0.8	1.3	2.4			0.3						
Bigmouth Sculpin											2.7	
Blackbelly Eelpout	-	-										
Bocaccio				0.3								
Canary Rockfish				1.6		4.8	2.2			29.0	2.6	
Curlfin Sole							0.9		0.3			
Darkblotched Rockfish	1.1		0.6	1.0								4.3
Dover Sole	53.7	23.7	8.1	31.6		1.3	0.6			6.3	0.9	1.0
English Sole					4.3	6.7	14.5	3.3	1.3	18.8		
Eulachon												
Flathead Sole	31.7	8.5	14.3	15.4	1.0	11.4	0.4		0.5	3.0		
Greenstriped Rockfish	0.4			1.5								
Harlequin Rockfish								-				
Lingcod		1.1			8.4			2.9	0.5			
Longnose Skate						5.2						8.8
Longspine Thornyhead												
North Pacific Spiny Dogfish				11.5	7.2	3.4	1.4	17.1	5.4	9.2		
Pacific Cod			2.2	8.3	16.8	1.1	0.2		2.2			
Pacific Hake		17.1	3.0	116.4	4.4	47.5	3.2			369.3	41.1	90.9
Pacific Halibut			6.4					5.3			7.2	
Pacific Ocean Perch	41.2	181.8	151.3	431.3	21.5	34.1	23.9			682.2	166.1	320.7
Pacific Sanddab							0.2	1.6				
Petrale Sole					41.3	5.3	17.1	2.6	1.9	0.7		
Pygmy Rockfish									0.3			
Quillback Rockfish								5.2	0.2			
Redbanded Rockfish	14.4	7.9	1.2	14.9		6.3				1.8		11.6
Redstripe Rockfish										0.6		
Rex Sole	56.7	42.8	138.8	40.6	0.5	11.6	0.2		0.6	21.3	0.4	
Rockfishes				-				-				
Rosethorn Rockfish												
Rougheye/Blackspotted												
Rockfish Complex	2.8	0.4	0.7								28.5	56.3
Sablefish	9.6	8.3	4.6	15.0		20.8				90.4	6.6	21.2
Sandpaper Skate	0.4			-								
Sharpchin Rockfish												
Shortraker Rockfish												
Shortspine Thornyhead	9.5	41.5	21.7	1.2	0.5	0.1					15.2	32.1
Silvergray Rockfish				4.9		2.3				5.3		
Slender Sole	3.1	5.2	5.5	0.9		2.2			0.1	0.7		
Southern Rock Sole					13.8		1.8	1.3	51.0	4.1		
Splitnose Rockfish			3.1			0.2					1.3	1.2
Spotted Ratfish	3.8	6.5	2.8	2.7	4.5	1.7	7.6	17.8	7.4	0.9	1.9	1.4
Walleye Pollock	1.1	38.9	7.7	79.2	5.7	6.9			0.5	9.3	-	
Widow Rockfish								0.3		0.9		
Wolf Eel								6.1	4.1			
Yelloweye Rockfish												
Yellowmouth Rockfish		4.3		1.7		11.0	0.8			79.8	3.1	1.5
Yellowtail Rockfish										1.1		
Other	1.9	0.2	0.6	0.3	0.5	0.2	4.0	10.9	2.7	2.8	16.0	12.1
Total	257.7	397.5	383.5	806.1	174.3	191.5	100.7	77.8	79.0	1400.1	299.3	575.2

Common Name	164	165	166	167	168	169	170	171	172	173	174	175
Arrowtooth Flounder		1.7	4.1	8.3	3.5	22.1	0.7	0.6			1.0	
Aurora Rockfish												
Big Skate												
Bigfin Eelpout												
Bigmouth Sculpin					3.9							
Blackbelly Eelpout												
Bocaccio				4.5	14.8		3.6			0.7		
Canary Rockfish									11.7			3.4
Curlfin Sole												
Darkblotched Rockfish	5.5			3.1								
Dover Sole		0.8	2.1	0.5	0.4	18.6	0.5					
English Sole						0.6	20.1	13.1	1.1	0.6	6.0	0.3
Eulachon												
Flathead Sole							0.1					
Greenstriped Rockfish					6.8				0.6	0.3		0.7
Harlequin Rockfish							0.1	0.2		0.1		
Lingcod							1.9		18.2	1.3		7.1
Longnose Skate	0.9	2.9				7.0						
Longspine Thornyhead												
North Pacific Spiny Dogfish				1.9			1.7	2.1	2.1			
Pacific Cod							1.0	16.3			10.2	0.1
Pacific Hake	130.1	100.6	82.9	201.6	119.0	3.8						
Pacific Halibut					10.7		2.3		51.4			4.1
Pacific Ocean Perch	376.1	242.3	168.5	2920.5	800.9	71.3						
Pacific Sanddab												0.2
Petrale Sole							5.2	3.8	0.8		6.8	9.4
Pygmy Rockfish									1.0	0.1		
Quillback Rockfish									25.3	8.6	0.7	5.7
Redbanded Rockfish	9.8	17.5	0.8	23.9	5.7	8.9						
Redstripe Rockfish					28.8	0.5			1.8	11.6	0.2	4.3
Rex Sole				0.8	2.6	5.2	13.4	11.4	0.6			
Rockfishes											-	
Rosethorn Rockfish					16.3	-			0.4			
Rougheye/Blackspotted												
Rockfish Complex	33.0	25.2	1.4									
Sablefish	11.2	13.5	15.4	37.8	26.6	100.0	0.3	13.6	0.9			
Sandpaper Skate		2.5		0.4		2.6						
Sharpchin Rockfish					18.9	1.6			-	-	0.1	
Shortraker Rockfish												
Shortspine Thornyhead	21.1	26.3	31.4	0.8	18.9	5.7						
Silvergray Rockfish				8.5	24.2		78.6	37.6	43.0	4.3	11.3	
Slender Sole			0.1			0.2						
Southern Rock Sole								3.1	3.9	0.5	0.4	28.5
Splitnose Rockfish	0.5		0.6	17.0		40.3						
Spotted Ratfish	2.2	1.1		0.1	1.0	0.7	0.6	1.8	2.7	4.2	2.7	287.9
Walleye Pollock				2.9	6.3	1.6	4.2	-			28.1	-
Widow Rockfish				9.2	1.9							
Wolf Eel												
Yelloweye Rockfish										0.3		
Yellowmouth Rockfish				19.3	3837.8	13.5						
Yellowtail Rockfish				1.6	3.0		0.8					
Other	11.2	16.0	5.1	3.6	0.7	13.4	9.2	5.8	3.5	8.6	9.6	3.4
Total	601.3	450.5	312.5	3266.4	4952.7	317.7	144.2	109.3	169.1	41.0	76.9	355.3

Common Name	176	177	178	179	180	181	182	183	184	185	186	187
Arrowtooth Flounder			0.8	4.4	2.5	4.6	22.2	17.0	53.0		141.9	71.2
Aurora Rockfish												
Big Skate												
Bigfin Eelpout												
Bigmouth Sculpin												
Blackbelly Eelpout											0.1	
Bocaccio								0.2				
Canary Rockfish		0.5		2.8		7.4	2.9	6.9	26.0			4.0
Curlfin Sole	0.1	0.4	0.4									
Darkblotched Rockfish												
Dover Sole			0.8	0.5			0.6	10.1	0.3		8.9	2.0
English Sole	4.0	0.3	21.1	15.4	1.2	2.7	0.2	1.0			6.8	17.1
Eulachon												
Flathead Sole			0.5					6.2	0.7		0.4	
Greenstriped Rockfish						0.3	2.1	1.4	3.9			0.4
Harlequin Rockfish												
Lingcod	1.2	1.9		0.9			3.6	1.8	5.0		1.5	
Longnose Skate												
Longspine Thornyhead												
North Pacific Spiny Dogfish	0.9	2.9		2.9		12.0		1.7	1.2			2.3
Pacific Cod	0.4			7.4	5.9	74.2	3.4	0.5	7.1		8.0	3.9
Pacific Hake								38.7				
Pacific Halibut				7.9	3.4		11.1	6.7	5.9		5.5	6.1
Pacific Ocean Perch							0.1	6.1	17.2			19.9
Pacific Sanddab	2.8	1.4										
Petrable Sole			2.7	8.3	0.7	8.2	2.1	2.5	3.5		2.0	2.5
Pygmy Rockfish						0.2	0.6	0.1				
Quillback Rockfish	0.2	1.9										
Redbanded Rockfish									-		2.3	
Redstripe Rockfish						6.4	83.4	5.5	2.2		0.6	
Rex Sole	0.1		13.9	2.1	0.6	1.6	2.5	2.8	4.0		16.9	13.9
Rockfishes								0.1				
Rosethorn Rockfish												
Rougheye/Blackspotted												
Rockfish Complex												
Sablefish								39.0	2.9		471.6	10.4
Sandpaper Skate								1.0				
Sharpchin Rockfish			0.2			0.4	5.9		0.7			
Shortraker Rockfish												
Shortspine Thornyhead												
Silvergray Rockfish				80.4	8.4	170.7	51.4	199.1	101.8		252.3	121.9
Slender Sole			0.2	0.1				0.3			0.5	
Southern Rock Sole	12.2	12.9	1.9	3.2	0.6	3.8						
Splitnose Rockfish												
Spotted Ratfish	40.8	389.5	13.5	2.5		2.4	2.5	1.8	3.0			1.4
Walleye Pollock	2.8		0.3	2.3	0.4	0.6		39.0	1.2		4.4	16.7
Widow Rockfish						4.0						
Wolf Eel												
Yelloweye Rockfish							3.3					
Yellowmouth Rockfish												
Yellowtail Rockfish						46.2	8.9		1.7			1.4
Other	14.1	3.4	4.0	7.5	3.5	6.7	1.2	2.9	3.5		9.4	2.2
Total	79.4	415.0	60.1	148.5	27.2	352.3	208.0	392.4	244.9		933.2	297.2

Common Name	188	189	190	191	192	193	194	195	196	197	198	199
Arrowtooth Flounder	57.2	96.2	88.0	1.4	67.9	23.2	24.3	37.9	4.2			36.7
Aurora Rockfish												
Big Skate												
Bigfin Eelpout												0.1
Bigmouth Sculpin						5.9						
Blackbelly Eelpout									-			
Bocaccio												
Canary Rockfish												
Curlfin Sole												
Darkblotched Rockfish												
Dover Sole		1.3	152.9	0.6	3.5	4.7	10.0	8.3	3.4	4.1	7.5	5.3
English Sole	1.4	0.8	1.4		8.7	0.6	0.4	1.4				
Eulachon										-	0.4	0.1
Flathead Sole												
Greenstriped Rockfish	3.3	3.7	0.2		0.4							
Harlequin Rockfish												
Lingcod	1.9		3.9				3.2					
Longnose Skate		22.7		0.9				14.4		4.0	17.2	11.2
Longspine Thornyhead												
North Pacific Spiny Dogfish	2.6				10.7			2.5	3.0			
Pacific Cod	12.9	37.2	0.3			0.4						
Pacific Hake						5.4	0.1	-		99.4	42.0	1.3
Pacific Halibut	20.4						6.4	8.1			4.7	
Pacific Ocean Perch	15.9	24.3	32.1	5.8		128.0	120.3	140.2	390.5	41.8	5.0	4.2
Pacific Sanddab												
Petrale Sole	0.7	4.9	0.9			1.0	1.4					
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish		3.2	36.8	1.0	6.1	17.5	17.7	6.2	4.8			
Redstripe Rockfish	1.0	1.2						0.8				
Rex Sole	2.4	2.7	68.1	2.0	15.3	7.4	11.2	15.6	2.1			2.7
Rockfishes		-				-		-				
Rosethorn Rockfish	0.7	0.8										
Rougheye/Blackspotted												
Rockfish Complex	0.6	0.1							1.3		2.4	
Sablefish	1.0	14.6	6.1		2.1	17.8	22.9	11.5	16.2	78.8	82.1	159.2
Sandpaper Skate											2.1	
Sharpchin Rockfish	8.5	1.7		0.9			0.5		12.5			
Shortraker Rockfish												
Shortspine Thornyhead		0.5	4.7	0.5	0.6	3.2	24.1	5.0	18.0	9.6	18.7	20.7
Silvergray Rockfish	40.1	39.3	35.3	13.6	29.2	44.5		19.1	22.9			
Slender Sole	-		0.3				0.4	0.2				
Southern Rock Sole												
Splitnose Rockfish						0.3	1.6		2.7			
Spotted Ratfish	0.4	4.6	6.0			0.9	0.9	1.4	3.4	3.9	3.1	
Walleye Pollock	0.4	2.6	2.7	1.0	1.6	34.9	6.0	10.5	5.0			
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish	1.5	1.3		3.4								
Yellowmouth Rockfish												
Yellowtail Rockfish	1.4				2.4							
Other	24.9	2.3	4.0	3.9	2.5	4.5	1.2	2.5	5.5	11.1	14.7	0.5
Total	199.0	265.7	443.5	35.0	151.1	300.1	252.5	285.7	495.6	252.6	200.1	241.9

Common Name	200	201	202	203	204	205	206	207	208	209	210	211
Arrowtooth Flounder	35.3	10.5	5.9	0.2	-	0.1			9.7	20.2		
Aurora Rockfish												
Big Skate									0.9			
Bigfin Eelpout												
Bigmouth Sculpin												
Blackbelly Eelpout	0.1	0.1								-		-
Bocaccio			6.4		0.6					0.1		0.6
Canary Rockfish	2.1					1.6		1.0				
Curlfin Sole				0.7	0.9	3.2	0.4		1.7			1.8
Darkblotched Rockfish												
Dover Sole	2.9	11.6	0.3							26.1		0.1
English Sole	3.5		4.8	8.9	6.8	6.8			8.5	9.2		
Eulachon												
Flathead Sole										21.0		
Greenstriped Rockfish			4.1	1.0						0.6		
Harlequin Rockfish						0.3						
Lingcod				0.8		5.5	1.1	13.8	0.5			
Longnose Skate	4.0	2.9			1.8							
Longspine Thornyhead												
North Pacific Spiny Dogfish										2.9		
Pacific Cod			8.5							0.1		2.6
Pacific Hake	2.6	2.8										
Pacific Halibut						4.1		3.6	4.9			
Pacific Ocean Perch	3.1	66.6										
Pacific Sanddab				1.9	4.0	1.6	0.7	0.8	4.7	0.5		0.5
Petrale Sole	10.1	0.9	1.3	3.8	3.1	4.5						
Pygmy Rockfish			0.3				-					
Quillback Rockfish				0.2		2.9	1.1	12.3	0.8			19.9
Redbanded Rockfish	1.6	7.2										
Redstripe Rockfish			74.5	11.1						5.8		2.7
Rex Sole	8.9	1.8	14.3	1.2	1.0	0.6			2.4	64.0		
Rockfishes												
Rosethorn Rockfish		0.7										
Rougheye/Blackspotted												
Rockfish Complex		2.4										
Sablefish	6.4	15.9							1.9	662.9		
Sandpaper Skate	1.0											
Sharpchin Rockfish		1.1	1.8									
Shortraker Rockfish												
Shortspine Thornyhead	9.0	10.2										
Silvergray Rockfish	4.4		34.5									
Slender Sole		3.6	0.2	0.2						0.2		
Southern Rock Sole				15.5	15.6	4.2	0.5	4.7	22.9			2.0
Splitnose Rockfish		5.2										
Spotted Ratfish	0.1		3.0	2.1	6.7	16.3	7.3	14.4	1.7	4.1		60.3
Walleye Pollock	1.2	0.1	0.6	-	0.3					0.2		0.4
Widow Rockfish						0.4	-					
Wolf Eel												
Yelloweye Rockfish				0.1								0.6
Yellowmouth Rockfish												
Yellowtail Rockfish	1.7		6.4									
Other	8.4	3.4	-	2.0	0.7	14.2	6.5	7.0	4.4	0.3		34.6
Total	106.4	146.9	166.8	49.6	41.5	66.2	17.5	57.5	64.9	818.3		126.2

Common Name	212	213	214	215	216	217	218	219	220	221	222	223
Arrowtooth Flounder					0.1	23.2	48.8		30.3	74.7	2.0	10.9
Aurora Rockfish												
Big Skate					0.8							
Bigfin Eelpout										0.2		
Bigmouth Sculpin												
Blackbelly Eelpout						0.9	0.2			-		
Bocaccio	0.1		0.4		0.1	0.3	0.9			0.2		
Canary Rockfish									3.1	8.4	18.8	
Curlfin Sole	4.0	0.8	4.6	1.0	1.9							
Darkblotched Rockfish												
Dover Sole						1.8	2.5		4.5	15.4	4.4	
English Sole					3.0	1.5						
Eulachon												
Flathead Sole						9.8	2.9		0.2	2.2		
Greenstriped Rockfish							3.5		2.8	3.2		
Harlequin Rockfish												
Lingcod		6.2	2.6				10.9		4.3	4.0		
Longnose Skate											2.3	
Longspine Thornyhead												
North Pacific Spiny Dogfish						3.2						2.8
Pacific Cod	5.0	0.2			0.4		1.5			8.1	1.4	
Pacific Hake										1.7		6.6
Pacific Halibut		6.3		13.0								
Pacific Ocean Perch									0.6	19.8	749.5	528.3
Pacific Sanddab	0.1	2.5	3.1	6.7	11.1		-					
Petrale Sole						1.3			1.2			
Pygmy Rockfish										-		
Quillback Rockfish		-										
Redbanded Rockfish									1.8	4.8	37.0	3.1
Redstripe Rockfish	0.3						128.4		11.1	8.0		
Rex Sole					2.2	32.9	33.8		7.5	20.7	1.1	1.2
Rockfishes					-		-					
Rosethorn Rockfish									0.7	2.9	10.9	
Rougheye/Blackspotted												
Rockfish Complex											9.8	4.6
Sablefish						0.7	2.7		1.1	6.7	1.3	16.8
Sandpaper Skate			0.7			1.0					7.1	
Sharpchin Rockfish							8.8		13.3	18.5	549.4	4.8
Shortraker Rockfish											31.9	
Shortspine Thornyhead									0.3	3.6	55.0	15.4
Silvergray Rockfish						9.8	59.0		10.0	17.7	17.2	
Slender Sole						1.3	0.8		0.1	0.6		
Southern Rock Sole	3.5	22.2	14.1	3.7	18.4	3.5						
Splitnose Rockfish	115.2											
Spotted Ratfish	4.6	37.7	33.2	4.5			0.8		0.4	1.1	1.2	2.1
Walleye Pollock		0.1	0.7	0.1	0.1	2.6	1.9			0.8		
Widow Rockfish												
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish									63.1	125.7	306.9	3.4
Yellowtail Rockfish							8.6					
Other	8.0	4.0	1.7	0.7	1.0	3.8	3.5		4.1	9.4	2.0	0.7
Total	140.8	80.0	61.2	29.7	38.9	97.8	319.4		160.4	358.4	1809.1	600.6

Common Name	224	225	226	227	228	229	230	231	232	233	234	235
Arrowtooth Flounder	3.3	10.8	2.3	1.3	56.7	7.5	10.5			0.9		
Aurora Rockfish												
Big Skate												
Bigfin Eelpout												
Bigmouth Sculpin											6.2	
Blackbelly Eelpout												
Bocaccio												
Canary Rockfish						81.7	16.9					2.1
Curlfin Sole												
Darkblotched Rockfish										14.6	3.4	
Dover Sole	8.2	10.1	3.2	8.9		0.7	0.4		6.0	3.9	4.8	0.4
English Sole												
Eulachon												
Flathead Sole												
Greenstriped Rockfish					38.8	19.8	5.4	1.0				
Harlequin Rockfish							0.5					
Lingcod					14.4							
Longnose Skate	5.4		1.7				6.9				4.3	
Longspine Thornyhead								7.1	14.6			
North Pacific Spiny Dogfish						2.7	1.3					
Pacific Cod												
Pacific Hake	7.0	11.3	91.2	26.6	1.0				2.2	1.0	12.3	4.1
Pacific Halibut					8.2							
Pacific Ocean Perch	351.3	310.8	38.7	33.3	2.5	124.0	139.9		2.6	334.6	111.1	172.5
Pacific Sanddab												
Petrale Sole					18.8	1.7	0.8					
Pygmy Rockfish						0.1						
Quillback Rockfish												
Redbanded Rockfish	3.8	4.9	1.5			85.4	4.2		0.7	2.2	3.8	2.1
Redstripe Rockfish						56.0	19.4			11.9	3.5	2.6
Rex Sole	1.0	1.3	1.1	5.4		13.0	12.0			7.0	6.5	2.8
Rockfishes							-	0.1				
Rosethorn Rockfish						3.1	2.7			5.8		11.3
Rougheye/Blackspotted												
Rockfish Complex	16.6	28.9	7.7	11.4		2.3		0.9	17.0	13.0		
Sablefish	54.3	27.3	119.3	74.4		23.3	14.9	17.7	71.2	18.8	23.2	6.8
Sandpaper Skate			3.6									
Sharpchin Rockfish		2.8			1.2	16.0	11.6			0.9		124.1
Shortraker Rockfish	10.1			7.6					13.3			
Shortspine Thornyhead	50.3	114.5	10.0	9.8		3.0	2.4	11.4	23.3	29.8	24.2	7.8
Silvergray Rockfish		2.1			3.4	43.7	32.6			1.4		
Slender Sole		0.1			-	0.3	0.5			0.4		
Southern Rock Sole												
Splitnose Rockfish			0.8							1319.7	757.4	53.3
Spotted Ratfish	1.8	1.2	6.1	0.2	3.0		2.2			1.1	0.6	
Walleye Pollock					4.8	2.1	4.7				1.9	
Widow Rockfish						2.7	1.6			6.9		
Wolf Eel												
Yelloweye Rockfish							4.9					
Yellowmouth Rockfish		1.8				126.1	38.5			87.5	20.7	15.5
Yellowtail Rockfish												
Other	0.8	2.2	8.0	8.0	3.9	4.4	4.0	1.6	6.5	9.9	3.4	11.5
Total	513.7	530.0	295.2	186.9	156.6	619.6	338.7	39.8	157.4	1871.2	987.3	416.8

Common Name	236	237	238	239	240	241	242	243	244	245	246	247
Arrowtooth Flounder	1.4	2.7	1.6	3.5					1.3	1.4		2.3
Aurora Rockfish												
Big Skate												
Bigfin Eelpout	0.6		0.7									
Bigmouth Sculpin		2.7										2.7
Blackbelly Eelpout											1.0	0.1
Bocaccio		13.3	3.9						0.2	0.8		
Canary Rockfish								1.5	0.3			
Curlfin Sole												
Darkblotched Rockfish	1.2											
Dover Sole	7.1	0.4	25.9	1.5							8.3	36.9
English Sole									4.4	0.9		
Eulachon												
Flathead Sole												
Greenstriped Rockfish		10.5		0.2	1.0		0.9				6.5	3.7
Harlequin Rockfish												
Lingcod		3.5						6.3	5.4		9.9	
Longnose Skate			13.4								1.5	4.4
Longspine Thornyhead												
North Pacific Spiny Dogfish								2.0				
Pacific Cod		1.2		0.3				-				
Pacific Hake	26.3	124.8	17.0	5.0					1.3			0.8
Pacific Halibut		20.2					7.7	4.6	12.9			
Pacific Ocean Perch	86.6	2000.2	120.2	275.4	9.3						217.6	452.4
Pacific Sanddab								-				
Petrale Sole									-			
Pygmy Rockfish							0.1		0.2	-		
Quillback Rockfish								10.8	4.3			
Redbanded Rockfish	9.9	9.0	5.3	2.9							1.4	9.8
Redstripe Rockfish		3.4		3.3			0.4	1.2	5.6	11.5	4.4	
Rex Sole	15.5	8.3	41.8	1.7	2.9		0.2		2.0	0.6	21.1	11.6
Rockfishes												
Rosethorn Rockfish	13.4	1.6	0.5	10.1	0.8		0.6	0.4		1.1		4.6
Rougheye/Blackspotted												
Rockfish Complex	190.1	171.9	16.9	17.7								
Sablefish	10.8	12.5	29.9	67.7							14.9	4.9
Sandpaper Skate			0.8									
Sharpchin Rockfish	3.6	73.4	2.1	232.2	5.4		2.9			2.2	24.5	79.5
Shortraker Rockfish												
Shortspine Thornyhead	35.2	0.6	46.2	23.8	2.5			0.2			1.1	18.8
Silvergray Rockfish		6.4		1.2				0.8	5.0		1.8	7.6
Slender Sole	0.1				0.1				-		0.7	0.7
Southern Rock Sole							0.9	12.5	1.7			
Splitnose Rockfish	0.7		0.4								168.8	192.4
Spotted Ratfish	3.3	0.4	2.6	4.2				2.1	3.7	0.6	1.8	6.0
Walleye Pollock		10.2							2.0		1.1	
Widow Rockfish		15.3										
Wolf Eel												
Yelloweye Rockfish		13.6					5.6		3.4			
Yellowmouth Rockfish	3.4	1599.9	17.7	676.4	15.3						160.6	69.5
Yellowtail Rockfish												
Other	3.3	1.8	4.7	2.2	1.2		0.4	3.1	1.5	1.3	1.7	5.2
Total	412.5	4108.0	351.2	1329.3	38.5		19.6	45.5	55.3	20.3	648.5	914.0

Common Name	248	249	250	251	252	253	254	255	256	257	258	259
Arrowtooth Flounder		0.9	1.7	2.7		1.8			0.2	0.6	5.4	6.9
Aurora Rockfish							8.2	0.5				1.7
Big Skate					8.8							
Bigfin Eelpout												
Bigmouth Sculpin												
Blackbelly Eelpout			0.3			0.6				0.3		
Bocaccio												
Canary Rockfish										1.8		
Curlfin Sole												
Darkblotched Rockfish	0.6	25.4	214.9	2.9	1.0	80.5						
Dover Sole	0.6		4.7	19.7	1.4	53.0	17.1		0.6	13.2	5.1	11.3
English Sole												
Eulachon											0.2	
Flathead Sole												
Greenstriped Rockfish	0.3											
Harlequin Rockfish												
Lingcod											3.5	
Longnose Skate	1.1					4.4				4.8		
Longspine Thornyhead							25.6					
North Pacific Spiny Dogfish												
Pacific Cod									0.8	1.7		
Pacific Hake		103.3	69.0	22.4	8.0	263.0	5.5	0.7		3.5	12.5	7.3
Pacific Halibut		11.0										
Pacific Ocean Perch	74.7	1216.2	605.2	209.0	297.8	478.7	32.7	100.0	346.4	64.7	93.4	206.7
Pacific Sanddab												
Petrale Sole												
Pygmy Rockfish												
Quillback Rockfish												
Redbanded Rockfish			27.8	5.7	0.2	7.2			1.2	1.1	8.2	1.6
Redstripe Rockfish					24.9	2.4						
Rex Sole	0.6	0.6	0.4	7.2	2.0	13.7	0.8			2.6		0.6
Rockfishes	0.1				-							
Rosethorn Rockfish	0.4	10.3	12.4	2.8	7.6	0.6		5.5	3.5			1.7
Rougheye/Blackspotted												
Rockfish Complex				22.5		3.4	78.1	41.9		0.8	10.3	3.7
Sablefish		28.4	6.4	25.3	14.1	18.8	69.3	2.1		8.0	2.4	2.5
Sandpaper Skate			1.4				3.5					
Sharpchin Rockfish	15.1	20.9			0.5			17.3	24.8			
Shortraker Rockfish							5.5					
Shortspine Thornyhead	1.4	24.7	49.1	46.2	29.2	48.9	16.8	8.8	1.0	34.3	37.9	20.6
Silvergray Rockfish	3.4											
Slender Sole			0.3	0.3	-	0.5						
Southern Rock Sole												
Splitnose Rockfish	13.2	1217.1	1432.6	35.0	678.2	100.8		0.3		41.1	12.1	
Spotted Ratfish		1.0	3.1	2.1	1.1	2.5	1.6			5.3	12.3	1.4
Walleye Pollock												
Widow Rockfish					12.8							
Wolf Eel												
Yelloweye Rockfish												
Yellowmouth Rockfish	4.8	352.3	211.0	6.7	280.4	30.7		55.9	194.5	11.0	1.5	0.9
Yellowtail Rockfish												
Other	2.9	3.6	1.0	1.9	1.8	34.7	9.0	2.8	0.2	13.6	5.6	8.0
Total	119.0	3015.5	2641.0	412.5	1369.8	1146.4	273.8	236.8	574.1	206.6	210.3	274.8

Common Name	260	261	262	263	264	265	266	267	268	269
Arrowtooth Flounder	12.7	29.7	69.3	13.4	11.8	42.6	17.9	12.8	74.2	158.2
Aurora Rockfish										
Big Skate										
Bigfin Eelpout							0.5			
Bigmouth Sculpin	4.8									
Blackbelly Eelpout		0.3	0.1	0.1	-	-		0.1		
Bocaccio					8.0	4.3	0.1			13.2
Canary Rockfish		19.1	15.9	10.0	33.1	25.0			3.5	12.5
Curlfin Sole										
Darkblotched Rockfish								0.6		
Dover Sole	3.2	10.3	22.9	4.0	7.7	30.2	19.9	16.3	1.7	2.2
English Sole							0.4		1.6	7.0
Eulachon										
Flathead Sole		21.6	3.9			31.4	4.1	4.6	0.9	3.6
Greenstriped Rockfish		2.7	15.9	4.1	3.8	6.3	0.8		0.1	0.4
Harlequin Rockfish										
Lingcod		5.1								
Longnose Skate	2.3	6.3			8.6	0.5		12.1		
Longspine Thornyhead										
North Pacific Spiny Dogfish		5.1						0.9		1.7
Pacific Cod		4.0		3.2	7.3	0.7	2.0		10.4	30.3
Pacific Hake	4.8	1.4	4.1		1.0	2.0	46.8	10.2	0.6	1.8
Pacific Halibut									5.4	
Pacific Ocean Perch	652.3	527.1	123.1	130.8	88.2	1321.0	181.9	303.7	121.3	10.9
Pacific Sanddab										
Petrable Sole			2.0							2.0
Pygmy Rockfish										
Quillback Rockfish										
Redbanded Rockfish	17.1	17.0	14.2	15.6	20.3	1.1	4.9	3.9		
Redstripe Rockfish		2.6	0.3	1.4	0.8	45.2	0.4	2.0	14.7	3.2
Rex Sole	4.0	8.2	15.8	2.4	3.2	25.0	37.0	43.0	2.8	2.2
Rockfishes										
Rosethorn Rockfish	37.1	0.2	2.7	1.6	1.5	0.1				
Rougheye/Blackspotted										
Rockfish Complex	2.5									
Sablefish	17.6	2.1	11.4		1.0	8.9	2.8	6.4	11.9	7.9
Sandpaper Skate					0.8					
Sharpchin Rockfish			29.2	16.6	29.5	6.6	0.2			
Shortraker Rockfish										
Shortspine Thornyhead	97.1	2.2	8.4	5.7	7.7	2.8	9.8	0.3		
Silvergray Rockfish		48.1	47.7	17.3	9.4	77.7	7.6	1.3	21.3	3861.5
Slender Sole		1.0	2.0	0.3	0.4	0.5	0.5	1.4		
Southern Rock Sole										
Splitnose Rockfish	104.6	2.2								
Spotted Ratfish			1.9	0.2	0.2	1.1		1.3	0.9	4.7
Walleye Pollock	1.7					32.0	26.3	49.5	16.2	6.5
Widow Rockfish		1.8	1.9			4.0				1.1
Wolf Eel										
Yelloweye Rockfish			3.2							
Yellowmouth Rockfish	3.5	117.3	17.3	105.7	191.0	866.2	19.7	10.3	5.8	2.1
Yellowtail Rockfish		23.5	1.7			1.0		5.3		64.2
Other	13.7	2.2	8.5	1.7	3.7	1.3	2.2	-	1.3	2.8
Total	978.9	861.3	423.4	334.1	439.1	2537.4	385.9	485.9	294.4	4200.0