Summary of the West Coast Vancouver Island Synoptic Bottom Trawl Survey, May 22 - June 16, 2012

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V9T 6N7

2017

Canadian Manuscript Report of Fisheries and Aquatic Sciences 3139

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Canadian Manuscript Report of Fisheries and Aquatic Sciences

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Cat. No. 97-4/3139E-PDF 978-0-660-23980-4 ISSN 1488-5387

Correct citation for this publication:

Williams, D.C., Nottingham, M.K., Olsen, N. and Wyeth, M.R. 2017. Summary of the West Coast Vancouver Island synoptic bottom trawl survey, May 22 - June 16, 2012. Can. Manuscr. Rep. Fish. Aquat. Sci. 3139: viii + 57 p.

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ABSTRACT

Williams, D.C., Nottingham, M.K., Olsen, N. and Wyeth, M.R. 2017. Summary of the West Coast Vancouver Island synoptic bottom trawl survey, May 22 - June 16, 2012. Can. Manuscr. Rep. Fish. Aquat. Sci. 3139: viii + 57 p.

A bottom trawl survey of the west coast of Vancouver Island was conducted on the Canadian Coast Guard Ship W. E. Ricker between May 22 and June 16, 2012. The West Coast Vancouver Island synoptic bottom trawl survey was first conducted in 2004, and has been repeated every second year since. 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. One hundred and fifty-one (75 %) of the 201 blocks assessed 2012 were successfully fished. The mean catch per tow was 710 kg with 11-51 species per tow. The average number of species per tow was 25. The most abundant fish species encountered was North Pacific Spiny Dogfish (*Squalus suckleyi*) followed by Redstripe Rockfish (*Sebastes proriger*), Pacific Ocean Perch (*Sebastes alutus*), Arrowtooth Flounder (*Reinhardtius stomias*) and Sharpchin Rockfish (*Sebastes zacentrus*). Biological data including individual length, weight, sex, maturity, and ageing structures were collected from selected species. Samples were collected from a total of 73 different species of fish. Oceanographic data, including water temperature, depth, salinity, and dissolved oxygen were also recorded for most tows.

RÉSUMÉ

Williams, D.C., Nottingham, M.K., Olsen, N. and Wyeth, M.R. 2017. Relevé synoptique au chalut de fond de la côte ouest de l'île de Vancouver, du 22 mai au 16 juin 2012. Rapp. manus. can. sci. halieut. aquat. 3139 : viii + 57 p.

Un relevé au chalut de fond de la côte ouest de l'île de Vancouver a été effectué par le navire de la Garde côtière canadienne *W. E. Ricker* entre le 22 mai et le 16 juin 2012. Le premier relevé synoptique au chalut de fond de la côte ouest de l'île de Vancouver a été réalisé en 2004, puis on a répété l'opération tous les deux ans depuis. Le relevé de la côte ouest de l'île de Vancouver 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 201 blocs choisi en 2012, 151 (75 %) ont fait l'objet d'une pêche avec succès. La moyenne de prises par trait était de 710 kg, avec entre 11 et 51 espèces capturées par trait. Le nombre moyen d'espèces par trait était de 25. Les espèces de poissons capturées le plus fréquemment étaient l'aiguillat commun du Pacifique Nord (*Squalus suckleyi*), suivi du sébaste à raie rouge (*Sebastes proriger*), du sébaste à longue mâchoire (*Sebastes alutus*), de la plie à grande bouche (*Reinhardtius stomias*), et du sébaste à menton pointu (*Sebastes zacentrus*). On a recueilli les données biologiques des espèces sélectionnées, notamment la longueur, le poids, le sexe, la maturité et la structure par âge. Les échantillons ont été prélevés sur un total de 73 espèces de poissons différentes. Les données océanographiques, 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.

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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, as an initial step, 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.

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

The first WCVI synoptic bottom trawl survey was successfully completed in 2004 (Workman et al. 2008a) and has been repeated every second year since. This document provides a brief summary of the results and methods from the fifth WCVI synoptic bottom trawl survey which occurred between May 22 and June 16, 2012. It is not intended as a comprehensive review of the survey, nor does it provide interpretive analysis of the survey results. Previous WCVI synoptic bottom trawl surveys are summarized in Workman et al. 2008a, Workman et al. 2008b, Olsen et al. 2009 and Wyeth et al. 2016.

METHODS

SURVEY DESIGN

The survey area is the west coast of Vancouver Island from approximately 49° 12' to 50° 36' North latitude and approximately 124° 48' to 128° 30' West longitude. The southern boundary is contiguous with the Canada/U.S. boundary (Figure 1).

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 WCVI synoptic bottom trawl survey are 50-125 m, 125-200 m, 200-330 m, and 330-500 m (Table 1). For each survey in the WCVI series, blocks are randomly selected within each depth 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 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 is 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 tow in each strata should match the initial target allocation that was modeled based on the commercial fishing data.

Canadian Coast Guard research vessel time is allocated amongst various users so each year only a set number of days are available for the synoptic bottom trawl surveys. The operational model that is used for chartered vessels will not work in such a scenario. Instead, we try to fish as many blocks as possible while maintaining the target relative allocation of tows amongst strata. First, the total number of blocks that can be assessed in the number of available fishing days is estimated. Then, using the target relative allocation of tows and the predicted failure and revisit rates, various total "target"

numbers of tows are tested until the total allocated blocks matches the number of blocks that can be assessed in the time available.

As indicated above, the start and end dates for trips on Canadian Coast Guard ships are determined in advance. However, it may not be possible to fish on some days due to weather, mechanical breakdowns, or unforeseen events such as responding to search and rescue calls. Those days are lost, so if the entire set of selected blocks is started and it is not possible to fish on a number of days, part of the survey area could be missed. To avoid such a situation, the selected blocks are divided into a primary set and a secondary set. The primary set consists of two-thirds of the total blocks and is visited first. In early years of the survey, both the primary and secondary tows of blocks were created before the start of the survey. The primary set was visited first and then the secondary set would be visited once the primary set was almost completed. The secondary set could be adjusted by randomly either adding or removing blocks, depending on the remaining fishing days. This method invariably created some confusion on board the vessel when the secondary set was adjusted mid-trip. In 2011, the practice was slightly altered. Improvements to the at-sea software facilitated the generation of blocks so at the start of the survey only the primary set of blocks was created. The secondary set of blocks was then added once the primary set was nearly complete. The number of blocks in secondary set would be based on the number of remaining fishing days.

For the 2012 WCVI survey, 207 blocks were randomly selected based on 9 blocks a day and 23 days available for fishing (Table 3). The primary set consisted of 138 blocks while the secondary set was anticipated to be 69 blocks.

VESSEL

The survey was conducted aboard the Canadian Coast Guard Ship W.E. Ricker, a 58 m research stern trawler (Figure 2).

FISHING GEAR

The research trawl was an Atlantic Western IIA box trawl net connected to 1,100 kg U.S.A. Jet doors (Figure 3). The net was thoroughly cleaned between tows to prevent cross-contamination of catches. The net was also inspected for damage after every tow. If the net was damaged, it was repaired and restored to its original dimensions prior to resuming fishing. Two nets were rigged at the start of the survey so that if one net was damaged beyond what could be immediately repaired, the second one could be used.

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

The Rockhopper footgear includes flying wing, mid wing, bunt wing, and bosom sections (Figure 8). The bosom section is built from 16 inch diameter (worn 18 inch) aircraft tires, while the bunt and mid wing sections have 16 inch Rockhopper disks. The flying wings have 5 inch rubber disks with swivel center 16 inch solid bunt bobbins at each end.

The specifications of net and footgear components are shown in Table 2 and dimensions for the assembled trawl pieces are shown in Figure 6 through Figure 8.

SCHEDULE

The survey was split into three sections or "legs" of 7-11 days in duration with seven science staff on each. Science crew changes were on May 29 and June 5 (Table 3).

FISHING PROTOCOL

Fishing operations were carried out based on the ship's 12 hour crew rotation commencing at approximately 0700 hrs and ending at approximately 2000 hrs each day. By following this schedule, survey fishing was limited to daylight hours. Catch processing often continued after fishing operations were completed for the day.

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

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

The target tow length was 20 minutes long. The tow start was intended to be 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. However, the net mensuration system was not functioning properly during the 2012 survey, so the fishing master's experience was used to estimate when the net reached the sea floor. After 19 minutes had elapsed, net haul back was initiated. The extra minute was intended to account for uptake of slack in the main warps. Although the target on-bottom time was 20 minutes, tows that were at least 14 minutes in length were accepted. This was a pragmatic decision that allowed for

retention of many tows that would otherwise have been unusable due to hang-ups or early haul-backs.

Tows were conducted at a target speed of 2.8 to 3.0 nautical miles per hour (5.2 - 5.6 km/hr). When retrieving the net, the 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." The vessel would then move on to the next selected block.

The result of trawling was either a useable or unusable tow. The most common reasons for deeming a tow unusable were a hang-up of the fishing gear, tear-up of the trawl net, or not achieving the minimum bottom contact time. In the event of an unusable tow, additional attempts to fish the block could be made at either the same location or a different location within the block. Alternatively, the block could be deemed unfishable, in which case it was rejected.

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

Fishing Data

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

CATCH PROCESSING

At the end of each tow the net was retrieved and the catch dumped into a hopper which emptied into the wetlab below the trawl deck. Catch was sorted in the wetlab 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 2000 kg or for catches with large numbers of small individuals, some method of

total catch estimation and sub-sampling for species composition was conducted. The specific method of catch estimation and sub-sampling varied based on the total weight and volume of the catch being subsampled as well as the composition of the catch. Large catches were typically visually estimated, although volumetric estimates were sometimes used. In all cases a representative sample of the catch was sorted to determine species composition and to provide individuals for biological sampling.

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

BIOLOGICAL SAMPLING

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

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

There are a variety of hard parts of a fish that can be used to determine the age of the fish (Chilton and Beamish 1982). The specific structure that provides the most accurate and efficient estimate of age varies by species but all the structures have the common trait of a series of annular rings that can be counted. Sagittal otoliths (calcareous accretions of the inner ear) were collected from rockfish and flatfish species while fin rays were taken from Walleye Pollock (*Theragra chalcogramma*), Lingcod (*Ophiodon elongatus*) 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 2012, spines and vertebrae were collected from small North Pacific Spiny Dogfish (*Squalus suckleyi*) and otoliths were collected from Pacific Cod (*Gadus macrocephalus*).

Until the mid-2000s, Rougheye Rockfish (*Sebastes aleutianus*) was considered to be a single, highly variable species with light and dark colour morphs. Genetic and morphological analysis has confirmed that there are two distinct species (Orr and Hawkins 2008): Rougheye Rockfish (*S. aleutianus*) and Blackspotted Rockfish (*S. melanostictus*). Historical biological and catch information for *S. aleutianus* must now be considered to be the aggregate of both species. During the 2008 WCHG survey an attempt was made to differentiate between the two species. That preliminary work showed that the two species cannot be reliably distinguished in the field because the morphological characteristics overlap. Further, there is evidence that the two species hybridize (Gharrett et al. 2005). Given that the historical data is recorded as *S. aleutianus* and that attempting to separate the species at the catch level is both time consuming and unreliable, starting in the fall of 2010, the catch for all surveys was simply recorded as *S. aleutianus*. Then, for every catch, biological samples were collected that included both a visual assessment of the species (*S. aleutianus* or *S. melanostictus*) as well as a tissue sample for genetic confirmation of the species. The survey catch data can then be partitioned into the two species using either the visual assessment or the results of genetic analyses. We do not attempt to partition the catch data for this report.

NET-MOUNTED SENSORS AND DATA RECORDERS

The W.E. Ricker is equipped with a Simrad ITI 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 and wingspread which are used to calculate swept area. Typically all the values reported by the system are logged during the survey and the output can be monitored in real-time during fishing operations. The ITI system was not functioning properly during the 2012 survey and very little useable data were obtained.

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

A Seabird SBE39 temperature and pressure recorder (TDR) was attached to the starboard wing of the trawl. A Seabird SBE19plus recorder (CTD) 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 values (Seabird, 2012). The SBE39 was activated prior to the first tow of the day and turned off after the last tow of the day, while the SBE19plus and SBE43 were turned on and off manually before and after each tow.

All data recorders were downloaded at the end of each day.

DATA RECORDING

All the fishing, catch, and biological data were recorded directly into a Microsoft SQL Server database. 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 database called "GFBIO", maintained at the Pacific Biological Station in Nanaimo, BC.

RESULTS

FISHING

The 2012 WCVI synoptic bottom trawl survey was divided into three legs of 7-11 days each. From a total of 28 allotted survey days, four days were required for travel, one day was required for a science crew change, one partial day was lost due to unfishable weather conditions, one partial day was required to investigate a reported sighting of a deceased whale, and two partial days were required for vessel crew changes and gear loading/unloading at the start and end of the survey (Table 3).

The initial plan was to assess 207 blocks. However, after completing the primary set of blocks it was clear that there was insufficient time remaining to complete the anticipated secondary set of 69 blocks. Therefore, the secondary set that was actually added consisted of 63 blocks.

From the adjusted target of 201 blocks, one block was left un-inspected and un-fished due to time constraints at the end of the survey. Two blocks were thought to have useable tows during the survey but review of the BCS traces indicated that they did not have sufficient bottom contact time. The tows were re-coded as unusable and the blocks remain in the sampling frame as unassessed. Of the 198 assessed blocks, 151 were successfully fished, 15 were rejected based on the fishing master's prior knowledge, 31 were rejected based on on-ground inspections, and one was rejected after one or more failed fishing attempts (Table 4 and Figure 9).

A total of 157 tows, of which 151 were useable, were completed during the 23 days that fishing occurred. Table 5 shows tow results by stratum for this survey. Six tows were not useable due to hang-ups, tear-ups or insufficient bottom time The scope (ratio of warp length to bottom depth) used for tows in 2012 is shown in Table 6 and Figure 10. Complete information for each tow including date, duration, location, average depth, average speed, warp, total catch weight and usability is presented in Appendix A.

CATCH

A total of 109,192 kg of fish and invertebrates was caught during the 2012 WCVI survey. The total catch weight for useable tows was typically less than 1,000 kg per tow and averaged 703 kg per tow (Figure 11). The majority of the catch (108,127 kg, 99.0%) consisted of 116 different species of fish, including 30 rockfish and 15 flatfish species. The remainder (1065 kg) consisted of 141 invertebrate groups. The average number of species identified in useable tows was 17 and ranged from six to 27 per tow (Figure 12). The frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species are shown in Table 7. Of the fish species caught, North Pacific Spiny Dogfish (*Squalus suckleyi*) was the most dominant by weight, followed by Redstripe Rockfish (*Sebastes proriger*), Pacific Ocean Perch (*Sebastes alutus*), Arrowtooth Flounder (*Reinhardtius stomias*) and Sharpchin Rockfish (*Sebastes zacentrus*). Catch weights by tow for the 50 most commonly encountered species in this survey are included in Appendix B.

BIOLOGICAL SAMPLES AND SPECIMENS

Biological samples were collected from a total of 31,913 individuals of 73 species of fish. The number of samples and recorded biological attributes per species is shown in Table 8. A summary of the biological data collected for each species is shown in Table 9.

NET-MOUNTED SENSORS AND DATA RECORDERS

As previously mentioned, the Simrad ITI Trawl System was not functioning properly in 2012 and no useable data were collected.

Seabird SBE39 data (water temperature and depth) and Seabird SBE19plus and SBE43 data (conductivity, water temperature, depth and dissolved oxygen) were collected from 182 tows (Table 10 and Figure 13).

BCS data were collected from 171 tows (Table 10). An example of data collected by the BCS is shown in Figure 14.

Global positioning system (GPS) data and bottom sounder data are available for all 182 tows.

ACKNOWLEDGEMENTS

Thank-you to the captain and crew of the CCGS W.E. Ricker and the science staff that participated in the survey.

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Table 1. The 2012 WCVI 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).

Depth Stratum (m)	Target Allocation	Target Tows	Predicted Adjustment	Total Block Allocation	Primary Set	Secondary Set	Revised Secondary Set
50 – 125	0.37	56	0.34	85	57	28	26
125 – 200	0.31	48	0.22	62	41	21	19
200 – 330	0.18	28	0.15	33	22	11	10
330 – 500	0.13	20	0.27	27	18	9	8
Total	**1.00**	**152**		**207**	**138**	**69**	**63**

Table 2. Atlantic Western IIa box trawl net specifications for the 2012 WCVI 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 netting	4 inch double 5 mm orange braided polyethylene
Codend liner	½ inch 210/20 knotless nylon
Floats	8 inch diameter center hole rated to 2000 m
Net frame chain	11 mm long link (64 mm inner length) grade 80 steel chain
Net frame rope	1 inch 3-strand twisted Polysteel
Net frame rope to chain lashing	3/8 inch 3-strand twisted Esterpro
Riblines	1 ¼ inch 3-strand twisted Polysteel
Footgear bosom	16 inch diameter tires (worn 18 inch aircraft tires)
Rubber spacers	4 inch, 5 inch, and 6 inch diameter disks cut from tires
Footgear wing center chain	16 mm mid link (65 mm inner length) grade 80 steel chain
Footgear wing top chain	11 mm long link (64 mm inner length) grade 80 steel chain
Rockhopper disk	16 inch diameter
Solid rubber bunt bobbin with steel tube center	16 inch diameter by 10 inch
Steel toggles	5 inch diameter by 3 inch long with 13 inches of chain (from center of toggle)

Table 3. Summary of operations during the 2012 WCVI synoptic bottom trawl survey.

	Fishing				Tows			Notes
Date	Start	End	Hours	Blocks Assessed	Useable	Not Useable	Total	
05/22/2012	-	-	-	-	-	-	-	half day vessel crew change/load and / travel
05/23/2012	11:17	19:01	8	6	6	0	6	half day travel
05/24/2012	7:10	17:54	10	10	9	0	9	
05/25/2012	7:06	16:38	9	12	6	0	6	
05/26/2012	7:12	18:55	11	7	7	1	8	
05/27/2012	7:24	19:24	12	10	8	0	8	
05/28/2012	7:00	19:00	12	9	9	0	9	
05/29/2012	7:09	18:33	11	6	6	0	6	crew change Ucuelet
05/30/2012	7:30	16:53	9	8	8	0	8	
05/31/2012	7:04	18:09	11	8	9	0	9	
06/01/2012	7:04	9:16	2	2	2	1	3	fishing gear repairs
06/02/2012	9:40	19:36	10	10	8	0	8	late start from repairs
06/03/2012	7:02	14:41	7	7	7	0	7	
06/04/2012	7:21	18:53	11	9	9	0	9	
06/05/2012	-	-	-	2	-	-	-	crew change Gold River
06/06/2012	7:06	18:08	11	10	9	0	9	
06/07/2012	14:50	18:58	4	4	2	2	4	partial weather day
06/08/2012	6:59	15:12	9	16	6	0	6	
06/09/2012	7:56	15:31	8	14	7	0	7	7 blocks added to survey
06/10/2012	9:06	9:26	0	8	1	0	1	many blocks rejected
06/11/2012	7:03	17:56	10	10	9	0	9	
06/12/2012	7:07	18:36	11	10	7	2	9	
06/13/2012	13:52	19:25	6	4	3	0	3	delayed start
06/14/2012	7:37	18:08	11	10	6	1	7	
06/15/2012	7:06	19:39	12	9	5	1	6	investigate dead whale
06/16/2012	-	-	-	-	-	-	-	travel
06/17/2012	-	-	-	-	-	-	-	arrival at destination
06/18/2012	-	-	-	-	-	-	-	scheduled maintenance
06/19/2012	-	-	-	-	-	-	-	half day vessel crew change/ unload
Total				**201**	**151**	**6**	**157**	
Average Per Day				**8.**	**6.6**	**0.3**	**6.8**	

Table 4. Block results by stratum for the 2012 WCVI synoptic bottom trawl survey.

Depth Stratum (m)	Successful	Rejected Prior	Rejected Inspected	Rejected Failed	Not Rejected Failed	Not Assessed	Total
50-125	60	4	17	1	1	0	83
125-200	46	7	7	0	0	0	60
200-330	25	2	4	0	1	0	32
330-500	20	2	3	0	0	1	26
Total	**151**	**15**	**31**	**1**	**2**	**1**	**201**

Table 5. Tow results by stratum for the 2012 WCVI synoptic bottom trawl survey.

Depth Stratum (m)	Useable	Not Useable
50-125	60	2
125-200	46	1
200-330	25	2
330-500	20	1
Total	**151**	**6**

Table 6. Mean warp length and scope by 50 meter depth interval for the 2012 WCVI synoptic bottom trawl survey.

Depth (m)	Mean Warp (m)	Mean Scope
0-50	125	2.84
50-100	210	2.90
100-150	328	2.68
150-200	447	2.67
200-250	535	2.45
250-300	688	2.49
300-350	786	2.44
350-400	904	2.45
400-450	892	2.16
450-500	1050	2.23

Table 7. Frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species captured during the 2012 WCVI 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**				
Yellowtail Rockfish	*Sebastes flavidus*	81	1658.92	101.56	8226.10
Greenstriped Rockfish	*Sebastes elongatus*	69	119.69	20.07	1385.08
Pacific Ocean Perch	*Sebastes alutus*	64	2364.62	168.59	10789.67
Sharpchin Rockfish	*Sebastes zacentrus*	64	4268.25	154.18	9250.82
Canary Rockfish	*Sebastes pinniger*	51	1948.69	63.00	3213.12
Rosethorn Rockfish	*Sebastes helvomaculatus*	51	262.15	10.75	548.10
Redbanded Rockfish	*Sebastes babcocki*	48	198.70	15.65	751.16
Silvergray Rockfish	*Sebastes brevispinis*	47	3289.54	104.12	4893.69
Redstripe Rockfish	*Sebastes proriger*	45	7597.92	274.24	12066.58
Shortspine Thornyhead	*Sebastolobus alascanus*	43	99.12	21.01	903.49
Yellowtail Rockfish	*Sebastes flavidus*	42	352.07	43.00	1805.86
Splitnose Rockfish	*Sebastes diploproa*	40	1452.20	165.98	6307.33
Rougheye Rockfish	*Sebastes aleutianus*	30	152.68	16.63	498.98
Darkblotched Rockfish	*Sebastes crameri*	26	195.24	24.71	617.78
Pygmy Rockfish	*Sebastes wilsoni*	22	20.58	2.09	46.07
Yelloweye Rockfish	*Sebastes ruberrimus*	18	41.46	12.95	220.16
Quillback Rockfish	*Sebastes maliger*	17	14.02	4.87	82.81
Bocaccio	*Sebastes paucispinis*	16	31.46	6.03	96.44
Widow Rockfish	*Sebastes entomelas*	13	21.87	2.82	33.79
Yellowmouth Rockfish	*Sebastes reedi*	12	379.71	43.16	517.95
Shortraker Rockfish	*Sebastes borealis*	10	53.80	18.62	186.18
Aurora Rockfish	*Sebastes aurora*	7	37.32	8.38	58.66
Stripetail Rockfish	*Sebastes saxicola*	7	1.86	0.75	5.27
Copper Rockfish	*Sebastes caurinus*	3	1.85	1.74	5.23
Puget Sound Rockfish	*Sebastes emphaeus*	2	2.76	2.76	2.76
Shortbelly Rockfish	*Sebastes jordani*	2	132.75	66.81	133.63
Vermilion Rockfish	*Sebastes miniatus*	1	1.69	1.69	1.69
China Rockfish	*Sebastes nebulosus*	1	1.16	1.16	1.16
Harlequin Rockfish	*Sebastes variegatus*	1	0.48	0.48	0.48
Bank Rockfish	*Sebastes rufus*	1	2.33	2.33	2.33
Longspine Thornyhead	*Sebastolobus altivelis*	1	0.51	0.51	0.51
Flatfishes	**Order Pleuronectiformes**				
Rex Sole	*Glyptocephalus zachirus*	139	131.21	17.74	2465.44
Arrowtooth Flounder	*Reinhardtius stomias*	138	1017.09	78.12	10780.62
Dover Sole	*Microstomus pacificus*	135	199.98	22.51	3038.27
Slender Sole	*Lyopsetta exilis*	102	12.94	1.72	173.90
Petrale Sole	*Eopsetta jordani*	94	152.16	8.89	817.65
English Sole	*Parophrys vetulus*	92	275.42	16.17	1487.25
Pacific Halibut	*Hippoglossus stenolepis*	62	117.84	12.69	786.87
Flathead Sole	*Hippoglossoides elassodon*	55	216.66	17.53	964.38
Pacific Sanddab	*Citharichthys sordidus*	48	202.36	20.95	1005.56
Southern Rock Sole	*Lepidopsetta bilineata*	36	81.36	9.50	342.00
Curlfin Sole	*Pleuronichthys decurrens*	20	9.18	2.86	57.20
Butter Sole	*Isopsetta isolepis*	4	0.76	0.32	1.27
Sand Sole	*Psettichthys melanostictus*	3	0.90	0.61	1.84
Starry Flounder	*Platichthys stellatus*	1	3.48	3.48	3.48
Deepsea Sole	*Microstomus bathybius*	1	1.22	1.22	1.22
Cod-Like Fishes	**Order Gadiformes**				
Pacific Cod	*Gadus macrocephalus*	95	139.74	13.63	1294.98

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Walleye Pollock	*Theragra chalcogramma*	56	198.52	11.15	624.32
Pacific Hake	*Merluccius productus*	53	477.93	27.71	1468.59
Pacific Tomcod	*Microgadus proximus*	14	29.64	4.74	66.34
Giant Grenadier	*Albatrossia pectoralis*	2	4.92	3.08	6.16
Cartilaginous Fish	**Class Chondrichthyes**				
Spotted Ratfish	*Hydrolagus colliei*	138	1224.27	33.10	4535.20
North Pacific Spiny Dogfish	*Squalus suckleyi*	95	5072.37	174.16	16545.05
Longnose Skate	*Raja rhina*	62	101.38	10.47	648.93
Sandpaper Skate	*Bathyraja interrupta*	15	3.10	1.14	17.09
Big Skate	*Raja binoculata*	8	48.82	14.54	116.31
Brown Cat Shark	*Apristurus brunneus*	6	9.02	3.20	19.22
Aleutian Skate	*Bathyraja aleutica*	1	7.08	7.08	7.08
Greenlings	**Family Hexagrammidae**				
Lingcod	*Ophiodon elongatus*	88	60.30	10.02	881.91
Kelp Greenling	*Hexagrammos decagrammus*	17	7.80	1.99	33.90
Sculpins	**Family Cottidae**				
Threadfin Sculpin	*Icelinus filamentosus*	50	7.29	1.55	68.18
Slim Sculpin	*Radulinus asprellus*	26	-	-	-
Roughspine Sculpin	*Triglops macellus*	6	0.12	0.08	0.32
Darkfin Sculpin	*Malacocottus zonurus*	3	0.46	0.31	0.62
Brown Irish Lord	*Hemilepidotus spinosus*	3	0.30	0.24	0.72
Northern Sculpin	*Icelinus borealis*	2	-	-	-
Roughback Sculpin	*Chitonotus pugetensis*	1	-	-	-
Tadpole Sculpin	*Psychrolutes paradoxus*	1	-	-	-
Eelpouts	**Family Zoarcidae**				
Blackbelly Eelpout	*Lycodes pacificus*	58	18.74	2.33	100.10
Black Eelpout	*Lycodes diapterus*	21	2.58	0.63	10.75
Bigfin Eelpout	*Lycodes cortezianus*	16	6.28	0.98	15.68
Pallid Eelpout	*Lycodapus mandibularis*	3	0.02	0.02	0.02
Blackmouth Eelpout	*Lycodapus fierasfer*	1	-	-	-
Poachers	**Family Agonidae**				
Smootheye Poacher	*Xeneretmus leiops*	21	0.20	0.09	1.12
Bigeye Poacher	*Bathyagonus pentacanthus*	18	0.40	0.11	1.01
Blackfin Poacher	*Bathyagonus nigripinnis*	12	0.34	0.15	0.73
Northern Spearnose Poacher	*Agonopsis vulsa*	4	0.06	0.05	0.10
Poachers	Agonidae (Family)	2	-	-	-
Sturgeon Poacher	*Podothecus accipenserinus*	1	-	-	-
Gray Starsnout	*Bathyagonus alascanus*	1	-	-	-
Lanternfishes	**Family Myctophidae**				
Northern Lampfish	*Stenobrachius leucopsarus*	14	0.08	0.07	0.13
Garnet Lanternfish	*Stenobrachius nannochir*	5	0.04	0.04	0.04
Pinpoint Lampfish	*Nannobrachium regale*	4	0.05	0.05	0.05
Blue Lanternfish	*Tarletonbeania crenularis*	3	-	-	-
Broadfin Lampfish	*Nannobrachium ritteri*	1	-	-	-
Lanternfish	*Tarletonbeania* (Genus)	1	-	-	-
California Headlightfish	*Diaphus theta*	1	-	-	-
Other Fish					
Sablefish	*Anoplopoma fimbria*	71	1788.10	70.19	4983.55
Eulachon	*Thaleichthys pacificus*	54	18.70	2.34	121.61
Pacific Herring	*Clupea pallasii*	42	4.46	0.51	19.40
Northern Ronquil	*Ronquilus jordani*	24	0.66	0.15	2.51
Shiner Perch	*Cymatogaster aggregata*	14	0.40	0.16	1.26
Pacific Lamprey	*Entosphenus tridentatus*	12	-	-	-
Whitebait Smelt	*Allosmerus elongatus*	11	2.18	0.60	5.95

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Pacific Viperfish	*Chauliodus macouni*	10	0.06	0.06	0.12
Snake Prickleback	*Lumpenus sagitta*	8	0.13	0.06	0.19
American Shad	*Alosa sapidissima*	7	4.68	2.13	14.88
Chinook Salmon	*Oncorhynchus tshawytscha*	6	17.92	6.42	38.49
Black Hagfish	*Eptatretus deani*	6	0.70	0.53	2.64
Whitebarred Prickleback	*Poroclinus rothrocki*	5	0.02	0.02	0.02
Pacific Sand Lance	*Ammodytes hexapterus*	5	5.30	1.61	6.44
Shining Tubeshoulder	*Sagamichthys abei*	4	0.18	0.10	0.38
Blacktail Snailfish	*Careproctus melanurus*	3	0.62	0.31	0.94
Northern Anchovy	*Engraulis mordax*	3	0.04	0.04	0.07
Green Sturgeon	*Acipenser medirostris*	3	30.30	25.32	75.96
Pacific Saury	*Cololabis saira*	3	0.12	0.07	0.14
Pacific Hagfish	*Eptatretus stoutii*	2	0.40	0.39	0.78
Plainfin Midshipman	*Porichthys notatus*	2	0.68	0.53	1.05
Blue-eyed Searcher	*Bathymaster signatus*	1	-	-	-
Humpback Snailfish	*Elassodiscus caudatus*	1	0.03	0.03	0.03
Duckbill Barracudina	*Magnisudis atlantica*	1	0.36	0.36	0.36
Ragfish	*Icosteus aenigmaticus*	1	31.80	31.80	31.80
Hagfishes	Myxinidae (Family)	1	0.24	0.24	0.24
Deepsea Smelts	Bathylagidae (Family)	1	0.03	0.03	0.03
Northern Smoothtongue	*Leuroglossus schmidti*	1	-	-	-
Longfin Dragonfish	*Tactostoma macropus*	1	0.03	0.03	0.03
Shining Loosejaw	*Aristostomias scintillans*	1	-	-	-
Crabs and Shrimp	**Class Malacostraca**				
Pink Shrimp (smooth)	*Pandalus jordani*	52	66.11	7.83	289.75
Prawn	*Pandalus platyceros*	45	12.15	0.91	40.16
Common Two-spined Crangon	*Neocrangon communis*	30	0.13	0.10	0.20
Sidestripe Shrimp	*Pandalopsis dispar*	23	12.54	2.16	32.41
Spike Shrimp (horned Shrimp)	*Paracrangon echinata*	14	-	-	-
Common Argid	*Argis alaskensis*	12	-	-	-
Isopods	Isopoda (Order)	10	0.16	0.16	0.16
Glass Shrimp	*Pasiphaea pacifica*	9	1.52	0.99	2.98
Brown Box Crab	*Lopholithodes foraminatus*	8	3.84	1.20	8.43
Decorator Crabs	*Oregonia* (Genus)	8	-	-	-
Squat Lobster	*Munida quadrispina*	6	-	-	-
Yellowleg Shrimp	*Pandalus tridens*	5	0.06	0.06	0.06
Graceful Decorator Crab	*Oregonia gracilis*	4	-	-	-
Inshore Tanner Crab	*Chionoecetes bairdi*	4	0.38	0.29	0.58
Bluespot Shrimp	*Pandalus stenolepis*	4	-	-	-
Northern Argid	*Argis lar*	3	-	-	-
Northern Crangon	*Crangon alaskensis*	3	-	-	-
Barbed Eualid	*Eualus barbatus*	3	-	-	-
Grooved Tanner Crab	*Chionoecetes tanneri*	2	1.40	1.31	2.62
Redclaw Crab	*Chorilia longipes*	2	-	-	-
-	*Argis* (Genus)	2	-	-	-
Sand Crangon	*Crangon nigricauda*	2	-	-	-
Dungeness Crab	*Metacarcinus magister*	2	1.75	1.30	2.61
Dana's Bladed Shrimp	*Spirontocaris lamellicornis*	1	-	-	-
-	*Eualus* (Genus)	1	-	-	-
Nelson's Argid	*Argis levior*	1	-	-	-
Split-eye Argid	*Argis ovifer*	1	-	-	-
-	Crangonidae (Family)	1	-	-	-
Pacific Lyre Crab	*Hyas lyratus*	1	-	-	-
Large Eyed Eualid	*Eualus macropthalmus*	1	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Furrowed Rock Crab	*Cancer branneri*	1	-	-	-
Spiny Ridge Shrimp	*Notostomus japonicus*	1	-	-	-
Northern Blunt-tailed Shrimp	*Bentheogennema borealis*	1	-	-	-
Right-handed Hermits	Paguridae (Family)	1	-	-	-
Furry Hermit	*Paguristes turgidus*	1	0.08	0.08	0.08
Stevens Hermit	*Pagurus stevensae*	1	-	-	-
Hairy Crab	*Hapalogaster mertensii*	1	-	-	-
Bristly Crab	*Acantholithodes hispidus*	1	0.08	0.08	0.08
Coonstripe Shrimp	*Pandalus danae*	1	-	-	-
Sea Stars	**Class Asteroidea**				
Sand Star	*Luidia foliolata*	25	2.36	0.47	11.64
Mud Star	*Ctenodiscus crispatus*	20	1.00	0.40	1.60
Spiny Red Sea Star	*Hippasteria spinosa*	19	1.02	0.39	6.63
Fish-eating Star	*Stylasterias forreri*	18	0.55	0.17	2.56
Vermillion Starfish	*Mediaster aequalis*	17	0.42	0.20	0.59
Cushion Star	*Pteraster tesselatus*	14	0.56	0.35	1.74
-	*Poraniopsis inflatus inflatus*	12	0.36	0.23	1.17
Rose Starfish	*Crossaster papposus*	10	0.08	0.06	0.11
-	*Solaster paxillatus*	9	0.39	0.21	1.90
-	*Cheiraster dawsoni*	8	0.56	0.32	0.96
-	*Henricia* (Genus)	7	-	-	-
Morning Sun Starfish	*Solaster dawsoni*	6	3.38	0.78	4.68
Long-armed Sea Star	*Orthasterias koehleri*	6	0.38	0.27	0.53
Sunflower Starfish	*Pycnopodia helianthoides*	4	1.04	0.55	2.18
-	*Solaster* (Genus)	4	0.09	0.09	0.09
-	*Hippasteria* (Genus)	3	4.00	1.49	4.46
Leather Star	*Dermasterias imbricata*	2	0.76	0.60	1.20
-	*Diplopteraster multipes*	2	0.64	0.64	0.64
Winged Sea Star	*Pteraster militaris*	1	-	-	-
-	*Ampheraster marianus*	1	-	-	-
Mottled Star	*Evasterias troschelii*	1	-	-	-
-	*Diplopteraster* (Genus)	1	0.22	0.22	0.22
-	*Poraniopsis* (Genus)	1	0.06	0.06	0.06
-	*Henricia aspera*	1	0.03	0.03	0.03
Striped Sun Starfish	*Solaster stimpsoni*	1	-	-	-
-	*Leptychaster arcticus*	1	-	-	-
Starfish	Asteroidea (Class)	1	0.47	0.47	0.47
-	*Hippasteria californica*	1	-	-	-
-	*Cryptopeltaster lepidonotus*	1	-	-	-
Brittle Stars	**Class Ophiuroidea**				
-	*Ophiura* (Genus)	18	0.43	0.20	1.02
Basket Star	*Gorgonocephalus eucnemis*	14	0.98	0.36	4.33
-	*Ophiura sarsi*	11	0.90	0.74	1.48
-	*Ophiura lutkeni*	1	-	-	-
-	*Ophiacanthidae* (Family)	1	-	-	-
-	*Ophiacantha* (Genus)	1	-	-	-
-	*Ophiactidae* (Family)	1	-	-	-
-	*Amphiophiura ponderosa*	1	-	-	-
Sea Cucumbers	**Class Holothuroidea**				
Whitespotted Sea Cucumber	*Parastichopus leukothele*	42	8.4	1.3	50.5
Giant Red Sea Cucumber	*Parastichopus californicus*	15	5.4	1.2	16.8
Soft Sea Cucumber	*Pseudostichopus mollis*	12	1.4	0.5	4.8
Armoured Sea Cucumber	*Psolus chitinoides*	3	-	-	-
Sea Cucumbers	Holothuroidea (Class)	2	0.04	0.04	0.04

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Peppered Sea Cucumber	*Cucumaria piperata*	1	-	-	-
Scaly Sea Cucumber	*Psolus squamatus*	1	-	-	-
Octopuses and Squid	**Class Cephalopoda**				
Pacific Bobtail Squid	*Rossia pacifica*	37	3.34	0.89	3.55
Opalescent Inshore Squid	*Doryteuthis opalescens*	17	0.38	0.27	1.59
Schoolmaster Gonate Squid	*Berryteuthis magister*	4	3.34	1.64	6.54
Giant Pacific Octopus	*Enteroctopus dofleini*	4	9.30	7.47	22.42
Smoothskin Octopus	*Benthoctopus leioderma*	2	-	-	-
Octopus	*Octopus* (Genus)	2	-	-	-
-	*Benthoctopus* (Genus)	2	1.00	0.79	1.58
Squids	*Teuthida* (Order)	1	-	-	-
East Pacific Red Octopus	*Octopus rubescens*	1	0.20	0.20	0.20
Sea Urchins	**Super Order Echinacea**				
Fragile Urchin	*Allocentrotus fragilis*	99	37.18	3.32	265.62
Pallid Urchin	*Strongylocentrotus pallidus*	9	0.72	0.30	1.78
Jellyfish	**Phylum Cnidaria**				
Lions Mane	*Cyanea capillata*	5	2.4	0.9	3.7
Jellyfish	Scyphozoa (Class)	4	0.1	0.1	0.1
-	*Periphylla periphylla*	3	-	-	-
Moon Jelly	*Aurelia aurita*	2	-	-	-
Fried Egg Jellyfish, Egg Yolk Jelly	*Phacellophora camtschatica*	2	0.88	0.50	1.00
Anemones and Corals	**Class Anthozoa**				
Anemone	Actiniaria (Order)	31	4.40	0.67	18.02
Sea Whip	*Balticina septentrionalis*	19	0.42	0.15	1.21
-	*Metridium* (Genus)	17	6.83	2.50	39.98
Sea Pen	*Ptilosarcus gurneyi*	3	-	-	-
-	*Acanthoptilum* (Genus)	2	-	-	-
-	*Liponema* (Genus)	1	0.72	0.72	0.72
-	*Stomphia* (Genus)	1	-	-	-
Snails and Slugs	**Class Gastropoda**				
Oregontriton	*Fusitriton oregonensis*	18	0.52	0.22	1.78
Seaslugs	Nudibranchia (Order)	10	-	-	-
California Armina	*Armina californica*	8	0.10	0.10	0.10
Gastropods	Gastropoda (Class)	4	-	-	-
-	*Neptunea* (Genus)	3	0.18	0.13	0.26
Whelks	Buccinidae (Family)	3	-	-	-
Rosy Tritonia	*Tritonia diomedea*	2	0.15	0.15	0.15
Lewis Moonsnail	*Euspira lewisii*	2	0.32	0.21	0.42
Silvery Topsnail	*Calliostoma platinum*	2	-	-	-
Turban Snails	Turbinidae (Family)	1	-	-	-
-	*Armina* (Genus)	1	-	-	-
White Night Doris	*Doris odhneri*	1	-	-	-
-	Discodorididae (Family)	1	-	-	-
Other Invertebrate Species					
Heart Urchins	Atelostomata (Super Order)	30	24.26	3.49	38.40
Sponges	Porifera (Phylum)	30	33.52	5.91	124.14
Salp	*Pegea confederata*	25	0.32	0.15	1.37
Sea Mouse	*Aphrodita* (Genus)	11	0.28	0.14	1.15
Glass Sponges	Hexactinellida (Class)	7	1.10	0.60	4.17
Lampshells	Brachiopoda (Phylum)	7	-	-	-
Bath Sponges	Demospongiae (Class)	6	8.80	3.97	19.87
Pink Scallop, (aka Reddish Scallop)	*Chlamys rubida*	5	0.16	0.16	0.16
Sea Lilies And Feather Stars	Crinoidea (Class)	4	0.06	0.06	0.06

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Spiny Scallop	*Chlamys hastata*	4	1.47	0.62	1.87
Fish Eggs		4	0.30	0.14	0.43
-	Tunicata (Sub Phylum)	3	-	-	-
Salps	Thaliacea (Class)	2	0.18	0.18	0.18
-	Flatworms (Phylum)	2	-	-	-
Peanutworms	Sipuncula (Phylum)	2	-	-	-
-	Echiura (Phylum)	1	-	-	-
Scale Worms	*Polynoe* (Genus)	1	-	-	-
-	*Cryptochiton stelleri*	1	-	-	-
Polychaete Worms	Polychaeta (Class)	1	-	-	-
-	Antedonidae (Family)	1	-	-	-
Bivalve Molluscs	Bivalvia (Class)	1	-	-	-
-	Ctenophora (Phylum)	1	-	-	-

Table 8. Species sampled during the 2012 WCVI 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
American Shad	*Alosa sapidissima*	11	38	0	8	0	0
Aleutian Skate	*Bathyraja aleutica*	1	1	0	1	0	0
American Shad	*Alosa sapidissima*	6	22	0	0	0	0
Arrowtooth Flounder	*Reinhardtius stomias*	102	2231	779	2231	589	591
Aurora Rockfish	*Sebastes aurora*	7	81	42	81	38	38
Bank Rockfish	*Sebastes rufus*	1	2	0	2	0	0
Big Skate	*Raja binoculata*	8	15	1	15	0	0
Bigeye Poacher	*Bathyagonus pentacanthus*	1	22	0	0	0	0
Bigfin Eelpout	*Lycodes cortezianus*	1	19	0	0	0	0
Black Eelpout	*Lycodes diapterus*	2	40	0	0	0	0
Blackbelly Eelpout	*Lycodes pacificus*	13	338	0	34	0	0
Bocaccio	*Sebastes paucispinis*	16	30	30	30	30	30
Brown Cat Shark	*Apristurus brunneus*	6	43	0	43	0	0
Butter Sole	*Isopsetta isolepis*	4	8	1	8	0	0
Canary Rockfish	*Sebastes pinniger*	48	410	337	410	302	302
China Rockfish	*Sebastes nebulosus*	1	2	2	2	0	0
Chinook Salmon	*Oncorhynchus tshawytscha*	6	17	0	16	0	0
Copper Rockfish	*Sebastes caurinus*	3	3	2	3	1	1
Curlfin Sole	*Pleuronichthys decurrens*	20	146	32	146	25	25
Darkblotched Rockfish	*Sebastes crameri*	23	315	253	315	234	234
Deepsea Sole	*Microstomus bathybius*	1	1	0	1	0	0
Dover Sole	*Microstomus pacificus*	92	2208	934	2208	761	760
English Sole	*Parophrys vetulus*	51	1072	617	1072	525	524
Eulachon	*Thaleichthys pacificus*	20	615	0	35	0	0
Flathead Sole	*Hippoglossoides elassodon*	33	816	273	816	210	213
Giant Grenadier	*Albatrossia pectoralis*	2	5	0	5	0	0
Green Sturgeon	*Acipenser medirostris*	3	3	0	0	0	0
Greenstriped Rockfish	*Sebastes elongatus*	54	1409	598	1409	320	321
Harlequin Rockfish	*Sebastes variegatus*	1	2	0	2	0	0
Kelp Greenling	*Hexagrammos decagrammus*	17	87	0	87	0	0
Lingcod	*Ophiodon elongatus*	88	344	243	344	193	193
Longnose Skate	*Raja rhina*	62	177	0	177	0	0
North Pacific Spiny Dogfish	*Squalus suckleyi*	39	703	221	703	212	231
Pacific Cod	*Gadus macrocephalus*	95	978	804	978	690	615
Pacific Hake	*Merluccius productus*	27	629	154	629	130	130
Pacific Halibut	*Hippoglossus stenolepis*	61	173	16	172	0	0
Pacific Herring	*Clupea pallasii*	4	78	0	0	0	0
Pacific Ocean Perch	*Sebastes alutus*	51	1186	876	1184	824	824
Pacific Sand Lance	*Ammodytes hexapterus*	3	89	0	0	0	0
Pacific Sanddab	*Citharichthys sordidus*	32	929	221	929	100	100
Pacific Tomcod	*Microgadus proximus*	8	238	47	238	47	47
Petrale Sole	*Eopsetta jordani*	90	791	643	791	536	538
Puget Sound Rockfish	*Sebastes emphaeus*	1	33	33	33	33	33
Pygmy Rockfish	*Sebastes wilsoni*	19	194	40	194	23	25
Quillback Rockfish	*Sebastes maliger*	17	72	36	72	29	29
Ragfish	*Icosteus aenigmaticus*	1	1	0	1	0	0
Redbanded Rockfish	*Sebastes babcocki*	46	401	296	400	248	248
Redstripe Rockfish	*Sebastes proriger*	32	764	494	748	450	450
Rex Sole	*Glyptocephalus zachirus*	118	3220	880	3220	441	443
Rosethorn Rockfish	*Sebastes helvomaculatus*	32	572	24	570	0	0

Common Name	Scientific Name	Number of Samples	Number of Recorded Biological Attributes				
			Length	Weight	Sex	Maturity	Age
Rougheye Rockfish	*Sebastes aleutianus*	30	216	216	216	216	216
Sablefish	*Anoplopoma fimbria*	70	845	518	845	456	456
Sand Sole	*Psettichthys melanostictus*	3	4	0	4	0	0
Sandpaper Skate	*Bathyraja interrupta*	15	18	1	18	0	0
Sharpchin Rockfish	*Sebastes zacentrus*	47	1179	605	1173	497	506
Shiner Perch	*Cymatogaster aggregata*	2	25	0	0	0	0
Shortbelly Rockfish	*Sebastes jordani*	2	31	27	31	27	27
Shortraker Rockfish	*Sebastes borealis*	10	31	31	31	31	31
Shortspine Thornyhead	*Sebastolobus alascanus*	37	1036	215	1006	0	38
Silvergray Rockfish	*Sebastes brevispinis*	36	412	306	412	255	255
Slender Sole	*Lyopsetta exilis*	51	1103	43	1100	0	0
Southern Rock Sole	*Lepidopsetta bilineata*	36	554	451	551	447	449
Splitnose Rockfish	*Sebastes diploproa*	31	742	368	716	284	284
Spotted Ratfish	*Hydrolagus colliei*	84	2460	97	2460	0	0
Starry Flounder	*Platichthys stellatus*	1	1	0	1	0	0
Stripetail Rockfish	*Sebastes saxicola*	6	31	22	31	0	0
Threadfin Sculpin	*Icelinus filamentosus*	9	179	0	12	0	0
Vermilion Rockfish	*Sebastes miniatus*	1	1	1	1	0	0
Walleye Pollock	*Theragra chalcogramma*	53	881	87	881	53	53
Whitebait Smelt	*Allosmerus elongatus*	5	114	0	24	0	0
Widow Rockfish	*Sebastes entomelas*	12	13	2	13	0	0
Yelloweye Rockfish	*Sebastes ruberrimus*	17	61	61	61	61	61
Yellowmouth Rockfish	*Sebastes reedi*	5	76	66	76	49	49
Yellowtail Rockfish	*Sebastes flavidus*	22	365	238	365	203	203
Total		**1954**	**31913**	**12284**	**30383**	**9570**	**9573**

Table 9. Summary of biological data collected during the 2012 WCVI 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 proportion of females is shown. Weights less than 0.1 kg are entered as <0.1 and no data collected is entered as -.

		Number of		Length	Length (cm)			Weight (kg)			Female
Common Name	**Scientific Name**	**Samples**	**Specimens**	**Type**	**Min.**	**Max.**	**Mean**	**Min.**	**Max.**	**Mean**	**Proportion**
Aleutian Skate	*Bathyraja aleutica*	1	1	Total	107	107	107	-	-	-	0.0
American Shad	*Alosa sapidissima*	6	22	Standard	25	38	31	-	-	-	-
Arrowtooth Flounder	*Reinhardtius stomias*	102	2231	Fork	11	73	43	<0.1	3.4	0.9	0.6
Aurora Rockfish	*Sebastes aurora*	7	81	Fork	18	39	31	0.1	1.2	0.5	0.6
Bank Rockfish	*Sebastes rufus*	1	2	Fork	38	41	40	-	-	-	0.0
Big Skate	*Raja binoculata*	8	15	Total	30	190	83	2.1	2.1	2.1	0.4
Bigeye Poacher	*Bathyagonus pentacanthus*	1	22	Total	9	20	13	-	-	-	-
Bigfin Eelpout	*Lycodes cortezianus*	1	19	Total	34	45	39	-	-	-	-
Black Eelpout	*Lycodes diapterus*	2	40	Total	13	35	25	-	-	-	-
Blackbelly Eelpout	*Lycodes pacificus*	13	338	Total	9	26	16	-	-	-	-
Bocaccio	*Sebastes paucispinis*	16	30	Fork	47	77	62	1.1	5.5	3.1	0.3
Brown Cat Shark	*Apristurus brunneus*	6	43	Total	12	65	48	-	-	-	0.2
Butter Sole	*Isopsetta isolepis*	4	8	Total	19	28	24	0.1	0.1	0.1	0.5
Canary Rockfish	*Sebastes pinniger*	48	410	Fork	8	61	40	<0.1	3.4	1.4	0.4
China Rockfish	*Sebastes nebulosus*	1	2	Fork	29	31	30	0.4	0.6	0.5	0.5
Chinook Salmon	*Oncorhynchus tshawytscha*	6	17	Fork	35	84	52	-	-	-	0.8
Copper Rockfish	*Sebastes caurinus*	3	3	Fork	43	46	44	1.7	1.7	1.7	1.0
Curlfin Sole	*Pleuronichthys decurrens*	20	146	Total	20	38	28	0.2	0.5	0.3	0.4
Darkblotched Rockfish	*Sebastes crameri*	23	315	Fork	16	48	32	0.2	2.1	0.7	0.4
Deepsea Sole	*Microstomus bathybius*	1	1	Total	46	46	46	-	-	-	1.0
Dover Sole	*Microstomus pacificus*	92	2208	Total	15	61	34	0.1	2.1	0.4	0.4
English Sole	*Parophrys vetulus*	50	1072	Total	12	44	32	<0.1	0.7	0.3	0.8
Eulachon	*Thaleichthys pacificus*	20	615	Standard	7	21	13	-	-	-	-
Flathead Sole	*Hippoglossoides elassodon*	33	816	Total	7	41	27	<0.1	0.6	0.2	0.5
Green Sturgeon	*Acipenser medirostris*	3	3	Total	165	175	170	-	-	-	-
Greenstriped Rockfish	*Sebastes elongatus*	54	1409	Fork	11	40	27	<0.1	1	0.3	0.5
Harlequin Rockfish	*Sebastes variegatus*	1	2	Fork	24	26	25	-	-	-	0.5
Kelp Greenling	*Hexagrammos decagrammus*	17	87	Fork	18	39	30	-	-	-	0.7
Lingcod	*Ophiodon elongatus*	88	344	Fork	27	101	61	0.2	10.1	2.4	0.7
Longnose Skate	*Raja rhina*	62	177	Total	28	130	78	-	-	-	0.5
North Pacific Spiny Dogfish	*Squalus suckleyi*	39	703	Total	37	116	76	0.4	7.9	1.8	0.5

Common Name	Scientific Name	Number of Samples	Number of Specimens	Length Type	Length (cm) Min.	Length (cm) Max.	Length (cm) Mean	Weight (kg) Min.	Weight (kg) Max.	Weight (kg) Mean	Female Proportion
Pacific Cod	*Gadus macrocephalus*	95	978	Fork	17	79	38	<0.1	5.6	0.9	0.5
Pacific Hake	*Merluccius productus*	27	629	Fork	16	72	46	0.1	1.7	0.8	0.7
Pacific Halibut	*Hippoglossus stenolepis*	61	173	Fork	57	109	72	2.3	14.9	5	0.4
Pacific Herring	*Clupea pallasii*	4	78	Standard	9	22	16	-	-	-	-
Pacific Ocean Perch	*Sebastes alutus*	51	1186	Fork	10	50	33	<0.1	1.6	0.7	0.5
Pacific Sand Lance	*Ammodytes hexapterus*	3	89	Total	12	20	17	-	-	-	-
Pacific Sanddab	*Citharichthys sordidus*	32	929	Total	7	33	23	<0.1	0.5	0.2	0.6
Pacific Tomcod	*Microgadus proximus*	8	238	Fork	13	21	17	<0.1	0.1	<0.1	0.6
Petrale Sole	*Eopsetta jordani*	90	791	Total	20	59	38	0.1	2.7	0.7	0.6
Puget Sound Rockfish	*Sebastes emphaeus*	1	33	Fork	11	17	14	<0.1	0.1	<0.1	0.6
Pygmy Rockfish	*Sebastes wilsoni*	19	194	Fork	11	24	17	<0.1	0.2	0.1	0.6
Quillback Rockfish	*Sebastes maliger*	17	72	Fork	12	47	38	0.4	1.7	1	0.5
Ragfish	*Icosteus aenigmaticus*	1	1	Total	152	152	152	-	-	-	1.0
Redbanded Rockfish	*Sebastes babcocki*	46	401	Fork	7	61	35	<0.1	4.2	1	0.5
Redstripe Rockfish	*Sebastes proriger*	32	764	Fork	5	42	29	<0.1	1.2	0.5	0.5
Rex Sole	*Glyptocephalus zachirus*	118	3220	Total	15	43	30	<0.1	0.5	0.2	0.5
Rosethorn Rockfish	*Sebastes helvomaculatus*	32	572	Fork	10	33	24	<0.1	0.4	0.2	0.5
Rougheye Rockfish	*Sebastes aleutianus*	30	216	Fork	15	65	45	<0.1	4.6	1.5	0.4
Sablefish	*Anoplopoma fimbria*	70	845	Fork	38	89	54	0.6	7.4	1.8	0.5
Sand Sole	*Psettichthys melanostictus*	3	4	Total	32	37	35	-	-	-	1.0
Sandpaper Skate	*Bathyraja interrupta*	15	18	Total	24	62	52	0.1	0.1	0.1	0.4
Sharpchin Rockfish	*Sebastes zacentrus*	47	1179	Fork	9	39	26	<0.1	1.1	0.4	0.5
Shiner Perch	*Cymatogaster aggregata*	2	25	Fork	10	14	11	-	-	-	-
Shortbelly Rockfish	*Sebastes jordani*	2	31	Fork	22	27	24	0.1	0.2	0.2	0.4
Shortraker Rockfish	*Sebastes borealis*	10	31	Fork	41	87	68	1.1	11.2	5.9	0.5
Shortspine Thornyhead	*Sebastolobus alascanus*	37	1036	Total	6	52	21	<0.1	1.1	0.2	0.4
Silvergray Rockfish	*Sebastes brevispinis*	36	412	Fork	33	64	50	0.9	4.7	1.9	0.4
Slender Sole	*Lyopsetta exilis*	51	1103	Total	8	32	22	<0.1	0.2	0.1	0.5
Southern Rock Sole	*Lepidopsetta bilineata*	36	554	Total	6	48	28	<0.1	1.3	0.3	0.6
Splitnose Rockfish	*Sebastes diploproa*	31	742	Fork	7	39	24	<0.1	1.2	0.4	0.4
Spotted Ratfish	*Hydrolagus colliei*	84	2460	2nd Dorsal	7	49	32	<0.1	0.9	0.3	0.5
Starry Flounder	*Platichthys stellatus*	1	1	Total	61	61	61	-	-	-	1.0
Stripetail Rockfish	*Sebastes saxicola*	6	31	Fork	17	31	21	0.1	0.3	0.1	0.2
Threadfin Sculpin	*Icelinus filamentosus*	9	179	Total	8	28	23	-	-	-	-
Vermilion Rockfish	*Sebastes miniatus*	1	1	Fork	43	43	43	1.6	1.6	1.6	1.0

Common Name	Scientific Name	Number of Samples	Number of Specimens	Length Type	Length (cm) Min.	Length (cm) Max.	Length (cm) Mean	Weight (kg) Min.	Weight (kg) Max.	Weight (kg) Mean	Female Proportion
Walleye Pollock	*Theragra chalcogramma*	53	881	Fork	13	55	21	<0.1	1.2	0.3	0.5
Whitebait Smelt	*Allosmerus elongatus*	5	114	Standard	8	14	10	-	-	-	-
Widow Rockfish	*Sebastes entomelas*	12	13	Fork	24	53	38	1.1	2	1.5	0.5
Yelloweye Rockfish	*Sebastes ruberrimus*	17	61	Fork	38	66	55	0.9	7.2	3.5	0.5
Yellowmouth Rockfish	*Sebastes reedi*	5	76	Fork	31	52	45	0.5	2.5	1.7	0.3
Yellowtail Rockfish	*Sebastes flavidus*	22	365	Fork	17	56	43	0.1	2.6	1.3	0.4

Table 10. Summary of data from net-mounted recorders during the 2012 WCVI synoptic bottom trawl survey, showing the number of tows and total number of records. A total of 157 survey tows were conducted, of which 150 were useable.

Data Recorder	Attribute	Number of	
		Tows	Records
Seabird SBE19plus Seacat Profiler	Conductivity of sea water (S/m)/ salinity (PSU)	147	34,374
	Water temperature (^{o}C)	147	34,121
	Pressure (db)/ depth (m)	147	34,374
Seabird SBE43	Oxygen voltage (V)/ dissolved oxygen (ml/L)	147	34,374
Seabird SBE39 Temperature And Pressure Recorder	Pressure (db)/ depth (m)	156	69,621
	Water temperature (^{o}C)	156	69,621
Mac Marine Industries Bottom Contact Sensor	Bottom Contact Sensor Tilt Angle	104	43077

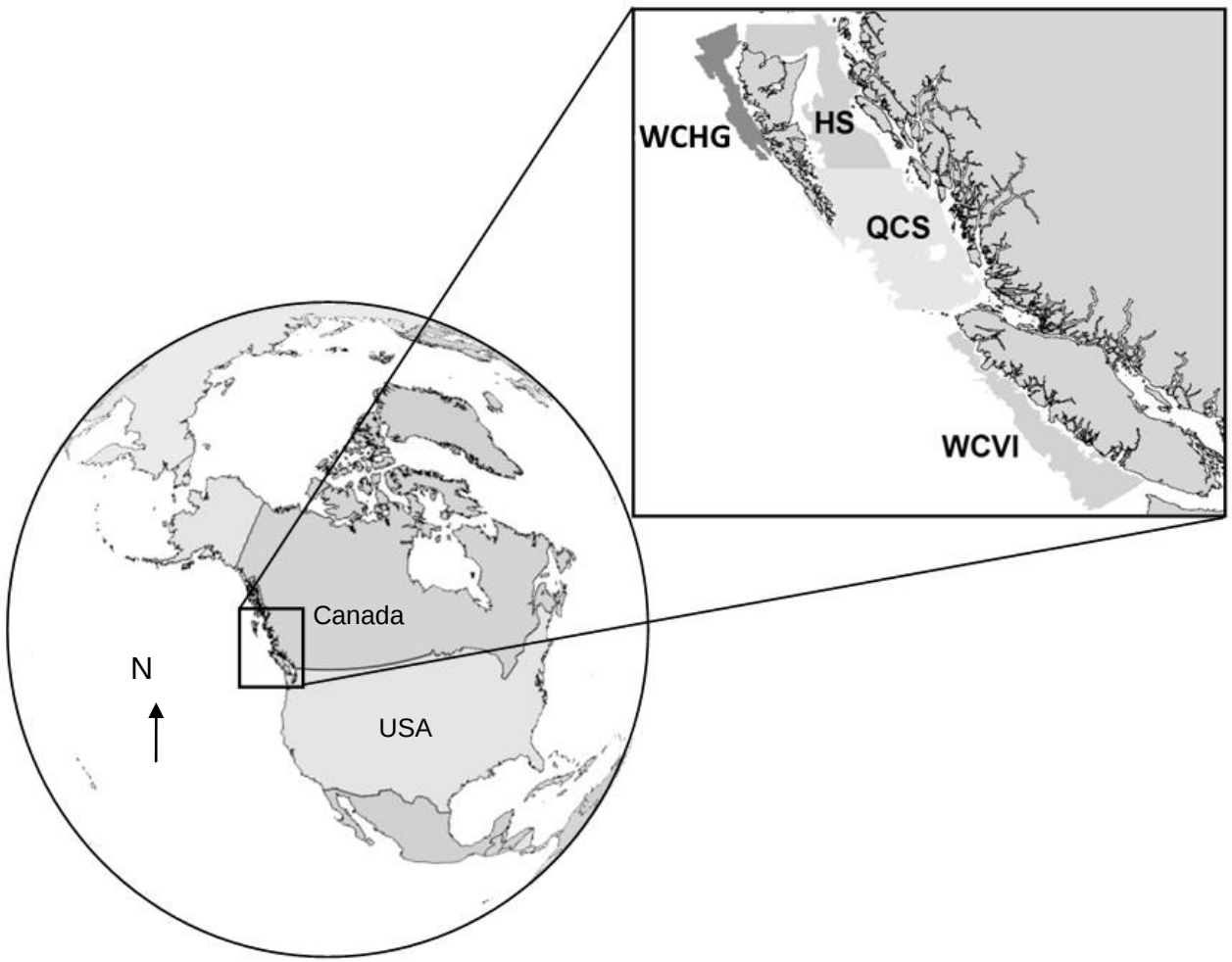

Figure 1. Locations of the current synoptic bottom trawl surveys on the coast of British Columbia, Canada. WCHG = West Coast Haida Gwaii; HS = Hecate Strait; QCS = Queen Charlotte Sound; WCVI = West Coast Vancouver Island.

Figure 2. The Canadian Coast Guard Ship W.E. Ricker used for the 2012 WCVI synoptic bottom trawl survey.

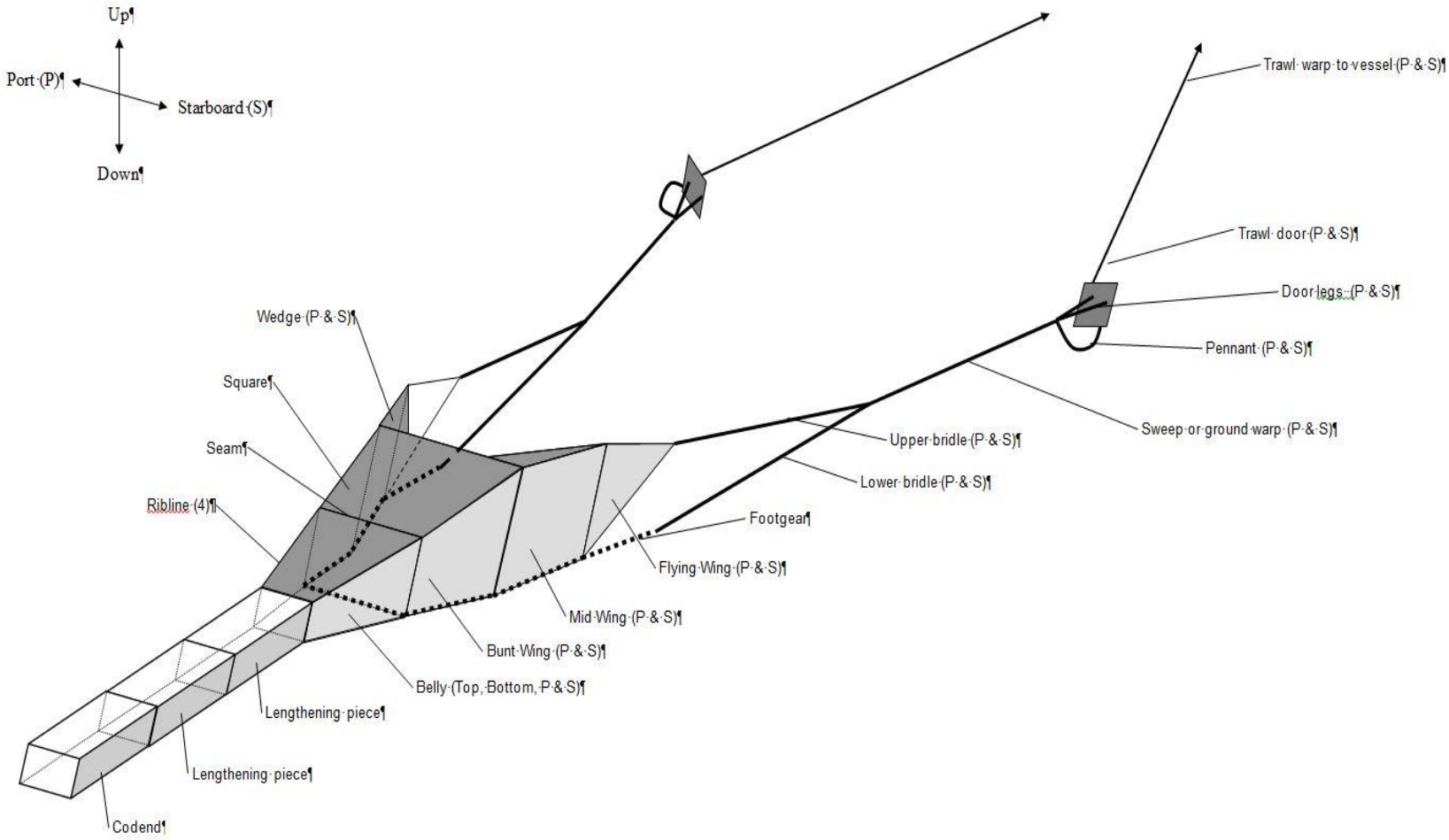

Figure 3. Overview diagram of the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey.

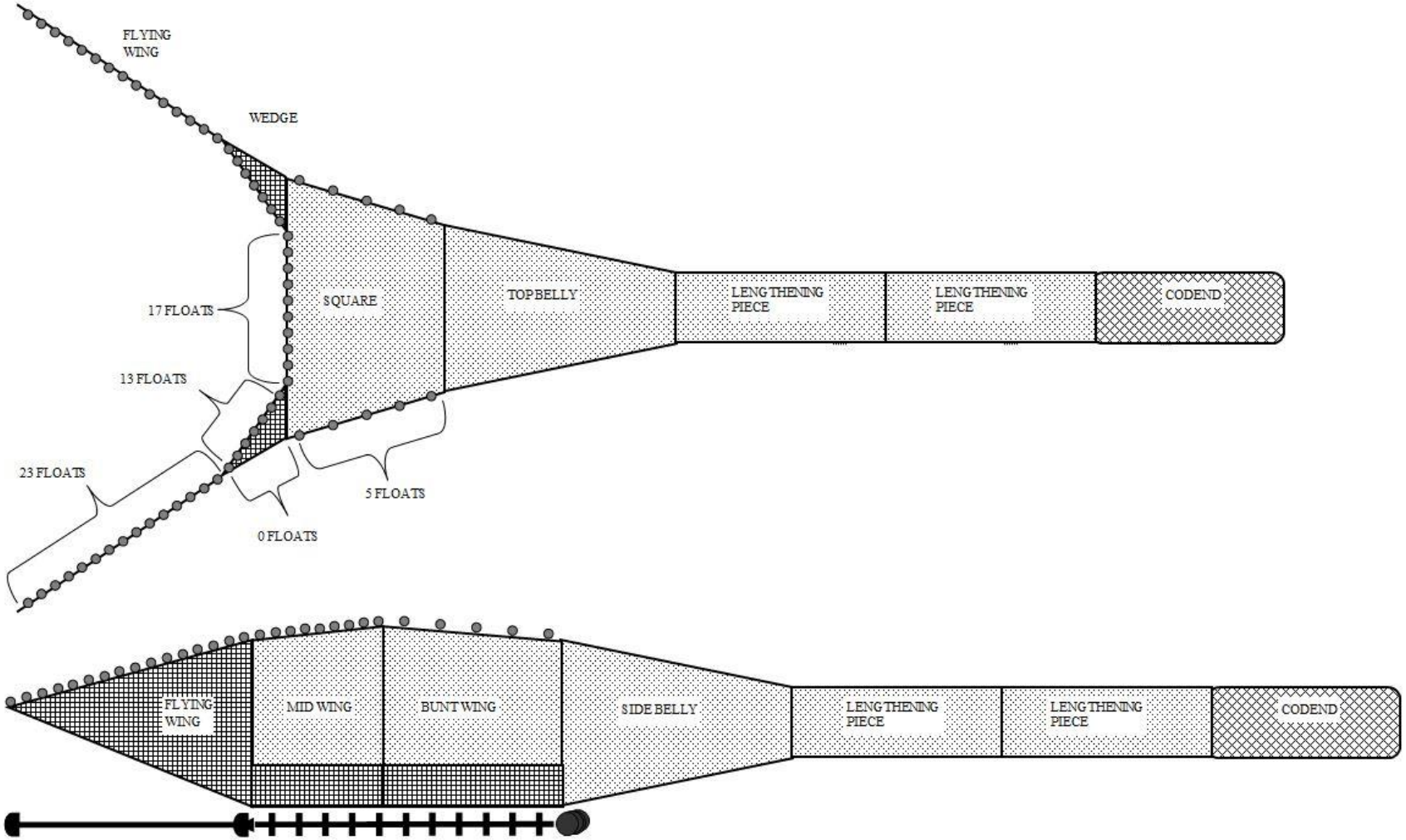

Figure 4. Top and side view of the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey.

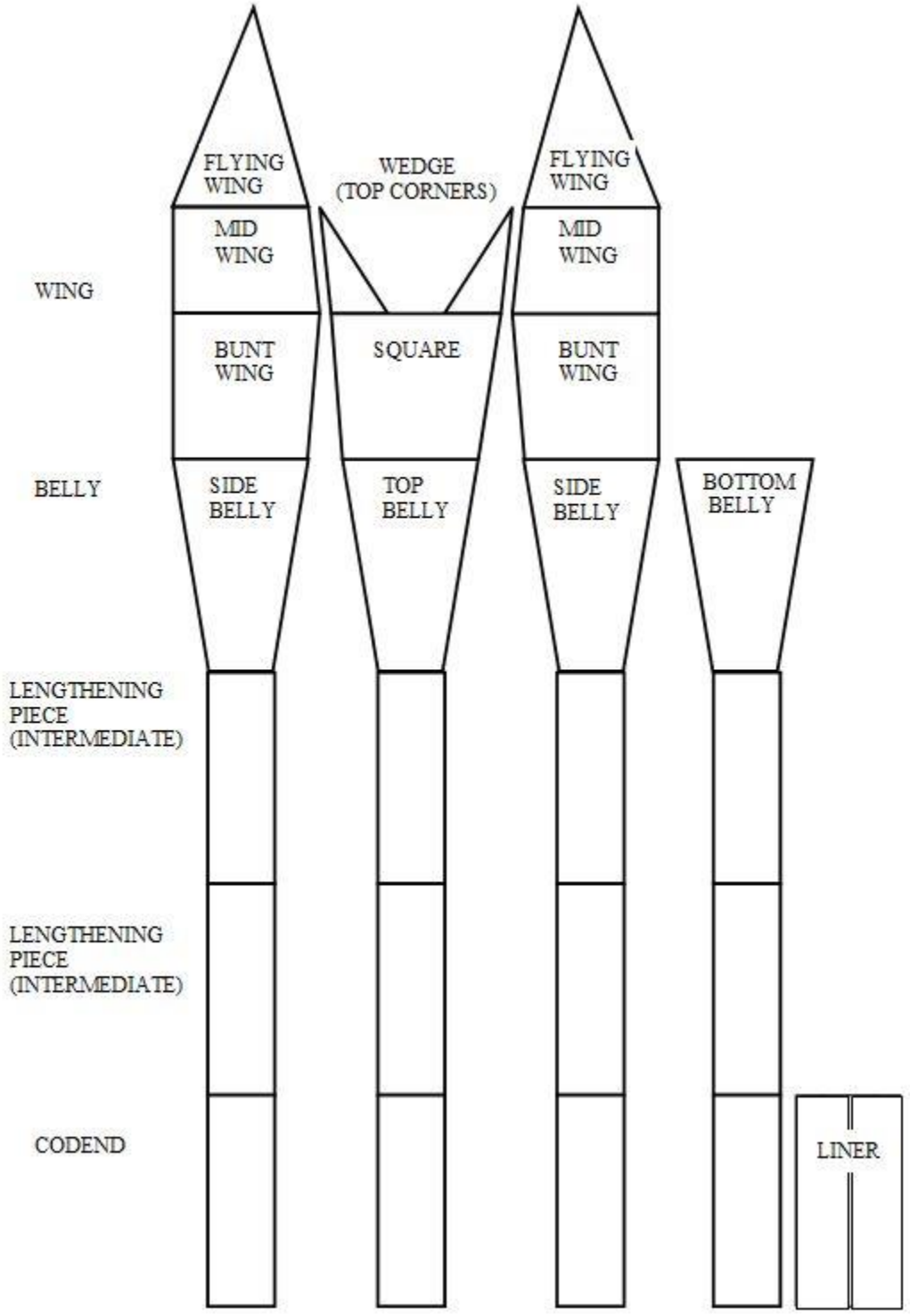

Figure 5. Diagram of the net panels with section names for the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey.

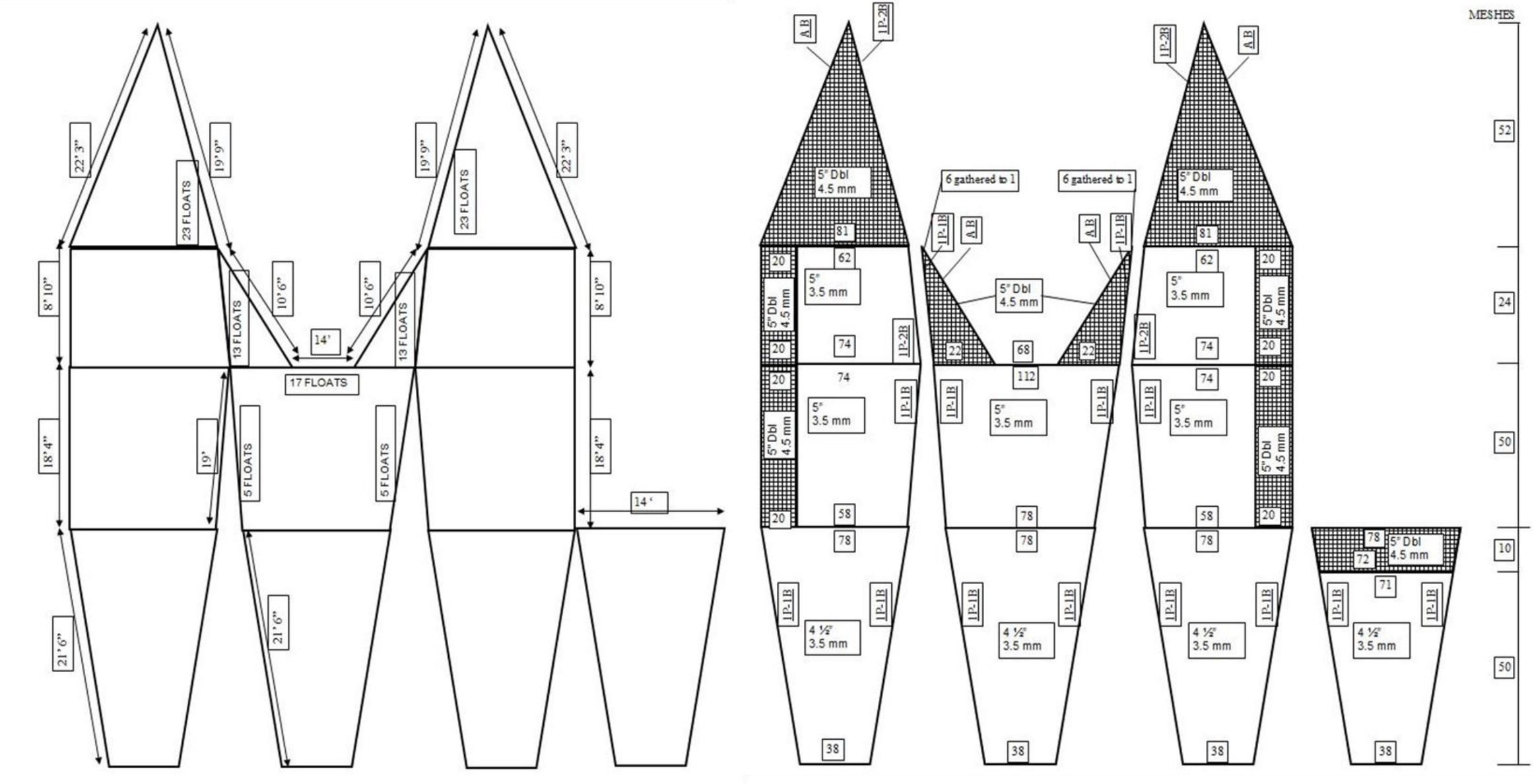

Figure 6. Details of the wing and belly sections of the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey. . Dimensions and the float arrangement are shown on the left while netting details, mesh counts, and mesh cuts are shown on the right side of the diagram.

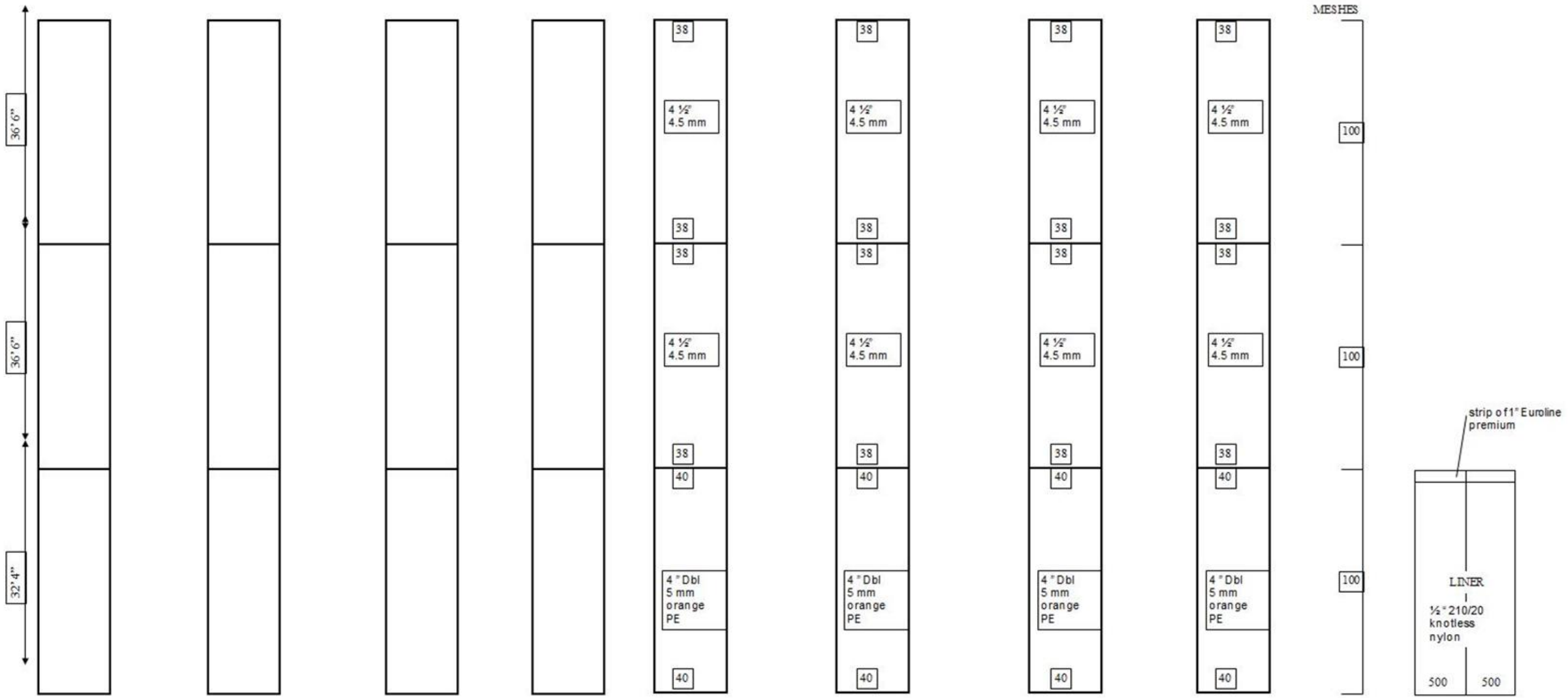

Figure 7. Details of the lengthening (intermediate) pieces and codend sections of the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey. Dimensions are shown on the left while netting details, mesh counts, and mesh cuts including the codend liner are shown on the right side of the diagram.

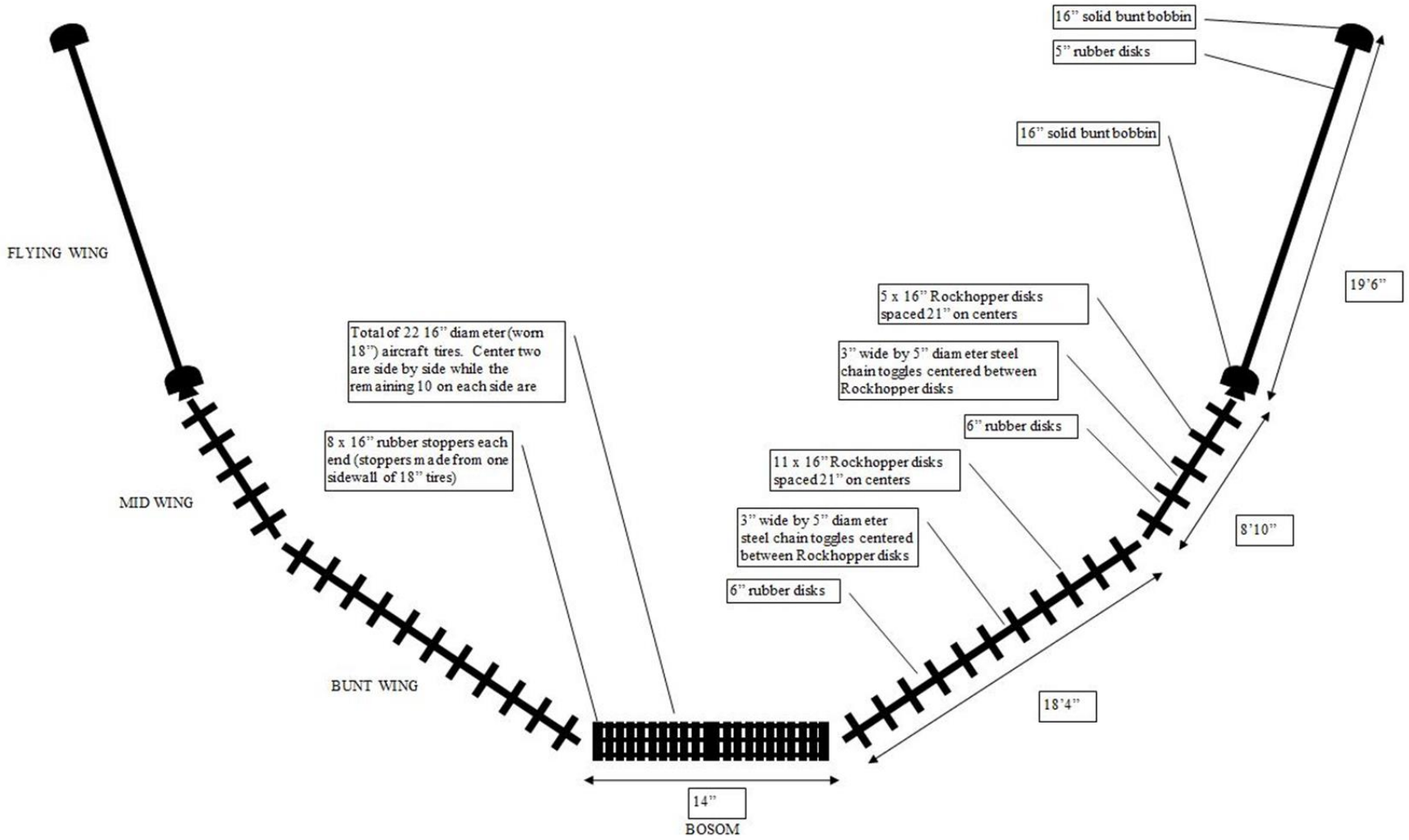

Figure 8. Details of the Rockhopper foot gear for the Atlantic Western IIa box trawl used on the 2012 WCVI synoptic bottom trawl survey.

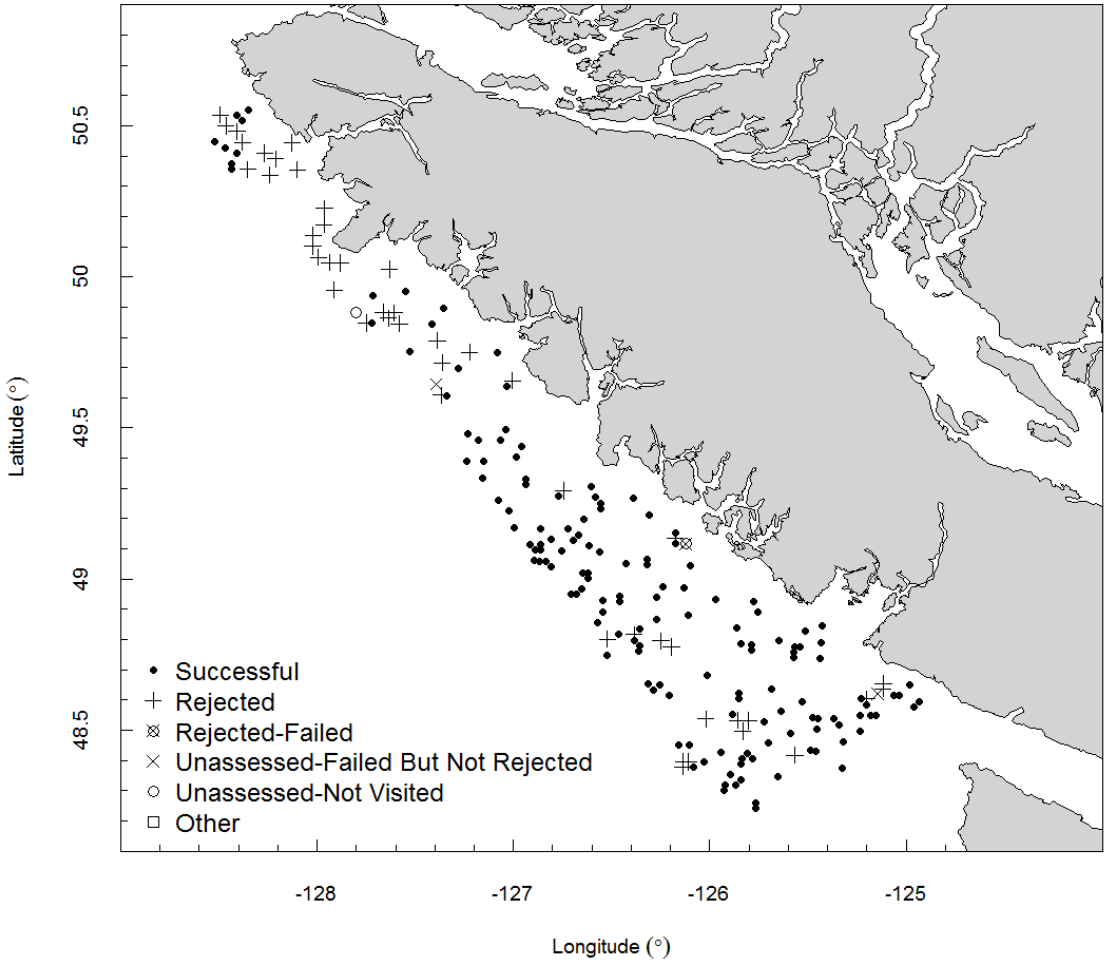

Figure 9. Final status of the 2012 WCVI synoptic bottom trawl survey showing 151 blocks that were fished successfully, 46 blocks rejected prior to fishing or after inspection, one block rejected after multiple failed fishing attempts, two blocks with failed fishing attempts but not rejected from the survey and one block unassessed.

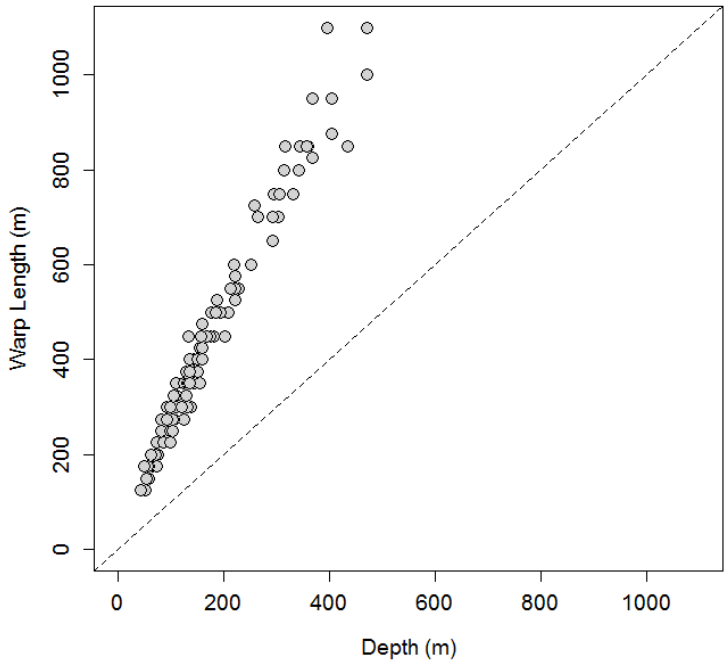

Figure 10. Warp length versus starting depth for each tow during the 2012 WCVI synoptic bottom trawl survey.

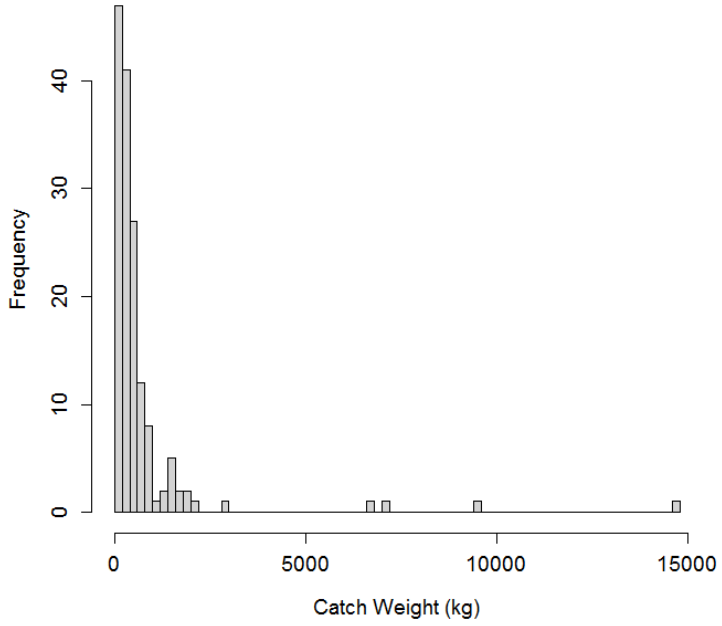

Figure 11. Histogram of catch weights in useable tows during the 2012 WCVI synoptic bottom trawl survey.

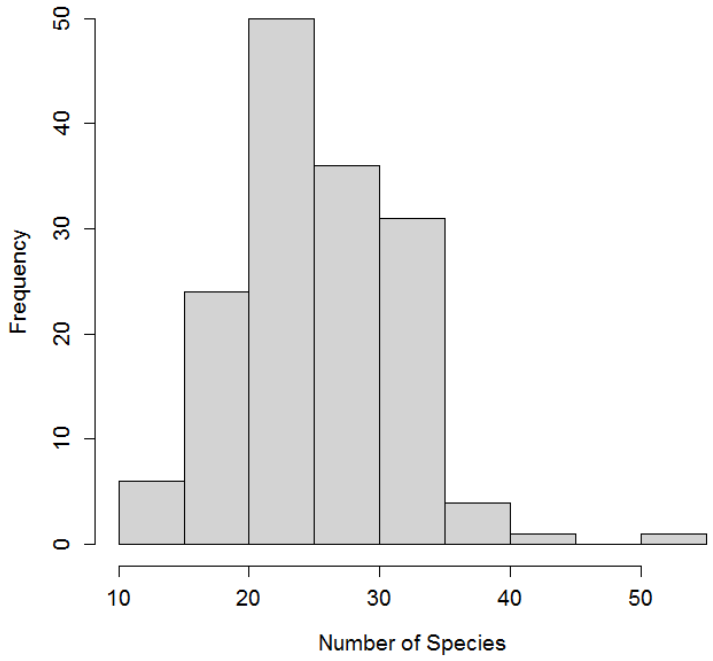

Figure 12. Histogram of number of species caught in useable tows during the 2012 WCVI synoptic bottom trawl survey.

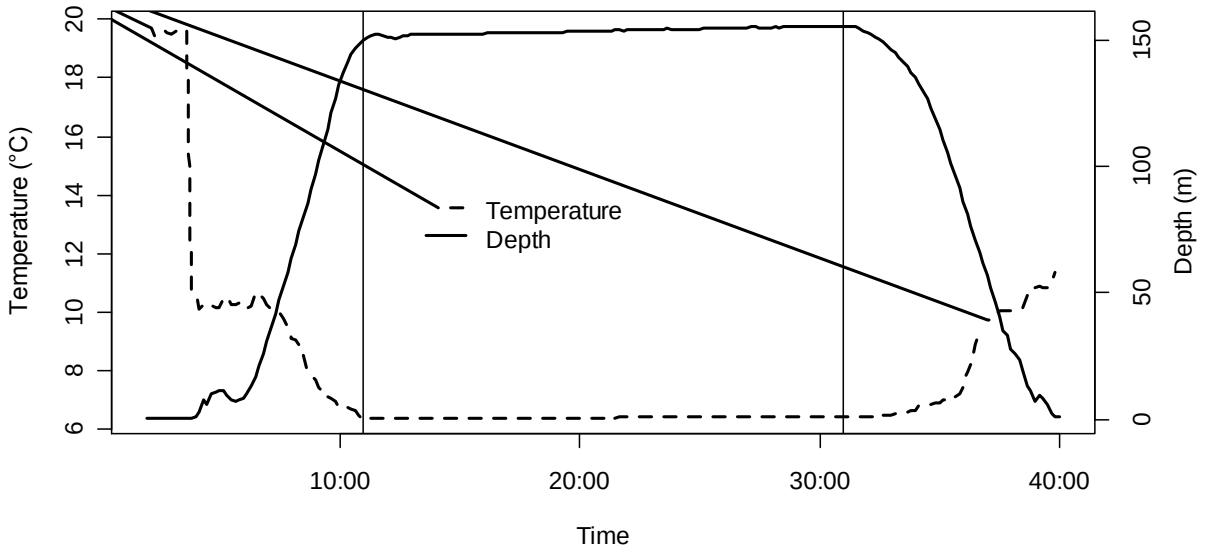

Figure 13. Example of a Seabird 39 temperature and pressure profile collected during a synoptic bottom trawl survey. The vertical lines indicate the start and end of net contact with the sea floor.

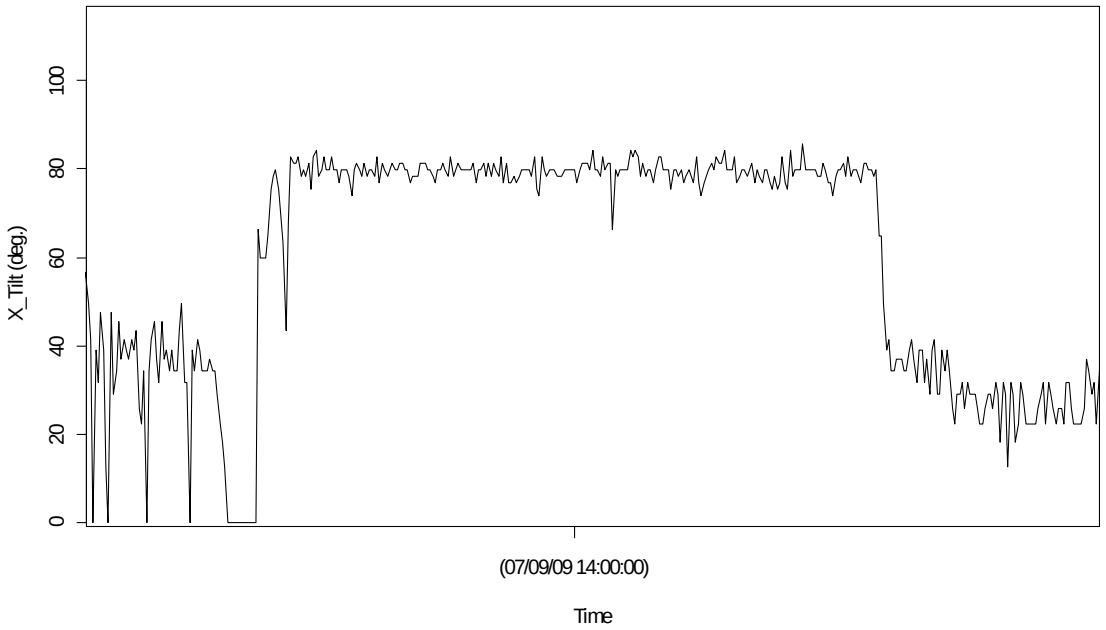

Figure 14. Example of a Mac Marine Industries bottom contact sensor profile collected during a synoptic bottom trawl survey. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

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APPENDIX A: WCVI 2012 SURVEY BRIDGE LOG

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
1	May-23	11:16	48.5942	124.9383	60	20	6.0	175	107.7	Yes
2	May-23	13:31	48.6544	124.9713	44	20	5.6	125	324.5	Yes
3	May-23	14:25	48.6223	125.0436	75	20	5.7	200	422.6	Yes
4	May-23	15:50	48.5739	124.9593	53	19	5.7	125	9.4	Yes
5	May-23	17:30	48.6122	125.0541	86	21	5.3	225	213.5	Yes
6	May-23	18:39	48.5899	125.1981	114	18	5.6	300	237.4	Yes
7	May-24	7:07	48.6114	125.2334	105	21	5.5	300	133.2	Yes
8	May-24	7:58	48.5645	125.2351	110	21	5.9	350	125.3	Yes
9	May-24	9:19	48.5478	125.1440	103	23	5.7	300	134.2	Yes
10	May-24	10:39	48.5106	125.3448	147	20	5.6	375	480.8	Yes
11	May-24	12:07	48.5302	125.3823	102	18	5.5	300	398.9	Yes
12	May-24	12:59	48.5429	125.4461	124	20	5.4	350	177.8	Yes
13	May-24	13:52	48.5089	125.4573	94	19	5.6	300	702.0	Yes
14	May-24	15:57	48.4657	125.3183	160	23	5.4	400	513.4	Yes
15	May-24	17:30	48.3731	125.3147	116	21	5.5	300	303.4	Yes
16	May-25	7:01	48.4336	125.4491	159	20	5.4	425	934.4	Yes
17	May-25	8:54	48.3540	125.6668	144	22	5.7		753.1	Yes
18	May-25	10:25	48.2678	125.7555	187	21	5.5	525	989.6	Yes
19	May-25	12:14	48.2452	125.7758	358	23	5.5	850	361.3	Yes
20	May-25	13:49	48.3087	125.8547	190	25	3.8	500	530.7	Yes
21	May-25	16:14	48.3398	125.8470	167	19	6.0		14644.1	Yes
22	May-26	7:04	48.3794	126.0822	331	21	5.3	750	542.1	Yes
23	May-26	8:16	48.3897	126.0339	303	19	5.6	700	651.0	Yes
24	May-26	9:54	48.4297	125.9599	174	21	5.7	450	6679.1	Yes
25	May-26	12:06	48.3464	125.8837	228	20	5.7		9592.4	Yes
26	May-26	13:45	48.3874	125.8494	150	22	5.9		704.4	Yes
27	May-26	14:51	48.4091	125.8477	147	21	5.8	400	7127.1	Yes
28	May-26	17:44	48.4262	125.8172	136	8	5.8	350	748.5	No
29	May-26	18:32	48.4148	125.7877	138	20	5.5	300	1816.7	Yes
30	May-27	7:14	48.7492	126.5295	472	23	5.3	1100	208.2	Yes
31	May-27	8:38	48.7630	126.3671	359	23	5.8	850	695.8	Yes
32	May-27	10:08	48.6633	126.3055	396	22	5.8	1100	1215.4	Yes
33	May-27	12:03	48.6469	126.2751	471	19	6.1	1000	290.0	Yes
34	May-27	13:41	48.6565	126.2510	317	25	6.4	850	1362.6	Yes
35	May-27	14:52	48.6292	126.2015	277	23	5.7		2933.3	Yes
36	May-27	17:32	48.6942	126.0281	105	21	5.1	275	93.2	Yes
37	May-27	19:01	48.6205	125.8541	74	21	6.3	200	119.4	Yes
38	May-28	6:57	48.6164	125.8501	72	20	5.4		160.9	Yes
39	May-28	8:07	48.5488	125.8811	83	21	5.7	250	103.9	Yes
40	May-28	10:22	48.4087	125.7891	144	21	5.5	400	1077.5	Yes
41	May-28	12:06	48.4556	125.6879	107	21	5.4		593.4	Yes
42	May-28	13:14	48.5252	125.7141	85	21	5.3	275	173.2	Yes
43	May-28	14:18	48.5610	125.6474	66	20	5.6	200	68.7	Yes
44	May-28	15:37	48.6412	125.6909	55	20	5.6	175	63.5	Yes
45	May-28	17:33	48.7367	125.5545	160	31	5.2	475	364.9	Yes
46	May-28	18:36	48.7794	125.5858	132	20	5.5		1444.3	Yes
47	May-29	7:05	48.7367	125.4249	112	21	5.5	300	315.1	Yes
48	May-29	8:04	48.7782	125.4297	100	21	5.5		231.3	Yes
49	May-29	9:17	48.8433	125.4439	84	21	5.9		266.5	Yes
50	May-29	15:22	48.7827	125.5492	130	22	5.6	375	537.0	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
51	May-29	16:51	48.7921	125.6463	66	22	5.9	175	112.9	Yes
52	May-29	16:14	48.7606	125.7991	72	21	5.8	200	456.0	Yes
53	May-30	7:27	48.7789	125.7834	59	21	6.0	175	103.7	Yes
54	May-30	8:11	48.7778	125.8354	63	20	5.8	200	56.1	Yes
55	May-30	8:57	48.8321	125.8584	56	20	5.6	175	67.5	Yes
56	May-30	10:00	48.8856	125.7643	104	21	5.6	300	716.2	Yes
57	May-30	10:55	48.9220	125.7852	82	22	6.0	275	566.2	Yes
58	May-30	13:16	48.8766	126.0992	87	22	6.3		391.0	Yes
59	May-30	14:44	48.8664	126.2674	137	22	5.8	400	777.0	Yes
60	May-30	16:26	48.7924	126.3639	221	20	5.2		1755.0	Yes
61	May-31	6:58	48.7967	126.3625	203	23	5.8	450	1630.6	Yes
62	May-31	8:00	48.8120	126.4488	210	22	5.7	500	398.1	Yes
63	May-31	9:24	48.8849	126.5374	367	26	5.7	950	909.0	Yes
64	May-31	10:50	48.9515	126.6799	405	25	5.2	950	275.1	Yes
65	May-31	12:12	48.9674	126.6550	404	22	5.3	875	234.5	Yes
66	May-31	13:19	49.0010	126.6173	245	23	5.7		998.3	Yes
67	May-31	15:19	48.9395	126.4523	160	21	5.7	450	462.1	Yes
68	May-31	16:12	48.9308	126.4479	160	24	5.2	450	599.6	Yes
69	May-31	17:45	48.9482	126.2867	125	21	5.1	350	540.3	Yes
70	Jun-01	7:01	48.9852	126.1356	74	22	5.1	175	91.8	Yes
71	Jun-01	8:03	49.0425	126.0927	58	21	6.1	175	75.6	Yes
72	Jun-01	8:58	49.1112	126.1105	49	17	5.9	150		No
73	Jun-02	9:38	49.2033	126.3036	58	19	5.5		101.3	Yes
74	Jun-02	11:21	49.1517	126.1867	55	20	5.2	150	61.8	Yes
75	Jun-02	12:35	49.1180	126.1896	56	17	5.4	175	40.0	Yes
76	Jun-02	13:56	49.0443	126.3103	110	23	5.5	300	582.6	Yes
77	Jun-02	14:52	49.0452	126.4060	132	22	5.4	350	85.5	Yes
78	Jun-02	16:04	49.0799	126.5432	133	23	5.3	350	89.0	Yes
79	Jun-02	18:05	49.0460	126.8087	229	20	5.6	550	552.9	Yes
80	Jun-02	19:07	49.0537	126.8530	293	24	5.6	700	514.2	Yes
81	Jun-03	6:57	49.0870	126.7398	156	19	5.3	350	399.7	Yes
82	Jun-03	8:11	49.1380	126.6596	131	20	5.4	300	201.8	Yes
83	Jun-03	8:59	49.1580	126.7025	129	19	5.6	325	92.8	Yes
84	Jun-03	10:30	49.2358	126.5593	103	21	6.0	250	201.6	Yes
85	Jun-03	11:50	49.3133	126.6181	94	22	5.3	275	130.0	Yes
86	Jun-03	12:35	49.2837	126.5839	99	20	5.9	225	143.7	Yes
87	Jun-03	14:20	49.2744	126.3760	51	20	5.5	175	76.1	Yes
88	Jun-04	7:11	49.0541	126.8864	369	24	5.3	825	249.8	Yes
89	Jun-04	8:17	49.0881	126.8626	229	18	5.7	550	1849.6	Yes
90	Jun-04	9:26	49.1092	126.8523	195	20	5.7	500	1429.5	Yes
91	Jun-04	10:35	49.1703	126.9853	305	21	5.7	750	901.4	Yes
92	Jun-04	11:51	49.2142	127.0090	221	27	5.9	575	761.4	Yes
93	Jun-04	14:11	49.2573	127.0674	221	23	5.6	550	780.1	Yes
94	Jun-04	15:34	49.3098	126.9421	151	21	5.6		180.8	Yes
95	Jun-04	17:28	49.4173	127.0086	136	19	5.5	375	239.1	Yes
96	Jun-04	18:29	49.4310	126.9493	123	19	5.6	300	141.9	Yes
97	Jun-06	7:02	49.4890	127.0316	123	19	5.7	300	207.4	Yes
98	Jun-06	7:56	49.4650	127.0669	136	20	5.5	350	238.5	Yes
99	Jun-06	9:21	49.3996	127.1607	160	19	5.3	400	200.2	Yes
100	Jun-06	10:14	49.3448	127.1660	186	19	5.5	500	216.7	Yes
101	Jun-06	11:15	49.3785	127.2245	213	19	5.8	550	448.3	Yes
102	Jun-06	12:30	49.4556	127.1688	158	19	5.7	450	177.6	Yes
103	Jun-06	13:27	49.4724	127.2217	182	19	6.1	500	419.0	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
104	Jun-06	15:49	49.6416	127.0503	96	18	5.6	275	95.5	Yes
105	Jun-06	17:46	49.7507	127.0943	66	19	5.6	175	138.7	Yes
106	Jun-07	14:46	49.7051	127.2850	125	18	5.3	275	41.8	Yes
107	Jun-07	15:58	49.6501	127.3925	293	13	5.3	650	209.0	No
108	Jun-07	17:43	49.6178	127.3439	160	6	5.4	450	158.7	No
109	Jun-07	18:34	49.5983	127.3150	157	19	6.0	400	154.0	Yes
110	Jun-08	6:56	49.9045	127.3480	64	20	6.1	200	200.6	Yes
111	Jun-08	7:47	49.8496	127.4157	73	21	5.8	225	51.2	Yes
112	Jun-08	9:04	49.7524	127.5244	176	19	5.7	500	869.0	Yes
113	Jun-08	12:05	49.8425	127.7099	182	19	6.1	450	203.7	Yes
114	Jun-08	13:25	49.9366	127.7105	134	19	5.9	450	98.0	Yes
115	Jun-08	14:55	49.9536	127.5615	58	15	5.6	150	70.6	Yes
116	Jun-09	7:52	50.5443	128.3416	100	21	5.6	300	356.1	Yes
117	Jun-09	8:44	50.5428	128.4084	159	21	5.6	450	1585.2	Yes
118	Jun-09	9:39	50.5103	128.3716	155	22	5.3	425	232.0	Yes
119	Jun-09	11:54	50.4558	128.5238	222	21	5.6	525	1401.1	Yes
120	Jun-09	12:59	50.4216	128.4623	209	20	6.0	500	588.4	Yes
121	Jun-09	14:03	50.3854	128.4446	224	19	5.5	550	764.4	Yes
122	Jun-09	15:02	50.3570	128.4356	343	20	5.5	800	824.2	Yes
123	Jun-10	9:00	50.4114	128.4199	206	21	5.5	500	528.7	Yes
124	Jun-11	6:59	49.3384	126.9430	150	20	5.1	400	237.5	Yes
125	Jun-11	8:26	49.2858	126.7899	122	18	6.0	300	158.5	Yes
126	Jun-11	10:32	49.1759	126.8630	157	19	5.7	450	102.0	Yes
127	Jun-11	11:54	49.1231	126.9301	296	19	5.6	750	389.9	Yes
128	Jun-11	12:52	49.1032	126.8946	264	19	5.7	700	621.0	Yes
129	Jun-11	13:50	49.0663	126.8364	226	19	6.0	550	1441.9	Yes
130	Jun-11	14:57	49.1241	126.7945	150	19	6.2	375	442.5	Yes
131	Jun-11	15:58	49.1373	126.7046	136	19	5.8	350	272.6	Yes
132	Jun-11	17:33	49.1894	126.6441	120	19	5.9	300	51.0	Yes
133	Jun-12	7:04	49.2404	126.5575	104	19	5.5	275	119.6	Yes
134	Jun-12	8:22	49.1173	126.6263	134	18		350	42.9	Yes
135	Jun-12	9:28	49.0197	126.6610	174	19	5.2	450	194.6	Yes
136	Jun-12	10:26	49.0177	126.6135	168	20	6.2	450	679.9	Yes
137	Jun-12	11:47	48.9487	126.7036	435	13	5.7	850	139.0	No
138	Jun-12	13:24	48.8543	126.5680	314	26	5.2	800	349.4	Yes
139	Jun-12	14:51	48.9191	126.5345	253	13	5.3	600	993.9	No
140	Jun-12	16:33	48.8312	126.3503	174	22	5.4	450	280.9	Yes
141	Jun-12	18:14	48.9648	126.2378	113	20	5.6	300	596.1	Yes
142	Jun-13	13:48	49.0724	126.3183	99	20	5.5	300	423.0	Yes
143	Jun-13	16:26	48.9209	125.9680	59	21	5.7	175	109.5	Yes
144	Jun-13	19:03	48.8311	125.5220	105	21	6.0	325	331.0	Yes
145	Jun-14	7:30	48.4533	126.1016	220	22	6.1	600	426.8	Yes
146	Jun-14	8:40	48.4465	126.1528	304	22	6.4	800	797.3	No
147	Jun-14	9:42	48.4445	126.1601	344	21	5.2	850	447.9	Yes
148	Jun-14	12:01	48.3167	125.915	359	20	5.7	850	518.5	Yes
149	Jun-14	13:07	48.3031	125.9112	259	23	5.1	725	2131.6	Yes
150	Jun-14	16:17	48.4867	125.5955	98	22	5.2	300	376.3	Yes
151	Jun-14	17:44	48.5862	125.5175	133	19	5.7	350	469.3	Yes
152	Jun-15	7:02	48.7559	125.5672	144	19	5.5	350	308.4	Yes
153	Jun-15	9:08	48.5485	125.4896	111	22	5.6	325	469.2	Yes
154	Jun-15	10:21	48.4407	125.4937	132	20	5.4	350	335.2	Yes
155	Jun-15	16:47	48.4962	125.2546	142	19	5.2	350	303.5	Yes
156	Jun-15	17:55	48.545	125.1697	107	17	5.7	300	348.8	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
157	Jun-15	19:23	48.6206	125.1396	99	14	6.1	250	105.2	No

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

Common Name	Scientific Name	Total weight (kg)	1	2	3	4	5
Arrowtooth Flounder	*Reinhardtius stomias*	10780.6			0.2		0.2
Aurora Rockfish	*Sebastes aurora*	58.7					
Big Skate	*Raja binoculata*	116.3					48.8
Blackbelly Eelpout	*Lycodes pacificus*	100.1					
Bocaccio	*Sebastes paucispinis*	96.4					
Brown Cat Shark	*Apristurus brunneus*	19.2					
Canary Rockfish	*Sebastes pinniger*	3213.1	2.5				
Curlfin Sole	*Pleuronichthys decurrens*	57.2			3.7		0.4
Darkblotched Rockfish	*Sebastes crameri*	617.8					
Dover Sole	*Microstomus pacificus*	3038.3			0.6		0.9
English Sole	*Parophrys vetulus*	1487.3			54.9	0.7	29.0
Eulachon	*Thaleichthys pacificus*	121.6					
Flathead Sole	*Hippoglossoides elassodon*	964.4			0.4		
Green Sturgeon	*Acipenser medirostris*	76.0					
Greenstriped Rockfish	*Sebastes elongatus*	1385.1					
Kelp Greenling	*Hexagrammos decagrammus*	33.9	2.2	0.4		2.0	
Lingcod	*Ophiodon elongatus*	881.9			1.5		1.4
Longnose Skate	*Raja rhina*	648.9					
North Pacific Spiny Dogfish	*Squalus suckleyi*	16545.1					
Pacific Cod	*Gadus macrocephalus*	1295.0	0.4	16.8	5.3		10.6
Pacific Hake	*Merluccius productus*	1468.6					
Pacific Halibut	*Hippoglossus stenolepis*	786.9			3.0		
Pacific Ocean Perch	*Sebastes alutus*	10789.7					
Pacific Sanddab	*Citharichthys sordidus*	1005.6		0.1	126.5	1.2	87.5
Pacific Tomcod	*Microgadus proximus*	66.3			0.2		
Petrale Sole	*Eopsetta jordani*	817.7			9.9		14.1
Pygmy Rockfish	*Sebastes wilsoni*	46.1					
Quillback Rockfish	*Sebastes maliger*	82.8	14.0	3.2			1.2
Ragfish	*Icosteus aenigmaticus*	31.8					
Redbanded Rockfish	*Sebastes babcocki*	751.2					
Redstripe Rockfish	*Sebastes proriger*	12066.6					
Rex Sole	*Glyptocephalus zachirus*	2465.4			4.9	0.3	8.2
Rosethorn Rockfish	*Sebastes helvomaculatus*	548.1					
Rougheye Rockfish	*Sebastes aleutianus*	499.0					
Sablefish	*Anoplopoma fimbria*	4983.6					
Sandpaper Skate	*Bathyraja interrupta*	17.1					
Sharpchin Rockfish	*Sebastes zacentrus*	9250.8					
Shortraker Rockfish	*Sebastes borealis*	186.2					
Shortspine Thornyhead	*Sebastolobus alascanus*	903.5					
Silvergray Rockfish	*Sebastes brevispinis*	4893.7					
Slender Sole	*Lyopsetta exilis*	173.9					
Southern Rock Sole	*Lepidopsetta bilineata*	342.0	0.5	5.8	1.2		
Splitnose Rockfish	*Sebastes diploproa*	6307.3					
Spotted Ratfish	*Hydrolagus colliei*	4535.2	86.2	280.9	10.8	5.0	4.0
Threadfin Sculpin	*Icelinus filamentosus*	68.2					
Walleye Pollock	*Theragra chalcogramma*	624.3	0.2		198.5		7.1
Widow Rockfish	*Sebastes entomelas*	33.8					
Yelloweye Rockfish	*Sebastes ruberrimus*	220.2					
Yellowmouth Rockfish	*Sebastes reedi*	518.0					
Yellowtail Rockfish	*Sebastes flavidus*	1805.9					
Other		1366.5	1.7	17.2	0.9	0.3	0.2
Total			**107.7**	**324.5**	**422.6**	**9.4**	**213.5**

Common Name	6	7	8	9	10	11	12	13	14	15	16
Arrowtooth Flounder	3.6	4.6	15.1	3.9	73.5	124.2	35.6	36.1	276.6	11.6	471.2
Aurora Rockfish											
Big Skate											
Blackbelly Eelpout	0.1	0.5	0.3	-	3.0	0.1	3.5		9.6		0.1
Bocaccio										12.1	
Brown Cat Shark											
Canary Rockfish				2.9	27.5	9.3	1.6			1.6	
Curlfin Sole											
Darkblotched Rockfish											
Dover Sole	15.5	9.1	12.5	4.0	59.4	25.1	12.9	2.3	8.9	1.9	38.0
English Sole	0.5	0.7	2.1			1.1	49.2	75.7	4.3	20.3	
Eulachon	0.1		0.4	0.1	5.4	0.3	0.3	0.2	3.7		0.3
Flathead Sole	6.0	10.3	4.7	0.6	57.8	2.5	3.9	0.7	42.2	0.5	8.4
Green Sturgeon											
Greenstriped Rockfish		0.8		5.6	1.0					35.0	
Kelp Greenling		0.3									
Lingcod				4.9	1.5	7.5		45.3	17.8	5.8	2.6
Longnose Skate					12.9	3.4	7.7		15.7	2.3	101.4
North Pacific Spiny Dogfish			5.8		13.5				27.4	8.1	13.5
Pacific Cod	12.3	31.5	14.1	36.7	3.2	24.0		107.2	2.3	53.4	
Pacific Hake							0.2				
Pacific Halibut						2.9		117.8	4.3		
Pacific Ocean Perch						-				0.1	
Pacific Sanddab				0.4			1.3	0.9		0.2	
Pacific Tomcod											
Petrale Sole	5.6	9.7	19.2	4.0	2.5	3.0	3.0	152.2	0.9	39.0	4.6
Pygmy Rockfish				0.6						0.7	
Quillback Rockfish				3.6							
Ragfish											
Redbanded Rockfish											
Redstripe Rockfish				10.4	1.3					20.8	
Rex Sole	18.5	10.0	16.3	5.5	61.2	13.3	12.4	1.8	22.5	7.2	29.7
Rosethorn Rockfish				0.4						1.0	
Rougheye Rockfish					0.1				0.5		
Sablefish						28.9		1.8	1.8	1.3	18.9
Sandpaper Skate								0.9	1.3		
Sharpchin Rockfish										0.5	
Shortraker Rockfish											
Shortspine Thornyhead											
Silvergray Rockfish											1.2
Slender Sole	1.5	1.8	3.4	0.6	12.9	1.4	4.3	0.3	6.6	0.2	3.5
Southern Rock Sole			0.7			1.9		12.5	0.4	0.5	
Splitnose Rockfish									0.2		
Spotted Ratfish	16.8	49.2	20.2	17.9	26.7	134.8	25.3	61.0	38.0	33.0	13.4
Threadfin Sculpin		2.0	6.0	5.1	0.3	1.6				4.6	0.8
Walleye Pollock	1.0	1.8	3.5	1.9	0.1	0.5	0.7	78.2		33.0	0.6
Widow Rockfish											
Yelloweye Rockfish				5.3							
Yellowmouth Rockfish											
Yellowtail Rockfish	145.4			15.9	76.8	10.1	3.0	5.7			223.3
Other	10.6	0.8	1.1	3.8	40.2	3.1	12.9	1.3	28.4	9.0	3.0
Total	**237.4**	**133.2**	**125.3**	**134.2**	**480.8**	**398.9**	**177.8**	**702.0**	**513.4**	**303.4**	**934.4**

Common Name	17	18	19	20	21	22	23	24	25	26	27
Arrowtooth Flounder	21.1	43.3	25.2	98.4	258.2	45.9	48.7	387.3	275.2	53.0	33.6
Aurora Rockfish			5.6	0.7							
Big Skate											
Blackbelly Eelpout											
Bocaccio		3.3			31.5						1.6
Brown Cat Shark											
Canary Rockfish		12.1		1.9	1948.7					94.0	431.0
Curlfin Sole											
Darkblotched Rockfish	0.6		3.6			105.6	10.9				
Dover Sole	34.0	15.2	29.6	55.2		23.7	52.0	138.2	6.9	0.8	
English Sole	85.2	2.7		8.4	5.8			41.5		0.6	
Eulachon											
Flathead Sole											
Green Sturgeon											
Greenstriped Rockfish	21.6	62.9		22.7	119.7			75.0	2.4	17.6	7.9
Kelp Greenling											
Lingcod	11.8	2.3			58.9			29.6	9.5	25.6	55.2
Longnose Skate			7.3		5.8	15.0	6.0		21.6		
North Pacific Spiny Dogfish	166.9	34.9		5.4	30.4			4657.4	23.9	367.4	5072.4
Pacific Cod	2.6	5.0		2.0	39.2					2.6	
Pacific Hake			95.6	1.0		147.0	4.7				
Pacific Halibut	12.1	13.2			66.9		3.7			25.1	21.4
Pacific Ocean Perch		679.7	18.2	98.2		93.9	165.6	135.5	2364.6		
Pacific Sanddab											
Pacific Tomcod											
Petrale Sole	7.6	0.5			-			-			
Pygmy Rockfish	2.5				1.5					11.5	20.6
Quillback Rockfish											
Ragfish											
Redbanded Rockfish	22.8	1.2	8.6	1.8	58.0	5.4	14.7	76.1	99.0		2.3
Redstripe Rockfish	213.4	13.9		64.3	7597.9			690.2	35.6	10.3	315.5
Rex Sole	0.5	8.2	7.4	49.8		4.5	5.2	36.3		1.0	
Rosethorn Rockfish	2.1	48.1		0.7	262.2	0.9	4.8	11.3	31.6	9.8	9.3
Rougheye Rockfish			36.3	10.7		11.4	12.3	11.1			
Sablefish	21.6		67.8	20.5	162.5	49.0	19.1	56.3	1788.1		
Sandpaper Skate									1.0		
Sharpchin Rockfish	82.4	3.9		56.6	125.5		1.2	212.4	4268.3	16.0	477.0
Shortraker Rockfish			4.0								
Shortspine Thornyhead			29.9			28.9	30.1				
Silvergray Rockfish	0.8	4.7	1.4	2.1	3289.5	0.7	20.7			11.4	614.3
Slender Sole	0.4	0.6	1.7	1.2		0.6	1.5	3.5	0.7	0.2	
Southern Rock Sole											
Splitnose Rockfish			9.3	1.7		5.9	238.7		36.0		
Spotted Ratfish		2.0		7.6	83.5	1.8		12.3		8.8	-
Threadfin Sculpin					7.3					0.5	
Walleye Pollock	0.6										
Widow Rockfish						0.9			21.9	2.2	
Yelloweye Rockfish	5.1	7.8			-			17.0		41.5	36.4
Yellowmouth Rockfish				0.9					379.7		
Yellowtail Rockfish	35.1	21.2		4.4	352.1			75.7	212.2	1.7	28.1
Other	2.3	3.0	9.8	14.7	139.1	0.9	11.0	12.5	14.5	2.8	0.5
Total	**753.1**	**989.6**	**361.3**	**530.7**	**14644.1**	**542.1**	**651.0**	**6679.1**	**9592.4**	**704.4**	**7127.1**

Common Name	28	29	30	31	32	33	34	35	36	37	38
Arrowtooth Flounder	6.3	49.2	3.6	95.0	3.4		101.2	236.6	0.3	0.2	1.6
Aurora Rockfish					37.3	9.6					
Big Skate											
Blackbelly Eelpout									-		
Bocaccio							4.7	5.7			
Brown Cat Shark			9.0	1.1	1.9	4.3					
Canary Rockfish	13.0	224.4								14.1	
Curlfin Sole										3.1	4.3
Darkblotched Rockfish					100.0		61.0	9.7			
Dover Sole	2.7	3.7	21.8	200.0	125.1	105.3	83.6	40.6	0.3		
English Sole	3.3	4.6							15.4	2.8	1.1
Eulachon									11.1	0.1	
Flathead Sole											
Green Sturgeon											
Greenstriped Rockfish	2.0	17.5									
Kelp Greenling										2.8	1.0
Lingcod		18.5								0.7	0.4
Longnose Skate			3.1	23.8	5.6	12.8	5.7			1.5	
North Pacific Spiny Dogfish	712.9	1364.5		18.0				19.0			5.9
Pacific Cod									9.2	7.2	25.9
Pacific Hake			2.0	25.0	78.4	9.2	13.9	11.1			
Pacific Halibut		9.8					6.4	2.6	4.4	36.6	3.4
Pacific Ocean Perch				6.5	100.1		217.8	242.6			
Pacific Sanddab										5.0	2.0
Pacific Tomcod											
Petrale Sole	1.1	2.0							6.1	5.1	9.4
Pygmy Rockfish		0.4									
Quillback Rockfish										6.2	5.4
Ragfish											
Redbanded Rockfish		4.2		11.3			11.7	18.3			
Redstripe Rockfish		32.5									-
Rex Sole		1.1	0.6	28.3	7.3	2.9	9.3	17.4	19.0	0.5	
Rosethorn Rockfish		4.7			4.3		12.7	18.4			
Rougheye Rockfish				43.3	5.4	5.4	5.6				
Sablefish			126.4	176.6	605.6	64.5	103.7	30.9			
Sandpaper Skate				1.4	1.2	1.4		0.9			
Sharpchin Rockfish	0.6	23.8						739.4			
Shortraker Rockfish			6.9		3.8		51.1	10.8			
Shortspine Thornyhead			25.9	46.7	99.1	53.0	69.4	53.0			
Silvergray Rockfish							4.1	6.7			
Slender Sole				0.2			0.5	0.3	1.0		
Southern Rock Sole										14.9	11.9
Splitnose Rockfish				0.9			581.9	1452.2			
Spotted Ratfish		1.2		2.0			2.5	7.4	26.3	13.7	28.9
Threadfin Sculpin		0.9						-	-		
Walleye Pollock										0.4	
Widow Rockfish								2.5			
Yelloweye Rockfish	6.2	36.6									
Yellowmouth Rockfish											
Yellowtail Rockfish		15.5						1.5			
Other	0.3	1.8	8.8	15.6	36.9	21.5	15.9	5.6	0.1	4.7	2.7
Total	**748.5**	**1816.7**	**208.2**	**695.8**	**1215.4**	**290.0**	**1362.6**	**2933.3**	**93.2**	**119.4**	**103.9**

Common Name	39	40	41	42	43	44	45	46	47	48	49
Arrowtooth Flounder	0.2	19.2	1.0	3.4	-		15.9	8.3	6.0	3.9	-
Aurora Rockfish											
Big Skate										7.2	13.0
Blackbelly Eelpout							-	-	5.4	10.7	0.6
Bocaccio		2.0									
Brown Cat Shark											
Canary Rockfish	21.2	35.4				0.1		0.5			
Curlfin Sole	2.2			0.2	0.3						
Darkblotched Rockfish											
Dover Sole		22.1	1.7	0.6			51.0	64.2	63.2	26.2	6.3
English Sole	6.4	15.6	81.1	8.8				1.8	1.2	18.7	27.6
Eulachon			-	0.1			2.4	0.9	3.1	3.7	1.9
Flathead Sole							0.5	4.0	62.0	35.1	4.3
Green Sturgeon	30.3										
Greenstriped Rockfish		13.8	1.1					4.4			
Kelp Greenling	3.3			0.3		2.2	0.4				
Lingcod	3.2	17.6		1.8	2.5	1.6	0.4	4.2	2.7	1.3	
Longnose Skate							6.7	4.7	12.5	0.6	11.1
North Pacific Spiny Dogfish	6.5	864.6	397.0	40.4	1.3		5.2				
Pacific Cod	0.4		34.9	5.7		1.4	4.4	24.7		14.2	
Pacific Hake							1.8		-	1.5	0.7
Pacific Halibut	2.7	5.3	4.7	27.2	4.4				4.3	4.3	3.0
Pacific Ocean Perch											
Pacific Sanddab	0.5			16.1	1.7	0.5	0.1	0.4		23.9	4.6
Pacific Tomcod											3.1
Petrale Sole	15.2	4.7	24.8	12.1	23.4		1.7	4.5	9.8	10.0	7.4
Pygmy Rockfish		0.4									
Quillback Rockfish	4.8							3.7		2.2	
Ragfish											
Redbanded Rockfish		18.1	1.5								
Redstripe Rockfish	0.4	1.1				-		3.4			
Rex Sole	0.1	4.1		2.2			76.6	43.1	32.8	14.5	20.4
Rosethorn Rockfish		2.2									
Rougheye Rockfish							1.1				
Sablefish			1.4								
Sandpaper Skate				1.2							
Sharpchin Rockfish		3.8									
Shortraker Rockfish											
Shortspine Thornyhead											
Silvergray Rockfish		12.6	1.6								
Slender Sole		0.8					3.1	1.3	8.8	1.7	0.7
Southern Rock Sole	16.7			8.3	18.7	30.0	1.3				0.1
Splitnose Rockfish											
Spotted Ratfish	40.1	5.2	3.9	33.4	16.3	21.9	73.0	1224.3	91.9	34.9	129.9
Threadfin Sculpin	0.7	1.1	0.3	-				0.8			
Walleye Pollock			36.5				95.7	14.6	2.8	6.0	0.5
Widow Rockfish											
Yelloweye Rockfish		12.3									
Yellowmouth Rockfish											
Yellowtail Rockfish		14.8							2.6		
Other	6.0	0.9	1.7	11.5	-	5.9	23.6	30.5	6.0	10.8	31.4
Total	**160.9**	**1077.5**	**593.4**	**173.2**	**68.7**	**63.5**	**364.9**	**1444.3**	**315.1**	**231.3**	**266.5**

Common Name	50	51	52	53	54	55	56	57	58	59	60
Arrowtooth Flounder	25.6	0.1	0.5				2.0		6.6	535.9	150.5
Aurora Rockfish											
Big Skate	14.1							21.3			
Blackbelly Eelpout	1.3								0.1	-	0.1
Bocaccio											
Brown Cat Shark											
Canary Rockfish		15.0	0.9				0.8				8.3
Curlfin Sole			5.5	6.8	2.6	1.3		8.2			
Darkblotched Rockfish										-	7.9
Dover Sole	40.8	0.8	18.0				69.0	20.1	1.5	11.7	10.2
English Sole	0.8	2.3	5.9		0.5	1.2	149.9	275.4	25.4		
Eulachon	9.4						2.4	1.6	1.5		
Flathead Sole	216.7	3.0					1.7		0.1	2.8	
Green Sturgeon											
Greenstriped Rockfish										0.9	8.2
Kelp Greenling		6.5				2.3					
Lingcod		1.3	4.7		0.3	1.8	2.9		6.9	1.5	9.1
Longnose Skate	15.8		2.5				7.4	14.5	5.3	3.5	3.6
North Pacific Spiny Dogfish					3.7				5.3	128.8	36.6
Pacific Cod		3.6	9.7	4.0	1.4	1.1	42.7	7.7	24.2	2.4	
Pacific Hake	3.1									9.2	31.8
Pacific Halibut			15.8	6.3	6.2	12.1		33.7	43.5		
Pacific Ocean Perch											314.6
Pacific Sanddab		6.7	202.4	1.1	1.6	1.9	17.6	49.3	183.8		
Pacific Tomcod			-				29.6	17.3			
Petrale Sole	4.6		1.9			0.8	33.1	29.1	55.6		
Pygmy Rockfish											
Quillback Rockfish		10.2	1.7		1.1	7.9					
Ragfish											
Redbanded Rockfish											4.0
Redstripe Rockfish		12.7									
Rex Sole	76.4	0.1	0.1			0.3	30.5	25.7	19.1	28.5	13.0
Rosethorn Rockfish											0.3
Rougheye Rockfish											
Sablefish							0.6			45.0	14.2
Sandpaper Skate											
Sharpchin Rockfish										-	68.7
Shortraker Rockfish											
Shortspine Thornyhead											14.7
Silvergray Rockfish		2.3									
Slender Sole	7.8								0.4	1.3	0.1
Southern Rock Sole		6.9	19.3	41.6	8.1	4.7		0.2			
Splitnose Rockfish	-									-	1040.6
Spotted Ratfish	101.8	29.0	165.9	43.1	30.6	31.6	316.7	57.6	8.2	1.3	16.5
Threadfin Sculpin		-	0.2								
Walleye Pollock	2.1						3.3		2.3		
Widow Rockfish									-		0.3
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish		3.7									
Other	16.7	8.7	0.9	0.8	0.1	0.6	5.8	4.5	1.3	4.1	1.8
Total	**537.0**	**112.9**	**456.0**	**103.7**	**56.1**	**67.5**	**716.2**	**566.2**	**391.0**	**777.0**	**1755.0**

Common Name	61	62	63	64	65	66	67	68	69	70	71
Arrowtooth Flounder	1017.1	87.7	337.8	16.3	38.9	134.5	50.1	48.3	394.5		-
Aurora Rockfish			3.2		0.8						
Big Skate											
Blackbelly Eelpout		-							1.6		
Bocaccio											
Brown Cat Shark			2.6								
Canary Rockfish	3.6	1.7				9.2		3.2			
Curlfin Sole										1.1	2.8
Darkblotched Rockfish	0.5					15.1					
Dover Sole	13.2	24.9	72.7	153.0	83.2	17.3	7.3	16.0	31.5	0.6	0.1
English Sole						0.7		0.5		8.2	15.7
Eulachon									0.5		
Flathead Sole									34.4		
Green Sturgeon											
Greenstriped Rockfish	30.8	13.1				0.3	56.8	64.9	10.0		
Kelp Greenling											
Lingcod	10.0						9.3	19.5	1.8		
Longnose Skate			11.8		13.8	6.1	5.6		5.4		
North Pacific Spiny Dogfish	94.8	58.1	3.7			12.9	303.6	399.8	13.7		
Pacific Cod	7.9	2.2					6.2	0.9	3.4	5.5	0.3
Pacific Hake			9.6	3.4	3.7	1.1	1.0		1.1		
Pacific Halibut						9.6		4.8			
Pacific Ocean Perch	168.6	80.2	29.8	4.9	2.6	122.3					
Pacific Sanddab										33.7	11.9
Pacific Tomcod										0.2	10.1
Petrale Sole	1.6						1.3	1.4	1.0	14.3	2.8
Pygmy Rockfish							0.5	3.3			
Quillback Rockfish											
Ragfish											
Redbanded Rockfish	9.9	3.6	7.4			11.1					
Redstripe Rockfish	1.6							1.6			
Rex Sole	8.4	19.4	5.9	2.4	0.9	2.8	4.3	10.6	21.2	9.0	9.2
Rosethorn Rockfish	1.5	0.8	1.0	0.5			0.6	3.3	1.8		
Rougheye Rockfish		0.2	15.1	7.4	11.6	10.8					
Sablefish	29.5	13.3	295.7	52.0	57.1	13.9		1.9	4.1		
Sandpaper Skate			3.1			0.6					
Sharpchin Rockfish	155.4	13.6					0.6	1.3	0.1		
Shortraker Rockfish			33.1	6.9							
Shortspine Thornyhead	6.1	5.2	58.4	18.1	16.5	6.0					
Silvergray Rockfish	1.4					3.3					
Slender Sole	0.2	1.1	0.2			0.1	0.1	0.7	3.5		
Southern Rock Sole										2.8	8.0
Splitnose Rockfish		2.5	7.6	1.8		612.6					
Spotted Ratfish	62.3	46.9	5.5			6.6		0.3	5.1	14.8	14.1
Threadfin Sculpin							0.9	2.0	0.3		
Walleye Pollock										0.8	
Widow Rockfish							1.1			0.4	
Yelloweye Rockfish							2.9	7.6			
Yellowmouth Rockfish											
Yellowtail Rockfish	1.9										
Other	4.3	23.6	4.9	8.4	5.3	1.3	10.0	7.7	5.3	0.4	0.7
Total	**1630.6**	**398.1**	**909.0**	**275.1**	**234.5**	**998.3**	**462.1**	**599.6**	**540.3**	**91.8**	**75.6**

Common Name	72	73	74	75	76	77	78	79	80	81	82
Arrowtooth Flounder					18.8	44.2	26.7	4.5	148.9	14.1	30.5
Aurora Rockfish											
Big Skate			5.8								
Blackbelly Eelpout					0.7	2.1	0.2				
Bocaccio										1.3	
Brown Cat Shark											
Canary Rockfish		1.3	4.8	0.8							
Curlfin Sole		0.9	2.2	0.4							
Darkblotched Rockfish									1.1		
Dover Sole		0.1	0.1		6.6	2.2	1.1	1.0	9.5	12.6	1.8
English Sole		22.1	8.6	2.5	1.2	0.4				14.7	0.4
Eulachon					1.2	0.4	-				0.1
Flathead Sole					15.6	5.2	0.3				
Green Sturgeon											
Greenstriped Rockfish								2.4		105.3	49.6
Kelp Greenling			1.1	0.6							
Lingcod		8.3	0.9	2.7			1.7	8.3		3.1	17.0
Longnose Skate						0.4				6.9	11.4
North Pacific Spiny Dogfish							18.3	3.9		27.4	25.1
Pacific Cod			4.1	0.9	10.9		2.1			12.4	5.5
Pacific Hake					477.9	3.2		43.1	135.8		
Pacific Halibut				4.8					4.8		
Pacific Ocean Perch								199.2	163.6	105.6	7.3
Pacific Sanddab		3.6	4.3	1.6							
Pacific Tomcod		0.9	2.3								
Petrale Sole		2.0			2.0		0.5			1.3	0.7
Pygmy Rockfish										0.5	0.2
Quillback Rockfish			2.3								
Ragfish											
Redbanded Rockfish								3.1	2.4		
Redstripe Rockfish								0.8		34.2	1.8
Rex Sole		12.2	1.4	0.8	20.4	5.1	29.9	1.1	1.1	31.2	13.2
Rosethorn Rockfish								2.0	0.3	4.3	3.0
Rougheye Rockfish											
Sablefish					1.5	1.1			25.6		
Sandpaper Skate											
Sharpchin Rockfish						-		197.4	1.6	4.3	1.2
Shortraker Rockfish											
Shortspine Thornyhead								0.6	7.3		
Silvergray Rockfish								8.0			2.4
Slender Sole					2.1	1.9	1.2	0.1	0.5	1.4	0.4
Southern Rock Sole		4.9	9.3	3.8							
Splitnose Rockfish								69.0	6.6		
Spotted Ratfish		36.9	9.8	5.4	23.5	16.6	3.1	0.3	1.2	3.7	7.4
Threadfin Sculpin					-				-	2.2	2.1
Walleye Pollock											
Widow Rockfish								0.6			
Yelloweye Rockfish										7.3	8.6
Yellowmouth Rockfish											
Yellowtail Rockfish											
Other		8.0	4.9	15.6	0.1	2.7	4.0	7.6	4.2	6.0	12.2
Total		**101.3**	**61.8**	**40.0**	**582.6**	**85.5**	**89.0**	**552.9**	**514.2**	**399.7**	**201.8**

Common Name	83	84	85	86	87	88	89	90	91	92	93
Arrowtooth Flounder	18.6	11.5	15.5	9.8		27.5	6.3	37.4	572.1	277.5	457.8
Aurora Rockfish											
Big Skate											
Blackbelly Eelpout	0.2	3.4	1.4	0.6				-		-	
Bocaccio							4.5	5.4			
Brown Cat Shark											
Canary Rockfish										1.4	2.3
Curlfin Sole											
Darkblotched Rockfish									1.0	7.6	0.4
Dover Sole	1.2	2.4	1.1	1.2		49.5	11.7	15.5	80.9	24.0	23.3
English Sole	5.6	15.5	22.1	11.8	7.8		0.5	1.0		1.6	9.9
Eulachon	1.2	0.4	0.4	0.4							
Flathead Sole	0.4	6.2	2.2	2.6							
Green Sturgeon											
Greenstriped Rockfish	0.8						7.2	19.2	1.9	17.3	9.4
Kelp Greenling											
Lingcod	3.5	18.6	11.0	31.9	20.9		2.3	1.5		7.1	14.4
Longnose Skate									14.3		
North Pacific Spiny Dogfish	35.3	6.2					2.4	10.2		2.0	24.7
Pacific Cod	8.1	4.7	2.2	0.5	0.3						3.9
Pacific Hake		1.8				55.8	35.5		25.4		
Pacific Halibut				5.2	13.2						
Pacific Ocean Perch						8.8	1514.2	29.2	27.0	60.2	70.6
Pacific Sanddab		3.0	15.4	10.1	4.0						
Pacific Tomcod					0.2						
Petrale Sole	1.6	9.0	2.3	2.9	1.4			1.1			1.3
Pygmy Rockfish											
Quillback Rockfish											
Ragfish											
Redbanded Rockfish							21.4	9.5	3.7	21.8	3.1
Redstripe Rockfish								827.8	28.2	2.3	
Rex Sole	11.4	7.1	7.1	6.5	1.8	9.5	4.5	93.4	36.0	131.2	77.0
Rosethorn Rockfish							1.3	2.0		1.0	0.1
Rougheye Rockfish						5.8	8.3		0.2	3.0	
Sablefish						68.5	6.5	1.3	73.9	3.8	1.3
Sandpaper Skate									1.6		
Sharpchin Rockfish	0.0						146.2	207.6	5.2	86.7	16.8
Shortraker Rockfish											
Shortspine Thornyhead						22.7	2.1		19.5	0.1	0.7
Silvergray Rockfish							14.1	47.0	3.5	61.9	13.4
Slender Sole	0.3	0.7	0.3	0.1			0.3	0.3	0.5	0.2	1.4
Southern Rock Sole			0.7		2.9						
Splitnose Rockfish							41.7	0.8	1.7	21.4	1.5
Spotted Ratfish	1.6	84.2	41.5	37.0	22.5	1.5	1.1	1.8	1.1	17.5	37.7
Threadfin Sculpin	0.3										0.1
Walleye Pollock	0.4	21.3	6.1	22.3				0.7			
Widow Rockfish			0.2					0.7			
Yelloweye Rockfish								7.7			
Yellowmouth Rockfish							15.0	0.6			
Yellowtail Rockfish							1.3	99.0			
Other	2.4	5.8	0.5	1.0	1.2	0.3	1.5	9.1	3.8	11.7	9.0
Total	**92.8**	**201.6**	**130.0**	**143.7**	**76.1**	**249.8**	**1849.6**	**1429.5**	**901.4**	**761.4**	**780.1**

Common Name	94	95	96	97	98	99	100	101	102	103	104
Arrowtooth Flounder	28.4	91.9	49.3	73.1	146.8	11.8	16.0	23.9	22.7	77.4	23.0
Aurora Rockfish											
Big Skate											
Blackbelly Eelpout	-	-	0.7	-					-		0.1
Bocaccio											
Brown Cat Shark											
Canary Rockfish	2.2		3.0			1.9	2.0		2.2	19.8	
Curlfin Sole											
Darkblotched Rockfish									0.3		
Dover Sole	7.8	2.8	5.1	5.7	6.0	5.1	1.9	5.7	1.6	5.4	1.3
English Sole			0.5	0.3						0.6	7.9
Eulachon	4.6	0.9	9.9		-						1.4
Flathead Sole	5.0	5.8	3.3	2.8	1.4						0.1
Green Sturgeon											
Greenstriped Rockfish				0.2	0.1	68.7	38.1	19.5	24.7	6.3	
Kelp Greenling											
Lingcod	3.5					1.3			60.3	10.9	11.6
Longnose Skate	3.5	8.5	7.3					3.0			
North Pacific Spiny Dogfish	15.9	14.5	4.8		10.0	33.6	45.4	10.7	23.4	108.0	
Pacific Cod		8.0	11.0	13.3	11.5	1.5	28.1	9.0	2.3	30.1	3.7
Pacific Hake	0.1		-					5.7			
Pacific Halibut	10.3	6.9	11.2						4.6		8.6
Pacific Ocean Perch	11.0						0.7	229.2	14.2	2.6	
Pacific Sanddab											9.8
Pacific Tomcod											-
Petrale Sole	1.2	20.6	7.5	3.9	6.8	2.5	6.6			1.2	3.6
Pygmy Rockfish						0.8					
Quillback Rockfish											
Ragfish											
Redbanded Rockfish								1.3			
Redstripe Rockfish								12.8	0.7		
Rex Sole	19.5	56.4	20.2	15.0	41.4	19.6	36.9	29.2	10.7	28.0	20.0
Rosethorn Rockfish						4.9	0.8	1.6		0.5	
Rougheye Rockfish											
Sablefish	1.0		1.8	0.9	0.7			8.3			
Sandpaper Skate											
Sharpchin Rockfish	1.2	-				1.2	1.9	45.8	0.8	48.6	0.4
Shortraker Rockfish											
Shortspine Thornyhead								2.8	0.1	0.1	
Silvergray Rockfish						2.5	18.7	16.1		72.2	
Slender Sole	2.8	1.7	1.8	1.0	3.0	0.8	1.3	0.1	0.8	0.4	
Southern Rock Sole											0.6
Splitnose Rockfish								0.2			
Spotted Ratfish	1.4	2.2	4.2	8.5	6.9	6.1	10.0	7.4	1.6	1.7	2.6
Threadfin Sculpin						3.1	2.6	0.4			
Walleye Pollock			0.1				0.5				0.3
Widow Rockfish											
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish				76.0							
Other	61.4	19.0	0.2	6.6	4.0	35.0	5.0	15.6	6.4	5.2	0.4
Total	**180.8**	**239.1**	**141.9**	**207.4**	**238.5**	**200.2**	**216.7**	**448.3**	**177.6**	**419.0**	**95.5**

Common Name	105	106	107	108	109	110	111	112	113	114	115
Arrowtooth Flounder	9.8	3.9	3.6		5.3			16.5	18.6	18.2	
Aurora Rockfish											
Big Skate						2.3					
Blackbelly Eelpout											
Bocaccio											
Brown Cat Shark											
Canary Rockfish				95.5	25.7			87.8	5.4		19.0
Curlfin Sole						9.2	0.2				
Darkblotched Rockfish											
Dover Sole	1.5	0.7		0.5	3.4	0.1		10.8	0.2	0.8	
English Sole	43.4	8.1	1.0			52.6	1.0			24.1	
Eulachon	0.1	0.3									
Flathead Sole		0.3									
Green Sturgeon	20.7										
Greenstriped Rockfish				6.9	40.1			9.9	5.9		
Kelp Greenling							0.2				7.8
Lingcod	5.1	1.6			11.9	3.4	1.6	12.3		1.3	3.8
Longnose Skate			10.1								
North Pacific Spiny Dogfish		5.3	4.1	14.3	29.9			24.5	17.2	10.8	
Pacific Cod	2.8					11.0	0.5	20.7		10.7	
Pacific Hake											
Pacific Halibut	9.8				2.3	12.0	17.5		2.8		
Pacific Ocean Perch			3.6	1.3				4.7			
Pacific Sanddab	23.2					70.8	1.0				0.2
Pacific Tomcod	0.8					1.4					
Petrale Sole	5.8			1.3	7.9	1.7		3.6	0.8	13.4	
Pygmy Rockfish					0.2						
Quillback Rockfish							9.2				3.9
Ragfish											
Redbanded Rockfish			4.7	0.3							
Redstripe Rockfish		1.3			2.0			33.7			0.2
Rex Sole	7.3	15.7	2.4	3.0	4.8			38.1	35.9	9.1	
Rosethorn Rockfish			4.1	0.1	-						
Rougheye Rockfish											
Sablefish											
Sandpaper Skate											
Sharpchin Rockfish			140.2	10.7	5.0			528.3	4.1		
Shortraker Rockfish			8.8								
Shortspine Thornyhead			2.0								
Silvergray Rockfish			1.6	10.8	12.6			55.9	101.7		
Slender Sole		0.1			0.2			0.7	1.2		
Southern Rock Sole	0.6					3.6	6.8				1.2
Splitnose Rockfish			17.2								
Spotted Ratfish	3.3	2.5	0.9	2.0	1.0	29.0	5.2	6.6	7.1	7.1	4.9
Threadfin Sculpin			-		0.2						
Walleye Pollock	4.3	1.6				0.3		8.5		1.9	
Widow Rockfish											
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish				11.4							23.7
Other	0.4	0.3	4.7	0.7	1.6	3.3	8.1	6.2	2.7	0.8	5.9
Total	**138.7**	**41.8**	**209.0**	**158.7**	**154.0**	**200.6**	**51.2**	**869.0**	**203.7**	**98.0**	**70.6**

Common Name	116	117	118	119	120	121	122	123	124	125	126
Arrowtooth Flounder	2.9	63.1	94.0	6.4	4.1	18.8	98.0	23.6	85.0	23.4	5.3
Aurora Rockfish											
Big Skate											
Blackbelly Eelpout								-	0.4	0.4	
Bocaccio		2.1		4.1		6.9	5.5				
Brown Cat Shark											
Canary Rockfish									1.7	24.6	2.6
Curlfin Sole											
Darkblotched Rockfish							61.6		0.1		
Dover Sole	0.7	76.6	4.0		1.7	12.4	26.1	51.2	17.3	3.3	0.9
English Sole	21.9	0.8							0.5	3.5	6.8
Eulachon			-						18.7	0.3	
Flathead Sole		5.0	1.0						4.4	0.1	
Green Sturgeon	25.0										
Greenstriped Rockfish		17.5	40.6	8.6	26.3	28.2	0.6	19.0		13.1	1.2
Kelp Greenling											
Lingcod	53.0	2.0				3.8		5.1		25.7	
Longnose Skate						8.3	18.7			6.3	
North Pacific Spiny Dogfish		33.4	2.8	153.3	83.2	133.2	16.9	56.0	23.8	2.8	60.3
Pacific Cod	60.0	14.4	7.6	2.0		82.1			13.8	2.0	1.8
Pacific Hake							37.8			1.1	
Pacific Halibut	11.1		14.3		15.1		2.6				
Pacific Ocean Perch		1.3	0.6	1004.1	22.1	124.4	275.0	4.6	0.2	0.1	
Pacific Sanddab	37.6										
Pacific Tomcod											
Petrale Sole	3.7								3.2	3.8	1.0
Pygmy Rockfish					0.3			0.2		0.1	
Quillback Rockfish											
Ragfish											
Redbanded Rockfish				1.9	1.6	3.8	11.0	11.6			
Redstripe Rockfish		1282.0			168.6	10.8	0.5	103.2			
Rex Sole	0.9	18.0	25.0	2.2	11.6	15.4	0.8	30.5	41.7	23.2	11.5
Rosethorn Rockfish				1.4	7.4	1.0		31.4			
Rougheye Rockfish							91.9				
Sablefish		7.8	27.7		3.9	3.2	39.8	1.7		1.8	
Sandpaper Skate							0.8	0.2			
Sharpchin Rockfish				25.7	136.1	60.6	1.8	132.2		-	
Shortraker Rockfish											
Shortspine Thornyhead				11.2	2.1	3.7	18.8	10.0			
Silvergray Rockfish		38.4	6.5	72.5	77.7	211.5	14.2	13.5			
Slender Sole		1.2	2.4				-	0.1	1.8	1.0	1.2
Southern Rock Sole	81.4										
Splitnose Rockfish				25.2	0.2	0.2	98.4	1.0			
Spotted Ratfish	51.1	2.3	0.6	5.0	11.8	13.1	1.1	4.8	6.1	7.1	
Threadfin Sculpin					-					3.6	-
Walleye Pollock		1.4	2.8	0.7	0.9						
Widow Rockfish											
Yelloweye Rockfish								9.0		5.0	
Yellowmouth Rockfish				71.0	5.4		0.7				
Yellowtail Rockfish		13.2		3.1	5.8	21.7			4.4		
Other	6.9	4.7	2.0	2.7	2.3	1.2	1.8	19.7	14.3	6.2	9.2
Total	**356.1**	**1585.2**	**232.0**	**1401.1**	**588.4**	**764.4**	**824.2**	**528.7**	**237.5**	**158.5**	**102.0**

Common Name	127	128	129	130	131	132	133	134	135	136	137
Arrowtooth Flounder	23.7	17.5	3.7	11.0	7.1	11.4	21.9	9.7	10.1	236.7	7.4
Aurora Rockfish											
Big Skate											
Blackbelly Eelpout	-	-			-	0.1	18.7	0.3			
Bocaccio			3.6	2.2							
Brown Cat Shark											0.3
Canary Rockfish	2.5								3.8	8.4	
Curlfin Sole											
Darkblotched Rockfish	4.2	1.4									
Dover Sole	7.0	15.8	3.0	0.2	2.1	1.2	5.6		8.2	13.5	45.6
English Sole	0.6	0.6		14.7		0.8	1.9	0.5	0.3	12.7	
Eulachon						0.1	0.5	0.4			
Flathead Sole						0.3	12.7	0.6			
Green Sturgeon											
Greenstriped Rockfish			7.0	71.3	6.6	0.2		1.7	17.1	36.6	2.7
Kelp Greenling											
Lingcod				1.4		1.9	9.4	4.6	3.7		
Longnose Skate	5.4						2.5				2.8
North Pacific Spiny Dogfish				11.9	15.3	5.6	4.6	3.6	5.4	111.3	
Pacific Cod				5.0	0.9	4.5	6.9			6.7	
Pacific Hake	16.7	12.3	2.3				4.3				20.4
Pacific Halibut		2.4	3.1				4.8			2.2	
Pacific Ocean Perch	88.5	134.4	201.1	12.2	1.1				-	76.4	
Pacific Sanddab											
Pacific Tomcod											
Petrale Sole	0.8					0.7	2.5	0.6	0.5	4.8	
Pygmy Rockfish					0.1				0.6	0.4	
Quillback Rockfish											
Ragfish											31.8
Redbanded Rockfish	2.8	2.6	198.7								0.8
Redstripe Rockfish				287.7	3.4				109.4	106.8	
Rex Sole	5.0	4.9	4.4	9.1	3.0	8.4	12.6	7.5	9.0	38.1	
Rosethorn Rockfish			12.1						0.4		
Rougheye Rockfish	0.1										
Sablefish	34.8	17.2	1.1							3.8	10.8
Sandpaper Skate			0.5								
Sharpchin Rockfish		0.2	914.0	5.4	1.5			0.1	12.8	2.4	
Shortraker Rockfish											6.8
Shortspine Thornyhead	8.6	3.7	1.0								7.4
Silvergray Rockfish	2.9		22.0						2.5	1.4	
Slender Sole	0.2	0.3			0.1	1.0	1.1	0.8		0.2	
Southern Rock Sole											
Splitnose Rockfish	183.9	396.1	26.3								
Spotted Ratfish		0.2	1.0	1.1	1.0	3.4	8.8	1.3	1.0	3.8	
Threadfin Sculpin		0.2	0.2		2.0	0.8	0.1	1.6	0.6	0.9	
Walleye Pollock				1.7		0.5	0.2				
Widow Rockfish											
Yelloweye Rockfish									3.9		
Yellowmouth Rockfish		0.9	33.8	1.7							
Yellowtail Rockfish					226.5	9.6		2.9	1.8	7.9	
Other	2.3	10.4	2.9	5.8	1.7	0.5	0.6	6.6	3.5	5.0	2.3
Total	**389.9**	**621.0**	**1441.9**	**442.5**	**272.6**	**51.0**	**119.6**	**42.9**	**194.6**	**679.9**	**139.0**

Common Name	138	139	140	141	142	143	144	145	146	147	148
Arrowtooth Flounder	32.7	13.0	162.0	244.7	130.9	0.1	5.6	44.48	51.3	31.4	18.1
Aurora Rockfish											1.4
Big Skate							3.8				
Blackbelly Eelpout		-	-	13.7	1.1		2.1		0.08		
Bocaccio											
Brown Cat Shark											
Canary Rockfish					0.8						
Curlfin Sole						1.8					
Darkblotched Rockfish	2.4	0.6	20.2						2.72	4.1	
Dover Sole	32.1	4.1	17.9	32.7	6.2		27.2	13.18	18.64	27.8	87.9
English Sole					4.5	15.1	16.7				
Eulachon				0.4	1.7	-	3.7				
Flathead Sole			1.1	51.5	25.5		107.9				
Green Sturgeon											
Greenstriped Rockfish			2.8					22.08			
Kelp Greenling											
Lingcod			4.8	11.9	11.8						
Longnose Skate	6.0	6.6		12.3			3.6	29.48		13.2	10.0
North Pacific Spiny Dogfish	5.6	11.9	16.3	45.4	17.4	4.4		22.07	5.56	5.8	
Pacific Cod				18.1	139.7	4.6		5.18			
Pacific Hake	10.1	10.2		3.5	0.2	0.1	4.0		57.72	23.8	17.0
Pacific Halibut				4.6	5.3	8.4	29.4		12.92		
Pacific Ocean Perch	123.2	350.2	0.5					86.42	269	73.8	21.9
Pacific Sanddab						34.1	2.7				
Pacific Tomcod						0.1					
Petrale Sole				11.2	48.5	1.9	3.4				
Pygmy Rockfish											
Quillback Rockfish											
Ragfish											
Redbanded Rockfish	1.6	10.3	0.9					6.49	5.9	2.5	7.8
Redstripe Rockfish											
Rex Sole	2.5		26.1	37.8	17.2	2.4	39.2	9.09	6.1	8.3	4.6
Rosethorn Rockfish		5.1							3.48	2.3	1.5
Rougheye Rockfish	22.5	2.4								13.1	152.7
Sablefish	43.5	1.3	1.1	14.0				88.65	243.4	193.8	77.3
Sandpaper Skate	1.1										
Sharpchin Rockfish	0.3	39.2						11.6			
Shortraker Rockfish											53.8
Shortspine Thornyhead	40.7	30.2						8.13	37.14	35.8	46.9
Silvergray Rockfish		6.4						1.59			
Slender Sole			1.9	12.8	0.5		6.3	2.02	0.14	-	0.3
Southern Rock Sole						9.6					
Splitnose Rockfish	22.0	483.8						50.88	80.36	3.9	14.5
Spotted Ratfish		9.7	3.5	14.7	9.0	24.2	55.9	9.34			
Threadfin Sculpin		0.1									
Walleye Pollock					1.5	1.6	13.7				
Widow Rockfish										2.0	
Yelloweye Rockfish											
Yellowmouth Rockfish		5.0									
Yellowtail Rockfish		2.8									
Other	3.1	0.8	21.9	66.9	1.0	1.1	5.7	16.09	2.8	6.5	2.8
Total	**349.4**	**993.9**	**280.9**	**596.1**	**423.0**	**109.5**	**331.0**	**426.8**	**797.3**	**447.9**	**518.5**

Common Name	149	150	151	152	153	154	155	156	157
Arrowtooth Flounder	78.5	197.6	301.3	30.8	239.3	177.5	75.01	48.63	2.92
Aurora Rockfish									
Big Skate									
Blackbelly Eelpout			1.5	0.2	1.8	0.04	12.81	0.5	0
Bocaccio									
Brown Cat Shark									
Canary Rockfish					8.3			1.3	
Curlfin Sole									
Darkblotched Rockfish	195.2								
Dover Sole	39.5	12.8	24.1	39.3	19.2	49.12	12.15	4.48	3.91
English Sole	1.3	0.5	0.3		50.8	1.86	0.44	0.32	7.31
Eulachon			0.7	16.0	0.1	0.3	7.75		0.27
Flathead Sole			5.6	81.2	11.0	0.88	101.3	0.46	0.1
Green Sturgeon									
Greenstriped Rockfish	3.1	8.7			12.1	1.48		7.02	
Kelp Greenling								0.56	
Lingcod	8.2	21.3	4.3		10.8	3.9		7.74	
Longnose Skate	33.1		18.8	6.5	7.2		7.91		2.5
North Pacific Spiny Dogfish	23.0	6.9	6.3		17.6	3.08	1.15	166.8	11.59
Pacific Cod	24.5	42.0	3.6	0.6	4.0			1.06	3.73
Pacific Hake				4.9			1.75		
Pacific Halibut		25.0			3.3			6.88	
Pacific Ocean Perch	619.7				-	0.04			
Pacific Sanddab			0.2		0.3	0.16	0.21		0.39
Pacific Tomcod									
Petrale Sole		13.9	3.5	2.5	4.5	4.72	1.65	12.52	12.94
Pygmy Rockfish					0.8			0.08	
Quillback Rockfish								2.08	
Ragfish									
Redbanded Rockfish	18.8								
Redstripe Rockfish			1.6		11.2	0.36		8.26	
Rex Sole	17.6	4.0	41.1	60.6	29.4	20.96	21.06	6.36	20.94
Rosethorn Rockfish	21.8								
Rougheye Rockfish	9.7		1.0	0.2					
Sablefish	34.7	15.7	2.1		4.8	29.38		10.32	
Sandpaper Skate									
Sharpchin Rockfish	200.3				0.2			0.1	
Shortraker Rockfish									
Shortspine Thornyhead	19.3								
Silvergray Rockfish								1.16	
Slender Sole	1.4	0.7	4.2	8.0	3.2	2.96	6.68	0.66	2.36
Southern Rock Sole									
Splitnose Rockfish	768.4								
Spotted Ratfish	8.4	22.4	27.0	21.5	17.5	13.32	11.23	21.82	9.67
Threadfin Sculpin		2.9			1.1	0.18		6.2	1.13
Walleye Pollock		1.4	1.2	15.2	0.8	0.18	0.14	1.04	18.44
Widow Rockfish	1.2								
Yelloweye Rockfish									
Yellowmouth Rockfish	3.2								
Yellowtail Rockfish			4.3		3.6	2.78		30.04	3.49
Other	0.7	0.5	16.6	20.9	6.4	22.02	42.25	2.38	3.55
Total	**2131.6**	**376.3**	**469.3**	**308.4**	**469.2**	**335.2**	**303.5**	**348.8**	**105.2**