Summary of the West Coast Vancouver Island Synoptic Bottom Trawl Survey, May 28 - June 21, 2014

M.K. Nottingham, D.C. Williams, M.R. Wyeth and, N. Olsen

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by

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ABSTRACT

Nottingham, M. K., Williams, D. C., Wyeth, M. R., and Olsen, N. 2017. Summary of the West Coast Vancouver Island synoptic bottom trawl survey, May 28-June 21, 2014. Can. Manuscr. Rep. Fish. Aquat. Sci. 3140: viii + 55 p.

A bottom trawl survey off the west coast of Vancouver Island was conducted on the Canadian Coastguard Ship W. E. Ricker between May 28 and June 21, 2014. 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 forty-six (77 %) of the 190 blocks assessed in 2014 were successfully fished. The mean catch per tow was 931 kg with 13-46 species per tow. The average number of species per tow was 27. The most abundant fish species encountered was Arrowtooth Flounder (*Reinhardtius stomias*) followed by, Pacific Ocean Perch (*Sebastes alutus*), Splitnose Rockfish (*Sebastes diploproa*), North Pacific Spiny Dogfish (*Squalus suckleyi*) 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 49 different species of fish. Oceanographic data, including water temperature, depth, salinity, and dissolved oxygen were also recorded for most tows.

RÉSUMÉ

Nottingham, M.K., Williams, D.C., Wyeth, M.R., et Olsen, N. 2017. Relevé synoptique au chalut de fond de la côte ouest de l'île de Vancouver, du 28 mai au 21 juin 2014. Rapp. manus. can. sci. halieut. aquat. 3140 : viii + 55 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 28 mai et le 21 juin 2014. 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 190 blocs retenus en 2014, 146 (77 %) ont fait l'objet d'une pêche avec succès. La moyenne de prises par trait était de 931 kg, avec entre 13 et 46 espèces capturées par trait. Le nombre moyen d'espèces par trait était de 27. Les espèces de poissons capturées le plus fréquemment étaient la plie à grande bouche (*Reinhardtius stomias*), suivi du sébaste à longue mâchoire (*Sebastes alutus*), du sébaste à bec-de-lièvre (*Sebastes diploproa*), de l'aiguillat commun du Pacifique Nord (*Squalus suckleyi*), 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 soixante 49 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 sixth WCVI synoptic bottom trawl survey which occurred between May 28 and June 21, 2014. 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, Wyeth et al. 2016 and Williams et al., 2017.

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 2014 WCVI survey, 207 blocks were randomly selected based on 9 blocks a day and 23 days available for fishing (Table 4). 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 4½ 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 eight to twelve days in duration with six or seven science staff on each. Science crew changes were on June 3 and 10 (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 of the block.
4. If it is not possible to make a tow through the center of the block, make a tow entirely within the block that passes as close to the center as possible.
5. If it is not possible to make a tow entirely within the block, make a tow such that at least 50 % of the tow is within the block.

The target tow length was 20 minutes long. The tow start was defined as the time at which the net mensuration data indicated stable bottom contact and the headline collapsed to 3-4 m above the bottom. 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, or when there was insufficient time available to fish a block without spending another day in the area, or if fishing was attempted and although the tow was not successful, the block was not rejected. These blocks would be considered unassessed at the end of the survey and have a final status of "block not fished but remains in sampling frame" or "not rejected but last attempt failed".

Fishing Data

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

CATCH PROCESSING

At the end of each tow the net was retrieved and the catch dumped into a hopper 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 2014, otoliths were also collected from Pacific Cod (*Gadus macrocephalus*), as well as tissue for DNA analysis from Blackspotted (*Sebastes melanostictus*) /Rougheye Rockfish (*Sebastes aleutianus*).

Until the mid-2000s, Rougheye Rockfish (*Sebastes aleutianus*) was considered to be a single, highly variable species with light and dark colour morphs. Genetic and morphological analysis has 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 Notus net mensuration system (a Simrad ITI system was used prior to 2013). 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. The Notus output was logged continuously during the survey and monitored in real-time during fishing operations.

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

A Seabird SBE39 temperature and pressure recorder (TDR) was attached to the starboard wing of the trawl. A Seabird SBE19plus recorder (CTD) with a SBE43 dissolved oxygen sensor was attached to the center of the headline. The SBE19plus

recorded conductivity, temperature and pressure data with derived values for salinity (Seabird, 1989) and depth (Seabird, 2002). The SBE43 recorded oxygen voltage output data with calculated values for dissolved oxygen (ml/l) using temperature, pressure, and salinity data (Seabird, 2012). The SBE39 was activated prior to the first tow of the day and turned off after the last tow of the day, while the SBE19plus and SBE43 were turned on and off manually before and after each tow.

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

DATA RECORDING

All the fishing, catch, and biological data were recorded directly into a Microsoft SQL Server database. 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 2014 WCVI synoptic bottom trawl survey was divided into three legs of 8-12 days each. From a total of 24 allotted survey days, two half days were required for travel and gear loading/unloading at the start and end of the survey, one full day and one partial day were required for science crew changes (Table 3).

The initial plan was to assess 207 blocks based on 9 blocks per day and 23 fishing days. 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 consisted of 55 blocks (Table 3).

From the adjusted target of 193 blocks, three blocks were left un-inspected and un-fished due to time constraints at the end of the survey. Of the 190 assessed blocks, 146 were successfully fished, ten were rejected based on the fishing master's prior knowledge, 29 were rejected based on on-ground inspections, three blocks were rejected after one or more failed fishing attempts and two blocks failed but remain in the sample frame as unassessed with the belief that the blocks are be fishable under other circumstances (Table 4 and Figure 9).

A total of 153 tows, of which 146 were useable, were completed during the 22 days that fishing occurred. Table 5 shows tow results by stratum for this survey. Seven 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 2014 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 138, 217 kg of fish and invertebrates was caught during the 2014 WCVI survey. The total catch weight for useable tows was typically less than 700 kg per tow

and averaged 931 kg per tow (Figure 11). The majority of the catch (137, 096 kg, 99.2%) consisted of 105 different species of fish, including 28 rockfish and 13 flatfish species. The remainder (1121 kg) consisted of 106 invertebrate groups. The average number of species identified in useable tows was 27 and ranged from 13 to 46 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, Arrowtooth Flounder (*Reinhardtius stomias*) was the most dominant by weight, followed by Pacific Ocean Perch (*Sebastes alutus*), Splitnose Rockfish (*Sebastes diploproa*), North Pacific Spiny Dogfish (*Squalus suckleyi*) 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 30,198 individuals of 49 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

Notus net mensuration data and door spread information were collected from 150 tows and from 143 tows respectively (Table 10).

Seabird SBE39 data (water temperature and depth) were collected from 153 tows while Seabird SBE19plus and SBE43 data (conductivity, water temperature, depth and dissolved oxygen) were collected from 150 tows (Table 10 and Figure 14).

BCS data were collected from 133 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 153 tows.

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Table 1. The 2014 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	60	0.29	84	56	28	22
125-200	0.32	52	0.18	63	42	21	17
200-330	0.18	29	0.12	33	22	11	9
330-500	0.13	21	0.20	27	18	9	7
Total	**1.00**	**162**		**207**	**138**	**69**	**55**

Table 2. Atlantic Western IIa box trawl net specifications for the 2014 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 2014 WCVI synoptic bottom trawl survey.

	Fishing				Tows			
Date	**Start**	**End**	**Hours**	**Blocks Assessed**	**Useable**	**Not Useable**	**Total**	**Notes**
05/28/2014	-	-	-	-	-	-	-	half day travel
05/29/2014	12:03	18:18	6	7	6	0	6	
05/30/2014	7:40	18:13	11	8	8	0	8	
05/31/2014	7:12	18:23	11	7	5	0	5	
06/01/2014	11:18	18:05	7	7	5	1	6	
06/02/2014	7:54	18:07	11	9	8	0	8	
06/03/2014	7:16	13:55	6	5	5	1	6	science crew change
06/04/2014	7:08	12:22	5	5	4	0	4	
06/05/2014	8:36	18:47	10	8	7	0	7	
06/06/2014	7:25	15:59	8	10	8	0	8	
06/07/2014	8:17	18:00	10	9	8	0	8	
06/08/2014	7:11	16:39	9	9	8	0	8	
06/09/2014	7:02	17:48	10	9	8	0	8	
06/10/2014	-	-	-	-	-	-	-	science crew change
06/11/2014	7:03	18:05	11	8	7	0	7	
06/12/2014	7:01	16:56	9	9	8	0	8	
06/13/2014	7:09	15:14	8	8	6	0	6	
06/14/2014	7:29	18:12	11	17	5	2	7	
06/15/2014	7:03	17:52	10	11	4	1	5	
06/16/2014	7:23	15:48	8	8	7	0	7	
06/17/2014	7:06	18:06	11	8	8	0	8	
06/18/2014	7:00	16:35	9	8	8	1	9	
06/19/2014	7:21	18:04	11	11	8	0	8	
06/20/2014	7:01	18:06	11	7	6	0	6	
06/21/2014	-	-	-	-	-	-	-	half day travel/ unload
Total				**188**	**147**	**6**	**153**	
Average Per Day				**8.5**	**6.7**	**0.3**	**7.0**	

Table 4. Block results by stratum for the 2014 WCVI synoptic bottom trawl survey.

Depth Stratum (m)	Primary Set	Secondary Set	Successful	Rejected Prior	Rejected Inspected	Rejected Failed	Not Rejected Failed	Not Assessed	Total
50-125	56	22	55	3	15	2	1	2	78
125-200	42	17	49	3	5	1	0	1	59
200-330	22	9	29	2	0	0	0	0	31
330-500	18	7	13	2	9	0	1	0	25
Total	**138**	**55**	**146**	**10**	**29**	**3**	**2**	**3**	**193**

Table 5. Tow results by stratum for the 2014 WCVI synoptic bottom trawl survey

Depth Stratum (m)	Useable	Not Useable
50-125	55	4
125-200	49	2
200-330	29	0
330-500	13	1
Total	**146**	**7**

Table 6. Mean warp length and scope by 50 meter depth interval for the 2014 WCVI synoptic bottom trawl survey.

Depth (m)	Mean Warp (m)	Mean Scope
0-50	150	3.08
50-100	240	3.09
100-150	358	2.85
150-200	515	3.00
200-250	660	2.93
250-300	733	2.83
300-350	925	2.86
350-400	1017	2.72
400-450	1120	2.63
450-500	1200	2.47

Table 7. Frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species captured during the 2014 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**				
Greenstriped Rockfish	*Sebastes elongatus*	81	112.10	18.81	1505.09
Yellowtail Rockfish	*Sebastes flavidus*	73	1597.07	113.94	8317.74
Pacific Ocean Perch	*Sebastes alutus*	69	3739.01	333.81	19694.63
Sharpchin Rockfish	*Sebastes zacentrus*	62	2164.48	153.94	9236.24
Canary Rockfish	*Sebastes pinniger*	60	1052.28	26.99	1619.20
Redstripe Rockfish	*Sebastes proriger*	46	2480.66	132.50	5962.56
Redbanded Rockfish	*Sebastes babcocki*	44	391.30	26.39	1161.30
Rosethorn Rockfish	*Sebastes helvomaculatus*	43	51.87	6.02	259.01
Shortspine Thornyhead	*Sebastolobus alascanus*	43	66.44	18.41	791.51
Silvergray Rockfish	*Sebastes brevispinis*	42	980.35	77.64	3260.75
Splitnose Rockfish	*Sebastes diploproa*	41	8000.00	349.50	12931.51
Rougheye Rockfish	*Sebastes aleutianus*	30	119.73	20.09	602.55
Widow Rockfish	*Sebastes entomelas*	27	83.10	6.50	175.59
Darkblotched Rockfish	*Sebastes crameri*	26	158.01	18.15	471.92
Pygmy Rockfish	*Sebastes wilsoni*	25	4.58	0.63	13.82
Yelloweye Rockfish	*Sebastes ruberrimus*	19	22.35	4.94	93.93
Bocaccio	*Sebastes paucispinis*	12	18.14	6.03	72.34
Quillback Rockfish	*Sebastes maliger*	11	19.43	4.68	51.50
Stripetail Rockfish	*Sebastes saxicola*	8	22.06	3.44	27.53
Yellowmouth Rockfish	*Sebastes reedi*	7	459.01	128.68	900.79
Shortbelly Rockfish	*Sebastes jordani*	7	5.44	1.28	6.42
Rockfishes	Sebastinae (Sub Family)	6	-	-	-
Aurora Rockfish	*Sebastes aurora*	4	1.80	0.85	3.40
Greenspotted Rockfish	*Sebastes chlorostictus*	2	1.30	1.24	2.48
Shortraker Rockfish	*Sebastes borealis*	2	18.78	10.94	21.88
Puget Sound Rockfish	*Sebastes emphaeus*	2	1.73	1.28	2.57
Harlequin Rockfish	*Sebastes variegatus*	2	0.52	0.31	0.62
Vermilion Rockfish	*Sebastes miniatus*	1	1.37	1.37	1.37
Rockfishes	*Sebastes* (Genus)	1	-	-	-
Flatfishes	**Order Pleuronectiformes**				
Arrowtooth Flounder	*Reinhardtius stomias*	147	1566.64	171.02	25139.72
Rex Sole	*Glyptocephalus zachirus*	141	204.00	39.34	5547.31
Dover Sole	*Microstomus pacificus*	138	277.98	31.90	4402.17
Slender Sole	*Lyopsetta exilis*	130	26.02	3.52	446.68
English Sole	*Parophrys vetulus*	108	177.12	22.55	2435.41
Petrale Sole	*Eopsetta jordani*	103	122.04	14.45	1488.33
Pacific Halibut	*Hippoglossus stenolepis*	91	72.08	11.86	1079.31
Flathead Sole	*Hippoglossoides elassodon*	69	238.34	22.92	1581.68
Pacific Sanddab	*Citharichthys sordidus*	43	107.48	18.52	796.55
Southern Rock Sole	*Lepidopsetta bilineata*	39	42.04	7.71	293.02
Curlfin Sole	*Pleuronichthys decurrens*	7	7.22	2.23	15.61
Sand Sole	*Psettichthys melanostictus*	1	0.40	0.40	0.40
Butter Sole	*Isopsetta isolepis*	1	0.28	0.28	0.28
Cod-Like Fishes	**Order Gadiformes**				
Pacific Cod	*Gadus macrocephalus*	115	488.18	25.22	2900.78
Walleye Pollock	*Theragra chalcogramma*	66	696.44	21.85	1420.12
Pacific Hake	*Merluccius productus*	39	336.04	33.38	1301.83
Pacific Tomcod	*Microgadus proximus*	14	11.67	2.28	29.59

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Cartilaginous Fish	**Class Chondrichthyes**				
Spotted Ratfish	*Hydrolagus colliei*	138	221.38	15.44	2146.57
North Pacific Spiny Dogfish	*Squalus suckleyi*	102	5694.58	112.59	11371.15
Longnose Skate	*Raja rhina*	67	58.48	9.48	635.34
Sandpaper Skate	*Bathyraja interrupta*	14	4.30	0.83	11.65
Big Skate	*Raja binoculata*	12	37.60	7.60	91.23
Brown Cat Shark	*Apristurus brunneus*	5	2.06	0.95	4.77
Skates	Rajidae (Family)	3	3.94	2.71	8.13
Greenlings	**Family Hexagrammidae**				
Lingcod	*Ophiodon elongatus*	91	245.25	17.05	1551.13
Kelp Greenling	*Hexagrammos decagrammus*	10	4.89	1.27	12.75
Sculpins	**Family Cottidae**				
Threadfin Sculpin	*Icelinus filamentosus*	67	5.50	1.12	68.12
Slim Sculpin	*Radulinus asprellus*	18	-	-	-
Roughspine Sculpin	*Triglops macellus*	9	0.33	0.17	0.83
Darkfin Sculpin	*Malacocottus zonurus*	7	0.40	0.23	0.90
Brown Irish Lord	*Hemilepidotus spinosus*	4	0.67	0.31	1.22
Tadpole Sculpin	*Psychrolutes paradoxus*	3	-	-	-
Sculpins	Cottidae (Family)	3	0.07	0.07	0.07
Spinyhead Sculpin	*Dasycottus setiger*	1	-	-	-
Grunt Sculpin	*Rhamphocottus richardsonii*	1	-	-	-
Dusky Sculpin	*Icelinus burchami*	1	-	-	-
Pacific Staghorn Sculpin	*Leptocottus armatus*	1	-	-	-
Eelpouts	**Family Zoarcidae**				
Blackbelly Eelpout	*Lycodes pacificus*	73	25.79	2.91	183.08
Bigfin Eelpout	*Lycodes cortezianus*	29	6.86	2.29	66.38
Black Eelpout	*Lycodes diapterus*	16	1.38	0.46	5.07
Pallid Eelpout	*Lycodapus mandibularis*	3	0.14	0.08	0.16
Shortfin Eelpout	*Lycodes brevipes*	1	-	-	-
Wattled Eelpout	*Lycodes palearis*	1	7.24	7.24	7.24
Poachers	**Family Agonidae**				
Bigeye Poacher	*Bathyagonus pentacanthus*	23	0.52	0.17	2.88
Smootheye Poacher	*Xeneretmus leiops*	14	3.47	0.46	5.51
Poachers	Agonidae (Family)	4	0.51	0.28	0.56
Blackfin Poacher	*Bathyagonus nigripinnis*	3	-	-	-
Blacktip Poacher	*Xeneretmus latifrons*	1	-	-	-
Lanternfishes	**Family Myctophidae**				
Lanternfishes	Myctophidae (Family)	12	0.30	0.16	0.95
Blue Lanternfish	*Tarletonbeania crenularis*	3	-	-	-
California Headlightfish	*Diaphus theta*	1	-	-	-
Lanternfish	*Tarletonbeania* (Genus)	1	-	-	-
Other Fish					
Sablefish	*Anoplopoma fimbria*	99	560.64	33.64	3297.15
Eulachon	*Thaleichthys pacificus*	78	232.11	18.64	1360.62
Pacific Herring	*Clupea pallasii*	72	10.90	0.95	62.71
American Shad	*Alosa sapidissima*	29	3.82	0.73	21.11
Northern Ronquil	*Ronquilus jordani*	23	0.48	0.19	3.34
Whitebait Smelt	*Allosmerus elongatus*	13	0.66	0.26	2.10
Chinook Salmon	*Oncorhynchus tshawytscha*	10	4.90	2.18	21.82
Pacific Lamprey	*Entosphenus tridentatus*	9	1.10	0.41	1.22
Snake Prickleback	*Lumpenus sagitta*	6	0.27	0.17	0.67
Whitebarred Prickleback	*Poroclinus rothrocki*	6	0.22	0.22	0.22
Pacific Viperfish	*Chauliodus macouni*	5	0.18	0.10	0.30
Shiner Perch	*Cymatogaster aggregata*	5	0.12	0.09	0.18

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Green Sturgeon	*Acipenser medirostris*	4	27.00	18.33	55.00
Wolf Eel	*Anarrhichthys ocellatus*	3	5.58	3.87	11.62
Pacific Sand Lance	*Ammodytes hexapterus*	3	11.94	4.34	13.02
Dwarf Wrymouth	*Cryptacanthodes aleutensis*	2	-	-	-
Northern Spearnose Poacher	*Agonopsis vulsa*	2	-	-	-
Shining Tubeshoulder	*Sagamichthys abei*	2	0.56	0.35	0.70
Pacific Hagfish	*Eptatretus stoutii*	1	0.50	0.50	0.50
Northern Anchovy	*Engraulis mordax*	1	0.13	0.13	0.13
Gray Starsnout	*Bathyagonus alascanus*	1	-	-	-
Sand Lances	Ammodytidae (Family)	1	0.40	0.40	0.40
Smalldisk Snailfish	*Careproctus gilberti*	1	-	-	-
Blacktail Snailfish	*Careproctus melanurus*	1	0.46	0.46	0.46
Crabs and Shrimp	**Class Malacostraca**				
Pink Shrimp (smooth)	*Pandalus jordani*	65	45.22	6.14	288.61
Prawn	*Pandalus platyceros*	45	4.14	0.89	34.87
Sidestripe Shrimp	*Pandalopsis dispar*	19	6.96	0.81	13.00
Crangons	*Crangon* (Genus)	19	-	-	-
Isopods	Isopoda (Order)	10	0.03	0.03	0.03
Glass Shrimp	*Pasiphaea pacifica*	7	0.42	0.23	0.70
Dungeness Crab	*Metacarcinus magister*	6	1.62	0.67	4.03
Inshore Tanner Crab	*Chionoecetes bairdi*	6	0.30	0.19	0.96
Common Two-spined Crangon	*Neocrangon communis*	6	-	-	-
-	*Argis* (Genus)	5	-	-	-
Common Argid	*Argis alaskensis*	4	-	-	-
Spider Crabs	Majidae (Family)	4	-	-	-
Yellowleg Shrimp	*Pandalus tridens*	3	-	-	-
Grooved Tanner Crab	*Chionoecetes tanneri*	2	1.81	1.59	3.17
Right-handed Hermits	Paguridae (Family)	1	-	-	-
Left-handed Hermits	Diogenidae (Family)	1	-	-	-
Hairy Crab	*Hapalogaster mertensii*	1	0.16	0.16	0.16
Brown Box Crab	*Lopholithodes foraminatus*	1	0.34	0.34	0.34
Puget Sound King Crab	*Lopholithodes mandtii*	1	-	-	-
Squat Lobster	*Munida quadrispina*	1	-	-	-
-	*Eualus* (Genus)	1	-	-	-
Sea Stars	**Class Asteroidea**				
Sand Star	*Luidia foliolata*	25	0.92	0.31	6.13
Fish-eating Star	*Stylasterias forreri*	18	3.62	0.51	6.67
Vermillion Starfish	*Mediaster aequalis*	17	0.32	0.16	1.79
Spiny Red Sea Star	*Hippasteria spinosa*	14	9.05	1.12	15.64
Mud Star	*Ctenodiscus crispatus*	12	0.52	0.24	1.41
Cushion Star	*Pteraster tesselatus*	12	0.50	0.25	1.73
Rose Starfish	*Crossaster papposus*	11	0.22	0.16	0.47
-	*Solaster* (Genus)	8	1.48	0.50	2.01
-	*Cheiraster dawsoni*	8	0.72	0.26	1.53
-	*Henricia* (Genus)	7	-	-	-
Starfish	Asteroidea (Class)	5	2.70	1.45	2.90
Morning Sun Starfish	*Solaster dawsoni*	2	0.22	0.22	0.22
Striped Sun Starfish	*Solaster stimpsoni*	2	-	-	-
Long-armed Sea Star	*Orthasterias koehleri*	2	0.20	0.20	0.20
-	*Poraniopsis inflatus inflatus*	2	0.24	0.24	0.24
Winged Sea Star	*Pteraster militaris*	1	-	-	-
Sunflower Starfish	*Pycnopodia helianthoides*	1	0.49	0.49	0.49
-	*Rathbunaster californicus*	1	2.70	2.70	2.70
-	*Orthasterias* (Genus)	1	-	-	-

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Six-rayed Starfish	*Leptasterias hexactis*	1	0.04	0.04	0.04
-	*Poraniopsis* (Genus)	1	-	-	-
-	*Mediaster* (Genus)	1	-	-	-
Brittle Stars	**Class Ophiuroidea**				
-	*Ophiura* (Genus)	25	0.52	0.21	1.90
Basket Star	*Gorgonocephalus eucnemis*	16	1.55	0.30	4.44
Basket Stars	Euryalina (Sub Order)	9	0.50	0.26	1.80
Basket Stars	Gorgonocephalidae (Family)	3	0.20	0.20	0.39
-	Ophiuridae (Family)	2	-	-	-
-	*Stegophiura* (Genus)	1	-	-	-
Sea Cucumbers	**Class Holothuroidea**				
Whitespotted Sea Cucumber	*Parastichopus leukothele*	54	17.76	1.65	87.47
Giant Red Sea Cucumber	*Parastichopus californicus*	8	2.14	0.96	7.64
Soft Sea Cucumber	*Pseudostichopus mollis*	6	1.02	0.47	2.34
Sea Cucumbers	Holothuroidea (Class)	4	0.34	0.26	0.52
-	Psolidae (Family)	2	-	-	-
Sweet Potato Sea Cucumber	*Molpadia intermedia*	2	0.99	0.99	0.99
Peppered Sea Cucumber	*Cucumaria piperata*	1	-	-	-
Octopuses and Squid	**Class Cephalopoda**				
Pacific Bobtail Squid	*Rossia pacifica*	37	0.86	0.22	2.19
Opalescent Inshore Squid	*Doryteuthis opalescens*	26	10.36	1.47	26.40
Schoolmaster Gonate Squid	*Berryteuthis magister*	26	42.38	4.25	110.59
Giant Pacific Octopus	*Enteroctopus dofleini*	6	9.32	4.61	27.65
Smoothskin Octopus	*Benthoctopus leioderma*	3	0.18	0.18	0.18
East Pacific Red Octopus	*Octopus rubescens*	2	-	-	-
Octopus	*Octopus* (Genus)	2	0.60	0.34	0.67
Squids	Teuthida (Order)	2	0.14	0.14	0.14
-	*Loligo* (Genus)	1	-	-	-
Robust Clubhook Squid	*Moroteuthis robusta*	1	19.06	19.06	19.06
Octopus	Octopoda (Order)	1	-	-	-
Flapjack Devilfish	*Opisthoteuthis californiana*	1	1.12	1.12	1.12
Sea Urchins	**Super Order Echinacea**				
Fragile Urchin	*Allocentrotus fragilis*	85	42.08	2.70	205.16
Pallid Urchin	*Strongylocentrotus pallidus*	21	1.68	0.38	6.10
Jellyfish	**Phylum Cnidaria**				
Jellyfish	Scyphozoa (Class)	11	2.77	0.64	4.45
Lions Mane	*Cyanea capillata*	8	0.62	0.27	2.15
-	*Periphylla* (Genus)	1	-	-	-
Anemones and Corals	**Class Anthozoa**				
Sea Whip	*Balticina septentrionalis*	37	1.08	0.34	4.69
Anemone	Actiniaria (Order)	30	1.40	0.42	10.82
-	*Metridium* (Genus)	16	5.84	1.51	24.18
Snails and Slugs	**Class Gastropoda**				
Oregontriton	*Fusitriton oregonensis*	22	1.19	0.26	4.15
Gastropods	Gastropoda (Class)	7	-	-	-
Silvery Topsnail	*Calliostoma platinum*	4	-	-	-
California Armina	*Armina californica*	4	0.10	0.10	0.10
Seaslugs	Nudibranchia (Order)	4	0.12	0.12	0.12
Rosy Tritonia	*Tritonia diomedea*	3	0.28	0.25	0.74
Lewis Moonsnail	*Euspira lewisii*	2	0.28	0.28	0.28
Turban Snails	Turbinidae (Family)	1	-	-	-
Other Invertebrate Species					
Sponges	Porifera (Phylum)	32	74.37	5.09	157.89
Sea Mouse	*Aphrodita* (Genus)	10	0.50	0.22	1.98

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Heart Urchin	*Brisaster latifrons*	9	0.38	0.21	0.85
Heart Urchins	Atelostomata (Super Order)	8	4.30	1.46	8.76
Salps	Thaliacea (Class)	7	0.06	0.06	0.06
-	*Suberites* (Genus)	5	0.07	0.07	0.07
Pink Scallop, (aka Reddish Scallop)	*Chlamys rubida*	5	0.71	0.30	0.91
Peanutworms	Sipuncula (Phylum)	3	-	-	-
Lampshells	Brachiopoda (Phylum)	3	-	-	-
-	*Aequorea* (Genus)	3	0.26	0.26	0.26
-	Ctenophora (Phylum)	2	-	-	-
-	Antedonidae (Family)	1	-	-	-
-	*Mitrocoma* (Genus)	1	0.32	0.32	0.32
-	*Nuditheca* (Genus)	1	-	-	-
-	Nuculoida (Order)	1	0.92	0.92	0.92
Scallop	Pectinidae (Family)	1	-	-	-
Weathervane Scallop	*Patinopecten caurinus*	1	0.11	0.11	0.11
Glass Sponges	Hexactinellida (Class)	1	0.30	0.30	0.30
Ascidians And Tunicates	Ascidiacea (Class)	1	-	-	-
Barnacles	Cirripedia (Infraclass)	1	0.20	0.20	0.20
Chitons	Polyplacophora (Class)	1	-	-	-
Polychaete Worms	Polychaeta (Class)	1	-	-	-

Table 8. Species sampled during the 2014 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
Arrowtooth Flounder	*Reinhardtius stomias*	102	2711	850	2711	850	848
Big Skate	*Raja binoculata*	12	14	0	14	0	0
Bocaccio	*Sebastes paucispinis*	12	22	22	22	22	22
Brown Cat Shark	*Apristurus brunneus*	1	4	0	4	0	0
Canary Rockfish	*Sebastes pinniger*	17	232	192	232	192	192
Curlfin Sole	*Pleuronichthys decurrens*	3	33	22	33	22	22
Darkblotched Rockfish	*Sebastes crameri*	8	145	30	145	30	30
Dover Sole	*Microstomus pacificus*	107	2671	820	2671	821	821
English Sole	*Parophrys vetulus*	58	1463	623	1463	623	623
Eulachon	*Thaleichthys pacificus*	32	1403	0	0	0	0
Flathead Sole	*Hippoglossoides elassodon*	34	923	125	923	125	125
Green Sturgeon	*Acipenser medirostris*	4	4	0	0	0	0
Greenstriped Rockfish	*Sebastes elongatus*	44	1226	22	1224	22	22
Kelp Greenling	*Hexagrammos decagrammus*	2	15	0	15	0	0
Lingcod	*Ophiodon elongatus*	61	385	273	385	273	273
Longnose Skate	*Raja rhina*	66	142	0	142	0	0
North Pacific Spiny Dogfish	*Squalus suckleyi*	41	898	177	898	177	177
Pacific Cod	*Gadus macrocephalus*	80	1196	900	1196	900	1008
Pacific Hake	*Merluccius productus*	16	366	77	365	76	77
Pacific Halibut	*Hippoglossus stenolepis*	90	259	0	259	0	0
Pacific Ocean Perch	*Sebastes alutus*	37	959	534	922	534	534
Pacific Sanddab	*Citharichthys sordidus*	20	610	0	610	0	0
Pacific Tomcod	*Microgadus proximus*	3	81	0	34	0	0
Petrale Sole	*Eopsetta jordani*	67	1046	907	1046	907	905
Puget Sound Rockfish	*Sebastes emphaeus*	1	24	0	24	0	0
Pygmy Rockfish	*Sebastes wilsoni*	1	35	0	35	0	0
Quillback Rockfish	*Sebastes maliger*	3	19	0	19	0	0
Redbanded Rockfish	*Sebastes babcocki*	29	439	427	439	427	427
Redstripe Rockfish	*Sebastes proriger*	30	867	362	867	351	362
Rex Sole	*Glyptocephalus zachirus*	116	3227	486	3227	483	486
Rosethorn Rockfish	*Sebastes helvomaculatus*	15	325	68	325	68	68
Rougheye Rockfish	*Sebastes aleutianus*	29	268	268	268	268	268
Sablefish	*Anoplopoma fimbria*	59	1063	432	1063	412	412
Sandpaper Skate	*Bathyraja interrupta*	14	18	0	18	0	0
Sharpchin Rockfish	*Sebastes zacentrus*	28	833	256	833	256	256
Shortraker Rockfish	*Sebastes borealis*	2	4	4	4	4	4
Shortspine Thornyhead	*Sebastolobus alascanus*	34	1073	211	1073	0	211
Silvergray Rockfish	*Sebastes brevispinis*	10	234	185	234	185	185
Skates	Rajidae	3	3	0	3	0	0
Slender Sole	*Lyopsetta exilis*	59	1788	0	1788	0	0
Southern Rock Sole	*Lepidopsetta bilineata*	12	344	325	344	325	322
Splitnose Rockfish	*Sebastes diploproa*	17	502	150	500	122	122
Spotted Ratfish	*Hydrolagus colliei*	23	775	0	775	0	0
Stripetail Rockfish	*Sebastes saxicola*	3	59	0	59	0	0
Walleye Pollock	*Theragra chalcogramma*	21	549	76	549	76	76
Widow Rockfish	*Sebastes entomelas*	6	78	25	78	25	25
Yelloweye Rockfish	*Sebastes ruberrimus*	18	30	30	30	30	30
Yellowmouth Rockfish	*Sebastes reedi*	3	67	35	67	35	35
Yellowtail Rockfish	*Sebastes flavidus*	36	766	379	766	379	379
Total		**1489**	**30198**	**9293**	**28702**	**9020**	**9347**

Table 9. Summary of biological data collected during the 2014 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**
Arrowtooth Flounder	*Reinhardtius stomias*	102	2711	Fork	12	82	41	<0.1	3.1	0.9	0.62
Big Skate	*Raja binoculata*	12	14	Total	46	167	86	-	-	-	0.79
Bocaccio	*Sebastes paucispinis*	12	22	Fork	20	79	61	0.1	6.2	3.2	0.23
Brown Cat Shark	*Apristurus brunneus*	1	4	Total	38	60	50	-	-	-	0.25
Canary Rockfish	*Sebastes pinniger*	17	232	Fork	19	61	42	0.1	3.9	1.4	0.37
Curlfin Sole	*Pleuronichthys decurrens*	3	33	Total	21	36	28	0.1	0.6	0.3	0.45
Darkblotched Rockfish	*Sebastes crameri*	8	145	Fork	12	43	32	0.4	1.6	0.9	0.48
Dover Sole	*Microstomus pacificus*	107	2671	Total	18	59	34	0.1	2.2	0.4	0.45
English Sole	*Parophrys vetulus*	58	1463	Total	18	46	33	<0.1	0.9	0.3	0.76
Eulachon	*Thaleichthys pacificus*	32	1403	Total	1	21	15	-	-	-	-
Flathead Sole	*Hippoglossoides elassodon*	34	923	Total	9	40	28	<0.1	0.7	0.2	0.51
Green Sturgeon	*Acipenser medirostris*	4	4	Total	125	168	137	-	-	-	-
Greenstriped Rockfish	*Sebastes elongatus*	44	1226	Fork	6	39	27	0.2	0.5	0.3	0.45
Kelp Greenling	*Hexagrammos decagrammus*	2	15	Fork	26	38	34	-	-	-	0.6
Lingcod	*Ophiodon elongatus*	61	385	Fork	29	103	67	0.2	8.3	3.1	0.67
Longnose Skate	*Raja rhina*	66	142	Total	23	140	84	-	-	-	0.44
North Pacific Spiny Dogfish	*Squalus suckleyi*	41	898	Total	46	112	73	0.4	3.7	1.5	0.39
Pacific Cod	*Gadus macrocephalus*	80	1196	Fork	9	83	42	<0.1	6.2	1.1	0.54
Pacific Hake	*Merluccius productus*	16	366	Fork	17	74	52	0.6	2.0	1.0	0.71
Pacific Halibut	*Hippoglossus stenolepis*	90	259	Fork	55	125	69	-	-	-	0.32
Pacific Ocean Perch	*Sebastes alutus*	37	959	Fork	10	49	34	0.1	1.8	1.0	0.43
Pacific Sanddab	*Citharichthys sordidus*	20	610	Total	14	33	25	-	-	-	0.49
Pacific Tomcod	*Microgadus proximus*	3	81	Fork	15	25	19	-	-	-	0.56
Petrale Sole	*Eopsetta jordani*	67	1046	Total	19	56	40	0.1	2.9	0.8	0.57
Puget Sound Rockfish	*Sebastes emphaeus*	1	24	Fork	11	21	14	-	-	-	0.58
Pygmy Rockfish	*Sebastes wilsoni*	1	35	Fork	10	20	17	-	-	-	0.66
Quillback Rockfish	*Sebastes maliger*	3	19	Fork	15	42	35	-	-	-	0.74
Redbanded Rockfish	*Sebastes babcocki*	29	439	Fork	13	61	37	<0.1	4.5	1.1	0.41
Redstripe Rockfish	*Sebastes proriger*	30	867	Fork	6	43	27	<0.1	1	0.3	0.47
Rex Sole	*Glyptocephalus zachirus*	116	3227	Total	8	44	31	<0.1	0.4	0.2	0.48
Rosethorn Rockfish	*Sebastes helvomaculatus*	15	325	Fork	6	32	23	<0.1	0.3	0.1	0.54

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
Rougheye Rockfish	*Sebastes aleutianus*	29	268	Fork	15	59	46	<0.1	3.3	1.7	0.40
Sablefish	*Anoplopoma fimbria*	59	1063	Fork	33	84	49	0.4	5.6	1.7	0.40
Sandpaper Skate	*Bathyraja interrupta*	14	18	Total	15	62	41	-	-	-	0.56
Sharpchin Rockfish	*Sebastes zacentrus*	28	833	Fork	7	40	26	<0.1	1.0	0.4	0.52
Shortraker Rockfish	*Sebastes borealis*	2	4	Fork	58	75	67	3.0	6.9	5.4	1.00
Shortspine Thornyhead	*Sebastolobus alascanus*	34	1073	Total	4	62	23	<0.1	3.9	0.3	0.45
Silvergray Rockfish	*Sebastes brevispinis*	10	234	Fork	39	59	49	0.9	3.0	1.7	0.36
Skates	*Rajidae*	3	3	Total	58	78	70	-	-	-	0.33
Slender Sole	*Lyopsetta exilis*	59	1788	Total	11	34	22	-	-	-	0.55
Southern Rock Sole	*Lepidopsetta bilineata*	12	344	Total	8	54	29	<0.1	1.7	0.4	0.75
Splitnose Rockfish	*Sebastes diploproa*	17	502	Fork	7	49	24	<0.1	1.0	0.3	0.46
Spotted Ratfish	*Hydrolagus colliei*	23	775	2nd Dorsal	8	63	33	-	-	-	0.45
Stripetail Rockfish	*Sebastes saxicola*	3	59	Fork	16	30	24	-	-	-	0.66
Walleye Pollock	*Theragra chalcogramma*	21	549	Fork	18	58	32	0.1	1.4	0.4	0.63
Widow Rockfish	*Sebastes entomelas*	6	78	Fork	27	59	42	0.5	2.8	1.5	0.49
Yelloweye Rockfish	*Sebastes ruberrimus*	18	30	Fork	34	67	52	0.8	6.1	2.9	0.47
Yellowmouth Rockfish	*Sebastes reedi*	3	67	Fork	31	52	47	0.8	2.4	1.9	0.60
Yellowtail Rockfish	*Sebastes flavidus*	36	766	Fork	28	55	44	0.3	2.7	1.4	0.36

Table 10. Summary of data from net-mounted recorders during the 2014 WCVI synoptic bottom trawl survey, showing the number of tows and total number of records. A total of 153 survey tows were conducted, of which 147 were useable.

		Number of	
Data Recorder	**Attribute**	**Tows**	**Records**
Hobo Pendant Acceleration Data Logger	Trawl Net Angle	133	51615
Notus Net Sensors	Net Depth (m)	150	29260
	Doorspread (m)	143	26960
	Headline height above bottom (m)	152	28817
Seabird Sbe19plus Seacat Profiler S/N 5130	Conductivity of sea water (S/m)	150	37045
	Pressure (db/ depth (m))	150	37045
	Salinity (PSU)	150	37045
	Water temperature (^{o}C)	150	37045
Seabird SBE43	Oxygen Voltage (V)/ Dissolved oxygen (ml/L)	150	37045
Seabird SBE39 Temperature And Pressure Recorder	Water temperature (^{o}C)	153	69610
	Pressure (db/ depth (m))	151	266208
Simrad Es70 Depth Sounder	Bottom Depth (m)	151	266208

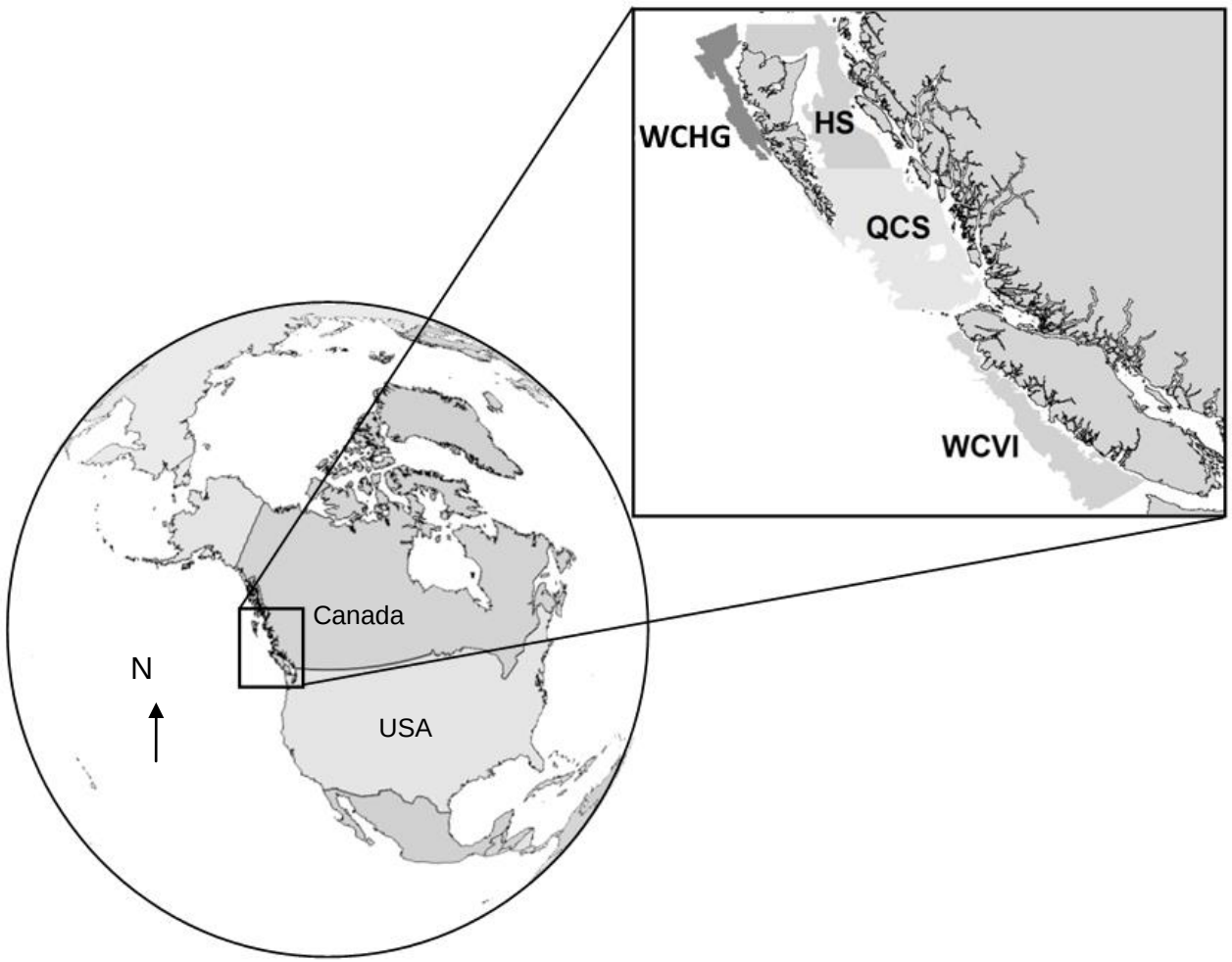

Figure 1. Locations of the current synoptic bottom trawl surveys on the coast of British Columbia, Canada. WCHG = West Coast Haida Gwaii; HS = Hecate Strait; QCS = Queen Charlotte Sound; WCVI = West Coast Vancouver Island.

Figure 2. The Canadian Coast Guard Ship W.E. Ricker used for the 2014 WCVI synoptic bottom trawl survey.

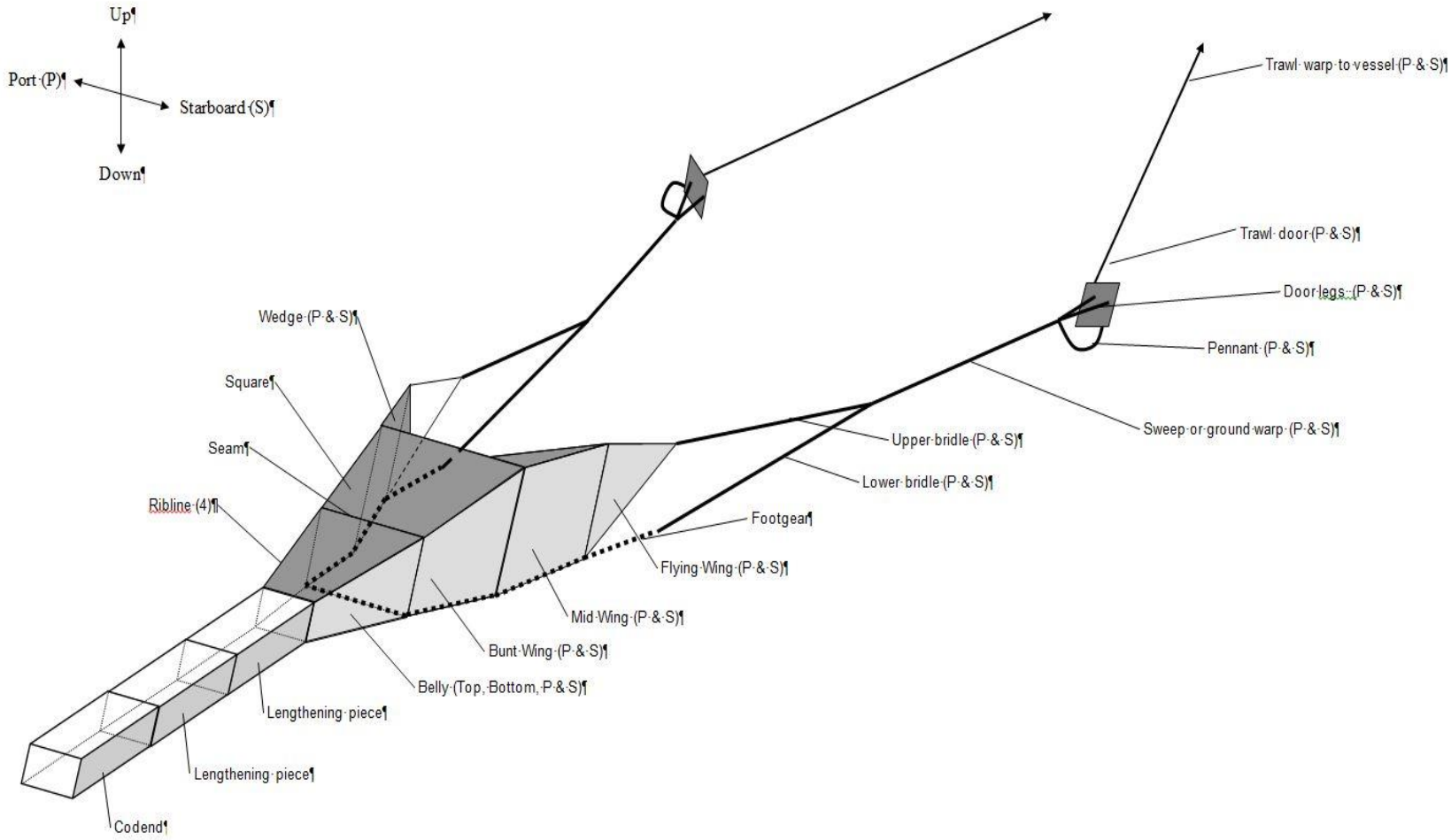

Figure 3. Overview diagram of the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey.

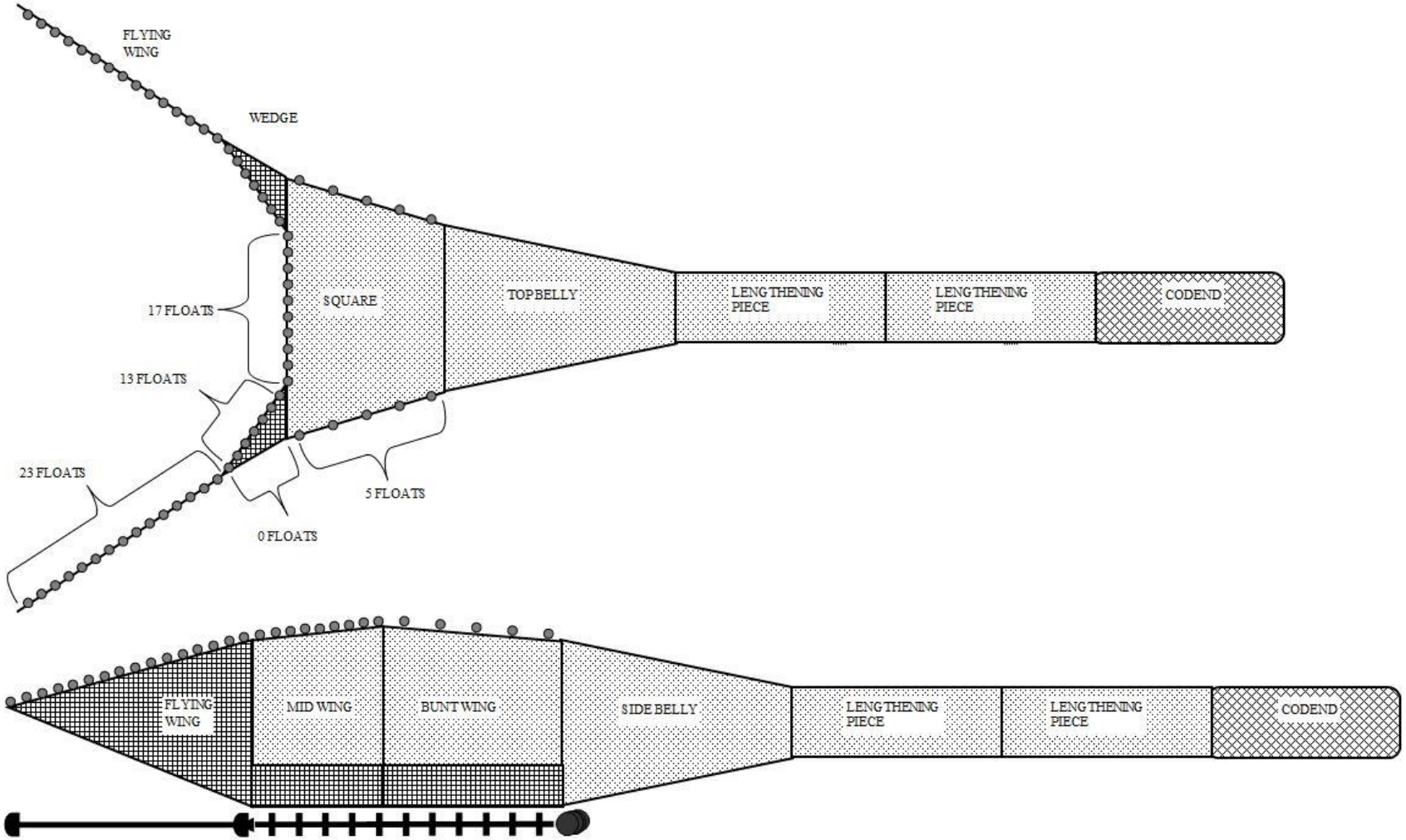

Figure 4. Top and side view of the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey.

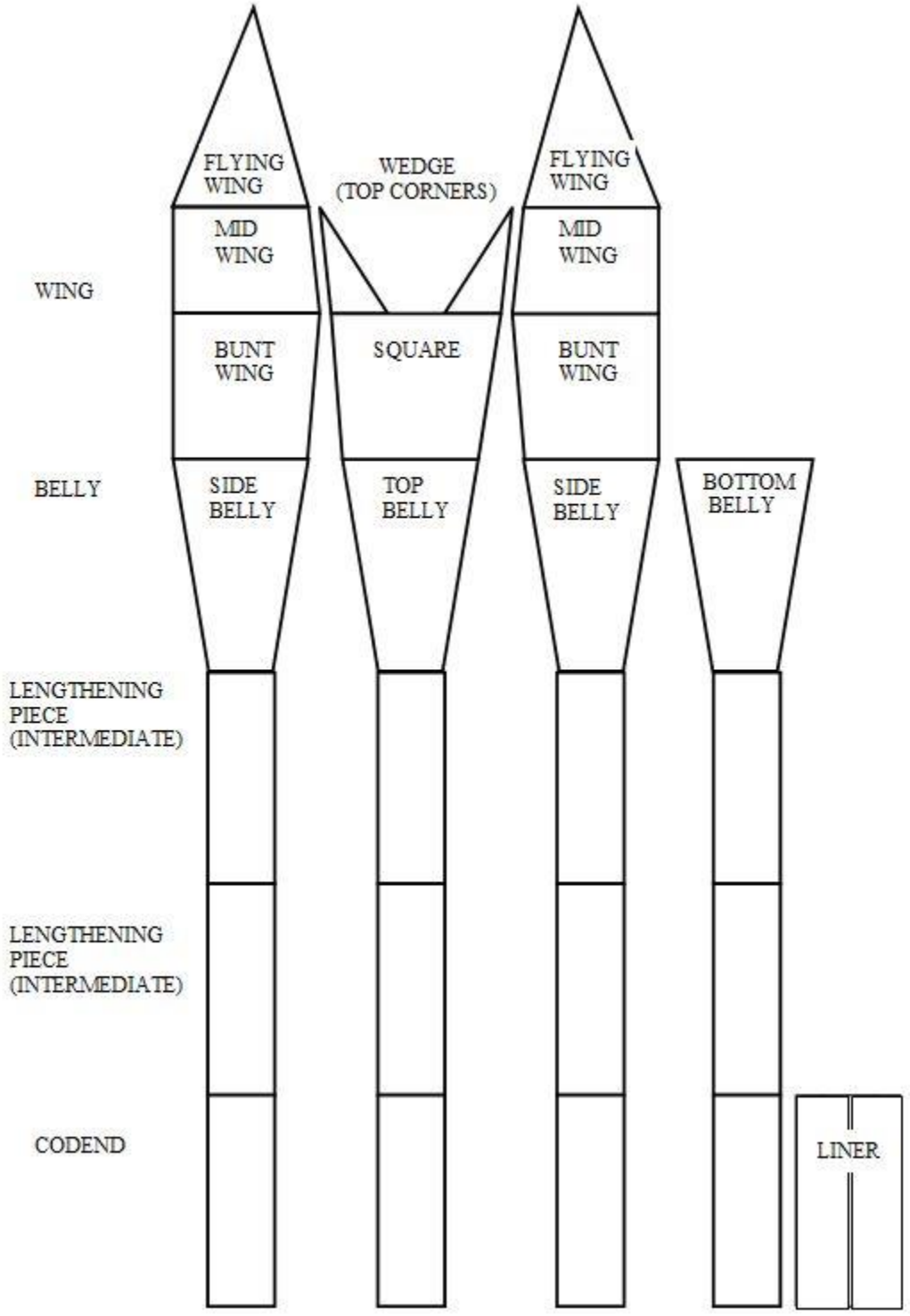

Figure 5. Diagram of the net panels with section names for the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey.

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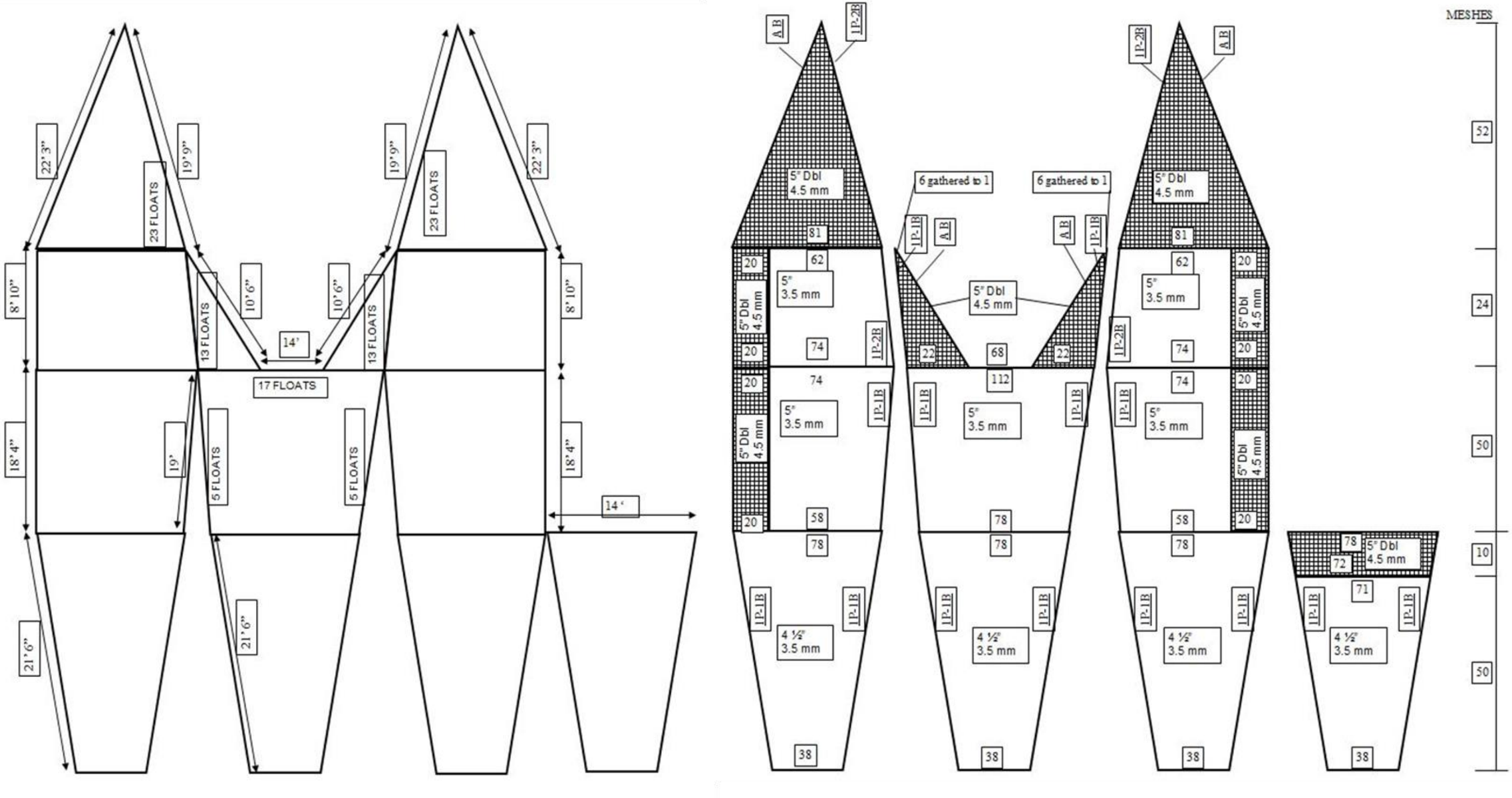

Figure 6. Details of the wing and belly sections of the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey. Dimensions and the float arrangement are shown on the left while netting details, mesh counts, and mesh cuts are shown on the right side of the diagram.

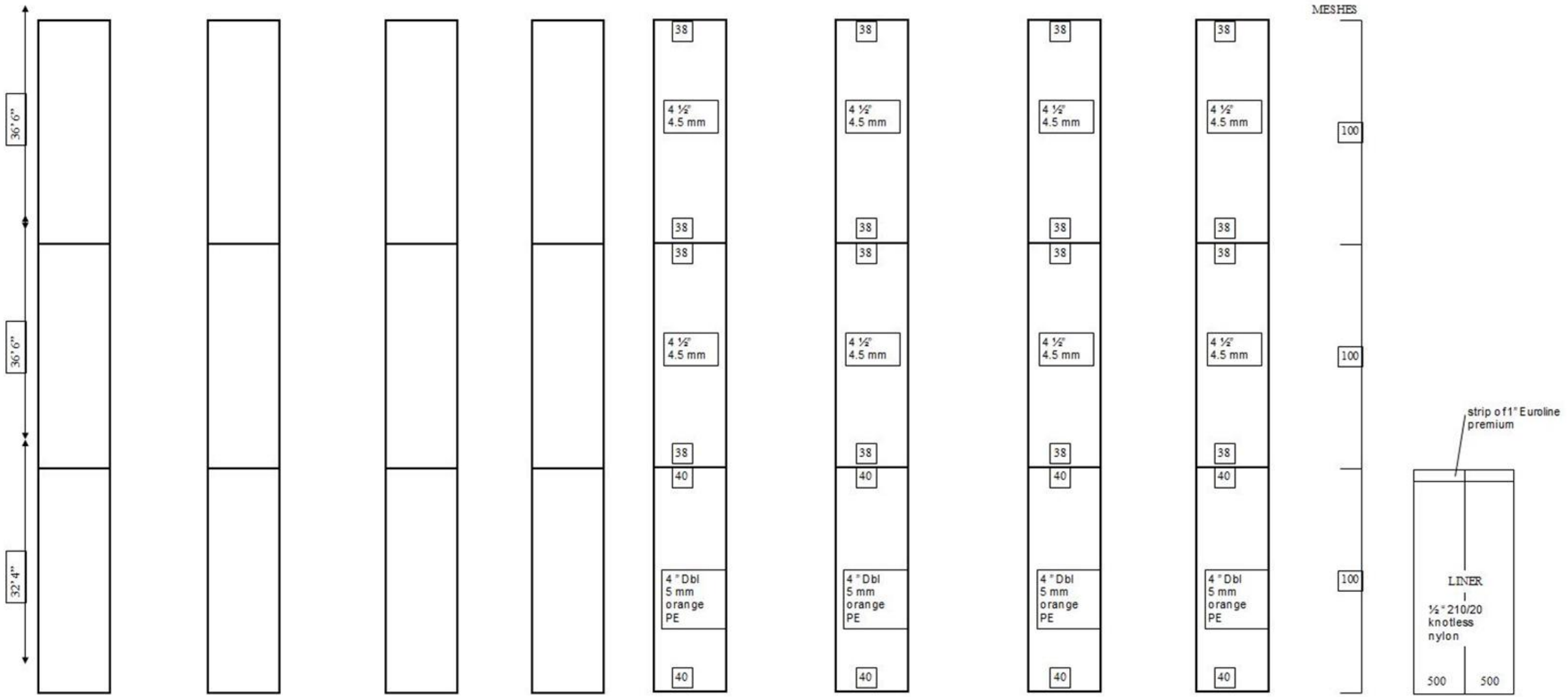

Figure 7. Details of the lengthening (intermediate) pieces and codend sections of the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey. Dimensions are shown on the left while netting details, mesh counts, and mesh cuts including the codend liner are shown on the right side of the diagram.

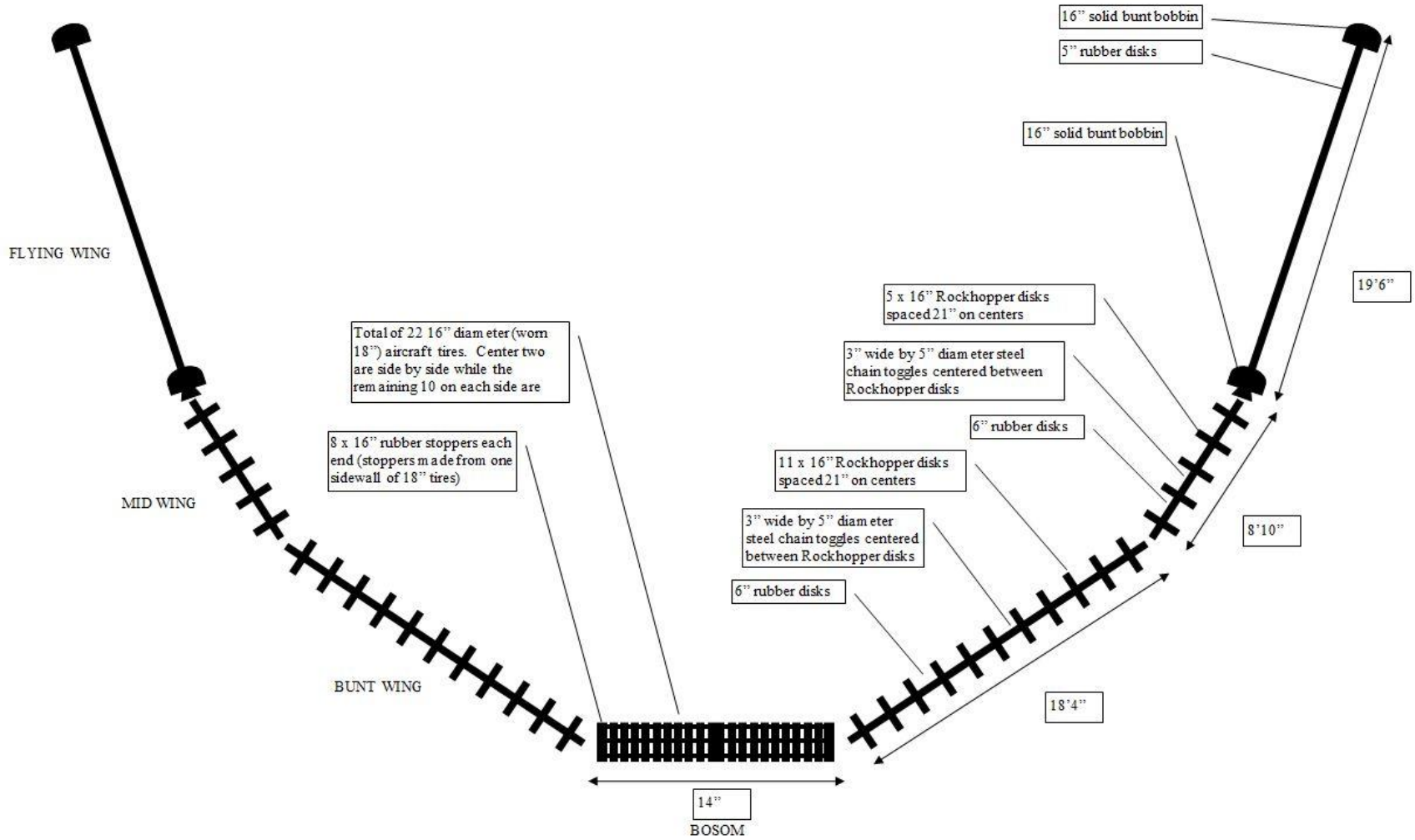

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Figure 8. Details of the Rockhopper foot gear for the Atlantic Western IIa box trawl used on the 2014 WCVI synoptic bottom trawl survey

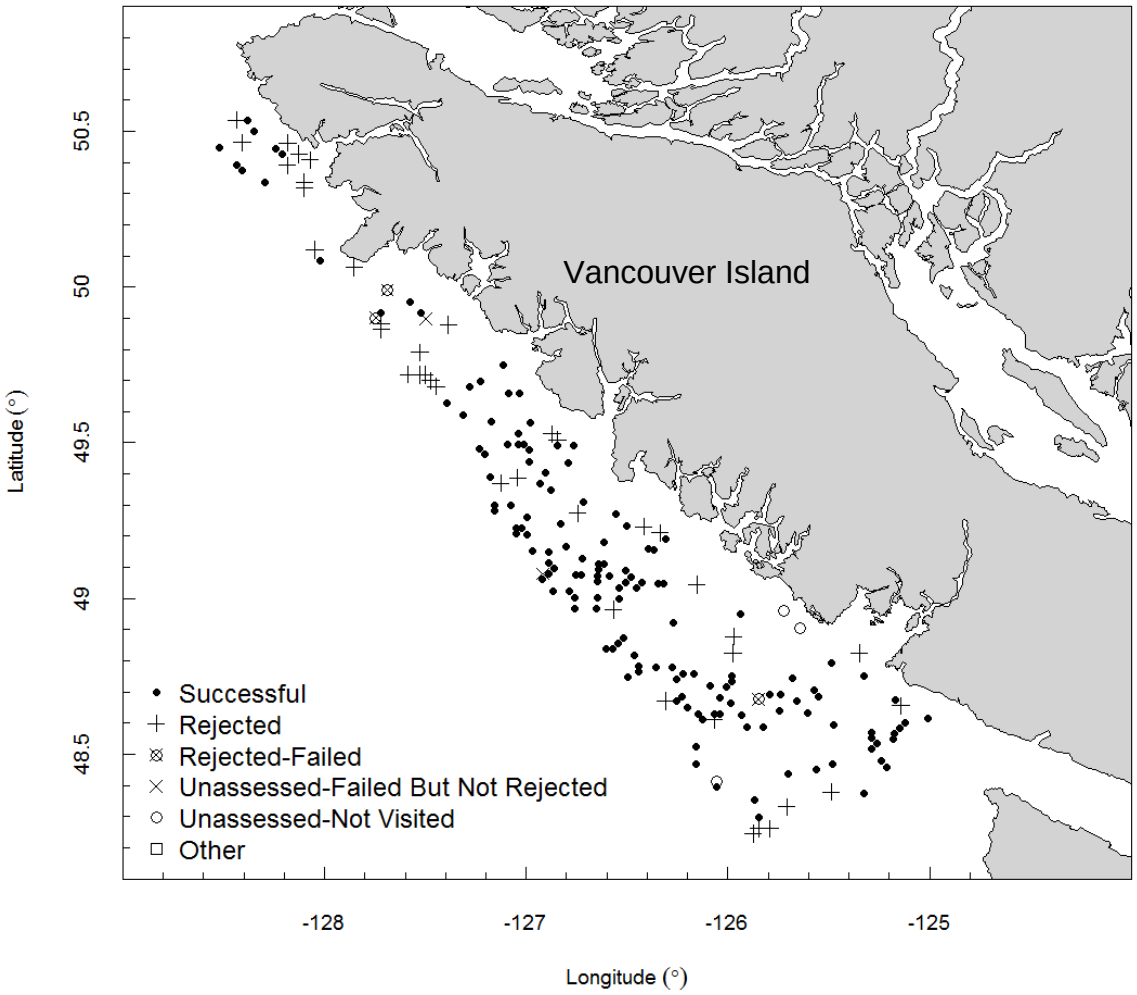

Figure 9. Final status of the 2014 WCVI synoptic bottom trawl survey showing 147 blocks that were fished successfully, 40 that were rejected prior to fishing or after inspection, two blocks that were abandoned after one or more failed fishing attempts and one block that was unassessed.

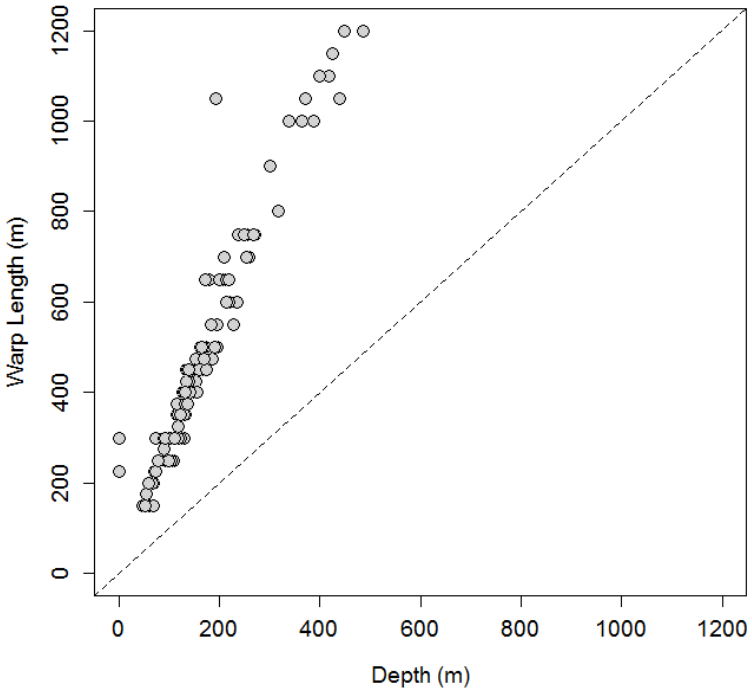

Figure 10. Warp length versus starting depth for each tow during the 2014 WCVI synoptic bottom trawl survey.

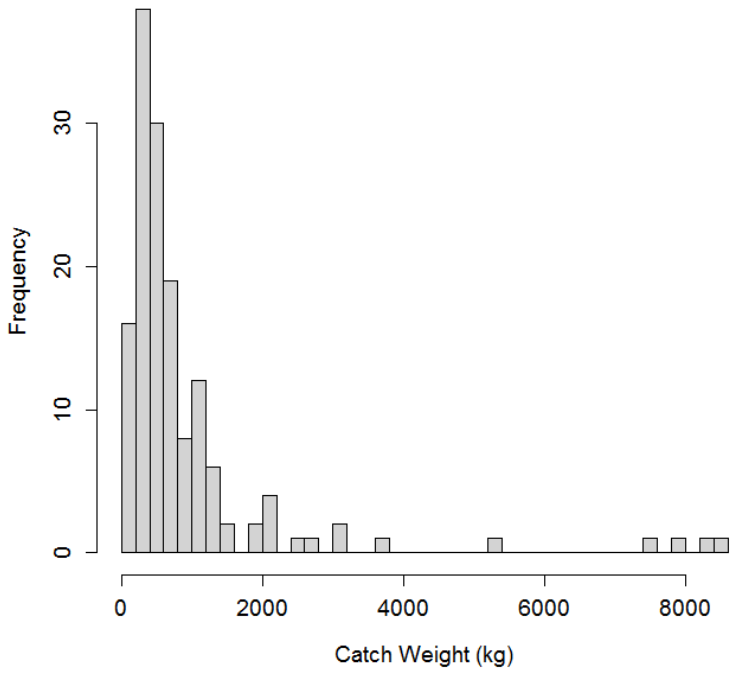

Figure 11. Histogram of catch weight per useable tow during the 2014 WCVI synoptic bottom trawl survey.

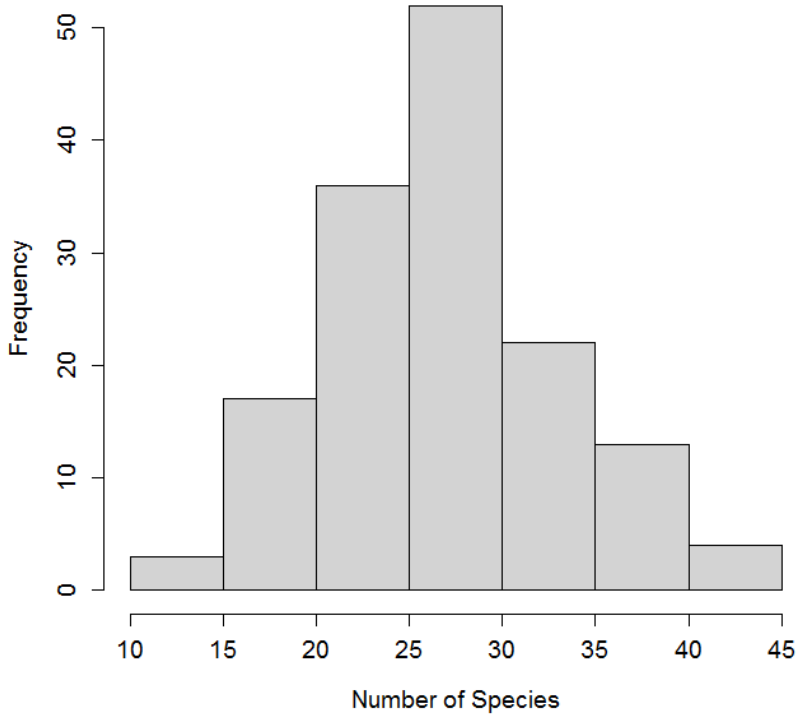

Figure 12. Histogram of number of species caught per useable tow during the 2014 WCVI synoptic bottom trawl survey.

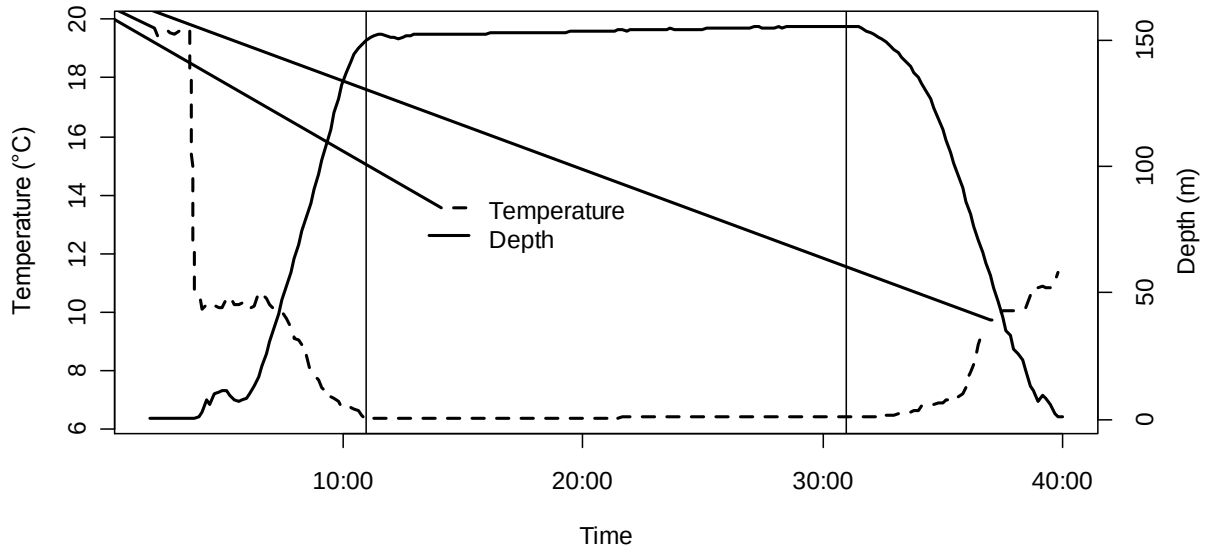

Figure 13. Example of a Seabird 39 temperature and pressure profile collected during a synoptic bottom trawl survey. The vertical lines indicate the start and end of net contact with the sea floor.

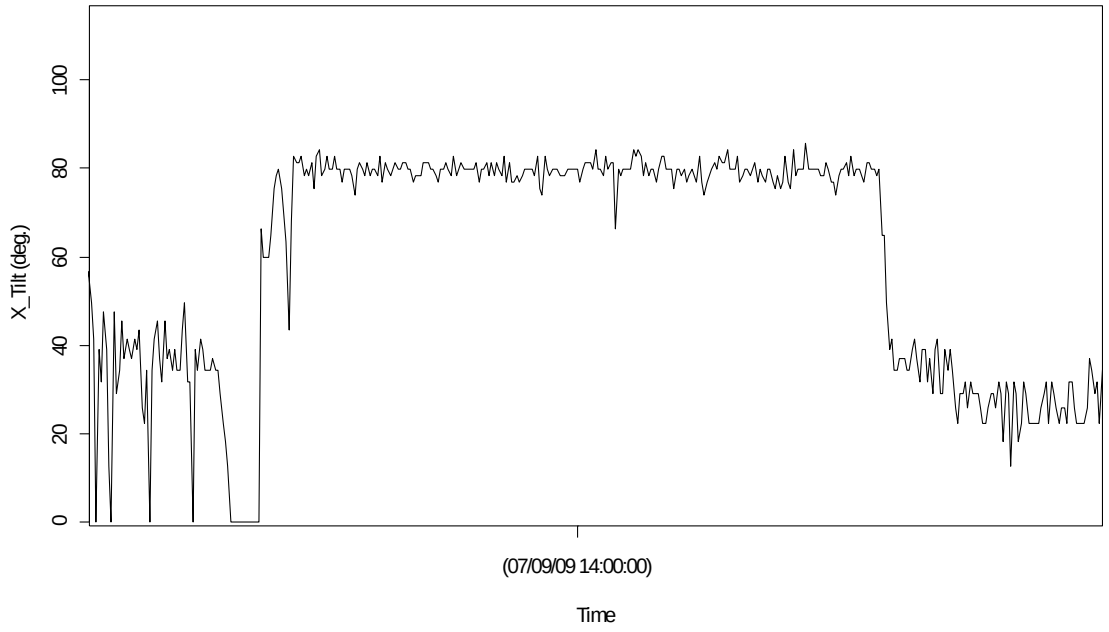

Figure 14. Example of a bottom contact sensor profile collected during a synoptic bottom trawl survey. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

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APPENDIX A: WCVI 2014 SURVEY BRIDGE LOG

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
1	May-29	12:00	48.6274	125.0225	58.5	19	5.5	150	249.3	Yes
2	May-29	13:45	48.6810	125.1843	69.4	19	6.6	150	96.1	Yes
3	May-29	14:39	48.6088	125.1275	100.0	19	5.8	250	222.4	Yes
4	May-29	15:41	48.5961	125.1619	104.8	19	5.8	300	255.6	Yes
5	May-29	16:38	48.5711	125.1860	97.9	19	6.0	250	1008.7	Yes
6	May-29	17:55	48.5536	125.1764	102.7	19	6.0	250	85.3	Yes
7	May-30	7:37	48.5538	125.2965	103.9	19	5.8	250	251.2	Yes
8	May-30	8:27	48.5571	125.2911	104.6	19	6.2	250	326.0	Yes
9	May-30	9:35	48.5378	125.2687	109.6	19	5.6	250	517.6	Yes
10	May-30	10:29	48.5135	125.2869	137.0	14	5.9		481.5	Yes
11	May-30	12:13	48.4793	125.2312	146.8	19	5.4	400	665.7	Yes
12	May-30	14:13	48.3730	125.3158	113.6	19	5.2	300	440.6	Yes
13	May-30	15:59	48.4726	125.4711	115.8	19	5.7	300	1387.4	Yes
14	May-30	17:50	48.4510	125.5522	109.9	20	5.1	300	808.5	Yes
15	May-31	7:07	48.4382	125.6909	126.5	21	5.4	300	173.4	Yes
16	May-31	8:40	48.3589	125.8625	164.6	22	5.8	450	8263.1	Yes
17	May-31	13:23	48.3008	125.8413	190.8	22	4.9	500	782.6	Yes
18	May-31	16:20	48.3985	126.0489	228.1	23	5.5	550	2165.5	Yes
19	May-31	17:54	48.4651	126.1491	257.5	22	5.6	700	1064.7	Yes
20	Jun-01	11:15	48.6395	126.0472	117.9	19	5.6	300	2055.6	Yes
21	Jun-01	13:26	48.6380	126.0760	129.1	9	5.4	300	501.2	No
22	Jun-01	14:08	48.6223	126.0672	129.4	22	5.1	300	721.4	Yes
23	Jun-01	15:26	48.6045	126.1232	153.5	22	5.1	425	305.2	Yes
24	Jun-01	16:16	48.6228	126.1365	158.2	22	5.5	450	585.4	Yes
25	Jun-01	17:41	48.5269	126.1546	195.3	23	5.9	550	5310.2	Yes
26	Jun-02	7:48	48.6537	126.2060	195.6	20	5.9	500	1153.8	Yes
27	Jun-02	9:00	48.6698	126.2499	233.0	14	5.5	600	7576.6	Yes
28	Jun-02	11:01	48.7535	126.2266	154.9	22	5.8	400	1091.3	Yes
29	Jun-02	12:33	48.7635	126.1769	137.1	23	5.4	450	493.3	Yes
30	Jun-02	13:58	48.7237	126.0137	90.9	20	5.6	300	249.9	Yes
31	Jun-02	14:50	48.6730	125.9929	99.2	17	5.3	300	94.1	Yes
32	Jun-02	16:01	48.6151	125.9290	94.1	21	5.1	250	163.8	Yes
33	Jun-02	17:45	48.5764	125.8248	70.3	20	5.4	225	230.8	Yes
34	Jun-03	7:14	48.6859	125.8771	67.1	7	5.1	175	6.1	No
35	Jun-03	7:53	48.7024	125.8036	67.5	20	5.0	200	113.9	Yes
36	Jun-03	8:38	48.6939	125.7495	137.9	21	5.4	400	1421.0	Yes
37	Jun-03	9:42	48.6410	125.7543	55.3	20	5.0	175	135.6	Yes
38	Jun-03	11:52	48.5969	125.4815	139.6	21	5.7	400	514.6	Yes
39	Jun-03	13:31	48.6892	125.5543	153.2	21	5.6	450	296.7	Yes
40	Jun-04	7:05	48.8051	125.4882	102.6	20	5.5	300	159.0	Yes
41	Jun-04	8:41	48.7037	125.5608	128.1	22	5.7	350	318.0	Yes
42	Jun-04	9:56	48.7448	125.6719	184.9	21	5.7	475	502.5	Yes
43	Jun-04	12:00	48.7292	125.9728	74.1	20	5.4	225	80.8	Yes
44	Jun-05	8:34	48.9423	125.9306	52.4	18	5.3	150	114.7	Yes
45	Jun-05	10:31	48.9123	126.2547	122.5	18	5.4	300	633.9	Yes
46	Jun-05	12:12	48.7652	126.4385	387.3	19	5.4	1000	653.2	Yes
47	Jun-05	13:35	48.7895	126.4509	254.6	19	5.4	750	491.0	Yes
48	Jun-05	15:15	48.8339	126.5679	301.4	19	5.7	900	458.8	Yes
49	Jun-05	16:20	48.8554	126.5352	235.7	19	6.8	600	2031.2	Yes
50	Jun-05	18:23	48.9945	126.5356	163.3	23	5.5	450	2461.8	Yes
51	Jun-06	7:15	48.9731	126.7591	438.1	23	5.7	1050	316.2	Yes
52	Jun-06	8:40	49.0058	126.6560	193.2	23	5.7	1050	269.4	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
53	Jun-06	9:47	49.0414	126.5525	148.1	21	5.8	450	785.2	Yes
54	Jun-06	10:40	49.0520	126.5182	142.1	22	6.2	400	1047.0	Yes
55	Jun-06	12:42	49.0404	126.4652	139.9	21	6.1	425	434.9	Yes
56	Jun-06	13:41	49.0571	126.4325	131.2	20	5.3	350	574.3	Yes
57	Jun-06	14:37	49.0538	126.3553	117.0	20	5.8	300	537.4	Yes
58	Jun-06	15:37	49.0503	126.3321	110.4	20	5.9	300	394.6	Yes
59	Jun-07	8:14	49.2358	126.5071	91.0	21	5.4	300	250.6	Yes
60	Jun-07	9:28	49.1683	126.4095	90.2	21	5.7	300	203.2	Yes
61	Jun-07	10:18	49.1677	126.3791	83.2	22	5.8		235.4	Yes
62	Jun-07	11:49	49.0700	126.4682	129.6	20	5.6	350	846.2	Yes
63	Jun-07	13:03	49.0854	126.6339	135.3	23	5.6	425	331.9	Yes
64	Jun-07	14:01	49.0730	126.6543	139.6	21	5.7	425	701.0	Yes
65	Jun-07	15:21	49.0035	126.7449	269.7	25	5.6	750	8461.0	Yes
66	Jun-07	17:35	49.0214	126.7739	246.3	24		750	1200.7	Yes
67	Jun-08	7:01	49.0208	126.8587	424.7	25	5.7	1150	242.9	Yes
68	Jun-08	8:08	49.0599	126.9178	448.1	27	5.8	1200	304.5	Yes
69	Jun-08	9:28	49.1157	126.8969	237.9	24		750	599.6	Yes
70	Jun-08	10:23	49.0969	126.8608	218.8	24	6.0	650	3720.3	Yes
71	Jun-08	12:51	49.1504	126.8860	184.6	22	5.6	550	783.1	Yes
72	Jun-08	13:58	49.0842	126.7618	167.4	21	5.9	450	724.5	Yes
73	Jun-08	14:57	49.0794	126.7317	159.7	21	5.6	450	1158.0	Yes
74	Jun-08	16:14	49.1177	126.6534	134.1	23	5.5	450	414.9	Yes
75	Jun-09	6:58	49.1004	126.6113	131.8	23	5.4	400	584.6	Yes
76	Jun-09	8:24	49.1623	126.7974	138.9	23	5.3	450	424.2	Yes
77	Jun-09	9:47	49.1468	126.9630	337.1	27	5.5	1000	616.5	Yes
78	Jun-09	11:05	49.2025	127.0479	338.6	27	5.5	1000	599.6	Yes
79	Jun-09	12:32	49.2306	127.0311	214.4	21	5.4	600	1067.8	Yes
80	Jun-09	13:52	49.2038	126.9854	219.8	23	5.5	600	822.2	Yes
81	Jun-09	15:26	49.2471	126.8310	136.7	22	5.7	450	536.5	Yes
82	Jun-09	17:24	49.3167	126.7351	110.1	21	5.6	300	795.7	Yes
83	Jun-11	7:00	49.3566	126.8866	130.2	20	5.6	350	932.5	Yes
84	Jun-11	8:34	49.2924	127.0640	173.6	21	5.6	450	530.0	Yes
85	Jun-11	9:44	49.2827	127.1521	370.2	25	6.0	1050	625.2	Yes
86	Jun-11	10:54	49.2983	127.1538	268.2	23	5.7	750	1277.8	Yes
87	Jun-11	13:42	49.3950	127.1829	170.6	21	5.8	475	472.4	Yes
88	Jun-11	15:44	49.3976	126.8950	122.8	21	5.8	350	319.6	Yes
89	Jun-11	17:44	49.4999	126.7706	48.7	21	4.9	150	182.4	Yes
90	Jun-12	6:59	49.4959	126.8401	68.3	20	5.2	200	408.8	Yes
91	Jun-12	8:19	49.4886	127.0056	117.1	20	5.4	350	804.5	Yes
92	Jun-12	9:16	49.4980	127.0884	135.5	22	5.6	450	635.1	Yes
93	Jun-12	10:27	49.4606	127.1971	163.3	21	5.0	500	831.4	Yes
94	Jun-12	12:09	49.4844	127.2227	172.7	19	6.2	500	2132.9	Yes
95	Jun-12	13:42	49.5596	127.1674	137.7	21	5.5	450	350.1	Yes
96	Jun-12	15:11	49.5731	126.9920	98.2	20	5.3	300	606.4	Yes
97	Jun-12	16:34	49.6651	127.0453	78.5	21		250	378.1	Yes
98	Jun-13	7:03	50.3759	128.4190	217.2	22	6.0	650	2650.7	Yes
99	Jun-13	8:49	50.4428	128.5138	252.8	24	5.5	750	1142.5	Yes
100	Jun-13	10:39	50.5050	128.3660	156.1	22	5.2	450	552.9	Yes
101	Jun-13	11:52	50.5262	128.3709	145.6	23	5.4	450	1328.9	Yes
102	Jun-13	13:29	50.3986	128.4427	216.3	23	6.4	650	1231.3	Yes
103	Jun-13	14:49	50.3418	128.2886	199.8	24	6.0	650	3121.8	Yes
104	Jun-14	7:25	50.4207	128.2030	118.0	17	5.3	350	233.0	Yes
105	Jun-14	8:16	50.4505	128.2459	122.3	21	5.3	350	549.5	Yes
106	Jun-14	11:43	50.0859	128.0130	203.7	22	5.8	650	709.0	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable
107	Jun-14	13:43	49.9960	127.7003	100.3	12	5.4	300	93.4	No
108	Jun-14	14:33	49.9207	127.7264	153.8	22	5.7	475	1964.3	Yes
109	Jun-14	16:16	49.9060	127.7292	163.1	17	6.1	550	555.2	No
110	Jun-14	17:50	49.9140	127.5387	64.9	21	5.8	200	59.3	Yes
111	Jun-15	7:00	49.9597	127.5668	61.1	15	5.5	200	125.3	Yes
112	Jun-15	8:01	49.9011	127.5070	71.2	21	5.4	250	77.4	No
113	Jun-15	13:21	49.6288	127.3987	246.4	16	5.9	750	7932.5	Yes
114	Jun-15	14:58	49.5961	127.3123	178.2	18	6.4	650	1033.7	Yes
115	Jun-15	17:29	49.6764	127.2674	130.7	22	5.5	400	881.4	Yes
116	Jun-16	7:20	49.7384	127.0944	68.7	19	5.4	200	308.4	Yes
117	Jun-16	8:38	49.6983	127.2185	117.2	19	5.5	300	307.0	Yes
118	Jun-16	9:47	49.6621	127.0991	100.7	20	5.6	300	516.6	Yes
119	Jun-16	11:03	49.5412	127.0437	114.9	21	5.5	300	1069.2	Yes
120	Jun-16	12:16	49.5018	127.0504	124.3	21	5.4	350	727.4	Yes
121	Jun-16	13:34	49.4315	126.9753	126.8	21	5.4	400	389.2	Yes
122	Jun-16	15:25	49.4277	126.7898	74.5	22		300	249.0	Yes
123	Jun-17	7:02	49.4824	126.9894	115.5	20	5.8	350	312.6	Yes
124	Jun-17	8:14	49.3712	126.9365	139.5	23	5.7	450	680.2	Yes
125	Jun-17	9:37	49.2664	126.9967	165.2	21	6.2	500	297.1	Yes
126	Jun-17	10:48	49.2289	127.0548	248.6	22	6.0	750	1801.1	Yes
127	Jun-17	12:23	49.0728	126.9163	400.2	25	5.8	1100	374.2	No
128	Jun-17	13:28	49.0702	126.8856	317.8	22	5.7	800	512.8	Yes
129	Jun-17	16:06	49.2783	126.5680	92.2	21	5.4	300	438.3	Yes
130	Jun-17	17:45	49.2025	126.3209	58.5	20	5.6	200	195.0	Yes
131	Jun-18	6:57	49.186	126.6033	118.6	11	5.5	300	179.9	No
132	Jun-18	7:41	49.1897	126.5854	117.4	20	5.1	325	453.4	Yes
133	Jun-18	8:49	49.1342	126.7219	136.7	21	5.5	375	1442.3	Yes
134	Jun-18	9:47	49.0614	126.6511	144.5	22	5.4	450	302.6	Yes
135	Jun-18	10:37	49.0704	126.6019	134.2	22	5.6	450	782.0	Yes
136	Jun-18	11:48	49.0888	126.5169	131.6	20	5.4	375	857.7	Yes
137	Jun-18	13:19	48.9639	126.6458	484.9	27	6.1	1200	232.1	Yes
138	Jun-18	14:52	48.88	126.5207	208.8	24	5.4	700	3045.8	Yes
139	Jun-18	16:09	48.8124	126.4581	212.9	23	5.7	650	355.7	Yes
140	Jun-19	7:11	48.8288	126.5889	363.6	27	5.9	1000	381.74	Yes
141	Jun-19	8:40	48.75	126.5045	417.0	25	6.1	1100	189.04	Yes
142	Jun-19	10:03	48.7841	126.3629	253.1	24	5.6	700	578.6	Yes
143	Jun-19	11:01	48.7852	126.2773	166.5	22	5.3	500	1017.6	Yes
144	Jun-19	12:20	48.7526	126.2414	164.5	22	5.3	500	1044.4	Yes
145	Jun-19	13:38	48.6967	126.2304	172.5	18	5.6	650	1267.4	Yes
146	Jun-19	15:25	48.7306	126.0989	116.1	21	5.5	375	314.0	Yes
147	Jun-19	17:42	48.7477	125.9662	78.7	20	5.7	250	220.8	Yes
148	Jun-20	6:58	48.7487	125.3203	94.9	21	5.6	300	282.0	Yes
149	Jun-20	8:59	48.6827	125.6464	91.5	22	5.2	300	469.9	Yes
150	Jun-20	10:12	48.6274	125.6216	63.1	21	5.3	225	432.2	Yes
151	Jun-20	12:58	48.6857	126.0287	105.2	20		300	197.4	Yes
152	Jun-20	14:09	48.6025	125.9128	89.2	21	5.6	275	722.8	Yes
153	Jun-20	17:42	48.46	125.2276	155.0	22	5.6	450	386.6	Yes

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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*	25139.7		1.0	10.2	11.7	2.5
Big Skate	*Raja binoculata*	91.2					
Bigfin Eelpout	*Lycodes cortezianus*	66.4					
Blackbelly Eelpout	*Lycodes pacificus*	183.1			0.5	1.4	
Bocaccio	*Sebastes paucispinis*	72.3					0.1
Canary Rockfish	*Sebastes pinniger*	1619.2					
Curlfin Sole	*Pleuronichthys decurrens*	15.6		0.7			
Darkblotched Rockfish	*Sebastes crameri*	471.9					
Dover Sole	*Microstomus pacificus*	4402.2			10.9	26.7	4.0
English Sole	*Parophrys vetulus*	2435.4	0.1	31.4	58.6	30.9	21.3
Eulachon	*Thaleichthys pacificus*	1360.6			1.0	24.6	0.6
Flathead Sole	*Hippoglossoides elassodon*	1581.7			38.8	74.7	46.1
Green Sturgeon	*Acipenser medirostris*	55.0					
Greenstriped Rockfish	*Sebastes elongatus*	1505.1				1.3	2.1
Kelp Greenling	*Hexagrammos decagrammus*	12.8	1.1				0.6
Lingcod	*Ophiodon elongatus*	1551.1	0.3	1.8	2.6		
Longnose Skate	*Raja rhina*	635.3					
North Pacific Spiny Dogfish	*Squalus suckleyi*	11371.2					
Pacific Cod	*Gadus macrocephalus*	2900.8	80.7	2.3	1.2	12.0	14.7
Pacific Hake	*Merluccius productus*	1301.8					
Pacific Halibut	*Hippoglossus stenolepis*	1079.3	4.8				16.6
Pacific Ocean Perch	*Sebastes alutus*	19694.6	-				
Pacific Sand Lance	*Ammodytes hexapterus*	13.0					
Pacific Sanddab	*Citharichthys sordidus*	796.6	0.1	22.6	3.8		
Pacific Tomcod	*Microgadus proximus*	29.6					
Petrale Sole	*Eopsetta jordani*	1488.3	0.1	2.4	23.1	13.6	16.1
Pygmy Rockfish	*Sebastes wilsoni*	13.8					4.6
Quillback Rockfish	*Sebastes maliger*	51.5				2.6	2.2
Redbanded Rockfish	*Sebastes babcocki*	1161.3					
Redstripe Rockfish	*Sebastes proriger*	5962.6					542.6
Rex Sole	*Glyptocephalus zachirus*	5547.3		5.4	20.3	13.0	6.2
Rosethorn Rockfish	*Sebastes helvomaculatus*	259.0					
Rougheye Rockfish	*Sebastes aleutianus*	602.6			0.1		
Sablefish	*Anoplopoma fimbria*	3297.2				1.0	
Sandpaper Skate	*Bathyraja interrupta*	11.7					
Sharpchin Rockfish	*Sebastes zacentrus*	9236.2	-				3.6
Shortraker Rockfish	*Sebastes borealis*	21.9					
Shortspine Thornyhead	*Sebastolobus alascanus*	791.5					
Silvergray Rockfish	*Sebastes brevispinis*	3260.8					1.4
Slender Sole	*Lyopsetta exilis*	446.7			1.4	7.5	3.6
Southern Rock Sole	*Lepidopsetta bilineata*	293.0	42.0	2.8	0.5		
Splitnose Rockfish	*Sebastes diploproa*	12931.5					
Spotted Ratfish	*Hydrolagus colliei*	2146.6	117.7	15.5	38.0	17.2	19.0
Stripetail Rockfish	*Sebastes saxicola*	27.5					
Threadfin Sculpin	*Icelinus filamentosus*	68.1	0.3	0.9		0.5	0.7
Walleye Pollock	*Theragra chalcogramma*	1420.1		0.2	9.9	15.4	109.4
Widow Rockfish	*Sebastes entomelas*	175.6					0.8
Yelloweye Rockfish	*Sebastes ruberrimus*	93.9					1.8
Yellowmouth Rockfish	*Sebastes reedi*	900.8					
Yellowtail Rockfish	*Sebastes flavidus*	8317.7					180.2
Other		1304.8	2.0	9.1	1.5	1.6	8.2
Total			**249.3**	**96.1**	**222.4**	**255.6**	**1008.7**

Common Name	6	7	8	9	10	11	12	13	14	15	16
Arrowtooth Flounder	2.8	8.6	10.3	21.2	82.3	265.5	34.7	276.7	39.1	7.7	1557.2
Big Skate											
Bigfin Eelpout											
Blackbelly Eelpout		0.5	0.4	1.7	16.8	8.7		-		0.3	
Bocaccio									3.4		8.9
Canary Rockfish	0.9		14.2	14.7	2.6	1.4	7.7				7.1
Curlfin Sole											
Darkblotched Rockfish											
Dover Sole	0.9	7.8	5.5	44.8	30.0	54.8	14.5	48.7	25.9	77.2	8.2
English Sole	1.7	23.0	20.1	9.8		1.7	42.6	177.1	143.8	22.4	8.1
Eulachon	0.3	0.3	0.3	0.6	115.4	19.6					
Flathead Sole	6.3	60.4	37.2	54.3	108.8	97.7		6.8	0.5	4.3	
Green Sturgeon											
Greenstriped Rockfish	0.7	1.7	3.1	1.4			49.3	3.2	3.1	0.3	112.1
Kelp Greenling											
Lingcod			6.2	2.5			4.7	35.1	3.3		103.5
Longnose Skate				3.1	0.6	58.5					
North Pacific Spiny Dogfish		6.7	1.6	7.2	48.4	46.5	23.1	319.0	144.2	22.1	5694.6
Pacific Cod	1.7	15.0	3.2	20.7	2.5	12.7	64.5	195.1	166.4	0.5	
Pacific Hake						0.2					
Pacific Halibut		6.8		4.9	3.8			72.1	7.5		50.5
Pacific Ocean Perch			0.1	-	-		-				
Pacific Sand Lance											
Pacific Sanddab						0.3	2.5	0.6			
Pacific Tomcod											
Petrale Sole	2.1	10.0	13.6	22.0	7.3	1.8	44.4	88.8	122.0	3.8	28.4
Pygmy Rockfish	0.3		0.1	-			-		0.3		
Quillback Rockfish	2.0										
Redbanded Rockfish											
Redstripe Rockfish	11.6	22.7	22.7	6.8			53.6			0.9	4.2
Rex Sole	1.4	13.5	10.2	35.0	20.4	43.3	18.3	41.0	27.9	22.9	
Rosethorn Rockfish							0.3				4.5
Rougheye Rockfish					0.2	0.7					
Sablefish		0.4	1.7	0.7			0.5	101.9	72.3	2.4	560.6
Sandpaper Skate						1.4					
Sharpchin Rockfish	0.1	0.1	0.1	0.1			0.7				0.3
Shortraker Rockfish											
Shortspine Thornyhead											
Silvergray Rockfish											
Slender Sole	0.3	9.8	12.2	10.5	9.2	8.2	0.8	0.2	1.6	1.7	
Southern Rock Sole							2.5		0.9	0.2	
Splitnose Rockfish					-						
Spotted Ratfish	7.9	15.0	10.0	27.6	8.0	10.4	18.7	8.7	25.2	2.2	64.6
Stripetail Rockfish											
Threadfin Sculpin	0.6	1.1		2.1			5.5	0.6	0.9	0.1	
Walleye Pollock	39.3	13.3	10.5	215.0	13.2	10.1		6.9	14.7	1.6	
Widow Rockfish		0.4									8.2
Yelloweye Rockfish				5.9							
Yellowmouth Rockfish											
Yellowtail Rockfish	2.3	26.4	134.4			9.5	48.6				42.1
Other	2.0	7.7	8.4	5.1	11.9	12.7	3.1	4.9	5.5	2.9	-
Total	**85.3**	**251.2**	**326.0**	**517.6**	**481.5**	**665.7**	**440.6**	**1387.4**	**808.5**	**173.4**	**8263.1**

Common Name	17	18	19	20	21	22	23	24	25	26	27
Arrowtooth Flounder	445.8	468.5	30.3	13.9	10.1	21.9	97.6	147.4	280.6	109.2	288.7
Big Skate				37.6		4.0					
Bigfin Eelpout			2.5							0.6	9.4
Blackbelly Eelpout				0.2	-			-			
Bocaccio		1.8		3.7							
Canary Rockfish		2.5		10.3		0.7	2.4	2.1	3.9	16.7	31.2
Curlfin Sole											
Darkblotched Rockfish			4.5					0.6			158.0
Dover Sole	148.0	3.3	22.8	18.9	8.8	10.8	38.4	23.5		14.2	59.6
English Sole	8.1		0.6	15.7	1.7	3.4	40.4	6.4	2.8		
Eulachon				0.2	-						
Flathead Sole				0.3	0.3						
Green Sturgeon											
Greenstriped Rockfish	45.2	30.6	1.4	31.2	4.5	15.6	4.7	1.2	108.4	57.1	
Kelp Greenling											
Lingcod		3.3		17.6		25.9	3.8		9.4	12.4	
Longnose Skate		15.7	6.1	2.0		1.7			20.0		14.6
North Pacific Spiny Dogfish	66.4		5.3	203.3	432.6	414.2	28.4	66.2	6.9		
Pacific Cod		3.3		4.5	0.6	2.2		1.2	30.0	29.9	
Pacific Hake			43.0								
Pacific Halibut						12.6	9.8	7.5	8.6		
Pacific Ocean Perch		156.2	344.2			-		-	3739.0	19.2	3225.0
Pacific Sand Lance											
Pacific Sanddab											
Pacific Tomcod											
Petrale Sole	4.7			6.1	11.2	21.3	25.3	15.3	5.5		
Pygmy Rockfish						2.1	0.2			0.2	
Quillback Rockfish											
Redbanded Rockfish		30.3	3.4						3.7	8.8	35.4
Redstripe Rockfish				37.9		118.7		6.3	42.4	4.7	3.5
Rex Sole	17.7	9.2	1.7	15.5	2.1	7.5	37.2	80.2	27.9	10.8	18.2
Rosethorn Rockfish		6.1	0.3	1.7		1.0			51.9	24.4	14.2
Rougheye Rockfish											
Sablefish	24.8	477.8	13.9		12.3		9.9	7.3	225.0	44.2	42.9
Sandpaper Skate											
Sharpchin Rockfish		933.7	33.4	0.3		3.4	0.4		471.2	650.5	2164.5
Shortraker Rockfish											
Shortspine Thornyhead		6.6	20.9							11.0	4.0
Silvergray Rockfish		4.3	6.1						234.5	8.6	57.1
Slender Sole	0.2	1.0	1.2	0.7	0.1	1.6	0.5	2.8	1.6	1.1	5.3
Southern Rock Sole				0.3				0.1			
Splitnose Rockfish		-	510.7	0.6	0.1					59.5	1202.4
Spotted Ratfish	10.7	9.7	6.4	7.8	0.5	0.9	2.0	3.1		5.1	148.7
Stripetail Rockfish										1.4	
Threadfin Sculpin			-	0.7		1.2		0.1			1.7
Walleye Pollock					1.4	1.2		2.1			
Widow Rockfish			2.1	4.3		1.0		1.6		17.4	15.1
Yelloweye Rockfish				8.1		22.4			2.7	2.7	
Yellowmouth Rockfish											
Yellowtail Rockfish				1597.1		3.6	1.3	209.4	19.1	42.9	
Other	11.1	1.7	4.1	14.9	14.8	22.3	2.8	1.2	15.2	1.3	77.2
Total	**782.6**	**2165.5**	**1064.7**	**2055.6**	**501.2**	**721.4**	**305.2**	**585.4**	**5310.2**	**1153.8**	**7576.6**

Common Name	28	29	30	31	32	33	34	35	36	37	38
Arrowtooth Flounder	443.6	266.4	20.8	4.6	1.2			0.3	43.8	0.7	215.8
Big Skate											
Bigfin Eelpout											
Blackbelly Eelpout			0.5	0.2	-				1.4		3.2
Bocaccio											
Canary Rockfish											
Curlfin Sole											
Darkblotched Rockfish		0.7									
Dover Sole	39.0	34.3	5.9	1.0	0.9				67.7		70.0
English Sole	1.8	6.7	22.7	21.8	88.4				9.0		3.8
Eulachon		2.5							232.1		69.3
Flathead Sole	2.7	19.6		0.2	0.2				83.1	0.4	13.4
Green Sturgeon											
Greenstriped Rockfish		0.4									
Kelp Greenling						1.1					
Lingcod		6.5	2.5			7.4		6.9	6.0	8.5	
Longnose Skate		0.7	0.5						13.7		18.9
North Pacific Spiny Dogfish	24.8	40.6	16.1	13.4	14.0	41.0					5.9
Pacific Cod	488.2	14.5	2.2	2.3	2.3			1.2			2.6
Pacific Hake									7.1		
Pacific Halibut		3.7	8.1	3.9	6.3	7.6		8.0	7.6	31.4	6.0
Pacific Ocean Perch	0.6	0.2									
Pacific Sand Lance										11.9	
Pacific Sanddab			107.5	12.9	36.3		0.3	0.5	0.1	0.6	
Pacific Tomcod			1.0	0.2							
Petrale Sole		4.3	2.9					4.8	3.5	6.4	3.2
Pygmy Rockfish						-					
Quillback Rockfish						5.9					
Redbanded Rockfish											
Redstripe Rockfish						92.7					
Rex Sole	38.9	51.6	55.1	21.5	8.3				147.5		24.2
Rosethorn Rockfish											
Rougheye Rockfish		0.2							0.5		1.3
Sablefish	25.6	13.6	1.5	0.4					2.7		6.7
Sandpaper Skate	0.6			1.5							
Sharpchin Rockfish											
Shortraker Rockfish											
Shortspine Thornyhead	0.4										
Silvergray Rockfish											
Slender Sole	2.1	3.7	1.0	0.5	0.2				11.7		4.7
Southern Rock Sole					3.4	12.3	2.8	16.9	2.7	40.8	1.2
Splitnose Rockfish											
Spotted Ratfish	8.9	8.9		2.9	1.3	46.3	3.1	61.1	79.3	30.8	34.4
Stripetail Rockfish											
Threadfin Sculpin				0.3	0.3						
Walleye Pollock	2.0	6.8		1.5					696.4		24.7
Widow Rockfish						0.1					
Yelloweye Rockfish						6.5					
Yellowmouth Rockfish											
Yellowtail Rockfish										0.3	0.2
Other	11.9	7.3	1.6	5.1	0.7	9.9	-	14.1	5.1	3.7	5.3
Total	**1091.3**	**493.3**	**249.9**	**94.1**	**163.8**	**230.8**	**6.1**	**113.9**	**1421.0**	**135.6**	**514.6**

Common Name	39	40	41	42	43	44	45	46	47	48	49
Arrowtooth Flounder	64.5	11.7	70.7	134.5	0.1		337.7	94.4	10.1	47.3	25.0
Big Skate							10.7				
Bigfin Eelpout								-	3.1	5.5	0.2
Blackbelly Eelpout	1.0	17.1	1.0	0.1			0.3				
Bocaccio											
Canary Rockfish											
Curlfin Sole					1.4	0.9					
Darkblotched Rockfish							0.3	0.9	8.2	1.9	0.8
Dover Sole	91.3	4.3	37.0	43.8			20.8	59.1	8.0	27.8	8.0
English Sole	1.5	16.0	0.6	1.3	11.4	0.2	1.9			0.6	
Eulachon	26.2	2.4	84.1	14.4			3.2				
Flathead Sole	5.3	34.7	18.5	0.4			93.3				
Green Sturgeon						27.0	18.0				
Greenstriped Rockfish											6.3
Kelp Greenling						0.3	0.2				
Lingcod	5.6		0.7			0.4	42.6				
Longnose Skate	10.9	4.7	18.0	6.8			5.5		6.6	23.8	
North Pacific Spiny Dogfish							10.7	1.4		2.2	1.6
Pacific Cod	5.5	5.1	28.6	5.5	1.1	0.8	8.6				
Pacific Hake		2.5	0.2					336.0	10.4	9.5	1.3
Pacific Halibut		2.6			9.1	15.8	7.5		11.1		
Pacific Ocean Perch							0.1	2.9	102.2	256.6	1903.3
Pacific Sand Lance						0.9	0.2				
Pacific Sanddab		0.4			33.8	0.6					
Pacific Tomcod											
Petrale Sole		3.3	8.5	2.1	1.9						
Pygmy Rockfish											
Quillback Rockfish											
Redbanded Rockfish									3.3		2.2
Redstripe Rockfish											
Rex Sole	30.9	7.1	10.7	51.0	2.0		33.4	6.9	0.3	2.2	5.6
Rosethorn Rockfish									2.1		0.9
Rougheye Rockfish	0.2							72.8	25.2		0.2
Sablefish		0.8	0.9				3.2	55.1	25.2	26.6	26.3
Sandpaper Skate											
Sharpchin Rockfish		0.1							7.1		31.7
Shortraker Rockfish											
Shortspine Thornyhead								12.8	18.9	13.8	6.5
Silvergray Rockfish										2.6	2.3
Slender Sole	1.6	1.7	4.4				8.8		1.1	1.3	0.2
Southern Rock Sole	0.2		0.3		6.4	42.0					
Splitnose Rockfish									240.1	32.6	0.5
Spotted Ratfish	16.1	38.5	11.2	151.0	9.5	14.7	11.9	1.1		1.2	5.5
Stripetail Rockfish											
Threadfin Sculpin				-							
Walleye Pollock	24.0	2.9	13.2	86.4			1.1				
Widow Rockfish											
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish							7.4	2.5			2.8
Other	11.8	3.2	9.2	5.2	4.0	11.1	6.7	7.2	8.0	3.4	0.1
Total	**296.7**	**159.0**	**318.0**	**502.5**	**80.8**	**114.7**	**633.9**	**653.2**	**491.0**	**458.8**	**2031.2**

Common Name	50	51	52	53	54	55	56	57	58	59	60
Arrowtooth Flounder	1566.6	7.7	61.7	407.2	390.1	88.6	279.3	78.5	24.6	10.3	2.9
Big Skate	0.6							4.3	4.9		
Bigfin Eelpout			2.6								
Blackbelly Eelpout			0.4					14.4	25.8	7.8	1.1
Bocaccio											
Canary Rockfish	3.9		2.2		4.1						
Curlfin Sole											
Darkblotched Rockfish						0.3	0.6				
Dover Sole	86.3	34.7	43.7	37.0	4.5	4.1	20.0	16.6	8.9	3.3	2.5
English Sole	9.0		1.7	75.7	26.5	5.1	8.5	11.9	42.6	82.6	55.6
Eulachon					12.1	5.9	6.4	5.1	37.5	17.3	18.3
Flathead Sole	0.4						27.9	238.3	74.8	6.3	1.3
Green Sturgeon											
Greenstriped Rockfish	69.6		13.2	7.2							
Kelp Greenling											
Lingcod	24.8		11.6	10.9	27.3	14.1	38.6	5.9	11.2	2.9	1.3
Longnose Skate					6.2		4.0				4.6
North Pacific Spiny Dogfish	115.7		12.0	122.9	415.7	287.9	92.6	22.4	19.5		5.3
Pacific Cod	0.9			3.3	40.3	0.5	9.1	8.7	14.0	18.6	8.2
Pacific Hake	1.5	48.2	1.9					0.2			
Pacific Halibut	10.8			8.9	17.5	11.9	18.9	6.7		9.8	3.1
Pacific Ocean Perch			3.3								
Pacific Sand Lance											
Pacific Sanddab								21.6	34.1	48.3	39.2
Pacific Tomcod										2.0	1.4
Petrale Sole	23.1			20.3	71.8	4.7	8.9	7.4	8.0	0.7	12.6
Pygmy Rockfish	0.4		0.3								
Quillback Rockfish											
Redbanded Rockfish	0.4	0.8		1.4							
Redstripe Rockfish	414.2										
Rex Sole	41.0		27.4	71.2	23.7	4.5	23.3	46.8	50.0	32.5	34.9
Rosethorn Rockfish	6.4		0.2								
Rougheye Rockfish		119.7	44.2								
Sablefish	6.3	75.7	14.3	0.5	0.7			3.0	2.6	2.4	
Sandpaper Skate											
Sharpchin Rockfish	11.3		7.5	0.6			0.1				
Shortraker Rockfish											
Shortspine Thornyhead		19.6	0.2	0.4							
Silvergray Rockfish			2.0								
Slender Sole	1.2		6.2	1.0	1.9	0.7	1.0	15.4	12.8	1.0	0.2
Southern Rock Sole											
Splitnose Rockfish			0.2								
Spotted Ratfish	6.9		4.3	3.4		2.1	9.8	28.9	21.1	2.9	5.3
Stripetail Rockfish											
Threadfin Sculpin	4.1		0.4	0.4	0.7	0.3	0.2	-	-		
Walleye Pollock								0.6	2.2	0.6	0.5
Widow Rockfish											
Yelloweye Rockfish	2.8										
Yellowmouth Rockfish											
Yellowtail Rockfish	43.3		3.2	4.7	1.4						
Other	10.3	9.7	5.1	8.2	2.6	4.4	25.3	0.8	-	1.5	5.0
Total	**2461.8**	**316.2**	**269.4**	**785.2**	**1047.0**	**434.9**	**574.3**	**537.4**	**394.6**	**250.6**	**203.2**

Common Name	61	62	63	64	65	66	67	68	69	70	71
Arrowtooth Flounder	2.3	108.2	56.0	56.9	12.0	76.1	8.7	3.0	65.3	42.4	316.0
Big Skate											
Bigfin Eelpout					3.4	3.0			1.0	0.6	
Blackbelly Eelpout	1.0		0.2	0.2					0.6		0.8
Bocaccio										7.8	
Canary Rockfish	0.8	20.3	2.5	3.7	2.8						4.3
Curlfin Sole											
Darkblotched Rockfish					127.3				3.1		
Dover Sole	0.5	15.4	4.5	8.1	15.0	14.6	52.9	33.0	34.9	7.0	13.7
English Sole	84.6	5.3	14.2	27.2					0.6		72.0
Eulachon	3.3	3.0	1.9	0.3							
Flathead Sole		6.6									
Green Sturgeon	10.0										
Greenstriped Rockfish		28.8	4.9	14.8	0.7	2.3			1.8	36.0	11.7
Kelp Greenling											
Lingcod	8.6	245.3	30.6	20.3						2.7	
Longnose Skate	4.1	7.7	3.7			12.0	19.7	7.2		8.1	
North Pacific Spiny Dogfish		66.2	103.8	370.3	9.1	6.4			39.5	86.5	67.8
Pacific Cod	20.7	23.5	23.4	63.8						7.0	11.9
Pacific Hake							7.3	61.5	5.2		
Pacific Halibut		5.0	3.0	22.0						16.1	7.6
Pacific Ocean Perch					188.3	262.0	1.8	7.5	52.5	247.4	0.7
Pacific Sand Lance											
Pacific Sanddab	34.5	2.0									
Pacific Tomcod	2.3										
Petrale Sole	9.1	5.7	9.9	42.8	0.9						
Pygmy Rockfish											
Quillback Rockfish											
Redbanded Rockfish					20.0	25.5			96.2	391.3	7.2
Redstripe Rockfish											26.7
Rex Sole	40.0	14.9	40.3	47.3	11.3	22.3	1.1	1.3	130.3	126.8	204.0
Rosethorn Rockfish			0.5		1.4	5.2			0.7	34.6	
Rougheye Rockfish							4.3	31.7	9.4		
Sablefish					1.7	9.1	119.8	88.4	59.3	64.5	5.9
Sandpaper Skate											
Sharpchin Rockfish		0.1	0.1	0.2	44.6	382.7		0.4	41.9	988.4	
Shortraker Rockfish								3.1			
Shortspine Thornyhead					4.6	7.5	22.5	43.2		6.7	
Silvergray Rockfish				2.7	6.2	2.3			9.9	980.4	2.4
Slender Sole	0.4	3.6	2.6	5.3	0.5	0.6			3.4	4.3	8.2
Southern Rock Sole	0.7		0.6								
Splitnose Rockfish					8000.0	363.0		0.8	23.4	18.8	
Spotted Ratfish	10.0	7.4	5.4	2.4	0.4				2.7	19.0	4.9
Stripetail Rockfish											
Threadfin Sculpin	0.1	2.7	0.8	2.4	0.8						
Walleye Pollock	0.2	0.2							0.9		0.5
Widow Rockfish											
Yelloweye Rockfish			1.8	1.0						7.6	
Yellowmouth Rockfish									9.9	459.0	
Yellowtail Rockfish		262.2	19.6	7.0	3.2					153.0	1.8
Other	2.6	12.2	1.6	2.2	6.8	6.3	4.9	23.5	7.2	4.6	14.9
Total	**235.4**	**846.2**	**331.9**	**701.0**	**8461.0**	**1200.7**	**242.9**	**304.5**	**599.6**	**3720.3**	**783.1**

Common Name	72	73	74	75	76	77	78	79	80	81	82
Arrowtooth Flounder	382.6	701.4	120.6	241.0	69.5	68.5	69.3	391.9	457.9	267.2	8.9
Big Skate											
Bigfin Eelpout						2.0		1.9	2.0		
Blackbelly Eelpout		-	0.2	0.3	0.2			0.3		1.1	5.0
Bocaccio											
Canary Rockfish		2.3		2.0				4.5			7.8
Curlfin Sole											
Darkblotched Rockfish							1.0	1.2	1.1		
Dover Sole	18.1	12.6	10.7	6.2	14.3	278.0	176.4	56.0	25.2	5.5	6.3
English Sole	5.2	8.6	7.1	12.2	87.4			0.6		31.8	35.7
Eulachon		-	1.3	2.7	0.2					0.5	6.9
Flathead Sole				0.4	0.4						4.3
Green Sturgeon											
Greenstriped Rockfish	41.6	100.7	19.7		5.3			32.0	2.3		4.6
Kelp Greenling											
Lingcod			22.5	110.6	11.6			5.5		20.8	24.2
Longnose Skate				3.0		1.6	15.7		7.6		
North Pacific Spiny Dogfish	147.7	183.4	13.6	14.5	55.2	1.6		21.8	31.5	139.1	3.8
Pacific Cod	3.6	4.3	12.1	98.0	8.1			3.1		6.2	11.7
Pacific Hake						5.3	9.9				
Pacific Halibut		10.1	12.5	6.0	16.0	6.0		8.0	3.2	15.6	
Pacific Ocean Perch	0.6					11.9	113.3	16.9	4.9	0.4	
Pacific Sand Lance											
Pacific Sanddab											1.4
Pacific Tomcod											
Petrale Sole	4.1	12.9	8.9	26.3	14.0					8.3	2.2
Pygmy Rockfish	0.5	0.3									0.1
Quillback Rockfish											1.0
Redbanded Rockfish	1.8					6.2	28.1	45.9	31.1	4.6	
Redstripe Rockfish	39.3	23.4	5.4					0.3			55.0
Rex Sole	57.1	39.9	36.1	50.1	60.1	94.2	77.5	165.2	197.1	18.2	39.9
Rosethorn Rockfish	0.5	30.6					0.4	1.3	0.2		
Rougheye Rockfish						1.9	6.3	7.8			
Sablefish	2.4	0.7	0.6	0.6	0.7	41.8	51.5	18.5	35.9	4.9	
Sandpaper Skate								0.2			
Sharpchin Rockfish	1.4	7.2	0.8					175.2	3.1		0.1
Shortraker Rockfish											
Shortspine Thornyhead						49.1	34.1	0.8	3.2		
Silvergray Rockfish	2.6	1.5						40.4	1.7		3.5
Slender Sole	1.1	1.7	2.6	3.8	0.7	3.7	0.3	6.1	5.5	0.7	2.1
Southern Rock Sole											
Splitnose Rockfish						0.7	3.1	1.4	0.6		
Spotted Ratfish	3.1	3.1	3.0	4.2	6.7		1.2	7.4	3.0	2.6	3.0
Stripetail Rockfish	1.2	0.3						22.1	1.1		
Threadfin Sculpin		2.0	3.5		0.6	0.4		0.2			2.6
Walleye Pollock	0.8							8.9			1.2
Widow Rockfish			2.3		0.6		0.9				
Yelloweye Rockfish		7.9									
Yellowmouth Rockfish											
Yellowtail Rockfish	1.3		126.4	0.8	66.3			15.2		2.4	563.9
Other	7.8	3.4	5.1	1.9	6.4	43.7	10.5	7.1	4.1	6.6	0.5
Total	**724.5**	**1158.0**	**414.9**	**584.6**	**424.2**	**616.5**	**599.6**	**1067.8**	**822.2**	**536.5**	**795.7**

Common Name	83	84	85	86	87	88	89	90	91	92	93
Arrowtooth Flounder	656.8	128.3	146.2	92.3	42.4	95.9	4.9	43.8	210.7	392.2	506.3
Big Skate							2.5	5.8			
Bigfin Eelpout				2.5							
Blackbelly Eelpout	2.6	0.2				3.1	-	0.1	0.2	0.2	
Bocaccio									2.9		
Canary Rockfish		14.2	2.4								9.1
Curlfin Sole							1.3				
Darkblotched Rockfish				2.5							
Dover Sole	17.1	84.3	88.6	50.1	26.0	13.0	0.8	6.3	26.4	15.8	77.7
English Sole	10.2	3.8			1.8	1.8	24.0	72.6	6.8	6.5	31.0
Eulachon	18.6	0.2	-			9.6		8.0	13.7		0.1
Flathead Sole	36.9	1.0			0.7	41.5			55.2	4.2	
Green Sturgeon											
Greenstriped Rockfish		50.1	2.2		61.8	12.9				0.3	9.0
Kelp Greenling											
Lingcod	20.3			7.4	1.3		7.9	13.4	9.2	11.0	18.7
Longnose Skate	5.0	5.9			3.1		4.7		15.4		3.3
North Pacific Spiny Dogfish	50.9	12.9	1.1	12.1	50.7	5.6			14.0		41.1
Pacific Cod	1.4	0.6			22.1	0.7		2.4	228.6	84.6	2.8
Pacific Hake			39.5	5.6							
Pacific Halibut	19.9				19.6	5.1	11.4	12.3	18.5	16.4	3.4
Pacific Ocean Perch	-	-	3.4	625.3	6.5	-					
Pacific Sand Lance											
Pacific Sanddab		0.2					51.6	92.8	0.3		
Pacific Tomcod							11.7	5.6			
Petrale Sole	3.4	2.4				8.1	6.7	77.4	56.2	8.0	4.5
Pygmy Rockfish		0.2			2.8	0.2					
Quillback Rockfish											
Redbanded Rockfish			8.6	17.0							
Redstripe Rockfish		5.5			12.4	2.2					
Rex Sole	35.4	132.2	10.9	29.8	59.5	36.1	12.6	34.0	22.6	53.4	110.3
Rosethorn Rockfish		1.6		0.3	10.0	0.5	0.2				
Rougheye Rockfish			100.8	5.2							
Sablefish	16.8	1.9	170.7	10.6	0.6	0.6		0.4	7.7		1.1
Sandpaper Skate					0.7						
Sharpchin Rockfish		0.6		22.3	13.9	1.3					
Shortraker Rockfish			18.8								
Shortspine Thornyhead			19.2	12.3							
Silvergray Rockfish		5.7		1.9	10.4	5.3	2.5				
Slender Sole	19.5	7.7	0.2	0.2	4.3	26.0		2.4	13.0	13.3	3.2
Southern Rock Sole							14.3	0.3			
Splitnose Rockfish			0.8	370.7	2.6	1.1					
Spotted Ratfish	13.8	3.5	5.0	2.1	10.1	7.3	23.5	21.6	16.7	6.9	4.1
Stripetail Rockfish											
Threadfin Sculpin	0.2	1.0			3.6		0.3			0.2	
Walleye Pollock								0.5			
Widow Rockfish											
Yelloweye Rockfish		2.2			5.5						
Yellowmouth Rockfish											
Yellowtail Rockfish	1.6	56.3	3.0			32.9			57.6	17.6	
Other	2.0	7.5	4.1	7.6	100.2	8.7	1.5	9.2	28.8	4.5	5.7
Total	**932.5**	**530.0**	**625.2**	**1277.8**	**472.4**	**319.6**	**182.4**	**408.8**	**804.5**	**635.1**	**831.4**

Common Name	94	95	96	97	98	99	100	101	102	103	104
Arrowtooth Flounder	695.8	123.7	315.1	133.7	135.5	151.3	356.0	1157.9	448.5	121.4	168.5
Big Skate				6.5							
Bigfin Eelpout					1.5				0.2		
Blackbelly Eelpout			9.9	0.9			0.3				0.1
Bocaccio	3.6	4.3								6.4	
Canary Rockfish	14.4	4.2			5.9		8.8	2.8	5.0	20.9	
Curlfin Sole											
Darkblotched Rockfish							0.2	2.0			
Dover Sole	114.2	12.4	12.3	14.4	13.7	22.3	23.2	10.4	57.9	40.9	4.6
English Sole	2.9	51.7	9.5	49.3			1.3	4.2			3.7
Eulachon	0.1	0.1	66.5	4.7			16.9	2.8		0.2	8.3
Flathead Sole		0.5	8.3	1.6			4.4	4.1			-
Green Sturgeon											
Greenstriped Rockfish	8.4	0.5			26.2	1.3	11.8	37.7	42.8	28.7	16.0
Kelp Greenling											
Lingcod	9.8		9.9	36.5			11.6	8.0	7.0	8.0	
Longnose Skate	37.4	8.6					0.8		8.4	10.3	
North Pacific Spiny Dogfish	32.8	11.1	11.2	4.7	27.6	17.9	3.9	5.6	27.7	4.4	
Pacific Cod	3.0	8.9	13.4	4.2	10.4	5.6	11.5	21.3	8.3	2.8	8.1
Pacific Hake						10.4				4.2	
Pacific Halibut	3.3	8.1	24.8	5.5	3.0			7.5	4.8		
Pacific Ocean Perch	0.1				16.3	642.1	12.1	4.9	2.8	1.5	0.1
Pacific Sand Lance											
Pacific Sanddab			0.2	18.3							
Pacific Tomcod				0.4							
Petrale Sole		26.4	17.6	12.9			2.9	1.2			2.4
Pygmy Rockfish									-		
Quillback Rockfish											
Redbanded Rockfish					10.0	7.1	5.8	2.4	3.9	6.9	
Redstripe Rockfish					1497.8	4.1	4.0	0.7	101.4	2480.7	0.2
Rex Sole	80.4	60.1	35.1	60.3	72.2	10.7	14.6	10.1	45.9	14.5	17.7
Rosethorn Rockfish	0.2				1.1	0.7			3.2	6.4	
Rougheye Rockfish											
Sablefish			7.7		11.4	4.2	38.7	19.5	8.4	4.3	
Sandpaper Skate					0.8			1.2			
Sharpchin Rockfish	7.8				88.8	1.0			116.1	117.0	
Shortraker Rockfish											
Shortspine Thornyhead					13.3	66.4	0.3		14.2	12.5	
Silvergray Rockfish	21.0		2.3		670.1	10.0	1.3	1.9	278.0	156.1	
Slender Sole	2.3	3.7	3.8	2.5	0.9	0.6	0.2	0.6	0.3		0.1
Southern Rock Sole			0.2								
Splitnose Rockfish					1.1	121.0	4.2		0.2	0.2	
Spotted Ratfish	0.8	3.9	9.1	16.7	1.5	27.8	5.9	2.4	5.5	0.8	1.3
Stripetail Rockfish										0.3	
Threadfin Sculpin	0.5										
Walleye Pollock			3.1	2.9	0.6		4.8	5.6	1.9		1.1
Widow Rockfish	2.2					2.0				5.3	
Yelloweye Rockfish								1.6			
Yellowmouth Rockfish					9.4	29.3	0.5		18.8		
Yellowtail Rockfish	1087.7	16.2			28.3			4.5	17.9	64.4	
Other	4.3	5.7	46.4	2.2	3.3	6.8	6.7	7.9	2.2	2.6	1.0
Total	**2132.9**	**350.1**	**606.4**	**378.1**	**2650.7**	**1142.5**	**552.9**	**1328.9**	**1231.3**	**3121.8**	**233.0**

Common Name	105	106	107	108	109	110	111	112	113	114	115
Arrowtooth Flounder	488.0	20.2	2.0	313.4	169.1			0.5	64.4	93.7	126.1
Big Skate											
Bigfin Eelpout		0.5									
Blackbelly Eelpout	-										
Bocaccio				11.4					18.1		
Canary Rockfish		1.5		1052.3	71.1		27.3	0.5	6.6	29.8	8.4
Curlfin Sole								7.2			
Darkblotched Rockfish	0.1								104.3		
Dover Sole	8.0	61.3		99.7	91.0				9.7	21.9	40.3
English Sole	5.6	1.6	10.9	5.5				0.9			8.7
Eulachon	3.6	-	-					0.6			
Flathead Sole	1.0	0.3		6.8	0.4			0.2			
Green Sturgeon											
Greenstriped Rockfish	3.1	15.9			7.3	1.0		0.7		56.2	4.4
Kelp Greenling							4.9	0.6			
Lingcod	7.0	4.1	48.7	12.6	5.3	8.2	10.2	1.2	13.3	6.0	
Longnose Skate					0.3				46.6	14.1	9.5
North Pacific Spiny Dogfish	5.2	8.8		6.3				2.5	22.3	2.3	
Pacific Cod	9.5	5.6	1.1	45.8	1.6	8.9		4.3		6.0	25.4
Pacific Hake											
Pacific Halibut	3.5	6.5	4.2			12.3	34.3	7.7		11.0	4.0
Pacific Ocean Perch	0.4	10.8	0.1	3.5	10.1	1.7			2943.0	8.3	
Pacific Sand Lance											
Pacific Sanddab			0.2			0.2		0.6			
Pacific Tomcod	-		-								
Petrale Sole	2.0	0.7	9.2	2.1	1.3	1.5	1.4				10.9
Pygmy Rockfish			0.2				0.1				
Quillback Rockfish			1.6				6.1	1.7	19.4		
Redbanded Rockfish		49.5	1.8						171.5	15.2	3.2
Redstripe Rockfish		23.6			8.7	1.7	12.4	1.8		35.8	
Rex Sole	10.6	45.4	0.9	91.7	117.3			0.2	5.3	22.5	63.6
Rosethorn Rockfish		0.2							33.2	3.4	0.1
Rougheye Rockfish											
Sablefish				2.3						7.4	
Sandpaper Skate				-							
Sharpchin Rockfish		74.9	0.9		1.9	0.3			1862.0	369.6	17.5
Shortraker Rockfish											
Shortspine Thornyhead		6.9							33.4	0.7	
Silvergray Rockfish		332.1		291.3	50.5		2.5			21.2	3.2
Slender Sole	0.2	1.2		8.0	12.3			-	0.5	2.5	4.2
Southern Rock Sole			1.9			2.5	2.3	20.5			
Splitnose Rockfish		0.1							1659.9		
Spotted Ratfish	0.6	3.0	1.8	6.3	2.4	17.6	14.5	18.3	17.6	1.2	2.0
Stripetail Rockfish		0.2									
Threadfin Sculpin		0.2								2.5	0.4
Walleye Pollock	0.5	0.8	0.2	0.3	0.5			0.2			
Widow Rockfish		0.7		1.7	0.6				2.9	83.1	8.2
Yelloweye Rockfish		4.6	3.6				3.4			2.0	
Yellowmouth Rockfish									373.8		
Yellowtail Rockfish		23.8	0.6	1.8			0.6		524.4	213.1	540.0
Other	0.5	4.1	3.4	1.5	3.5	3.6	5.3	7.3	0.3	4.2	1.3
Total	**549.5**	**709.0**	**93.4**	**1964.3**	**555.2**	**59.3**	**125.3**	**77.4**	**7932.5**	**1033.7**	**881.4**

Common Name	116	117	118	119	120	121	122	123	124	125	126
Arrowtooth Flounder	4.3	154.9	236.7	564.9	242.8	180.8	21.5	177.1	472.2	52.4	46.9
Big Skate				7.1	6.0						
Bigfin Eelpout											0.6
Blackbelly Eelpout	-	0.3	7.9	0.2	0.2	0.2	0.8	0.2	0.4	0.7	
Bocaccio											
Canary Rockfish		5.1			92.2				2.2	7.5	1.7
Curlfin Sole											
Darkblotched Rockfish											6.0
Dover Sole	5.6	29.5	56.5	25.7	24.5	17.4	3.8	27.8	22.6	29.9	45.7
English Sole	79.0	8.6	38.4	3.4	1.8		26.3	2.1			
Eulachon	21.9	15.6	30.5	3.3	11.2	30.9	27.2	27.1	19.0		
Flathead Sole		2.6	50.9	26.8	6.1	13.4	0.6	9.8	13.1		
Green Sturgeon							-				
Greenstriped Rockfish					-			0.2	-	15.6	15.2
Kelp Greenling											
Lingcod	2.4	1.6	5.4	4.3	14.0	10.3	4.2		27.2		
Longnose Skate					16.2	9.0		7.4	9.2		
North Pacific Spiny Dogfish					7.0				6.4	11.3	
Pacific Cod	7.9	6.7	6.9	21.9	23.9	0.6	5.6	5.9	1.7		
Pacific Hake									2.5	7.5	13.3
Pacific Halibut	11.0	9.6	2.8	60.6	32.4	2.3	10.3		21.5		
Pacific Ocean Perch						-					1109.6
Pacific Sand Lance											
Pacific Sanddab	99.8	1.9	0.6				42.2				
Pacific Tomcod	1.9						2.3				
Petrale Sole	21.3	18.9	17.3	51.3	45.3	26.0	37.5	15.1	3.2		
Pygmy Rockfish											
Quillback Rockfish											
Redbanded Rockfish										2.1	61.2
Redstripe Rockfish										0.3	
Rex Sole	37.4	37.2	45.9	17.2	11.8	30.4	57.1	7.4	47.6	135.6	44.5
Rosethorn Rockfish											5.5
Rougheye Rockfish											0.2
Sablefish			2.8	5.8	2.0	2.2		2.3			19.3
Sandpaper Skate											
Sharpchin Rockfish		-									188.9
Shortraker Rockfish											
Shortspine Thornyhead											9.5
Silvergray Rockfish											3.1
Slender Sole	0.2	0.7	1.5	2.1	2.9	4.9	0.4	4.4	7.4	6.2	1.1
Southern Rock Sole	6.8	0.4					0.5				
Splitnose Rockfish									-		214.2
Spotted Ratfish	1.5	8.2	6.5	8.9	11.1	14.5	2.0	7.2	6.8	1.8	4.8
Stripetail Rockfish										1.1	
Threadfin Sculpin										0.2	-
Walleye Pollock	0.4		1.1				2.4	0.5	0.3		
Widow Rockfish				0.6							
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish		3.4	1.9	255.3	157.9		3.3	2.0	13.3	3.2	
Other	7.0	1.8	3.0	10.0	18.1	46.4	0.9	16.2	3.8	21.8	9.8
Total	**308.4**	**307.0**	**516.6**	**1069.2**	**727.4**	**389.2**	**249.0**	**312.6**	**680.2**	**297.1**	**1801.1**

Common Name	127	128	129	130	131	132	133	134	135	136	137
Arrowtooth Flounder	18.0	62.6	94.0	4.8	107.9	252.1	150.7	65.4	307.7	688.8	10.9
Big Skate				1.2							
Bigfin Eelpout	0.8	4.1									
Blackbelly Eelpout			15.4	-	0.2	0.5		-		-	
Bocaccio											
Canary Rockfish				1.3		4.3	3.1	7.2			
Curlfin Sole				3.6							
Darkblotched Rockfish											
Dover Sole	142.2	93.7	4.4	3.2	9.3	19.9	8.3		31.8	9.9	35.6
English Sole			117.6	49.3	3.8	9.1	5.4	39.9	45.1	3.4	
Eulachon			36.2	0.1	1.2	25.5	-		4.7	95.7	
Flathead Sole			48.7	1.7		0.4					
Green Sturgeon											
Greenstriped Rockfish						0.2	16.1	10.2	4.1		
Kelp Greenling											
Lingcod		9.2	19.4	11.9		16.9		10.4	3.5	13.0	
Longnose Skate	5.4	1.8				14.4	2.6		4.1		
North Pacific Spiny Dogfish		5.2	6.7		14.6	8.6	-	2.9		9.4	
Pacific Cod			34.7	3.0	4.2	6.6	9.2	19.8	207.8	3.9	
Pacific Hake	22.3	96.9	1.5			1.3					29.7
Pacific Halibut				6.5		9.9		2.7	13.4	3.6	
Pacific Ocean Perch	13.6	38.8								-	
Pacific Sand Lance											
Pacific Sanddab			15.3	11.3							
Pacific Tomcod			0.3	0.6							
Petrale Sole			9.7	13.0	2.2	4.8	2.6	1.6	18.9		
Pygmy Rockfish								0.2			
Quillback Rockfish											
Redbanded Rockfish	4.6	3.2									
Redstripe Rockfish											
Rex Sole	3.1	82.1	20.2	41.8	30.5	60.6	18.0	63.8	41.9	25.4	
Rosethorn Rockfish	0.3							0.4			
Rougheye Rockfish	45.0	37.7									1.8
Sablefish	51.7	25.7	1.1				-	2.4	0.6		80.0
Sandpaper Skate								0.1			
Sharpchin Rockfish											
Shortraker Rockfish											
Shortspine Thornyhead	61.3	34.1									51.4
Silvergray Rockfish											
Slender Sole		0.7	2.2	0.2	-	8.8	1.4	4.5	2.3	0.6	
Southern Rock Sole				31.1	-			0.2			
Splitnose Rockfish		14.5									
Spotted Ratfish			3.2	8.4	3.1	4.0	0.6	0.2		1.7	
Stripetail Rockfish											
Threadfin Sculpin					0.5	0.3		0.7	-	0.4	0.3
Walleye Pollock			6.5	-		0.2					
Widow Rockfish											
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish						1.5	1222.9	66.7	95.0		
Other	6.0	2.6	1.4	1.9	2.4	3.5	1.3	3.5	1.3	1.9	22.5
Total	**374.2**	**512.8**	**438.3**	**195.0**	**179.9**	**453.4**	**1442.3**	**302.6**	**782.0**	**857.7**	**232.1**

Common Name	138	139	140	141	142	143	144	145	146	147	148
Arrowtooth Flounder	17.2	5.4	1.6	1.4	77.2	480.7	384.8	68.8	106.8	4.1	6.3
Big Skate											
Bigfin Eelpout	1.6		0.7	0.9	6.9	2.6	2.8	3.2			
Blackbelly Eelpout		-							5.1	0.1	12.0
Bocaccio											
Canary Rockfish	3.0	1.8				3.9	7.1	14.2			
Curlfin Sole											
Darkblotched Rockfish					8.3	34.8	2.6				
Dover Sole	12.6	29.9	74.6	42.2	51.5	27.1	27.2	37.4	11.0	7.2	43.6
English Sole			0.6				0.4	4.4	8.3	18.3	17.6
Eulachon									18.5	-	20.0
Flathead Sole									2.1		51.4
Green Sturgeon											
Greenstriped Rockfish	14.9	7.0	1.7			11.0	6.2	44.9		0.5	
Kelp Greenling										2.8	
Lingcod										10.0	
Longnose Skate			6.2	3.1		1.7	2.2	8.9	2.4		
North Pacific Spiny Dogfish					10.4	11.8	1.5	3.8	48.0	22.3	5.9
Pacific Cod	6.4					31.5	83.4	15.3	5.7	26.8	14.2
Pacific Hake	9.2	155.3	183.8	63.4	88.8	7.2	1.5				
Pacific Halibut		4.8					3.9	4.0		13.5	8.1
Pacific Ocean Perch	2844.4	27.9	16.4	9.7	45.6	80.0	268.6	278.5	7.1		
Pacific Sand Lance											
Pacific Sanddab										50.9	0.4
Pacific Tomcod											
Petrale Sole						2.5	0.5	0.6	4.5	0.6	4.3
Pygmy Rockfish								0.4		0.2	
Quillback Rockfish										6.5	
Redbanded Rockfish	3.3	7.0			5.5	8.9	4.9	10.1			
Redstripe Rockfish	0.5					50.3	18.8	145.5	-	3.0	
Rex Sole	7.1	34.4	12.8	0.8	39.4	93.1	108.9	104.7	21.9	18.6	10.2
Rosethorn Rockfish	0.2							2.1	0.4		
Rougheye Rockfish			30.9	39.0	9.5	4.2	0.1				
Sablefish	24.2	40.0	8.0	7.4	82.1	91.7	17.9	66.0	35.0		0.4
Sandpaper Skate		-	4.3		0.6	0.2			0.1		
Sharpchin Rockfish	3.3	5.7			0.4		1.2	371.7	1.9		
Shortraker Rockfish											
Shortspine Thornyhead	33.6	14.7	35.8	16.2	49.4	8.1	8.7	2.7			
Silvergray Rockfish	12.6							5.3			
Slender Sole	1.0	3.2	-		0.8	3.8	3.1	1.3	3.9	0.8	5.6
Southern Rock Sole										10.9	0.2
Splitnose Rockfish	-	5.9	0.2		57.1	17.9	1.3	0.1			
Spotted Ratfish	17.2	0.7			2.4	2.0	0.9	0.9	0.4	15.2	41.5
Stripetail Rockfish											
Threadfin Sculpin	3.3	0.6				1.5	0.3	1.0	0.3	4.8	0.8
Walleye Pollock							1.1			0.1	35.5
Widow Rockfish						0.5	1.1	11.3			
Yelloweye Rockfish											
Yellowmouth Rockfish											
Yellowtail Rockfish	25.9					23.7	73.9	53.1	9.2		
Other	4.1	11.3	4.1	5.0	42.7	16.9	9.4	7.3	21.7	3.4	4.3
Total	**3045.8**	**355.7**	**381.7**	**189.0**	**578.6**	**1017.6**	**1044.4**	**1267.4**	**314.0**	**220.8**	**282.0**

Common Name	149	150	151	152	153
Arrowtooth Flounder	16.8	4.4	38.9	6.0	115.9
Big Skate					
Bigfin Eelpout					
Blackbelly Eelpout			0.2		6.8
Bocaccio					
Canary Rockfish					
Curlfin Sole				0.5	
Darkblotched Rockfish					0.5
Dover Sole	5.8		2.1	3.3	18.1
English Sole	8.8		10.2	47.9	
Eulachon	6.2	0.1	9.5		82.4
Flathead Sole	4.9		0.2		13.0
Green Sturgeon					
Greenstriped Rockfish	73.1	3.8			
Kelp Greenling	0.8			0.3	
Lingcod	21.1	86.5	3.5	9.2	
Longnose Skate	10.9		1.8		17.4
North Pacific Spiny Dogfish	6.4	8.6	31.4	567.1	35.3
Pacific Cod	74.4	59.0	7.6	23.8	
Pacific Hake			5.5		1.2
Pacific Halibut		30.4	5.9	22.0	
Pacific Ocean Perch					
Pacific Sand Lance					
Pacific Sanddab	1.0	1.0		4.0	
Pacific Tomcod					
Petrale Sole	54.9	12.1	14.0	12.9	1.2
Pygmy Rockfish	0.2				
Quillback Rockfish	2.4				
Redbanded Rockfish					
Redstripe Rockfish	15.7				
Rex Sole	7.0		16.0	9.1	53.9
Rosethorn Rockfish					
Rougheye Rockfish					1.5
Sablefish			13.4	1.1	
Sandpaper Skate					
Sharpchin Rockfish	0.2				
Shortraker Rockfish					
Shortspine Thornyhead					
Silvergray Rockfish					
Slender Sole	2.0		1.6	0.3	8.1
Southern Rock Sole	15.6	1.7		3.9	
Splitnose Rockfish					
Spotted Ratfish	135.1	221.4	9.2	7.4	9.8
Stripetail Rockfish					
Threadfin Sculpin	3.1	0.4		0.7	0.3
Walleye Pollock	2.1		4.5	0.3	2.5
Widow Rockfish				0.6	
Yelloweye Rockfish					
Yellowmouth Rockfish					
Yellowtail Rockfish			6.2	1.3	
Other	1.6	2.7	15.7	1.4	18.7
Total	**469.9**	**432.2**	**197.4**	**722.8**	**386.6**