Summary of the West Coast Vancouver Island Synoptic Bottom Trawl Survey, June 7-29, 2010

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by

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Table of Contents

List of Tables

List of Figures

ABSTRACT

Wyeth, M. R., Olsen, N., Nottingham, M. K., and Williams, D. C. 2016. Summary of the West Coast Vancouver Island synoptic bottom trawl survey, June 7-29, 2010. Can. Manuscr. Rep. Fish. Aquat. Sci. 3089: vii + 53 p.

A bottom trawl survey off the west coast of Vancouver Island was conducted on the Canadian Coastguard Ship W. E. Ricker between June 7 and June 29, 2010. 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 thirty six (84.0 %) of the 164 blocks assessed in 2010 were successfully fished. The mean catch per tow was 866 kg with between seven and 38 species per tow. The average number of species per tow was 22. The most abundant fish species encountered was North Pacific Spiny Dogfish (*Squalus suckleyi*) followed by Arrowtooth Flounder (*Reinhardtius stomias*), Pacific Ocean Perch (*Sebastes alutus*), Yellowtail Rockfish (*Sebastes flavidus*), 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 sixty different species of fish. Oceanographic data, including water temperature, depth, salinity, and dissolved oxygen were also recorded for most tows.

RÉSUMÉ

Wyeth, M.R., Olsen, N., Nottingham, M.K., et Williams, D.C. 2016. Relevé synoptique au chalut de fond de la côte ouest de l'île de Vancouver, 7 au 29 juin 2010. Rapp. manus. can. sci. halieut. aquat. 3089 : vii + 53 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 7 juin et le 29 juin 2010. 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 162 blocs évalués en 2010, 136 (84 %) ont fait l'objet d'une pêche. La moyenne de prises par trait était de 866 kg, avec entre 7 et 38 espèces par trait. Le nombre moyen d'espèces par trait était de 22. Les espèces de poissons capturées le plus fréquemment étaient l'aiguillat commun du Pacifique Nord (*Squalus suckleyi*), suivi de la plie à grande bouche (*Reinhardtius stomias*), du sébaste à longue mâchoire (*Sebastes alutus*), du sébaste à queue jaune (*Sebastes flavidus*), 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 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.

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). This region was recommended in part because it was not covered by other bottom trawl surveys and it represented a significant portion of the commercial bottom trawl fishery. 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).

The first WCVI synoptic bottom trawl survey was successfully completed in 2004 (Workman et al. 2008a) and has been repeated every second year since. This document provides a brief summary of the results and methods from the fifth WCVI synoptic bottom trawl survey which occurred between June 7 and June 29, 2010. It is not intended as a comprehensive review of the survey, nor does it provide interpretive analysis of the survey results. Summaries of the previous WCVI synoptic bottom trawl surveys are given in Workman et al. 2008a, Workman et al. 2008b and Olsen et al. 2009.

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

Prior to the first WCVI synoptic survey, commercial fishery catch data were used to model the expected groundfish catches during the survey. The relative allocation of tows amongst strata was based on providing the most precise catch rate indices for as many species as possible. The target number of tows for the survey was the estimated achievable number of tows given the number of fishing days available. We estimated that approximately 140 to 150 tows could be completed during the allocated time.

The expected proportion of blocks in each stratum that would not result in a useable tow (predicted failure rate) was estimated based on the results of previous WCVI synoptic surveys. The expected probability of returning to a block that was successfully fished in a previous survey (predicted revisit rate) was also estimated. The predicted failure and revisit rates were combined into a single probability for each depth stratum (Table 1). These probabilities were then used to calculate the anticipated number of blocks per stratum required to complete the target number of tows. For the 2010 WCVI survey, 206 blocks were randomly selected based on a target of 143 useable tows (Table 1 and Figure 2).

The start and end dates for trips on Canadian Coast Guard ships are set 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 we are unable 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. The secondary set is visited once the primary set of blocks is almost completed. The secondary set can be adjusted for the number of remaining days by randomly adding or removing blocks. In 2010, the 206 selected blocks were divided into 137 primary blocks and 69 secondary blocks.

VESSEL

The survey was conducted aboard the Canadian Coast Guard Ship W.E. Ricker, a 58 m research stern trawler (Figure 3).

FISHING GEAR

The research trawl was an Atlantic Western IIA box trawl net connected to 1,100 kg U.S.A. Jet doors (Figure 4). The net was thoroughly cleaned between tows to prevent cross-contamination of catches. The net was also inspected for damage after every tow. If the net was damaged, it was repaired and restored to its original dimensions prior to resuming fishing. Two nets were rigged at the start of the survey so that if one net was damaged beyond what could be immediately repaired, the second one could be used.

The net includes a main body (wing and belly sections), two lengthening pieces, and a codend with liner (Figure 5 and Figure 6). The main body of the net has an 11 mm long-link steel chain frame and is constructed from a mix of double 4.5 mm strand 5 inch web, single 3.5 mm strand 5 inch web, and single 3.5 mm strand 4 ½ inch web (Figure 7). The intermediate sections are constructed from single 4.5 mm strand 4½ inch web (Figure 8). All web in the main body and lengthening pieces is constructed from a compacted strand braided polyethylene (Euroline Premium). The codend is constructed from double 5 mm strand 4 inch regular braided polyethylene web with a ½ inch 210/20 knotless nylon liner (Figure 8).

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

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

SCHEDULE

The survey was split into four sections or "legs" of 4 to 11 days in duration with 8 to 10 science staff on each. Science crew changes were on June 14, 21 and 24 (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 throughout each day. During this review process, one or more blocks might be determined not fishable by the fishing master based on his experience and knowledge of the area. In such cases the blocks were marked as "rejected based on prior knowledge". After compiling a list of blocks to be visited, the most efficient route of travel between blocks would be planned.

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

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

The target tow length was 20 minutes long. The tow start was intended to be defined as the time at which the net mensuration data indicated stable bottom contact and the headline collapsed to 3-4 m above the bottom. However, the net mensuration system was not functioning during the 2010 survey, so the fishing master's experience was used to identify when the net reached the sea floor. After 19 minutes had elapsed, net haul back was initiated. The extra minute was intended to account for uptake of slack in the main warps. Although the target on-bottom time was 20 minutes, tows that were at least 14 minutes in length were accepted. This was a pragmatic decision that allowed for retention of many tows that would otherwise have been unusable due to hang-ups or early haul-backs.

Tows were conducted at a target speed of 2.8 to 3.0 nautical miles per hour. 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 of at least 14 minutes length in the target depth stratum 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 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 is insufficient time available to fish a block without spending another day in the area. These blocks would have a final status of "block not fished but remains in sampling frame".

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 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 sub yearling juvenile 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. Specifically, length, sex, and sample weight by sex data (length samples) were collected from as many species in each tow as was possible. 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. In addition to the length samples, individual weights, reproductive maturities and ageing structures (age samples) were

collected from selected species in each tow. The choice of the species to collect age samples from would depend 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. The specific structure that provides the most accurate and efficient estimate of age varies by species but all the structures have the common trait of a series of annular rings that can be counted. Sagittal otoliths (calcareous accretions of the inner ear) were collected from rockfish and flatfish species while fin rays were taken from Walleye Pollock (*Theragra chalcogramma*), Lingcod (*Ophiodon elongates*) and Pacific Cod (*Gadus macrocephalus*). Dorsal spines were collected from North Pacific Spiny Dogfish (*Squalus suckleyi*). All age samples collected on this survey were submitted to the Sclerochronology Lab located at the Pacific Biological Station in Nanaimo, BC for storage and future analysis. In addition to the biological sampling described above, specific data, specimens or tissue samples are routinely collected following requests from other institutions or researchers. In 2010, whole Spotted Ratfish (*Hydrolagus colliei*) were collected as well as tissue for DNA analysis from Longnose Skate (*Raja rhina*) and Big Skate (*Raja binoculata*).

NET-MOUNTED SENSORS AND DATA RECORDERS

The W.E. Ricker is equipped with a Simrad ITI trawl mensuration system. Sensors attached to the net use acoustic signals to communicate with each other and the vessel and provide real-time net geometry including headline height and depth, as well as doorspread and wingspread which are used to calculate swept area. Typically all the values reported by the system are recorded. However, as previously mentioned, the system was not functioning during the WCVI 2010 survey, therefore, no data were collected.

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 conductivity, temperature, pressure/depth recorder (CTD) with a SBE43 dissolved oxygen sensor was attached to the center of the headline. Both recorders were activated prior to the first tow of the day and turned off after the last tow of the day. Pressure data from both Seabird recorders can then be converted to confirm depth measurements after the survey.

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

DATA RECORDING

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

All the data from the survey are archived in the GFBIO database maintained at the Pacific Biological Station in Nanaimo, BC.

RESULTS

FISHING

The 2010 WCVI synoptic bottom trawl survey was divided into four legs of 4-11 days each. From a total of 26 allotted survey days, three days were lost to unplanned maintenance, two days were required for travel and gear loading/ unloading at the start and end of the survey, one day was required for planned vessel maintenance and a science crew change, two partial days were required for science crew changes, one day was lost due to unfishable weather conditions, and one day was required for a vessel crew change (Table 3). The initial plan was to assess 206 blocks. Unfortunately, the departure date was delayed due to a mechanical break-down. Therefore, the total number of blocks to assess was reduced prior to departure. Blocks were randomly removed from both the primary set and secondary set, while maintaining the same initial allocation amongst strata. The primary set of blocks was adjusted to 114 blocks and the secondary set was adjusted to 56 blocks for a total of 170 blocks.

From the adjusted target of 170 blocks, a total of 164 were actually assessed during the survey. Five blocks were left un-inspected and un-fished due to time constraints at the end of the survey. There were 136 successfully fished blocks, one block was rejected based on the fishing master's prior knowledge, 21 were rejected based on on-ground inspections, and six were rejected after one or more failed fishing attempts (Table 4 and Figure 10). One additional block was successfully fished during the survey but has since been excluded from the data due to a subsequent redefinition of survey boundaries.

A total of 144 tows, of which 136 were useable, were completed during the 18 days that fishing occurred. Table 4 shows tow results by stratum for this survey. Seven tows were not useable due to hang-ups, tear-ups or insufficient bottom time and one was aborted due to proximity to the edge of the block for a total of eight unusable tows (see

Figure 11 for examples of the variation of tow locations within selected blocks). The scope (ratio of warp length to bottom depth) used for tows in 2010 is shown in Table 5 and Figure 12. 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 122,096 kg of fish and invertebrates was caught during the 2010 WCVI survey. The total catch weight for useable tows was typically less than 1,000 kg per tow and averaged 866 kg per tow (Figure 13). The majority of the catch (121,859 kg, 99.8%) consisted of 86 different species of fish, including 25 rockfish and 12 flatfish species. The remainder (237 kg) consisted of 90 invertebrate groups. The average number of species identified in useable tows was 22 with the minimum count being seven and the maximum count being 38 per tow (Figure 14). The frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species are shown in Table 6. Of the fish species caught, North Pacific Spiny Dogfish (*Squalus suckleyi*) was the most dominant by weight, followed by Arrowtooth Flounder (*Reinhardtius stomias,)* Pacific Ocean Perch (*Sebastes alutus*), Yellowtail Rockfish (*Sebastes flavidus)*, 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 32,411 individuals of 60 species of fish during the 2010 WCVI synoptic bottom trawl survey. The number of samples and recorded biological attributes per species is shown in Table 7. A summary of the biological data collected for each species is shown in Table 8.

NET-MOUNTED SENSORS AND DATA RECORDERS

As previously mentioned, the Simrad ITI Trawl System was not functioning properly in 2010 so no data were collected.

Seabird SBE39 data (water temperature and pressure) were collected from 135 tows while Seabird SBE19plus and SBE43 data (water temperature, pressure, salinity and dissolved oxygen) were collected from 126 tows (Table 9 and Figure 15).

BCS data were collected from 138 tows (Table 9). An example of data collected by the BCS is shown in Figure 16.

Global positioning system (GPS) data and bottom sounder data are available for all 144 tows.

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REFERENCES

Olsen, N. 2010. A user's guide to GFBioField: The Pacific Region's at-sea data acquisition system for groundfish trawl surveys. Can. Tech. Rep. Fish. Aquat. Sci. 2887: x + 77 p.

Olsen, N., Rutherford, K.L., Stanley, R.D., and Wyeth, M.R. 2009. West coast Vancouver Island groundfish bottom trawl survey, May 26th to June 22nd, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2902: vi + 50 p.

Olsen, N., Workman, G.D., and Stanley, R.D. 2007. Queen Charlotte Sound groundfish bottom trawl survey July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: 58 p.

Sinclair, A., Schnute, J., Haigh, R., Starr, P., Stanley, R.D., Fargo, J., and Workman, G. 2003. Feasibility of multispecies groundfish bottom trawl surveys on the BC coast. Can. Stock Assess. Sec. Res. Doc. 2003/049.

Workman G.D., Olsen, N., Fargo, J., and Stanley, R.D. 2008a. West coast Vancouver Island groundfish bottom trawl survey, R/V WE RICKER, May 25th to June 10th, 2004. Can. Manuscr. Rep. Fish. Aquat. Sci.2826: 70 p.

Workman G.D., Olsen, N., Fargo, J., and Stanley, R.D. 2008b. West coast Vancouver Island groundfish bottom trawl survey, R/V WE RICKER, May 23rd to June 19th, 2006. Can. Manuscr. Rep. Fish. Aquat. Sci.2841: viii + 83 p.

Table 1. The 2010 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 Primary Set	Revised Secondary Set
50-125	0.37	53	0.39	86	57	29	49	24
125-200	0.31	45	0.25	60	40	20	34	17
200-330	0.18	26	0.21	33	22	11	19	9
330-500	0.13	19	0.31	27	18	9	12	6
Total	**1.00**	**143**		**206**	**137**	**69**	**114**	**56**

Table 2. Atlantic Western IIa box trawl net specifications for the 2010 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 2010 WCVI synoptic bottom trawl survey.

	Fishing				Tows			
Date	**Start**	**End**	**Hours**	**Blocks Assessed**	**Useable**	**Not Useable**	**Total**	**Notes**
06/04/2010	-	-	-	-	-	-	-	unplanned maintenance
06/05/2010	-	-	-	-	-	-	-	unplanned maintenance
06/06/2010	-	-	-	-	-	-	-	unplanned maintenance
06/07/2010	-	-	-	-	-	-	-	loading and travel
06/08/2010	10:37	17:54	7	7	7	0	7	
06/09/2010	7:16	16:46	9	9	7	1	8	
06/10/2010	9:30	19:45	10	13	6	1	7	
06/11/2010	7:05	18:00	11	6	6	2	8	
06/12/2010	7:27	14:01	7	6	6	0	6	
06/13/2010	-	-	-	-	-	-	-	weather day
06/14/2010	8:25	13:45	5	5	5	0	5	science crew change
06/15/2010	7:33	19:04	12	13	11	0	11	
06/16/2010	8:09	16:11	8	8	5	1	6	
06/17/2010	7:09	18:58	11	12	11	0	11	
06/18/2010	7:15	18:38	11	12	10	1	11	
06/19/2010	7:06	17:57	10	8	8	1	9	
06/20/2010	7:19	17:56	10	16	9	0	9	
06/21/2010	-	-	-	-	-	-	-	planned maintenance and science crew change
06/22/2010	-	-	-	-	-	-	-	vessel crew change
06/23/2010	7:39	18:48	11	7	5	1	6	
06/24/2010	7:14	17:25	10	7	7	0	7	science crew change
06/25/2010	7:09	18:50	11	9	10	0	10	
06/26/2010	7:08	19:24	12	10	9	0	9	
06/27/2010	7:17	16:18	9	8	8	0	8	
06/28/2010	7:15	15:43	8	6	6	0	6	
06/29/2010	-	-	-	-	-	-	-	travel and unload
Total				**162**	**136**	**8**	**144**	
Average Per Day				**9.0**	**7.6**	**0.4**	**8.0**	

Table 4. Block and tow results by stratum for the 2010 WCVI synoptic bottom trawl survey. This table does not include the one block that was successfully fished during the survey but has since been excluded from the data due to a subsequent redefinition of survey boundaries.

Depth Stratum (m)	Blocks						Tows	
	Successful	Rejected Prior	Rejected Inspected	Failed	Not Fished	Total	Useable	Not Useable
50-125	58	0	11	2	1	72	58	2
125-200	46	1	2	2	0	51	46	2
200-330	22	0	4	0	2	28	22	0
330-500	10	0	4	2	2	18	10	5
Total	**136**	**1**	**21**	**6**	**5**	**169**	**136**	**8**

Table 5. Mean warp length and scope by 50 meter depth interval for the 2010 WCVI synoptic bottom trawl survey.

Depth (m)	Mean Warp (m)	Mean Scope
50-100	214	2.66
100-150	313	2.53
150-200	439	2.62
200-250	568	2.62
250-300	750	2.90
300-350	875	2.74
350-400	892	2.43
400-450	1150	2.67
450-500	1200	2.51

Table 6. Frequency of occurrence, maximum catch weight, mean catch weight per tow, and total survey catch weight of each species captured during the 2010 WCVI synoptic bottom trawl survey. Trace amounts (<0.02 kg) are entered as -.

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Rockfishes	**Family Scorpaenidae**				
Yellowtail Rockfish	*Sebastes flavidus*	81	1658.92	101.56	8226.10
Greenstriped Rockfish	*Sebastes elongatus*	78	166.89	17.42	1341.21
Pacific Ocean Perch	*Sebastes alutus*	63	4438.77	250.58	15535.80
Canary Rockfish	*Sebastes pinniger*	59	1192.38	77.47	4570.96
Sharpchin Rockfish	*Sebastes zacentrus*	46	679.49	131.12	5769.06
Silvergray Rockfish	*Sebastes brevispinis*	45	224.06	30.35	1365.53
Rosethorn Rockfish	*Sebastes helvomaculatus*	43	81.13	6.47	278.05
Redbanded Rockfish	*Sebastes babcocki*	41	58.54	9.20	377.21
Redstripe Rockfish	*Sebastes proriger*	41	927.84	100.66	4126.86
Shortspine Thornyhead	*Sebastolobus alascanus*	32	91.39	20.87	646.91
Yelloweye Rockfish	*Sebastes ruberrimus*	27	37.06	8.72	235.32
Splitnose Rockfish	*Sebastes diploproa*	27	1119.09	158.99	4292.79
Widow Rockfish	*Sebastes entomelas*	24	1918.89	87.35	2096.47
Darkblotched Rockfish	*Sebastes crameri*	23	54.44	9.32	214.38
Pygmy Rockfish	*Sebastes wilsoni*	21	2.62	0.73	15.40
Bocaccio	*Sebastes paucispinis*	19	29.50	6.38	121.18
Rougheye Rockfish	*Sebastes aleutianus*	15	283.19	65.13	976.89
Yellowmouth Rockfish	*Sebastes reedi*	12	485.28	101.22	1214.66
Quillback Rockfish	*Sebastes maliger*	10	19.40	4.47	44.67
Aurora Rockfish	*Sebastes aurora*	5	21.16	5.24	26.19
Shortraker Rockfish	*Sebastes borealis*	4	14.06	8.02	32.07
Stripetail Rockfish	*Sebastes saxicola*	4	69.07	19.37	77.49
Harlequin Rockfish	*Sebastes variegatus*	2	0.81	0.46	0.91
Greenspotted Rockfish	*Sebastes chlorostictus*	2	1.12	0.81	1.62
Shortbelly Rockfish	*Sebastes jordani*	2	0.52	0.32	0.64
Unidentified Rockfishes (Juveniles)	*Sebastes* (Genus)	2	0.05	0.05	0.05
Flatfishes	**Order Pleuronectiformes**				
Rex Sole	*Glyptocephalus zachirus*	132	162.36	24.41	3197.23
Dover Sole	*Microstomus pacificus*	131	177.36	23.14	3007.59
Arrowtooth Flounder	*Reinhardtius stomias*	129	1612.93	165.34	21163.80
Slender Sole	*Lyopsetta exilis*	111	17.17	1.71	188.17
Petrale Sole	*Eopsetta jordani*	97	63.44	8.31	805.78
English Sole	*Parophrys vetulus*	95	122.39	20.19	1897.52
Pacific Halibut	*Hippoglossus stenolepis*	58	91.22	12.37	717.61
Flathead Sole	*Hippoglossoides elassodon*	39	73.64	9.32	363.60
Pacific Sanddab	*Citharichthys sordidus*	38	117.34	23.19	857.93
Southern Rock Sole	*Lepidopsetta bilineata*	28	140.34	9.39	262.90
Curlfin Sole	*Pleuronichthys decurrens*	10	4.38	1.33	13.30
Starry Flounder	*Platichthys stellatus*	1	6.60	6.60	6.60
Cod-Like Fishes	**Order Gadiformes**				
Pacific Cod	*Gadus macrocephalus*	103	179.00	20.41	2102.62
Pacific Hake	*Merluccius productus*	46	114.04	13.58	624.70
Walleye Pollock	*Theragra chalcogramma*	23	1060.30	81.91	1883.83
Giant Grenadier	*Albatrossia pectoralis*	1	2.30	2.30	2.30
Cartilaginous Fish	**Class Chondrichthyes**				
North Pacific Spiny Dogfish	*Squalus suckleyi*	120	3037.55	213.43	25611.70
Spotted Ratfish	*Hydrolagus colliei*	120	428.16	11.86	1423.35
Longnose Skate	*Raja rhina*	75	47.21	9.08	681.17
Big Skate	*Raja binoculata*	10	38.62	9.04	90.43

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Sandpaper Skate	*Bathyraja interrupta*	7	4.52	1.68	10.10
Brown Cat Shark	*Apristurus brunneus*	2	3.90	2.35	4.70
Unidentified Skates	Rajidae (Family)	1	4.88	4.88	4.88
Greenlings	**Family Hexagrammidae**				
Lingcod	*Ophiodon elongatus*	92	106.74	15.34	1410.83
Kelp Greenling	*Hexagrammos decagrammus*	10	2.40	0.81	8.12
Sculpins	**Family Cottidae**				
Threadfin Sculpin	*Icelinus filamentosus*	58	11.20	1.27	69.75
Darkfin Sculpin	*Malacocottus zonurus*	9	0.34	0.19	0.75
Roughspine Sculpin	*Triglops macellus*	9	0.02	0.01	0.04
Slim Sculpin	*Radulinus asprellus*	8	-	-	-
Brown Irish Lord	*Hemilepidotus spinosus*	1	0.26	0.26	0.26
Thorny Sculpin	*Icelus spiniger*	1	-	-	-
Sculpins	Cottidae (Family)	1	-	-	-
Eelpouts	**Family Zoarcidae**				
Blackbelly Eelpout	*Lycodes pacificus*	46	3.66	0.54	20.91
Bigfin Eelpout	*Lycodes cortezianus*	16	3.84	1.29	20.64
Black Eelpout	*Lycodes diapterus*	9	1.22	0.41	3.24
Pallid Eelpout	*Lycodapus mandibularis*	1	0.04	0.04	0.04
Poachers	**Family Agonidae**				
Smootheye Poacher	*Xeneretmus leiops*	18	0.48	0.14	1.58
Bigeye Poacher	*Bathyagonus pentacanthus*	1	-	-	-
Blackfin Poacher	*Bathyagonus nigripinnis*	1	-	-	-
Unidentified Poachers	Agonidae (Family)	1	0.12	0.12	0.12
Lanternfishes	**Family Myctophidae**				
California Headlightfish	*Diaphus theta*	8	-	-	-
Northern Lampfish	*Stenobrachius leucopsarus*	5	-	-	-
Pinpoint Lampfish	*Nannobrachium regale*	3	-	-	-
Blue Lanternfish	*Tarletonbeania crenularis*	2	-	-	-
Lanternfish	*Tarletonbeania* (Genus)	1	-	-	-
Lanternfishes	Myctophidae (Family)	1	-	-	-
Other Fish					
Sablefish	*Anoplopoma fimbria*	105	675.66	35.32	3708.13
Eulachon	*Thaleichthys pacificus*	40	8.98	1.39	48.48
American Shad	*Alosa sapidissima*	17	8.10	0.76	12.95
Pacific Herring	*Clupea pallasii*	17	1.06	0.29	4.70
Northern Ronquil	*Ronquilus jordani*	16	0.26	0.08	0.90
Whitebarred Prickleback	*Poroclinus rothrocki*	5	0.02	0.02	0.02
Chinook Salmon	*Oncorhynchus tshawytscha*	5	7.12	4.45	22.25
Black Hagfish	*Eptatretus deani*	4	0.34	0.28	0.84
Shining Tubeshoulder	*Sagamichthys abei*	4	0.12	0.09	0.28
Pacific Sand Lance	*Ammodytes hexapterus*	4	1.38	0.68	2.72
Pacific Lamprey	*Lampetra tridentata*	3	0.02	0.02	0.02
Pacific Sardine	*Sardinops sagax*	3	0.28	0.19	0.58
Whitebait Smelt	*Allosmerus elongatus*	2	0.89	0.50	0.99
Wolf Eel	*Anarrhichthys ocellatus*	2	4.67	4.64	9.27
Blacktail Snailfish	*Careproctus melanurus*	2	0.34	0.33	0.65
Pacific Hagfish	*Eptatretus stoutii*	1	0.15	0.15	0.15
Quillfish	Ptilichthyidae (Family)	1	-	-	-
Shiner Perch	*Cymatogaster aggregata*	1	-	-	-
Pacific Viperfish	*Chauliodus macouni*	1	-	-	-
Crabs and Shrimp	**Class Malacostraca**				
Prawn	*Pandalus platyceros*	38	3.96	0.97	34.77
Pink Shrimp (Smooth)	*Pandalus jordani*	34	10.64	1.38	31.78

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Sidestripe Shrimp	*Pandalopsis dispar*	14	0.34	0.16	1.92
Crangons	*Crangon* (Genus)	6	-	-	-
Northern Crangon	*Crangon alaskensis*	4	-	-	-
Spike Shrimp (Horned Shrimp)	*Paracrangon echinata*	4	-	-	-
Redclaw Crab	*Chorilia longipes*	3	-	-	-
Tanner Crabs	*Chionoecetes* (Genus)	2	3.93	2.79	5.57
Glass Shrimp	*Pasiphaea pacifica*	2	-	-	-
Stevens Hermit	*Pagurus stevensae*	2	-	-	-
Isopods	Isopoda (Order)	2	-	-	-
Shrimp	Dendrobranchiata (Sub Order)	2	-	-	-
Bristly Crab	*Acantholithodes hispidus*	1	-	-	-
-	*Phyllolithodes* (Genus)	1	0.24	0.24	0.24
Squat Lobster	*Munida quadrispina*	1	-	-	-
Common Argid	*Argis alaskensis*	1	-	-	-
Bluespot Shrimp	*Pandalus stenolepis*	1	-	-	-
Grooved Tanner Crab	*Chionoecetes tanneri*	1	1.30	1.30	1.30
Sea Stars	**Class Asteroidea**				
Fish-eating Star	*Stylasterias forreri*	16	1.10	0.21	2.51
Spiny Red Sea Star	*Hippasteria spinosa*	11	0.86	0.35	3.16
Sand Star	*Luidia foliolata*	8	0.46	0.23	1.81
Rose Star	*Crossaster papposus*	5	-	-	-
Vermillion Star	*Mediaster aequalis*	5	0.18	0.08	0.24
Cushion Star	*Pteraster tesselatus*	4	0.30	0.24	0.48
Mud Star	*Ctenodiscus crispatus*	4	-	-	-
-	*Solaster* (Genus)	3	0.25	0.25	0.25
Sunflower Star	*Pycnopodia helianthoides*	3	3.54	1.56	4.69
Starfish	Asteroidea (Class)	3	0.06	0.06	0.06
-	*Cheiraste*r (Genus)	2	-	-	-
-	*Cheiraster dawsoni*	2	-	-	-
Cookie Star	*Ceramaster patagonicus*	2	0.24	0.16	0.31
-	Echinasteridae (Family)	1	-	-	-
-	*Poraniopsis inflatus inflatus* (Sub Species)	1	-	-	-
Blood Star	*Henricia leviuscula annectens* (Sub Species)	1	0.16	0.16	0.16
Smooth Sun Star	*Solaster endeca*	1	0.36	0.36	0.36
-	*Solaster paxillatus*	1	0.50	0.50	0.50
-	*Leptychaster* (Genus)	1	-	-	-
-	*Pteraster* (Genus)	1	0.12	0.12	0.12
-	*Rathbunaster californicus*	1	0.71	0.71	0.71
Brittle Stars	**Class Ophiuroidea**				
Basket Star	*Gorgonocephalus eucnemis*	17	0.60	0.16	1.57
-	*Ophiura sarsi*	5	0.12	0.12	0.12
-	Ophiuroidea (Class)	2	-	-	-
Basket Stars	Gorgonocephalidae (Family)	1	0.20	0.20	0.20
-	*Ophioscolex* (Genus)	1	-	-	-
Sea Cucumbers	**Class Holothuroidea**				
Whitespotted Sea Cucumber	*Parastichopus leukothele*	21	3.30	0.62	9.92
Giant Red Sea Cucumber	*Parastichopus californicus*	3	0.48	0.32	0.64
Soft Sea Cucumber	*Pseudostichopus mollis*	2	0.46	0.46	0.46
Scaly Sea Cucumber	*Psolus squamatus*	1	-	-	-
Octopuses and Squid	**Class Cephalopoda**				
Pacific Bobtail Squid	*Rossia pacifica*	13	0.07	0.06	0.12
Schoolmaster Gonate Squid	*Berryteuthis magister*	12	3.42	1.13	13.54
Opalescent Inshore Squid	*Doryteuthis opalescens*	9	0.25	0.14	0.97
Octopus	*Octopus* (Genus)	3	0.82	0.78	1.55

Common Name	Scientific Name	Number of Tows	Catch Weight (kg)		
			Max	Mean	Total
Giant Pacific Octopus	*Enteroctopus dofleini*	1	19.97	19.97	19.97
-	Loliginidae (Family)	1	0.44	0.44	0.44
Sea Urchins	**Super Order Echinacea**				
Fragile Urchin	*Allocentrotus fragilis*	49	6.16	0.54	19.88
Pallid Urchin	*Strongylocentrotus pallidus*	2	0.10	0.10	0.10
Jellyfish	**Phylum Cnidaria**				
Jellyfish	Scyphozoa (Class)	15	1.04	0.41	5.38
-	*Periphylla periphylla*	3	-	-	-
Anenomes and Corals	**Class Anthozoa**				
Sea Whip	*Balticina septentrionalis*	21	0.80	0.22	2.20
Anemone	Actiniaria (Order)	14	5.79	1.05	10.45
-	*Metridium* (Genus)	9	16.10	2.99	26.94
Sea Pen	*Ptilosarcus gurneyi*	2	-	-	-
Sea Pens	Pennatulacea (Order)	2	0.06	0.06	0.06
-	*Primnoa* (Genus)	1	0.66	0.66	0.66
Snails and Slugs	**Class Gastropoda**				
Oregontriton	*Fusitriton oregonensis*	8	0.28	0.14	0.97
Seaslugs	Nudibranchia (Order)	2	-	-	-
White Night Doris	*Doris odhneri*	1	0.01	0.01	0.01
California Armina	*Armina californica*	1	-	-	-
-	Pleurobranchidae (Family)	1	-	-	-
Topsnails	Calliostomatidae (Family)	1	-	-	-
Topshells	Trochidae (Family)	1	-	-	-
Fragile Barleysnail	*Barleeia subtenuis*	1	-	-	-
-	*Buccinum* (Genus)	1	-	-	-
-	*Neptunea* (Genus)	1	-	-	-
Other Invertebrate Species					
Sponges	Porifera (Phylum)	15	9.08	1.80	21.63
Heart Urchins	Atelostomata (Super Order)	7	2.22	1.19	2.38
Sea Mouse	*Aphrodita* (Genus)	7	0.26	0.15	0.58
Bath Sponges	Demospongiae (Class)	4	2.04	1.10	3.29
Salps	Salpida (Order)	3	0.05	0.04	0.07
Salp	*Cyclosalpa affinis*	3	0.16	0.11	0.22
Glass Sponges	Hexactinellida (Class)	1	-	-	-
Lampshells	Brachiopoda (Phylum)	1	-	-	-
-	*Florometra asperrima*	1	-	-	-
-	Nuculoida (Order)	1	-	-	-
Peanutworms	Sipuncula (Phylum)	1	-	-	-
-	Echiura (Phylum)	1	-	-	-
Fish Eggs		1	-	-	-
Chitons	Polyplacophora (Class)	1	-	-	-
Polychaete Worms	Polychaeta (Class)	1	-	-	-
-	Aphroditidae (Family)	1	0.26	0.26	0.26
Unidentified invertebrates		3	1.32	0.49	1.48

Table 7. Species sampled during the 2010 WCVI synoptic bottom trawl survey. The number of samples and number of recorded biological attributes are shown for each species.

Species Name		Number of	Number of Recorded Biological Attributes				
Common	Scientific	Samples	Length	Weight	Sex	Maturity	Age
American Shad	*Alosa sapidissima*	11	38	0	8	0	0
Arrowtooth Flounder	*Reinhardtius stomias*	87	2402	1488	2402	1239	1240
Aurora Rockfish	*Sebastes aurora*	4	38	32	38	32	32
Big Skate	*Raja binoculata*	10	11	5	11	0	0
Blackbelly Eelpout	*Lycodes pacificus*	13	484	0	0	0	0
Bocaccio	*Sebastes paucispinis*	19	47	44	47	44	44
Brown Cat Shark	*Apristurus brunneus*	2	12	12	12	0	0
Canary Rockfish	*Sebastes pinniger*	58	539	384	539	358	358
Chinook Salmon	*Oncorhynchus tshawytscha*	5	6	0	6	0	0
Curlfin Sole	*Pleuronichthys decurrens*	10	33	0	33	0	0
Darkblotched Rockfish	*Sebastes crameri*	9	171	52	171	0	0
Dover Sole	*Microstomus pacificus*	78	2233	460	2233	460	460
English Sole	*Parophrys vetulus*	59	1488	830	1488	830	830
Eulachon	*Thaleichthys pacificus*	18	656	0	1	0	0
Flathead Sole	*Hippoglossoides elassodon*	17	425	195	423	38	39
Giant Grenadier	*Albatrossia pectoralis*	1	2	0	2	0	0
Greenspotted Rockfish	*Sebastes chlorostictus*	2	2	0	2	0	0
Greenstriped Rockfish	*Sebastes elongatus*	54	1400	535	1400	23	0
Harlequin Rockfish	*Sebastes variegatus*	2	4	0	4	0	0
Kelp Greenling	*Hexagrammos decagrammus*	10	20	1	19	0	0
Lingcod	*Ophiodon elongatus*	91	756	620	756	502	502
Longnose Skate	*Raja rhina*	74	150	49	149	0	0
North Pacific Spiny Dogfish	*Squalus suckleyi*	72	2006	1129	2006	758	758
Pacific Cod	*Gadus macrocephalus*	101	1329	1101	1330	770	408
Pacific Hake	*Merluccius productus*	13	317	74	318	0	0
Pacific Halibut	*Hippoglossus stenolepis*	58	111	14	111	0	0
Pacific Herring	*Clupea pallasii*	2	26	0	0	0	0
Pacific Ocean Perch	*Sebastes alutus*	51	1502	905	1503	904	905
Pacific Sand Lance	*Ammodytes hexapterus*	2	65	0	0	0	0
Pacific Sanddab	*Citharichthys sordidus*	27	894	558	894	31	31
Petrale Sole	*Eopsetta jordani*	96	973	804	973	802	802
Pygmy Rockfish	*Sebastes wilsoni*	21	249	54	249	54	54
Quillback Rockfish	*Sebastes maliger*	10	33	18	33	14	14
Redbanded Rockfish	*Sebastes babcocki*	23	299	218	299	217	218
Redstripe Rockfish	*Sebastes proriger*	31	771	420	730	418	420
Rex Sole	*Glyptocephalus zachirus*	102	3071	1124	3072	992	993
Rosethorn Rockfish	*Sebastes helvomaculatus*	31	673	45	673	45	45
Rougheye Rockfish	*Sebastes aleutianus*	13	272	262	272	262	262
Sablefish	*Anoplopoma fimbria*	104	1232	585	1232	585	585
Sandpaper Skate	*Bathyraja interrupta*	5	8	6	8	0	0
Sharpchin Rockfish	*Sebastes zacentrus*	37	1163	605	1160	134	134
Shortbelly Rockfish	*Sebastes jordani*	2	4	0	4	0	0
Shortraker Rockfish	*Sebastes borealis*	4	8	8	8	8	8
Shortspine Thornyhead	*Sebastolobus alascanus*	26	739	265	736	28	28
Silvergray Rockfish	*Sebastes brevispinis*	25	506	68	506	68	68
Skates	*Rajidae*	1	1	0	1	0	0
Slender Sole	*Lyopsetta exilis*	50	1239	214	1239	0	0
Southern Rock Sole	*Lepidopsetta bilineata*	28	304	239	304	239	236
Splitnose Rockfish	*Sebastes diploproa*	19	605	261	606	154	154
Spotted Ratfish	*Hydrolagus colliei*	34	917	289	917	0	0

Species Name		Number of	Number of Recorded Biological Attributes				
Common	**Scientific**	**Samples**	**Length**	**Weight**	**Sex**	**Maturity**	**Age**
Starry Flounder	*Platichthys stellatus*	1	2	0	2	0	0
Stripetail Rockfish	*Sebastes saxicola*	4	69	58	69	58	58
Threadfin Sculpin	*Icelinus filamentosus*	5	119	0	0	0	0
Walleye Pollock	*Theragra chalcogramma*	21	246	166	244	27	27
Whitebait Smelt	*Allosmerus elongatus*	1	48	0	0	0	0
Widow Rockfish	*Sebastes entomelas*	23	134	29	134	29	29
Wolf Eel	*Anarrhichthys ocellatus*	2	2	0	0	0	0
Yelloweye Rockfish	*Sebastes ruberrimus*	26	77	77	78	77	78
Yellowmouth Rockfish	*Sebastes reedi*	8	229	108	229	108	108
Yellowtail Rockfish	*Sebastes flavidus*	56	1251	704	1251	704	702
Total		**1769**	**32411**	**15115**	**30935**	**11012**	**10630**

Table 8. Summary of biological data collected during the 2010 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 -.

Species Name		Number of		Length	Length (cm)			Weight (kg)			Female
Common	Scientific	Samples	Specimens	Type	Min.	Max.	Mean	Min.	Max.	Mean	Proportion
American Shad	*Alosa sapidissima*	11	38	Fork	17	42	28	-	-	-	0.6
Arrowtooth Flounder	*Reinhardtius stomias*	87	2402	Fork	12	75	46	<0.1	3.9	1.1	0.7
Aurora Rockfish	*Sebastes aurora*	4	38	Fork	12	41	32	0.3	1.2	0.7	0.6
Big Skate	*Raja binoculata*	10	11	Total	47	175	89	1.9	16.4	5.5	0.8
Blackbelly Eelpout	*Lycodes pacificus*	13	484	Total	7	28	15	-	-	-	-
Bocaccio	*Sebastes paucispinis*	19	47	Fork	29	88	55	0.2	7.9	2.6	0.4
Brown Cat Shark	*Apristurus brunneus*	2	12	Total	42	56	48	0.2	0.6	0.4	<0.1
Canary Rockfish	*Sebastes pinniger*	58	539	Fork	17	62	46	0.1	3.6	1.7	0.5
Chinook Salmon	*Oncorhynchus tshawytscha*	5	6	Fork	56	74	65	-	-	-	0.7
Curlfin Sole	*Pleuronichthys decurrens*	10	33	Total	22	38	28	-	-	-	0.3
Darkblotched Rockfish	*Sebastes crameri*	9	171	Fork	23	51	35	0.2	2.3	0.9	0.5
Dover Sole	*Microstomus pacificus*	78	2233	Total	17	64	35	0.1	1.8	0.5	0.5
English Sole	*Parophrys vetulus*	59	1488	Total	17	45	33	<0.1	0.8	0.3	0.8
Eulachon	*Thaleichthys pacificus*	18	656	Standard	8	20	16	-	-	-	<0.1
Flathead Sole	*Hippoglossoides elassodon*	17	425	Total	5	41	30	<0.1	0.6	0.3	0.6
Giant Grenadier	*Albatrossia pectoralis*	1	2	Total	65	70	68	-	-	-	1.0
Greenspotted Rockfish	*Sebastes chlorostictus*	2	2	Fork	31	40	36	-	-	-	0.5
Greenstriped Rockfish	*Sebastes elongatus*	54	1400	Fork	7	38	27	<0.1	1.0	0.3	0.5
Harlequin Rockfish	*Sebastes variegatus*	2	4	Fork	24	31	28	-	-	-	0.8
Kelp Greenling	*Hexagrammos decagrammus*	10	20	Fork	21	40	30	0.1	0.1	0.1	0.6
Lingcod	*Ophiodon elongatus*	91	756	Fork	31	110	52	0.2	12.0	1.4	0.6
Longnose Skate	*Raja rhina*	74	150	Total	26	130	86	0.6	14.2	4.5	0.5
North Pacific Spiny Dogfish	*Squalus suckleyi*	72	2006	Total	39	123	70	0.3	7.8	1.4	0.5
Pacific Cod	*Gadus macrocephalus*	101	1330	Fork	23	76	46	0.1	4.5	1.2	0.5
Pacific Hake	*Merluccius productus*	13	318	Fork	27	70	50	0.2	2.2	0.7	0.5
Pacific Halibut	*Hippoglossus stenolepis*	57	111	Fork	60	176	79	2.6	78.0	10.0	0.4
Pacific Herring	*Clupea pallasii*	2	26	Total	14	21	17	-	-	-	-
Pacific Ocean Perch	*Sebastes alutus*	51	1503	Fork	9	51	32	<0.1	1.8	0.9	0.5
Pacific Sand Lance	*Ammodytes hexapterus*	2	65	Total	14	21	17	-	-	-	-
Pacific Sanddab	*Citharichthys sordidus*	27	894	Total	9	33	25	0.1	0.4	0.2	0.5
Petrale Sole	*Eopsetta jordani*	96	973	Total	23	57	35	0.1	2.3	0.5	0.5

Species Name		Number of		Length	Length (cm)			Weight (kg)			Female
Common	Scientific	Samples	Specimens	Type	Min.	Max.	Mean	Min.	Max.	Mean	Proportion
Pygmy Rockfish	*Sebastes wilsoni*	21	249	Fork	12	24	17	<0.1	0.1	0.1	0.6
Quillback Rockfish	*Sebastes maliger*	10	33	Fork	26	45	40	0.8	1.9	1.4	0.5
Redbanded Rockfish	*Sebastes babcocki*	23	299	Fork	9	66	35	<0.1	4.0	1.0	0.5
Redstripe Rockfish	*Sebastes proriger*	31	771	Fork	7	42	29	0.1	1.3	0.4	0.6
Rex Sole	*Glyptocephalus zachirus*	102	3072	Total	15	48	30	<0.1	0.6	0.2	0.5
Rosethorn Rockfish	*Sebastes helvomaculatus*	31	673	Fork	7	34	24	<0.1	0.4	0.2	0.5
Rougheye Rockfish	*Sebastes aleutianus*	13	272	Fork	16	64	45	0.1	4.6	1.5	0.5
Sablefish	*Anoplopoma fimbria*	104	1232	Fork	31	86	50	0.4	6.8	1.5	0.5
Sandpaper Skate	*Bathyraja interrupta*	5	8	Total	46	63	60	0.5	1.4	1.1	0.4
Sharpchin Rockfish	*Sebastes zacentrus*	37	1163	Fork	7	38	24	<0.1	1.0	0.3	0.5
Shortbelly Rockfish	*Sebastes jordani*	2	4	Fork	21	23	22	-	-	-	0.8
Shortraker Rockfish	*Sebastes borealis*	4	8	Fork	53	77	62	2.4	6.7	3.9	0.3
Shortspine Thornyhead	*Sebastolobus alascanus*	26	739	Total	4	59	23	<0.1	3.1	0.2	0.5
Silvergray Rockfish	*Sebastes brevispinis*	25	506	Fork	36	63	50	0.8	3.3	1.8	0.3
Skates	Rajidae	1	1	Total	81	81	81	-	-	-	1.0
Slender Sole	*Lyopsetta exilis*	50	1239	Total	9	32	23	<0.1	0.3	0.1	0.7
Southern Rock Sole	*Lepidopsetta bilineata*	28	304	Total	14	49	30	<0.1	1.5	0.4	0.7
Splitnose Rockfish	*Sebastes diploproa*	19	605	Fork	8	36	21	0.1	0.8	0.3	0.5
Spotted Ratfish	*Hydrolagus colliei*	34	917	2nd Dorsal	7	49	33	0.1	1.3	0.5	0.5
Starry Flounder	*Platichthys stellatus*	1	2	Total	58	65	62	-	-	-	1.0
Stripetail Rockfish	*Sebastes saxicola*	4	69	Fork	14	31	21	<0.1	0.5	0.2	0.7
Threadfin Sculpin	*Icelinus filamentosus*	5	119	Total	13	28	23	-	-	-	-
Walleye Pollock	*Theragra chalcogramma*	21	246	Fork	18	65	32	0.1	0.8	0.3	0.5
Whitebait Smelt	*Allosmerus elongatus*	1	48	Total	10	13	12	-	-	-	-
Widow Rockfish	*Sebastes entomelas*	23	134	Fork	31	55	43	0.4	0.7	0.6	0.6
Wolf Eel	*Anarrhichthys ocellatus*	2	2	Total	120	135	128	-	-	-	-
Yelloweye Rockfish	*Sebastes ruberrimus*	26	77	Fork	27	70	52	0.3	6.1	2.9	0.6
Yellowmouth Rockfish	*Sebastes reedi*	8	229	Fork	18	53	44	0.6	2.4	1.7	0.4
Yellowtail Rockfish	*Sebastes flavidus*	56	1251	Fork	32	56	46	0.6	2.5	1.5	0.4

Table 9. Summary of data from net-mounted recorders during the 2010 WCVI synoptic bottom trawl survey, showing the number of tows and total number of records. A total of 144 survey tows were conducted, of which 136 were useable.

Data Recorder	Attribute	Number of	
		Tows	Records
Mac Marine Industries Bottom Contact Sensor	Bottom contact sensor tilt angle	138	46,777
Seabird SBE19plus Seacat Profiler	Conductivity of sea water (S/m)	126	24,000
	Dissolved oxygen (ml/L)	126	24,000
	Oxygen voltage (V)	126	24,000
	Salinity (PSU)	126	24,000
	Pressure (db)	126	24,000
	Water temperature (^{o}C)	126	24,000
	Depth (m)	126	24,000
Seabird SBE43	Dissolved oxygen (ml/L)	126	24,000
Seabird SBE39 Temperature And Pressure Recorder	Pressure (db)	135	47,205
	Water temperature (^{o}C)	135	47,205
	Depth (m)	135	47,205

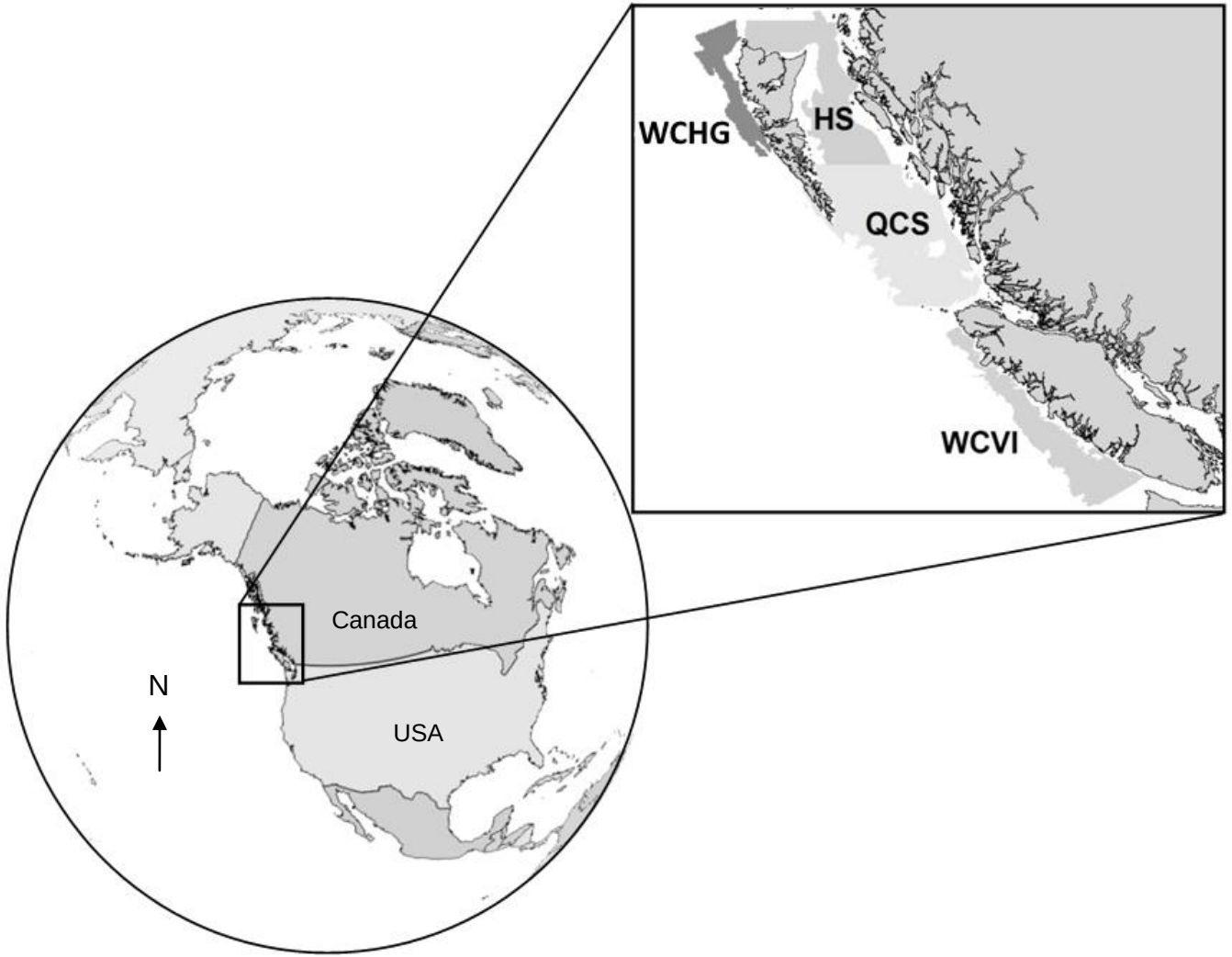

Figure 1. Locations of the current synoptic bottom trawl surveys on the coast of British Columbia, Canada. WCHG = West Coast Haida Gwaii; HS = Hecate Strait; QCS = Queen Charlotte Sound; WCVI = West Coast Vancouver Island.

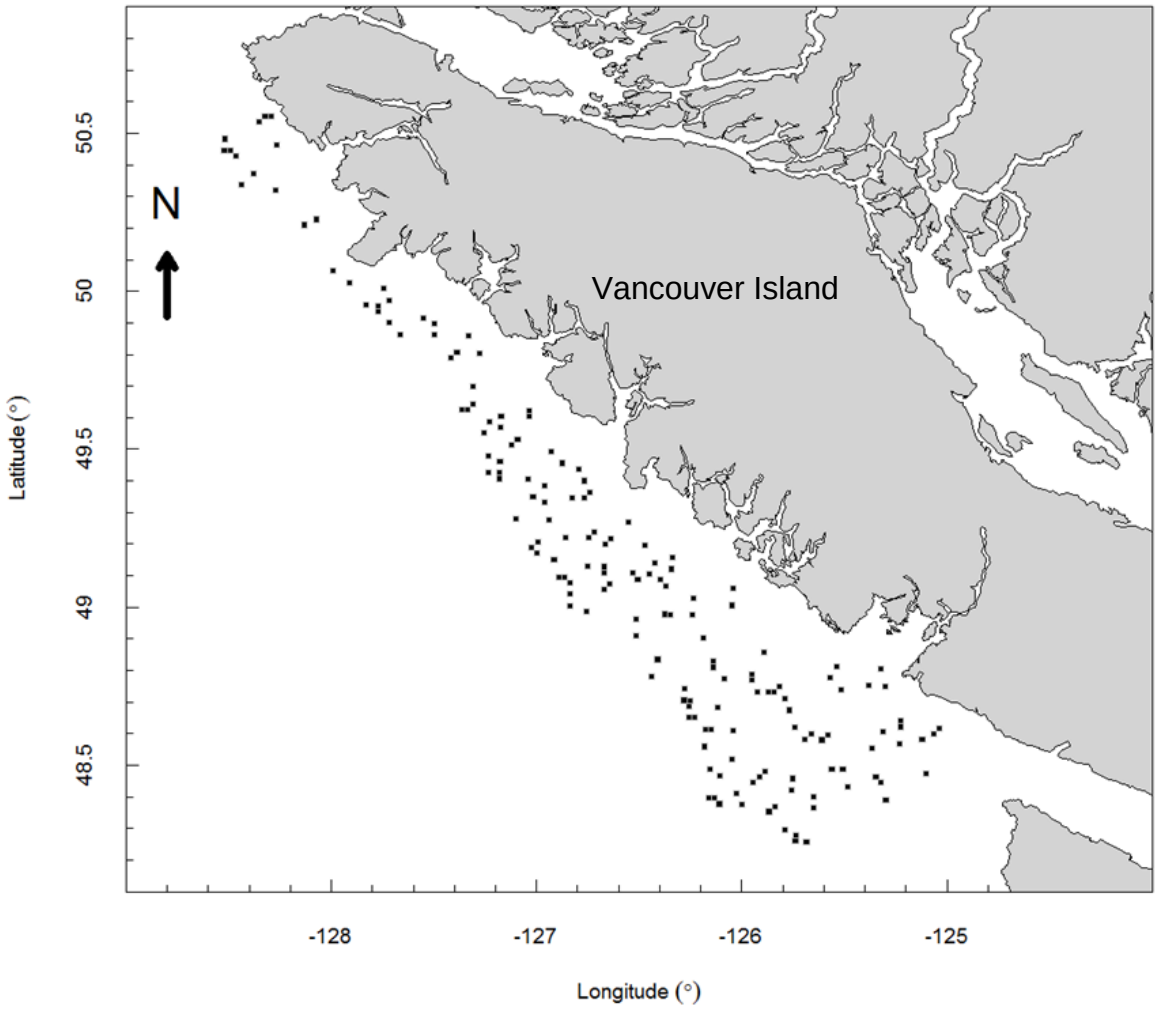

Figure 2. The WCVI synoptic bottom trawl survey area showing the 170 randomly selected blocks for the 2010 survey.

Figure 3. The Canadian Coast Guard Ship W.E. Ricker used for the 2010 WCVI synoptic bottom trawl survey.

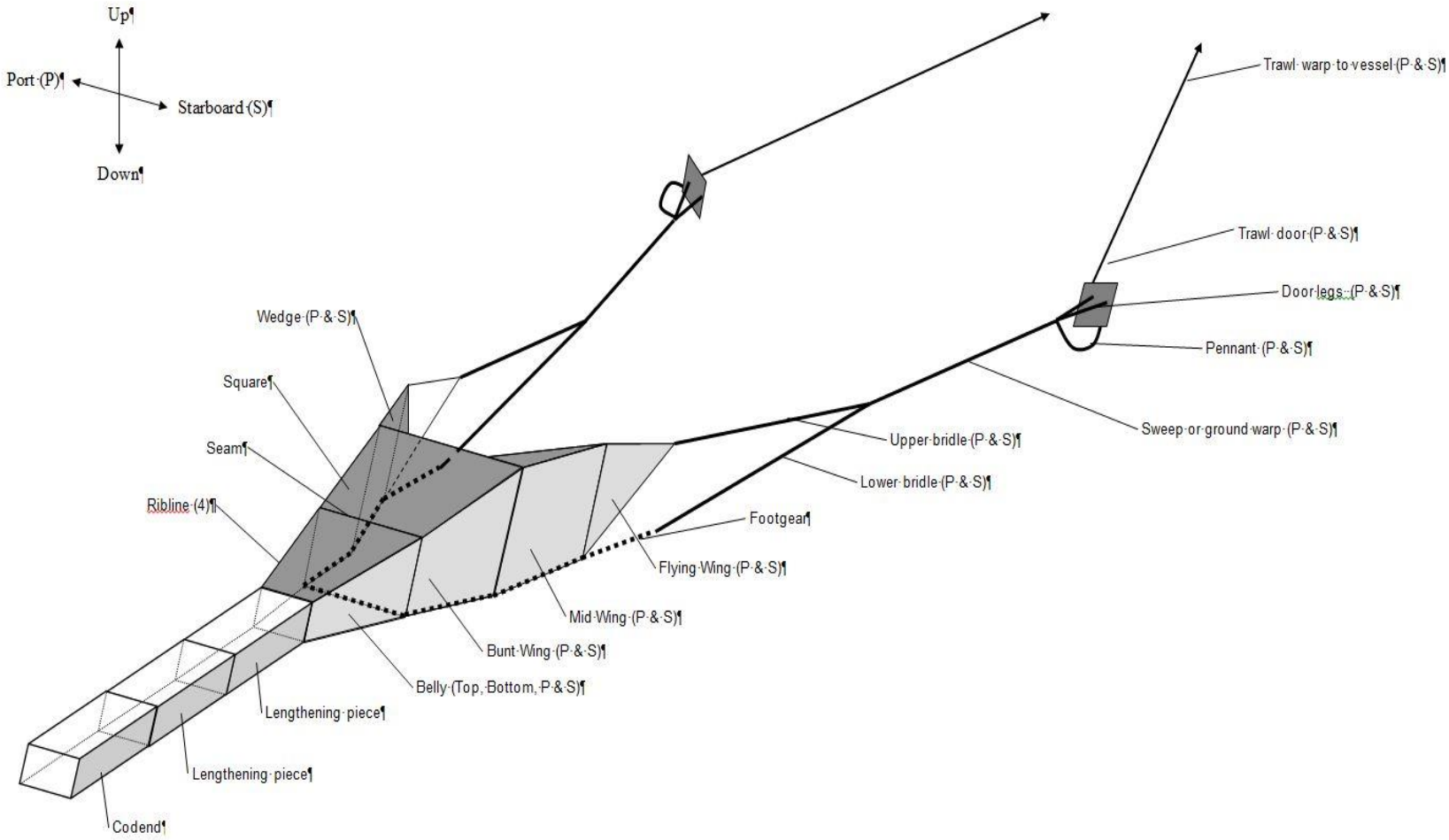

Figure 4. Overview diagram of the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey.

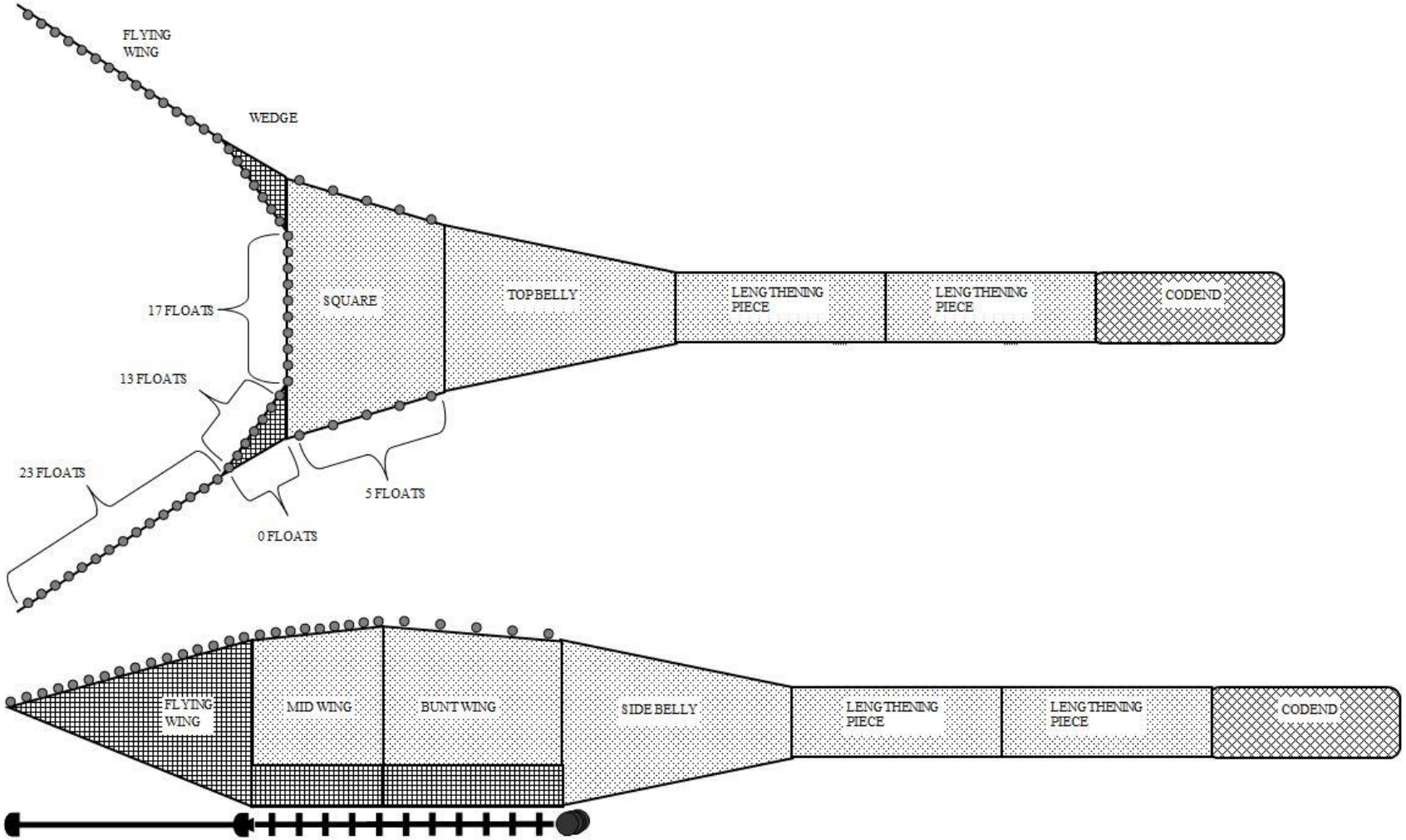

Figure 5. Top and side view of the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey.

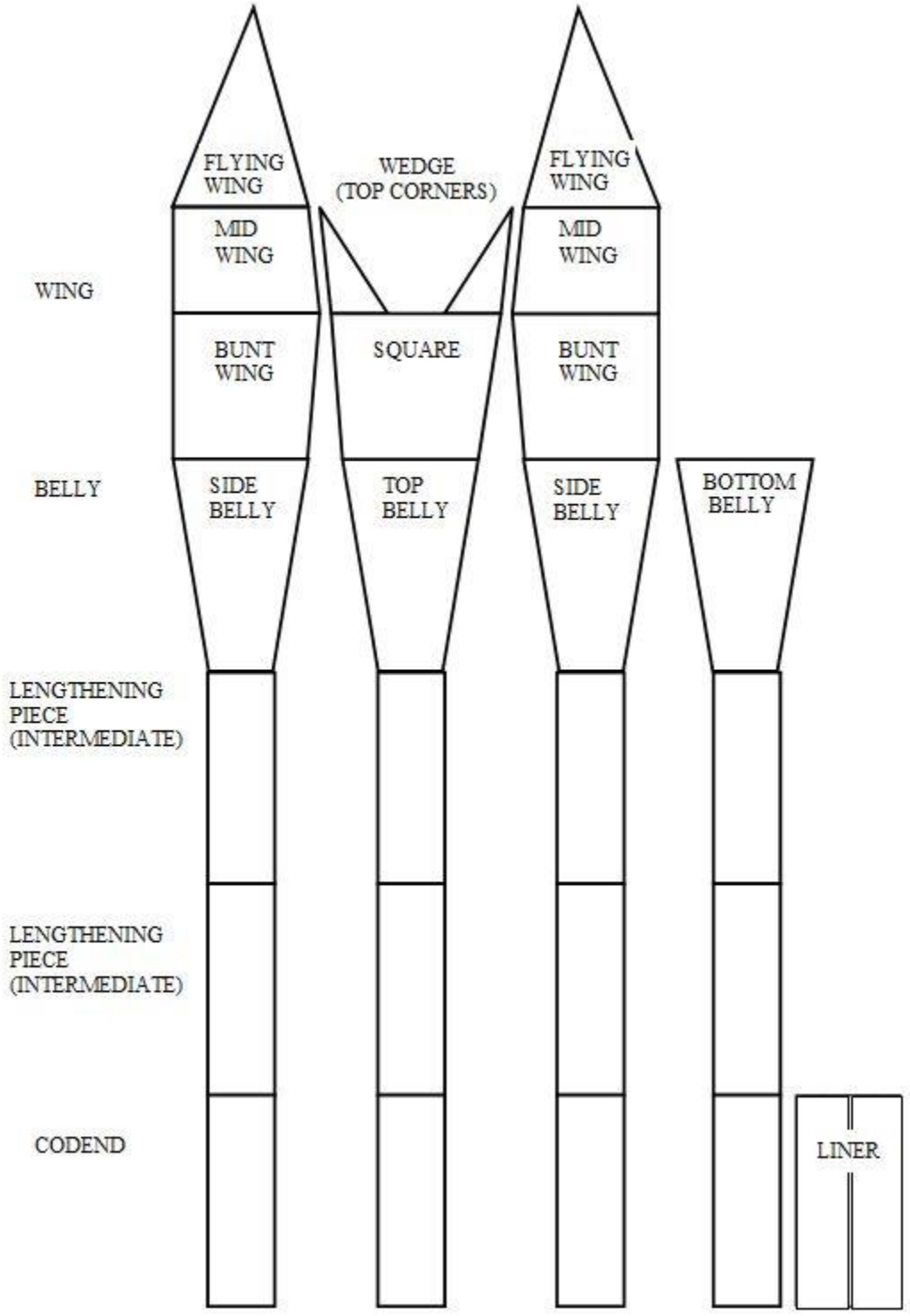

Figure 6. Diagram of the net panels with section names for the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey.

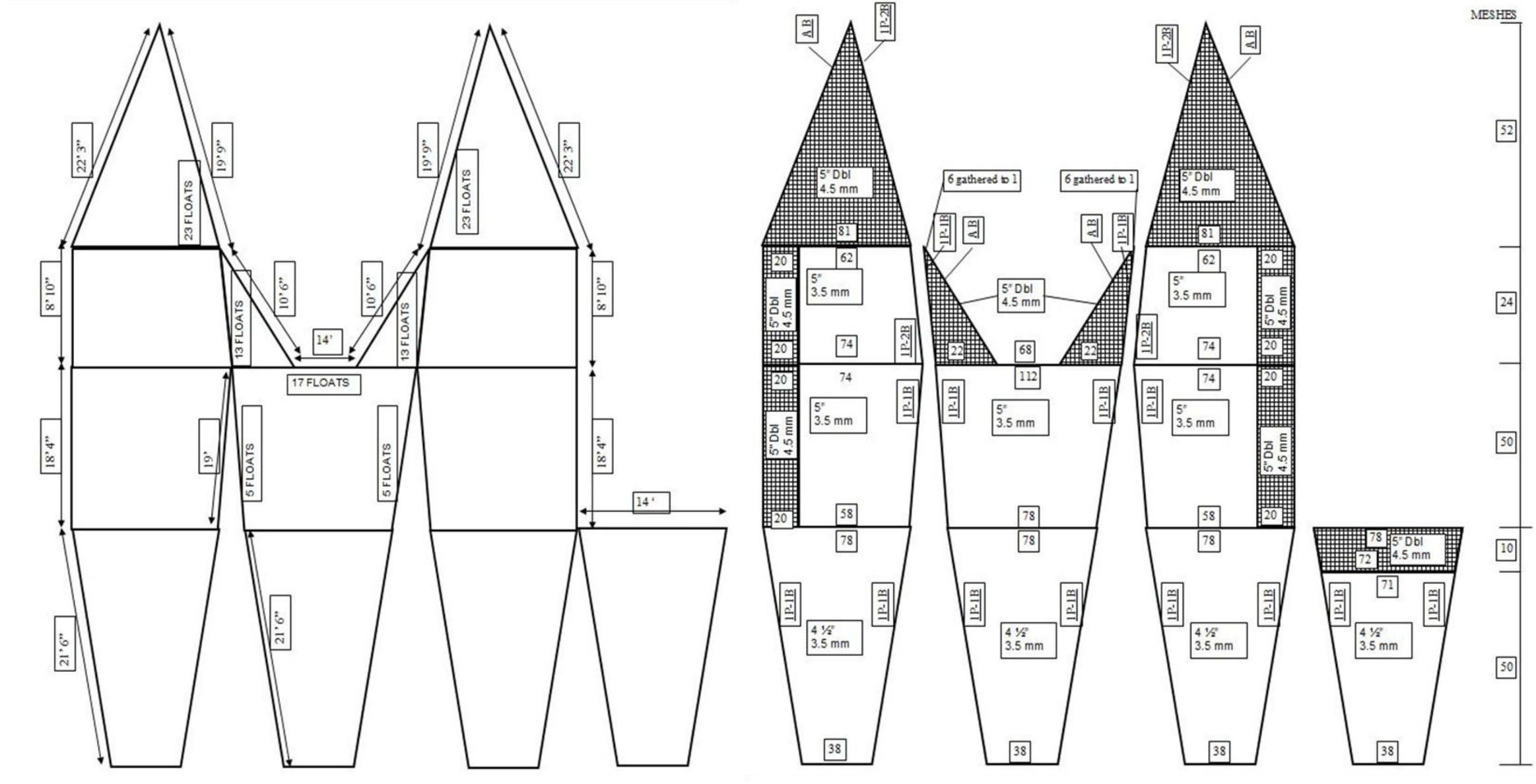

Figure 7. Details of the wing and belly sections of the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey. Dimensions and the float arrangement are shown on the left while netting details, mesh counts, and mesh cuts are shown on the right side of the diagram.

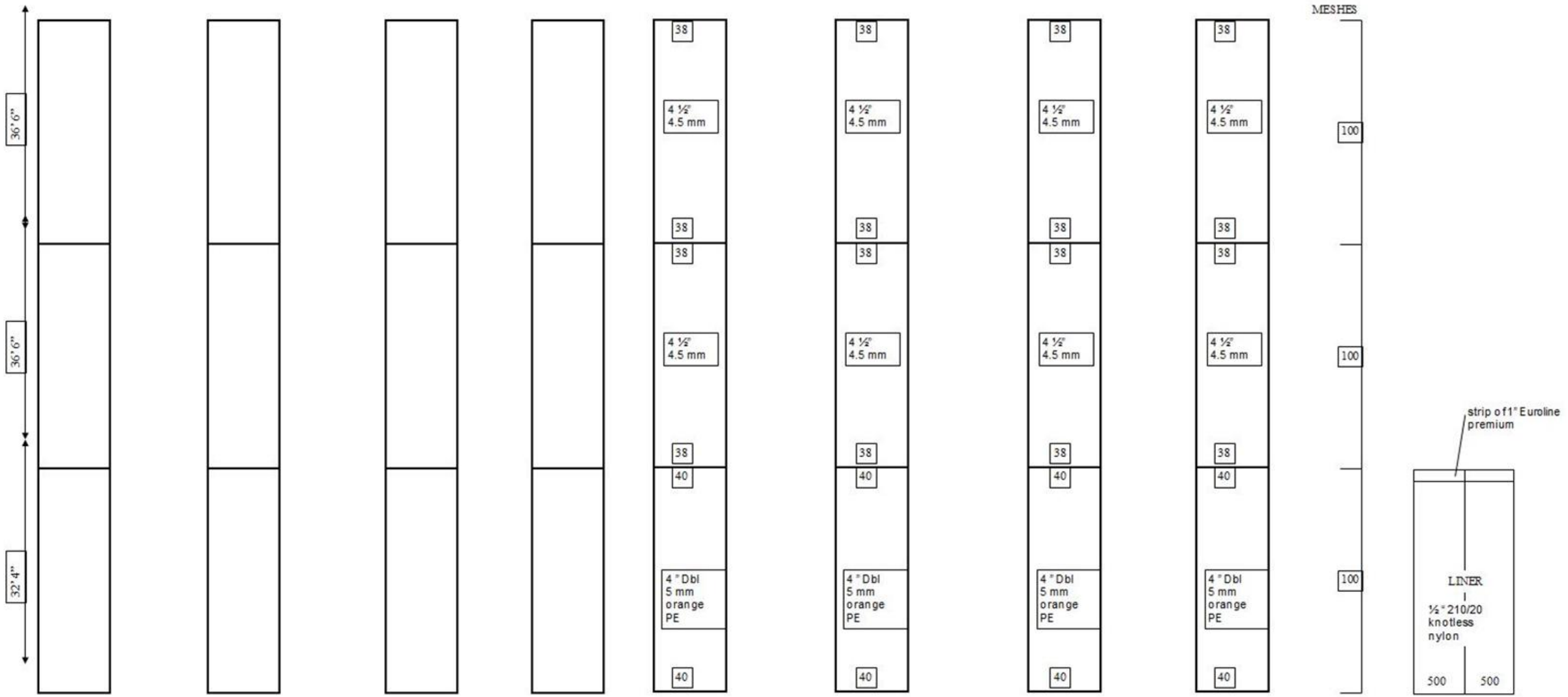

Figure 8. Details of the lengthening (intermediate) pieces and codend sections of the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey. Dimensions are shown on the left while netting details, mesh counts, and mesh cuts including the codend liner are shown on the right side of the diagram.

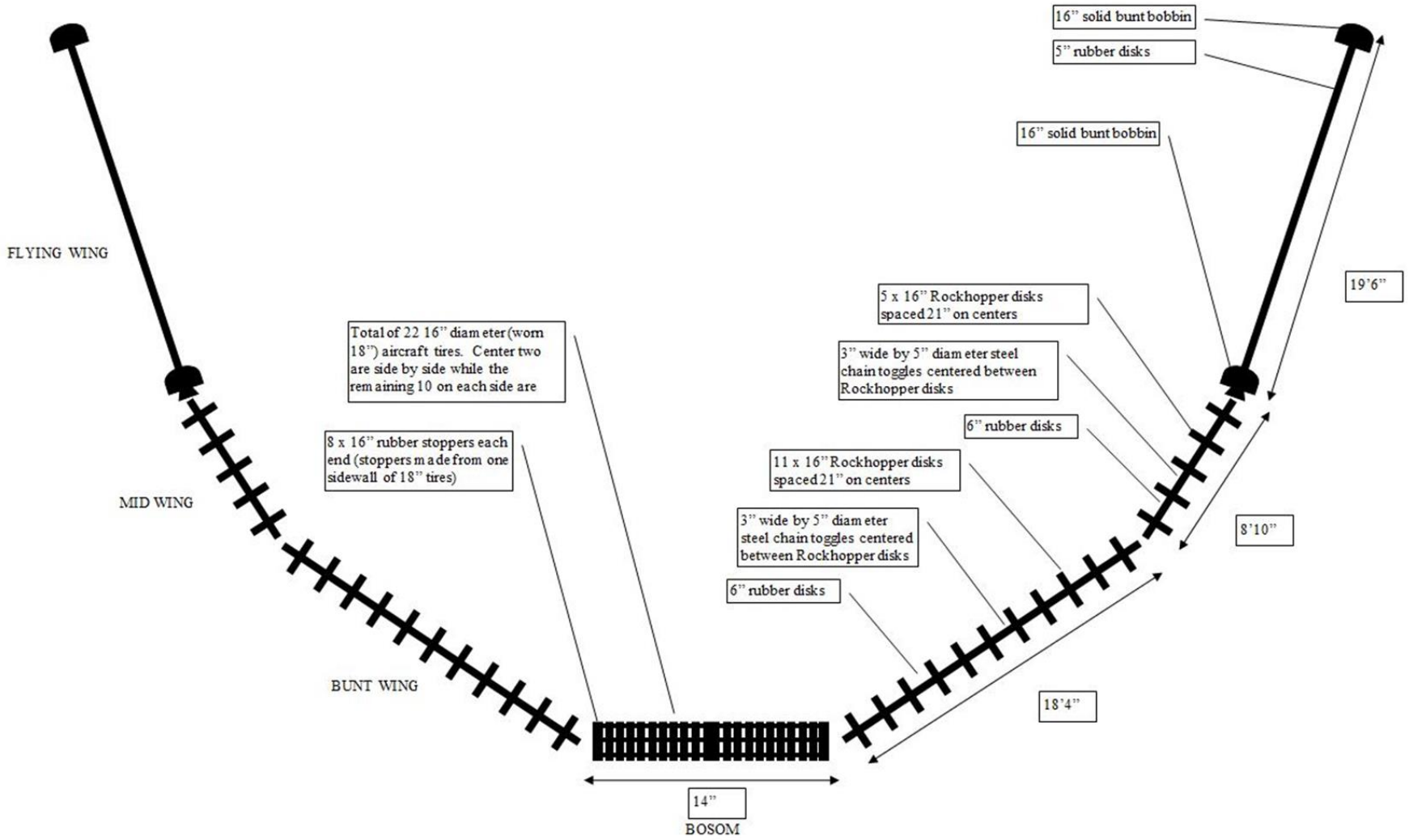

Figure 9. Details of the Rockhopper foot gear for the Atlantic Western IIa box trawl used on the 2010 WCVI synoptic bottom trawl survey.

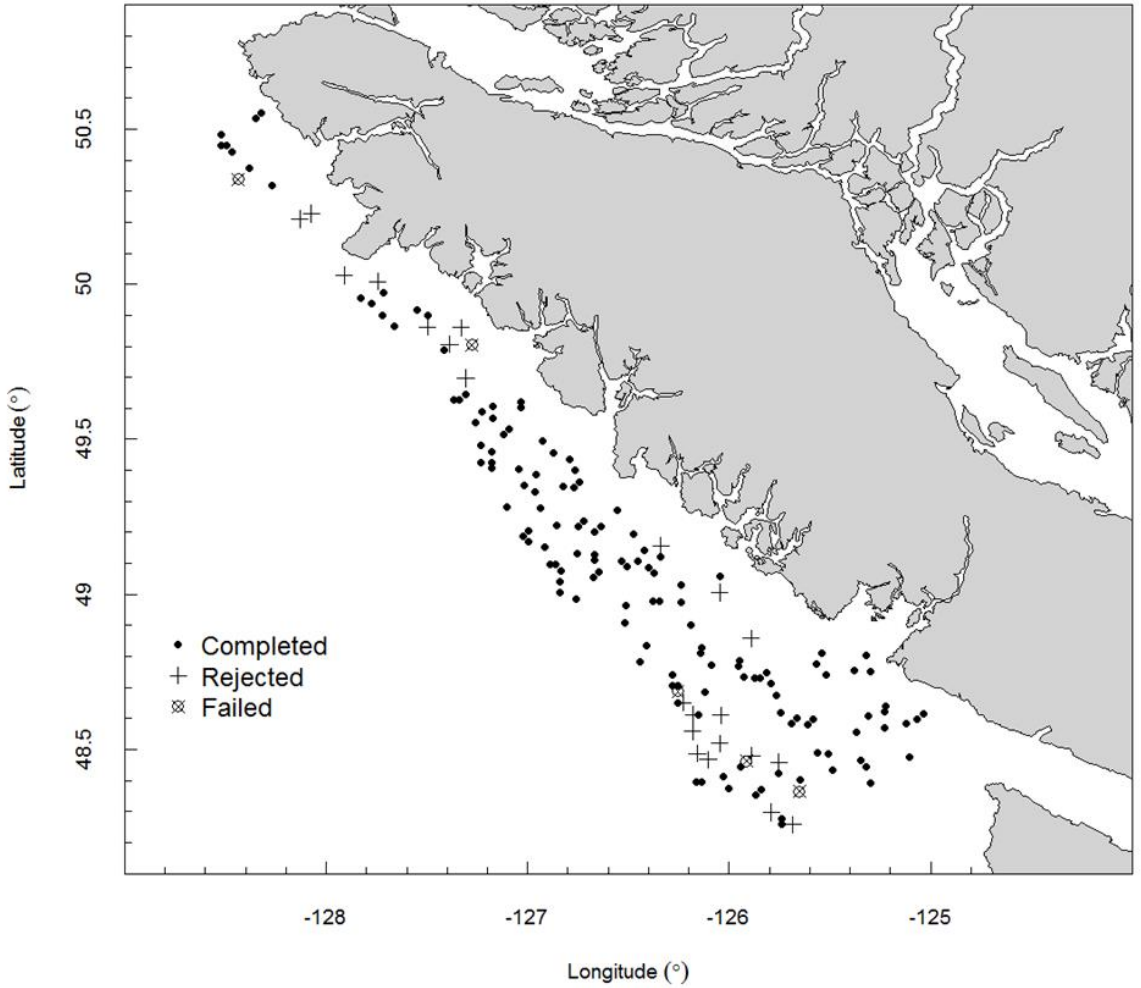

Figure 10. Final status of the 2010 WCVI synoptic bottom trawl survey showing blocks that were fished successfully (completed), rejected prior to fishing (rejected), or abandoned after one or more unsuccessful fishing attempts (failed).

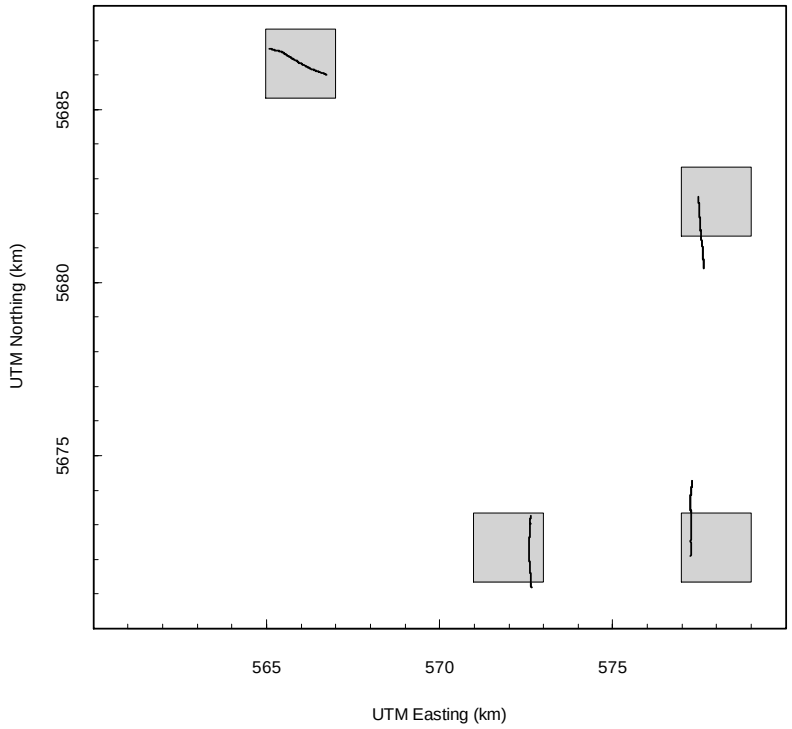

Figure 11. Example of tow tracks demonstrating variations in track locations within blocks for synoptic bottom trawl surveys.

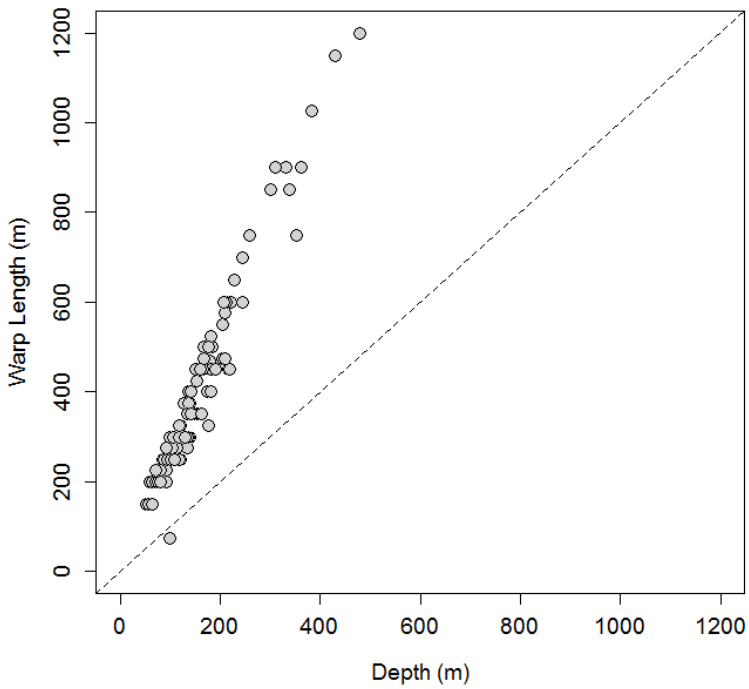

Figure 12. Warp length versus starting depth for each tow during the 2010 WCVI synoptic bottom trawl survey.

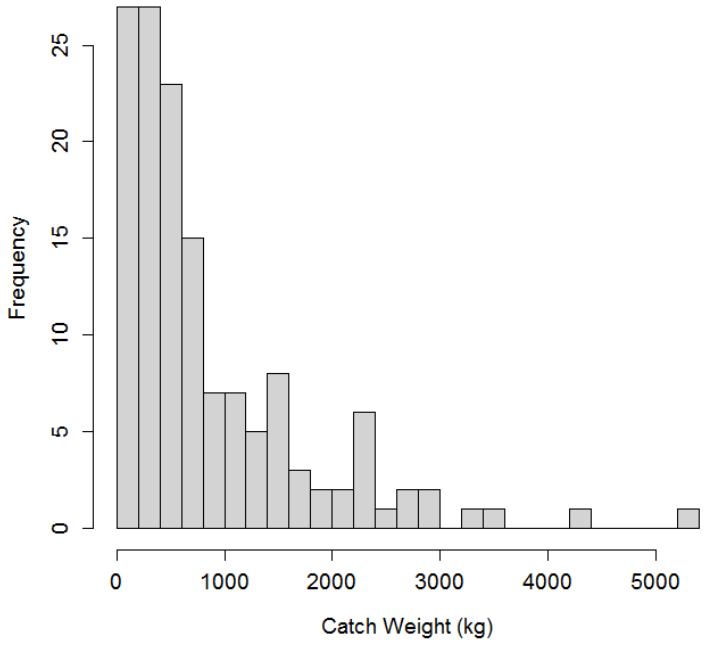

Figure 13. Histogram of catch weight per useable tow during the 2010 WCVI synoptic bottom trawl survey.

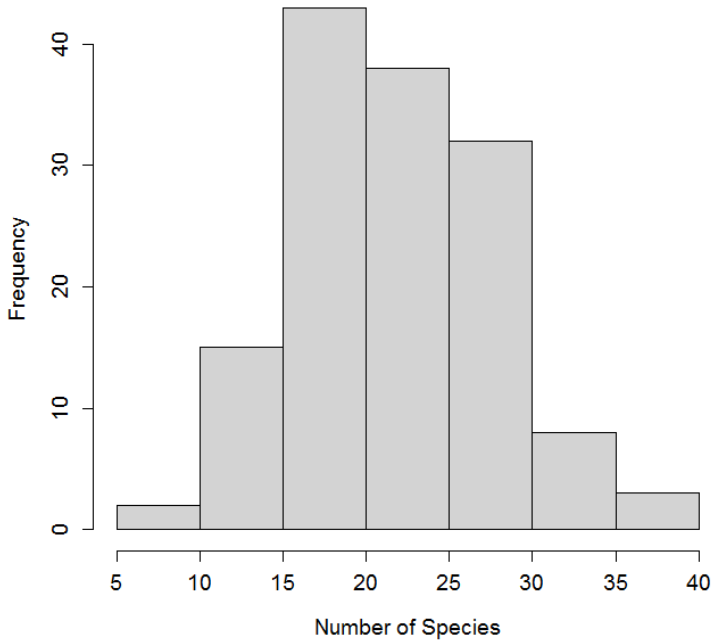

Figure 14. Histogram of number of species caught per useable tow during the 2010 WCVI synoptic bottom trawl survey.

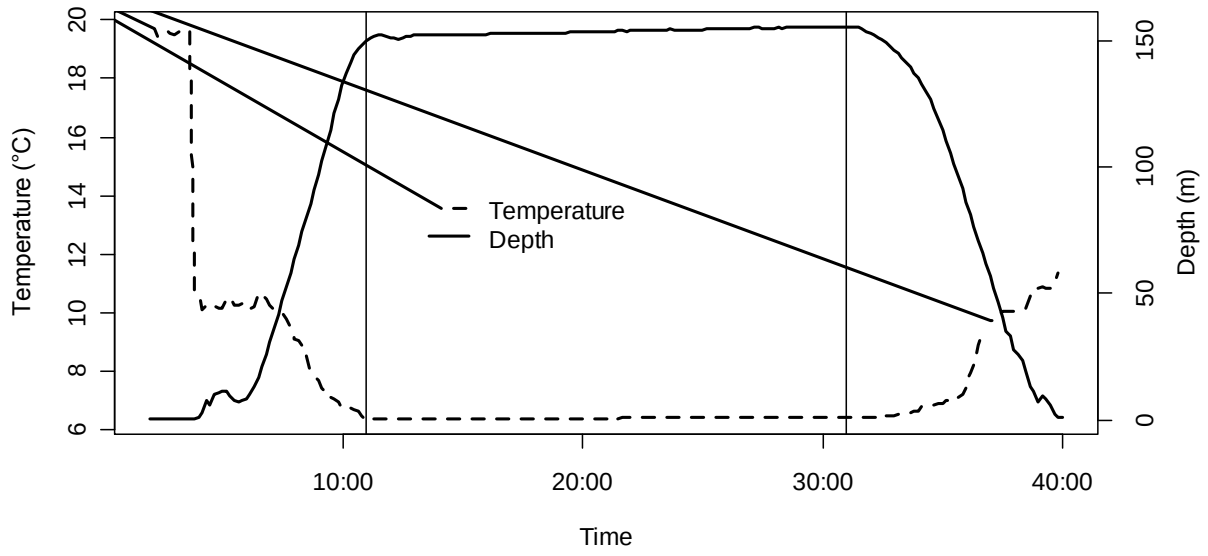

Figure 15. Example of a Seabird 39 temperature and pressure profile collected during a synoptic bottom trawl survey. The vertical lines indicate the start and end of net contact with the sea floor.

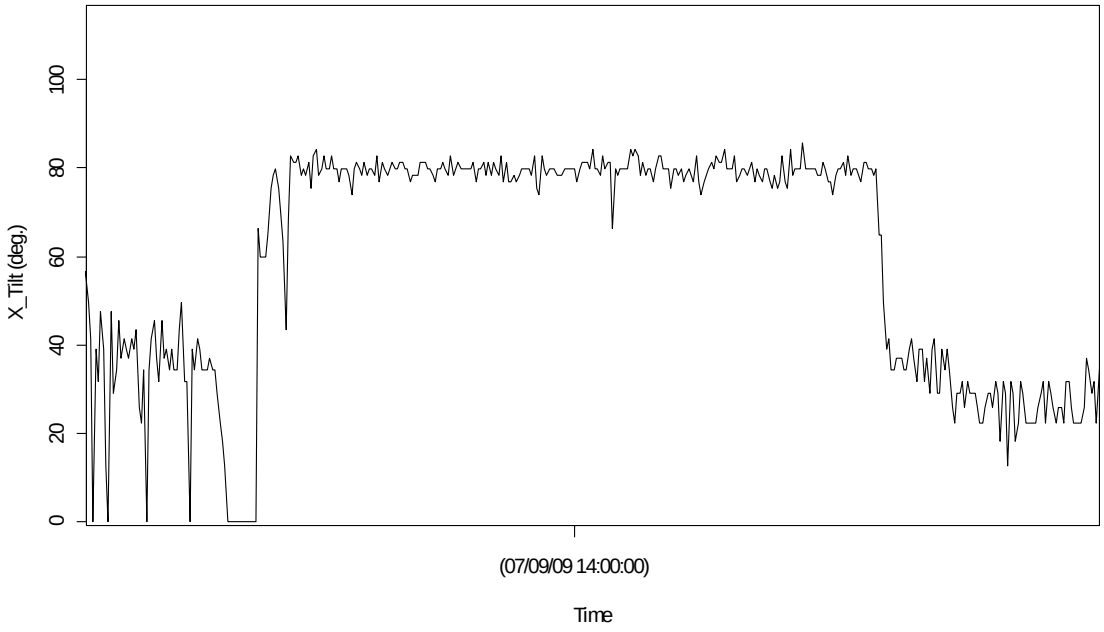

Figure 16. Example of a Mac Marine Industries bottom contact sensor profile collected during a synoptic bottom trawl survey. The raised segment in the middle of the profile at approximately 80° indicates where the net made contact with the sea floor.

APPENDIX A: WCVI 2010 SURVEY BRIDGE LOG

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
1	Jun-08	10:34	48.6063	125.0656	91.0	19	5.2	225	221.6	Yes
2	Jun-08	11:21	48.5856	125.1090	109.0	18	5.5	250	149.9	Yes
3	Jun-08	12:29	48.5763	125.2347	134.0	18	5.4	275	317.4	Yes
4	Jun-08	13:53	48.5518	125.3796	114.0	19	6.2	275	2984.3	Yes
5	Jun-08	14:52	48.4743	125.3264	157.0	19	5.6	450	1578.4	Yes
6	Jun-08	15:40	48.4439	125.3203	168.0	21	5.8	475	481.2	Yes
7	Jun-08	17:32	48.4345	125.4840	128.0	20	5.5	375	2257.8	Yes
8	Jun-09	7:13	48.5932	125.5960	118.0	19	5.7	300	896.6	Yes
9	Jun-09	8:02	48.5861	125.6079	81.0	20	6.2	225	293.2	Yes
10	Jun-09	9:21	48.4885	125.4953	90.0	19	5.7	250	2732.2	Yes
11	Jun-09	10:42	48.4079	125.6414	133.0	19	5.3	375	1160.5	Yes
12	Jun-09	12:03	48.3627	125.6406	143.0	3	5.6	375	63.1	No
13	Jun-09	14:05	48.2690	125.7436	205.0	13	6.1	475	370.7	Yes
14	Jun-09	15:28	48.3474	125.8567	168.0	22	5.4	500	1649.4	Yes
15	Jun-09	16:22	48.3709	125.8505	153.0	18	5.8	425	2604.0	Yes
16	Jun-10	9:23	48.6099	126.1543	204.0	17	5.1	550	858.7	Yes
17	Jun-10	11:59	48.6675	126.1183	137.0	19	5.2	350	295.2	Yes
18	Jun-10	13:29	48.6825	126.2460	238.0	12	5.1	600	1464.3	No
19	Jun-10	15:29	48.7603	126.0850	106.0	20	5.1	250	76.1	Yes
20	Jun-10	16:48	48.8140	126.1380	112.0	19	6.0	275	284.1	Yes
21	Jun-10	18:03	48.8157	126.1412	113.0	17	5.1	275	442.0	Yes
22	Jun-10	19:28	48.8965	126.1777	105.0	15	6.3	275	131.2	Yes
23	Jun-11	7:04	49.0483	126.2517	87.0	16		250	41.0	No
24	Jun-11	8:09	48.9750	126.2367	109.0	19	5.0	300	102.8	Yes
25	Jun-11	10:18	48.9106	126.5166	178.0	22	5.4	470	1149.8	Yes
26	Jun-11	11:38	48.8445	126.4241	176.0	18	5.7	325	751.9	Yes
27	Jun-11	12:55	48.7940	126.4493	244.0	20	5.8	700	1747.4	Yes
28	Jun-11	14:24	48.7015	126.2875	447.0	17	6.0	950		No
29	Jun-11	15:25	48.7056	126.2734	430.0	17	4.3	1150	465.0	Yes
30	Jun-11	17:36	48.7159	126.2424	182.0	19	5.5	500	1666.2	Yes
31	Jun-12	7:17	48.9834	126.7467	361.0	23	4.8	900	612.6	Yes
32	Jun-12	8:17	49.0009	126.8323	478.0	27	4.7	1200	380.3	Yes
33	Jun-12	9:35	49.0448	126.8454	301.0	26	4.7	850	304.0	Yes
34	Jun-12	10:41	49.0721	126.8249	209.0	21	5.5	575	1034.0	Yes
35	Jun-12	12:20	49.0906	126.8569	221.0	19	5.9	600	793.8	Yes
36	Jun-12	13:34	49.0950	126.8836	259.0	20	5.8	750	1128.0	Yes
37	Jun-14	8:20	49.4469	126.8684	99.0	22	5.1	75	116.6	Yes
38	Jun-14	9:25	49.3828	126.9443	138.0	21	5.2	375	271.8	Yes
39	Jun-14	10:59	49.2721	127.0879	210.0	22	5.1	475	2148.9	Yes
40	Jun-14	12:15	49.1857	127.0243	339.0	22	5.3	850	508.8	Yes
41	Jun-14	13:17	49.1694	126.9896	331.0	24	5.3	900	631.1	Yes
42	Jun-15	7:31	48.7935	125.9401	72.0	18	6.0	200	65.3	Yes
43	Jun-15	8:19	48.7741	125.9615	74.0	19	5.5	200	67.8	Yes
44	Jun-15	9:22	48.7304	125.9155	74.0	19	5.6	200	85.6	Yes
45	Jun-15	10:23	48.7353	125.8754	71.0	19	5.4	225	2348.1	Yes
46	Jun-15	11:51	48.7323	125.8475	98.0	21	5.3	300	430.5	Yes
47	Jun-15	12:36	48.7141	125.7985	118.0	19	5.3	300	272.9	Yes
48	Jun-15	13:28	48.6789	125.7728	105.0	21	5.4	300	241.1	Yes
49	Jun-15	14:20	48.6298	125.7430	59.0	20	5.6	200	135.2	Yes
50	Jun-15	16:01	48.7351	125.5049	134.0	21	5.4	350	607.6	Yes
51	Jun-15	17:28	48.7779	125.5715	162.0	22	5.4	450	559.6	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
52	Jun-15	18:44	48.8207	125.5460	84.0	18	6.0	250	218.5	Yes
53	Jun-16	8:04	48.4419	125.9344	161.0	21	5.8	450	683.8	Yes
54	Jun-16	9:21	48.4101	126.0207	184.0	21	5.6	500	745.7	Yes
55	Jun-16	10:40	48.3962	126.1381	339.0	24	4.9	950	639.6	No
56	Jun-16	12:26	48.3994	126.1612	383.0	29	4.5	1025	1320.7	Yes
57	Jun-16	14:02	48.3784	125.9968	309.0	19	5.5	900	1534.0	Yes
58	Jun-16	15:48	48.4224	125.7618	135.0	20	6.0	375	159.3	Yes
59	Jun-17	7:07	49.0701	126.0451	52.0	20	4.9	150	159.2	Yes
60	Jun-17	9:19	49.0819	126.3853	116.0	20	5.3	300	457.8	Yes
61	Jun-17	10:09	49.1300	126.4132	103.0	22	5.3	300	241.2	Yes
62	Jun-17	11:05	49.1144	126.4567	119.0	21	5.3	325	449.7	Yes
63	Jun-17	12:18	49.0855	126.4937	131.0	22	5.0	375	480.0	Yes
64	Jun-17	13:36	49.0533	126.6639	152.0	22	5.1	450	555.7	Yes
65	Jun-17	14:31	49.1056	126.6689	139.0	21	5.4	375	226.3	Yes
66	Jun-17	15:35	49.1923	126.6557	120.0	20	5.5	325	156.2	Yes
67	Jun-17	16:19	49.2202	126.6454	118.0	19	5.4	325	288.3	Yes
68	Jun-17	17:39	49.1961	126.4655	99.0	21	5.5	300	121.0	Yes
69	Jun-17	18:36	49.2650	126.5424	93.0	20	5.8	275	141.9	Yes
70	Jun-18	7:12	49.4904	126.9161	106.0	21	5.3	300	203.5	Yes
71	Jun-18	8:23	49.5246	127.0821	128.0	21	5.1	375	596.7	Yes
72	Jun-18	9:11	49.5197	127.1167	137.0	20	6.5	400	726.1	Yes
73	Jun-18	10:17	49.4592	127.1694	157.0	21	5.4	450	1373.8	Yes
74	Jun-18	11:10	49.4764	127.2265	181.0	21	5.7	525	411.9	Yes
75	Jun-18	12:20	49.5427	127.2594	181.0	18	5.4	450	1869.6	Yes
76	Jun-18	13:20	49.5665	127.1722	136.0	20	5.2	375	251.1	Yes
77	Jun-18	14:03	49.5814	127.2105	142.0	20	5.0	400	1585.3	Yes
78	Jun-18	15:18	49.6184	127.3670	177.0	22	5.3	500	1320.0	Yes
79	Jun-18	16:26	49.6363	127.3078	151.0	18	4.8	450	2204.1	Yes
80	Jun-18	18:35	49.8106	127.2699	55.0	0	6.5	150		No
81	Jun-19	7:04	50.5607	128.3302	75.0	19	5.8	200	188.4	Yes
82	Jun-19	7:52	50.5258	128.3431	119.0	20	4.9	300	139.4	Yes
83	Jun-19	9:23	50.4792	128.5321	210.0	21	5.7	600	732.3	Yes
84	Jun-19	10:13	50.4492	128.5175	229.0	23	5.3	650	2920.5	Yes
85	Jun-19	12:15	50.4544	128.5071	208.0	23	6.0	600	2250.6	Yes
86	Jun-19	13:09	50.4270	128.4720	212.0	23	6.1	600	1552.4	Yes
87	Jun-19	14:29	50.3766	128.3887	212.0	22	5.6	600	717.2	Yes
88	Jun-19	16:09	50.3415	128.4250						No
89	Jun-19	17:37	50.3198	128.2756	206.0	16	5.9	600	1154.1	Yes
90	Jun-20	7:15	49.9780	127.7261	134.0	18	5.5	350	1339.3	Yes
91	Jun-20	8:06	49.9403	127.7595	165.0	19	6.2	450	2493.3	Yes
92	Jun-20	9:06	49.9533	127.8251	244.0	16	5.9	600	354.9	Yes
93	Jun-20	10:14	49.9037	127.7209	166.0	19	6.1	475	984.5	Yes
94	Jun-20	11:02	49.8620	127.6693	161.0	21	6.0	450	513.3	Yes
95	Jun-20	12:19	49.9076	127.5569	65.0	20	5.3	200	68.3	Yes
96	Jun-20	13:16	49.9066	127.5105	72.0	20	5.8	200	23.5	Yes
97	Jun-20	15:25	49.7870	127.4090	84.0	20	5.9	250	69.7	Yes
98	Jun-20	17:34	49.6195	127.3474	161.0	18	5.7	450	1063.8	Yes
99	Jun-23	7:34	48.2757	125.7407	174.0	19	5.2	400	985.4	Yes
100	Jun-23	9:46	48.4596	125.9208	144.0	18	5.6	350	201.3	No
101	Jun-23	13:41	48.6593	126.2481	353.0	16	5.1	750	927.4	Yes
102	Jun-23	15:09	48.7553	126.2827	182.0	17	5.7	400	742.7	Yes
103	Jun-23	17:35	48.9657	126.3366	134.0	18	5.3	300	1236.5	Yes
104	Jun-23	18:26	48.9835	126.3637	139.0	17	5.9	300	1437.6	Yes

Tow	Date	Start Time	Start Latitude	Start Longitude	Average Depth (m)	Bottom Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Useable
105	Jun-24	7:11	48.7490	125.8067	87.0	20	5.6	250	2061.4	Yes
106	Jun-24	9:50	48.6068	125.6843	56.0	19	5.8	150	551.1	Yes
107	Jun-24	10:40	48.5908	125.7005	64.0	20	5.5	150	119.1	Yes
108	Jun-24	13:06	48.6060	125.2861	119.0	19	5.3	300	3464.6	Yes
109	Jun-24	14:51	48.7490	125.2897	99.0	19	5.6	250	500.5	Yes
110	Jun-24	15:40	48.7482	125.3697	98.0	19	5.3	250	487.9	Yes
111	Jun-24	17:02	48.7986	125.3150	84.0	20	5.4	200	322.3	Yes
112	Jun-25	7:06	49.6160	127.0267	95.0	20	5.3	250	738.4	Yes
113	Jun-25	7:58	49.6079	127.0468	103.0	19	5.7	250	1899.7	Yes
114	Jun-25	9:25	49.5976	127.1600	128.0	18	5.1	300	410.4	Yes
115	Jun-25	11:55	49.4363	126.7933	75.0	20	5.8	200	154.3	Yes
116	Jun-25	13:03	49.3963	126.7647	84.0	19	5.7	200	161.1	Yes
117	Jun-25	14:05	49.3583	126.7334	92.0	19	5.6	200	154.7	Yes
118	Jun-25	15:03	49.3429	126.7646	106.0	18	5.6	250	295.1	Yes
119	Jun-25	15:55	49.3567	126.8306	118.0	19	5.2	300	245.4	Yes
120	Jun-25	17:35	49.2433	126.7316	120.0	17	5.4	250	242.4	Yes
121	Jun-25	18:26	49.2214	126.7595	124.0	19	5.4	300	774.6	Yes
122	Jun-26	7:04	49.4307	127.2322	191.0	19	6.0	450	5318.0	Yes
123	Jun-26	8:33	49.4350	127.1900	160.0	18	5.6	350	868.8	Yes
124	Jun-26	10:30	49.4094	127.1744	161.0	19	5.5	350	493.7	Yes
125	Jun-26	12:04	49.4149	127.0444	137.0	19	5.6	300	421.5	Yes
126	Jun-26	14:06	49.3433	127.0295	143.0	20	6.5	350	208.8	Yes
127	Jun-26	15:06	49.3326	126.9587	148.0	19	5.2	350	258.1	Yes
128	Jun-26	15:52	49.2865	126.9469	154.0	19	5.5	350	184.6	Yes
129	Jun-26	17:38	49.2112	126.8624	147.0	19	5.8	350	1102.4	Yes
130	Jun-26	19:00	49.2106	126.9979	216.0	18	5.3	450	587.3	Yes
131	Jun-27	7:12	49.1533	126.9230	219.0	17	5.6	450	649.5	Yes
132	Jun-27	8:40	49.1215	126.7430	142.0	19	5.8	350	553.9	Yes
133	Jun-27	9:39	49.1318	126.6843	134.0	19	5.6	300	368.3	Yes
134	Jun-27	10:33	49.0714	126.6569	142.0	19	5.3		235.5	Yes
135	Jun-27	11:59	49.1172	126.5486	128.0	19	5.1	300	410.1	Yes
136	Jun-27	13:24	48.9730	126.5219	163.0	19	5.2	350	2243.6	Yes
137	Jun-27	14:47	49.0775	126.3851	118.0	22	5.8	300	861.4	Yes
138	Jun-27	15:56	49.1308	126.3567	92.0	20	5.1	200	121.7	Yes
139	Jun-28	7:13	48.4884	125.5711	130.0	18	5.4	300	521.1	Yes
140	Jun-28	9:07	48.3931	125.2895	117.0	19	5.8	250	3288.0	Yes
141	Jun-28	10:51	48.4796	125.1185	156.0	18	5.3		1520.5	Yes
142	Jun-28	13:09	48.6491	125.2154	102.0	20	5.3	250	1469.3	Yes
143	Jun-28	14:00	48.6148	125.2205	108.0	20	5.8	250	2261.5	Yes
144	Jun-28	15:21	48.6274	125.0499	80.0	19	5.8	200	4369.5	Yes

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

Common Name	Scientific Name	Total Weight (kg)	1	2	3	4	5
Arrowtooth Flounder	*Reinhardtius stomias*	21163.8	1.4	12.9	65.4	1238.1	350.8
Aurora Rockfish	*Sebastes aurora*	26.2					
Big Skate	*Raja binoculata*	90.4					
Bigfin Eelpout	*Lycodes cortezianus*	20.6					
Blackbelly Eelpout	*Lycodes pacificus*	20.9		0.1	-	-	0.2
Bocaccio	*Sebastes paucispinis*	121.2					
Canary Rockfish	*Sebastes pinniger*	4571.0	0.9				
Curlfin Sole	*Pleuronichthys decurrens*	13.3					
Darkblotched Rockfish	*Sebastes crameri*	214.4					
Dover Sole	*Microstomus pacificus*	3007.6	4.9	3.7	36.2	63.2	36.8
English Sole	*Parophrys vetulus*	1897.5	106.6	29.4	4.3	24.5	2.3
Eulachon	*Thaleichthys pacificus*	48.5			0.1		-
Flathead Sole	*Hippoglossoides elassodon*	363.6			7.3	2.4	12.4
Greenstriped Rockfish	*Sebastes elongatus*	1341.2				6.1	
Kelp Greenling	*Hexagrammos decagrammus*	8.1	1.4				
Lingcod	*Ophiodon elongatus*	1410.8	8.3	2.2	7.3	48.3	20.3
Longnose Skate	*Raja rhina*	681.2	8.1	4.3	2.0	0.7	29.7
North Pacific Spiny Dogfish	*Squalus suckleyi*	25611.7		8.4	22.8	1294.2	1038.7
Pacific Cod	*Gadus macrocephalus*	2102.6	3.6	18.1	20.4	179.0	25.7
Pacific Hake	*Merluccius productus*	624.7					
Pacific Halibut	*Hippoglossus stenolepis*	717.6				4.9	
Pacific Ocean Perch	*Sebastes alutus*	15535.8				0.1	0.5
Pacific Sanddab	*Citharichthys sordidus*	857.9	35.0	1.7			
Petrale Sole	*Eopsetta jordani*	805.8	10.1	28.8	5.8	9.2	0.7
Pygmy Rockfish	*Sebastes wilsoni*	15.4					
Quillback Rockfish	*Sebastes maliger*	44.7	2.6				
Redbanded Rockfish	*Sebastes babcocki*	377.2					
Redstripe Rockfish	*Sebastes proriger*	4126.9					
Rex Sole	*Glyptocephalus zachirus*	3197.2	9.8	9.4	52.6	40.6	21.6
Rosethorn Rockfish	*Sebastes helvomaculatus*	278.1					
Rougheye Rockfish	*Sebastes aleutianus*	976.9					
Sablefish	*Anoplopoma fimbria*	3708.1		2.0	10.1	49.9	12.2
Sandpaper Skate	*Bathyraja interrupta*	10.1					
Sharpchin Rockfish	*Sebastes zacentrus*	5769.1					0.0
Shortraker Rockfish	*Sebastes borealis*	32.1					
Shortspine Thornyhead	*Sebastolobus alascanus*	646.9					
Silvergray Rockfish	*Sebastes brevispinis*	1365.5					
Slender Sole	*Lyopsetta exilis*	188.2		0.4	4.3	2.0	2.6
Southern Rock Sole	*Lepidopsetta bilineata*	262.9					
Splitnose Rockfish	*Sebastes diploproa*	4292.8					
Spotted Ratfish	*Hydrolagus colliei*	1423.4	8.1	11.8	6.5	13.2	16.0
Starry Flounder	*Platichthys stellatus*	6.6					
Stripetail Rockfish	*Sebastes saxicola*	77.5					
Threadfin Sculpin	*Icelinus filamentosus*	69.8		1.0	0.2		
Walleye Pollock	*Theragra chalcogramma*	1883.8	20.8	10.2	0.6	0.9	
Widow Rockfish	*Sebastes entomelas*	2096.5					
Wolf Eel	*Anarrhichthys ocellatus*	9.3					
Yelloweye Rockfish	*Sebastes ruberrimus*	235.3					
Yellowmouth Rockfish	*Sebastes reedi*	1214.7					
Yellowtail Rockfish	Sebastes flavidus	8226.1			70.3	6.6	7.1
Other		305.0	0.1	5.7	1.3	0.4	0.8
Total		**122096.2**	**221.6**	**149.9**	**317.4**	**2984.3**	**1578.4**

Common Name	6	7	8	9	10	11	12	13	14	15	16
Arrowtooth Flounder	226.1	1612.9	108.9	8.3	0.9	41.5	5.3	35.4	76.4	49.8	75.9
Aurora Rockfish								-			
Big Skate											
Bigfin Eelpout											
Blackbelly Eelpout	0.7	0.0	0.6								
Bocaccio			11.1			4.1				1.1	
Canary Rockfish		0.7	255.5	5.2		66.1	3.5		50.6	103.6	19.0
Curlfin Sole											
Darkblotched Rockfish	7.3							0.2	0.3		
Dover Sole	8.3	102.4	52.0	5.1		19.7	0.4	2.7	9.7	26.0	12.7
English Sole		1.6	17.7	5.2	0.3	0.8	0.7	1.0	0.3	7.0	1.6
Eulachon	0.3		0.6	0.0							
Flathead Sole	39.6	6.7	9.9								
Greenstriped Rockfish		17.8	28.2			47.7	0.4	1.3	166.9	113.2	2.8
Kelp Greenling											
Lingcod		2.1	44.8	74.7	55.1	13.8			8.5	11.6	
Longnose Skate	11.7	11.8				18.3			13.9	14.2	9.7
North Pacific Spiny Dogfish	90.3	115.0	146.6	14.6	2606.7	385.4	1.3	25.8	170.1	1066.2	8.4
Pacific Cod	4.3	34.0	9.9	52.1	2.3	13.5		4.9	5.0	7.5	
Pacific Hake	3.4										0.2
Pacific Halibut		10.7	8.9	27.6	35.7				6.0		
Pacific Ocean Perch	0.8							57.8	122.7	4.7	85.4
Pacific Sanddab				28.7	1.0						
Petrale Sole		3.4	19.9	7.2	14.5					2.6	0.5
Pygmy Rockfish						1.1			2.1	0.6	
Quillback Rockfish											
Redbanded Rockfish	0.2							3.5	7.0	0.4	7.3
Redstripe Rockfish			25.7			126.8	8.1	2.8	392.2	927.8	
Rex Sole	21.7	26.2	15.3	1.7		7.1		0.3	18.8	14.2	2.2
Rosethorn Rockfish						5.9		2.0	81.1	13.7	7.8
Rougheye Rockfish	2.8										
Sablefish	34.0	302.0	21.3		2.2	2.2		0.8	10.7	3.4	0.8
Sandpaper Skate											
Sharpchin Rockfish			9.9			326.7	38.8	25.9	233.3	5.6	325.5
Shortraker Rockfish											
Shortspine Thornyhead								5.0	0.2		9.7
Silvergray Rockfish			41.7			1.3		1.3	18.0	9.7	2.6
Slender Sole	17.2	1.4	4.6	0.3		0.9		0.4	1.6	1.4	0.4
Southern Rock Sole				7.0	2.2						
Splitnose Rockfish								2.4			281.6
Spotted Ratfish	7.4	6.6	22.5	55.3	11.2	6.2	1.1	2.0	4.6	4.9	0.7
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin	0.3		0.8	0.0		3.7	0.6		11.2	1.5	0.3
Walleye Pollock											
Widow Rockfish			0.8					5.1	20.6	49.2	
Wolf Eel											
Yelloweye Rockfish			7.7			14.5			15.7	6.0	
Yellowmouth Rockfish									21.5	2.4	
Yellowtail Rockfish		2.2	30.1			53.0	2.2	187.1	177.2	155.2	1.7
Other	4.9	0.0	1.8		0.1	0.2	1.1	2.8	2.9	0.5	1.9
Total	**481.2**	**2257.8**	**896.6**	**293.2**	**2732.2**	**1160.5**	**63.1**	**370.7**	**1649.4**	**2604.0**	**858.7**

Common Name	17	18	19	20	21	22	23	24	25	26	27
Arrowtooth Flounder	23.2	24.6	0.1	2.7	4.2	1.7	0.0	9.7	96.8	208.4	29.3
Aurora Rockfish											
Big Skate					2.8						
Bigfin Eelpout											1.3
Blackbelly Eelpout			0.0	0.1	0.2	0.3	0.0	1.1			
Bocaccio		3.8									
Canary Rockfish									1.8	7.1	
Curlfin Sole											
Darkblotched Rockfish		3.8									51.3
Dover Sole	40.1	4.4		0.7	0.7	1.1	0.0	1.1	4.8	21.2	8.2
English Sole	0.3		5.9	7.2	2.7	7.0	0.0	9.3	0.4		
Eulachon	1.9			1.4	0.7	1.3	0.0	0.8			
Flathead Sole					0.1			0.3			
Greenstriped Rockfish	0.4	3.6							35.7	60.5	6.8
Kelp Greenling											
Lingcod		7.1	2.4	9.6	11.9	0.7	10.4	3.2	11.0	12.9	
Longnose Skate	1.6			1.8	2.1				6.0	8.0	
North Pacific Spiny Dogfish	142.8	11.9	45.6	81.3	47.9	46.8	22.7	25.7	101.1	37.6	23.9
Pacific Cod	19.9	22.8		1.4	0.4		1.2	11.0	71.8	11.0	
Pacific Hake		1.3									2.1
Pacific Halibut			4.5	9.1	8.9				16.0	5.3	
Pacific Ocean Perch		399.7							248.2	24.6	413.0
Pacific Sanddab			5.9	1.2		1.3	0.0	3.3			
Petrale Sole	0.9		2.3	3.5	1.1	0.5	4.6	4.6	2.2		
Pygmy Rockfish									-	0.2	
Quillback Rockfish											
Redbanded Rockfish		7.6								3.9	12.0
Redstripe Rockfish									461.3	88.2	
Rex Sole	10.3	2.5	8.3	18.8	11.8	16.1	0.0	17.2	5.9	17.7	2.4
Rosethorn Rockfish		7.8							1.0	13.4	2.5
Rougheye Rockfish											
Sablefish	3.9	1.0		2.6	2.3	1.0		0.4	12.2	13.3	1.3
Sandpaper Skate										0.0	
Sharpchin Rockfish		625.3							9.8	127.0	29.1
Shortraker Rockfish											
Shortspine Thornyhead		16.5									32.5
Silvergray Rockfish		3.4							15.2	3.0	1.2
Slender Sole	0.8	0.1	0.2	2.5	0.2	1.6	0.0	1.9	0.3	0.9	0.2
Southern Rock Sole			0.8				0.9				
Splitnose Rockfish		297.1									1119.1
Spotted Ratfish		2.6		0.9			1.0	5.2	1.6	1.0	3.9
Starry Flounder											
Stripetail Rockfish										69.1	
Threadfin Sculpin		0.1						0.1	2.9	1.7	0.6
Walleye Pollock						0.6		2.1			
Widow Rockfish		1.8			4.3						1.3
Wolf Eel											
Yelloweye Rockfish		1.9								4.0	
Yellowmouth Rockfish									2.5		
Yellowtail Rockfish	48.9	12.2		139.2	339.2	50.9		5.8	40.2	11.3	
Other	0.3	1.5	0.1	0.2	0.3	0.3			1.2	0.6	5.1
Total	**295.2**	**1464.3**	**76.1**	**284.1**	**442.0**	**131.2**	**41.0**	**102.8**	**1149.8**	**751.9**	**1747.4**

Common Name	28	29	30	31	32	33	34	35	36	37	38
Arrowtooth Flounder		16.2	121.3	12.8	3.4	17.0	70.0	9.0	8.1	12.0	83.0
Aurora Rockfish		1.5									
Big Skate											
Bigfin Eelpout			0.3	0.5		2.7					
Blackbelly Eelpout										0.7	0.0
Bocaccio											
Canary Rockfish			31.5								18.1
Curlfin Sole											
Darkblotched Rockfish			1.1								
Dover Sole		53.4	30.9	98.5	103.1	87.3	15.4	0.8	17.7	8.4	7.1
English Sole			1.4							12.4	1.1
Eulachon										2.2	9.0
Flathead Sole										1.4	3.3
Greenstriped Rockfish			26.7				34.4		1.4		
Kelp Greenling											
Lingcod			1.3				13.5			4.6	
Longnose Skate		12.4	5.4	12.3	13.0	1.8		23.9			1.1
North Pacific Spiny Dogfish			32.5				3.5			17.4	67.0
Pacific Cod			63.7				29.1	2.7		0.7	1.9
Pacific Hake		1.8	2.2	60.8	0.8	59.6	5.8				
Pacific Halibut			6.5					5.6		5.2	10.6
Pacific Ocean Perch			471.7	19.2	2.7	56.4	347.2	435.2	89.8		
Pacific Sanddab										13.1	
Petrale Sole										2.4	1.0
Pygmy Rockfish			1.0								
Quillback Rockfish											
Redbanded Rockfish			12.7	4.2		2.6	9.8	23.1	0.6		
Redstripe Rockfish			8.7				36.3				
Rex Sole		5.4	16.8	20.9	1.0	3.1	6.0	1.7	0.4	31.2	47.2
Rosethorn Rockfish			6.1			0.3	2.2	2.8			
Rougheye Rockfish			4.1	163.0	35.8	3.5					
Sablefish		258.6	19.9	209.9	151.9	38.2	55.7	10.4	14.8		4.3
Sandpaper Skate		1.4		1.1	4.5	1.4					
Sharpchin Rockfish			679.5				348.4	185.5			
Shortraker Rockfish		14.1	5.7		9.3						
Shortspine Thornyhead		91.4	3.3	7.6	38.3	19.6	2.0	0.1	1.3		
Silvergray Rockfish			5.5				11.4	15.7			
Slender Sole			0.6			0.7	0.8		0.6	1.5	2.8
Southern Rock Sole											
Splitnose Rockfish			66.6			3.1	7.6	12.7	991.1		
Spotted Ratfish			1.1	1.2		1.2	17.7	2.3	0.6	2.3	2.1
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin			0.1				3.8	0.1	0.3		
Walleye Pollock						1.0					
Widow Rockfish			4.0			2.8	1.8		1.2		
Wolf Eel											
Yelloweye Rockfish			4.5								
Yellowmouth Rockfish							1.9	62.1			
Yellowtail Rockfish			27.5				4.6				10.4
Other		8.9	2.5	0.6	16.7	1.9	4.8	0.6	0.1	1.3	1.9
Total		**465.0**	**1666.2**	**612.6**	**380.3**	**304.0**	**1034.0**	**793.8**	**1128.0**	**116.6**	**271.8**

Common Name	39	40	41	42	43	44	45	46	47	48	49
Arrowtooth Flounder	58.4	49.5	106.1			2.0		2.6	2.2	1.6	
Aurora Rockfish											
Big Skate						4.7				2.0	16.5
Bigfin Eelpout		1.2	3.8								
Blackbelly Eelpout											
Bocaccio							7.1				
Canary Rockfish	3.7						0.7				
Curlfin Sole				0.4	0.7	0.4	0.9				1.7
Darkblotched Rockfish	0.8	10.2	9.3								
Dover Sole	50.5	32.8	87.9	0.1	0.4	0.2	2.4	14.6	5.8	6.9	
English Sole	2.7	0.4		7.3	21.4	14.3	11.0	86.3	34.1	25.7	
Eulachon											
Flathead Sole											
Greenstriped Rockfish	15.9				0.3				0.2		0.1
Kelp Greenling				1.2	0.3	1.2	2.4				0.1
Lingcod				3.7	3.4	4.4	51.7	32.4	35.9	61.6	29.8
Longnose Skate	15.5	10.6							7.0	7.2	
North Pacific Spiny Dogfish	6.1				5.7		12.5	155.3	24.1	5.9	12.2
Pacific Cod				4.3	4.7	4.1		2.5	13.4	42.3	0.4
Pacific Hake	14.0	35.5	15.4						0.3		
Pacific Halibut				12.1	4.2	8.8	18.4	33.9	16.4	28.3	13.4
Pacific Ocean Perch	1199.1	144.9	91.4								
Pacific Sanddab				5.1	7.8	16.2	14.3	89.9	117.3	40.1	0.3
Petrale Sole				0.6	0.2	0.2	0.6	7.2	3.0	0.3	1.5
Pygmy Rockfish											
Quillback Rockfish				1.9		2.0	19.4				
Redbanded Rockfish	12.8	3.5	5.8								
Redstripe Rockfish							231.5				
Rex Sole	162.4	8.6	84.4	0.6	1.4	1.0	0.4	2.7	2.5	1.8	0.1
Rosethorn Rockfish	8.6										
Rougheye Rockfish		67.9	50.5								
Sablefish	54.3	80.1	112.3						3.8		
Sandpaper Skate											
Sharpchin Rockfish	190.0										
Shortraker Rockfish											
Shortspine Thornyhead	0.5	59.4	54.5								
Silvergray Rockfish	29.6						2.2			1.4	
Slender Sole	1.3	0.1	1.6							0.1	
Southern Rock Sole				5.4	5.7	15.9	16.2			8.8	16.9
Splitnose Rockfish	23.4	1.1	1.2								
Spotted Ratfish	1.1	2.8	2.9	20.1	11.1	9.3	32.6	3.0	4.9	1.5	38.2
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin					0.0	0.9	0.7			0.1	
Walleye Pollock											
Widow Rockfish	9.5						1918.9				
Wolf Eel										4.7	
Yelloweye Rockfish				2.5			3.3				
Yellowmouth Rockfish	6.1										
Yellowtail Rockfish	282.3										
Other	0.6	0.3	3.9	0.2	0.5	0.0	1.1	0.1	1.8	0.8	4.1
Total	**2148.9**	**508.8**	**631.1**	**65.3**	**67.8**	**85.6**	**2348.1**	**430.5**	**272.9**	**241.1**	**135.2**

Common Name	50	51	52	53	54	55	56	57	58	59	60
Arrowtooth Flounder	154.0	18.4	0.3	27.5	17.1	3.9	10.6	6.4	23.9	2.4	214.2
Aurora Rockfish							1.8				
Big Skate			2.1							38.6	
Bigfin Eelpout						0.4	2.3	0.5			
Blackbelly Eelpout	1.0										0.4
Bocaccio				0.9							
Canary Rockfish			3.2	35.8	14.0				10.1		
Curlfin Sole			1.7							4.4	0.5
Darkblotched Rockfish						16.3	13.3	23.6			
Dover Sole	76.4	145.1	3.9	42.1	7.3	9.8	114.7	45.5	3.9	0.3	11.3
English Sole	0.4		65.5	11.9					4.4	25.3	5.9
Eulachon	-	0.8									1.1
Flathead Sole	42.9	1.5									12.4
Greenstriped Rockfish		1.4	0.1	21.6	98.2				3.8		
Kelp Greenling			0.4								
Lingcod	9.9	19.3	6.2								1.9
Longnose Skate	10.5	8.7	12.4	0.8	14.4		1.7	5.4			
North Pacific Spiny Dogfish	60.7	90.8	20.6						89.6	11.3	103.9
Pacific Cod	28.7	21.2	14.4	2.8	10.8				4.0		4.2
Pacific Hake						45.9	43.7	114.0	0.7		
Pacific Halibut		6.8	6.3		8.2					11.7	7.1
Pacific Ocean Perch				4.4	175.5	377.3	717.8	90.6			
Pacific Sanddab			12.2							44.9	
Petrale Sole		0.7	0.8				1.4				5.7
Pygmy Rockfish					1.3				0.1		
Quillback Rockfish			5.2								
Redbanded Rockfish					6.0	1.4	3.2	49.6	2.2		
Redstripe Rockfish			0.9	116.4	226.0						
Rex Sole	115.6	55.1	13.6	28.6	5.9	56.5	57.7	14.5	7.9	1.6	21.6
Rosethorn Rockfish				5.2	24.9	5.4	0.6	4.4			
Rougheye Rockfish	1.8					42.4	251.2	51.5			
Sablefish	25.5	4.8		3.5	8.6	20.2	19.7	5.6	2.9		6.2
Sandpaper Skate											
Sharpchin Rockfish				147.2	24.2						
Shortraker Rockfish							3.0				
Shortspine Thornyhead						49.8	75.8	31.2			
Silvergray Rockfish				15.3	36.8	2.8		5.5			
Slender Sole	8.4	0.2		1.0	0.3	0.5		1.2			3.0
Southern Rock Sole	1.6	0.2	3.3							6.2	
Splitnose Rockfish	0.1					0.3	0.5	1082.9			
Spotted Ratfish	62.6	167.4	40.1	7.5	2.4	1.0	0.7		1.2	5.8	8.1
Starry Flounder										6.6	
Stripetail Rockfish											
Threadfin Sculpin				0.6	4.6	0.2					0.3
Walleye Pollock	3.3	4.7									
Widow Rockfish					3.1						
Wolf Eel											
Yelloweye Rockfish				24.2	4.4						
Yellowmouth Rockfish											
Yellowtail Rockfish	1.9		4.2	186.3	50.2	2.3			3.6		26.3
Other	2.4	12.7	1.0	0.3	1.6	3.3	0.9	1.6	1.2	0.2	23.6
Total	**607.6**	**559.6**	**218.5**	**683.8**	**745.7**	**639.6**	**1320.7**	**1534.0**	**159.3**	**159.2**	**457.8**

Common Name	61	62	63	64	65	66	67	68	69	70	71
Arrowtooth Flounder	18.9	280.1	384.7	97.5	56.3	26.3	73.2	21.4	20.0	23.8	281.9
Aurora Rockfish											
Big Skate											
Bigfin Eelpout											
Blackbelly Eelpout	1.8	0.4	0.2			0.9	1.0	0.2	-	0.7	
Bocaccio											
Canary Rockfish			1.4	2.1	6.8						
Curlfin Sole											
Darkblotched Rockfish											
Dover Sole	1.2	6.7	13.4	2.6	3.6	1.1	2.1	0.7	2.6	10.0	20.6
English Sole	13.6	2.2	10.0	42.9	3.5	10.7	12.3	13.2	50.3	23.2	9.3
Eulachon	1.7	1.2				2.8	1.4	0.1	-	1.0	
Flathead Sole	15.2	3.2	0.5			0.4	0.1	1.8	0.5	0.3	
Greenstriped Rockfish				5.7	33.4	2.8	0.7				0.0
Kelp Greenling											
Lingcod	13.2	13.8	0.9		42.7	3.9	4.7	15.6	13.3	11.7	9.5
Longnose Skate	7.7	13.3		1.6	15.1	5.2	4.3			2.1	
North Pacific Spiny Dogfish	57.0	40.3	19.1	2.8	5.4	37.9	119.7	22.5	10.9	25.7	51.1
Pacific Cod	18.8	1.2		9.2		10.9	12.7		0.3	2.7	27.6
Pacific Hake											
Pacific Halibut		4.2				6.0				4.1	5.0
Pacific Ocean Perch				67.1	5.5						
Pacific Sanddab	28.9	1.7						15.9	17.0	12.6	
Petrale Sole	7.6	9.3	1.6	0.7	4.5	2.5	6.9	3.8	2.9	10.4	15.0
Pygmy Rockfish					0.4						
Quillback Rockfish											
Redbanded Rockfish											
Redstripe Rockfish				3.9	1.5						
Rex Sole	19.5	15.0	20.3	26.0	17.1	28.3	29.7	15.1	17.9	71.8	49.1
Rosethorn Rockfish					1.6						
Rougheye Rockfish											
Sablefish	6.1	5.2	3.1	1.6			1.9				12.5
Sandpaper Skate											
Sharpchin Rockfish					1.7						
Shortraker Rockfish											
Shortspine Thornyhead											
Silvergray Rockfish				8.8	2.4						
Slender Sole	4.9	3.2	1.4	1.1	1.1	2.2	2.0	2.4	0.3	1.0	0.5
Southern Rock Sole									3.1		
Splitnose Rockfish											
Spotted Ratfish	1.0	4.3	1.5	1.3		0.8	2.2	3.3	2.8	0.7	0.1
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin			0.3		2.5	0.3					
Walleye Pollock	0.3									0.3	
Widow Rockfish											
Wolf Eel											
Yelloweye Rockfish					14.6						
Yellowmouth Rockfish											
Yellowtail Rockfish	12.9	41.4	20.7	279.6	1.3	13.1	13.5	5.0			114.4
Other	10.8	3.1	0.9	1.0	5.5	0.1	0.2	0.0	0.1	1.5	0.0
Total	**241.2**	**449.7**	**480.0**	**555.7**	**226.3**	**156.2**	**288.3**	**121.0**	**141.9**	**203.5**	**596.7**

Common Name	72	73	74	75	76	77	78	79	80	81	82
Arrowtooth Flounder	205.1	443.6	178.5	1321.3	99.2	1389.7	460.8	165.5			31.8
Aurora Rockfish											
Big Skate											
Bigfin Eelpout											
Blackbelly Eelpout	-										
Bocaccio				6.9				29.5			3.5
Canary Rockfish	1.9	2.5	6.1	2.0		2.7	3.1	1192.4			
Curlfin Sole										0.8	
Darkblotched Rockfish			0.1								
Dover Sole	19.4	21.2	19.2	4.6	4.4	36.9	35.0	8.7			5.2
English Sole	19.5	2.0			3.9	9.8					7.6
Eulachon			0.0								0.6
Flathead Sole											0.1
Greenstriped Rockfish	0.8	9.7	1.5	8.9	0.5		24.1	9.2			19.8
Kelp Greenling											
Lingcod		3.9	22.0	20.6		7.7	34.6	33.8		9.7	
Longnose Skate		9.2		27.2		5.7	47.2	18.6			
North Pacific Spiny Dogfish	62.1	178.6	76.4	69.4	53.6	79.9	35.4	47.9			10.1
Pacific Cod	6.0	3.2	1.9	3.1		2.0	3.3	0.9		14.9	4.8
Pacific Hake	1.2	0.9									0.9
Pacific Halibut					4.4		6.8	28.0		3.6	18.9
Pacific Ocean Perch		0.1	2.0	228.3	4.7	1.8	257.8	11.3			
Pacific Sanddab										2.0	
Petrale Sole	33.4	3.4	1.6	3.4	45.9	20.5	2.3	31.6		3.8	1.3
Pygmy Rockfish							-	1.6			
Quillback Rockfish											
Redbanded Rockfish			1.3				3.4				
Redstripe Rockfish				0.4				0.7		-	
Rex Sole	37.6	13.2	23.6	1.9	9.6	23.8	21.2	6.3			20.1
Rosethorn Rockfish				1.6			1.9	3.8			
Rougheye Rockfish											
Sablefish	40.3	675.7	1.1	3.8	17.8	1.4	3.6				4.4
Sandpaper Skate											
Sharpchin Rockfish			27.1	30.6			57.9	4.7			
Shortraker Rockfish											
Shortspine Thornyhead				0.1							
Silvergray Rockfish		2.8	3.6	46.3	4.8		224.1	56.0			
Slender Sole	1.6	0.5	0.3	0.3	0.4	1.2	2.7	0.3			2.1
Southern Rock Sole										140.3	5.2
Splitnose Rockfish											
Spotted Ratfish	0.1	3.5	0.8	5.3	0.7	1.4	0.2	0.9		13.4	2.8
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin				0.3		0.1	0.3	2.7			
Walleye Pollock											0.1
Widow Rockfish							2.4	8.2			
Wolf Eel								4.6			
Yelloweye Rockfish				1.9			3.3	8.2			
Yellowmouth Rockfish							55.6				
Yellowtail Rockfish	296.1		44.0	81.5			32.3	516.3			
Other	1.1	0.0	0.8	0.1	1.2	0.7	0.9	12.4		-	-
Total	**726.1**	**1373.8**	**411.9**	**1869.6**	**251.1**	**1585.3**	**1320.0**	**2204.1**		**188.4**	**139.4**

Common Name	83	84	85	86	87	88	89	90	91	92	93
Arrowtooth Flounder	20.7	16.1	30.6	60.9	108.3		608.4	108.8	162.8	43.8	55.2
Aurora Rockfish											
Big Skate											
Bigfin Eelpout					1.9		1.7				
Blackbelly Eelpout											
Bocaccio								3.6	7.0		1.0
Canary Rockfish	1.7			6.6				920.9	1189.4		58.1
Curlfin Sole											
Darkblotched Rockfish										4.4	
Dover Sole	31.9	0.4	1.1	1.4	69.6		84.0	10.9	54.6	6.8	58.9
English Sole							1.2	63.9	73.3		1.3
Eulachon											
Flathead Sole									0.6		0.4
Greenstriped Rockfish	31.6	6.5	16.1	26.9	20.6		7.6		17.0	1.2	19.5
Kelp Greenling											
Lingcod					6.7				6.0		4.8
Longnose Skate					3.6						
North Pacific Spiny Dogfish	89.4	111.4	117.0	163.5	65.6		12.5	1.2	25.2		24.7
Pacific Cod	6.0	2.8	19.1	15.8	9.2			41.6	44.1		
Pacific Hake	1.8	4.6	1.7	1.5	1.1		19.0		9.6		0.8
Pacific Halibut		5.3	91.2	8.0							
Pacific Ocean Perch	86.3	2439.9	756.6	272.1	18.6		192.6		14.0	158.7	35.2
Pacific Sanddab											
Petrale Sole					0.7		0.4	9.7	63.4		1.4
Pygmy Rockfish	-		0.2	0.3							
Quillback Rockfish											
Redbanded Rockfish	7.4	0.1	21.1	17.3	9.1		14.4			4.8	58.5
Redstripe Rockfish	71.4	3.0	19.4	6.2	15.2				474.7		4.0
Rex Sole	34.6	2.2	23.1	18.2	17.0		27.9	28.8	44.0	0.7	3.8
Rosethorn Rockfish	19.0	0.9	8.5	7.5	7.8		1.8		0.1	1.9	1.8
Rougheye Rockfish											
Sablefish	9.3	4.1	7.3	10.6	38.3		13.7		25.1		21.5
Sandpaper Skate											
Sharpchin Rockfish	173.8	8.5	510.6	612.4	232.6		130.3		44.4	86.9	323.3
Shortraker Rockfish											
Shortspine Thornyhead	13.6	13.6	9.1	0.0	12.6		8.2			29.0	
Silvergray Rockfish	50.6	44.0	122.4	66.2	23.7		4.9	5.1	222.0	10.0	38.9
Slender Sole	0.2	0.1			0.2		0.3	0.7	1.9	0.2	3.8
Southern Rock Sole											
Splitnose Rockfish	3.4	20.8	3.2	8.5	8.5		2.4			0.3	
Spotted Ratfish	6.2	2.0	0.5	1.2	0.1			3.1			-
Starry Flounder											
Stripetail Rockfish											0.7
Threadfin Sculpin	0.5								0.2		0.2
Walleye Pollock		0.5							0.7		0.8
Widow Rockfish		1.8	0.7				2.1				1.6
Wolf Eel											
Yelloweye Rockfish			3.9	6.2					1.5		8.1
Yellowmouth Rockfish	67.5	229.9	485.3	236.2	43.7						
Yellowtail Rockfish				1.6			19.2	140.9	11.3	2.9	255.5
Other	5.4	1.8	2.3	3.3	2.4		2.1	0.2	0.4	3.5	0.5
Total	**732.3**	**2920.5**	**2250.6**	**1552.4**	**717.2**		**1154.1**	**1339.3**	**2493.3**	**354.9**	**984.5**

Common Name	94	95	96	97	98	99	100	101	102	103	104
Arrowtooth Flounder	55.0				66.6	61.2	26.0	5.8	418.9	1111.8	1308.9
Aurora Rockfish								21.2	1.8		
Big Skate											
Bigfin Eelpout								1.0	0.5		
Blackbelly Eelpout	-									-	
Bocaccio					25.4						
Canary Rockfish	33.7	2.0			16.1	30.3		5.7	3.6	1.0	
Curlfin Sole											
Darkblotched Rockfish								54.4	11.7	0.4	0.2
Dover Sole	177.4				28.9	43.4	59.6	45.9	31.8	29.8	16.1
English Sole	4.2		0.2			39.8	0.8		1.1		
Eulachon										0.3	0.1
Flathead Sole	1.3										0.3
Greenstriped Rockfish	0.7				16.9	73.7	9.7	0.5	10.7	1.9	
Kelp Greenling											
Lingcod	14.9		0.6	4.5	1.5				1.5	3.8	7.1
Longnose Skate							0.3		6.5		5.0
North Pacific Spiny Dogfish	14.5	35.4	4.5	27.4	27.8	6.0	2.5			6.7	53.9
Pacific Cod	14.0					6.8	0.8		4.0	51.3	7.2
Pacific Hake						1.3		43.0	1.6		
Pacific Halibut		11.5		11.0	6.7	3.4					
Pacific Ocean Perch	2.1				8.1	39.3	1.9	368.6	69.1	2.9	0.1
Pacific Sanddab											
Petrale Sole	8.3	1.6		1.5	31.8	0.9				1.3	
Pygmy Rockfish					0.1						
Quillback Rockfish			3.1	5.3							
Redbanded Rockfish	4.8				1.4			11.4	1.3		
Redstripe Rockfish		1.1		0.4	22.1	120.3	23.1	1.9	0.9		
Rex Sole	150.5				18.0	31.1	17.0	0.5	129.5	10.1	15.0
Rosethorn Rockfish					1.3	0.4	1.0		1.3		
Rougheye Rockfish								283.2	17.2		
Sablefish	6.5					2.8	9.8	28.3	4.7	3.8	9.5
Sandpaper Skate							0.3				
Sharpchin Rockfish	5.2				25.8		11.7		20.3	0.4	
Shortraker Rockfish											
Shortspine Thornyhead								35.4	0.5		
Silvergray Rockfish					38.2						
Slender Sole	10.2				0.4	5.0	0.6	0.3	2.4	0.6	0.4
Southern Rock Sole		5.2	1.4	10.3							
Splitnose Rockfish								16.3			
Spotted Ratfish	0.1	10.6	13.7	7.9	3.0	0.2	2.3			0.9	2.6
Starry Flounder											
Stripetail Rockfish	7.1					0.6					
Threadfin Sculpin	-				0.6	0.2	2.4	0.7	0.2		
Walleye Pollock	0.2										
Widow Rockfish					31.2						
Wolf Eel											
Yelloweye Rockfish							5.4				
Yellowmouth Rockfish											
Yellowtail Rockfish					691.5	518.5	23.1			9.8	9.8
Other	2.6	0.8	-	1.5	0.6	0.3	2.9	3.3	1.8	0.1	1.5
Total	**513.3**	**68.3**	**23.5**	**69.7**	**1063.8**	**985.4**	**201.3**	**927.4**	**742.7**	**1236.5**	**1437.6**

Common Name	105	106	107	108	109	110	111	112	113	114	115
Arrowtooth Flounder				869.5	22.3	26.3	2.4	381.2	1214.2	283.0	2.8
Aurora Rockfish											
Big Skate	14.9										2.7
Bigfin Eelpout											
Blackbelly Eelpout				1.7	3.7	0.9	0.7	0.5	0.2	0.2	
Bocaccio									3.7		
Canary Rockfish					16.5	19.2	6.2	1.2	1.1		
Curlfin Sole	1.9										
Darkblotched Rockfish											
Dover Sole	3.5			44.4	41.4	26.7	16.4	6.1	11.6	28.8	0.3
English Sole	21.7			0.9	113.7	48.3	105.1	40.6	24.5	4.7	49.1
Eulachon					6.6	3.7	0.3	0.1			
Flathead Sole				44.7	42.8	73.6	4.5	2.4	1.5	0.1	
Greenstriped Rockfish							-				
Kelp Greenling		0.3	0.3								
Lingcod	30.0	37.7	6.1	5.4	5.5	2.2	0.5	21.8	8.2	5.3	27.4
Longnose Skate	7.7			12.6	9.1	14.6	8.0	5.2	15.2		8.6
North Pacific Spiny Dogfish	1656.9	24.0		2402.9	100.3	58.9	69.4	206.7	139.4	17.4	25.7
Pacific Cod	139.0			3.4	13.2	3.0	2.0	7.4	146.1	6.7	
Pacific Hake				1.6		0.6	2.2				
Pacific Halibut		44.4	31.8		6.3		13.5			8.4	
Pacific Ocean Perch											
Pacific Sanddab	108.4	0.1			10.1	75.7	26.0				22.8
Petrale Sole	45.2	4.7	0.4		7.8	5.1	2.8	5.5	33.5	6.2	9.2
Pygmy Rockfish											
Quillback Rockfish		2.8		1.6	0.8						
Redbanded Rockfish											
Redstripe Rockfish											
Rex Sole	6.3			40.3	30.4	18.1	24.4	26.2	35.7	26.7	3.9
Rosethorn Rockfish											
Rougheye Rockfish											
Sablefish	1.2			1.3	12.4	4.5		7.9	19.6	16.4	
Sandpaper Skate											
Sharpchin Rockfish											
Shortraker Rockfish											
Shortspine Thornyhead											
Silvergray Rockfish											
Slender Sole				1.8	3.7	2.3	0.7	0.8	4.7	1.5	
Southern Rock Sole	0.7	0.9	1.3				0.9	0.7			0.8
Splitnose Rockfish											
Spotted Ratfish	23.6	428.2	73.3	18.6	14.3	6.2	35.3	2.5	2.0	1.3	1.0
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin											
Walleye Pollock					15.3	93.4					
Widow Rockfish											
Wolf Eel											
Yelloweye Rockfish			3.6								
Yellowmouth Rockfish											
Yellowtail Rockfish				12.4				20.9	237.4	3.2	
Other	0.2	8.0	2.3	1.3	24.5	4.7	1.1	0.7	1.0	0.5	-
Total	**2061.4**	**551.1**	**119.1**	**3464.6**	**500.5**	**487.9**	**322.3**	**738.4**	**1899.7**	**410.4**	**154.3**

Common Name	116	117	118	119	120	121	122	123	124	125	126
Arrowtooth Flounder	34.6	26.9	51.4	11.8	114.5	456.2	58.4	50.2	12.8	21.5	33.5
Aurora Rockfish											
Big Skate			2.1								
Bigfin Eelpout											
Blackbelly Eelpout			0.3	0.6		0.1					
Bocaccio							1.3	6.3			
Canary Rockfish				1.2		1.9	3.8	106.9	44.4	193.6	
Curlfin Sole											
Darkblotched Rockfish							2.3				
Dover Sole	2.2	0.4	2.6	4.6	2.3	11.5	14.7	45.2	4.6	3.1	14.8
English Sole	27.0	32.6	83.4	10.9	3.0	15.3		1.5			26.7
Eulachon			2.3	0.2		0.1					0.2
Flathead Sole			2.9	0.9							
Greenstriped Rockfish				0.3	9.6	0.8	9.6	37.9	62.3	5.6	0.2
Kelp Greenling					0.5						
Lingcod	16.9	33.4	1.9	1.3	25.5				9.1	106.7	
Longnose Skate	4.6		10.0	3.8		7.2	14.7			4.0	10.4
North Pacific Spiny Dogfish	9.5	13.4	16.5	109.8	21.9	38.6	29.9	19.4	43.6	20.4	49.3
Pacific Cod	2.4	0.8	31.9	14.1	24.7	82.2	17.6	10.4	24.4		29.3
Pacific Hake			0.7			3.7	4.3				
Pacific Halibut		5.0		3.9	14.6					4.0	
Pacific Ocean Perch							4438.8	0.5	10.0		
Pacific Sanddab	5.6	8.4	1.4								
Petrale Sole	11.6	16.5	32.3	6.0	5.4	44.2	2.0			6.9	14.6
Pygmy Rockfish					0.4			1.7	2.6		
Quillback Rockfish											
Redbanded Rockfish							27.1				
Redstripe Rockfish					0.3		1.0	299.8	70.3		
Rex Sole	43.1	14.9	20.8	47.3	6.0	17.2	75.9	43.4	24.1	37.4	16.0
Rosethorn Rockfish					0.4		0.4	0.3	10.4		
Rougheye Rockfish				-							
Sablefish		0.5	14.2	1.5		12.1	26.1	32.7	24.4	6.4	8.3
Sandpaper Skate											
Sharpchin Rockfish					-		43.1	4.7	35.4		
Shortraker Rockfish											
Shortspine Thornyhead							0.7				
Silvergray Rockfish							9.7	81.8	66.0	4.0	
Slender Sole		0.5	2.0	4.6	0.9	0.7	0.2	0.8	0.3	0.4	1.4
Southern Rock Sole	0.1										
Splitnose Rockfish											
Spotted Ratfish	3.0	1.3	0.1	0.7				2.6	0.1		0.2
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin					1.6	0.3	0.2	1.4	1.7		0.2
Walleye Pollock							4.3				
Widow Rockfish							5.6				
Wolf Eel											
Yelloweye Rockfish					4.6			5.5	37.1	4.6	
Yellowmouth Rockfish											
Yellowtail Rockfish			15.4	21.9	4.0	82.6	526.1	112.7	5.4		2.3
Other	0.5	0.1	3.2	-	2.3	0.2	0.4	3.0	4.7	2.9	1.4
Total	**161.1**	**154.7**	**295.1**	**245.4**	**242.4**	**774.6**	**5318.0**	**868.8**	**493.7**	**421.5**	**208.8**

Common Name	127	128	129	130	131	132	133	134	135	136	137
Arrowtooth Flounder	112.4	47.8	218.0	50.9	25.7	149.1	78.3	70.5	217.1	57.9	158.6
Aurora Rockfish											
Big Skate											
Bigfin Eelpout	0.6			0.2	1.9						
Blackbelly Eelpout		0.2					-		0.1		0.5
Bocaccio						1.2	2.1			1.6	
Canary Rockfish	11.5	4.3	22.9	2.4			3.6		1.4	7.6	
Curlfin Sole											
Darkblotched Rockfish				1.4					0.4		
Dover Sole	17.5	5.0	27.2	18.0	31.9	6.1	3.6	7.8	4.7	17.4	7.0
English Sole						122.4	1.0	41.7	0.6		0.4
Eulachon	0.2	0.4									4.8
Flathead Sole	0.6										23.7
Greenstriped Rockfish	-	2.0	12.1	4.0	0.7	12.4	26.2	23.4	2.2	41.4	
Kelp Greenling											
Lingcod		2.1					51.7	17.6	1.3	10.4	1.2
Longnose Skate		0.5					7.6		6.2		9.7
North Pacific Spiny Dogfish	30.9	35.7	85.8	8.4	1.3	49.6	58.8	18.4	68.9	25.4	576.1
Pacific Cod	1.3		6.2			5.8	23.7	11.4	2.5	26.2	25.1
Pacific Hake	4.4	5.0		17.1	77.9	1.1	0.8		7.7		1.3
Pacific Halibut			5.1				6.9				
Pacific Ocean Perch			4.3	283.4	120.7	45.4	0.4		-	5.8	
Pacific Sanddab											
Petrale Sole	1.0		1.2			1.3		2.3	2.0	1.5	
Pygmy Rockfish							0.8	0.1		0.6	
Quillback Rockfish											
Redbanded Rockfish		1.3		8.9	3.9					0.2	
Redstripe Rockfish						62.8	3.0	0.6		266.5	
Rex Sole	42.6	31.2	68.4	76.7	21.2	15.5	11.9	28.8	9.1	32.9	9.3
Rosethorn Rockfish							4.8	0.6		3.4	
Rougheye Rockfish											
Sablefish	12.8	11.5	466.2	67.4	43.8	31.6		1.0	6.9	16.4	29.2
Sandpaper Skate											
Sharpchin Rockfish					0.3		0.7	0.1		44.4	
Shortraker Rockfish											
Shortspine Thornyhead				8.7	16.8						
Silvergray Rockfish								2.0		3.7	
Slender Sole	3.7	6.2	4.1	1.1	0.6	0.8	0.6	2.0	0.9	0.2	3.7
Southern Rock Sole											
Splitnose Rockfish				31.7	301.4	5.5					
Spotted Ratfish		0.9	0.5	1.7	0.7		1.4	0.2	1.4		2.6
Starry Flounder											
Stripetail Rockfish											
Threadfin Sculpin	-						5.7	1.3	0.3	6.2	0.5
Walleye Pollock											0.8
Widow Rockfish			9.3							9.3	
Wolf Eel											
Yelloweye Rockfish							35.2	3.3			
Yellowmouth Rockfish											
Yellowtail Rockfish	12.4	29.4	170.7	3.5		43.5	38.8		76.3	1658.9	5.2
Other	6.3	1.0	0.5	1.9	0.9		0.7	2.5	0.3	5.9	1.7
Total	**258.1**	**184.6**	**1102.4**	**587.3**	**649.5**	**553.9**	**368.3**	**235.5**	**410.1**	**2243.6**	**861.4**

Common Name	138	139	140	141	142	143	144
Arrowtooth Flounder	1.4	264.6	24.9	797.3	1.7	0.5	
Aurora Rockfish							
Big Skate						4.1	
Bigfin Eelpout							
Blackbelly Eelpout	0.1			0.1	0.2	-	
Bocaccio							
Canary Rockfish							
Curlfin Sole							
Darkblotched Rockfish		1.3		0.4			
Dover Sole	1.3	20.1	1.8	30.1	1.1		0.3
English Sole	10.2	11.9	32.8	0.7	18.9	0.9	59.8
Eulachon	0.1				-		
Flathead Sole	0.4			0.6			
Greenstriped Rockfish	0.2	0.7	13.8	2.4			
Kelp Greenling							
Lingcod	12.6	1.0	3.0	3.7	2.9		
Longnose Skate	2.6	3.0	5.9	10.8	1.1	17.7	
North Pacific Spiny Dogfish	25.7	56.5	3037.2	580.7	1098.9	1646.7	3037.6
Pacific Cod		37.9	81.5	4.1	12.8	45.2	138.9
Pacific Hake							
Pacific Halibut	3.5				7.0		4.2
Pacific Ocean Perch			1.4				
Pacific Sanddab	32.2				0.6		49.2
Petrale Sole	4.8	0.7	2.3	1.0	18.4	10.3	17.8
Pygmy Rockfish							
Quillback Rockfish							
Redbanded Rockfish							
Redstripe Rockfish							
Rex Sole	21.9	70.8	3.1	25.8	0.3		0.2
Rosethorn Rockfish							
Rougheye Rockfish				1.9			
Sablefish	0.8	3.9	53.8	36.0	36.5	126.4	
Sandpaper Skate				1.4			
Sharpchin Rockfish		0.7					
Shortraker Rockfish							
Shortspine Thornyhead							
Silvergray Rockfish							
Slender Sole	0.7	3.3	0.8	4.3	0.3		0.6
Southern Rock Sole							0.8
Splitnose Rockfish							
Spotted Ratfish	0.5	14.7	22.6	11.2	1.3	1.3	
Starry Flounder							
Stripetail Rockfish							
Threadfin Sculpin		0.3	1.2	0.4			
Walleye Pollock					266.5	396.3	1060.3
Widow Rockfish							
Wolf Eel							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish	2.1	29.3	1.6	6.4		7.7	
Other	0.7	0.4	0.2	1.2	0.7	4.5	
Total	**121.7**	**521.1**	**3288.0**	**1520.5**	**1469.3**	**2261.5**	**4369.5**