

Summary of the annual 2012 sablefish (*Anoplopoma fimbria*) trap survey, October 9 - November 17, 2012

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2012

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Canadian Technical Report of Fisheries and Aquatic Sciences

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OCTOBER 9 - NOVEMBER 17, 2012

by

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ABSTRACT

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This document describes sampling activities and summarizes results from the 2012 British Columbia Sablefish research and assessment survey. It is intended to provide a historical reference for researchers and industry. This annual survey utilized the same sampling strategy as earlier years at stratified random (StRS) sites within depth-stratified areas.

The survey utilized the same three sampling strategies and longline trap gear used in surveys since 2003. Sampling strategies included sampling at stratified random sites (StRS), traditional inlet sites, and one exploratory area. The random component included StRS sets at five depth-stratified areas and the traditional component included standardized sets at four inlet localities on the mainland. The exploratory component included two sets in a northern Vancouver Island inlet to evaluate Sablefish density and/or size compositions. A benthic impact study was also initiated where digital images were collected to assess the impact of longline trap gear on the benthic habitat.

Biological sampling for sablefish included collection of length, weight, sex, maturity and age structures. Sablefish were randomly sampled from every third trap on all sets, up to a maximum sample size of 60 sablefish. Biological samples (length, weight, sex, maturity, otoliths and genetic samples) were taken for rougheye/blackspotted rockfish species from catch in all traps. The tag and release study has been conducted annually since 1991 and was continued in 2012. Sablefish were selected randomly for tag and release from every third trap up to a maximum of 125 fish.

In total, x sablefish were caught in 2012, of which x were used for biological samples and x were tagged and released. Of those released, x were recaptured tagged fish. x recaptured fish was retained for sampling and the remaining x were fitted with a new tag and released back into the water.

Catch rates are an important product from this survey. They can be used to infer population trends, which are critical data elements used in stock assessment. Catch rates from stratified random sets in the shallow depth stratum have shown a gradual decline from 2003 to 2009, increasing in 2010 and 2011 and decreasing in 2012. Catch rates in the middle depth stratum declined between 2003 and 2010, increased in 2011, and decreased in 2012. Catch rates from the deep depth stratum increased between 2003 and 2006, were variable in the preceding three years and increased in both 2010 and 2011 and decreased again in 2012. Between 2008 and 2011, traditional standardized sets at mainland inlet locations showed a steady increase in catch rates, and in 2012, the catch rate dropped to 2010 levels.

RÉSUMÉ

Lacko, L.C. and Acheson, S.M. 2012. Summary of the annual 2012 sablefish (*Anoplopoma fimbria*) trap survey, October 9 - November 17, 2012. Can. Tech. Rep. Fish. Aquat. Sci. nnn: vi + 66 p.

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1 Introduction

Sablefish (*Anoplopoma fimbria*) are a commercially valuable species that are harvested in British Columbia (BC) using trap, longline and trawl gear as part of the integrated groundfish fishery. For the past ten years (2003 to 2012), BC fishermen have landed an average of 3,006 metric tons of sablefish annually. The majority of sablefish in 2012 were captured by longline trap gear (40%) and longline hook gear (52%). Commercial harvest of sablefish typically occurs at depths up to 985 fathoms, along the steep-walled slopes off the west coast of Haida Gwaii (formerly Queen Charlotte Islands), in the complex troughs of Queen Charlotte Sound, and in the steep canyons and ridges off the west coast of Vancouver Island.

Fishery-independent research and assessment surveys for sablefish have been conducted in BC coastal waters since 1988. Survey procedures have evolved over time, but each year they have consisted of fishing sets using trap gear at randomly selected and/or index sites. These surveys are used to obtain catch rate data, gather biological samples, capture oceanographic measurements and collect tag release and recapture data. In turn, this information is used as the key contemporary index of abundance for assessing the biological status of the sablefish stock, and to condition an operating model that serves as the biological basis of the coastal Management Strategy Evaluation.

The design of the sablefish survey has remained relatively consistent since 2011, and has been comprised of stratified random sampling (StRS) for sites along BC's continental shelf and the continuation of sampling at standardized index sites at four mainland inlets. Due to the COVID-19 virus, the 2020 survey was shortened and the inlet sites were not surveyed. For details about past survey designs, see the historic overview provided by (Wyeth and Kronlund 2003) and (Wyeth et al. 2004a). For details on specific surveys conducted from 1988 through 1993 see (Smith et al. 1996); for surveys in 1994 and 1995 see (Downes et al. 1997); for surveys from 1996 to 2000 see (Wyeth and Kronlund 2003). For the 2001 through 2006 surveys see (Wyeth and Kronlund 2003), (Wyeth et al. 2004b), (Wyeth et al. 2004a) and (Wyeth et al. 2006), respectively.

In this technical report we describe survey operations and summarize data collected on the 2012 chartered survey aboard the F/V Ocean Pearl. Tables and figures referred to in the main text are numbered sequentially. Tables and figures in the appendices are labelled with a letter code.

2 Methods

2.1 SURVEY DESIGN

Methodology for the 2012 sablefish research and assessment surveys employed a stratified random sampling (StRS) design. The survey protocol required the StRS component to be completed from the southern end of Vancouver Island to the north coast of Haida Gwaii. If weather impacts the survey plan, the inlet sites are fished before completing the northern StRS sites in order to reduce the total number of fishing days.

2.1.1 STRATIFIED RANDOM SAMPLING SURVEY DESIGN COMPONENT

Since 2011, the StRS design has been conducted in all offshore survey areas. The StRS design began in 2003 with the purpose of distributing tag releases at random, collecting biological samples and developing a catch-rate based index of abundance (Wyeth and Kronlund 2003). It also provided an alternative design to the historic traditional offshore component of the survey (1990 to 2010) which occurred at fixed locations.

Under the StRS design the offshore survey area is partitioned into five spatial strata (S_1 to S_5) and three depth strata (RD_1 to RD_3) for a total of 15 (Figure 1). The five spatial strata are S_1 (South West Coast Vancouver Island or SWCVI), S_2 (North West Coast Vancouver Island or NWCVI), S_3 (Queen Charlotte Sound or QCS), S_4 (South West Coast of Haida Gwaii or SWCHG), and S_5 (North West Coast of Haida Gwaii or NWCHG). The three targeted depth ranges are 100-250 fathoms (RD_1), 250-450 fathoms (RD_2), and 450-750 fathoms(RD_3). The area within each of the 15 strata are sectioned into 2 km x 2 km grid cells or ‘fishing blocks’ from which set locations are randomly chosen.

From 2003 through 2005, five grid cells were randomly selected in each spatial-depth stratum. From 2006 through 2010, the number was increased to six. An analysis was completed for the 2011 survey to optimize the allocation of the blocks to strata for the 2011 and 2012 survey. However, in order to lower survey costs, the number of blocks were further reduced for the 2013 survey, from a total of 110 to 91 offshore blocks while maintaining the same relative allocation of blocks to strata. This total number of blocks has been in place on all subsequent surveys (Table ??), including 2012 (Figure 2).

2.1.2 TRADITIONAL STANDARD SURVEY COMPONENTS

Standardized fishing sets under the traditional component of the survey have specific gear, bait, and sampling protocols. The original intent of the standardized sets was to collect catch rate data in order to index trends in abundance, tag fish and obtain biological samples. In 2010 the offshore portion of the traditional standardized survey was terminated as it was shown that the continued use of the standardized survey, in combination with the StRS, resulted in greater frequency for stock assessment errors (Cox et al. 2011). Since then only standardized fishing sets within four mainland inlet localities have continued (Appendix A). A string of twenty-five (25) traps were set at five specific localities in each of the following four (4) areas: Portland Inlet, Gil Island, Finlayson Channel, and Dean/Burke Channel. Trap gear was deployed near the center of each of the five locality boundaries in order to avoid the steep slopes characteristic of these channels/fjords (Figure 3).

2.2 VESSELS

The 2012 survey of 135 sets was chartered aboard the 25.34 meter F/V Ocean Pearl (Figure 3), skippered by Darcy Nichols between Oct 9 - Nov 17 , 2012 . Information about the vessel can be found at <http://marinetrack.com>.

2.3 FISHING GEAR

The longline trap gear consisted of a groundline resting on the ocean floor with 25 baited traps attached to beackets at 150 foot intervals along its length and 90 pound anchors at each end (Figure 4, b). A flagpole was required for at least one end of the set to improve visibility for retrieval. The traps were steel frame with a bottom hoop diameter of 54 inches and covered with an North American #84 black braided nylon web of 2.75 inch mesh (Figure 4, a). The tunnels were made of green braided, knotless, 1.25 inch mesh. The traps did not include escape rings; but instead a ‘rot panel’ of # 21 cotton located above the middle ring.

Standard bait bags (6 by 12 inches) made of 1/8 inch web with a nylon drawstring and #7 stainless trolling snaps were included with the traps.

2.4 FISHING OPERATIONS

During normal survey fishing operations gear was deployed on alternate days. Prior to deployment, the Fishing Master inspected the block to determine fishability and if it was within the targeted depth range. The goal was to have as much gear as possible within the block boundaries. If unfishable, the survey protocol requires that an alternate block is to be chosen to the east, west, north, and south, respectively. If none of those blocks meet the criteria, an alternate block of the same area and depth strata was randomly chosen. In 2020, the choice of alternate blocks were limited to a pre-selected list prepared by DFO in advance of the survey.

Two science staff recorded information associated with the deployment of the gear. One science member was positioned in the wheelhouse and recorded set details on the bridge log data form. The start and end geo-referenced positions of each set were entered at the time when the first and last traps were set over the stern. Depths were recorded at one-minute intervals between the first and last anchors being set. Later, the duration of the set was calculated as the time elapsed between the first anchor being set over the stern and the first anchor hauled aboard (Appendix B, Figure B.1).

A set log was filled out on the deck by the science recorder who had maximum visibility of the crew setting the traps over the stern rail. The set log included the time and identity of the first and last buoys, anchor time, a tally of beackets and traps, as well as the unique identifying numbers of sensors deployed (Appendix B, Figure B. 2)

2.4.1 Stratified Random Component (StRS)

Sets in StRS blocks had a targeted soak time of 24 hours. Fishing sets were designated useable if hauled between 22 and 26 hours. Traps were baited with 10 pounds of loose offshore Pacific Hake (*Merluccius productus*) and 2 pounds of bagged squid.

2.5 CATCH PROCESSING

Haulback speed allowed the science crew to accurately record catch. Two science staff were positioned on deck at the haul card station; one recorded the catch and the other managed the movement of baskets. As the groundline was hauled, each becket and trap were entered in the charter catch log form (Appendix B, Figure B.3). Crew members alerted the recorder about any damage to a trap (i.e. holes) which was then recorded.

Catch by species from each trap was sorted into baskets by the crew. Baskets were then weighed to the nearest 0.2 kg on a motion compensating scale and given a basket use code of D, A, T, L, SD or F. Code D designated fish species as discards or commercial catch; code A allocated sablefish for age samples; code T allocated sablefish to be tagged and released; code L allocated fish for length samples; code SD identified sublegal sablefish discards; code F represented fish frames with amphipod or hagfish damage (Appendix B, Figure B.3). The next day, the entries on charter catch log form were transposed to tabular format on the charter catch log entry form (Appendix B, Figure B.4).

2.5.1 Sablefish Allocation Details

Sablefish were tagged from 1/3 of the traps on StRS sets and 1/2 of the traps on the inlet sets. Due to high catch numbers, the survey protocol was revised in 2018 to designate ~125 sablefish to be tagged (T) from 1/3 of the traps on all sets. When catches were high, traps targeted for tagging were spread throughout the string to avoid tagging the first 125 fish. A biological sample was collected from the coded “A” traps with the goal of selecting 50 to 60 fish. If CPUE was high, the new survey protocol of 2018 designated a minimal of two traps to be used for samples. If both traps contained more than 60 sablefish, a random process was used to select ~60 specimens.

The remaining traps were allocated to the discard category and sorted by size into either legal (D) or sublegal (SD) discards. The SD (sublegal discards) code was added during the 2017 survey to account for the large numbers of juvenile sablefish and facilitate their quick return to the ocean. Legal discards (D) of sablefish were kept by the vessel and processed as commercial catch.

2.6 BIOLOGICAL SAMPLING (LWSMO)

Biological samples were collected from sablefish and rougheye/blackspotted rockfish (*Sebastodes aleutianus/Sebastodes melanostictus*) specimens. Measurements were recorded for fork length (L), body weight (W), sex (S) and maturity level (M) (Appendix B, Figure B.5). Sagittal otoliths (O) were collected and stored for potential ageing by the sclerochronology laboratory. In addition, tissue for DNA was collected from the rougheye/blackspotted rockfish complex for later species determination. Since this complex of two distinct species (Orr and Hawkins 2008) have similar appearances with slight variations in colour markings and dorsal fin lengths, the sampler visually identified each specimen as either a rougheye, a blackspotted or a hybrid species. All rockfish

and legal-sized sablefish (fork length > 55 cm) that were sacrificed for biological samples were dressed, frozen, and landed as commercial catch.

Length (L) and weight (W) measurements were collected from all Pacific halibut (*Hippoglossus stenolepis*) before they were released at sea. Only the length (L) was recorded for Pacific sleeper sharks (*Somniosus pacificus*) before release. No biological samples were collected from other species.

2.7 SABLEFISH TAGGING

Fish destined to be tagged were transferred from the sorting area to a tagging tank. A vessel crew member was positioned to retrieve sablefish from the tank and provide assistance with fish handling. A scientist stood at the sample station and tagged fish with a Mark II Long Tagging gun loaded with Floy FD-94 T-bar anchor tags. The tag was inserted on the left side of the fish, 1 cm below and 2-3 cm behind the anterior insertion of the first dorsal fin. Fork length (mm to the nearest ½ cm) measurements were taken. Before release, any sampling errors, injuries or damage to the fish were recorded on the tagging form by a second scientist. Tag checks were performed systematically to ensure tag numbers on the data form matched those on the fish specimen (Appendix C, Figure B.6).

2.8 SABLEFISH TAG RECOVERY

Any previously tagged fish brought aboard may have been treated in one of two ways. First, sablefish with Canadian tags were re-released with a new tag and the previous tag was removed. In addition, any wounds from the old tag were recorded. Second, sablefish with a foreign agency tag or sablefish that had sustained numerous injuries were retained for biological sampling. For these specimens, the tag and otoliths were stored in a bar-coded vial that was later scanned into the GFBioField Tag Recovery Entry form (Olsen 2010). Foreign tags were returned to their country of origin.

During survey years 1992 through 1997 and 2004, previously tagged sablefish were re-released with the same tag. New tagging protocols of replacing the tag began in 2005.

2.9 OCEANOGRAPHIC SENSOR DATA COLLECTION

A Sea-bird Bird SBE 39 temperature and pressure logger was placed in a protective plastic pipe and attached to the inside of the middle or end traps. Data was successfully collected from 134 sets in 2012 (Appendix C). A SBE 39 was also placed in the tagging tank on hauling days to record water temperature. Data from the SBE temperature and pressure loggers were processed at sea after the set was complete.

2.10 ELECTRONIC MONITORING VIDEO DATA COLLECTION

During haulback, the electronic monitoring (EM) system cameras were activated by the hydraulic sensor. Three standard analog cameras were positioned at optimal viewing angles to record survey activities. Two cameras were stationed along the mast to record the catch as it was processed at the hopper. A third camera was stationed on the side of the wheelhouse to record the traps as they were brought over the rail. The video data from each set was reviewed by science staff the following day to provide quality control on catch data.

3 Results and Discussion

3.1 FISHING

Of the 91 original blocks for the StRS portion of the survey, ten were replaced at-sea and four blocks were rejected, for a total of 87 blocks successfully fished (Table ??). Of the ten replacements, one was revoked after on-ground inspection, three were located within unfishable habitat, four had failed to meet depth strata requirements, one was located in a conservation area and one generated an error.

3.2 CATCH PER UNIT EFFORT (CPUE)

The sablefish survey of 2012 have documented recent changes in the sablefish population structure.

3.2.1 Stratified Random Set CPUE

Catch per unit effort (CPUE), as indexed by kilograms of sablefish per trap, increased across most offshore survey strata in 2018, and again in 2019 (Figure 5). The most pronounced increases occurred in the middle depth strata which recorded the largest CPUEs in 2018 and 2019 since the StRS began (Figure 6). These increases in CPUE were the result of a relatively large increase in the number of small sablefish encountered on the survey (Figure 7 and Figure 8, likely due to a large recent recruitment event that has occurred coastwide (DFO 2020). The stratified mean survey abundance in 2012 was 35 kg/trap, which is down -17% from 2011 and -13% from the 2018-2019 average (DFO 2021) (Figure 9).

3.3 CATCH COMPOSITION

A total of seventy-three taxonomic groups were represented in the catches in StRS sets in 2012 (Table ??). These included thirteen roundfish species, twelve rockfish species, four flatfish species and forty-four invertebrate species. Other than sablefish, the most common species, by weight, were Pacific halibut (*Hippoglossus stenolepis*), Spiny dogfish (*Squalus acanthias*), arrowtooth flounder (*Atheresthes stomias*), rougheye/blackspotted rockfish complex (*Sebastodes aleutianus*) and pectoral rattail (*Albatrossia pectoralis*).

3.4 SABLEFISH SAMPLING

A detailed breakdown of the fate of the catch in each trap for the 2012 survey is listed in Appendix D.

During the 2012 StRS, a total of 6,213 sablefish were caught. Of that total, 2,924 were tagged and released and 983 were retained for biological sampling. Of the tagged fish, 102 were previously tagged fish that were re-released with a new tag. One previously tagged fish was retained for sampling (Appendix E).

Overall, the StRS sets had a higher proportion of females than males over the spatial strata S₂, S₃, S₄ and S₅ (Table ??). More females than males were seen in the shallow depth stratum within the spatial strata S₂, S₃, S₄ and S₅. In the mid depth stratum, there were more males than females in S₁, S₂, S₃ and S₅. The deepest depth stratum saw more females in spatial strata S₁, S₂, S₃ and S₅.

In 2012, the average mean fork length for the 2,404 females was 66 cm and the average mean fork length for the 2,282 males was 58 cm. The mean length of both females and males reached their lowest mean size since 2003 (Figure 14).

On average, female sablefish grow faster and reach a far greater size (Figure 15a) compared to males (Figure 15b).

3.5 RECOVERED TAGGED SABLEFISH

Of the 102 Canadian tagged fish that were recovered on the survey, the majority (79%) had travelled within 50 kilometers of the release site. Most of these tagged fish (70%) were recaptured within 5 years at liberty (Table ??). Three fish were recovered a second time and released a third time (Table ??).

3.6 OTHER FISH SAMPLING

Length, sex, maturity, otoliths and DNA samples were collected for the rougheye/blackspotted rockfish complex. (Appendix F).

3.7 SABLEFISH AGES

At the time of this report, sablefish ages were available until 2018. The highest proportion of male ages in StRS sets for 2003 through to 2011 were 3, 5, 5, 6, 8, 8, 8, 10 and 12 years of age, respectively. Another cohort appeared in 2012 through to 2016 as 4, 5, 7, 7 and 8 year olds. A cohort appeared to arrive in 2017 which was dominated by 3 year olds, in 2018 by 5 year olds (Figure ??a).

The highest proportion of female ages in the StRS sets for 2003 through to 2010 were 3, 4, 5, 6, 7, 8, 9 and 10 years of age, respectively. Then, another cohort appeared in 2011 through to 2015, showing up as 3, 4, 5, 6 and 7 year olds. In 2016, 2017, and 2018 the highest proportion of female sablefish were ages 3, 4, and 5 (Figure ??b).

Historic data from all samples lists the oldest female sablefish at 92 years of age collected in

2003 where as the oldest male sablefish with the age of 96 years old was documented for the year 2018.

3.8 BENTHIC IMPACTS

Canada's strongest earthquake in more than 60 years hit Haida Gwaii on Saturday October 27, 2012 at 08:04 pm. At that time, several bottom sensors were on the seafloor and recorded the seismic activity of the 7.7 magnitude earthquake. The tremor was also felt aboard the vessel (Figure x).

3.9 OCEANOGRAPHIC TEMPERATURES AND DEPTHS

Co-plots of average temperatures and average depths by 1-degree latitude intervals from southwest Vancouver Island to northwest Haida Gwaii can be found in Figure ???. The 2012 survey data exhibit a general trend of decreasing temperature with depth over latitude.

SBE 39 recorders have been placed on survey fishing sets since 2006. In the shallow waters, the lowest average temperature was 4.1 °C in 2016; the highest average temperature was 7.4 °C in 2016. Moving into the mid-depth waters, from 458-823 meters, the lowest average temperature was 2.9 °C in 2019; the highest average temperature was 6.4 °C in 2013. In the deepest waters, the lowest average temperature of 2.2 °C in 2016 and the highest average temperature was 4.1°C in 2016 (Figure ??).

3.10 ACKNOWLEDGEMENTS

The stock assessment survey and data report is the result of the collaborative efforts of many individuals. Wild Canadian Sablefish has provided coordination and support of the annual Sablefish survey since 1994. The scientific staff that conducted the 2012 sablefish research charter included Jonas Barranco, Guy Boxall, Jon Eis, Margo Elfert, Ian Hamilton, Matthew McKay, and Jonathan Monahan of Archipelago Marine Research Ltd (AMR). A special thanks to the skipper and crew of the F/V Ocean Pearl, whose efforts made the survey successful. In 2012, the crew consisted of Schon Acheson, Kristina Anderson, Lisa Lacko and Malcolm Wyeth.

4 Figures

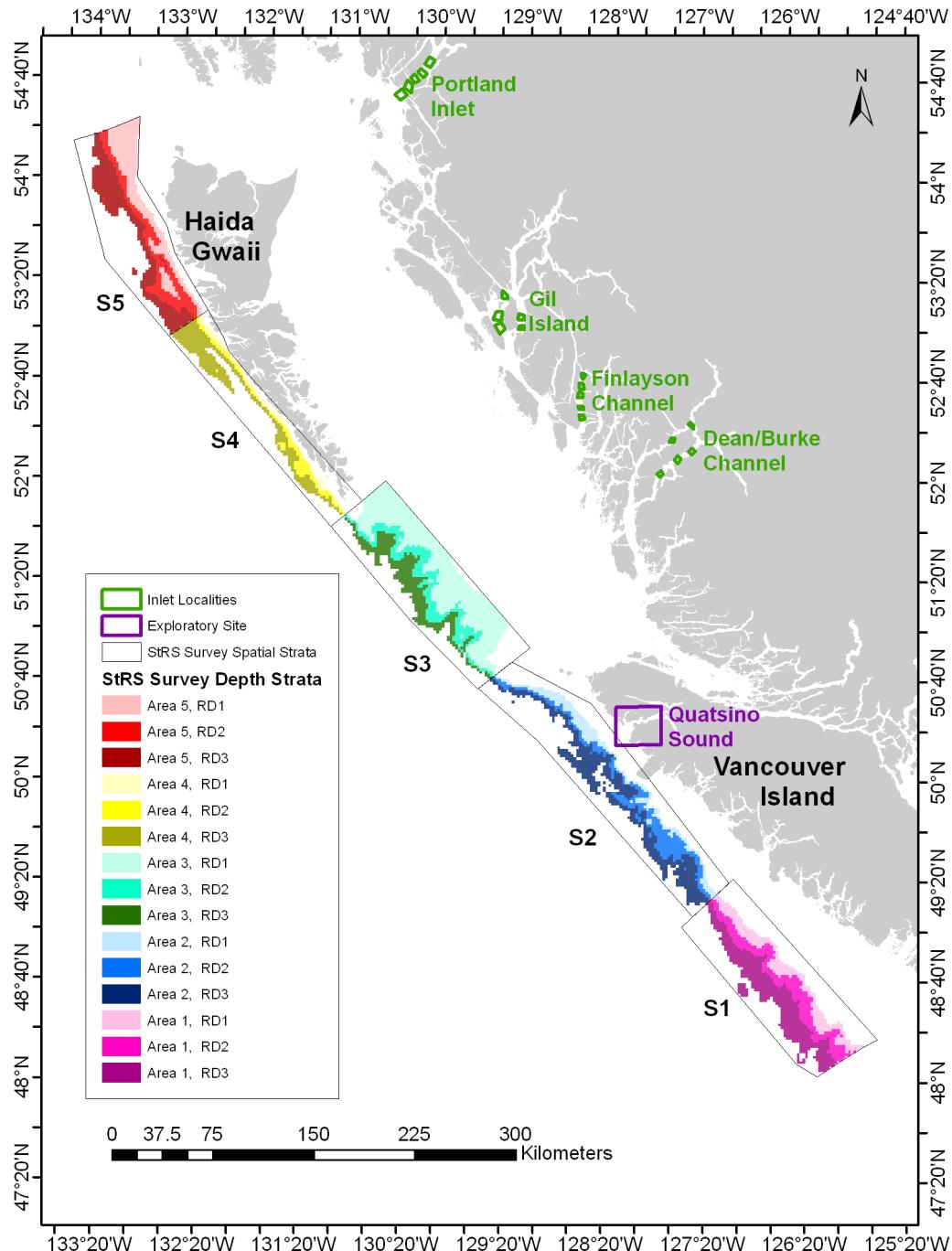


Figure 1. Location of the boundaries of the five spatial areas (S_1 - S_5) of the 2012 stratified random survey design. The three depths strata (RD₁-RD₃) are colour-coded and nested within each of the five spatial strata.

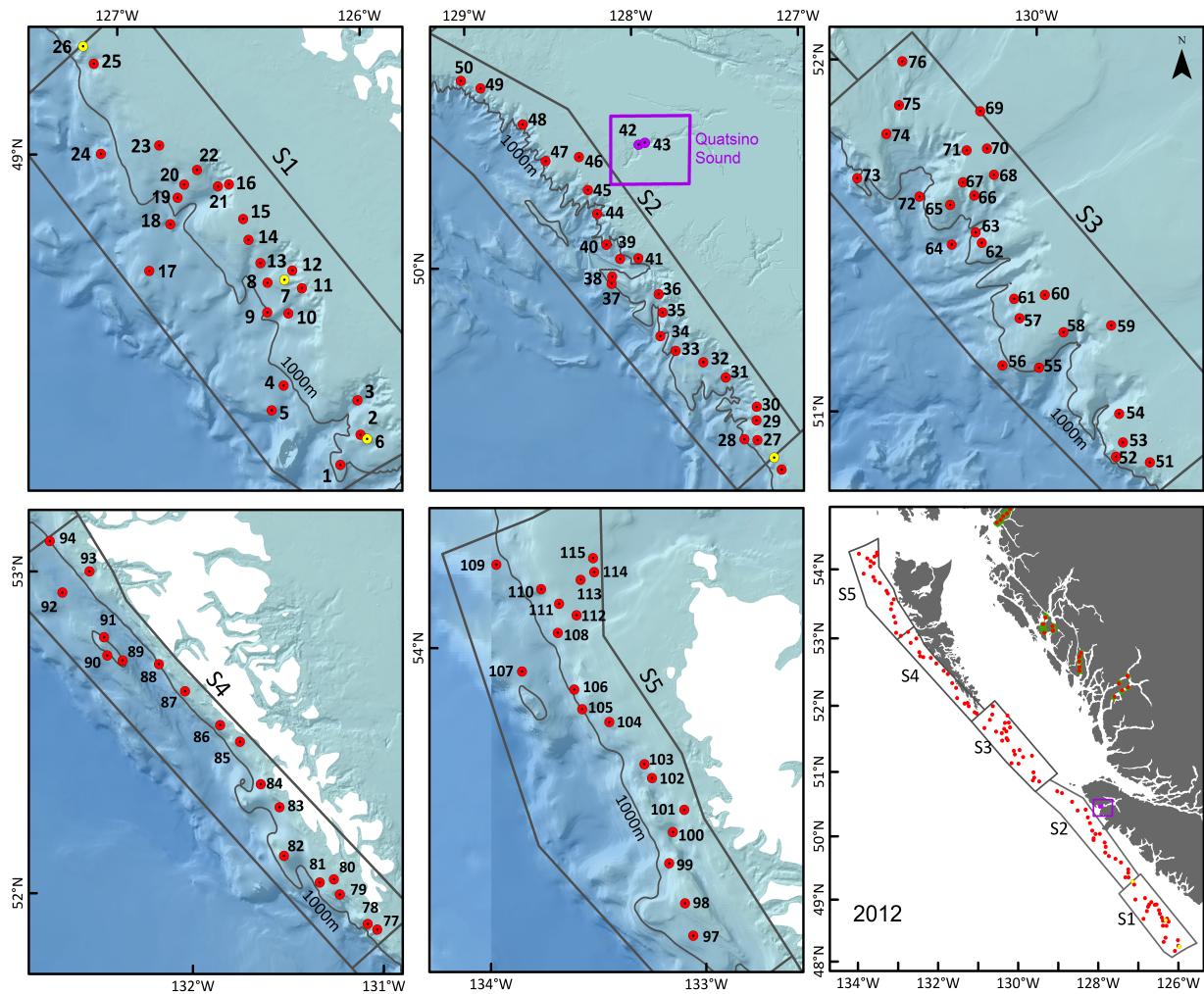


Figure 2. Start locations of survey sets (red markers) conducted in 2012 for the stratified random survey areas S_1 through S_5 .



Figure 3. Image of the F/V Ocean Pearl used for the 2012 sablefish research and assessment survey.

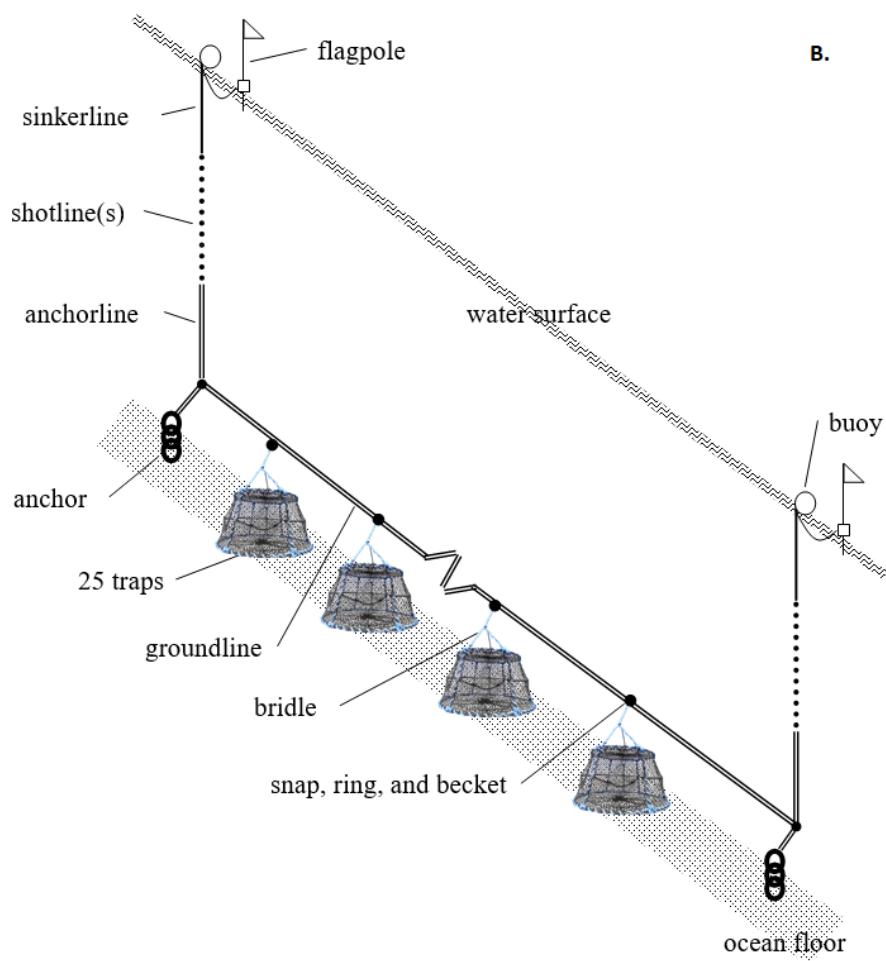
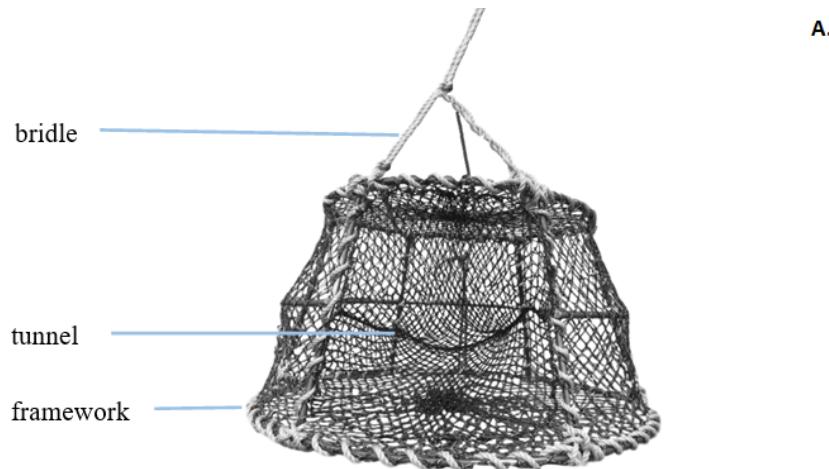


Figure 4. Trap elements (A). Trap gear elements consisting of 25 baited traps snapped to beackets along a groundline (B).

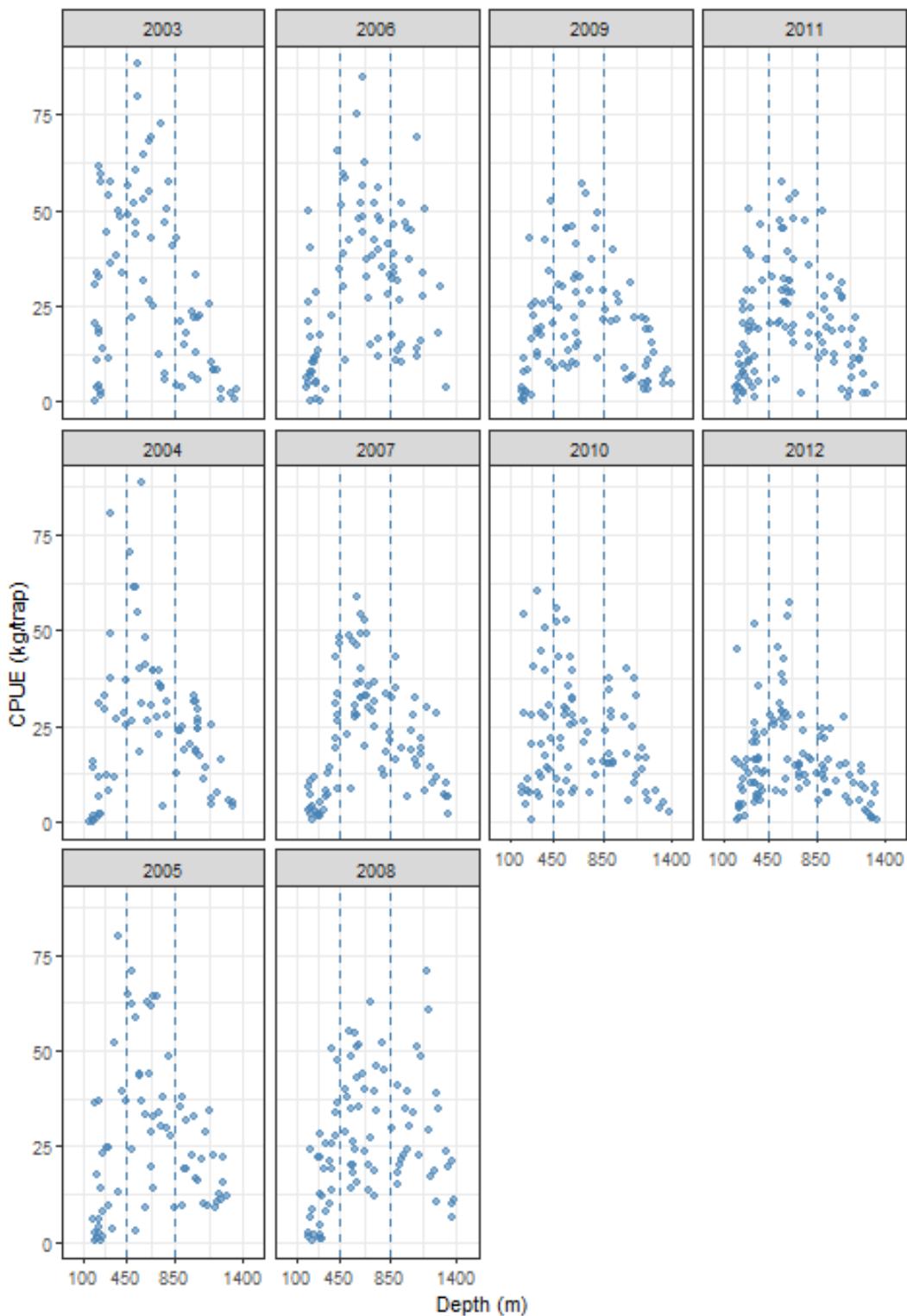


Figure 5. Sablefish catch per unit effort (CPUE) by depth and year for StRS sets. Dashed lines delineate depth strata (shallow(RD₁) = 100-450m, mid(RD₂) = 450-850m, deep(RD₃) = 850-1400m).

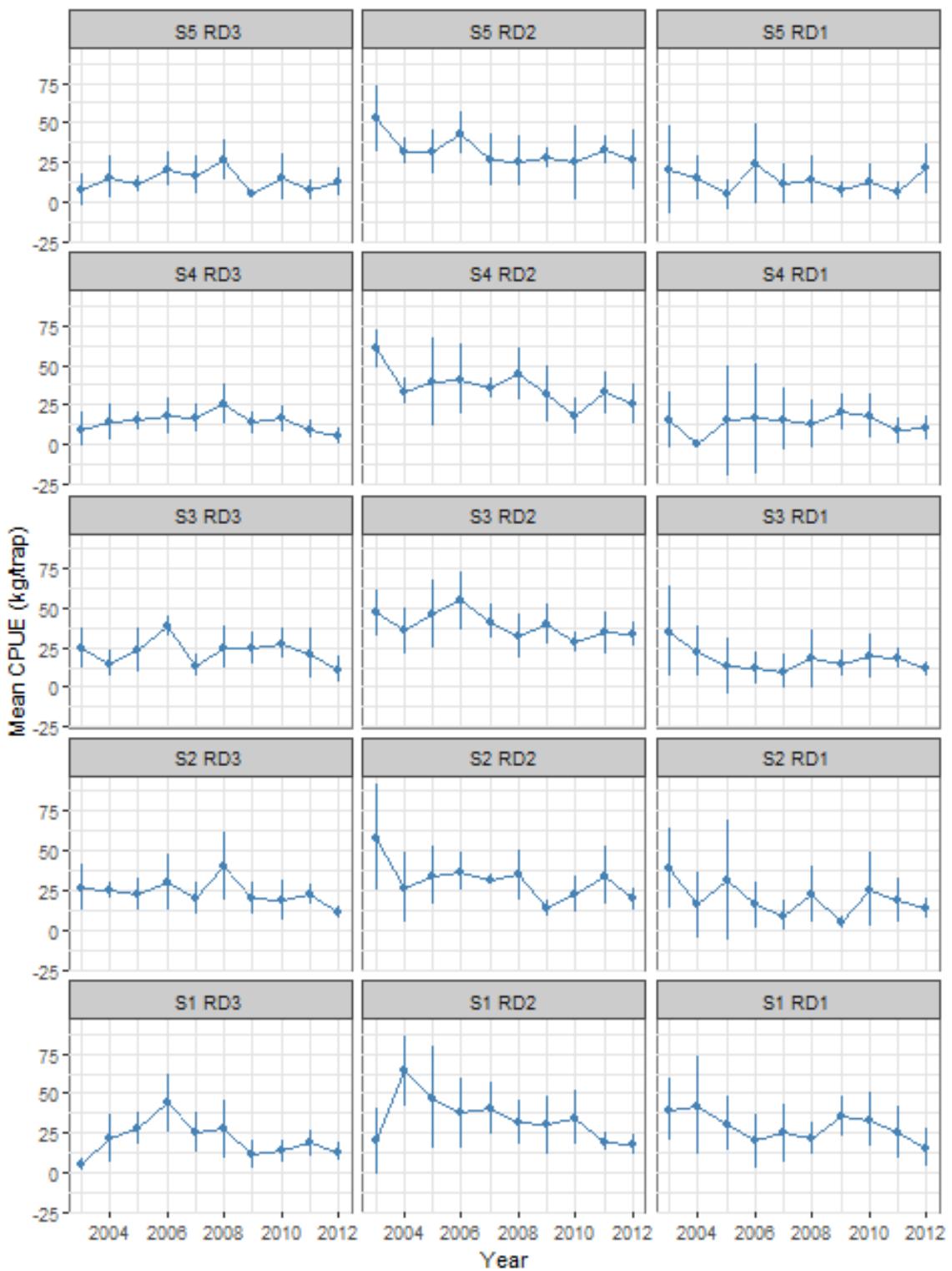


Figure 6. Average Sablefish catch per unit effort (CPUE; mean +/- 95% CIs) by survey strata since 2003. Panels run deep to shallow (left to right) and north to south (top to bottom).

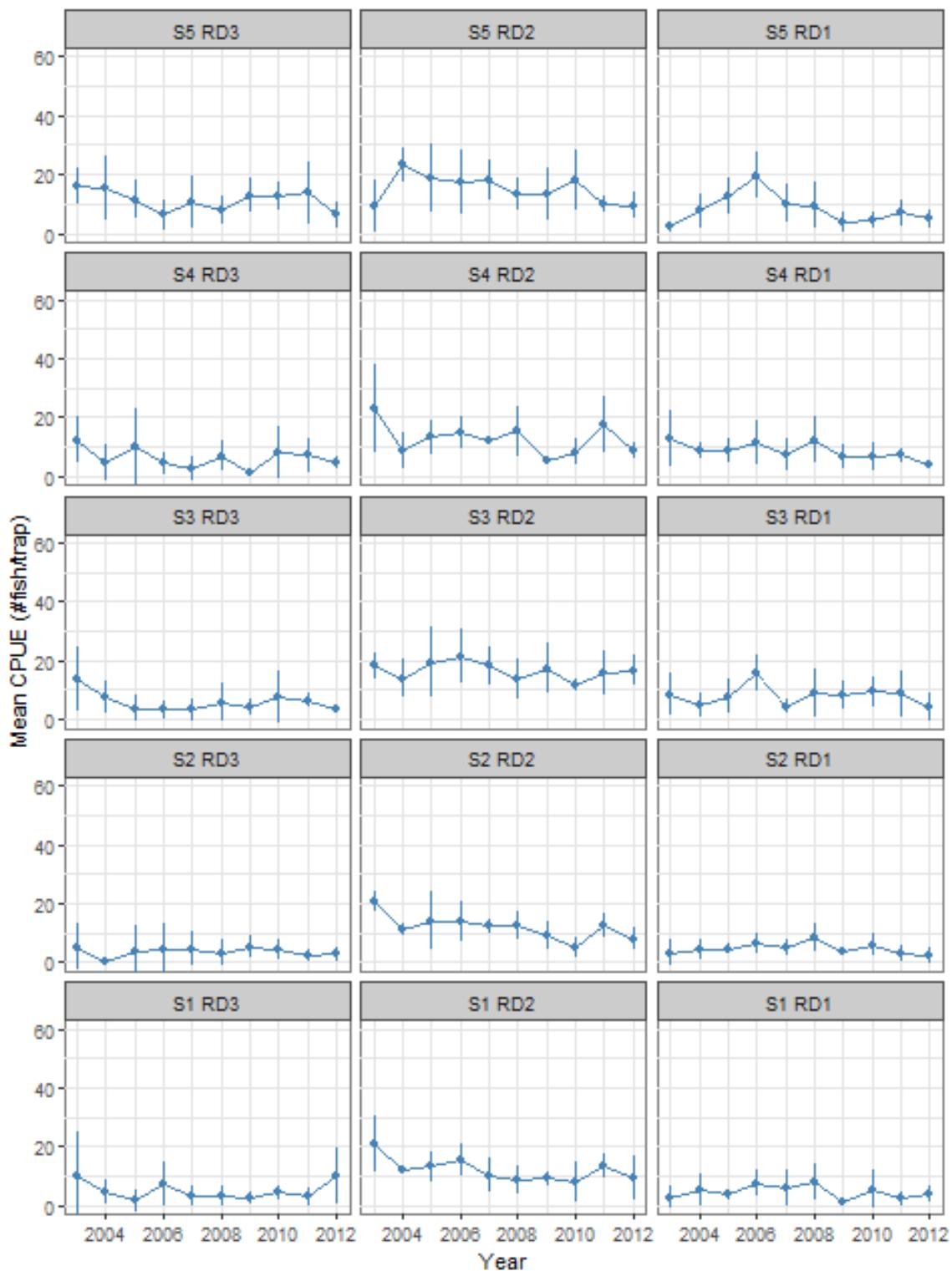


Figure 7. Average number of sablefish per trap (mean +/- 95% CIs) by StRS survey strata over time. Panels run shallow to deep (left to right) and south to north (top to bottom).

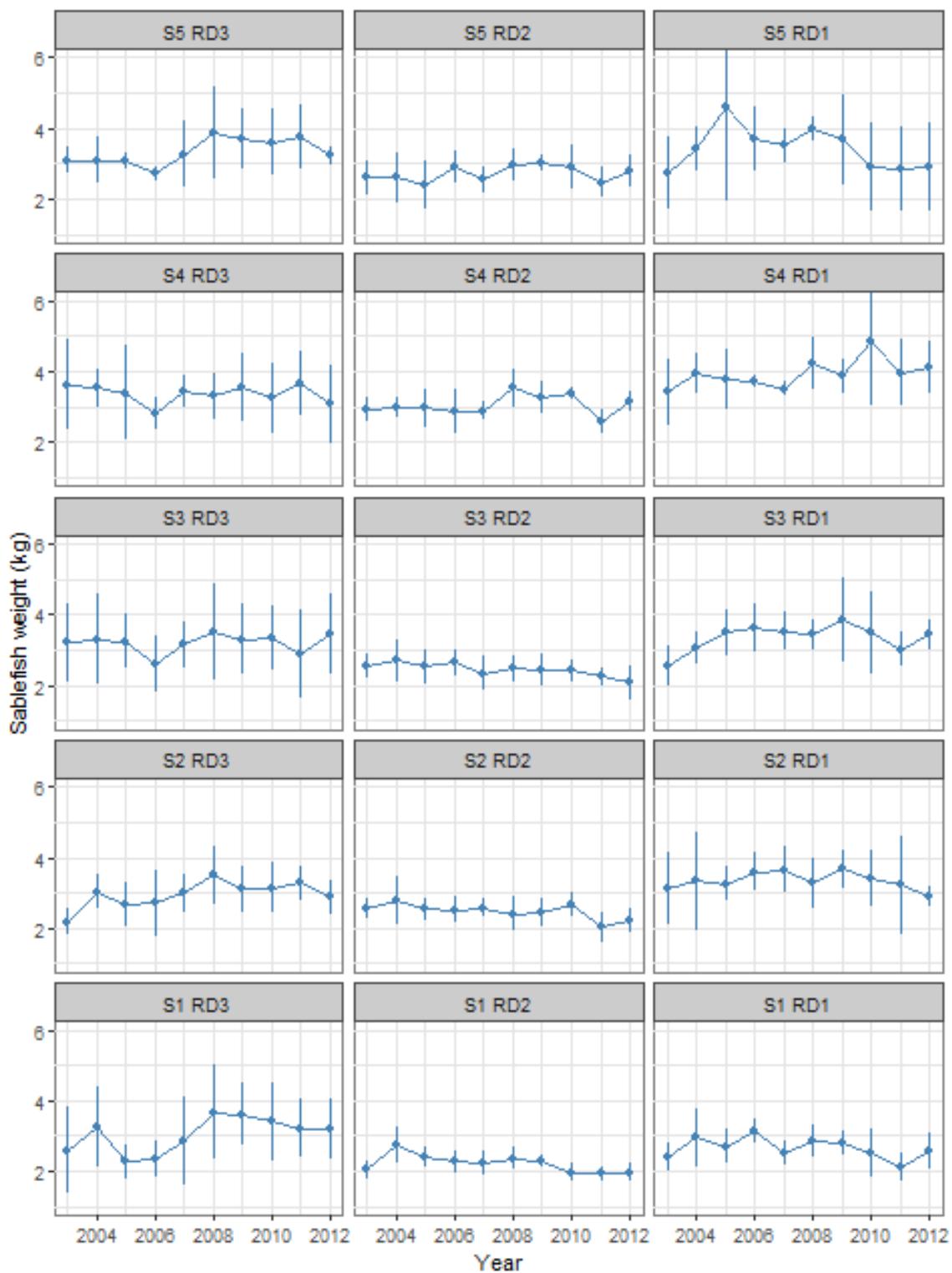


Figure 8. Average weight of sablefish (mean +/- 95% CIs) by survey strata over time. Panels run shallow to deep (left to right) and south to north (top to bottom).

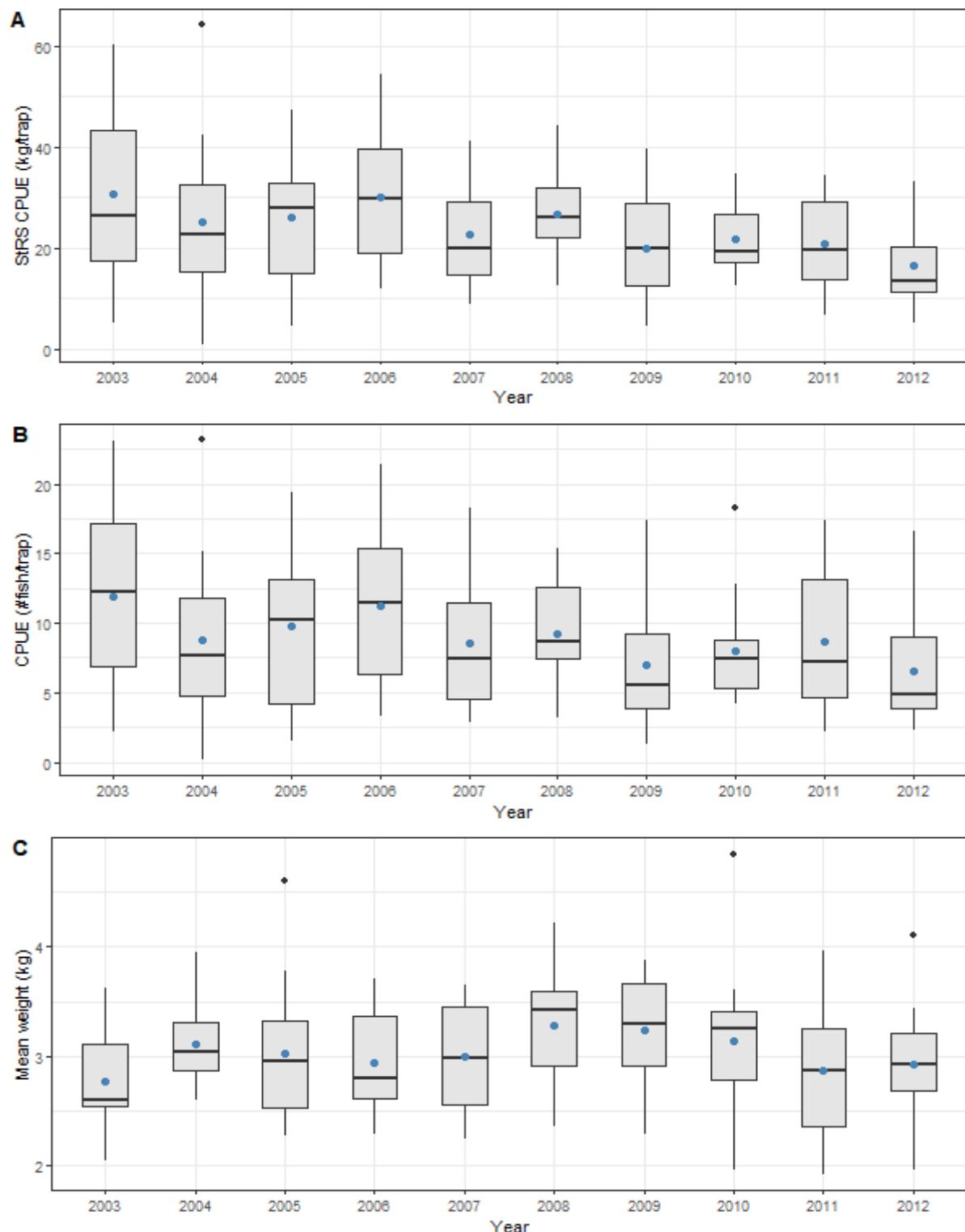


Figure 9. Annual mean weight of sablefish per trap (kg/trap) (A); annual mean number of sablefish per trap (#fish/trap) (B); annual mean weight of sablefish (kg) (C) by StRS survey strata over time. Horizontal line is median and blue dots are arithmetic mean.

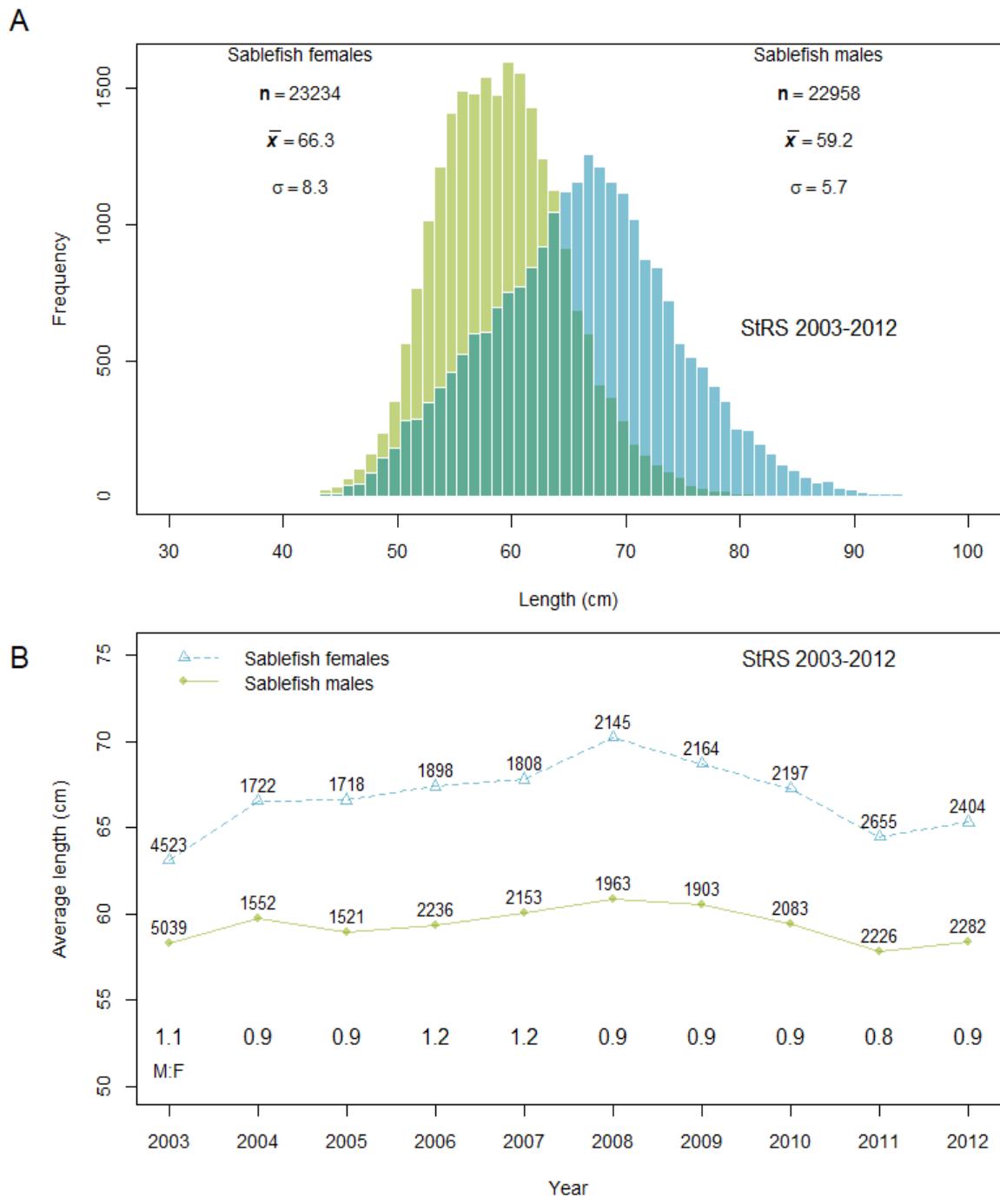


Figure 10. Length frequencies for female (cyan) and male sablefish (green) and up to 2013 for all StRS sets. The number of specimens is denoted by the letter n, the mean indicated by the \bar{x} and the standard deviation is represented by the symbol sigma Σ (A). Average length and ratios of male and female sablefish by year. Counts by sex are shown across the top of the lines (B).

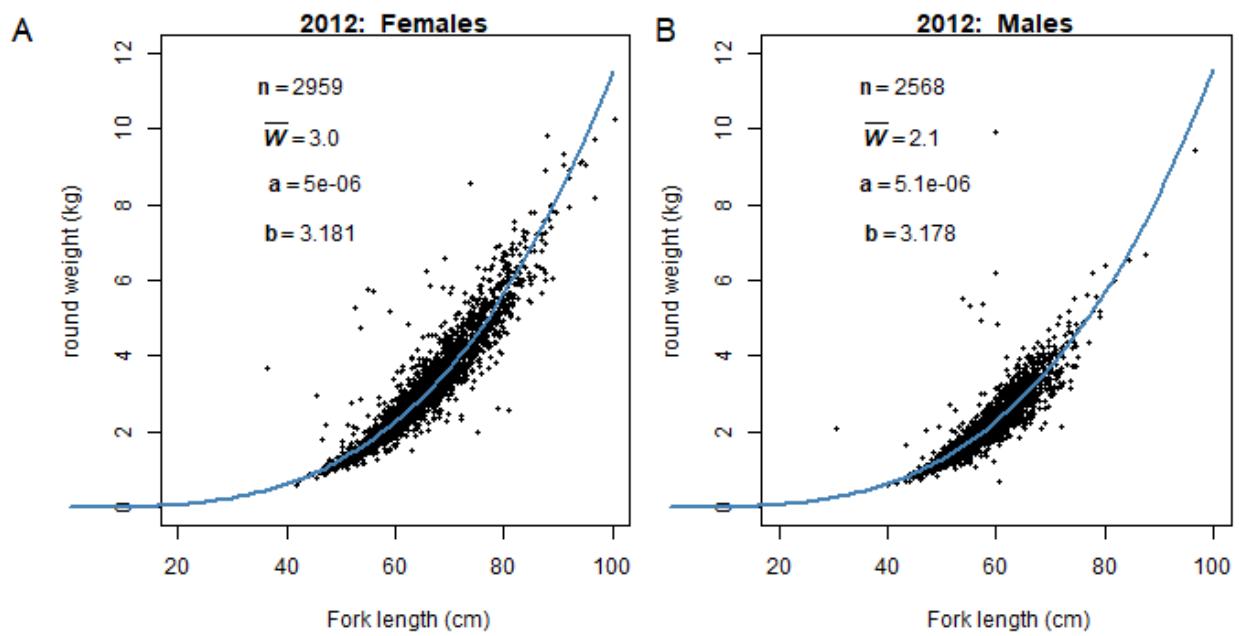
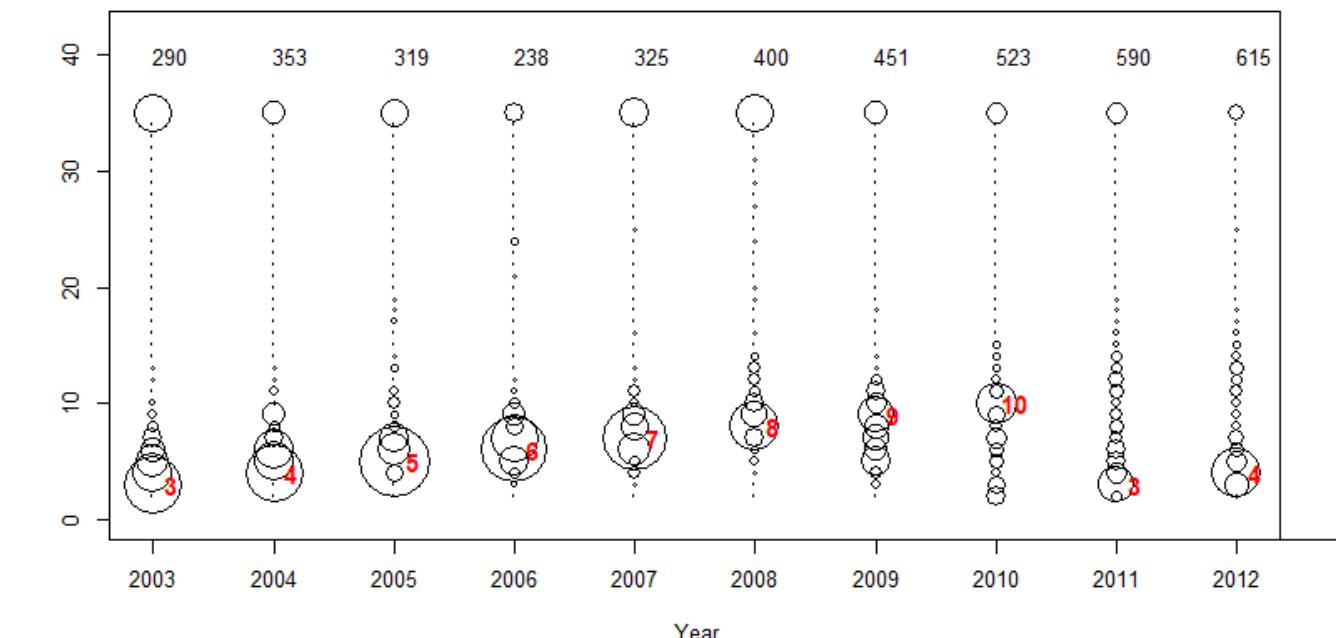


Figure 11. Sablefish fork length (L in cm) vs weight (W in kg) for females (A) and males (B) for the 2012 survey.

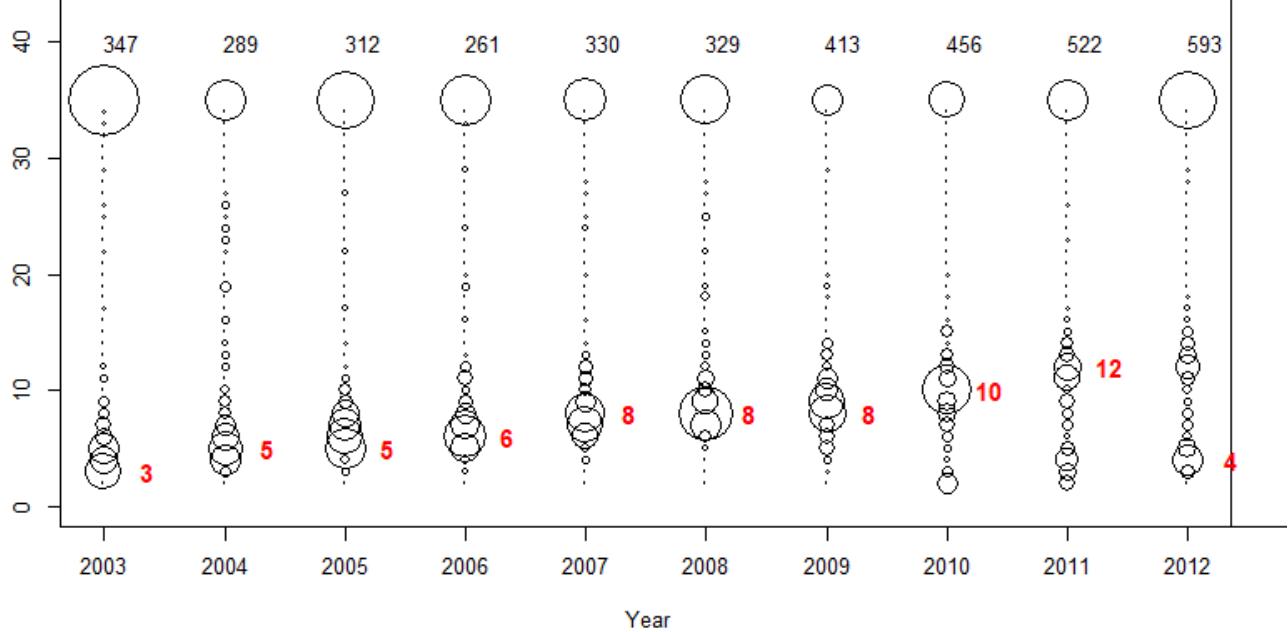
A

Females

Age

Males

B



Year

Figure 12. Bubble plot for female (A) and male (B) sablefish ages by survey year from StRS sets that have been aged. The sizes of the circles are proportional to the number of fish with given ages. Fish age 35 and older are included in one bubble. The total number(n) of fish aged are listed across the top of each panel. The ages with the highest ratios are posted to the right of each bubble.

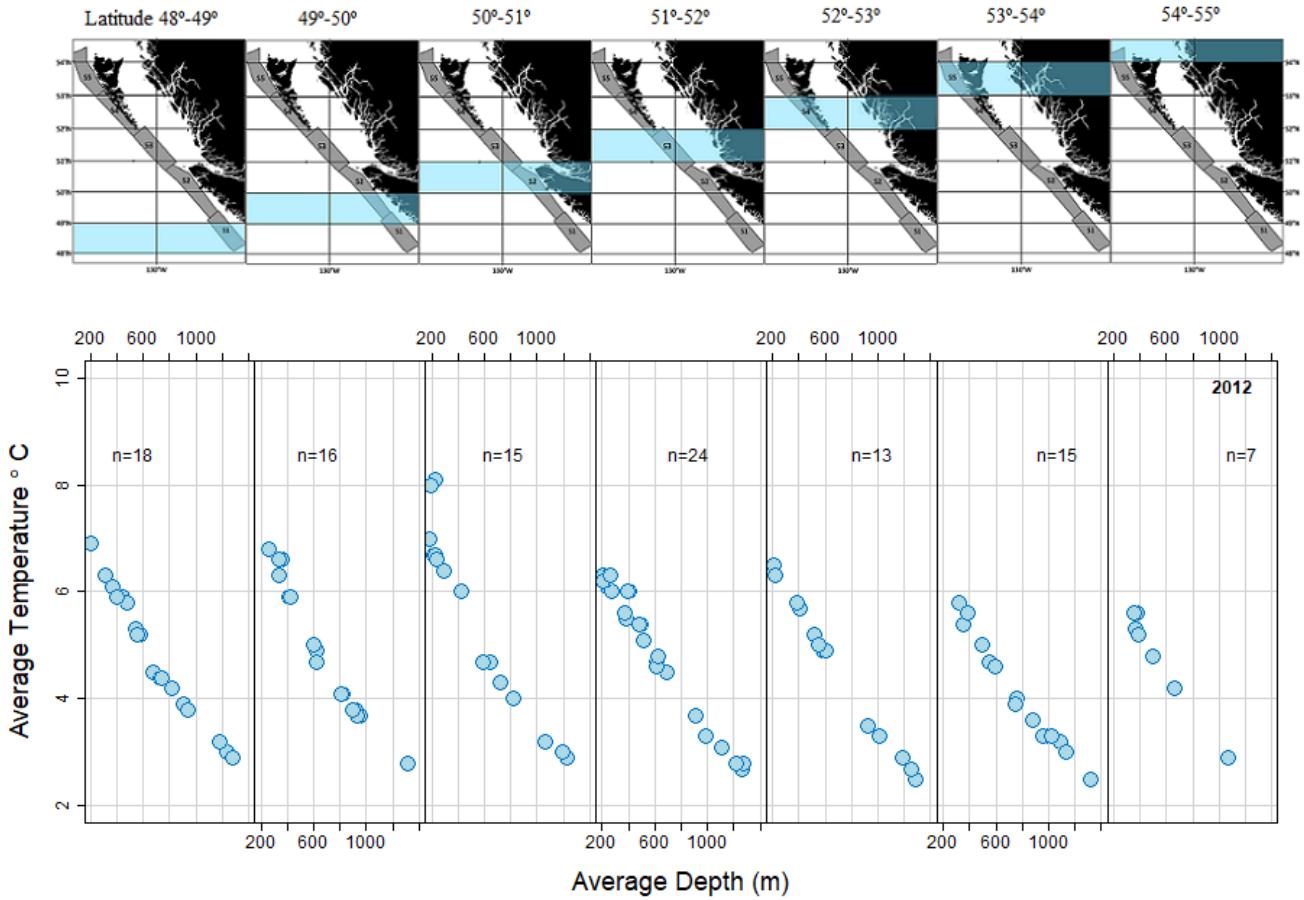


Figure 13. Coplot of average depth (m) vs average temperature ($^{\circ}\text{C}$) for a given 1-degree latitude range (blue bands) for 2012. The number of fishing sets deployed with a SBE 39 recorder are represented by n.

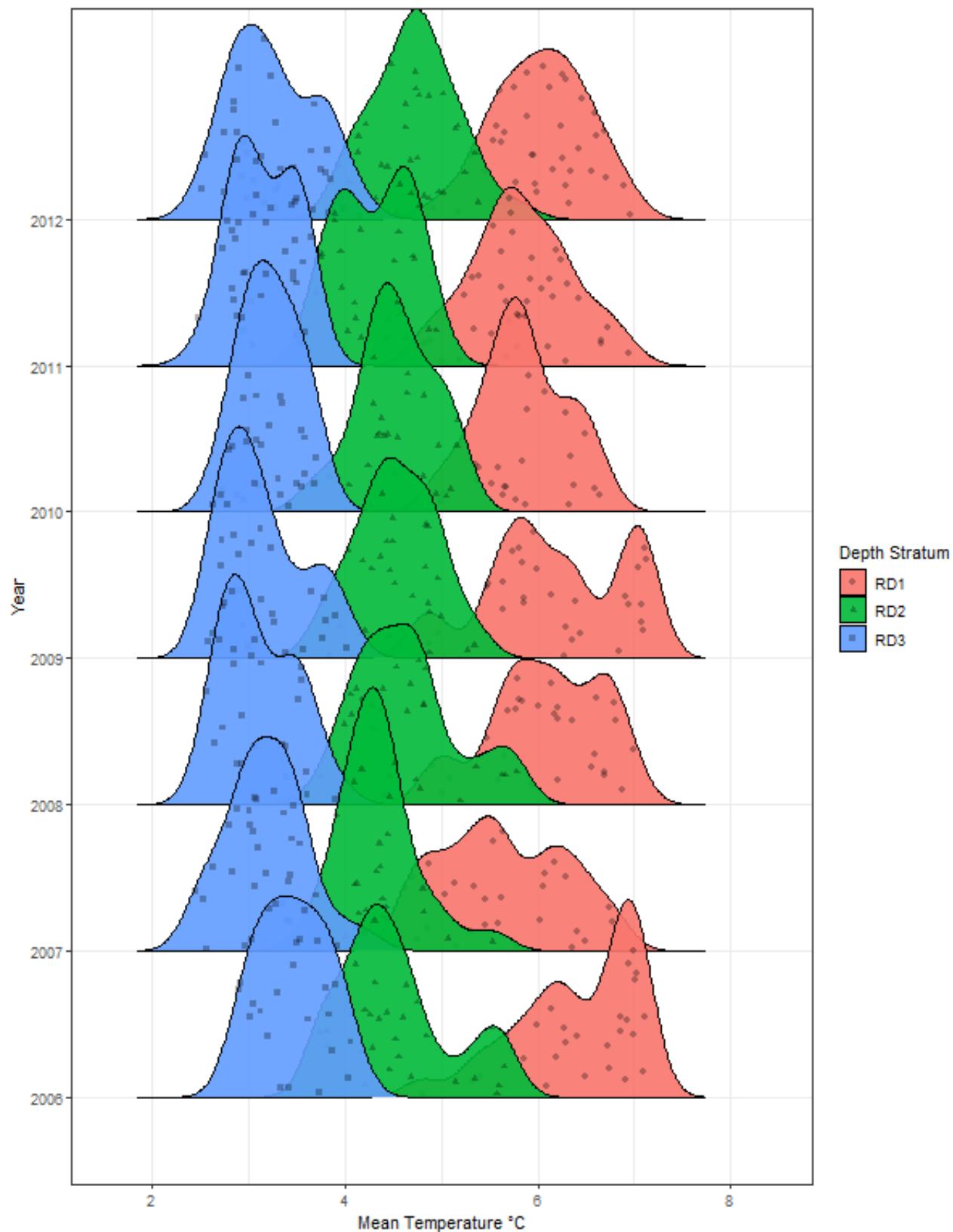


Figure 14. Vertical density ridgeplots of mean temperatures per year as reported by set from the Sea-bird SBE 39 loggers on traps at three depth intervals, RD₁ = shallow (100-450 m), RD₂ = mid (450-850 m), RD₃ = deep (850-1400 m). Lines indicate the 2.5% and 97.5% tails.

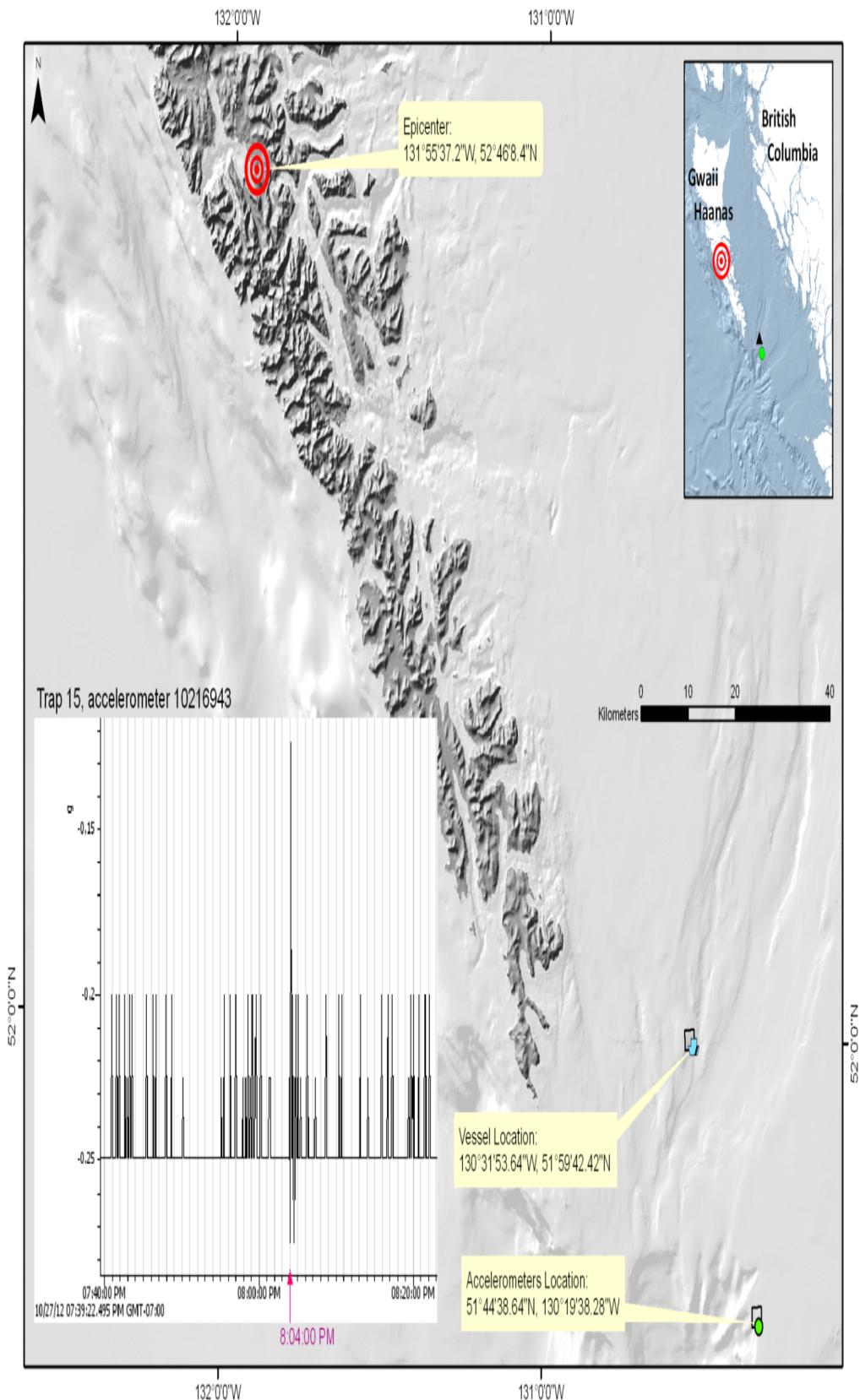


Figure 15. Location of the epicentre of a 7.7 magnitude earthquake on Saturday October 27, 2012 at 8:04 p.m. The inset shows the accelerometer reading that captured the earthquake event..

APPENDIX A LIST OF SABLEFISH RESEARCH AND ASSESSMENT SURVEYS.

Year	Dates	Vessel	Captain	Set Count	GFBIO Id
1988	Oct 28 - Nov 24	VICIOUS FISHER	VANCE FLETCHER	16	43990
1989	Oct 19 - Nov 18	LA PORSCHE	SIGURD BRYNJOLFSON	29	43910
1990	Nov 8 - Nov 18	VIKING STAR	DOUG FARRINGTON	24	43750
1991	Oct 9 - Oct 29	W. E. RICKER	ALAN FARRINGTON	32	43673
1992	Oct 13 - Nov 4	W. E. RICKER	RON ROBERTS	38	43670
1993	Oct 19 - Nov 11	W. E. RICKER	ALAN FARRINGTON	42	43650
1994	Oct 13 - Oct 31	LA PORSCHE	RICHARD BEAUV AIS	39	43630
1994	Oct 18 - Nov 13	WESTERN VIKING	RICK JONES	27	43390
1995	Oct 8 - Oct 20	OCEAN PEARL	ROBERT FRAUMENI	29	43270
1995	Oct 11 - Oct 28	VICTOR F	MICHAEL DERRY	34	43330
1995	Oct 1 - Oct 31	VIKING SUNRISE	JASON OLSEN	40	43350
1996	Sep 26 - Oct 10	OCEAN PEARL	MICHAEL DERRY	32	43039
1996	Sep 30 - Oct 22	VIKING STAR	OTTO ELVAN	49	43210
1996	May 10 - May 30	VIKING SUNRISE	ALBERT (DEACON) MELNYCHUK	42	43024
1997	Sep 26 - Oct 21	OCEAN PEARL	MICHAEL DERRY	74	42699
1997	May 20 - Jun 10	VIKING SUNRISE	ALBERT (DEACON) MELNYCHUK	42	42760
1998	Sep 22 - Oct 17	OCEAN PEARL	MICHAEL DERRY	89	41122
1999	Sep 29 - Oct 30	OCEAN PEARL	MICHAEL DERRY	109	40589
2000	Oct 8 - Nov 14	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	131	40517
2001	Oct 6 - Nov 6	OCEAN PEARL	MICHAEL DERRY	134	43233
2002	Oct 4 - Nov 7	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	125	48120
2002	Oct 5 - Nov 13	VIKING SUNRISE	JASON OLSEN	90	48110
2003	Oct 15 - Nov 13	OCEAN PEARL	MICHAEL DERRY	94	52100
2003	Oct 7 - Nov 10	VIKING STAR	JIM FARRINGTON	84	52120
2004	Oct 5 - Nov 15	MILBANKE SOUND	DON QUAST	95	58145
2004	Oct 5 - Nov 3	OCEAN MARAUDER	ALBERT (DEACON) MELNYCHUK	84	57360
2005	Oct 4 - Nov 2	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	84	60529
2005	Oct 7 - Nov 17	VIKING SUNRISE	RORY JOHNSON	88	60503
2006	Oct 1 - Nov 1	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	98	62966
2006	Oct 2 - Nov 15	SENA II	TIM JOYS	98	62666
2007	Oct 7 - Nov 12	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	99	65106
2007	Oct 8 - Nov 12	VIKING TIDE	JASON OLSEN	91	65107
2008	Sep 29 - Nov 16	OCEAN PEARL	ROBERT FRAUMENI	157	67007
2009	Oct 8 - Nov 25	OCEAN PEARL	ROBERT FRAUMENI	155	69067
2010	Oct 9 - Nov 30	OCEAN PEARL	ROBERT FRAUMENI	153	70787
2011	Oct 9 - Nov 21	OCEAN PEARL	DARCY NICHOLS	132	72067
2012	Oct 9 - Nov 17	OCEAN PEARL	DARCY NICHOLS	135	73190

APPENDIX B DATA FORMS 2012 SABLEFISH SURVEY.

SABLEFISH CHARTER BRIDGE LOG

VESSEL: <u>OCEAN PEARL</u>	SET NUMBER: <u>065-</u>									
RANDOM TAGGING SET										
Spatial Stratum: <u>53</u>	Depth Stratum: <u>RDZ</u>									
Box ID: <u>10256</u>										
EXPLORATORY VANCOUVER ISLAND INLET SET										
Location Name:										
INLET SET										
Locality Name:	Location Number:									
year month day										
SET: Date: <u>2012</u>	<u>10</u>	<u>25</u>	Recorder: <u>I4N</u>							
Target Depth: Minimum: <u>250</u>		(fm)	Maximum: <u>450</u>	(fm)						
1 st Buoy: Number: <u>5'</u>		Time: <u>1612'</u>								
1 st Anchor : Time: <u>1619</u>		Bottom Depth: <u>364</u>	(fm)							
Latitude: <u>51</u> deg. <u>35</u> . <u>374</u>		Longitude: <u>130</u> deg. <u>24</u> . <u>311</u>	min.	min.						
SETTING BOTTOM DEPTH										
min : 0	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	
fm										
min : 0	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	
fm	<u>355</u>	<u>338</u>	<u>323</u>	<u>313</u>	<u>305</u>	<u>304</u>	<u>291</u>	<u>282</u>	<u>274</u>	<u>272</u>
min : 0	: 1	: 2	: 3	: 4	: 5	: 6	: 7	: 8	: 9	
fm										

ENVIRONMENTAL CONDITIONS

Wind speed (knots): <u>20</u>	Swell height (m): <u>2'</u>
Beaufort Scale (circle one): <u>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</u>	
Wind direction (circle one): <u>SE, S, SW, W, NW, N, NE, N</u>	
Sun shining (circle one): <u>yes</u> or <u>no</u>	% cloud cover: <u>100</u>
2 nd Anchor: Time: <u>1630'</u>	Bottom Depth: <u>269</u> (fm)
Latitude: <u>51</u> deg. <u>35</u> . <u>742</u>	Longitude: <u>130</u> deg. <u>25</u> . <u>265</u>
2 nd Buoy: Number: <u>9'</u>	Time: <u>1639'</u>
COMMENTS: <u>Facing</u>	

Figure B.1. Example of a completed bridge log data form used during the 2012 survey. This form was completed from the bridge of the Ocean Pearl for each set.

SABLEFISH CHARTER SET LOG

VESSEL: Ocean Pearl SET NUMBER: 065

DATE: October 25, 2012 Recorder: Jonas B.

1st Buoy Number: 5 Time: 16:12

1st ANCHOR TIME 16:20

NUMBER TRAPS SET: 10 10 10 10 Total: 25

TEMP-DEPTH RECORDER:

Serial Number: 3903 On Trap #: 3

MISSED BECKETS:

2nd ANCHOR TIME 16:31

2nd Buoy Number: 9 Time: 16:39

BAIT: Type 1: Squid Weight: 2.0 (lb) Method: Bagged

Type 2: Hake Weight: 10.0 (lb) Method: Loose

COMMENTS:

updated 19/09/2011

Figure B.2. Example of a completed set log data form used during the 2012 survey. This form was completed by science staff from the deck as the gear was set.

SABLEFISH CHARTER CATCH LOG

DATE: October 26, 2012 SET NUMBER: 065 pg 1 / 1
 VESSEL: Ocean Pearl RECORDER: Jonas B.

1ST Buoy 5 HHMM 16:47 1ST Anchor Aboard: 17:02

trap	SABLEFISH				species 2		species 3		species 4		species 5		species 6	
	num	Use	#	kg	#	kg	#	kg	#	kg	#	kg	#	kg
1	T	6	10.2	12.6	9	13.7								1x4in
2	D	10	15.4	15.3	10	13.7	10	14.9	11	7.5				
3	A	10	21.2	18.9					1	1.3				
4	T	10	19.1	5.4										1x5in
5	D	10	20.4	17.3	1	1.8								
6	D	10	22.8	10.6	10	18.4					1	2.6		
7	T	6	11.6	8.7	4	7.4	13	23.3	7	3.1				
8	D	10	26.3	16.6	10	18.0					1	Short		
9	D	10	20.1	7.9	10	18.5					1	Nept		
10	F	10	19.2	20.1	10	20.6	2	5.5						
11	D	10	18.7	18.9	10	18.8	15	29.3	10	19.1	4	5.9		
12	D	10	18.9	3	8.5									
13	T	4	14.8	8.1	6.7						1	Short		
14	D	10	22.1	10	20	2	3.9							2x4in
15	A	5	9.2											
16	T	9	19.6	17	17.8									
17	D	9	18.3	6	12.4									
18	A	2	6.0	5	9.6									
19	T	11	23.1											1x3in
20	D	1	2.3	Tagged	10.9									
21	A	9	18.1	11.9										
22	F	2	5.8											
23	D	10	19.3	2	7.9									
24	A	10	18.1	9	17.2									
25	T	10	22.9											
	Total		423.8		286		130.3		73		26.6		6.4	

2ND Buoy 9 HHMM 17:42 2ND Anchor Aboard: 17:51
 COMMENTS: Vish lost without weight set 14. (fall in the shot)

Total Sablefish #: 481 kg: 888.1 Other Species Records (#): 11

Video Trap Tally:

"Use" column indicates how the trap contents were treated: T=tagged, A=LSWMO sample, B=LSM sample, D=discarded after recording

Figure B.3. Example of a completed catch log data form.

L-SWMO
SABLEFISH CHARTER BIOSAMPLING SHEET

columns 1-3-Sub

Vessel: OCEAN PEARL Set Number: 8 Sample Date: 10/16/05 Sample Type: random
 Sampler: Guy Boxall Recorder: Locko Species: Sabrefish Sample Weight: 29 kgs
 Sample Source: Unsorted Catch Storage: fresh Specimen Form: Round Length Type: Fork
 Length Unit: Min 10 Weight Type: whole round 43 Weight Unit: 0 45 Maturity Convention: 3 3

Trap Num	Fish Number	Length	Sex	Mat	Weight	Otolith CellNum	Comments																																					
							49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	TRAY NUM	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80					
1	5	5	B	1	58	59	60	61	62	63	AD1																																	
2	5	5	A	1	4	4	1	4	5	0																																		
3	5	5	A	5	1	2	1	3	4	5																																		
4	5	5	B	1	4	3	1	5																																				
5	5	5	B	2	1	4	3	0	8	0																																		
6	5	5	B	1	4	3	1	5	5	5																																		
7	5	5	B	2	1	5	1	0	ADP																																			
8	5	6	B	1	4	3	1	7	6	0																																		
9	5	6	B	1	4	3	1	7	6	0																																		
10	5	6	B	2	2	1	8	4	5	ADP																																		
1	5	6	B	2	2	1	7	6	0																																			
2	4	9	B	1	4	1	3	7	0																																			
3	6	6	B	1	4	3	4	4	5																																			
4	6	6	B	1	4	3	9	4	0																																			
5	6	5	B	1	2	1	3	3	5	A15																																		
6	4	9	B	1	2	1	1	8	0	A14																																		
7	5	5	B	1	4	1	6	5	5																																			
8	5	5	B	1	4	1	7	2	8																																			
9	5	2	B	1	4	1	8	7	5																																			
10	5	7	B	1	4	1	7	6	5	A20																																		

COMMENTS: Nefel 20 samples
 updated 30/08/2007

Figure B.5. Example of a completed biological sampling form.

Length Sex Species page 11
SABLEFISH CHARTER BIOSAMPLING SHEET

Vessel: OCEAN PEARL 0732 Set Number: 046 Recorder: JAN
 Sample Date: 2012-10-22 Sampler: LISA 107A
 Catch Storage: fresh Specimen Form: round Length Unit: mm Sample Source: unsorted

Species: TURBOT 602 Total number sampled: 1
 Length Type: FORK Sample Type (circle one): Random / Total

Fish Number	Length	Sex
1	5733	
2		
3		
4		
5		
6		
7		
8		
9		
0		

Fish Number	Length	Sex
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

Fish Number	Length	Sex
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

Species: DOGFISH 044 Total number sampled: 28
 Length Type: TOTAL Sample Type (circle one): Random / Total

Fish Number	Length	Sex
1	7201	
2	8721	
3	7801	
4	7351	
5	7102	
6	9412	
7	8331	
8	7402	
9	7341	
0	7651	

Fish Number	Length	Sex
1	7951	
2	7101	
3	7601	
4	7631	
5	7421	
6	7512	
7	7661	
8	7751	
9	7232	
0	7641	

Fish Number	Length	Sex
1	7141	
2	7022	
3	8691	
4	7591	
5	8231	
6	8541	
7	7541	
8	7751	
9		
0		

Species: _____ Total number sampled: _____
 Length Type: _____ Sample Type (circle one): Random / Total

Fish Number	Length	Sex
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

Fish Number	Length	Sex
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

Fish Number	Length	Sex
1		
2		
3		
4		
5		
6		
7		
8		
9		
0		

updated 20/09/2011

Figure B.6. Example of a completed LSS biological sampling form used during the 2012 survey for samples of species other than sablefish or rougheye/blackspotted rockfish.

columns 1-3=ST1

SABLEFISH CHARTER TAGGING SHEET

pg: 4, 4

Vessel: OCEAN PEARL Set Number: 065

Date:¹¹ 20127826 Sample Type: RANDOM19
02

Tagger: GUY BOXALL Recorder: LACKS 2071

Species: SABLE FISH Tag Type: ANCHOR

29 455 30 90

Tag Check	Primary Tag Number prefix 35-37	Fork Length (mm)	Error 1	Error 2	Injury 1	Injury 2	Comments/ previous tag number
A	000						
34	471420	495					
	1	525	F				
	2	591					
0	423	587					400 674 307✓
	4	623					
	425	UNK					
	426	595					
	7	568	P				
	8	555					
	429	682					1b
0	430	583					
	1	575	F				
	2	595					
	3	604					
	4	615					
	5	571					
3	6	661					
	7	542					
	8	615					
	439	565					1d
	440	511					
0	441	506					
	2	610					
	3	515					
	4	556					
	471445	580					
	6	561	F				
	7	555					
	8	631					
	449	672					1b
0	450	548					
	1	575					
	2	590					
	3	542					
	454	522					
	455	528					
	6	583					
	457	533	F				
0	458	565					9
	9						

COMMENTS:

updated 20/09/2011

Sample Type:

- 1 = total catch
- 2 = random

Tag Type:

- 10 = anchor

Tag Check:

- null = tag number not verified
- 0 = tag number verified and corresponds to fish data
- 1 = tag number may not correspond to fish data

Error:

- B = tag broken, not used
- D = dead fish, tagged
- P = paired tag, sequential tags in same fish
- N = tag not well implanted
- L = loose tag
- T = tight tag
- R = release of OTC from hole
- U = unknown length

Injury:

- A = damage from amphipods
- B = bleeding
- C = cuts or fresh wounds
- D = fish dropped on deck
- E = eyes cloudy, blind
- F = fin damaged
- H = misshapen fish
- L = scale loss
- N = scrapes and abrasion
- O = bleeding at OTC hole
- R = raw wound around tag
- S = scar of healing wound
- T = tail damaged
- J = jaw damaged
- P = broken anchor tag already in fish.
- W = weak or lethargic fish
- Z = ectoparasitic copepods

Tagging Start Time

17:08

Tagging End Time

17:35

Fish Tagged On This Page

39 ✓

Fish Tagged On This Set

152

Fish Not Tagged On This Page

Fish Not Tagged On This Set

Figure B.7. Example of a completed tagging form used during the 2012 survey.

SABLEFISH CHARTER TAG RECOVERY SHEET

Year: 2012

Vessel: Ocean Pearl

Maturity Convention:

page 3 / 8

Set Number	Set Haul Date						Primary Tag Number	Fork Length (mm)	Sex	Mat	Round Weight (g) Cond.	Wound	Otolith Tray #	Cell #	New tag number for re-released fish						
	Y	Y	Y	Y	M	M									D	D					
8420	1	2	1	0	3	1	A	0	0	8	8	05	0	1	6	8	9	0	1	A005	11278
8420	1	2	1	0	3	1	A	0	0	6	3	3	1	2	6	6	3	0	0	A005	11279
8420	1	2	1	0	3	1	A	0	0	8	8	02	9	5	6	0	9	0	1	A005	11287
8920	1	2	1	1	0	2	A	0	0	6	6	3	2	6	3	5	8	2	0	A005	11397
8920	1	2	1	1	0	2	A	0	0	8	17	2	3	7	5	5	8	0	2	A005	11422
9120	1	2	1	1	0	2	A	0	0	8	17	2	3	7	5	5	8	0	2	A005	11422
9320	1	2	1	1	0	2	A	0	0	8	8	3	1	0	4	7	2	6	0	A005	11507
9420	1	2	1	1	0	5	C	S	A	2	6	8	0	6	6	3	2	0	2	A005	11536
9520	1	2	1	1	0	5	A	0	0	1	5	3	1	5	0	6	0	0	2	A005	11574
9820	1	2	1	1	0	5	B	9	9	2	4	9	0	0	0	7	1	6	0	A005	11594
70420	1	1	0	7	4	0	0	9	6	6	2	5	9	1	6	5	8	0	1	A005	11681
71020	1	2	1	1	0	9	A	0	0	2	5	4	7	9	3	6	6	2	0	A005	11700
711720	1	2	1	1	1	1	A	0	0	6	3	0	2	7	1	5	9	2	0	A005	11701
711920	1	1	1	1	1	1	A	0	0	6	3	0	1	7	0	6	2	2	0	A005	11702
7120	1	1	1	1	1	1	A	0	0	6	3	0	1	7	0	6	2	0	1	A005	11703
7121	1	1	1	1	1	1	A	0	0	6	3	0	7	6	2	5	3	4	0	A005	11704
7120	1	1	1	1	1	1	A	0	0	6	3	0	7	6	2	5	3	4	0	A005	11705
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11706
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11707
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11708
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11709
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11710
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11711
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11712
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11713
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11714
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11715
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11716
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11717
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11718
7120	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	1	A005	11719
7121	1	1	1	1	1	1	A	0	0	6	4	6	7	3	5	7	2	0	2	A005	11720

Tag Wound Condition: blank = unknown; 00 = not examined; 01 = normal to slightly exposed (good); 02 = enlarged and raw; 04 = anchor good, suture exposed (2 tags present); 05 = anchor exposed, suture good (2 tags present); 06 = tag too tight; 07 = tag too loose; 99 = tag missing, wound only.

Sex: 0=not looked at, 1=male, 2=female, 3=looked at but unknown.

MANAGAHO CHARTER FISHING 89924900

Figure B.8. Example of a completed tag recovery form used during the 2012 survey. Image of recovered tag B9924900 (inset)

Step 1. Only select fish >70 cm PCL (Fig. 1). Check that the first dorsal spine is intact. These can be kept in the live tank until step 3.



Step 2. Collect tags to be deployed. Gently remove from case and pull off tape/magnet (do not throw away!). Check attachments for all parts: mono, tube, 2 crimping sleeves. Let sit. Collect tools: needle nose pliers, power drill, 5/64 drill bit, crimper.



Step 3. Have one person hold shark. Record tag number, shark PCL, and sex on data sheet.



Step 4. Find spot above the base of the fin to drill. Drill hole through spine horizontal. If spine breaks, release animal.



Step 5. Feed loose end of mono through hole and back into crimping sleeve. Use pliers to make it as tight as possible.



Step 6. Crimp sleeve through the tubing, so that it hangs to the side of shark.



Step 7. Observe in recovery tank for a few minutes then release over the side.



Figure B.10. Pop-off satellite tagging instructions for spiny dogfish.

APPENDIX C SET DETAILS 2012.

Details of sets completed during the 2012 survey program (F/V Ocean Pearl). Sets are listed by stratum/inlet name, set type, depth stratum, start date, end of gear deployment time and duration in minutes. The depth strata for type 3 tagging sets include RD₁ (100-250 fathoms), RD₂ (250-450 fathoms) and RD₃ (450-750 fathoms). The position data includes the major area and start and end latitude and longitude in degrees decimal minutes. The bottom depths (in meters) of the fishing set are shown with the mean bottom depth calculated from recordings at one minute intervals between the start and end of the set. The number of traps fished for each set excludes open traps, while holed or fouled traps have been included. Sets that successfully deployed a Seabird SBE temperature and pressure recorder are indicated with an 'x'.

continued.

Spatial Stra-tum	Set	Type	Depth Stra-tum	Date	Time	Duration (min-utes)	Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Start Depth (m)	End Depth (m)	Mean Depth (m)	Traps Fished	SBE 39	HoboCam
Gil Is-land	124	Inlet		Nov 12	07:31	1197	5C	53° 0.8'N	129° 7.6'W	53° 0.1'N	129° 6.6'W	566	541	548	25	x	
Gil Is-land	125	Inlet		Nov 12	08:18	1246	5C	53° 0.7'N	129° 8.6'W	53° 1.1'N	129° 7.6'W	556	570	566	24	x	
Finlayson126		Inlet		Nov 13	12:19	1094	5C	52° 7.3'N	128° 25.8'W	52° 7'N	128° 26.8'W	574	576	579	25	x	
Finlayson127		Inlet		Nov 13	13:03	1163	5C	52° 3.9'N	128° 28'W	52° 3.2'N	128° 27.8'W	716	581	618	25	x	
Finlayson128		Inlet		Nov 13	14:02	1252	5C	52° 9.7'N	128° 28.2'W	52° 9.1'N	128° 28.6'W	656	587	630	25	x	x
Finlayson129		Inlet		Nov 13	14:50	1299	5C	52° 4.9'N	128° 27.8'W	52° 4.2'N	128° 28.1'W	766	645	676	25	x	
Finlayson130		Inlet		Nov 13	15:33	1357	5C	52° 1.4'N	128° 28.3'W	52° 0.8'N	128° 27.8'W	689	795	746	25	x	
Dean/Burk01		Inlet		Nov 14	21:16	1077	5B	52° 0.2'N	127° 28.7'W	52° 0.9'N	127° 28.1'W	468	515	515	25	x	
Dean/Burk02		Inlet		Nov 14	22:42	1121	5B	52° 6.7'N	127° 15.9'W	52° 6.3'N	127° 15.9'W	548	510	524	25	x	x
Dean/Burk03		Inlet		Nov 15	00:16	1163	5B	52° 6.7'N	127° 14.8'W	52° 6.4'N	127° 15.7'W	579	581	581	25	x	
Dean/Burk04		Inlet		Nov 15	01:16	1205	5B	52° 4.1'N	127° 24'W	52° 3.8'N	127° 25.2'W	596	594	596	25	x	
Dean/Burk05		Inlet		Nov 15	02:28	1253	5B	52° 0.2'N	127° 35.4'W	52° 0.8'N	127° 36.4'W	437	433	442	25	x	

APPENDIX D SUMMARY OF BASKET USE BY TRAP 2012.

Summary of the basket use by trap number for StRS sets during the 2012 sablefish survey. The fate of the sablefish catch for each set and trap is indicated using the following abbreviations: D = Discarded after weighing (processed as commercial catch), A = Sampled for LSMWO, T = Tagged and released, SD = Sublegal discarded, F= Frames, NULL = No sablefish catch/Trap missing.

continued.

Set	Trap.1	Trap.2	Trap.3	Trap.4	Trap.5	Trap.6	Trap.7	Trap.8	Trap.9	Trap.10	Trap.11	Trap.12	Trap.13	Trap.14	Trap.15	Trap.16	Trap.17	Trap.18	Trap.19	Trap.20	Trap.21	Trap.22	Trap.23	Trap.24	Trap.25
115	D	A	T		D	T	D	A	T	D	D,F	T	D	D	T	D	D	T	D	D	T	D	D	T	
116	A	T		T			T			A	T	A	T	A	T	A	T	A	T	A	A	T	A	T	
117	T	A	T	A	T	A	T	D	T	D	T	D	T	A	T	T	D	T	D	T	A	T	A	T	
118	A	T	D	T	A	T	D	T	A	T	D	T	D	T	D	T	D	T	A	T	D	T	A	T	
119	A	T	D	T	A	T	D	T	A	T	D	T	D	T	A	T	D	D	Use:	D	T	A	T	D	
120	T	A	T	D	T	D	T	D	T	D	T	D	T	D	T	A	T	A	T	D	A	T	T	T	
121	A	T	D	T	D	T	A	T	D	T	A	T	D	T	D	T	D	T	D	T	D	T	D	T	
122	A	T	A	T	D	T	D	T	D	T	D	T	D	T	A	T	D	T	D	T	D	T	D	T	
123	T	A	T	D	T	D	T	A	T	D	T	D	T	D	T	D	T	D	T	D	D	A	T	D	
124	A	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	A	T	D	T	D	T	D	T	
125	T	D	T	D	T	D	T	T	A	T	A	T	A	T	A	T	T	A	T	D	T	D	T	T	
126	A	T	D	T	D	T	D	T	D	T	A	T	D	T	D	T	D	T	Use:	D	T	D	T	D	
127	T	T	A	T	D	T	A	T	A	T	D	T	A	T	D	T	A	T	T	A	T	D	T	T	
128	A	T	D	T	D	T	D	T	D	T	A	T	D	T	D	T	D	T	D	T	D	T	D	T	
129	T	A	T	D	T	A	T	D	T	D	T	A	T	D	T	D	T	A	T	D	T	A	T	D	
130	A	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	A	T	D	T	D	T	D	T	
131	T	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	T	A	T	A	T	
132	A	A	T	A			T			T	D	T	A	A	A	T	A	A	A	T	A	T	A	T	A
133	T	A	T	A	T	A	A	T	A	D	T	A	T	A	T	A	T	T	D	T	A	T	A	T	
134	A	T	A	T	D	T	D	T	A	T	D	T	A	T	A	T	A	T	A	F	T	A	A	A	
135	T		T		T	A	T																		

APPENDIX E SUMMARY OF SABLEFISH BIOLOGICAL DATA 2012.

Biological data collected for sablefish by set, catch weight in kilograms and numbers of fish. Sablefish counts by trap are represented by sparklines. Details include a tally of specimens recovered, tagged and sampled. Mean fork lengths for tagged sablefish and sampled male and female sablefish are listed.

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)			Specimen Count					Mean Fork Length(mm)		
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
1	514	213		1	0	60	61	603	62	62	62	62	62	62	0.42	566	639
2	389	195		1	0	48	49	569	68	68	68	68	68	68	0.66	559	603
3	320	167		0	0	49	49	576	57	57	57	57	57	57	0.74	552	615
4	141	45		0	0	2	2	660	41	41	41	41	41	41	0.05	608	650
5	250	69		1	0	20	21	683	43	43	43	43	43	43	0.07	651	676
8	327	169		0	0	50	50	560	47	47	47	47	47	47	0.79	562	601
9	603	275		0	0	74	74	597	47	47	47	47	47	47	0.53	576	623
10	336	164		0	0	58	58	568	55	55	55	55	55	55	0.80	553	624
11	192	66		0	0	19	19	623	44	44	44	44	44	44	0.25	588	643
12	206	89		0	0	37	37	611	39	39	39	39	39	39	0.69	588	593
13	730	432		1	0	131	132	525	44	44	44	44	44	44	0.80	525	539
14	206	83		0	0	32	32	601	41	41	41	41	41	41	0.63	600	598
15	893	315		2	0	61	63	629	84	84	84	84	84	84	0.36	618	639
16	277	97		0	0	31	31	607	48	48	48	48	48	48	0.48	616	659
17	208	44		0	0	27	27	719	10	10	10	10	10	10	0.10	618	761
18	263	76		0	0	16	16	660	52	52	52	52	52	52	0.06	648	673
19	369	194		1	0	60	61	567	49	49	49	49	49	49	0.82	532	630
20	710	451		2	0	184	186	519	56	56	56	56	56	56	0.82	525	514
21	444	178		0	0	45	45	605	62	62	62	62	62	62	0.66	588	679
22	418	226		2	0	87	89	568	63	63	63	63	63	63	0.65	542	556
23	265	154		2	0	27	29	543	63	63	63	63	63	63	0.63	540	528
24	194	48		0	0	20	20	694	28	28	28	28	28	28	0.00	0	700

continued.

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Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)		Specimen Count					Mean Fork Length(mm)			
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
25	219	71		0	0	26	26	675	40	40	40	40	40	40	0.73	606	703
26	3	1		0	0	0	0		0	0	0	0	0	0	0.00	0	0
27	482	184		1	0	61	62	620	56	56	56	56	56	56	0.68	579	632
28	371	160		0	0	61	61	606	56	56	56	56	56	56	0.54	567	612
29	234	84		0	0	11	11	621	62	62	62	62	62	62	0.26	589	626
30	56	21		0	0	7	7	612	14	14	14	14	14	14	0.43	590	651
31	195	93		1	0	27	28	585	46	46	45	46	45	46	0.78	568	649
32	422	260		0	0	103	103	534	47	47	47	47	47	47	0.53	512	557
33	146	56		1	0	20	21	629	35	35	35	35	35	35	0.26	584	629
34	180	74		0	0	16	16	599	48	48	48	48	48	48	0.63	572	664
35	415	195		0	0	61	61	563	54	54	50	54	50	54	0.59	553	641
36	291	101		0	0	26	26	627	41	41	41	41	41	41	0.68	624	665
37	339	126		0	0	43	43	620	53	53	53	53	53	53	0.40	571	662
38	593	297		0	0	113	113	576	60	60	60	60	60	60	0.73	548	618
39	69	18		0	0	7	7	683	11	11	11	11	11	11	0.09	697	710
40	387	149		0	0	75	75	601	51	51	51	51	51	51	0.55	592	676
41	774	300		0	0	124	123	617	54	54	54	54	54	54	0.91	623	705
43	1	1		0	0	0	0		1	1	1	1	0	0	1.00	453	0
44	351	92		0	0	26	26	695	57	57	57	57	0	57	0.28	646	697
45	657	251		1	0	97	97	599	49	49	49	49	49	49	0.71	588	602
46	325	107		0	0	34	34	642	51	51	50	51	51	51	0.22	642	663
47	256	87		1	0	19	20	601	53	53	53	53	53	53	0.38	631	660

continued.

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)		Specimen Count					Mean Fork Length(mm)			
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
48	355	140		1	0	53	54	601	55	55	55	55	55	55	0.58	583	620
49	315	103		0	0	17	17	637	61	61	61	61	0	61	0.18	572	635
50	453	127		0	0	39	39	659	47	47	47	47	47	47	0.15	636	677
51	29	11		0	0	1	1	559	8	8	8	8	8	8	0.38	617	625
52	592	207		0	0	84	84	633	51	51	51	51	51	51	0.33	599	661
53	153	29		0	0	9	9	801	20	20	20	20	20	20	0.20	685	747
54	336	101		0	0	30	29	664	45	48	48	48	48	48	0.25	606	666
55	591	297		0	0	137	137	562	53	53	53	53	53	53	0.85	555	572
56	213	54		1	0	15	16	707	38	38	38	38	38	38	0.05	664	705
57	1181	654		2	0	273	275	544	57	57	57	57	57	57	0.56	557	531
58	641	222		1	0	65	66	636	52	52	52	52	52	52	0.33	617	640
59	131	41		1	0	19	20	697	20	20	20	20	0	20	0.20	639	620
60	151	54		0	0	16	16	659	34	34	34	34	34	34	0.15	590	632
61	668	432		1	0	114	115	536	59	59	59	59	59	59	0.59	516	541
62	710	373		0	0	132	132	557	60	60	60	60	60	60	0.77	549	604
63	305	115		2	0	41	43	634	49	49	48	49	48	49	0.22	598	631
64	42	10		0	0	2	2	767	7	7	7	7	7	7	0.00	0	700
65	953	482		1	0	151	151	568	61	61	61	61	61	61	0.77	564	587
66	924	401		1	0	146	146	586	57	57	57	57	57	57	0.51	582	631
67	531	155		0	0	50	50	672	50	50	50	50	50	50	0.32	617	667
68	360	87		1	0	40	41	707	39	39	39	39	39	39	0.15	609	704
69	22	4		0	0	3	3	761	2	2	2	2	2	2	0.50	558	778

continued.

4

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)		Specimen Count					Mean Fork Length(mm)			
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
70	91	24		0	0	9	9	670	15	15	15	15	15	15	0.13	686	707
71	246	86		0	0	24	24	644	48	48	48	48	48	48	0.33	619	661
72	101	21		0	0	6	6	725	11	11	11	11	11	11	0.09	710	759
73	391	132		1	0	30	31	646	56	56	56	56	56	56	0.68	617	707
74	279	62		0	0	24	23	682	38	38	38	38	38	38	0.18	672	752
75	203	55		0	0	18	18	688	34	34	34	34	34	34	0.35	621	690
76	403	160		1	0	42	43	611	47	47	47	47	47	47	0.38	581	660
77	16	3		0	0	0	0		3	3	3	3	3	3	0.00	0	799
78	1100	333		2	0	123	125	651	55	55	55	55	55	55	0.47	629	693
79	382	120		1	0	35	36	637	46	47	47	47	47	47	0.26	631	675
80	14	4		0	0	0	0		4	4	4	4	4	4	0.25	642	685
81	628	192		1	0	82	83	646	53	54	54	54	54	54	0.52	616	659
82	277	100		2	1	36	38	619	53	53	53	53	53	53	0.79	613	621
83	679	194		0	0	76	76	661	58	58	58	58	58	58	0.43	639	681
84	615	219		3	0	54	57	625	58	58	58	58	58	58	0.40	604	648
85	72	18		0	0	5	5	680	6	6	6	6	6	6	0.00	0	706
86	115	25		0	0	7	7	699	18	18	18	18	18	18	0.28	716	693
87	404	122		0	0	55	54	640	55	55	55	55	55	55	0.22	630	674
88	100	21		0	0	3	3	692	18	18	18	18	18	18	0.22	697	796
89	338	171		1	0	73	74	578	38	38	38	38	38	38	0.87	553	692
90	26	7		0	0	7	7	721	0	0	0	0	0	0	0.00	0	0
91	194	92		1	0	37	38	569	45	45	45	45	45	45	0.80	554	624

continued.

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)		Specimen Count					Mean Fork Length(mm)			
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
92	29	8		0	0	4	4	698	4	4	4	4	4	4	0.25	648	718
93	269	67		1	0	25	26	696	41	41	41	41	41	41	0.12	657	710
94	139	53		1	0	29	30	638	23	23	23	23	23	23	0.78	641	688
95	116	40		1	0	12	13	650	27	27	27	27	27	27	0.41	621	667
96	12	4		0	0	2	2	655	2	2	2	2	2	2	0.00	0	653
97	249	122		0	0	50	50	564	52	52	52	52	52	52	0.79	556	648
98	139	58		1	0	30	31	608	27	27	27	27	27	27	0.70	583	611
99	188	72		0	0	22	22	625	38	38	38	38	38	38	0.71	578	610
100	230	62		0	0	15	15	706	41	41	41	41	41	41	0.17	593	706
101	160	42		0	0	17	17	671	24	24	24	24	24	24	0.21	665	703
102	452	152		0	0	52	52	645	56	56	56	56	56	56	0.66	602	674
103	1306	435		0	0	168	168	627	58	58	58	58	58	58	0.41	611	674
104	1315	533		1	0	203	202	598	41	41	41	41	41	41	0.61	583	616
105	359	112		0	0	45	45	665	53	53	53	53	53	53	0.45	640	694
106	480	152		0	0	57	57	648	51	51	51	51	49	51	0.53	610	698
107	252	72		0	0	33	32	669	39	39	39	39	39	39	0.41	677	719
108	281	89		0	0	38	38	653	50	50	50	50	50	50	0.58	593	669
109	684	211		0	0	72	71	673	51	50	50	51	51	51	0.58	652	711
110	746	217		1	0	72	73	644	54	54	54	54	54	54	0.63	619	689
111	447	118		0	0	36	36	659	42	42	42	42	42	42	0.50	638	678
112	152	30		0	0	11	11	722	17	17	17	17	17	17	0.24	714	760
113	1228	586		0	0	186	186	572	62	62	62	62	62	62	0.31	541	596

continued.

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)		Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
114	813	546		0	0	177	177	523	61	61	61	61	61	61	0.34	502	541
115	606	328		0	0	118	118	537	55	55	55	55	55	55	0.44	533	553
116	47	27		0	0	12	12	529	15	15	15	15	15	15	0.27	563	550
117	496	284		1	0	101	102	547	66	66	66	66	66	66	0.36	525	538
118	603	276		1	0	116	117	581	52	52	52	52	52	52	0.42	561	615
119	1234	529		1	0	300	299	599	56	57	57	57	57	57	0.37	576	613
120	1690	580		2	0	237	239	630	57	57	57	57	57	57	0.18	572	633
121	854	398		2	0	144	146	582	51	51	51	51	51	51	0.33	539	593
122	713	355		8	0	147	155	578	53	53	53	53	53	53	0.42	556	596
123	1069	436		3	0	178	181	607	60	60	60	60	60	60	0.18	570	626
124	1075	487		13	0	217	230	585	57	57	57	57	57	57	0.35	576	609
125	852	409		12	0	212	223	584	54	54	54	54	54	54	0.46	548	607
126	1288	445		14	0	186	200	636	44	44	44	44	44	44	0.25	598	635
127	554	193		1	0	117	118	628	49	49	49	49	49	49	0.24	604	644
128	1115	405		19	0	187	204	622	52	52	52	52	52	52	0.33	594	667
129	929	335		5	0	177	182	631	69	69	68	69	68	69	0.38	588	625
130	1282	488		15	0	217	231	607	58	58	58	58	58	58	0.41	575	658
131	157	78		0	0	39	39	576	39	39	39	39	39	39	0.28	543	590
132	228	111		0	0	22	22	571	42	42	42	42	42	42	0.26	515	580
133	417	165		4	0	103	107	607	45	45	45	45	45	45	0.27	558	623
134	446	159		0	0	80	80	621	42	42	42	42	42	42	0.33	582	637

continued.

Set	Total Catch			Tagged Fish Counts			Tagged Fork Lengths(mm)			Specimen Count					Mean Fork Length(mm)		
	kg	Count	Count by Trap	Recover-Rerelease	Deceased	Released	Count	Mean	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
135	126	53	<u> </u>	1	0	30	31	593	21	21	21	21	21	21	0.19	546	622
Total	57178	23060		151	1	8574	8708		5677	5682	5674	5683	5535	5682			

APPENDIX F SUMMARY OF BIOLOGICAL DATA FOR ROUGHEYE/BLACKSPOTTED ROCKFISH COMPLEX.

Biological data collected for rougheye/blackspotted rockfish complex. Each set is listed with counts of specimens sampled, calculations of mean fork lengths and number of species visually identified as either a RE = rougheye rockfish, BS = blackspotted rockfish or a hybrid.

Species Name	Set	Specimen Count							Mean Fork Length(mm)			Sampler Visual id Count			
		Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex	RE	BS	Hybrid
ROUGHEYE/BLACKSPOTTED ROCKFISH COMPLEX	11	1	1	1	1	1	1	1	1	440	0	0	1	0	0
	14	22	22	22	22	22	22	22	0.5	475	493	0	21	1	0
	16	6	6	6	6	6	6	6	0.5	442	488	0	5	1	0
	22	25	25	25	25	25	25	25	0.28	457	456	0	18	7	0
	23	26	26	26	26	26	26	26	0.54	459	489	0	19	7	0
	25	4	4	4	4	4	4	4	0.75	471	505	0	4	0	0
	27	15	15	15	15	15	15	15	0.73	484	529	0	8	7	0
	30	9	9	9	9	9	9	9	0.44	488	524	0	9	0	0
	36	3	3	3	3	3	3	3	1	459	0	0	2	1	0
	50	4	4	4	4	4	4	4	0.5	406	507	0	4	0	0
	52	2	2	2	2	2	2	2	1	452	0	0	0	2	0
	54	8	8	7	7	8	8	8	0.43	468	466	511	1	7	0
	58	19	19	19	19	19	19	19	0.63	423	430	0	5	14	0
	65	3	3	3	3	3	3	3	0.33	615	578	0	3	0	0
	67	52	52	52	51	52	52	52	0.65	451	453	370	17	35	0
	74	20	20	20	20	20	20	20	0.45	472	450	0	0	20	0
	75	5	5	5	5	5	5	5	0.4	425	475	0	1	4	0
	76	6	6	6	6	6	6	6	0.67	486	438	0	2	4	0
	79	3	3	3	3	3	3	3	1	452	0	0	1	2	0
	81	9	9	9	9	9	9	9	0.78	462	454	0	0	9	0
	82	8	8	8	8	8	8	8	0.38	470	469	0	0	8	0
	85	3	3	3	3	3	3	3	0.33	423	421	0	0	3	0
	86	31	31	31	31	31	31	31	0.45	480	508	0	9	22	0
	87	14	14	14	14	14	14	14	0.5	461	463	0	1	13	0
	93	23	23	23	23	23	23	23	0.35	479	475	0	7	16	0
	98	10	10	10	10	10	10	10	0.6	466	509	0	3	7	0
	99	10	10	10	10	10	10	10	0.3	514	506	0	1	9	0
	101	10	10	10	10	10	10	10	0.2	498	592	0	5	5	0
	110	17	17	17	17	17	17	17	0.35	460	469	0	4	13	0
	111	15	15	15	15	15	15	15	0.27	470	474	0	5	10	0
	112	10	10	10	10	10	10	10	0.4	453	503	0	1	9	0
	120	1	1	0	0	1	1	1	0	0	0	480	0	1	0
	132	1	1	1	1	1	1	1	0	0	526	0	0	1	0
Total		395	395	393	392	395	395	395					157	238	0

APPENDIX G SUMMARY OF BIOLOGICAL DATA FOR ALL OTHER SPECIES.

Biological data collected for species other than sablefish or rougheye/blackspotted rockfish complex. Each set is listed with counts of specimens sampled, and calculations of mean fork lengths.

Species Name	Length Type	Specimen Count							Mean Fork Length(mm)				
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
ARROWTOOTH FLOUNDER	FORK LENGTH	11	25	0	25	0	0	0	25	0.00	0	585	0
		12	13	0	13	0	0	0	13	0.00	0	568	707
		14	2	0	2	0	0	0	2	0.00	0	635	0
		15	18	0	18	0	0	0	18	0.00	0	593	565
		22	1	0	1	0	0	0	1	0.00	0	496	0
		23	5	0	5	0	0	0	5	0.00	0	551	0
		25	22	0	22	0	0	0	22	0.00	0	592	602
		27	19	0	19	0	0	0	19	0.00	0	608	0
		29	21	0	21	0	0	0	21	0.00	0	602	560
		30	15	0	15	0	0	0	15	0.00	0	601	589
		36	10	0	10	0	0	0	10	0.00	0	601	671
		41	2	0	2	0	0	0	2	0.00	0	564	0
		42	16	0	16	0	0	0	16	0.00	0	555	527
		43	22	0	22	0	0	0	22	0.00	0	565	552
		46	1	0	1	0	0	0	1	0.00	0	0	573
		49	11	0	11	0	0	0	11	0.00	0	583	612
		50	4	0	4	0	0	0	4	0.00	0	555	0
		51	1	0	1	0	0	0	1	0.00	0	689	0
		54	14	0	14	0	0	0	14	0.00	0	559	0
		58	8	0	8	0	0	0	8	0.00	0	618	0
		59	13	0	13	0	0	0	13	0.00	0	553	0
		60	30	0	30	0	0	0	30	0.00	0	548	0
		65	1	0	1	0	0	0	1	0.00	0	495	0
		67	22	0	21	0	0	0	22	0.00	0	568	507
		68	21	0	21	0	0	0	21	0.00	0	589	0
		69	7	0	7	0	0	0	7	0.00	0	571	0
		70	28	0	28	0	0	0	28	0.00	0	540	0
		71	19	0	19	0	0	0	19	0.00	0	552	493
		74	77	0	77	0	0	0	77	0.00	0	565	567
		75	30	0	30	0	0	0	30	0.00	0	550	0
		76	27	0	27	0	0	0	27	0.00	0	555	0
		77	4	0	4	0	0	0	4	0.00	0	546	0
		78	3	0	3	0	0	0	3	0.00	0	571	0
		79	4	0	4	0	0	0	4	0.00	0	573	0
		80	7	0	7	0	0	0	7	0.00	0	572	613
		81	7	0	7	0	0	0	7	0.00	0	584	0
		83	10	0	10	0	0	0	10	0.00	0	548	0
		85	3	0	3	0	0	0	3	0.00	0	600	0
		86	9	0	9	0	0	0	9	0.00	0	566	555
		87	7	0	7	0	0	0	7	0.00	0	571	535
		93	23	0	23	0	0	0	23	0.00	0	566	0

continued.

Species Name	Length Type	Specimen Count							Mean Fork Length(mm)				
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
		99	2	0	2	0	0	0	2	0.00	0	536	0
		101	9	0	9	0	0	0	9	0.00	0	564	0
		103	3	0	3	0	0	0	3	0.00	0	546	0
		104	2	0	2	0	0	0	2	0.00	0	595	0
		110	7	0	7	0	0	0	7	0.00	0	546	0
		111	30	0	30	0	0	0	30	0.00	0	580	0
		112	23	0	23	0	0	0	23	0.00	0	568	0
		113	16	0	16	0	0	0	16	0.13	431	560	0
		114	9	0	9	0	0	0	9	0.00	0	512	0
		115	11	0	11	0	0	0	11	0.00	0	580	0
		121	2	0	2	0	0	0	2	0.00	0	554	0
		122	1	0	1	0	0	0	1	0.00	0	601	0
		124	2	0	2	0	0	0	2	0.00	0	569	0
		125	5	0	5	0	0	0	5	0.00	0	545	0
		126	3	0	3	0	0	0	3	0.00	0	548	0
		128	1	0	1	0	0	0	1	0.00	0	595	0
		132	1	0	1	0	0	0	1	0.00	0	844	0
		133	2	0	2	0	0	0	2	0.00	0	473	0
		134	1	0	1	0	0	0	1	0.00	0	576	0
AURORA ROCKFISH		82	2	0	2	0	0	0	2	0.50	324	368	0
		93	1	0	1	0	0	0	1	1.00	357	0	0
DOVER SOLE	TOTAL LENGTH	11	2	0	2	0	0	0	2	0.00	0	0	0
		12	2	0	0	0	0	0	2	0.00	0	0	601
		22	2	0	2	0	0	0	2	0.00	0	0	0
		23	2	0	2	0	0	0	2	0.00	0	0	0
		36	1	0	1	0	0	0	1	0.00	0	0	0
		45	2	0	2	0	0	0	2	0.50	0	0	0
		57	1	0	1	0	0	0	1	1.00	0	0	0
		59	1	0	1	0	0	0	1	1.00	0	0	0
		75	1	0	1	0	0	0	1	0.00	0	0	0
		78	1	0	1	0	0	0	1	0.00	0	0	492
		99	3	0	3	0	0	0	3	0.00	0	0	0
		132	1	0	0	0	0	0	1	0.00	0	0	429
GIANT BLOBSCLUPIN		56	1	0	1	0	0	0	1	0.00	0	0	0
GIANT GRENADIER	SNOUT TO ANAL FIN LENGTH	1	4	0	4	0	0	0	4	0.33	0	0	248

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
		5	4	0	4	0	0	0	4	0.00	0	0	0
		17	18	0	18	0	0	0	18	0.17	0	0	0
		24	12	0	12	0	0	0	12	0.25	0	0	0
		39	10	0	10	0	0	0	10	0.00	0	0	0
		40	1	0	1	0	0	0	1	0.00	0	0	0
		47	2	0	2	0	0	0	2	0.50	0	0	0
		56	14	0	14	0	0	0	14	0.21	0	0	0
		62	1	0	0	0	0	0	1	0.00	0	0	762
		63	2	0	2	0	0	0	2	0.00	0	0	441
		64	2	0	2	0	0	0	2	0.00	0	0	0
		72	5	0	5	0	0	0	5	0.20	0	0	0
		84	1	0	1	0	0	0	1	0.00	0	0	0
		88	8	0	8	0	0	0	8	0.25	0	0	0
		89	1	0	1	0	0	0	1	0.00	0	0	0
		90	6	0	6	0	0	0	6	0.33	0	0	0
		91	2	0	2	0	0	0	2	0.50	0	0	0
		92	25	0	25	0	0	0	25	0.24	0	0	0
		94	5	0	5	0	0	0	5	0.20	0	0	0
		95	12	0	12	0	0	0	12	0.00	0	0	0
		96	23	0	23	0	0	0	23	0.35	0	0	0
		105	1	0	1	0	0	0	1	0.00	0	0	0
		106	3	0	3	0	0	0	3	0.00	0	0	0
		107	13	0	13	0	0	0	13	0.00	0	0	0
		108	2	0	2	0	0	0	2	0.00	0	0	0
		109	14	0	14	0	0	0	14	0.07	0	0	0
GREENSTRIPED ROCKFISH	FORK LENGTH	15	1	0	1	0	0	0	1	0.00	0	327	0
		60	1	0	1	0	0	0	1	1.00	268	0	0
LINGCOD		51	3	0	3	0	0	0	3	0.00	0	927	930
LONGSPINE THORNYHEAD	TOTAL LENGTH	3	1	0	1	0	0	0	1	1.00	0	0	0
		4	1	0	1	0	0	0	1	0.00	0	0	0
		10	1	0	1	0	0	0	1	1.00	0	0	0
		28	2	0	2	0	0	0	2	0.50	0	0	0
		31	1	0	1	0	0	0	1	0.00	0	0	0
		38	2	0	2	0	0	0	2	0.50	0	0	0
		91	1	0	1	0	0	0	1	0.00	0	0	0
		100	1	0	1	0	0	0	1	0.00	0	0	0

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
NORTH PACIFIC SPINY DOGFISH		11	2	0	2	0	0	0	2	1.00	0	0	0
		12	3	0	3	0	0	0	3	0.67	0	0	0
		14	67	0	67	0	0	0	67	0.49	0	0	0
		15	62	0	62	0	0	0	62	0.31	0	0	0
		22	8	0	8	0	0	0	8	0.38	0	0	0
		23	27	0	27	0	0	0	28	0.46	0	0	0
	PRE-CAUDAL LENGTH	23	27	0	27	0	0	0	28	0.46	0	0	0
TOTAL LENGTH		23	0	0	1	0	0	0	28	0.46	0	0	0
PRE-CAUDAL LENGTH		23	0	0	1	0	0	0	28	0.46	0	0	0
TOTAL LENGTH		25	34	0	34	0	0	0	34	0.24	0	0	0
		27	24	0	24	0	0	0	24	0.38	0	0	0
		29	26	0	26	0	0	0	26	0.50	0	0	0
		30	0	0	1	0	0	0	8	0.38	0	0	0
	PRE-CAUDAL LENGTH	30	0	0	1	0	0	0	8	0.38	0	0	0
TOTAL LENGTH		30	7	0	7	0	0	0	8	0.38	0	0	0
PRE-CAUDAL LENGTH		30	7	0	7	0	0	0	8	0.38	0	0	0
TOTAL LENGTH		42	0	0	1	0	0	0	13	0.15	0	0	0
PRE-CAUDAL LENGTH		42	0	0	1	0	0	0	13	0.15	0	0	0
TOTAL LENGTH		42	8	0	12	0	0	0	13	0.15	0	0	0
PRE-CAUDAL LENGTH		42	8	0	12	0	0	0	13	0.15	0	0	0
TOTAL LENGTH		43	9	0	12	0	0	0	13	0.15	0	0	0
PRE-CAUDAL LENGTH		43	9	0	12	0	0	0	13	0.15	0	0	0
TOTAL LENGTH		43	0	0	1	0	0	0	13	0.15	0	0	0
PRE-CAUDAL LENGTH		43	0	0	1	0	0	0	13	0.15	0	0	0
TOTAL LENGTH		46	28	0	28	0	0	0	28	0.79	0	0	0
		49	27	0	27	0	0	0	29	0.38	0	0	0
	PRE-CAUDAL LENGTH	49	27	0	27	0	0	0	29	0.38	0	0	0
TOTAL LENGTH		49	0	0	2	0	0	0	29	0.38	0	0	0
PRE-CAUDAL LENGTH		49	0	0	2	0	0	0	29	0.38	0	0	0
TOTAL LENGTH		50	29	0	29	0	0	0	29	0.24	0	0	0

continued.

Species Name	Length Type	Specimen Count							Mean Fork Length(mm)				
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
		51	8	0	8	0	0	0	8	0.00	0	0	0
		53	33	0	33	0	0	0	34	0.21	0	0	0
	PRE-CAUDAL LENGTH	53	33	0	33	0	0	0	34	0.21	0	0	0
	TOTAL LENGTH	53	0	0	1	0	0	0	34	0.21	0	0	0
	PRE-CAUDAL LENGTH	53	0	0	1	0	0	0	34	0.21	0	0	0
	TOTAL LENGTH	54	21	0	21	0	0	0	21	0.19	0	0	0
		58	5	0	5	0	0	0	5	0.40	0	0	0
		59	0	0	1	0	0	0	10	0.20	0	0	0
	PRE-CAUDAL LENGTH	59	0	0	1	0	0	0	10	0.20	0	0	0
	TOTAL LENGTH	59	9	0	9	0	0	0	10	0.20	0	0	0
	PRE-CAUDAL LENGTH	59	9	0	9	0	0	0	10	0.20	0	0	0
	TOTAL LENGTH	60	33	0	33	0	0	0	33	0.30	0	0	0
		67	20	0	20	0	0	0	20	0.15	0	0	0
		68	11	0	11	0	0	0	11	0.27	0	0	0
		69	4	0	4	0	0	0	4	0.00	0	0	0
		70	0	0	1	0	0	0	20	0.30	0	0	0
	PRE-CAUDAL LENGTH	70	0	0	1	0	0	0	20	0.30	0	0	0
	TOTAL LENGTH	70	19	0	19	0	0	0	20	0.30	0	0	0
	PRE-CAUDAL LENGTH	70	19	0	19	0	0	0	20	0.30	0	0	0
	TOTAL LENGTH	71	16	0	16	0	0	0	16	0.00	0	0	0
		77	22	0	22	0	0	0	23	0.30	0	0	0
	PRE-CAUDAL LENGTH	77	22	0	22	0	0	0	23	0.30	0	0	0
	TOTAL LENGTH	77	0	0	1	0	0	0	23	0.30	0	0	0
	PRE-CAUDAL LENGTH	77	0	0	1	0	0	0	23	0.30	0	0	0
	TOTAL LENGTH	80	0	0	1	0	0	0	29	0.14	0	0	0
	PRE-CAUDAL LENGTH	80	0	0	1	0	0	0	29	0.14	0	0	0
	TOTAL LENGTH	80	28	0	28	0	0	0	29	0.14	0	0	0
	PRE-CAUDAL LENGTH	80	28	0	28	0	0	0	29	0.14	0	0	0
	TOTAL LENGTH	85	18	0	18	0	0	0	19	0.05	0	0	0

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
G	PRE-CAUDAL LENGTH	85	18	0	18	0	0	0	19	0.05	0	0	0
	TOTAL LENGTH	85	0	0	1	0	0	0	19	0.05	0	0	0
	PRE-CAUDAL LENGTH	85	0	0	1	0	0	0	19	0.05	0	0	0
	TOTAL LENGTH	86	19	0	19	0	0	0	19	0.44	0	0	843
		87	17	0	17	0	0	0	17	0.35	0	0	0
		93	7	0	7	0	0	0	11	0.00	0	0	0
	PRE-CAUDAL LENGTH	93	7	0	7	0	0	0	11	0.00	0	0	0
	TOTAL LENGTH	93	0	0	4	0	0	0	11	0.00	0	0	0
	PRE-CAUDAL LENGTH	93	0	0	4	0	0	0	11	0.00	0	0	0
	TOTAL LENGTH	101	26	0	26	0	0	0	26	0.31	0	0	0
PACIFIC COD		112	3	0	3	0	0	0	4	0.00	0	0	0
	PRE-CAUDAL LENGTH	112	3	0	3	0	0	0	4	0.00	0	0	0
	TOTAL LENGTH	112	0	0	1	0	0	0	4	0.00	0	0	0
	PRE-CAUDAL LENGTH	112	0	0	1	0	0	0	4	0.00	0	0	0
	TOTAL LENGTH	113	10	0	10	0	0	0	10	0.60	0	0	0
	PRE-CAUDAL LENGTH	114	0	0	1	0	0	0	1	0.00	0	0	0
	TOTAL LENGTH	115	1	0	1	0	0	0	1	0.00	0	0	0
		122	6	0	6	0	0	0	6	0.00	0	0	0
		123	4	0	4	0	0	0	4	0.00	0	0	0
		124	1	0	1	0	0	0	1	0.00	0	0	0
PACIFIC FLATNOSE	FORK LENGTH	29	1	0	1	0	0	0	1	1.00	471	0	0
		42	1	0	1	0	0	0	1	0.00	0	0	735
		43	7	0	7	0	0	0	7	0.29	646	724	0
		124	1	0	0	0	0	0	1	0.00	0	0	580
	TOTAL LENGTH	4	1	0	1	0	0	0	1	0.00	0	0	0
		17	3	0	3	0	0	0	3	1.00	0	0	0
		24	5	0	5	0	0	0	5	0.80	0	0	0
		39	1	0	1	0	0	0	1	1.00	0	0	0
		56	5	0	5	0	0	0	5	0.40	0	0	0
		72	3	0	3	0	0	0	3	1.00	0	0	0

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
PACIFIC GRENADIER	SNOUT TO ANAL FIN LENGTH	4	4	0	4	0	0	0	4	0.75	0	0	0
		5	11	0	11	0	0	0	11	0.91	0	0	0
		17	16	0	16	0	0	0	16	0.69	0	0	0
		18	10	0	10	0	0	0	10	0.70	0	0	0
		24	30	0	30	0	0	0	30	0.52	0	0	224
		28	2	0	2	0	0	0	2	0.00	0	0	0
		33	1	0	1	0	0	0	1	0.00	0	0	0
		34	1	0	1	0	0	0	1	1.00	0	0	0
		37	1	0	1	0	0	0	1	1.00	0	0	0
		39	29	0	29	0	0	0	29	0.72	0	0	0
PACIFIC HALIBUT	FORK LENGTH	40	1	0	1	0	0	0	1	0.00	0	0	0
		44	18	0	18	0	0	0	18	0.83	0	0	0
		45	1	0	1	0	0	0	1	0.00	0	0	0
		56	38	0	38	0	0	0	38	0.71	0	0	0
		63	1	0	1	0	0	0	1	0.00	0	0	0
		64	18	0	18	0	0	0	18	0.89	0	0	0
		72	28	0	28	0	0	0	28	0.50	0	0	0
		73	8	0	8	0	0	0	8	0.88	0	0	0
		88	30	0	30	0	0	0	30	0.90	0	0	0
		90	30	0	30	0	0	0	30	0.90	0	0	0
PACIFIC HALIBUT	FORK LENGTH	91	1	0	1	0	0	0	1	0.00	0	0	0
		92	26	0	26	0	0	0	26	0.31	0	0	0
		94	8	0	8	0	0	0	8	0.63	0	0	0
		95	6	0	6	0	0	0	6	0.33	0	0	0
		96	30	0	30	0	0	0	30	0.37	0	0	0
		105	1	0	1	0	0	0	1	1.00	0	0	0
		107	25	0	25	0	0	0	25	0.56	0	0	0
		109	5	0	5	0	0	0	5	0.40	0	0	0
		11	2	0	2	0	0	0	2	0.00	0	814	0
		23	1	0	1	0	0	0	1	0.00	0	861	0

continued.

Species Name	Length Type	Specimen Count							Mean Fork Length(mm)				
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
PINK SNAILFISH	TOTAL LENGTH	119	4	0	4	0	0	0	4	1.00	813	0	953
		5	1	0	1	0	0	0	1	0.00	0	0	0
		44	1	0	0	0	0	0	1	0.00	0	0	335
REDBANDED ROCKFISH	FORK LENGTH	14	3	0	3	0	0	0	3	0.33	414	416	0
G		22	1	0	1	0	0	0	1	0.00	0	436	0
		23	1	0	1	0	0	0	1	1.00	381	0	0
		25	7	0	7	0	0	0	7	0.29	411	418	0
		27	6	0	6	0	0	0	6	0.50	419	478	0
		29	3	0	3	0	0	0	3	1.00	447	0	0
		30	6	0	6	0	0	0	6	0.83	405	452	0
		42	2	0	2	0	0	0	2	0.50	370	360	0
		43	2	0	2	0	0	0	2	0.50	373	333	0
		49	7	0	7	0	0	0	7	0.86	438	473	0
		50	9	0	9	0	0	0	9	0.67	433	444	0
G		51	2	0	2	0	0	0	2	0.50	435	539	0
		53	5	0	5	0	0	0	5	0.60	443	458	0
		54	22	0	22	0	0	0	22	0.55	435	449	0
		58	10	0	10	0	0	0	10	0.70	387	423	0
		59	3	0	3	0	0	0	3	1.00	408	0	0
		60	6	0	6	0	0	0	6	1.00	434	0	0
		67	9	0	9	0	0	0	9	0.67	435	430	0
		68	4	0	4	0	0	0	4	0.50	455	579	0
		69	15	0	15	0	0	0	15	0.60	452	487	0
		70	5	0	5	0	0	0	5	0.80	470	508	0
G		71	2	0	2	0	0	0	2	0.00	0	412	0
		74	9	0	9	0	0	0	9	0.67	443	433	0
		75	14	0	14	0	0	0	14	0.64	414	450	0
		76	6	0	6	0	0	0	6	0.67	448	504	0
		77	9	0	9	0	0	0	9	0.33	486	510	0
		80	16	0	16	0	0	0	16	0.38	447	444	0
		85	3	0	3	0	0	0	3	0.67	466	408	0
		86	3	0	3	0	0	0	3	0.67	435	432	0
		87	5	0	5	0	0	0	5	0.80	425	441	0
		93	2	0	1	0	0	0	2	1.00	445	0	364
G		101	8	0	8	0	0	0	8	0.38	465	468	0
		113	1	0	1	0	0	0	1	1.00	341	0	0
		115	2	0	2	0	0	0	2	0.50	519	330	0
		125	1	0	1	0	0	0	1	0.00	0	373	0

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
ROSETHORN ROCKFISH		50	1	0	1	0	0	0	1	0.00	0	300	0
		60	2	0	2	0	0	0	2	1.00	289	0	0
		68	2	0	2	0	0	0	2	1.00	307	0	0
		70	2	0	2	0	0	0	2	1.00	251	0	0
SHORTRAKER ROCKFISH		29	1	0	1	0	0	0	1	0.00	0	701	0
		36	1	0	1	0	0	0	1	1.00	843	0	0
		41	1	0	1	0	0	0	1	0.00	0	604	0
		54	2	0	2	0	0	0	2	0.50	624	680	0
		58	1	0	1	0	0	0	1	1.00	331	0	0
		65	2	0	2	0	0	0	2	0.00	0	594	0
		78	4	0	4	0	0	0	4	0.75	448	588	0
		79	4	0	4	0	0	0	4	0.25	658	589	0
		81	9	0	9	0	0	0	9	0.67	627	627	0
		82	10	0	10	0	0	0	10	0.70	652	545	0
		83	2	0	2	0	0	0	2	1.00	536	0	0
		84	1	0	1	0	0	0	1	1.00	621	0	0
		86	3	0	3	0	0	0	3	0.67	723	561	0
		87	5	0	5	0	0	0	5	0.40	477	595	0
		93	7	0	7	0	0	0	7	0.57	677	686	0
		99	4	0	4	0	0	0	4	0.00	0	635	0
		104	2	0	2	0	0	0	2	0.00	0	577	0
		131	2	0	2	0	0	0	2	0.50	406	794	0
SHORTSPINE THORNYHEAD	TOTAL LENGTH	3	2	0	2	0	0	0	2	0.50	0	0	0
		19	1	0	1	0	0	0	1	1.00	0	0	0
		28	2	0	2	0	0	0	2	0.00	0	0	0
		31	2	0	2	0	0	0	2	0.00	0	0	0
		33	1	0	1	0	0	0	1	1.00	0	0	0
		34	1	0	1	0	0	0	1	0.00	0	0	0
		37	12	0	12	0	0	0	12	0.67	0	0	0
		38	1	0	1	0	0	0	1	1.00	0	0	0
		40	4	0	4	0	0	0	4	0.75	0	0	0
		44	1	0	1	0	0	0	1	0.00	0	0	0
		45	2	0	2	0	0	0	2	0.50	0	0	0
		47	2	0	2	0	0	0	2	1.00	0	0	0
		56	2	0	2	0	0	0	2	0.50	0	0	0
		60	1	0	1	0	0	0	1	0.00	0	0	0

continued.

Species Name	Length Type	Specimen Count						Mean Fork Length(mm)					
		Set	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex
WALLEYE POLLOCK	FORK LENGTH	63	1	0	1	0	0	0	1	1.00	0	0	0
		65	1	0	1	0	0	0	1	1.00	0	0	0
		66	1	0	1	0	0	0	1	1.00	0	0	0
		74	1	0	1	0	0	0	1	0.00	0	0	0
		75	1	0	1	0	0	0	1	1.00	0	0	0
		76	1	0	1	0	0	0	1	0.00	0	0	0
		82	4	0	0	0	0	0	4	0.00	0	0	481
		91	1	0	0	0	0	0	1	0.00	0	0	374
		94	2	0	2	0	0	0	2	0.50	0	0	0
		97	1	0	0	0	0	0	1	0.00	0	0	711
		100	1	0	1	0	0	0	1	1.00	0	0	0
		103	1	0	1	0	0	0	1	0.00	0	0	0
		104	1	0	1	0	0	0	1	1.00	0	0	0
		109	1	0	1	0	0	0	1	1.00	0	0	0
		110	1	0	1	0	0	0	1	0.00	0	0	0
		124	1	0	0	0	0	0	1	0.00	0	0	450
		113	2	0	2	0	0	0	2	0.00	0	489	0
		132	1	0	0	0	0	0	1	0.00	0	0	520
YELLOWEYE ROCKFISH		42	1	0	1	0	0	0	1	0.00	0	520	0
		51	3	0	3	0	0	0	3	1.00	604	0	0
		53	3	0	3	0	0	0	3	0.33	572	492	0
		69	1	0	1	0	0	0	1	1.00	615	0	0
		77	21	0	21	0	0	0	21	0.33	577	576	0
YELLOWMOUTH ROCKFISH		85	4	0	4	0	0	0	4	0.50	582	628	0
		60	2	0	2	0	0	0	2	1.00	438	0	0

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