

Summary of the 2023 British Columbia Sablefish (*Anoplopoma fimbria*) trap survey, September 29–November 13, 2023

Lisa C. Lacko, Schon M. Hardy, Kendra R. Holt and Kathryn L.
Temple

Pacific Biological Station
Fisheries and Oceans Canada, 3190 Hammond Bay Road
Nanaimo, British Columbia, V9T 6N7, Canada

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SURVEY, SEPTEMBER 29-NOVEMBER 13, 2023

by

Lisa C. Lacko, Schon M. Hardy, Kendra R. Holt and Kathryn L. Temple

¹Pacific Biological Station
Fisheries and Oceans Canada, 3190 Hammond Bay Road
Nanaimo, British Columbia, V9T 6N7, Canada

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ABSTRACT

Lacko, L.C., Hardy, S.M., Holt, K.R. and Temple, K.L. 2026. Summary of the 2023 British Columbia Sablefish (*Anoplopoma fimbria*) trap survey, September 29-November 13, 2023. Can. Tech. Rep. Fish. Aquat. Sci. 3750: vii + 65 p. <https://doi.org/10.60825/v9h9-8342>

This report presents the methodologies and findings of the 2023 British Columbia Sablefish longline trap survey. The survey design included 91 stratified random sampling (StRS) sets across five depth-stratified areas, along with five sets at Gil Island locality. Biological sampling was carried out for Sablefish and incidentally captured Shortraker Rockfish, Yelloweye Rockfish, and Rougheye/Blackspotted Rockfish. Sablefish were randomly sampled from traps spaced along each gear string to ensure even coverage, with a target of 30 specimens per set. The tag and release study, conducted annually since 1991, was not performed in 2023 due to a shift to tagging in even-numbered years. The survey also included 16 experimental fishing sets to investigate the impact of escape ring configuration on Sablefish catch rates and size distribution.

In 2023, a total of 39,044 Sablefish were captured on StRS sets, of which 2,932 were selected for biological sampling. The target number of 91 StRS blocks, along with one inlet site, was completed. To assess trends over time, survey catch per unit effort (CPUE) and biological data were compared to previous years. The 2023 Sablefish StRS abundance index was 36 kg/trap, representing a decrease of 10% from 2022 but remaining consistent with the relatively high values observed since 2018.

RÉSUMÉ

Lacko, L.C., Hardy, S.M., Holt, K.R. and Temple, K.L. 2026. Summary of the 2023 British Columbia Sablefish (*Anoplopoma fimbria*) trap survey, September 29-November 13, 2023. Can. Tech. Rep. Fish. Aquat. Sci. 3750: vii + 65 p. <https://doi.org/10.60825/v9h9-8342>

Ce rapport présente les méthodologies et les résultats du relevé au casier et à la palangre pour la morue charbonnière en Colombie-Britannique en 2023. Le relevé comprenait 91 séries d'échantillonnage aléatoire stratifié dans cinq zones stratifiées en profondeur, ainsi que cinq séries dans la localité de Gil Island. On a effectué un échantillonnage biologique pour la morue charbonnière et les prises accessoires, soit le sébaste boréal, le sébaste aux yeux jaunes, le sébaste à œil épineux et le sébaste à taches noires. Les morues charbonnières ont été échantillonnées de manière aléatoire à partir de casiers espacés le long de chaque ligne d'engin afin de garantir une couverture uniforme, avec un objectif de 30 spécimens par série. L'étude d'étiquetage et de remise à l'eau, menée chaque année depuis 1991, n'a pas été réalisée en 2023 en raison du changement consistant à effectuer l'étiquetage dans les années paires. Le relevé comprenait également 16 séries de pêche expérimentale visant à étudier l'incidence de la configuration des anneaux de sortie sur les taux de prises et la répartition selon la taille de la morue charbonnière.

En 2023, un total de 39 044 morues charbonnières ont été capturées dans les séries d'échantillonnage aléatoire stratifié, dont 2 932 ont été sélectionnées pour l'échantillonnage biologique. Le nombre cible de 91 séries d'échantillonnage aléatoire stratifié, ainsi qu'un site d'entrée, a été atteint. Pour évaluer les tendances au fil du temps, les captures par unité d'effort (CPUE) et les données biologiques ont été comparées à celles des années précédentes. L'indice de l'abondance de la morue charbonnière tiré des séries d'échantillonnage aléatoire stratifié pour 2023 était de 36 kg/casier, ce qui représente une diminution de 10 % par rapport à 2022, mais reste cohérent avec les valeurs relativement élevées observées depuis 2018.

1 Introduction

Fisheries and Oceans Canada (DFO), in partnership with the Canadian Sablefish Association (CSA), has conducted fishery-independent longline trap surveys along the continental shelf of British Columbia (B.C.) since 1988. Over time, survey methodologies have evolved, leading to standardized sampling protocols and shifts in the spatial distribution of survey sites.

The survey timeline includes several key developments. From 1988 to 2010, fishing was conducted at offshore indexing localities using standardized gear, bait, and sampling designs. Tag-and-release efforts were carried out at these offshore indexing sites between 1991 and 2007, with additional tagging conducted at offshore tagging localities from 1995 to 2008. Inlet sites along the B.C. mainland were surveyed from 1994 to 2019 and again from 2021 to 2023. A transition to stratified random sampling (StRS) began in 2003 (Wyeth et al. 2004) and has since been conducted within five defined spatial areas, based on a grid system of two-by-two kilometer survey blocks.

In 2023, the StRS design facilitated the collection of catch and effort metrics, biological specimens, and oceanographic data. These data provide an independent assessment of Sablefish population status and serve as key inputs for the Management Strategy Evaluation (MSE) process that supports sustainable Sablefish management in B.C. (Johnson et al. 2025). No tag-and-release work was conducted in 2023, following the shift to a biennial tagging schedule. To evaluate the effects of escape ring configuration on trap performance, a selectivity study was conducted comparing three open-ring designs. Escape rings function as size-selective openings that permit sublegal fish to escape the traps. This experimental study assessed the effects of the different ring configurations on Sablefish catch rates and the size distribution of retained fish.

2 Methods

2.1 SURVEY DESIGN

The design for the 2023 survey is described in Sections 2.1.1, 2.1.2, and 2.1.3.

2.1.1 Stratified Random Sampling Component (StRS)

Since 2003, the StRS survey zone has been partitioned into five spatial strata (S_1 to S_5) and three depth strata (RD_1 to RD_3) (Figure 1). The depth strata correspond to RD_1 (100–250 fathoms; 183–457 m), RD_2 (250–450 fathoms; 458–823 m), and RD_3 (450–750 fathoms; 824–1,372 m). Each of these 15 strata were divided into two-by-two kilometer grid cells, known as “fishing blocks” from which specific locations were randomly selected for surveying in a given year. For the 2023 survey, the goal was to survey 91 blocks, with allocations specified within each stratum (Table 1).

Historically, the allocation of blocks has varied since the inception of the StRS component in

2003. From 2003 to 2005, five grid cells were randomly selected in each spatial-depth stratum, resulting in a total of 75 targeted survey blocks (Wyeth et al. 2007). Between 2006 and 2010, this number increased to six blocks per stratum for a total of 90 targeted survey blocks. In 2011, block allocation was optimized, and the sampling rate was raised to a target of 110 blocks for both the 2011 and 2012 surveys. To reduce survey costs in 2013, the number of offshore blocks was reduced from 110 to 91, while maintaining the same relative allocation of blocks to strata. This target block count has remained consistent in all subsequent surveys, including 2023 (Table 1).

2.1.2 Inlet Survey Component

Under the inlet design, one set was allocated to each of the five specific polygons in the Gil Island Inlet locality (Figure 1).

2.1.3 Experimental Component

Experimental sets were opportunistically deployed in offshore locations to investigate the effects of various escape ring configurations on the capture of sub-legal (<55 cm fork length) sized Sablefish. The Fishing Master selected the locations for these sets, ensuring they were at least 1 nautical mile away from any survey blocks that had not yet been fished. Each fishing set was configured with 25 trap strings with four different configurations of escape ring traps repeated several times on each string, as described in 2.4.1.

2.2 GHNMCA AND HAIDA HERITAGE SITE

The Sablefish survey received approval from the Archipelago Management Board (AMB) of the Gwaii Haanas National Marine Conservation Area Reserve (GHNMCA) to operate within the reserve's multi-use protection zones (Figure 1, inset) between 2021 and 2023. In 2023, five randomly selected survey blocks fell within the multiuse zone (MUZ). An additional three randomly selected blocks were located within the GHNMCA strict protection zone (SPZ); however, as sampling was not permitted in the SPZ in 2023, these blocks were replaced with new ones outside of this protected area.

The Gwaii Haanas Gina 'Waadluxan KilGuhIGa Land-Sea-People Management Plan is located at <https://parks.canada.ca/pn-np/bc/gwaiihaanas/info/consultations/gestion-management-2018>.

2.3 FISHING VESSEL

The 2023 survey of 96 fishing sets and 16 escape ring experimental sets were chartered aboard the F/V *Ocean Pearl* (Figure 2), skippered by James Simpson between September 29 – November 13, 2023 (Appendix A). Further information about the vessel can be found at <http://marinetraffic.com>.

2.4 FISHING GEAR

The longline trap setup was comprised of a groundline positioned on the seabed. Along its length, 25 baited traps were attached to beckets at 150-foot intervals, and 90-pound anchors were placed at each end. A flagpole was securely attached to mark the gear location for retrieval. The traps were constructed with a steel frame, with a bottom hoop diameter of 54 inches, and covered with a North American #84 black braided nylon web with a mesh size of 2.75 inches. Illustrations of the gear can be found in the 2021 survey report (Lacko et al. 2023).

Each trap had a standard bait bag (6 by 12 inches) made from 1/8 inch mesh, with a nylon drawstring and #7 stainless steel snaps. The Canadian Sablefish Association provided the traps and bait bags. Tunnel entrances were made of green braided, knotless material with a mesh size of 1.25 inches, and traps included a rot panel of #21 cotton, positioned above the middle ring.

2.4.1 Experimental Escape Ring Component

The longline gear utilized for the escape ring sets was similar to that used for the StRS and inlet sets, consisting of 25 baited traps on a string of gear. The study involved four different escape ring treatments for the traps (Appendix B). The first, designated as the control trap (code E1), had no escape rings. The second trap configuration (E2) followed current conditions of licence, which require at least two escape rings. These rings were placed in the corners below the horizontal bar, behind the first vertical bar, and away from the tunnel. The third configuration (E3) also had two escape rings, but they were positioned above the bottom hoop, in the corners behind the vertical bars near the tunnel opening. The fourth configuration (E4) combined both E3 and E4 designs for a total of four escape rings.

As part of the escape ring study, four traps of each type (E1, E2, E3, and E4) were set in a specific order along the string of gear, as outlined in Table 2. Regular traps with no escape rings were placed at the ends and between the test traps to act as buffers. These 'no treatment' traps were set up the same way as the StRS traps, without escape rings, in order to limit the amount of gear the vessel had to carry.

The escape rings were constructed from a single piece of 3/16-inch (4.8 mm) diameter stainless steel round bar. The bar was bent into a circle, with the ends welded together, resulting in an inside diameter of 3 3/4 inches (95.3 mm). This matched the standard size commonly used by most of the fleet.

2.5 FISHING OPERATIONS

During routine survey activities, fishing gear was deployed on alternate days. Before deploying the gear, the Fishing Master checked the block to evaluate its suitability for fishing and confirm it matched the target depth range. The main objective was to place the gear within the block's boundaries.

In cases where the block was determined to be unsuitable for fishing, a neighboring block was

selected as a replacement, with preference given to blocks to the east or west of the original block. If those blocks did not meet the survey criteria, alternatives to the north or south were considered. If none of those adjacent blocks were suitable, a random block within the same area and depth stratum was selected.

Two science team members recorded information during gear deployment. One member worked from the wheelhouse, entering data into the Electronic Data Acquisition System (EDAS) using the GFBioField Bridge Log form (Olsen 2010). The Bridge Log form had nine sections for recording key details about each set: Header, Fishing, Spatial, Gear Specs, Depths, Environment, Comment, Usability, Finish.

EDAS collected National Marine Electronics Association (NMEA)-formatted data from the global positioning system (GPS) and depth sounder. Set depth data was plotted and reviewed using the GFBiofield Bridge log form. Further details on the electronic input of the EDAS GFBioField forms mentioned in this document are in the GFBioField User Guide 2023, which is available upon request.

The second science team member acted as the science recorder. They were stationed on the back deck for the best view of the crew setting traps along the stern rail and completed a fishing set paper log. An example of such a log can be found in the 2021 survey report (Lacko et al. 2023). This log detailed the deployment time, identification of buoys, timing of trap deployment, becket and trap count, as well as information about the data recorders, including their placement in traps and unique identifying numbers.

2.5.1 Stratified Random Sampling Component (StRS)

Sets in StRS blocks had a targeted soak time of 24 hours +/- 2 hours. Fishing sets were designated useable if hauled between 22 and 26 hours. Traps were baited with 4.5 kg of loose offshore Pacific Hake (*Merluccius productus*) and 0.9 kg of bagged squid.

2.5.2 Inlet Component

Fishing sets in inlet localities were targeted for a soak time of 18 hours, with a tolerance of +/- 2 hours. These sets were considered usable if hauled between 16 and 20 hours, in accordance with historic inlet survey protocols. As with previous surveys, traps were baited with 0.9 kg of bagged squid.

2.5.3 Experimental Escape Ring Component

Fishing sets had soak times 24 hours in duration. Sets shorter than 22 hours and longer than 26 hours were considered unsuccessful. Traps were baited with a 0.9 kg of bagged squid and a 4.5 kg block of Pacific Hake.

2.6 CATCH PROCESSING

The Skipper adjusted the haulback speed as needed to enable the science crew to accurately document the catch as each trap was retrieved. On deck, two science staff members were stationed at the haul card area: one was responsible for recording the catch, while the other handled the movement of baskets.

First, the catch recorder entered set details into the EDAS GFBioField Bridge Log, including the buoy number and retrieval time of the first buoy. The first and last trap retrieval times, along with the trap number containing the data recorder, were automatically populated from the GFBioField Trap Catch Form. The start and end times of the haul were also filled in automatically when the first and last trap times were entered.

As the groundline was hauled, each becket and trap was recorded in the EDAS GFBioField Trap Catch form, which is accessed through the Haul Card form. If crew members noticed any damage or issues with a trap, they informed the science recorder, who then logged the problem in the EDAS GFBioField Trap Usability form.

For each trap, the crew sorted the catch by species and counted it into baskets. The number of fish in each basket was recorded, and the weight measured to the nearest 0.2 kg using a motion-compensating scale. Each basket on StRS sets was assigned a basket use code of D, A, SD, and/or F. Code D designated fish species as discards or commercial catch; code A allocated fish for age samples; code SD identified sublegal Sablefish discards; and code F referred to fish frames with amphipod or hagfish damage. For escape ring sets, each basket was assigned a basket use code of D, SD, L (length frequency) and/or F.

2.6.1 Sablefish Allocation Details

Traps were selected for biological sampling with the goal of selecting 30 fish per StRS and inlet set. Under the updated 2018 survey protocol, if CPUE was high, a minimum of two traps were required for sampling. If the two traps collectively held over 30 Sablefish, 30 specimens were randomly selected from the sample. If catch rates were low, a sufficient number of traps were kept for sampling, to ensure that the biosample contained 30 pieces.

The traps that were not kept were allocated into the discard category and organized by size into either legal discards or sublegal discards. The sublegal (<55 cm fork length) discard category was introduced during the 2017 survey to manage the large number of juvenile Sablefish and to streamline their prompt release back into the water. Sablefish that met the legal discard criteria were retained by the vessel and processed as part of the commercial catch. For fish damaged by amphipods, the partially depredated fish frames were put in a separate basket, with both their weight and count recorded. For escape ring sets, the goal was to sample 50 Sablefish from each treatment (E1, E2, E3, E4) for length and sex.

2.7 BIOLOGICAL SAMPLING (LWSMO)

Biological samples were collected from Sablefish as well as incidentally captured rockfish species, including Shortraker Rockfish, Yelloweye Rockfish, and Rougheye/Blackspotted Rockfish. For the escape ring sets, only Sablefish were sampled. All data were recorded on the EDAS GFBioField Fish Recording form.

2.7.1 Sablefish Sampling

For each individual Sablefish, fork length (L), body weight (W), sex (S), and maturity level (M) were electronically documented. Sagittal otoliths (O) were also collected and stored for potential age estimation at the sclerochronology laboratory in Nanaimo, B.C., at the Pacific Biological Station. For the experimental (escape ring) sets, Sablefish were only sampled for fork length (L).

2.7.2 Rockfish Sampling

In 2023, when present in a survey set, Shortraker Rockfish, Yelloweye Rockfish, and Rougheye/Blackspotted Rockfish were sampled, with approximately 25 pieces per set, for LWSMO. Tissue samples (fin clips in vials containing 95% ethanol) for DNA extraction were collected from Rougheye/Blackspotted Rockfish.

Since 2010, each specimen has been visually identified by the at-sea sampler as Rougheye, Blackspotted, or a hybrid using a standardized identification guide. These field identifications are subsequently validated against DNA results to assess the accuracy of visual differentiation. The taxonomic separation of these species was formally established based on morphological and genetic analyses (Orr and Wildes 2008; Harris et al. 2019), which recognized them as distinct members of the *Sebastes* complex. However, accurate visual identification between Blackspotted Rockfish and Rougheye Rockfish remains difficult. As noted by Starr and Haigh (2020), visual identification alone is often unreliable, making genetic (DNA) analysis necessary for confident identification.

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

2.8 TAG RECOVERY

Sablefish previously marked with t-bar tags were recovered and separated from the catch. Those with Canadian tags and foreign agency tags were sacrificed for biological sampling. These specimens' tags and otoliths were placed in a bar-coded vial and then scanned into the EDAS GFBioField Tag Recovery Entry form (Olsen 2010) by DFO personnel. The Department later returned the foreign agency tags to their respective countries as part of the BC Sablefish tagging program.

2.9 2023 F/V OCEAN PEARL GFSURVEYS NETWORK CONFIGURATION

An Electronic Data Acquisition System (EDAS) was used for data capture. EDAS network components, their setup locations on the vessel, and connection types are summarized in Figure 1 in Appendix C. The EDAS network incorporated various hardware, including rugged laptops (Panasonic CF-31 Toughbooks), motion-compensated marine scales, electronic fish measuring boards, headphones, IP cameras, barcode scanners, printers, a network switch, and backup devices. The software was built around the GFBioField SQL Server database with a Microsoft Access front end. Hardware components were connected through a local area network via router, using either hardwired Ethernet or wireless connections.

1. On the bridge of the F/V *Ocean Pearl*, the Chief Scientist's (CS) laptop recorded bridge log data and NMEA streams from the vessel's GPS and depth sounder using GFBioField. It was connected to a network switch in the dry lab via a long Ethernet cable. Other network components in the dry lab, connected to the network switch via Ethernet cables, included:
 - The GFSERVER laptop, which hosts the three core GFBioField databases (GFBioFieldSQL, NMEA, and SensorData).
 - The GFFCBACKUP RAID, housing a duplicate of the GFSurveys network folder and serving as a repository for database backups, barcode images, and photographs.
 - The Sensors Toughbook, used for downloading and processing data from the data recorders deployed on the survey.
 - The barcode label printer, utilized for printing otolith tray and sample labels through the GFBioField frontend.
 - A SQLBackup USB RAID, connected to the GFServer laptop, handled database backups.

Also in the dry lab, an uninterruptible power source (UPS) ensured continuous power to essential EDAS components, including the network switch, two backup RAID devices, and the router. The network switch was connected via Ethernet cable to the wireless router in the mudroom, which established the GFSurveys local area network (LAN).

In the mudroom, a power injector supplied an internet protocol (IP) camera mounted on the deck rail behind the wheelhouse. The injector was connected via Ethernet to both the GFSurveys router and the camera. The IP camera captured photographs of each basket weighed at the haul card station.

In the gear room, a Toughbook dedicated to scale logging was wirelessly connected to the GFSurveys LAN. This unit was specifically configured to capture data output from the marine platform scales located at the haul card and biosample stations, with all information directed to the NMEA database. The scales were physically linked to the logging Toughbook via serial cables. Given the laptop's sole serial port, a USB-serial adaptor facilitated the second connection.

At the biosample station, a third Toughbook connected wirelessly to the GFSurveys LAN and was linked to a fish measuring board, barcode scanner, and a Bluetooth headset for audio feedback from GFBioField.

At the haul card station, a fourth Toughbook connected wirelessly to the GFSurveys LAN. At both the haul card and biosample stations, GFBioField recorded scale weights to the NMEA database.

2.10 ELECTRONIC MONITORING (EM) VIDEO DATA COLLECTION

The electronic monitoring (EM) system was installed by Archipelago Marine Research, Inc. (AMR, <https://www.archipelago.ca/services/electronic-monitoring>), with the objective of collecting fishing activity data. The EM system recorded video and logged vessel sensor data during the survey trip. A pair of science staff utilized AMR's FishVue Interpret Lite software to review EM video data, which included activities at the rail, hopper, and scale captured by two cameras. During the review, one science team member identified traps, species, and basket stations (Aging, Length Frequency or Discard) from the video, while another ensured the GFBioField Trap Catch records matched the footage.

2.11 ANALYSIS OF 2023 EXPERIMENTAL ESCAPE RING STUDY

To examine differences between escape ring treatments, several metrics were analyzed. Catch per unit effort (CPUE) was assessed using both the number of fish and the total catch weight per trap. Length-frequency distributions were used to visualize differences in the size composition of the catch among treatments. The proportion of sublegal fish (<55 cm fork length) was examined, as the primary objective of the study was to reduce the number of undersized Sablefish brought to the surface, in alignment with Fisheries and Oceans Canada management guidelines, which define sublegal fish as those less than 55 cm in length, measured from the tip of the nose to the fork of the tail (Fisheries and Oceans Canada 2023). Additionally, the proportion of fish <60 cm was analyzed to reflect market preferences for larger fish exceeding this size threshold.

3 Results and Discussion

3.1 FISHING

The 2023 Sablefish trap survey was 46 days long, commencing in Nanaimo, B.C., on September 29 (Figure 3). The first day of fishing began on October 2 off the south coast of Vancouver Island. Crew rotations occurred on October 16 in Coal Harbour and on October 31 in Skidegate Narrows. The survey concluded on November 13, with a total loss of one day due to weather (October 10) and two harbor days (October 17, 18) for a crew member change.

There were a total of 112 sets completed for the 2023 survey (Appendix D). In the stratified random sampling (StRS) areas, 19 sets were conducted in area S_1 , 18 sets in area S_2 , 19 sets in area S_3 , 17 sets in area S_4 and 18 sets in area S_5 , for a total of 91 StRS sets (Figure 4). There were 16 escape ring study sets completed during the survey, two in area S_1 , three in area S_3 , four in area S_4 , and seven in area S_5 (Figure 4). Five standardized sets were completed at Gil Island Inlet locality, one in Lewis Passage, two in Squally Channel, and two in Whale Channel (Figure 5).

All 91 blocks designated for the StRS portion of the survey were successfully fished. Three of the original allocated blocks that fell within the strict protection zone of the GHNMCA were replaced. Six other original blocks were replaced with new ones due to survey or weather logistics (Figure 6).

3.2 CATCH PER UNIT EFFORT (CPUE)

CPUE data for 2023 are presented relative to the available time series for each survey component: (i) StRS (2003–2023) and (ii) inlet sites (1991–2023).

3.2.1 StRS Set CPUE

Catch rates, measured as kilograms and number of Sablefish per trap (Figure 7 and Figure 8) were generally higher in the mid-depth strata (RD_2) of areas S_2 , S_3 , S_4 and S_5 over the survey time series (2003–2023). However, in recent years, CPUE in shallow depth strata (RD_1) in southern regions have been equal or higher than those in the corresponding mid-depth strata (RD_2). Specifically, area S_1 (South West Coast Vancouver Island) has consistently recorded higher CPUE in the shallow depth strata (RD_1) since 2017.

In 2023, CPUE in the mid-depth strata (RD_2) of areas S_2 – S_5 in 2023 was equal to or lower than 2022 levels and remained below the 2019 peak. Trends in CPUE in the middle-depth stratum of area S_1 differed somewhat from those in other spatial areas. CPUE (both in kg/trap and #/trap) was higher in 2023 than in 2022, but remained below the time series peak for that stratum observed in 2021.

Mean Sablefish weight in 2023 was stable or slightly higher compared to 2022 across most areas

except a slight decline in S₄ (South West Coast Haida Gwaii), RD₃ (deep depth strata) (Figure 9). Annual mean CPUE (kg/trap and #fish/trap) declined in 2023 compared to 2022 (Figure 10a and Figure 10b), although total mean catch weight (kg) increased from 2022 (Figure 10c).

The Sablefish stratified random sampling (StRS) abundance index for 2023 was 36 kg/trap, which is a decrease of 10% from 2022 but consistent with the relatively high values observed since 2018 (DFO 2024).

3.2.2 Inlet CPUE

CPUE in the mainland inlets has shown variations over the years (1995–2019), with peak CPUE occurring approximately every 5–8 years (Figure 11). There were no inlet surveys conducted in 2020. In 2021, only Dean/Burke Channel on the mainland was surveyed; in 2022, only Finlayson Inlet was surveyed; and in 2023, Gil Island was surveyed. Over the 25-year time series, when all inlet localities were surveyed (1995–2019), the highest catch rates were recorded in 2019 at Dean/Burke Channel, Gil Island, and Portland Inlet. The exception was Finlayson Channel, which recorded its peak catch rate in 2018. At Gil Island, the 2023 CPUE was 76 kg/trap, which is the highest recorded at that location since the start of the time series (Figure 11).

3.3 CATCH COMPOSITION

A total of fifty-one taxonomic groups were represented in the 2023 catch from StRS sets (Table 3). These included ten roundfish species, thirteen rockfish species, four flatfish species and twenty-four invertebrate species. Sablefish was the most common species caught by weight, followed by Lingcod (*Ophiodon elongatus*), North Pacific Spiny Dogfish (*Squalus acanthias*), Pacific Halibut (*Hippoglossus stenolepis*) and Redbanded Rockfish (*Sebastes babcocki*).

In the inlet sets, a total of six taxonomic groups were represented in the 2023 catch (Table 4). These included two roundfish species, no rockfish species, three flatfish species and one invertebrate species. Sablefish was again the most common species caught by weight, followed by Pacific Halibut (*Hippoglossus stenolepis*).

3.4 SABLEFISH BASKET USE BY TRAP

A detailed breakdown of the fate of the Sablefish basket use for each trap for the 2023 survey is provided in Appendix D. Across all StRS sets, 376 traps were sampled for Length, Sex, Maturity, Weight and Otoliths (LSMWO); 1609 traps were not sampled; and 290 traps had no catch or were missing. For all inlet sets, 12 traps were sampled for LSMWO, 111 traps were not sampled, and 2 traps had no catch or were missing. On the escape ring experimental sets, 228 traps were sampled for length frequency, 140 traps were not sampled, and 32 traps had no catch or were missing.

3.5 SABLEFISH SAMPLING

On StRS sets, a total of 39,044 Sablefish were caught, of which 2,932 were retained for biological sampling. On Gil Island inlet sets, 3,698 Sablefish were captured, of which 168 were used for biological sampling. On the experimental escape ring sets, 5,203 Sablefish were captured, with 2,297 of those used for biological sampling (Appendix F).

Overall, the StRS sets had a higher proportion of females than males in the spatial strata S_1 , S_2 , S_3 and S_5 while StRS sets in S_4 had an equal sex ratio (Table 5). More females than males were caught in the shallow depth stratum (RD_1) within all spatial strata ($S_1 - S_5$). In the mid depth stratum (RD_2), there were more males than females in all spatial strata ($S_1 - S_5$). The deepest depth stratum (RD_3) saw more females in spatial strata S_1 , S_2 , S_3 and S_5 . At the Gil Island inlet locality, a higher proportion of females was found (Table 5).

3.6 SABLEFISH FORK LENGTH

Variations in length distributions between male and female Sablefish are evident in the data collected from the StRS portion of the surveys conducted from 2003 to 2023. Over this 21 year period, the mean fork length (\bar{x}) was 64.7 cm for females and 58.1 cm for males (Figure 12A). In 2023, the mean fork length for both sexes in the StRS samples were slightly below the long-term average (Figure 12B).

Since 1994, data at the inlets have yielded a mean fork length (\bar{x}) of 60.4 cm for females and 55.1 cm for males (Figure 13A). In 2023, at Gil Island inlet locality, the average mean fork length was 62.6 cm for the 108 females and 56.6 cm for the 60 males (Figure 13B).

Figure 14 illustrates the relationship between fork length and weight in 2023, with females exhibiting steeper growth curves and higher average weight at length than males.

3.7 SABLEFISH MATURITY

The maturity stages of Sablefish were identified macroscopically and coded based on gonadal structure, colour, and developmental characteristics (Appendix G). The relative frequency of the maturity stages each year for the random (StRS) survey indicated a slight increase in skipped spawning over the past two years. Skipped spawners are individuals that have spawned before, but are not spawning the current year. This trend is reflected in the slightly higher proportion of sampled fish in the 'resting' stage (Figure 15). In particular, the proportion of females in resting stage was higher in 2023 than in any other year in the time series.

3.8 SABLEFISH SUBLEGAL ENCOUNTERS

More than half of the sublegal specimens were captured in the mid-depth waters of i) the northern strata of S_4 and S_5 in 2018, ii) all spatial strata in 2019, iii) S_1 , S_4 and S_5 in 2020, iv)

S₁, S₂, S₃ and S₅ in 2021, and v) S₁ in 2022 and 2023 (Figure 16).

The proportion of sublegal (55 cm or smaller) Sablefish encountered in the samples in each survey strata has fluctuated in recent years (Figure 16). Overall, the proportion of sublegal Sablefish tends to be higher in the mid-depth strata. In 2018, several strata had over 50% of Sablefish caught be of sublegal size (the mid-depth of the two most northern spatial strata, S₄ and S₅). In 2019, the proportion of sublegal Sablefish rose sharply across all strata, with over 50% of the fish caught at mid-depths in each of the five spatial strata being of sublegal size. The proportion of sublegal fish continued to be high in 2020 and 2021, but has started to decline again in all strata in 2022 and 2023. Only a single strata of mid-depth S₁ in 2022 and 2023 have over 50% of sampled Sablefish measured as sublegal.

3.9 RECOVERED TAGGED SABLEFISH

There were no Sablefish tagged and released during the 2023 survey. Of the 99 previously tagged fish that were recovered on the 2023 survey, two had no release location data and four were USA tags. Three quarters of these fish (73/93 or 67%) had travelled no more than 50 kilometers from the release site. More than half of the recoveries (61/93 or 65%) were recaptured within five years at liberty (Table 6).

3.10 OTHER FISH SAMPLES

Length, sex, maturity, otoliths, and DNA samples were collected from 192 of the total 260 Rougheye/Blackspotted Rockfish specimens captured in 2023. The science samplers visually identified 59 specimens as Rougheye, 133 specimens as Blackspotted and no specimens as a hybrid species (Appendix H). Length, sex, maturity and otoliths were also collected for 79 Shortraker Rockfish and 117 Yelloweye Rockfish (Appendix I).

3.11 SABLEFISH AGES

Age composition data collected during the survey show the progression of strong recruitment events over time (Figure 17). From 2003 to 2010, the highest proportions of female ages in StRS sets were 3, 4, 5, 6, 7, 8, 9, and 10 years of age, respectively. Another cohort emerged from 2011 to 2015, with dominant ages 3, 4, 5, 6, and 7. In 2016, 2017, and 2018, the highest proportion of female Sablefish were 3, 4, and 5 years old. From 2019 to 2023, the dominant age group consisted of 3, 4, 5, 6 and 7-year-old females (Figure 17A).

For males, the highest proportions in StRS sets from 2003 to 2011 were 3, 5, 5, 6, 8, 8, 8, 10, and 12 years of age, respectively. A new cohort began dominating the StRS catch starting in 2012, initially as 4-year-olds, followed by 5-year-olds in 2013, 7-year-olds in 2014 and 2015, and 8-year-olds in 2016. From 2019 to 2023, the age distribution consisted of 3, 4, 5, 6 and 7-year-old males, respectively (Figure 17B), mirroring the pattern observed in females.

3.12 OCEANOGRAPHIC TEMPERATURES AND DEPTHS

SBE 39 temperature (and pressure) recorders have been deployed on survey fishing sets since 2006. Depth and temperature data were extracted from approximately one hour after deployment and one hour before retrieval to capture temperatures while the trap was positioned on the seafloor bottom. Consistent with previous years, the survey data for the year 2023 revealed a trend of decreasing temperature with depth across 1-degree latitude intervals from southwest Vancouver Island to northwest Haida Gwaii (Figure 18).

In the shallow waters, the lowest average bottom temperature (4.1 °C) was recorded in 2016 within the latitude zone 52°–53°, while the highest (7.6 °C) was recorded in 2016 in the 50°–51° zone. In the mid-depth waters, the lowest average bottom temperature (2.9 °C) was recorded in 2019 within the latitude zone 52°–53°, while the highest (6.4 °C) was recorded in 2013 in the 50°–51° zone. In the deepest waters, the lowest average bottom temperature (2.2 °C) was recorded in 2016 within the latitude zone 54°–55°, while the highest (4.1 °C) was recorded in 2016 in the 48°–49° zone (Figure 19).

3.13 EXPERIMENTAL ESCAPE-RING STUDY

Sixteen sets with escape-ring traps were deployed: two in strata S_1 , three in S_3 , four in S_4 , and seven in S_5 (Figure 4).

During set 13, trap 23 had improperly configured escape rings, and was therefore not classified as E4 as intended (Appendix J and Appendix K). The single Sablefish retained in this trap was preserved for biological sampling. Additionally, sets 81 and 83, located just north of Englefield Bay, had significantly lower catch rates than other sets, with many traps recording no Sablefish. Due to their small sample sizes and potential to introduce outliers, these two sets were excluded from the analysis (Appendix J and Appendix K).

Throughout the escape ring study sets, traps that were not fishing effectively were recorded (Table 7). These traps were grouped into categories based on the problem: snarled traps, traps with large holes, traps with a fish gilled in the trap or tunnel, or traps with one or more gilled escape rings. The most common issue was a single escape ring blocked by a gilled fish, which occurred in 45 of the 67 traps that were considered ineffective (Table 7).

3.13.1 Effect of Gilled Trap Catch on Escape-Ring Trap CPUE

CPUE was summarized in two ways: by the number of fish per trap and catch weight per trap. Two different data filtering options were initially considered when looking at the effect of escape ring treatment on CPUE:

- 1) Usable traps: excludes traps that were open or had holes on retrieval, as well as traps with gilled fish in the escape ring, tunnel, or trap.

- 2) Usable + gilled traps: excludes traps that were open or had holes on retrieval, but includes traps that had gilled fish in escape rings, trap, or tunnel.

These two data-filtering methods were used to examine whether excluding traps containing gilled fish might obscure the benefits of additional escape rings, as more rings provide fish with greater opportunities to escape, even if one or two rings are blocked. The results indicated that CPUE values were relatively consistent between the “usable traps” and “usable + gilled traps” categories across all trap treatments (Tables 8-11, Figure 20). Therefore, for conciseness, the remainder of the results are presented based on catch rates from “usable traps” only.

3.13.2 Length Distribution

A total of 5,203 Sablefish were caught in escape ring treatment traps, with 2,289 Sablefish kept for fork length samples, and 8 retained as tag recoveries, across all the escape-ring study sets (Table 12). Over half of the Sablefish sampled (67%) from the escape-ring sets were female, although the sex ratio varied among sets, ranging from 36% to 91%. The mean fork length was 60 cm for males and 65 cm for females in the escape-ring sets (Table 12).

Not all Sablefish from the treatment traps were collected due to high catch volumes, so subsampling was conducted. Based on the subsampled data (Table 13), an average of 11% of fish in E1 traps, 5% in E2, 8% in E3, and 4% in E4 were smaller than 55 cm. Similarly, 45%, 27%, 29%, and 23% of fish in E1 to E4 traps, respectively, were smaller than 60 cm. Traps with four escape rings (E4) had the lowest proportion of fish below both size thresholds, while traps with no escape rings (E1) had the highest (Figure 21).

3.14 ACKNOWLEDGEMENTS

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4 Tables

Table 1. Spatial and depth stratum allocation and completed set counts (blue) for the StRS component of the 2023 B.C. Sablefish longline trap survey. The depth strata include RD₁: 100-250 fathoms (183 to 457 meters), RD₂: 250-450 fathoms (458-823 meters) and RD₃: 450-750 fathoms (824-1372 meters).

Spatial Strata	Depth Strata						Total	Total 2023
	RD ₁	RD ₁ 2023	RD ₂	RD ₂ 2023	RD ₃	RD ₃ 2023		
S ₁ (South West Coast Vancouver Island or SWCVI)	6	6	8	8	5	5	19	19
S ₂ (North West Coast Vancouver Island or NWCVI)	6	6	7	7	5	5	18	18
S ₃ (Queen Charlotte Sound or QCS)	8	8	6	6	5	5	19	19
S ₄ (South West Coast Haida Gwaii or SWCHG)	6	6	6	6	5	5	17	17
S ₅ (North West Coast Haida Gwaii or NWCHG)	6	6	7	7	5	5	18	18
Total	32	32	34	34	25	25	91	91

Table 2. Escape ring study planned order of trap deployment for each of the E1, E2, E3, and E4 configurations along the string of 25 traps. 'N' represents 'no treatment' or regular fishing traps used to provide a buffer between the escape ring study traps.

Trap 1-6	Treatment	Trap 7-12	Treatment	Trap 13-18	Treatment	Trap 19-25	Treatment
1	N	7	N	13	N	19	N
2	E1	8	E1	14	E1	20	E1
3	E2	9	E2	15	E2	21	E2
4	E3	10	E3	16	E3	22	E3
5	E4	11	E4	17	E4	23	E4
6	N	12	N	18	N	24	N
						25	N

Table 3. Summary of species captured during the 2023 survey StRS sets conducted by the F/V *Ocean Pearl*. Species without a count or weight indicates trace weight only.

Category	Common Name	Scientific Name	Count	Weight(kg)
Roundfish Species	Sablefish	ANOPLOPOMA FIMBRIA		89,556
	Lingcod	OPHIODON ELONGATUS		1,953
	North Pacific Spiny Dogfish	SQUALUS ACANTHIAS		1,333
	Pacific Grenadier	CORYPHAENOIDES ACROLEPIS		485
	Pectoral Rattail	ALBATROSSIA PECTORALIS		290
	Pacific Flatnose	ANTIMORA MICROLEPIS		9
	Snailfishes	LIPARINAE		3
	Pink Snailfish	PARALIPARIS ROSACEUS		1
	Hagfishes	MYXINIDAE		1
	Popeye	CORYPHAENOIDES CINEREUS	1	
Rockfish Species	Redbanded Rockfish	SEBASTES BABCOCKI		499
	Rougheye/Blackspotted Rockfish Complex	SEBASTES ALEUTIANUS		444
	Yelloweye Rockfish	SEBASTES RUBERRIMUS		376
	Shortraker Rockfish	SEBASTES BOREALIS		335
	Shortspine Thornyhead	SEBASTOLOBUS ALASCANUS		54
	Yellowmouth Rockfish	SEBASTES REEDI		6
	Rosethorn Rockfish	SEBASTES HELVOMACULATUS		4
	Canary Rockfish	SEBASTES PINNIGER		4
	Aurora Rockfish	SEBASTES AURORA		2
	Sharpchin Rockfish	SEBASTES ZACENTRUS		1
	Harlequin Rockfish	SEBASTES VARIEGATUS	1	
	Longspine Thornyhead	SEBASTOLOBUS ALTIVELIS	1	
Pacific Ocean Perch	SEBASTES ALUTUS	1		
Flatfish Species	Pacific Halibut	HIPPOGLOSSUS STENOLEPIS		689
	Arrowtooth Flounder	ATHERESTHES STOMIAS		304
	Dover Sole	MICROSTOMUS PACIFICUS		10
	Petrale Sole	EOPSETTA JORDANI		2
Invertebrate Species	Grooved Tanner Crab	CHIONOECETES TANNERI		153
	Brown Box Crab	LOPHOLITHODES FORAMINATUS		18
	Spiny King Crab	PARALOMIS MULTISPINA		15
	Fragile Urchin	ALLOCENTROTUS FRAGILIS		14
	Oregontriton	FUSITRITON OREGONENSIS		12
	Red Queen Crab	LITHODES COUESI		9
	Giant Pacific Octopus	ENTEROCTOPUS DOFLEINI		7
	Golden King Crab	LITHODES AEQUISPINA		2
	Smoothskin Octopus	BENTHOCTOPUS LEIODERMA		2
	Prawn	PANDALUS PLATYCEROS		1
	Fish-Eating Star	STYLASTERIAS FORRERI		1
		NEPTUNEA	3	
	California Sun Star	RATHBUNASTER CALIFORNICUS	3	
		SOLASTER	3	
		AMPHIOPHIURA PONDEROSA	2	
	Jellyfish	SCYPHOZOA	2	
		TUNICATA	1	
	Seaslugs	NUDIBRANCHIATA	1	
		GORGONOCEPHALUS EUCNEMIS	1	
	Fragile Star	LUIDIASTER DAWSONI	1	
		THALIACEA		
	Sea Lilies And Feather Stars	CRINODEA		
	Morning Sun Starfish	SOLASTER DAWSONI		
Ophiuroidea	OPHIUROIDEA			

Table 4. Summary of species captured by the F/V *Ocean Pearl* during the 2023 survey sets conducted at Gil Island Inlet locality. Species without a weight indicates trace weight only.

Category	Common Name	Scientific Name	Weight(kg)
Roundfish Species	Sablefish	ANOPLOPOMA FIMBRIA	9461
	Spiny Dogfish	SQUALUS ACANTHIAS	2
Flatfish Species	Pacific Halibut	HIPPOGLOSSUS STENOLEPIS	56
	Arrowtooth Flounder	ATHERESTHES STOMIAS	13
	Dover Sole	MICROSTOMUS PACIFICUS	3
Invertebrate Species	Mud Star	CTENODISCUS CRISPATUS	

Table 5. Summary of Sablefish sex ratios and mean fork length measurements collected during the 2023 stratified random sampling sets by spatial and depth stratum and the 2023 inlet survey sets.

Strata		Proportion			Mean Fork Length (mm)	
Spatial	Depth	M:F	Males	Females	Males	Females
S ₁	RD ₁		0.34	0.66	565	610
	RD ₂		0.67	0.33	548	589
	RD ₃		0.18	0.82	570	649
	All		0.40	0.60	561	616
S ₂	RD ₁		0.17	0.83	606	661
	RD ₂		0.57	0.43	555	579
	RD ₃		0.21	0.79	578	644
	All		0.32	0.68	580	628
S ₃	RD ₁		0.21	0.79	616	689
	RD ₂		0.65	0.35	572	608
	RD ₃		0.46	0.54	551	641
	All		0.44	0.56	580	646
S ₄	RD ₁		0.31	0.69	621	653
	RD ₂		0.62	0.38	582	626
	RD ₃		0.58	0.42	568	623
	All		0.50	0.50	590	634
S ₅	RD ₁		0.16	0.84	593	648
	RD ₂		0.68	0.32	562	616
	RD ₃		0.45	0.55	590	673
	All		0.43	0.57	582	646
Gil Island			0.36	0.64	565	626

Table 6. Canadian tag recovery counts by distance from release site and years at liberty. Two tags lacked release location data, and four were American tags.

Years at Liberty	Distance (km) from Release Location						Recovery count	Other count	
	<10	11-50	51-100	101-250	251-500	501-1000			1000+
1	113	82	27	39	8	3	0	272	0
2-5	100	72	25	34	25	5	1	262	0
6-10	45	38	14	29	15	3	0	144	0
11+	66	33	12	21	9	2	0	143	0
Total Counts	324	225	78	123	57	13	1	821	6

Table 7. Unusable traps from escape ring sets, categorized by reason for not fishing correctly ('x' = unusable).

Set	Trap Number	Large Holes	Trap Open	Snarl	Gilled in Trap	Gilled in Tunnel	1 Escape Ring Gilled	2 Escape Rings Gilled	3 Escape Rings Gilled
17	9	x							
50	2			x			x		
50	3			x					
50	4,5,10,15,17						x		
50	25			x					
51	15						x		
58	15,16,21						x		
69	3	x							
69	4,10,22						x		
74	9,17,21,23						x		
77	4,5						x		
77	10		x				x		
77	15						x		
81	3								x
81	5							x	
83	5						x		
83	11	x							
83	23						x		
88	9								x
88	10							x	
88	12				x				
88	17						x		
88	21								x
92	5							x	
92	9	x						x	
92	16						x		
92	17	x					x		
92	21							x	
92	23						x		
94	11,17,22,23						x		
94	24					x			
99	3,10,16,21,22						x		
101	4						x		
101	5							x	
101	9,11,16,21,22						x		
105	3,5						x		
105	11							x	
105	17						x		
105	25					x			

Table 8. Summary of sablefish catch rates (#fish/trap) by escape ring treatment. Catch rates were included only for those traps that were fishing correctly (referred to as 'usable traps'). Sets 81 and 83 were not included.

set	E1			E2			E3			E4		
	count	traps	cpue	count	traps	cpue	count	traps	cpue	count	traps	cpue
13	63	4	15.8	19	4	4.8	22	4	5.5	14	3	4.7
17	132	4	33.0	49	4	12.2	49	4	12.2	21	3	7.0
50	82	4	20.5	14	2	7.0	32	2	16.0	11	2	5.5
51	67	4	16.8	39	4	9.8	43	4	10.8	24	3	8.0
58	66	4	16.5	13	2	6.5	30	3	10.0	35	4	8.8
69	59	4	14.8	19	4	4.8	12	1	12.0	3	3	1.0
74	46	4	11.5	13	1	13.0	22	4	5.5	10	2	5.0
77	59	3	19.7	20	3	6.7	2	1	2.0	5	2	2.5
88	24	3	8.0	17	3	5.7	17	3	5.7	10	2	5.0
92	117	4	29.2	12	1	12.0	24	3	8.0	23	2	11.5
94	57	4	14.2	17	4	4.2	17	3	5.7			
99	107	4	26.8	29	4	7.2	11	1	11.0	2	1	2.0
101	156	4	39.0	35	2	17.5	13	1	13.0	23	2	11.5
105	91	4	22.8	3	1	3.0	42	4	10.5	27	3	9.0
Total	1126	54		299	39		336	38		208	32	
Mean			20.6			8.2			9.1			6.3

Table 9. Summary of sablefish catch rates (#fish/trap) by escape ring treatment. Catch rates were included for those traps that were fishing correctly and in addition, those traps with fish gilled in the trap, tunnel or escape rings (referred to as 'usable + gilled traps'). Sets 81 and 83 were not included.

set	E1			E2			E3			E4		
	count	traps	cpue	count	traps	cpue	count	traps	cpue	count	traps	cpue
13	63	4	15.8	19	4	4.8	22	4	5.5	14	3	4.7
17	132	4	33.0	49	4	12.2	49	4	12.2	21	3	7.0
50	82	4	20.5	28	4	7.0	81	4	20.2	32	4	8.0
51	67	4	16.8	39	4	9.8	43	4	10.8	27	4	6.8
58	66	4	16.5	43	4	10.8	60	4	15.0	35	4	8.8
69	59	4	14.8	19	4	4.8	36	4	9.0	3	3	1.0
74	46	4	11.5	27	3	9.0	22	4	5.5	20	4	5.0
77	59	3	19.7	22	4	5.5	9	3	3.0	13	3	4.3
88	41	4	10.2	25	4	6.2	29	4	7.2	30	4	7.5
92	117	4	29.2	43	4	10.8	37	4	9.2	45	4	11.2
94	57	4	14.2	17	4	4.2	23	4	5.8	15	3	5.0
99	107	4	26.8	29	4	7.2	70	4	17.5	21	3	7.0
101	156	4	39.0	58	4	14.5	66	4	16.5	42	4	10.5
105	91	4	22.8	49	4	12.2	42	4	10.5	35	4	8.8
Total	1143	55		467	55		589	55		353	50	
Mean			20.8			8.5			10.6			6.8

Table 10. Summary of sablefish catch rates (kg/trap) by escape ring treatment. Catch rates were included only for those traps that were fishing correctly (referred to as 'usable traps'). Sets 81 and 83 were not included.

set	E1			E2			E3			E4		
	weight	traps	cpue	weight	traps	cpue	weight	traps	cpue	weight	traps	cpue
13	163.9	4	41.0	64.3	4	16.1	69.8	4	17.4	52.6	3	17.5
17	296.5	4	74.1	131.8	4	32.9	131.2	4	32.8	62.7	3	20.9
50	277.6	4	69.4	69.5	2	34.7	126.4	2	63.2	46.6	2	23.3
51	201.9	4	50.5	133.0	4	33.2	150.4	4	37.6	80.2	3	26.7
58	220.0	4	55.0	52.2	2	26.1	123.1	3	41.0	135.2	4	33.8
69	152.8	4	38.2	68.1	4	17.0	34.0	1	34.0	11.0	3	3.7
74	142.6	4	35.6	41.9	1	41.9	80.9	4	20.2	44.4	2	22.2
77	179.5	3	59.8	72.1	3	24.0	9.3	1	9.3	21.3	2	10.6
88	73.1	3	24.4	49.3	3	16.4	58.4	3	19.5	31.9	2	15.9
92	292.0	4	73.0	35.6	1	35.6	90.8	3	30.3	72.0	2	36.0
94	143.8	4	36.0	51.6	4	12.9	59.6	3	19.9			
99	246.5	4	61.6	84.0	4	21.0	27.4	1	27.4	8.8	1	8.8
101	378.6	4	94.7	86.0	2	43.0	35.4	1	35.4	68.7	2	34.4
105	190.0	4	47.5	8.6	1	8.6	93.8	4	23.5	62.8	3	20.9
Total	2958.7	54		947.9	39		1090.4	38		698.0	32	
Mean			54.3			26.0			29.4			21.1

Table 11. Summary of Sablefish catch rates (kg/trap) by escape ring treatment. Catch rates were included for those traps that were fishing correctly and in addition, those traps with fish gilled in the trap, tunnel or escape rings (referred to as 'usable + gilled traps'). Sets 81 and 83 were not included.

set	E1			E2			E3			E4		
	weight	traps	cpue									
13	163.9	4	41.0	64.3	4	16.1	69.8	4	17.4	52.6	3	17.5
17	296.5	4	74.1	131.8	4	32.9	131.2	4	32.8	62.7	3	20.9
50	277.6	4	69.4	119.1	4	29.8	283.6	4	70.9	123.2	4	30.8
51	201.9	4	50.5	133.0	4	33.2	150.4	4	37.6	91.7	4	22.9
58	220.0	4	55.0	179.1	4	44.8	234.1	4	58.5	135.2	4	33.8
69	152.8	4	38.2	68.1	4	17.0	106.6	4	26.6	11.0	3	3.7
74	142.6	4	35.6	98.6	3	32.9	80.9	4	20.2	77.7	4	19.4
77	179.5	3	59.8	81.7	4	20.4	34.7	3	11.6	53.2	3	17.7
88	131.4	4	32.9	72.6	4	18.1	101.7	4	25.4	97.7	4	24.4
92	292.0	4	73.0	132.0	4	33.0	125.0	4	31.2	137.7	4	34.4
94	143.8	4	36.0	51.6	4	12.9	79.1	4	19.8	53.0	3	17.7
99	246.5	4	61.6	84.0	4	21.0	175.3	4	43.8	60.9	3	20.3
101	378.6	4	94.7	145.9	4	36.5	170.7	4	42.7	118.1	4	29.5
105	190.0	4	47.5	113.6	4	28.4	93.8	4	23.5	83.0	4	20.7
Total	3017.1	55		1475.2	55		1836.8	55		1157.7	50	
Mean			54.9			26.9			33.0			22.4

Table 12. Summary of Sablefish sampled from all treatment traps in the escape-ring study during the 2023 survey, including set 81 and 83.

Set	Specimen Count	Mean Fork Length (mm)		Male Proportion
		Males	Females	
13	113	595	640	0.35
17	180	574	620	0.27
50	171	623	681	0.28
51	163	610	677	0.33
58	176	657	705	0.33
69	124	595	642	0.23
74	116	602	666	0.26
77	101	602	660	0.16
81	34	610	675	0.09
83	36	608	660	0.14
88	124	598	659	0.31
92	198	591	665	0.53
94	108	594	645	0.32
99	206	570	626	0.50
101	223	580	635	0.59
105	216	562	600	0.64
Total	2289			
Mean		598	654	0.33

Table 13. Summary of Sablefish catch counts, biological specimen counts, and the proportion of sampled Sablefish below two fork length thresholds (<55 cm and <60 cm), categorized by fishing set and escape-ring treatment type (E1–E4). Due to subsampling requirements, not all Sablefish caught in treatment traps were retained for biological sampling. Total counts across all sets are provided in the final row, showing cumulative catch, sample sizes, and the number of individuals below each length threshold for each treatment type.

Set	Number Caught				Number Sampled				Proportion <55 cm				Proportion <60 cm			
	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
13	63	19	22	14	56	20	22	15	0.16	0.0	0.05	0.0	0.54	0.1	0.32	0.07
17	132	49	49	29	54	49	49	28	0.09	0.08	0.12	0.11	0.61	0.33	0.37	0.36
50	82	28	81	39	54	32	53	32	0.0	0.0	0.02	0.0	0.07	0.0	0.09	0.06
51	67	39	43	27	52	39	45	27	0.08	0.03	0.07	0.0	0.29	0.1	0.2	0.07
58	66	43	60	35	50	40	50	36	0.0	0.0	0.0	0.0	0.08	0.0	0.0	0.0
69	59	19	36	11	59	18	35	12	0.14	0.0	0.03	0.0	0.46	0.0	0.14	0.08
74	46	27	22	20	47	27	23	19	0.0	0.0	0.04	0.0	0.28	0.15	0.04	0.05
77	59	22	10	13	58	20	9	14	0.03	0.0	0.0	0.0	0.21	0.1	0.0	0.07
81	5	8	6	15	5	8	6	15	0.0	0.0	0.0	0.0	0.0	0.12	0.0	0.0
83	18	9	9	0	18	8	10	0	0.06	0.0	0.0	0.0	0.28	0.12	0.1	
88	41	25	29	30	41	25	29	29	0.07	0.08	0.03	0.03	0.34	0.4	0.21	0.1
92	117	43	37	45	87	38	37	36	0.07	0.05	0.03	0.06	0.51	0.34	0.32	0.31
94	57	17	23	15	55	16	22	15	0.04	0.0	0.0	0.0	0.58	0.19	0.0	0.13
99	107	29	70	21	86	30	70	20	0.2	0.07	0.17	0.05	0.65	0.43	0.53	0.45
101	156	58	66	42	60	56	66	41	0.1	0.12	0.14	0.05	0.57	0.5	0.56	0.44
105	91	49	42	35	91	49	41	35	0.4	0.16	0.24	0.2	0.79	0.63	0.71	0.69
Total	1166	484	605	391	873	475	567	374	99	26	46	16	395	128	167	85
count																

5 Figures

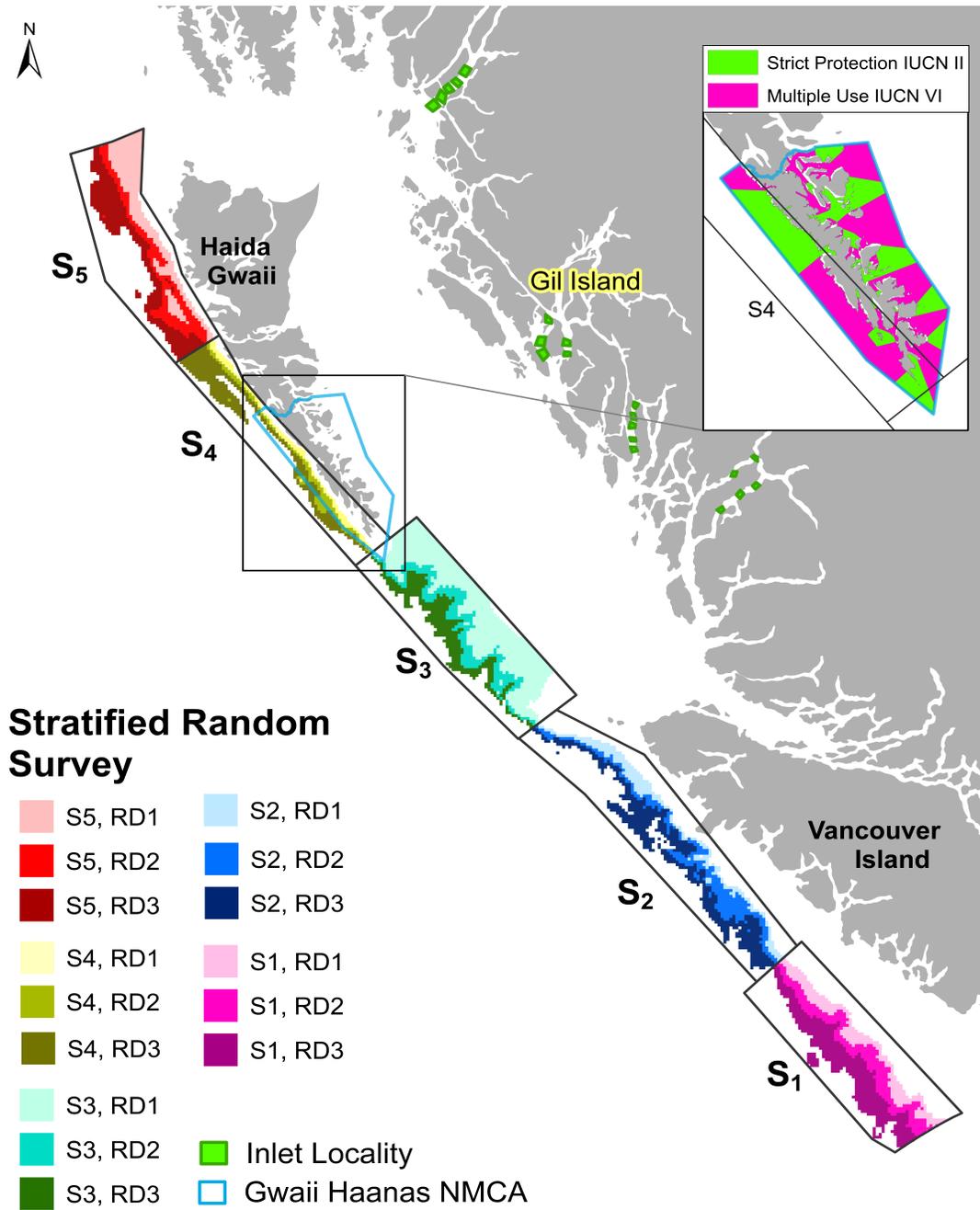


Figure 1. British Columbia Sablefish trap survey design for 2003–2023, including locations of the Randomized component and Inlets survey component. Randomized Survey depth strata (RD₁–RD₃) are colour-coded and nested within each of the five spatial strata (S₁–S₅). Inlets Survey set locations are indicated by green polygons. In 2023, of the four inlet locations, only Gil Island Inlet locality (highlighted) was surveyed. Inset: Gwaii Haanas NMCA.



Figure 2. Image of the F/V *Ocean Pearl* used for the 2023 Sablefish trap survey. Photo credit: Schon Hardy.

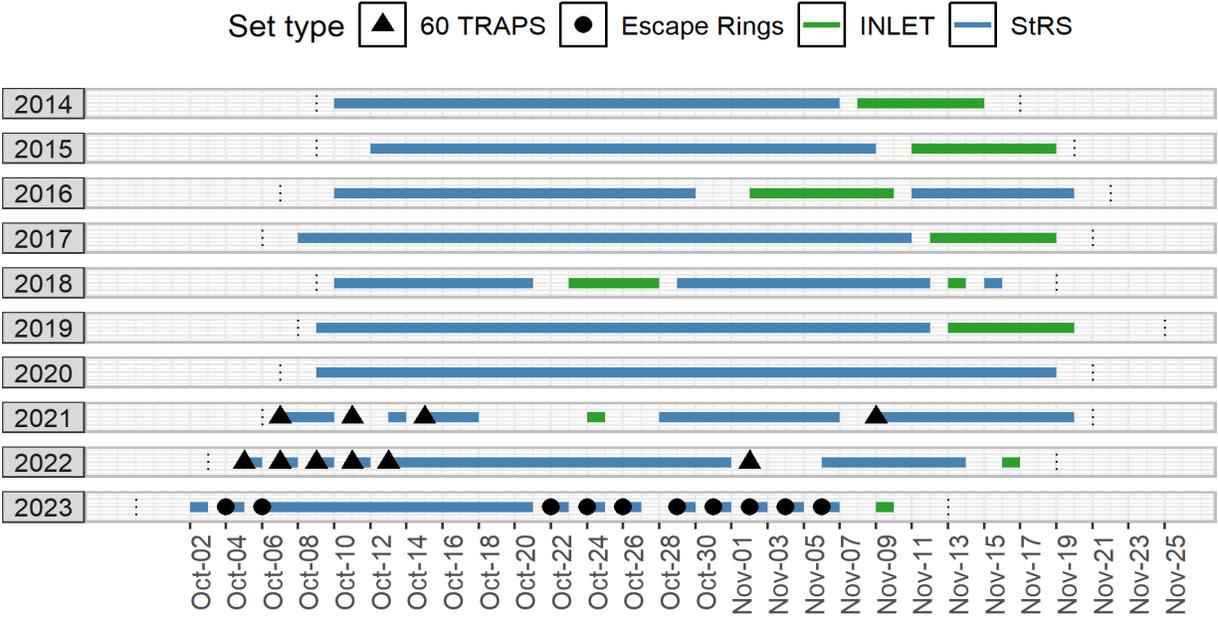


Figure 3. Timeline of survey dates by set type over the past 10 years, with dotted black lines indicating the start and end dates of each trip.

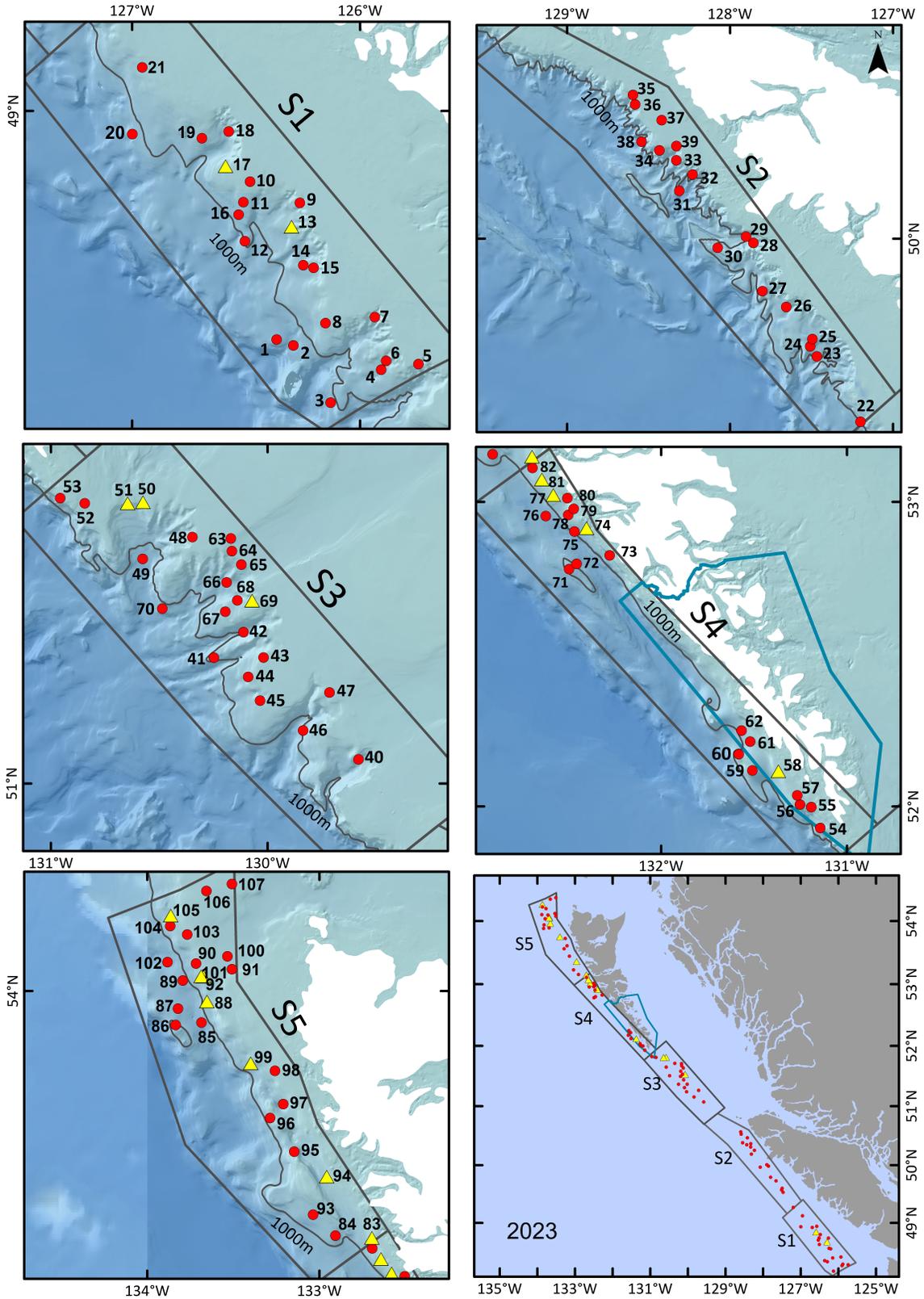


Figure 4. Start locations of survey sets (red markers) conducted in 2023 for the stratified random sampling areas S₁ through S₅. The yellow triangle symbols represent the 16 escape ring study sets.

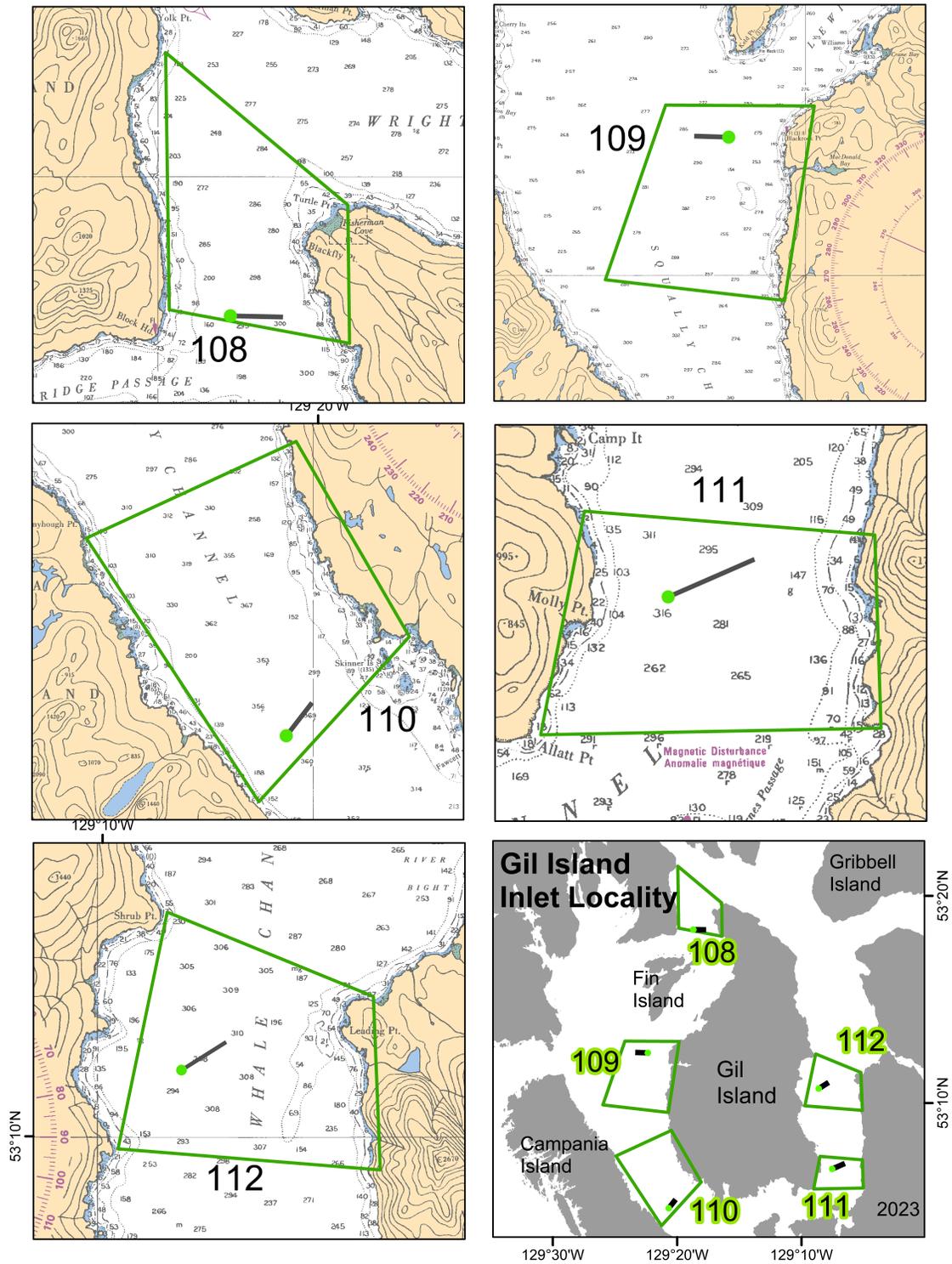


Figure 5. Location of the 2023 sets within the Gil Island inlet locality. The green dots represent the start position of the set.

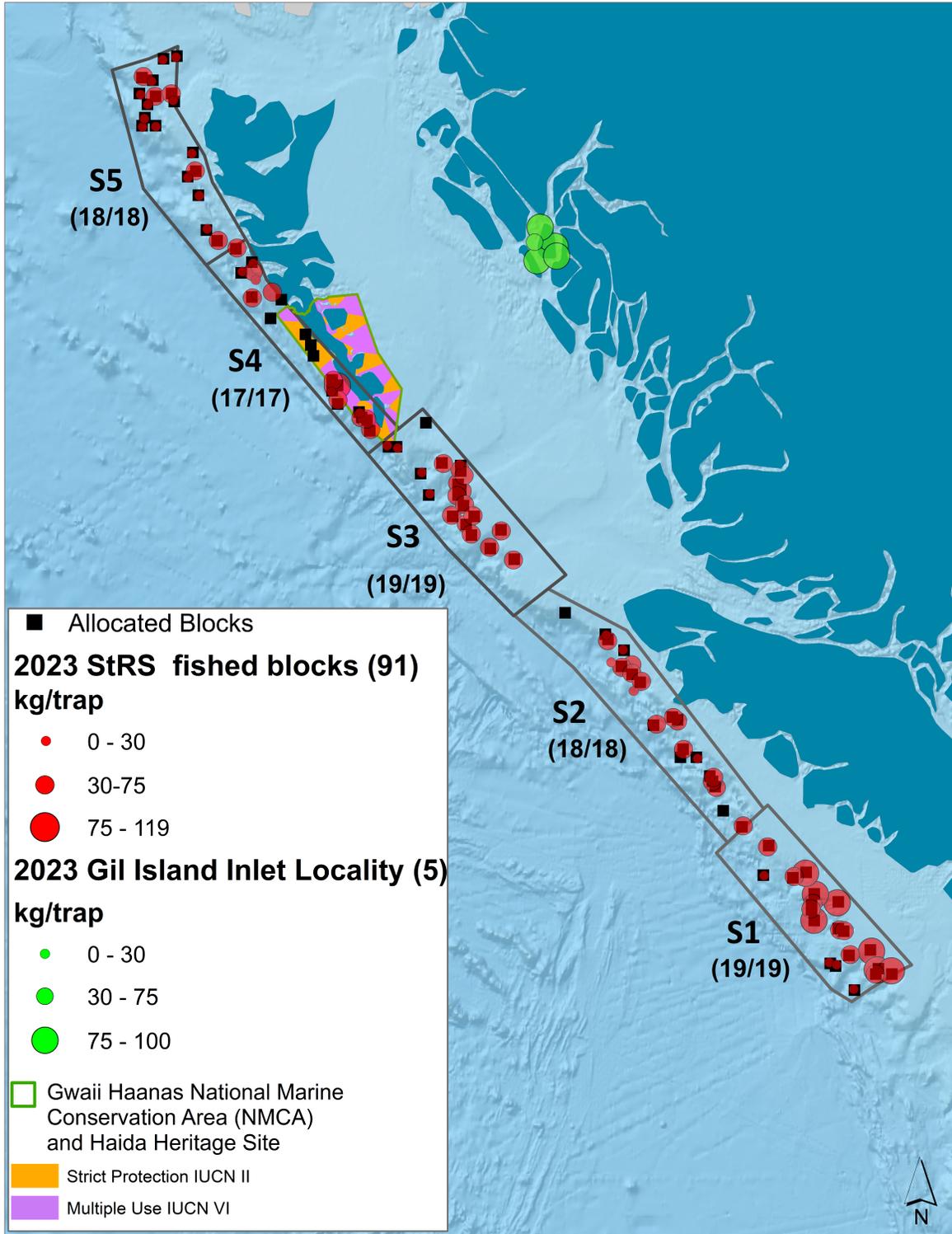


Figure 6. Map of allocated (depicted by black squares) and completed survey blocks (red circles) for the 2023 StRS survey sets. Blocks that fell within the strict protection zone of the Gwaii Haanas NMCA were replaced, along with those that did not meet the survey criteria. The Gil Island mainland inlet locality was the sole inlet fished in 2023, indicated by green circles. Additionally, the map displays Catch per Unit Effort (CPUE) values, measured in kilograms per trap, for each set location.

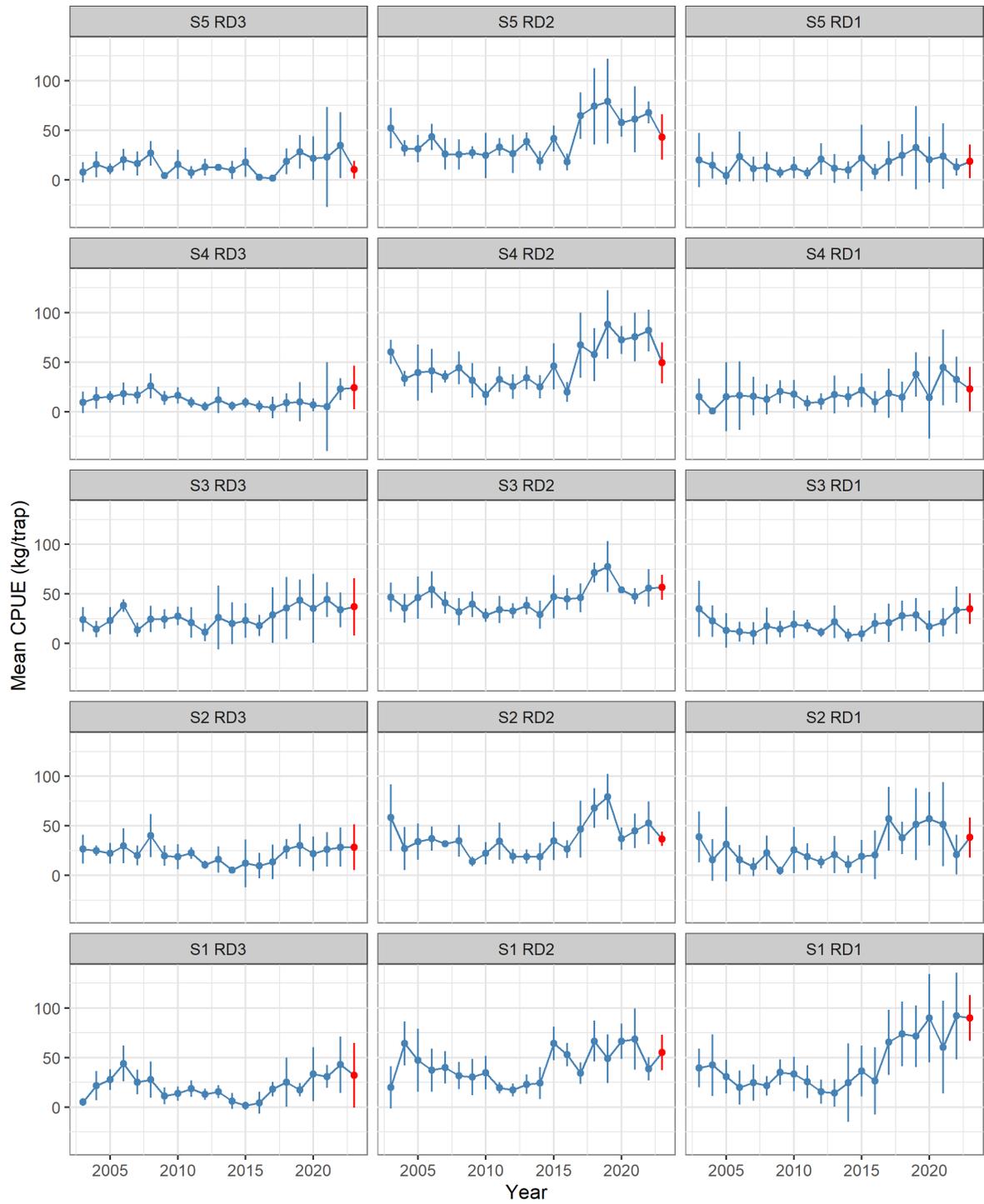


Figure 7. Average Sablefish catch per unit effort (CPUE; mean \pm 95% CIs) by survey strata since 2003. Panels run deep to shallow (left to right) and north to south (top to bottom).

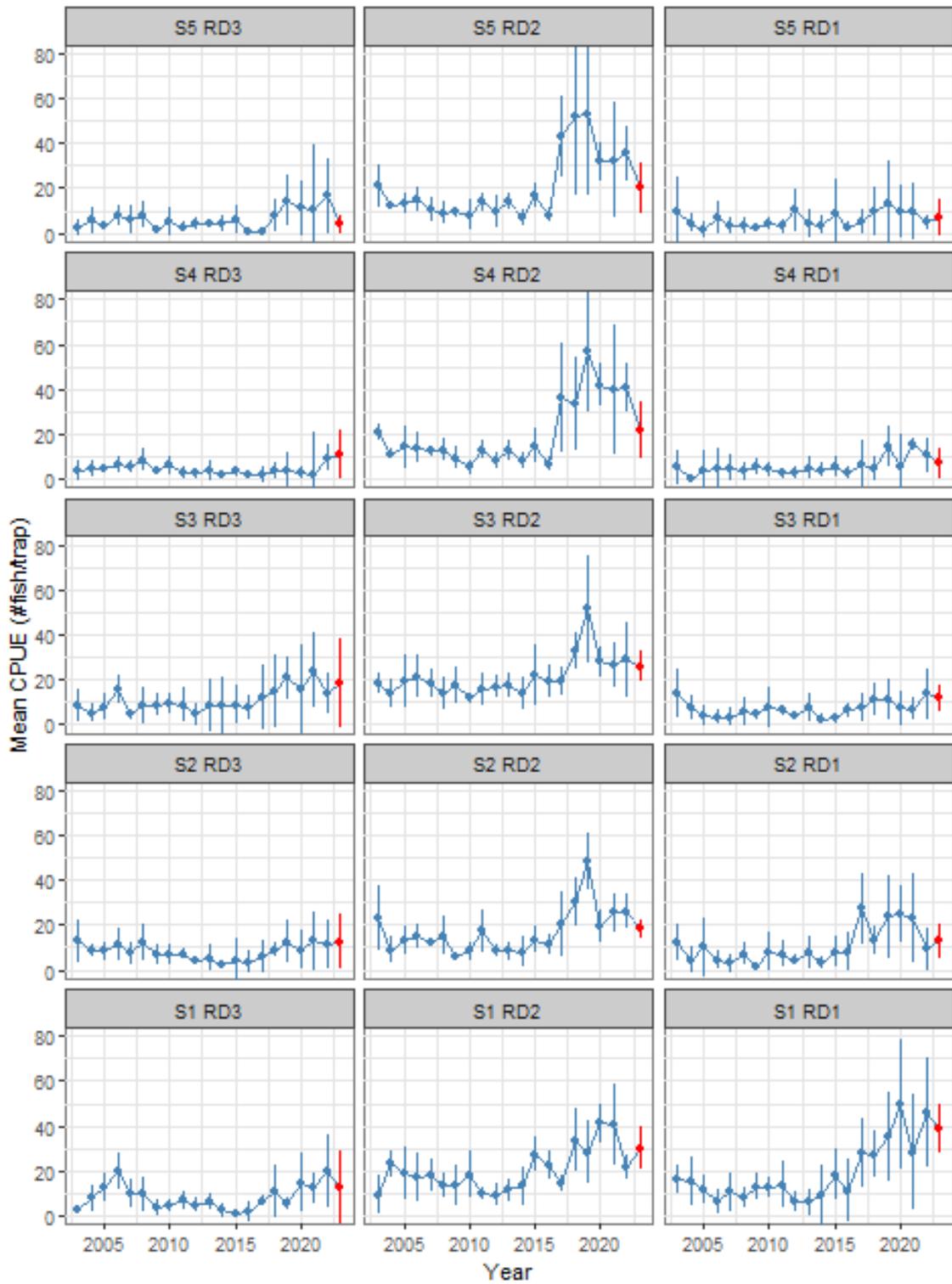


Figure 8. Average number of Sablefish per trap (mean \pm 95% CIs) by StRS survey strata over time. Panels run deep to shallow (left to right) and north to south (top to bottom).

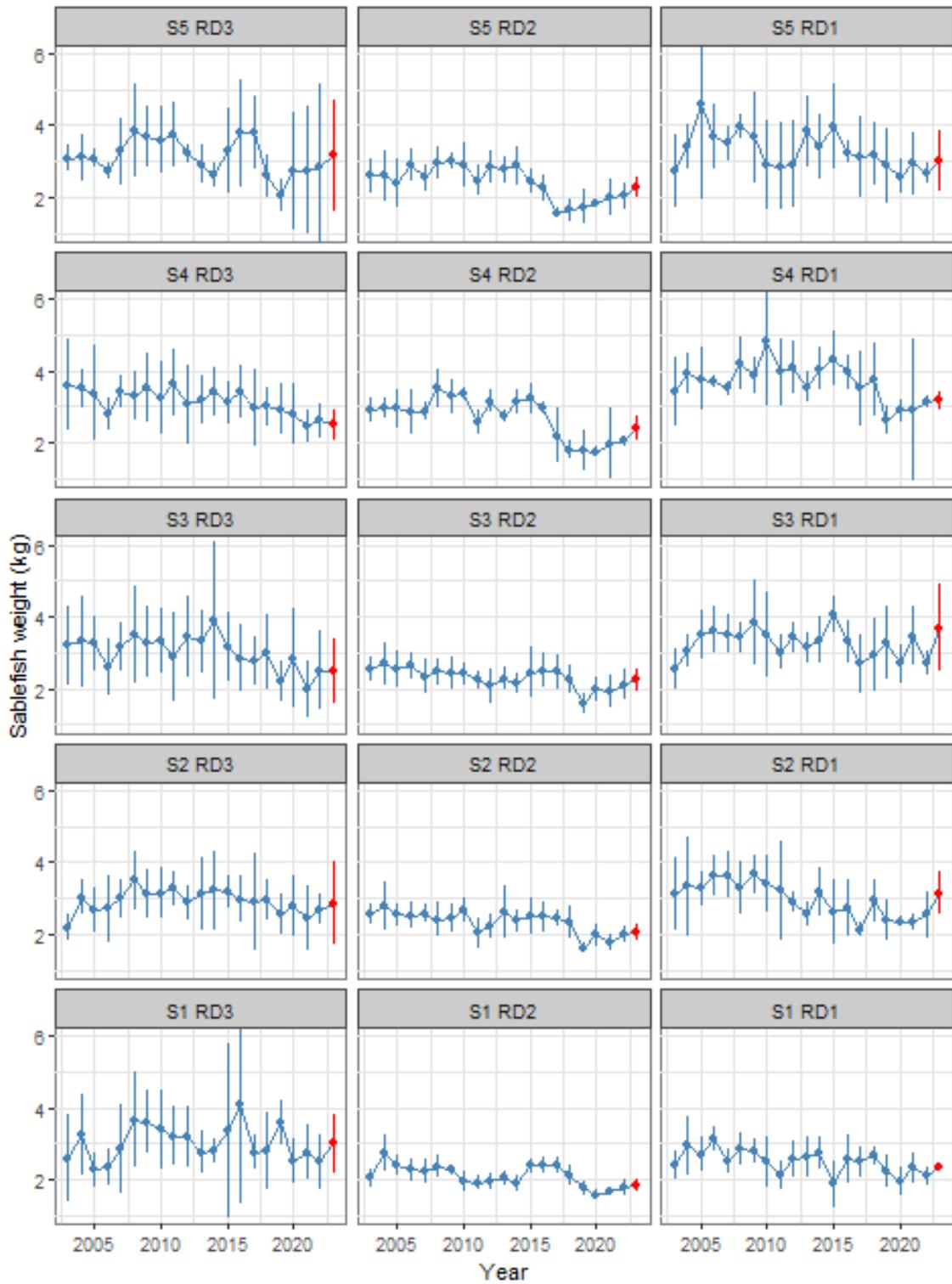


Figure 9. Average weight of Sablefish (mean \pm 95% CIs) by survey strata over time. Panels run deep to shallow (left to right) and north to south (top to bottom).

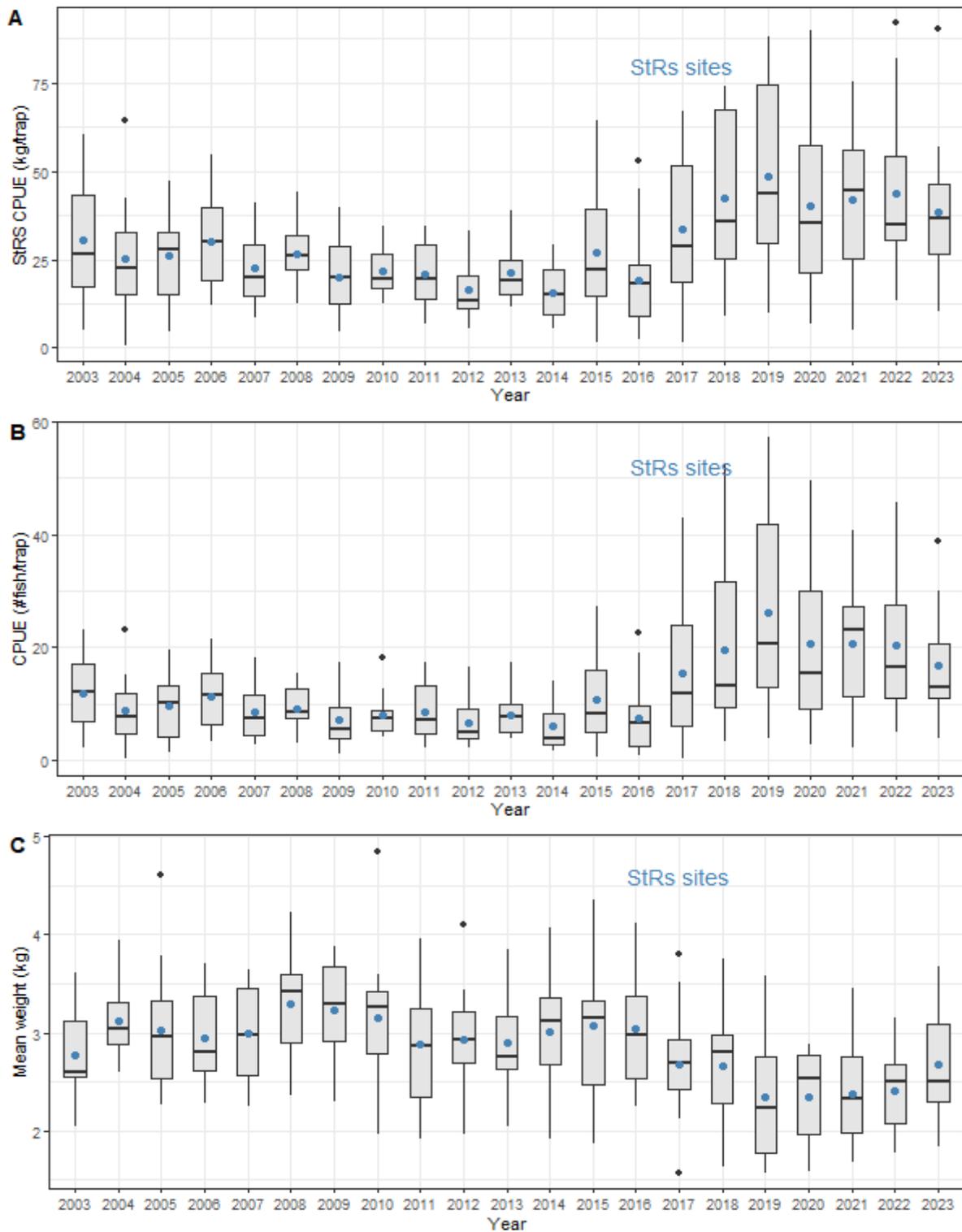


Figure 10. (A) Annual mean weight of Sablefish per trap (kg/trap); (B) annual mean number of Sablefish per trap (#fish/trap); (C) annual mean weight of Sablefish (kg) by StRS survey strata over time. Horizontal line is median and blue dots are arithmetic mean.

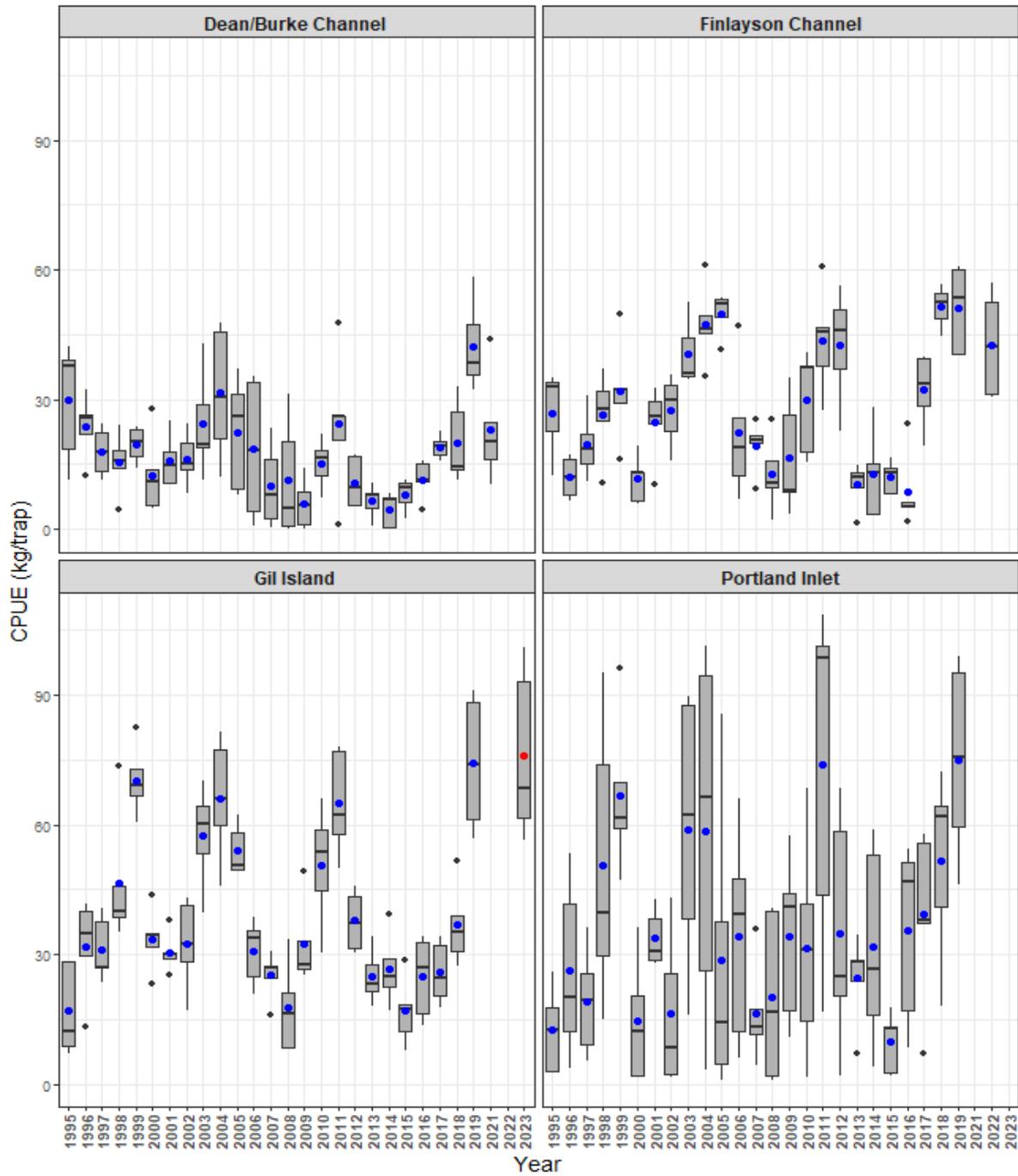
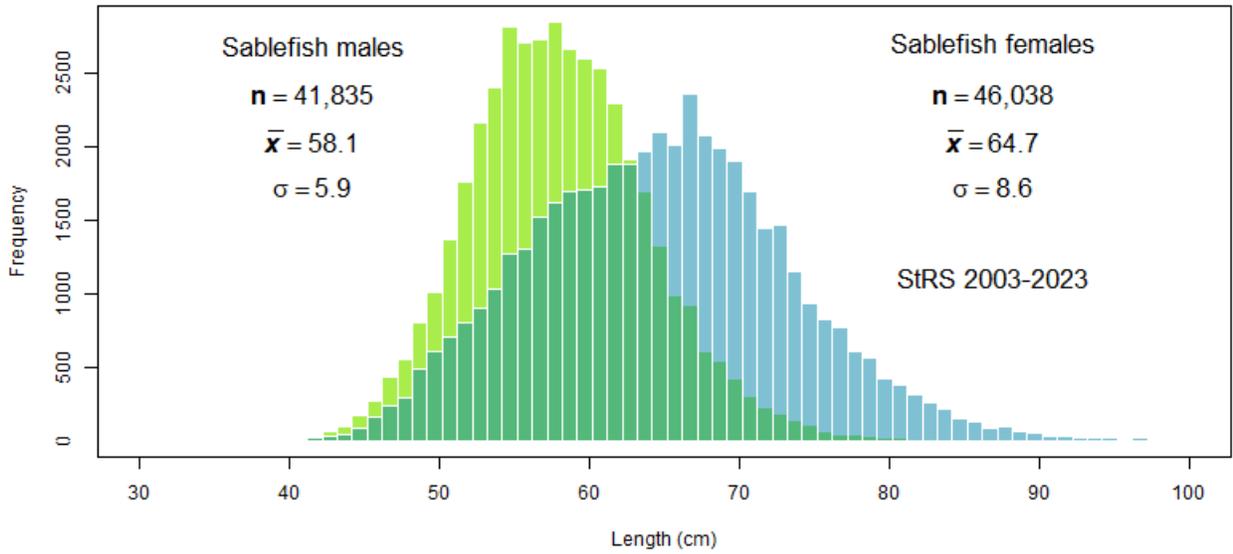


Figure 11. Annual distributions of catch statistics over the four mainland inlet indexing sets between 1994 and 2023 with CPUE in units of weight of Sablefish per trap (kg/trap). Horizontal line is median, grey shading shows the 25th and 75% percentiles, and blue/red dots show arithmetic means. No inlets were surveyed in 2020. Dean/Burke Channel inlet was the only inlet surveyed in 2021; Finlayson Inlet was the only inlet surveyed in 2022; Gil Island inlet was the only inlet surveyed in 2023.

A



B

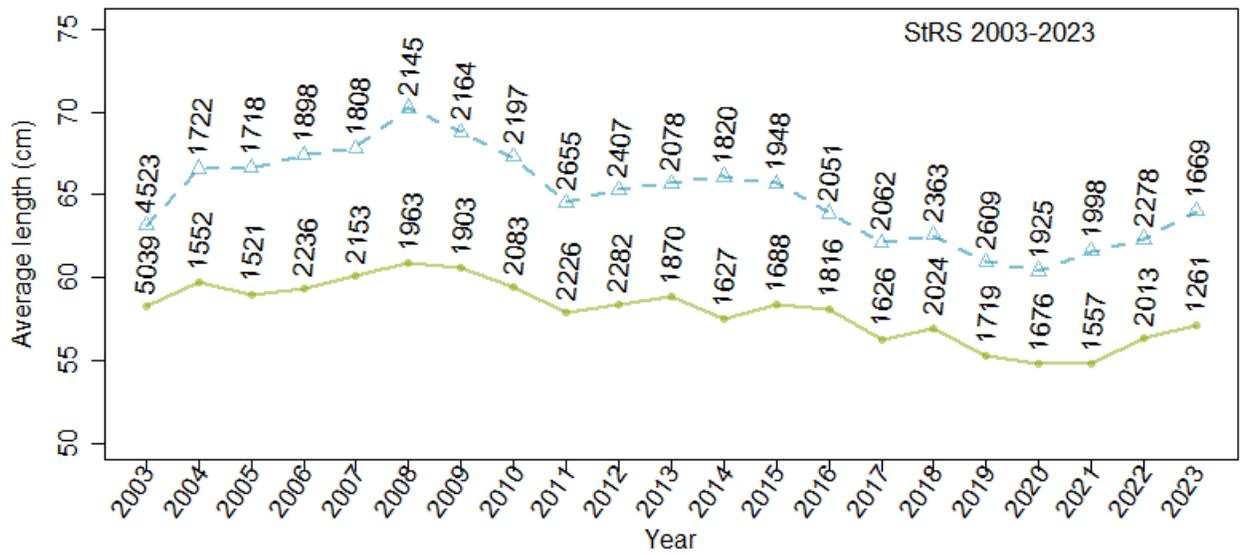


Figure 12. Length frequencies for female (blue) and male Sablefish (green) up to 2023 for all StRS sets. Specimen number (n), mean (\bar{x}) and standard deviation (σ) are displayed (A). Average length of male and female Sablefish by year. Counts by sex are labelled (B).

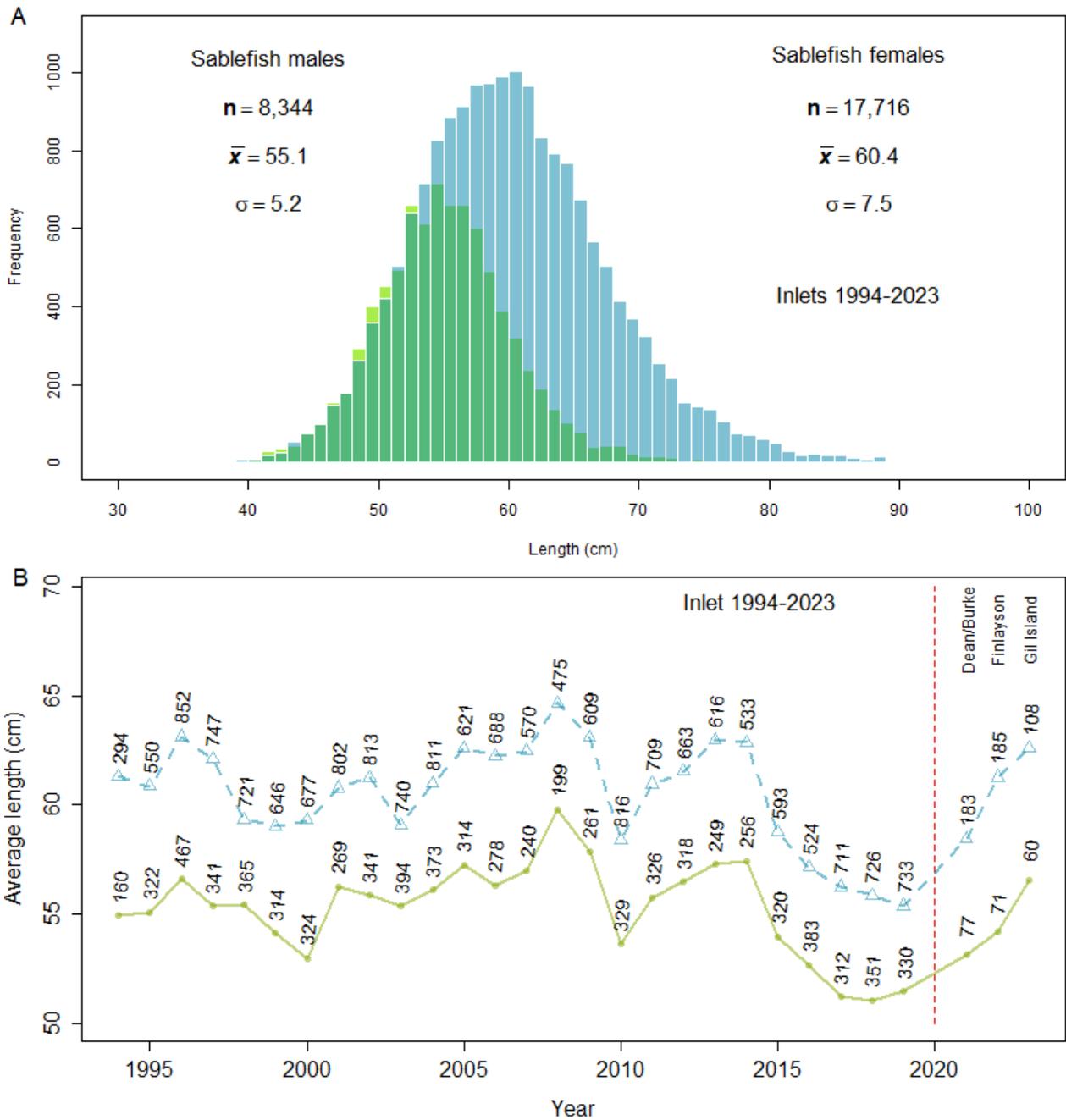


Figure 13. Length frequencies for female (blue) and male Sablefish (green) up to 2023 for all Inlet sets. Specimen number (n), mean (\bar{x}) and standard deviation (σ) are displayed (A). Average length of male and female Sablefish by year. Counts by sex are labelled (B). Data for all years includes all inlets, with the exception of no inlets surveyed in 2020; only the Dean/Burke Channel Inlet locality was surveyed in 2021; only the Finlayson Channel Inlet locality was surveyed in 2022, and only the Gil Island Inlet locality was surveyed in 2023.

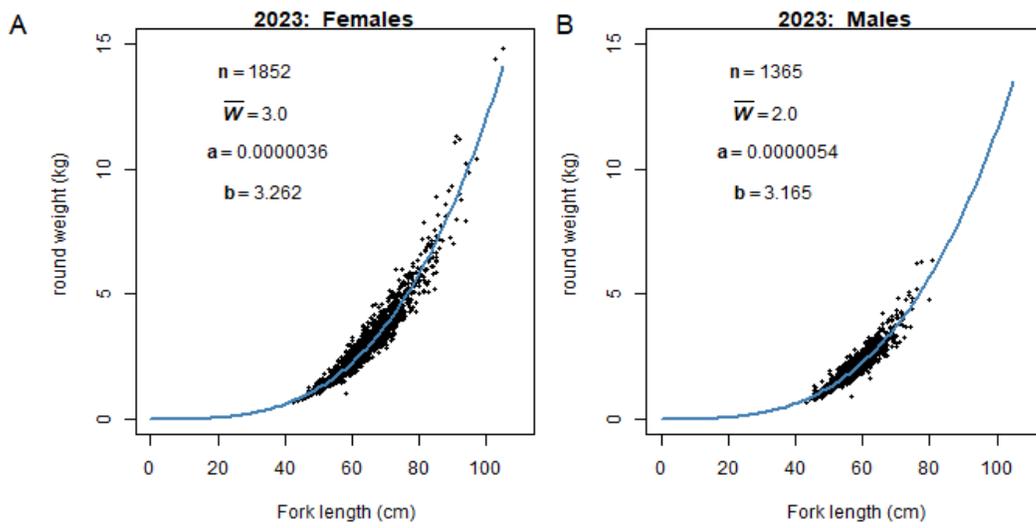


Figure 14. Sablefish fork length (cm) vs weight (kg) for females (A) and males (B) for the 2023 survey.

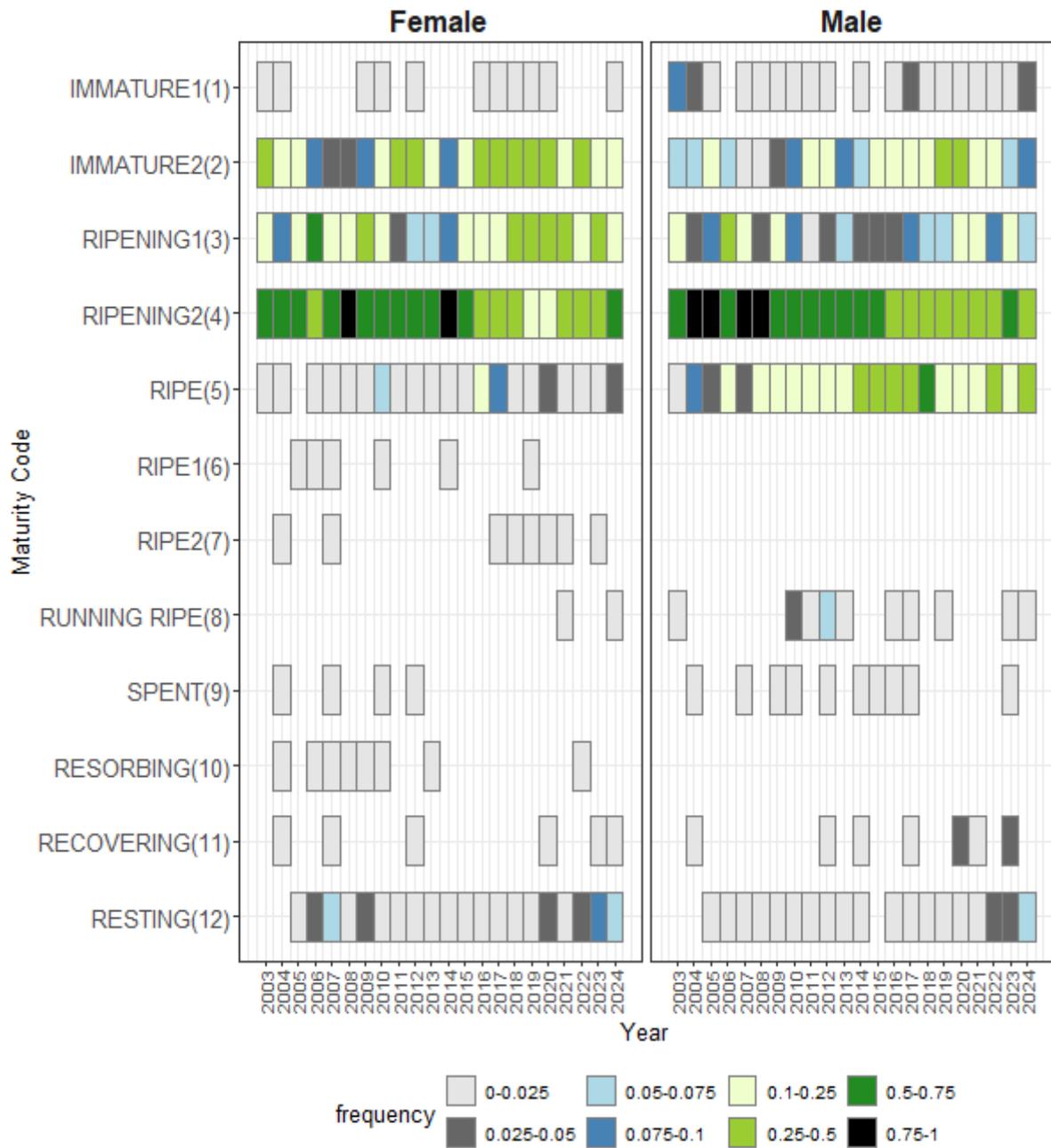


Figure 15. Relative frequency of maturity stages by survey year for female and male Sablefish caught on StRS sets. Maturity stage 3 through to stage 12 is considered a mature fish.

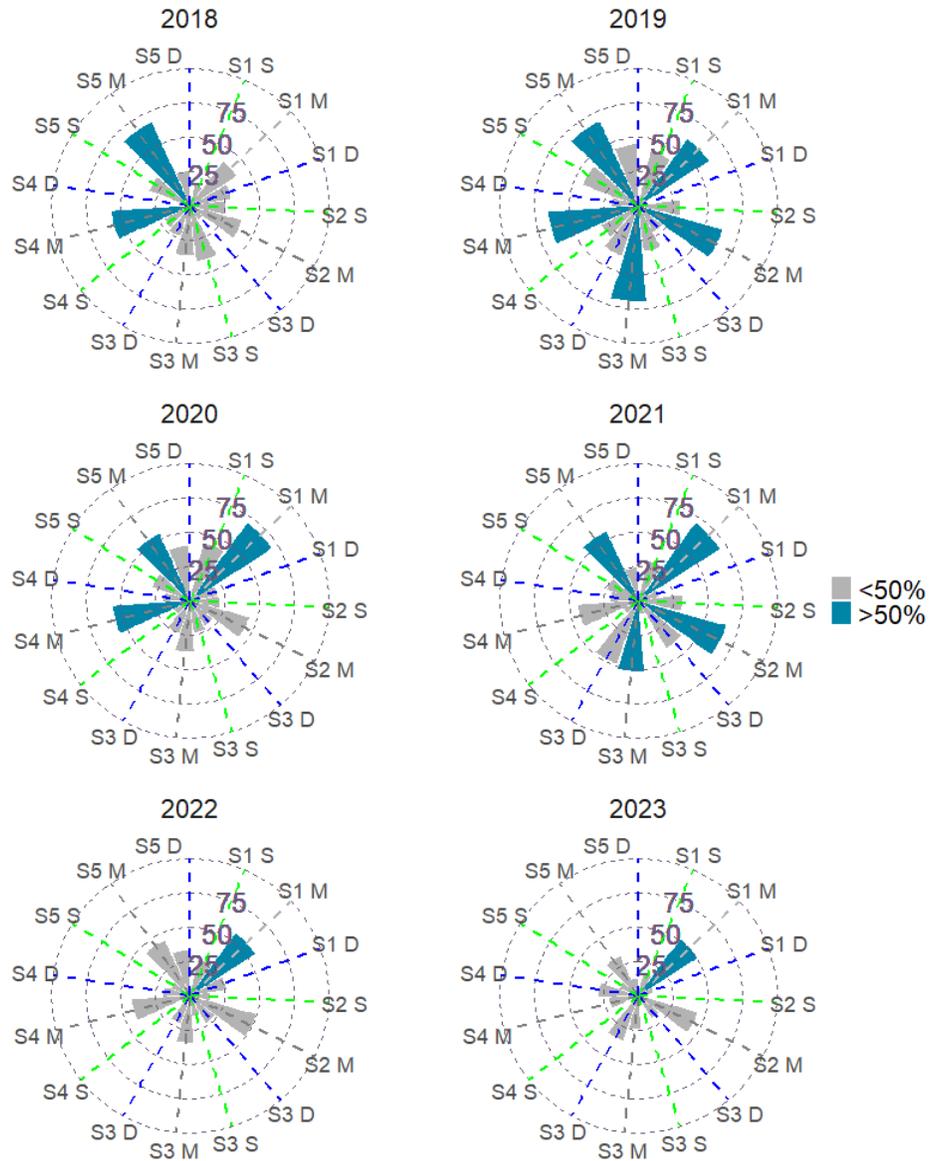


Figure 16. The percentage of sublegal Sablefish (<55 cm fork length) specimens sampled by spatial (S₁-S₅) and depth strata (S=shallow, RD₁; M=mid, RD₂; D=deep, RD₃) since 2018. Sampled sublegal specimen count above 50% sampled are shown in blue.

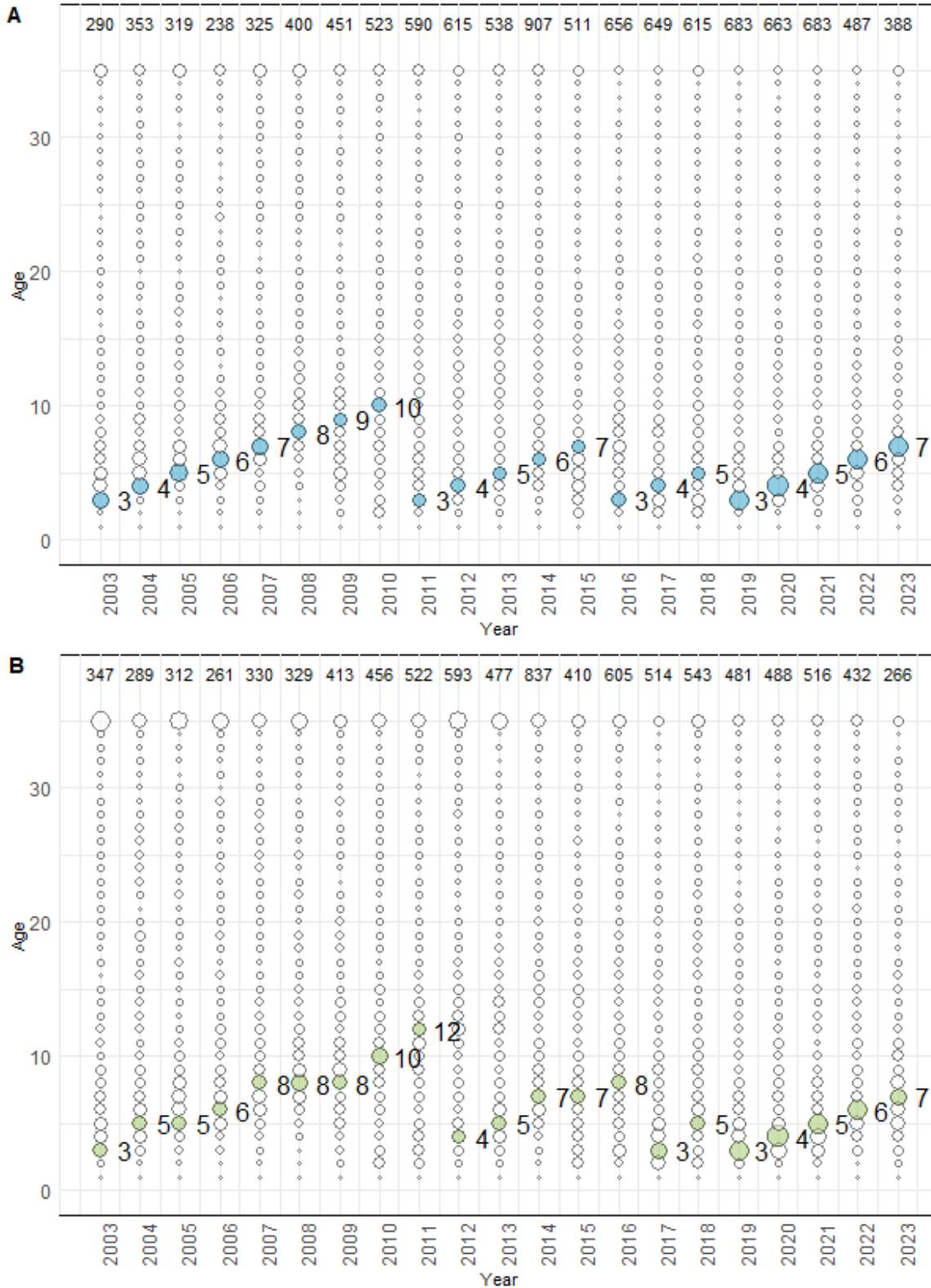


Figure 17. Bubble plot for female (A) and male (B) Sablefish ages by survey year from StRS sets for specimens that have been aged. The sizes of the circles are proportional to the number of ages. Fish age 35 and older are included in one bubble. The total number of fish aged are listed across the top of each panel. The ages with the highest numbers are posted to the right of the corresponding bubble.

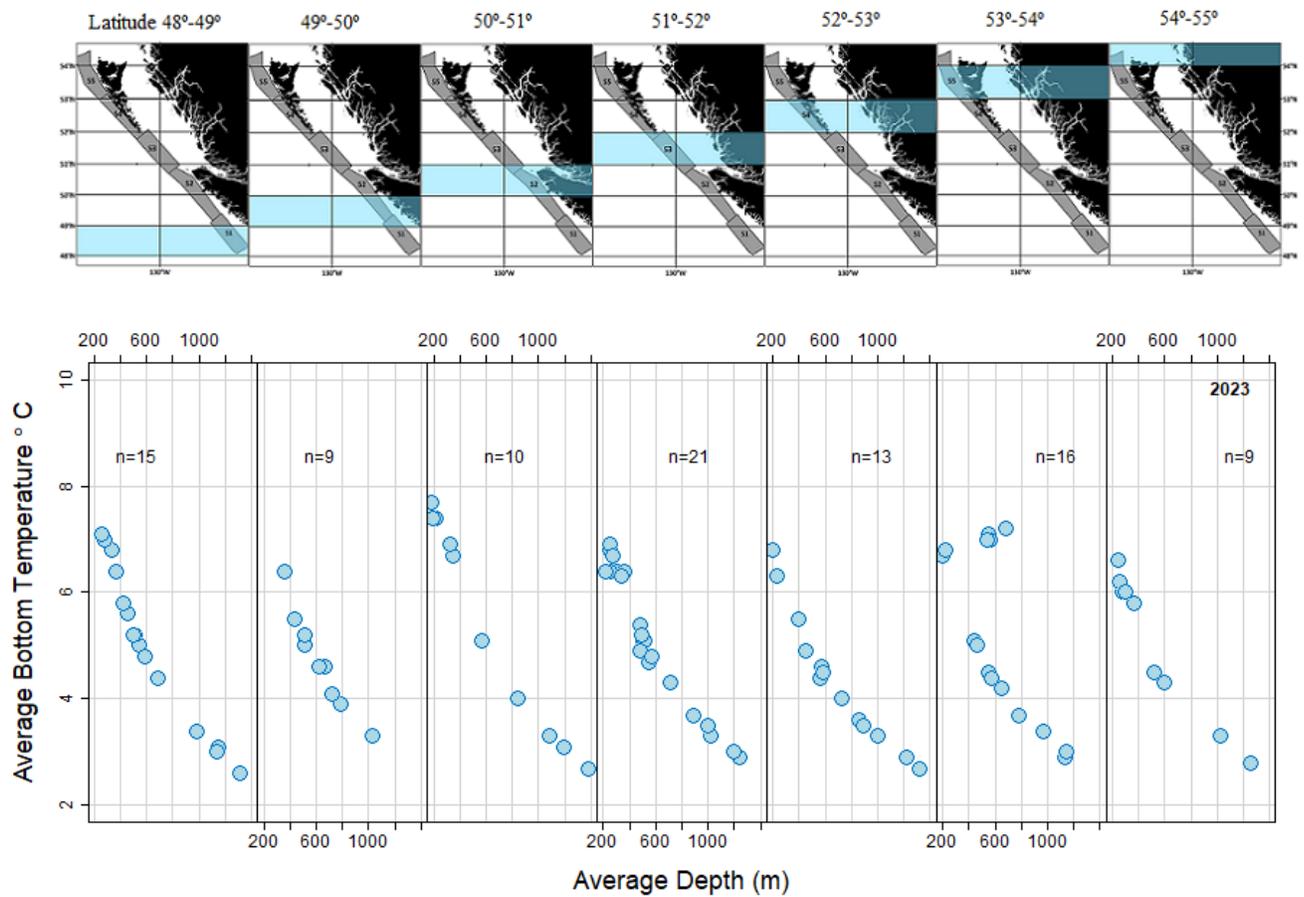


Figure 18. Coplot of average depth (m) vs average bottom temperature (°C) for a given 1-degree latitude range (blue bands) for 2023 while the gear on/near bottom. The number of fishing sets deployed with a TDR logger are represented by n.

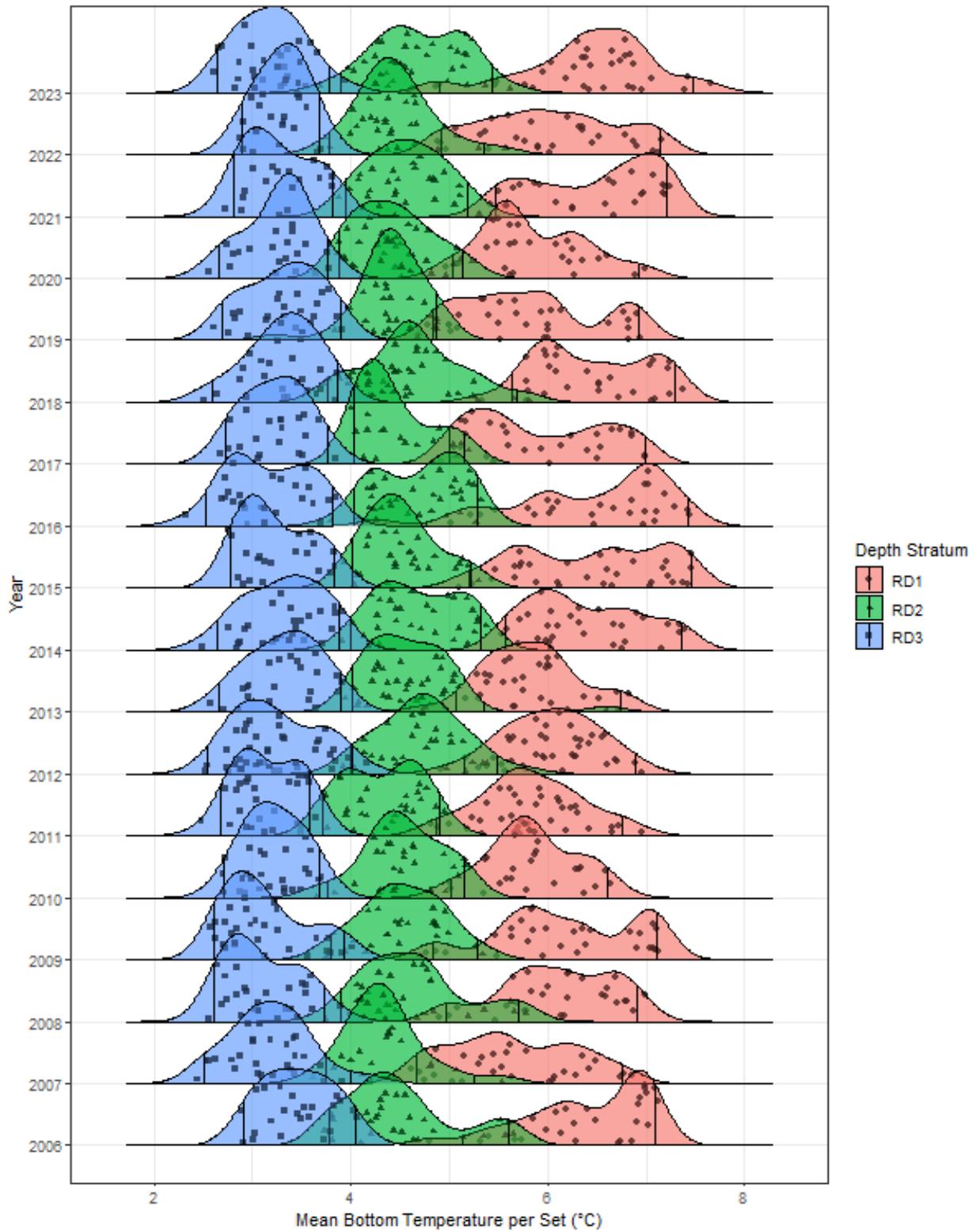


Figure 19. Vertical density ridgeplots of mean temperatures per year as reported by set from the TDR loggers on traps at three depth intervals, RD₁ = shallow (100-250 fa), RD₂ = mid (250-450 fa), RD₃ = deep (450-750 fa). Lines indicate the 2.5% and 97.5% tails.

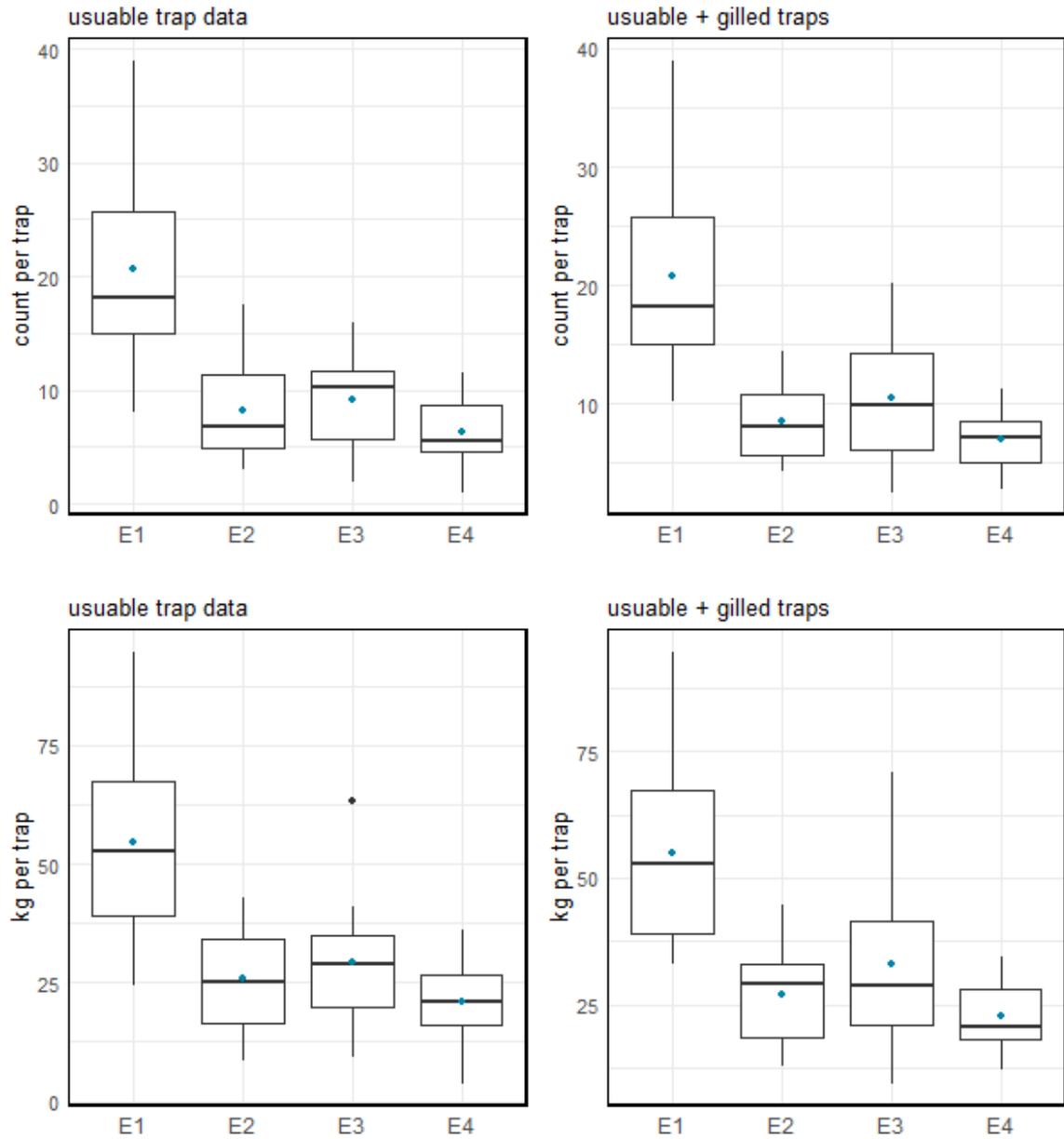


Figure 20. Distribution of Sablefish escape-ring trap catch rates by treatment for usable traps (left), and usable + gilled traps (right), excluding set 81 and set 83.

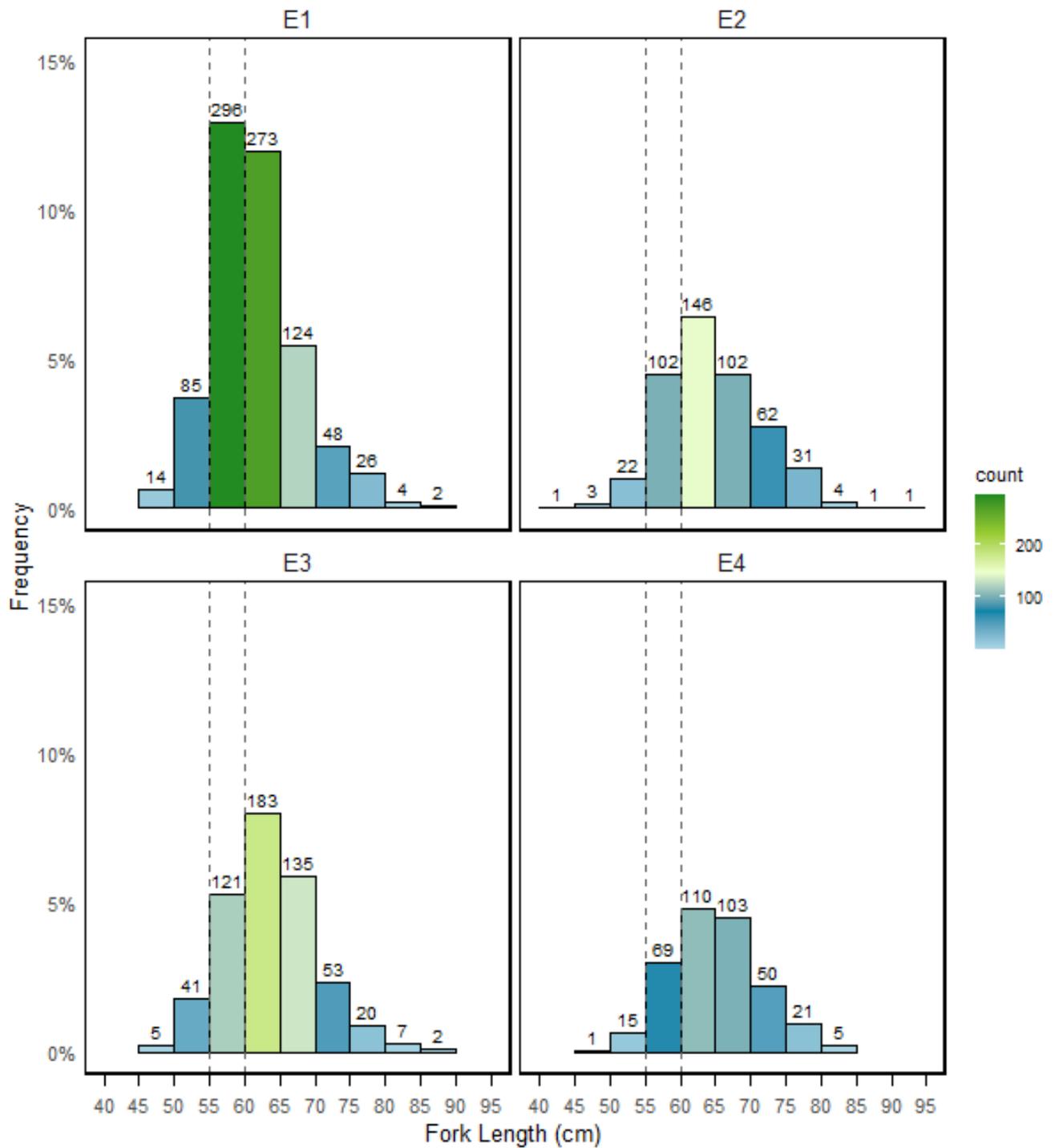


Figure 21. Distribution of the 2,289 fork lengths (FL) across different trap treatments, with vertical dashed lines marking key lengths at 55 cm, and 60 cm. The y-axis represents the frequency as a percentage, with a consistent scale ranging from 0% to 15% across all facets. The color gradient indicates the count of specimens, while the labels above each bar show the fish counts.

APPENDIX A LIST OF SABLEFISH RESEARCH AND ASSESSMENT SURVEYS.

Year	Dates	Vessel	Captain	Set Count	GFBI0 Trip 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 BEAUVAIS	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
2013	Oct 11 - Nov 17	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	111	74872
2014	Oct 9 - Nov 17	OCEAN PEARL	DARCY NICHOLS	111	76150
2015	Oct 9 - Nov 20	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	111	77830
2016	Oct 7 - Nov 22	OCEAN PEARL	DARCY NICHOLS	111	80471
2017	Oct 6 - Nov 21	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	109	82790
2018	Oct 9 - Nov 19	OCEAN PEARL	DARCY NICHOLS	111	84250
2019	Oct 8 - Nov 25	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	109	85230
2020	Oct 7 - Nov 21	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	87	85690
2021	Oct 6 - Nov 21	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	81	86130
2022	Oct 3 - Nov 19	PACIFIC VIKING	ALBERT (DEACON) MELNYCHUK	97	86530
2023	Sep 29 - Nov 13	OCEAN PEARL	JAMES SIMPSON	112	86950

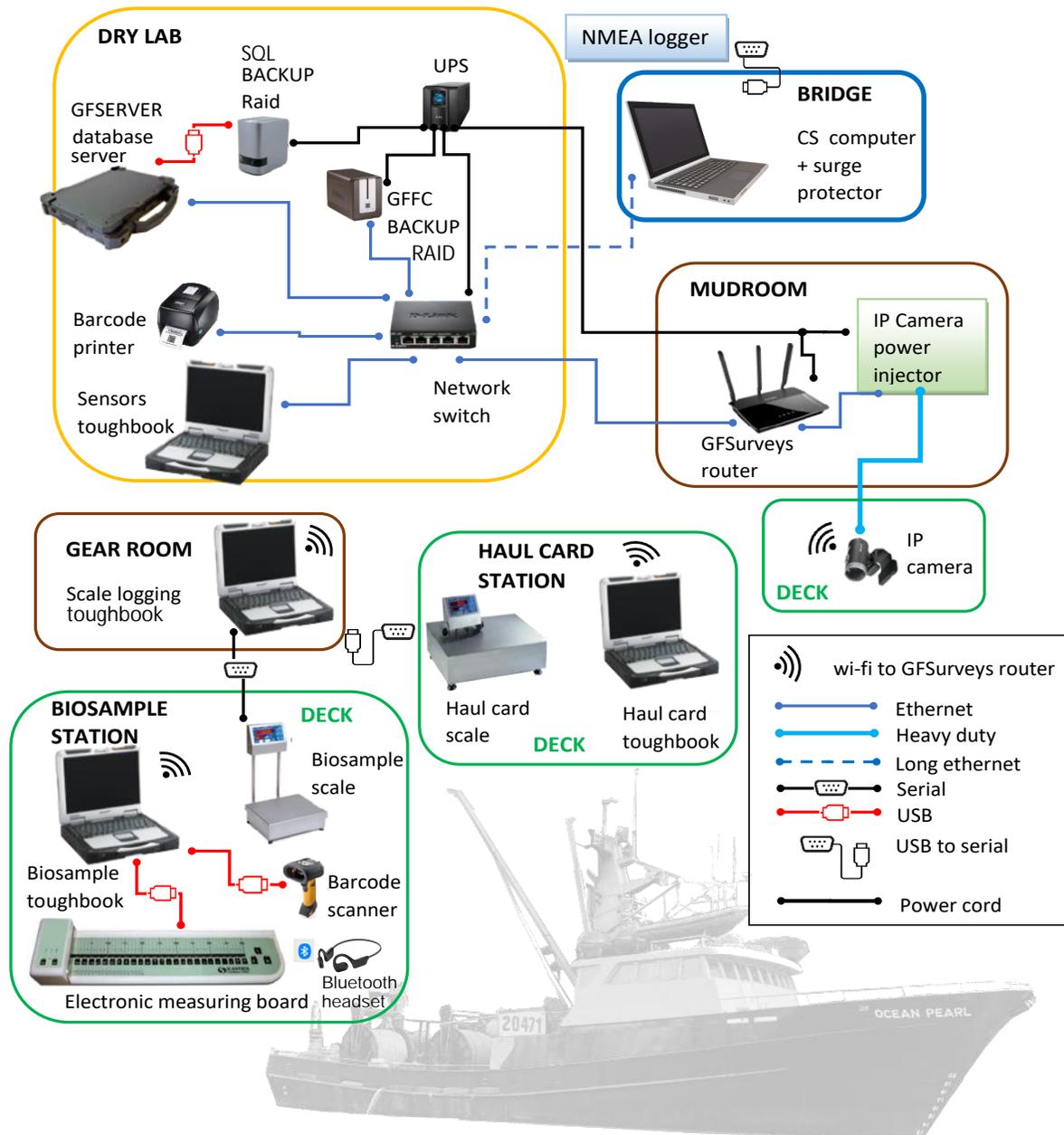
APPENDIX B TRAP MODIFICATION CODES USED FOR THE ESCAPE RING STUDY.

Table of images, code and descriptions of the escape ring treatments. The yellow area indicates the tunnel, while red circles highlight the various ring positions.

Image	Code	Treatment Description
	E1	Control: Standard survey traps with no escape rings or escape rings sewn shut
	E2	Conditions of Licence - two 3 and 3/4 inch opening 3/16 inch stainless escape rings attached below the horizontal bar in the corners behind the first vertical bar away from the tunnel.
	E3	Escape Rings Near Tunnel treatment - two 3 and 3/4 inch opening 3/16 inch stainless escape rings attached above the bottom hoop in the corners behind the tunnel opening vertical bars.
	E4	Conditions of Licence plus Tunnel Rings treatment - four 3 and 3/4 inch opening 3/16 inch stainless escape rings; two attached below the horizontal bar in the corners behind the first vertical bar away from the tunnel and two attached above the bottom hoop in the corners behind the tunnel opening vertical bars.

APPENDIX C 2023 GFSURVEYS NETWORK CONFIGURATION.

Figure 1. The GFSurveys network components and connection types on the F/V *Ocean Pearl*. Details of the network are found in the methods section 2.9.



APPENDIX D SURVEY SET DETAILS 2023.

Details of sets completed during the 2023 survey program aboard the F/V *Ocean Pearl*. Sets are listed by stratum/inlet name, set type, depth stratum, start date, end time of gear deployment, 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 includes holed or fouled traps. Sets that successfully deployed a temperature- depth recorder (TDR) are indicated with an 'x'.

Set	Spatial Stratum	Type	Depth Stratum	Date	Time	Duration (minutes)	Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Start Depth (m)	End Depth (m)	Mean Depth (m)	Traps Fished	TDR
1	S1	StRS	RD3	Oct 2	07:06	1363	3C	48°0.2'N	126 22'W	48 0'N	126 21.2'W	1123	1153	1139	25	x
2	S1	StRS	RD3	Oct 2	09:02	1378	3C	48°9.1'N	126 17.6'W	48 8.6'N	126 17.5'W	1260	1297	1303	25	x
3	S1	StRS	RD3	Oct 2	11:01	1443	3C	48°0.1'N	126 7.8'W	48 0.1'N	126 6.9'W	1260	1030	1162	25	x
4	S1	StRS	RD2	Oct 2	13:00	1488	3C	48°4.9'N	125 54.5'W	48 5.1'N	125 53.7'W	708	638	672	25	x
5	S1	StRS	RD1	Oct 2	15:00	1488	3C	48°5.8'N	125 44.7'W	48 5.8'N	125 43.9'W	277	399	323	25	x
6	S1	StRS	RD1	Oct 2	17:00	1498	3C	48°6.4'N	125 53.2'W	48 6.9'N	125 52.7'W	466	372	415	25	x
7	S1	StRS	RD1	Oct 2	18:57	1516	3C	48°4.1'N	125 56.1'W	48 4.5'N	125 56.7'W	418	289	348	25	x
8	S1	StRS	RD2	Oct 2	20:58	1544	3C	48°3'N	126 9.1'W	48 2.6'N	126 10'W	412	503	453	25	x
9	S1	StRS	RD1	Oct 4	08:02	1334	3C	48°4.1'N	126 15.9'W	48 4.5'N	126 15.3'W	284	209	258	25	x
10	S1	StRS	RD1	Oct 4	10:03	1384	3C	48°7.7'N	126 29'W	48 7.6'N	126 29.9'W	250	264	257	25	x
11	S1	StRS	RD2	Oct 4	12:00	1413	3C	48°4.2'N	126 30.8'W	48 3.8'N	126 31.3'W	484	522	504	25	x
12	S1	StRS	RD3	Oct 4	14:08	1426	3C	48°7.4'N	126 30.3'W	48 7'N	126 29.7'W	1017	976	994	25	x
13		Esc Ring		Oct 4	15:58	1456	3C	48°9.9'N	126 18'W	48 9.9'N	126 17.1'W	368	355	366	25	x
14	S1	StRS	RD2	Oct 4	18:06	1460	3C	48°3.2'N	126 15'W	48 3.7'N	126 15.2'W	571	705	617	25	x
15	S1	StRS	RD2	Oct 4	19:58	1444	3C	48°2.7'N	126 12.3'W	48 2.3'N	126 12.9'W	478	575	532	25	x
16	S1	StRS	RD2	Oct 6	07:59	1349	3C	48°2'N	126 32'W	48 2'N	126 31.1'W	746	691	715	25	x
17		Esc Ring		Oct 6	09:56	1367	3C	48°0.4'N	126 35.4'W	48 0.4'N	126 34.4'W	364	315	340	25	x
18	S1	StRS	RD2	Oct 6	11:58	1373	3C	48°6.5'N	126 34.6'W	48 6.7'N	126 33.7'W	546	457	516	25	x
19	S1	StRS	RD2	Oct 6	14:00	1383	3C	48°5.3'N	126 41.6'W	48 4.9'N	126 42.2'W	495	531	513	25	x
20	S1	StRS	RD3	Oct 6	16:02	1448	3C	48°6'N	126 60'W	48 6.1'N	127 0.8'W	1138	1167	1153	25	x
21	S1	StRS	RD1	Oct 6	18:02	1491	3D	49°0.5'N	126 57.4'W	49 0'N	126 56.6'W	387	319	355	25	x
22	S2	StRS	RD3	Oct 6	20:15	1537	3D	49°6.3'N	127 12'W	49 6.3'N	127 13.1'W	992	1109	1019	25	x
23	S2	StRS	RD3	Oct 8	08:16	1335	3D	49°2'N	127 28.1'W	49 2.6'N	127 28.2'W	719	872	781	25	x
24	S2	StRS	RD2	Oct 8	10:03	1359	3D	49°4.4'N	127 30.5'W	49 5'N	127 31.2'W	676	620	638	25	x
25	S2	StRS	RD2	Oct 8	12:03	1371	3D	49°6.1'N	127 29.7'W	49 6.6'N	127 30.3'W	711	761	730	24	x
26	S2	StRS	RD2	Oct 8	14:03	1431	3D	49°3.8'N	127 39.4'W	49 4.3'N	127 39.4'W	600	488	529	25	x
27	S2	StRS	RD1	Oct 8	16:03	1466	3D	49°7.5'N	127 48.1'W	49 8'N	127 47.5'W	443	446	439	25	x
28	S2	StRS	RD2	Oct 11	08:20	1340	3D	49°9'N	127 51.5'W	49 9.4'N	127 52.1'W	721	761	681	25	x
29	S2	StRS	RD3	Oct 11	10:08	1354	3D	50°0.5'N	127 54.1'W	50 0.9'N	127 54.7'W	1107	1078	1091	25	x
30	S2	StRS	RD2	Oct 11	12:02	1390	3D	49°7.9'N	128 4.6'W	49 7.7'N	128 6.7'W	474	525	497	24	x
31	S2	StRS	RD3	Oct 11	14:28	1445	3D	50°1.4'N	128 18.7'W	50 2.1'N	128 18.7'W	1205	1084	1191	25	x
32	S2	StRS	RD2	Oct 11	16:41	1441	3D	50°5.2'N	128 13.8'W	50 4.8'N	128 14.5'W	679	647	630	25	x
33	S2	StRS	RD2	Oct 11	18:39	1443	3D	50°8.6'N	128 19.8'W	50 8.2'N	128 20.2'W	475	549	504	24	x
34	S2	StRS	RD1	Oct 11	20:26	1434	3D	50°0.9'N	128 26'W	50 1.5'N	128 25.6'W	366	285	322	25	x
35	S2	StRS	RD1	Oct 13	06:59	1332	5A	50°3.9'N	128 35.8'W	50 4.6'N	128 35.8'W	193	197	196	25	x
36	S2	StRS	RD1	Oct 13	08:35	1335	5A	50°1.7'N	128 35'W	50 2.2'N	128 34.3'W	442	207	303	25	x
37	S2	StRS	RD1	Oct 13	10:37	1454	3D	50°8'N	128 25.2'W	50 7.5'N	128 25.1'W	186	189	188	25	x
38	S2	StRS	RD3	Oct 14	09:14	1423	3D	50°3'N	128 32.6'W	50 2.6'N	128 33.1'W	1037	1059	1043	25	x
39	S2	StRS	RD1	Oct 14	12:48	1405	3D	50°1.9'N	128 19.8'W	50 1.9'N	128 18.9'W	204	433	314	24	x
40	S3	StRS	RD2	Oct 19	20:10	1501	5A	51°0.2'N	129 34.8'W	51 0.8'N	129 34.5'W	562	459	503	25	x
41	S3	StRS	RD3	Oct 20	07:04	1352	5B	51°1.9'N	130 14.9'W	51 2'N	130 14.1'W	903	964	907	25	x
42	S3	StRS	RD3	Oct 20	09:02	1392	5B	51°6.3'N	130 6.7'W	51 5.9'N	130 6.8'W	944	934	980	25	x

continued.

Set	Spatial Stratum	Type	Depth Stratum	Date	Time	Duration (minutes)	Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Start Depth (m)	End Depth (m)	Mean Depth (m)	Traps Fished	TDR
43	S3	StRS	RD1	Oct 20	11:05	1393	5B	51°1.9'N	130 1.1'W	51 1.4'N	130 1.1'W	300	274	278	25	x
44	S3	StRS	RD2	Oct 20	13:02	1389	5B	51°8.6'N	130 5.4'W	51 8.2'N	130 5.9'W	469	600	536	25	x
45	S3	StRS	RD2	Oct 20	15:03	1401	5A	51°4.5'N	130 2.1'W	51 4'N	130 2.4'W	479	506	489	25	x
46	S3	StRS	RD3	Oct 20	17:00	1466	5A	51°0.2'N	129 50.2'W	51 0.3'N	129 49.2'W	955	936	991	25	x
47	S3	StRS	RD1	Oct 20	19:05	1517	5B	51°5.9'N	129 42.9'W	51 6.5'N	129 43.3'W	344	249	269	25	x
48	S3	StRS	RD1	Oct 22	08:04	1332	5B	51°2.7'N	130 20.9'W	51 3.2'N	130 21.4'W	281	393	347	25	x
49	S3	StRS	RD3	Oct 22	10:05	1386	5B	51°9'N	130 34.6'W	51 9'N	130 35.6'W	1162	1198	1181	25	x
50		Esc Ring		Oct 22	12:39	1383	5B	51°8.7'N	130 34.5'W	51 8.2'N	130 35'W	366	444	406	25	x
51		Esc Ring		Oct 22	14:50	1390	5B	51°8.5'N	130 38.8'W	51 8'N	130 38.8'W	365	472	417	25	x
52	S3	StRS	RD1	Oct 22	16:51	1399	5B	51°8.5'N	130 50.7'W	51 9'N	130 51.3'W	223	219	221	25	x
53	S3	StRS	RD1	Oct 22	18:42	1407	5B	51°9.4'N	130 57.5'W	51 8.8'N	130 56.9'W	230	254	239	24	x
54	S4	StRS	RD2	Oct 22	20:48	1438	5B	51°5.7'N	131 8.7'W	51 5.7'N	131 9.5'W	474	524	514	25	x
55	S4	StRS	RD1	Oct 24	08:04	1332	5B	51°9.9'N	131 11.6'W	51 9.3'N	131 11.4'W	421	388	400	24	x
56	S4	StRS	RD1	Oct 24	09:32	1373	5E	52°0.4'N	131 15.2'W	52 0.8'N	131 15.5'W	441	457	455	25	x
57	S4	StRS	RD1	Oct 24	11:02	1382	5E	52°0.2'N	131 16.1'W	52 0.7'N	131 16.7'W	229	224	227	25	x
58		Esc Ring		Oct 24	13:05	1394	5E	52°0'N	131 22.1'W	52 0.3'N	131 22.7'W	418	523	462	25	x
59	S4	StRS	RD2	Oct 24	15:01	1448	5E	52°0.2'N	131 30.6'W	52 0.1'N	131 31.4'W	593	459	529	25	x
60	S4	StRS	RD2	Oct 24	17:02	1446	5E	52°0.4'N	131 35'W	52 0.4'N	131 34'W	641	603	573	25	x
61	S4	StRS	RD2	Oct 24	19:04	1445	5E	52°2.9'N	131 31.3'W	52 3.1'N	131 30.3'W	765	693	732	25	x
62	S4	StRS	RD3	Oct 24	21:00	1451	5E	52°5.1'N	131 34.1'W	52 5.7'N	131 34.4'W	844	844	855	25	x
63	S3	StRS	RD1	Oct 26	08:06	1328	5B	51°2.5'N	130 10.2'W	51 2.1'N	130 9.6'W	236	277	254	25	x
64	S3	StRS	RD1	Oct 26	09:34	1339	5B	51°0.3'N	130 9.9'W	51 9.9'N	130 9.7'W	309	310	309	24	x
65	S3	StRS	RD1	Oct 26	11:09	1350	5B	51°8'N	130 7.3'W	51 7.4'N	130 7.5'W	319	437	378	25	x
66	S3	StRS	RD2	Oct 26	13:06	1349	5B	51°4.9'N	130 11.4'W	51 4.4'N	130 11.8'W	705	752	723	25	x
67	S3	StRS	RD2	Oct 26	15:03	1365	5B	51°9.9'N	130 11.7'W	51 9.9'N	130 10.9'W	526	489	508	25	x
68	S3	StRS	RD2	Oct 26	17:09	1355	5B	51°1.8'N	130 8.4'W	51 2.5'N	130 8.5'W	444	733	540	25	x
69		Esc Ring		Oct 26	19:10	1348	5B	51°1.8'N	130 4.3'W	51 1.9'N	130 5.2'W	326	464	400	25	x
70	S3	StRS	RD3	Oct 26	21:28	1429	5B	51°0.4'N	130 29.2'W	51 9.9'N	130 29.7'W	1237	1284	1255	25	x
71	S4	StRS	RD3	Oct 29	08:04	1351	5E	52°6.9'N	132 29.7'W	52 7.5'N	132 29.3'W	836	859	853	25	x
72	S4	StRS	RD3	Oct 29	10:05	1358	5E	52°7.9'N	132 27.3'W	52 7.9'N	132 26.5'W	1090	1285	1186	25	x
73	S4	StRS	RD1	Oct 29	12:00	1359	5E	52°9.6'N	132 16.7'W	52 0.2'N	132 16.8'W	424	243	365	25	x
74		Esc Ring		Oct 29	14:01	1348	5E	52°4.9'N	132 24.1'W	52 4.5'N	132 24.8'W	326	470	419	25	x
75	S4	StRS	RD3	Oct 29	16:06	1346	5E	52°4.2'N	132 28'W	52 4.2'N	132 29'W	986	1059	1013	25	x
76	S4	StRS	RD3	Oct 29	18:04	1381	5E	52°7.2'N	132 37.3'W	52 7.1'N	132 38.3'W	1334	1334	1338	25	x
77		Esc Ring		Oct 29	19:56	1379	5E	53°0.3'N	132 34.8'W	53 0.6'N	132 35.9'W	287	448	362	24	x
78	S4	StRS	RD2	Oct 31	07:03	1452	5E	52°7.5'N	132 30'W	52 7.3'N	132 31'W	500	642	564	25	x
79	S4	StRS	RD1	Oct 31	08:36	1449	5E	52°8.6'N	132 28.2'W	52 9.3'N	132 28.3'W	269	184	211	25	x
80	S4	StRS	RD1	Oct 31	10:04	1453	5E	53°0.7'N	132 30.3'W	53 0.7'N	132 31.3'W	210	205	204	25	x
81		Esc Ring		Oct 31	11:35	1461	5E	53°0.4'N	132 38.5'W	53 0.2'N	132 39.5'W	228	400	327	23	x
82	S4	StRS	RD2	Oct 31	15:21	1348	5E	53°0.6'N	132 41.6'W	53 0.4'N	132 42.6'W	537	614	573	25	x
83		Esc Ring		Oct 31	17:12	1341	5E	53°0.8'N	132 41.7'W	53 0.2'N	132 42.3'W	289	377	325	25	x
84	S5	StRS	RD2	Oct 31	19:07	1365	5E	53°0.3'N	132 54.4'W	53 0.5'N	132 55.5'W	799	774	785	25	x

continued.

Set	Spatial Stratum	Type	Depth Stratum	Date	Time	Duration (minutes)	Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Start Depth (m)	End Depth (m)	Mean Depth (m)	Traps Fished	TDR
85	S5	StRS	RD3	Nov 2	08:10	1345	5E	53°3.5'N	133 41.1'W	53 4.2'N	133 41.6'W	1136	1162	1141	25	x
86	S5	StRS	RD3	Nov 2	10:01	1363	5E	53°3'N	133 50.1'W	53 3'N	133 51.1'W	981	913	942	25	x
87	S5	StRS	RD3	Nov 2	12:00	1367	5E	53°6.4'N	133 49.3'W	53 7.1'N	133 49.1'W	1153	1146	1149	25	x
88		Esc Ring		Nov 2	13:34	1388	5E	53°7.9'N	133 39.2'W	53 8.6'N	133 39.2'W	595	507	546	25	x
89	S5	StRS	RD3	Nov 2	15:32	1396	5E	54°0.2'N	133 47.6'W	54 0.7'N	133 47'W	1068	1021	1046	25	x
90	S5	StRS	RD2	Nov 2	16:57	1421	5E	54°0.7'N	133 43'W	54 0.2'N	133 42.2'W	603	470	534	25	x
91	S5	StRS	RD1	Nov 2	18:30	1449	5E	54°0.5'N	133 30.5'W	54 0.5'N	133 29.6'W	308	278	295	25	x
92		Esc Ring		Nov 2	20:01	1468	5E	54°0'N	133 40.4'W	54 0.4'N	133 41'W	451	569	517	25	x
93	S5	StRS	RD2	Nov 4	08:00	1340	5E	53°3.7'N	133 2.2'W	53 3.6'N	133 3.3'W	774	826	793	25	x
94		Esc Ring		Nov 4	09:56	1360	5E	53°1.6'N	132 57.4'W	53 1.6'N	132 58.5'W	389	542	445	25	x
95	S5	StRS	RD2	Nov 4	12:03	1380	5E	53°6.8'N	133 8.8'W	53 7.4'N	133 9.3'W	467	602	528	25	x
96	S5	StRS	RD2	Nov 4	13:57	1409	5E	53°3.8'N	133 17.2'W	53 4.3'N	133 17.8'W	471	483	476	25	x
97	S5	StRS	RD2	Nov 4	16:06	1392	5E	53°6.7'N	133 12.6'W	53 7'N	133 11.7'W	679	611	641	25	x
98	S5	StRS	RD1	Nov 4	18:02	1404	5E	53°3.6'N	133 15.5'W	53 4.4'N	133 15.5'W	224	212	219	25	x
99		Esc Ring		Nov 4	20:02	1387	5E	53°5.1'N	133 23.9'W	53 5.7'N	133 23.9'W	587	519	547	25	x
100	S5	StRS	RD1	Nov 6	08:00	1331	5E	54°0.1'N	133 32'W	54 0.5'N	133 31.3'W	369	372	371	25	x
101		Esc Ring		Nov 6	09:40	1367	5E	54°0'N	133 41.2'W	54 0.9'N	133 42.3'W	520	674	589	25	x
102	S5	StRS	RD3	Nov 6	11:30	1417	5E	54°0.9'N	133 53'W	54 0.6'N	133 53'W	1223	1297	1258	25	x
103	S5	StRS	RD1	Nov 6	13:32	1412	5E	54°1.6'N	133 46.1'W	54 2.3'N	133 46.2'W	294	252	271	25	x
104	S5	StRS	RD2	Nov 6	14:59	1415	5E	54°3.3'N	133 52'W	54 2.8'N	133 52.6'W	570	626	597	25	x
105		Esc Ring		Nov 6	16:36	1432	5E	54°5.5'N	133 51.8'W	54 5.4'N	133 50.9'W	599	550	574	25	x
106	S5	StRS	RD1	Nov 6	18:00	1470	5E	54°0.5'N	133 39.4'W	54 1.1'N	133 38.7'W	248	245	247	25	x
107	S5	StRS	RD1	Nov 6	19:28	1472	5E	54°1.9'N	133 30.5'W	54 2.3'N	133 29.6'W	252	249	251	25	x
108	Gil Island	Inlet		Nov 9	15:00	986	5C	53°8.4'N	129 18.7'W	53 8.4'N	129 17.7'W	517	536	537	24	x
109	Gil Island	Inlet		Nov 9	16:39	1024	5C	53°2.4'N	129 22.4'W	53 2.4'N	129 23.4'W	545	512	538	25	x
110	Gil Island	Inlet		Nov 9	18:24	1133	5C	53°0.9'N	129 20.7'W	53 0.3'N	129 20.1'W	678	684	682	25	x
111	Gil Island	Inlet		Nov 9	20:13	1220	5C	53°0.8'N	129 7.5'W	53 0.1'N	129 6.5'W	568	545	546	25	x
112	Gil Island	Inlet		Nov 9	21:37	1278	5C	53°0.7'N	129 8.6'W	53 1'N	129 7.8'W	554	570	564	25	x

APPENDIX E SUMMARY OF BASKET USE BY TRAP 2023.

Summary of the basket use by trap number for sets during the 2023 Sablefish trap 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 Length, Sex, Maturity, Weight and Otoliths (LSMWO), L = Sampled for length frequency, SD = Sublegal discarded, F= Frames, NULL = No Sablefish catch/trap missing. Those set numbers highlighted with blue were part of the escape ring study. Inlet sets are highlighted with green and StRS sets have no background colour.

Set	Trap																									Total				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	A	D	L	-	
1	D	D,SD	A	D,SD	D,SD	D	D	D,SD	D,SD	D	A	A	D,SD	D	A	D	D	D	A	A	D	D	D	D,SD	D,SD	6	19	0	0	
2	D		A	A	A	A	A	A	A		A	A	A	A	D		A	D	D	D	D	D	D	D	D	12	10	0	3	
3	D,SD	D,SD	D	A		A	A	D	A	D	D,SD	D	A	D		A	D	A	D,SD	D,SD		D,SD	D,SD	D,SD	D,SD	7	15	0	3	
4	D,SD	A	D,SD	D,F	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	D,F	D,SD	D,F	D,SD	D,SD	D,F	D,SD	A	D,SD	2	23	0	0							
5	D,SD	D,SD	D	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,F	D,SD	2	23	0	0								
6	A	D,SD	A	D,SD	D,SD	D,SD	D	D,SD	2	23	0	0																		
7	D,F	D	D,SD	D,F	D,F	D,SD	D,SD	D,F	D,F	D,SD	A	D,F	D,SD	D,SD	D,F	D,F	D,SD	D	D,SD	A	D,F	D,F	D	D	D,F	2	23	0	0	
8	D,SD	D,SD	D,SD	A		D,SD	D,SD	D,SD	D,SD	D,SD	D,F	D	D,SD	D,SD	A	D,F	D,SD	D,SD	D,SD	D,SD	D,F	D,SD	D,SD	D,SD	2	22	0	1		
9	D,SD	D,F	D,F	D,SD	A,F	D,F	A	D,F	D,SD	D,F	D,SD	D	D	D,SD	D	2	23	0	0											
10	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,F	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,F	D,SD	D,SD	D,F	D,F	D,SD	D,F	2	23	0	0	
11	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																			
12	D,F	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0													
13	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	0	9	16	0	
14	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D	D,SD	D,SD	D,SD	D,SD	D,SD		D,SD	D,SD	D,SD	A	D,SD	D,F	D,SD	D,F	2	22	0	1	
15	D,F	D,F	D,F	D,F	D,F	D,F	A	D,F	D,F	D,F	D,F	D,SD	D,SD	D,F	D,SD	D,F	D,SD	A,F	D,SD	A,F	D,SD	D,F	D,F	D,F	D,F	3	22	0	0	
16	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																		
17	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L,F	L	L	L	D,SD	0	9	16	0	
18	D,F	D,SD	D,F	D,SD	D,SD	D,SD	A	D,SD	D,F	D,SD	D,SD	D,SD	D,SD	D,F	D,F	D,F	D,F	D,F	A,F	D,F	D,F	D,SD	D,F	D,F	D,F	2	23	0	0	
19	D,SD	D,SD	A	D,SD	A		D,SD	2	22	0	1																			
20	D	D,SD	D,SD	A	D	D,SD	D	D	D,SD	D	D	A	D	D	D	A	D,SD	D		D	A	D	D	D	D	4	18	0	3	
21	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	2	23	0	0																		
22	D,SD	A	D,SD	A	D,SD	D,SD	D	D	D,SD	D,SD	D,SD	D	D,SD	D,SD	2	23	0	0												
23	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																			
24	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0													
25	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	3	20	0	2								
26	D	D,SD	A	D	D,SD	A	D,SD	D,SD	D,SD	D,SD	D	D,SD	A	A	D,SD	D,SD	D	4	21	0	0									
27	D,SD	D,SD	A	D,SD	A	D,SD	D	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	3	22	0	0												
28	D,F	D,SD	D,F	D,F		A	D,F	D,F	D,F	D,SD	D,SD	D,F	D,F	A,F	D,F	D,F	D,SD	D,F	D,F	D,F	D,F	D,F	D,F	D,SD	D,F	2	22	0	1	
29	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	A	D,SD	3	22	0	0																	
30	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	3	20	0	2													
31		A		A	A	D,SD	D		A	D	D	D		A		A	A		A	A	D,SD	D,SD	D,SD			9	8	0	8	
32	D,SD		A	D,F		A	D,SD	D,F	D,SD	D,F	D,F	D,SD	D,F	D,F	D,SD	D,SD	D	A	D,SD	D,SD	D,SD	D,SD	D,SD	D	D,SD	3	20	0	2	
33	D,F	D,SD	D,SD		A	D,SD		A	A	D,SD	D,F	D,SD	D		D,SD	D,SD	D,SD	3	19	0	3									
34	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD		D,SD	D,SD	D,SD	2	22	0	1										
35		A		A	A	A	A	A	A	A	A	A	A	A		A	D	D				D		D	D,SD	12	6	0	7	
36		A			A	A			A	A	D	D,SD	D	D,SD	D,SD	D,SD	D,SD	D	D	D,SD	D,SD	D,F	D,F	D,F	D,SD	5	15	0	5	
37	A,F		A		A	A	A	A	A	A	A	A	D	D,SD	D	D,SD	D,SD	D	D	D	D		D	D	D,SD	10	11	0	4	
38							A		A		A	D	A	A	A	A		A	A	D,SD	D					8	3	0	14	
39	D	D,F	D	A	D,SD	D	D	D,SD	D,SD	D,SD	D	D,SD	D,SD	A	D,SD	A	D,F	D,SD	D,SD	3	21	0	1							
40	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0														
41	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0														
42	D,SD		A	D,SD		D,SD	A		D,SD	D,SD	D,SD	D,SD	2	19	0	4														
43	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D	D,SD	D,SD	D,SD	D,SD	2	22	0	1											
44	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																		
45	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D	D,SD	D,SD	D,SD	2	22	0	1										
46	D,SD	D,SD	D	A	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D	D,SD	D,SD	D,SD	A	D	D,SD	D	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	3	22	0	0	

continued.

Set	Trap																									Total			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	A	D	L	-
47	D,SD	D,F	D,F	D,SD	D,SD	D,SD	A	D,SD	D	D,SD	D,SD	D,SD	D,SD	D,F	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D	D,SD	D,SD	D,SD	2	23	0	0
48	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	D,F	A	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,F	D,SD	D	4	21	0	0
49	D	D,SD		D,SD	A	D	D,SD	D		D	A	D,SD	D	D	A	D	D	D,SD	A	D,SD	A			D,SD		5	15	0	5
50	D,SD	L	D,SD	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	D,SD	L	D,SD	D,SD	0	11	14	0
51	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	0	9	16	0
52			A	A			A		A		A	A		A	A	A			A	A		D	D		D	11	3	0	11
53	D	A	D	A,F					A	A			A	A	A				A	A	D	D	D			9	5	0	11
54	D,SD	D,SD	D,SD	A	D,SD	D	A	D,SD	2	23	0	0																	
55	D,SD	D	D	D	D	A	D	D	D	A	D		A	D	D,SD	D,SD	D	D	D	D	D	D,SD	D	D	D	3	21	0	1
56	D,SD	D,SD	D	A	D	D	D,SD	D	D,SD	D,SD	D,SD	A	D,SD	D	D,SD	D,SD	D,SD	2	23	0	0								
57		D,SD					D	D			D		A		A			A	A	A	A			A		7	4	0	14
58	D	L	L	L	L	D	D	L,F	L	L	L	D	D	L	L	L	L	D	D,SD	L	L	L	L	D	D,SD	0	9	16	0
59	D,SD	A	D,SD	A	D,SD	2	23	0	0																				
60	D,SD	D	D,SD	D,SD	A	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D		A	D,SD	D,SD	D,SD	4	19	0	2
61	D,SD	A	D,SD	A	D,SD	2	23	0	0																				
62	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D	D,SD	D,SD	D,SD	3	22	0	0							
63	D	D,SD	D,SD	D	A	D,SD			D	D,SD	D	D,SD	A	D,SD	D	D	D,SD	D,SD	D	A	D,SD	D,SD	D,SD	D,SD	D,SD	3	20	0	2
64	D,SD	D,SD	D,SD	D,SD	A	D,SD	1	21	0	3																			
65	D,SD	D	D,SD	A	D	D,SD	D	D	A	D,SD	D	D	D	D	D	D,F	D	A	D	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	3	22	0	0
66	D,SD	A	D,SD	D,SD	D,SD	D,F	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	D,F	D,SD	2	23	0	0						
67	D,SD	A	D,SD	A	D,SD	D,F	D,SD	2	23	0	0																		
68	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	2	23	0	0																
69	D,SD	D	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	0	9	16	0
70	A	D,SD	A		D	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D	A		A	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	6	15	0	4
71	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD		D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	2	22	0	1							
72		D,SD	A	D	D,SD	D,SD	D	D,SD	D,SD	D,SD	A			D,SD	D	D,SD	D	D,SD		A	D	D,SD	D,SD			3	16	0	6
73	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D	D	D,SD	A	A	D	D	D		D,SD	D,SD	D,SD	D,SD	D		3	20	0	2
74	D	L		L	L	D,SD	D	L	L	L	L	D	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	0	9	15	1
75	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD		A		D,SD	D,SD	D	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	3	18	0	4
76		A						A		A					A					A	A	A	A	A	A	10	0	0	15
77	D,SD	L	L	L	L	D	D,SD	L	L	L	L	D	D	L	L			D	D		L	L	L		D,SD	0	8	13	4
78	D,SD	D,SD	D,SD	D,SD	A	D,SD		D,SD	A	D,SD	D,SD	D,SD	A	D,SD	D	D,SD	D,SD	D,SD	3	21	0	1							
79	D	D,SD						A																		1	2	0	22
80	A						A									A			A	A	A		A	A		8	0	0	17
81		D	L		L	L	D,SD	D	L	L		L	D,SD		L		L		D			L	L			0	5	10	10
82	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																	
83	D			L						L	L				L		L	D	D,SD			L	L	D,SD		0	4	8	13
84	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0														
85		A			A	A	A	A	A	D,SD	A	A		A		A	A	A	A	A	A	A	A	A	A	17	1	0	7
86	A	D,SD			A		D,SD	A	A	D,SD	A	D,SD	D,SD	D	D	D,SD	D,SD	D,SD	D,SD	5	17	0	3						
87		A	A		A	A	A	A		A			A	A				A				A	A	D,SD		12	1	0	12
88	D,SD	D,SD	L	L	L	L	D,SD	D	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	0	9	16	0
89	A	A	A	A	A	D,SD	D,SD	D	D,SD	D,SD		D,SD	D,SD		D,SD		D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD	6	14	0	5
90	D,SD	D,SD	D,SD	D,SD	D	A	D,SD		A	D,SD	2	22	0	1															
91	A				A					A		A				A		A	A			A	A	A		10	0	0	15

continued.

Set	Trap																									Total				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	A	D	L	-	
92	D,SD	D,SD	L	L	L	L	D,SD	D,SD	D	L	L	L	D,SD	D,SD	L	L		L	D,SD	D,SD	L	L	L	D,SD	D,SD	0	11	13	1	
93	D,SD	D,SD	D,SD	D,SD	D,SD		A		A		D,SD	D,SD	D,SD	A	D,SD		D,SD	3	17	0	5									
94	D,SD	L	L	L		D	D	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D	L	L	L,F	L	D,SD	D	0	9	15	1	
95	A	A		A	A	A		A	D	D,SD	D	D	D,SD	D,SD	D	D,SD		D,SD	D,SD	D,SD		A	D,SD	D,SD	7	13	0	5		
96	D		A	A		D,SD	A	D,SD	A	A	D,SD	D,SD	D	A	A	D,SD	A	D	D	D	A	D,SD	D,SD	D	D	9	14	0	2	
97	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	2	23	0	0															
98														A	A								A		3	0	0	22		
99	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD			L	L	L	D,SD	D,SD	L	L	L	D,SD	D	0	9	14	2	
100	D,SD	D,SD	D,SD	D	A	D,SD		D,SD	D,SD	D,SD	A	D,SD	D,SD	D	D,SD	D,SD	D,SD	2	22	0	1									
101	D	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	D,SD	L	L	L	D,SD	D,SD	D,SD	L	L	L	D,SD	D,SD	0	11	14	0	
102		A			A		A	A		A					A		A	A	A	A			A	A	A	13	0	0	12	
103	A	D,SD	A		A	A	D	A	D	D,SD	D	D	D	D,SD	D			A	A	D	D	D		D	D	7	14	0	4	
104	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	2	23	0	0																		
105	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	D,SD	L	L	L	L	D,SD	0	9	16	0	
106	A,F	A,F	D,SD		A	D,SD	A		D	D	D	D,SD	D,SD	D	D	D,SD	D,SD	A	D,SD	D	D	D	D	D,F	5	18	0	2		
107	D,F	A			A	D,SD	D,SD	D,SD	A	D,SD	D	A	D,SD			D,SD	A	D,SD	D	D,SD	D,SD	D,SD	D	D,SD	5	15	0	5		
108	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	D,SD	D,SD		D	D,SD	D,SD		D,SD	A	A	3	20	0	2									
109	D,SD	D,SD	D,SD	A	D	A	D,SD	A	D,SD	D,SD	D,SD	D,SD	3	22	0	0														
110	D,SD	D,SD	D,F	D,SD	D,SD	D,SD	D,SD	D,SD	A	D,SD	A	D,SD	D,SD	D	D	2	23	0	0											
111	D,SD	A	D,SD	D,SD	D,SD	D,SD	D,SD	D,SD	D	D,SD	D,SD	D,SD	A	D,SD	D	D,SD	D,SD	D	2	23	0	0								
112	D,SD	A	D,SD	A	D,SD	D,SD	D,SD	D	D	2	23	0	0																	

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APPENDIX F SUMMARY OF SABLEFISH BIOLOGICAL DATA 2023.

Summary of the biological data collected for Sablefish, detailing information on the set, catch weight (in kilograms), and fish count. Sablefish counts by trap are visually represented with sparklines. Sets retrieved from the end location are highlighted by green sparklines, while those picked up from the start location are marked by blue sparklines. Tagged fish counts are recorded based solely on the number of fish recovered and sampled, and are included in the total specimen count. Specimen counts are categorized by sample type, with mean fork lengths tabulated. Those set numbers highlighted with blue were part of the escape ring study. Inlet sets are highlighted with green and StRS sets have no background colour.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
1	611	215		2	38	38	38	38	38	38	0.13	626	640
2	255	63		0	32	32	32	32	32	32	0	0	702
3	665	235		1	31	31	31	31	31	31	0.16	570	650
4	1153	661		0	34	34	34	33	34	34	0.82	561	558
5	1959	789		1	33	33	33	33	33	33	0.3	572	615
6	2215	948		1	38	38	38	38	38	38	0.45	583	605
7	2186	959		0	33	33	33	33	33	33	0.33	568	617
8	1107	518		0	35	35	35	35	35	35	0.4	557	597
9	2981	1276		0	31	31	31	31	31	31	0.32	554	596
10	2723	1254		0	34	34	34	34	34	34	0.38	552	603
11	1684	841		2	39	39	39	39	39	39	0.62	563	594
12	1941	871		0	32	32	32	32	32	32	0.5	552	586
13	742	268		0	113	113	0	0	113	113	0.35	595	640
14	1178	660		1	35	35	35	35	35	35	0.63	540	552
15	868	486		0	33	33	33	33	33	33	0.85	563	631
16	1462	985		2	36	36	36	36	36	36	0.69	503	585
17	1314	554		0	180	180	0	0	0	180	0.27	574	620
18	2535	1304		2	34	34	34	34	34	34	0.68	555	639
19	1023	554		1	35	35	35	35	35	35	0.66	547	568
20	513	164		1	32	32	32	32	32	32	0.13	575	639
21	1418	591		0	35	35	35	35	34	35	0.23	550	621
22	1114	468		2	37	37	37	37	37	37	0.43	608	594

continued.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
23	1124	594		1	31	31	31	31	31	31	0.42	537	582
24	1106	609		2	35	35	35	35	35	35	0.74	533	555
25	730	382		0	33	33	33	33	33	33	0.58	523	548
26	702	284		0	34	34	34	34	34	34	0.21	591	601
27	1112	401		3	37	37	37	37	37	37	0.3	592	649
28	1254	600		1	33	33	33	33	33	33	0.58	610	624
29	935	402		2	37	37	37	37	37	37	0.08	513	591
30	772	340		0	31	31	31	31	31	31	0.65	575	584
31	235	63		0	32	32	32	32	32	32	0.03	745	685
32	887	469		0	32	32	32	32	32	32	0.72	545	560
33	916	472		1	32	32	32	32	32	32	0.5	539	555
34	1458	535		0	31	31	31	31	31	31	0.16	606	645
35	257	71		0	31	31	31	31	31	31	0.06	568	682
36	948	362		1	34	34	34	34	34	34	0.15	601	630
37	552	136		0	34	34	34	34	34	34	0.09	652	718
38	175	44		1	33	33	33	33	33	33	0.06	630	732
39	1382	440		0	32	32	32	32	32	32	0.22	625	635
40	1546	573		0	33	33	33	32	33	33	0.58	578	634
41	1769	1066		1	32	33	33	33	33	33	0.64	516	574
42	1207	675		2	33	33	33	33	33	33	0.64	531	618
43	1160	432		0	28	28	28	28	28	28	0.25	566	635
44	1680	793		2	32	32	32	32	32	32	0.63	581	597

continued.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
45	874	406		1	31	31	31	31	31	31	0.65	573	587
46	867	275		0	31	31	31	31	31	31	0.23	586	683
47	1360	467		1	36	36	36	36	36	36	0.22	627	645
48	1227	394		1	31	31	31	31	31	31	0.55	614	684
49	373	115		0	29	29	29	29	29	29	0.41	619	665
50	1393	400		1	172	172	1	1	1	172	0.28	623	681
51	1034	329		0	163	163	0	0	0	163	0.33	610	677
52	261	40		0	32	32	32	32	32	32	0	0	804
53	255	50		0	35	35	35	35	35	35	0.23	708	756
54	1304	477		1	32	32	32	32	32	32	0.66	615	679
55	889	258		1	33	33	33	33	33	33	0.24	645	660
56	1081	319		0	28	28	28	28	28	28	0.29	630	674
57	137	44		0	29	30	30	29	30	30	0.3	632	606
58	1178	306		1	177	177	1	1	1	177	0.33	658	705
59	1017	381		5	35	35	35	35	35	35	0.71	600	632
60	695	271		2	34	34	34	34	34	34	0.65	573	670
61	2159	1114		0	33	33	33	33	33	33	0.64	552	600
62	968	410		0	33	33	33	33	33	33	0.73	564	606
63	531	191		2	34	34	34	34	34	34	0.18	601	639
64	1166	399		2	19	19	19	19	19	19	0.16	558	647
65	973	307		3	38	38	38	38	38	38	0.13	585	661
66	1542	832		2	33	33	33	33	33	33	0.76	564	635

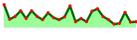
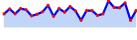
continued.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
67	1249	538		3	36	36	36	36	36	36	0.64	575	610
68	1613	716		2	34	34	34	34	34	34	0.65	565	590
69	633	216		2	126	126	2	2	2	126	0.23	595	641
70	410	162		1	32	32	32	32	32	32	0.34	559	626
71	1082	540		12	42	42	42	42	42	42	0.76	532	569
72	279	102		0	35	35	35	35	34	35	0.4	595	654
73	1142	353		0	36	36	36	36	36	36	0.44	603	672
74	759	230		0	116	116	0	0	0	116	0.26	602	666
75	638	258		0	30	30	30	30	30	30	0.6	614	602
76	52	18		0	18	18	18	18	18	18	0.22	606	649
77	543	170		0	101	101	0	0	0	101	0.16	602	660
78	1117	455		1	32	32	32	32	32	32	0.59	583	613
79	39	14		0	1	1	1	1	1	1	0	0	645
80	110	35		0	29	29	29	29	29	29	0.28	618	656
81	236	71		0	34	34	0	0	0	34	0.09	610	675
82	1076	515		0	33	33	33	32	33	33	0.48	563	588
83	239	70		0	36	36	0	0	0	36	0.14	608	660
84	1460	830		4	39	39	39	39	39	39	0.79	530	518
85	131	45		0	28	28	28	28	28	28	0.39	610	649
86	421	174		1	31	31	31	31	31	31	0.61	582	610
87	127	48		1	32	32	32	32	32	32	0.47	611	645
88	882	307		1	125	125	1	1	1	125	0.3	598	659

continued.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
89	485	196		0	35	35	35	35	35	35	0.66	568	640
90	1288	516		0	32	32	32	32	32	32	0.75	576	612
91	84	22		0	20	20	20	20	20	20	0.1	578	696
92	1137	420		0	198	198	0	0	0	198	0.53	591	665
93	696	357		1	35	35	35	35	35	35	0.74	536	631
94	658	234		1	109	109	1	1	1	109	0.33	594	645
95	373	142		1	31	31	31	31	31	31	0.55	598	648
96	277	110		1	30	30	30	30	30	30	0.53	580	609
97	1605	687		2	36	36	36	36	36	36	0.56	575	635
98	15	7		0	5	5	5	5	5	5	0	0	554
99	886	370		1	207	207	1	1	1	207	0.5	570	626
100	1087	515		1	33	33	33	33	33	33	0.39	579	601
101	1732	746		1	224	224	1	1	1	224	0.59	580	635
102	140	26		0	26	26	26	26	26	26	0.04	730	757
103	459	115		1	39	39	39	39	39	39	0.18	664	689
104	1787	818		2	34	34	34	34	34	34	0.79	572	631
105	1082	512		0	216	216	0	0	0	216	0.64	562	600
106	446	142		2	33	33	33	33	33	33	0.06	500	645
107	691	253		0	40	40	40	40	40	40	0.1	569	631
108	1476	610		0	33	33	33	33	33	33	0.48	575	610
109	1427	594		0	36	36	36	36	36	36	0.28	554	627
110	2323	825		0	35	35	35	35	35	35	0.31	576	644

continued.

Set	Total Catch			Tag Recovery	Specimen Count						Mean Fork Length(mm)		
	kg	Count	Count by Trap	Sample Count	Fork Length	Sex	Maturity	Otoliths	Weight	Count	Proportion Males	Males	Females
111	1710	675		1	32	32	32	32	32	32	0.41	564	598
112	2525	994		0	32	32	32	32	32	32	0.31	553	642
EscapeRing		5,203		8	2,297	2,297	8	8	121	2,297			
StRS		39,044		90	2,930	2,932	2,932	2,928	2,930	2,932			
Inlet		3,698		1	168	168	168	168	168	168			
Total		47,945		99	5,395	5,397	3,108	3,104	3,219	5,397			

APPENDIX G TABLE OF SABLEFISH MATURITY CONVENTION CODES.

Maturity convention codes and gonad descriptions for female and male Sablefish.

Maturity code	Sex	Maturity Name	Maturity Description
1	Female	IMMATURE 1	Thin string-like =1.5mm thick mid-section, translucent-white colour
2		IMMATURE 2	Thicked >5mm, does not extend length of body cavity, some folds sausage-like, translucent-white colour
3		RIPENING 1	Eggs present, white opaque colour, encased in translucent sock, <25cavity
4		RIPENING 2	Eggs larger =1mm diameter, white in colour, blood vessels present on surface, >25body cavity
5		RIPE	Eggs at least 1mm diameter, white in colour, gonad full size, >50cavity
6		RIPE1	Gonad full size, >50cavity but at least 25have become translucent
7		RIPE2	Gonad full size, >50cavity but at least 50have become translucent
8		RUNNING	Stream of translucent eggs released when slight-moderate pressure is applied to external posterior region of body cavity
9		SPENT	Gonad is red-purple in colour, residual eggs may be present, outer wall of gonad flaccid
10		RESORBING	Eggs present but did not function normally (not normal)
11		RECOVERING	Still some red purple colour, not flaccid, whitish sheen to exterior surface
12		RESTING	Smooth elongated and round in shape, brown purple pulp interior, exterior surface has whitish sheen
1	Male	IMMATURE 1	Very thin string-like >1mm thick, translucent white colour
2		IMMATURE 2	Thin string-like 3mm thick, extends length of body cavity, white-translucent colour
3		RIPENING 1	Thick >10mm, visible folds, white smooth texture, =20body cavity
4		RIPENING 2	Thick >10mm, visible folds, white smooth texture with blood vessels present on surface, >30body cavity
5		RIPE	Thick >10mm, visible folds, white smooth texture wiith blood vessels present on surface, folds delicate, some sperm may flow, >40cavity
8		RUNNING	Lobes fully developed, sperm is released when slight pressure is applied to external posterior region of body cavity
9		SPENT	Lobes or folds are bloodshot, some sperm may be present when moderate pressure is applied to external posterior region of body cavity
11		RECOVERING	Lobes flat, brown in colour, bloodshot appearance on edges and ends of lobes
12		RESTING	Firm, light brown colour, wrinkles on surface

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

Biological data collected for Roughey/Blackspotted Rockfish complex. Each set is listed with counts of specimens sampled, calculations of mean fork lengths and the number of species visually identified as either a RE = Roughey Rockfish, BS = Blackspotted Rockfish or a hybrid. All were captured on StRS sets.

Set	Specimen Count						Mean Fork Length(mm)					Sampler Visual id		
	Fork Length	Weight	Sex	Maturity	Otolith	DNA	Total Count	Proportion Males	Males	Females	No sex	RE	BS	Hybrid
8	4	3	4	4	4	4	4	0	0	530	0	4	0	0
21	4	4	4	4	4	4	4	0.5	530	528	0	4	0	0
30	1	1	1	1	1	1	1	1	530	0	0	0	1	0
34	29	29	29	29	29	29	29	0.62	456	465	0	24	5	0
36	2	2	2	2	2	2	2	1	438	0	0	1	1	0
43	1	1	1	1	1	0	1	1	445	0	0	1	0	0
44	1	1	1	1	1	1	1	1	470	0	0	1	0	0
45	20	20	20	20	20	20	20	0.7	467	459	0	9	11	0
48	1	1	1	1	1	1	1	0	0	420	0	0	1	0
53	3	3	3	3	3	3	3	1	517	0	0	0	3	0
55	9	9	9	9	9	9	9	0.56	421	413	0	0	9	0
56	23	23	23	23	23	23	23	0.48	461	451	0	3	20	0
59	5	5	5	5	5	5	5	1	479	0	0	0	5	0
60	1	1	1	1	1	1	1	0	0	505	0	0	1	0
65	4	4	4	4	4	0	4	0.5	450	380	0	0	4	0
67	1	1	1	1	1	1	1	0	0	445	0	0	1	0
73	11	11	11	11	11	11	11	0.55	480	451	0	2	9	0
78	1	1	1	1	1	1	1	1	465	0	0	0	1	0
79	1	1	1	1	1	1	1	0	0	810	0	0	1	0
90	26	26	26	26	26	26	26	0.38	468	470	0	7	19	0
95	17	17	17	17	17	17	17	0.53	499	495	0	1	16	0
96	25	25	25	25	25	25	93	0.6	488	501	0	2	23	0
100	2	2	2	2	2	2	2	0.5	535	390	0	0	2	0
	192	191	192	192	192	187	260					59	133	0

APPENDIX I SUMMARY OF BIOLOGICAL DATA FOR OTHER ROCKFISH SPECIES.

Biological data collected for other rockfish species. Each set is listed with counts of specimens sampled and calculations of mean fork lengths. All were captured on StRS sets.

Species Name	Set	Specimen Count							Mean Fork Length(mm)		
		Fork Length	Weight	Sex	Maturity	Otoliths	DNA	Total	Prop Males	Males	Females
SHORTRAKER ROCKFISH	11	1	1	1	1	1	0	1	0.00	0	700
	26	1	1	1	1	1	0	1	1.00	655	0
	34	2	2	2	2	2	0	2	1.00	735	0
	44	6	6	6	6	6	0	6	0.33	668	636
	45	11	11	11	11	11	0	11	0.82	675	630
	55	2	2	2	2	2	0	2	0.50	660	555
	56	3	3	3	3	3	0	3	0.33	785	748
	59	15	15	15	15	15	0	15	0.47	607	544
	60	18	18	18	18	18	0	18	0.50	637	613
	67	2	2	2	2	2	0	2	0.50	715	545
	68	2	2	2	2	2	0	2	1.00	645	0
	73	2	2	2	2	2	0	2	0.50	710	795
	78	4	4	4	4	4	0	4	0.75	635	435
	79	1	1	1	1	1	0	1	1.00	615	0
	95	8	8	8	8	8	0	8	0.38	730	561
96	1	1	1	1	1	0	1	0.00	0	590	
YELLOWEYE ROCKFISH	35	1	1	1	1	1	1	1	0.00	0	455
	36	1	1	1	1	1	1	1	1.00	570	0
	37	6	6	6	6	6	6	6	0.67	584	520
	52	29	29	29	29	29	29	62	0.52	535	479
	53	16	16	16	16	16	16	16	0.69	564	572
	57	2	2	2	2	2	0	2	0.00	0	440
	79	25	25	25	25	25	25	28	0.44	594	565
	80	1	1	1	1	1	1	1	0.00	0	515

APPENDIX J ESCAPE RING STUDY CATCH COUNTS PER TRAP.

Table 1: Sablefish catch counts per trap for all traps in the escape ring study set. Each trap treatments is color-coded as listed in the legend below.

Set	Trap																									Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
13	12	17	2	1	4	11	9	24	6	12	7	26	23	16	9	7	3	25	25	6	2	2	1	10	8	268
17	23	29	7	17	10	24	36	38	8	9	26	55	49	55	3	21	8	33	25	24	11	2	5	20	16	554
50	16	7	30	25	8	14	19	21	1	24	6	31	23	22	14	17	6	11	19	18	10	15	8	26	9	400
51	25	25	7	16	7	15	16	10	9	6	11	14	19	12	3	14	11	21	19	15	8	7	10	17	12	329
58	12	13	8	10	8	6	11	6	5	8	12	6	13	14	15	30	4	12	11	33	15	12	11	22	9	306
69	9	8	8	9	2	19	9	16	1	8	7	10	13	12	1	12	7	12	7	7	1	7	3	18	10	216
74	2	2	0	3	2	32	14	11	10	4	8	11	12	21	13	12	3	14	10	12	4	3	7	10	10	230
77	19	34	9	6	8	1	18	17	8	1	4	9	7	8	2	0	0	1	1	0	3	2	1	0	11	170
81	0	2	10	0	7	1	11	12	4	4	0	3	10	0	1	0	1	0	1	1	0	2		1		71
83	2	0	0	0	1	0	0	0	0	6	2	10	0	1	0	3	0	3	2	12	0	0	6	5	17	70
88	8	17	6	5	2	10	19	8	4	12	10	17	19	41	4	9	8	13	17	28	16	3	5	1	25	307
92	10	17	9	9	11	23	27	12	9	11	12	39	15	28	14	13	5	24	29	28	13	4	15	31	12	420
94	6	23	4	5	0	3	14	14	5	6	2	23	14	8	2	6	7	20	23	12	6	6	6	15	4	234
99	34	6	10	11	1	53	9	8	2	27	4	3	44	0	0	26	14	30	11	15	9	6	10	21	16	370
101	27	30	18	16	11	32	21	25	12	13	8	44	59	48	17	15	12	52	74	53	11	22	11	54	61	746
105	22	21	8	17	15	18	18	36	13	6	10	23	45	38	10	15	21	30	32	38	4	4	3	20	45	512
Total:																									5203	

Legend: No treatment E1 E2 E3 E4 Other Lost Trap

Table 2: Sablefish catch counts per trap. Traps that were not fishing correctly have been greyed out and coded as listed in the legend below. Sets 81 and 83 were excluded.

Set	Trap																									Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
13	12	17	2	1	4	11	9	24	6	12	7	26	23	16	9	7	3	25	25	6	2	2	1	10	8	268
17	23	29	7	17	10	24	36	38	H	9	26	55	49	55	3	21	8	33	25	24	11	2	5	20	16	546
50	16	S1E	S	1E	1E	14	19	21	1	1E	6	31	23	22	1E	17	1E	11	19	18	10	15	8	26	S	277
51	25	25	7	16	7	15	16	10	9	6	11	14	19	12	1E	14	11	21	19	15	8	7	10	17	12	326
58	12	13	8	10	8	6	11	6	5	8	12	6	13	14	1E	1E	4	12	11	33	1E	12	11	22	9	246
69	9	8	H	1E	2	19	9	16	1	1E	7	10	13	12	1	12	7	12	7	7	1	1E	3	18	10	184
74	2	2	0	3	2	32	14	11	1E	4	8	11	12	21	13	12	1E	14	10	12	1E	3	1E	10	10	206
77	19	34	9	1E	1E	1	18	17	8	O1E	4	9	7	8	1E	0	0	1	1	0	3	2	1	0	11	153
81			3E		2E																					
83					1E						H													1E		
88	8	17	6	5	2	10	19	8	3E	2E	10	GT	19	41	4	9	1E	13	17	28	3E	3	5	1	25	250
92	10	17	9	9	2E	23	27	12	H2E	11	12	39	15	28	14	1E	H1E	24	29	28	2E	4	1E	31	12	354
94	6	23	4	5	0	3	14	14	5	6	1E	23	14	8	2	6	1E	20	23	12	6	1E	1E	Gt	4	198
99	34	6	1E	11	1	53	9	8	2	1E	4	3	44	0	0	1E	14	30	11	15	1E	1E	10	21	16	292
101	27	30	18	1E	2E	32	21	25	1E	13	1E	44	59	48	17	1E	12	52	74	53	1E	1E	11	54	61	651
105	22	21	1E	17	1E	18	18	36	13	6	2E	23	45	38	10	15	1E	30	32	38	4	4	3	20	Gt	413
Total:																									4364	

Legend: H Large Holes O Open Trap S Snarl GT Gilled in Trap Gt Gilled in Tunnel 1E 1 Escape Ring Gilled 2E 2 Escape Rings Gilled 3E 3 Escape Rings Gilled

APPENDIX K ESCAPE RING STUDY CATCH WEIGHTS PER TRAP.

Table 1: Sablefish catch weights per trap for all traps in the escape ring study set. Each trap treatments is color-coded as listed in the legend below.

Set	Trap																									Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
13	42.3	43.6	6.6	2.9	16.0	26.7	29.7	61.1	20.0	37.8	25.2	59.8	61.9	42.9	30.0	23.0	11.4	57.4	61.3	16.2	7.6	6.1	3.8	26.5	22.1	742.0
17	56.7	65.5	21.9	39.0	30.5	51.1	82.4	98.2	18.9	27.3	63.8	125.5	108.9	119.2	9.4	58.7	22.7	72.2	59.9	53.3	31.4	6.1	14.7	47.7	28.5	1313.5
50	41.6	24.0	24.0	100.0	28.7	42.1	50.9	64.0	6.1	64.0	39.1	112.8	72.4	72.2	52.6	61.7	21.0	41.2	73.2	82.1	40.4	64.7	30.4	81.6	32.9	1343.6
51	65.8	71.6	22.0	41.9	25.0	40.5	47.1	25.4	30.9	23.1	35.3	37.6	56.8	31.1	11.5	60.5	36.5	70.5	62.6	53.1	27.3	24.9	36.2	53.3	43.8	1034.3
58	55.9	50.4	31.2	44.7	30.1	24.1	43.4	17.1	20.9	36.5	51.0	21.7	58.5	48.9	60.7	111.1	13.2	43.7	47.2	103.5	66.2	41.9	40.9	81.3	34.3	1178.4
69	29.6	25.4	38.2	28.3	8.0	54.2	30.5	45.8	4.7	21.9	25.1	28.0	35.7	28.7	2.7	34.0	23.9	26.7	17.8	19.9	3.6	22.3	11.0	43.8	23.3	633.3
74	12.5	8.5	N/A	14.7	7.0	94.7	54.3	40.0	41.9	20.0	37.4	35.3	38.9	60.1	41.9	36.3	12.1	39.4	33.1	34.0	14.8	9.9	21.1	27.6	23.4	759.0
77	51.5	92.8	24.9	22.5	32.0	2.8	50.1	56.8	34.0	5.8	18.8	32.5	19.7	29.8	9.6	N/A	N/A	3.3	4.6	N/A	13.3	9.3	2.4	N/A	29.4	545.9
81	N/A	5.4	36.8	N/A	23.0	2.9	34.7	39.6	20.6	15.0	N/A	9.5	24.2	N/A	4.5	N/A	4.7	N/A	3.6	2.2	N/A	4.9	N/A	4.3	N/A	236.0
83	7.2	N/A	N/A	N/A	3.3	N/A	N/A	N/A	N/A	22.9	6.0	31.6	N/A	2.0	N/A	11.8	N/A	19.0	9.0	35.2	N/A	N/A	19.8	17.3	53.7	238.8
88	22.4	47.4	18.7	17.3	6.3	35.1	49.4	29.9	13.6	43.3	33.1	58.3	62.0	111.5	13.2	31.9	23.3	36.7	38.5	72.4	52.3	9.3	9.9	1.3	45.0	881.9
92	37.5	47.6	30.1	41.0	42.7	72.7	76.5	37.7	32.0	36.7	35.6	101.6	36.3	65.9	41.9	34.2	15.5	52.3	59.3	64.9	33.7	13.1	38.1	65.4	24.6	1137.0
94	13.5	49.5	15.3	15.8	N/A	8.0	40.0	42.5	12.5	20.1	6.6	60.0	41.8	21.7	4.5	23.7	27.1	50.3	66.3	30.1	19.4	19.5	19.3	38.4	12.5	658.4
99	72.3	12.6	25.2	27.5	1.8	125.3	21.8	19.0	8.8	71.1	17.3	5.0	91.4	N/A	N/A	62.6	41.4	63.7	31.0	34.2	26.9	14.1	23.4	52.5	37.4	886.4
101	57.0	76.2	43.8	39.3	28.4	73.4	51.5	71.6	32.9	35.4	21.0	101.4	142.5	110.0	42.2	40.9	37.8	106.1	154.0	120.8	27.0	55.1	30.9	108.3	124.2	1731.7
105	51.8	41.2	20.2	35.6	37.9	37.8	37.1	77.3	27.1	15.8	24.2	53.1	95.3	88.4	23.9	34.7	43.0	60.3	63.7	77.4	11.7	7.8	8.6	38.8	69.0	1081.6
																									Total:	14401.6

Legend: No treatment (Yellow), E1 (Green), E2 (Light Blue), E3 (Blue), E4 (Dark Blue), Other (Orange), Lost Trap (Grey)

Table 2: Sablefish catch weights per trap. Traps that were not fishing correctly have been greyed out and coded as listed in the legend below. Sets 81 and 83 were excluded.

Set	Trap																									Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
13	42.3	43.6	6.6	2.9	16.0	26.7	29.7	61.1	20.0	37.8	25.2	59.8	61.9	42.9	30.0	23.0	11.4	57.4	61.3	16.2	7.6	6.1	3.8	26.5	22.1	742.0
17	56.7	65.5	21.9	39.0	30.5	51.1	82.4	98.2	H	27.3	63.8	125.5	108.9	119.2	9.4	58.7	22.7	72.2	59.9	53.3	31.4	6.1	14.7	47.7	28.5	1294.7
50	41.6	S1E	S	1E	1E	42.1	50.9	64.0	6.1	1E	39.1	112.8	72.4	72.2	1E	61.7	1E	41.2	73.2	82.1	40.4	64.7	30.4	81.6	S	976.3
51	65.8	71.6	22.0	41.9	25.0	40.5	47.1	25.4	30.9	23.1	35.3	37.6	56.8	31.1	1E	60.5	36.5	70.5	62.6	53.1	27.3	24.9	36.2	53.3	43.8	1022.8
58	55.9	50.4	31.2	44.7	30.1	24.1	43.4	17.1	20.9	36.5	51.0	21.7	58.5	48.9	1E	1E	13.2	43.7	47.2	103.5	1E	41.9	40.9	81.3	34.3	940.4
69	29.6	25.4	H	1E	8.0	54.2	30.5	45.8	4.7	1E	25.1	28.0	35.7	28.7	2.7	34.0	23.9	26.7	17.8	19.9	3.6	1E	11.0	43.8	23.3	522.6
74	12.5	8.5	N/A	14.7	7.0	94.7	54.3	40.0	1E	20.0	37.4	35.3	38.9	60.1	41.9	36.3	1E	39.4	33.1	34.0	1E	9.9	1E	27.6	23.4	669.0
77	51.5	92.8	24.9	1E	1E	2.8	50.1	56.8	34.0	O1E	18.8	32.5	19.7	29.8	1E	N/A	N/A	3.3	4.6	N/A	13.3	9.3	2.4	N/A	29.4	476.0
81			3E		2E																					
83					1E						H															
88	22.4	47.4	18.7	17.3	6.3	35.1	49.4	29.9	3E	2E	33.1	GT	62.0	111.5	13.2	31.9	1E	36.7	38.5	72.4	3E	9.3	9.9	1.3	45.0	691.1
92	37.5	47.6	30.1	41.0	2E	72.7	76.5	37.7	H2E	36.7	35.6	101.6	36.3	65.9	41.9	1E	H1E	52.3	59.3	64.9	2E	13.1	1E	65.4	24.6	940.8
94	13.5	49.5	15.3	15.8	N/A	8.0	40.0	42.5	12.5	20.1	1E	60.0	41.8	21.7	4.5	23.7	1E	50.3	66.3	30.1	19.4	1E	1E	Gt	12.5	547.5
99	72.3	12.6	1E	27.5	1.8	125.3	21.8	19.0	8.8	1E	17.3	5.0	91.4	N/A	N/A	1E	41.4	63.7	31.0	34.2	1E	1E	23.4	52.5	37.4	686.5
101	57.0	76.2	43.8	1E	2E	73.4	51.5	71.6	1E	35.4	1E	101.4	142.5	110.0	42.2	1E	37.8	106.1	154.0	120.8	1E	1E	30.9	108.3	124.2	1487.1
105	51.8	41.2	1E	35.6	1E	37.8	37.1	77.3	27.1	15.8	2E	53.1	95.3	88.4	23.9	34.7	1E	60.3	63.7	77.4	11.7	7.8	8.6	38.8	Gt	887.3
																									Total:	11884.0

Legend: H Large Holes, O Open Trap, S Snarl, GT Gilled in Trap, Gt Gilled in Tunnel, 1E 1 Escape Ring Gilled, 2E 2 Escape Rings Gilled, 3E 3 Escape Rings Gilled

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