Canadian Data Report of
Fisheries and Aquatic Sciences 1140

2004

SUMMARY OF THE 2002 BRITISH COLUMBIA SABLEFISH (*Anoplopoma fimbria*) RESEARCH AND ASSESSMENT SURVEY

by

M.R. Wyeth[1], A.R. Kronlund[1], and M. Elfert[2]

[1]Fisheries and Oceans Canada
Science Branch, Pacific Region
Pacific Biological Station
Nanaimo, British Columbia
V9T 6N7

[2]Archipelago Marine Research Ltd.
525 Head Street
Victoria, British Columbia
V9A 5S1

Cat. No. Fs 97-13/1140E ISSN 0706-6465

Correct citation for this publication:

Wyeth, M.R., A.R. Kronlund, and M. Elfert. 2004. Summary of the 2002 British Columbia Sablefish (*Anoplopoma fimbria*) research and assessment survey. Can. Data Rep. Fish. Aquat. Sci. 1140: 50 p.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Wyeth, M.R., A.R. Kronlund, and M. Elfert. 2004. Summary of the 2002 British Columbia Sablefish (*Anoplopoma fimbria*) research and assessment survey. Can. Data Rep. Fish. Aquat. Sci. 1140: 50 p.

This document provides a summary of the methodology and results of the 2002 British Columbia sablefish research and assessment survey. The 2002 survey continued the time series of annual fall surveys initiated in 1988 and standardized beginning in 1990. Longline trap fishing was conducted at selected offshore and mainland inlet localities. Survey tasks were divided between two chartered commercial fishing vessels.

The indexing charter vessel conducted standardized indexing sets at nine offshore and five mainland inlet localities. These sets provide a catch rate based abundance index used for stock assessment. In addition, sablefish were tagged and released from the sets fished in the mainland inlet localities.

The tagging charter vessel conducted tagging sets at 15 offshore localities. Three types of tagging set were completed: Type 1 (traditional) tagging sets followed protocols used for tagging sets since 1995; Type 2 (systematic) tagging sets were conducted in the same localities and depth ranges as the offshore indexing sets; and Type 3 (random design) tagging sets were conducted at randomly selected locations within two of the offshore localities.

The distribution of catch rates in 2002 for the offshore indexing sets increased from that observed in 2001 to a level consistent with catch rates observed during the late 1990s. Catch rates for tagging sets and mainland inlet indexing sets were comparable to earlier surveys. Of the 31,452 sablefish captured, 19,847 were tagged and released, 566 previously tagged sablefish were recovered, and 7,378 were sampled for biological data.

RÉSUMÉ

Wyeth, M.R., A.R. Kronlund, and M. Elfert. 2004. Summary of the 2002 British Columbia Sablefish (*Anoplopoma fimbria*) research and assessment survey. Can. Data Rep. Fish. Aquat. Sci. 1140: 50 p.

Ce document fait la synthèse des méthodes et des résultats du relevé de recherche et d'évaluation de la morue charbonnière de la Colombie-Britannique effectué en 2002. Ce relevé s'ajoute à la série chronologique des relevés d'automne annuels qui ont commencé en 1988 et ont été normalisés à partir de 1990. Le relevé a été effectué par deux bateaux de pêche commerciale affrétés et a consisté à pêcher la morue au moyen de casiers fixés à des lignes de fond dans des endroits choisis au large et dans des bras de mer continentaux.

Un des bateaux affrété a effectué la pêche indicatrice normalisée à neuf stations au large et à cinq stations dans des bras de mer continentaux pour obtenir un indice d'abondance fondé sur les taux de capture, à des fins d'évaluation du stock. En outre, des morues capturées dans les bras de mer continentaux ont été marquées et libérées.

L'autre bateau affrété a servi à capturer des morues pour le marquage à quinze stations au large. Trois types de mouillages de casiers ont été effectués à des fins de marquage du poisson : mouillages de type 1 (traditionnels) réalisés selon le protocole utilisé pour le marquage depuis 1995; mouillages de type 2 (systématiques) effectués aux mêmes stations et profondeurs que les mouillages de pêche indicatrice au large; mouillages de type 3 (aléatoires) effectués à des endroits choisis au hasard près de deux des stations au large.

Les taux de capture pour les mouillages de pêche indicatrice au large en 2002 étaient en hausse par rapport aux taux de 2001 et correspondaient aux taux observés à la fin des années 1990. Les taux de capture pour les mouillages de marquage et les mouillages de pêche indicatrice dans des bras de mer continentaux étaient comparables à ceux des relevés antérieurs. Des 31 452 morues charbonnières capturées, 19 847 ont été marquées et relâchées, 566 morues charbonnières marquées lors d'années antérieures ont été recapturées, et 7 378 ont été échantillonnées pour obtenir des données biologiques.

1.0 INTRODUCTION

Sablefish (*Anoplopoma fimbria*) are an abundant and commercially valuable species throughout their range in the North Pacific. They have a long history of exploitation in Canadian waters with landings reported as early as the early 1800s (McFarlane and Beamish 1983). British Columbia fishermen harvest sablefish with longline trap, longline hook, and trawl gear along the continental shelf at depths up to 1800 m. The British Columbia sablefish fishery landed approximately 4000 metric tons annually for the period 1997 to 2001. The majority of the fish (>75%) were captured using trap gear.

In 1988 an annual sablefish research and assessment survey of the British Columbia coast was initiated. For details of how the survey has expanded and changed over the years, see Wyeth and Kronlund (2003). Each year, fishing was conducted at selected localities using trap gear consistent with the commercial fishery. The fishing protocol was refined over the first few years and was standardized beginning in 1990. These standardized "indexing sets" were designed to track trends in abundance and biological characteristics at the selected localities. In addition to the indexing component of the annual survey, sablefish were tagged and released beginning in 1991. In 1994, "tagging sets" specifically for capturing sablefish for tag and release became part of the annual survey and in 1995 localities specifically for tagging sets were added.

The 2002 survey was a continuation of the 1990 to 2001 standardized time series and followed the same protocols for fishing gear, catch monitoring, biological sampling, and tagging. For details on surveys conducted from 1988 through 1993, see Smith et al. (1996); for surveys in 1994 and 1995 see Downes et al. (1997); for surveys from 1996 to 2000 see Wyeth and Kronlund (2003), for the 2001 survey see Wyeth et al. (2003). For details concerning tag releases from 1977 through 1981 see Beamish et al. (1978, 1979, 1980, and 1983) and for tag releases from 1982 through 1987 see Murie at al. (1995). In 2002, indexing and tagging sets were conducted at offshore and mainland inlet localities. In addition, systematic tagging sets as well as sets designed to examine the feasibility of fishing in randomly selected locations were conducted.

This document summarises the methods and results of the 2002 survey and consists of a main body of text with supporting appendices. Tables and figures referred to in the main text are sequentially numbered. Tables and figures in the appendices are labelled with the letter code of the appendix and a sequential number, e.g. Table A.2 for the second table in Appendix A.

2.0 METHODS

The 2002 sablefish survey followed protocols that have evolved over the 15 year life of the annual survey. Sets were made at selected offshore and mainland inlet localities along the British Columbia coast. Sets were of two types: 1) standardized "indexing" sets had prescribed gear requirements and were used to collect catch rate data intended to index trends in abundance and to obtain fish for biological sampling; 2) "tagging" sets were designed specifically to capture sablefish for tag and release. The protocol for indexing sets developed over the first few years of the time series and was standardized beginning in 1990. The protocol for tagging sets has been standardized since 1996.

There were a number of changes to the 2002 survey design compared to surveys in previous years as summarised below.

1. The 2002 survey tasks were split between two vessels. One vessel conducted the offshore and mainland inlet indexing components of the survey (indexing charter) while the second vessel conducted the offshore tagging component (tagging charter).
2. No fish were tagged from offshore indexing sets in 2002 which was unlike sets conducted in previous years when sablefish in excess of the biological sampling requirements were tagged and released.
3. Replicate indexing sets were conducted at three localities in 2002 which was unlike previous years when only one set was made in each depth strata and locality combination.
4. The offshore tagging program included not only the traditional (Type 1) tagging sets, but also new systematic (Type 2) tagging sets and sets designed to examine the feasibility of fishing in randomly selected locations (Type 3). The Type 1 tagging sets were conducted at the six offshore tagging localities. The Type 2 tagging sets were conducted at the offshore indexing localities and targeted at the indexing depth strata. For the Type 3 sets, locations were randomly selected within two of the indexing localities.

2.1 SURVEY VESSELS

The F/V Pacific Viking was chartered to conduct the indexing charter portion of the 2002 sablefish research and assessment survey. The vessel was skippered by Albert "Deacon" Melynchuk and a total of 125 sets were completed during the period from October 4 to November 5, 2002 (Table 1). Detailed information for each set conducted during the 2002 indexing charter is shown in Appendix A.

The F/V Viking Sunrise was chartered to conduct the tagging charter portion of the 2002 survey. The vessel was skippered by Jason Olsen and a total of 90 sets were completed during the period from October 5 to November 12, 2002. Detailed information for each set conducted during the 2002 tagging charter is shown in Appendix B.

2.2 SURVEY LOCALITIES

Unlike previous years, when the skippers were instructed to set gear in a loosely defined area, the geographic boundaries of the localities were defined in 2002 (Table 2, Figure 1).

2.2.1 Indexing Localities

Nine offshore indexing localities were visited in 2002 (Figure 2 and Figure 3). From north to south they were Langara Island-North Frederick, Hippa Island, Buck Point, Gowgaia Bay, Cape St. James, Triangle Island, Quatsino Sound, Esperanza Inlet, and Barkley Canyon.

2.2.2 Tagging Localities

Six offshore tagging localities were visited in 2002 (Figure 2 and Figure 3). From north to south they were Rennell Sound, Tasu Sound, Middle Ground, Pisces Canyon, Estevan Point, and Father Charles Canyon.

2.2.3 Mainland Inlet Localities

Five mainland inlet localities were visited in 2002. From north to south they were Portland Inlet, Gil Island, Finlayson Channel, and Dean/Burke Channel (Figure 4). In previous years the skippers were directed to make five sets in each inlet locality and no specific locations

were given. Nonetheless, there was a fair degree of consistency of the set locations within each inlet among years. In 2002, five locations were chosen within each inlet locality to spatially distribute the sets within each locality and to ensure that consistency with the positions of sets conducted in previous years could be maintained. The skipper was directed to make one set in each location.

2.3 DEPTH STRATA

Within the offshore localities, the skipper had discretion over the exact location of all sets provided the sets were made in the specified depth strata.

Sets made at the offshore indexing localities in 2002 were targeted at seven depth strata (Table 4): 274-457 m (150-249 fm), 457-641 m (250-349 fm), 641-824 m (350-449 fm), 824-1006 m (450-549 fm), 1006-1189 m (550-649 fm), 1189-1389 m (650-749 fm), and 1372-1827 m (750-999 fm). Beginning in 1990, five core depth strata (D1 - D5) have been fished each year at each of the indexing localities (Wyeth and Kronlund 2003). Beginning in 1999, the core depth strata were supplemented with additional deep sets. During the 1999 survey, one deep set was targeted at approximately 1097m (600 fm) at each of the Queen Charlotte Island indexing localities (Wyeth and Kronlund 2003). For the 2000 and 2001 surveys, deep sets were targeted at 3 depth strata at indexing localities off the west coast of Vancouver Island: 1188-1280 m (650-700fm), 1280-1463 m (700-800 fm), and deeper than 1463 m (800 fm). Additional deep sets were fished off the Queen Charlotte Islands at the indexing localities as well as at other locations. These sets were targeted at a single stratum bounded by 1188-1463 m (600-800 fm). The deep sets were redesigned for the 2002 survey. Two deep depth strata (D6-D7) were defined that followed the same 183 m (100 fm) ranges of the D1-D5 core depth strata (Table 4). Sets were made in all nine offshore indexing localities and the deep locations off the Queen Charlotte Islands added in 1999 were not fished.

The indexing charter vessel made one indexing set in each of the seven depth strata at each indexing locality. To examine variation of catch rates within each locality, replicates sets in each depth stratum were conducted at three localities: Hippa Island, Gowgaia Bay, and Esperanza Inlet. A total of 21 sets were completed in each of these localities (Table 3).

To provide a systematic distribution of tag releases over the depth range and area of the indexing survey, the tagging charter vessel made one Type 2 tagging set in each of the seven depth strata at each indexing locality. In addition, the feasibility of fishing at randomly selected locations was evaluated by fishing five sets at randomly selected coordinates within each of the Hippa Island and Barkley Canyon localities.

Type 1 (traditional) offshore tagging sets were targeted where the highest catch rates were expected at 457-824 m (250-450 fm, Table 4) to maximise the number of releases per set. Two to three tagging sets were made at each tagging locality.

Sets at the mainland inlet localities were made at the prevailing depth of the set location (Table 4). Fishing within specific depth strata was not possible because of the steep-sided bathymetry of the inlets. Five sets were made at each mainland inlet locality, with one set positioned at each of the locations identified in Figure 4.

2.4 FISHING GEAR AND OPERATIONS

The fishing gear and operations used in 2002 were consistent with the protocol of surveys from 1990 onwards (Wyeth and Kronlund 2003). All sets were made using the charter vessels' longline trap gear which is typical of that employed in the commercial sablefish trap fishery. For a more detailed description of the survey fishing gear and the setting and hauling procedures, see Wyeth and Kronlund (2003). Briefly, each set or "string" of longline trap gear consisted of a line resting on the ocean floor (groundline) with baited traps attached at intervals along its length (Figure 5). The groundline was secured to the ocean floor by anchors at each end and the location of the string was marked by floats attached to the groundline by anchorlines.

The start and end positions of each set were recorded from the vessels' global positioning system (GPS) when the first and last anchors were set over the stern. The start and end bottom depths were recorded from the vessels' depth sounder when the respective anchors were set. The mean bottom depth was calculated as the average of depth recordings from the vessels' depth sounder at one-minute intervals between the first and last anchors being set. The duration, or soak time, of the set was calculated as the time elapsed between the first anchor being set over the stern and the first anchor hauled aboard. Figure C.1 shows an example of a completed bridge log data form. In addition to the bridge log, science staff also observed each set from the deck and completed a set log (Figure C.2).

All sets were made using traps with black mesh. All traps had two stainless steel escape rings (Figure 5). Some of the traps were new to the indexing charter vessel and had not been used for commercial fishing yet. These traps had mesh over the escape ring openings rather than being sewn shut with net twine as with the previously fished traps. The escape rings on the tagging charter vessel traps were sewn shut with net twine. The vessel skippers reported that the escape rings on the indexing charter vessel had internal diameters of 86 mm (3 $^{7}/_{8}$ inch) while the tagging charter vessel had 95 mm (3 $^{3}/_{4}$ inch).

Indexing sets were made using strings of 25 traps and each trap was baited with an approximately 1 kg block of frozen squid (*Loligo opalescens*) in a bait bag. All tagging sets were baited with a combination of a 1 kg block of frozen squid in a bait bag and approximately 3 kg of frozen Pacific hake (*Merluccius productus*) loose in the trap. Type 1 tagging sets consisted of strings of approximately 65 traps while Type 2 and Type 3 tagging sets had 25 traps.

2.5 CATCH AND EFFORT DATA COLLECTION

2.5.1 Indexing Sets

The catch of all species in each trap was counted and weighed. All weights were taken using a Marel M1100 portable, motion-compensating electronic platform scale. Small catches of animals weighing less than 1 kg were counted but not always weighed while large catches of such animals were weighed but not always counted. Effort data was calculated by tallying each trap as it was hauled aboard. Any damage to the trap was noted and necessary repairs were affected before the trap was set again. Figure C.3 shows an example of a completed catch log form for an indexing set.

2.5.2 Tagging Sets

The collection of catch composition and effort data for tagging sets followed the protocol used for the indexing sets, except that no weights were recorded due to the lack of a motion compensating scale.

2.6 CATCH PROCESSING

2.6.1 Recovered Tagged Sablefish

Previously tagged sablefish recovered during survey sets were set aside as the catch was sorted. These fish were sacrificed and sampled after the set was completely hauled aboard. The fish were measured for fork length (L) in millimetres (mm). The abdominal cavities were opened and the gonads were examined to determine the fish sex (S) and to visually estimate the state of maturity (M, see Appendix D). Sagittal otoliths (O) were collected for subsequent age determination. The otoliths were excised from the fish, cleaned, and stored in 50% glycerine and 3% thymol solution in Tres Bien plastic trays. Due to time limitations for some sets, the tag identification numbers on the recovered tagged fish were recorded and the fish were frozen whole to be sampled on shore at a later date. The round body weights (W, dekagrams) of these fish were also recorded. Figure C.4 shows an example of a completed sablefish tag recovery sampling form.

2.6.2 Biological Samples

Sablefish were measured for fork length in millimetres (mm) and the whole body weight was recorded in grams (g) or kilograms (kg). The abdominal cavities of the fish were opened to determine the sex and a visual estimate of the state of maturity (Appendix D). Sagittal otoliths were excised from the fish, cleaned, and stored in 50% glycerine and 3% thymol solution in Tres Bien plastic trays.

2.6.2.1 Offshore Indexing Sets. All the sablefish captured during the offshore indexing sets were used for biological samples. All the fish from selected traps from each set were examined for LSMO, and W if weather conditions permitted accurate measurements. The goal was to obtain a sample of at least 50 fish per set. The specific selection method depended on the sablefish catch rate and varied from every trap, to every second or third trap, to an ad hoc selection of traps spaced throughout the string. The balance of the sablefish were examined for LS. Figure C.5 shows an example of a completed LS(W)MO sampling form while Figure C.6 shows an example of a completed LS sampling form.

2.6.2.2 Inlet Indexing Sets. Fish from selected traps throughout the inlet indexing sets were examined for LS(W)MO. The goal was to obtain a sample of at least 50 fish per set. The specific selection method depended on the sablefish catch rate and varied from every trap, to every second or third trap, to an ad hoc selection of traps spaced throughout the string. The remainder of the fish were tagged and released (see below).

2.6.2.3 Tagging Sets. Only sablefish in excess of the tagging goals (see below) from the Type 1 tagging sets were collected for biological samples. These fish were collected for an investigation of the effects of freezing and thawing on length measurements. A potential length change due to freezing is of particular concern as tagged sablefish recovered during the course of commercial fishing are typically frozen whole at sea and then thawed and sampled on shore. Sablefish were selected for sampling based on size with the goal of obtaining equal numbers of

fish in each of 19 fork length groups. Specifically, 10 fish were required in each 25 mm interval from 450 to 950 mm. Each fish was measured (fork length) live and tagged following normal tagging protocols (see section 2.6.3.2). Fish were then sacrificed and measured again. Finally, fish were frozen in the round and returned to shore where they were weighed, measured for length a third time, and the sex determined. All length measurements were made without knowledge of the previous measurements. The results of this investigation will be reported elsewhere.

2.6.3 Tagging

2.6.3.1 Tag Type.

All sablefish were tagged using a Floy FD-94 T-bar anchor tag which has similar characteristics to the FD-68B model used during surveys until 2000. The newer model has an improved coating to prevent wear of the tag label. The information printed on the tag appeared as:

CSA REWARD PACIFIC BIO. STATION
NANAIMO, B.C. CANADA *## ### ###

where "*" is a letter and "#" is any integer from 0 to 9, e.g. A00 123 456.

2.6.3.2 Tagging Procedures

2.6.3.2.1 Indexing Sets. No sablefish captured during offshore indexing sets were tagged. During the inlet indexing sets, fish in excess of the biological sampling requirements were tagged. Fish to be tagged were transferred from the sorting area using plastic baskets to a 2400 litre fibreglass holding tank secured to the vessel's deck. The tank received a continuous supply of fresh seawater from the vessel's fire pump system. Fish were removed from the holding tank by hand or with a dip-net and then measured for fork length (mm) on a wooden measuring board. The tag was inserted on the left side of the fish at the base of the dorsal fin using a Mark II Long Tagging gun. The tag was injected approximately 1 cm below, and 2-3 cm behind the anterior insertion of the first dorsal fin. The tag was angled into the fish so the tag could stream and the vertebral column and internal organs would not be damaged. Any significant injuries to the fish were recorded prior to the fish being released. Figure C.7 shows an example of a completed tagging form.

2.6.3.2.2 Tagging Sets. Tagging procedures for tagging sets followed the same protocols used during indexing sets. The goal of the Type 1 tagging sets was to tag and release a total of 1000 sablefish in each of the 6 offshore tagging localities. Once this goal had been achieved, tagging was discontinued and the remainder of the catch was processed by the vessel to be landed as commercial catch. All the sablefish captured during the Type 2 and Type 3 tagging sets were tagged and released.

Table 5 summarizes the different set types conducted during the 2002 survey.

2.7 OCEANOGRAPHIC SAMPLING

A VEMCO MiniLog TD or TDR (temperature or temperature/depth) recorder was attached to a trap on selected sets conducted by the indexing charter vessel. These data will be summarised elsewhere.

3.0 RESULTS

3.1 CATCH RATES

The distribution of catch rates (number of sablefish/number of traps) achieved for each set is summarised by boxplots by year for each of the offshore indexing, offshore tagging, and inlet indexing set types (Figure 6). The lower bound of the box indicates the first quartile (25th percentile) of the data and the upper bound of the box indicates the third quartile (75th percentile). The horizontal line that divides the box is the median (50th percentile). The upper and lower whiskers are positioned at 1.5 times the inter-quartile range. Open circles indicate data values that fall outside the whiskers, or outliers. The lightly shaded rectangle positioned in each box represents an approximate 95 percent confidence interval for the sample median. Solid circles indicate the mean catch rate for each group. The nominal data are presented here with no attempt to filter data or standardize for any factors. All traps that could have captured fish were included in the calculation of catch rates. For example, holed or fouled traps were included while open traps were excluded. The fishing protocol has varied over the time period shown (Wyeth and Kronlund 2003). Specifically, the more recent surveys have spanned a greater depth range than the early surveys. In addition, baiting practices have not been consistent. Deep indexing sets in 1999 were baited with both Pacific hake and squid and the amount of Pacific hake used in tagging sets varied from year to year. Indeed, the 1988 and 1989 surveys were significantly different than subsequent surveys, with much longer strings and different baiting practices (Wyeth and Kronlund 2003).

High catch rates were achieved during indexing sets until 1993, but from 1994 to 2000, catch rates were consistently at a lower level (Figure 6). The 2001 survey had the lowest mean indexing catch rate and also exhibited significantly reduced variability of catch rates. Indexing set catch rates in 2002 were at levels similar to those achieved in the late 1990s.

In years when both offshore indexing and tagging sets were conducted, the catch rates for tagging sets were greater (Figure 6). This is may be due to the depths targeted by the traditional tagging sets but is more likely due to the addition of Pacific hake to the bait load. The effect of bait is demonstrated by comparing the catch rates of Type 2 tagging sets and the indexing sets completed in 2002. The distribution of catch rates achieved for each set is summarised using boxplots by locality for the offshore indexing and Type 2 tagging sets (Figure 7). These two set types were conducted in the same localities and at the same depths. The major difference between the sets types was that the tagging sets were baited with both Pacific hake and squid while the indexing sets were baited with squid only.

Catch rates at inlet localities have remained relatively consistent among years with the exception of high catch rates in 1998 and 1999 (Figure 6).

3.2 CATCH COMPOSITION

Thirty-one species or taxonomic groups were captured during the 2002 indexing charter (Table 6). Other than sablefish, the most common species in order of total weight captured were arrowtooth flounder (*Atheresthes stomias*), pectoral rattail (*Albatrosia pectoralis*), roughscale rattail (*Coryphaenoides acrolepis*), rougheye rockfish (*Sebastes aleutianus*), Pacific halibut (*Hippoglossus stenolepis*), lingcod (*Ophiodon elongatus*), and Pacific sleeper sharks (*Somniosus*

pacificus). Only 3 Pacific sleeper sharks were captured but the large size of this species resulted in a significant weight. Other species accounted for minor fractions of the total catch.

Thirty-four species or taxonomic groups were captured during the tagging charter. Catch weights were not recorded but the relative abundances of species other than sablefish were generally consistent with the catch of the indexing charter. An exception to this was that the tagging charter captured relatively fewer rattails (family Macrouridae) and more tanner crabs (*Chionoecetes* sp.). These differences may be explained by the relatively deeper depths fished by the indexing charter. The differences could also be attributed to the Pacific hake and squid bait used by the tagging charter compared to the indexing charter which used squid only.

3.3 SABLEFISH SAMPLING AND TAGGING

Of the 31,452 sablefish captured during the 2002 survey, 27,801 were either tagged or used for biological sampling (Table 8). A total of 19,847 sablefish were tagged and released with 10,405 from offshore indexing localities, 5,903 from offshore tagging localities, and 3,549 from the inlet localities. In addition, 7,378 sablefish were sampled for length and sex of which 5,692 were also examined for maturity state, otoliths were collected from 5,682 and 2,198 were weighed. A total of 566 previously tagged sablefish were recovered during the 2002 survey.

The sex ratio varied among localities from 23 % to 68 % males (Table 9). In general, proportionally fewer males were seen at the inlet localities than at the offshore localities. The mean fork length of females was greater than that of males at all localities.

Details on the number of sablefish captured, sampled, and tagged for each set are shown in Appendix E for the indexing charter and Appendix F for the tagging charter.

4.0 ACKNOWLEDGEMENTS

This document reflects the contributions of many individuals. The Canadian Sablefish Association provided coordination and support for the 2002 survey, as it has done for surveys since 1994. The staff of Archipelago Marine Research (AMR) assisted in the preparation of the scientific equipment and supplies as well as providing scientific staff for the survey. The scientific staff that conducted the indexing charter included Malcolm Wyeth (Fisheries and Oceans Canada), Daniella Imhof (AMR) and Rob Havers (AMR). Margo Elfert (AMR), John Manning (AMR), and Dean Gaidica (AMR) conducted the tagging charter. A special thanks is due to the skippers and crews of the survey vessels, without whom the survey would not have been completed. Albert "Deacon" Melynchuck, Tom Amirault, Kevin Woodman, Don Enockson, and Dave Holomego crewed the Pacific Viking. Jason Olsen, Kevin Pogue, Rick Schneider, Peter Snelling, Arvend "Butch" Acton, and Trevor Olsen crewed the Viking Sunrise.

5.0 REFERENCES

Beamish, R.J., C. Wood, and C. Houle. 1978. A summary of sablefish tagging studies conducted during 1977 by the Pacific Biological Station. Fish. Mar. Serv. Data Rep. 77: 102 p.

Beamish, R.J., C. Houle, C. Wood, and R. Scarsbrook. 1979. A summary of sablefish tagging and exploratory trapping studies conducted during 1978 by the Pacific Biological Station. Can. Data Rep. Fish. Aquat. Sci. 162: 113 p.

Beamish, R.J., C. Houle, and R. Scarsbrook. 1980. A summary of sablefish tagging and biological studies conducted during 1979 by the Pacific Biological Station. Can. Manuscr. Rep. Fish. Aquat. Sci. 1588: 194 p.

Beamish, R.J., G.A. McFarlane, R. Scarsbrook, D. Chilton, I. Barber, K. Best, A. Cass, and W. Shaw. 1983. A summary of sablefish tagging and biological studies conducted during 1980 and 1981 by the Pacific Biological Station. Can. Manuscr. Rep. Fish. Aquat. Sci. 1732: 135 p.

Downes, A.J., W.T. Andrews, M.S. Smith, M.W. Saunders, and G.D. Jewsbury. 1997. Cruise details of sablefish (*Anoplopoma fimbria*) surveys conducted in B.C. waters, 1994-1995. Can. Data. Rep. Fish. Aquat. Sci. 1007: 106 p.

McFarlane, G.A. and R. J. Beamish. 1983. Overview of the fishery and management strategy for sablefish (*Anoplopoma fimbria*) off the west coast of Canada. p.13-35. *In* Proceedings of the Second Lowell Wakefield Fisheries Symposium, Anchorage, AK, Alaska Sea Grant Report 83-3.

Murie, D.J., W. Mitton, M.W. Saunders and G.A. McFarlane. 1995. A summary of sablefish tagging and biological studies conducted during 1982-87 by the Pacific Biological Station. Can. Data Rep. Fish. Aquat. Sci. 959: 84 p.

Smith, M.S., Saunders, M.W. and W.T. Andrews. 1996. Cruise details of sablefish (*Anoplopoma fimbria*) surveys conducted in B.C. waters 1988-1993. Can. Data Rep. Fish. Aquat. Sci. 976: 129 p.

Wyeth, M.R. and A.R. Kronlund. 2003. Sablefish (*Anoplopoma fimbria*) Research and Assessment Surveys conducted in British Columbia waters from 1996 through 2000. Can. Data Rep. Fish. Aquat. Sci. 1116: 130 p.

Wyeth, M.R., A.R. Kronlund, and M. Elfert. 2003. Summary of the 2001 British Columbia Sablefish (*Anoplopoma fimbria*) Research and Assessment Survey. Can. Data Rep. Fish. Aquat. Sci. 1118: 54 p.

Table 1. sablefish research and assessment surveys conducted from 1988 to 2002.

Year	Vessel	Skipper	Dates	Sets	GFBio Trip ID
1988	F/V Vicious Fisher	Vance Fletcher	28 Oct - 24 Nov	16	43990
1989	F/V La Porsche	Sigurd Brynjolfson	19 Oct - 18 Nov	29	43910
1990	F/V Viking Star	Doug Farrington	08 Nov - 18 Nov	24	43750
1991	R/V W. E. Ricker	Alan Farrington	09 Oct - 29 Oct	32	43673
1992	R/V W. E. Ricker	Ron Roberts	13 Oct - 04 Nov	38	43670
1993	R/V W. E. Ricker	Alan Farrington	19 Oct - 11 Nov	42	43650
1994	F/V La Porsche	Richard Beauvais	13 Oct - 31 Oct	39	43630
	F/V Western Viking	Rick Jones	18 Oct - 13 Nov	27	43390
1995	F/V Ocean Pearl	Robert Fraumeni	08 Oct - 20 Oct	29	43270
	F/V Victor F	Michael Derry	11 Oct - 28 Oct	34	43330
	F/V Viking Sunrise	Jason Olsen	01 Oct - 31 Oct	40	43350
1996	F/V Viking Sunrise	Albert Melnychuck	10 May - 30 May	42	43024
	F/V Ocean Pearl	Michael Derry	26 Sept - 10 Oct	32	43039
	F/V Viking Star	Otto Elvan	30 Sept - 22 Oct	49	43210
1997	F/V Viking Sunrise	Albert Melnychuck	20 May - 10 Jun	42	42760
	F/V Ocean Pearl	Michael Derry	26 Sept - 21 Oct	74	42699
1998	F/V Ocean Pearl	Michael Derry	22 Sept - 17 Oct	89	41122
1999	F/V Ocean Pearl	Michael Derry	29 Sept - 30 Oct	109	40589
2000	F/V Pacific Viking	Albert Melnychuck	08 Oct - 14 Nov	131	40517
2001	F/V Ocean Pearl	Michael Derry	06 Oct - 06 Nov	134	43233
2002	F/V Pacific Viking	Albert Melnychuck	04 Oct - 05 Nov	125	48120
	F/V Viking Sunrise	Jason Olsen	05 Oct - 12 Nov	90	48110

Table 2. Geographic boundaries of the sablefish survey localities.

Locality	Latitude North Maximum	Latitude North Minimum	Longitude West Maximum	Longitude West Minimum
Indexing				
Langara Island-North Frederick	54°9′	53°59′	134°2′	133°32′
Hippa Island	53°32′	53°20′	133°24′	132°55′
Buck Point	53°14′	53°01′	133°10′	132°35′
Gowgaia Bay	52°27′	52°17′	131°51′	131°33′
Cape St. James [1]	51°50′	51°37′	130°59′	130°19′
Triangle Island	51°08′	50°58′	129°55′	129°31′
Quatsino Sound	50°25′	50°12′	128°38′	128°08′
Esperanza Inlet	49°47′	49°24′	127°39′	127°13′
Barkley Canyon	48°24′	48°10′	126°12′	125°53′
Tagging				
Rennell Sound	53°33′	53°14′	133°17′	132°55′
Tasu Sound	52°49′	52°34′	132°16′	131°58′
Middle Ground	51°20′	51°09′	130°9′	129°57′
Pisces Canyon	50°37′	50°29′	128°47′	128°34′
Estevan Point	49°16′	48°59′	127°10′	126°53′
Father Charles Canyon	48°29′	48°46′	126°35′	126°09′

[1] The South Moresby Rockfish Protected Area (RPA) overlaps slightly with the Cape St. James survey locality so sets were not made in the Northwest corner of the locality. The South Moresby RPA is described as:, McLean-Fraser Point to Grey Rock: Sub-areas 2-31 to 2-37 and those portions of Sub-areas 102-3, 130-3 and 142-1 that are inside of a line that begins at 52 deg 12 min north and 131 deg 25 min west, then south westerly to 52 deg 11 min north and 131 deg 30 min west, then south-easterly to 51 deg 49 min north and 130 deg 57 min west, then northerly to 51 deg 54 min north and 130 deg 54 min west, then north-easterly to 51 deg 59 min north and 131 deg west.

Table 3. Localities visited during sablefish research and assessment surveys from 1994 through 2002 showing the number of indexing (I) and tagging (T) sets completed at each locality. For simplicity, surveys conducted prior to 1994 are not shown.

	Year	1994		1995		1996			1997			1998		1999		2000		2001		2002	
	Survey	fall		fall		spring	fall		spring	fall		fall		fall		fall		fall		fall	
	Set Type	I	T	I	T	T	I	T	T	I	T	I	T	I	T	I	T	I	T	I	T
Offshore Indexing Locality	Langara Island-North Frederick	5	-	5	-	3	5	-	3	5	-	5	-	6	1	8	1	5	1	7	7
	Louis Point-Frederick Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
	Kunakun Point	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
	Hippa Island	5	-	5	-	-	5	-	-	-	-	5	-	6	1	8	1	5	1	21	12
	Buck Point	5	-	5	-	3	5	-	3	5	-	5	-	6	1	5	1	5	1	7	7
	Tasu Sound-Marble Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	6	-	-	-
	Gowgaia Bay	5	-	5	5	3	5	-	3	5	-	5	-	6	1	8	1	8	1	21	7
	Flamingo Inlet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	3	-	-	-
	Cape St. James	5	-	5	-	3	5	-	3	5	-	5	-	5	1	5	1	5	1	7	7
	Triangle Island	5	-	5	-	3	5	-	3	5	-	5	-	5	1	5	1	5	1	7	7
	Quatsino Sound	5	-	5	-	3	5	-	3	5	-	5	-	5	1	8	1	8	1	7	7
	Solander Island	5	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Esperanza Inlet	5	-	5	-	3	5	-	3	5	-	5	-	5	1	8	1	8	1	21	7
	Barkley Canyon	5	-	5	-	3	5	-	3	5	-	5	-	5	1	8	1	8	1	7	12
	Total	**50**	**-**	**50**	**5**	**24**	**45**	**-**	**24**	**40**	**-**	**45**	**-**	**49**	**9**	**72**	**9**	**72**	**9**	**105**	**73**
Mainland Inlet Locality	Portland Inlet	5	-	5	-	-	5	-	-	5	-	5	-	5	-	5	-	5	-	5	-
	Gil Island	5	-	5	-	-	5	-	-	5	-	5	-	5	-	5	-	5	-	5	-
	Finlayson Channel	-	1	3	-	-	4	-	-	5	-	5	-	5	-	5	-	5	-	5	-
	Mathieson Channel	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dean/Burke Channel	-	-	5	-	-	5	-	-	5	-	5	-	5	-	5	-	5	-	5	-
	Total	**10**	**2**	**18**	**-**	**-**	**20**	**-**	**-**	**20**	**-**	**20**	**-**	**20**	**-**	**20**	**-**	**20**	**-**	**20**	**-**

	Year	1994		1995		1996			1997			1998		1999		2000		2001		2002	
	Survey	**fall**		**fall**		**spring**	**fall**		**spring**	**fall**		**fall**		**fall**		**fall**		**fall**		**fall**	
	Set Type	**I**	**T**	**I**	**T**	**T**	**I**	**T**	**T**	**I**	**T**	**I**	**T**	**I**	**T**	**I**	**T**	**I**	**T**	**I**	**T**
Offshore Tagging Locality	Frederick Island	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hogback	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
	Rennell Sound	-	-	-	-	3	-	2	3	-	2	-	-	-	8	-	5	-	4	-	2
	Chads Point	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tasu Sound	-	-	-	-	3	-	2	3	-	2	-	5	-	5	-	3	-	4	-	3
	Anthony Island	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mitchell's Gully/Middle Ground	-	-	-	3	3	-	3	3	-	2	-	4	-	3	-	4	-	4	-	3
	Pisces Canyon	-	-	-	2	3	-	3	3	-	2	-	4	-	6	-	4	-	4	-	3
	Kyuquot Sound-Ouokinish Inlet	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
	Estevan Point	-	-	-	2	3	-	3	3	-	2	-	4	-	4	-	4	-	4	-	3
	Father Charles Canyon	-	-	-	2	3	-	3	3	-	2	-	3	-	4	-	4	-	4	-	3
	Total	**-**	**-**	**-**	**27**	**18**	**-**	**16**	**18**	**-**	**14**	**-**	**24**	**-**	**30**	**-**	**24**	**-**	**24**	**-**	**17**
	Grand Total	**60**	**2**	**68**	**22**	**42**	**65**	**16**	**42**	**60**	**14**	**65**	**24**	**69**	**37**	**92**	**33**	**92**	**33**	**125**	**90**

Table 4. Sablefish research and assessment survey depth strata.

Depth Strata	Minimum depth m (fm)	Maximum depth m (fm)
Offshore Indexing and Type 2 Tagging		
D1	274 (150)	457 (249)
D2	457 (250)	641 (349)
D3	641 (350)	824 (449)
D4	824 (450)	1006 (549)
D5	1006 (550)	1189 (649)
D6	1189 (650)	1372 (749)
D7	1372 (750)	1827 (999)
Type 1 Tagging		
	457 (250)	824 (450)
Mainland Inlet Indexing		
	prevailing depth at set locations	

Table 5. Summary of sets conducted during the 2002 sablefish research and assessment survey.

Charter	Set Type	Location	Depth	Traps	Bait	Sablefish Catch Processing
Indexing	Indexing	Nine offshore indexing localities	7 depth strata	25	1 kg squid	50 piece LS(W)MO biosample, LS remainder
	Indexing	Specified sites in five mainland inlet localities	prevailing depth	25	1 kg squid	50 piece LS(W)MO biosample, tag remainder
Tagging	Type 1 (traditional) Tagging	Six offshore tagging localities	250-450 fm	~60	1 kg squid plus 3 kg hake	all tagged until 1000 fish tagged in each locality
	Type 2 (systematic) Tagging	Nine offshore indexing localities	7 depth strata	25	1 kg squid plus 3 kg hake	all tagged
	Type 3 (random) Tagging	random coordinates in two offshore indexing localities	depth at coordinates	25	1 kg squid plus 3 kg hake	all tagged

Table 6. Summary of species captured during the indexing charter.

Common Name	Scientific Name	Total Count	Total Weight
Round fish			
Sablefish	*Anoplopoma fimbria*	10,943	28,987
Roughscale rattail	*Coryphaenoides acrolepis*	709	653
Pectoral rattail	*Albatrossia pectoralis*	187	1088
Pacific flatnose	*Antimora microlepis*	63	61
Snailfishes	Liparis	35	16
Lingcod	*Ophiodon elongatus*	16	173
Pacific sleeper shark	*Somniosus pacificus*	3	141
Pacific cod	*Gadus macrocephalus*	1	1
Sculpins	Cottidae	1	not weighed
Skates	Rajidae	1	not weighed
Rockfish			
Rougheye rockfish	*Sebastes aleutianus*	345	635
Shortspine thornyhead	*Sebastolobus alascanus*	47	45
Redbanded rockfish	*Sebastes babcocki*	28	43
Longspine thornyhead	*Sebastolobus altivelis*	15	4
Shortraker rockfish	*Sebastes borealis*	15	86
Pacific ocean perch	*Sebastes alutus*	6	8
Flatfish			
Arrowtooth flounder	*Atheresthes stomias*	817	2,066
Dover sole	*Microstomus pacificus*	45	59
Pacific halibut	*Hippoglossus stenolepis*	29	303
Invertebrates			
Tanner crabs	*Chionoecetes* sp.	187	28
Gastropods	Gastropoda	170	4
Echinoidea	Echinoidea	108	22
Paralomis multispina	*Paralomis multispina*	108	38
Lithodes couesi	*Lithodes couesi*	45	18
Starfish	Asteriodea	12	1
Decapods	Decapoda	7	2
Octopus	Octopoda	5	4
Sea cucumber	Holothuroidea	4	not weighed
Squids	Teuthoidea	3	1
Red king crab	*Paralithodes cammtschatica*	1	not weighed
Golden king crab	*Lithodes aequispina*	1	1

Table 7. Summary of species captured during the tagging charter

Common name	Scientific Name	Total Count
Round fish		
Sablefish	*Anoplopoma fimbria*	20,509
Roughscale rattail	*Coryphaenoides acrolepis*	1,016
Pectoral rattail	*Albatrossia pectoralis*	190
Pacific flatnose	*Antimora microlepis*	70
Snailfishes	Liparis	34
Spiny dogfish	*Squalus acanthias*	31
Lingcod	*Ophiodon elongatus*	18
Spotted ratfish	*Hydrolagus colliei*	1
Snipe eels	Nemichthyidae	1
Rockfish		
Rougheye rockfish	*Sebastes aleutianus*	449
Redbanded rockfish	*Sebastes babcocki*	71
Shortspine thornyhead	*Sebastolobus alascanus*	57
Shortraker rockfish	*Sebastes borealis*	43
Longspine thornyhead	*Sebastolobus altivelis*	13
Rosethorn rockfish	*Sebastes helvomaculatus*	8
Rockfishes	Sebastinae	1
Darkblotched rockfish	*Sebastes crameri*	1
Flatfish		
Arrowtooth flounder	*Atheresthes stomias*	331
Pacific halibut	*Hippoglossus stenolepis*	18
Dover sole	*Microstomus pacificus*	16
Invertebrates		
Tanner crabs	*Chionoecetes* sp.	2,832
Paralomis multispina	*Paralomis multispina*	388
Lithodes couesi	*Lithodes couesi*	228
Gastropods	Gastropoda	129
Paralomis verrilli	*Paralomis verrilli*	99
Sea urchins	Echinoidea	94
Brittle stars	*Phrynophiurida*	49
Starfish	Asteriodea	19
Octopus	Octopoda	9
Box crabs	Lopholithodes	5
Anemone	Actiniaria	5
Sea cucumber	Holothuroidea	3
Sea lilies and feather stars	Crinodea	3
Basket stars	Euryalae	1
Squat lobster	*Munida quadrispina*	1

Table 8. Summary of the number of sablefish recovered, tagged, and sampled during the 2002 survey.

	Number of Sablefish		Number of Sablefish sampled for					
Locality	**Recovered**	**Tagged**	**Length**	**Sex**	**Maturity**	**Otoliths**	**Weight**	**Total**
Langara Island-North Frederick	5	562	709	710	391	393	251	1,276
Hippa Island	11	1,307	1,606	1,606	970	971	137	2,924
Buck Point	8	1,176	382	382	304	304	79	1,566
Gowgaia Bay	8	849	896	893	753	756	520	1,753
Cape St. James	1	1,152	237	237	237	237	134	1,390
Triangle Island	7	1,304	181	181	181	181	15	1,492
Quatsino Sound	3	937	233	228	228	233	232	1,173
Esperanza Inlet	10	1,027	1,329	1,327	823	800	61	2,366
Barkley Canyon	19	2,091	650	649	649	650	58	2,760
Offshore Indexing Total	**72**	**10,405**	**6,223**	**6,213**	**4,536**	**4,525**	**1,487**	**16,700**
Rennell Sound	4	990	0	0	0	0	0	994
Tasu Sound	22	996	0	0	0	0	0	1,018
Middle Ground	231	977	0	0	0	0	0	1,208
Pisces Canyon	8	972	0	0	0	0	0	980
Estevan Point	102	1,125	0	0	0	0	0	1,227
Father Charles Canyon	8	843	0	0	0	0	0	851
Offshore Tagging Total	**375**	**5,903**	**0**	**0**	**0**	**0**	**0**	**6,278**
Portland Inlet	13	528	252	252	252	252	106	793
Gil Island	52	1,500	340	341	341	341	157	1,892
Finlayson Channel	44	976	287	286	286	287	193	1,307
Dean/Burke Channel	10	545	276	277	277	277	255	831
Inlet Indexing Total	**119**	**3,549**	**1,155**	**1,156**	**1,156**	**1,157**	**711**	**4,823**
Grand Total	**566**	**19,857**	**7,378**	**7,369**	**5,692**	**5,682**	**2,198**	**27,801**

Table 9. Summary of biological data collected during the 2002 survey excluding recovered tagged fish.

	Mean Fork Length (mm)			Proportion
Locality	**Males**	**Females**	**Combined**	**Males**
Langara Island-North Frederick	618	692	661	0.35
Hippa Island	599	680	646	0.43
Buck Point	612	687	649	0.58
Gowgaia Bay	625	697	669	0.45
Cape St. James	598	667	656	0.68
Triangle Island	592	687	650	0.49
Quatsino Sound	593	659	612	0.51
Esperanza Inlet	561	652	608	0.61
Barkley Canyon	557	639	592	0.54
Offshore Indexing Total	**595**	**673**	**638**	**0.52**
Rennell Sound	-	-	613	-
Tasu Sound	-	-	687	-
Middle Ground	-	-	576	-
Pisces Canyon	-	-	626	-
Estevan Point	-	-	568	-
Father Charles Canyon	-	-	611	-
Offshore Tagging Total	**-**	**-**	**614**	**-**
Portland Inlet	552	602	605	0.23
Gil Island	553	608	581	0.40
Finlayson Channel	579	631	607	0.29
Dean/Burke Channel	550	610	592	0.24
Inlet Indexing Total	**558**	**613**	**596**	**0.29**
Grand Total	**577**	**643**	**617**	**0.40**

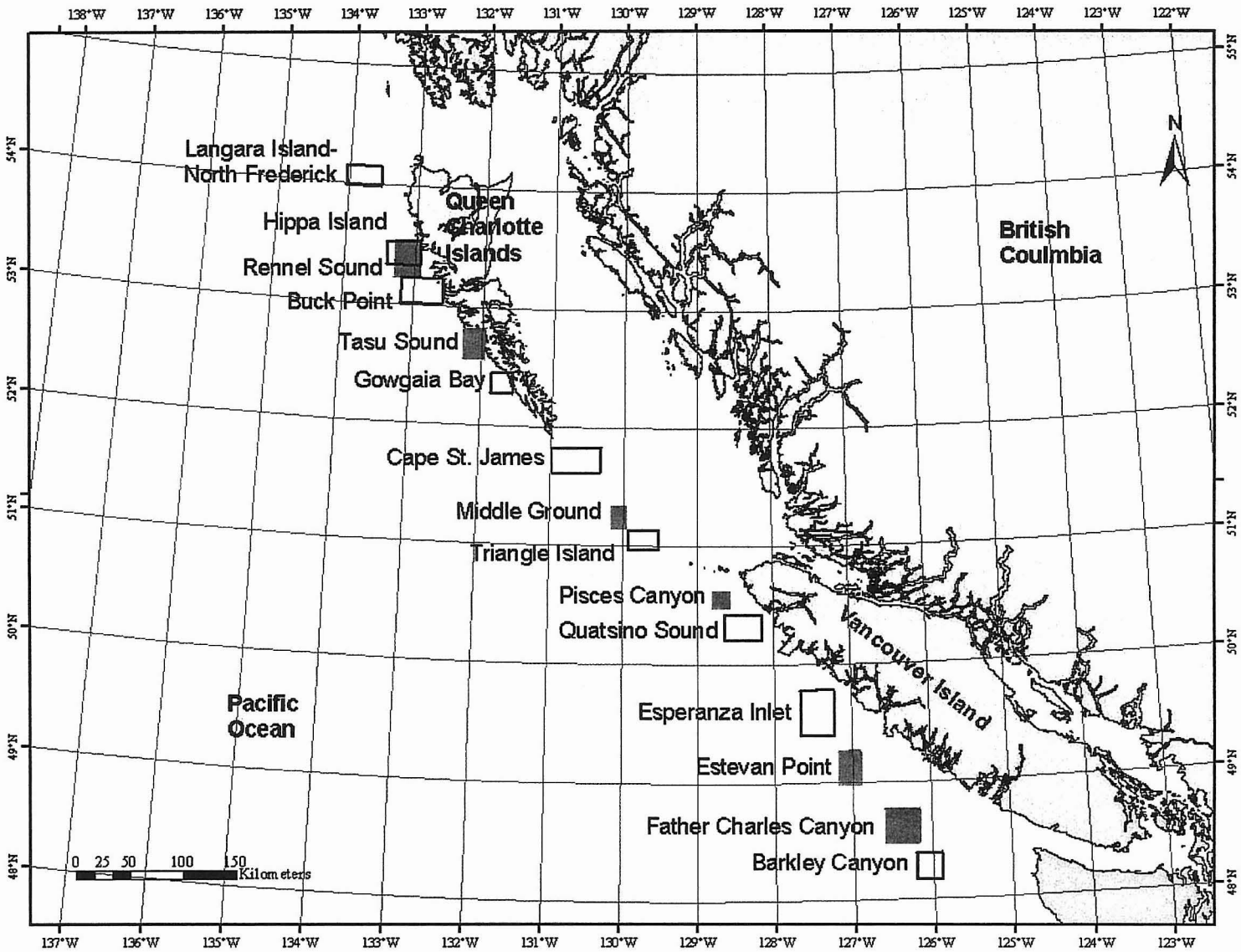


Figure 1. Geographic boundaries of offshore localities. Open boxes indicate an indexing locality while tagging localities are indicated by shaded boxes.

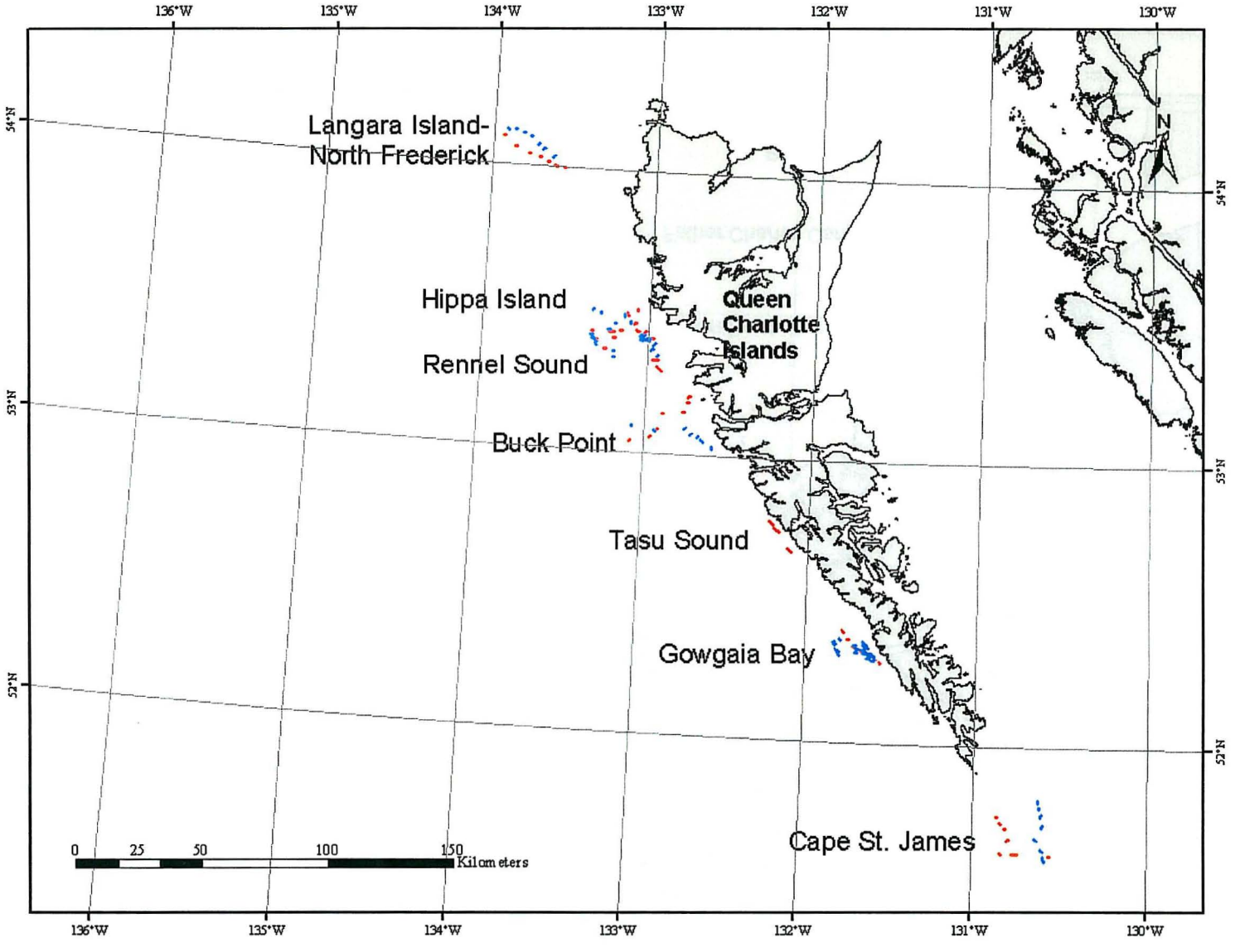


Figure 2. Locations of northern sets completed during the 2002 sablefish research and assessment survey. Sets conducted by the Pacific Viking (indexing charter) are shown in blue while sets conducted by the Viking Sunrise (tagging charter) are shown in red.

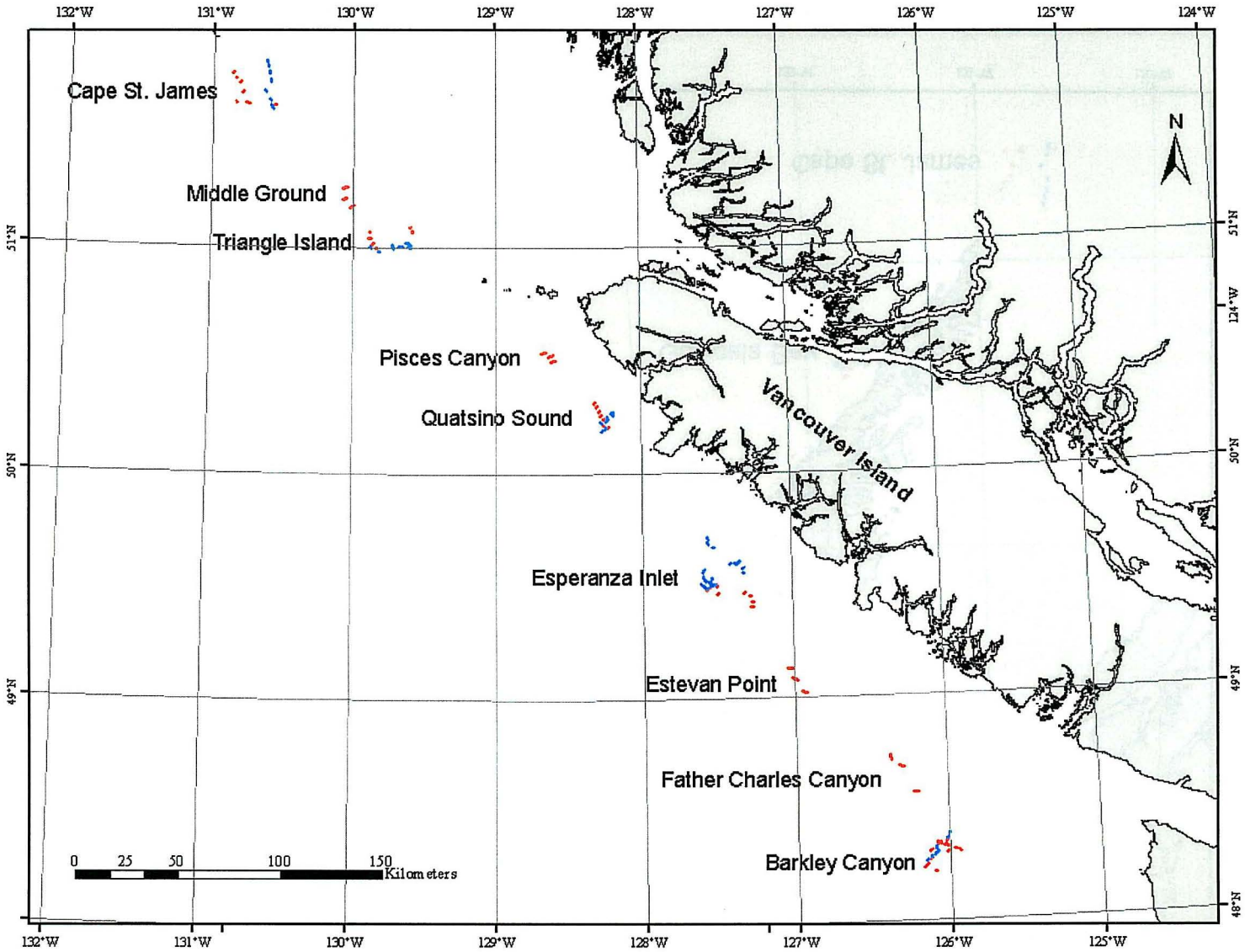


Figure 3. Locations of southern sets completed during the 2002 sablefish research and assessment survey. Sets conducted by the Pacific Viking (indexing charter) are shown in blue while sets conducted by the Viking Sunrise (tagging charter) are shown in red.

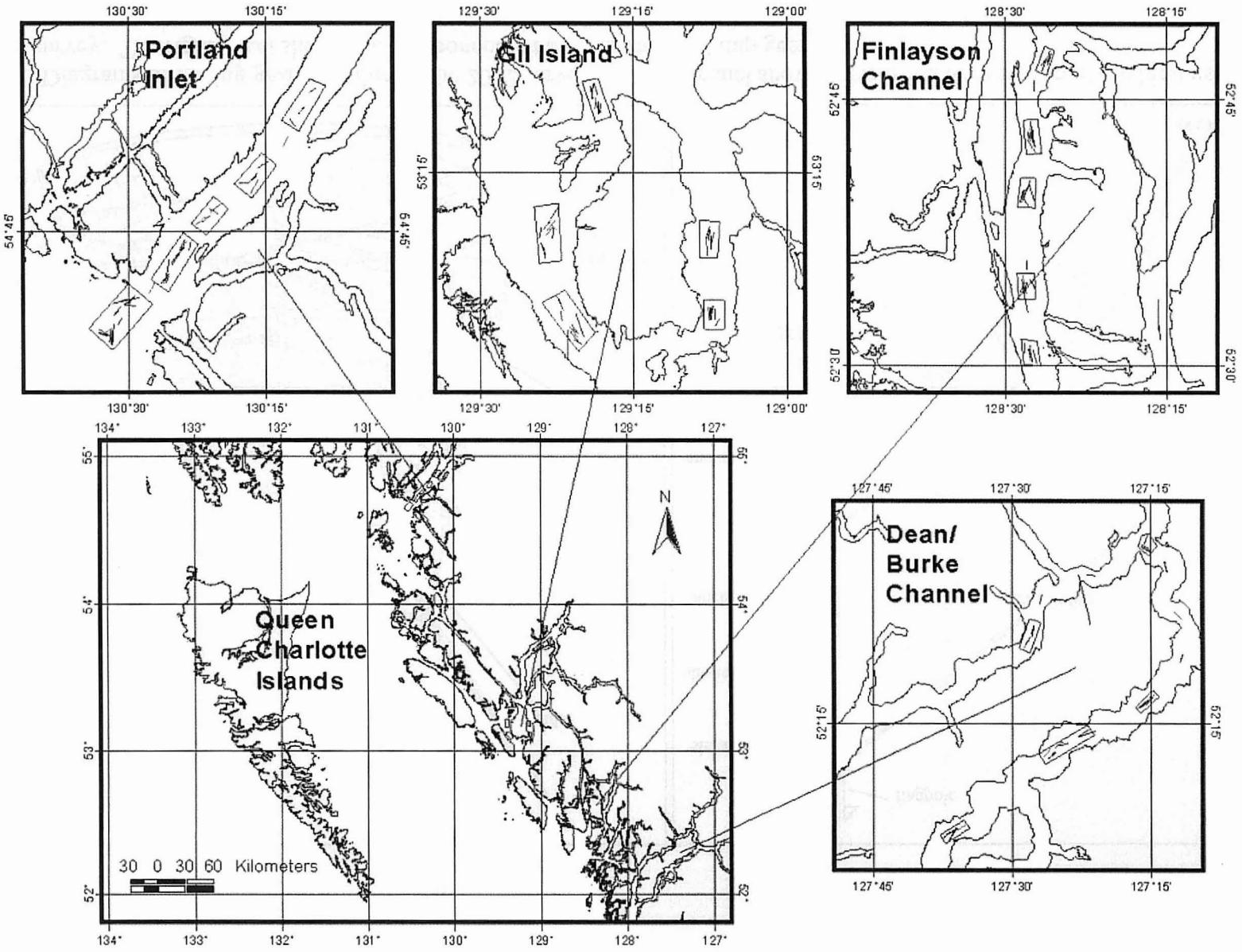


Figure 4. Sablefish research and assessment survey mainland inlet localities. Sets conducted from 1994 to 2001 are shown in black while the 2002 sets are shown in red. The black polygons indicate the locations where the skippers were directed to set.

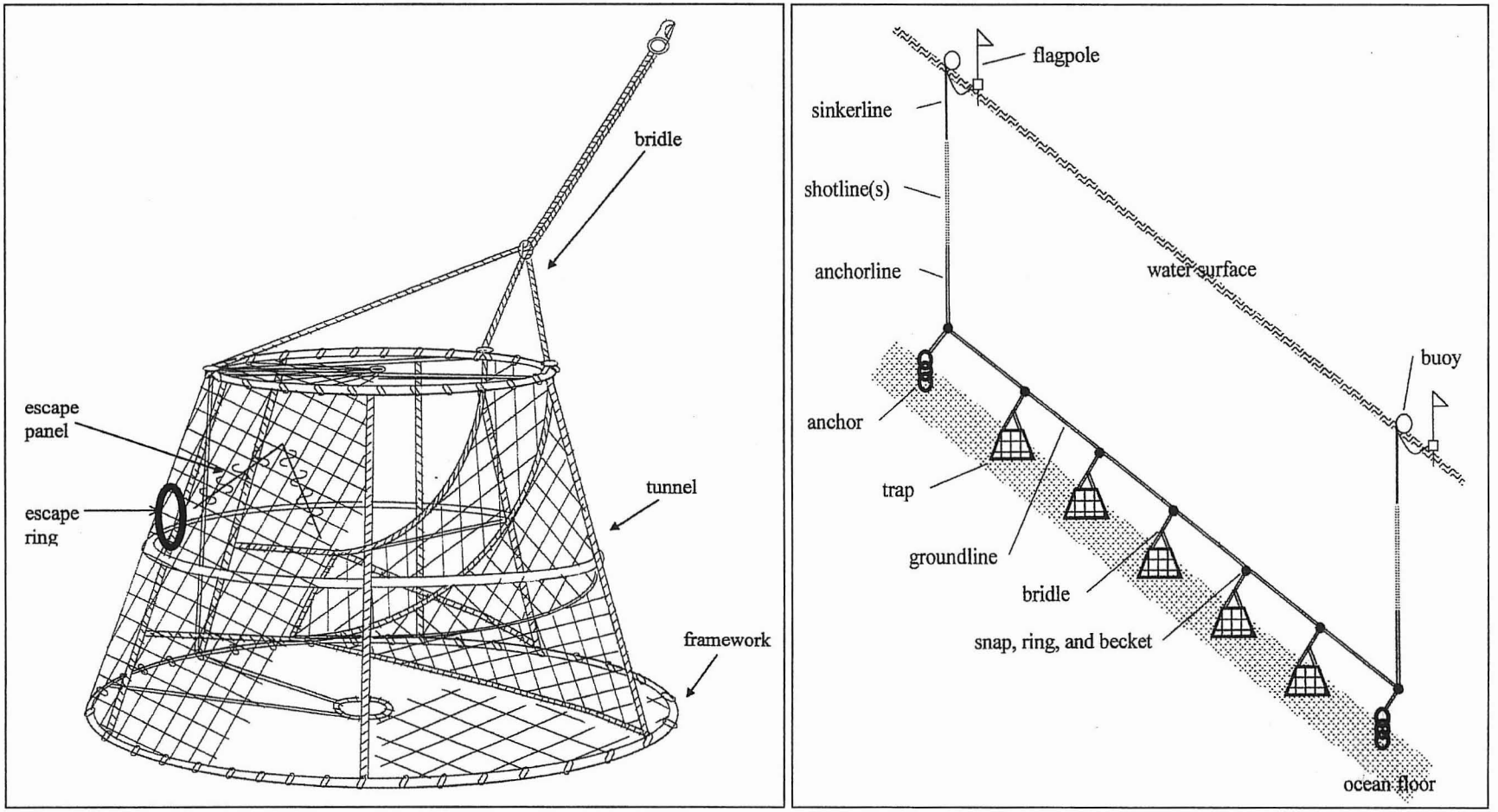


Figure 5. Diagrams of fishing gear used during the 2002 survey. The left panel shows a modified Korean trap of the kind used during the 2002 survey. The right panel shows the components of a set or string of trap gear.

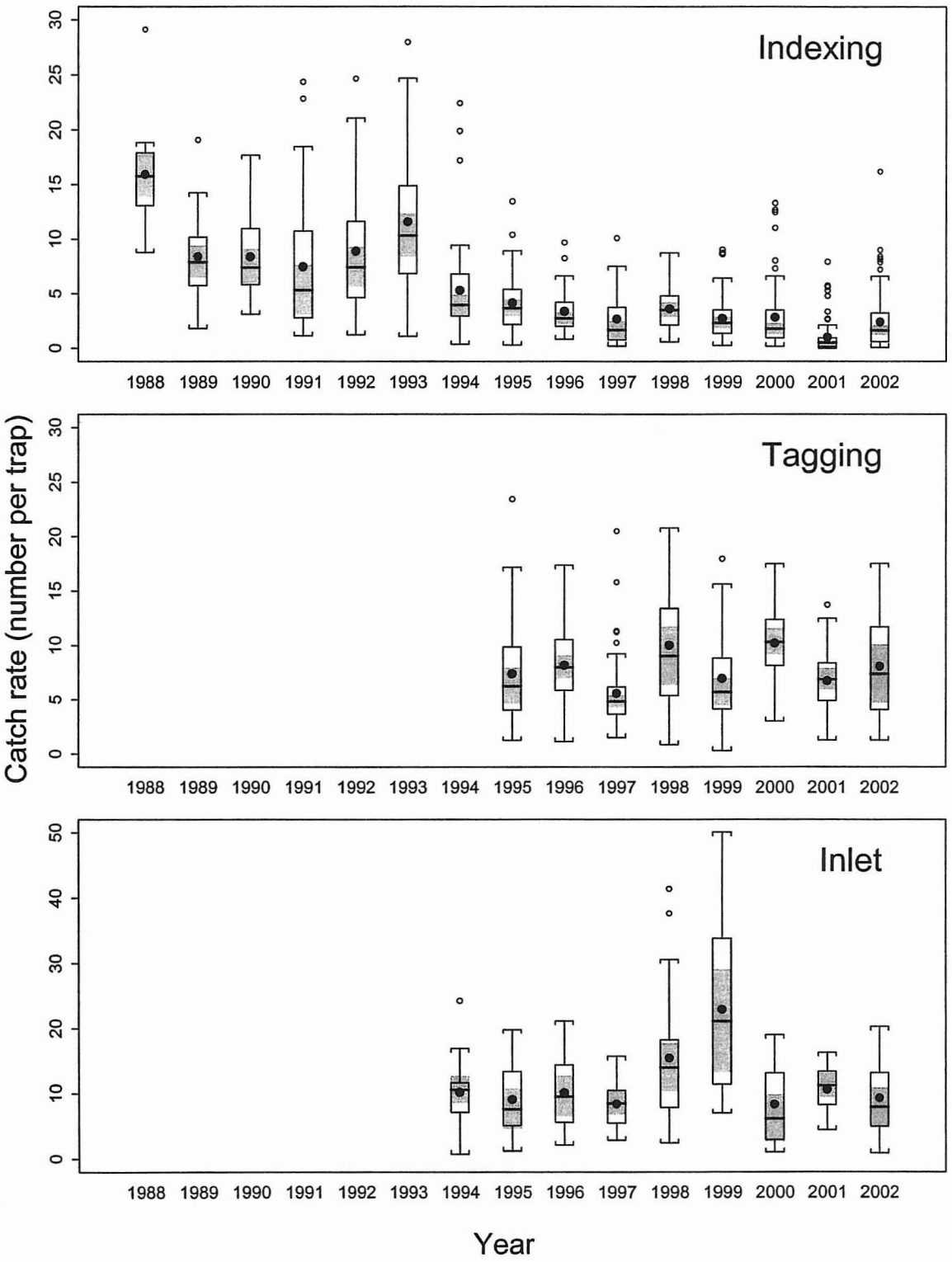


Figure 6. Distribution of catch rates for offshore indexing, tagging, and inlet sets summarised by a boxplot for each year. The filled circles show the mean annual catch rates. The shaded rectangles indicate an approximate 95 percent confidence interval on the median annual catch rate.

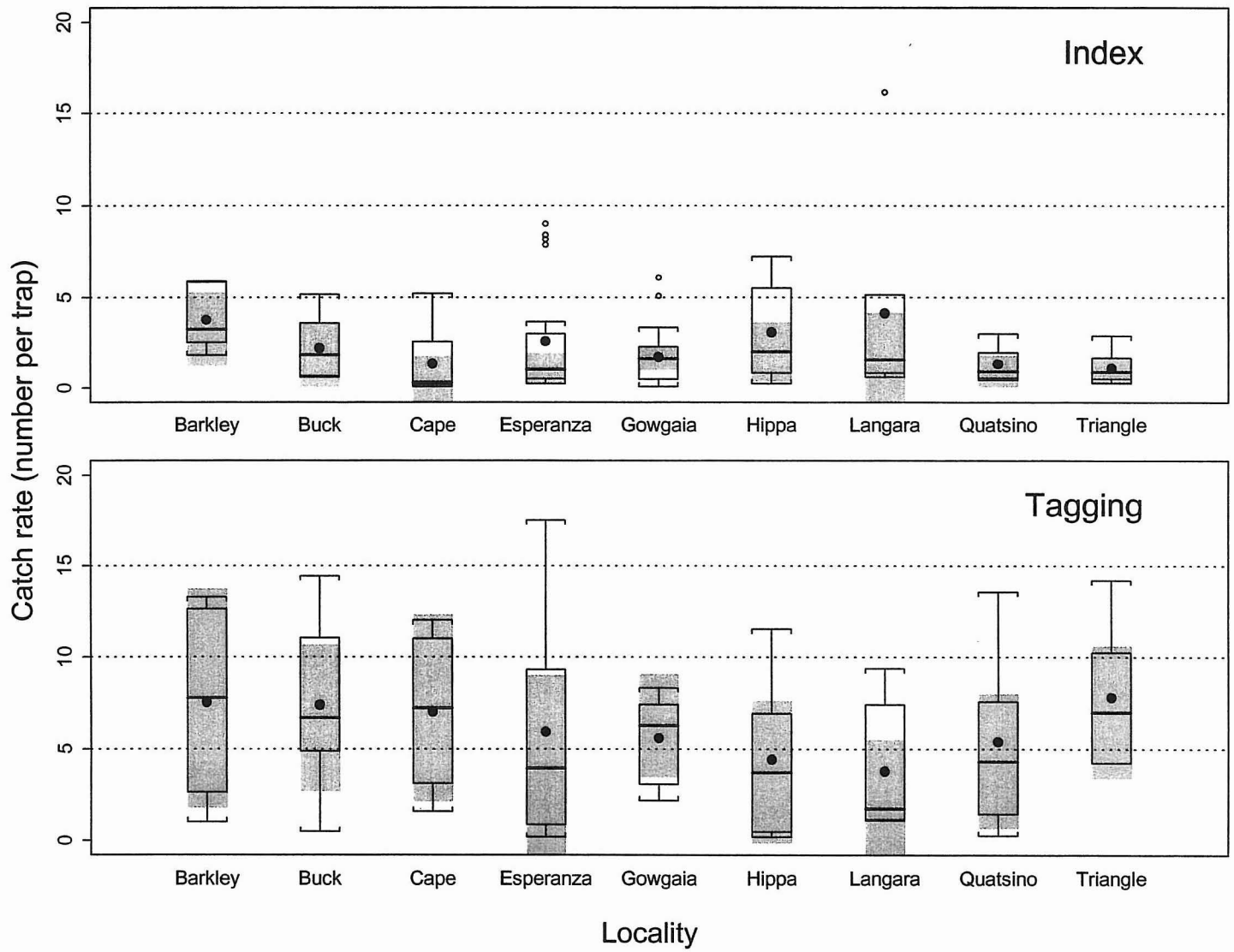


Figure 7. Distribution of catch rates for indexing and Type 2 (systematic) tagging sets summarised by boxplots for each offshore locality. The filled circles show the mean locality catch rates. The shaded rectangles indicate an approximate 95 percent confidence interval on the median annual catch rate.

APPENDIX A DETAILS OF SETS COMPLETED DURING THE 2002 INDEXING CHARTER (PACIFIC VIKING).

Sets are listed sequentially by the start date. The locality name, the replicate, the start date and time as well as the duration in minutes are shown for each set. Position data include the Groundfish Major, Minor, and Locality coding as well as the start and end latitude and longitude in degrees and decimal minutes. The bottom depth (m) at the start and end of the set are shown. The mean bottom depth is calculated from recordings at one minute intervals between the start and end of the set. The number of traps fished is also shown and excludes only open traps, while holed or fouled traps are included. All sets were baited with approximately one kilogram of frozen squid in a bait bag in each trap.

			Target			Duration	Area	Start		End		Bottom Depth (m)			Traps
Locality	Set	Replicate	Strata	Date	Time	(min)	(Maj-Min-Loc)	Latitude	Longitude	Latitude	Longitude	Start	End	Mean	Fished
Barkley Canyon	1		D1	05-Oct-02	0608	1133	03-23-10	48 23.3	125 60.0	48 22.7	126 00.3	276	386	346	24
	2		D2	05-Oct-02	0639	1159	03-23-10	48 22.2	126 00.4	48 21.5	126 01.0	454	638	539	25
	3		D3	05-Oct-02	0732	1187	03-23-10	48 19.6	126 05.5	48 18.9	126 05.6	635	843	713	25
	4		D4	05-Oct-02	0819	1196	03-23-10	48 18.5	126 04.9	48 17.9	126 05.0	834	962	881	26
	5		D5	05-Oct-02	0846	1230	03-23-10	48 17.7	126 05.9	48 17.1	126 06.3	999	1183	1117	25
	6		D6	05-Oct-02	0919	1287	03-23-10	48 17.1	126 07.7	48 16.5	126 07.8	1200	1361	1324	25
	7		D7	05-Oct-02	1000	1327	03-23-0	48 16.4	126 09.3	48 15.7	126 09.5	1377	1448	1430	25
Esperanza Inlet	8	1	D7	06-Oct-02	2134	1276	04-25-4	49 30.1	127 35.0	49 29.5	127 35.0	1351	1520	1441	25
	9	1	D6	06-Oct-02	2223	1311	04-25-4	49 31.3	127 34.1	49 31.1	127 34.6	1167	1313	1275	26
	10	1	D5	06-Oct-02	2304	1336	04-26-8	49 32.5	127 35.4	49 31.4	127 35.1	816	1130	1048	24
	11	1	D4	06-Oct-02	2350	1355	04-26-8	49 34.0	127 35.3	49 34.7	127 35.0	850	1024	953	25
	12	1	D3	07-Oct-02	0101	1381	04-25-4	49 36.0	127 24.2	49 35.7	127 25.2	587	660	636	25
	13	1	D2	07-Oct-02	0144	1441	04-25-3	49 36.5	127 21.0	49 35.7	127 21.7	411	523	488	25
	14	1	D1	07-Oct-02	0216	1363	04-25-4	49 35.7	127 21.9	49 36.1	127 23.0	338	514	399	24
Quatsino Sound	15		D2	08-Oct-02	0833	1365	04-27-6	50 16.3	128 11.5	50 15.5	128 11.7	422	688	598	25
	16		D1	08-Oct-02	0901	1292	04-27-3	50 16.7	128 11.7	50 16.1	128 12.7	214	426	351	25
	17		D3	08-Oct-02	0927	1373	04-27-6	50 15.5	128 14.1	50 14.6	128 13.8	693	779	732	25
	18		D4	08-Oct-02	0955	1400	04-27-6	50 14.5	128 13.9	50 13.9	128 14.5	796	945	845	25
	19		D5	08-Oct-02	1027	1434	04-27-6	50 14.0	128 17.1	50 13.6	128 16.1	986	1220	1161	25
	20		D6	08-Oct-02	1054	1479	04-27-6	50 12.0	128 14.7	50 12.7	128 14.8	1291	1291	1238	25
	21		D7	08-Oct-02	1130	1519	04-27-6	50 11.9	128 15.7	50 11.3	128 16.5	1331		1399	25
Esperanza Inlet	22	2	D7	09-Oct-02	1916	1361	04-26-8	49 30.8	127 36.7	49 30.1	127 36.2	1372	1556	1399	25
	23	2	D6	09-Oct-02	1951	1414	04-25-4	49 30.1	127 32.9	49 30.1	127 31.7	1161	1366	1330	25
	24	2	D5	09-Oct-02	2029	1440	04-25-4	49 31.5	127 32.5	49 30.7	127 32.5	962	1086	1057	25
	25	2	D4	09-Oct-02	2133	1460	04-26-8	49 33.8	127 36.1	49 33.7	127 35.3	838	1030	783	25

Locality	Set	Replicate	Target Strata	Date	Time	Duration (min)	Area (Maj-Min-Loc)	Start Latitude	Start Longitude	End Latitude	End Longitude	Bottom Depth (m) Start	End	Mean	Traps Fished
	26	2	D3	09-Oct-02	2252	1491	04-26-8	49 40.3	127 30.8	49 40.2	127 31.9	640	757	706	25
	27	2	D2	09-Oct-02	2336	1501	04-26-8	49 41.8	127 33.6	49 41.1	127 33.2	452	589	505	25
	28	2	D1	10-Oct-02	0024	1516	04-26-8	49 43.1	127 33.5	49 42.3	127 33.4	265	390	344	25
Triangle Island	29		D1	11-Oct-02	1634	1296	05-11-7	50 60.0	129 35.6	51 00.2	129 36.9	298	410	336	25
	30		D2	11-Oct-02	1705	1304	05-11-7	51 00.7	129 35.4	51 00.9	129 36.6	457	583	530	25
	31		D3	11-Oct-02	1730	1329	05-11-7	51 01.3	129 36.5	51 01.3	129 37.9	620	746	711	25
	32		D4	11-Oct-02	1756	1364	05-11-7	51 00.4	129 39.2	51 00.4	129 40.9	655	967	891	25
	33		D5	11-Oct-02	1828	1397	05-11-7	51 00.8	129 43.3	50 59.8	129 43.1	788	1163	1094	25
	34		D6	11-Oct-02	1917	1431	05-11-0	50 59.1	129 48.7	50 59.0	129 49.6	1245	1236	1125	25
	35		D7	11-Oct-02	1952	1478	05-11-0	50 59.8	129 52.2	51 00.1	129 53.1	1392	1406	1383	24
Gowgaia Bay	36	1	D7	13-Oct-02	1053	1338	09-34-0	52 18.6	131 47.5	52 19.1	131 48.4	1273	1383	1361	25
	37	1	D6	13-Oct-02	1123	1387	09-34-0	52 21.0	131 49.0	52 21.6	131 49.6	1174	1143	1116	25
	38	1	D5	13-Oct-02	1238	1406	09-34-3	52 20.1	131 41.1	52 20.0	131 42.2	1008	1052	1031	25
	39	1	D4	13-Oct-02	1326	1426	09-34-3	52 19.3	131 38.5	52 19.2	131 39.5	843	920	892	25
	40	1	D3	13-Oct-02	1404	1441	09-34-3	52 18.4	131 36.5	52 18.7	131 37.7	671	832	799	25
	41	1	D2	13-Oct-02	1440	1463	09-34-3	52 18.4	131 35.6	52 17.7	131 35.5	443	627	591	25
	42	1	D1	13-Oct-02	1510	1493	09-34-3	52 18.8	131 35.4	52 19.2	131 36.7	276	437	384	25
Cape St. James	43		D1	14-Oct-02	2221	1313	06-08-6	51 49.0	130 37.2	51 48.3	130 37.4	293	357	311	25
	44		D2	14-Oct-02	2247	1338	06-08-6	51 47.7	130 36.8	51 46.9	130 36.8	459	563	523	25
	45		D3	14-Oct-02	2313	1368	06-08-6	51 46.0	130 36.0	51 45.3	130 36.2	640	746	697	25
	46		D4	14-Oct-02	2343	1408	06-08-6	51 43.8	130 35.6	51 43.0	130 35.7	828	889	860	25
	47		D5	15-Oct-02	0018	1444	06-08-12	51 40.9	130 38.2	51 40.3	130 37.4	1000	1057	1030	25
	48		D6	15-Oct-02	0047	1488	06-08-15	51 38.6	130 36.0	51 38.1	130 35.3	1189	1247	1225	25
	49		D7	15-Oct-02	0121	1525	06-08-15	51 37.2	130 35.5	51 35.9	130 34.6	1320	1351	1331	25
Gowgaia Bay	50	2	D7	16-Oct-02	1114	1324	09-34-0	52 19.6	131 48.3	52 20.1	131 49.1	1267	1384	1355	25
	51	2	D6	16-Oct-02	1152	1360	09-34-3	52 21.7	131 47.2	52 22.2	131 47.9	1169	1247	1207	25
	52	2	D5	16-Oct-02	1254	1375	09-34-3	52 20.9	131 41.7	52 20.8	131 43.1	1008	1136	1077	25
	53	2	D4	16-Oct-02	1341	1388	09-34-3	52 19.9	131 39.1	52 19.8	131 40.2	854	903	872	25
	54	2	D3	16-Oct-02	1423	1411	09-34-3	52 19.1	131 37.4	52 19.7	131 38.6	616	823	755	25
	55	2	D2	16-Oct-02	1457	1433	09-34-3	52 20.5	131 38.4	52 20.8	131 39.7	455	726	594	24
	56	2	D1	16-Oct-02	1532	1465	09-34-3	52 21.2	131 38.5	52 21.6	131 39.7	269	519	410	25
Hippa Island	57	1	D1	18-Oct-02	0143	1383	09-31-1	53 21.2	132 56.0	53 21.0	132 57.1	271	419	344	25
	58	1	D2	18-Oct-02	0217	1400	09-31-1	53 22.3	132 58.0	53 22.0	132 59.2	465	614	567	25
	59	1	D3	18-Oct-02	0303	1417	09-31-1	53 24.2	133 01.3	53 23.9	133 02.3	635	812	750	25
	60	1	D4	18-Oct-02	0404	1456	09-31-14	53 21.7	133 12.0	53 21.6	133 12.9	823	1046	942	25

Locality	Set	Replicate	Target Strata	Date	Time	Duration (min)	Area (Maj-Min-Loc)	Start Latitude	Start Longitude	End Latitude	End Longitude	Bottom Depth (m) Start	End	Mean	Traps Fished
	61	1	D5	18-Oct-02	0442	1478	09-31-14	53 20.4	133 11.8	53 20.4	133 12.8	1026	1020	1022	25
	62	1	D6	18-Oct-02	0529	1526	09-31-0	53 22.6	133 18.6	53 23.0	133 19.5	1209	1295	1245	25
	63	1	D7	18-Oct-02	0607	1560	09-31-0	53 24.2	133 19.7	53 24.2	133 20.9	1295	1397	1351	25
Buck Point	64		D7	19-Oct-02	1216	1357	09-31-0	53 06.1	133 04.6	53 05.5	133 04.5		1337	1333	25
	65		D6	19-Oct-02	1319	1410	09-31-0	53 05.0	132 56.9	53 04.8	132 55.9	1203	1187	1196	25
	66		D5	19-Oct-02	1433	1443	09-31-3	53 05.8	132 45.0	53 05.4	132 45.9	1000	1161	1097	25
	67		D4	19-Oct-02	1518	1464	09-31-3	53 04.6	132 42.5	53 04.2	132 43.3	825	1046	940	25
	68		D3	19-Oct-02	1557	1482	09-31-3	53 04.3	132 40.5	53 03.8	132 41.1	613	843	733	25
	69		D2	19-Oct-02	1635	1498	09-31-8	53 03.4	132 39.5	53 02.8	132 38.8	485	664	611	25
	70		D1	19-Oct-02	1711	1526	09-31-8	53 02.1	132 35.7	53 01.4	132 35.8	269	518	419	25
Gowgaia Bay	71	3	D1	21-Oct-02	0315	1325	09-34-3	52 20.9	131 38.1	52 20.1	131 37.8	271	503	432	25
	72	3	D2	21-Oct-02	0345	1353	09-34-3	52 19.3	131 37.1	52 18.7	131 36.6	465	594	580	25
	73	3	D3	21-Oct-02	0415	1381	09-34-3	52 17.7	131 35.5	52 17.7	131 36.6	635	889	774	25
	74	3	D4	21-Oct-02	0444	1408	09-34-3	52 18.2	131 37.2	52 18.3	131 38.3	821	874	856	25
	75	3	D5	21-Oct-02	0520	2887	09-34-3	52 19.4	131 41.5	52 19.3	131 42.7	995	1046	1020	25
	76	3	D6	21-Oct-02	0600	1599	09-34-3	52 19.6	131 47.7	52 19.6	131 48.3	1143	1267	1194	25
	77	3	D7	21-Oct-02	0633	1485	09-34-0	52 20.9	131 49.5	52 21.4	131 50.4	1245	1359	1344	25
Hippa Island	78	2	D6	22-Oct-02	1933	1435	09-31-0	53 23.4	133 18.4	53 23.6	133 19.3	1183	1275	1223	25
	79	2	D7	22-Oct-02	2009	1333	09-31-0	53 24.8	133 20.1	53 24.8	133 21.3	1306	1397	1359	25
	80	2	D5	22-Oct-02	2124	1403	09-31-1	53 26.2	133 13.8	53 26.0	133 14.9	999	1138	1088	25
	81	2	D4	22-Oct-02	2212	1422	09-31-1	53 27.4	133 11.9	53 27.4	133 12.7	814	997	1015	25
	82	2	D3	22-Oct-02	2334	1426	09-31-1	53 24.5	133 02.1	53 24.1	133 03.3	635	849	763	25
	83	2	D2	23-Oct-02	0026	1430	09-31-1	53 24.5	132 59.5	53 23.8	132 59.8	457	521	558	25
	84	2	D1	23-Oct-02	0100	1453	09-31-1	53 23.6	132 57.4	53 23.1	132 58.3	291	386	397	26
Langara Island-	85		D1	24-Oct-02	0729	1286	09-35-2	54 02.2	133 37.1	54 01.9	133 38.3	293	454	373	25
North Frederick	86		D2	24-Oct-02	0809	1309	09-35-6	54 03.8	133 41.1	54 03.5	133 42.3	461	607	534	25
	87		D3	24-Oct-02	0841	1390	09-35-6	54 04.6	133 43.1	54 04.4	133 44.2	646	746	708	25
	88		D4	24-Oct-02	0916	1418	09-35-6	54 06.1	133 45.9	54 06.0	133 46.9	838	914	858	25
	89		D5	24-Oct-02	0945	1447	09-35-6	54 06.8	133 48.7	54 06.8	133 49.8	1017	1020	1020	25
	90		D6	24-Oct-02	1014	1483	09-35-0	54 07.5	133 51.9	54 07.4	133 52.9	1200	1275	1238	25
	91		D7	24-Oct-02	1045	1512	09-35-0	54 07.6	133 55.1	54 06.9	133 55.0	1397	1423	1421	25
Hippa Island	92	3	D7	25-Oct-02	1815	1323	09-31-0	53 30.6	133 20.2	53 30.0	133 20.4	1372	1452	1394	25
	93	3	D6	25-Oct-02	1900	1350	09-31-12	53 29.8	133 17.3	53 29.3	133 17.3	1203	1203	1181	25
	94	3	D5	25-Oct-02	2007	1385	09-31-12	53 29.6	133 08.7	53 28.9	133 08.7	1011	1123	1106	25
	95	3	D4	25-Oct-02	2041	1423	09-31-1	53 28.1	133 06.7	53 27.5	133 06.4	821	945	861	25

Locality	Set	Replicate	Target Strata	Date	Time	Duration (min)	Area (Maj-Min-Loc)	Start Latitude	Start Longitude	End Latitude	End Longitude	Bottom Depth (m) Start	Bottom Depth (m) End	Bottom Depth (m) Mean	Traps Fished
	96	3	D3	25-Oct-02	2131	1445	09-31-1	53 25.3	133 02.1	53 25.1	133 03.2	614	757	695	25
	97	3	D2	25-Oct-02	2211	1454	09-31-1	53 25.3	133 01.0	53 24.7	133 02.0	496	618	514	25
	98	3	D1	25-Oct-02	2250	1465	09-31-1	53 24.9	132 59.9	53 24.3	133 00.6	283	459	379	25
Portland Inlet	99			27-Oct-02	1741	1074	08-04-10	54 38.7	130 32.7	54 39.0	130 31.7	561	644	631	25
	100			27-Oct-02	1820	1132	08-04-12	54 41.2	130 27.8	54 41.8	130 27.1	561	614	593	25
	101			27-Oct-02	1909	1178	08-04-12	54 45.5	130 22.6	54 45.9	130 21.6	536	512	523	25
	102			27-Oct-02	1954	1203	08-04-12	54 47.4	130 16.8	54 48.3	130 15.8	490	496	494	25
	103			27-Oct-02	2035	1228	08-04-12	54 50.4	130 13.1	54 51.0	130 12.6	441	439	439	25
Gil Island	104			29-Oct-02	1946	984	07-06-6	53 19.5	129 18.6	53 18.7	129 18.7	536	534	536	25
	105			29-Oct-02	2125	984	07-06-6	53 12.3	129 22.7	53 11.7	129 23.4	596	521	550	25
	106			29-Oct-02	2220	1048	07-06-6	53 06.1	129 21.2	53 05.4	129 20.4	671	682	677	24
	107			29-Oct-02	2351	1090	07-06-6	53 06.4	129 07.7	53 06.9	129 07.2	490	550	558	25
	108			30-Oct-02	0041	1160	07-06-6	53 10.8	129 07.9	53 11.4	129 07.8	569	565	569	25
Finlayson Channel	109			31-Oct-02	0338	1015	07-07-3	52 47.7	128 25.7	52 47.1	128 26.3	558	578	565	25
	110			31-Oct-02	0424	1045	07-07-3	52 43.5	128 27.7	52 42.7	128 27.6	572	532	552	25
	111			31-Oct-02	0457	1093	07-07-3	52 40.1	128 28.0	52 39.3	128 28.5	578	605	622	25
	112			31-Oct-02	0541	1147	07-07-3	52 35.1	128 28.4	52 34.5	128 28.2	602	642	602	25
	113			31-Oct-02	0620	1198	07-07-3	52 31.0	128 27.8	52 30.3	128 27.7	779	662	739	25
Dean/Burke Channel	114			01-Nov-02	2151	1098	06-08-8	52 20.0	127 28.7	52 20.7	127 28.1	433	519	510	25
	115			01-Nov-02	2330	1127	06-08-8	52 26.7	127 16.0	52 26.3	127 15.2	525	505	512	25
	116			02-Nov-02	0106	1167	06-08-8	52 16.7	127 14.7	52 16.1	127 15.7	580	576	576	25
	117			02-Nov-02	0204	1204	06-08-8	52 13.4	127 25.8	52 12.8	127 26.7	583	594	532	25
	118			02-Nov-02	0300	1263	06-08-8	52 08.3	127 35.1	52 07.9	127 36.1	437	441	439	24
Esperanza Inlet	119	3	D1	03-Nov-02	2217	840	04-25-3	49 36.5	127 20.6	49 36.0	127 21.2	287	432	373	25
	120	3	D2	03-Nov-02	2254	862	04-25-4	49 34.9	127 18.9	49 34.5	127 19.8	466	614	532	25
	121	3	D3	03-Nov-02	2333	871	04-25-4	49 33.5	127 18.7	49 33.5	127 19.8	627	671	686	25
	122	3	D4	04-Nov-02	0045	916	04-25-4	49 32.4	127 31.9	49 31.7	127 32.0	823	991	887	25
	123	3	D5	04-Nov-02	0117	953	04-25-4	49 31.2	127 33.0	49 30.6	127 33.4	1017	978	1031	25
	124	3	D6	04-Nov-02	0148	1015	04-25-4	49 30.5	127 31.7	49 30.3	127 30.7	1176	1331	1293	24
	125	3	D7	04-Nov-02	0231	1101	04-25-4	49 29.7	127 33.1	49 29.2	127 34.0	1377	1582	1454	25

APPENDIX B DETAILS OF SETS COMPLETED DURING THE 2002 TAGGING CHARTER (VIKING SUNRISE).

Sets are listed sequentially by the start date. The locality name, the type of set (Type 1 traditional, Type 2 systematic or Type 3 random), the start date and time as well as the duration in minutes are shown for each set. Position data include the Groundfish Major, Minor, and Locality coding as well as the start and end latitude and longitude in degrees and decimal minutes. The bottom depth (m) at the start and end of the set are shown. The mean bottom depth is calculated from recordings at one minute intervals between the start and end of the set. The number of traps fished is also shown and excludes only open traps, while holed or fouled traps are included. All sets were baited with approximately one kilogram of frozen squid in a bait bag and 3 kg of frozen hake loose in each trap.

			Target			Duration	Area	Start		End		Bottom Depth (m)			Traps
Locality	Set	Type	Strata	Date	Time	(min)	(Maj-Min-Loc)	Latitude	Longitude	Latitude	Longitude	Start	End	Mean	Fished
Father Charles Canyon	1	1		06-Oct-02	1836	1150	03-24-6	48 44.6	126 22.3	48 42.9	126 22.3	457	761	651	64
	2	1		06-Oct-02	2007	1237	03-23-12	48 41.2	126 16.8	48 41.4	126 19.5	421	733	596	60
Barkley Canyon	3	2	D6	07-Oct-02	0004	1938	03-23-10	48 16.7	126 07.4	48 16.3	126 07.9	1225	1372	1309	25
	4	2	D7	07-Oct-02	0105	2014	03-23-0	48 15.0	126 08.7	48 14.2	126 10.7	1448	1571	1540	25
	5	2	D5	07-Oct-02	0231	2027	03-23-13	48 13.0	126 05.5	48 12.9	126 06.6	949	1106	1072	25
	6	2	D2	07-Oct-02	2232	1215	03-23-10	48 20.9	126 04.9	48 20.2	126 04.6	457	516	492	24
	7	2	D4	07-Oct-02	2339	1268	03-23-10	48 20.2	126 01.6	48 19.7	126 02.0	847	944	913	25
	8	2	D1	08-Oct-02	0051	1454	03-23-10	48 18.3	125 55.6	48 18.7	125 56.5	256	355	311	25
	9	2	D3	08-Oct-02	0145	1240	03-23-10	48 18.2	126 00.4	48 18.0	126 01.2	695	686	689	25
	10	3		08-Oct-02	1425	1413	03-23-10	48 18.8	126 07.2	48 18.2	126 07.8	832	841	810	24
	11	3		08-Oct-02	1950	1210	03-23-10	48 21.0	126 03.7	48 20.2	126 03.6	618	655	680	25
	12	3		08-Oct-02	2154	1260	03-23-10	48 19.7	126 00.5	48 19.5	126 01.3	814	841	834	25
	13	3		09-Oct-02	0012	1050	03-23-10	48 21.7	126 01.2	48 20.9	126 01.1	625	704	673	26
	14	3		09-Oct-02	0208	1077	03-23-10	48 18.7	125 57.4	48 19.0	125 58.2	430	494	461	25
Father Charles Canyon	15	1		10-Oct-02	0007	1960	03-23-12	48 34.4	126 11.6	48 34.4	126 13.8	549	832	722	65
Estevan Point	16	1		11-Oct-02	1546	1277	04-25-1	49 01.4	126 54.6	49 01.8	126 57.1	585	677	618	65
	17	1		11-Oct-02	1647	1438	04-25-1	49 04.7	126 58.3	49 05.3	127 00.9	585	786	684	65
	18	1		11-Oct-02	1803	1507	04-25-1	49 08.0	127 00.3	49 07.9	127 02.6	567	750	699	66
Esperanza Inlet	19	2	D1	13-Oct-02	0010	1385	04-25-4	49 24.5	127 15.4	49 24.6	127 16.4	346	463	404	25
	20	2	D2	13-Oct-02	0055	1408	04-25-4	49 25.6	127 15.4	49 25.7	127 16.3	510	629	576	25
	21	2	D3	13-Oct-02	0155	1440	04-25-4	49 27.2	127 16.2	49 27.3	127 17.2	653	759	724	25
	22	2	D4	13-Oct-02	0245	1477	04-25-4	49 28.3	127 18.4	49 28.1	127 19.4	814	978	940	25
	23	2	D5	13-Oct-02	0429	1498	04-25-4	49 28.2	127 29.5	49 27.9	127 30.3	1015	1159	1094	24
	24	2	D6	13-Oct-02	0539	1549	04-25-4	49 29.7	127 30.3	49 30.3	127 30.3	1298	1362	1379	25

Locality	Set	Type	Target Strata	Date	Time	Duration (min)	Area (Maj-Min-Loc)	Start Latitude	Start Longitude	End Latitude	End Longitude	Bottom Depth (m) Start	Bottom Depth (m) End	Bottom Depth (m) Mean	Traps Fished
	25	2	D7	13-Oct-02	0633	1594	04-25-4	49 29.4	127 33.2	49 28.9	127 34.1	1544	1662	1613	26
Quatsino Sound	26	2	D7	14-Oct-02	1835	1349	04-27-6	50 12.8	128 13.4	50 12.4	128 14.4	1372	1353	1397	25
	27	2	D6	14-Oct-02	1927	791	04-27-6	50 13.1	128 15.7	50 13.4	128 15.5	1234	1225	1277	25
	28	2	D5	14-Oct-02	2008	1436	04-27-6	50 15.1	128 15.3	50 14.6	128 15.8	1024	969	1013	25
	29	2	D4	14-Oct-02	2059	1454	04-27-6	50 15.9	128 16.1	50 15.6	128 16.9	841	869	841	25
	30	2	D3	14-Oct-02	2154	1502	04-27-6	50 17.2	128 17.1	50 16.7	128 17.8	576	805	669	25
	31	2	D2	14-Oct-02	2245	1512	04-27-3	50 18.3	128 17.9	50 18.0	128 18.8	496	622	567	25
	32	2	D1	14-Oct-02	2330	1537	04-27-3	50 19.3	128 19.0	50 18.7	128 19.5	430	457	466	25
Pisces Canyon	33	1		16-Oct-02	0856	1319	05-11-11	50 30.4	128 34.9	50 29.9	128 37.3	666	1097	867	63
	34	1		16-Oct-02	1059	1346	05-11-11	50 32.0	128 36.1	50 31.4	128 38.6	443	1097	832	64
	35	1		16-Oct-02	1220	1435	05-11-11	50 32.7	128 39.1	50 32.4	128 41.5	512	914	693	63
Triangle Island	36	2	D1	17-Oct-02	1944	6601	05-11-7	51 05.6	129 35.4	51 05.3	129 36.0	300	384	349	25
	37	2	D2	17-Oct-02	2042	6608	05-11-7	51 04.4	129 34.9	51 03.8	129 34.9	466	622	567	25
	38	2	D3	17-Oct-02	2134	6630	05-11-7	51 01.2	129 37.2	51 01.4	129 38.2	638	850	753	25
	39	2	D4	17-Oct-02	2301	6704	05-11-0	50 60.0	129 49.5	50 59.9	129 50.6		1033	916	25
	40	2	D5	17-Oct-02	2350	6757	05-11-0	51 01.2	129 51.3	51 01.0	129 52.3	1006	1180	1083	25
	41	2	D6	18-Oct-02	0105	6790	05-11-0	51 02.4	129 52.3	51 02.4	129 53.8	1207	1384	1306	25
	42	2	D7	18-Oct-02	0213	6859	05-11-0	51 03.9	129 52.5	51 04.0	129 53.4	1436	1388	1384	25
Middle Ground	43	1		22-Oct-02	2337	1366	05-11-12	51 11.1	129 59.4	51 10.3	130 01.6	518	596	556	62
	44	1		23-Oct-02	0047	1503	05-11-12	51 12.9	130 02.3	51 12.4	130 04.6	545	651	605	65
	45	1		23-Oct-02	0208	1555	06-08-10	51 15.9	130 02.2	51 15.5	130 04.6	477	777	636	64
Cape St. James	46	2	D6	24-Oct-02	1115	1390	06-08-15	51 37.1	130 32.8	51 37.1	130 33.8	1280	1280	1275	24
	47	2	D5	24-Oct-02	1250	1435	06-08-12	51 37.5	130 44.0	51 37.6	130 46.3	1002	1262	1114	25
	48	2	D7	24-Oct-02	1354	1479	06-08-0	51 37.5	130 49.7	51 37.8	130 50.5	1372	1463	1401	25
	49	2	D4	24-Oct-02	1505	1512	06-08-12	51 40.6	130 47.1	51 40.3	130 48.0	841	1033	938	25
	50	2	D3	24-Oct-02	1616	1529	06-08-12	51 42.9	130 48.1	51 42.8	130 48.9	658	741	678	25
	51	2	D2	24-Oct-02	1709	1566	06-08-12	51 43.8	130 50.0	51 44.1	130 50.8	475	616	600	25
	52	2	D1	24-Oct-02	1746	1632	06-08-12	51 45.4	130 51.2	51 45.2	130 52.2	272	508	399	25
Gowgaia Bay	53	2	D1	26-Oct-02	0412	1976	06-08-0	52 17.2	131 33.3	52 17.4	131 33.9	349	448	428	24
	54	2	D2	26-Oct-02	0446	2017	09-34-3	52 17.9	131 34.9	52 18.0	131 35.7	461	688	560	25
	55	2	D3	26-Oct-02	0526	2064	09-34-3	52 19.0	131 36.9	52 18.9	131 38.0	657	805	693	25
	56	2	D4	26-Oct-02	0603	2115	09-34-3	52 19.7	131 38.9	52 19.7	131 40.0	854	887	869	25
	57	2	D5	26-Oct-02	0645	2174	09-34-3	52 20.3	131 42.0	52 20.5	131 43.0	1006	1105	1061	25
	58	2	D6	26-Oct-02	0759	2183	09-34-3	52 22.1	131 44.3	52 22.1	131 45.3	1225	1326	1280	25
	59	1	D7	26-Oct-02	0855	2248	09-34-3	52 23.5	131 46.3	52 23.9	131 47.2	1408	1463	1430	25

Locality	Set	Type	Target Strata	Date	Time	Duration (min)	Area (Maj-Min-Loc)	Start Latitude	Start Longitude	End Latitude	End Longitude	Bottom Depth (m) Start	Bottom Depth (m) End	Bottom Depth (m) Mean	Traps Fished
Tasu Sound	60	1		28-Oct-02	0730	1418	09-31-13	52 40.3	132 05.8	52 41.0	132 07.4	457	640	693	65
	61	1		28-Oct-02	0851	1633	09-31-13	52 44.6	132 10.4	52 45.2	132 12.4	421	823	646	63
	62	1		28-Oct-02	1006	1731	09-31-13	52 45.9	132 12.3	52 46.6	132 14.4	402	786	651	64
Buck Point	63	2	D7	29-Oct-02	2349	2621	09-31-0	53 02.6	133 04.4	53 02.5	133 05.4	1445	1536	1485	24
	64	2	D6	30-Oct-02	0216	2349	09-31-0	53 03.6	132 57.3	53 03.4	132 58.4	1207	1229	1222	25
	65	2	D5	30-Oct-02	0325	2180	09-31-0	53 05.0	132 56.1	53 05.4	132 55.2	1189	1170	1180	24
	66	2	D4	30-Oct-02	0434	2012	09-31-7	53 08.8	132 54.1	53 08.6	132 53.1	832	922	871	25
	67	2	D3	30-Oct-02	0549	1807	09-31-7	53 09.2	132 45.6	53 09.1	132 46.8	713	785	748	25
	68	2	D2	30-Oct-02	0646	1630	09-31-7	53 11.1	132 45.4	53 11.4	132 44.3	627	424	541	25
	69	1	D1	30-Oct-02	0737	1514	09-31-7	53 12.5	132 44.0	53 12.2	132 45.1	274	430	333	25
Rennell Sound	70	1		31-Oct-02	2250	1259	09-31-14	53 17.7	132 55.0	53 18.8	132 56.8	642	631	642	65
	71	1		31-Oct-02	2345	1359	09-31-1	53 20.2	132 56.2	53 20.1	132 58.6	452	644	576	66
Hippa Island	72	2	D5	01-Nov-02	0130	2130	09-31-14	53 21.9	133 15.0	53 21.9	133 16.1	1041	1037	1035	26
	73	2	D4	01-Nov-02	1527	1527	09-31-1	53 24.5	133 11.8	53 24.4	133 12.9	812	977	907	26
	74	2	D3	01-Nov-02	1649	1665	09-31-1	53 26.1	133 03.6	53 26.3	133 04.7	640	805	715	25
	75	2	D2	01-Nov-02	1734	1682	09-31-1	53 27.7	133 04.5	53 27.5	133 05.5	465	611	545	25
	76	2	D7	02-Nov-02	1059	1411	09-31-0	53 25.6	133 19.9	53 25.7	133 20.8	1426	1428	1443	25
	77	2	D6	02-Nov-02	1143	1454	09-31-0	53 23.9	133 19.6	53 23.9	133 18.4	1300	1183	1233	25
	78	3		02-Nov-02	1505	1348	09-31-1	53 25.7	133 12.2	53 25.5	133 14.3	785	995	889	26
	79	3		02-Nov-02	1559	1371	09-31-1	53 26.0	133 09.5	53 25.9	133 10.7	285	507	391	25
	80	2	D1	02-Nov-02	1846	1323	09-31-1	53 24.6	132 58.1	53 24.6	132 59.4	291	406	340	25
	81	3		02-Nov-02	1945	1355	09-31-1	53 26.2	133 00.8	53 25.9	133 01.9	274	468	353	25
	82	3		02-Nov-02	2315	1253	09-31-12	53 30.4	133 04.1	53 30.7	133 04.5	274	258	307	25
	83	3		03-Nov-02	0020	1268	09-31-12	53 29.3	133 07.5	53 29.9	133 08.0	591	691	624	25
Langara Island-	84	2	D1	04-Nov-02	0709	3372	09-31-2	53 59.9	133 33.2	53 60.0	133 34.2	391	346	369	24
North Frederick	85	2	D2	04-Nov-02	0745	3402	09-35-2	54 00.2	133 36.3	54 00.2	133 37.4	532	594	580	25
	86	2	D3	04-Nov-02	0902	3528	09-35-2	54 01.0	133 39.2	54 00.9	133 40.1	636	697	668	21
	87	2	D4	04-Nov-02	0941	6079	09-35-6	54 01.8	133 42.4	54 01.8	133 43.2	823	924	891	25
	88	2	D5	04-Nov-02	1034	6154	09-35-0	54 02.5	133 46.4	54 02.4	133 47.3	1013	1050	1033	25
	89	2	D6	04-Nov-02	1208	6172	09-35-0	54 03.9	133 51.5	54 03.7	133 52.5	1207	1253	1234	24
	90	2	D7	04-Nov-02	1335	6193	09-35-0	54 05.9	133 55.9	54 05.9	133 57.0	1469	1511	1503	25

APPENDIX C EXAMPLE DATA FORMS.

SABLEFISH CHARTER SETTING BRIDGE LOG

VESSEL: Pacific Viking SET NUMBER: 1

LOCALITY: Barkley Canyon REASON: Index

Intended Stratum: D1 Recorder: Malcolm

Target Depth: Minimum: 150 (fm) Maximum: 249 (fm)

SET: Date: 2002 10 5

1st Buoy: Number: 18 Time: 0603 Bottom Depth: 134 (fm)

Latitude: . Longitude: .

1st Anchor : Time: 608 Bottom Depth: 151 (fm)

Latitude: 48 23.299 Longitude: 125 59.989

SETTING BOTTOM DEPTH (fm/min): 161, 167, 175, 182, 191, 193, 201, 205, 207, 208

Mean: (of fm/min)

2nd Anchor: Time: 620 Bottom Depth: 211 (fm)

Latitude: 48 22.617 Longitude: 126 00.270

2nd Buoy: Number: 17 Time: 06:26 Bottom Depth: 264 (fm)

Latitude: 48 22.156 Longitude: 126 00.504

COMMENTS: A little late on the 1st Anchor position & time

Figure C.1. Example of a completed bridge log data form used on the 2002 survey. This form was completed from the bridge as each string was set.

SABLEFISH CHARTER SET LOG

VESSEL: PACIFIC VIKING SET NUMBER: 003

DATE: OCT 5/02 Recorder: HAV

1st Buoy Number: 09 Time: 07:25

1st ANCHOR TIME 07:32

NUMBER TRAPS SET: 25

TEMP SENSOR: #: On Trap #:

Missed Beckets:

2nd ANCHOR TIME 07:45

2nd Buoy Number: 09 Time: 07:50

BAIT: Type 1: SQUID Weight: 2 LB (lb) Method: BAG

Type 2: Weight: (lb) Method:

Bait sampled? (circle one) Y / (N)

COMMENTS:

BOTH BUOY NUMBERS ARE 09

~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~ ~~HH~~

BAIT WEIGHT QUALITY CONTROL Date Sampled:

Bait Type: Sampler:

SOURCE: Vessel: Set(s):

Gross Weight/Bag 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: 26: 27: 28: 29:

FROZEN BAIT SAMPLE TAG Date Sampled:

Bait Type: Sampler:

SOURCE: Vessel: Set:

From Freezer: Supplier:

Figure C.2. Example of a completed set log data form used on the 2002 survey. This form was completed from the deck as the gear was set.

SABLEFISH CHARTER CATCH LOG

DATE: [illegible] SET NUMBER: 003 pg [illegible]

VESSEL: [illegible] RECORDER: [illegible]

1ST Buoy [illegible] 1ST Anchor Aboard: [illegible]

trap	SABLEFISH			[illegible]									
num	Use	#	weight	#	weight	#	weight	#	weight	#	weight	#	weight
1		[illegible]	[illegible]										
2		1	1.9										
3		6	[illegible]										
4		[illegible]	[illegible]	[illegible]	[illegible]								
5		6	[illegible]										
6		9	[illegible]	[illegible]	[illegible]								
7		7	[illegible]										
8		6	[illegible]										
9		8	[illegible]										
10		8	[illegible]										
11		[illegible]	[illegible]										
12		[illegible]	[illegible]										
13		[illegible]	[illegible]										
14		[illegible]	[illegible]										
15		[illegible]	[illegible]										
16		9	[illegible]										
17		9	[illegible]										
18		3	[illegible]										
19		[illegible]	[illegible]										
20		2	[illegible]										
21		[illegible]	[illegible]										
22		[illegible]	[illegible]										
23		[illegible]	[illegible]										
24		1	[illegible]										
25		2	[illegible]										
total		146	2035										
[illegible]													

2ND Buoy [illegible] 2ND Anchor Aboard: [illegible]

COMMENTS: [illegible]

The "Use " column is to indicate how the trap contents was treated: T=tagged, A=LSWMO sample, B=LF sample, D=dumped

Figure C.3. Example of a completed catch log data form used during the 2002 survey.

SABLEFISH CHARTER TAG RECOVERY SHEET

page 1 / 3

Vessel: PACIFIC VIKING 0499 Sample Type: TAGGED FISH

Sampler: MALCOLM Recorder: HAVEN Species: SABLEFISH Sample Weight:

Sample Source: UNSORTED Catch Storage: FRESH Specimen Form: ROUND Length Type: FORK

Length Unit: mm Weight Type: ROUND Weight Unit: g Maturity Convention: SABLEFISH 1

Set Number	Set Haul Date (Y Y Y Y M M D D)	Tag Number	Length	Sex	Mat	Weight	Wound Cond.	Otolith Tray #	Otolith Cell #	Comments
104	20021030	B 99323887	593	2	02	1903	01	TR2	A1	
		CSA 11474	581	2	02	1847	01			
		CSA 11589	605	1	01	2128	01			
104	20021030	CSA 28679	537	2	02	1519	01		A4	
105	20021030	CSA 11572	588	1	01	1931	01		A5	
		B 99430300	585	1	01	1859	01			
		B 99327994	716	2	02	3728	01			
		B 98196002	643	2	02	2760	01			
		B 99330097	592	2	09	2138	01			
		CSA 11737	561	2	02	1629	01			
		B 99332222	571	2	02	1887	01			
		CSA 28474	520	2	02	1313	01			
		B 99325822	730	2	02	4302	01			
105	20021030	CSA 28446	791	2	04	6.02	01		A14	
106	20021030	B 99432888	710	2	02	3470	01		A15	
		CSA 28646	645	2	02	2543	01			
		CSA 12154	613	1	05	2766	01			
		CSA 28734	585	2	02	1940	01			
		B 99348999	631	2	02	2693	01			
		B 99433773	667	2	02	3160	01		A20	

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

Figure C.4. Example of a completed tag recovery form used during the 2002 survey.

columns 1-3=SB1

SABLEFISH CHARTER BIOSAMPLING SHEET

page 1 / 3

Vessel: PACIFIC VIKING [4] 0 4 9 9 Set Number: [8] 0 0 0 1 Sample Date: [12] 2 0 0 2 1 0 0 7 Sample Type: TOTAL CATCH [20] 0 1

Sampler: MALCOLM [22] 2 9 7 Recorder: JAVERS Species: SABLEFISH [26] 4 5 5 Sample Weight: [29]

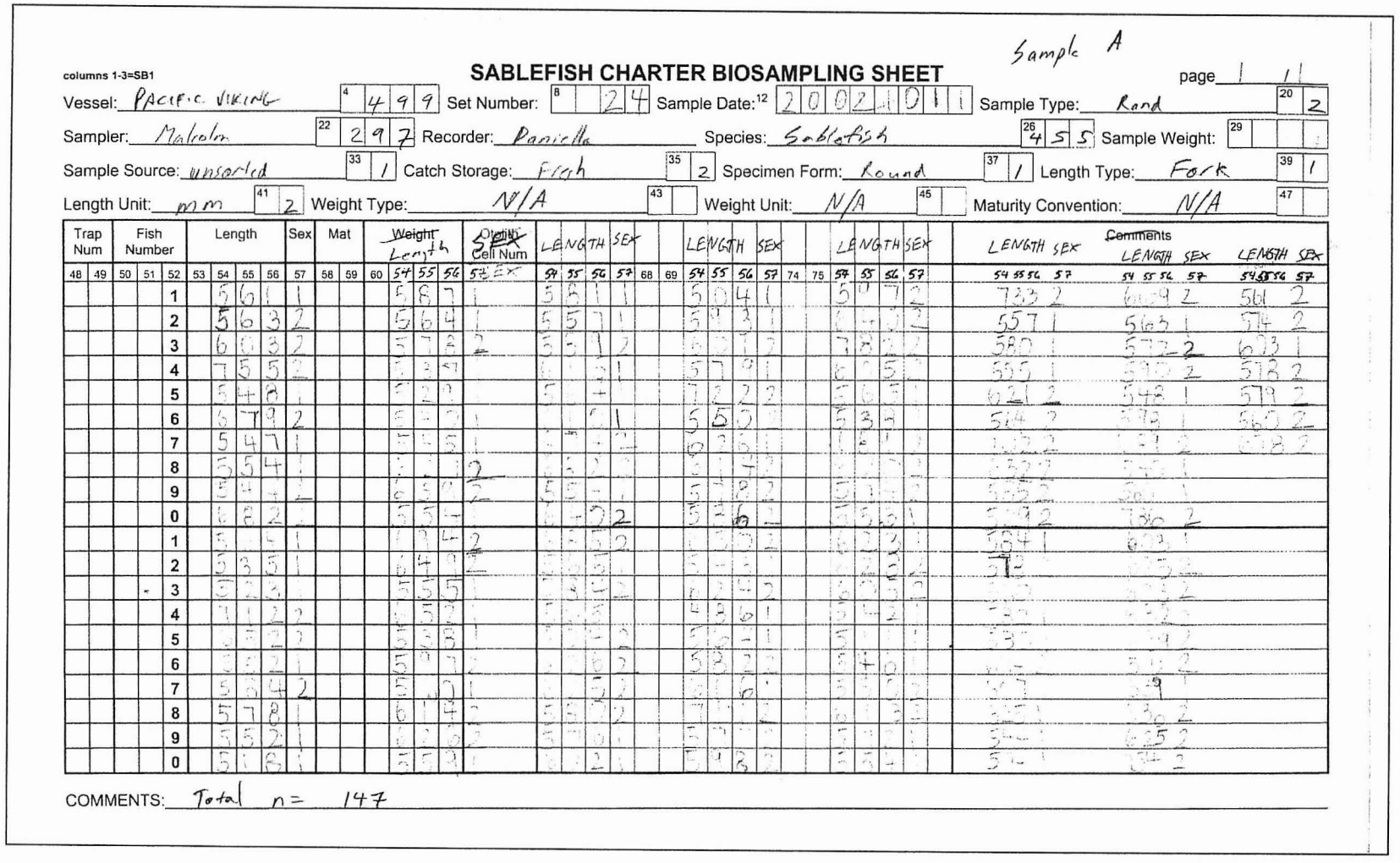
Sample Source: UNSORTED [33] 0 1 Catch Storage: FRESH [35] 0 2 Specimen Form: ROUND [37] 0 1 Length Type: FORK [39] 0 1

Length Unit: MM [41] 0 2 Weight Type: N/A [43] Weight Unit: N/A [45] Maturity Convention: SABLEFISH 1 [47] 0 3

Trap Num (48–49)	Fish Number (50–52)	Length (53–56)	Sex (57)	Mat (58–59)	Weight (60–63)	Otolith Cell Num (1–63)	Comments (64–80)
							TRAY 2002-1-1
	1	681	2	4		A 1	
	2	577	1	4		A 2	
	3	483	1	2		A 3	
	4	763	2	4		A 4	
	5	661	1	4		A 5	
	6	585	1	3		A 6	
	7	540	1	4		A 7	
	8	650	2	4		A 8	
	9	586	2	2		A 9	JAW DAMAGE
	10	550	1	2		A 10	
	11	730	2	4		A 11	
	12	780	2	4		A 12	
	13	643	1	5		A 13	
	14	525	1	2		A 14	
	15	674	1	4		A 15	
	16	518	1	2		A 16	
	17	614	1	5		A 17	JAW DAMAGE
	18	610	1	5		A 18	JAW DAMAGE
	19	535	2	2		A 19	
	20	622	2	2		A 20	

COMMENTS: SAMPLED NEXT DAY

Figure C.5. Example of a completed biological sampling form used for LS(W)MO samples during the 2002 survey.



columns 1-3=SB1

SABLEFISH CHARTER BIOSAMPLING SHEET

Sample A

page 1 / 1

Vessel: PACIFIC VIKING | 4 | 4 9 9 | Set Number: 8 | 2 4 | Sample Date: 12 | 2 0 0 2 1 0 1 1 | Sample Type: Rand | 20 | 2

Sampler: Malcolm | 22 | 2 9 7 | Recorder: Danielle | Species: Sablefish | 26 | 4 5 5 | Sample Weight: 29

Sample Source: unsorted | 33 | 1 | Catch Storage: Fish | 35 | 2 | Specimen Form: Round | 37 | 1 | Length Type: Fork | 39 | 1

Length Unit: mm | 41 | 2 | Weight Type: N/A | 43 | Weight Unit: N/A | 45 | Maturity Convention: N/A | 47

Trap Num	Fish Number	Length	Sex	Mat	~~Weight~~ Length	~~Sex~~ Cell Num	LENGTH SEX	LENGTH SEX	LENGTH SEX	LENGTH SEX	~~Comments~~ LENGTH SEX	LENGTH SEX
48 49	50 51 52	53 54 55 56	57	58 59	60 54 55 56	57	54 55 56 57 68	69 54 55 56 57 74	75 57 55 56 57	54 55 56 57	54 55 56 57	54 55 56 57
	1	5 6 1	1		5 8 7	1	5 8 1 1	5 0 4 1	5 0 7 2	733 2	669 2	561 2
	2	5 6 3	2		5 6 4	1	5 5 7 1	5 9 3 1	6 4 0 2	557 1	563 1	574 2
	3	6 0 3	2		5 7 3	2	5 5 1 2	5 8 1 2	7 8 2 2	580 1	572 2	623 1
	4	7 5 5	2		5 3 4		5 1 1	5 7 9 1	6 2 5 2	555 1	510 2	518 2
	5	5 4 8	1		5 2 8		5 1 1 1	7 2 2 2	5 6 5 1	621 2	548 1	579 2
	6	6 7 9	2		5 5 3	1	5 1 1 1	5 5 5 1	5 3 3 1	514 2	573 1	565 2
	7	5 4 7	1		5 5 5	1	5 1 1 2	5 3 5 1	5 5 1 2	[illegible]	[illegible]	[illegible]
	8	5 5 4	1		5 5 5	2	5 1 1 1	5 3 4 2	[illegible]	[illegible]	[illegible]	
	9	5 4 4	2		5 5 5	2	5 1 1 1	5 3 2 2	[illegible]	[illegible]	[illegible]	
	0	6 8 2	2		5 5 5	1	5 1 1 2	5 3 6 2	[illegible]	[illegible]	586 2	
	1	5 3 5	1		5 5 5	2	5 1 1 2	5 3 3 1	6 2 2 1	584 1	603 1	
	2	5 3 5	1		5 4 5	1	5 1 1 1	5 1 1 1	6 2 2 2	572	5[illegible]	
	3	6 2 3	1		5 5 5	1	5 1 1 2	5 3 5 2	6 2 3 2	[illegible]	[illegible]	
	4	7 1 2	2		5 5 5	1	5 1 1 1	5 3 6 1	5 4 2 1	[illegible]	[illegible]	
	5	5 5 2	2		5 5 5	1	5 1 1 2	5 3 2 1	5 5 1 1	535	[illegible]	
	6	6 8 2	1		5 5 5	2	5 1 1 2	5 3 2 1	5 4 0 1	[illegible]	5[illegible] 2	
	7	5 8 4	2		5 5 5	1	5 1 1 2	5 3 6 1	5 4 2 1	5[illegible]	59 1	
	8	5 7 8	1		5 6 4	2	5 1 1 2	5 3 2 1	5 5 1 1	5[illegible]	5[illegible] 2	
	9	5 5 2	1		5 5 5	2	5 1 1 1	5 3 2 1	5 5 1 1	5[illegible]	625 2	
	0	5 7 8	1		5 5 5	1	5 1 1 2	5 3 3 2	5 5 1 1	5[illegible]	[illegible] 2	

COMMENTS: Total n= 147

Figure C.6. Example of a completed biological sampling form used for LS samples during the 2002 survey.

columns 1-3=ST1

SABLEFISH CHARTER TAGGING SHEET pg: 1 1 7

Vessel: PACIFIC VIKING [4] 0 4 9 9 Set Number: [8] 9 9

Date:[11] 2 0 0 2 1 0 2 8 Sample Type: RANDOM "T" [19] 2

Tagger: MALCOLM [21] 2 9 7 Recorder: ROB [25] 2 7 4

Species: SABLEFISH [29] 4 5 5 Tag Type: ANCHOR [32] 1 0

Tag Check	Primary Tag Number prefix [35-37]							Fork Length (mm)			Error 1	Error 2	Injury 1	Injury 2	Comments
	A	0	0												
34	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
	7	8	8	0	0	0		6	9	0					
						1		6	4	6					
						2		6	8	4					
						3		6	7	3					
						4		6	6	0					
						5		6	1	6			C		
						6		6	4	4					
						7		5	5	0					
						8		5	8	1					
A	7	8	8	0	0	9		6	9	8					
					1	0		6	0	1					
						1		6	1	4					
						2		6	1	3					
						3		7	1	1					
						4		5	9	6					
						5		6	6	5					
						6		5	9	3					
						7		6	1	9					
						8		6	0	8					
0	7	8	8	0	1	9		5	8	9					
					2	0		6	1	1					
						1		5	4	1					
						2		7	1	3			C	D	
						3		6	8	2					
						4		5	9	1					
0	7	8	8	0	2	5		5	9	4					
						6		6	5	1					
						7		5	5	5					
						8		7	8	6	P		F		
						9		5	5	8					
				0	3	0		6	[illegible]	[illegible]	B				
						1		5	4	1					
						2		6	5	5					
						3		6	3	8					
						4		7	5	6					
						5		5	9	8					
						6		6	3	2					
0	7	8	8	0	3	7		6	4	5					
						8		5	7	4					
						9		6	1	2					

COMMENTS:

Sample Type:
- **1** = total catch
- **2** = random
- **4** = selected
- **9** = juveniles
- **10** = adults

Tag Type:
- **10** = anchor
- **20** = suture
- **30** = Peterson disc

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

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

Injury:
- **A** = damage from amphipods
- **B** = bleeding
- **C** = cuts or fresh wounds
- **D** = fish dropped on deck
- **E** = eyes cloudy, blind
- **F** = fin damaged
- **H** = misshapen fish
- **L** = scale loss
- **N** = scrapes and abrasion
- **O** = bleeding at OTC hole
- **R** = raw wound around tag
- **S** = scar of healing wound
- **T** = tail damaged
- =
- =
- =
- =
- =

Figure C.7. Example of a completed tagging form used during the 2002 survey.

APPENDIX D SABLEFISH GONAD MATURITY STAGES

Maturity Stage	Code	Males	Females
Immature 1	01	very thin string-like >1 mm thick, translucent white colour	thin string-like =1.5mm thick mid-section, translucent-white colour
Immature 2	02	thin string-like 3mm thick, extends length of cavity, white-translucent colour	thickened >5mm, does not extend length of cavity, some folds sausage like translucent-white colour
Ripening 1	03	thick >10mm visible folds, white smooth texture, =20% body cavity	eggs present, white opaque colour encased in translucent sock, <25% of body cavity
Ripening 2	04	as above but with blood vessels present on surface, >30% body cavity	eggs larger =1mm diameter, white in colour, blood vessels present on surface, >25% of body cavity
Ripe	05	as above blood vessels present, folds delicate, some sperm may flow, >40% of body cavity	eggs at least 1mm diameter, white in colour, gonad full size, >50% of body cavity
Ripe 1	06	no stage in males	gonad same size as above but at least 25% of eggs have become translucent
Ripe 2	07	no stage in males	gonad same size as above but at least 50% of eggs have become translucent
Running Ripe	08	lobes fully developed, sperm is released when slight pressure is applied to external posterior region of body cavity	stream of translucent eggs released when slight-moderate pressure is applied to external posterior region of body cavity
Spent	09	lobes or folds are bloodshot, some sperm may be present when moderate pressure is applied to external posterior region of body cavity	gonad is red-purple in colour, residual eggs may be present, outer wall of gonad flaccid
Resorbing	10	no stage in males	eggs present but did not function normally (not normal)
Recovering	11	lobes flat, brown in colour, bloodshot appearance on edges and ends of lobes	still some red purple colour, not flaccid, whitish sheen to exterior surface
Resting	12	firm, light brown colour, some wrinkles on surface	smooth elongated and round in shape, brown purple pulp interior, exterior surface has whitish sheen

APPENDIX E DETAILS ON SABLEFISH CATCH AND NUMBERS RECOVERED, SAMPLED AND TAGGED DURING THE 2002 INDEXING CHARTER (PACIFIC VIKING).

Set	Catch		Number		Number sampled for					Proportion	Mean Fork Length (mm)		
	Weight (kg)	Count	Recovered	Tagged	Fork Length	Sex	Maturity	Otolith	Round Weight	Males (%)	Male	Female	Tagged
1	120	44		0	44	44	44	44	0	55	583	645	-
2	137	63		0	58	58	58	58	58	74	553	587	-
3	297	146	4	0	143	143	143	143	0	72	547	620	-
4	289	153	2	0	149	148	148	149	0	77	545	622	-
5	219	100		0	101	101	101	101	0	48	572	610	-
6	221	81	1	0	80	80	80	80	0	16	619	636	-
7	251	75		0	75	75	75	75	0	8	637	691	-
8	44	11		0	11	11	11	11	11	0	-	730	-
9	66	19		0	19	19	19	19	19	5	705	696	-
10	206	88		0	88	88	88	63	31	43	573	637	-
11	165	74	3	0	71	70	70	71	0	64	562	654	-
12	30	13		0	13	13	13	13	0	69	575	640	-
13	196	64		0	65	65	65	65	0	54	623	659	-
14	139	45		0	45	45	45	45	0	60	617	661	-
15	192	75		0	75	75	75	75	75	64	596	662	-
16	68	21		0	21	21	21	21	21	62	608	723	-
17	100	49		0	49	45	45	49	49	67	580	596	-
18	30	13		0	14	13	13	14	13	39	583	612	-
19	99	40		0	40	40	40	40	40	40	591	634	-
20	70	23		0	23	23	23	23	23	22	627	676	-
21	47	11		0	11	11	11	11	11	0	-	748	-
22	43	11		0	11	11	11	11	0	0	-	713	-
23	143	44		0	43	43	43	43	0	2	651	676	-
24	469	210	1	0	211	211	64	64	0	49	569	621	-
25	363	204	4	0	202	202	67	67	0	86	549	674	-
26	55	26	1	0	26	26	26	26	0	73	558	616	-
27	31	13		0	14	14	14	14	0	64	574	635	-
28	17	6		0	6	6	6	6	0	33	627	643	-
29	20	7		0	7	7	7	7	0	57	598	674	-

Set	Catch		Number		Number sampled for					Proportion	Mean Fork Length (mm)		
	Weight (kg)	Count	Recovered	Tagged	Fork Length	Sex	Maturity	Otolith	Round Weight	Males (%)	Male	Female	Tagged
30	111	42		0	33	33	33	33	15	69	577	684	-
31	164	72		0	71	71	71	71	0	72	588	624	-
32	43	13		0	13	13	13	13	0	31	653	689	-
33	77	23		0	23	23	23	23	0	26	619	702	-
34	82	22		0	22	22	22	22	0	5	709	715	-
35	48	12		0	12	12	12	12	0	0	-	727	-
36	51	11		0	11	11	11	11	11	0	-	767	-
37	89	20		0	20	20	20	20	3	20	716	756	-
38	138	41		0	41	41	41	41	41	63	646	707	-
39	105	42		0	43	43	43	43	43	93	627	629	-
40	211	84	1	0	79	78	78	79	0	80	628	666	-
41	142	50		0	50	50	50	50	50	36	633	646	-
42	100	34		0	34	34	34	34	33	41	628	656	-
43	18	6		0	6	6	6	6	6	50	647	652	-
44	166	64		0	63	63	63	63	0	71	599	662	-
45	316	130		0	132	132	132	132	92	70	591	645	-
46	54	21		0	21	21	21	21	21	71	609	649	-
47	38	8		0	8	8	8	8	8	50	650	817	-
48	6	2		0	2	2	2	2	2	50	702	676	-
49	22	5		0	5	5	5	5	5	0	-	763	-
50	23	5		0	5	5	5	5	5	0	-	764	-
51	65	12		0	12	12	12	12	12	8	769	792	-
52	70	24		0	24	24	24	24	24	79	641	703	-
53	7	2		0	2	2	2	2	2	50	595	787	-
54	19	8		0	8	8	8	8	8	75	604	639	-
55	114	41		0	41	40	40	41	41	40	587	648	-
56	193	57		0	56	56	56	56	56	25	625	687	-
57	152	42		0	43	43	43	43	0	14	597	682	-
58	418	134		0	134	134	65	65	0	48	611	665	-
59	447	151		0	148	148	101	101	0	36	586	662	-
60	113	50		0	50	50	50	50	0	80	577	692	-
61	271	160	3	0	157	157	57	57	57	90	535	590	-

Set	Catch		Number		Number sampled for					Proportion	Mean Fork Length (mm)		
	Weight (kg)	Count	Recovered	Tagged	Fork Length	Sex	Maturity	Otolith	Round Weight	Males (%)	Male	Female	Tagged
62	55	13		0	13	13	13	13	0	31	683	738	-
63	33	9		0	9	9	9	9	0	22	707	737	-
64	51	15		0	15	15	15	15	15	47	645	719	-
65	123	46		0	46	46	46	46	46	65	608	700	-
66	57	18		0	18	18	18	18	18	61	666	712	-
67	43	17	1	0	16	16	16	16	0	69	610	699	-
68	193	71		0	75	75	75	75	0	65	599	697	-
69	337	129	2	0	124	124	74	74	0	69	617	657	-
70	302	88		0	88	88	60	60	0	31	625	687	-
71	489	127	2	0	127	126	80	81	79	27	599	688	-
72	475	152	1	0	151	151	57	57	0	42	611	664	-
73	190	61	1	0	60	60	60	60	20	48	622	683	-
74	163	60		0	60	60	60	60	40	73	609	709	-
75	43	12		0	12	12	12	12	0	42	657	731	-
76	244	52		0	52	52	52	52	52	15	711	773	-
77	41	8		0	8	8	8	8	0	0	-	793	-
78	93	22		0	22	22	22	22	22	27	694	758	-
79	36	7		0	7	7	7	7	7	0	-	788	-
80	116	32		0	32	32	32	32	32	38	676	715	-
81	73	19		0	19	19	19	19	19	11	611	711	-
82	485	165		0	165	165	117	117	0	47	598	664	-
83	612	181	2	0	176	176	50	50	0	35	620	693	-
84	439	143	1	0	141	141	48	48	0	28	602	666	-
85	382	95		0	93	94	71	72	72	12	631	706	-
86	1339	404		0	395	394	162	163	44	39	612	675	-
87	403	128		0	127	128	64	64	41	44	621	679	-
88	130	39		0	38	38	38	38	38	42	598	692	-
89	81	21		0	21	21	21	21	21	29	635	715	-
90	91	21		0	21	21	21	21	21	14	656	747	-
91	67	14		0	14	14	14	14	14	0	-	774	-
92	30	6		0	6	6	6	6	0	0	-	746	-
93	80	21		0	21	21	20	21	0	29	645	719	-

Set	Catch		Number		Number sampled for					Proportion	Mean Fork Length (mm)		
	Weight (kg)	Count	Recovered	Tagged	Fork Length	Sex	Maturity	Otolith	Round Weight	Males (%)	Male	Female	Tagged
94	172	50		0	50	50	50	50	0	20	610	689	-
95	176	50		0	50	50	50	50	0	34	617	696	-
96	277	98		0	98	98	69	69	0	50	606	649	-
97	342	112		0	112	112	69	69	0	46	605	663	-
98	532	154	1	0	153	153	73	73	0	35	633	686	-
99	1036	364	9	267	358	91	91	91	20	19	578	630	631
100	178	77	4	198	261	63	63	63	20	18	553	609	600
101	206	109		63	108	45	45	45	20	33	531	569	569
102	60	31		0	31	31	31	31	24	26	553	572	-
103	38	22		0	22	22	22	22	22	32	533	550	-
104	421	178	4	109	175	67	67	67	67	37	574	609	601
105	708	333	10	252	320	68	68	68	24	28	530	609	575
106	1073	507	15	421	490	71	71	71	66	37	567	625	577
107	1029	492	19	404	470	67	67	67	0	36	553	602	581
108	809	387	4	314	380	68	68	68	0	60	543	583	581
109	391	160	4	102	157	55	55	55	0	15	556	607	594
110	747	326	4	239	323	84	84	84	84	32	570	624	586
111	860	303	15	240	287	47	47	47	32	26	586	648	620
112	835	322	4	258	313	55	55	55	31	40	592	642	604
113	564	201	17	137	183	45	45	46	46	29	582	645	622
114	205	86	2	31	85	55	55	55	33	22	552	600	586
115	376	170	3	118	168	50	50	50	50	34	543	608	566
116	338	137	2	97	135	38	38	38	38	21	515	617	595
117	475	187	3	123	184	61	61	61	61	31	576	616	603
118	606	246		176	249	73	73	73	73	14	534	610	594
119	97	25		0	25	25	25	25	0	48	628	739	-
120	62	20		0	19	19	19	19	0	58	589	708	-
121	75	30	1	0	30	30	30	30	0	47	552	642	-
122	334	197		0	197	197	72	72	0	91	544	620	-
123	518	225		0	211	211	114	114	0	59	566	652	-
124	60	15		0	14	13	13	14	0	0	-	699	-
125	32	8		0	8	8	8	8	0	0	-	733	-

APPENDIX F DETAILS ON SABLEFISH CATCH AND NUMBERS RECOVERED, SAMPLED AND TAGGED DURING THE 2002 TAGGING CHARTER (VIKING SUNRISE).

Set	Catch Count	Number Recovered	Number Tagged	Tagged Fish Mean Fork Length (mm)
1	411	4	416	597
2	221	3	225	619
3	167	2	167	633
4	66	1	66	714
5	332	1	331	599
6	303		285	588
7	194	3	188	586
8	26	1	26	671
9	214		218	574
10	401	3	395	547
11	111			
12	169		169	595
13	150	1	149	594
14	98		97	621
15	207	1	202	632
16	858	46	807	567
17	726	36	318	571
18		20		
19	75	2	71	659
20	233	2	233	642
21	99		99	603
22	5		5	614
23	420	1	426	588
24	166		170	656
25	23		23	730
26	37		37	694
27	108		107	662
28	164		164	630
29	339		336	591
30	189		189	582
31	100	3	97	595
32	7		7	610
33	344	2	339	648
34	284		285	636
35	341	6	348	598
36	142	1	120	643
37	175	1	174	623
38	223		221	625
39	355		331	589
40	256		253	689
41	106		104	755

Set	Catch Count	Number Recovered	Number Tagged	Tagged Fish Mean Fork Length (mm)
42	106		101	770
43	1049	112	977	576
44		89		
45		30		
46	75		74	746
47	102		101	729
48	40		39	792
49	275	1	274	651
50	300		294	626
51	259		254	636
52	116		116	699
53	156		155	677
54	185		182	646
55	151		151	652
56	208	2	200	666
57	77		76	697
58	55		55	763
59	31	1	30	783
60	642	11	617	682
61	547	11	379	694
62	661			
63	12		12	739
64	124	1	123	700
65	117		118	664
66	210		209	645
67	276	3	275	642
68	361		356	632
69	74	1	83	662
70	210	2	205	604
71	834	2	785	616
72	97	2	93	678
73	129		125	632
74	173		171	643
75	288		286	639
76	5		5	780
77	12		13	723
78	120		120	649
79	62	1	61	631
80	79	1	77	665
81	86		86	660
82	10		10	620
83	260		260	640
84	27		26	657
85	185	2	148	640
86	197		195	633
87	104	2	100	660

Set	Catch Count	Number Recovered	Number Tagged	Tagged Fish Mean Fork Length (mm)
88	44	1	41	671
89	37		34	742
90	29		18	778

APPENDIX G: TRAP GEAR GLOSSARY

This appendix describes the typical longline trap fishing gear deployed during sablefish research and assessment surveys. Slight variations in parameters such as rope length and diameter exist between these descriptions and the gear on any specific charter vessel.

Anchor: Bundle of chains weighing approximately 40 kg (90 lb) that are attached to the groundline on the becket before the first trap and after the last trap. Prevents drifting and sliding of the groundline.

Anchorline or buoyline: A 22 mm (7/8 in.) 3-ply polypropylene rope permanently attached to the groundline at the first and last becket. This line retrieves the anchor and groundline. The length depends on the depth of the set.

Baitbag: 15 x 20 cm (6 x 8 in.) 3.175 mm (1/8 in) mesh bag with a nylon drawstring and no. 72 stainless steel halibut longline snap.

Becket: 13 mm (½ in.) diameter 2 in 1 braided nylon rope spliced into the groundline every 46 m (150 ft). Each becket forms a loop of approximately 15 cm (6 in.).

Buoy: 60 to 90 cm (2 to 3 ft) diameter Bright orange inflatable plastic bladders used in combinations of two or three to suspend the sinkerline and buoyline.

Bridle: 13 mm (½ in.) 3-ply polypropylene rope "double" fastened at three points to the top hoop of the trap and knotted at a single point to form a loop of approximately 158 cm (62 in.) long with a snap bent on to the end. This bridle is fastened onto the top hoop in such a manner that pressure is inward on the tunnel when the trap is being retrieved.

Drum: Large capacity spool or drum that stores 3 to 5 complete anchor and groundline combinations.

Escape panel: 12 meshes of the trap web located in the upper half of one of the panels opposite the tunnel and cut along the horizontal bar to make a triangular opening of approximately 25 cm (10 in.) when allowed to hang loose. The cut is laced closed with a single piece of 2 mm cotton "butcher" twine. The purpose of the panel is to open when the cotton twine rots if the trap is lost while fishing, i.e. to prevent ghost fishing.

Flagpole: Attached to buoys and helps to locate the end of the string.

Groundline: 22 mm (7/8 in.) 3 ply polypropylene rope, length depending on the type and depth of the set.

Hauler or power block: Hydraulic powered pulley that hauls all the line (approximately 30 m (100 ft) per minute) aboard the vessel prior to winding or storing on the drum.

Ring: 52 mm (2 in.) diameter 8 mm (5/16 in.) stainless steel ring bent or knotted onto becket.

Shotline: Additional pieces of 22 mm (7/8 in.) polypropylene rope used to extend the anchor or buoyline, usually 91 m (50 fm) or 183 m (100 fm) long.

Sinkerline: 19 mm (¾ in.) 3-ply nylon rope attached to the top of the buoylines or shotlines. The purpose of this line is to prevent the polypropylene anchor or buoyline from floating and "puddling" on the surface and posing a hazard to navigation. The line is usually 91 m (50 fm) or 183 m (100 fm) long.

Snap: Steel device with ring on one end and a spring loaded enclosure on the other end strong enough to withstand a 1400 kg (3000 lb) strain.

Traps: The traps are a Korean design adopted and modified by local fishers to local conditions. They are designed and constructed to stack into each other when transported or stored. The traps are constructed of mild steel rod welded at all junctures. The top hoop diameter is 84 cm (33 in.), the bottom hoop diameter is 137.2 cm (54 in.), and the 6 vertical members are 79 cm (31 in.) long giving the trap a 74 cm (29 in.) vertical height. Horizontal bars are attached midway between the top and bottom hoops in 5 of the 6 vertical panels. The trap is covered or caped with a single piece of black nylon 70 mm (#42) web (stretch measure inside the knots). This is fastened to the frame so that the top is permanently closed and the bottom can be opened and closed with a draw string. The one side panel without a horizontal bar is not covered with web and accommodates the trap entrance or tunnel. The tunnel is constructed of two pieces of green 44 mm (#18) knotless braided web. The two seams of the tunnel are fastened together prior to attaching to the frame of the trap. When the tunnel is fastened to the trap it slopes downward with a 36 cm (14 in.) opening or slit. The bottom part of the slit will be taut and the top will be loose when the tunnel is stretched into place from the opposite panel of the trap. The tunnel extends 64 cm (25 in.) into the trap. When the trap is prepared for fishing both the tunnel lines and the bottom closing line (4 mm braided single-ply polypropylene twine) are pulled taut, looped together and knotted at a single point. The tunnel and bottom closing lines are of sufficient length to allow the bottom and the tunnel to collapse completely against the inside of the trap to allow for stacking. One pf the panels opposite the tunnel contains the escape panel (defined above). Chafing line (10 mm (3/8 in.) and 13 mm (½ in.) diameter 3-ply polypropylene) is wrapped around all the frame members to protect the web after the trap is covered.

(Descriptions were modified from Smith et al. 1996)