

**Summary of Non-Halibut Catch from the
Standardized Stock Assessment Survey
Conducted by the International Pacific Halibut
Commission in British Columbia from
May 28 to July 20, 2009**

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SUMMARY OF NON-HALIBUT CATCH FROM THE STANDARDIZED STOCK
ASSESSMENT SURVEY CONDUCTED BY THE INTERNATIONAL PACIFIC
HALIBUT COMMISSION IN BRITISH COLUMBIA FROM
MAY 28 TO JULY 20, 2009

by

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ABSTRACT

Flemming, R.G., Yamanaka, K.L., Cooke, K., and Dykstra, C. 2011. Summary of non-Halibut catch from the standardized stock assessment survey conducted by the International Pacific Halibut Commission in British Columbia from May 28 to July 20, 2009. Can. Tech. Rep. Fish. Aquat. Sci. 2971: viii + 87 p.

Since 2003, a third observer has been deployed on the International Pacific Halibut Commission's (IPHC) Standardized Stock Assessment (SSA) survey in British Columbia, IPHC regulatory area 2B. This document summarizes the non-Halibut catch during the 2009 survey and constructs an index of relative abundance for four species of rockfish: Redbanded (*Sebastes babcocki*), Yelloweye (*S. ruberrimus*), Rougheye (*S. aleutianus*), and Quillback (*S. maliger*) from survey data collected from 2003 to 2009. This index from recent survey years shows low growth rates of +13.2%, +9.1%, and -4.3%, for Redbanded, Yelloweye, and Rougheye Rockfishes, respectively. The series growth rate for Quillback Rockfish is +118.7%, but this value may be unduly influenced by two low CPUE values at the beginning of the series in 2003 and 2004. The annual change in the index of positive catches for Redbanded Rockfish is 0.04 over the 2003 to 2009 time series. The index of positive catches continues to decrease for Yelloweye, Rougheye, and Quillback Rockfishes at average annual rates of -0.26, -0.31, and -0.14, respectively.

RÉSUMÉ

Flemming, R.G., Yamanaka, K.L., Cooke, K., and Dykstra, C. 2011. Summary of non-Halibut catch from the standardized stock assessment survey conducted by the International Pacific Halibut Commission in British Columbia from May 28 to July 20, 2009. Can. Tech. Rep. Fish. Aquat. Sci. 2971: viii + 87 p.

Depuis 2003, un troisième observateur a été affecté à l'étude sur l'évaluation des stocks normalisés de la Commission internationale du flétan du Pacifique (CIFP) en Colombie-Britannique, dans la zone de réglementation 2B de la CIFP. Le présent document fait un résumé des captures de poissons autres que le flétan durant l'étude de 2009 et établit un indice de l'abondance relative de quatre espèces de sébastes : le sébaste à bandes rouges (*Sebastodes babcocki*), le sébaste aux yeux jaunes (*Sebastodes ruberrimus*), le sébaste à œil épineux (*S. aleutianus*) et le sébaste à dos épineux (*Sebastodes maliger*) à partir des données de l'étude recueillies de 2003 à 2009. L'indice issu des années récentes de l'étude montre de faibles taux de croissance de +13,2 %, +9,1 % et -4,3 %, respectivement, pour le sébaste à bandes rouges, le sébaste aux yeux jaunes et le sébaste à œil épineux. Le taux de croissance enregistré pour le sébaste à dos épineux est de +118,7 %. Cependant, cette valeur pourrait être faussée par deux faibles valeurs de prise par unité d'effort (PUE) au début de la série de données en 2003 et 2004. Le taux de changement annuel dans l'indice des taux positifs de prises est de 0,04 pendant la période allant de 2003 à 2009. L'indice des taux de prises positifs continue de diminuer pour le sébaste aux yeux jaunes, le sébaste à œil épineux et le sébaste à dos épineux, pour lesquels on enregistre des taux annuels moyens respectifs de -0,26, -0,31 et -0,14.

1.0 INTRODUCTION

The International Pacific Halibut Commission's (IPHC) Standardized Stock Assessment (SSA) survey is a fixed-station longline survey that extends from southern Oregon to the Bering Sea. This survey is directed to index Pacific Halibut (*Hippoglossus stenolepis*) abundance and provide accompanying biological samples to assess the Pacific Halibut (Halibut) stock. The British Columbia (regulatory area 2B) portion of this survey has been conducted annually in various configurations since 1963 (www.iphc.washington.edu). Since 2003, the IPHC has provided the opportunity to deploy an additional technician during the survey to identify the catch to species on a hook-by-hook basis and to collect biological samples from rockfish (Yamanaka *et al.* 2004, 2007, 2008, 2011; Lochead *et al.* 2006; Obradovich *et al.* 2008). Between 2003 and 2006, a contractor was hired to conduct this onboard sampling; beginning in 2007 the IPHC was contracted by DFO to provide the third technician for this survey. In addition to Halibut, many other groundfish species are commonly caught on the survey including North Pacific Spiny Dogfish (*Squalus suckleyi*), Sablefish (*Anoplopoma fimbria*), and rockfishes (*Sebastes* spp.).

Similar to past reports, this report summarizes the catch and effort by location and the biological data for the rockfish species caught incidentally during the survey. Catch and effort data collected from the IPHC SSA survey in British Columbia (BC) provide informative coastwide relative abundance indices for many groundfish species.

2.0 METHODS

2.1 IPHC Chartered Vessels and Survey Locations

The *F/V Proud Venture* and *F/V Vanisle* were chartered in 2009 to conduct the Canadian portion (Area 2B) of the IPHC SSA surveys. The *F/V Proud Venture* (CFV/VRN 23197) is a 70-foot steel vessel, skippered by Charles Harper. The *F/V Vanisle* (CFV/VRN 21912) is a 69-foot vessel, skippered by Rob Stanley.

The Canadian portion of the IPHC survey consists of 170 fixed (non-random) survey stations. From 1998 to the present, survey stations are positioned equidistant from one another on a 10 nm square grid. Beginning in 1998, regulatory area 2B was divided into four survey regions: 'Vancouver', 'Goose Island', 'St. James', and 'Charlotte'. Surveys were conducted annually in all regions with the exception of 'Vancouver', which was surveyed in 1999 and in years since 2001. The 2009 Area 2B and SE Alaska bycatch sampling manual prepared by IPHC (Appendix A) presents maps of these stations in Appendix 3 of that document, "IPHC Stations by DFO Area". Locations of stations fished in 2009 are also plotted (by mean depth) in Figure 1.

2.2 Fishing Gear and Operations

Standardized "conventional" (fixed) longline fishing gear was deployed during the survey and standardized fishing operations followed, as described in the IPHC report of assessment and research activities (<http://www.iphc.int/publications/rara/2009/553.pdf>).

Fishing gear specifications and fishing operations are detailed in Yamanaka *et al.* (2004). For 2009, seven skates per string were deployed. The duration of the fishing event or ‘soak time’ of the set is calculated as the time elapsed between the last anchor set over the stern and the first anchor hauled aboard (Yamanaka *et al.* 2004). A Sea-Bird Electronics Inc SeaCat 19 water column profiler (temperature, depth, and conductivity) was deployed on all sets. Data are available from the IPHC upon request. Average bottom depths are calculated as the average of the minimum and maximum bottom depths of the set.

2.3 Data Collection

The hook-by-hook observations and biological sampling were conducted as described for the 2003 survey (Yamanaka *et al.* 2004). Appendix A details the biological sampling protocol compiled by the IPHC. For 2009, all rockfish species were sampled and for the first time there was an attempt to record Blackspotted Rockfish (*Sebastes melanostictus*) separately from Rougheye Rockfish based on visual assessments (Orr and Hawkins 2008).

In previous years, the majority of rockfish length data was collected on dressed fish (gilled and gutted with gonads intact). Conversion factors to round length were calculated in Obradovich *et al.*, (2008), based on linear regressions fit to all round and dressed fork length data collected in 2004, 2005, and 2006 for Redbanded, Yelloweye, and Quillback Rockfish. Similar methods were used in Lochead *et al.* (2006) to calculate conversion factors for Rougheye Rockfish using combined data from 2003 and 2004. To attempt to improve the conversion factors and account for recognized variations in fish characteristics with latitude and variations in dressing technique, DFO requested in 2009 to collect additional samples of corresponding round and dressed lengths and weights. Sampling crew determined that the most expedient option was to adapt the sampling procedure to collect round lengths and weights for all species. So, in 2009, the majority of rockfish length data was collected on round fish. Lengths for six individual fish that were measured in the dressed state are converted back to the round state using the conversion factors previously developed. The conversion factor for Rougheye Rockfish was also applied to the Shortraker Rockfish, which was not sampled but is similar in morphology to the Rougheye Rockfish. The regression equations from previous years are reprinted here for convenience.

Redbanded:	$l_r = 0.9870 l_d + 5.4041 \text{ mm}$
Yelloweye:	$l_r = 1.0048 l_d - 5.9226 \text{ mm}$
Rougheye:	$l_r = 0.9675 l_d + 15.555 \text{ mm}$
Quillback:	$l_r = 0.9400 l_d + 17.7126 \text{ mm}$

where l_r = round length and l_d = dressed length

2.4 Catch Rate

Catch rate (U) is defined here as the total number of fish caught (N) divided by the number of normal condition hooks (H) returned from the set, multiplied by 100. The number of fish caught does not include those fish that were identified but escaped before being brought on board (i.e., lost at the roller). The hook count excludes all missing, bent, and broken hooks. Mean species catch rates (\bar{U}_s) are calculated as the sum of the

non-zero catch rates per set (U_{is}) divided by the number of sets with positive catch (n), where s denotes the species, and i denotes the set.

$$U_{is} = \frac{N_{is}}{H_i} * 100 \quad \overline{U}_s = \frac{1}{n} \sum_{i=1}^n \left(\frac{N_{is}}{H_i} * 100 \right) \quad (3, 4)$$

2.5 Relative abundance index

For the time series of data from earlier surveys conducted in 1995 to 2002, a relative abundance index is presented in Yamanaka *et al.* (2011).

The relative abundance index is constructed from \log_2 transformed non-zero catch rate data. Examining the slope of the regression line running through the median values gives an annual logarithmic growth rate (b), where a slope of 1 and -1 reflect a doubling and halving, respectively, of the catch rate (Schnute *et al.* 2004). Annual relative growth rate (r) is calculated from:

$$r = 2^b - 1 \quad (5)$$

where b is the annual logarithmic growth rate. The accumulated relative change (R) is similarly calculated from:

$$R_l = 2^{b(l-1)} - 1 \quad (6)$$

where b is the annual logarithmic growth rate and l is the number of observations over the time series (Schnute *et al.* 2004).

The index of relative abundance is created using catch rate data from all stations fished during 2003 to 2009. During this period, a third technician collected complete hook by hook catch information, and survey design, gear specifications and fishing operations were consistent. Hook counts exclude all missing, bent or broken hooks. This index benefits from the inclusion of data from all stations, accounting for hook problems, and its conceptual simplicity. With more than six years of data this index can be expected to capture trends in relative abundance (Yamanaka *et al.* 2004).

2.6 Index of positive catches

Only a small proportion of the stations fished in this Halibut-directed survey yield a rockfish catch. Since the indices of relative abundance are determined from positive catches, the trends in positive catches over time are also examined. Because this is a spatially explicit survey, positive trends may represent an increasing spatial distribution of rockfish as more of the stations are yielding rockfish. In addition, the frequency of zero catches has also shown to be proportional to abundance in hook and line fisheries (Bannerot and Austin 1983).

3.0 RESULTS AND DISCUSSION

3.1 Survey Locations

The *F/V Proud Venture* fished the ‘Vancouver’, ‘Goose Island’, and ‘St. James’ regions between May 28 and July 20, 2009 and the *F/V Vanisle* fished the ‘Charlotte’ region between June 28 and July 18, 2009. (The *F/V Vanisle* also conducted portions of the IPHC SSA survey in the ‘Fairweather’ region in Alaskan waters.) Figure 1 shows survey locations grouped by mean depth of fishing plotted over IPHC survey regions, and Pacific States Marine Fisheries Commission (PSMFC) Areas. Details for each set are listed in Appendix B.

3.2 Catch Summary

The DFO “GFBio” database archives data from the 2009 IPHC SSA survey with TRIP_IDs 69047 (*F/V Proud Venture*) and 69048 (*F/V Vanisle*). The FOS database (Fisheries Operations System) houses landed catch weights under Trip IDs 125432, 125872, 126379, 126965, 127631, 128177 (*F/V Proud Venture*), 126427, 127039, 127663, and 128115 (*F/V Vanisle*), readily accessible through the Groundfish Section database front-end “GFFOS”. Appendix C lists detailed set information by PSMFC Area, common IPHC station and year (2003 to 2009), showing the number of hooks deployed, returned, with bait, empty, or with catch, separated for Halibut, North Pacific Spiny Dogfish (Dogfish), Redbanded Rockfish, Yelloweye Rockfish, Rougheye Rockfish, and Quillback Rockfish, with catch per 100 hooks shown for rockfish.

Species catch, in numbers, is shown in Table 1. Dogfish, Halibut, and Sablefish are the three most commonly caught species on the survey, accounting for 78% (in numbers) of all species caught. Table 2 lists species that were identified at the surface but escaped before being brought on board, which amount to only a half a percentage of the total catch of marine fish. A total of 49,428 kilograms (kg) of Halibut and 13,327 kg of Rockfish were landed during the survey (Table 3). Yelloweye Rockfish and Redbanded Rockfish account for the 2nd and 3rd greatest landed weights by species. Sablefish caught on the 2009 survey were not landed.

3.2.1. Hook by Hook

Forty percent of the hooks deployed on the survey returned empty, 26% of the hooks returned with bait or bait skin, and 34% of the hooks were occupied by a fish or an invertebrate (Table 4). Less than one percent of the hooks were missing, bent or broken. Table 5 lists the total number of hooks deployed in each year from 2003 to 2009, and summarizes line snarls. There were 448 line snarls in 2009, which is consistent with previous years. Fish are often caught on hooks involved in line snarls, so in many cases these hooks can still be considered to be fishing.

3.2.2. Biological Sampling

Biological samples were taken for 14 species of rockfish, including 1580, 1268, 346, and 177 otolith pairs from Redbanded, Yelloweye, Rougheye, and Quillback, respectively (Table 6).

Rockfish length (round) summaries by species, for all regions combined, and by PSMFC Area, are shown in Table 7. Area 5C/D had the largest mean size for Yelloweye Rockfish at 56cm.

Rockfish sexual maturity summaries are shown in Table 8. The majority of rockfish caught during the survey were sexually mature. In previous years there have been a higher proportion of males, with female Yelloweye Rockfish making up only 37-44% of the catch. In 2009 there was a nearly even sex ratio for Yelloweye Rockfish, with females making up 49.6% of the sampled catch.

Summary statistics of age data collected in 2009 are presented in Table 9 for Yelloweye Rockfish and Table 10 Quillback Rockfish, for all areas combined and by PSMFC Areas. Also shown are mean, minima and maxima by sex for each species. Age frequency histograms for Yelloweye Rockfish and Quillback Rockfish, males and females combined, are shown in Figure 2. The age of Yelloweye Rockfish caught ranged from 12 years to 115 years, with a mean of 36 years. The most common age of Yelloweye Rockfish caught on this 2008 IPHC SSA survey was 27 years. Yelloweye Rockfish from area 5E had the oldest mean age at 40 years, all other areas had a mean age of approximately 36 years. The mean age of female Yelloweye Rockfish is 39 years, greater than that for males throughout the survey, at 34 years. However, in area 5E, the mean age of male Yelloweye Rockfish was 40 years, one year greater than the mean age of females. The greatest disparity in ages between sexes occurred in area grouping 3C/D,5A where the mean age of female Yelloweye Rockfish was 44 years and the mean age of males was 33 years. Quillback Rockfish ages ranged from 13 to 70 years with a mean of approximately 33 years. Quillback Rockfish ages were bi-modal, with 25 and 33 years occurring with equal frequency. The mean age of male Quillback Rockfish, at 34 years, was greater than the mean age of 33 years for female Quillback Rockfish. As with Yelloweye Rockfish, Area 5E produced the oldest mean age for male Quillback Rockfish of 38 years.

3.3 Catch Rates

Summaries of non-zero rockfish catch rates (numbers of fish per 100 hooks), for the entire BC coast (IPHC area 2B) and separated by PSMFC Areas, are presented in Table 11. Overall mean catch rates were highest for Redbanded and Yelloweye rockfishes at 3.7 fish per 100 hooks and 2.7 fish per 100 hooks, respectively. The highest mean catch rate for Redbanded Rockfish occurred in area 5E at 6.2 fish per 100 hooks, while for Yelloweye Rockfish the highest rates occurred in area 5E at 4.3 fish per 100 hooks.

Table 11 also shows the proportion of positive catches for each rockfish species. Redbanded and Yelloweye Rockfishes occurred in only 76 and 74 respectively of 170 sets. Quillback Rockfish occur in only 28 sets. Boccaccio, and Canary, Rougheye,

Shortraker, and Silvergray Rockfishes were encountered on average in 12.4% of the sets. Other rockfishes were caught only sporadically, ranging from 1 to 6 positive catches. Darkblotched and Yellowtail Rockfishes were not encountered in 2009.

The spatial distribution of rockfish catch rates (numbers per 100 hooks) of Redbanded, Yelloweye, Rougheye, and Quillback, four commonly caught species, are shown in Figures 3 through 6. Redbanded, Yelloweye, and Quillback Rockfishes were caught throughout the entire survey area. Rougheye Rockfish was caught more commonly in the northern half of the survey area. Catch identified as Blackspotted Rockfish is not included on Figure 5. Redbanded Rockfish occur consistently in the deepest stratum of the ‘St. James’ and ‘Goose Island’ IPHC survey regions. Generally, the distributions of the catch rates are related to mean fishing depth.

3.4 Relative abundance index

A relative abundance index was constructed for each of four commonly caught rockfish species. This index employs all 170 stations fished each year between 2003 and 2009, with the exception of one station in 2008 for which hook tally data was lost overboard, and uses 100 hooks as a unit of effort (Table 12 and Figures 7 through 10). Rougheye and Blackspotted Rockfishes have been aggregated to maintain comparability with other survey years.

For the four commonly caught rockfish species, the \log_2 transformed median catch per unit effort (of non-zero catches) are shown in Table 12 for 2003 to 2009.

Figures 7 through 10 present the abundance indices for the four commonly caught rockfish species. Boxplots of the \log_2 transformed median non-zero catch per unit effort for the time series are shown in the upper panels and a series median and growth rate with r^2 value are listed. The lower panels of each show a plot of the rate of positive catches with a regression line for the index shown and the average annual change listed.

For the 2003 to 2009 time series index the change in CPUE from year to year is nearly zero, except in the case of Quillback Rockfish which shows an increase in CPUE. The series growth rate in the last seven years of the survey is +13.2%, +9.1%, -4.3%, for Redbanded, Yelloweye, and Rougheye Rockfishes, respectively (Figure 7, 8, and 9). The series growth rate for Quillback Rockfish is +118.7%, but this value may be unduly influenced by two low CPUE values at the beginning of the series in 2003 and 2004 (Figure 12).

3.5 Index of positive catches

The positive catch rate from all stations in 2003 to 2009 ranges from a high of 45% of stations for Redbanded Rockfish in 2005 and in 2009 to a low of 11% of stations for Rougheye Rockfish in both 2006 and 2007 (Table 12).

Redbanded, Yelloweye, and Quillback Rockfishes were caught more frequently in 2009 than in previous years. The proportion of positive catches have changed only slightly

over the 2003 to 2009 time series, with an average annual change of +0.04, -0.26, -0.31, and -0.14 for Redbanded, Yelloweye, Rougheye, and Quillback Rockfishes, respectively.

SUMMARY

The 2003 – 2009 indices reveal no remarkable changes to trends. Series median catch rates are unchanged by the addition of 2009 data. For Redbanded and Yelloweye Rockfishes, slightly higher CPUE series growth rates coincide with relatively high proportions of positive catches in 2009. For Rougheye and Quillback Rockfishes the proportion of positive catches in 2009 is closer to the series average. All indices appear to be fairly stable, suggesting only small changes in the relative abundances of these species.

The IPHC SSA Halibut survey provides valuable, fishery independent relative abundance indices for commonly caught rockfish. There is no other coastwide, long-term abundance index available for these rockfishes. This survey may also provide similar indices for other species commonly caught on longline gear, such as Dogfish and Sablefish, and proportion of positive catch trends for other less commonly caught species.

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Table 1. Summary of species catch brought on board in numbers (descending order) and as a percent of total marine fish species for the BC coast, and in numbers by each PSMFC Area. Rockfish are highlighted.

Common Name	Taxonomic Name	Total	3C/D, 5A	5B	5C/D	5E	% Total Fish
North Pacific Spiny Dogfish	<i>Squalus suckleyi</i>	19112	6802	5556	6220	534	47.88
Pacific Halibut	<i>Hippoglossus stenolepis</i>	9204	2809	2625	2986	784	23.06
Sablefish	<i>Anoplopoma fimbria</i>	3342	820	1098	1067	357	8.37
Redbanded Rockfish	<i>Sebastodes babcocki</i>	1910	204	668	908	130	4.78
Arrowtooth Flounder	<i>Reinhardtius stomaticus</i>	1908	627	369	854	58	4.78
Yelloweye Rockfish	<i>Sebastodes ruberrimus</i>	1358	326	606	279	147	3.40
Longnose Skate	<i>Raja rhina</i>	1242	482	423	306	31	3.11
Lingcod	<i>Ophiodon elongatus</i>	504	297	68	98	41	1.26
Sunflower Starfish	<i>Pycnopodia helianthoides</i>	448	185	72	169	22	-
Rougheye Rockfish	<i>Sebastodes aleutianus</i>	343	12	26	62	243	0.86
Quillback Rockfish	<i>Sebastodes maliger</i>	181	66	19	46	50	0.45
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	155	4	58	65	28	0.39
Shortraker Rockfish	<i>Sebastodes borealis</i>	147	3	56	70	18	0.37
Big Skate	<i>Raja binoculata</i>	116	63	14	32	7	0.29
Pacific Cod	<i>Gadus macrocephalus</i>	97	16	10	70	1	0.24
Silvergray Rockfish	<i>Sebastodes brevispinis</i>	78	10	33	14	21	0.20
Canary Rockfish	<i>Sebastodes pinniger</i>	66	24	10	13	19	0.17
Fish-Eating Star	<i>Stylasterias forsteri</i>	65	23	12	26	4	-
Spotted Ratfish	<i>Hydrolagus colliei</i>	36	7		17	12	0.09
Bocaccio	<i>Sebastodes paucispinis</i>	24	8	9	3	4	0.06
Starfish	<i>Asteroidea</i>	23	15	8			-
Blackspotted Rockfish	<i>Sebastodes melanostictus</i>	23		13	3.00	7.00	0.06
Octopus	<i>Octopoda</i>	17	3	3	11		-
Petrale Sole	<i>Eopsetta jordani</i>	16	8		6	2	0.04
Tope Shark	<i>Galeorhinus galeus</i>	16	2	3	9	2	0.04
Yellowmouth Rockfish	<i>Sebastodes reedi</i>	12	1	11			0.03
Anemone	<i>Actiniaria</i>	11	7		4		-
Pacific Sleeper Shark	<i>Somniosus pacificus</i>	9		6	3		0.02
Aleutian Skate	<i>Bathyraja aleutica</i>	8		1	6	1	0.02
Blue Shark	<i>Prionace glauca</i>	8	2	2	4		0.02
China Rockfish	<i>Sebastodes nebulosus</i>	6	1		1	4	0.02
Wolf Eel	<i>Anarrhichthys ocellatus</i>	5	3	1	1		0.01
Sea Whip	<i>Balticina septentrionalis</i>	3	2		1		-
Alaska Skate	<i>Bathyraja parmisera</i>	3		1	2		0.01
Basket Stars	<i>Euryalina</i>	3	2		1		-
Bluntnose Sixgill Shark	<i>Hexanchus griseus</i>	3	3				0.01
Southern Rock Sole	<i>Lepidotsetta bilineata</i>	3	3				0.01
Slender Sole	<i>Lyopsetta exilis</i>	3	1	2			0.01
Sponges	<i>Porifera</i>	3	1	1	1		-
Radiata	<i>Radiata</i>	3	1		2		-
Walleye Pollock	<i>Theragra chalcogramma</i>	3	1		2		0.01
Anthozoa	<i>Anthozoa</i>	2			2		-
Sandpaper Skate	<i>Bathyraja interrupta</i>	2			2		0.01
Steller Sea Lion	<i>Eumetopias jubatus</i>	2	1	1			-
Inanimate Object(s)	<i>Inanimate object(s)</i>	2	2				-
Box Crabs	<i>Lopholithodes</i>	2			1	1	-
Copper Rockfish	<i>Sebastodes caurinus</i>	2	1		1		0.01
Greenstriped Rockfish	<i>Sebastodes elongatus</i>	2	1	1			0.01
Rosethorn Rockfish	<i>Sebastodes helvomaculatus</i>	2	1			1	0.01
Whiteblotched Skate	<i>Bathyraja maculata</i>	1		1			0.00
Pacific Grenadier	<i>Coryphaenoides acrolepis</i>	1	1				0.00
Gastropods	<i>Gastropoda</i>	1			1		-
Sea Cucumbers	<i>Holothuroidea</i>	1				1	-
Salmon Shark	<i>Lamna ditropis</i>	1		1			0.00
Bent-Nose Macoma	<i>Macoma nasuta</i>	1				1	-
Skates	<i>Rajidae</i>	1	1				0.00
Vermilion Rockfish	<i>Sebastodes miniatus</i>	1	1				0.00
Tiger Rockfish	<i>Sebastodes nigrolineatus</i>	1	1				0.00
Unidentified Organic Matter	Unknown	1	1				-
Marine Fish Only		39919	12605	11691	13133	2490	100
Total Catch		40543	12855	11788	13370	2530	

Nb: this table includes second species caught on the same hook, and thus reports higher catch than table 3.

Table 2. Summary of species catch identified but escaped before being brought on board (“lost at the roller”) in numbers (descending order) and as a percent of total marine fish species for the BC coast and in numbers by each PSMFC Area.

Common Name	Taxonomic Name	Total	3C/D, 5A	5B	5C/D	5E	% Total Fish
Pacific Halibut	<i>Hippoglossus stenolepis</i>	104	35	39	28	2	0.26
Redbanded Rockfish	<i>Sebastes babcocki</i>	36	2	15	19	—	0.09
Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	13	3	8	2	—	0.03
Shortraker Rockfish	<i>Sebastes borealis</i>	5	—	3	—	2	0.01
Rougheye Rockfish	<i>Sebastes aleutianus</i>	3	—	—	—	3	0.01
Canary Rockfish	<i>Sebastes pinniger</i>	3	2	—	—	1	0.01
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	2	—	2	—	—	0.01
Pacific Cod	<i>Gadus macrocephalus</i>	1	—	1	—	—	0.00
Octopus	<i>Octopoda</i>	1	1	—	—	—	—
Arrowtooth Flounder	<i>Reinhardtius stomaia</i>	1	—	1	—	—	0.00
Quillback Rockfish	<i>Sebastes maliger</i>	1	1	—	—	—	0.00
Blackspotted Rockfish	<i>Sebastes melanostictus</i>	1	—	1	—	—	0.00
Marine Fish Only		170	43	70	49	8	0.43
Total Catch		171	44	70	49	8	

Table 3. Total landed weight (kg) by species for the BC stations in the 2009 IPHC survey. Weights are for fresh, round fish, converted automatically and provided by the Groundfish Section front-end to the Fisheries Operating System database (GFFOS).

Species	Kilograms
Pacific Halibut	49,428
Yelloweye Rockfish	5,564
Redbanded Rockfish	4,756
Shortraker Rockfish	1,178
Rougheye Rockfish	1,010
Shortspine Thornyhead	255
Quillback Rockfish	221
Silvergray Rockfish	176
Canary Rockfish	128
Bocaccio	101
Pacific Cod	96
Yellowmouth Rockfish	14
Dusky Rockfish	7
Vermilion Rockfish	6
China Rockfish	6
Sablefish	4
Copper Rockfish	3
Tiger Rockfish	1
Blackspotted Rockfish	1
Pacific Ocean Perch	1
Rosethorn Rockfish	0
Greenstriped Rockfish	0
ALL ROCKFISH	13,173

Table 4. Summary of hook observations by description, DFO GFBio database code, number of hooks retrieved, and percent of total hooks.

HOOK YIELD

Description	GFBio Code	# hooks	% of total
Unknown	0	1	0.00
Empty hook	1	46789	39.58
Bait on hook	2	13438	11.37
Animal on hook (fish or invertebrate)	3	40081	33.91
Species dropped off hook	5	170	0.14
Bait skin on hook	6	17347	14.67
Eaten or bitten (by shark, etc.)	8	386	0.33
Total		118212	100.00

HOOK CONDITION

Description	GFBio Code	# hooks	% of total
Unknown	0	1	0.00
Normal	6	117106	99.06
Missing, bent, or broken hook	7	1105	0.93
Total		118212	100.00

LINE CONDITION

Description	GFBio Code	# hooks	% of total
Normal	1	116746	98.76
Snarl in line	2	1456	1.23
Gear parted	4	10	0.01
Total		118212	100.00

NB: Table counts do not include second animals/inanimate objects caught on the same hook.

Table 5. Number of hooks deployed and summary of line snarls, including the total number and percentage of hooks involved in snarls each year, for 2003 to 2009 data.

YEAR	Number of Hooks Deployed	Total Number of Snarls	Number of Hooks Per Snarl				Total Number of Hooks Involved	% hooks involved
			Average	Minimum	Maximum	Standard Deviation		
2003	134,956	294	1.44	1	15	1.59	423	0.31
2004	135,288	547	3.13	1	57	4.22	1711	1.26
2005	118,897	426	3.03	1	111	6.09	1291	1.09
2006	101,273	281	4.05	1	72	6.54	1139	1.12
2007	84,231	243	4.24	1	66	6.52	1030	1.22
2008	83,695	189	5.86	1	45	7.91	1107	1.32
2009	118,212	448	3.25	1	77	5.77	1456	1.23

Table 6. Number of specimens, by species, measured for length, examined for sex and maturity state, and with otoliths removed for ageing.

Species	Lengths	Weights	Sex	Maturities	Otoliths
Redbanded Rockfish	1889	1850	1572	1572	1580
Yelloweye Rockfish	1349	1340	1259	1259	1268
Rougheye Rockfish	368	364	346	345	346
Quillback Rockfish	177	171	177	177	177
Shortraker Rockfish	116	111	64	64	64
Silvergray Rockfish	77	76	51	51	51
Canary Rockfish	65	64	26	26	26
Blackspotted Rockfish	24	24	21	21	21
Bocaccio	24	24	11	11	11
Yellowmouth Rockfish	12	9	10	10	10
China Rockfish	6	6	6	6	6
Copper Rockfish	2	2	2	2	2
Greenstriped Rockfish	2	2	0	0	0
Rosethorn Rockfish	1	1	0	0	0
All rockfish	4112	4044	3545	3544	3562

Table 7. Summary of rockfish (round) fork length in centimetres of all rockfishes for entire BC coast (IPHC area 2B) and by PSMFC Area.

	Blackspotted Rockfish					Bocaccio				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	46	41	47	41	47	71	71	71	71	70
Standard Error	0.65	-	0.74	0.33	0.97	1.24	2.83	2.21	0.88	1.55
Median	46	41	46	41	48	71	69	72	71	69
Mode	45	41	45	41	45,50	74	>3 values	78	69,71,72	>3 values
Standard Deviation	3.17	-	2.67	0.58	2.56	6.06	8.01	6.63	1.53	3.11
Sample Variance	10.03	-	7.10	0.33	6.57	36.72	64.21	44.00	2.33	9.67
Minimum	41	41	43	41	44	62	63	62	69	67
Maximum	53	41	53	42	50	88	88	79	72	74
Range	12	0	10	1	6	26	25	17	3	7
Count	24	1	13	3	7	24	8	9	3	4
	Canary Rockfish					China Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	49	48	51	49	48	34	35	36	34	-
Standard Error	0.58	1.12	1.10	1.14	1.05	0.80	-	-	1.11	-
Median	48	47	52	48	47	35	35	36	34	-
Mode	>3 values	45	48,52	46	47	35,36	35	36	>3 values	-
Standard Deviation	4.65	5.24	3.66	4.11	4.58	1.97	-	-	2.22	-
Sample Variance	21.66	27.47	13.42	16.90	21.00	3.87	-	-	4.92	-
Minimum	38	39	45	42	38	31	35	36	31	-
Maximum	57	57	57	55	55	36	35	36	36	-
Range	19	18	12	13	17	5	0	0	5	-
Count	65	22	11	13	19	6	1	1	4	-
	Copper Rockfish					Greenstriped Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	39	41	37	-	-	34	32	35	-	-
Standard Error	2.00	-	-	-	-	1.50	-	-	-	-
Median	39	41	37	-	-	34	32	35	-	-
Mode	37,41	41	37	-	-	32,35	32	35	-	-
Standard Deviation	2.83	-	-	-	-	2.12	-	-	-	-
Sample Variance	8.00	-	-	-	-	4.50	-	-	-	-
Minimum	37	41	37	-	-	32	32	35	-	-
Maximum	41	41	37	-	-	35	32	35	-	-
Range	4	0	0	-	-	3	0	0	-	-
Count	2	1	1	-	-	2	1	1	-	-
	Quillback Rockfish					Redbanded Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	39	39	40	39	37	50	49	50	51	48
Standard Error	0.22	0.33	0.65	0.42	0.43	0.12	0.34	0.22	0.17	0.47
Median	39	39	39	39	37	50	49	50	51	48
Mode	38	38	39	38	35	52	49	48	52	49
Standard Deviation	2.90	2.66	2.83	2.85	3.00	5.40	4.74	5.63	5.17	5.28
Sample Variance	8.43	7.05	8.04	8.10	9.03	29.15	22.46	31.74	26.69	27.92
Minimum	30	32	34	30	31	32	36	33	32	36
Maximum	47	44	45	47	44	68	64	64	68	62
Range	17	12	11	17	13	36	28	31	36	26
Count	177	63	19	46	49	1889	200	658	904	127

Table 7 continued on next page.

Table 7 continued

	Rosethorn Rockfish					Rougheye Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	29	29	-	-	-	51	50	50	54	49
Standard Error	-	-	-	-	-	0.30	2.08	1.33	0.53	0.31
Median	29	29	-	-	-	50	51	49	54	49
Mode	29	29	-	-	-	47	51,56	53	54	47
Standard Deviation	-	-	-	-	-	5.68	5.87	6.65	5.70	4.65
Sample Variance	-	-	-	-	-	32.27	34.50	44.17	32.55	21.62
Minimum	29	29	-	-	-	39	40	39	42	40
Maximum	29	29	-	-	-	74	56	67	74	66
Range	0	0	-	-	-	35	16	28	32	26
Count	1	1	-	-	-	368	8	25	114	221
	Shortraker Rockfish					Silvergray Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	59	64	56	69	58	55	54	55	57	53
Standard Error	1.02	5.74	1.33	1.87	1.80	0.48	0.85	0.67	1.38	0.92
Median	56	62	55	70	55	54	54	55	57	53
Mode	51	>3 values	50,55	73	51	53	53,54	56	>3 values	53
Standard Deviation	11.01	12.83	10.12	7.24	11.10	4.24	2.70	3.83	5.17	4.12
Sample Variance	121.32	164.70	102.44	52.35	123.20	18.01	7.29	14.70	26.75	17.01
Minimum	40	51	40	59	42	45	50	47	48	45
Maximum	95	78	95	85	82	68	59	62	68	59
Range	55	27	55	26	40	23	9	15	20	14
Count	116	5	58	15	38	77	10	33	14	20
	Yelloweye Rockfish					Yellowmouth Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	55	55	54	56	55	43	45	43	-	-
Standard Error	0.16	0.32	0.24	0.36	0.58	0.71	-	0.76	-	-
Median	54	55	54	55	56	43	45	43	-	-
Mode	53	55	53	53	56	43	45	43	-	-
Standard Deviation	6.01	5.68	5.88	6.03	7.01	2.46	-	2.52	-	-
Sample Variance	36.14	32.24	34.57	36.36	49.21	6.06	-	6.36	-	-
Minimum	31	40	35	43	31	40	45	40	-	-
Maximum	73	73	71	73	69	49	45	49	-	-
Range	42	33	36	30	38	9	0	9	-	-
Count	1349	319	602	281	147	12	1	11	-	-

Table 8. Sexual maturity, assessed visually, for male and female rockfish species showing the number (proportion) of fish in each maturity stage and the total number of fish sampled.

MALE		Proportion of Individuals in Each Maturity Stage						Total	
ROCKFISH		Immature	Maturing	Developing	Developed	Running	Spent	Resting	N
Blackspotted		0.17	0.67	0.17					6
Bocaccio				0.25	0.75				8
Canary			0.22		0.67		0.11		9
China							0.67	0.33	3
Copper					1.00				1
Quillback		0.18	0.16	0.16	0.01	0.20	0.29		91
Redbanded		0.07	0.22	0.65	0.00	0.04	0.03		667
Rougheye	0.01	0.16	0.10	0.64		0.06	0.03		178
Shortraker		0.07	0.11	0.69		0.04	0.09		45
Silvergray		0.13	0.08	0.04		0.21	0.54		24
Yelloweye	0.02	0.22	0.25	0.12	0.00	0.34	0.05		741
Yellowmouth			0.13	0.75		0.13			8
All Rockfish		0.01	0.15	0.21	0.39	0.00	0.18	0.06	1781

FEMALE		Proportion of Individuals in Each Maturity Stage						Total	
ROCKFISH		Immature	Maturing	Mature	Fertilized	Larvae	Spent	Resting	N
Blackspotted		0.07	0.80	0.13					15
Bocaccio						1.00			3
Canary			0.47	0.47				0.06	17
China						0.33	0.33	0.33	3
Copper							1.00		1
Quillback	0.01	0.14	0.16	0.02	0.02	0.41	0.23		86
Redbanded	0.00	0.08	0.05	0.01	0.02	0.70	0.15		905
Rougheye	0.01	0.32	0.06	0.01		0.40	0.21		167
Shortraker		0.21	0.21			0.42	0.16		19
Silvergray		0.04	0.04			0.07	0.63	0.22	27
Yelloweye	0.04	0.09	0.05	0.04	0.10	0.55	0.13		518
Yellowmouth			0.50				0.50		2
All Rockfish		0.01	0.12	0.06	0.02	0.04	0.59	0.15	1763

Table 9. Summary statistics by PSMFC Area groupings for Yelloweye Rockfish age data collected on the IPHC 2009 SSA Survey.

Male and Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	35.8	36.4	35.1	35.6	39.5
Standard Error	0.47	0.90	0.66	1.07	2.44
Median	30.0	30.0	29.0	31.0	34.0
Mode	27	29	27	26	28
Standard Deviation	15.71	16.03	14.98	16.23	17.97
Sample Variance	246.66	256.94	224.44	263.54	322.78
Minimum	12	12	14	14	16
Maximum	115	100	104	115	96
Count	1121	316	519	232	54

Male Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	33.9	32.8	34.3	33.4	39.9
Minimum	14	14	17	14	19
Maximum	96	78	96	87	80
Count	672	215	289	135	33

Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	38.7	44.1	36.2	38.8	38.8
Minimum	12	12	14	14	16
Maximum	115	100	104	115	96
Count	449	101	230	97	21

Table 10. Summary statistics by PSMFC Area groupings for Quillback Rockfish age data collected on the IPHC 2009 SSA Survey.

Male and Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	33.3	31.1	28.8	33.3	37.8
Standard Error	0.95	1.40	2.16	2.18	1.75
Median	31.0	28.0	27.0	29.5	35.0
Mode	25,33	26	25	21,27,29	33
Standard Deviation	12.61	11.14	9.42	14.75	12.28
Sample Variance	159.13	124.03	88.70	217.71	150.83
Minimum	13	13	14	13	19
Maximum	70	65	50	70	61
Count	177	63	19	46	49

Male Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	34.0	30.1	31.4	33.3	38.2
Minimum	13	15	25	13	19
Maximum	70	65	50	70	61
Count	91	30	5	22	34

Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	32.5	32.0	27.9	33.2	36.9
Minimum	13	13	14	15	20
Maximum	62	61	43	62	61
Count	86	33	14	24	15

Table 11. Summary of rockfish catch rate (numbers of fish per 100 hooks, non-zero catches) for entire BC coast (IPHC area 2B) and by PSMFC Area grouping.

All Areas (170 sets)	Black-spotted	Bocaccio	Canary	China	Copper	Green-striped	Quillback	Red-banded
Mean	0.553	0.212	0.473	0.283	0.140	0.140	0.924	3.670
Median	0.145	0.140	0.140	0.140	0.140	0.140	0.715	1.875
Standard Deviation	0.681	0.149	0.589	0.248	0.000	0.000	1.044	4.277
Sample Variance	0.464	0.022	0.346	0.062	0.000	0.000	1.090	18.292
Minimum	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
Maximum	1.760	0.720	2.300	0.570	0.140	0.140	5.130	23.320
Positive Catch Rate	0.035	0.094	0.118	0.018	0.012	0.012	0.165	0.447
3C/D, 5A (54 Sets)								
Mean		0.161	0.431	0.140	0.140	0.140	0.862	2.115
Median		0.140	0.140	0.140	0.140	0.140	0.720	1.165
Standard Deviation		0.057	0.562				0.834	2.703
Sample Variance		0.003	0.316				0.696	7.308
Minimum		0.140	0.140	0.140	0.140	0.140	0.140	0.140
Maximum		0.290	1.600	0.140	0.140	0.140	3.040	8.510
Positive Catch Rate		0.000	0.130	0.148	0.019	0.019	0.204	0.259
5B (50 Sets)								
Mean	0.950	0.320	0.282			0.140	0.680	3.086
Median	0.950	0.210	0.140			0.140	0.430	1.590
Standard Deviation	1.146	0.275	0.247				0.745	3.390
Sample Variance	1.312	0.075	0.061				0.555	11.489
Minimum	0.140	0.140	0.140			0.140	0.140	0.140
Maximum	1.760	0.720	0.710			0.140	1.720	16.440
Positive Catch Rate	0.040	0.080	0.100	0.000	0.000	0.020	0.080	0.640
5C/D (56 Sets)								
Mean	0.143	0.140	0.468	0.140	0.140		0.726	4.888
Median	0.140	0.140	0.355	0.140	0.140		0.560	3.500
Standard Deviation	0.006	0.000	0.386				0.469	5.390
Sample Variance	0.000	0.000	0.149				0.220	29.055
Minimum	0.140	0.140	0.140	0.140	0.140		0.140	0.140
Maximum	0.150	0.140	1.020	0.140	0.140		1.440	23.320
Positive Catch Rate	0.054	0.054	0.071	0.018	0.018	0.000	0.161	0.482
5E (10 Sets)								
Mean	0.990	0.280	0.907	0.570			1.783	6.190
Median	0.990	0.280	0.280	0.570			0.930	6.680
Standard Deviation		0.000	1.209				2.270	5.541
Sample Variance		0.000	1.461				5.151	30.706
Minimum	0.990	0.280	0.140	0.570			0.140	0.420
Maximum	0.990	0.280	2.300	0.570			5.130	11.470
Positive Catch Rate	0.100	0.200	0.300	0.100	0.000	0.000	0.400	0.300

Table 11 continued on next page...

Table 11 continued

All Areas (170 sets)	Rosethorn	Rougheye	Shortraker	Silvergray	Tiger	Vermilion	Yelloweye	Yellow-mouth
Mean	0.140	2.449	1.056	0.377	0.140	0.140	2.710	0.295
Median	0.140	0.585	0.285	0.140	0.140	0.140	1.295	0.160
Standard Deviation	0.000	4.469	1.910	0.382			3.610	0.292
Sample Variance	0.000	19.976	3.648	0.146			13.033	0.086
Minimum	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
Maximum	0.140	16.470	8.280	1.850	0.140	0.140	17.440	0.880
Positive Catch Rate	0.012	0.118	0.118	0.176	0.006	0.006	0.435	0.035
3C/D, 5A (54 Sets)								
Mean	0.140	0.885	0.440	0.238	0.140	0.140	1.898	0.140
Median	0.140	0.885	0.440	0.215	0.140	0.140	0.720	0.140
Standard Deviation		0.841		0.119			2.312	
Sample Variance		0.708		0.014			5.346	
Minimum	0.140	0.290	0.440	0.140	0.140	0.140	0.140	0.140
Maximum	0.140	1.480	0.440	0.430	0.140	0.140	8.020	0.140
Positive Catch Rate	0.019	0.037	0.019	0.111	0.019	0.019	0.463	0.019
5B (43 Sets)								
Mean		0.469	0.906	0.492			4.380	0.326
Median		0.430	0.580	0.505			2.180	0.180
Standard Deviation		0.389	1.030	0.332			5.444	0.316
Sample Variance		0.151	1.062	0.110			29.638	0.100
Minimum		0.140	0.140	0.140			0.140	0.140
Maximum		1.310	3.190	0.870			17.440	0.880
Positive Catch Rate	0.000	0.160	0.180	0.200	0.000	0.000	0.420	0.100
5C/D (62 Sets)								
Mean		1.267	1.108	0.248			1.824	
Median		1.140	0.140	0.140			0.430	
Standard Deviation		1.328	2.692	0.249			2.328	
Sample Variance		1.763	7.244	0.062			5.419	
Minimum		0.140	0.140	0.140			0.140	
Maximum		4.000	8.280	0.850			8.600	
Positive Catch Rate	0.000	0.125	0.161	0.143	0.000	0.000	0.393	0.000
5E (10 Sets)								
Mean	0.140	11.530	2.560	0.497			3.498	
Median	0.140	13.370	2.560	0.210			3.925	
Standard Deviation		6.073		0.673			2.021	
Sample Variance		36.879		0.453			4.083	
Minimum	0.140	4.750	2.560	0.140			0.140	
Maximum	0.140	16.470	2.560	1.850			5.700	
Positive Catch Rate	0.100	0.300	0.100	0.600	0.000	0.000	0.600	0.000

Table 12. Catch data summary for Quillback, Yelloweye, Redbanded and Rougheye rockfishes caught on the IPHC SSA survey from 2003 to 2009, for all stations fished. For each year, the number of stations fished, the total number of hooks fished, the number of fish caught, the positive catch rate, and the \log_2 median catch rates (#fish/100 hooks) of the non-zero catches are reported.

Year	Redbanded Rockfish				Yelloweye Rockfish				Rougheye Rockfish				Quillback Rockfish		
	# Stations with data	# Hooks	Number Caught	Positive Catch Rate	Number Caught	Positive Catch Rate	Number Caught	Positive Catch Rate	Number Caught	Positive Catch Rate	Number Caught	Positive Catch Rate	log ₂ (Median)		
2003	170	134,868	1,295	41.8	0.333	1210	41.8	-0.184	286	12.9	-1.184	154	17.6	-1.396	
2004	170	133,212	1,972	43.5	0.978	1522	40.6	0.595	458	17.1	-0.168	138	13.5	-2.000	
2005	170	117,947	1,568	44.7	1.000	1168	40.6	0.506	536	15.9	-0.811	295	15.3	-0.234	
2006	170	100,423	1,270	41.2	0.824	995	38.2	0.043	215	10.6	-0.234	195	17.1	-0.578	
2007	170	83,637	724	38.8	0.491	688	32.4	0.536	117	11.2	-2.252	121	13.5	-0.304	
2008	169	82,770	1,137	42.6	0.795	830	38.5	0.029	276	14.2	-0.128	88	14.2	-0.713	
2009	170	117,106	1,910	44.7	0.907	1358	43.5	0.384	366	13.5	-0.786	181	16.5	-0.474	

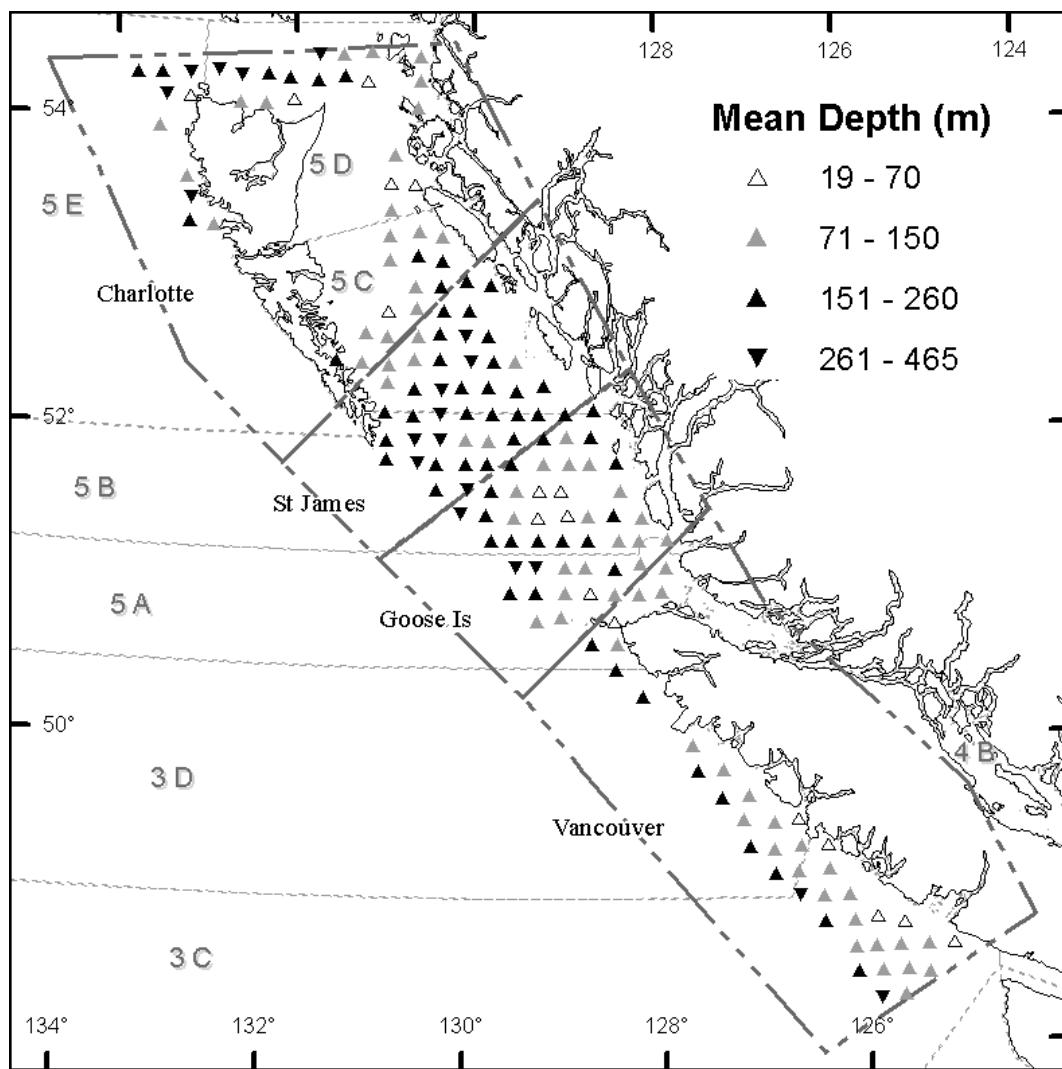


Figure 1. 2009 IPHC SSA survey stations grouped by mean depth of fishing in metres showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

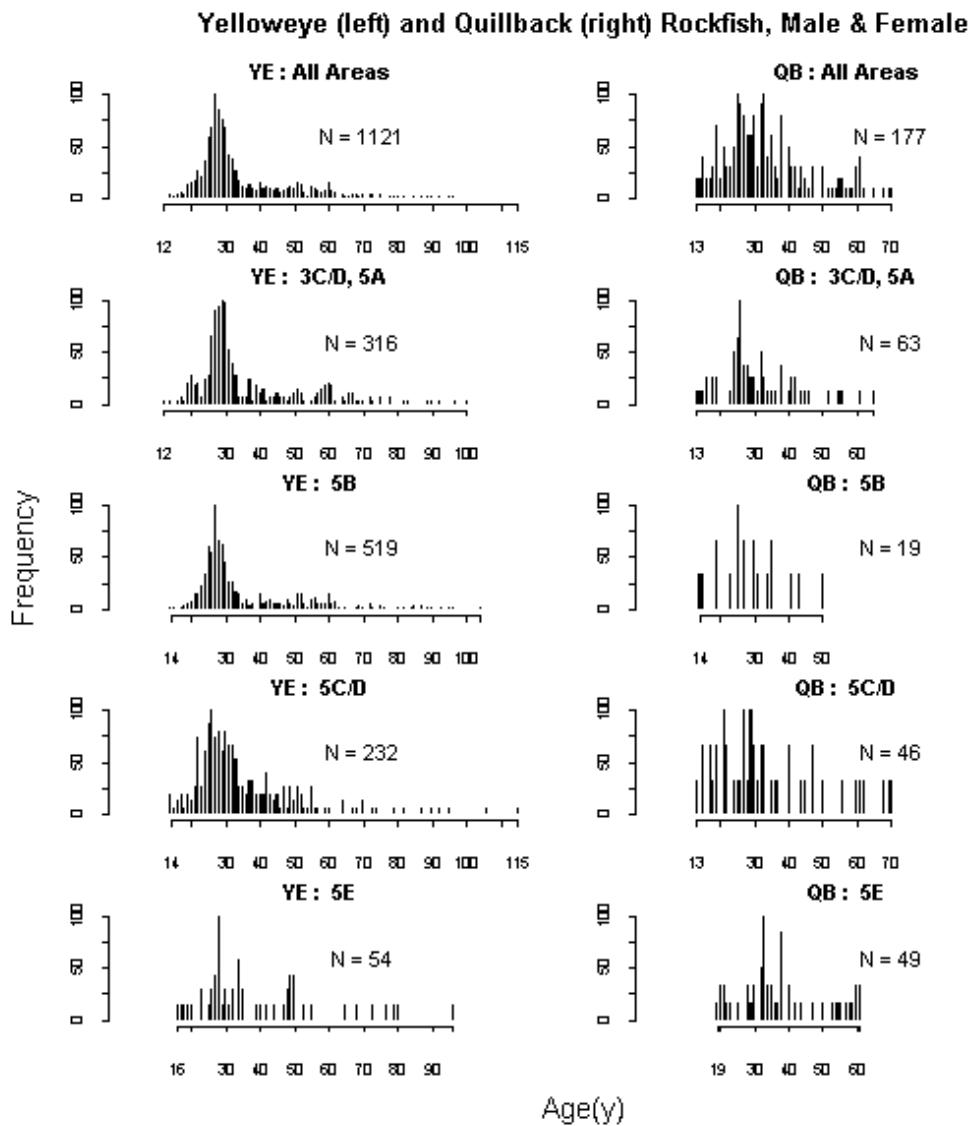


Figure 2. Age frequency histograms for all areas and by PSMFC Area for Yelloweye (left column) and Quillback Rockfish (right column), male and female combined, using data collected on the 2009 IPHC SSA Survey.

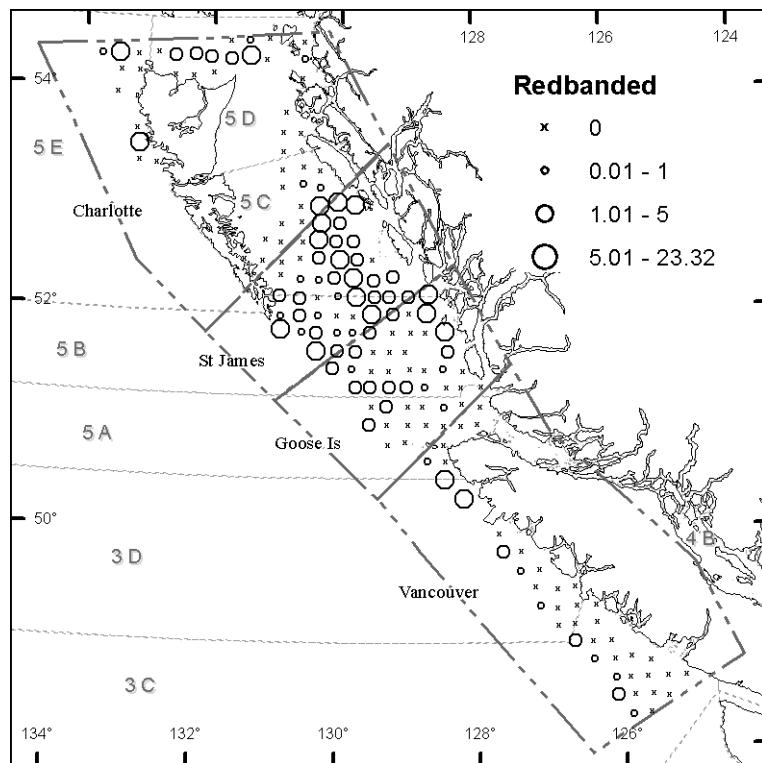


Figure 3 Catch rate of Redbanded Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

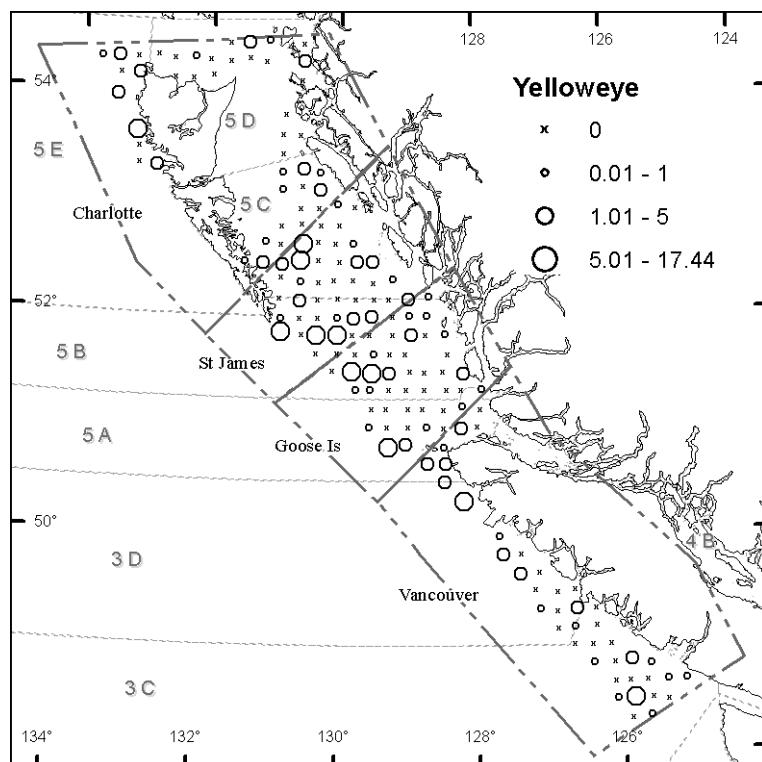


Figure 4. Catch rate of Yelloweye Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

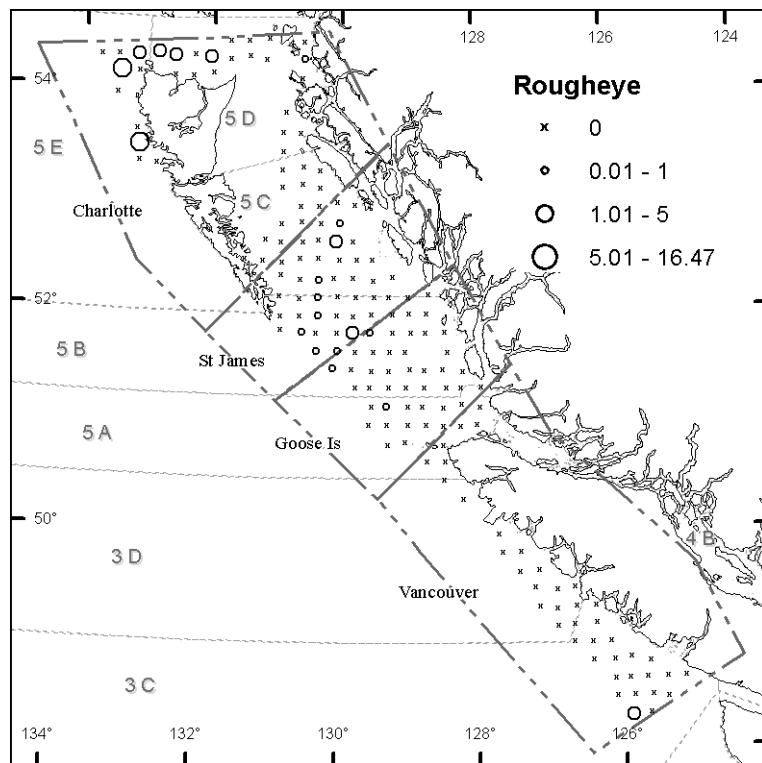


Figure 5. Catch rate of Rougheye Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

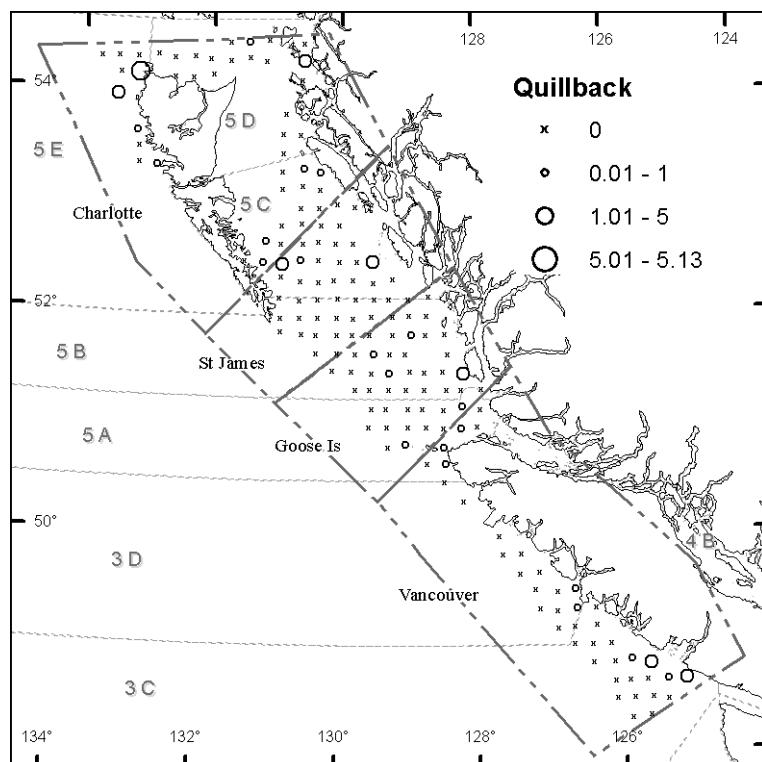


Figure 6. Catch rate of Quillback Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

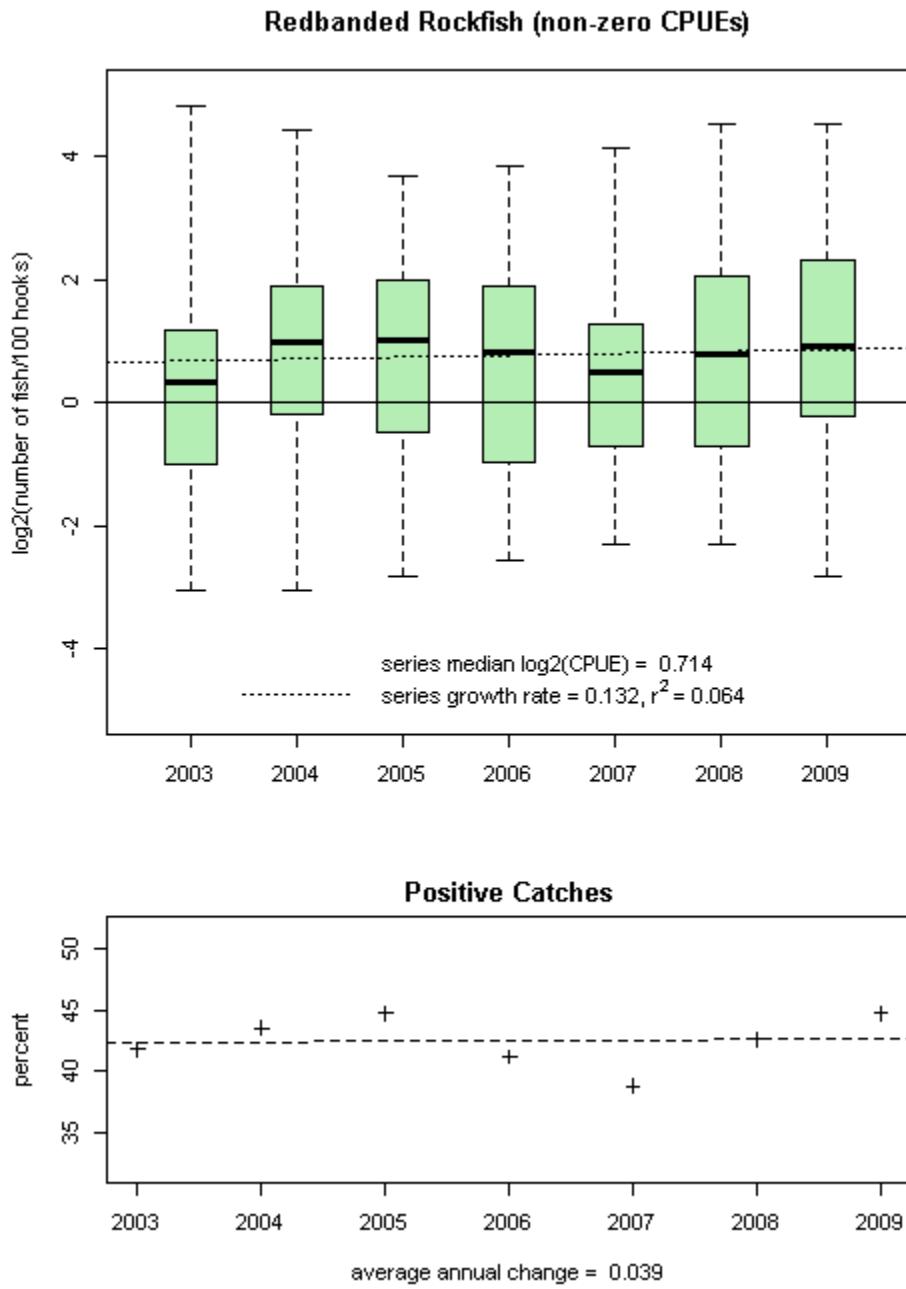


Figure 7. Upper panel: Relative abundance index (\log_2 (number of fish/100 hooks)) for non-zero catches of Redbanded Rockfish from 2003 to 2009. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median \log_2 (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the “+” symbol with a dashed regression line and the annual change presented below the graph.

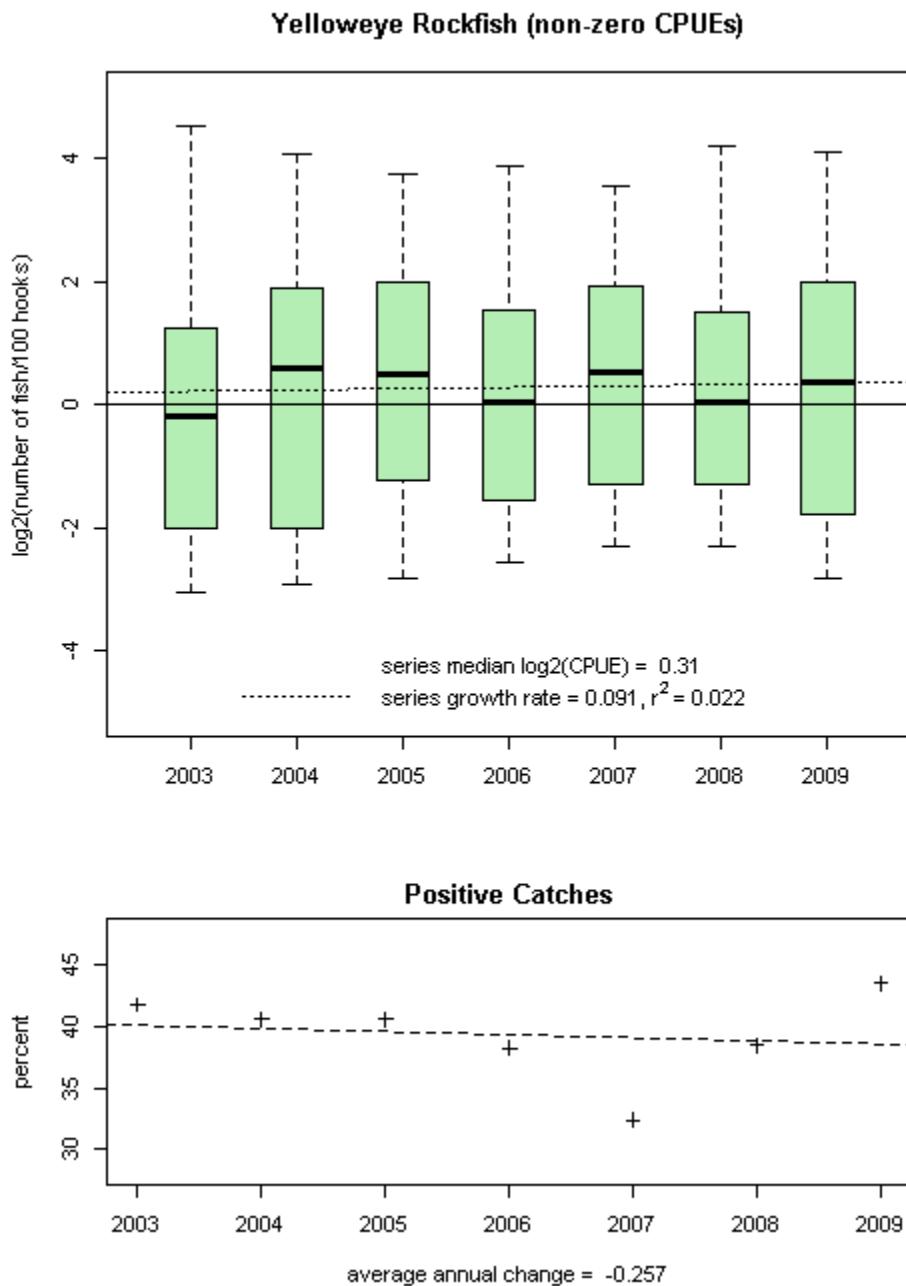


Figure 8. Upper panel: Relative abundance index (\log_2 (number of fish/100 hooks)) for non-zero catches of Yelloweye Rockfish from 2003 to 2009. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median \log_2 (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the “+” symbol with a dashed regression line and the annual change presented below the graph.

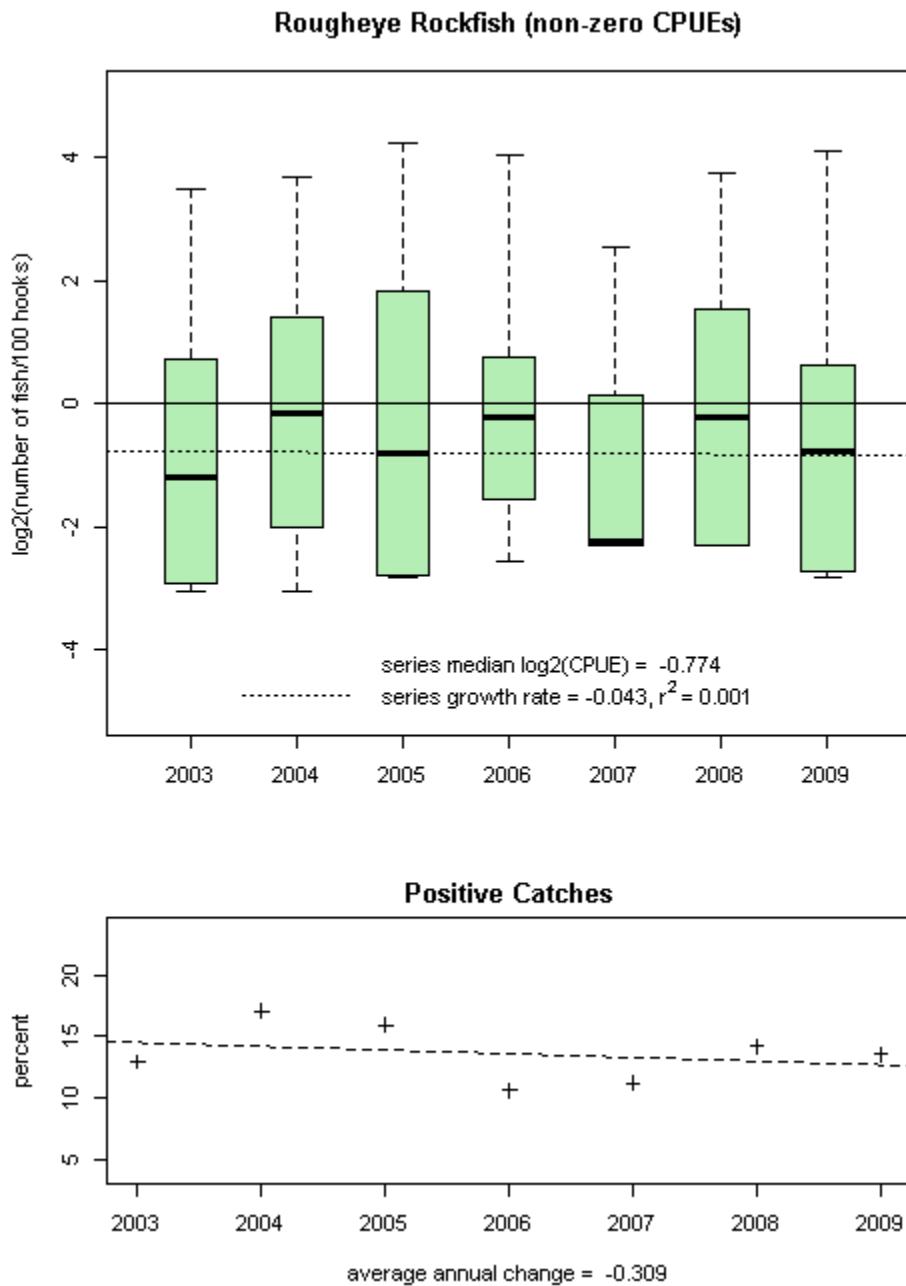


Figure 9. Upper panel: Relative abundance index (log₂ (number of fish/100 hooks)) for non-zero catches of Rougheye Rockfish from 2003 to 2009. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median log₂ (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the “+” symbol with a dashed regression line and the annual change presented below the graph.

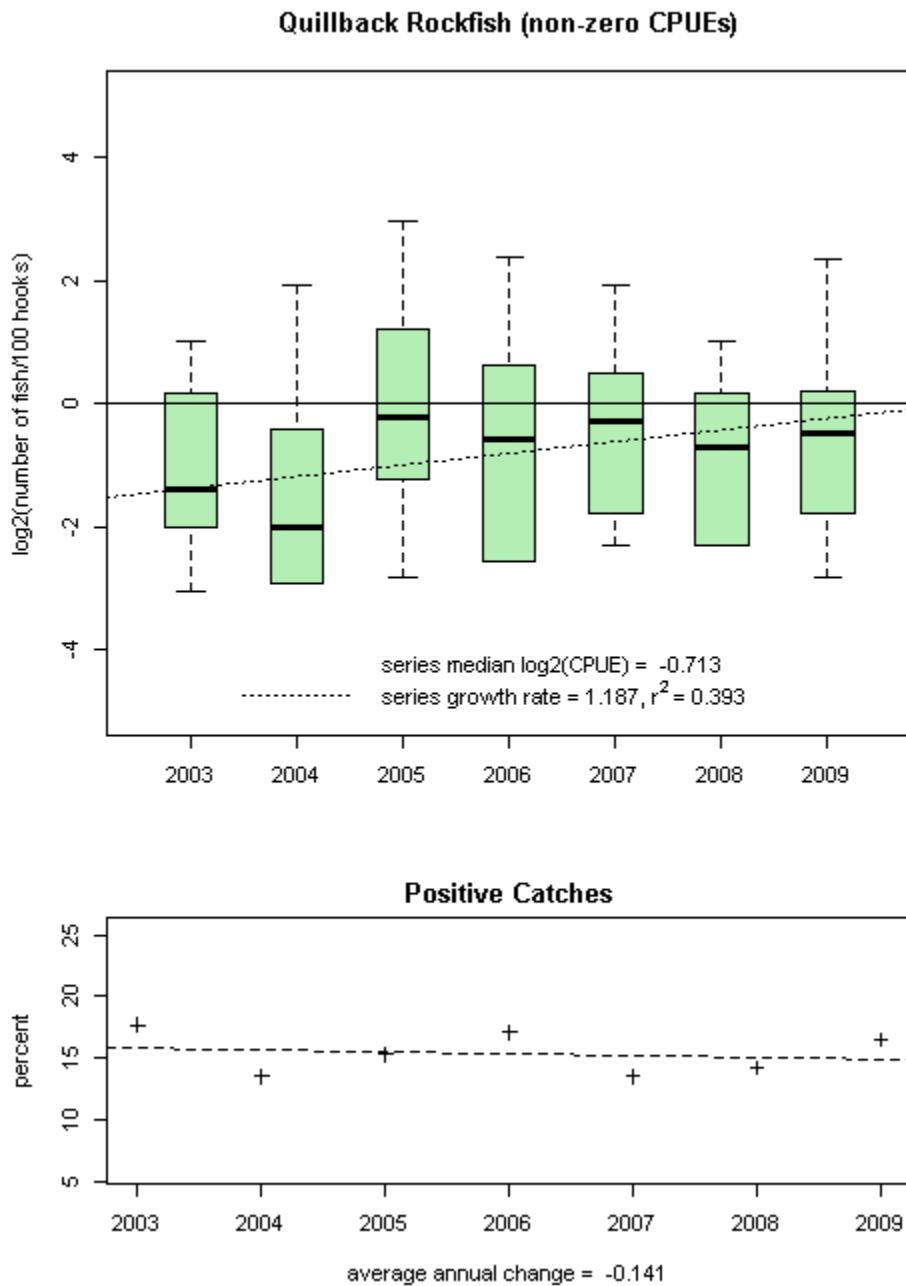
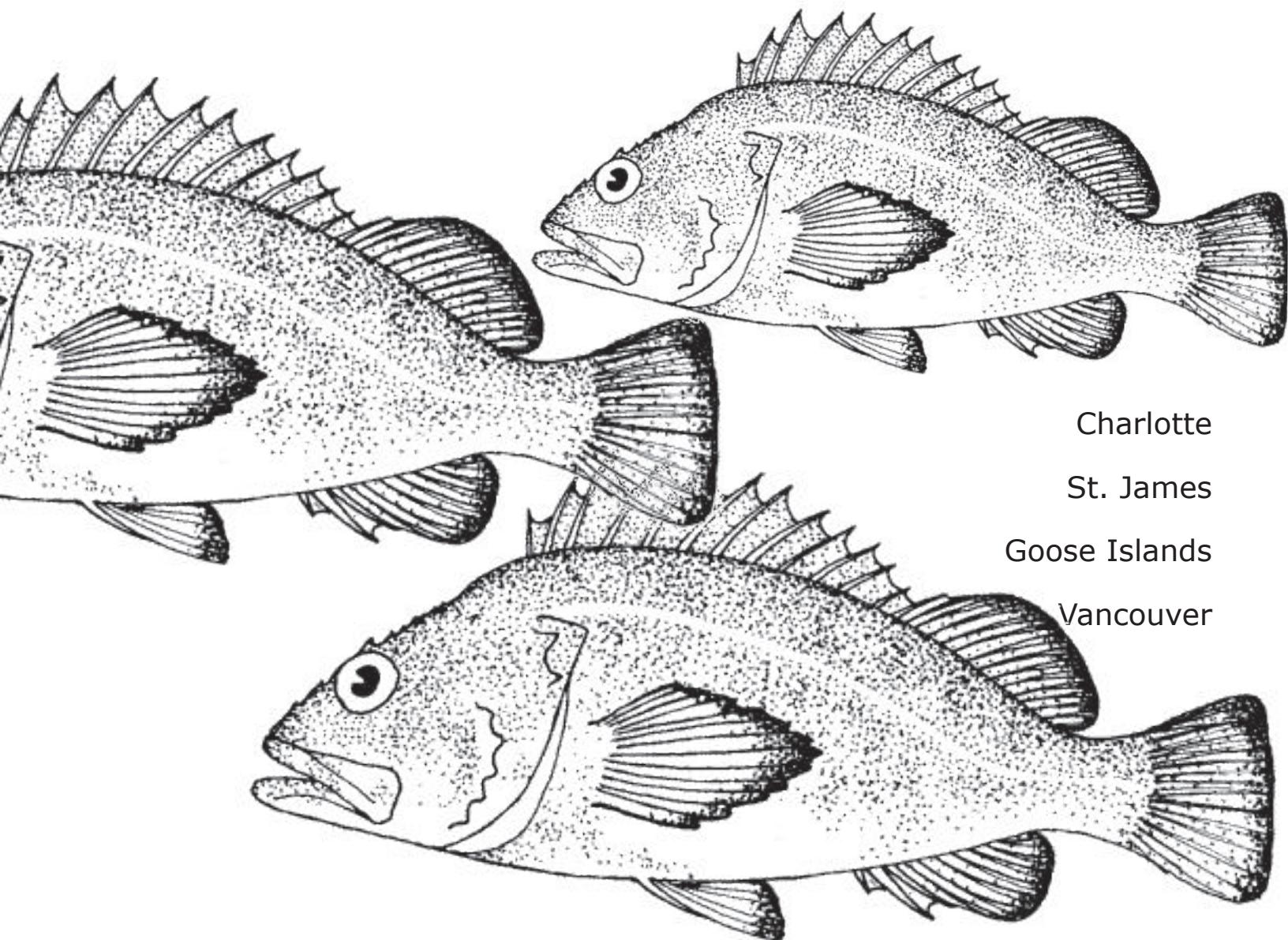


Figure 10. Upper panel: Relative abundance index (\log_2 (number of fish/100 hooks)) for non-zero catches of Quillback Rockfish from 2003 to 2009. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median \log_2 (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the “+” symbol with a dashed regression line and the annual change presented below the graph.

Appendix A. 2009 IPHC Survey Sampling Protocol
2009 Area 2B and SE Alaska bycatch sampling manual in pdf format.

2009 PROTOCOLS FOR ROCKFISH DATA COLLECTION IN BRITISH COLUMBIA



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INTRODUCTION

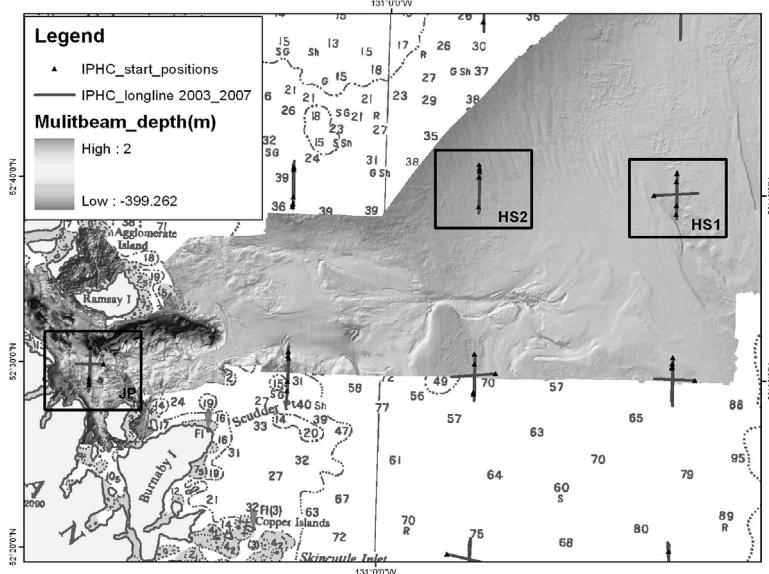
In 2009 the IPHC will collaborate with the Department of Oceans and Fisheries, Canada (DFO) to collect data about incidentally captured rockfish encountered during the Standardized Stock Assessment survey (SSA). Data will be collected from all charter regions in British Columbia.

Samplers will collect two distinct data sets: a whole-haul hook occupancy accounting and a suite of biological data from rockfish. A third IPHC sea sampler on these vessel will assist with data collection. One sampler will be focussed on collecting hook occupancy data, while the other two samplers will collect standard halibut survey data as well as sample rockfish as halibut sampling workload permits. Protocols have been developed so that rockfish can be sampled during the haul.



Changes from 2008

In 2009, DFO will provide a Marel motion-compensated scale to collect round weights for a subsample of each species. Because in 2009 more gear will be hauled at each station, a reduced sampling protocol is available for times when rockfish sampling begins to impact halibut sampling. Samplers will also collect both round and dressed lengths on a subsample of some species to establish a round to dressed conversion factor (CF) needed for the reduced sampling protocol. In 2008, no sets were subjected to reduced sampling, and that may be the case again in 2009. However, we feel it is important for data quality as well as team morale to have reduced sampling effort protocols available in case you really need to use them.



Hook by Hook Occupancy Data Collection

Overview

The IPHC collected hook-by-hook occupancy data on the SSA survey from 1993-1996 for internal research projects. Several individual projects in later years also collected these data. The goal of hook-by-hook sampling (a.k.a. whole-haul hook tally) is to record the species caught in order along the line. DFO overlays these data on high resolution bathymetric features for fine-scale habitat analysis.

Hook Tally Form

Each tally form represents one IPHC set. Each form has seven blocks of squares. Each block of 105 squares represents one skate of gear and each square represents one hook. If the gear is maintained to survey standards, there will never be more than 105 hooks per skate. Never record information about two different skates of gear within one block of squares. Use the space on the bottom of the page to tally rockfish that were counted but will not be part of Set Form C data (e.g., lost at the roller, sand fleed, etc). Explain any discrepancy between counts on hook tally form and on Set Form C in the logbook and on the data form.

IPHC Hook Tally Form

Set	Vessel	Month	Day	Year	Trip No.	1st Buoy	End Buoy

Skate No:

Skate No:

Skate No:

Skate No.						
1						
21						
41						
61						
81						
101						

81

Hook status	Code	Hook status	Code
Bent/broken/missing	BM	Lost at roller	#
Two spp/hook	Circle winner	Line parts	/
Eaten	%	Snarled hooks	[codes]

Procedure

HEADER

Transcribe set number, vessel code, date, trip number and buoy information from the Set Form A.

SKATE No.

Observe retrieval of the first flag and buoy. Label the top block of squares on the Hook Tally Form with the appropriate skate number depending on which direction the set is being hauled. When the gear is hauled backwards, still begin the hook tally at the top block of squares, but use the skate number of the last skate set. Always begin at the top of the form, regardless of the hauling direction.

Hook OCCUPANCY

Find a safe location with a view of the line coming out of the water where you can also see the rollerman's work area. It is important to have a clear view of the hooks as they come out of the water.

Record the status or occupancy of each hook, begin at the top left square of the block and continue across to the end of the row, then move to the left square on the second line and work across that row, and so on.

Identify and record all vertebrates to the species level. Do your best to identify all invertebrates to the species level. Ask the deck sampler to confirm identification.

Use the standard set of shorthand Hook Tally Codes supplied in Appendix 1. Please use an upper case letter for each code, except for 'E', which may be written lower case. Legibility is paramount! If there is not a shorthand code assigned to a species, write the numeric IPHC species code for the organism in the square. A detailed list of IPHC species codes is found in the 2009 SSA survey manual. An example of the top 10 hook tally codes used for animals in BC in 2008 is shown below.

Common Name	Hook Tally Code
Spiny Dogfish	D
Pacific Halibut	H
Sablefish (Black cod)	BC
Arrowtooth Flounder	A
Yelloweye Rockfish	YE
Redbanded Rockfish	RB
Sunflower Sea Star	SN
Longnose Skate	LN
Lingcod	LC
Rougheye Rockfish	RE

FREQUENTLY USED HOOK TALLY CODES

When there is a skate change, begin recording hook occupancy in a new block of squares for the new skate. If there were less than 105 hooks on the skate, leave the remaining squares empty. Remember, hooks from different skates should never be recorded in adjacent squares.

Inanimate Objects

If the hook 'catches' or snags an inanimate object (e.g., rocks, shoes, derelict fishing gear), fill in the square for that hook with the inanimate object code (IPHC species code 100).

Unidentified Plant Matter

If the hook 'catches' or snags sticks or logs, fill in the square for that hook with the unidentified plant matter code (IPHC species code 296).

Algae

Ignore the presence algae snagged by the hook or the line and record the appropriate status.

Hook Status

When a hook has not caught an object, has caught more than one organism, or the organism has been bitten or lost at the roller, record a code describing the state of the hook. Use the codes listed in the table below.

Hook status	Hook Tally Code
Empty Hook	E
Bait	B
Skin Hook	S
Bent/Broken/Missing	BM
Two spp/hook	(depredator) predator
Eaten	code %
Lost at roller	code #
Line Parts	/
Snarl- write brackets around the hooks involved in the snarl	[]

* For the Empty Hook code, you may use a lower case, hand-written "e", as long as the letter is written clearly.

DIFFERENCE BETWEEN 'BAIT' AND 'SKIN HOOK'

Use Hook Tally Code 'B' (Bait) when the retrieved hook contains the original bait, including the skin and all or part of the flesh. Use the Hook Tally Code 'S' (Skin) when the retrieved hook contains only the skin of the original bait, or there is hardly any of flesh left on the bait skin.

UNIDENT. CODES

If you are not 100% confident you can correctly identify a discarded organism to the species level, ask the rollerman to bring it on board. Only unidentifiable escaped organisms should be recorded using an 'unidentified' code.

Code thornyheads on the line as "UI, Unidentified Idiot (Thornyhead)" whenever you do not have the fish in hand to identify it to the species level.



META-CODES

The following codes are used to describe either the condition of the line or additional information about the status of the hook.

Gear snarl: []

Gear snarls are commonplace during longline operations. Gear snarls make it difficult to accurately record the sequential order of hooks and catch. Make your best guess as to the sequence of the hooks (and status) in the snarl and record hook status in the boxes on the form. Then put brackets ([]) around the hooks involved in the snarl. The purpose of the brackets is to inform data users of the hook status with the caution that the order is uncertain. If only two or three hooks are involved in the 'snarl' you should be able to determine the status of each hook and brackets should not be needed.

Parted gear: /

When the longline parts the vessel will run to the other end and retrieve the gear. When the groundline parts record a forward slash (/) after the last retrieved hook. When hauling resumes from the other end, begin recording hook status in reverse order starting with the last square in the last block of squares. Record hook status in reverse order from right to left for the entire row. After the row is filled, move to the next row above and continue in the same manner. At the skate junction, move to the next block of squares directly above, starting from the bottom square in that block.

In short, you will be filling the squares with hook information in the opposite direction from the way you were filling the squares before the gear parted so that the total sequence of hooks on the page will still match the sequence of hooks on the line. When the last hook is comes aboard, place another slash to the left of the last retrieved hook. There should be forward slashes at both ends of the parted gear. Record the details of the parted gear in the logbook.

If the line parts before any hooks have been retrieved, complete the hook tally form as if nothing happened and make a note of the event in the logbook. However, be sure the skates are numbered correctly on the form.

Two species caught on one hook: circled

When two fish are caught on one hook, the first fish hooked is considered the predator, because it was pursuing the bait. The second fish is considered the depredator, because it was attacking the predator. The depredator is the species of interest. On the hook tally form, record the depredator first. Circle this code to note its importance and then record the code for the predator to the right of the circled depredator code. (e.g. LC RE)

Eaten fish: %

Write a percent (%) sign next to the code for the animal if the fish shows fresh bite wounds, heavy sand flea predation, or if only lips or a head come up on the line.

Lost at the roller: #

Write a pound (#) sign next to the code when a fish that would normally be retained is lost at the roller. In 2009, only rockfish, pacific cod, and halibut will be retained during survey, so only these species can be considered "lost at roller".

PROTOCOLS FOR ANOMALOUS EVENTS:

A skate has >105 hooks

If a skate has more than 105 hooks record occupancy of **all** hooks by adding additional squares to that skate's block. Be sure to flag the skate for correction by the crew.

Lost gear

If gear is lost during a haul estimate the number of hooks lost on each skate based on the number of hooks set and fill in the appropriate number of boxes with code '306' or 'UN'. If all skates are lost write "ALL GEAR LOST" across the Hook Tally Form for that set.

Form Example:

IPHC Hook Tally Form					
Set	Vessel	Month	Day	Year	Trip No.
003	STW	07	15	09	01
					1st Buoy End Buoy
					3 4
Skate No: 7					
1	H E S S S G L C H	E e D D E H	E H E E E H	Y E E H	
21	S B B C L N B	B B B B B	E E E E E	H B D E B B	E
41	B B B B B	B H R B D	H E B Y E	B C D E E H	B B E
61	B B B B B	H E B R B D	B H B B S	B E B C L N B	H B
81	B B B B B	H D [B H E E]	H H L N E B	B B B B	B E
101	e				
Gear snarl start: [
Gear snarl end:]					
Skate No: 6					
1	B B B B B	D B e B B	B B B B e B	R B H B B	B C
21	H H e L N Y E	B B B B B	B e D B e H	e H B B	
41	B R B #	C B B	H % B C B	B e H e H	H D e B H e B
61	C B B e B C	B C H S B B	B S B B B	B e B B e e	
81	B B H [B H e e e e e	H e e e e e	H e (Y) e e e	B S S	
101	B e				
Eaten fish: %					
Depredation					
Parted gear: /.../					
Lost at roller: #					
Skate No: 5					
1	L C e e e e B C e A H	B Y E B e H B	H e H e e		
21	e e e B C H e H H	B e B e e e	ST 0% BM/		
41	H % e B M A e e e e e	H B R B e B B C B e			
61	e H H Y E e B C H S B B	B 604 B B B e B B C B B			
81	Y E # B B B e H B e A D B B	B B B D Y E B C e e e			
101	B C B L N B B				
Skate No: 4					
1		Y E e e e H B e e B	R B D B e D		
21	e B B H S e e e e B C e e L N	B e H H e Y E			
41	e B B C A B H e L N e B B	B C D D B C L N e L N B C H			
61	Y E # H e S G e B e Y E e H H	H e Y E e D B D Y E e e			
81	e H e e H R B B H e B C S e B	H % H H e B M B e			
101	e D e e Y E				
LARS YE-2 RIS-1					
Hook status			Code		
Bent/broken/missing			BM		
Two spp/hook			Circle winner		
Eaten			%		
Lost at roller			#		
Line parts			/		
Snarled hooks			[codes]		

ROCKFISH BIOLOGICAL DATA COLLECTION

Overview

The Set Form C is for recording biological data from non-target species encountered on our surveys. These data include weight, length, sex, maturity, and otolith collection information; and are referred to as LSMO data in this document. The Set Form C is similar to the Set Form B, used for recording biological data from halibut. As with halibut sampling, the shack sampler will record rockfish data on the forms and put the otoliths in the trays. The third sampler will be occupied recording hook occupancy throughout haul, so will not be available to collect biological data from rockfish until hauling is completed. The deck sampler's priority is halibut sampling. If halibut catch allows, the deck sampler should collect rockfish data throughout the set. The appendix has tables showing predicted rockfish and halibut catch at each station; use this information to anticipate your workload for the set and plan accordingly.

Set Form C

Set Form Cs are double-sided. Use the Set Form C to record data about one species on the front side and the same or a different species on the back side. Do not record data from more than one set on one Set Form C. Fill out all header information, even if data on both sides of the paper are from the same species.

Set Form C

Page No. ____ of ____

Set	Vessel	Month	Day	Year	Trip no			
Common Name:		Species Code	Sample method	Collection type	Sample Method	Fish State		
				1 = two otoliths in one cell 2 = two otoliths in two cells and two trays 3 = one otolith lost 4 = both otoliths lost	1 = whole haul 2 = random sub-sample 3 = non-random sub-sample	20 = Round 4 = Gilled & Gutted		
Weight (kg)	Length (cm)	Fish State	Otolith Number	Collection Type	Sex	Maturity	Comment Codes	Oto tray:
							I = Internal parasite R = Tag recovery C = Crystallized otolith E = Eaten S = Sand flea predation	Remarks (not entered)
5	.							
.								
.								
.								
10	.							
.								

Procedure

Rockfish will be collected and processed throughout the set. They do not have to be separated according to skate. Do not collect LSMO data from *Sebastolobus* species (thornyheads). Fish will be weighed and measured in the round state, then dressed by the crew and returned to samplers for collection of LSMO. Spring clamps with numbered disks will be attached to fish after weighing in order to track fish from round to dressed state.

HEADER

Transcribe the set number, vessel code, date, and trip number from the Set Form A.

COMMON NAME

Write the common name of the sampled species.

SPECIES CODE

Record the numeric IPHC species code of the sampled species.

SAMPLE METHOD

Sample method describes the sampling system. There are three possible codes:

- 1 = whole haul: all retained fish of this species were sampled.
- 2 = random sub-sample: a random collection from the retained fish of this species was sampled.
- 3 = non-random sub-sample: a portion of the retained fish were selected non-randomly for sampling.

In 2009 the Sample Method will be '1' (whole haul) for all species, except when you have to enact the reduced sampling protocols. When using the reduced-sampling protocol, the specimens with LSMO data are Sample Method code 3, while the remaining specimens (those subjected to the reduced sampling protocol) must be on data sheets with Sample Method code 1. Specimens with different Sample Methods may not be recorded on the same sheet.

WEIGHT

Using the motion-compensated scale, record the weight of the fish to the nearest gram (or possibly lower resolution if dictated by scale and conditions). The fish should be weighed round, not gilled or gutted unless it is one of the species for which you have been collecting CF data (yelloweye, redbanded, quillback, silvergrey, and rougheye), in which case you may already have recorded the round weight on the CF form. The weight and length for each fish on this form must be recorded from the same fish state (either both round or both dressed). Follow the protocols for scale usage as directed by the DFO representative who brought the scale to your boat. To track a fish from the round to dressed state, attach a numbered spring clamp to the fish after weighing and convey number to the shack sampler.

LENGTH

Using the halibut cradle to measure the fish in the round state, record the fork length in centimeters in the same way halibut are measured. If the caudal fin is not forked, measure to the center of the caudal fin. Except for the four or five species for which you may collect round to dressed CF data, always measure these fish in the round, not gilled or gutted. The weight and length for each fish on this form must be recorded from the same fish state (either both round or both dressed). To track a fish from the round to dressed state, attach a numbered spring clamp to the fish after weighing and convey number to the shack sampler.

FISH STATE

Record the physical state of the fish at time you took the length and weight measurements. Most fish will be measured round. If you have measured a fish that does not fit into either of the following codes, note this in the remarks field, and let the office know that you need a code for the new fish state.

- 4 = dressed, gills and guts removed, gonads intact
- 20 = round, gills and belly intact.

OTOLITH NUMBER

Record the number of the otolith. On each vessel, otoliths from each species will be numbered sequentially throughout the season beginning at number one for each species. Refer to the following section titled Otolith Collection for otolith extraction instructions.

Every LSMO sampled fish will have an otolith number, even if both otoliths are lost. If both otoliths are lost, leave the oto tray cell empty for that fish, and record the number of the empty oto tray cell on the Set Form C as the otolith number. Every fish on the Set Form C has a corresponding cell in the oto tray, regardless of the type of otolith collection made (**except**

when the reduced sampling protocol is enacted, in which case, the fish that are measured only will not have an otolith number, but will be recorded on the Set Form C).

COLLECTION TYPE

Collection type describes the type of specimen collected during sampling. There are four valid otolith collection codes in 2009. More details are in the Otolith Collection section.

- 1 = both otoliths collected and stored in one cell in the otolith tray
- 3 = both otoliths collected and stored in separate cells because two cannot fit in one cell. The first otolith will go in cell 'N' in tray A and the second otolith will go in cell 'N' in tray B. For example: the first otolith goes in cell 44 in Tray 3 and the second otolith goes in cell 44 in Tray 4.
- 5 = one otolith lost; one otolith collected and stored in the otolith tray
- 6 = both otoliths lost

SEX

Record the sex of the fish. There are three acceptable codes:

- M = Male
- F = Female
- U = Unidentified. Use the unidentified code if you are unable to classify the sex, or were unable to observe the gonads for whatever reason.

MATURITY

Consult the rockfish maturity guidelines outlined below and, to the best of your ability, assign a maturity to the sample. If you are unable to determine the maturity, or did not observe the gonads, use code U.

		Female		Male	
Maturity Code	Maturity stage	Maturity sub-stage	Gonad Condition	Maturity sub-stage	Gonad Condition
1	Immature	Immature	small translucent pink	Immature	threadlike translucent pink
2		Maturing	small yellow eggs no small black dots present (no reabsorbed larvae) translucent or opaque	Maturing	string-like slight swelling residual milt not present translucent
3	Mature	Developed eggs	large yellow or orange eggs a few small black dots may be present (reabsorbed larvae) opaque	Developing	swelling residual milt may be present in seminal vesicle brown-white
4		Fertilized eggs	large orange-yellow eggs translucent	Developed	large easily broken white
5		Embryos/larvae	large Embryos or larvae present- include eyed eggs translucent	Running	running sperm
6		Spent	large flaccid a few larvae may be present red ovaries	Spent	sperm still in duct white-brown
7		Resting	moderate size firm orange-grey ovaries, some with dark blotches	Resting	small triangular in cross-section brown
U	Unknown	Unknown	Unknown	Unknown	Unknown

Remember the following points while determining rockfish maturities:

- Mature rockfish cycle back to maturity stage #3, after the resting stage #7, for example: 1-2-3-4-5-6-**7-3-4**...
- For females – look for the presence of eyed larvae (small black dots on ovaries) to distinguish mature females (stage 3) from maturing females (stage 2) which do not have eyed larvae present. Determining mature from immature is most important.
- For males – look for the presence of residual milt in the seminal vesicle to distinguish mature testes (stage 3) from immature testes (stage 2), which will not have residual milt present.

COMMENT

There are five comment codes that may be entered in this column. You can only enter one code in the comment code field. If you encounter a fish that has more than one comment code, see the priority rules below. You may enter additional comment codes in the Remarks section.

I = Internal parasite present. Use this code to indicate that you observed evidence of parasitic copepods- *Sarcotaces spp.*- in the gut cavity. According to *The Rockfishes of the Northeast Pacific* by Love, Yoklavich and Thorsteinson, adult *Sarcotaces* live in an internal cyst that is usually attached to the rectum, where it feeds off the blood of the host. The cyst often appears as a silver sac filled with black ink that, when burst, emits a black fluid.

R = Tag recovery. If you find a tagged rockfish collect the data required for the Set Form C, record the tag number in the remarks field, and put the tag in a completed tag envelope.

C = Crystallized otolith(s).

E = Eaten or bitten by dogfish, shark, whale, etc. Ignore healed bite wounds.

S = Eaten by sand fleas.

OTO TRAY

This field was requested by samplers to track the trays they were using. It is not entered into the database, so you can use it as you please.

REMARKS

Write the fish tracking number (spring clamp number) here to track the specimen from round to dressed state. Place any other information you find useful in this field, keeping in mind that it is not entered in the database, so end-users of this data will not see your comment unless they have the data sheet in hand.

TOTAL NO. SAMPLED FOR SET FORM C AND TOTAL NO. OBSERVED ON THE HOOK TALLY FORM

Record the total number of fish of that species sampled on the Set Form C for that set. Record the number of times that species was recorded on the Hook Tally Form. Do this once for each species on every set. The number observed on the Hook Tally Form should equal the number sampled on the Set Form C, after fish that were lost at the roller have been added. If there are irresolvable differences between the counts record the explanation in the logbook.

Boom or Bust

No ROCKFISH CAUGHT

If no rockfish are captured on this set, it is not necessary to fill out a Set Form C. Please make sure to write "No Rockfish caught" in the Comments section of the Set Form A for that set.

TOO MANY ROCKFISH TO HANDLE

There may be times when you will not be able to complete all the required rockfish sampling before it is time to haul the next string. If this situation is encountered, the fish should be

placed in baskets or buckets and stored out of the way in a cool place, (and separate from fish on the next string) until there is sufficient time to complete the sampling. You may need to store the fish in the hold to maintain quality and food safety. Use the time at the end of the day to complete the sampling.

If sampling rockfish begins to negatively affect halibut sampling, halibut sampling takes priority. When the rockfish capture is too high for all specimens to be processed or when unforeseen events prevent you from collecting full LSMO data from all rockfish, you will have to reduce sampling on rockfish. To that end we have worked with DFO to arrive at a reduced sampling protocol that still provides DFO with useful data. We consider this an 'emergency escape button' of sorts, and we do not expect it to be employed more than a couple of times in each charter region—if that often. If you find yourself using the reduced sampling protocols more than two times on a trip, please call the office and discuss the deck situation so we can convey this to DFO at the end of the year.

Reduced Sampling Protocol

Based on the workflow and other issues, the lead will select from the following three options:

1. Collect round length and round weight on Set Form C
2. Collect round length and sex (no weight) on Set Form C
3. Collect dressed length and weight; requires that sufficient conversion factor data is collected.

Before enacting reduced sampling protocol, you must first sample 50 fish for standard data collection of LSMO (and CF data if needed). If there are 50 yelloweye rockfish, sample the yelloweye first. If there are less than 50 yelloweye, sample all available yelloweye first, then make up the remaining sample from redbanded, then quillback, then copper, china, tiger, and black rockfish.

Priority	Species
1	Yelloweye
2	Redbanded
3	Quillback
4	Copper
5	China
6	Tiger
7	Black

After you have collected LSMO for at least 50 fish, sample the remaining rockfish by collecting only the length and weight.

Sample Method: Do not mix sample methods on one sheet! On the data sheets with records of the 50 LSMO fish, record the Sample Method 'code 3 = non-random subsample'. On the sheets containing reduced data collection (length + weight or sex), record Sample Method 'code 1 = random sample' because you will be sampling every fish for length and weight (or sex).

When collecting only lengths and weights (or sex) from a sampled fish, complete all fields as usual, leaving Collection Type, Sex (or Weight), and Maturity, and Otolith number blank. If you need to begin a fresh page, continue to use Sample Method of '1' for this species.

This reduced-effort sampling protocol is intended to allow you to begin sampling while gear is still being hauled. If you have all pieces for one species on deck at the end of the haul, use the random sample table to select fish for sampling—do not simply select the first 50 fish in this case—and remember to use Sample Method of '2'. A random sample table is in the appendix.

Unidentified rockfish and unknown maturities

If you are unable to confidently identify a rockfish or have problems classifying the maturity level of a sampled fish, please utilize the resources listed below to ensure the correct ID and maturities are assigned.

1. CALL OR EMAIL A DFO REPRESENTATIVE FOR ADVICE

Lynne Yamanaka is the lead scientist on this project and the end-user of the data you are collecting. Telephone her from the vessel to discuss any problems you have with identifications or maturities. Please take good notes of your conversation so you can relay what you learn to the IPHC office.

If you are unable to contact Lynne, call the DFO port samplers from Vancouver and Prince Rupert for assistance.

DFO contacts

Lynne Yamanaka (Project director)	office: 250-756-7211 cell: 250-714-9251 email: Lynne.Yamanaka@dfo-mpo.gc.ca
Schon Acheson (Vancouver)	office: 604-666-2658 cell: 604-209-4184 email: AchesonSm@pac.dfo-mpo.gc.ca
Kristina Anderson (Prince Rupert)	office: 250-627-3475 email: AndersonKr@pac.dfo-mpo.gc.ca

2. SAVE THE SPECIMEN FOR LATER ANALYSIS

Label a freezer bag for the sample with the following information: "IPHC research", vessel name, date, set number, your name, otolith number, and the species name or maturity code you have assigned the fish on the data sheet.

Record all label information in the logbook and outline the difficulties of the identification.

Freeze the sample and pass it to a port sampler as outlined in the next point.

3. DISCUSS THE IDENTIFICATION WITH THE DFO OR AMR PORT SAMPLER AT LANDING

If you are offloading in Prince Rupert or Vancouver, call the DFO port sampler to arrange a meeting with them at offload. At the dock you can discuss the species ID or rockfish maturity with them, and give them the frozen sample so they can pass it on to the DFO office for further examination if necessary.

In Prince Rupert, you should only give the specimen to the AMR port sampler if the DFO sampler is unavailable. If you are offloading at other BC ports, you can ask the AMR port sampler for advice and give the frozen fish to them to store for DFO. Also inform the appropriate DFO representative as to whom was given the specimen.

Double-check that the specimen is well-labeled before handing it off to the port sampler. Record the name of the port sampler and any other details of the discussion in the logbook offload summary notes for that delivery.

OTOLITH COLLECTION SPECIFICS

COLLECTION

Collect both otoliths from each fish, and place them together in one cell in the otolith tray. Make cuts for otolith extraction from within the gill cavity to avoid damaging the outside of the fish. Cuts to the outside of the head can reduce marketability of the catch.

CLEANING AND STORAGE

Rockfish otoliths do not need to be kept in glycerin, but must be stored **clean and dry**. Make sure to remove all blood and membranes from the otoliths and wipe them dry with a towel before storing them in the tray. Take time at the end of the day or while the vessel is setting the following morning to ensure the otoliths are completely clean.

CRYSTALLIZED OTOLITHS

Collect crystallized otoliths and process them in the same manner as un-crystallized otoliths. Record 'C' in the Comment field.

BROKEN OTOLITHS

Save and collect the pieces of broken otoliths.

TRAY NUMBERING

Otoliths will be stored in separate trays for each species. Record the tray number on the otolith label affixed to the lid as Tray # ___ of ___.

CELL NUMBERING

Otolith trays contain one hundred cells that are numbered by the IPHC from 1 to 100 and from left to right and top to bottom. The plastic molding on the tray shows a different numbering system, but your tray bien holder is numbered with the IPHC system for reference.

Cells will be filled sequentially throughout the season on each vessel, starting at 1 for each species, and vessel. The cell number on the otolith tray will always correspond to the otolith number recorded on the Set Form C. Throughout the set, double check that you have the same number of otoliths in the tray as you have on the Set Form C, and that any fish with Collection type of 6 are represented in the tray by an empty cell.

Do not skip cells between sets or trips: always start the next set and the next trip in the next available cell. Place a paper star in the first and last cell of each tray and at the beginning and end cells of each trip. Mark the paper star with the vessel code, trip number, Hook Tally species code and otolith number.

LOST OTOLITHS

If you lose **one otolith**, collect the remaining otolith and **record code 5** (one otolith lost) in the Collection Type field. The single otolith will occupy the cell that corresponds to the otolith number.

If you lose **both otoliths** collect the remaining data from the fish, record the otolith number, **record code 6** (both otoliths lost) in the Collection Type field, and leave the corresponding otolith cell empty. For the next fish ensure the otolith number matches the next cell in the otolith tray. Because trays will be filled sequentially and completely, the only empty cells in a tray will represent sampled fish with both otoliths lost.

LARGE OTOLITHS

If otoliths are too large to fit into the cell, you may snip the tips off the otoliths so they will fit in the cell. Avoid making a break near the center of the otolith. Try to avoid breaking otoliths if at all possible.

If the otoliths are still too large to fit in one cell, you will need to spread them across two cells and two trays. In order to maintain the link between otolith number and cell number you

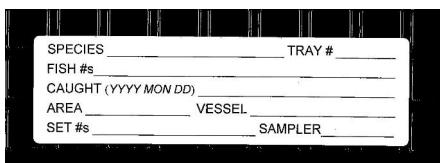
will put the second otolith in the same cell number in a **new tray**. For example, if the 44th sampled Rougheye rockfish has otoliths that are too big to fit into one cell store one otolith in cell 44 of the first otolith tray and the second otolith in cell 44 of the second otolith tray. This may seem like a 'waste' of tray space, but it is currently the best method to collect two large otoliths and maintain a numbering system that allows you to coordinate otolith number with cell number. In this instance record code 3 (two otoliths split in two cells and two trays) in the Collection Type field. For the next fish, use the next consecutive otolith number and store the otoliths in the next available cell **in the new tray**. Leave the remaining cells in the old tray empty.

If a single otolith alone is too large to fit in a cell and you do not want to clip the ends off, put a star in that cell and put the otoliths in an envelope. Be sure to write vessel, year, species, and otolith number on the envelope. Attach the envelope to the appropriate Tray Bien with rubber bands or tape.

Otolith Tray Label

DFO has supplied the IPHC with Tray Biens™ for storing rockfish otoliths. These trays have special labels that should be completed as outlined below.

DFO Rockfish otolith tray label shown below



Species

Record the Latin name for the species.

Tray #

Label the trays as 1 of 3, 2 of 3, and 3 of 3.

Fish Number

Record the range of otolith numbers in the tray.

Caught

Record the range of dates the otoliths were obtained, in the following format: YYYYmonDD (e.g. 2007Jun04 – 2007Jul17).

Area

List all DFO Areas in which these fish were caught (Appendix 3 lists the DFO area for each IPHC station).

Vessel

Record the full name of the vessel.

Set Numbers

Record the range of set numbers included in the tray.

Samplers

Record the full name of the lead sampler.

Mailing Otoliths

Mail otoliths to Seattle after the boat has completed all its BC charter regions for the season. If you do not have sufficient storage space on your vessel for the full trays you may mail **completed** trays to Seattle as needed. If you accidentally mail a tray of otoliths with unused

cells mid-season, start the next tray on the next cell number. Cell number should always match otolith number from Set Form C.

For Example:

Trip two has ended with yelloweye fish number 332. The cases have been mailed back to the lab, so trip three will start with a new case. The first yelloweye otolith number will be 333, and its otolith will be placed in cell 33.

Use rubber bands or masking tape to secure the lid of the tray, but be sure not to cover the label. Package rockfish otoliths separately from halibut otoliths. Clearly mark the outside of the package to indicate it contains rockfish otoliths.

CONVERSION FACTOR DATA COLLECTION

Background

Obtaining conversion factors (CF) for converting dressed lengths and weights to round lengths and weights will allow managers to use our data without taking round measurements of every fish. Because DFO recognizes that rockfish characteristics vary dependent on latitude and because different dressing techniques affect the dressed weight and length, DFO does not use standard conversion factors for the rockfish work for which we are collecting data. We will collect round weight and a round length for **10% by number of each rockfish species or 50 specimens, whichever is greater** for each charter region. The collection of these data must be roughly dispersed among stations and sizes; i.e., don't collect all on one trip or all from fish of similar sizes.

Charter region	Species potentially targeted for CF data collection
Vancouver	Quillback, Redbanded, Yelloweye
Goose Island	Redbanded, Yelloweye
St. James	Redbanded, Rougheye, Yelloweye
Charlotte	Quillback, Redbanded, Rougheye, Silvergrey, Yelloweye

While collecting the normal rockfish LSMO data, you will select fish for determining round to dressed conversion factors. These fish will not be selected randomly. Instead, select fish so that lengths are spread across the range of lengths for that species and so that the data collected is distributed (north-south) within that charter region. The appendix has tables showing maximum catch of each rockfish species at each station in 2B over the last two years and extrapolated to 7 skates. Use this information to predict when to take your CF samples on which species. You will notice that for several, less frequently encountered species, you will be collect CF data on every specimen because less than 50 fish are anticipated to be captured.

****Important consideration****

The lead will need to determine if collecting CF data will reduce or create work on your boat in the region you are working. If collecting round weights and lengths does not slow your workflow, it may be easiest to simply collect round weights and lengths for all species rather than collecting dressed weights and lengths for all and round weights and lengths for only a subset.

Data form

Round to Dressed Conversion Factor data					Page No. ____ of ____
Vessel	Year	Trip no	Charter Region		
Common Name:			Species Code		
Tracking No. (not entered)	Round Weight (kg)		Round Length (cm)	Otolith Number	Remarks (not entered)

5

Record round lengths and weights on a conversion factor data collection sheet(s) for each species for which you have decided to collect CF data. The data on the CF form is linked to the Set form C by vessel, year, species, and otolith number. At the top of the form, add the vessel code, year, and charter region. Write the common name of the species recorded on the form and enter that species number as well. The data table has five (5) columns, two (2) of which are not entered in the database.

TRACKING NUMBER

The first column, Tracking No., is where you record the number on the disc clipped to the fish when it is in the round state (explained in Procedure section). The tracking number is used to match the round measurements on the CF form with the dressed measurements on the Set Form C before an otolith number has been assigned to that fish. These numbers are not unique and may repeat.

ROUND WEIGHT

Record the round weight as displayed on the scale

ROUND LENGTH

Measure the fish in round state using the measuring cradle.

REMARKS

Use this field to take notes that will help you keep track of fish or any other remarks you find helpful. This info will not be entered into a database. Information about specific fish is best saved for the Set Form C.

PROCEDURE

- Shack sampler determines if a fish is to be sampled for round weight and length. The shack sampler will tell you which sizes are desired. The only time you will not sample for round weight and length is when fishing is too heavy to keep up with the work or when there are far more fish available than CF samples needed for a species for which you are collecting CF data.
- Record round weight and length on the CF form. The otolith number will be added when the fish is ready for LSMO sampling, after it has been dressed by the crew.
- Clip a numbered snap on the fish, convey number to shack sampler.

4. Give the fish back to the crew for dressing.
5. After the fish has been dressed, tell the shack sampler the number on the snap so the shack sampler can write the otolith number on the CF form.
6. Remove numbered snap
7. Weigh it and collect LSMO data on Set form C.

TRACKING SAMPLES FOR STRATIFICATION

To obtain the best CF, it is important to spread the sample within each Charter region and to collect measurements from as broad a size range as possible. To that end, you have been supplied with a table to help track your samples of each species (shown below). The tables have a column for length, based on the maximum and minimum lengths of that species captured on our surveys over the last few years, and a column for each third of the charter region, divided in to a northern, a central, and a southern sector. Use the tables to make sure your sample is spread as evenly as possible. When you take a CF sample, record that sample in the appropriate box. The catch table in the Survey manual has stations shaded by geographic sector.

CF tracking table

Redbanded			
Length (cm)	Northern 1/3	Middle 1/3	Southern 1/3
25			
26	x		
27			
28			
29			
30			
31	x		
32			
33		x	x
34			
35		x	

CF Data submission

Please fax your CF data forms with your end of trip packets. Include them with your EOT forms (not your set forms) that are mailed to the Seattle office. The tracking sheets are for your own use and do not need to be mailed because we will have this information when the Set Form Cs and the CF sheets are key punched.

MISCELLANY

20 hook count

Because you are completing a Hook Tally Form for a set, you are NOT required to complete "Part 2: Subsample" on the back of the Set Form A. You still must complete "Part 1: Whole Haul Sample" for missing bait, bent/broken/missing hooks, marine mammals and seabirds.

Data editing

The total number of rockfish in your hook-by-hook tally will equal the total number of samples on the suite of Set Form Cs for that set (corrected for fish lost at roller).

Lost hook tally form

If a hook tally form is washed or blown overboard during a haul, get a new form and collect as much data as possible and write an explanation on the form, logbook, and Set Form A. If a hook tally form is lost at the end of a set, use a blank form, with header info, to indicate that it was lost.

End of Trip Summary in your logbook

Include the last otolith number of each rockfish species in the End of Trip Summary in your logbook.

Mailing data forms

Collate the Set Form Cs with the Set Form A and Set Form Bs for each set.

Keep the Hook Tally Forms separate. When you are preparing to mail the data packets clip the Hook Tally Forms by trip.

Evaluations

Your feedback on any aspect of this project is welcomed at any time throughout the season.

The lead, second and third samplers should each fill out an evaluation of the project at the end of their time on the vessel, or at the end of the project, whichever occurs first. These **special project evaluations** are in the Admin pack. Mail completed evaluations with end of trip documents.

Vessel Logbooks

There is no requirement for the IPHC sampler to fill out the vessel logbook; this is solely the responsibility of the charter vessel captain. Additionally, there is no need for the IPHC sampler to report catch data to the dockside monitors. This is also the responsibility of the captain. If you have time and would like to do so, you may assist the captain with these responsibilities by sharing bycatch information with him. IPHC surveys are cooperative ventures and we encourage all members of the team to work together to complete the charter.

APPENDIX 1: HOOK TALLY CODES

Round and Flat Fish			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
2	Arrowtooth Flounder	<i>Atheresthes stomias</i>	A
12	Dover Sole	<i>Microstomus pacificus</i>	DS
64	Flatfish, unident.	<i>Pleuronectiformes</i>	UF
3	Flathead Sole	<i>Hippoglossoides elassodon</i>	FS
37	Giant Wrymouth	<i>Delolepis gigantia</i>	WE
148	Great Sculpin	<i>Myoxocephalus polyacanthocephalus</i>	GS
16	Greenland Turbot	<i>Reinhardtius hippoglossoides</i>	GT
23	Greenling, unident.	<i>Hexagrammidae</i>	G
42	Grenadier (Rattail), unident.	<i>Macrouridae</i>	RT
152	Kamchatka Flounder	<i>Atheresthes evermanni</i>	KF
21	Lingcod	<i>Ophiodon elongatus</i>	LC
26	Pacific Cod	<i>Gadus macrocephalus</i>	C
86	Pacific Hake	<i>Merluccius productus</i>	PH
1	Pacific Halibut	<i>Hippoglossus stenolepis</i>	H
14	Petrale Sole	<i>Eopsetta jordani</i>	P
145	Red Irish Lord	<i>Hemilepidotus hemilepidotus</i>	RL
4	Rock Sole, unident.	<i>Lepidopsetta sp.</i>	RS
34	Ronquil, unident.	<i>Bathymasteridae</i>	RQ
27	Sablefish (Blackcod)	<i>Anoplopoma fimbria</i>	BC
20	Salmon, unident	<i>Salmonidae</i>	SA
29	Sculpin, unident.	<i>Cottidae</i>	SC
56	Spotted Ratfish	<i>Hydrolagus colliei</i>	RF
28	Walleye Pollock	<i>Theragra chalcogramma</i>	PO
146	Yellow Irish Lord	<i>Hemilepidotus jordani</i>	YL

Rockfish			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
132	Blackgill Rockfish	<i>Sebastes melanostomus</i>	BG
127	Bocaccio	<i>Sebastes paucispinis</i>	BO
57	Canary Rockfish	<i>Sebastes pinniger</i>	CA
88	China Rockfish	<i>Sebastes nebulosus</i>	CH
58	Dusky Rockfish	<i>Sebastes ciliatus</i>	DR
154	Greenstriped Rockfish	<i>Sebastes elongatus</i>	GN
59	Northern Rockfish	<i>Sebastes polyspinis</i>	NR
87	Quillback Rockfish	<i>Sebastes maliger</i>	QB
90	Redbanded Rockfish	<i>Sebastes babcocki</i>	RB
121	Rosethorn Rockfish	<i>Sebastes helvomaculatus</i>	RO
31	Rougheye Rockfish	<i>Sebastes aleutianus</i>	RE
119	Shortraker Rockfish	<i>Sebastes borealis</i>	SR
60	Silvergray Rockfish	<i>Sebastes brevispinis</i>	SG
45	Unident. Rockfish	<i>Sebastes spp</i>	R
136	Widow Rockfish	<i>Sebastes entomelas</i>	WI
89	Yelloweye Rockfish	<i>Sebastes ruberrimus</i>	YE
128	Yellowmouth Rockfish	<i>Sebastes reedi</i>	YM
122	Yellowtail Rockfish	<i>Sebastes flavidus</i>	YT

Skates and Sharks			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
137	Alaska Skate	<i>Bathyraja parmifera</i>	AK
138	Aleutian Skate	<i>Bathyraja aleutica</i>	AL
167	Bering Skate	<i>Bathyraja interrupta</i>	BE
141	Big Skate	<i>Raja binoculata</i>	BI
140	Black Skate	<i>Bathyraja trachura</i>	BS
126	Blue Shark	<i>Prionace glauca</i>	BL
169	Commander Skate	<i>Bathyraja lindbergi</i>	CK
168	Golden Skate	<i>Bathyraja smirnovi</i>	GO
143	Longnose Skate	<i>Raja rhina</i>	LN
142	Sandpaper Skate	<i>Bathyraja kincaida</i>	SD
63	Shark, unident.	<i>Elasmobranchii</i>	SH
55	Skate, unident.	<i>Rajidae</i>	SK
125	Sleeper Shark	<i>Somniosus pacificus</i>	SS
129	Soupfin Shark	<i>Galeorhinus zyopterus</i>	SF
54	Spiny Dogfish	<i>Squalus acanthias</i>	D
156	Whiteblotched Skate	<i>Bathyraja maculata</i>	W

Invertebrates			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
211	Basketstar	<i>Gorgonocephalus eucnemis</i>	BK
106	Bryozoa, unident.	Bryozoa	BZ
95	Coral, unident.	(includes hard and soft)	CO
209	Fish-eating Star	<i>Stylasterias Forreri</i>	FE
218	Glass Sponge, unident.	Hexactinellida	GL
51	Octopus, unident.	Octopoda	O
52	Scallop, unident.	Pectinid	US
93	Sea Anemone, unident.	Actiniaria	AN
73	Sea Cucumber, unident.	Holothuroidea	CU
92	Sea Pen, unident.	Pennatulacea	SE
82	Sea Urchin, unident.	Echinoidea	SU
103	Shells, unident.	(includes bivalve and gastropods)	SL
91	Sponge, unident.	Porifera	SP
81	Starfish, unident.	(includes brittle and basketstars)	ST
210	Sunflower Sea Star	<i>Pycnopodia helianthoides</i>	SN

Other	
IPHC Species Code	Common Name
100	Inanimate Object
296	Unidentified plant matter

APPENDIX 2: PREDICTED ROCKFISH ENCOUNTERS FOR 2009

The following tables list the maximum rockfish encounter at each station from 2007-2008. The numbers have been scaled to reflect anticipated catch on 7 skates. Use these tables to predict the amount of work at each station and whether you will need to prepare to subsample rockfish on a set. Stations not listed are ones that did not catch any rockfish in 2007-2008.

2009 Vancouver Region Rockfish predictions

Station no.	Bocaccio	Canary Rockfish	China Rockfish	Greenstriped Rockfish	Quillback Rockfish	Redbanded Rockfish	Rosethorn Rockfish	Rougheye Rockfish	Shortraker Rockfish	Silvergray Rockfish	Yelloweye Rockfish	Total Rockfish prediction	Halibut prediction
2002						1		7				13	18
2005				1							49	50	81
2006										1	1	3	13
2007					18						11	29	25
2008						1					15	17	91
2012		8		8							4	21	39
2013					6						8	14	34
2014		1										1	64
2015	1					1						3	21
2016					3							3	31
2018	1					1						3	24
2020											13	13	48
2024		4	1		4		1			1	48	60	43
2026						6						6	18
2027					1							1	11
2029										1		1	11
2031	1					20					3	24	8
2033	4	3									6	13	17
2034					4						6	10	130
2035	6	1				15					28	50	17
2037	1					42				1	18	63	7
2038		4			10					1	24	39	63
2039						1				4	1	7	14
2040		1			10						1	13	49
2042					6						4	10	56
2043						1						1	88

2009 Goose Island Rockfish Prediction

Station no.	Bocaccio	Canary Rockfish	Greenstriped Rockfish	Quillback Rockfish	Redbanded Rockfish	Rougheye Rockfish	Shortraker Rockfish	Silvergray Rockfish	Yelloweye Rockfish	Yellowmouth Rockfish	Total Rockfish prediction	Halibut prediction
2044			1					18		20	53	
2045	1	1					11	48		62	13	
2046								6		6	78	
2047								1		1	48	
2049								1		1	39	
2050	3			67			7	15	1	94	57	
2051		4	1					25		31	43	
2052				8					1	10	60	
2054	1						1	1		4	111	
2055				7	4	4			1	17	76	
2056				1						1	122	
2057								7		7	34	
2060			1	4			1	1		8	69	
2061	1	1		15	1					20	42	
2062		1		13	1					15	126	
2063				7				1		8	10	
2064				10						10	14	
2065			8				1	70		80	43	
2066				4	1					6	32	
2069								10		10	192	
2070	1		1					102		105	144	
2071		4		7			13	109	1	134	55	
2072				36	1				3	41	13	
2073		1		3				3		7	143	
2077				29	15			4	1	50	48	
2078			7	21				7		35	111	
2079	1									1	200	
2080	3		4					15		22	168	
2081	1	1					1			4	50	
2082				28	27	1				56	22	
2083				160						160	63	
2084	1							13		14	108	
2085				17						17	15	
2086				69	1		3	7		80	57	

Appendix 2: Predicted rockfish encounters in 2009
 Based on maximum encounters 2007-2008,
 scaled for 7 skates

2009 St. James Rockfish Prediction

Station no.	Bocaccio	Canary	Darkblotched	Quillback	Redbanded	Rosethorn	Rougheye	Shortraker	Silvergray	Tiger	Yelloweye	Yellowmouth	Total Rockfish prediction	Halibut prediction
2087					24		35	3			1	63	6	
2088		1			20		1				3	25	63	
2089					27		1	1				29	8	
2090	1				10				6	29		46	94	
2091	1				25				3	34		63	41	
2092					1		8				3	13	70	
2093	8	1			24				6		123	162	115	
2094					39						11	50	20	
2095		1							3	27		31	164	
2097					1		4					6	3	
2098					3							3	31	
2099					1				3	4		8	46	
2100	3	3			49						73	127	28	
2101					8							8	8	
2102					10							10	10	
2103					42				1			43	15	
2104									1			1	62	
2105							1					1	0	
2106		1			8				1	1		13	91	
2107					7							7	241	
2108					8							8	101	
2109					21							21	45	
2110					112				1			113	45	
2111					28				1			29	52	
2112					8		1					10	3	
2113					3						4	7	27	
2115					1							1	42	
2116	1				11				1	22		36	104	
2117					41		1					42	56	
2118					11	1	3		1			17	25	
2119		6								1	32	39	62	
2120					3				1	1		6	25	
2121	1				41				1	3		46	60	
2122					49		8	6				63	14	
2123					63		1					64	13	
2124					1				1	29		32	31	
2125					39		1	1				42	6	
2126					15							15	7	
2127					38				1	1		41	42	
2128					53						1	55	32	

Appendix 2: Predicted rockfish encounters in 2009
 Based on maximum encounters 2007-2008,
 scaled for 7 skates

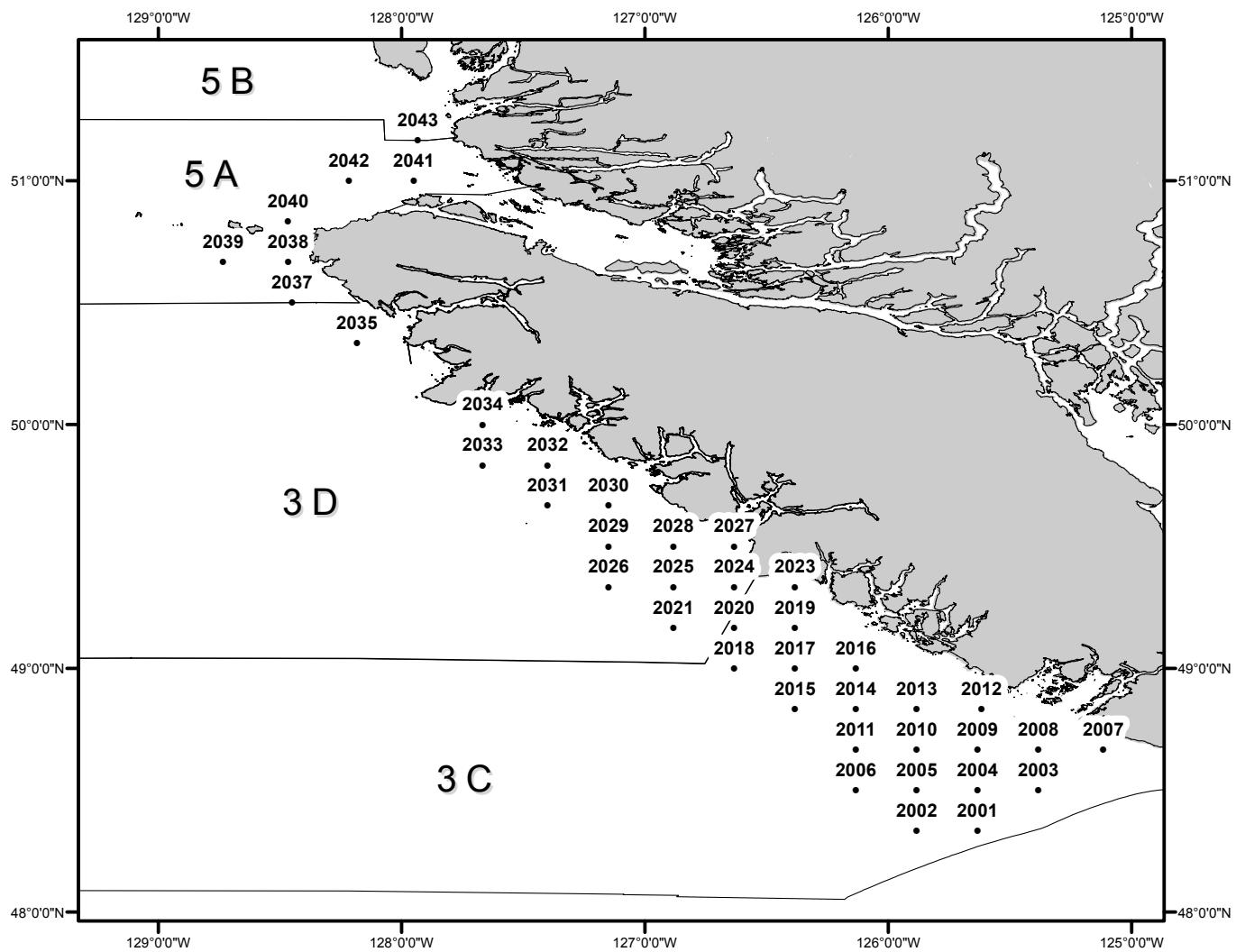
2009 Charlotte Rockfish Prediction

Station no.	Bocaccio	Canary Rockfish	China Rockfish	Copper Rockfish	Darkblotched Rkfsh	Greenstriped Rockfish	Quillback Rockfish	Redbanded Rockfish	Rosethorn Rockfish	Rougheye Rockfish	Shortraker Rockfish	Silvergray Rockfish	Yelloweye Rockfish	Yellowmouth Rockfish	Yellowtail Rockfish	Total Rockfish prediction	Halibut prediction
2129						11						1	17			29	66
2130						3							7			10	28
2131	1															1	69
2132						1										1	90
2133												1	4			6	48
2135						59		1								60	3
2136	1															1	45
2137						50						10				60	38
2138						27										27	8
2139												1				1	21
2140						1						6				7	132
2141	1					18		1				50				71	106
2142						1	3					1				6	50
2143	4	4						1				32	10			52	94
2144	1					1					1	10		3		17	55
2146	3						10		57	22						92	31
2147					8											8	41
2149	1	4										15	28			49	105
2151		6				13						6	28			52	74
2152						8										8	20
2154												1			1	3	63
2156	4	6				27						20				56	85
2157								91	10							101	45
2158						10						4				14	31
2160							97									97	55
2161							8			42						50	98
2162							11		18	1						31	22
2163							22		17	4	8					52	81
2164							10		57	6						73	29
2165									27	1						28	34
2166									21	1						22	25
2167	1					56						20	57			134	69
2168							4									4	99
2169						1						1				3	24
2170							4									4	161
2171		7		1	1	6						1	13			29	144

Appendix 2: Predicted rockfish encounters in 2009
 Based on maximum encounters 2007-2008,
 scaled for 7 skates

APPENDIX 3: IPHC STATIONS BY DFO AREA

Vancouver Stations



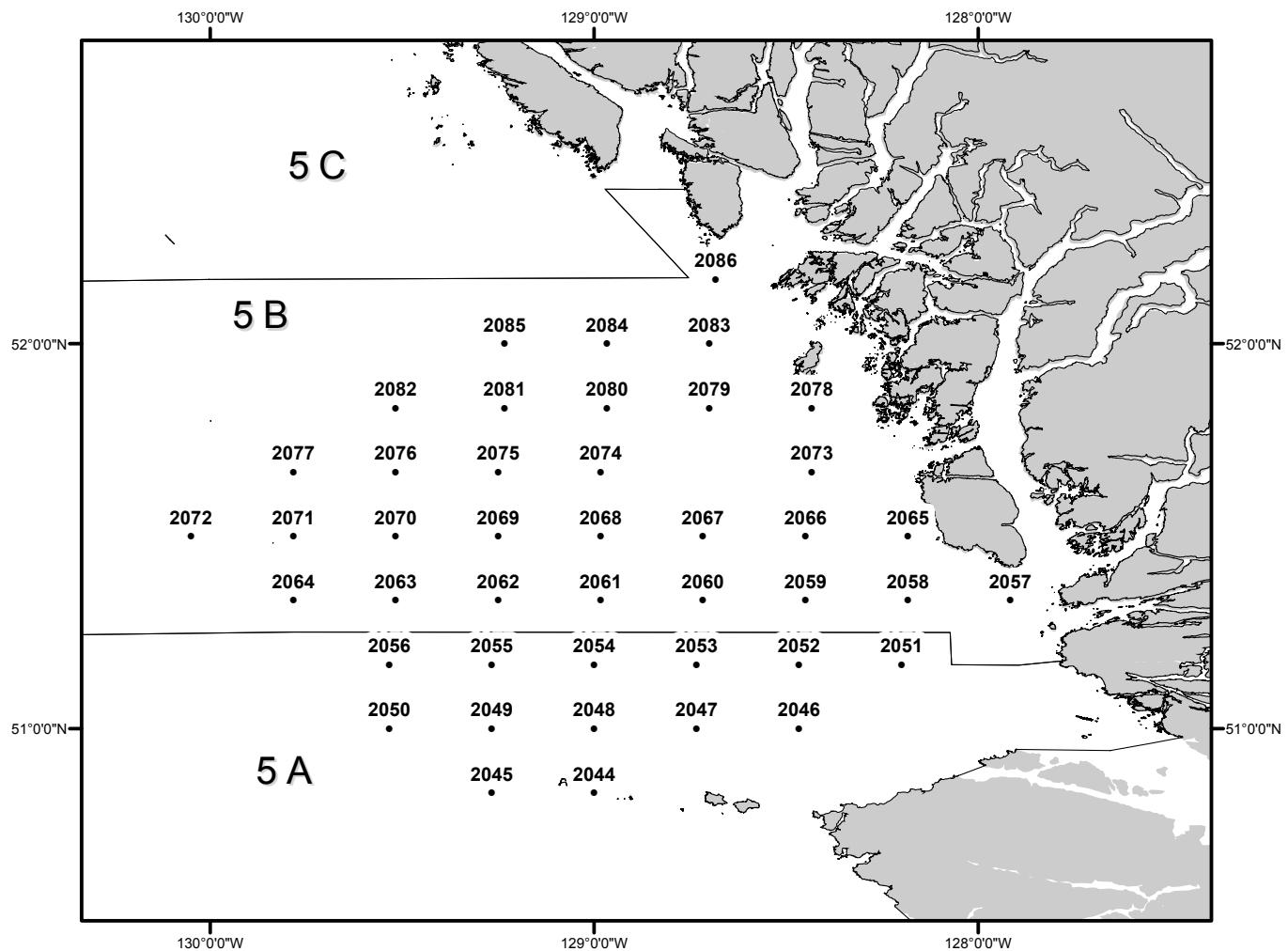
IPHC Station Number	DFO Area
2001	3C
2002	3C
2003	3C
2004	3C
2005	3C
2006	3C
2007	3C
2008	3C
2009	3C
2010	3C
2011	3C
2012	3C
2013	3C
2014	3C

IPHC Station Number	DFO Area
2015	3C
2016	3C
2017	3C
2018	3C
2019	3C
2020	3C
2021	3D
2023	3C
2024	3D
2025	3D
2026	3D
2027	3D
2028	3D
2029	3D

IPHC Station Number	DFO Area
2030	3D
2031	3D
2032	3D
2033	3D
2034	3D
2035	3D
2037	3D
2038	5A
2039	5A
2040	5A
2041	5A
2042	5A
2043	5B

Appendix 3: IPHC stations by DFO area

Goose Island Stations



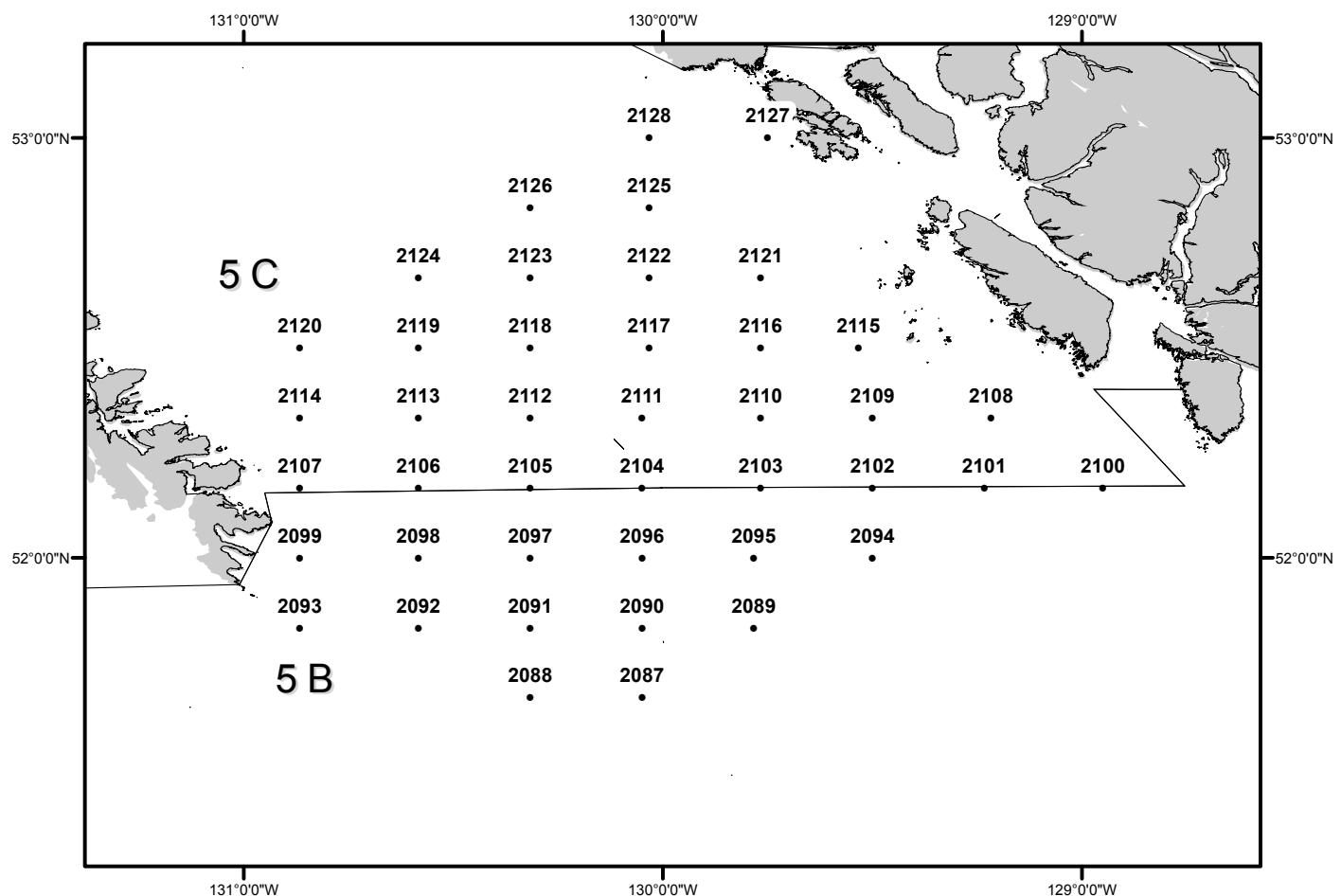
IPHC Station Number	DFO Area
2044	5A
2045	5A
2046	5A
2047	5A
2048	5A
2049	5A
2050	5A
2051	5A
2052	5A
2053	5A
2054	5A
2055	5A
2056	5A
2057	5B
2058	5B

IPHC Station Number	DFO Area
2059	5B
2060	5B
2061	5B
2062	5B
2063	5B
2064	5B
2065	5B
2066	5B
2067	5B
2068	5B
2069	5B
2070	5B
2071	5B
2072	5B

IPHC Station Number	DFO Area
2073	5B
2074	5B
2075	5B
2076	5B
2077	5B
2078	5B
2079	5B
2080	5B
2081	5B
2082	5B
2083	5B
2084	5B
2085	5B
2086	5B

Appendix 3: IPHC stations by DFO area

St. James Stations

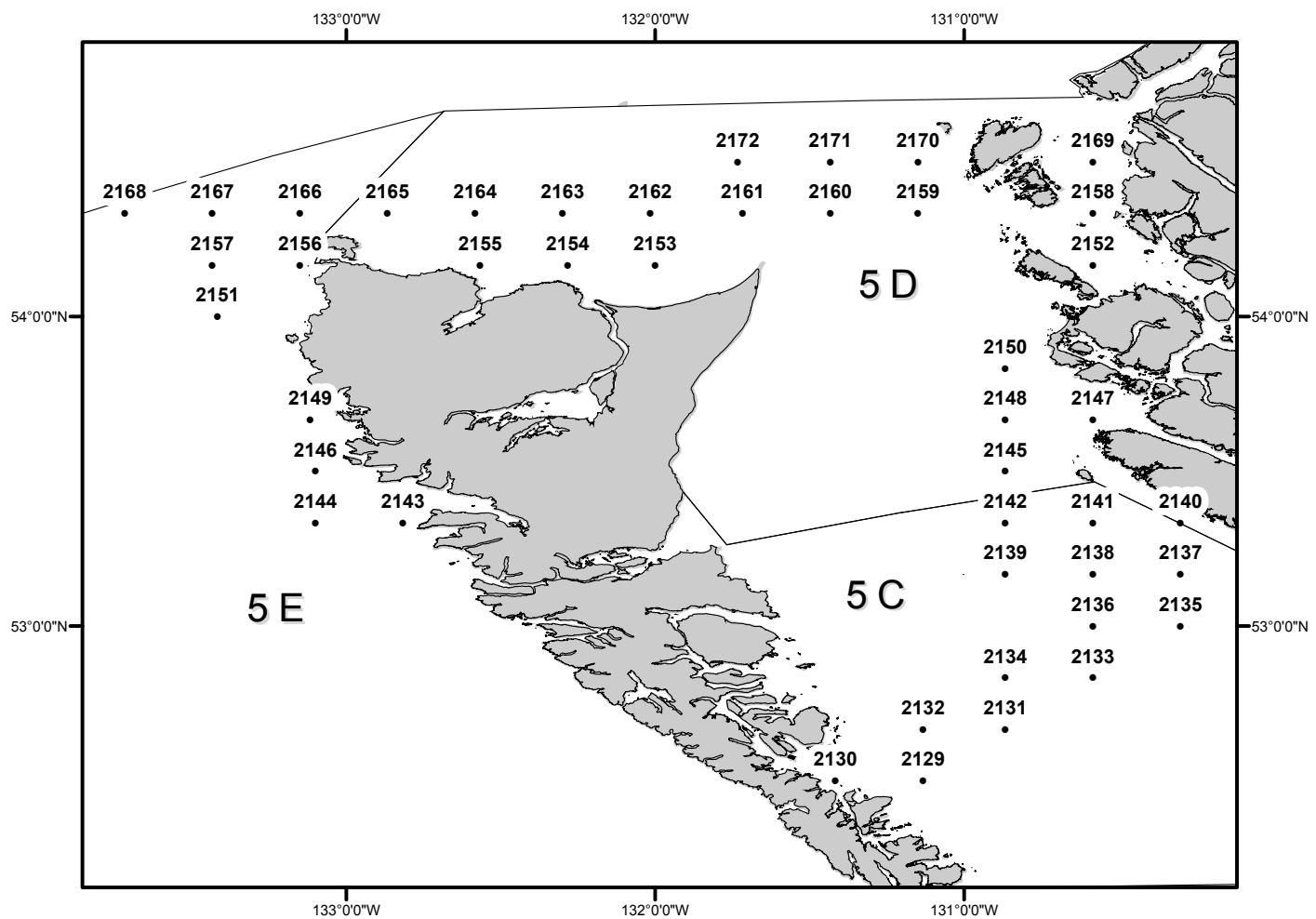


IPHC Station Number	DFO Area
2087	5B
2088	5B
2089	5B
2090	5B
2091	5B
2092	5B
2093	5B
2094	5B
2095	5B
2096	5B
2097	5B
2098	5B
2099	5B
2100	5B

IPHC Station Number	DFO Area
2101	5B
2102	5B
2103	5B
2104	5C
2105	5C
2106	5C
2107	5C
2108	5C
2109	5C
2110	5C
2111	5C
2112	5C
2113	5C
2114	5C
2115	5C
2116	5C
2117	5C
2118	5C
2119	5C
2120	5C
2121	5C
2122	5C
2123	5C
2124	5C
2125	5C
2126	5C
2127	5C
2128	5C

IPHC Station Number	DFO Area
2115	5C
2116	5C
2117	5C
2118	5C
2119	5C
2120	5C
2121	5C
2122	5C
2123	5C
2124	5C
2125	5C
2126	5C
2127	5C
2128	5C

Charlotte Stations



IPHC Station Number	DFO Area
2044	5A
2045	5A
2046	5A
2047	5A
2048	5A
2049	5A
2050	5A
2051	5A
2052	5A
2053	5A
2054	5A
2055	5A
2056	5A
2057	5B
2058	5B

IPHC Station Number	DFO Area
2059	5B
2060	5B
2061	5B
2062	5B
2063	5B
2064	5B
2065	5B
2066	5B
2067	5B
2068	5B
2069	5B
2070	5B
2071	5B
2072	5B

IPHC Station Number	DFO Area
2073	5B
2074	5B
2075	5B
2076	5B
2077	5B
2078	5B
2079	5B
2080	5B
2081	5B
2082	5B
2083	5B
2084	5B
2085	5B
2086	5B

Appendix 3: IPHC stations by DFO area

APPENDIX 4: RANDOM NUMBER TABLE

	0-5%	5-10%	10-15%	15-20%	20-25%	25-30%	30-35%	35-40%	40-45%	45-50%	50-55%	55-60%	60-65%	65-70%	70-75%	75-80%	80-85%	85-90%	90-95%	95-100%	
1	X	X	0	0	0	0	0	0	X	X	0	0	X	X	X	0	X	X	0	X	1
2	0	0	0	0	0	0	X	X	X	0	X	X	0	X	0	X	0	X	0	X	2
3	0	0	0	0	0	0	X	X	X	0	0	X	X	0	X	0	X	X	X	X	3
4	0	0	0	0	0	0	0	0	0	0	X	0	0	X	0	X	X	X	X	X	4
5	0	0	X	X	0	0	X	0	0	X	0	0	X	X	X	X	X	X	X	X	5
6	0	0	0	0	0	0	0	X	X	X	X	X	0	0	0	0	X	0	X	X	6
7	0	0	0	X	0	0	0	X	0	0	X	0	0	0	0	0	0	0	X	X	7
8	0	0	0	0	0	0	X	X	0	X	0	0	X	X	X	X	X	0	X	0	8
9	0	0	0	0	0	0	0	0	0	X	0	0	0	0	0	X	0	X	X	X	9
10	0	X	0	0	X	0	0	X	X	0	X	0	X	X	0	X	X	X	X	X	10
11	0	0	0	0	X	X	0	X	0	X	0	0	X	X	X	X	0	X	0	X	11
12	0	0	0	X	0	0	0	X	0	0	X	X	X	X	X	X	X	X	X	X	12
13	0	0	0	0	X	0	X	X	X	0	X	X	0	X	X	X	X	X	X	X	13
14	0	0	0	0	0	0	X	X	0	0	0	X	X	X	X	X	X	0	X	X	14
15	0	0	0	X	0	0	0	X	X	0	X	X	0	X	X	X	X	X	0	X	15
16	0	0	0	0	X	0	0	X	0	X	0	0	X	X	X	0	X	X	X	X	16
17	0	X	0	0	0	X	0	0	X	0	X	0	0	0	0	X	X	X	X	X	17
18	0	0	0	0	0	0	0	X	X	0	X	X	X	X	X	0	X	X	X	X	18
19	0	0	0	0	0	0	X	X	0	X	0	0	0	0	0	X	X	X	X	X	19
20	0	0	0	0	0	0	X	0	0	X	X	X	0	X	0	X	X	X	X	0	20
21	0	0	0	0	0	0	X	X	X	0	0	0	X	0	X	X	0	X	X	X	21
22	0	0	0	0	0	0	X	X	X	0	X	X	X	0	0	0	X	X	X	X	22
23	0	0	0	0	0	0	X	X	0	X	X	0	X	X	X	X	X	X	X	X	23
24	0	0	0	0	0	0	0	X	0	X	X	0	X	X	X	0	X	X	X	X	24
25	0	0	0	0	X	0	0	X	0	0	X	X	X	X	0	0	X	X	X	X	25
26	0	0	0	0	0	X	0	0	0	X	0	0	X	X	X	X	X	X	X	X	26
27	0	0	0	0	0	0	X	X	0	X	0	X	X	X	X	X	X	X	X	X	27
28	0	0	0	0	0	X	0	0	X	X	0	X	0	X	X	X	X	X	X	X	28
29	0	0	0	0	0	0	0	X	X	X	0	X	X	X	X	X	0	X	X	X	29
30	0	0	0	0	0	0	0	0	0	0	X	X	0	0	X	X	X	X	X	X	30
31	0	0	X	X	0	0	0	0	X	X	0	X	X	X	X	X	X	X	X	X	31
32	0	0	0	0	0	0	X	0	X	X	0	X	X	X	X	0	0	X	X	X	32
33	0	0	0	0	0	X	0	0	X	0	X	X	X	X	X	X	0	X	X	X	33
34	0	0	0	0	0	0	X	0	X	X	X	0	X	X	X	0	X	X	X	X	34
35	0	0	X	0	X	0	0	0	X	X	0	0	0	0	0	0	X	X	X	X	35
36	0	0	X	0	X	0	X	0	X	0	0	X	0	0	X	X	X	X	X	0	36
37	X	0	0	0	0	0	0	0	X	0	X	0	X	0	0	0	X	X	X	X	37
38	0	0	0	0	X	0	X	0	0	X	0	0	X	0	0	X	0	X	X	X	38
39	0	X	0	0	X	0	0	X	0	X	X	0	X	X	X	X	0	X	X	X	39
40	0	0	0	0	0	X	0	0	0	0	0	0	X	X	0	X	X	X	X	X	40
41	0	0	0	0	X	0	X	0	X	X	0	X	0	X	X	X	X	X	X	X	41
42	X	X	0	X	0	0	X	X	0	0	X	0	X	X	0	X	X	X	X	X	42
43	0	0	0	X	0	X	0	X	0	X	0	0	X	X	0	X	X	X	X	X	43
44	0	0	X	0	0	0	X	X	0	X	X	X	X	0	X	0	X	X	X	X	44
45	0	0	0	0	0	X	0	0	X	X	X	X	X	X	X	X	X	X	X	X	45
46	0	0	0	0	0	0	X	0	0	0	0	X	X	0	X	X	X	X	X	X	46
47	0	0	0	0	X	0	0	0	X	X	0	X	X	X	0	X	X	X	X	X	47
48	0	0	0	0	0	0	0	X	X	0	0	0	0	0	0	X	X	X	0	X	48
49	0	0	0	0	X	0	X	0	X	0	0	X	0	X	X	X	X	X	X	X	49
50	0	0	X	X	0	0	X	0	0	X	X	X	0	X	X	0	X	X	X	X	50

HOW TO USE THE RANDOM SAMPLE TABLE

In order to do a true random sub-sample, you must wait until all rockfish caught on the set have been brought onboard. If you begin sub-sampling before haul back is finished then every rockfish will not have an equal opportunity to be selected and the sub-sample will not be randomly chosen.

1. Count the total number of pieces in the group you want to sub-sample (eg. 82 yelloweye)
2. Determine the number of fish needed to reach the correct sub-sample size (eg. 50 of 82 yelloweye)
3. Calculate the percentage of the total needed to reach the desired sampling rate, rounding to the nearest percent (eg. 50 out of 82 yelloweye = 61%)
4. Locate the random sample table (RST) column that matches the desired sampling rate. The RST consists of rows of 0's and X's: each digit represents one fish, and indicates whether or not you should include that fish in the sub-sample.
0 = do not sample
X = sample this fish
5. Starting at the top left corner or the table and reading across the rows as if reading a book, assign a 0 or X to each fish. To do this the deck sampler should hold the fish up one at a time, and the shack sampler will direct them to eliminate or add the fish to sub-sample, according to the RST. The deck sampler should not be able to read the RST as they choose which fish to present next.

NOTES

Appendix B. Summary of set specifications by vessel, including set number, IPHC station number, date, location (start and end latitudes and longitudes in degrees, decimal minutes), depths (minimum, maximum and average in metres) and times (end deployment and begin retrieval).

Vessel PROUD VENTURE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
1	2003	28-May-09	48° 28.96'	125° 22.99'	48° 31.14'	125° 23'	70	82	76	6:17 am	11:32 am
2	2004	28-May-09	48° 30.01'	125° 36.39'	48° 30'	125° 39.46'	52	70	61	7:46 am	2:18 pm
3	2001	28-May-09	48° 20.95'	125° 38'	48° 18.6'	125° 38'	75	77	76	9:13 am	5:01 pm
4	2002	29-May-09	48° 19.4'	125° 53'	48° 21.27'	125° 53'	114	210	162	5:19 am	10:38 am
5	2005	29-May-09	48° 30'	125° 51.49'	48° 30'	125° 54.57'	56	59	57	6:58 am	2:06 pm
6	2006	29-May-09	48° 30'	126° 5.63'	48° 30'	126° 8.65'	103	114	108	8:13 am	4:58 pm
7	2009	30-May-09	48° 40.04'	125° 39.78'	48° 39.99'	125° 36.86'	50	79	64	5:04 am	11:27 am
8	2008	30-May-09	48° 40'	125° 23.7'	48° 39.99'	125° 20.63'	36	44	40	6:34 am	2:29 pm
9	2007	30-May-09	48° 40'	125° 8.62'	48° 40.05'	125° 5.51'	32	38	35	7:57 am	5:17 pm
10	2019	31-May-09	49° 10.49'	126° 20.58'	49° 10.51'	126° 23.62'	42	47	44	5:02 am	11:18 am
11	2023	31-May-09	49° 19.99'	126° 21.49'	49° 20.01'	126° 24.64'	22	23	22	6:41 am	2:05 pm
12	2024	31-May-09	49° 19.99'	126° 37.03'	49° 19.99'	126° 40.17'	35	52	43	8:09 am	4:45 pm
13	2020	31-May-09	49° 10.02'	126° 39.22'	49° 10.02'	126° 36.08'	63	71	67	9:52 am	8:09 pm
14	2021	01-Jun-09	49° 9.09'	126° 53'	49° 11.02'	126° 52.98'	91	102	96	5:03 am	10:22 pm
15	2025	01-Jun-09	49° 19.15'	126° 53.04'	49° 21.15'	126° 53.03'	75	79	77	6:38 am	11:59 am
16	2028	01-Jun-09	49° 28.93'	126° 53'	49° 30.88'	126° 52.99'	48	55	51	7:57 am	2:50 pm
17	2027	01-Jun-09	49° 30.57'	126° 37.99'	49° 28.54'	126° 38.01'	23	23	23	9:39 am	5:52 pm
18	2018	02-Jun-09	49° 0.01'	126° 39.45'	49° 0.02'	126° 36.34'	114	180	147	6:01 am	11:49 am
19	2017	02-Jun-09	49° 0'	126° 24.54'	49° 0'	126° 21.52'	74	80	77	7:20 am	3:08 pm
20	2016	02-Jun-09	49° 0'	126° 9.56'	49° 0'	126° 6.61'	37	42	39	8:42 am	6:06 pm
21	2013	03-Jun-09	48° 51.1'	125° 53'	48° 49.26'	125° 52.97'	30	33	31	5:05 am	10:45 am
22	2010	03-Jun-09	48° 39.98'	125° 54.35'	48° 39.99'	125° 51.51'	39	43	41	6:46 am	2:09 pm
23	2012	03-Jun-09	48° 49.11'	125° 37.04'	48° 51.26'	125° 37'	24	27	25	8:53 am	5:23 pm
24	2014	06-Jun-09	48° 50'	126° 6.4'	48° 50'	126° 9.64'	53	64	58	5:01 am	11:02 am
25	2011	06-Jun-09	48° 40.02'	126° 6.52'	48° 40'	126° 9.65'	74	82	78	7:03 am	2:12 pm
26	2015	06-Jun-09	48° 50.01'	126° 24.37'	48° 50'	126° 21.38'	97	99	98	9:28 am	5:43 pm
27	2026	07-Jun-09	49° 19.99'	127° 7.78'	49° 20'	127° 10.72'	97	118	107	5:09 am	12:33 pm
28	2029	07-Jun-09	49° 30.01'	127° 11.12'	49° 30'	127° 7.92'	78	84	81	6:57 am	4:12 pm
29	2030	07-Jun-09	49° 40'	127° 7.72'	49° 39.99'	127° 10.87'	61	66	63	9:17 am	7:27 pm
30	2031	08-Jun-09	49° 39.55'	127° 24.01'	49° 41.47'	127° 24.03'	71	120	95	5:03 am	3:18 pm
31	2032	08-Jun-09	49° 50'	127° 22.68'	49° 49.99'	127° 25.49'	42	45	43	6:35 am	12:15 pm
32	2033	08-Jun-09	49° 50'	127° 38.33'	49° 50'	127° 41.18'	76	99	87	8:11 am	7:14 pm
33	2034	08-Jun-09	49° 59.97'	127° 41.27'	49° 59.99'	127° 38.48'	43	52	47	9:52 am	10:27 pm
34	2035	09-Jun-09	50° 19.12'	128° 11'	50° 21.22'	128° 11'	85	91	88	5:08 am	10:14 am
35	2037	09-Jun-09	50° 29.87'	128° 27'	50° 31.59'	128° 27'	100	104	102	7:07 am	2:20 pm
36	2047	10-Jun-09	50° 59.99'	128° 42.6'	51° 0'	128° 46.03'	35	38	36	6:36 am	12:09 pm
37	2054	10-Jun-09	51° 9.99'	128° 58.61'	51° 10.01'	129° 1.81'	72	75	73	8:34 am	3:55 pm
38	2053	10-Jun-09	51° 10'	128° 45.6'	51° 10'	128° 42.49'	53	58	55	10:18 am	7:03 pm
39	2060	11-Jun-09	51° 20'	128° 44.49'	51° 20.01'	128° 41.27'	114	118	116	5:05 am	11:35 am
40	2067	11-Jun-09	51° 29.99'	128° 44.52'	51° 29.99'	128° 41.51'	27	67	47	6:54 am	2:46 pm
41	2066	11-Jun-09	51° 30'	128° 28.47'	51° 29.99'	128° 25.32'	102	105	103	8:17 am	5:58 pm
42	2059	11-Jun-09	51° 20'	128° 25.26'	51° 19.99'	128° 28.74'	79	86	82	9:53 am	9:09 pm
43	2058	12-Jun-09	51° 20'	128° 12.57'	51° 20.01'	128° 9.35'	39	53	46	5:00 am	10:46 am
44	2065	12-Jun-09	51° 29.06'	128° 11'	51° 31.11'	128° 10.99'	38	49	43	6:37 am	1:58 pm

Appendix B continued on next page.

Vessel PROUD VENTURE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
45	2057	12-Jun-09	51° 20.88'	127° 54.97'	51° 18.8'	127° 54.82'	67	76	71	9:05 am	5:34 pm
46	2042	15-Jun-09	50° 58.98'	128° 13.02'	51° 0.99'	128° 13'	42	69	55	5:05 am	10:30 am
47	2041	15-Jun-09	51° 0'	127° 58.47'	51° 0'	127° 55.28'	62	66	64	6:34 am	1:21 pm
48	2043	15-Jun-09	51° 9.03'	127° 56.02'	51° 11.05'	127° 55.99'	65	75	70	8:04 am	4:21 pm
49	2051	16-Jun-09	51° 10.87'	128° 12.02'	51° 8.67'	128° 11.97'	44	73	58	5:01 am	11:42 am
50	2052	16-Jun-09	51° 9.25'	128° 28.02'	51° 11.32'	128° 27.96'	105	109	107	6:45 am	2:42 pm
51	2046	16-Jun-09	50° 59.24'	128° 28'	51° 1.22'	128° 28'	51	54	52	9:09 am	5:49 pm
52	2040	17-Jun-09	50° 49.07'	128° 27.99'	50° 51.09'	128° 28.02'	31	41	36	6:23 am	12:42 pm
53	2038	17-Jun-09	50° 39.99'	128° 26.71'	50° 40'	128° 29.87'	44	60	52	8:24 am	4:00 pm
54	2039	17-Jun-09	50° 40'	128° 42.56'	50° 40'	128° 45.79'	100	110	105	9:51 am	6:52 pm
55	2045	18-Jun-09	50° 49'	129° 16.01'	50° 51.24'	129° 16'	63	71	67	5:02 am	11:52 am
56	2044	18-Jun-09	50° 50'	129° 1.45'	50° 49.99'	128° 58.3'	43	51	47	6:36 am	3:20 pm
57	2048	18-Jun-09	50° 59.99'	128° 58.84'	51° 0.01'	129° 1.71'	45	48	46	8:14 am	6:03 pm
58	2049	18-Jun-09	50° 59.99'	129° 16.9'	51° 0'	129° 13.76'	83	90	86	10:08 am	9:31 pm
59	2050	19-Jun-09	50° 59.99'	129° 33.16'	51° 0.01'	129° 29.86'	128	134	131	5:09 am	12:17 pm
60	2055	19-Jun-09	51° 9.98'	129° 17.53'	51° 10.02'	129° 14.4'	133	154	143	8:03 am	4:39 pm
61	2056	19-Jun-09	51° 10'	129° 30.43'	51° 10'	129° 33.75'	150	158	154	10:03 am	7:59 pm
62	2063	20-Jun-09	51° 20'	129° 32.74'	51° 19.99'	129° 29.78'	109	114	111	5:17 am	11:33 am
63	2070	20-Jun-09	51° 29.04'	129° 30.98'	51° 31.25'	129° 30.99'	51	62	56	6:46 am	3:27 pm
64	2069	20-Jun-09	51° 29.2'	129° 16.01'	51° 31.3'	129° 16'	26	28	27	8:34 am	6:51 pm
65	2068	21-Jun-09	51° 30'	128° 57.56'	51° 30.01'	129° 1.01'	23	25	24	5:03 am	11:07 am
66	2062	21-Jun-09	51° 19.99'	129° 16.11'	51° 19.99'	129° 13'	124	130	127	7:42 am	2:39 pm
67	2061	21-Jun-09	51° 20.01'	129° 0.4'	51° 19.99'	128° 57.19'	133	137	135	9:11 am	6:25 pm
68	2073	25-Jun-09	51° 40'	128° 24.37'	51° 40'	128° 27.4'	79	81	80	5:03 am	11:38 am
69	2078	25-Jun-09	51° 50.96'	128° 26'	51° 48.92'	128° 26.01'	88	92	90	7:04 am	3:03 pm
70	2079	25-Jun-09	51° 49.99'	128° 43.62'	51° 50'	128° 40.37'	42	75	58	9:17 am	6:14 pm
71	2085	26-Jun-09	52° 0'	129° 12.54'	52° 0'	129° 15.97'	98	102	100	5:02 am	11:08 am
72	2101	26-Jun-09	52° 9.97'	129° 15.77'	52° 10.01'	129° 12.75'	94	99	96	6:56 am	2:02 pm
73	2100	26-Jun-09	52° 10'	128° 58.63'	52° 10.01'	128° 55.61'	85	93	89	8:34 am	4:53 pm
74	2086	28-Jun-09	52° 10.96'	128° 41.01'	52° 9.19'	128° 41'	112	137	124	5:13 am	12:02 pm
75	2083	28-Jun-09	52° 0.9'	128° 42'	51° 58.89'	128° 42'	89	92	90	7:02 am	3:36 pm
76	2084	28-Jun-09	52° 0.96'	128° 58'	51° 58.99'	128° 58.02'	69	95	82	9:12 am	6:56 pm
77	2102	29-Jun-09	52° 10'	129° 28.49'	52° 10'	129° 31.83'	108	121	114	5:02 am	10:39 am
78	2103	29-Jun-09	52° 10'	129° 44.42'	52° 10'	129° 47.5'	112	118	115	6:31 am	1:42 pm
79	2094	29-Jun-09	52° 0'	129° 31.68'	52° 0.01'	129° 28.55'	109	118	113	8:42 am	6:16 pm
80	2082	30-Jun-09	51° 50'	129° 32.61'	51° 50'	129° 29.33'	136	142	139	5:04 am	11:17 am
81	2075	30-Jun-09	51° 39.99'	129° 14.4'	51° 40'	129° 17.36'	27	33	30	7:22 am	3:14 pm
82	2076	30-Jun-09	51° 40.01'	129° 29.31'	51° 40'	129° 32.37'	46	59	52	8:54 am	6:35 pm
83	2080	01-Jul-09	51° 50.01'	128° 56.31'	51° 50'	128° 59.54'	40	51	45	5:02 am	11:47 am
84	2081	01-Jul-09	51° 50.02'	129° 12.42'	51° 50'	129° 15.69'	67	69	68	6:47 am	2:49 pm
85	2074	01-Jul-09	51° 40'	129° 0.7'	51° 39.97'	128° 57.28'	26	35	30	9:07 am	6:27 pm
86	2077	05-Jul-09	51° 40.01'	129° 45.22'	51° 40'	129° 48.64'	124	160	142	5:38 am	11:50 am
87	2087	05-Jul-09	51° 40'	130° 1.64'	51° 40'	130° 5.01'	190	196	193	7:09 am	3:00 pm
88	2089	05-Jul-09	51° 49.97'	129° 48.3'	51° 49.97'	129° 45.17'	134	150	142	9:46 am	7:43 pm

Appendix B continued on next page.

Vessel PROUD VENTURE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
89	2096	06-Jul-09	51° 59.99'	130° 1.38'	51° 59.99'	130° 4.87'	76	80	78	5:06 am	11:21 am
90	2090	06-Jul-09	51° 49.99'	130° 1.78'	51° 50.02'	130° 5.36'	98	103	100	7:01 am	2:54 pm
91	2095	06-Jul-09	51° 59.2'	129° 46.92'	52° 1.32'	129° 46.99'	61	64	62	9:26 am	7:03 pm
92	2104	07-Jul-09	52° 10'	130° 1.29'	52° 10'	130° 4.61'	88	106	97	5:02 am	10:42 am
93	2111	07-Jul-09	52° 20'	130° 4.49'	52° 20'	130° 1.16'	100	145	122	6:49 am	1:54 pm
94	2110	07-Jul-09	52° 20'	129° 47.61'	52° 20.01'	129° 44.33'	114	116	115	8:14 am	5:06 pm
95	2117	08-Jul-09	52° 30'	130° 0.26'	52° 30'	130° 3.59'	144	152	148	5:04 am	11:24 am
96	2122	08-Jul-09	52° 39.99'	130° 3.45'	52° 40'	130° 0'	145	146	145	6:55 am	2:45 pm
97	2121	08-Jul-09	52° 40'	129° 47.72'	52° 40'	129° 44.49'	82	109	95	8:11 am	5:52 pm
98	2116	08-Jul-09	52° 30'	129° 44.42'	52° 29.99'	129° 47.67'	90	108	99	9:53 am	8:54 pm
99	2115	09-Jul-09	52° 30.02'	129° 30.55'	52° 30.01'	129° 33.83'	34	61	47	5:17 am	11:15 am
100	2108	09-Jul-09	52° 20.89'	129° 12.98'	52° 18.78'	129° 12.99'	78	88	83	7:45 am	3:33 pm
101	2109	09-Jul-09	52° 19.01'	129° 29.99'	52° 20.91'	129° 30'	87	101	94	9:33 am	6:59 pm
102	2112	10-Jul-09	52° 19.13'	130° 19'	52° 21.1'	130° 19'	188	198	193	5:10 am	12:25 pm
103	2113	10-Jul-09	52° 19.1'	130° 34.99'	52° 21.02'	130° 34.99'	90	95	92	7:04 am	3:49 pm
104	2119	10-Jul-09	52° 30.79'	130° 35'	52° 28.69'	130° 34.99'	64	69	66	8:59 am	6:50 pm
105	2118	10-Jul-09	52° 30.86'	130° 19.01'	52° 29.03'	130° 18.99'	132	147	139	10:48 am	9:53 pm
106	2128	14-Jul-09	53° 1.2'	130° 2'	52° 59.22'	130° 2'	74	118	96	5:02 am	10:42 am
107	2127	14-Jul-09	53° 0'	129° 46.78'	52° 59.99'	129° 43.66'	119	131	125	6:40 am	1:48 pm
108	2125	14-Jul-09	52° 50.01'	130° 0.37'	52° 50'	130° 3.56'	141	143	142	8:52 am	5:58 pm
109	2126	15-Jul-09	52° 50'	130° 17.24'	52° 50'	130° 20.62'	108	121	114	5:09 am	10:34 am
110	2123	15-Jul-09	52° 40.99'	130° 19.01'	52° 38.95'	130° 19'	122	125	123	6:46 am	1:45 pm
111	2124	15-Jul-09	52° 40'	130° 33.26'	52° 39.99'	130° 36.5'	78	81	79	8:14 am	5:30 pm
112	2120	16-Jul-09	52° 28.54'	130° 52'	52° 30.68'	130° 52'	56	61	58	5:02 am	11:45 am
113	2114	16-Jul-09	52° 21.03'	130° 52'	52° 19.09'	130° 52'	77	84	80	6:51 am	2:38 pm
114	2107	16-Jul-09	52° 9.99'	130° 53.7'	52° 10.01'	130° 50.42'	122	124	123	8:27 am	6:16 pm
115	2106	17-Jul-09	52° 8.98'	130° 35'	52° 11'	130° 35.01'	105	109	107	5:32 am	12:55 pm
116	2105	17-Jul-09	52° 9.24'	130° 19.02'	52° 11.42'	130° 19'	205	223	214	7:44 am	4:19 pm
117	2097	17-Jul-09	51° 58.88'	130° 19'	52° 0.98'	130° 19.01'	193	199	196	10:34 am	8:14 pm
118	2098	18-Jul-09	51° 59.04'	130° 34.99'	52° 1.09'	130° 34.98'	125	162	143	5:03 am	11:51 am
119	2099	18-Jul-09	51° 58.87'	130° 52'	52° 0.86'	130° 52.05'	91	120	105	7:19 am	3:32 pm
120	2093	18-Jul-09	51° 51.12'	130° 51.99'	51° 49.19'	130° 52'	96	112	104	9:14 am	6:37 pm
121	2092	19-Jul-09	51° 49.99'	130° 33.39'	51° 50'	130° 36.81'	152	164	158	5:33 am	12:06 pm
122	2091	19-Jul-09	51° 49.99'	130° 20'	51° 50.01'	130° 17.45'	117	119	118	7:27 am	3:59 pm
123	2088	19-Jul-09	51° 40.01'	130° 20.22'	51° 40.01'	130° 16.74'	137	147	142	9:28 am	7:35 pm
124	2072	20-Jul-09	51° 30.01'	130° 5.06'	51° 29.99'	130° 1.86'	141	202	171	5:02 am	10:43 am
125	2071	20-Jul-09	51° 30'	129° 48.52'	51° 30'	129° 45.31'	89	95	92	6:29 am	3:06 pm
126	2064	20-Jul-09	51° 20'	129° 45.42'	51° 20'	129° 48.5'	130	135	132	8:17 am	6:23 pm

Appendix B continued on next page.

Vessel VANISLE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
50	2130	28-Jun-09	52° 29.41'	131° 25.35'	52° 31.24'	131° 24.18'	54	162	108	5:00 am	10:25 am
51	2129	28-Jun-09	52° 29.12'	131° 8.71'	52° 30.84'	131° 6.82'	30	90	60	6:30 am	2:01 pm
52	2132	28-Jun-09	52° 40.75'	131° 6.72'	52° 39.32'	131° 8.74'	35	47	41	8:10 am	5:22 pm
53	2131	29-Jun-09	52° 39.01'	130° 53.07'	52° 40.48'	130° 50.95'	52	54	53	5:05 am	10:36 am
54	2134	29-Jun-09	52° 49.45'	130° 52.32'	52° 47.55'	130° 52.9'	29	32	30	6:35 am	1:36 pm
55	2133	29-Jun-09	52° 50.7'	130° 34.77'	52° 49.03'	130° 36.36'	63	64	63	8:25 am	4:50 pm
56	2136	30-Jun-09	52° 58.93'	130° 35.43'	53° 0.73'	130° 34.12'	49	60	54	5:00 am	10:39 am
57	2135	30-Jun-09	52° 59.08'	130° 18.9'	53° 0.54'	130° 16.91'	114	117	115	6:35 am	1:52 pm
58	2137	30-Jun-09	53° 9.29'	130° 18.42'	53° 11.08'	130° 17.18'	53	121	87	8:05 am	5:20 pm
59	2140	01-Jul-09	53° 18.98'	130° 18.92'	53° 20.62'	130° 17.06'	50	70	60	5:15 am	10:39 am
60	2141	01-Jul-09	53° 20.65'	130° 33.7'	53° 19.33'	130° 36.45'	31	88	59	6:50 am	2:02 pm
61	2138	01-Jul-09	53° 10.91'	130° 34.05'	53° 9.28'	130° 35.75'	100	109	104	8:15 am	5:15 pm
62	2139	02-Jul-09	53° 9.13'	130° 52.36'	53° 10.89'	130° 51.21'	56	62	59	5:02 am	11:30 am
63	2142	02-Jul-09	53° 19.01'	130° 53.14'	53° 20.66'	130° 51.46'	66	80	73	6:50 am	3:01 pm
64	2145	02-Jul-09	53° 28.97'	130° 52.71'	53° 30.67'	130° 51.26'	51	54	52	8:25 am	6:17 pm
65	2148	03-Jul-09	53° 39'	130° 52.63'	53° 40.56'	130° 51.28'	24	26	25	5:00 am	10:21 am
66	2147	03-Jul-09	53° 39.14'	130° 36.63'	53° 40.31'	130° 34.01'	16	32	24	6:30 am	1:26 pm
67	2150	03-Jul-09	53° 50.51'	130° 50.81'	53° 49.13'	130° 53.2'	43	52	47	8:40 am	3:22 pm
68	2143	07-Jul-09	53° 20.78'	132° 48.06'	53° 19.08'	132° 49.82'	61	84	72	5:03 am	10:29 am
69	2144	08-Jul-09	53° 21.66'	133° 4.61'	53° 19.82'	133° 6.09'	109	140	124	6:35 am	2:14 pm
70	2146	08-Jul-09	53° 31.12'	133° 5.11'	53° 29.27'	133° 6.61'	125	276	200	8:25 am	6:02 pm
71	2149	09-Jul-09	53° 39.46'	133° 7.49'	53° 41.1'	133° 5.71'	67	87	77	5:12 am	11:43 am
72	2151	09-Jul-09	53° 58.57'	133° 27.05'	54° 0.32'	133° 25.15'	41	45	43	8:20 am	5:14 pm
73	2157	10-Jul-09	54° 10.58'	133° 24.63'	54° 9.52'	133° 27.8'	211	225	218	5:30 am	10:40 am
74	2168	10-Jul-09	54° 19.06'	133° 43.68'	54° 20.75'	133° 42'	132	136	134	7:25 am	2:57 pm
75	2167	09-Jul-09	54° 19.32'	133° 27.22'	54° 20.5'	133° 25.2'	114	127	120	8:45 am	6:38 pm
76	2156	11-Jul-09	54° 10.79'	133° 7.79'	54° 9.38'	133° 10.35'	20	42	31	5:10 am	11:02 am
77	2166	11-Jul-09	54° 19.33'	133° 9.79'	54° 20.91'	133° 8.52'	252	255	253	6:50 am	2:45 pm
78	2165	11-Jul-09	54° 21.07'	132° 51.04'	54° 19.32'	132° 52.72'	210	215	212	8:35 am	7:31 pm
79	2155	14-Jul-09	54° 9.24'	132° 34.69'	54° 10.81'	132° 32.6'	44	53	48	5:20 am	10:10 am
80	2164	14-Jul-09	54° 19.27'	132° 35.31'	54° 20.92'	132° 33.7'	143	148	145	6:40 am	1:01 pm
81	2163	14-Jul-09	54° 20.56'	132° 16.95'	54° 19.12'	132° 19.34'	116	130	123	8:10 am	4:19 pm
82	2154	15-Jul-09	54° 9.09'	132° 17.89'	54° 10.75'	132° 16'	45	55	50	5:00 am	10:00 am
83	2162	15-Jul-09	54° 19.23'	132° 1.81'	54° 20.92'	131° 59.78'	132	138	135	6:40 am	1:25 pm
84	2153	15-Jul-09	54° 10.96'	131° 59.08'	54° 9.27'	132° 1'	23	51	37	8:10 am	4:15 pm
85	2161	16-Jul-09	54° 18.93'	131° 43.63'	54° 20.78'	131° 41.86'	96	103	99	5:25 am	10:42 am
86	2172	16-Jul-09	54° 29.14'	131° 44.34'	54° 31.01'	131° 42.92'	182	189	185	6:45 am	1:55 pm
87	2171	16-Jul-09	54° 29.02'	131° 26.76'	54° 30.73'	131° 24.95'	36	79	57	8:10 am	5:07 pm
88	2170	17-Jul-09	54° 30.63'	131° 8.19'	54° 29.17'	131° 9.61'	71	80	75	5:00 am	10:25 am
89	2160	17-Jul-09	54° 20.6'	131° 25.41'	54° 18.91'	131° 26.94'	82	100	91	6:55 am	2:10 pm
90	2159	17-Jul-09	54° 19.11'	131° 9.64'	54° 20.75'	131° 8.05'	33	41	37	8:30 am	5:12 pm
91	2158	18-Jul-09	54° 19.34'	130° 35.31'	54° 21.21'	130° 34.15'	40	70	55	5:00 am	10:36 am
92	2169	18-Jul-09	54° 29.01'	130° 35.62'	54° 30.87'	130° 34.31'	59	70	64	6:10 am	1:12 pm
93	2152	18-Jul-09	54° 9.4'	130° 36.29'	54° 10.58'	130° 33.57'	42	67	54	9:10 am	5:32 pm

Appendix C. Set information by PSMFC Area, common IPHC station and year (2003 to 2009), showing number of hooks deployed, returned, with bait, empty, or with catch, separated for Pacific Halibut, North Pacific Spiny Dogfish, Redbanded Rockfish, Yelloweye Rockfish, Rougheye Rockfish, and Quillback Rockfish, with catch per 100 hooks shown for rockfish.

Hkd # Hooks deployed	No # other catch	401 # Redbanded Rockfish, catch per 100 Hooks
Hko # Hooks observed/returned	(fish/invert./inanimate)	442 # Yelloweye Rockfish, catch per 100 Hooks
Nb # Hooks with bait left intact	614 # Pacific Halibut	394 # Rougheye Rockfish, catch per 100 Hooks
Ne # Hooks empty/bait skin	044 # North Pacific Spiny Dogfish	424 # Quillback Rockfish, catch per 100 Hooks

Area Station Year Set Hkd Hko Nb Ne No 614 044 401 CPUE 442 CPUE 394 CPUE 424 CPUE

3C/D, 5A

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(3C/D, 5A)																		
2029	2009	28	710	706	13	367	40	75	212	0	0	0	0	0	0	0	0	0
2030	2003	29	811	811	3	420	39	32	317	0	0	0	0	0	0	0	0	0
	2004	20	793	793	58	553	153	29	0	0	0	0	0	0	0	0	0	0
	2005	29	706	706	1	445	31	11	219	0	0	0	0	0	0	0	0	0
	2006	29	599	599	2	424	11	7	155	0	0	0	0	0	0	0	0	0
	2007	29	496	496	36	248	52	47	113	0	0	0	0	0	0	0	0	0
	2008	29	496	494	127	189	34	36	108	0	0	0	0	0	0	0	0	0
	2009	29	700	697	102	301	63	35	196	0	0	0	0	0	0	0	0	0
2031	2003	30	791	791	13	435	101	16	214	9	1.14	0	3	0.38	0	0	0	0
	2004	21	786	783	80	449	190	27	6	21	2.68	8	1.02	2	0.26	0	0	0
	2005	30	700	699	16	363	206	55	46	16	2.29	0	1	0.14	0	0	0	0
	2006	30	599	597	0	454	26	6	103	6	1.01	2	0.34	0	0	0	0	0
	2007	30	497	496	6	291	31	14	141	10	2.02	2	0.4	1	0.2	0	0	0
	2008	30	497	490	5	231	27	7	179	15	3.06	0	0	0	0	0	0	0
	2009	30	688	678	12	320	109	155	72	3	0.44	8	1.18	0	0	0	0	0
2032	2003	31	804	804	22	321	5	29	426	0	0	0	0	0	1	0.12	0	0
	2004	31	795	794	237	435	3	73	44	0	1	0.13	0	0	1	0.13	0	0
	2005	31	701	697	93	333	11	157	102	0	0	0	0	0	1	0.14	0	0
	2006	31	601	601	7	328	15	143	108	0	0	0	0	0	0	0	0	0
	2007	31	499	498	43	308	4	100	43	0	0	0	0	0	0	0	0	0
	2008	31	495	493	187	204	7	75	20	0	0	0	0	0	0	0	0	0
	2009	31	697	696	21	253	12	90	320	0	0	0	0	0	0	0	0	0
2033	2003	32	801	801	5	458	39	9	262	23	2.87	4	0.5	0	0	0	0	0
	2004	32	799	794	33	563	175	6	1	14	1.76	0	2	0.25	0	0	0	0
	2005	32	704	703	2	356	65	11	257	12	1.71	0	0	0	0	0	0	0
	2006	32	599	599	4	408	10	2	165	0	10	1.67	0	0	0	0	0	0
	2007	32	502	500	2	210	20	14	254	0	0	0	0	0	0	0	0	0
	2008	32	495	490	1	208	14	12	251	0	4	0.82	0	0	0	0	0	0
	2009	32	691	683	29	345	33	96	148	10	1.46	22	3.22	0	0	0	0	0
2034	2003	33	788	788	16	345	21	68	335	0	1	0.13	0	2	0.25	0	0	0
	2004	33	798	796	121	575	19	66	10	0	3	0.38	0	2	0.25	0	0	0
	2005	33	705	704	47	460	15	114	51	0	11	1.56	0	6	0.85	0	0	0
	2006	33	602	602	25	368	31	94	81	0	3	0.5	0	0	0	0	0	0
	2007	33	497	496	9	255	20	39	174	0	0	0	0	0	0	0	0	0
	2008	33	498	496	86	250	26	93	34	0	4	0.81	0	3	0.6	0	0	0
	2009	33	701	675	10	390	30	92	152	0	1	0.15	0	0	0	0	0	0
2035	2003	34	802	802	11	524	52	11	183	3	0.37	18	2.24	0	0	0	0	0
	2004	34	792	784	146	361	59	73	2	92	11.7	51	6.51	0	0	0	0	0
	2005	34	699	699	9	368	53	41	211	9	1.29	10	1.43	0	0	0	0	0
	2006	34	601	600	3	415	9	9	153	2	0.33	9	1.5	0	0	0	0	0
	2007	34	499	498	50	218	20	39	140	11	2.21	20	4.02	0	0	0	0	0
	2008	34	488	487	1	261	13	12	194	5	1.03	1	0.21	0	0	0	0	0
	2009	34	695	693	108	284	54	64	82	59	8.51	42	6.06	0	0	0	0	0
2037	2003	35	800	800	4	484	88	20	186	8	1	10	1.25	0	0	0	0	0
	2004	35	793	789	83	444	208	18	2	11	1.39	23	2.92	0	0	0	0	0
	2005	35	702	699	6	328	141	38	131	29	4.15	29	4.15	0	0	0	0	0
	2006	35	602	597	1	404	21	13	132	21	3.52	6	1.01	0	0	0	0	0
	2007	35	497	497	3	276	21	24	130	30	6.04	13	2.62	0	0	0	0	0
	2008	35	488	486	0	301	4	5	170	5	1.03	2	0.41	0	0	0	0	0
	2009	35	698	691	37	307	102	70	105	54	7.81	18	2.6	0	0	0	0	0
2038	2003	36	800	800	230	472	10	43	41	0	3	0.38	0	1	0.12	0	0	0
	2004	82	794	791	22	635	28	104	2	0	0	0	0	0	0	0	0	0
	2005	37	704	703	49	461	64	84	14	0	30	4.27	0	2	0.28	0	0	0
	2006	36	596	596	41	358	35	76	71	0	12	2.01	0	4	0.67	0	0	0
	2007	36	501	501	76	244	58	35	69	0	12	2.4	0	7	1.4	0	0	0
	2008	37	495	494	216	165	37	45	8	0	17	3.44	0	6	1.21	0	0	0
	2009	53	697	687	125	365	61	64	55	0	12	1.75	0	5	0.73	0	0	0
2039	2003	37	792	792	6	536	27	7	201	9	1.14	6	0.76	0	0	0	0	0
	2004	36	796	793	35	609	109	21	5	7	0.88	7	0.88	0	0	0	0	0
	2005	38	703	703	9	434	46	14	173	20	2.84	10	1.42	0	0	0	0	0
	2006	37	603	602	7	425	4	2	164	0	0	0	0	0	0	0	0	0
	2007	69	500	499	0	325	5	2	166	1	0.2	1	0.2	0	0	0	0	0
	2008	36	498	493	10	266	6	10	201	0	0	0	0	0	0	0	0	0
	2009	54	697	695	17	363	23	20	258	6	0.86	8	1.15	0	0	0	0	0
2040	2003	38	793	793	51	630	40	66	3	0	1	0.13	0	2	0.25	0	0	0
	2004	83	795	790	67	554	73	91	5	0	0	0	0	0	0	0	0	0
	2005	36	702	702	35	486	61	102	9	0	6	0.85	0	3	0.43	0	0	0

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(3C/D, 5A)																		
2040	2006	40	599	597	100	360	40	91	2	0	1	0.17	0	3	0.5			
	2007	68	496	495	79	302	54	47	6	0	1	0.2	0	7	1.41			
	2008	38	494	489	91	318	40	36	3	0	1	0.2	0	0				
	2009	52	700	698	50	493	94	46	9	0	3	0.43	0	3	0.43			
2041	2003	53	800	800	24	616	87	69	3	0	0	0	1	0.12	0			
	2004	50	797	794	117	554	91	29	3	0	0	0	0	0	0			
	2005	78	701	700	59	516	85	36	4	0	0	0	0	0	0			
	2006	43	600	599	0	419	4	1	175	0	0	0	0	0	0			
	2007	37	500	500	61	332	43	53	11	0	0	0	0	0	0			
	2008	66	494	488	148	237	30	51	23	0	0	0	0	0	0			
	2009	47	699	696	174	430	57	26	9	0	0	0	0	0	0			
2042	2003	52	788	788	215	506	27	30	1	0	7	0.89	0	2	0.25			
	2004	49	793	784	163	500	55	42	9	0	14	1.79	0	1	0.13			
	2005	79	698	696	40	530	30	90	1	0	5	0.72	0	0				
	2006	42	603	603	36	458	57	27	21	0	4	0.66	0	0				
	2007	38	499	499	72	368	18	36	4	0	1	0.2	0	0				
	2008	65	499	495	82	340	15	40	11	0	3	0.61	0	4	0.81			
	2009	46	698	698	108	365	124	56	27	0	14	2.01	0	6	0.86			
2043	2003	54	798	798	16	539	36	27	180	0	0	0	0	0	0			
	2004	51	801	799	85	558	61	31	64	0	0	0	0	0	0			
	2005	81	702	701	29	483	87	29	73	0	0	0	0	0	0			
	2006	45	601	600	6	390	52	17	140	0	0	0	0	0	0			
	2007	40	501	500	36	292	43	100	35	0	0	0	0	0	0			
	2008	63	496	490	33	276	34	65	82	1	0.2	0	0	0	0			
	2009	48	694	689	4	438	81	108	59	0	0	0	0	0	0			
2044	2003	41	797	797	164	481	24	57	16	0	45	5.65	0	10	1.25			
	2004	80	792	789	81	514	47	70	0	0	72	9.13	0	5	0.63			
	2005	40	705	699	72	492	24	81	1	0	29	4.15	0	0				
	2006	38	598	594	105	354	35	89	4	0	8	1.35	0	0				
	2007	70	501	498	33	346	14	80	11	0	13	2.61	0	1	0.2			
	2008	43	495	491	310	122	17	37	2	0	2	0.41	0	1	0.2			
	2009	56	689	680	358	208	33	43	7	0	27	3.97	0	4	0.59			
2045	2003	42	610	610	276	243	8	72	7	0	4	0.66	0	0				
	2004	79	787	780	155	451	43	89	13	0	29	3.72	0	0				
	2005	39	703	700	116	389	15	143	3	0	34	4.86	0	0				
	2006	39	596	596	75	348	18	93	18	0	44	7.38	0	0				
	2007	82	494	492	19	252	24	83	79	0	35	7.11	0	0				
	2008	44	499	488	315	135	4	9	17	0	8	1.64	0	0				
	2009	55	694	685	157	290	26	100	57	0	55	8.03	0	0				
2046	2003	51	801	801	155	578	34	30	0	0	2	0.25	0	2	0.25			
	2004	84	791	789	43	670	14	62	0	0	0	0	0	0	0			
	2005	76	702	700	31	550	7	99	1	0	10	1.43	0	2	0.29			
	2006	41	594	592	81	455	5	48	0	0	3	0.51	0	0				
	2007	67	501	500	74	355	3	61	7	0	0	0	0	0				
	2008	41	494	490	51	370	5	57	3	0	4	0.82	0	0				
	2009	51	701	701	216	363	30	82	11	0	0	0	0	0				
2047	2003	39	794	794	213	487	2	73	3	0	4	0.5	0	12	1.51			
	2004	72	794	793	461	274	15	40	1	0	1	0.13	0	1	0.13			
	2005	75	702	702	118	512	5	62	3	0	0	0	0	2	0.28			
	2006	64	597	597	112	436	5	36	7	0	0	0	0	1	0.17			
	2007	64	496	495	325	125	1	43	1	0	0	0	0	0	0			
	2008	39	496	494	333	125	1	34	0	0	1	0.2	0	0	0			
	2009	36	696	692	441	183	2	60	5	0	1	0.14	0	0				
2048	2003	40	792	792	100	622	5	61	4	0	0	0	0	0	0			
	2004	81	789	787	93	627	7	60	0	0	0	0	0	0	0			
	2005	41	700	700	32	608	5	51	4	0	0	0	0	0	0			
	2006	61	600	600	115	455	8	19	3	0	0	0	0	0	0			
	2007	71	497	496	393	81	3	14	5	0	0	0	0	0	0			
	2008	42	491	488	324	135	11	16	2	0	0	0	0	0	0			
	2009	57	693	689	549	123	6	8	3	0	0	0	0	0	0			
2049	2003	43	801	801	213	506	24	51	7	0	0	0	0	0	0			
	2004	77	788	785	72	565	106	36	6	0	0	0	0	0	0			
	2005	42	703	702	24	544	99	27	8	0	1	0.14	0	0	0			
	2006	59	600	600	100	379	57	42	23	0	0	0	0	0	0			
	2007	72	500	499	212	220	27	12	27	0	1	0.2	0	0	0			
	2008	45	499	497	348	73	7	28	41	0	0	0	0	0	0			
	2009	58	704	698	143	454	16	49	36	0	0	0	0	0	0			

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(3C/D, 5A)																		
2050		2003	44	792	792	111	375	62	35	198	10	1.26	1	0.13	0	0	0	
		2004	76	790	781	221	324	91	54	12	64	8.19	15	1.92	0	0	0	
		2005	43	703	699	48	341	86	68	89	48	6.87	21	3	0	0	0	
		2006	60	594	593	10	331	45	10	122	50	8.43	26	4.38	0	0	0	
		2007	83	496	494	2	296	19	8	145	16	3.24	12	2.43	0	0	0	
		2008	53	500	489	55	156	81	41	105	48	9.82	5	1.02	0	0	0	
		2009	59	690	684	7	288	22	17	326	20	2.92	4	0.58	0	0	0	
2051		2003	55	796	796	11	519	8	34	214	0	9	1.13	1	0.13	0	0	
		2004	54	793	787	172	471	36	62	41	0	5	0.64	0	0	0	0	
		2005	80	704	702	23	455	60	66	70	0	29	4.13	0	0	0	0	
		2006	46	598	597	14	345	11	10	204	0	13	2.18	0	0	0	0	
		2007	39	491	483	219	202	4	26	13	0	18	3.73	0	1	0.21	0	
		2008	64	498	498	220	196	7	31	36	0	9	1.81	0	0	0	0	
		2009	49	694	691	58	573	18	10	25	0	5	0.72	0	2	0.29	0	
2052		2003	56	800	800	395	296	55	40	13	1	0.12	0	0	0	0	0	
		2004	53	795	793	209	515	32	20	14	3	0.38	0	0	0	0	0	
		2005	77	701	699	195	446	23	23	2	10	1.43	0	0	0	0	0	
		2006	47	598	598	5	452	8	2	130	1	0.17	0	0	0	0	0	
		2007	66	501	501	184	241	16	9	45	6	1.2	0	0	0	0	0	
		2008	40	492	483	22	280	72	43	65	1	0.21	0	0	0	0	0	
		2009	50	693	681	14	478	64	45	79	2	0.29	0	0	0	0	0	
2053		2003	57	798	798	557	187	0	54	0	0	0	0	0	0	0	0	
		2004	71	795	792	254	411	18	109	0	0	0	0	0	0	0	0	
		2005	74	701	699	66	521	9	103	0	0	0	0	0	0	0	0	
		2006	63	600	599	19	473	10	96	1	0	0	0	0	0	0	0	
		2007	65	498	498	167	266	6	57	2	0	0	0	0	0	0	0	
		2008	47	493	490	191	208	5	79	7	0	0	0	0	0	0	0	
		2009	38	700	695	35	483	36	129	12	0	0	0	0	0	0	0	
2054		2003	63	801	801	138	570	8	81	4	0	0	0	0	0	0	0	
		2004	70	794	793	336	325	78	52	2	0	0	0	0	0	0	0	
		2005	73	704	704	101	500	17	79	7	0	0	0	0	0	0	0	
		2006	62	599	599	42	454	29	70	4	0	0	0	0	0	0	0	
		2007	74	498	498	33	327	15	117	6	0	0	0	0	0	0	0	
		2008	46	504	501	149	250	10	80	13	0	1	0.2	0	0	0	0	
		2009	37	695	690	23	478	24	141	24	0	0	0	0	0	0	0	
2055		2003	45	800	800	148	401	140	64	19	21	2.62	0	7	0.88	0		
		2004	78	795	789	188	457	85	36	4	12	1.52	0	7	0.89	0		
		2005	45	703	702	12	402	216	43	11	14	1.99	0	5	0.71	0		
		2006	58	597	595	16	397	146	22	12	2	0.34	0	0	0	0	0	
		2007	73	500	498	15	348	70	17	43	4	0.8	0	1	0.2	0	0	
		2008	51	493	493	34	291	93	54	13	5	1.01	0	3	0.61	0	0	
		2009	60	697	685	19	377	172	65	38	12	1.75	0	2	0.29	0	0	
2056		2003	46	798	798	78	538	125	18	39	0	0	0	0	0	0	0	
		2004	75	795	780	319	336	59	49	10	6	0.77	0	1	0.13	0	0	
		2005	44	702	701	6	420	134	54	86	3	0.43	0	0	0	0	0	
		2006	57	601	600	49	391	107	8	43	2	0.33	0	0	0	0	0	
		2007	84	502	500	1	338	31	6	124	0	0	0	0	0	0	0	
		2008	52	500	491	61	221	88	89	31	1	0.2	0	0	0	0	0	
		2009	61	463	447	4	269	55	30	90	0	0	0	0	0	0	0	
2058		2003	76	803	803	82	641	23	39	18	0	0	0	0	0	0	0	
		2007	42	498	497	152	291	11	26	17	0	0	0	0	0	0	0	
5B		2057	2003	74	803	803	152	488	32	73	53	0	3	0.37	0	2	0.25	
		2004	39	800	795	104	551	45	29	50	0	16	2.01	0	0	0	0	
		2005	84	695	695	71	536	23	7	56	0	2	0.29	0	0	0	0	
		2006	44	603	602	32	400	16	13	132	0	5	0.83	0	4	0.66	0	
		2007	41	501	500	58	356	15	25	41	0	5	1	0	0	0	0	
		2008	62	498	495	18	378	10	25	59	0	5	1.01	0	0	0	0	
		2009	45	689	681	13	477	40	44	107	0	1	0.15	0	0	0	0	
2058		2004	37	798	796	122	584	37	44	9	0	0	0	0	0	0	0	
		2005	83	701	700	48	594	13	36	10	0	0	0	0	0	0	0	
		2006	48	601	601	80	479	15	23	4	0	0	0	0	0	0	0	
		2008	61	501	499	252	174	16	41	16	0	0	0	0	0	0	0	
		2009	43	699	695	244	374	31	31	15	0	0	0	0	0	0	0	
2059		2003	77	801	801	485	269	18	12	13	1	0.12	3	0.37	0	0	0	
		2004	52	799	796	115	533	78	17	25	28	3.52	0	0	0	0	0	
		2005	70	701	700	99	471	69	11	47	5	0.71	0	0	0	0	0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
2069	2003	65	802	802	1	453	1	3	343	0	1	0.12	0	0	0	0	0	0
	2004	66	798	791	5	486	1	16	282	0	1	0.13	0	0	0	0	0	0
	2005	66	701	699	23	355	15	29	269	0	11	1.57	0	0	0	0	0	0
	2006	53	599	588	41	367	10	39	127	0	4	0.68	0	0	0	0	0	0
	2007	75	498	497	9	312	10	28	132	0	6	1.21	0	0	0	0	0	0
	2008	71	497	492	18	242	8	137	82	0	7	1.42	0	0	0	0	0	0
	2009	64	702	689	75	368	16	133	73	0	24	3.48	0	1	0.15	0	0	0
2070	2003	66	799	799	30	472	24	191	11	0	69	8.64	0	2	0.25	0	0	0
	2004	65	792	783	47	479	17	129	0	0	111	14.1	0	0	0	0	0	0
	2005	52	700	700	42	418	20	128	22	0	70	10	0	0	0	0	0	0
	2006	54	600	587	51	404	9	58	50	0	17	2.9	0	0	0	0	0	0
	2007	78	497	496	2	320	3	21	111	0	39	7.86	0	1	0.2	0	0	0
	2008	68	493	490	5	230	5	102	77	0	73	14.9	0	0	0	0	0	0
	2009	63	697	689	23	375	12	109	67	0	103	14.9	0	0	0	0	0	0
2071	2003	49	791	791	69	386	67	65	138	8	1.01	58	7.33	0	0	0	0	0
	2004	62	797	790	142	327	70	109	1	7	0.89	134	16.9	0	0	0	0	0
	2005	48	701	699	17	365	69	43	116	6	0.86	83	11.8	0	0	0	0	0
	2006	67	599	596	3	345	40	58	76	7	1.17	67	11.2	0	0	0	0	0
	2007	79	497	494	3	291	36	26	77	3	0.61	58	11.7	0	0	0	0	0
	2008	69	496	493	153	130	62	38	28	5	1.01	77	15.6	0	0	0	0	0
	2009	125	693	689	2	244	36	46	271	5	0.73	85	12.3	0	0	0	0	0
2072	2003	50	793	793	94	488	129	19	23	20	2.52	1	0.13	19	2.4	0	0	0
	2004	63	796	786	148	408	157	30	1	29	3.69	0	13	1.65	0	0	0	0
	2005	47	703	696	103	411	71	30	48	28	4.02	0	5	0.72	0	0	0	0
	2006	66	600	600	41	341	76	22	106	15	2.5	0	0	0	0	0	0	0
	2007	80	501	501	6	328	78	11	68	9	1.8	0	0	0	0	0	0	0
	2008	56	494	482	22	329	79	9	17	26	5.39	0	0	0	0	0	0	0
	2009	124	696	681	84	316	114	31	103	33	4.85	0	1	0.15	0	0	0	0
2073	2003	80	804	804	497	283	12	8	4	0	0	0	0	0	0	0	0	0
	2004	40	799	798	437	277	28	19	32	4	0.5	1	0.13	0	0	0	0	0
	2005	55	701	696	151	418	73	16	23	11	1.58	4	0.57	0	0	0	0	0
	2006	81	596	595	42	401	84	49	19	0	0	0	0	0	0	0	0	0
	2007	46	503	501	5	416	22	31	23	2	0.4	2	0.4	0	0	0	0	0
	2008	79	500	492	196	146	38	102	8	2	0.41	0	0	0	0	0	0	0
	2009	68	698	690	89	413	91	32	50	16	2.32	0	0	0	0	0	0	0
2074	2003	60	800	800	18	515	0	24	243	0	0	0	0	0	0	0	0	0
	2004	59	791	791	32	415	7	20	317	0	0	0	0	0	0	0	0	0
	2005	64	703	702	0	425	0	2	275	0	0	0	0	0	0	0	0	0
	2006	78	598	598	6	406	2	14	171	0	0	0	0	0	0	0	0	0
	2007	58	501	500	38	310	9	33	110	0	0	0	0	0	0	0	0	0
	2008	73	498	496	108	207	2	20	159	0	0	0	0	0	0	0	0	0
	2009	85	693	678	0	299	1	33	345	0	0	0	0	0	0	0	0	0
2075	2003	67	798	798	4	572	8	26	188	0	0	0	0	0	0	0	0	0
	2004	60	800	800	86	482	97	41	94	0	0	0	0	0	0	0	0	0
	2005	65	701	700	0	422	0	2	276	0	0	0	0	0	0	0	0	0
	2006	77	597	597	56	375	9	37	120	0	0	0	0	0	0	0	0	0
	2007	59	502	501	188	214	17	31	51	0	0	0	0	0	0	0	0	0
	2008	74	492	490	4	277	4	43	162	0	0	0	0	0	0	0	0	0
	2009	81	698	690	7	338	0	50	295	0	0	0	0	0	0	0	0	0
2076	2003	68	799	799	486	221	4	61	26	0	1	0.13	0	0	0	0	0	0
	2004	64	789	786	175	408	51	102	50	0	0	0	0	0	0	0	0	0
	2005	49	702	701	123	437	5	51	84	0	1	0.14	0	0	0	0	0	0
	2006	68	600	598	1	428	3	8	158	0	0	0	0	0	0	0	0	0
	2007	53	502	502	1	336	0	41	124	0	0	0	0	0	0	0	0	0
	2008	54	499	499	3	277	1	9	209	0	0	0	0	0	0	0	0	0
	2009	82	688	683	2	369	4	93	208	0	6	0.88	0	1	0.15	0	0	0
2077	2003	69	795	795	103	527	80	31	35	14	1.76	5	0.63	0	0	0	0	0
	2004	61	796	773	132	457	124	31	0	9	1.16	11	1.42	9	1.16	0	0	0
	2005	51	701	700	23	493	94	11	70	7	1	0	2	0.29	0	0	0	0
	2006	69	596	595	9	454	85	2	36	5	0.84	0	5	0.84	0	0	0	0
	2007	52	496	492	138	275	55	8	8	6	1.22	0	2	0.41	0	0	0	0
	2008	55	499	494	30	302	87	34	6	21	4.25	3	0.61	11	2.23	0	0	0
	2009	86	691	682	58	438	70	22	77	17	2.49	0	0	0	0	0	0	0
2078	2003	79	801	801	68	668	26	35	4	0	0	0	0	0	0	0	0	0
	2004	42	798	792	134	605	33	11	4	2	0.25	2	0.25	1	0.13	0	0	0
	2005	56	702	701	23	529	62	40	10	5	0.71	15	2.14	0	18	2.57	0	0
	2006	79	602	600	40	469	46	25	1	17	2.83	0	0	3	0.5	0	0	0

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
2078	2007	47	497	497	13	414	24	20	6	11	2.21	4	0.8	0	5	1.01		
	2008	78	495	485	87	253	38	79	8	15	3.09	5	1.03	0	0	0		
	2009	69	680	670	10	492	57	54	15	40	5.97	2	0.3	0	0	0		
2079	2003	81	802	802	33	600	18	120	31	0	0	0	0	0	0	0	0	
	2004	41	797	795	127	563	12	88	5	0	0	0	0	0	0	0	0	
	2005	57	702	702	31	419	83	146	24	0	0	0	0	0	0	0	0	
	2006	80	600	599	47	383	26	133	12	0	0	0	0	0	0	0	0	
	2007	56	494	493	1	349	13	98	32	0	0	0	0	0	0	0	0	
	2008	80	500	494	80	241	22	144	10	0	0	0	0	0	0	0	0	
	2009	70	699	695	7	402	15	245	26	0	0	0	0	0	0	0	0	
2080	2003	73	795	795	95	460	2	30	163	0	42	5.28	0	3	0.38			
	2004	58	795	788	293	347	12	66	43	0	26	3.3	0	1	0.13			
	2005	61	701	699	162	326	4	48	147	0	10	1.43	0	2	0.29			
	2006	75	598	598	21	407	15	110	32	0	12	2.01	0	1	0.17			
	2007	57	495	491	49	303	14	30	86	0	9	1.83	0	2	0.41			
	2008	81	495	492	22	274	4	119	59	0	11	2.24	0	3	0.61			
	2009	83	692	685	49	322	6	120	168	0	15	2.19	0	5	0.73			
2081	2003	71	800	800	424	247	4	36	89	0	0	0	0	0	0	0	0	
	2004	47	800	798	12	534	19	52	181	0	0	0	0	0	0	0	0	
	2005	63	700	700	63	459	9	48	121	0	0	0	0	0	0	0	0	
	2006	76	603	603	62	426	30	39	46	0	0	0	0	0	0	0	0	
	2007	55	499	499	4	353	8	54	80	0	0	0	0	0	0	0	0	
	2008	77	499	496	4	313	3	36	140	0	0	0	0	0	0	0	0	
	2009	84	690	678	73	429	6	41	129	0	0	0	0	0	0	0	0	
2082	2003	70	800	800	4	711	48	22	1	12	1.5	0	2	0.25	0			
	2004	48	793	787	66	585	45	25	4	34	4.32	0	28	3.56	0			
	2005	50	703	697	68	514	54	11	26	20	2.87	0	4	0.57	0			
	2006	70	603	603	21	493	55	9	10	15	2.49	0	1	0.17	0			
	2007	54	499	499	43	345	48	17	33	13	2.61	0	0	0	0			
	2008	75	493	490	105	235	83	16	12	20	4.08	0	19	3.88	0			
	2009	80	702	688	0	514	68	43	39	22	3.2	0	3	0.44	0			
2083	2003	82	800	800	70	509	98	50	57	16	2	0	0	0	0	0	0	
	2004	44	795	787	130	523	92	10	11	20	2.54	1	0.13	0	0			
	2005	58	702	701	99	425	129	8	17	23	3.28	0	0	0	0			
	2006	72	597	597	44	405	58	21	26	43	7.2	0	0	0	0			
	2007	49	499	497	45	380	14	23	25	10	2.01	0	0	0	0			
	2008	83	499	498	93	214	19	45	12	115	23.0	0	0	0	0			
	2009	75	699	686	5	537	21	33	17	73	10.6	2	0.29	0	0			
2084	2003	84	805	805	228	443	13	77	41	0	3	0.37	0	0				
	2004	43	798	789	216	411	72	73	4	0	13	1.65	0	0				
	2005	60	702	702	20	465	62	77	74	0	4	0.57	0	0				
	2006	73	595	592	50	403	24	105	8	0	2	0.34	0	0				
	2007	50	501	500	31	323	47	72	21	0	6	1.2	0	0				
	2008	82	498	493	146	180	38	77	43	0	9	1.83	0	0				
	2009	76	694	683	65	410	14	87	105	0	2	0.29	0	0				
2085	2003	72	801	801	284	487	5	5	19	1	0.12	0	0	0	0			
	2004	46	798	797	350	344	22	26	33	22	2.76	0	0	0	0			
	2005	62	703	702	23	628	13	7	25	7	1	0	0	0				
	2006	74	604	603	17	494	25	14	53	0	0	0	0					
	2007	51	502	502	55	392	6	16	33	0	0	0	0					
	2008	76	502	490	155	267	7	11	38	12	2.45	0	0	0				
	2009	71	697	690	34	574	30	5	17	30	4.35	0	0					
2086	2003	83	803	803	489	262	18	20	5	9	1.12	0	0	0	0			
	2004	45	800	791	197	483	22	15	2	68	8.6	4	0.51	0	0			
	2008	84	500	496	107	220	58	41	17	49	9.88	3	0.6	1	0.2			
2087	2003	3	795	795	6	639	114	7	4	12	1.51	0	13	1.64	0			
	2004	41	792	790	4	523	137	10	0	27	3.42	1	0.13	88	11.1	0		
	2005	33	699	690	27	448	156	8	16	11	1.59	0	25	3.62	0			
	2006	12	595	571	10	394	128	19	20	2	0.35	0	1	0.18	0			
	2007	17	482	473	1	354	93	5	19	0	0	0	3	0.63	0			
	2008	3	488	488	34	302	103	4	2	19	3.89	0	24	4.92	0			
	2009	87	690	676	10	440	163	21	36	7	1.04	0	1	0.15	0			
2088	2003	4	784	784	267	366	99	7	6	39	4.97	0	0	0	0			
	2004	42	797	794	77	497	82	108	2	27	3.4	0	1	0.13	0			
	2005	31	696	693	173	291	96	15	42	76	10.9	0	0	0	0			
	2006	13	598	583	40	309	39	17	113	65	11.1	1	0.17	0	0			
	2007	16	485	483	1	355	39	10	70	9	1.86	0	0	0	0			

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
2088	2008	4	490	487	131	223	52	44	21	15	3.08	0		1	0.21	0		
	2009	123	694	678	88	251	86	48	164	41	6.05	0		1	0.15	0		
2089	2003	1	793	793	47	660	45	29	4	4	0.5	0		4	0.5	0		
	2004	10	803	800	121	548	64	16	36	14	1.75	0		1	0.12	0		
	2005	35	692	688	165	385	42	16	53	24	3.49	2	0.29	1	0.15	0		
	2006	10	585	580	21	314	6	53	185	0		1	0.17	0		0		
	2007	10	493	489	2	368	24	24	57	14	2.86	0		0		0		
	2008	15	503	501	221	220	33	6	1	19	3.79	0		1	0.2	0		
	2009	88	694	686	0	545	40	17	69	6	0.87	0		9	1.31	0		
2090	2003	2	786	786	108	399	70	109	41	7	0.89	52	6.62	0		0		
	2004	40	804	800	97	426	83	98	2	27	3.38	67	8.38	0		0		
	2005	34	701	694	135	296	82	41	101	3	0.43	36	5.19	0		0		
	2006	11	566	550	22	258	30	55	119	13	2.36	53	9.64	0		0		
	2007	18	492	485	0	320	23	43	90	1	0.21	8	1.65	0		0		
	2008	2	494	491	148	182	41	69	23	7	1.43	21	4.28	0		0		
	2009	90	696	691	4	318	53	48	175	4	0.58	90	13.0	0		0		
2091	2003	5	788	788	253	276	40	160	18	9	1.14	32	4.06	0		0		
	2004	39	805	798	39	503	56	109	5	47	5.89	39	4.89	0		0		
	2005	32	694	688	101	255	48	128	76	34	4.94	46	6.69	0		0		
	2006	14	590	582	11	270	34	67	166	16	2.75	20	3.44	0		0		
	2007	15	488	478	0	292	7	13	137	7	1.46	22	4.6	0		0		
	2008	1	477	476	181	170	33	29	21	19	3.99	24	5.04	0		0		
	2009	122	691	684	31	230	52	68	238	19	2.78	47	6.87	0		0		
2092	2003	6	788	788	72	533	48	104	16	2	0.25	0		13	1.65	0		
	2004	35	799	141	10	74	30	18	0	0		0		9	6.38	0		
	2005	30	699	693	198	267	87	102	38	1	0.14	0		0		0		
	2006	15	589	433	16	209	18	92	98	2	0.46	0		0		0		
	2007	12	481	479	0	285	69	66	54	1	0.21	0		4	0.84	0		
	2008	6	496	489	80	284	63	50	5	1	0.2	0		6	1.23	0		
	2009	121	692	679	71	315	163	36	84	6	0.88	0		4	0.59	0		
2093	2003	7	789	789	30	405	36	68	21	47	5.96	182	23.0	0		0		
	2004	34	795	791	20	541	18	125	0	16	2.02	71	8.98	0		0		
	2005	29	657	649	68	317	28	59	66	26	4.01	87	13.4	0		0		
	2006	16	600	584	10	264	21	48	146	10	1.71	86	14.7	0		0		
	2007	11	495	484	0	220	9	4	194	6	1.24	53	10.9	0		0		
	2008	7	490	479	14	243	33	81	3	17	3.55	89	18.5	0		0		
	2009	120	546	531	30	253	20	41	69	27	5.08	93	17.5	0		0		
2094	2003	78	795	795	228	430	53	46	3	21	2.64	14	1.76	0		0		
	2004	12	800	796	88	415	114	38	29	87	10.9	25	3.14	0		0		
	2005	37	700	698	149	307	66	12	130	25	3.58	9	1.29	0		0		
	2006	9	593	585	53	266	121	37	51	51	8.72	6	1.03	0		0		
	2007	9	489	480	36	244	74	21	70	28	5.83	7	1.46	0		0		
	2008	16	495	493	203	178	54	14	19	18	3.65	8	1.62	0		0		
	2009	79	701	681	0	421	90	25	84	37	5.43	24	3.52	0		0		
2095	2003	77	793	793	38	576	9	127	2	0		41	5.17	0		0		
	2004	11	800	798	63	458	16	213	10	0		38	4.76	0		0		
	2005	23	702	697	44	425	9	69	122	0		28	4.02	0		0		
	2006	8	583	574	56	225	32	85	111	0		66	11.5	0		0		
	2007	8	492	485	25	279	14	68	80	0		19	3.92	0		0		
	2008	14	494	494	28	315	7	116	14	0		14	2.83	0		0		
	2009	91	699	678	38	331	14	188	77	0		30	4.42	0		0		
2096	2003	76	794	794	46	574	16	155	3	0		0		0		0		
	2004	37	805	803	141	492	23	144	3	0		0		0		0		
	2005	36	700	697	52	456	5	85	96	0		3	0.43	0		0		
	2006	20	618	613	27	313	12	73	188	0		0		0		0		
	2007	7	490	488	6	285	5	42	150	0		0		0		0		
	2008	11	500	494	33	289	9	151	12	0		0		0		0		
	2009	89	698	693	26	307	27	139	194	0		1	0.14	0		0		
2097	2003	11	791	791	3	666	116	0	3	0		0		3	0.38	0		
	2004	38	802	798	15	634	135	10	1	2	0.25	0		1	0.13	0		
	2005	28	696	694	45	492	132	7	17	0		0		2	0.29	0		
	2006	19	586	582	29	367	153	10	17	1	0.17	0		5	0.86	0		
	2007	6	489	487	0	392	43	5	47	0		0		0		0		
	2008	12	497	497	30	357	104	2	0	1	0.2	0		3	0.6	0		
	2009	117	697	687	35	553	71	4	19	1	0.15	0		4	0.58	0		
2098	2003	9	785	785	307	348	40	76	9	5	0.64	0		0		0		
	2004	36	804	803	100	516	96	79	1	11	1.37	0		0		0		

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
2098	2005	24	699	695	233	260	71	30	99	2	0.29	0	0	0	0	0	0	0
	2006	18	596	589	11	305	22	20	231	3	0.51	0	0	0	0	0	0	0
	2007	13	495	494	0	239	14	35	204	2	0.4	0	0	0	0	0	0	0
	2008	5	499	498	273	140	58	22	3	2	0.4	0	0	0	0	0	0	0
	2009	118	702	700	253	246	81	29	80	11	1.57	0	0	0	0	0	0	0
2099	2003	8	792	792	235	462	17	61	8	1	0.13	8	1.01	0	0	0	0	0
	2004	33	799	794	179	460	16	123	4	0	0	12	1.51	0	0	0	0	0
	2005	25	699	697	138	318	15	41	182	2	0.29	1	0.14	0	0	0	0	0
	2006	17	584	582	5	359	5	11	201	0	0	1	0.17	0	0	0	0	0
	2007	14	493	486	0	266	4	8	151	0	0	2	0.41	0	0	0	0	0
	2008	8	495	489	41	343	7	33	62	1	0.2	3	0.61	0	0	0	0	0
	2009	119	692	691	239	309	8	23	106	5	0.72	2	0.29	0	0	0	0	0
2100	2007	71	479	479	111	231	12	20	20	33	6.89	52	10.8	0	0	0	0	0
	2009	73	695	679	30	509	22	32	44	9	1.33	34	5.01	0	0	0	0	0
2101	2004	14	797	795	30	656	20	3	79	7	0.88	0	0	0	0	0	0	0
	2006	3	588	577	34	447	24	13	57	2	0.35	0	0	0	0	0	0	0
	2007	70	492	490	193	270	6	4	14	3	0.61	0	0	0	0	0	0	0
	2009	72	694	689	2	608	25	12	34	8	1.16	0	0	0	0	0	0	0
2102	2003	79	796	796	232	498	38	22	3	2	0.25	1	0.13	0	0	0	0	0
	2004	8	800	799	56	555	101	7	17	63	7.88	0	0	0	0	0	0	0
	2006	4	589	579	27	326	105	19	55	48	8.29	0	0	0	0	0	0	0
	2009	77	693	685	139	413	39	8	53	33	4.82	0	0	0	0	0	0	0
2103	2004	9	799	796	290	372	20	21	49	44	5.53	0	0	0	0	0	0	0
	2009	78	697	681	32	419	19	11	89	112	16.4	0	0	0	0	0	0	0
2104	2006	21	586	586	5	298	28	43	213	0	0	0	0	0	0	0	0	0
	2007	4	493	491	0	321	3	8	159	0	0	0	0	0	0	0	0	0
	2009	92	695	695	14	357	28	71	223	2	0.29	0	0	0	0	0	0	0
2105	2004	2	804	801	3	586	206	1	0	1	0.12	0	4	0.5	0	0	0	0
	2006	33	594	583	7	398	156	4	9	3	0.51	0	7	1.2	0	0	0	0
	2009	116	696	691	0	505	172	2	9	0	0	0	3	0.43	0	0	0	0
2106	2004	32	800	798	160	424	30	165	2	7	0.88	10	1.25	0	0	0	0	0
	2005	11	698	686	74	318	10	43	191	41	5.98	9	1.31	0	0	0	0	0
	2006	34	591	583	180	235	20	19	89	40	6.86	0	0	0	0	0	0	0
	2007	80	499	495	61	256	9	20	142	7	1.41	0	0	0	0	0	0	0
	2009	115	690	678	16	487	16	53	71	25	3.69	10	1.47	0	0	0	0	0
2107	2003	16	793	791	324	390	35	33	2	7	0.88	0	0	0	0	0	0	0
	2006	35	594	589	40	329	52	90	78	1	0.17	0	0	0	0	0	0	0
	2007	81	495	489	15	286	6	87	94	1	0.2	0	0	0	0	0	0	0
	2009	114	698	685	25	443	31	67	110	11	1.61	0	0	0	0	0	0	0
5C/D																		
2086	2005	59	702	700	64	535	37	11	7	45	6.43	0	1	0.14	0	0	0	0
	2006	71	597	596	55	368	57	11	17	86	14.4	1	0.17	1	0.17	0	0	0
	2007	48	487	475	72	303	37	10	26	23	4.84	5	1.05	0	0	0	0	0
	2009	74	696	666	20	458	34	27	23	102	15.3	2	0.3	0	0	0	0	0
2100	2003	86	784	784	86	480	21	105	23	16	2.04	53	6.76	0	0	0	0	0
	2004	13	796	793	83	526	22	44	68	7	0.88	43	5.42	0	0	0	0	0
	2005	19	698	692	253	237	39	52	21	40	5.78	51	7.37	0	0	0	0	0
	2006	2	579	574	106	264	38	27	60	36	6.27	43	7.49	0	0	0	0	0
	2008	47	494	491	110	216	19	21	46	35	7.13	44	8.96	0	0	0	0	0
2101	2003	85	789	789	305	466	11	5	2	0	0	0	0	0	0	0	0	0
	2005	18	700	695	246	358	41	12	24	13	1.87	1	0.14	0	0	0	0	0
	2008	48	489	485	167	247	18	6	41	6	1.24	0	0	0	0	0	0	0
2102	2005	21	695	593	114	303	29	4	79	62	10.4	2	0.34	0	0	0	0	0
	2007	73	492	488	177	224	67	3	11	7	1.43	0	0	0	0	0	0	0
	2008	49	500	496	241	166	41	7	39	2	0.4	0	0	0	0	0	0	0
2103	2003	80	792	792	361	353	11	63	2	2	0.25	0	0	0	0	0	0	0
	2005	22	702	698	59	361	8	6	260	4	0.57	0	0	0	0	0	0	0
	2006	7	592	583	30	378	14	14	97	52	8.92	0	0	0	0	0	0	0
	2007	74	488	483	109	318	14	11	28	3	0.62	0	0	0	0	0	0	0
	2008	13	491	491	205	211	10	11	25	29	5.91	0	0	0	0	0	0	0
2104	2003	75	791	791	367	339	9	70	6	0	0	0	0	0	0	0	0	0
	2004	1	798	795	233	357	43	104	58	0	0	0	0	0	0	0	0	0
	2005	27	696	694	5	381	17	25	267	0	1	0.14	0	0	0	0	0	0
	2008	10	499	497	312	88	9	45	43	0	0	0	0	0	0	0	0	0
2105	2003	10	793	793	7	587	195	1	0	3	0.38	0	0	0	0	0	0	0

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
2105		2005	26	698	694	61	489	128	1	10	0	0	5	0.72	0			
		2007	5	493	486	10	384	72	1	18	0	0	1	0.21	0			
		2008	9	492	491	37	343	111	0	0	0	0	0	0	0			
2106		2003	12	792	792	348	327	30	56	11	13	1.64	7	0.88	0	0		
		2008	18	497	490	175	209	21	65	16	3	0.61	1	0.2	0	0		
2107		2004	31	798	796	113	545	37	92	4	5	0.63	0	0	0	0		
		2005	10	699	687	52	376	33	75	153	2	0.29	0	0	0	0		
		2008	19	500	499	30	249	17	174	24	5	1	0	0	0	0		
2108		2003	84	801	801	341	326	57	38	8	29	3.62	2	0.25	0	0		
		2004	15	805	803	62	445	44	59	67	98	12.2	28	3.49	0	0		
		2005	20	700	697	55	358	58	105	33	85	12.2	4	0.57	0	0		
		2006	1	591	577	41	271	45	63	103	55	9.53	0	0	0	0		
		2007	69	489	478	20	225	46	169	17	2	0.42	0	0	0	0		
		2008	50	495	491	25	303	21	73	64	6	1.22	0	0	0	0		
		2009	100	693	691	94	268	60	164	93	12	1.74	2	0.29	0	0		
2109		2003	82	785	785	214	479	19	23	16	33	4.2	1	0.13	0	0		
		2004	7	798	797	33	589	48	33	67	27	3.39	0	0	0	0		
		2005	13	697	690	18	439	31	10	179	15	2.17	0	0	0	0		
		2006	5	577	566	13	400	23	30	51	50	8.83	0	0	0	0		
		2007	72	493	488	77	271	33	49	43	15	3.07	0	0	0	0		
		2008	54	495	490	40	322	11	32	70	15	3.06	0	0	0	0		
		2009	101	707	702	65	421	25	39	125	27	3.85	0	0	0	0		
2110		2003	81	785	785	19	486	7	46	2	225	28.6	0	0	0	0		
		2004	6	792	792	253	343	31	76	22	67	8.46	0	0	0	0		
		2005	12	697	692	50	408	23	60	63	89	12.8	0	0	0	0		
		2006	6	598	589	7	364	32	45	134	9	1.53	0	0	0	0		
		2007	75	497	476	5	336	15	15	22	84	17.6	0	0	0	0		
		2008	53	490	487	9	370	12	32	14	50	10.2	0	0	0	0		
		2009	94	695	686	2	417	9	36	63	160	23.3	0	0	0	0		
2111		2003	74	794	794	252	423	30	45	11	33	4.16	0	0	0	0		
		2004	5	794	793	110	434	39	36	127	47	5.93	0	0	0	0		
		2005	16	700	695	32	296	33	18	309	7	1.01	0	0	0	0		
		2006	32	586	581	22	340	7	13	190	9	1.55	0	0	0	0		
		2007	76	490	489	130	213	23	25	78	20	4.09	0	0	0	0		
		2008	58	497	495	294	125	13	37	20	6	1.21	0	0	0	0		
		2009	93	698	685	25	394	25	24	193	24	3.5	0	0	0	0		
2112		2003	73	790	790	42	620	101	15	0	9	1.14	0	3	0.38	0		
		2004	3	801	797	0	594	161	17	1	8	1	0	16	2.01	0		
		2005	8	700	696	7	447	119	48	43	5	0.72	0	29	4.17	0		
		2006	31	590	587	23	396	146	6	7	0	0	0	10	1.7	0		
		2007	79	491	484	5	363	90	12	10	3	0.62	0	1	0.21	0		
		2008	61	490	488	10	396	73	2	0	6	1.23	0	1	0.2	0		
		2009	102	692	676	16	544	90	11	10	4	0.59	0	1	0.15	0		
2113		2003	18	775	774	362	312	21	64	9	0	6	0.78	0	0	0		
		2004	30	798	798	81	542	23	104	6	7	0.88	35	4.39	0	0		
		2005	9	698	688	13	362	4	51	257	0	1	0.15	0	0	0		
		2006	37	590	589	320	173	4	14	67	7	1.19	4	0.68	0	0		
		2007	83	496	496	9	265	10	25	184	0	3	0.6	0	0	0		
		2009	103	692	691	233	219	7	29	196	4	0.58	3	0.43	0	0		
2114		2003	17	787	787	367	323	16	72	9	0	0	0	0	0	0		
		2004	29	799	798	119	549	27	99	4	0	0	0	0	0	0		
		2005	38	696	694	321	223	15	71	64	0	0	0	0	0	0		
		2006	36	596	596	49	343	5	29	170	0	0	0	0	0	0		
		2007	82	498	494	10	310	3	55	117	0	0	0	0	0	0		
		2008	20	492	482	216	193	4	45	24	0	0	0	0	0	0		
		2009	113	696	690	111	352	11	30	186	0	0	0	0	0	0		
2115		2003	83	786	786	262	436	20	31	14	0	7	0.89	0	16	2.04		
		2004	16	804	803	44	586	6	29	106	0	17	2.12	0	15	1.87		
		2005	14	700	690	151	366	6	17	144	0	0	0	0	6	0.87		
		2006	25	588	583	184	174	11	76	120	0	9	1.54	0	9	1.54		
		2007	3	490	479	130	224	10	76	37	0	0	0	0	1	0.21		
		2008	51	499	491	42	302	3	30	113	0	0	0	0	1	0.2		
		2009	99	697	690	106	318	17	86	137	0	16	2.32	0	10	1.45		
2116		2003	32	795	795	44	501	27	100	79	17	2.14	27	3.4	0	0		
		2004	17	798	797	153	389	104	68	47	16	2.01	20	2.51	0	0		
		2005	17	696	693	36	378	34	48	157	22	3.17	22	3.17	0	0		
		2006	26	595	590	3	338	22	74	139	6	1.02	8	1.36	0	0		

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
2116		2007	2	491	486	0	291	11	18	159	4	0.82	4	0.82	0	0	0	
		2008	52	495	494	17	263	3	74	113	9	1.82	16	3.24	0	0	0	
		2009	98	696	685	46	321	60	67	156	24	3.5	11	1.61	0	0	0	
2117		2003	33	792	792	270	451	23	24	14	10	1.26	0	0	0	0	0	
		2004	4	802	799	239	403	46	34	13	64	8.01	0	0	0	0	0	
		2005	15	703	696	187	299	41	13	130	25	3.59	0	1	0.14	0	0	
		2006	27	588	579	25	315	67	14	119	41	7.08	0	0	0	0	0	
		2007	77	491	484	15	341	32	43	35	19	3.93	0	0	0	0	0	
		2008	57	499	497	183	211	27	40	5	30	6.04	0	1	0.2	0	0	
		2009	95	693	687	62	383	44	50	95	53	7.71	0	0	0	0	0	
2118		2003	72	800	800	262	456	54	18	4	6	0.75	0	0	0	0	0	
		2004	25	799	796	90	576	62	30	13	23	2.89	0	2	0.25	0	0	
		2005	7	697	690	24	414	44	16	169	18	2.61	0	6	0.87	0	0	
		2006	30	593	589	16	407	74	18	68	10	1.7	0	0	0	0	0	
		2007	78	498	488	63	287	53	38	39	8	1.64	0	0	0	0	0	
		2008	60	504	502	281	149	38	18	8	6	1.2	0	2	0.4	0	0	
		2009	105	697	679	138	369	54	44	64	10	1.47	0	0	0	0	0	
2119		2003	26	790	790	213	396	11	82	28	0	60	7.59	0	0	0	0	
		2004	26	797	795	114	495	24	110	29	0	23	2.89	0	0	0	0	
		2005	40	699	693	66	370	19	98	74	0	63	9.09	0	3	0.43	0	
		2006	39	595	593	15	286	15	50	164	0	62	10.4	0	1	0.17	0	
		2007	33	501	500	7	310	9	21	137	0	17	3.4	0	0	0	0	
		2008	62	495	491	195	208	7	45	12	0	24	4.89	0	0	0	0	
		2009	104	691	686	14	294	19	64	235	0	59	8.6	0	1	0.15	0	
2120		2003	25	796	794	303	387	4	57	39	0	2	0.25	0	2	0.25	0	
		2004	28	800	798	200	476	7	73	11	0	26	3.26	0	5	0.63	0	
		2005	39	692	691	195	312	2	84	88	1	0.14	4	0.58	0	5	0.72	
		2006	38	589	588	39	333	6	14	194	0	1	0.17	0	2	0.34	0	
		2007	32	495	490	2	310	3	21	155	0	0	0	0	0	0	0	
		2008	63	490	487	369	86	4	18	7	0	1	0.21	0	2	0.41	0	
		2009	112	699	697	300	186	6	49	125	0	23	3.3	0	8	1.15	0	
2121		2003	31	791	791	70	572	22	20	78	25	3.16	4	0.51	0	0	0	
		2004	18	799	795	22	490	72	116	68	16	2.01	11	1.38	0	0	0	
		2005	6	701	696	2	495	30	10	160	4	0.57	0	0	0	0	0	
		2006	24	595	591	42	290	54	15	142	44	7.45	4	0.68	0	0	0	
		2007	1	488	482	0	313	1	8	154	7	1.45	1	0.21	0	0	0	
		2008	55	493	492	71	260	15	43	72	29	5.89	2	0.41	0	0	0	
		2009	97	697	695	26	482	31	30	111	14	2.01	3	0.43	0	0	0	
2122		2003	30	797	796	58	628	68	15	9	18	2.26	0	0	0	0	0	
		2004	24	794	787	3	645	91	9	31	8	1.02	0	0	0	0	0	
		2005	5	699	697	9	489	64	8	126	1	0.14	0	0	0	0	0	
		2006	28	593	592	25	352	115	15	78	5	0.84	0	5	0.84	0	0	
		2007	36	495	494	13	330	73	25	50	3	0.61	0	0	0	0	0	
		2008	56	493	491	76	294	68	10	1	36	7.33	0	6	1.22	0	0	
		2009	96	700	693	47	481	85	17	44	10	1.44	0	9	1.3	0	0	
2123		2003	29	793	793	245	466	40	7	25	10	1.26	0	0	0	0	0	
		2004	23	790	790	58	521	57	12	36	106	13.4	0	0	0	0	0	
		2005	42	702	696	332	196	57	14	72	25	3.59	0	0	0	0	0	
		2006	29	589	589	33	333	56	10	137	22	3.74	0	0	0	0	0	
		2007	35	499	480	27	313	21	16	57	46	9.58	0	0	0	0	0	
		2008	59	493	491	269	165	21	9	9	17	3.46	0	1	0.2	0	0	
		2009	110	690	685	21	453	39	26	74	72	10.5	0	0	0	0	0	
2124		2003	27	797	796	433	238	5	83	20	1	0.13	16	2.01	0	0	0	
		2004	27	800	798	61	480	26	113	63	0	55	6.89	0	0	0	0	
		2005	41	700	696	410	147	19	56	40	0	24	3.45	0	0	0	0	
		2006	40	590	584	71	280	10	53	107	1	0.17	62	10.6	0	0	0	
		2007	34	497	492	8	295	3	36	131	0	19	3.86	0	0	0	0	
		2008	67	496	492	344	71	20	22	12	1	0.2	22	4.47	0	0	0	
		2009	111	693	690	118	276	18	49	184	0	45	6.52	0	0	0	0	
2125		2003	34	792	792	152	502	73	5	11	49	6.19	0	0	0	0	0	
		2004	19	798	798	69	623	80	4	2	19	2.38	0	1	0.13	0	0	
		2005	4	697	697	58	455	68	6	50	58	8.32	0	2	0.29	0	0	
		2006	42	587	584	69	378	108	5	4	18	3.08	0	2	0.34	0	0	
		2007	37	491	489	0	353	64	8	58	8	1.64	0	0	0	0	0	
		2008	22	489	482	148	255	38	4	9	27	5.6	0	1	0.21	0	0	
		2009	108	687	676	5	437	115	16	87	14	2.07	0	4	0.59	0	0	
2126		2003	28	797	797	331	398	37	4	13	14	1.76	0	0	0	0	0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
2126		2004	22	801	801	37	563	77	26	45	53	6.62	0	0	0	0	0	0
		2005	43	701	701	270	215	60	14	125	17	2.43	0	0	0	0	0	0
		2006	41	593	590	151	269	68	13	45	44	7.46	0	0	0	0	0	0
		2007	38	496	493	2	356	14	15	96	9	1.83	0	0	0	0	0	0
		2008	21	496	494	295	132	25	5	26	11	2.23	0	0	0	0	0	0
		2009	109	701	696	91	462	20	17	66	40	5.75	0	0	0	0	0	0
2127		2003	36	785	785	81	559	33	20	36	43	5.48	11	1.4	0	2	0.25	
		2004	21	804	803	38	662	62	7	26	8	1	0	0	0	0	0	0
		2005	3	700	694	90	407	94	13	34	57	8.21	0	0	0	0	0	0
		2006	23	594	587	6	339	78	29	121	18	3.07	0	0	0	0	0	0
		2007	20	494	479	2	328	27	24	70	29	6.05	0	0	0	0	0	0
		2008	24	499	497	40	330	63	30	10	23	4.63	1	0.2	0	0	0	0
		2009	107	701	689	68	394	94	24	29	80	11.6	0	0	0	0	0	0
2128		2003	35	798	798	74	528	40	26	71	53	6.64	6	0.75	0	0	0	0
		2004	20	796	794	15	619	33	21	72	33	4.16	1	0.13	0	0	0	0
		2005	2	691	690	21	460	46	17	135	11	1.59	1	0.14	0	0	0	0
		2006	22	592	536	4	342	11	11	151	17	3.17	0	0	0	0	0	0
		2007	19	493	492	0	325	2	1	156	8	1.63	0	0	0	0	0	0
		2008	23	497	490	61	330	26	24	10	38	7.76	1	0.2	0	0	0	0
		2009	106	699	681	132	296	46	25	118	64	9.4	2	0.29	0	0	0	0
2129		2003	14	787	785	102	471	27	140	8	0	24	3.06	0	13	1.66		
		2004	2	799	585	83	298	13	105	83	0	3	0.51	0	0			
		2005	34	697	692	100	391	20	95	72	0	5	0.72	0	10	1.45		
		2006	10	597	590	99	386	12	69	12	0	6	1.02	0	6	1.02		
		2007	30	497	481	13	314	2	26	108	0	12	2.49	0	8	1.66		
		2008	64	488	487	166	248	8	46	11	0	4	0.82	0	5	1.03		
		2009	51	702	701	224	270	21	68	95	0	17	2.43	0	6	0.86		
2130		2003	13	787	783	75	429	18	47	202	0	5	0.64	0	7	0.89		
		2004	1	804	801	32	340	4	7	413	0	3	0.37	0	2	0.25		
		2005	35	698	696	63	368	24	34	192	0	8	1.15	0	7	1.01		
		2006	11	596	592	150	301	23	16	88	1	0.17	9	1.52	0	4	0.68	
		2007	31	488	483	2	251	5	6	212	0	5	1.04	0	2	0.41		
		2008	65	498	494	175	198	21	20	76	0	3	0.61	0	1	0.2		
		2009	50	700	695	221	240	35	32	167	0	3	0.43	0	0	0		
2131		2003	24	791	789	30	626	27	100	6	0	0	0	0	0	0	0	0
		2004	4	800	796	46	260	10	56	424	0	0	0	0	0	0	0	0
		2005	32	693	692	42	447	18	55	132	0	0	0	0	0	0	0	0
		2006	12	595	589	143	320	19	82	25	0	1	0.17	0	0	0	0	0
		2007	29	494	489	0	309	2	50	127	0	0	0	0	0	0	0	0
		2008	68	492	488	126	266	20	54	22	0	0	0	0	0	0	0	0
		2009	53	699	699	3	313	7	14	362	0	0	0	0	0	0	0	0
2132		2003	15	792	791	14	605	6	41	124	0	1	0.13	0	0	0	0	0
		2004	3	796	796	177	362	16	77	163	0	1	0.13	0	0	0	0	0
		2005	33	694	693	118	365	14	62	133	0	0	0	0	2	0.29		
		2006	9	598	595	121	367	9	83	14	0	0	0	0	1	0.17		
		2007	28	496	488	46	300	8	23	114	0	0	0	0	0	0		
		2008	66	504	503	100	315	3	64	20	0	0	0	0	1	0.2		
		2009	52	703	701	34	298	10	50	310	0	1	0.14	0	2	0.29		
2133		2003	22	790	789	374	300	25	56	14	0	20	2.53	0	0	0	0	0
		2004	6	789	788	173	278	3	36	291	0	7	0.89	0	0	0	0	0
		2005	30	693	690	52	414	17	55	150	0	2	0.29	0	0	0	0	0
		2006	14	583	583	71	385	9	14	95	0	9	1.54	0	0	0	0	0
		2007	26	491	491	0	351	1	9	130	0	0	0	0	0	0	0	0
		2008	70	485	482	295	124	9	34	17	0	3	0.62	0	0	0	0	0
		2009	55	702	702	53	385	4	29	231	0	0	0	0	0	0	0	0
2134		2003	23	790	789	1	537	5	15	231	0	0	0	0	0	0	0	0
		2004	5	796	795	98	274	17	34	372	0	0	0	0	0	0	0	0
		2005	31	699	698	21	403	25	43	206	0	0	0	0	0	0	0	0
		2006	13	599	593	53	339	38	31	132	0	0	0	0	0	0	0	0
		2007	27	496	492	5	257	13	12	205	0	0	0	0	0	0	0	0
		2008	69	499	499	150	176	62	15	97	0	0	0	0	0	0	0	0
		2009	54	706	706	19	351	20	36	283	0	0	0	0	0	0	0	0
2135		2003	20	788	785	20	634	42	15	8	66	8.41	0	0	0	0	0	0
		2004	41	795	794	51	527	86	18	35	77	9.7	0	0	0	0	0	0
		2005	28	696	695	30	496	101	4	10	55	7.91	0	0	0	0	0	0
		2006	17	598	591	20	472	41	5	20	33	5.58	0	0	0	0	0	0
		2007	84	496	491	56	349	24	5	14	42	8.55	0	1	0.2	0	0	0

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
2148		2005	40	694	693	95	392	45	43	118	0	0	0	0	0	0	0	0
		2006	6	597	597	40	404	39	44	70	0	0	0	0	0	0	0	0
		2007	21	503	501	47	311	52	63	27	0	0	0	0	0	0	0	0
		2008	79	495	493	53	275	16	61	88	0	0	0	0	0	0	0	0
		2009	65	701	701	152	316	53	104	76	0	0	0	0	0	0	0	0
2150		2003	57	790	788	32	570	121	34	29	2	0.25	0	0	0	0	0	0
		2004	33	794	788	154	329	151	130	24	0	0	0	0	0	0	0	0
		2005	41	698	694	41	428	70	67	89	0	0	0	0	0	0	0	0
		2006	5	598	596	42	299	127	98	35	0	0	0	0	0	0	0	0
		2007	22	490	489	31	320	69	58	12	0	0	0	0	0	0	0	0
		2008	86	499	496	48	269	53	112	16	0	0	0	0	0	0	0	0
		2009	67	705	705	62	426	72	108	39	0	0	0	0	0	0	0	0
2152		2003	56	780	780	18	601	84	27	48	0	1	0.13	0	1	0.13		
		2004	7	802	798	102	496	53	31	114	0	0	0	0	2	0.25		
		2005	44	693	693	99	470	67	20	43	0	0	0	0	0	0		
		2006	23	594	588	94	375	50	10	57	0	3	0.51	0	1	0.17		
		2007	39	498	497	114	286	31	33	28	0	0	0	0	6	1.21		
		2008	46	491	490	135	273	33	14	34	0	0	0	0	1	0.2		
		2009	93	707	706	87	487	19	15	98	0	0	0	0	0	0		
2153		2003	51	796	795	2	608	55	121	9	0	0	0	0	0	0	0	0
		2004	32	782	781	65	465	80	138	33	0	0	0	0	0	0	0	0
		2005	16	696	694	4	606	9	56	21	0	0	0	0	0	0	0	0
		2006	41	591	581	2	452	34	27	75	0	0	0	0	0	0	0	0
		2007	57	498	493	2	400	10	11	74	0	0	0	0	0	0	0	0
		2008	40	492	489	1	353	14	111	12	0	0	0	0	0	0	0	0
		2009	84	703	703	11	359	67	194	72	0	0	0	0	0	0	0	0
2154		2003	50	794	793	3	641	6	103	40	0	0	0	0	0	0	0	0
		2004	31	800	791	3	566	67	90	65	0	0	0	0	0	0	0	0
		2005	15	695	693	0	561	24	50	62	0	0	0	0	0	0	0	0
		2006	34	590	578	3	439	16	5	117	0	0	0	0	0	0	0	0
		2007	42	501	498	0	390	22	42	50	0	0	0	0	0	0	0	0
		2008	31	492	488	5	354	32	45	55	0	0	0	0	0	0	0	0
		2009	82	704	703	38	439	33	71	126	0	0	0	0	0	0	0	0
2155		2003	49	793	792	3	637	47	87	18	0	0	0	0	0	0	0	0
		2004	19	795	792	7	588	67	49	81	0	0	0	0	0	0	0	0
		2005	12	696	693	28	497	93	60	18	0	0	0	0	0	0	0	0
		2006	33	597	596	25	352	112	54	45	0	8	1.34	0	4	0.67		
		2007	45	498	496	5	338	83	48	30	0	0	0	0	0	0		
		2008	32	501	500	10	332	81	62	17	0	0	0	0	0	0		
		2009	79	705	704	17	422	43	89	133	0	0	0	0	0	0		
2158		2003	55	778	777	54	555	91	31	32	0	7	0.9	0	7	0.9		
		2004	8	792	789	103	517	71	64	4	0	5	0.63	0	9	1.14		
		2005	43	695	693	151	384	60	43	45	0	5	0.72	0	5	0.72		
		2006	24	599	596	195	283	71	27	17	0	2	0.34	0	1	0.17		
		2007	40	493	491	80	335	30	27	12	0	1	0.2	0	7	1.43		
		2008	45	496	496	176	232	37	23	21	0	3	0.6	0	4	0.81		
		2009	91	702	701	282	295	37	28	38	1	0.14	10	1.43	1	0.14	9	1.28
2159		2003	71	794	794	29	549	92	124	0	0	0	0	0	0	0	0	0
		2004	12	798	795	33	397	144	208	13	0	0	0	0	0	0	0	0
		2005	23	694	690	24	470	68	119	15	0	0	0	0	0	0	0	0
		2006	4	597	595	35	391	107	56	8	0	0	0	0	0	0	0	0
		2007	64	491	491	46	267	81	81	16	0	0	0	0	0	0	0	0
		2008	75	501	498	66	229	110	78	17	0	0	0	0	0	0	0	0
		2009	90	704	700	68	270	104	145	114	0	0	0	0	0	0	0	0
2160		2003	66	790	790	10	626	108	33	3	10	1.27	0	0	0	0	0	0
		2004	13	800	799	13	646	80	16	41	3	0.38	0	0	0	0	0	0
		2005	20	698	696	1	533	141	5	4	13	1.87	0	0	0	0	0	0
		2006	1	601	601	7	474	84	10	16	11	1.83	0	0	0	0	0	0
		2007	63	495	492	0	388	62	6	25	12	2.44	0	0	0	0	0	0
		2008	76	479	474	4	295	52	39	16	68	14.3	0	0	0	0	0	0
		2009	89	705	703	16	389	82	110	52	54	7.68	0	0	0	0	0	0
2161		2003	67	794	794	15	615	118	36	6	4	0.5	0	0	0	0	0	0
		2004	14	793	793	16	652	38	34	53	0	0	0	0	0	0	0	0
		2005	18	698	698	11	552	70	24	27	14	2.01	0	0	0	0	0	0
		2006	43	596	593	1	435	86	25	41	5	0.84	1	0.17	0	0	0	0
		2007	59	494	493	0	405	20	32	33	3	0.61	0	0	0	0	0	0
		2008	42	496	494	7	304	91	70	16	6	1.21	0	0	0	0	0	0

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
	2161	2009	85	704	701	111	321	120	80	60	10	1.43	0	0	0	0	0	0
	2162	2003	52	794	793	2	636	128	14	3	9	1.13	0	1	0.13	0		
		2004	15	795	788	57	510	171	14	21	15	1.9	0	0	0	0		
		2005	17	701	695	6	516	145	7	13	6	0.86	1	0.14	4	0.58	0	
		2006	42	589	584	11	433	114	9	4	5	0.86	0	8	1.37	0		
		2007	58	494	492	1	407	55	4	19	1	0.2	0	5	1.02	0		
		2008	41	496	483	16	305	112	16	13	8	1.66	0	13	2.69	0		
		2009	83	702	700	110	345	144	38	27	28	4	0	8	1.14	0		
	2163	2003	53	791	787	29	616	93	38	0	11	1.4	0	0	0	0	0	0
		2004	30	788	784	265	323	82	83	20	9	1.15	0	2	0.26	0		
		2005	14	701	696	54	454	114	40	12	20	2.87	0	2	0.29	0		
		2006	35	591	590	39	397	96	34	10	12	2.03	0	2	0.34	0		
		2007	43	494	493	4	378	40	24	45	3	0.61	0	0	0	0		
		2008	30	484	477	65	222	92	59	12	16	3.35	0	11	2.31	0		
		2009	81	705	702	106	323	103	83	60	27	3.85	1	0.14	0	0		
	2164	2003	48	787	780	63	491	171	18	1	15	1.92	0	21	2.69	0		
		2004	18	776	768	42	453	158	37	23	24	3.12	0	31	4.04	0		
		2005	13	701	697	38	415	145	12	1	11	1.58	0	75	10.7	0		
		2006	36	592	587	95	337	94	17	12	9	1.53	0	23	3.92	0		
		2007	44	494	492	0	356	72	22	38	4	0.81	0	1	0.2	0		
		2008	29	496	489	37	274	106	21	3	7	1.43	0	41	8.38	0		
		2009	80	700	700	59	329	205	36	30	14	2	0	28	4	0		
	2165	2003	44	795	791	12	598	164	13	0	0	0	0	4	0.51	0		
		2004	17	798	795	98	415	213	32	1	0	0	0	36	4.53	0		
		2005	11	700	693	21	454	165	18	0	1	0.14	0	35	5.05	0		
		2006	31	593	573	43	336	153	24	2	0	0	0	17	2.97	0		
		2007	56	497	484	2	353	95	9	5	0	0	0	20	4.13	0		
		2008	35	490	482	17	315	113	24	6	0	0	0	7	1.45	0		
		2009	78	703	697	42	384	191	50	19	0	0	0	11	1.58	0		
	2169	2003	54	787	787	8	626	116	7	29	0	0	0	0	1	0.13	0	
		2004	9	796	796	286	346	106	47	11	0	0	0	0	0	0		
		2005	42	698	696	3	504	61	19	118	0	0	0	0	0	0		
		2006	25	596	595	31	420	93	16	35	0	0	0	1	0.17	0		
		2007	41	487	487	5	396	18	25	42	0	1	0.21	0	0	0		
		2008	44	493	488	124	237	67	17	41	0	1	0.2	0	1	0.2	0	
		2009	92	702	701	226	371	38	20	46	0	0	0	0	0	0		
	2170	2003	70	797	797	8	571	47	106	65	0	0	0	0	0	0	0	0
		2004	10	793	792	99	508	60	83	42	0	0	0	0	0	0	0	
		2005	22	698	696	54	420	100	104	17	2	0.29	0	0	0	0	0	
		2006	3	599	595	28	419	78	43	26	1	0.17	0	0	0	0	0	
		2007	62	501	495	25	322	58	74	16	0	0	0	0	0	0	0	
		2008	78	501	498	36	276	45	115	23	3	0.6	0	0	0	0	0	
		2009	88	703	703	271	245	55	67	64	0	1	0.14	0	0	0	0	
	2171	2003	69	797	797	139	479	77	54	6	3	0.38	36	4.52	0	3	0.38	0
		2004	11	792	789	151	396	73	99	58	1	0.13	10	1.27	0	1	0.13	0
		2005	21	697	696	99	382	112	30	31	15	2.16	28	4.02	0	0	0	
		2006	2	599	596	28	396	75	60	20	1	0.17	14	2.35	0	2	0.34	0
		2007	61	495	490	38	336	24	32	53	4	0.82	3	0.61	0	0	0	
		2008	77	491	488	87	226	50	103	11	3	0.61	9	1.84	0	1	0.2	0
		2009	87	705	702	244	205	39	152	24	1	0.14	34	4.84	0	3	0.43	0
	2172	2003	68	793	793	8	662	99	11	4	0	0	0	0	0	0	0	
		2004	16	793	790	28	594	144	17	7	0	0	0	0	0	0		
		2005	19	703	700	1	562	132	7	1	0	0	0	0	0	0		
		2006	44	592	587	0	463	114	11	1	0	0	0	0	0	0		
		2007	60	503	501	1	419	76	4	1	0	0	0	0	0	0		
		2008	43	483	479	4	405	56	13	1	0	0	0	0	0	0		
		2009	86	704	704	26	521	134	19	4	0	0	0	0	0	0		
5E																		
	2143	2003	39	790	788	56	525	40	131	23	0	13	1.65	0	0	0	0.25	
		2004	26	798	794	48	487	46	126	72	0	13	1.64	0	2	0.25		
		2005	1	696	694	94	421	44	78	55	0	4	0.58	0	0	0		
		2006	26	597	592	59	305	106	68	49	0	6	1.01	0	0	0		
		2007	53	494	492	35	289	29	60	72	0	7	1.42	0	0	0		
		2008	25	492	489	58	283	49	66	27	0	6	1.23	0	0	0		
		2009	68	704	703	151	253	19	83	175	0	17	2.42	0	5	0.71		
	2144	2003	38	796	795	204	454	71	13	15	0	0	38	4.78	0			
		2004	25	793	785	473	201	62	36	11	0	0	2	0.25	0			

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5E)																		
2144		2005	2	696	692	299	234	41	56	58	0		2	0.29	2	0.29	0	
		2006	27	599	594	345	193	41	12	3	0		0		0		0	
		2007	52	494	493	134	289	29	25	14	0		0		1	0.2	0	
		2008	26	490	480	207	199	27	38	11	0		0		0		0	
		2009	69	701	699	390	135	48	100	26	0		0		0		0	
2146		2003	37	796	794	43	479	111	19	9	44	5.54	0		89	11.2	0	
		2004	27	795	791	25	412	185	20	17	30	3.79	0		102	12.9	0	
		2005	3	692	687	25	375	98	15	7	36	5.24	0		131	19.0	0	
		2006	28	593	589	5	369	75	22	6	16	2.72	0		97	16.4	0	
		2007	51	488	487	3	326	97	19	9	6	1.23	0		27	5.54	0	
		2008	27	496	493	17	283	122	21	1	7	1.42	0		41	8.32	0	
		2009	70	703	703	47	370	107	22	16	47	6.69	0		94	13.3	0	
2149		2003	40	795	791	83	469	24	143	38	0		34	4.3	0	0		
		2004	29	800	794	104	366	25	139	94	0		66	8.31	0	0		
		2005	4	701	688	84	405	30	103	30	0		37	5.38	0	0		
		2006	29	595	587	41	382	29	95	15	0		25	4.26	0	0		
		2007	50	487	481	0	318	21	88	35	0		19	3.95	0	0		
		2008	28	498	414	9	270	29	77	18	0		12	2.9	0	0		
		2009	71	704	699	11	348	14	161	127	0		40	5.72	0	1	0.14	
2151		2003	41	791	790	74	532	41	96	1	0		35	4.43	0	11	1.39	
		2004	28	788	779	98	528	61	45	5	0		27	3.47	0	15	1.93	
		2005	5	700	696	51	478	59	75	4	0		13	1.87	1	0.14	16	2.3
		2006	37	593	588	44	377	44	96	7	0		15	2.55	0	6	1.02	
		2007	49	494	488	26	370	17	48	7	0		13	2.66	0	8	1.64	
		2008	36	487	470	41	305	31	53	12	0		19	4.04	0	9	1.91	
		2009	72	700	695	32	488	43	85	6	0		34	4.89	0	8	1.15	
2156		2003	42	795	795	111	568	31	62	4	0		10	1.26	0	9	1.13	
		2004	21	799	791	148	491	44	44	14	0		20	2.53	0	30	3.79	
		2005	9	692	689	62	504	37	50	8	0		11	1.6	0	17	2.47	
		2006	32	593	588	58	411	48	40	13	0		6	1.02	0	13	2.21	
		2007	54	502	496	66	324	24	33	22	0		8	1.61	0	19	3.83	
		2008	33	505	503	46	310	42	62	22	0		14	2.78	0	8	1.59	
		2009	76	702	701	109	377	47	56	44	0		32	4.56	0	36	5.14	
2157		2003	47	792	788	8	628	85	9	2	0		0	56	7.11	0		
		2004	24	791	778	66	510	139	32	0	0		0	31	3.98	0		
		2005	6	697	695	8	404	136	19	0	0		0	128	18.4	0		
		2006	38	595	590	1	514	49	11	0	0		0	16	2.71	0		
		2007	46	490	484	2	358	72	14	10	0		0	28	5.79	0		
		2008	37	488	483	9	333	42	32	3	0		0	65	13.4	0		
		2009	73	704	704	2	452	104	10	20	0		0	116	16.4	0		
2166		2003	43	788	788	53	531	187	16	0	0		0	1	0.13	0		
		2004	20	798	209	77	81	37	8	1	0		0	5	2.39	0		
		2005	10	698	688	34	398	185	29	0	0		0	42	6.1	0		
		2006	30	594	588	188	205	174	12	1	0		0	9	1.53	0		
		2007	55	488	485	30	305	126	8	4	0		0	12	2.47	0		
		2008	34	490	481	8	313	126	18	1	0		0	15	3.12	0		
		2009	77	704	692	138	253	215	50	5	0		0	33	4.77	0		
2167		2003	45	788	786	95	394	44	45	12	103	13.1	92	11.7	1	0.13	0	
		2004	22	795	786	100	300	56	72	28	171	21.7	59	7.51	0	0		
		2005	7	702	697	28	391	96	57	12	70	10.0	47	6.74	0	0		
		2006	39	593	575	20	352	30	70	14	71	12.3	21	3.65	0	0		
		2007	47	489	483	5	272	36	54	51	41	8.49	23	4.76	0	0		
		2008	38	495	484	31	280	34	49	7	43	8.88	40	8.26	0	0		
		2009	75	699	697	24	407	22	76	66	80	11.4	23	3.3	0	0		
2168		2003	46	791	789	114	524	25	107	18	1	0.13	0	0	0	0	0	
		2004	23	801	795	117	419	58	102	92	7	0.88	0	0	0	0	0	
		2005	8	700	698	27	501	51	92	24	4	0.57	0	0	0	0	0	
		2006	40	598	583	16	486	13	61	3	3	0.51	1	0.17	0	0	0	
		2007	48	499	493	10	357	20	53	50	3	0.61	0	0	0	0	0	
		2008	39	498	488	83	312	8	72	13	0		0	0	0	0	0	
		2009	74	700	698	90	391	23	141	49	3	0.43	1	0.14	0	0	0	