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## EXECUTIVE SUMMARY

Carbines, G.D.; Beentjes, M.P. (2003). Relative abundance of blue cod in Dusky Sound in 2002.

*New Zealand Fisheries Assessment Report 2003/37. 25 p.*

This report describes the results of a potting survey in 2002 to determine the relative abundance of blue cod (*Parapercis colias*) in Dusky Sound.

Forty-four stations were surveyed (6 pots per station = 264 pot lifts) from five strata (*inner, mid, outer, extreme outer, and open coast*) that covered an area between the inner fiord and the open coast of Dusky Sound. A total of 1004 kg of catch was taken on the survey of which 873 kg (87%) was blue cod, consisting of 1515 fish. Bycatch included 12 fish and 1 octopus species.

Mean catch rates of blue cod ranged from 1.28 kg per pot per hour in stratum *mid*, to 8.42 kg per pot per hour for stratum *open coast*. Overall mean catch rate and c.v. were 2.69 kg/pot/hour and 6.7%. For blue cod over 33 cm (minimum legal size), highest catch rates were also in stratum *open coast* and overall mean catch rate and c.v. were 2.23 kg per pot per hour and 7.2%.

The overall sex ratio was skewed in favour of females at 0.78:1 (male:female), and only stratum *outer* had more males than females (1.5:1). Length frequency distributions for the four strata within Dusky Sound were similar but no clear modes were present, whereas the *open coast* stratum at the entrance to the sound showed a clear mode at about 33 cm, but with few blue cod under 25 cm. In all strata, the largest blue cod were males and mean lengths of males were also greater than females. Both blue cod sizes and catch rates in Dusky Sound were generally higher than in equivalent surveys done in the Marlborough Sounds and off Banks Peninsula.

A total of 1497 blue cod had gonads staged and of these about 80% were either resting or maturing, and about 20% were mature or running ripe for both sexes. Males attain a running ripe or spawning condition as small as 25 cm and females at about 29 cm.

## 1. INTRODUCTION

Blue cod (*Parapercis colias*) is endemic to New Zealand, and, while most abundant around Southland and the Chatham Islands, is distributed from the shore to the shelf edge throughout New Zealand. These opportunistic bottom dwelling carnivores (Jaing & Carbines 2002) are found mainly on light foul (reef edges, shingle/gravel, and biogenic structures) or sand close to rocky outcrops shallower than 150 m (Anderson et al. 1998). Blue cod is also a highly sought after recreational finfish and the species most commonly landed by recreational fishers in the South Island (Teirney et al. 1992, Bradford 1998, Carbines 1999, James & Unwin 2000). However, in some popular and easily accessible areas, such as the inner Marlborough Sounds (Blackwell 2002) and inshore Banks Peninsula (Beentjes & Carbines 2003), patterns of size and catch rates of blue cod indicate that local depletion and over-fishing have occurred.

The "Guardians of Fiordland's Fisheries" believe that Fiordland is increasingly becoming a recreational fishing destination, and as a consequence several fiords (most notably Milford and Doubtful Sounds) no longer support blue cod fisheries of the quality formerly offered. The Guardians believe that increasing recreational pressure will ultimately lead to the depletion of blue cod in some areas, thus pre-empting their development of an integrated management strategy for Fiordland's fisheries. To improve our knowledge about the blue cod fishery, the Ministry of Fisheries sought information on both abundance and movement rates of blue cod in the fiords. Movement rates of blue cod will determine the most appropriate scale for management of this species to avoid localized depletion, while the abundance and population size structure of blue cod stocks are an important component of decisions about which management measures are appropriate. Currently there are no baseline data available to assess the status of Fiordland blue cod stocks and determine if numbers are declining.

Catch rates from potting (kg per pot per hour) have provided a satisfactory index of relative abundance of blue cod in the Marlborough Sounds (Blackwell 1997, 1998) and off Banks Peninsula (Beentjes & Carbines 2003). However, its application to estimating absolute abundance is considered unreliable as there is only a weak correlation between pot catches and diver counts (Cole 1999). The difficulty appears to be in estimating and maintaining a constant area fished. There may also be some size selectivity bias with very small blue cod sampled less often by pots than by divers (Cole 1999), but no such bias was observed by McClary (unpublished results).

A structured collection of relative abundance data using cod pots was previously considered physically impossible in Fiordland, due to the steep, frequently vertical fiord walls in many areas. However, when tagging blue cod in Dusky Sound both lines and pots were used simultaneously, and blue cod were seldom if ever caught in such areas (Carbines, unpublished results). Divers further confirmed the rarity of blue cod on vertical fiord walls, thus enabling these areas to be ignored and potting to be used in all other areas of fiords to survey blue cod. The objective of this research was to estimate the relative abundance of blue cod in and around Dusky Sound. This report describes the results of a blue cod relative abundance survey in Dusky Sound carried out in October 2002 using cod pots. It is envisaged that regular surveys will be undertaken to provide a time series of relative abundance estimates for blue cod around Fiordland.

## 2. METHODS

### 2.1 Timing

October 2002 was chosen for the potting survey in Dusky Sound, partly because of spawning (Carbines 1998) but mainly to recover blue cod tagged and released there one year earlier in October 2001 to describe annual movement rates. The entire potting survey was done over 12 consecutive days of mixed weather conditions from 15 to 26 October 2002.

## 2.2 Survey area

In October 2001, over 4000 tagged and released blue cod were caught from 115 sites distributed over five strata throughout Dusky Sound and its immediate coastline, and those same five strata (*inner, mid, outer, extreme outer, and open coast*) were used in the potting survey reported here (Figure 1). Stratum size was determined by the scale at which blue cod might be expected to form distinct stocks (Mace & Johnston 1983, Carbines & McKenzie 2001) separated by natural boundaries where possible. While tagging blue cod, Carbines (unpublished results) found the blue cod habitat within Dusky Sound constituted an often narrow band/ledge of light foul extending out from the shore, or exposed headland reefs usually shallower than 50 m depth. Very few blue cod were ever caught along submerged cliff faces or in deep trenches. This habitat band was assumed to be reasonably constraining and the length of the coastline and equivalent submerged areas supporting such habitat (measured by the 50 m contour line from Chart NZ7653) was proportional to the amount of blue cod habitat in each strata. Thus the size of each stratum was recorded as length of fishable coast and submerged areas (Table 1).

## 2.3 Survey design

The survey used a two-phase stratified random station design (Francis 1984), adapted from the standard application for trawl surveys to allow for the use of pots. The 115 sites of the October 2001 tagging survey were all used as potential stations for the potting survey in October 2002. Ensuring that sites were at least 300 m apart, and that stations were allocated randomly for phase 1 and 2 of the survey. Allocation of phase 2 stations to strata was carried out at the completion of phase 1 based on the mean catch rate (kg per pot per hour) of all blue cod per stratum and optimised using the “area mean squared” method of Francis (1984). In this way, stations were assigned iteratively to the stratum in which the expected gain was greatest, where expected gain is given by:

$$expected\ gain_i = A_i^2 \cdot mean_i^2 / (n_i(n_i+1))$$

where for the  $i$ th stratum  $mean_i$  is the mean weight of blue cod per stratum, and  $A_i$  is the area of the stratum (= relative length of coastline) and  $n_i$  is the number of pots.

## 2.4 Vessel and gear

The survey was conducted from FV *Solitaire*, a Milford Sound based commercial vessel equipped to set and lift rock lobster and blue cod pots targeted by sonar. The vessel was chartered by NIWA and skippered by the owner, Mr T. Willetts. Six custom designed and built cod pots were used to conduct the survey. Pot specifications are: length, 1200 mm; width, 900 mm; depth, 500 mm; synthetic inner mesh, 30 mm diameter; outer cyclone wire mesh, 50 mm diameter; 4 entrances. Pots were numbered and baited with paua guts.

## 2.5 Sampling methods

At each station six pots were set and left to fish (soak) for approximately 1 h during daylight. Soak time was standardised at 1 h to be consistent with previous potting surveys in the Marlborough Sounds and off Banks Peninsula (Blackwell 1997, 1998, Beentjes & Carbines 2003). At each site pots were separated by a distance of at least 100 m to avoid them competing for the same fish. The position of each of the six pots was determined by the skipper using local knowledge and the vessel sonar to locate a suitable area of light foul. After a station was completed (six pot lifts) the next closest station in the stratum was fished and no allowance was made for time of

day or tides. The order that strata and stations were surveyed was dependent on the prevailing weather conditions as exposed stations could be surveyed only during relatively calm weather.

As each pot was set, a record was made of pot number, latitude and longitude from GPS, depth and bottom type from the sonar, and time of day. Pots were lifted aboard using the vessel's hydraulic pot lifter, emptied, and the contents sorted by species. Total weight of blue cod per pot was recorded to the nearest 10 g using 5 kg Seaway scales, except hagfish and octopus where only the number of each fish was recorded. Total length down to the nearest centimetre was measured for blue cod. Sex and maturity were determined by dissection and macroscopic examination of the gonads (Carbines 1998). Gonads were recorded as 1 of 5 stages as follows: 1, immature or resting; 2, maturing (oocytes visible in females); 3, mature (hyaline oocytes in females, milt expressible in males); 4, running ripe (eggs and milt free flowing); 5, spent. A subsample of blue cod over the available size range in each strata had their otoliths taken and individual weights recorded.

## 2.6 Data analysis

For each stratum (*inner, mid, outer, extreme outer, and open coast*) and for all strata combined catch rates for all blue cod and for legal sized blue cod (over 33 cm) were estimated as the mean kg per pot per hour. Coefficients of variation for each stratum were determined from:

$$cv_i = se_i / mean_i$$

where for the  $i$ th stratum  $se_i$  is the standard error and  $mean_i$  is the mean catch rate (kg per pot per hour) .

The overall weighted mean catch rate for all strata was determined by weighting each stratum mean by the relative stratum coastline length ( $area_i$ ) divided by the sum of all relative coastline lengths ( $area_{total}$ ).

$$mean_{overall} = \sum (mean_i * area_i) / area_{total}$$

The overall weighted mean standard error of the means was determined by squaring each standard error times its weighting, summing them, and then taking the square root.

$$se_{overall} = \sqrt{\sum (se_i^2 * area_i / area_{total})}$$

The overall coefficient of variation for the survey was then determined from the overall mean and standard errors providing a weighted c.v.

$$cv_{overall} = se_{overall} / mean_{overall}$$

Length frequency for blue cod for each sex is presented by stratum; these were not scaled to the area fished as for pots this is unknown. Mean length for each sex was calculated for individual strata and overall for all strata combined.

For blue cod that were not weighed individually, weight was estimated from the length weight relationship determined from the blue cod subsample weighed on this survey using the model  $W = aL^b$ , where  $W$  = weight (g),  $L$  = length (cm); Individual fish weights were used to calculate catch rates of blue cod over 33 cm (minimum legal size).

### 3. RESULTS

#### 3.1 Stations surveyed

Forty-four stations (= sets) were surveyed (6 pots per station = 264 pot lifts) from five strata (*inner*, *mid*, *outer*, *extreme outer*, and *open coast*) that covered an area between the inner fiord and the open coast of Dusky Sound (Figure 1, Table 1, Appendix 1). Of the 44 stations, 38 were carried out in phase 1 (8 in strata *inner*, *mid*, *outer*, and *extreme outer*, and 6 in *open coast*) and 6 were allocated to stratum *outer* in phase 2. Depth ranged from about 4 to 82 m with average depth of 26 m (Table 1).

#### 3.2 Catch

A total of 1004 kg of catch was taken on the survey of which 873 kg (87%) was blue cod, consisting of 1515 fish (Table 2). Bycatch included 12 fish and 1 octopus species. The five most common bycatch species by weight were scarlet wrasse (*Pseudolabrus miles*), girdled wrasse (*Notolabrus cinctus*), octopus (*Pinnoctopus cordiformis*), spotty (*Notolabrus celidotus*), and sea perch (*Helicolenus percoides*).

Mean catch rates of blue cod (all sizes) ranged from 1.28 kg per pot per hour in stratum *mid* to 8.42 kg per pot per hour for stratum *open coast*. Overall mean catch rate and c.v. were 2.69 kg per pot per hour and 6.7% (Table 3). For blue cod over 33 cm (minimum legal size), highest catch rates were also in stratum *open coast* and overall mean catch rate and c.v. were 2.23 kg per pot per hour and 7.2% (Table 4).

#### 3.3 Biological and length frequency data

Of the 1515 blue cod caught on the survey length was recorded for 1499 and sex for 1497. Otoliths were taken from and individual weights recorded for 645 blue cod covering the available size range of each stratum.

The overall sex ratio was skewed in favour of females at 0.78:1 (male:female), and only stratum *outer* had more males than females (1.5:1) (Table 5).

Length frequency distributions for the four strata within Dusky Sound (*inner*, *mid*, *outer*, and *extreme outer*) were similar but no clear modes were present (Figure 2). In contrast, stratum *open coast* shows a clear mode at about 33 cm but with few blue cod under 25 cm. In all strata the largest blue cod were males and mean lengths of males were also larger than females (Table 5).

A total of 1497 blue cod were staged and of these about 80% were either resting or maturing, and about 20% were mature or running ripe for both sexes (Table 6). Males attain a running ripe or spawning condition as small as 25 cm and females at about 29 cm (Figure 3).

Length weight coefficients were as follows: (males),  $a = 0.007825$ , and  $b = 3.1727$ ,  $N = 324$ , range 18–55 cm; (females)  $a = 0.00506$ , and  $b = 3.2988$ ,  $N = 316$ , range 14–48 cm.



#### 4. DISCUSSION

The results of this survey provide the first relative abundance index of blue cod using potting in Fiordland. The overall c.v. of 6.7% for all blue cod is excellent given there were no previous surveys on which to optimise allocation of stations. The mean catch rates were variable between strata and over twice as high in the *open coast* stratum (8.42 kg per pot per hour) than in any stratum within Dusky Sound (mean 2.49 kg per pot per hour, see Table 3). Blue cod catches do not appear to be affected by time of day, but can be influenced by the state of the tide in areas where tidal flow is high such as Foveaux Strait (Warren et al. 1997, Cole et al. 1999). In our sampling design it was not practical to allow for the effect that tide might have on catch rates and we cannot rule out the possibility that some catch rates may have been affected, although compared to Foveaux Strait, tidal flow around Dusky Sound is comparatively low.

When compared to equivalent potting surveys done in other areas, the mean catch rate of blue cod in Dusky Sound was higher than in Queen Charlotte Sound (1.66 kg per pot per hour) and similar to that in Pelorus Sound (3.00 kg per pot per hour) (Blackwell 1997, 1998), although a recent survey of Marlborough Sound indicates that blue cod abundance has since declined markedly (Blackwell 2002). Blue cod catch rates in Dusky Sound were also considerably higher than from inshore strata of a recent survey off Banks Peninsula (mean = 1.18 kg per pot per hour), but lower than offshore strata of that survey area (mean = 3.39 kg per pot per hour) (Beentjes & Carbines 2003).

Except for the *outer* stratum, blue cod from the five strata of Dusky Sound were all dominated by females (see Figure 2). This contrasts with both the Banks Peninsula and the Marlborough Sounds surveys in which most strata were dominated by males (Blackwell 1997, 1998, Beentjes & Carbines 2003). The notable distinctions between the blue cod size frequencies of the Dusky Sound strata were the relatively low number of large males in the *mid* stratum, very few small fish from the *open coast* stratum, and relatively larger fish in both the *inner* and *open coast* strata (see Figure 2). Overall the mean size of both male (34.9 cm) and female (30.4 cm) blue cod surveyed in Dusky Sound was considerably greater than those from Queen Charlotte Sound (male = 30.97 cm, female = 28.46 cm; Blackwell 1997), Pelorus Sound (male = 30.09 cm, female = 25.94 cm; Blackwell 1997, 1998) or inshore Banks Peninsula (male = 28.3 cm, female = 25.3 cm) (Beentjes & Carbines 2003). However, blue cod from all strata in Dusky Sound were considerably smaller than blue cod from the offshore strata of Banks Peninsula (male = 37.7 cm, female = 36.6 cm; Beentjes & Carbines 2003).

The relative abundance of blue cod in the *open coast* stratum was over 2.6 times higher than anywhere else within Dusky Sound and this may be due to a combination of several possible factors. Fishing pressure may be higher in the more accessible inshore/inner strata (as observed in other areas; Blackwell 2002, Beentjes & Carbines 2003) but information on fishing effort is needed to confirm this. However, it is also probable that the observed differences in the relative abundance of blue cod in strata of Dusky Sound are due to a limitation of available blue cod habitat, especially in the *mid* stratum where there are very few shallow flat areas of light fowl.

Southland blue cod spawn mainly between September and November but continue through to January (Carbines 1998). The mature or running ripe gonads observed for 20% of sampled fish in October suggest that timing of spawning in Fiordland is similar to that in Southland.

#### 5. ACKNOWLEDGMENTS

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**Table 1: Length of blue cod inhabitable coastline and submerged areas, number of phase 1 and 2 stations, pot lifts, and depth.**

Stratum	Inhabitable coastline (km)	Number of sets		Number of pot lifts	Depth (m)	
		Phase 1	Phase 2		Mean	Range
inner	74.56	8		48	10.2	5–18
mid	61.61	8		48	14.4	4–33
outer	94.72	8	6	84	26.4	5–62
extreme outer	44.22	8		48	33.5	13–82
open coast	20.35	6		36	55.9	33–82
Total	295.46	38	6	264	26.5	4–82

**Table 2: Catch weights and/or numbers of blue cod and bycatch species caught on the survey and percentage of total weight. \*Estimated weight where average weight estimated at 0.4 kg for hagfish and 5.5 kg for octopus; –did not record numbers.**

Common name	Scientific name	Catch (kg)	Number	Percent of total catch
Blue cod	<i>Parapercis colias</i>	873.37	1515	86.96
Scarlet wrasse	<i>Pseudolabrus miles</i>	59.53	–	5.93
Girdled wrasse	<i>Notolabrus cinctus</i>	20.61	–	2.05
Octopus	<i>Pinnoctopus cordiformis</i> *	16.50	3	1.64
Spotty	<i>Notolabrus celidotus</i>	9.94	–	0.99
Sea perch	<i>Helicolenus percoides</i>	7.64	–	0.76
Red cod	<i>Pseudophycis bachus</i>	5.26	–	0.52
Hagfish	<i>Eptatretus cirrhatus</i> *	4.80	12	0.48
Banded Wrasse	<i>Notolabrus fucicola</i>	3.98	–	0.39
Tarakihi	<i>Nemadactylus macropterus</i>	1.63	–	0.16
Leather jacket	<i>Parika scaber</i>	0.65	–	0.06
Scorpion fish	<i>Scorpaena papillosus</i>	0.39		0.04
Butterfly perch	<i>Caesioperca lepidoptera</i>	0.04		0.00
Total		1004.34		100.00

**Table 3: Mean catch rate, standard error, and c.v. per stratum and overall for all blue cod.**

Stratum	Mean (kg/lift)	s.e.	c.v. %	Pot lifts (N)
inner	2.85	0.31	11.0	48
mid	1.28	0.19	14.4	48
outer	2.63	0.39	14.9	84
extreme outer	3.21	0.36	11.2	48
open coast	8.42	1.46	17.3	36
Overall	2.69	0.17	6.69	264

**Table 4: Mean catch rate, standard error, and c.v. per stratum and overall for blue cod  $\geq 30$  cm.**

Stratum	Mean (kg/lift)	s.e.	c.v. %	Pot lifts (N)
inner	2.27	0.27	12.0	48
mid	0.81	0.17	20.6	48
outer	1.82	0.31	16.8	84
extreme outer	1.94	0.28	14.4	48
open coast	5.46	0.84	15.4	36
Overall	2.23	0.17	7.20	264

**Table 5: Mean lengths of blue cod by stratum and sex. s.e., standard error.**

Stratum	Sex	N	Mean length (cm)	s.e.
inner	male	68	36.9	1.07
	female	134	31.9	0.69
mid	male	55	31.3	0.95
	female	77	28.6	0.91
outer	male	241	34.9	0.40
	female	158	27.3	0.42
	unsexed	2	18.2	3.75
extreme outer	male	128	35.2	0.51
	female	167	28.3	0.47
open coast	male	165	35.3	0.46
	female	304	32.8	0.26
overall	male	657	34.9	0.26
	female	840	30.4	0.23
	unsexed	2	18.2	3.75

**Table 6: Percent of blue cod males and females by gonad stage.**

Stage	Percent	
	Males	Females
1	37.6	42.0
2	45.4	37.3
3	11.4	18.3
4	5.6	2.4
5	0.0	0.0
N	657	840

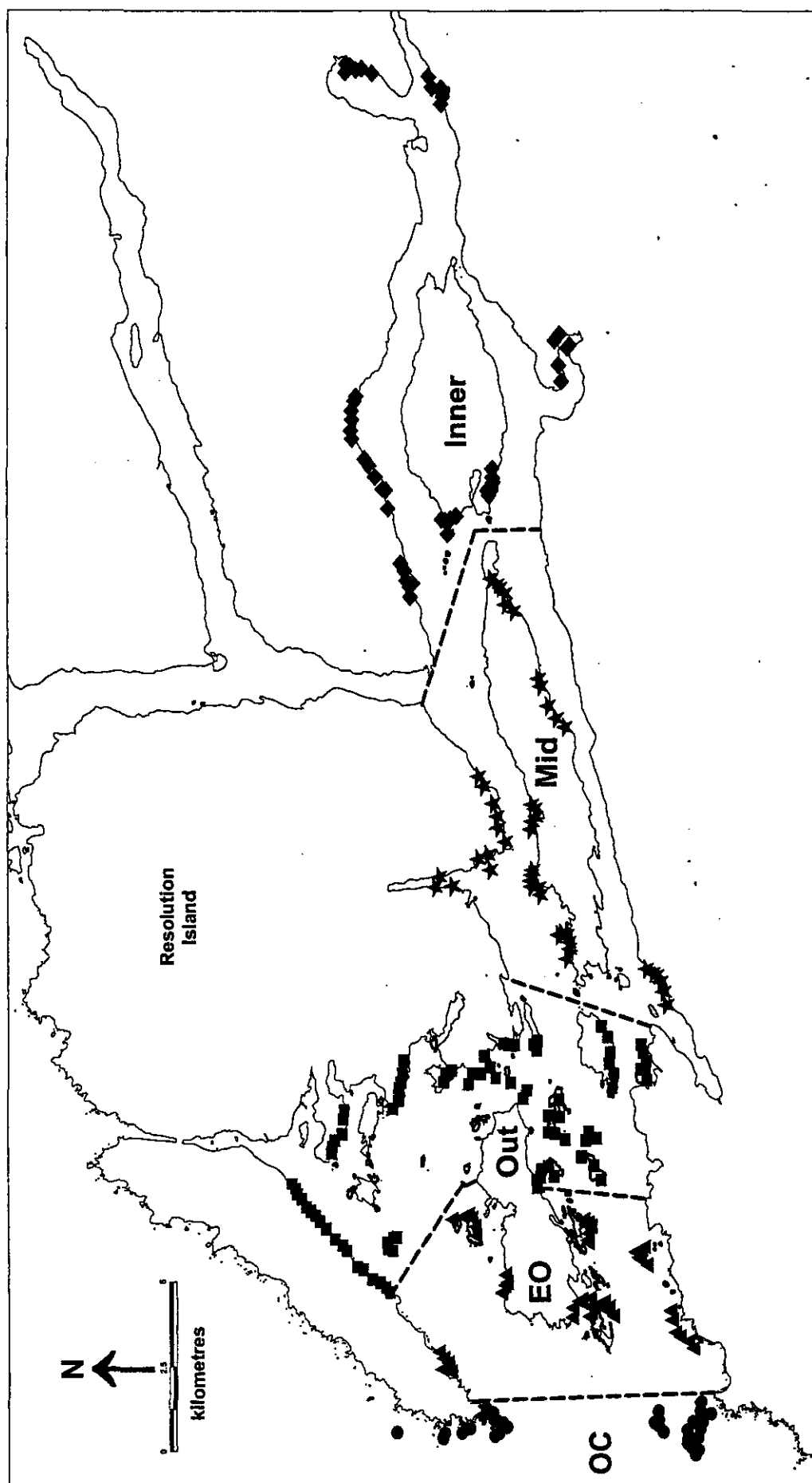


Figure 1: Map of Dusky Sound showing strata (OC – open coast, EO – extreme outer, Out – outer, Mid – middle, and Inner) and pot locations of forty-four stations (= sets) surveyed (6 pots per station = 264 pot lifts).

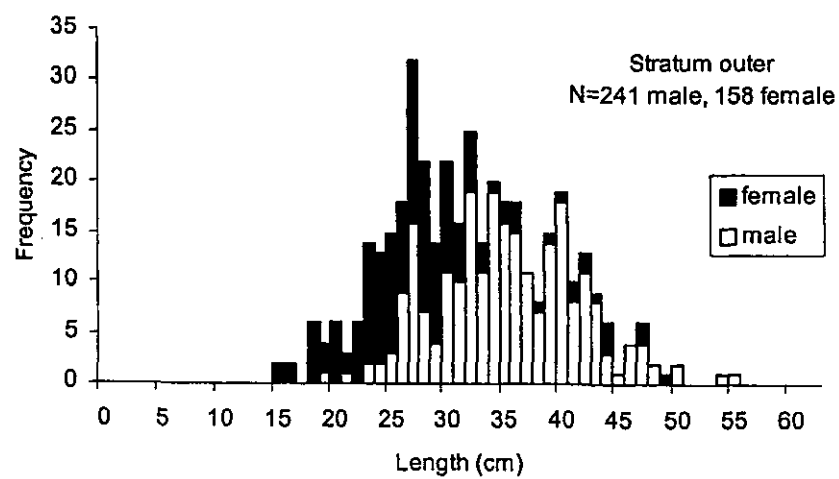
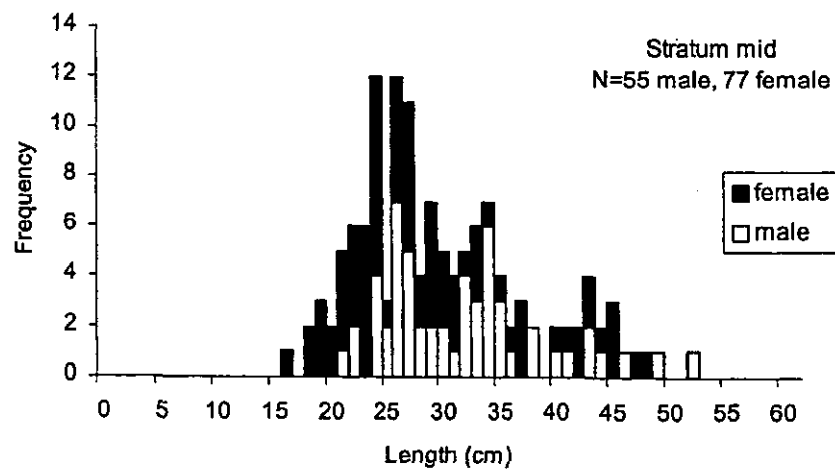
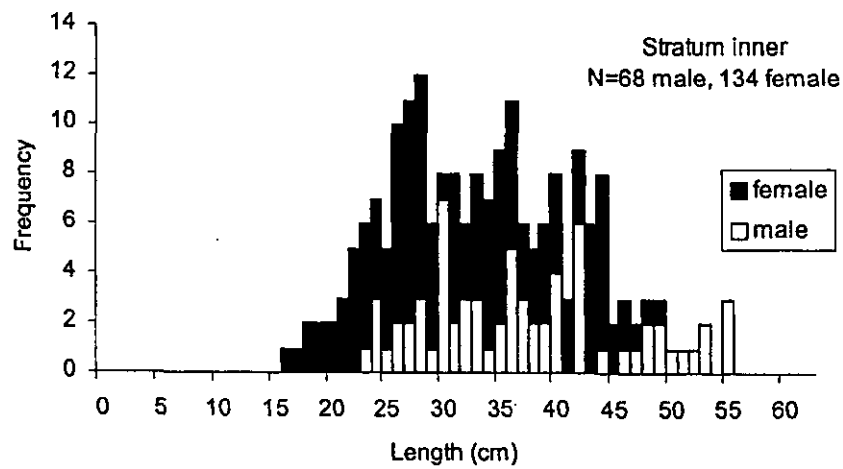


Figure 2: Length frequency distributions of blue cod for each stratum and for all strata combined.

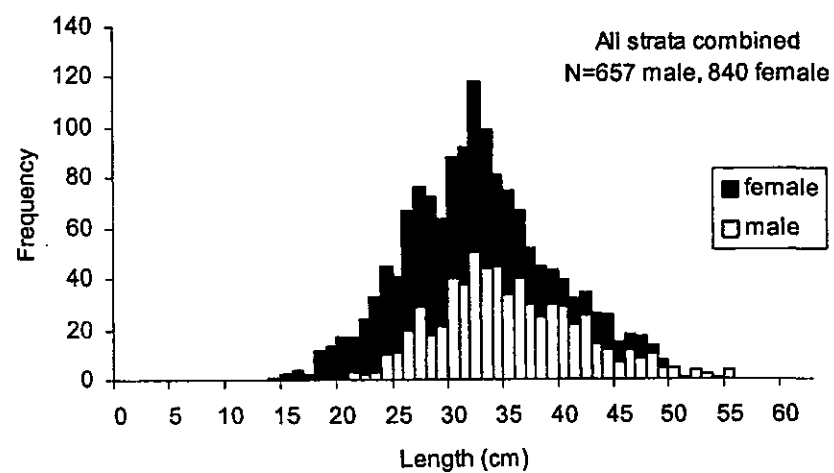
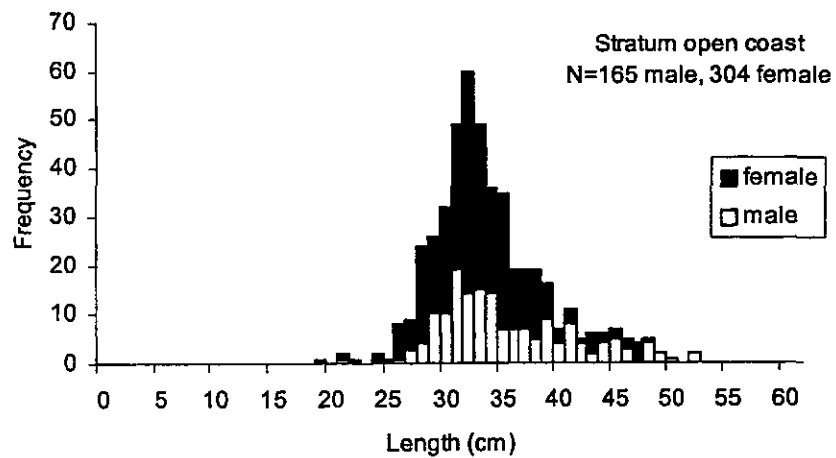
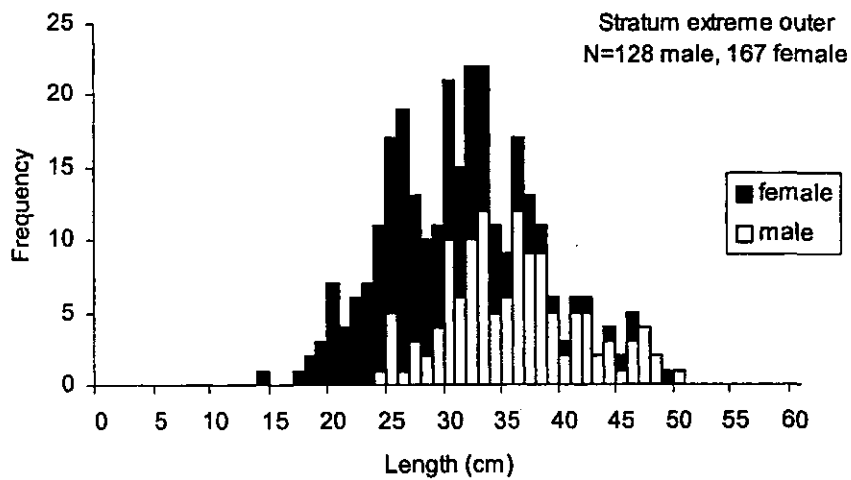


Figure 2 – continued

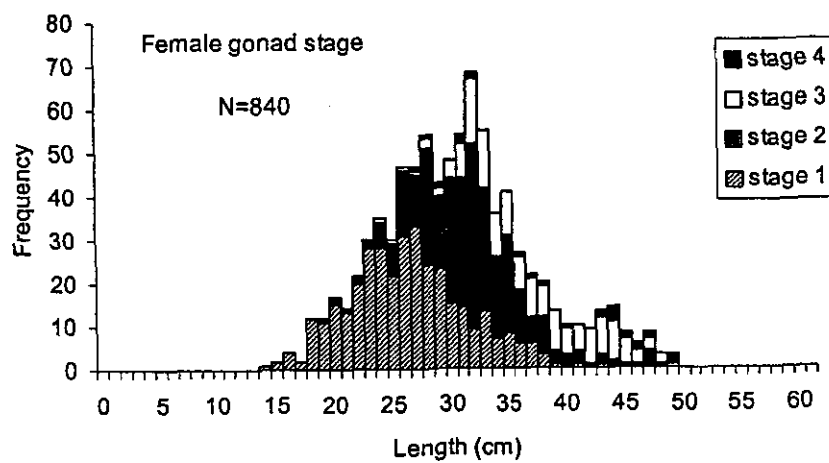
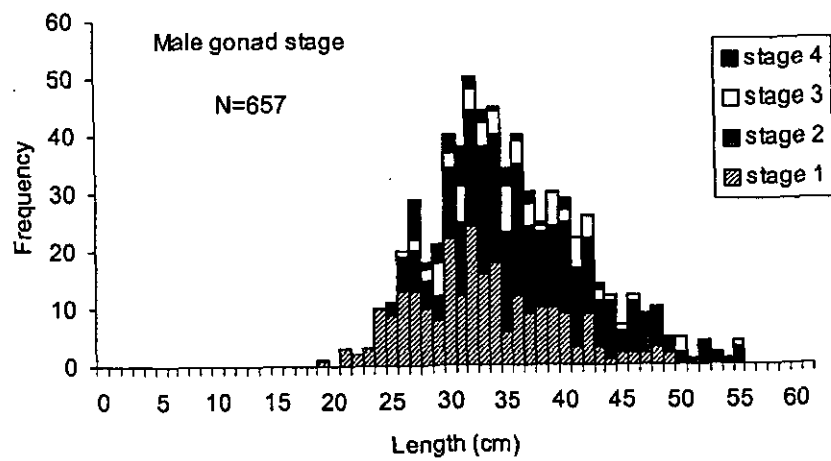


Figure 3: Length at maturity for blue cod males and females.



**Appendix 1: Summary of pot lift station data.**

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
1	15/10/02	1	extreme outer	1	45.7758	166.5223	27.5	1.05	2	0.44	1
1	15/10/02	1	extreme outer	1	45.7767	166.5147	51.2	1.00	4	3.18	4
1	15/10/02	1	extreme outer	1	45.7770	166.5210	31.1	1.03	1	3.98	5
1	15/10/02	1	extreme outer	1	45.7770	166.5172	36.6	1.05	0	1.65	3
1	15/10/02	1	extreme outer	1	45.7770	166.5137	82.4	0.98	5	2.95	6
1	15/10/02	1	extreme outer	1	45.7778	166.5198	45.8	1.05	3	1.65	2
34	24/10/02	1	extreme outer	3	45.8020	166.4880	42.1	1.05	3	2.26	3
34	24/10/02	1	extreme outer	3	45.8025	166.4845	32.9	1.06	0	3.07	7
34	24/10/02	1	extreme outer	3	45.8035	166.4798	42.1	1.06	2	1.32	2
34	24/10/02	1	extreme outer	3	45.8048	166.4782	45.8	1.05	5	4.95	9
34	24/10/02	1	extreme outer	3	45.8073	166.4765	36.6	1.03	4	13.91	21
34	24/10/02	1	extreme outer	3	45.8088	166.4738	32.9	1.03	1	2.68	5
6	17/10/02	1	extreme outer	6	45.7915	166.5100	45.8	1.00	3	1.42	2
6	17/10/02	1	extreme outer	6	45.7923	166.5078	43.9	1.00	2	2.25	4
6	17/10/02	1	extreme outer	6	45.7932	166.5070	47.6	1.05	5	8.40	16
6	17/10/02	1	extreme outer	6	45.7933	166.5112	40.3	1.00	0	4.75	6
6	17/10/02	1	extreme outer	6	45.7943	166.5120	23.8	1.00	1	2.28	5
6	17/10/02	1	extreme outer	6	45.7950	166.5052	58.6	1.03	4	3.60	6
4	16/10/02	1	extreme outer	10	45.7775	166.4928	34.8	1.08	4	2.69	8
4	16/10/02	1	extreme outer	10	45.7798	166.4903	34.8	1.08	5	4.56	11
4	16/10/02	1	extreme outer	10	45.7818	166.4915	54.9	1.16	1	0.00	0
4	16/10/02	1	extreme outer	10	45.7822	166.4885	51.2	1.11	2	5.29	6
4	16/10/02	1	extreme outer	10	45.7833	166.4895	67.7	1.15	0	1.44	1
4	16/10/02	1	extreme outer	10	45.7847	166.4862	64.1	1.13	3	8.02	7
27	22/10/02	1	extreme outer	15	45.7352	166.5227	16.5	1.00	1	3.08	7
27	22/10/02	1	extreme outer	15	45.7387	166.5237	14.6	1.00	0	2.24	13
27	22/10/02	1	extreme outer	15	45.7403	166.5245	16.5	1.00	5	1.75	3
27	22/10/02	1	extreme outer	15	45.7413	166.5230	12.8	1.00	4	0.89	8
27	22/10/02	1	extreme outer	15	45.7423	166.5200	20.1	0.98	3	1.32	4

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
27	22/10/02	1	extreme outer	15	45.7425	166.5167	16.5	0.98	2	0.18	1
28	22/10/02	1	extreme outer	19	45.5010	166.7508	22.0	1.06	0	3.09	5
28	22/10/02	1	extreme outer	19	45.7343	166.4965	18.3	1.05	3	3.57	7
28	22/10/02	1	extreme outer	19	45.7503	166.4952	20.1	1.03	2	3.48	8
28	22/10/02	1	extreme outer	19	45.7515	166.4980	16.5	1.05	4	1.02	1
28	22/10/02	1	extreme outer	19	45.7517	166.5018	16.5	1.06	1	3.23	11
28	22/10/02	1	extreme outer	19	45.7522	166.4990	12.8	1.05	5	6.90	18
42	26/10/02	1	extreme outer	21	45.7310	166.4730	51.2	1.01	2	0.53	1
42	26/10/02	1	extreme outer	21	45.7318	166.4663	12.8	1.01	5	1.88	8
42	26/10/02	1	extreme outer	21	45.7323	166.4705	40.3	1.00	0	1.95	6
42	26/10/02	1	extreme outer	21	45.7337	166.4688	40.3	1.00	3	4.52	10
42	26/10/02	1	extreme outer	21	45.7338	166.4670	32.9	1.00	4	2.92	6
42	26/10/02	1	extreme outer	21	45.7347	166.4653	31.1	1.00	1	5.32	5
29	22/10/02	1	extreme outer	29	45.7720	166.4858	27.5	1.00	1	2.97	6
29	22/10/02	1	extreme outer	29	45.7722	166.4893	22.0	0.98	0	5.31	8
29	22/10/02	1	extreme outer	29	45.7740	166.4918	18.3	1.00	2	2.14	4
29	22/10/02	1	extreme outer	29	45.7750	166.4925	18.3	0.98	3	6.23	10
29	22/10/02	1	extreme outer	29	45.7772	166.4860	18.3	0.98	5	2.24	4
29	22/10/02	1	extreme outer	29	45.7773	166.4895	20.1	1.00	4	0.60	1
24	21/10/02	1	inner	21	45.7325	166.7878	11.0	1.05	4	4.96	7
37	25/10/02	1	inner	2	45.7200	166.7708	9.2	0.98	2	3.67	7
37	25/10/02	1	inner	2	45.7212	166.7680	14.6	–	0	1.90	2
37	25/10/02	1	inner	2	45.7217	166.7643	5.5	–	3	6.12	4
37	25/10/02	1	inner	2	45.7227	166.7618	11.0	1.00	4	1.13	2
37	25/10/02	1	inner	2	45.7228	166.7580	11.0	–	1	0.00	0
37	25/10/02	1	inner	2	45.7237	166.7632	7.3	–	5	3.84	3
38	25/10/02	1	inner	4	45.7087	166.8107	12.8	1.05	1	0.44	1
38	25/10/02	1	inner	4	45.7102	166.8082	5.5	1.05	4	2.45	4
38	25/10/02	1	inner	4	45.7122	166.8038	7.3	1.03	5	0.31	1

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
38	25/10/02	1	inner	4	45.7145	166.7993	5.5	1.05	3	4.27	4
38	25/10/02	1	inner	4	45.7155	166.7988	12.8	1.01	0	4.17	5
38	25/10/02	1	inner	4	45.7162	166.7918	7.3	1.00	2	1.76	1
39	25/10/02	1	inner	6	45.7045	166.8215	7.3	1.03	4	4.61	3
39	25/10/02	1	inner	6	45.7047	166.8290	7.3	1.06	3	4.92	7
39	25/10/02	1	inner	6	45.7048	166.8183	5.5	1.00	1	2.92	3
39	25/10/02	1	inner	6	45.7048	166.8257	7.3	1.05	5	3.18	3
39	25/10/02	1	inner	6	45.7057	166.8327	7.3	1.06	0	1.17	2
39	25/10/02	1	inner	6	45.7062	166.8345	5.5	1.06	2	1.03	1
41	25/10/02	1	inner	7	45.7027	166.9567	7.3	1.00	2	6.48	10
41	25/10/02	1	inner	7	45.7030	166.9598	11.0	1.01	0	1.52	4
41	25/10/02	1	inner	7	45.7043	166.9590	9.2	1.00	3	2.22	3
41	25/10/02	1	inner	7	45.7060	166.9577	12.8	0.98	5	3.4	4
41	25/10/02	1	inner	7	45.7078	166.9582	9.2	1.03	4	4.81	5
41	25/10/02	1	inner	7	45.7110	166.9563	9.2	1.03	1	0.68	1
26	21/10/02	1	inner	15	45.7673	166.8558	12.8	1.01	4	3.00	2
26	21/10/02	1	inner	15	45.7685	166.8463	14.6	1.00	3	1.67	3
26	21/10/02	1	inner	15	45.7688	166.8582	12.8	1.05	0	1.95	4
26	21/10/02	1	inner	15	45.7693	166.8402	9.2	1.01	2	0.90	7
26	21/10/02	1	inner	15	45.7712	166.8530	18.3	1.05	1	0.07	1
26	21/10/02	1	inner	15	45.7718	166.8540	14.6	1.06	5	0.00	0
40	25/10/02	1	inner	18	45.7283	166.9552	9.2	1.00	1	0.78	1
40	25/10/02	1	inner	18	45.7293	166.9510	7.3	1.00	4	8.02	6
40	25/10/02	1	inner	18	45.7322	166.9448	7.3	0.98	2	2.29	3
40	25/10/02	1	inner	18	45.7322	166.9508	5.5	0.98	5	0.00	0
40	25/10/02	1	inner	18	45.7327	166.9477	7.3	0.98	0	0.95	1
40	25/10/02	1	inner	18	45.7327	166.9493	12.8	0.98	3	2.48	3
24	21/10/02	1	inner	21	45.7337	166.7873	12.8	1.03	0	5.53	12
24	21/10/02	1	inner	21	45.7343	166.7823	18.3	1.03	2	3.84	11

**Appendix 1 – continued**

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
24	21/10/02	1	inner	21	45.7353	166.7880	16.5	1.05	5	1.48	2
24	21/10/02	1	inner	21	45.7370	166.7892	12.8	1.10	1	5.44	8
24	21/10/02	1	inner	21	45.7838	166.7843	7.3	1.03	3	5.75	11
25	21/10/02	1	inner	24	45.7467	166.7988	9.2	5.00	5	1.55	3
25	21/10/02	1	inner	24	45.7472	166.7970	18.3	1.00	1	0.61	4
25	21/10/02	1	inner	24	45.7480	166.7990	11.0	1.03	0	6.40	12
25	21/10/02	1	inner	24	45.7482	166.8072	7.3	1.05	2	7.36	9
25	21/10/02	1	inner	24	45.7483	166.8037	9.2	1.05	3	1.82	4
25	21/10/02	1	inner	24	45.7485	166.8020	14.6	1.03	4	3.45	8
30	22/10/02	1	mid	3	45.7950	166.6173	12.8	1.00	2	1.28	4
30	22/10/02	1	mid	3	45.7970	166.6157	14.6	1.00	3	0.54	4
30	22/10/02	1	mid	3	45.7982	166.6148	14.6	1.03	4	2.72	5
30	22/10/02	1	mid	3	45.7993	166.6123	16.5	1.03	5	1.38	1
30	22/10/02	1	mid	3	45.8003	166.6085	11.0	1.03	1	0.59	2
30	22/10/02	1	mid	3	45.8010	166.6035	16.5	1.03	0	0.05	1
17	20/10/02	1	mid	10	45.7682	166.6303	18.3	1.03	1	0.31	1
17	20/10/02	1	mid	10	45.7692	166.6310	12.8	1.05	5	2.64	7
17	20/10/02	1	mid	10	45.7707	166.6213	18.3	1.00	2	0.00	0
17	20/10/02	1	mid	10	45.7708	166.6303	20.1	1.03	0	3.21	7
17	20/10/02	1	mid	10	45.7713	166.6277	18.3	1.01	4	2.36	3
17	20/10/02	1	mid	10	45.7715	166.6252	25.6	1.00	3	1.12	2
20	20/10/02	1	mid	15	45.7302	166.6488	11.0	5.00	5	2.01	3
20	20/10/02	1	mid	15	45.7315	166.6527	11.0	1.01	0	0.36	1
20	20/10/02	1	mid	15	45.7355	166.6492	12.8	1.00	1	0.45	1
20	20/10/02	1	mid	15	45.7435	166.6593	11.0	1.03	4	0.00	0
20	20/10/02	1	mid	15	45.7465	166.6608	18.3	1.03	3	0.84	5
20	20/10/02	1	mid	15	45.7473	166.6552	23.8	1.05	2	0.22	1
21	20/10/02	1	mid	17	45.7435	166.6905		1.10	1	0.36	1
21	20/10/02	1	mid	17	45.7452	166.6867	11.0	1.10	5	1.46	4

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
21	20/10/02	1	mid	17	45.7482	166.6802	9.2	1.10	0	0.00	0
21	20/10/02	1	mid	17	45.7493	166.6753	14.6	1.08	4	1.92	3
21	20/10/02	1	mid	17	45.7498	166.6710	12.8	1.08	3	0.72	1
21	20/10/02	1	mid	17	45.7520	166.6657	12.8	1.05	2	1.52	1
19	20/10/02	1	mid	19	45.7500	166.8667	12.8	1.03	1	0.00	0
19	20/10/02	1	mid	19	45.7598	166.6703	12.8	1.00	2	0.00	0
19	20/10/02	1	mid	19	45.7602	166.6733	12.8	1.01	3	1.88	2
19	20/10/02	1	mid	19	45.7602	166.6797	18.3	1.03	5	1.12	2
19	20/10/02	1	mid	19	45.7612	166.6782	12.8	1.01	0	0.66	2
19	20/10/02	1	mid	19	45.7613	166.6752	12.8	1.01	4	1.40	3
18	20/10/02	1	mid	22	45.7597	166.6510	12.8	–	4	0.42	1
18	20/10/02	1	mid	22	45.7600	166.6488	18.3	1.03	0	0.00	0
18	20/10/02	1	mid	22	45.7600	166.6532	18.3	1.03	3	1.27	3
18	20/10/02	1	mid	22	45.7603	166.6550	22.0	1.03	2	0.45	2
18	20/10/02	1	mid	22	45.7622	166.6485	18.3	1.00	5	0.27	1
18	20/10/02	1	mid	22	45.7627	166.6458	32.9	1.00	1	0.62	3
22	21/10/02	1	mid	25	45.7580	166.7220	12.8	1.03	0	3.21	3
22	21/10/02	1	mid	25	45.7622	166.7272	11.0	1.05	1	3.05	9
22	21/10/02	1	mid	25	45.7628	166.7242	12.8	1.03	5	0.32	1
22	21/10/02	1	mid	25	45.7650	166.7168	14.6	1.05	4	0.15	1
22	21/10/02	1	mid	25	45.7675	166.7122	14.6	1.01	3	2.21	5
22	21/10/02	1	mid	25	45.7702	166.7088	14.6	1.03	2	0.48	2
23	21/10/02	1	mid	28	45.7477	166.7652	3.7	1.05	2	5.51	6
23	21/10/02	1	mid	28	45.7495	166.7630	5.5	1.06	3	0.51	2
23	21/10/02	1	mid	28	45.7503	166.7617	7.3	1.06	4	2.76	8
23	21/10/02	1	mid	28	45.7518	166.7595	9.2	1.06	0	4.96	3
23	21/10/02	1	mid	28	45.7520	166.7553	9.2	1.08	5	1.68	7
23	21/10/02	1	mid	28	45.7545	166.7527	9.2	1.01	1	2.54	8
11	18/10/02	1	open coast	3	45.8088	166.4458	-	1.00	5	11.95	16

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
11	18/10/02	1	open coast	3	45.8103	166.4400	51.2	1.00	3	5.38	7
11	18/10/02	1	open coast	3	45.8110	166.4432	40.3	1.03	0	6.62	10
11	18/10/02	1	open coast	3	45.8110	166.4500	36.6	0.98	4	11.57	11
11	18/10/02	1	open coast	3	45.8112	166.4532	32.9	0.96	2	14.14	17
11	18/10/02	1	open coast	3	45.8117	166.4458	42.1	1.03	1	10.78	17
32	23/10/02	1	open coast	5	45.7973	166.4457	56.7	1.00	0	5.72	11
32	23/10/02	1	open coast	5	45.7985	166.4498	69.5	1.00	5	3.56	5
32	23/10/02	1	open coast	5	45.7987	166.4463	51.2	1.00	4	28.02	59
32	23/10/02	1	open coast	5	45.7987	166.4443	36.6	1.05	3	27.40	55
32	23/10/02	1	open coast	5	45.8142	166.4488	54.9	1.00	1	6.13	12
32	23/10/02	1	open coast	5	45.8000	166.4420	51.2	1.03	2	37.71	62
31	23/10/02	1	open coast	10	45.7183	166.4422	42.1	1.00	4	0.66	1
31	23/10/02	1	open coast	10	45.7323	166.4402	49.4	1.00	2	2.12	2
31	23/10/02	1	open coast	10	45.7328	166.4420	42.1	0.98	3	4.43	5
31	23/10/02	1	open coast	10	45.7382	166.4422	49.4	1.01	5	3.03	2
31	23/10/02	1	open coast	10	45.7395	166.4437	36.6	1.01	1	4.93	8
31	23/10/02	1	open coast	10	45.7407	166.4438	36.6	1.03	0	7.00	17
2	16/10/02	1	open coast	11	45.7483	166.4410	56.7	1.15	1	2.68	3
2	16/10/02	1	open coast	11	45.7497	166.4420	54.9	1.13	0	4.80	5
2	16/10/02	1	open coast	11	45.7498	166.4455	65.9	1.15	3	1.51	2
2	16/10/02	1	open coast	11	45.7508	166.4458	78.7	1.30	4	3.32	3
2	16/10/02	1	open coast	11	45.7522	166.4442	78.7	1.38	5	1.29	2
2	16/10/02	1	open coast	11	45.9168	166.4437	56.7	1.15	2	4.61	4
3	16/10/02	1	open coast	12	45.7457	166.4515	43.9	1.13	4	5.55	16
3	16/10/02	1	open coast	12	45.7472	166.4500	64.1	1.05	5	1.44	1
3	16/10/02	1	open coast	12	45.7477	166.4490	51.2	1.03	2	1.05	1
3	16/10/02	1	open coast	12	45.7478	166.4497	82.4	1.00	3	0.00	0
3	16/10/02	1	open coast	12	45.7480	166.4472	58.6	1.16	0	10.20	29
3	16/10/02	1	open coast	12	45.7490	166.4467	65.9	1.15	1	5.32	9

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
10	18/10/02	1	open coast	15	45.8072	166.4377	69.5	1.20	2	21.11	25
10	18/10/02	1	open coast	15	45.8072	166.4427	60.4	1.15	4	22.36	25
10	18/10/02	1	open coast	15	45.8073	166.4397	69.5	1.16	5	10.16	18
10	18/10/02	1	open coast	15	45.8085	166.4358	73.2	1.10	3	10.80	18
10	18/10/02	1	open coast	15	45.8095	166.4333	69.5	1.08	0	1.66	2
10	18/10/02	1	open coast	15	45.8103	166.4352	76.9	1.08	1	4.28	5
33	23/10/02	2	outer	1	45.7615	166.5378	27.5	0.98	1	0.77	3
33	23/10/02	2	outer	1	45.7617	166.5345	14.6	0.96	0	0.90	8
33	23/10/02	2	outer	1	45.7627	166.5388	45.8	1.00	4	0.00	0
33	23/10/02	2	outer	1	45.7630	166.5418	34.8	1.00	5	2.12	4
33	23/10/02	2	outer	1	45.7650	166.5428	23.8	0.98	2	0.16	2
33	23/10/02	2	outer	1	45.7668	166.5392	14.6	1.00	3	2.39	10
9	17/10/02	1	outer	4	45.7453	166.5847	27.5	1.01	4	2.85	2
9	17/10/02	1	outer	4	45.7472	166.5805	20.1	1.00	5	1.00	2
9	17/10/02	1	outer	4	45.7488	166.5765	42.1	1.01	2	0.00	0
9	17/10/02	1	outer	4	45.7535	166.5745	25.6	1.06	3	0.46	3
9	17/10/02	1	outer	4	45.7575	166.5685	23.8	1.08	0	4.88	9
9	17/10/02	1	outer	4	45.7585	166.5717	29.3	1.10	1	0.00	0
35	24/10/02	2	outer	5	45.6983	166.5482	11.0	1.08	3	0.00	0
35	24/10/02	2	outer	5	45.6987	166.5503	12.8	1.08	0	0.49	2
35	24/10/02	2	outer	5	45.6995	166.5527	12.8	1.08	2	0.00	0
35	24/10/02	2	outer	5	45.7017	166.5550	11.0	1.06	5	0.86	3
35	24/10/02	2	outer	5	45.7020	166.5607	11.0	–	4	0.00	0
35	24/10/02	2	outer	5	45.7023	166.5642	16.5	–	1	0.00	0
15	19/10/02	1	outer	6	45.6863	166.5365	12.8	–	5	18.32	30
15	19/10/02	1	outer	6	45.6873	166.5345	20.1	1.00	1	17.88	26
15	19/10/02	1	outer	6	45.6878	166.5323	22.0	1.00	0	4.57	14
15	19/10/02	1	outer	6	45.6892	166.5303	27.5	1.00	4	6.19	11
15	19/10/02	1	outer	6	45.6907	166.5273	20.1	1.00	3	1.11	4

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
15	19/10/02	1	outer	6	45.6920	166.5258	27.5	0.98	2	2.89	5
43	26/10/02	2	outer	8	45.6935	166.5242	27.5	1.06	1	6.39	10
43	26/10/02	2	outer	8	45.6947	166.5220	23.8	1.05	4	5.85	11
43	26/10/02	2	outer	8	45.6967	166.5192	22.0	1.03	5	6.82	9
43	26/10/02	2	outer	8	45.6993	166.5152	18.3	1.03	3	6.38	10
43	26/10/02	2	outer	8	45.7017	166.5128	23.8	1.03	0	6.71	11
43	26/10/02	2	outer	8	45.7030	166.5108	25.6	1.03	2	5.44	6
12	18/10/02	1	outer	10	45.7933	166.5793	31.1	1.10	4	0.06	1
12	18/10/02	1	outer	10	45.7935	166.5887	22.0	1.10	5	0.29	3
12	18/10/02	1	outer	10	45.7942	166.5857	32.9	1.06	1	1.15	3
12	18/10/02	1	outer	10	45.7947	166.5795	18.3	1.08	3	0.20	1
12	18/10/02	1	outer	10	45.7950	166.5822	22.0	1.06	0	0.00	0
12	18/10/02	1	outer	10	45.7952	166.5752	18.3	1.10	2	0.60	2
13	19/10/02	1	outer	11	45.6667	166.5148	34.8	1.00	4	2.04	2
13	19/10/02	1	outer	11	45.7153	166.5140	36.6	0.96	0	0.84	1
13	19/10/02	1	outer	11	45.7157	166.5115	31.1	0.98	1	1.62	1
13	19/10/02	1	outer	11	45.7172	166.5108	38.4	1.00	5	0.25	1
13	19/10/02	1	outer	11	45.7175	166.5157	36.6	1.01	3	0.00	0
13	19/10/02	1	outer	11	45.7183	166.5160	40.3	1.00	2	0.00	0
14	19/10/02	1	outer	13	45.7062	166.5048	18.3	1.06	5	3.72	4
14	19/10/02	1	outer	13	45.7080	166.5038	22.0	1.08	1	5.71	10
14	19/10/02	1	outer	13	45.7108	166.5002	22.0	1.06	0	10.62	20
14	19/10/02	1	outer	13	45.7132	166.4990	51.2	1.08	4	8.65	14
14	19/10/02	1	outer	13	45.7150	166.4972	36.6	1.06	3	10.55	14
14	19/10/02	1	outer	13	45.7162	166.4953	34.8	1.08	2	5.90	14
36	24/10/02	2	outer	14	45.7173	166.5647	18.3	1.01	1	0.00	0
36	24/10/02	2	outer	14	45.7192	166.5677	18.3	1.03	4	1.70	3
36	24/10/02	2	outer	14	45.7192	166.5725	9.2	1.03	5	0.00	0
36	24/10/02	2	outer	14	45.7197	166.5747	12.8	1.05	2	3.61	8



Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude dec	Longitude dec	Depth (m)	Time set	Pot Number	Catch of blue cod	
										(kg)	Number of fish
36	24/10/02	2	outer	14	45.7202	166.5782	11.0	1.06	0	0.94	1
36	24/10/02	2	outer	14	45.7207	166.5830	5.5	1.05	3	1.68	5
16	19/10/02	2	outer	15	45.7327	166.5750	27.5	1.00	5	0.00	0
16	19/10/02	2	outer	15	45.7338	166.5783	27.5	1.00	1	0.49	1
16	19/10/02	2	outer	15	45.7352	166.5793	32.9	1.00	0	1.00	4
16	19/10/02	2	outer	15	45.7403	166.5742	31.1	1.03	4	2.04	3
16	19/10/02	2	outer	15	45.7417	166.5782	27.5	1.01	3	1.64	6
16	19/10/02	2	outer	15	45.7442	166.5780	23.8	1.03	2	2.50	4
44	26/10/02	2	outer	17	45.7513	166.5895	32.9	0.98	4	0.16	1
44	26/10/02	2	outer	17	45.7528	166.5890	14.6	0.98	1	3.39	3
44	26/10/02	2	outer	17	45.7547	166.5887	9.2	0.98	5	0.00	0
44	26/10/02	2	outer	17	45.7607	166.5890	16.5	1.00	3	2.90	4
44	26/10/02	2	outer	17	45.7615	166.5867	29.3	1.00	0	1.53	3
44	26/10/02	2	outer	17	45.7617	166.5903	27.5	0.85	2	2.84	5
5	16/10/02	1	outer	18	45.7813	166.5957	38.4	1.15	4	4.57	4
5	16/10/02	1	outer	18	45.7832	166.5917	43.9	1.11	5	5.55	5
5	16/10/02	1	outer	18	45.7837	166.5815	12.8	1.13	3	0.45	3
5	16/10/02	1	outer	18	45.7840	166.5857	62.2	1.10	2	2.38	1
5	16/10/02	1	outer	18	45.7847	166.5723	16.5	1.06	1	2.31	8
5	16/10/02	1	outer	18	45.7850	166.5777	60.4	1.08	0	0.00	0
8	17/10/02	1	outer	19	45.7652	166.5555	27.5	1.06	3	0.00	0
8	17/10/02	1	outer	19	45.7652	166.5620	36.6	1.05	2	1.96	5
8	17/10/02	1	outer	19	45.7672	166.5550	36.6	1.06	0	0.00	0
8	17/10/02	1	outer	19	45.7683	166.5680	14.6	1.10	4	10.16	20
8	17/10/02	1	outer	19	45.7685	166.5615	18.3	1.08	5	0.88	2
8	17/10/02	1	outer	19	45.7702	166.5528	32.9	1.11	1	1.82	6
7	17/10/02	1	outer	21	45.7752	166.5463	47.6	1.00	2	0.00	0
7	17/10/02	1	outer	21	45.7765	166.5523	36.6	1.00	3	2.09	5
7	17/10/02	1	outer	21	45.7775	166.5557	40.3	1.00	1	2.65	3

Appendix 1 – continued

Set	Date	Phase	Stratum	Pot lift station	Latitude <sup>dec</sup>	Longitude <sup>dec</sup>	Depth (m)	Time set	Pot Number	Catch of blue cod (kg)	Number of fish
7	17/10/02	1	outer	21	45.7790	166.5430	29.3	1.00	5	0.56	1
7	17/10/02	1	outer	21	45.7798	166.5532	31.1	–	0	1.12	1
7	17/10/02	1	outer	21	45.7812	166.5377	36.6	1.00	4	0.00	0