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Contents

Introduction

This is the third in a series of atlases describing the spatial distribution of a wide range of New Zealand marine fish and squid species. These atlases, produced as the first step towards analysing fish community structure in the New Zealand region (*see* Anderson *et al.* 1998, Bagley *et al.* 2000), contain distribution maps which greatly extend our knowledge of the range of most species and we hope that they will provide valuable reference documents.

The first atlas (Anderson *et al.* 1998) contained geographical and depth distribution maps for species taken in research bottom trawls over a 35 year period. It included 270 species or species groups (236 species, 26 species groups, and 8 families) and covered most areas around New Zealand and its offshore islands, from 4 to 1700 m depth.

The second atlas (Bagley *et al.* 2000) contained distribution maps for species which occur off the bottom (in midwater and at the surface) as sampled by midwater trawl and tuna longline, and recorded from aerial sightings. It included 112 species or species groups (90 species, 17 species groups, and 5 families).

This third atlas includes species from the first two atlases for which there were sufficient length measurements to enable us to determine the distribution of immature and adult life history stages. It includes species (mostly of commercial importance) sampled by bottom trawl, midwater trawl, and tuna longline. Distributions of demersal and midwater trawl species were determined using data from the Ministry of Fisheries research trawl and commercial scientific observer databases. Distributions of pelagic species (in the top 250 m) were determined from the Ministry of Fisheries tuna longline observer database. As well as the geographical distribution of various life history stages, length frequency histograms are presented for each species and fishing method.

Species selection

An outline of the catch data contained in the Ministry of Fisheries trawl survey, scientific observer, and tuna longline observer databases was given in the first two atlases. These databases span 12 (commercial) to nearly 40 (research) years. A large amount of biological data, including individual fish lengths and gonad maturity stages, are also available for the more important commercial species. In selecting the species to include in this atlas, it was necessary that age/growth or maturity data were available (either published or from the databases), and that the species was well sampled. In general, there were more measurements for species caught by bottom trawl than by midwater trawl, and the species sampled from midwater formed a subset of the species sampled by bottom trawl. Therefore, to ensure data from bottom and midwater were included for the same species we initially chose bottom trawl species with more than 1000 fish measured and midwater trawl species with more than 250 fish measured. A 250 fish measured cutoff was also used for species caught by tuna longlines. For most species, these length frequency samples were associated with a reasonable number of trawl tows or longline sets (i.e., over 20), but species with low tow or set numbers (e.g., *Trachurus novaezelandiae*, 336 fish measured in 8 tows) are still included. Species were not included in the atlas if size at maturity data were not available.

A variety of midwater nets have been used for both commercial and research tows, with various headline heights, codend mesh sizes, and towing speeds. We made no attempt in this atlas to identify any differences in distribution which may be due to such factors, but they are likely to be important (e.g., commercial trawl codend mesh size is generally 100 mm north of about 49° S, and 60 mm south of 49° S; research codend mesh sizes vary among vessels, trawls, and years). Also, the distribution of midwater tows and tuna longline positions is more patchy than for bottom trawl positions. Therefore, the resulting distributions are more reliable indicators of where size and age groups are caught rather than where they do not occur.

Distribution maps were produced for 53 species: 8 from tuna longline only, 25 from bottom trawl only, 17 from bottom and midwater trawl, and 3 from all three methods.

Species identification

Species identification issues were summarised by Anderson *et al.* (1998) and Bagley *et al.* (2000) and are not repeated here. Many of the identification problems outlined in the previous two atlases are not relevant here as the risk of misidentification is less when fish are individually measured. The most likely sources of error for species selected for this atlas are where a single species has been found later to include more than one species (e.g., giant stargazer initially included banded stargazer) and where two species were often confused (e.g., mako and porbeagle sharks). These problems have been lessened by including only later records where appropriate. Where identification problems are still likely to exist footnotes have been included on the plots.

Determination of life history stages and lengths

Two main steps were involved in determining age classes of the species included here. Firstly, a literature search was made to obtain information on birth dates and length-at-age (Table 1). The birth date was usually the mid-spawning season or, for species with slightly different spawning seasons in different areas, the mid-point of the range. Secondly, length frequencies were plotted for all species to determine appropriate length cutoffs by age class. This often required breakdown of the data into two or four seasons per year, especially for species that have either fast growth, or multiple or extended spawning seasons.

For many species, it was possible to determine the youngest two age classes or size groups represented in the length frequency samples (*see* Table 1). These were designated 0 (less than 12 months old) and 1 (12 to less than 24 months old). A few species did not appear to be sampled by trawls or longlines until they were older (e.g., bluenose, ages 2 and 3) and these first sampled age classes were used. For some species, there was no published information on age and growth but modal groups could be determined from the length frequencies. In these cases, the first two groups present were classified as Groups i and ii. This classification was sometimes used when an arbitrary grouping was made which may have included more than one age class. Details are listed in Table 1 and in footnotes on the plots to explain what each set of groups represent.

Maturity at size or age was used to determine the distribution of immature and mature fish. For many of these species, the size or age at which 50% of the fish are mature has been published (*see* Table 1). As the size at maturity often varies slightly by sex, the average of the male and female lengths was used except where the difference was greater than 10 cm. For these species (mainly elasmobranchs), the distribution of immature and mature fish was determined separately for each sex before the data were combined on the final plot. When the size at 50% maturity was not available, other published data on size at maturity (e.g., a size range, minimum length at maturity) were used, or size was determined from biological data in the research or scientific observer databases. Maturity cutoffs and data sources are listed in Table 1.

Data presentation

For all species, distribution maps are presented for immature and adult fish. Additional maps show the distribution of the two youngest age or size classes, where these could be determined. The maps are arranged in two sections: bottom trawl positions are shown separately from midwater and tuna longline positions. The last two were combined (for three species) where there were sufficient data for

both methods and because the distributions did not overlap. Closed circles and open squares show research and scientific observer data, open triangles show tuna longline positions. Baseline maps showing all positions for these methods and data sources are shown in Figures 1–5. These baseline maps are the same as those for the first two atlases, except that some additional research trawl data have been included for bottom trawls (Figure 1b) and a plot of all observed bottom tows is also provided (Figure 2).

Within each section, the maps are in alphabetical order by scientific name, with one common name (where it exists) listed on each map. Footnotes identify issues concerning the reliability of species identification or provide additional information on the determination of age classes or size at maturity.

The grey background on each adult plot shows all positions where the species has been caught (thereby indicating where they occur but may not have been measured). For midwater trawl and tuna longline caught species, these grey background plots are the same as the species plots in the second atlas (Bagley *et al.* 2000). For bottom trawl plots, these plots are the same as the research bottom trawl plots in the first atlas (Anderson *et al.* 1998), except that the additional research data are included here. Commercial bottom trawl tows were not used for these background plots because the distribution of tows is generally covered by that of the research tows and the data were not included in the first atlas so were not subject to the same standard of error checking.

The location of the tow for the bottom and midwater trawls is the start position. Coverage by bottom trawl is extensive, although the Fiordland coast, the Kermadec Ridge, and parts of the Challenger Plateau were not well sampled. Coverage by midwater trawl was more restricted to commercial fishing areas focussing on hoki (west coast South Island, Chatham Rise) southern blue whiting (Subantarctic), jack mackerel (Taranaki Bight), and orange roughy/oreos (deeper areas around the 1000 m contour). Depth distribution plots are presented for bottom and midwater and trawl tows (research and observer data combined). These represent the proportion of tows, within each 10 m depth interval, in which the age or maturity stage of that species occurred. For midwater trawl plots, both the depth of capture (dashed line) and bottom depth (solid line) are shown.

The location of each tuna longline sample was calculated from data recorded by observers (i.e., position, time, and number of hooks per set). Tuna longline data were distributed unevenly across months. South Island data were collected during March-July (mostly April-June). North Island data were collected throughout the year, but most effort was in June-July. The fish distributions shown in the plots therefore reflect mainly winter conditions. There were no depth of capture data available for tuna longline data. The depth plot for the three species which occurred in both midwater trawl and tuna longline catches represents the midwater trawl data only.

The number of occurrences of each life history stage is given on each plot. The overall length frequency for each method and data source, and the number of fish measured, are shown in Figures 6–9. Length measurement methods for each species are given in Table 1.

An index of common names (Index 1) and an index of family names (Index 2) are provided. Common names vary considerably among countries and among regions within a country. On the plots, we have attempted to provide the common names used most often within New Zealand, especially in standard texts. They generally follow Paulin & Stewart (1985) and Paulin *et al.* (1989) who based their names on earlier lists (Phillips 1927, Graham 1956, Whitley 1968, Doak 1972, Ayling & Cox 1982). In the index of common names, we also list other common names used by fisheries researchers and the fishing industry. For lists of Maori fish names, see Whitley (1968) and Strickland (1990). The family names for teleosts, elasmobranchs, and squids follow Paulin *et al.* (1989), Compagno & Didier (in press) and Roper *et al.* (1984), respectively, except for a few recently updated names (C. Paulin and A. Stewart, Museum of New Zealand Te Papa Tongarewa, pers. comm.).

Possible sources of error or uncertainty

Details of possible sources of uncertainty in the positions of bottom and midwater trawls and tuna longline sets were outlined by Anderson *et al.* (1998) and Bagley *et al.* (2000) and are not repeated here. Some errors in fish measurement may have occurred during data collection, transcribing, or computer entry. Many of these errors will have been corrected during the normal error checking procedures before data were loaded on the database. However, it is impossible to remove all errors in this type of data summary without having individual fish weights to search for outliers.

Acknowledgments

We thank the many fisheries researchers and scientific observers who have taken the time to identify and measure species over the years. In particular, for this third atlas we thank Kevin Mackay (NIWA) for assisting with database linking and extraction of research length frequency data, and Colin Simpfendorfer (now with Mote Marine Laboratory, Florida, USA) and Western Australian Fisheries for the data and regression to convert school shark fork length to total length. The Ministry of Fisheries provided access to their research trawl survey, tuna longline, and scientific observer databases and the Foundation for Research, Science and Technology funded the project. Talbot Murray reviewed the draft manuscript.

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Total effort distributions

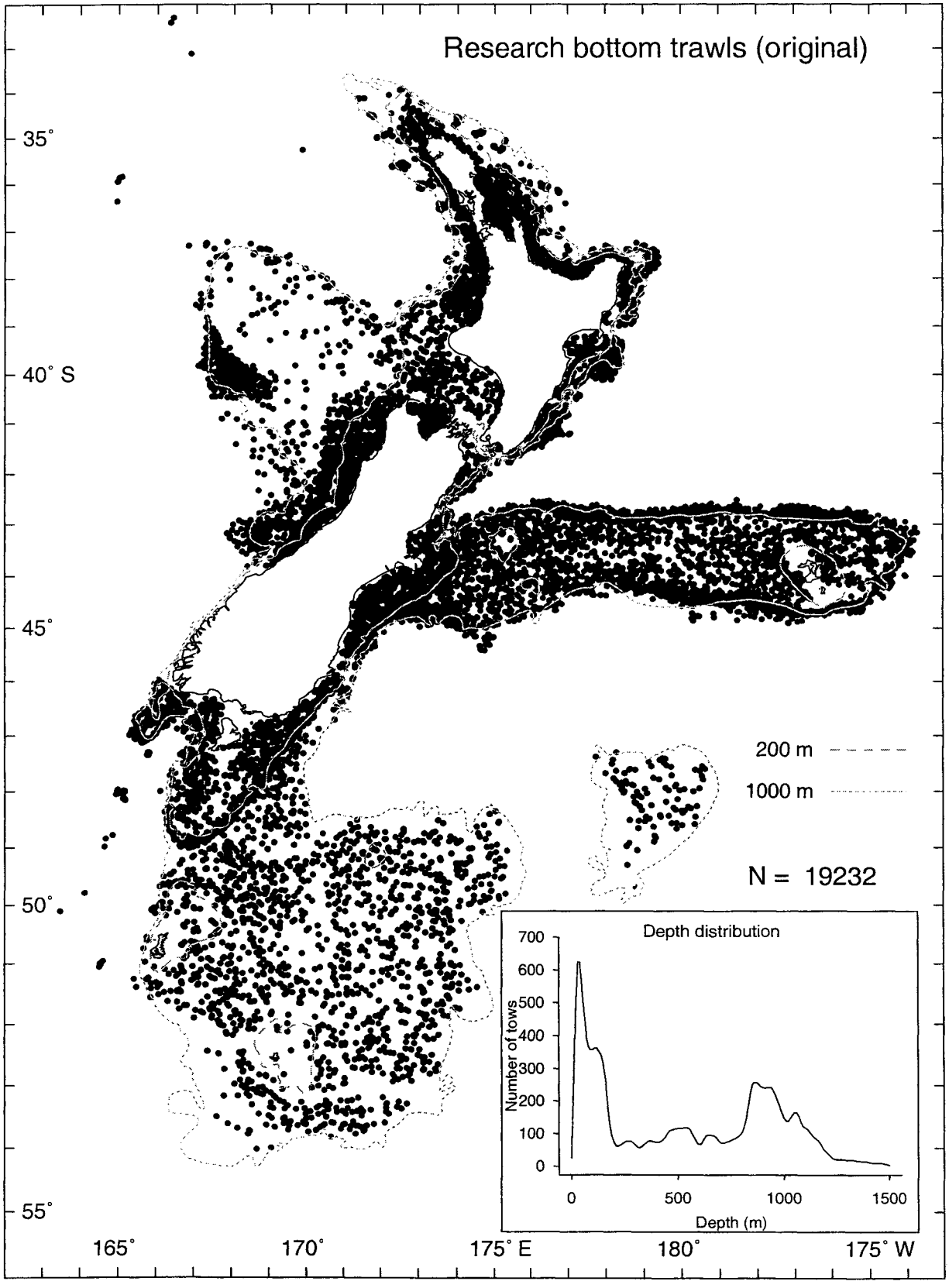


Figure 1a: **Distribution of research bottom trawl as available on the Ministry of Fisheries trawl survey database at 12 May 1997 (*see* Anderson *et al.* 1998). N is the number of tows. The depth distribution plot shows the depth of the seabed by 10 m depth intervals.**

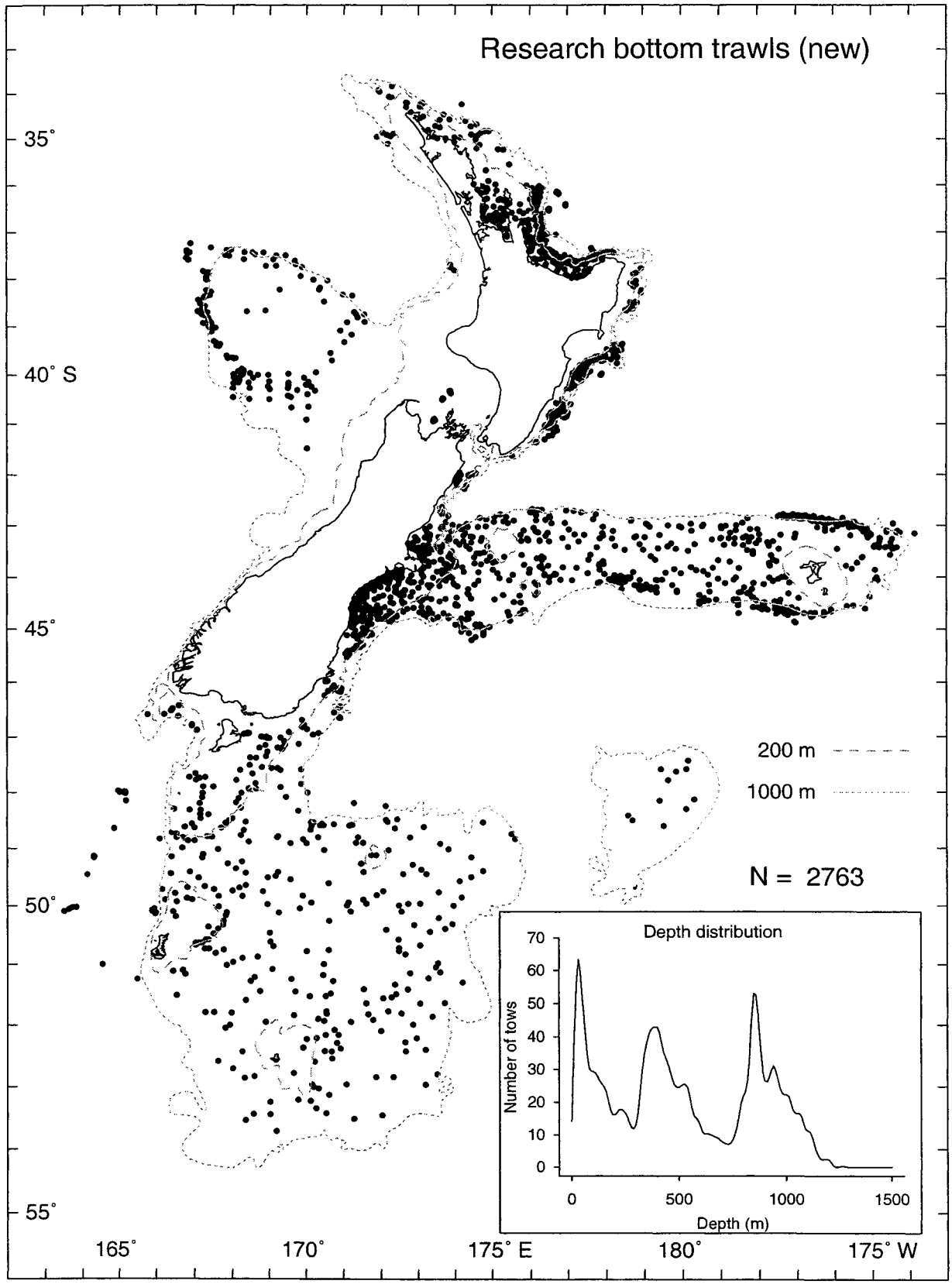


Figure 1b: **Distribution of research prawn trawls and additional (i.e., added to the Ministry of Fisheries trawl survey database between May 1997 and January 1999) research bottom trawls. N is the number of tows. The depth distribution plot shows the depth of the seabed by 10 m depth intervals.**

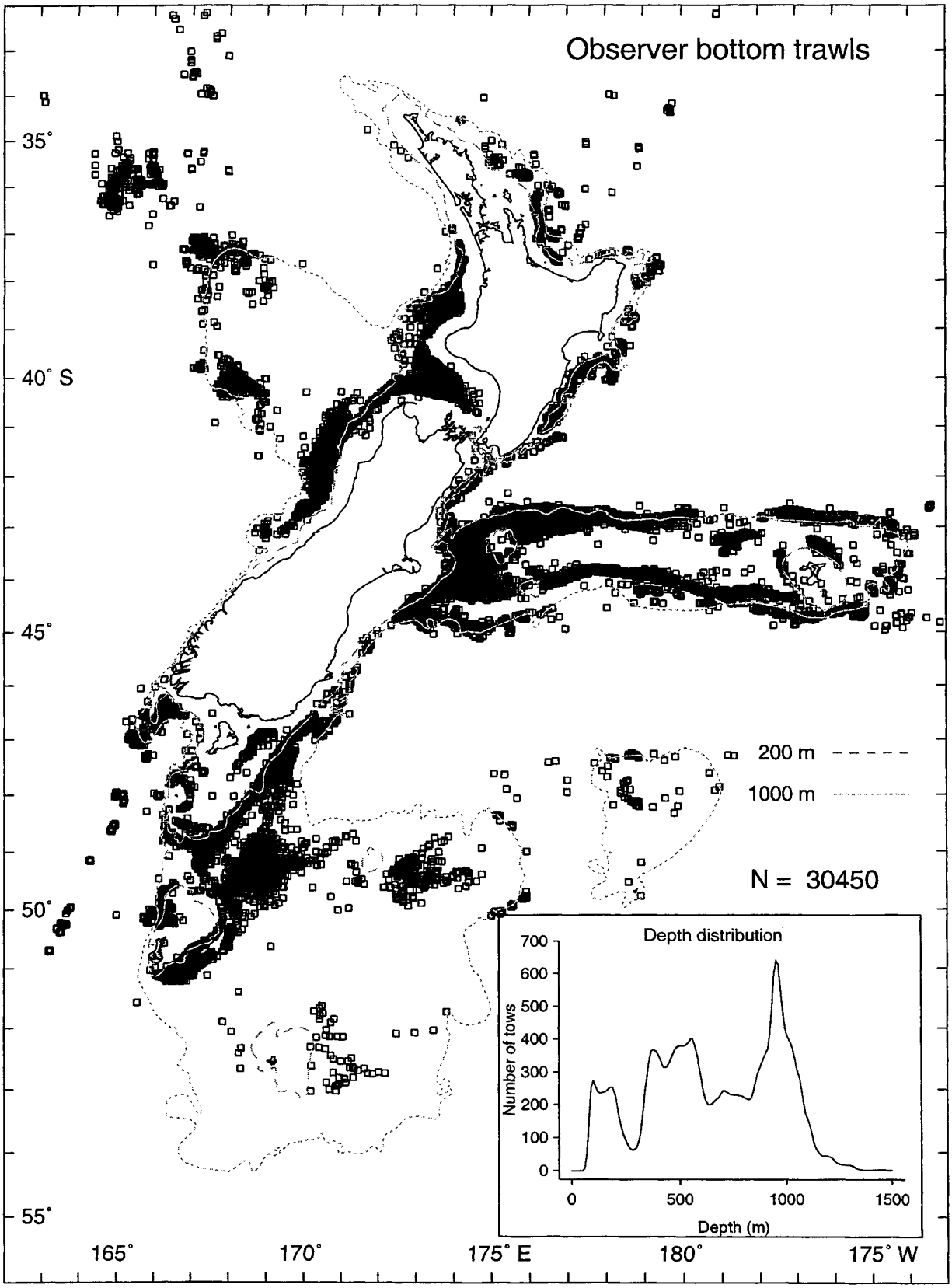


Figure 2: **Distribution of observer bottom trawls from March 1990 to November 1998 (squid bottom trawls to April 1997). N is the number of tows. The depth distribution plot shows the depth of the seabed by 10 m depth intervals.**

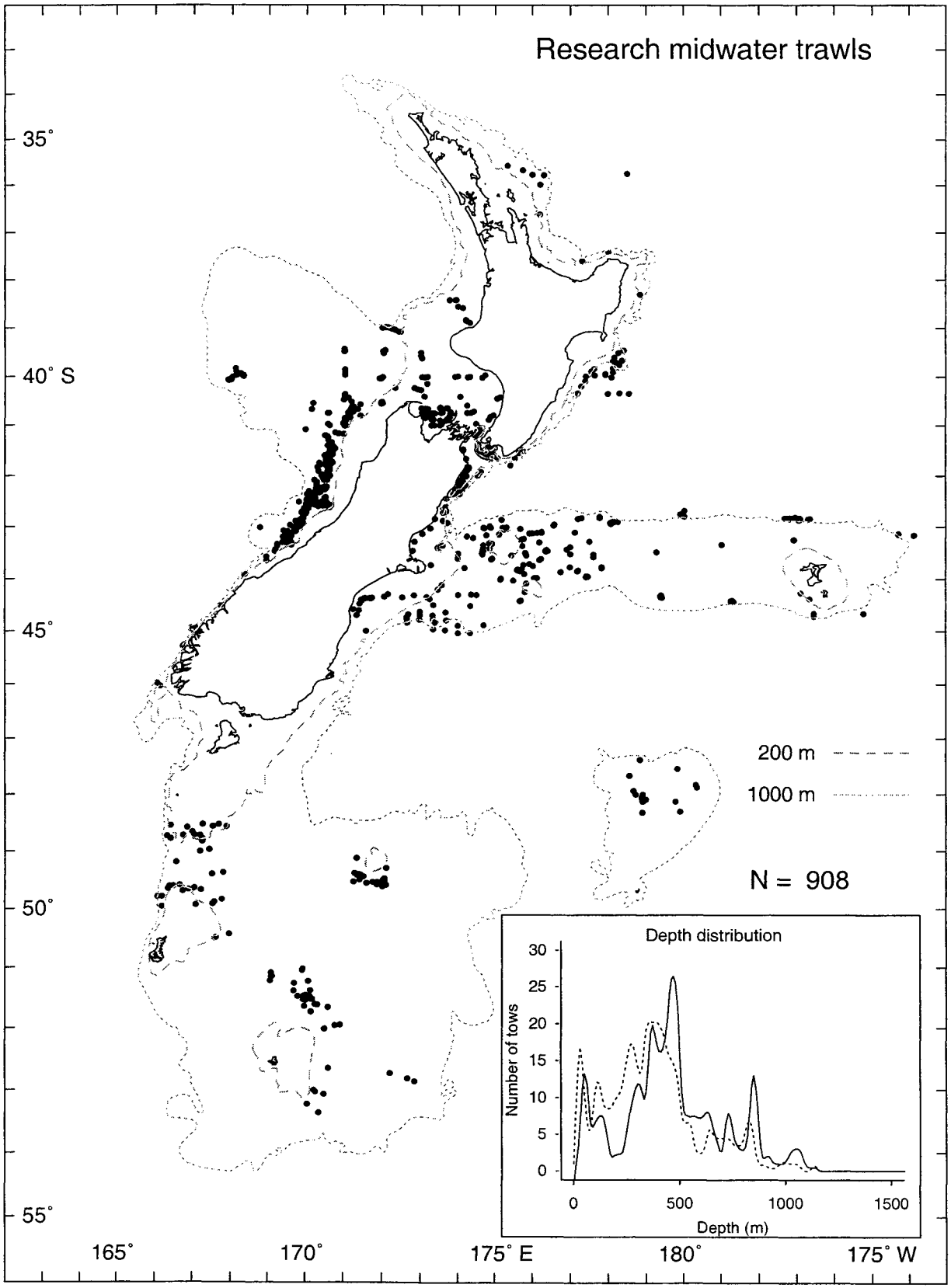


Figure 3: **Distribution of research midwater trawl to January 1999. N is the number of tows. The depth distribution plot shows the depth of the seabed (continuous line) and depth of the trawl net groundrope (dashed line) by 10 m depth intervals.**

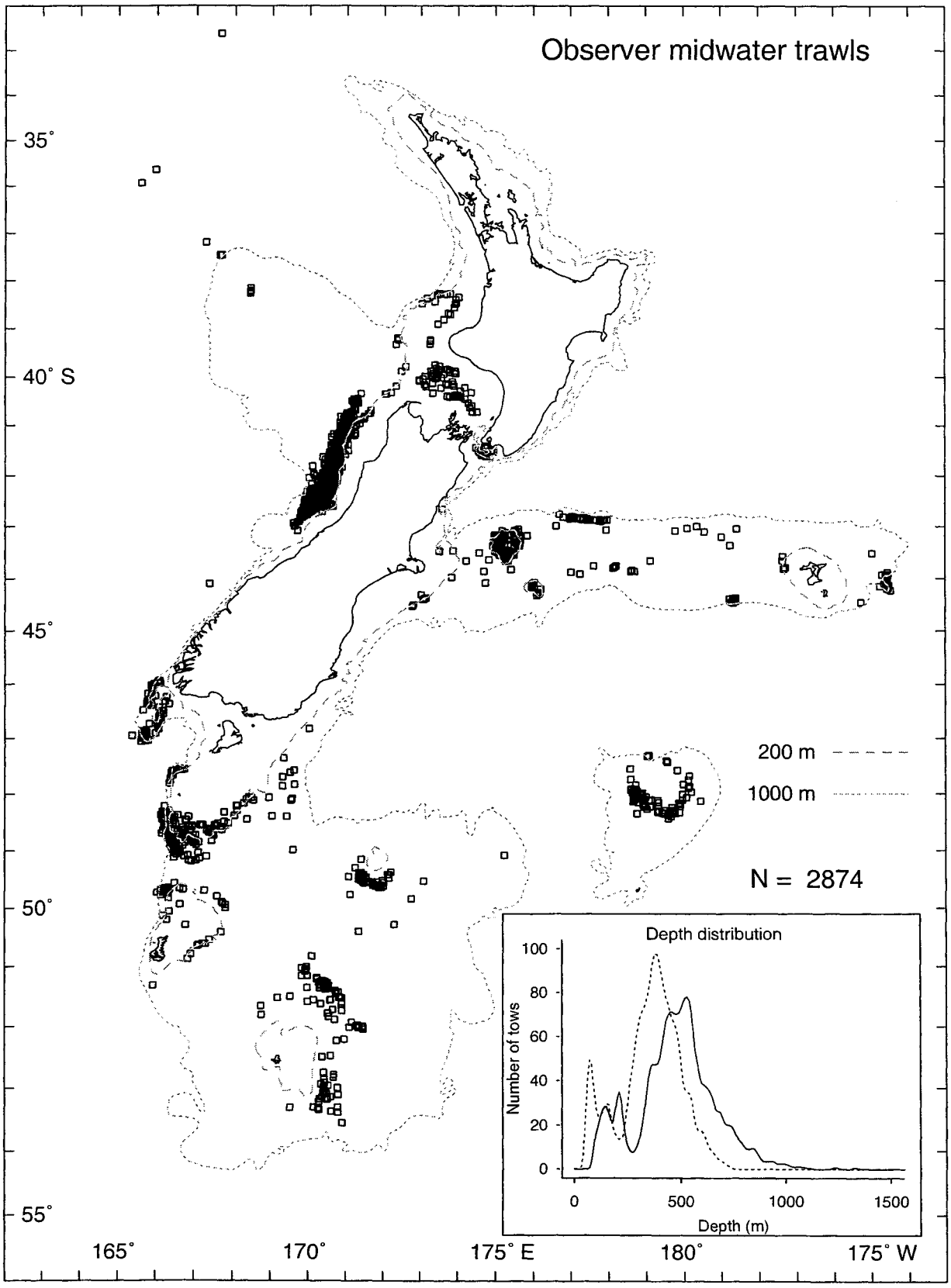


Figure 4: **Distribution of observer midwater trawls (above 20 m off the bottom) from March 1990 to August 1998 (squid midwater trawls to March 1997). N is the number of tows. The depth distribution plot shows the depth of the seabed (continuous line) and depth of the trawl net groundrope (dashed line) by 10 m depth intervals.**

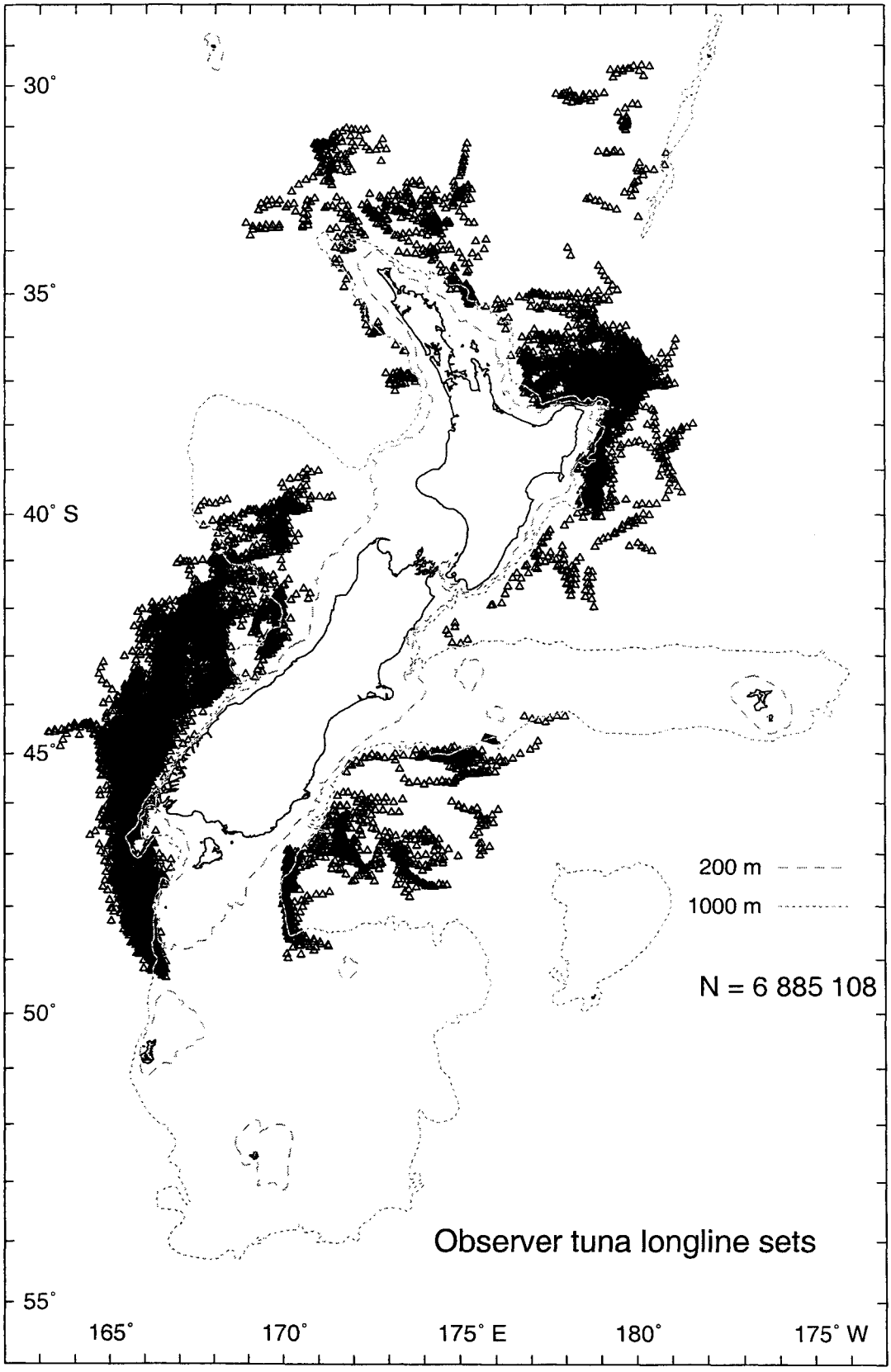


Figure 5: **Distribution of tuna longline sets. Only a subset of the hooks is shown for each set (the first hook plus every 500th hook thereafter). N is the total number of hooks.**

Length data summaries

Table 1: **Lengths (cm) used to separate age classes (by season) and maturity stages, based on database extracts and published age and length at maturity and growth data. Seasonal divisions (up to four periods) were made for species that are fast growing or have multiple or extended spawning seasons (i.e. where 1 period is indicated this represents a 12 month season; 2 periods represent 6 month seasons; 4 periods represent 3 month seasons). Divisions start at the assumed birthday which is the first day of the month indicated. Where growth is very slow or unknown, age groups have not been determined. Length measurement methods are: F, fork; G, snout tip to posterior end of dorsal fin; M, mantle; P, pelvic; S, standard; T, total. The length at maturity is the length at which 50% of fish are mature (averaged across sexes where appropriate), or an approximation of this, as indicated. M, male; F, female; SOP, Scientific Observer Programme; –, not determined**

Species	Length method	Length at maturity	Birth	Age/ group	Maximum length by season				Length at maturity source	Growth/age data source
					1	2	3	4		
Allocyttus niger	T	34	–[1]	–					Annala *et al.* 1998	Smaller fish may represent many age classes
Arripis trutta	F	38	Feb	0	10	14			Francis 1996: 35–40 cm (4–5 years)	Francis 1996
				1	21	25				
Beryx splendens	F	34	Aug	1	23				Annala *et al.* 1998: age 4–5 years	Massey & Horn 1990
				2	26					
Brama brama	F	43	Jan	i	35	41			Estimated from SOP data	Arbitrary, based on length frequency modes
				ii	42	45				
Callorhinchus milii	F	M: 52	May	0	15	20	23	29	Gorman 1963	Francis 1997
		F: 71		1	32	32	38	40		
Chelidonichthys kumu	F	36	Jan	0	18	22			Annala *et al.* 1998: 2–3 years	Francis 1996, Sutton 1997
				1	30	35				
Cyttus traversi	T	33	Oct	i	13	13			Clark & King 1989: 30–35 cm	Arbitrary, based on length frequency modes
				ii	18	20				
Deania calcea	T	M: 78	–	i	40				Clark & King 1989	Arbitrary, based on length frequency modes
		F: 100		ii	70					
Epigonus telescopus	F	46	–	–					Field *et al.* 1997	Smaller fish may represent many age classes
Galeorhinus galeus	T[1]	130	Oct	0	35	40	44	50	Hurst *et al.* 1999	Francis & Mulligan 1998
				1	50	54	59	61	Francis & Mulligan 1998	
Genypterus blacodes	T	68	Oct	0	26	28			Annala *et al.* 1998: 30% at age 6, 75% at age 7	Horn 1993a
				1	38	40				
Hoplostethus atlanticus	S	30	–	–					Horn *et al.* 1998	Smaller fish may represent many age classes
Hydrolagus novaezealandiae	G	M: 52	–	i	30				Horn 1997a	Arbitrary, groups may represent several year classes
		F: 61		ii	40					

Table 1 — continued

Species	Length method	Length at maturity	Birth	Age/ group	Maximum length by season 1	2	3	4	Length at maturity source	Growth/age data source
Hydrolagus sp. B2	G	M: 59	–	i	35				Horn 1997a	Arbitrary, groups may
		F: 69		ii	45					represent several year classes
Hyperoglyphe antarctica	F	62	Feb	2	46	51			Annala *et al.* 1998	Horn 1988 (recruit to the
				3	56	59				bottom at 47 cm, age 2)
Isurus oxyrinchus	F	M:182	–	i	110				Francis *et al.* 1999b	Pratt & Casey 1983. Groups i &
		F:251		ii	160					ii may approximate ages 0 & 1
Kathetostoma giganteum	T	45	Mar	0	10	16			Sutton 1999	Sutton 1999
				1	19	23				
Lamna nasus	F	166	–	i	75				Francis & Stevens 2000	Groups i & ii may approximate
				ii	95				(F: 165, M unknown)	ages 0 & 1
Macruronus novaezelandiae	T	66	Aug	0	27	31			Annala *et al.* 1998	Horn & Sullivan 1996
				1	45	55				
Merluccius australis	T	76	Oct	0	22	25	18	25	Annala *et al.* 1998	Horn 1997b
				1	40	45	45	44		
Micromesistius australis	F	38	Aug	0	19	24			Annala *et al.* 1998	Hanchet & Uozumi 1996
				1	26	30				
Mora moro	T	45	Aug	i	23	28	25	27	Research and SOP data	Arbitrary, based on length
				ii	31	35	31	34		frequency modes
Mustelus lenticulatus	T	M:87	Sep	0	45	50			Francis & Francis 1992	Francis & Francis 1992
		F: 102		1	65	70				
Myliobatis tenuicaudatus	P	41	Sep	i	14	24			Hartill 1989: Minimum length	Hartill 1989. Groups i & ii may
				ii	25	32			M: 35; F: 41	approximate ages 0 & 1
Nemadactylus macropterus	F	31	Mar	0	–	11			Tong & Vooren 1972	Vooren 1975, 1977 (recruit to the
				1	15	17				bottom at about 10 cm
Neocyttus rhomboidalis	T	30	–	–					Research and SOP data	Smaller fish may represent
										many age classes
Nototodarus gouldi & N. sloanii	M	31	Oct	i	14	15	13	14	Derived from Uozumi *et al.*	Arbitrary, based on length
				ii	19	21	20	20	1995, Uozumi 1997	frequency modes
Pagrus auratus	F	24	Jan	0	8	12			Crossland 1981, Francis 1996	Francis 1994
				1	16	18				
Parika scaber	T	19	–	–					Francis 1996	

Table 1 — continued

Species	Length Method	Length at maturity	Birth	Age/ group	Maximum length by season 1	2	3	4	Length at maturity source	Growth/age data source
Pelotretis flavilatis	T	18	Aug	0	11	15			Rapson 1940	Rapson 1940 (age 1 may
				1	25	28				Include some age 2 fish)
Polyprion oxygeneios	T	86	Jul	i	50				Annala *et al.* 1998	Arbitrary, smaller fish represent
				ii	60					several age classes
Prionace glauca	T	221	–	i	80				Francis et al. 1999b	Stevens1975,Caillet *et al.* 1983
				ii	110					Groups i & ii approx.ages 0 & 1
Pseudocaranx dentex	F	36	Jan	0	14	17			Annala *et al.* 1998	Gilbert 1988, James 1984
				1	25	27				
Pseudocyttus maculatus	T	40	–	–					Annala *et al.* 1998	Smaller fish may represent many age classes
Pseudophycis bachus	T	51	Oct	0	14	22			Annala *et al.* 1998	Horn 1996
				1	35	45				
Rexea solandri	F	65	Oct	0	20	20	35	28	Derived from Hurst *et al.* 1998	Horn & Hurst 1999
				1	34	39	39	44		
Rhombosolea leporina	T	21	Jan	0	15	20			Colman 1972	
				1	23	29				
Rhombosolea plebeia	T	18	Jan	0	10	19			Colman 1972	Colman 1978
				1	25	28				
Scomber australasicus	F	36	Aug	i	22	28			Research and SOP data: F:	Arbitrary, groups i & ii may
				ii	33	39			35–42, M: no data	represent ages 1 & 2
Seriolella brama	F	36	Oct	0	13	17	10	20	Bagley *et al.* 1998: age 4	Bagley *et al.* 1998
				1	24	28	26	30		
Seriolella caerulea	F	40	Aug	1	23	29			Gavrilov 1979	Gavrilov 1979
				2	33	38				
Seriolella punctata	F	47	Oct	0	20	24	25	28	Horn & Sutton 1996	Horn & Sutton 1996
				1	30	33	35	36		
Squalus acanthias	T	M: 58	Jul	0	28	30	32	35	Hanchet 1988	Hanchet 1986
		F: 72		1	33	37	37	42		
Thunnus alalunga	F	85	–	i	64				Bailey 1991: capable of	Arbitrary, may contain several
				ii	74				spawning at 85 cm	ages, youngest not caught
Thunnus albacares	F	105	–	–					Anonymous 1998	
Thunnus maccoyii	F	146	–	–					Farley & Davis 1997	

Table 1 — continued

Species	Length Method	Length at maturity	Birth	Age/ group	Maximum length by season 1	2	3	4	Length at maturity source	Growth/age data source
Thunnus obesus	F	130	–	–					Collette & Nauen 1983	
Thyrsites atun	F	56	Oct	0	20	25	30	32	Annala *et al.* 1998	Harley *et al.* 1999
				1	36	40	42	45		
Trachurus declivis	F	31	Jan	0	13	19			Horn 1991	Horn 1993b
				1	22	28				
Trachurus murphyi	F	39	–	–					Andrianov 1985	
Trachurus novaezelandiae	F	27	Jan	0	13	15			Horn 1991	Horn 1993b
				1	19	22				
Xiphias gladius	F	160	–	–					Nakamura 1985	
Zeus faber	T	36	Jan	0	25	30			Francis 1996, Hanchet & Francis unpubl. results	Hanchet & Francis unpubl. results
				1	35	40				

Notes:

1 School shark fork length measurements from tuna longline data were converted to total length using TL = 3.311 + 1.138 FL (Simpfendorfer, pers. comm)

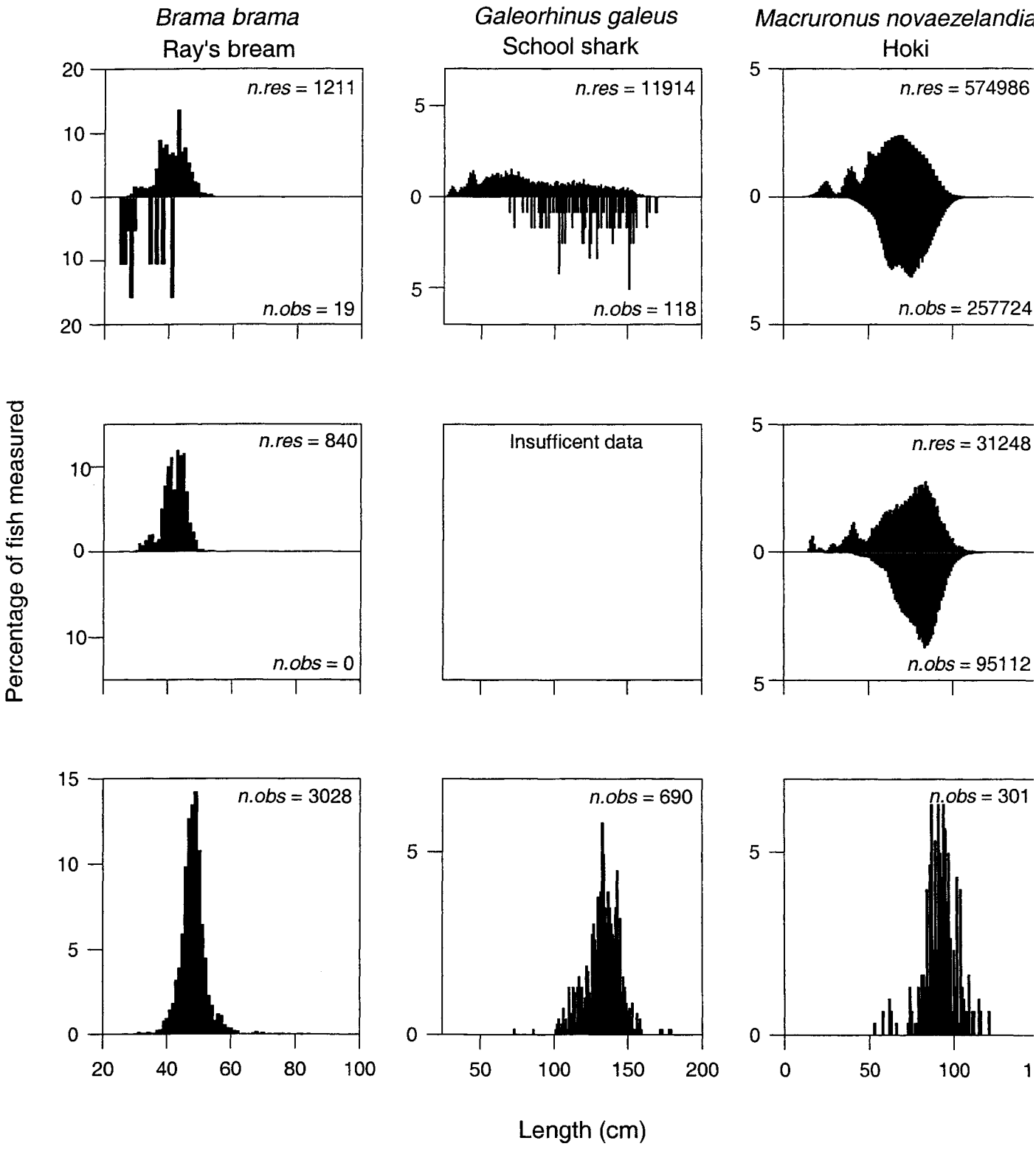


Figure 6: **Length frequency histograms of species measured from bottom trawl (above), midwater trawl (middle), and tuna longline (below) catches. *n.res*, number of fish measured by research; *n.obs*, number of fish measured by observers.**

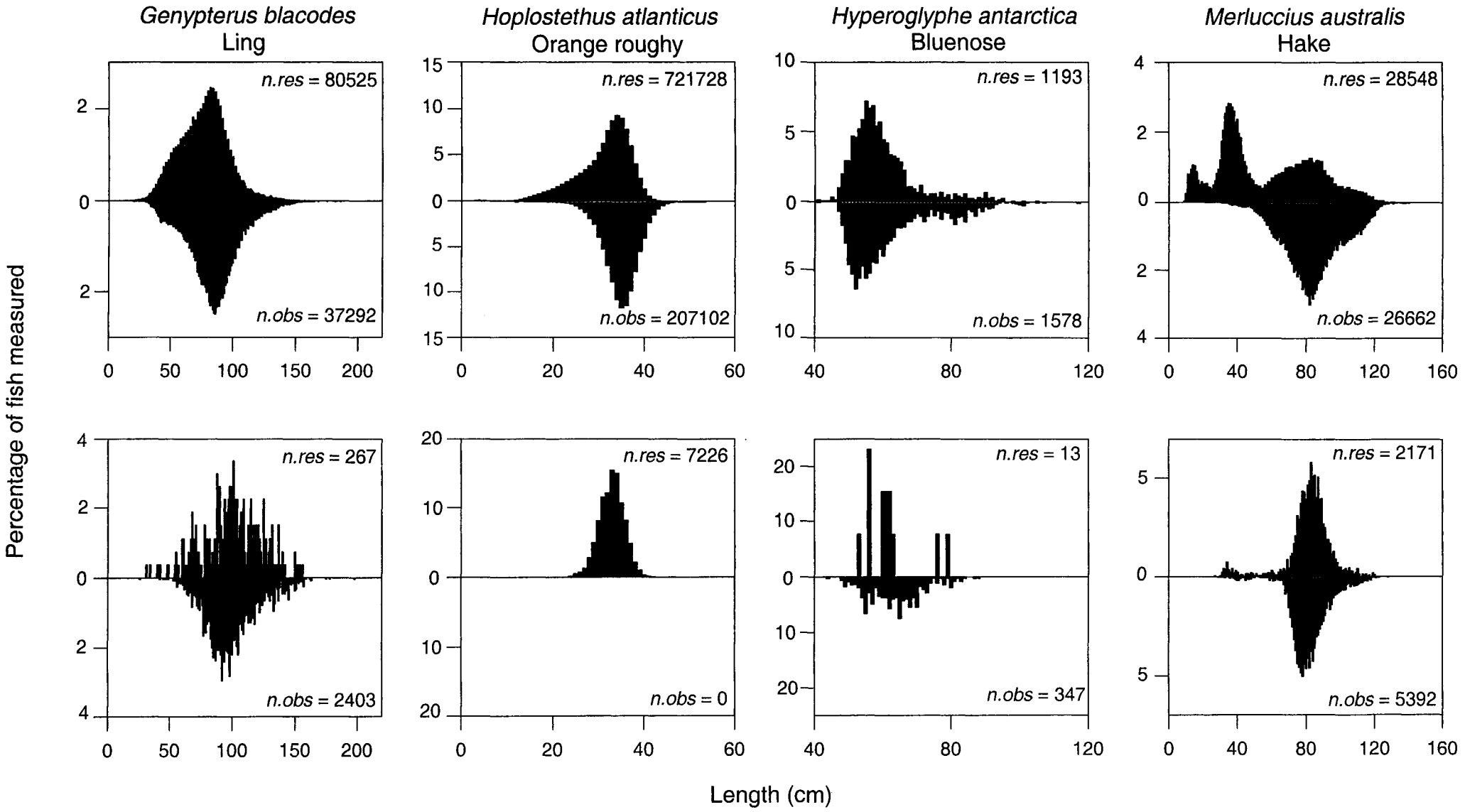


Figure 7: **Length frequency histograms of species measured from bottom (above) and midwater (below) trawl catches. *n.res*, number of fish measured by research; *n.obs*, number of fish measured by observers.**

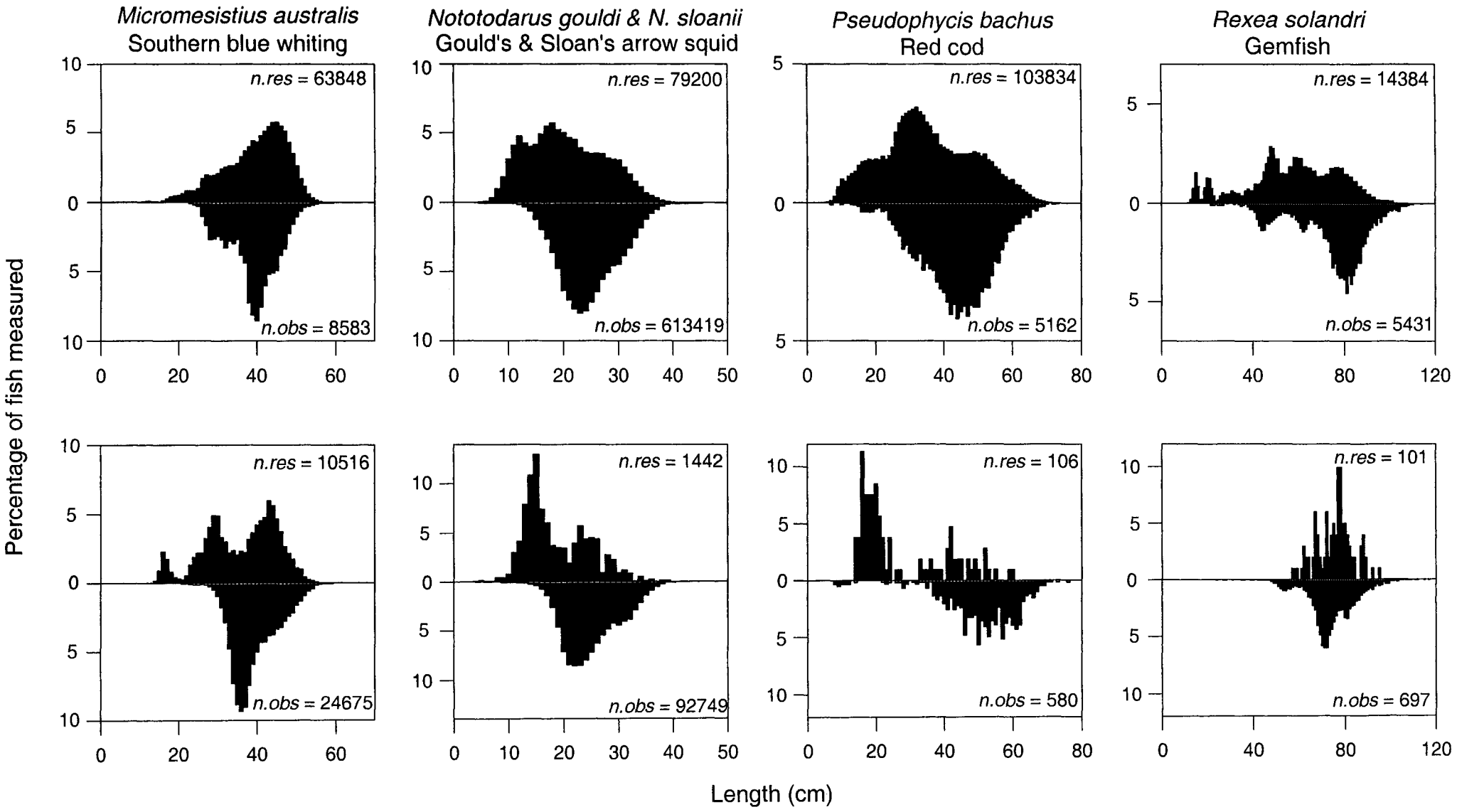


Figure 7: – continued

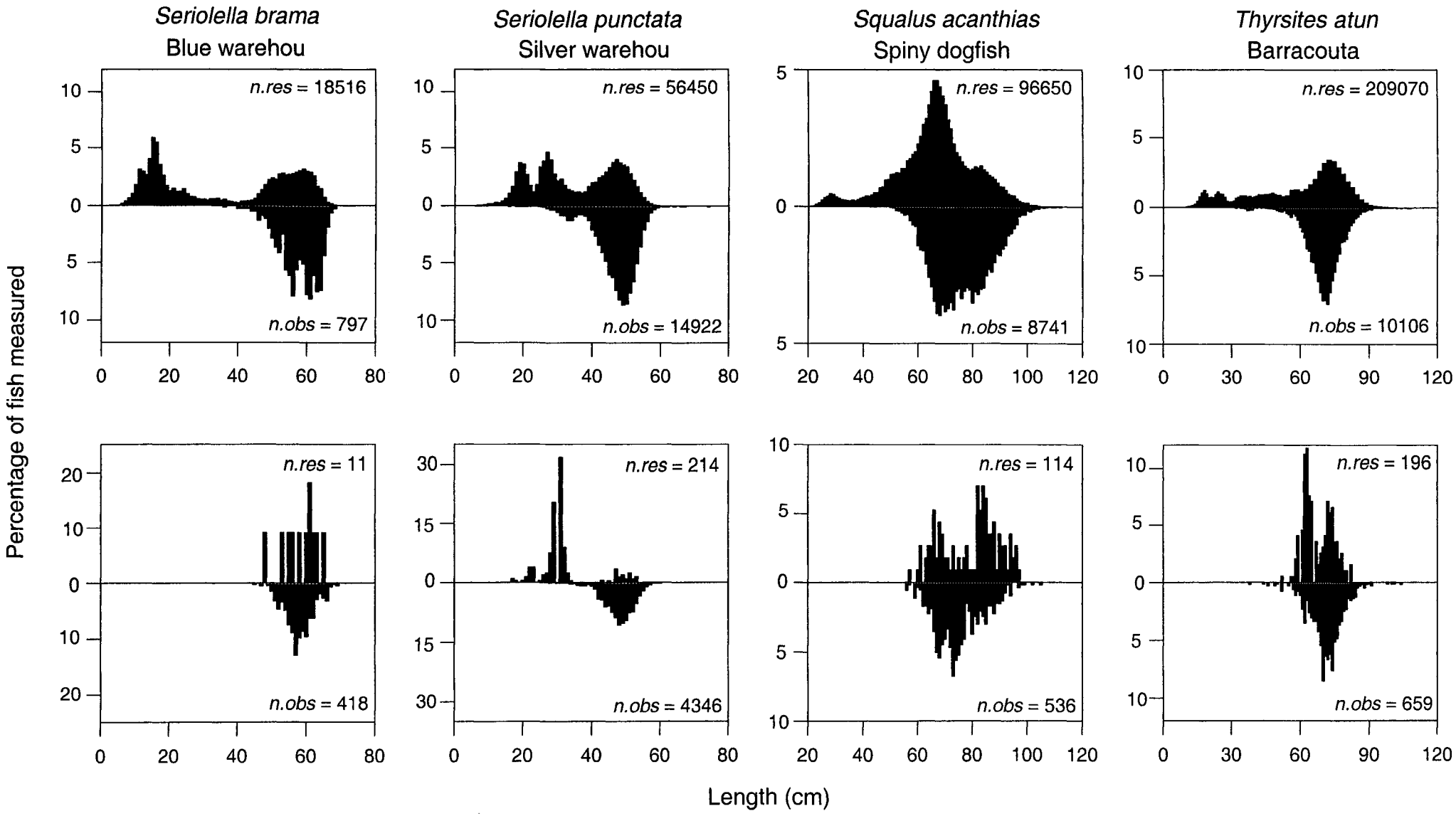


Figure 7: – continued

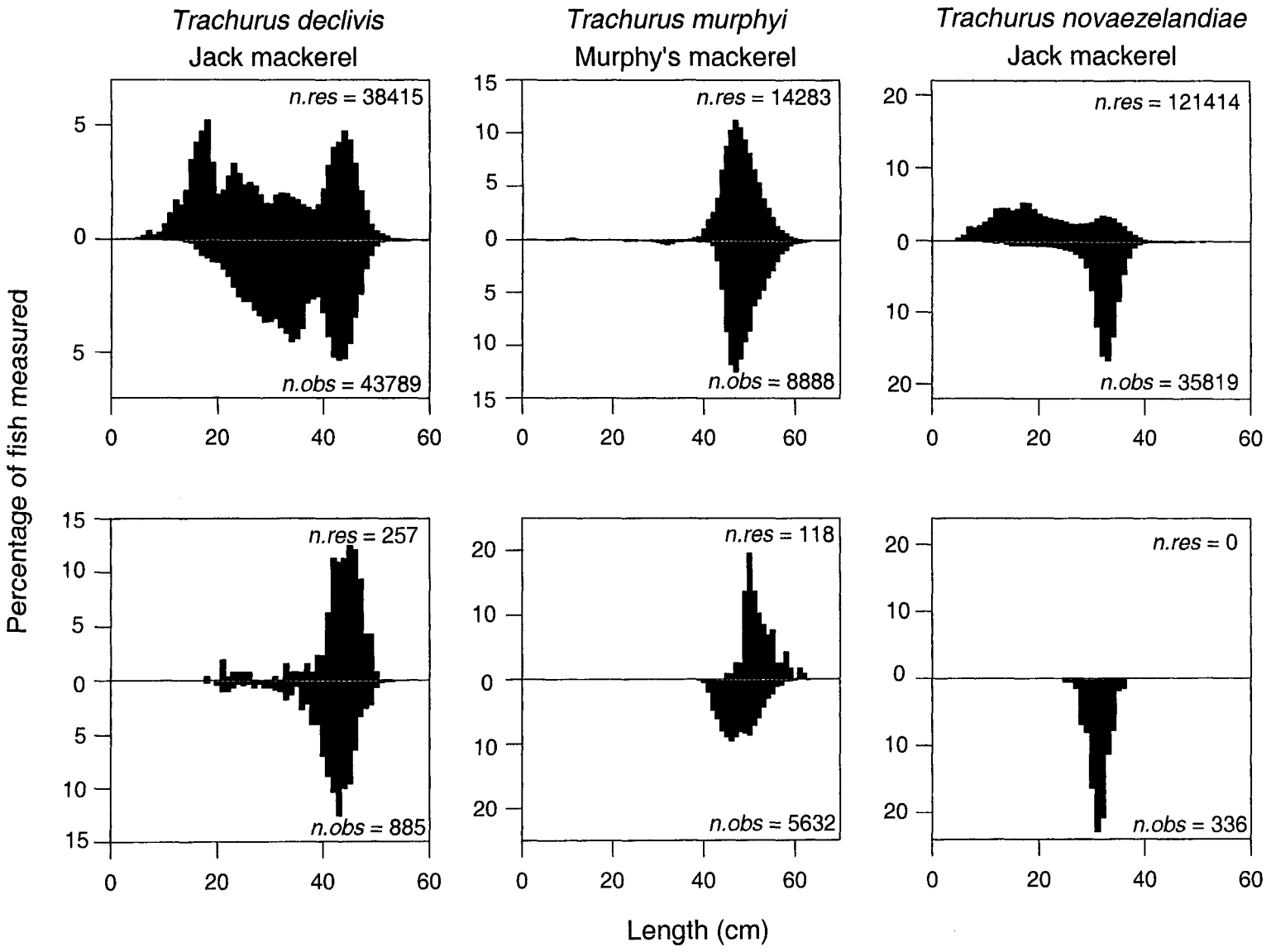


Figure 7: – continued

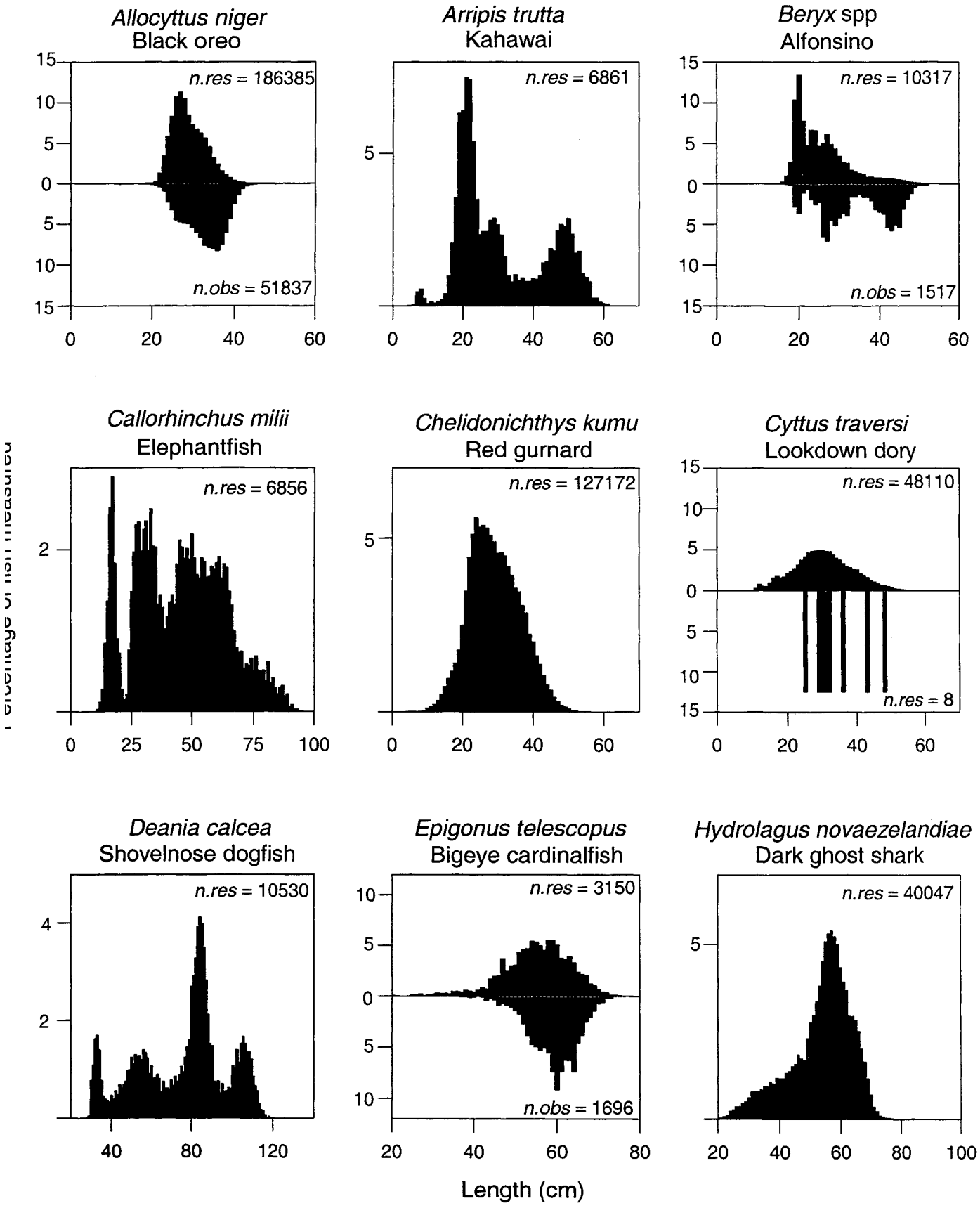


Figure 8: **Length frequncy histograms of species measured from bottom trawl catches (res, research; obs, observer data). *n.res*, number of fish measured by research; *n.obs*, number of fish measured by observers.**

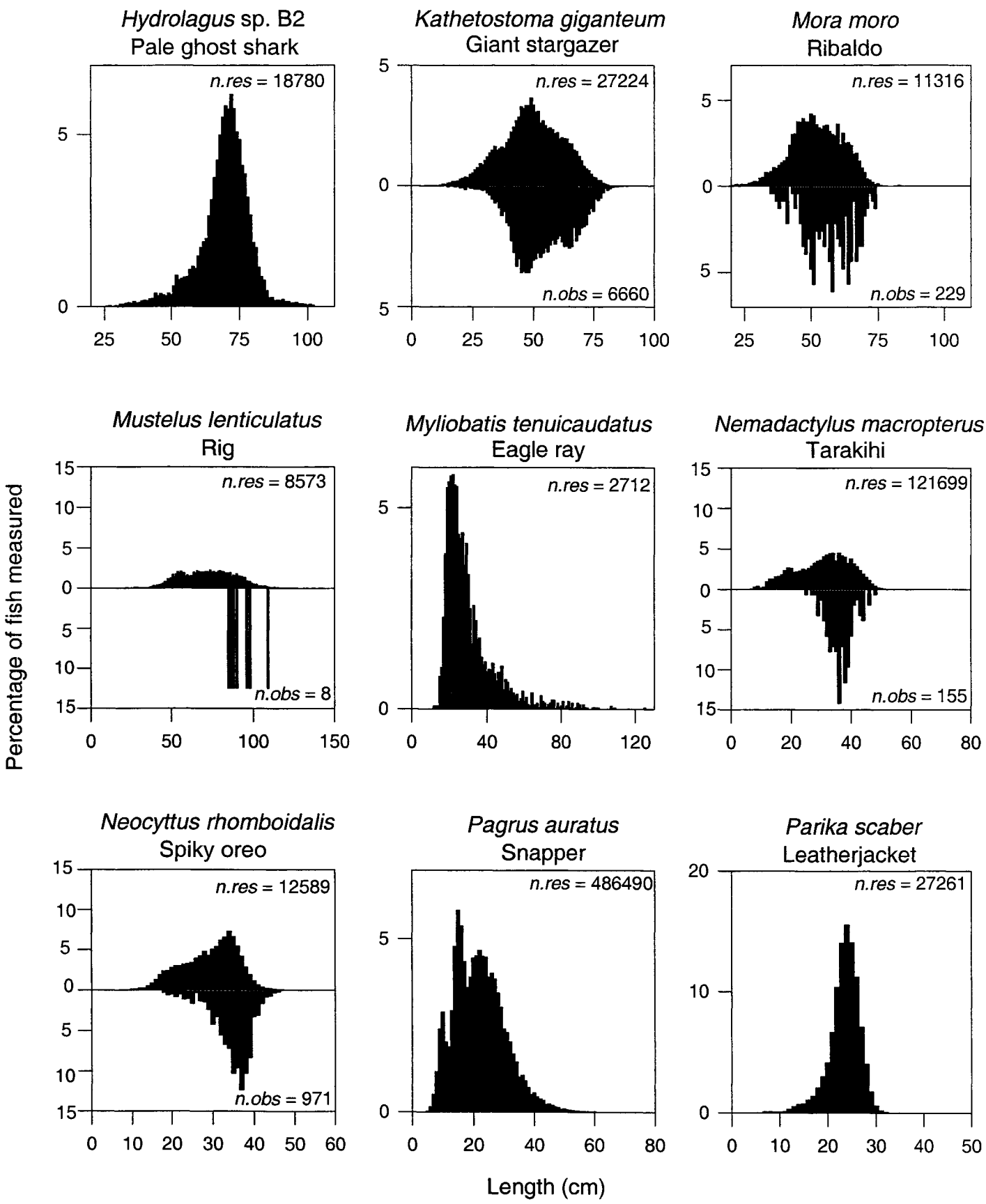


Figure 8: – continued

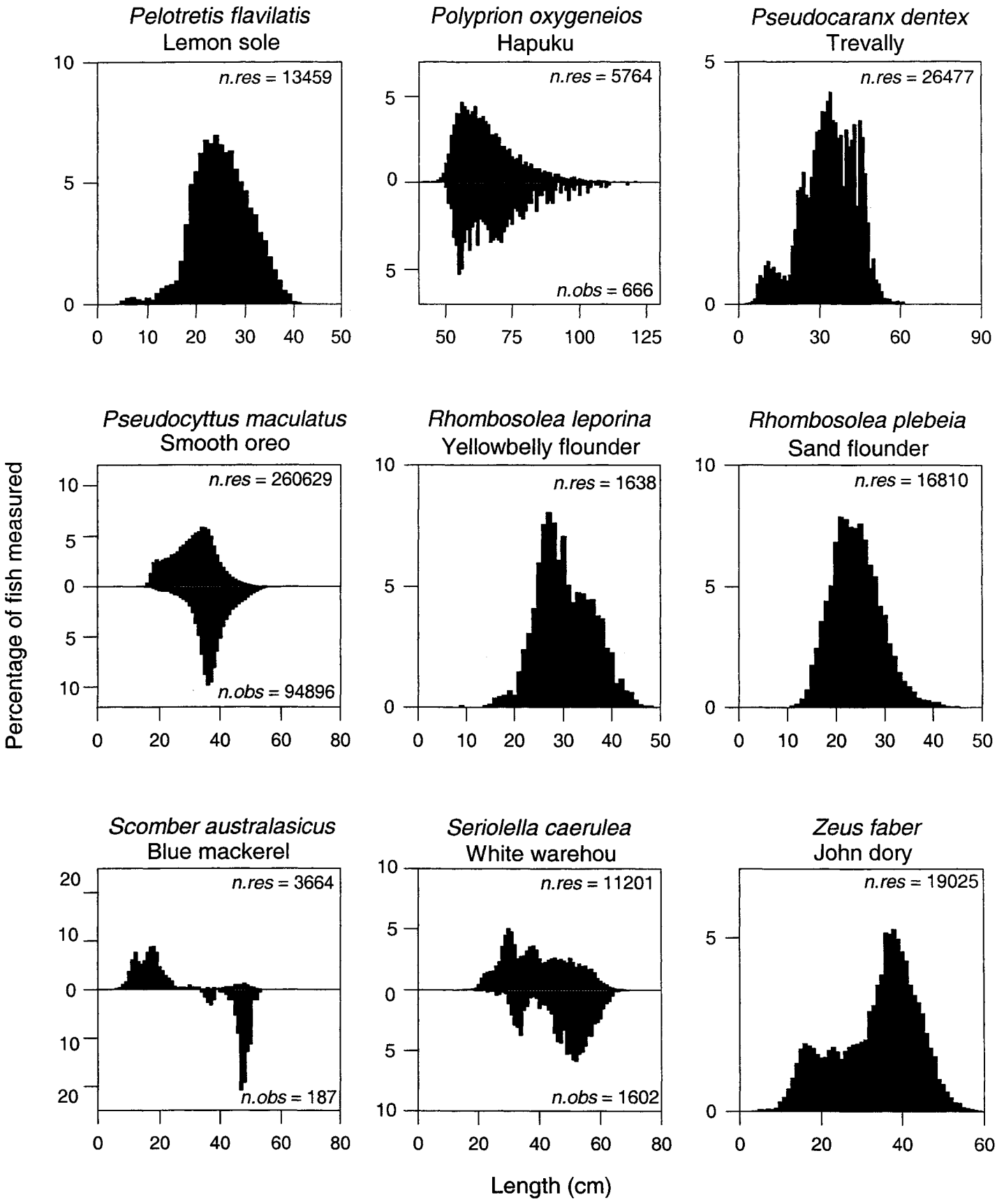
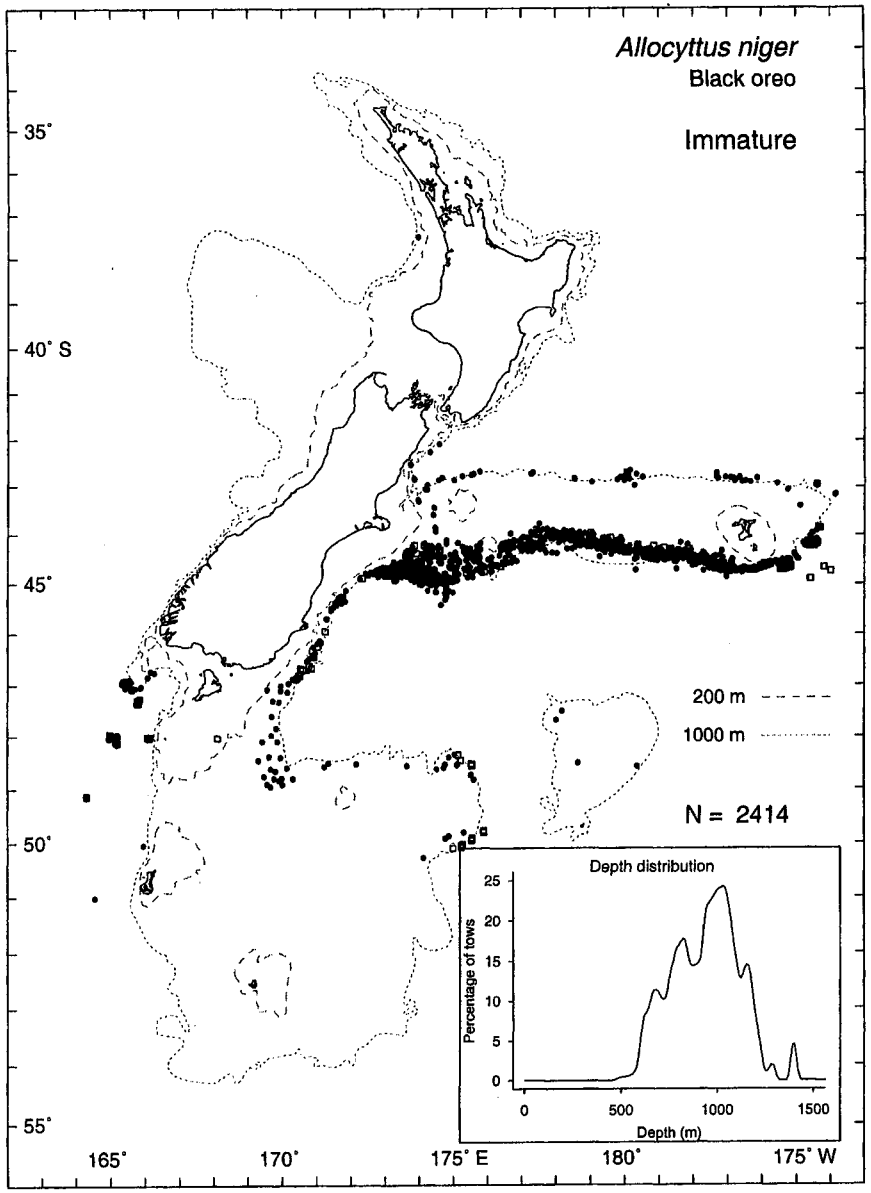


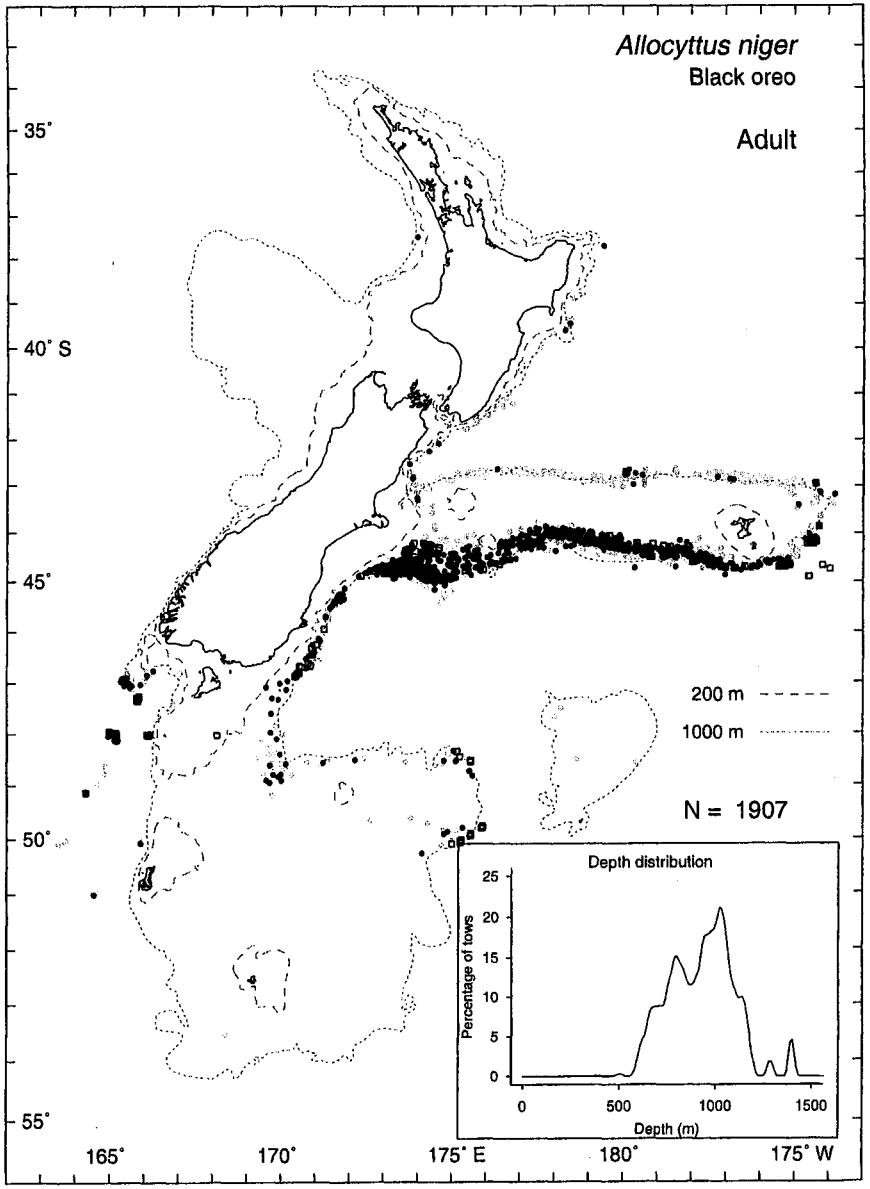
Figure 8: – continued

Bottom trawl distributions

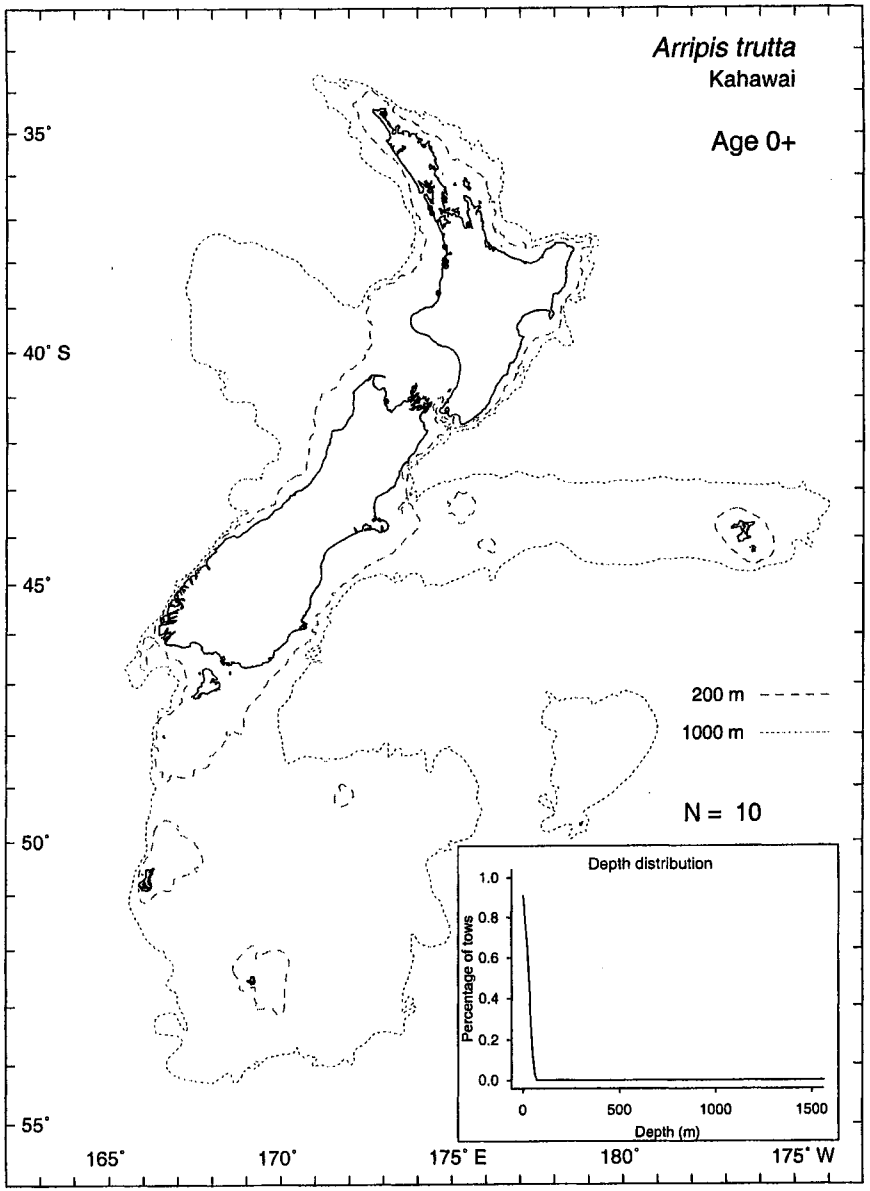
Key to symbols and shading in the distribution plots

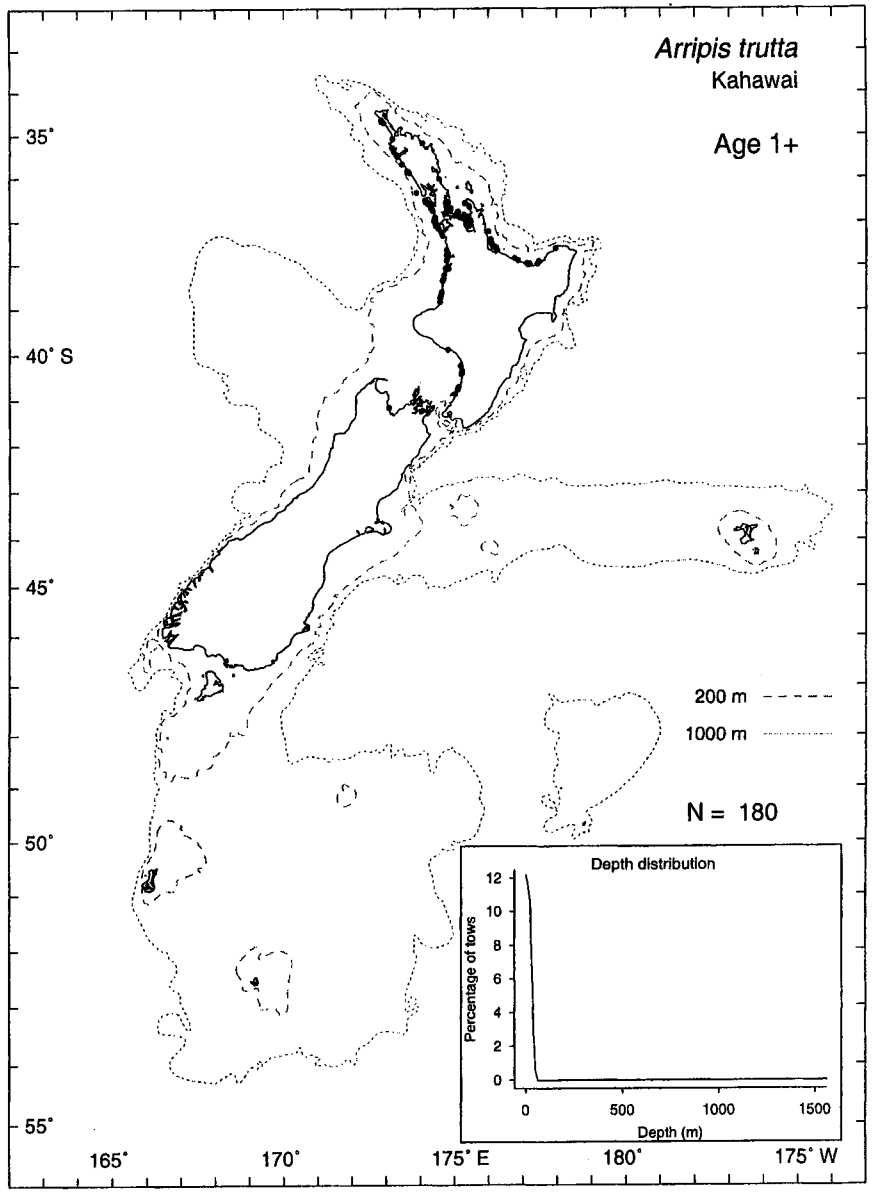
●	Research bottom tow
□	Observer bottom tow
Black	Position where the life history stage occurs
Grey	Position where the species occurs



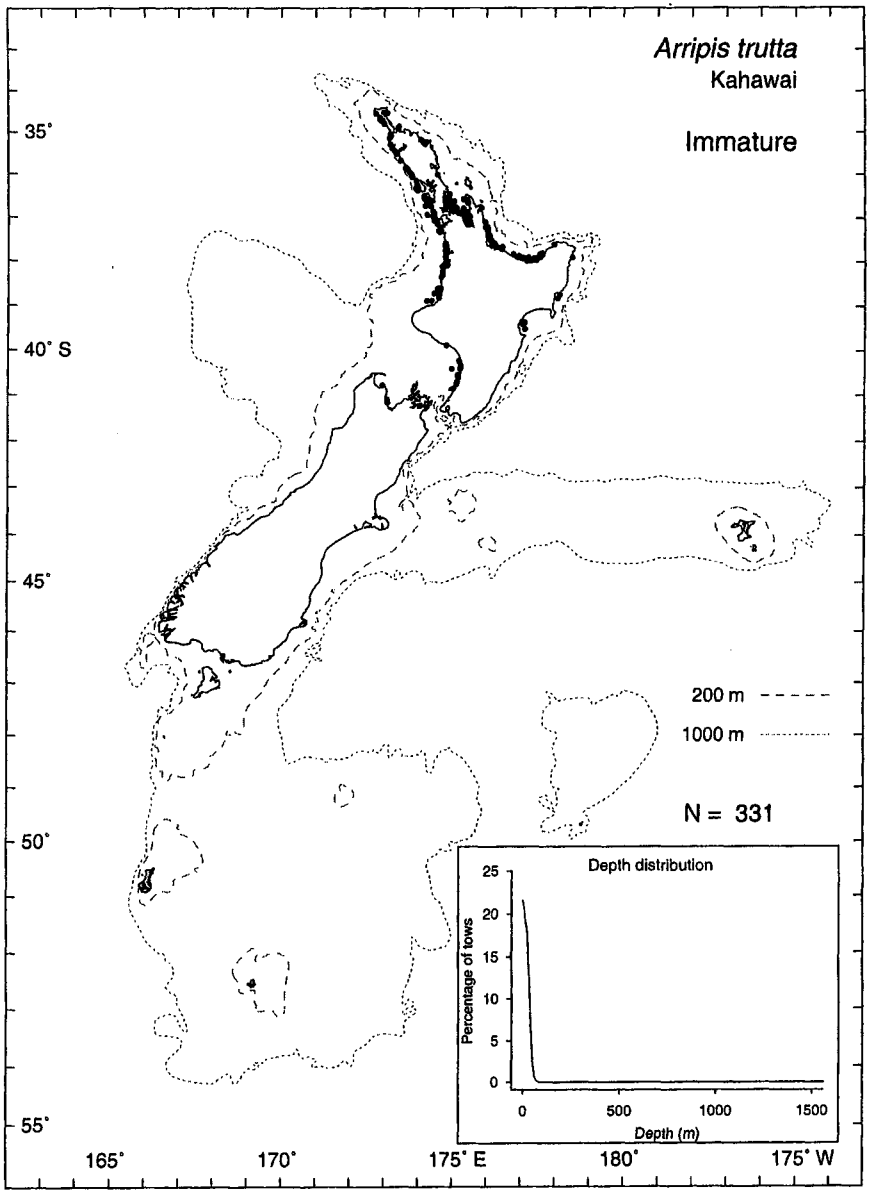


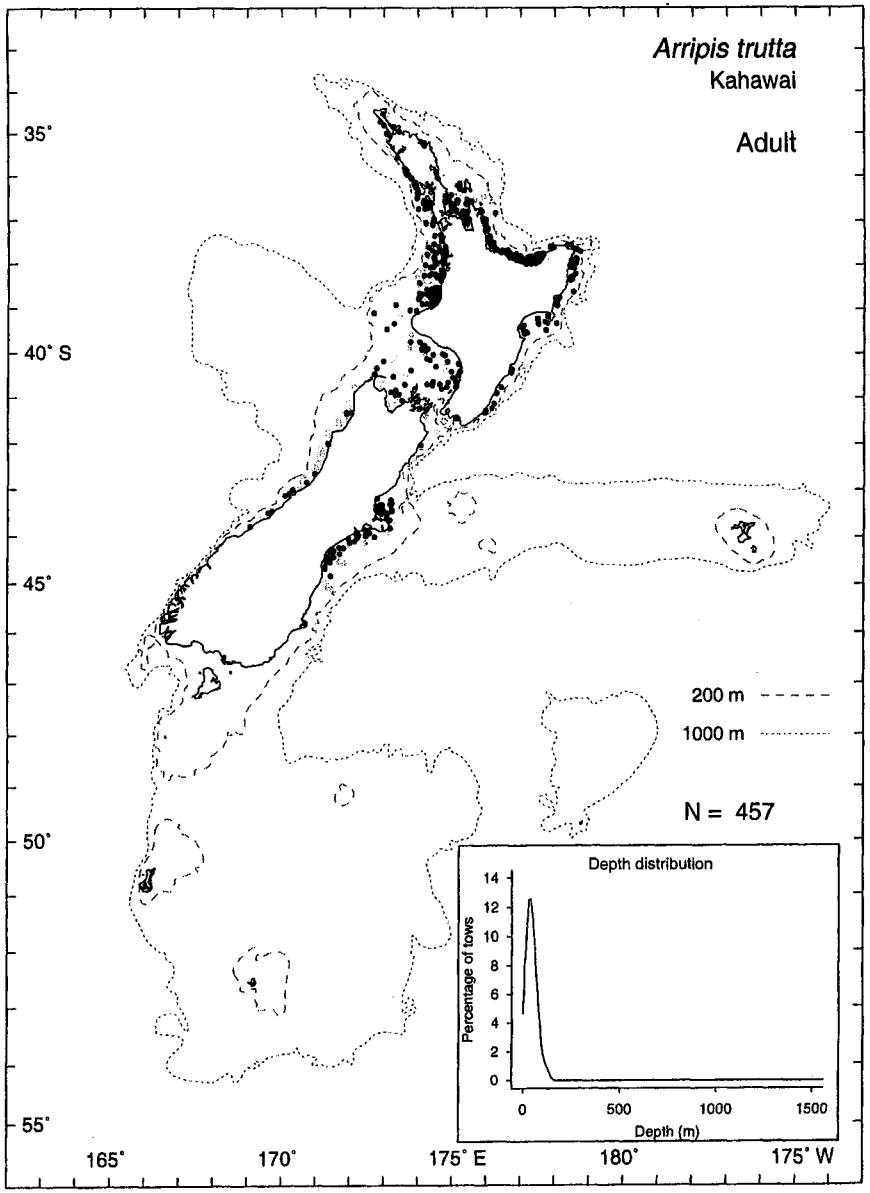
Juvenile plots are not presented for this species.



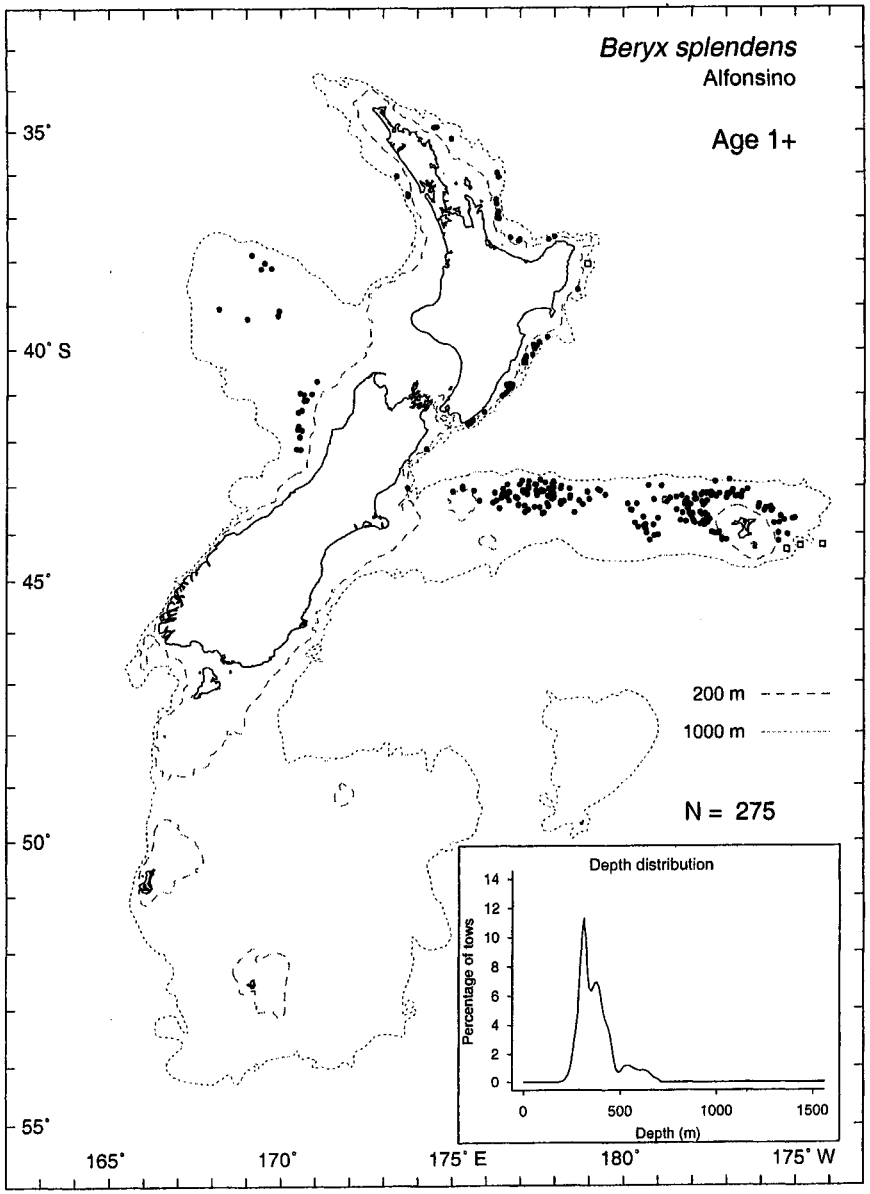


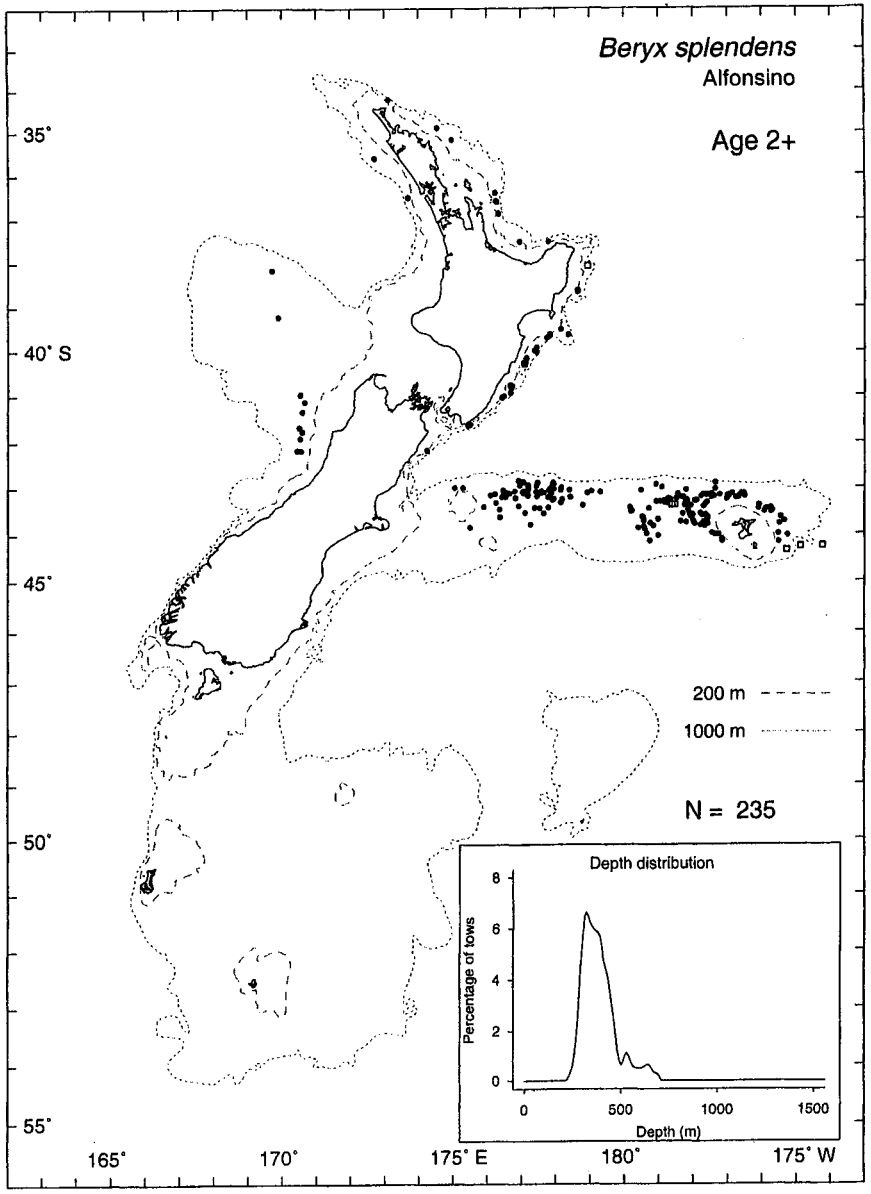
Juvenile plots are not presented for this species.



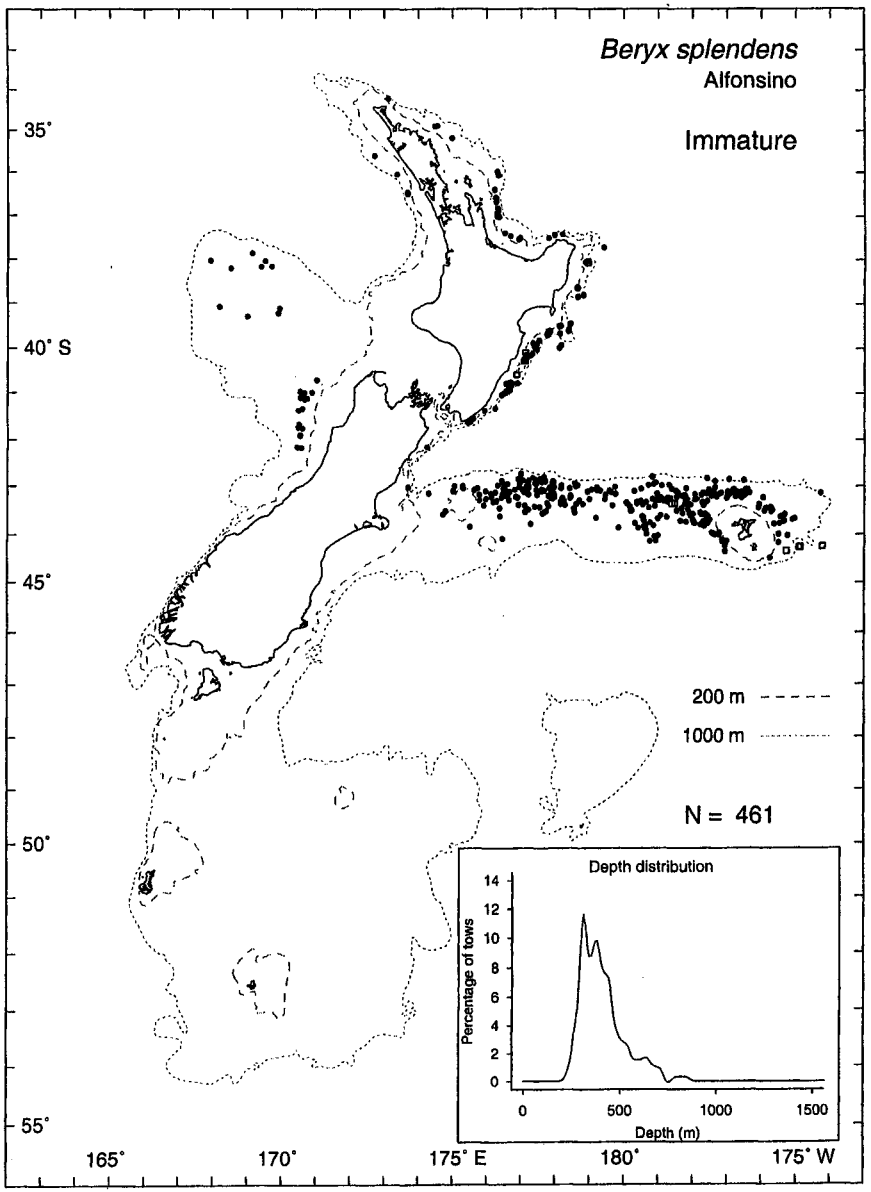


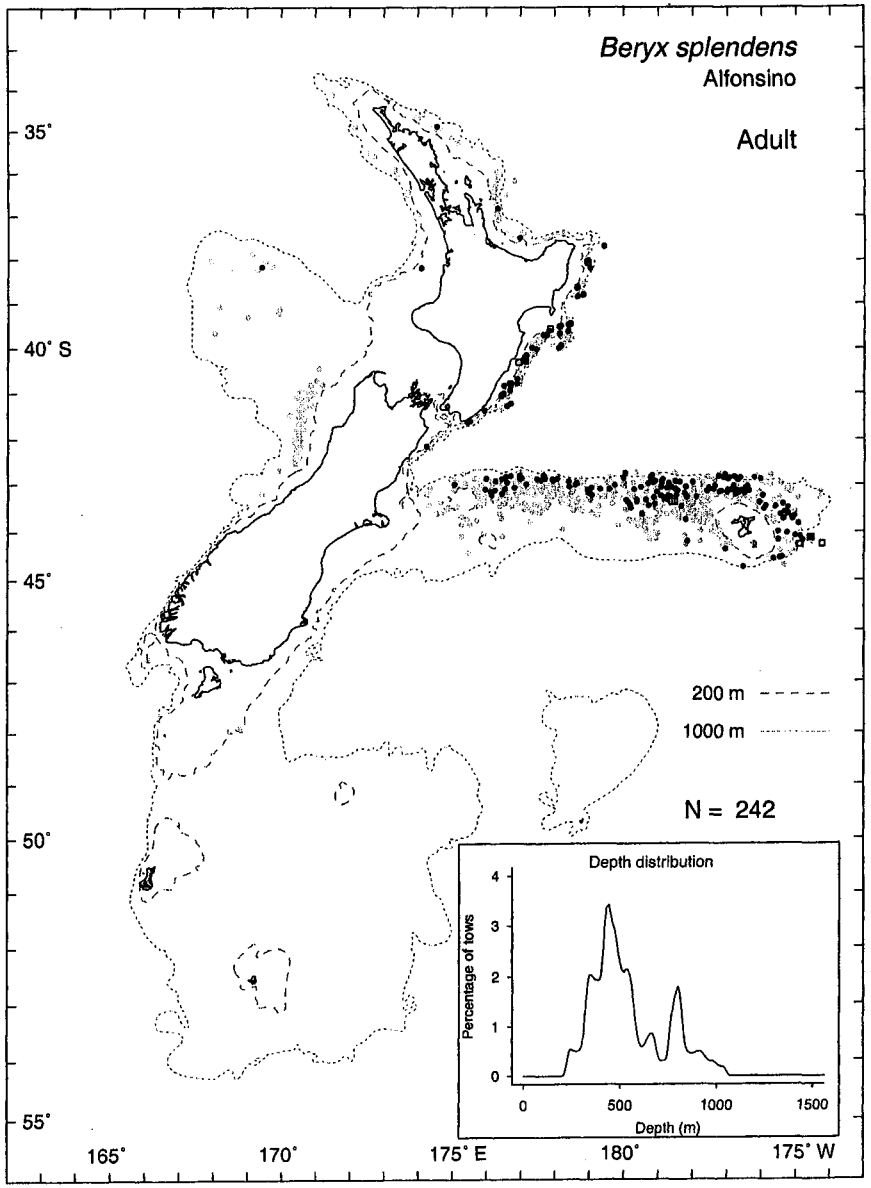
Juvenile plots are not presented for this species.



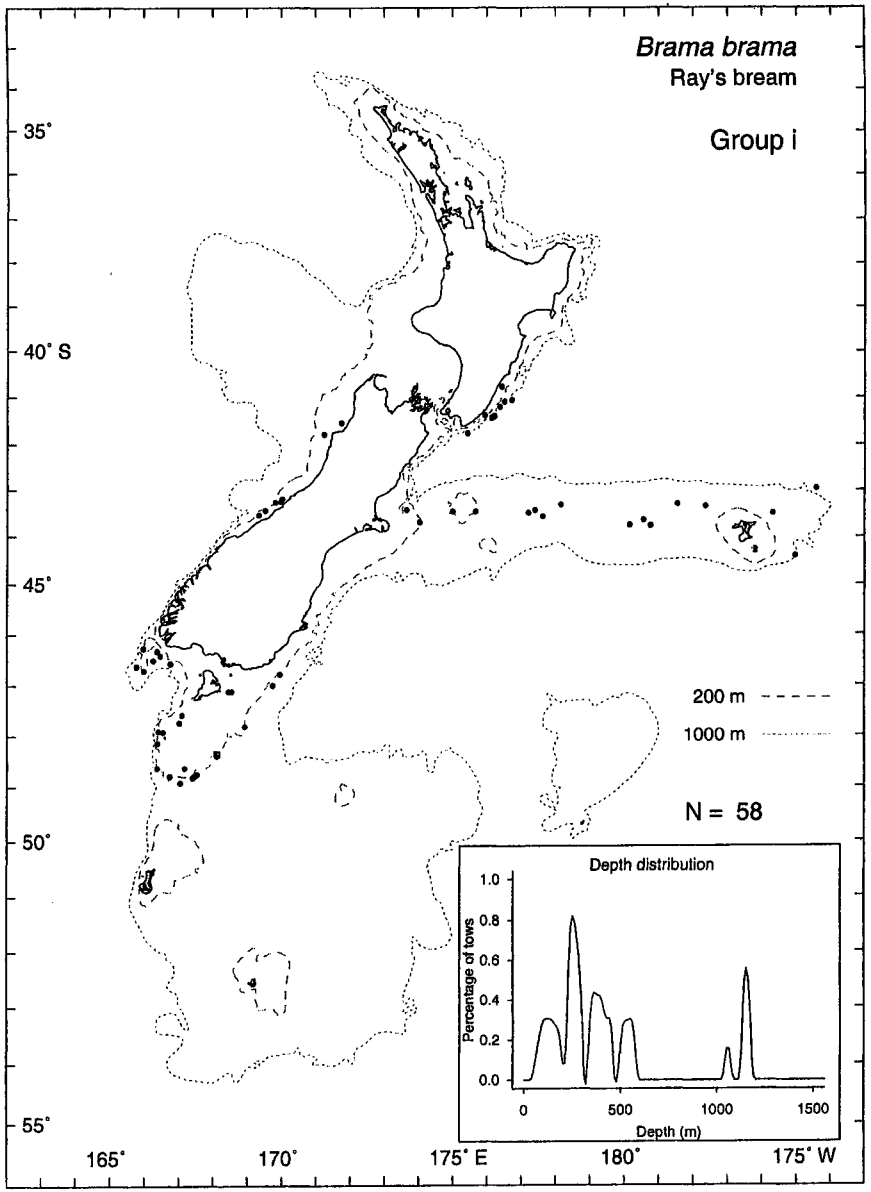


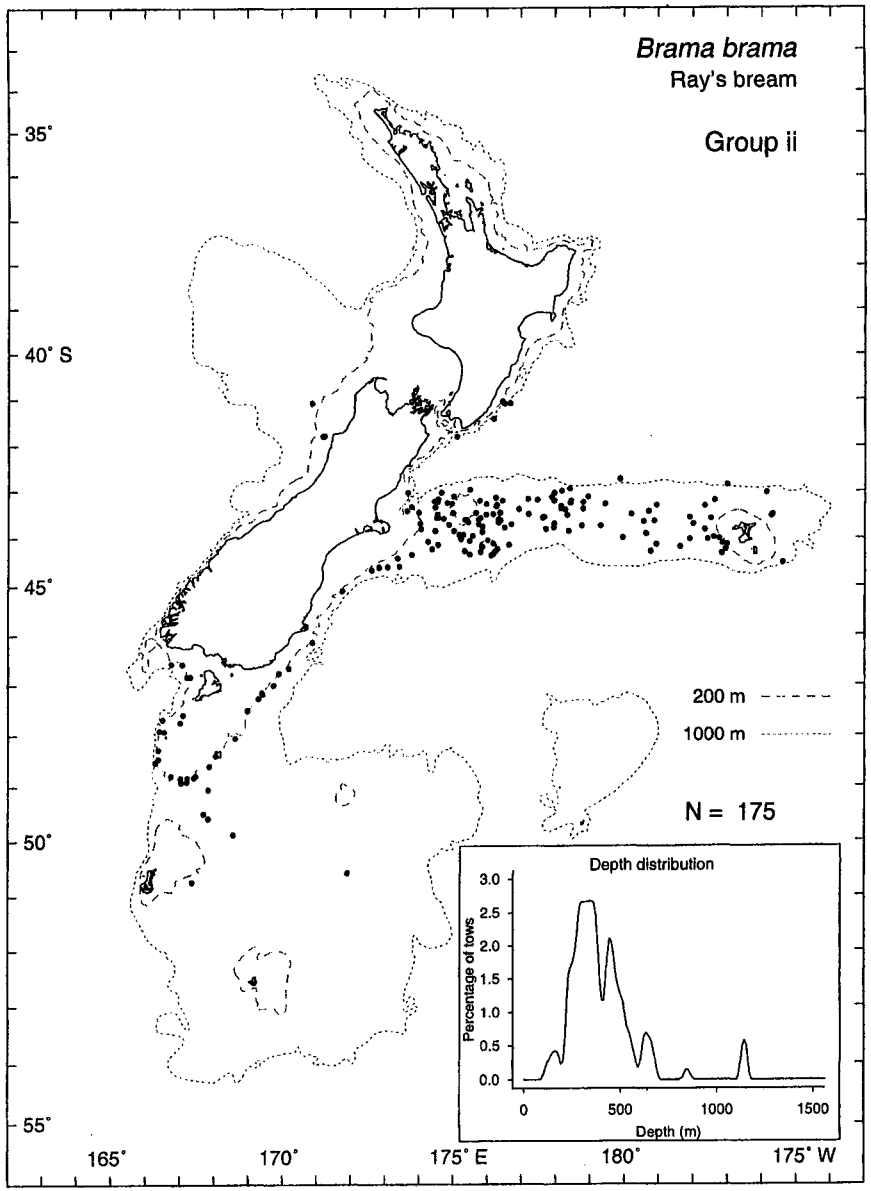
Includes some *B. decadactylus.*



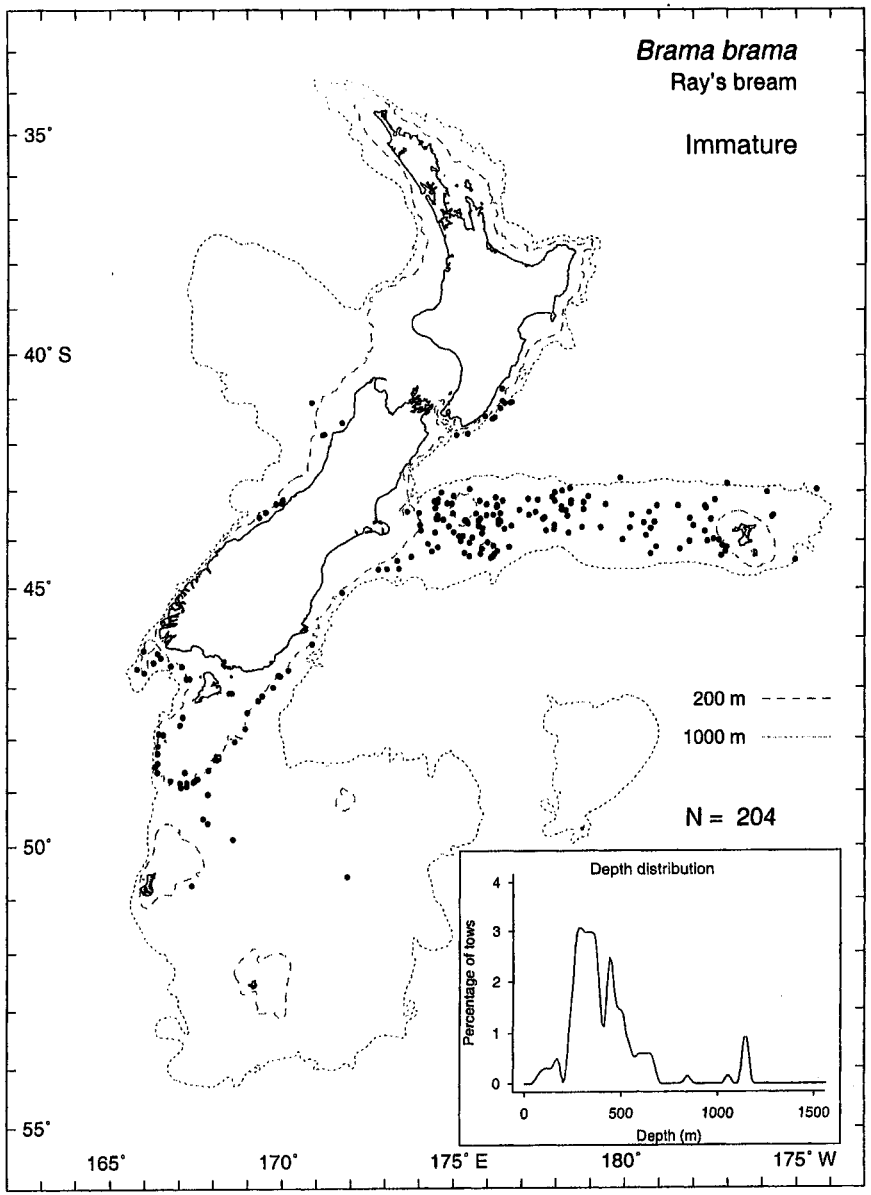


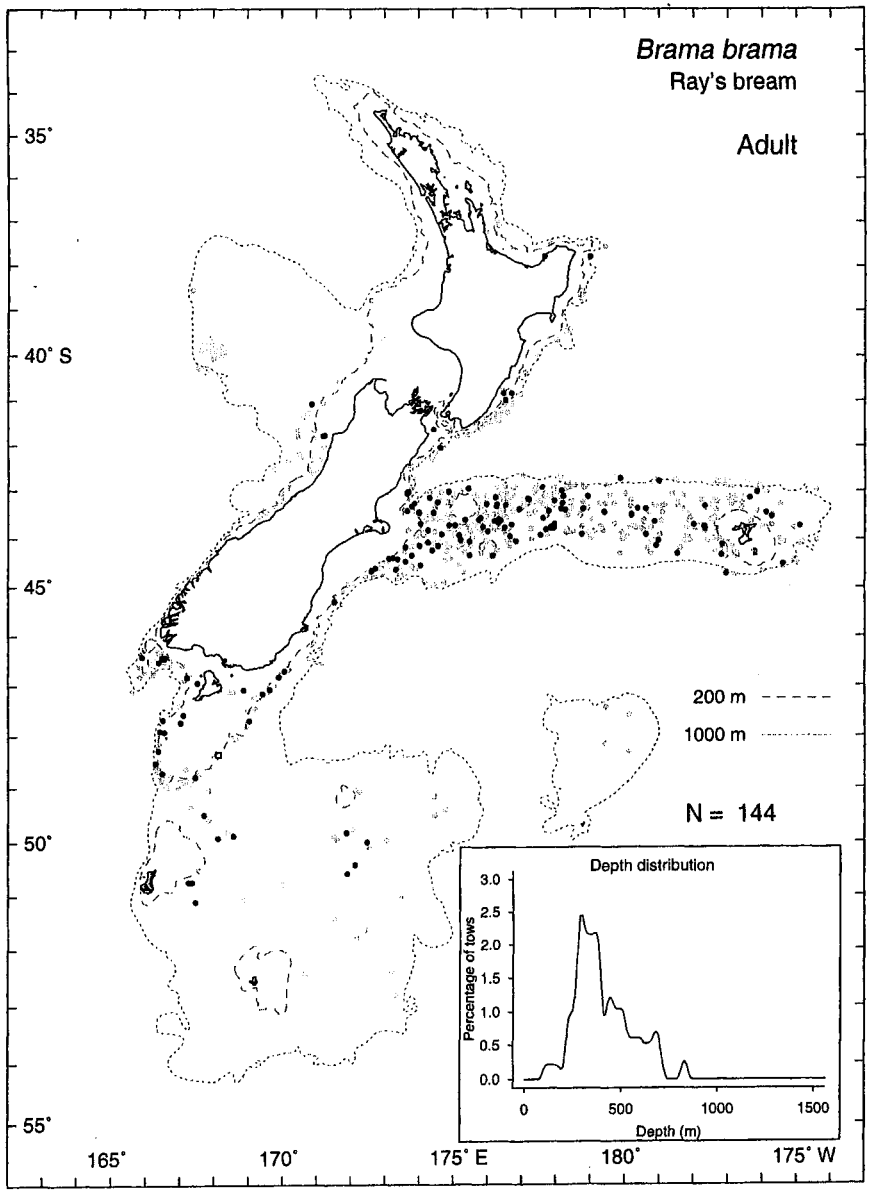
Includes some *B. decadactylus.*

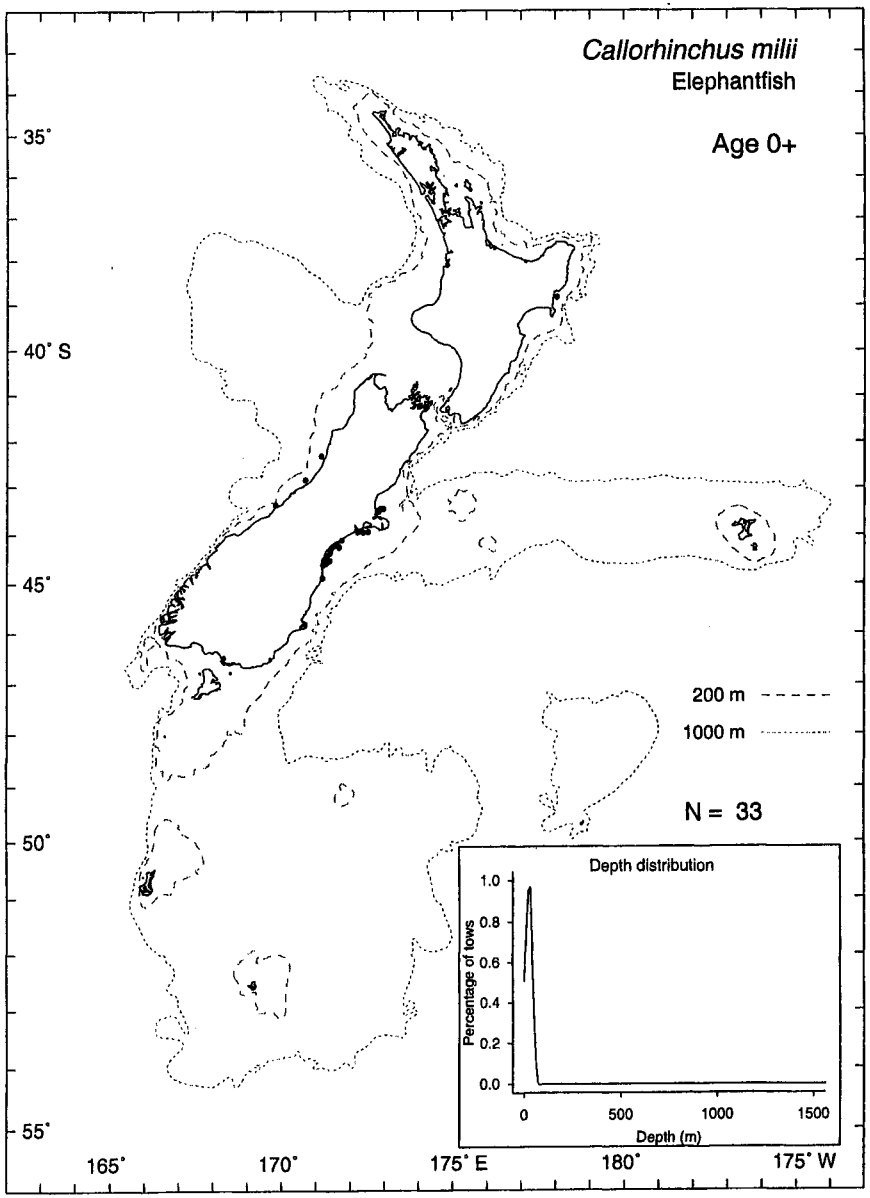


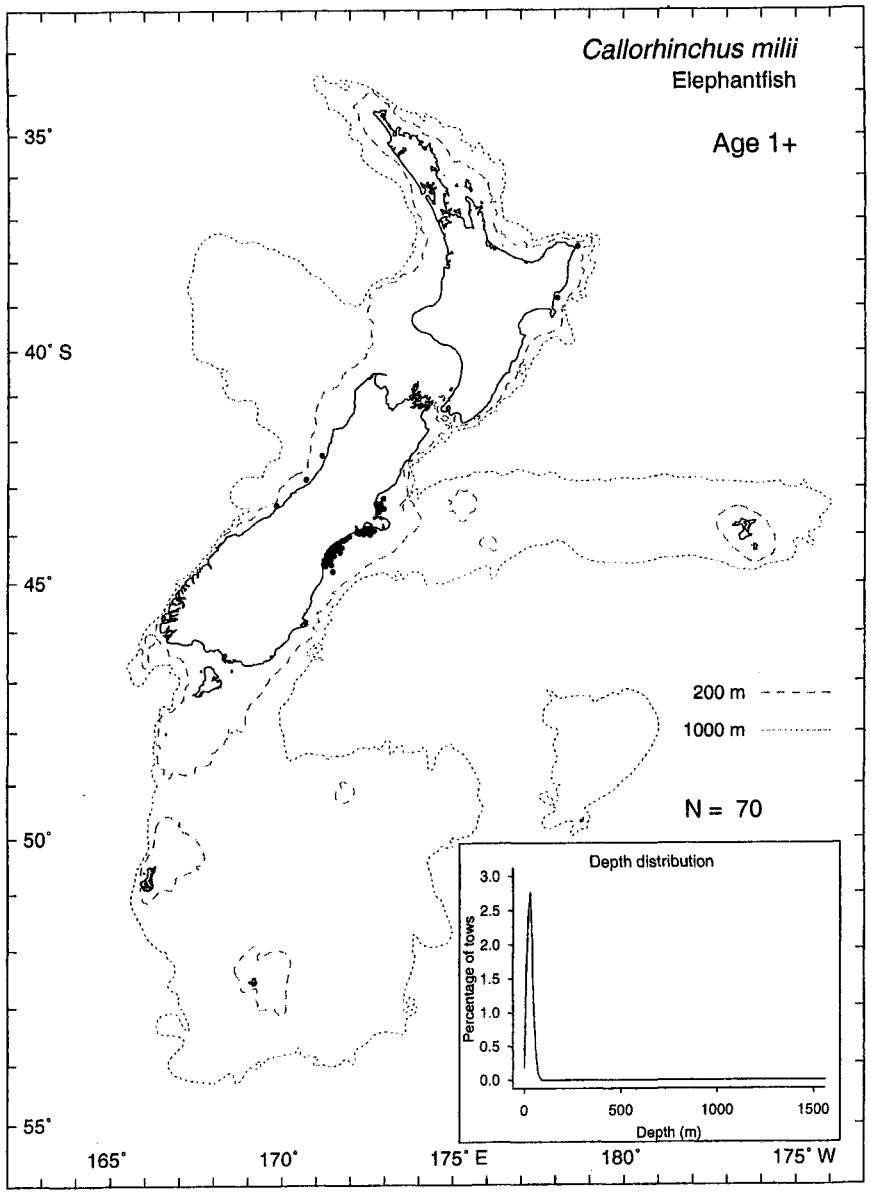


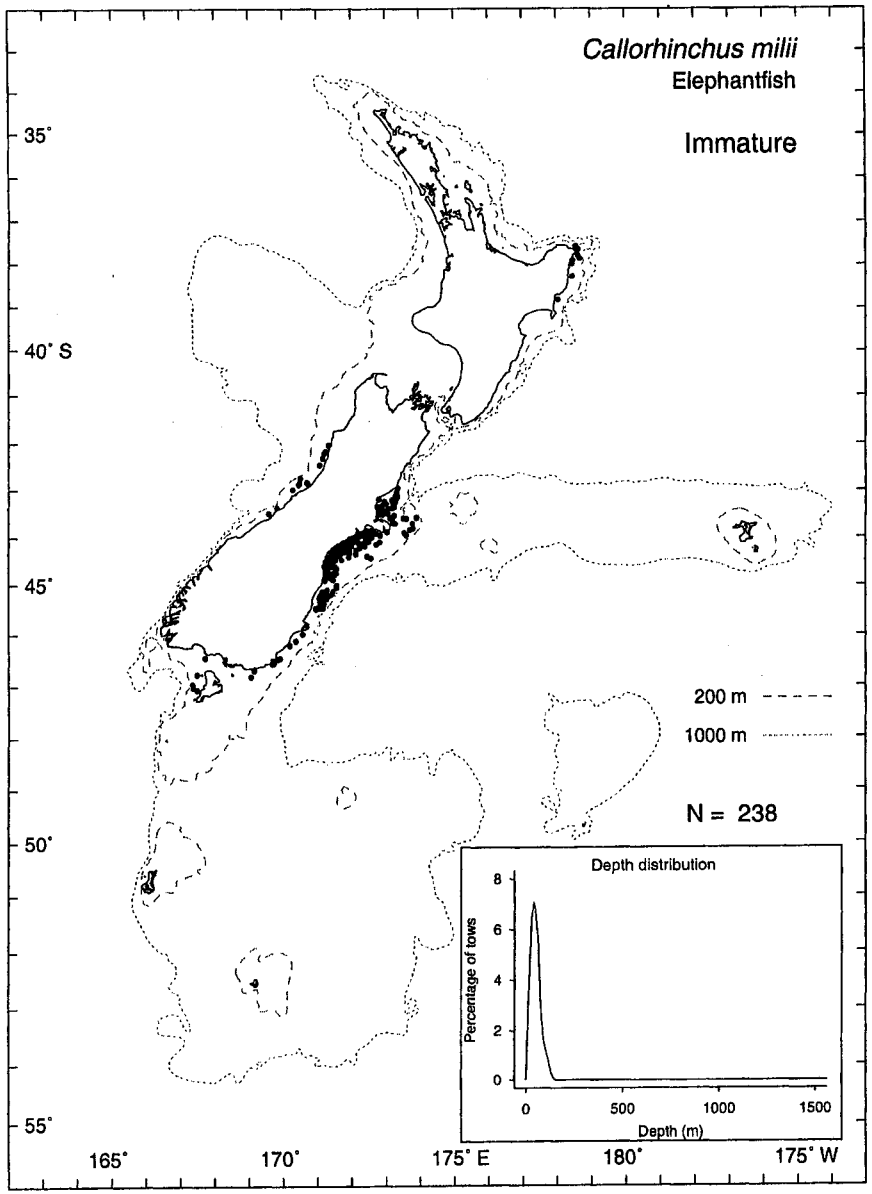
Groups i and ii are arbitrary and were determined from length frequency modes.

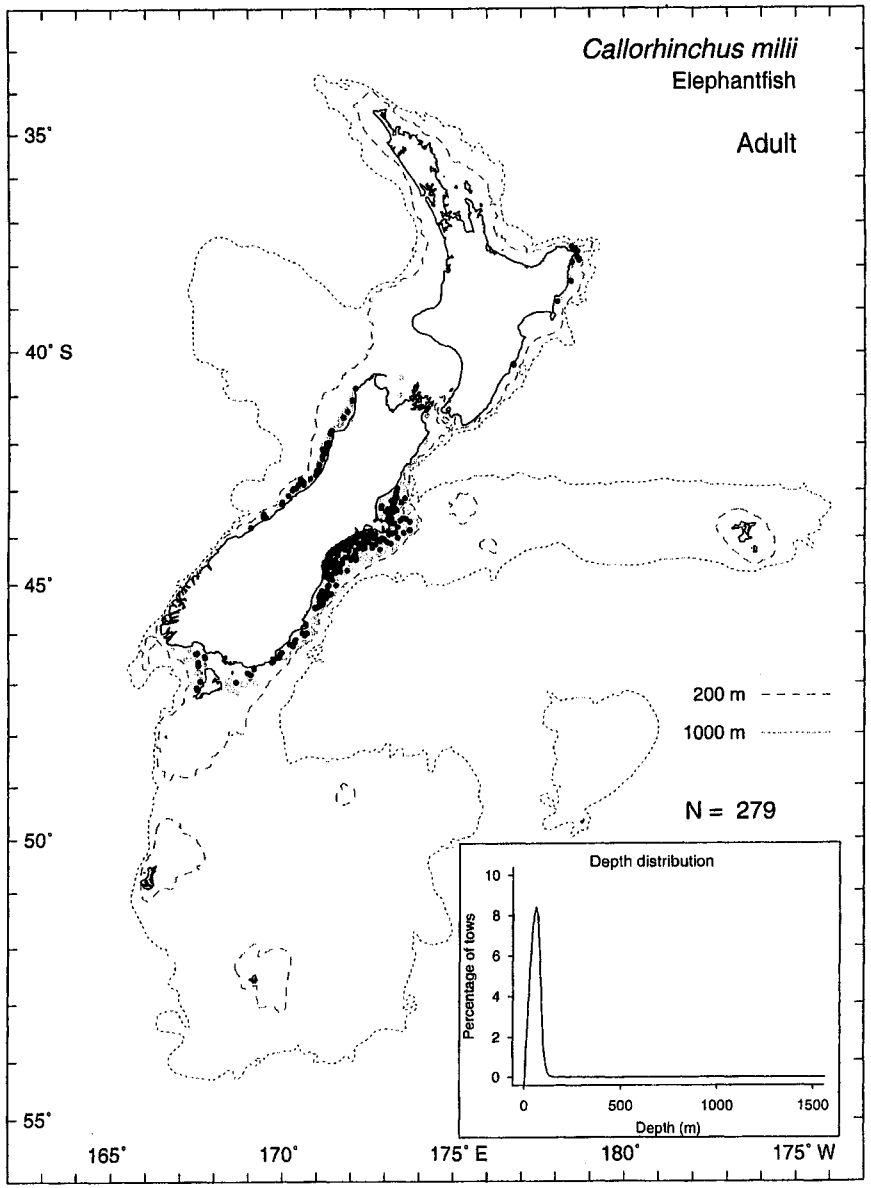

Brama brama
Ray's bream
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 204
Depth distribution
Percentage of tows
Depth (m)
0
1
2
3
4
0
500
1000
1500

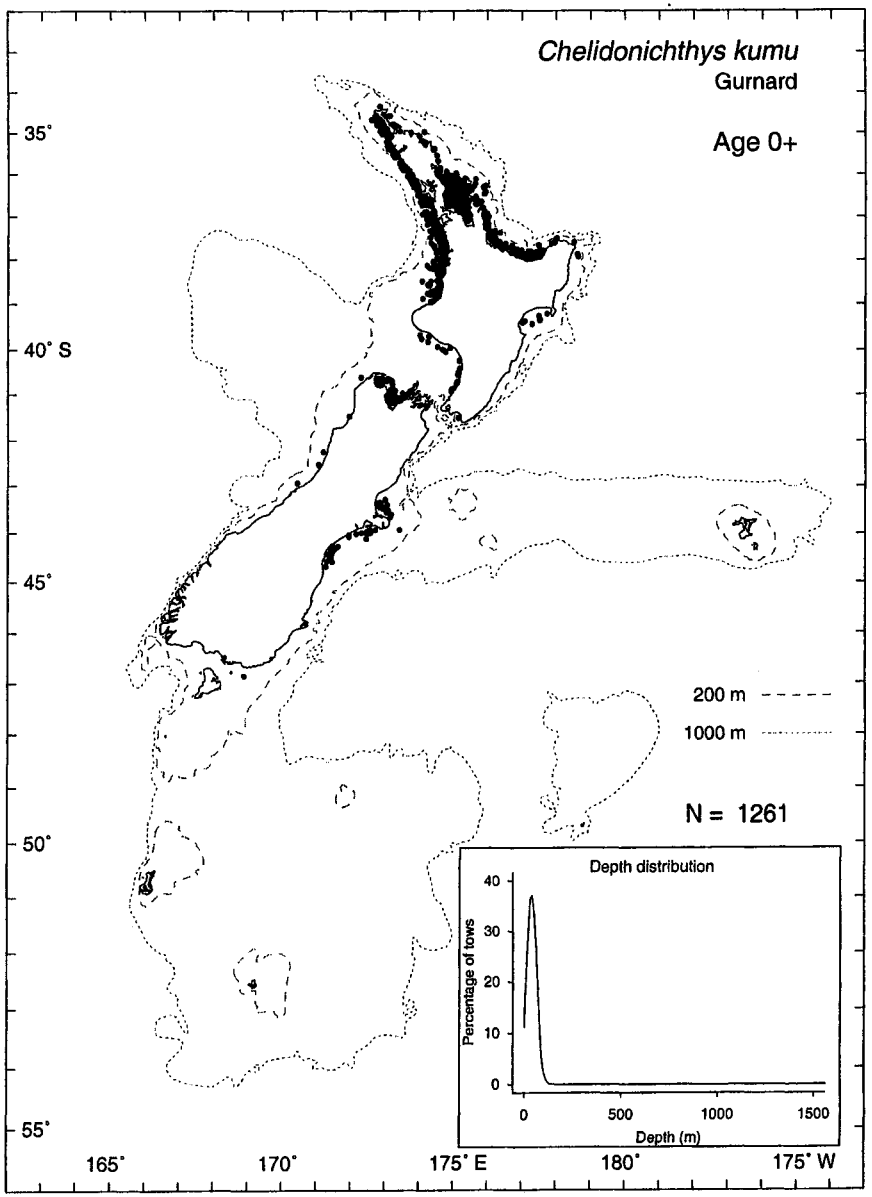

Brama brama
Ray's bream
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 144
Depth distribution
Percentage of tows
Depth (m)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
500
1000
1500

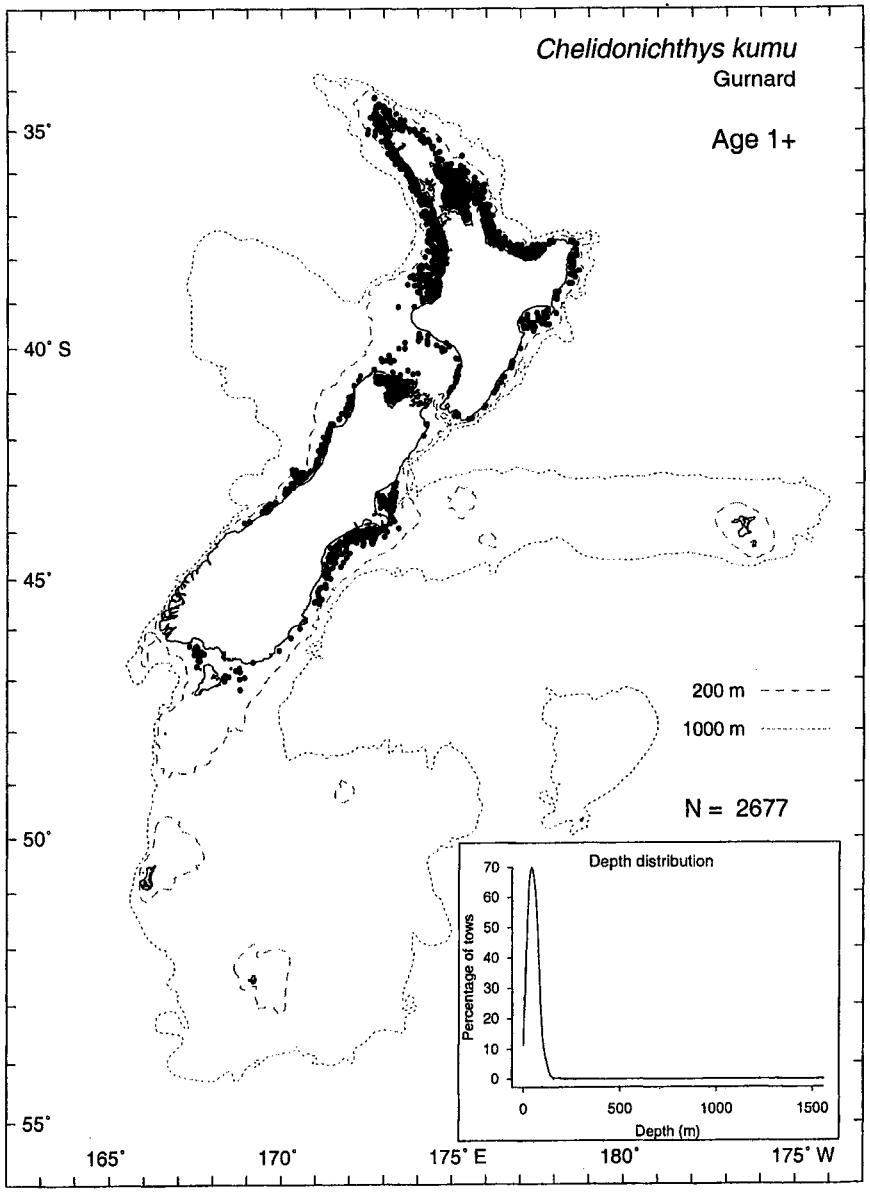

Callorhinchus milii
Elephantfish
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 33
Depth distribution
Percentage of tows
1.0
0.8
0.6
0.4
0.2
0.0
0
500
1000
1500
Depth (m)

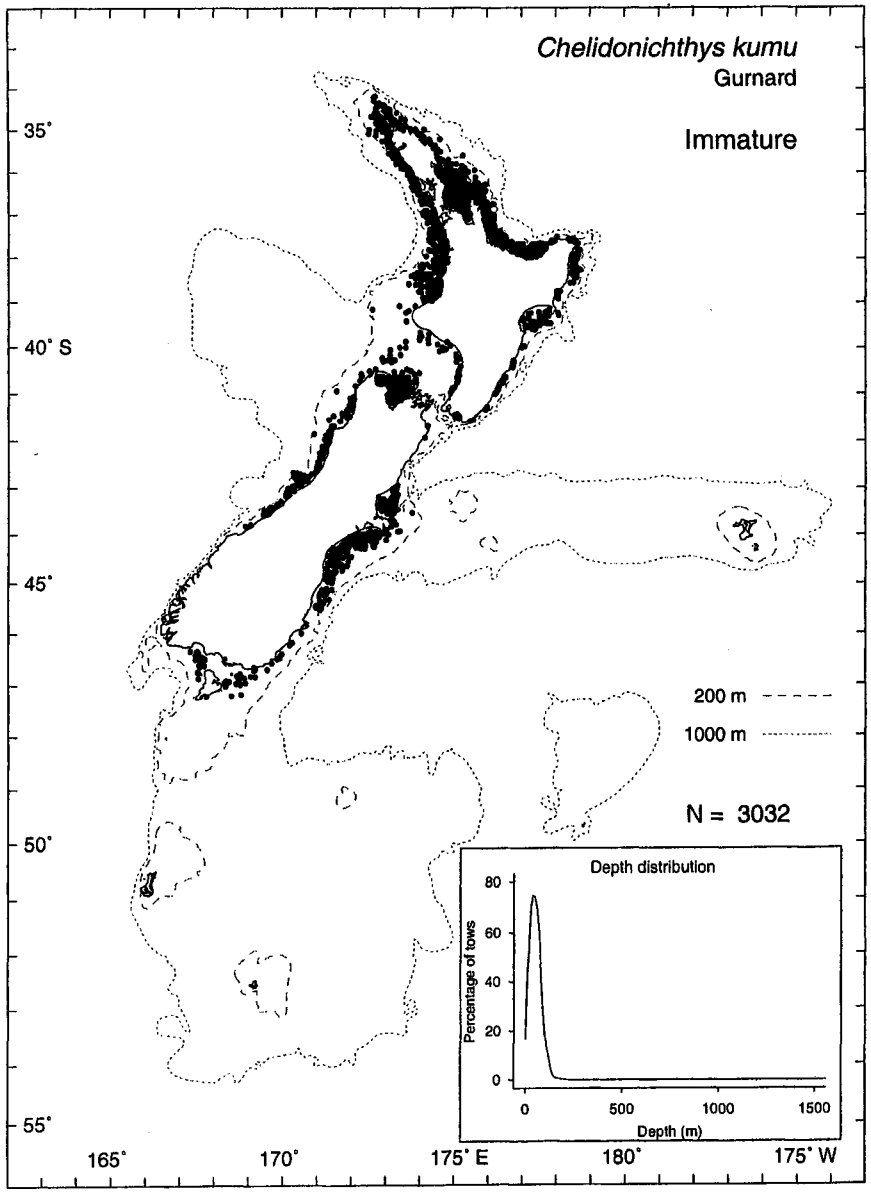

Callorhinchus milii
Elephantfish
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 70
Depth distribution
Percentage of tows
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)

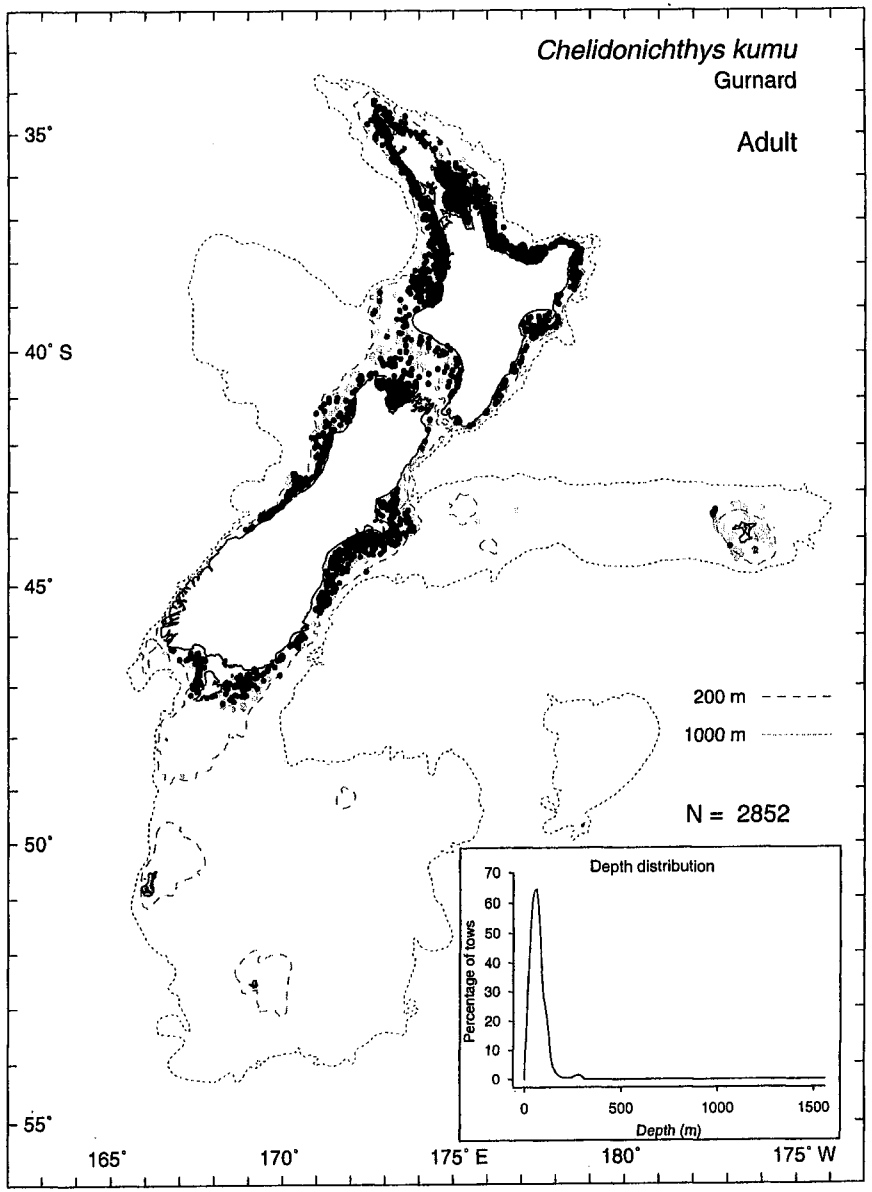

Callorhinchus milii
Elephantfish
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 238
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8

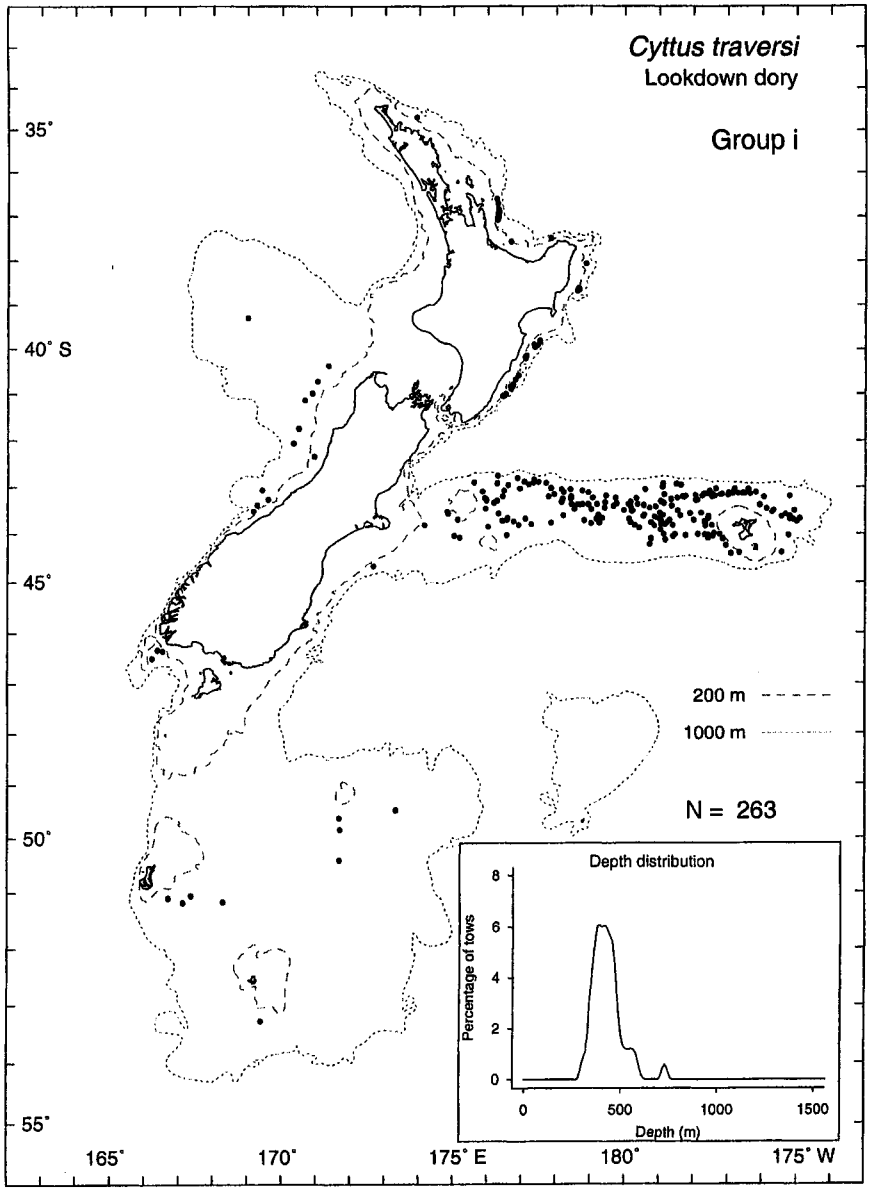

Callorhinchus milii
Elephantfish
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 279
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10

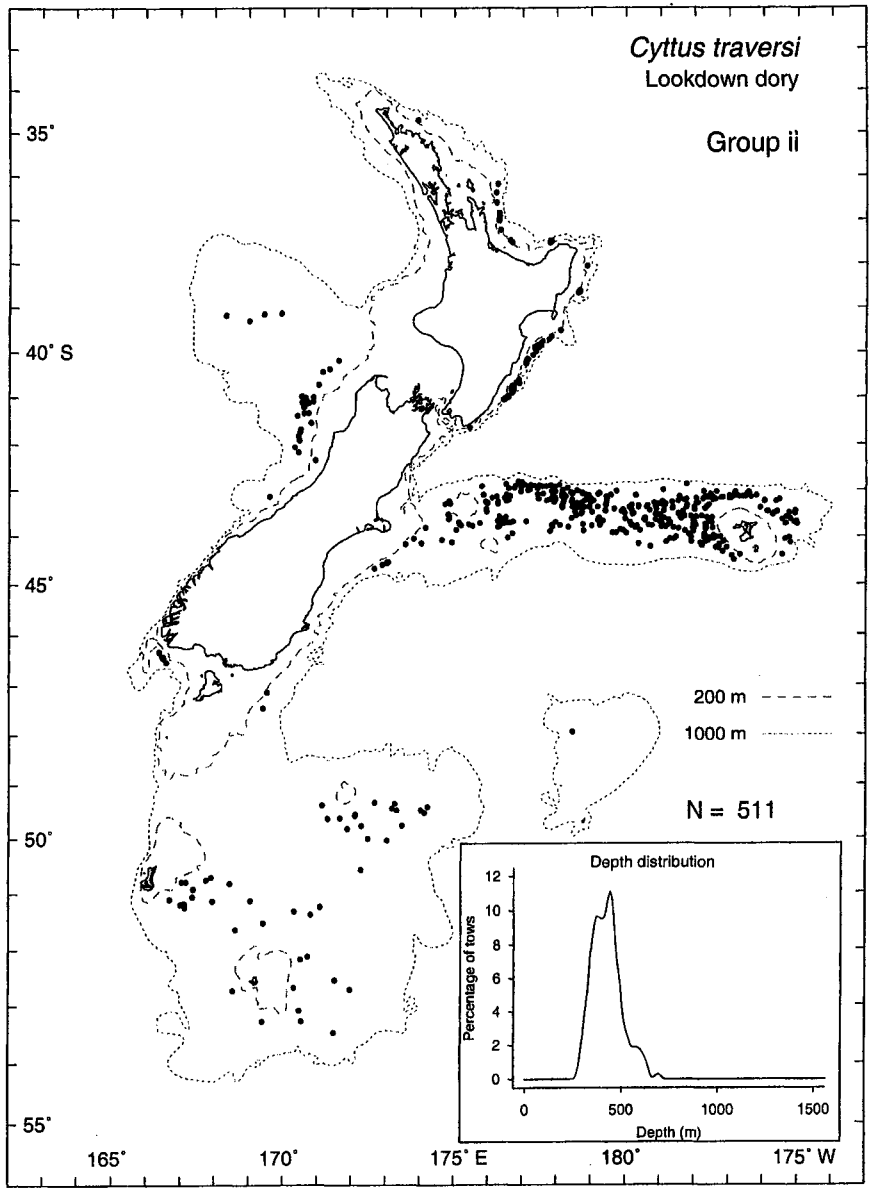

Chelidonichthys kumu
Gurnard
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1261
Depth distribution
Percentage of tows
0
10
20
30
40
0
500
1000
1500
Depth (m)


Chelidonichthys kumu
Gurnard
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2677
Depth distribution
Percentage of tows
0
10
20
30
40
50
60
70
0
500
1000
1500
Depth (m)

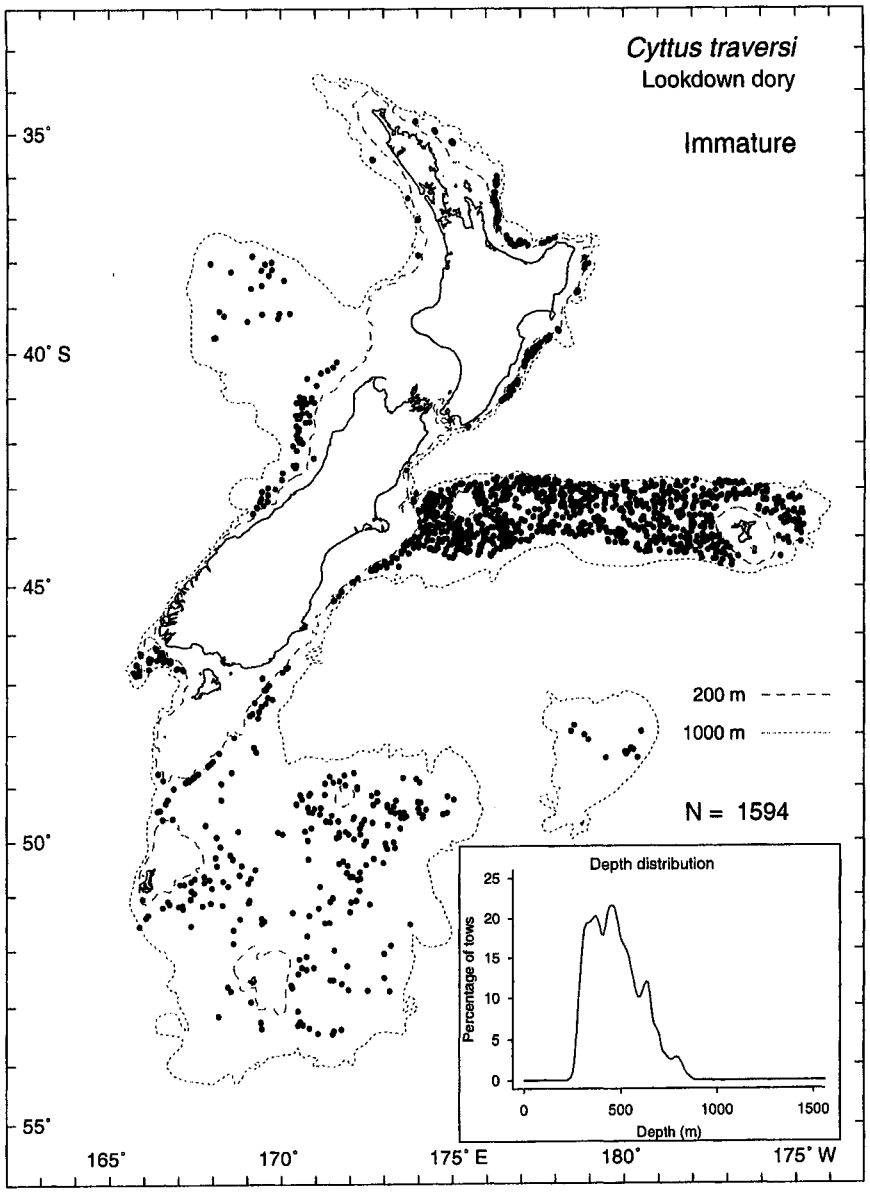

Chelidonichthys kumu
Gurnard
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3032
Depth distribution
Percentage of tows
80
60
40
20
0
0
500
1000
1500
Depth (m)

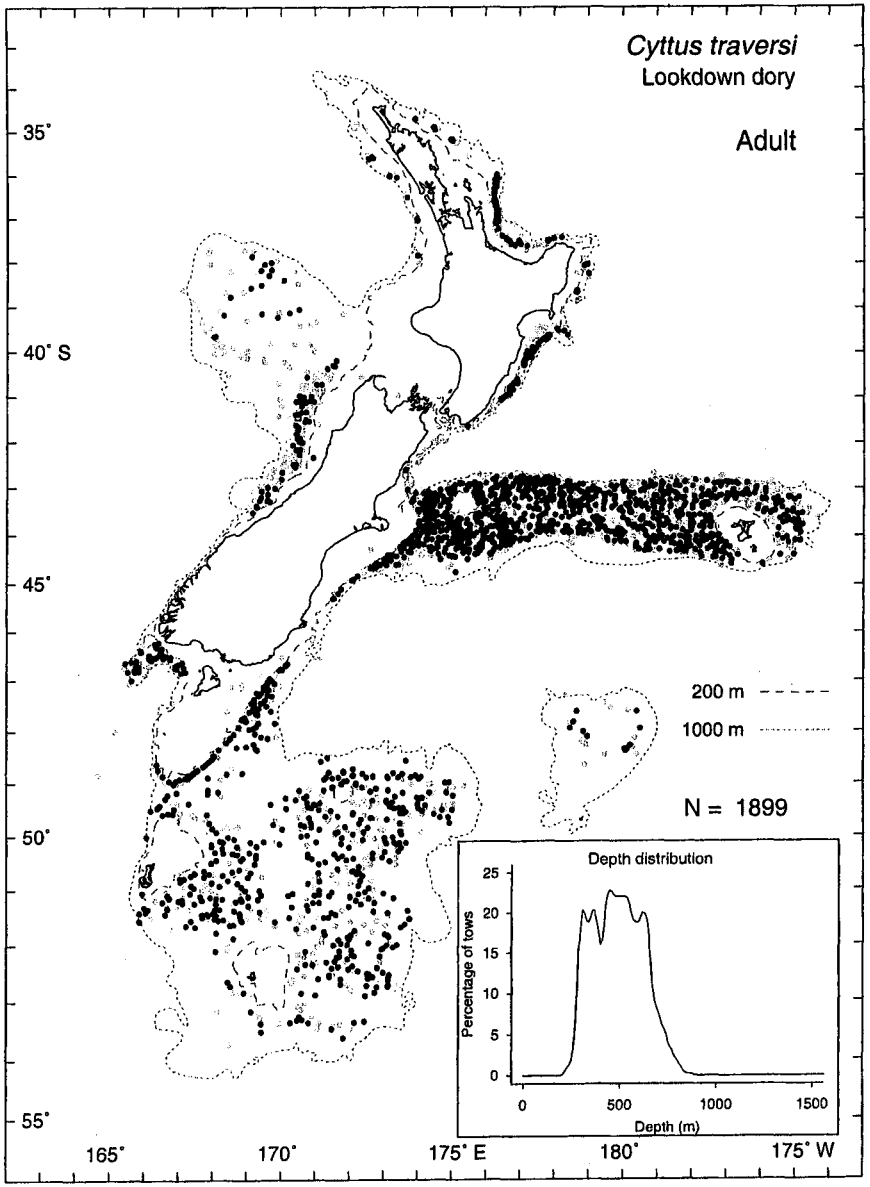

Chelidonichthys kumu
Gurnard
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2852
Depth distribution
Percentage of tows
70
60
50
40
30
20
10
0
0
500
1000
1500
Depth (m)

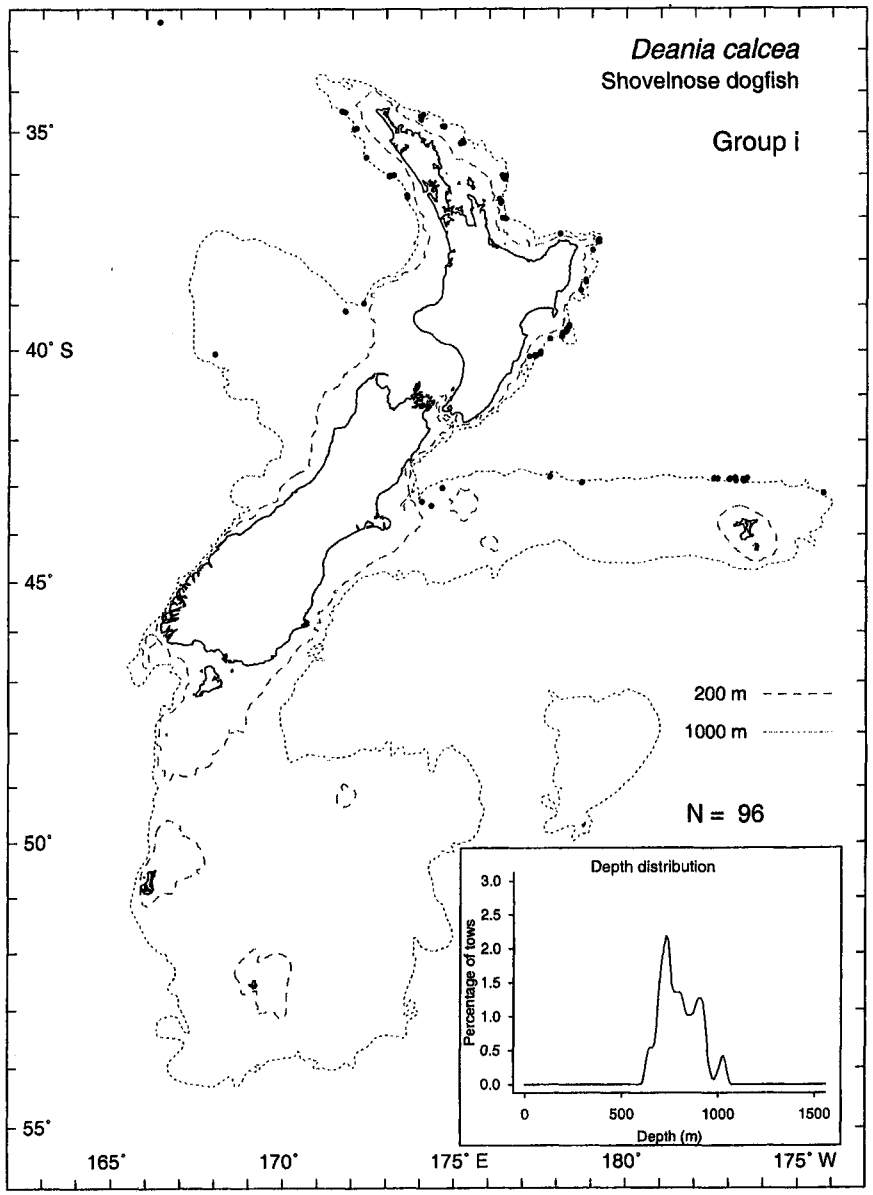


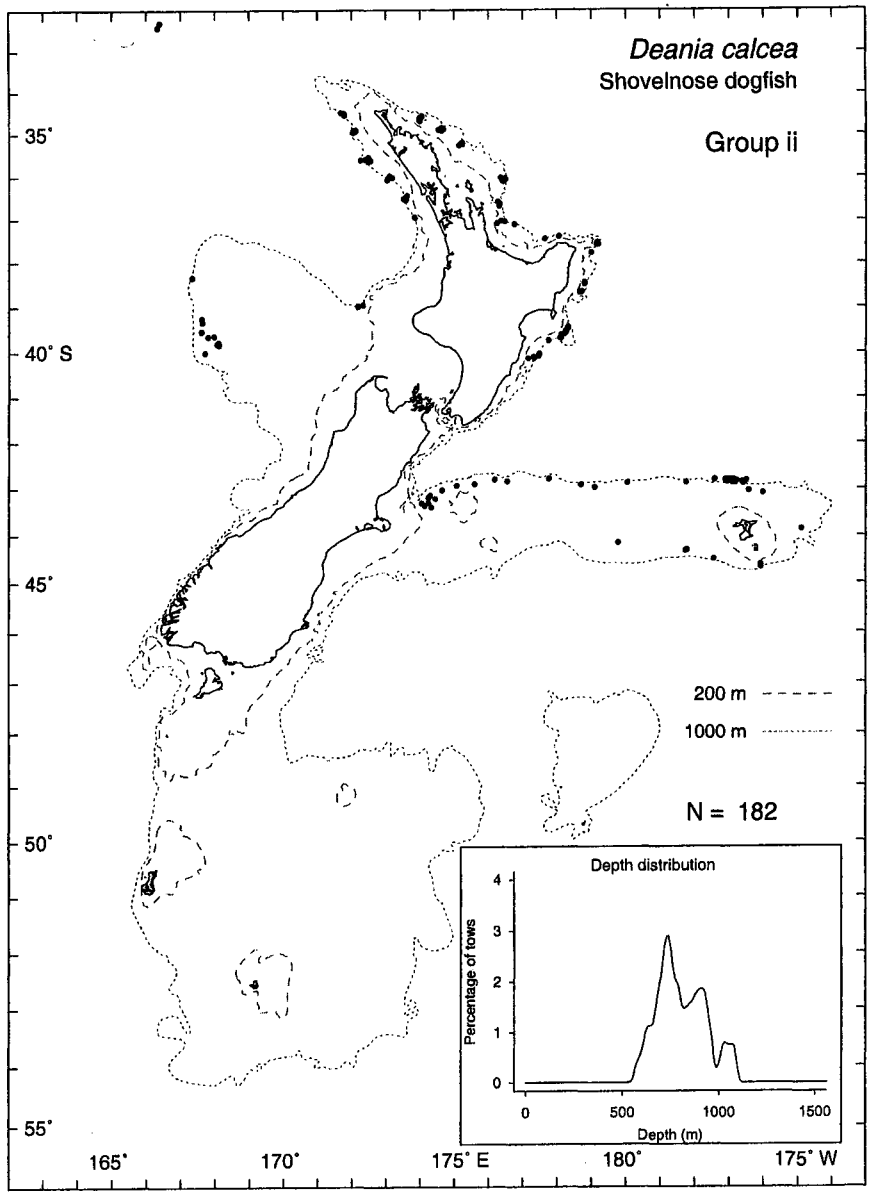


Groups i and ii are arbitrary and were determined from length frequency modes.

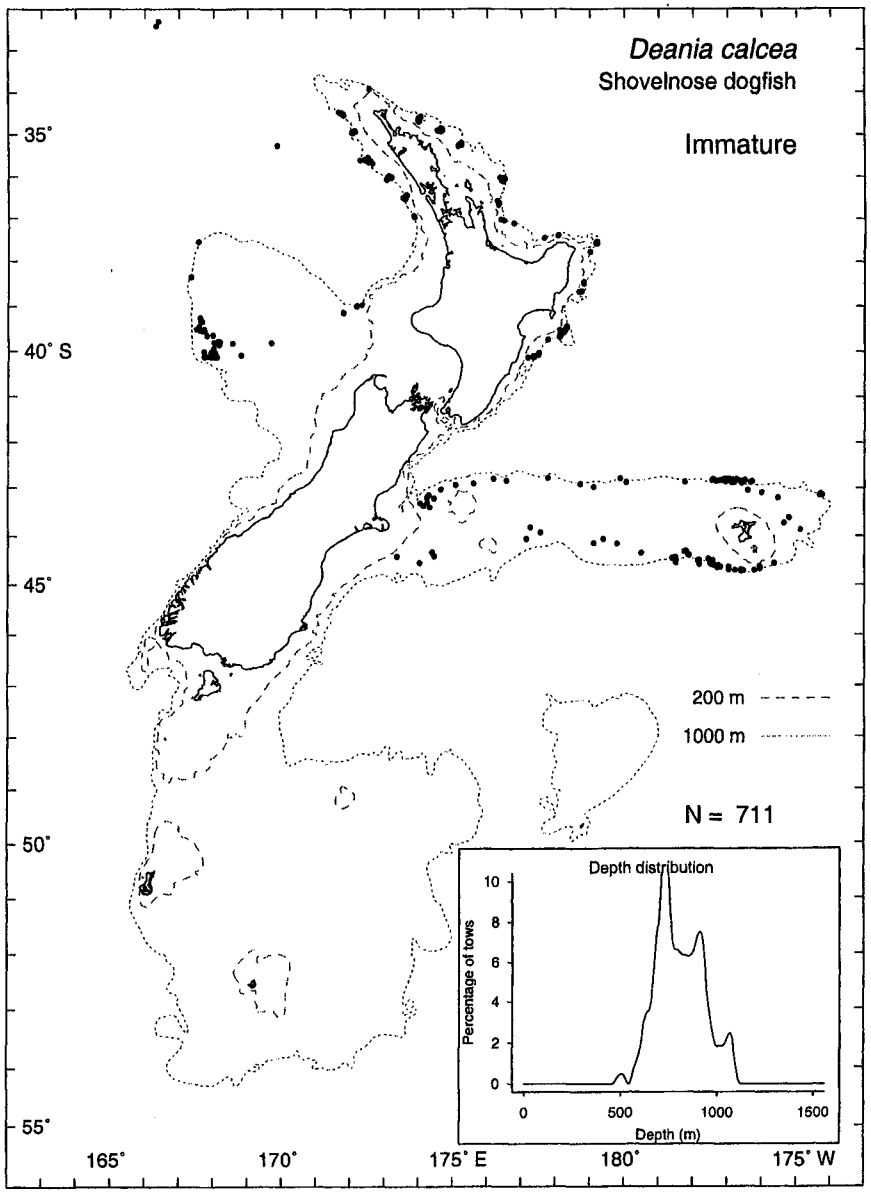

Cyttus traversi
Lookdown dory
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1594
Depth distribution
Percentage of tows
0
5
10
15
20
25
0
500
1000
1500
Depth (m)

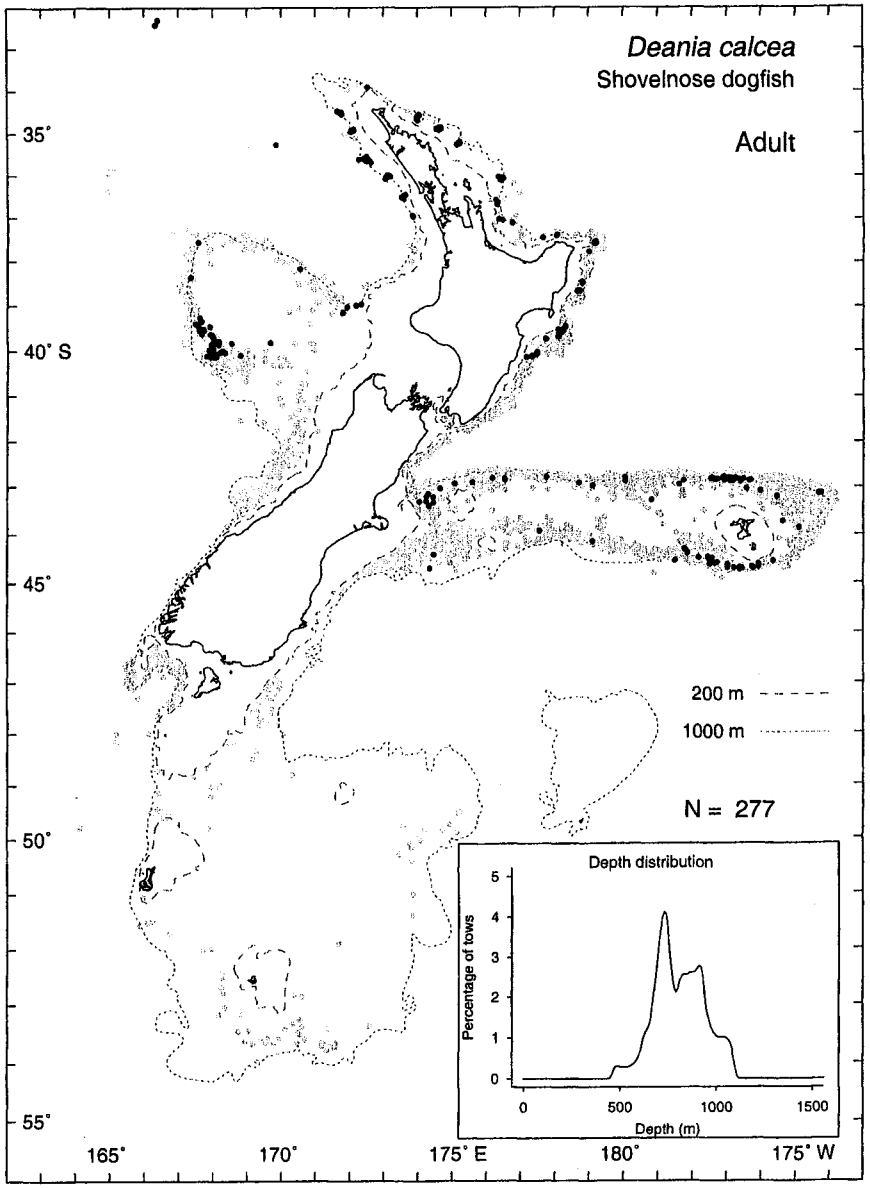

Cyttus traversi
Lookdown dory
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1899
Depth distribution
Percentage of tows
0
5
10
15
20
25
0
500
1000
1500
Depth (m)





Groups i and ii are arbitrary and were determined from length frequency modes.


Deania calcea
Shovelnose dogfish
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 711
Depth distribution
Percentage of tows
0
2
4
6
8
10
0
500
1000
1500
Depth (m)


Deania calcea
Shovelnose dogfish
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 277
Depth distribution
Percentage of tows
0
1
2
3
4
5
0
500
1000
1500
Depth (m)

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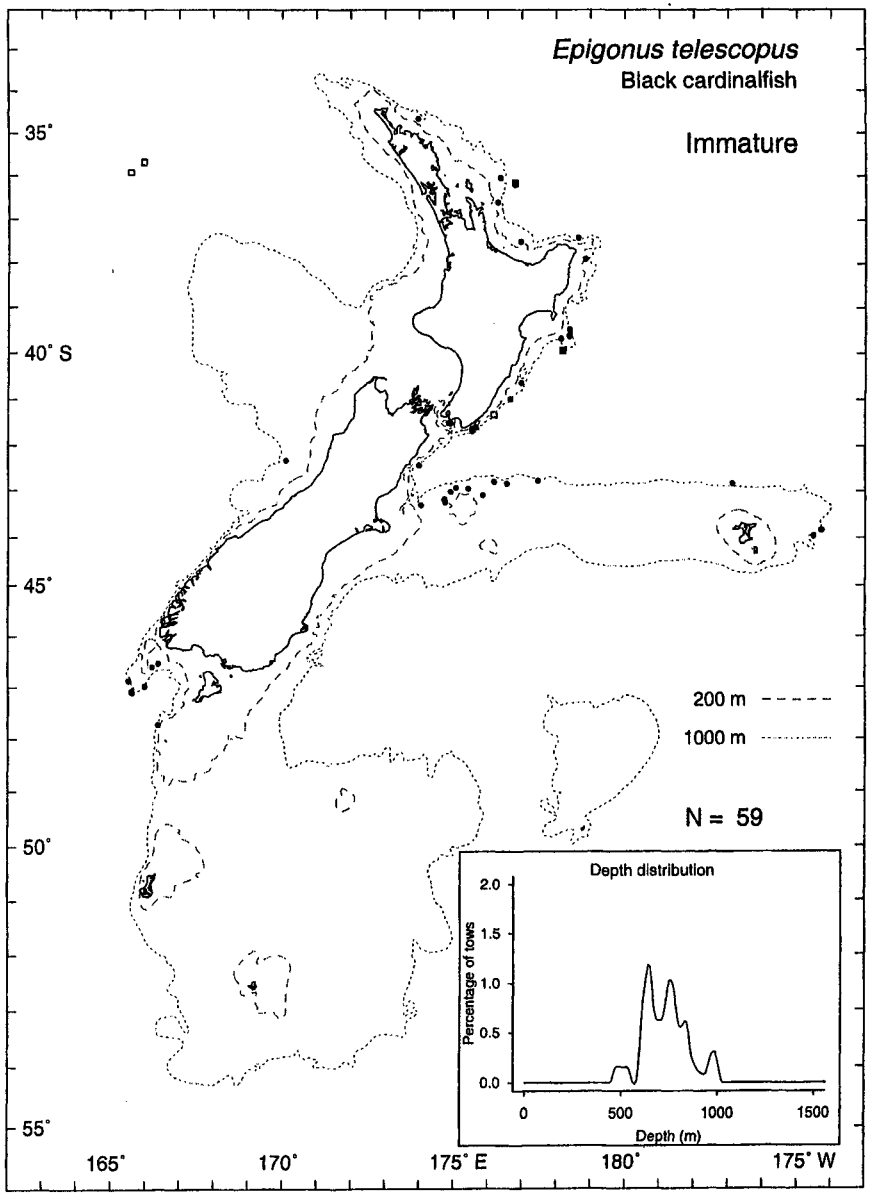
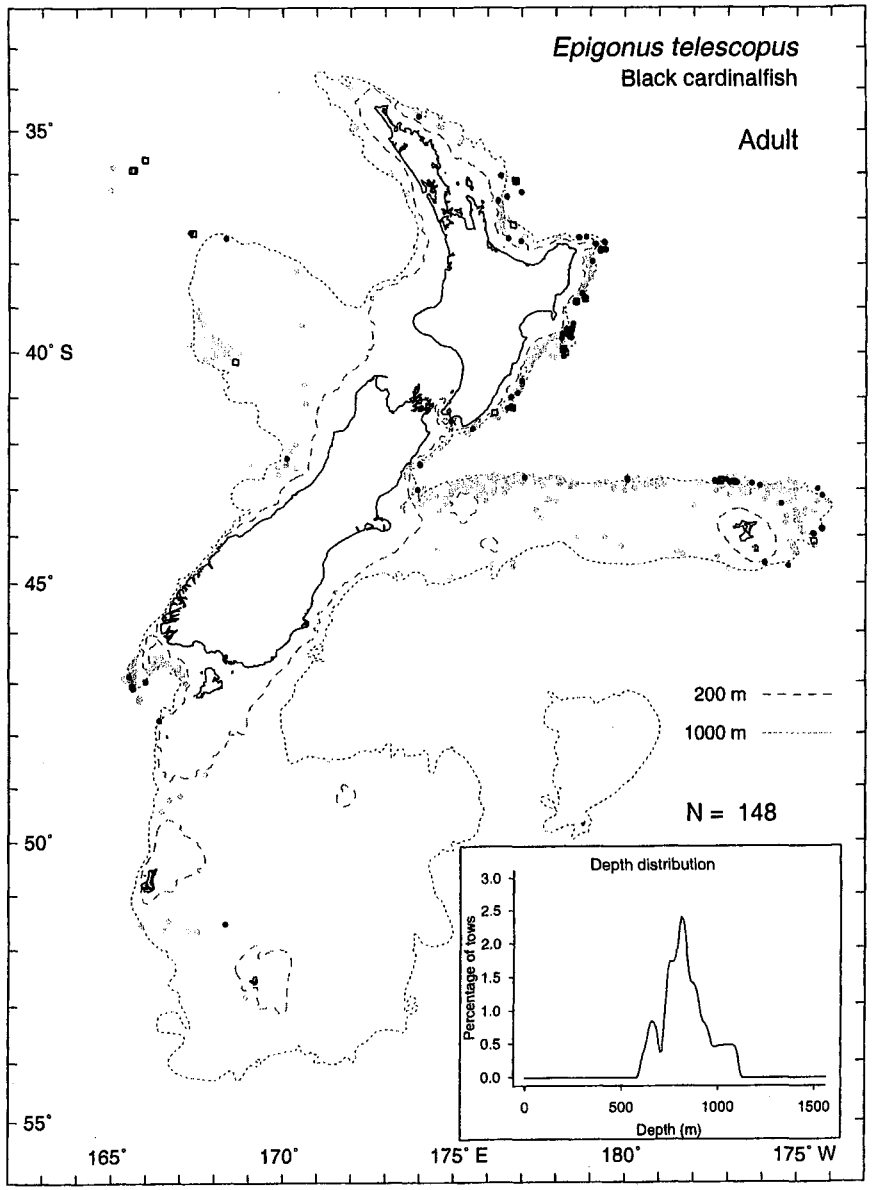
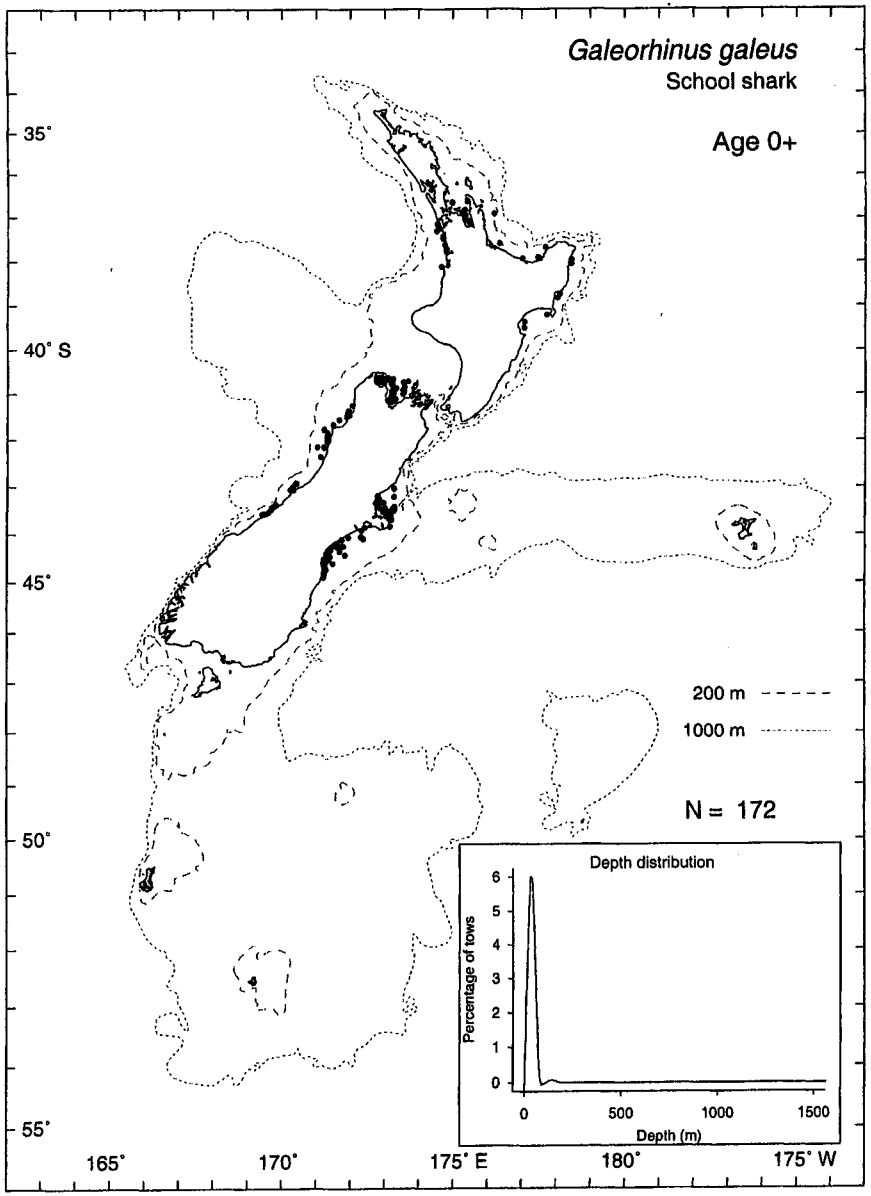
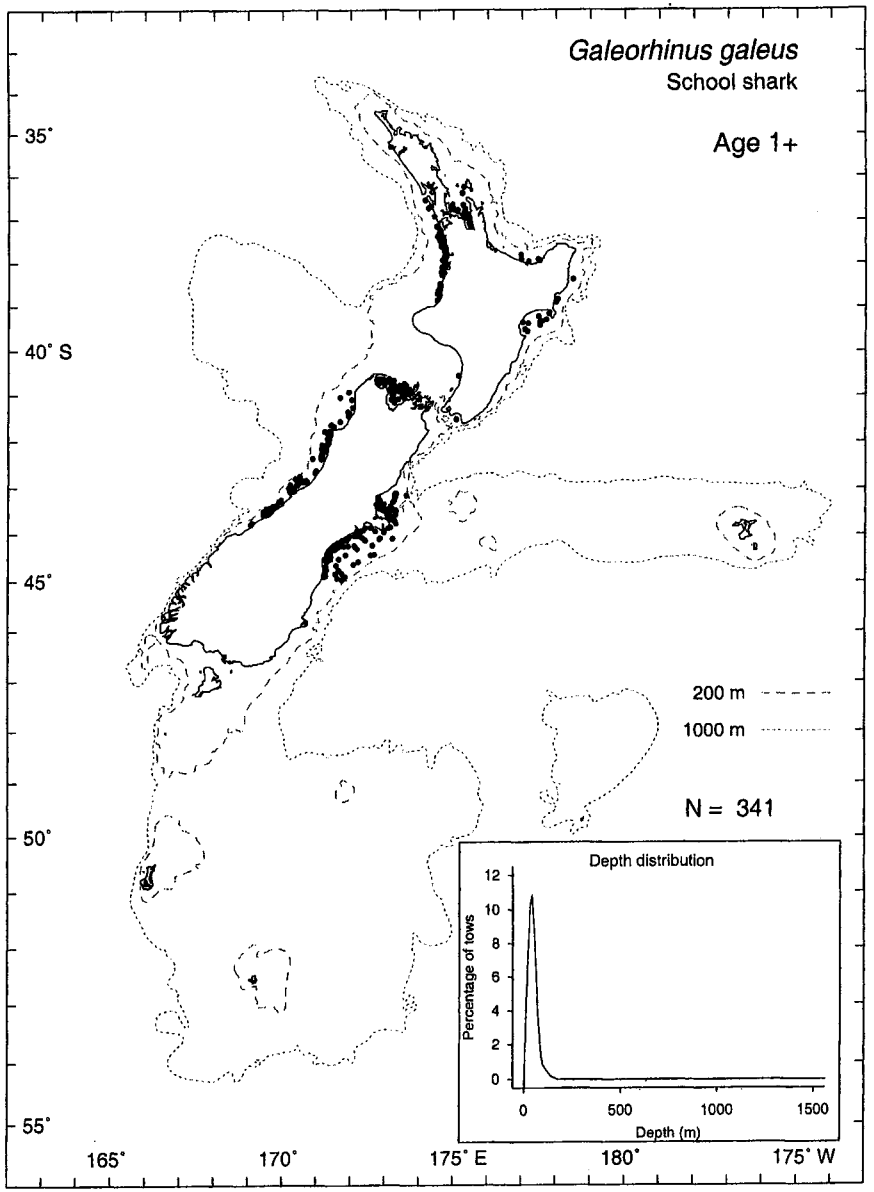
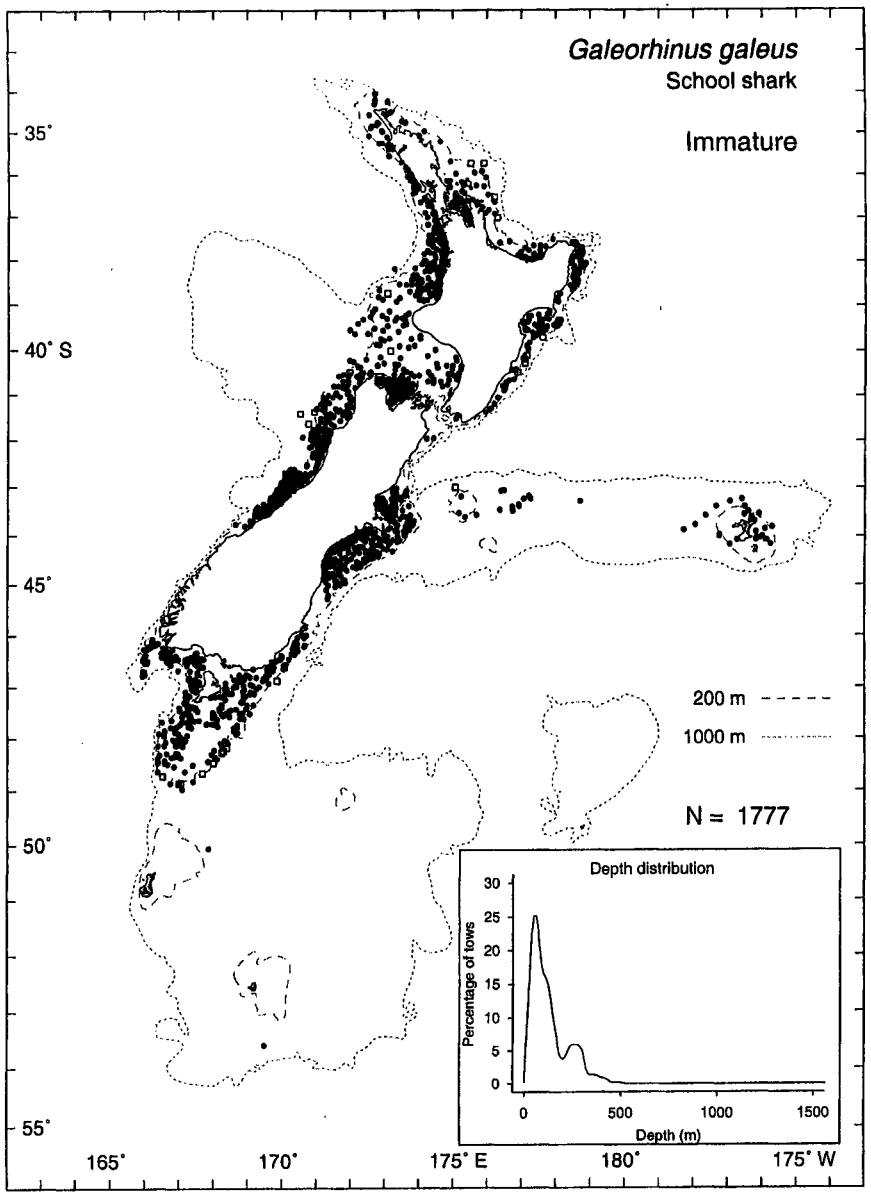


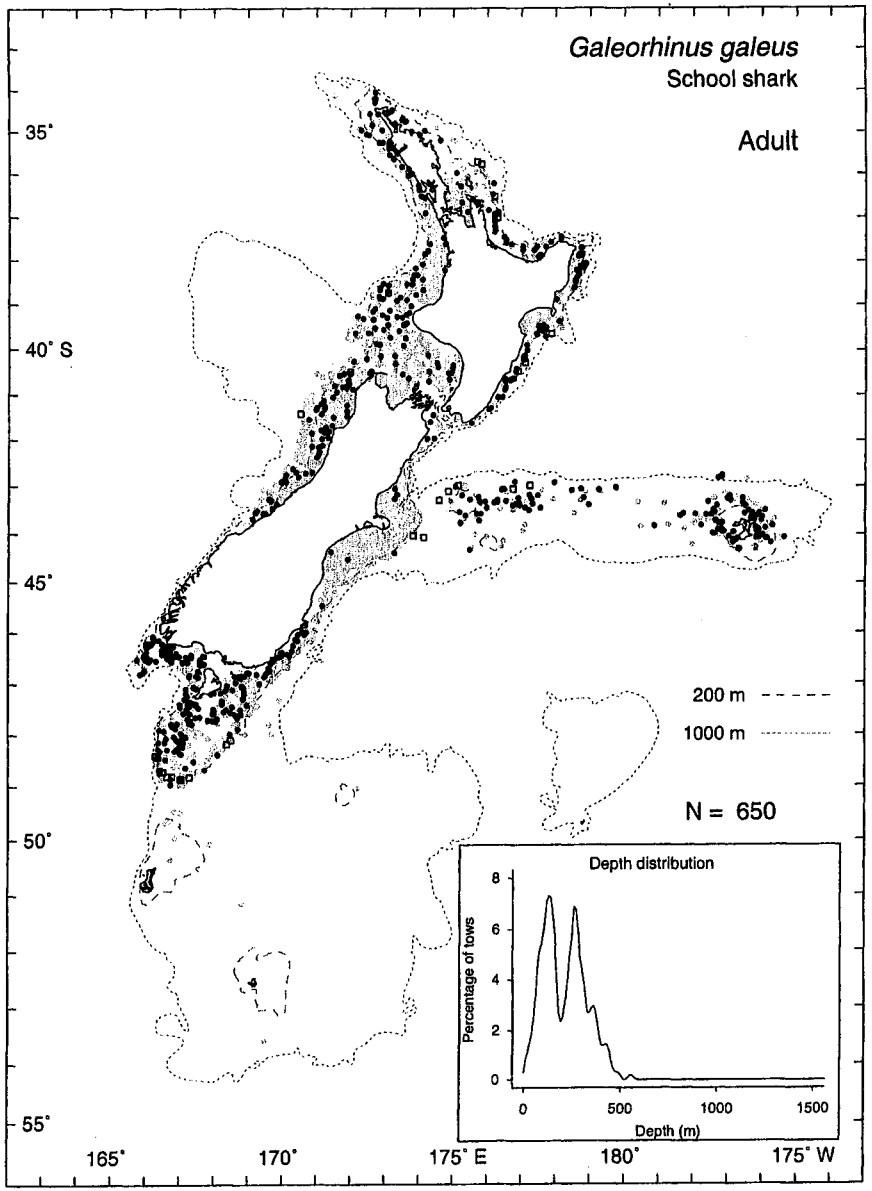


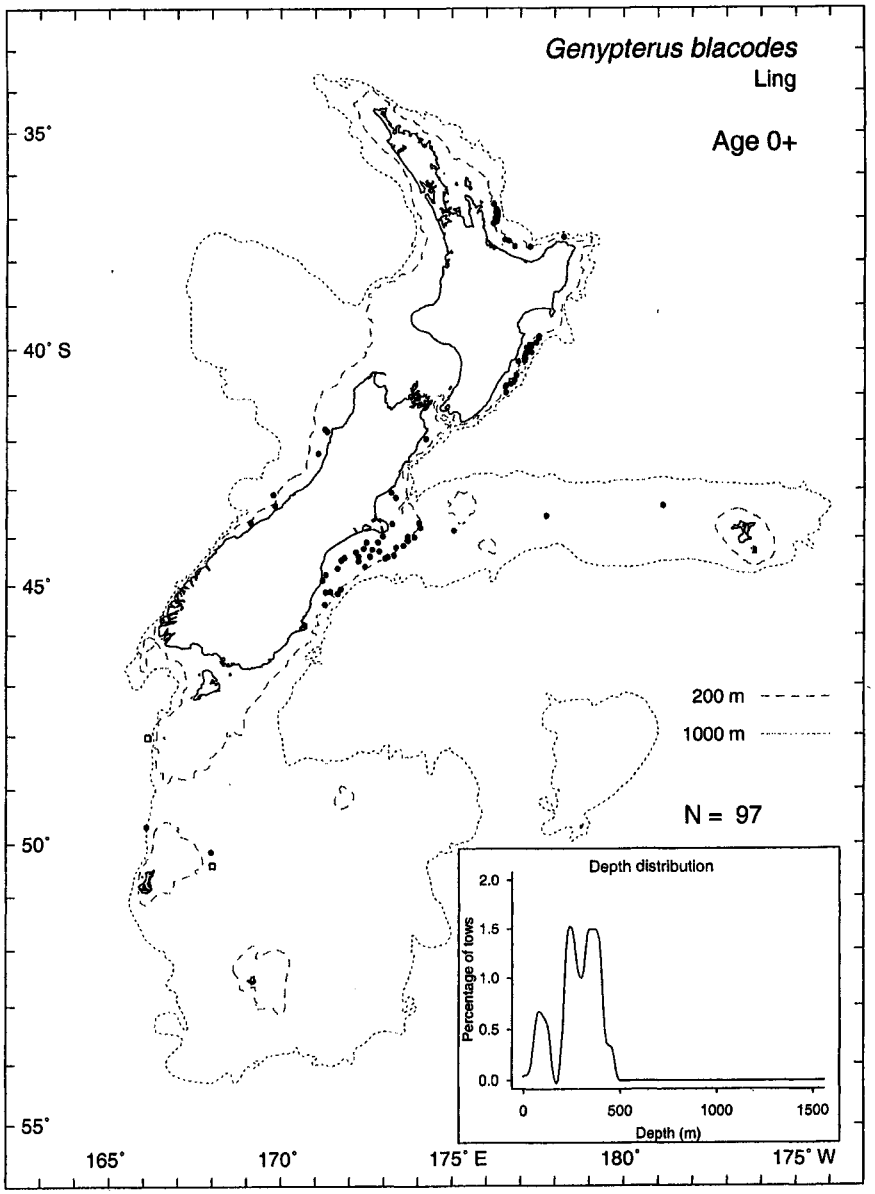
Juvenile plots are not presented for this species.

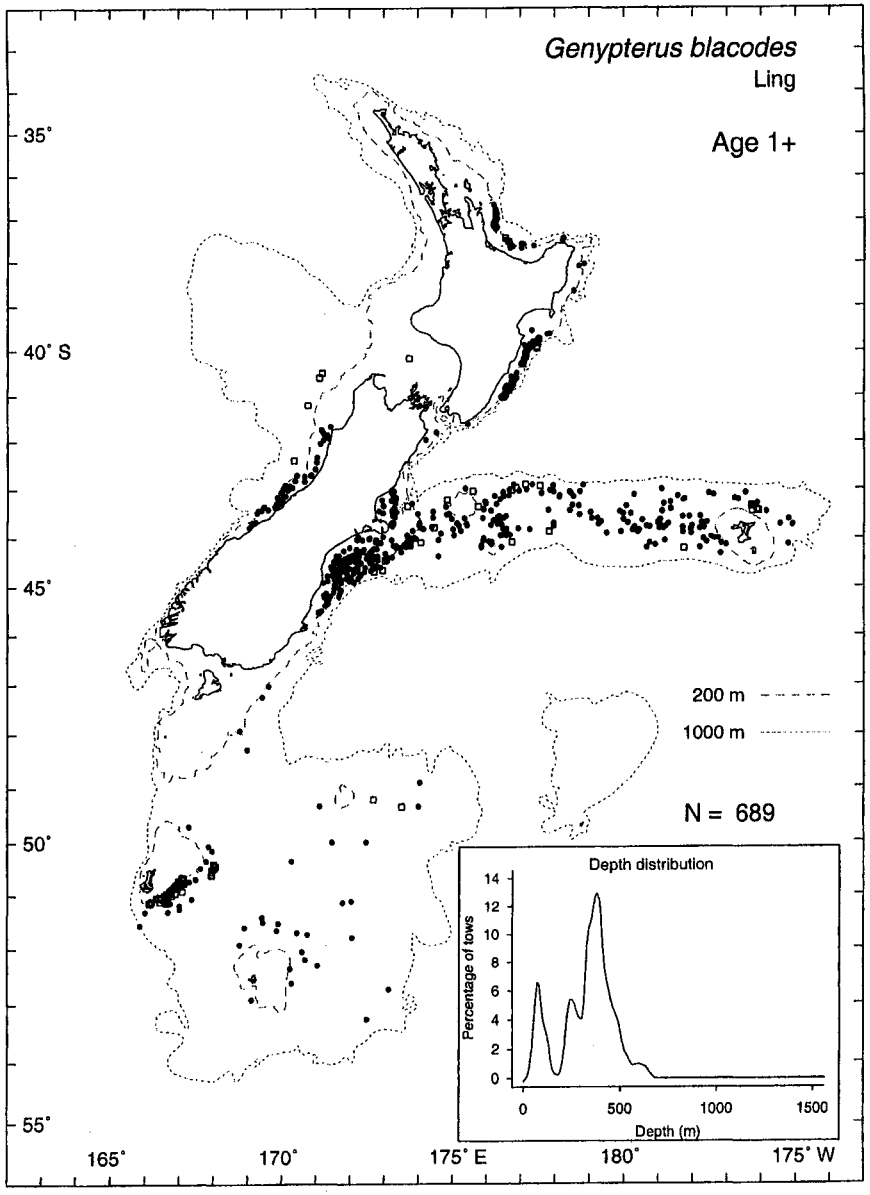

Galeorhinus galeus
School shark
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 172
Depth distribution
Percentage of tows
0
1
2
3
4
5
6
0
500
1000
1500
Depth (m)

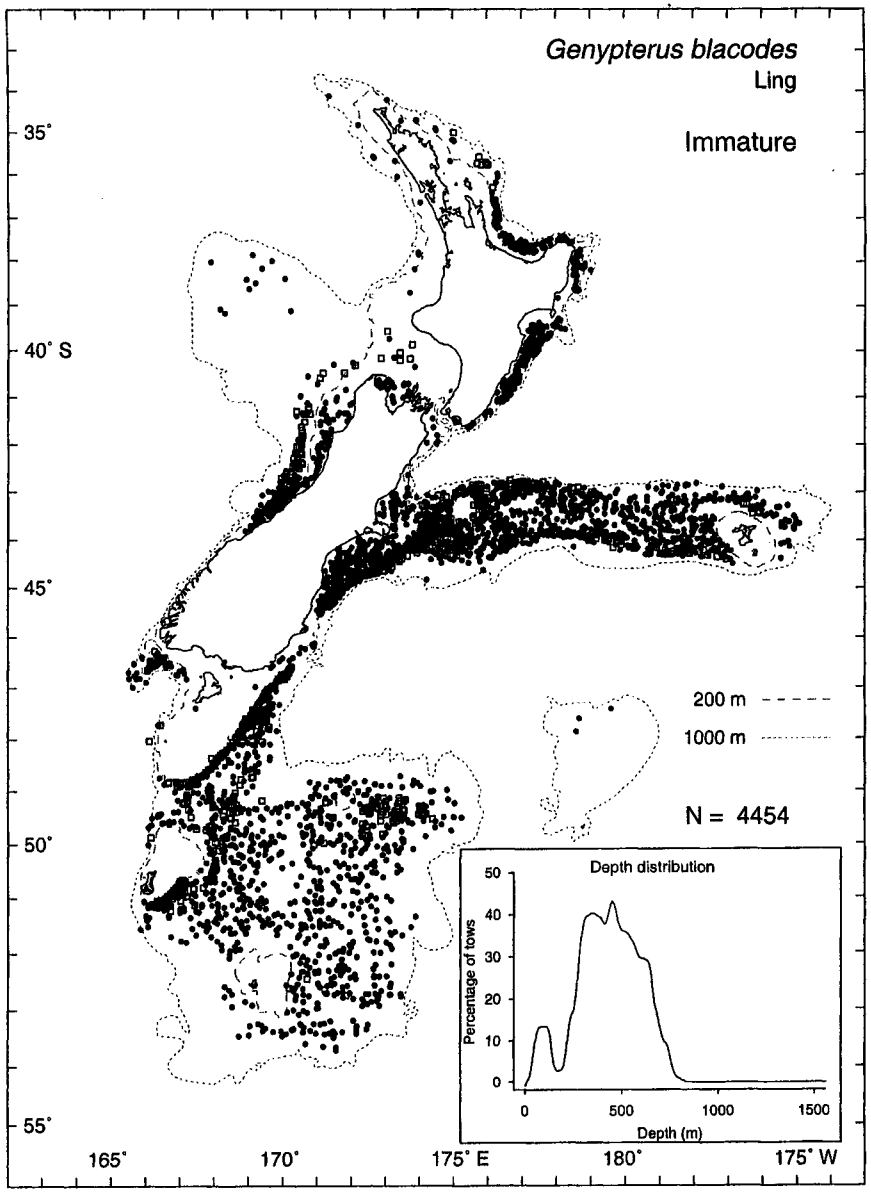

Galeorhinus galeus
School shark
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 341
Depth distribution
Percentage of tows
0
2
4
6
8
10
12
0
500
1000
1500
Depth (m)

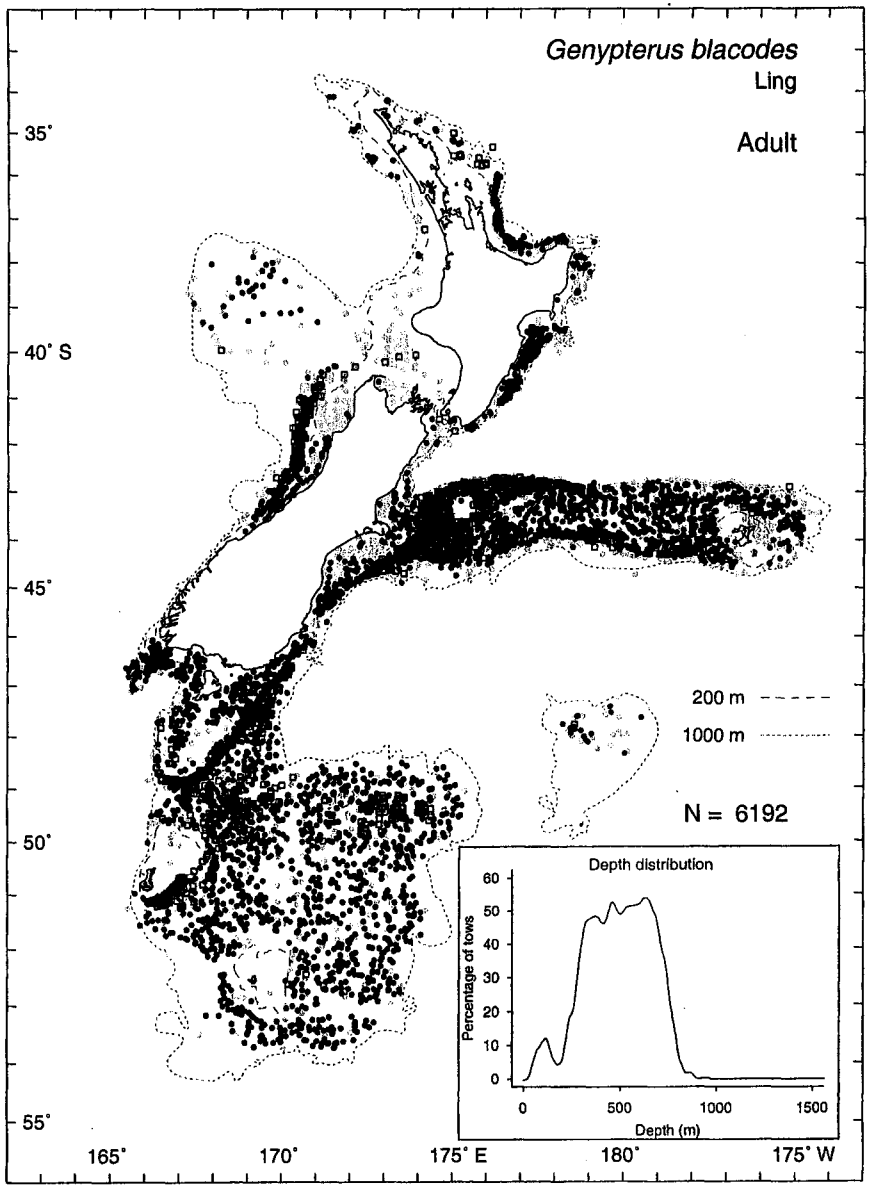

Galeorhinus galeus
School shark
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1777
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)


Galeorhinus galeus
School shark
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 650
Depth distribution
Percentage of tows
8
6
4
2
0
0
500
1000
1500
Depth (m)


Genypterus blacodes
Ling
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 97
Depth distribution
Percentage of tows
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)


Genypterus blacodes
Ling
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 689
Depth distribution
Percentage of tows
14
12
10
8
6
4
2
0
0
500
1000
1500
Depth (m)


Genypterus blacodes
Ling
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 4454
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
10
20
30
40
50


Genypterus blacodes
Ling
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 6192
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
10
20
30
40
50
60

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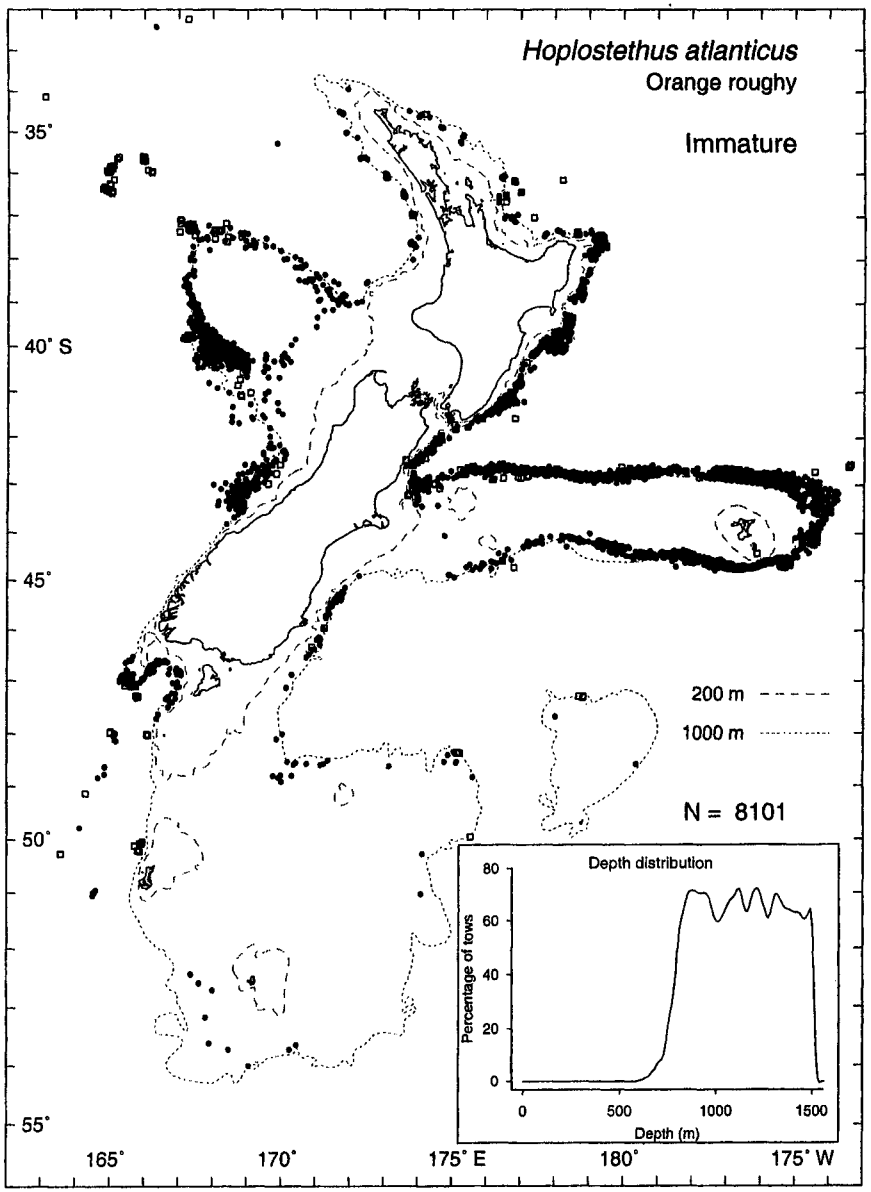
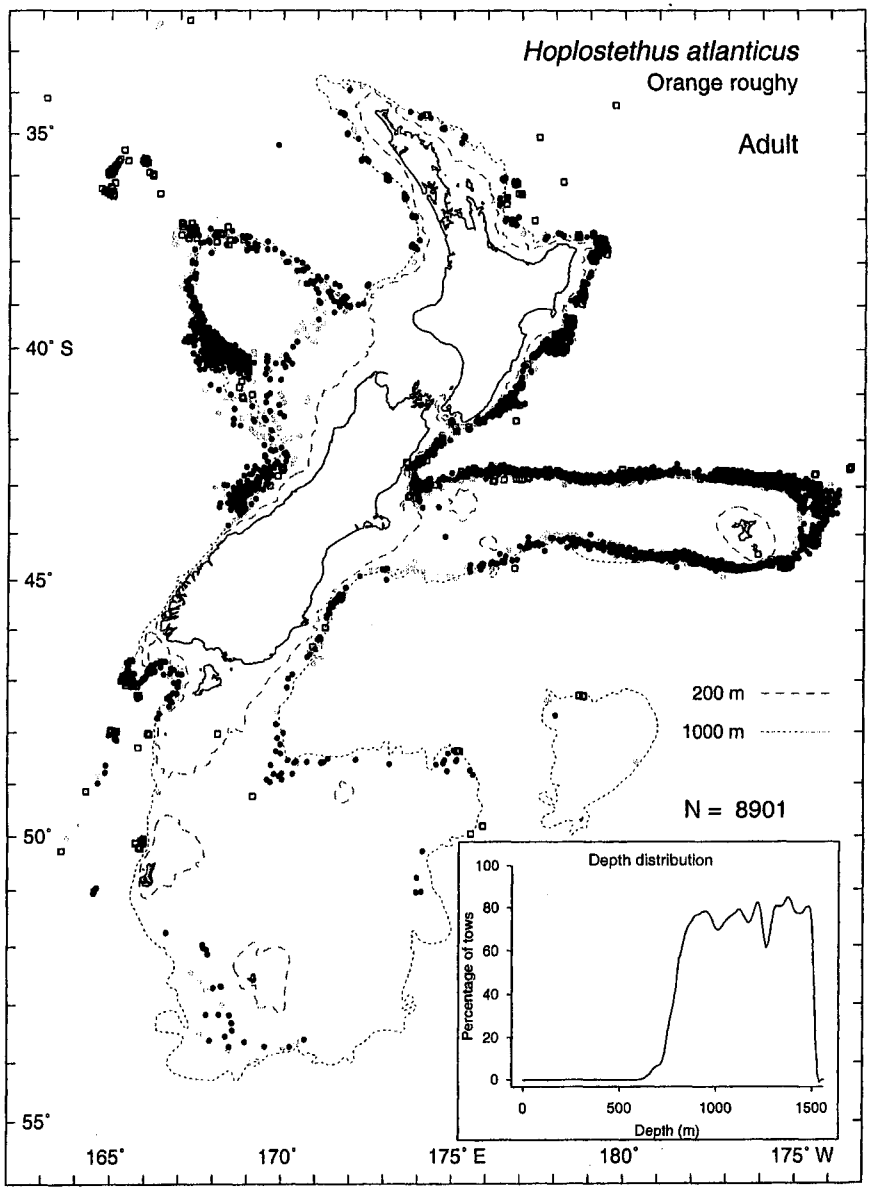
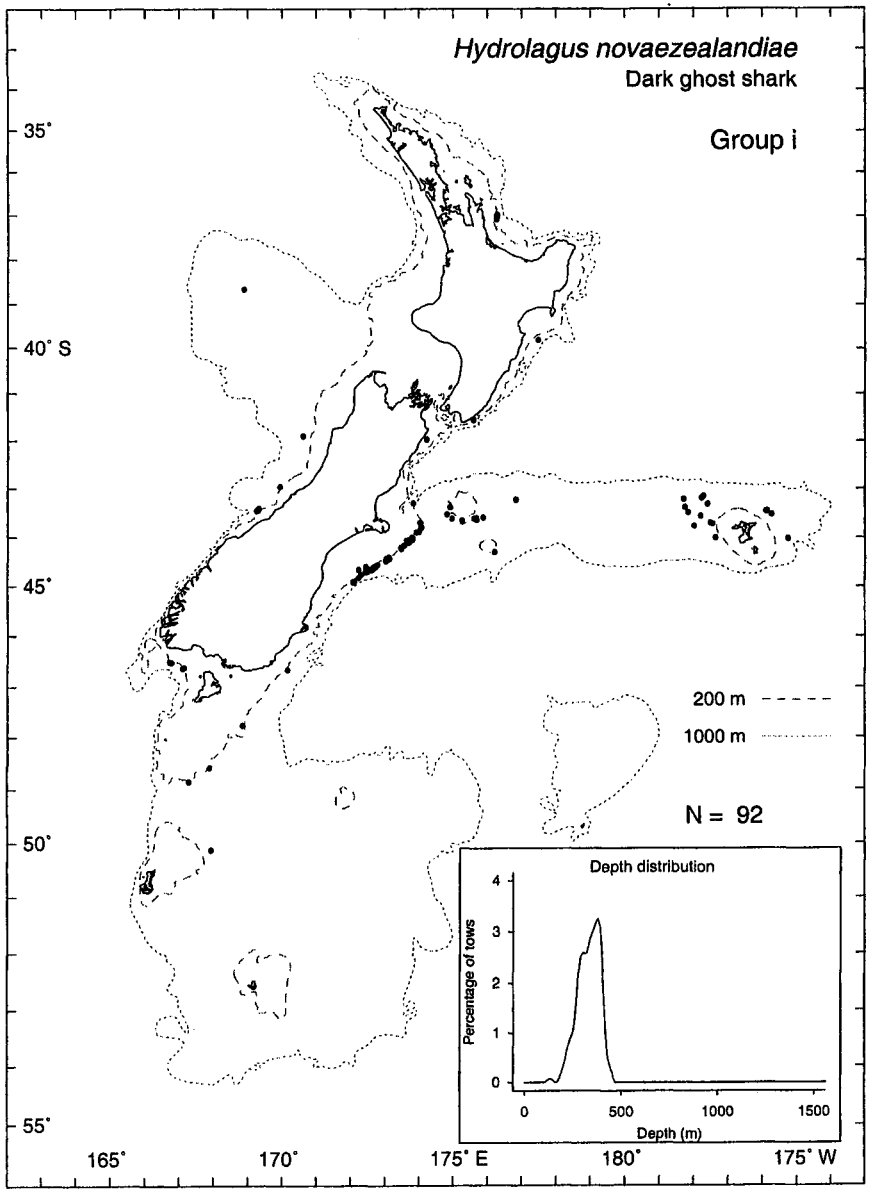
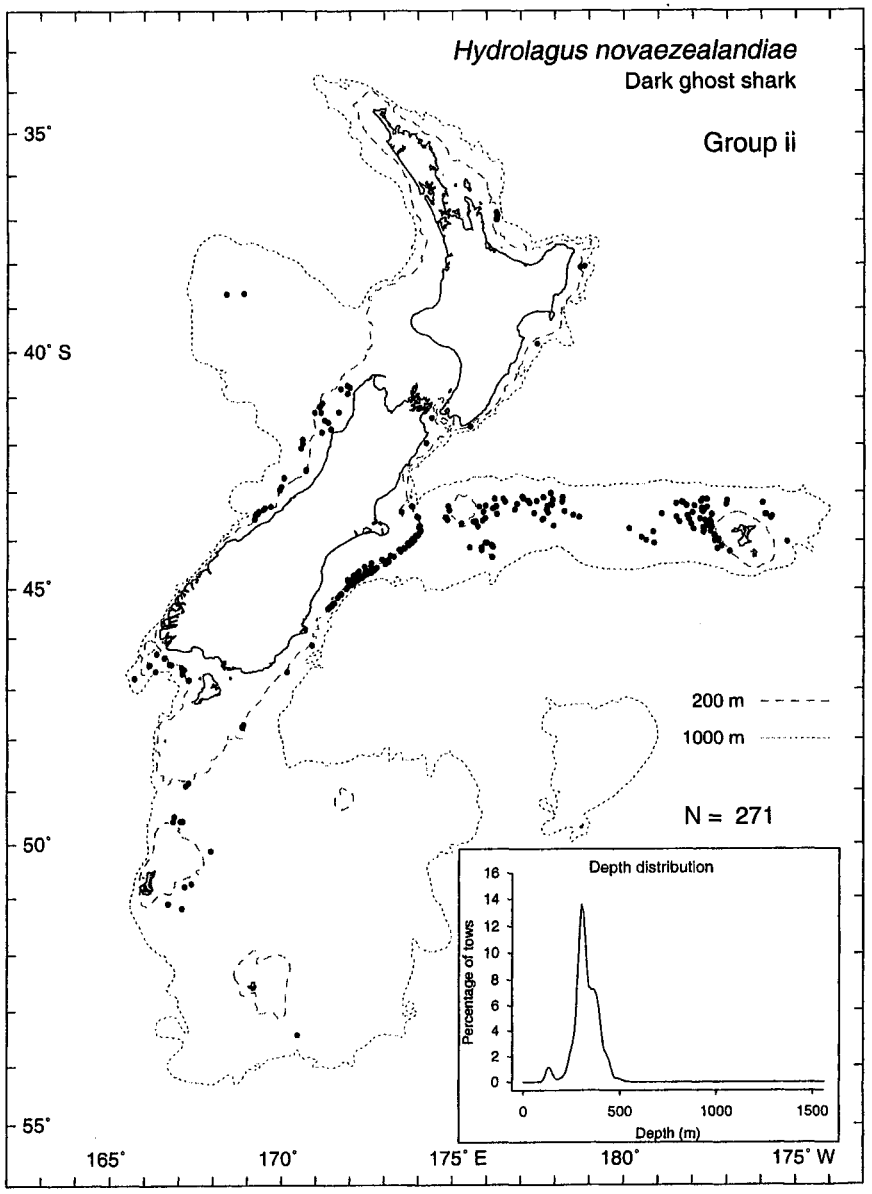


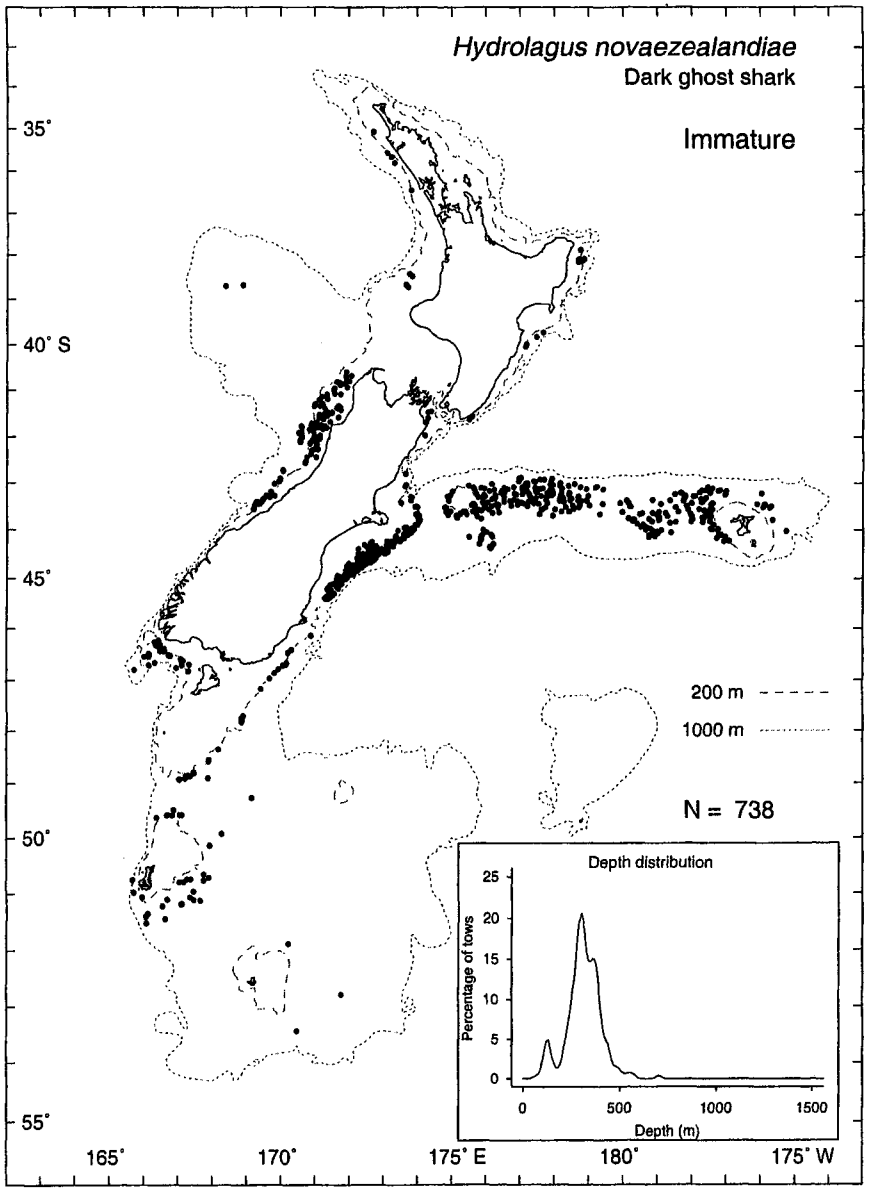


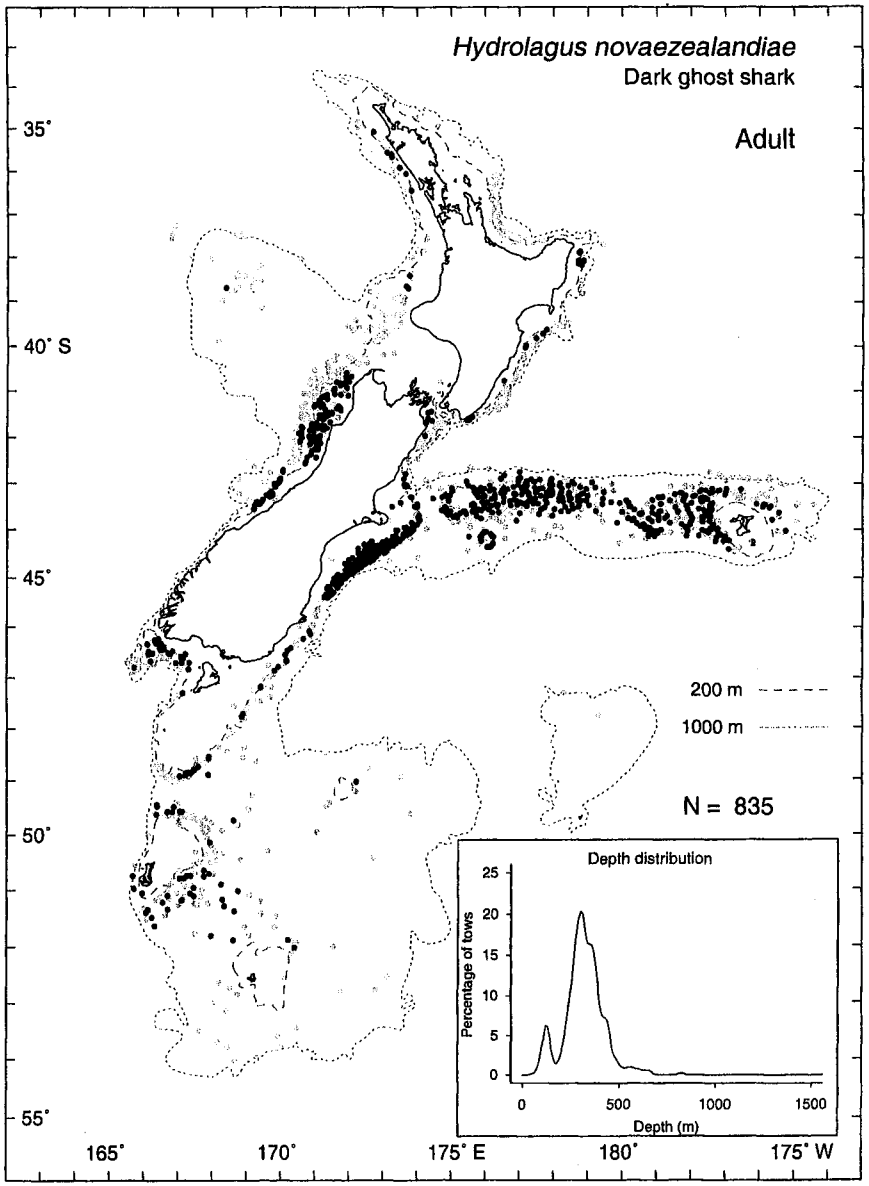
Juvenile plots are not presented for this species.

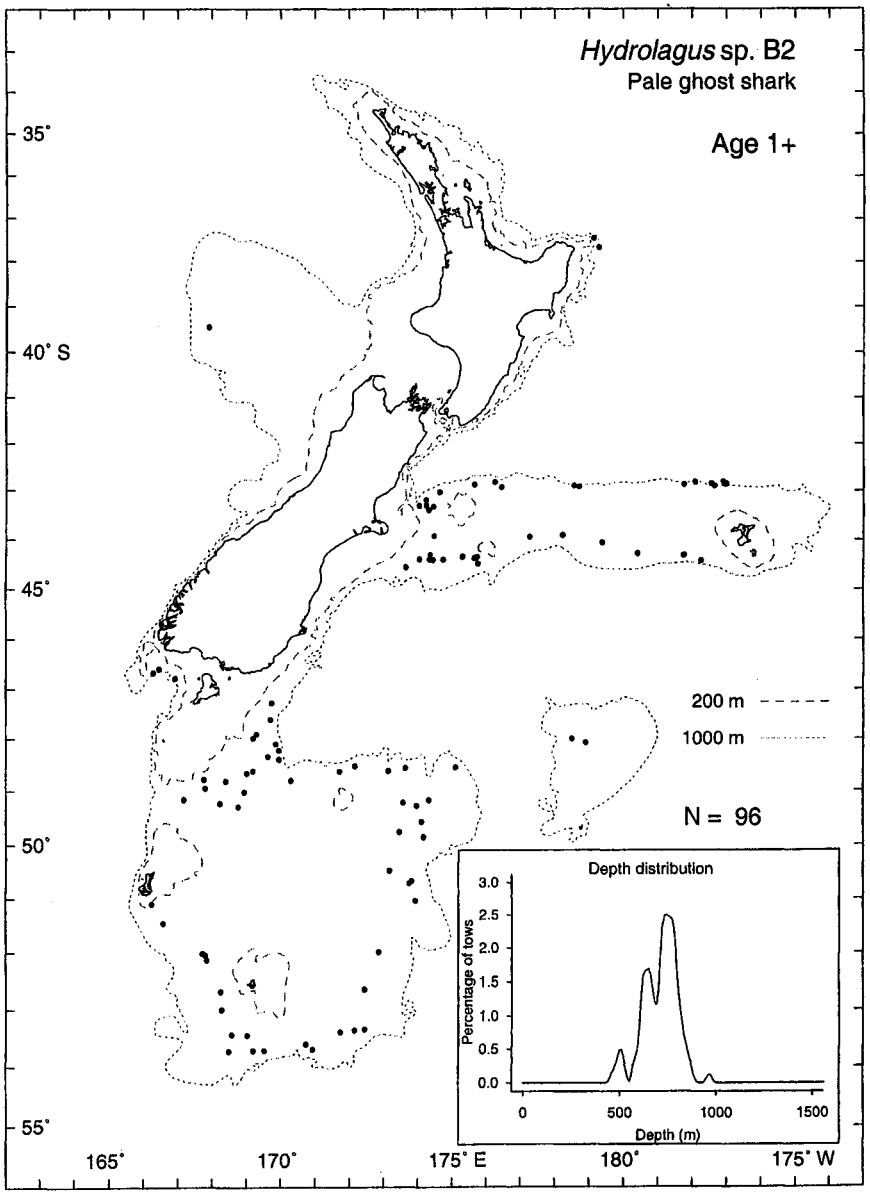


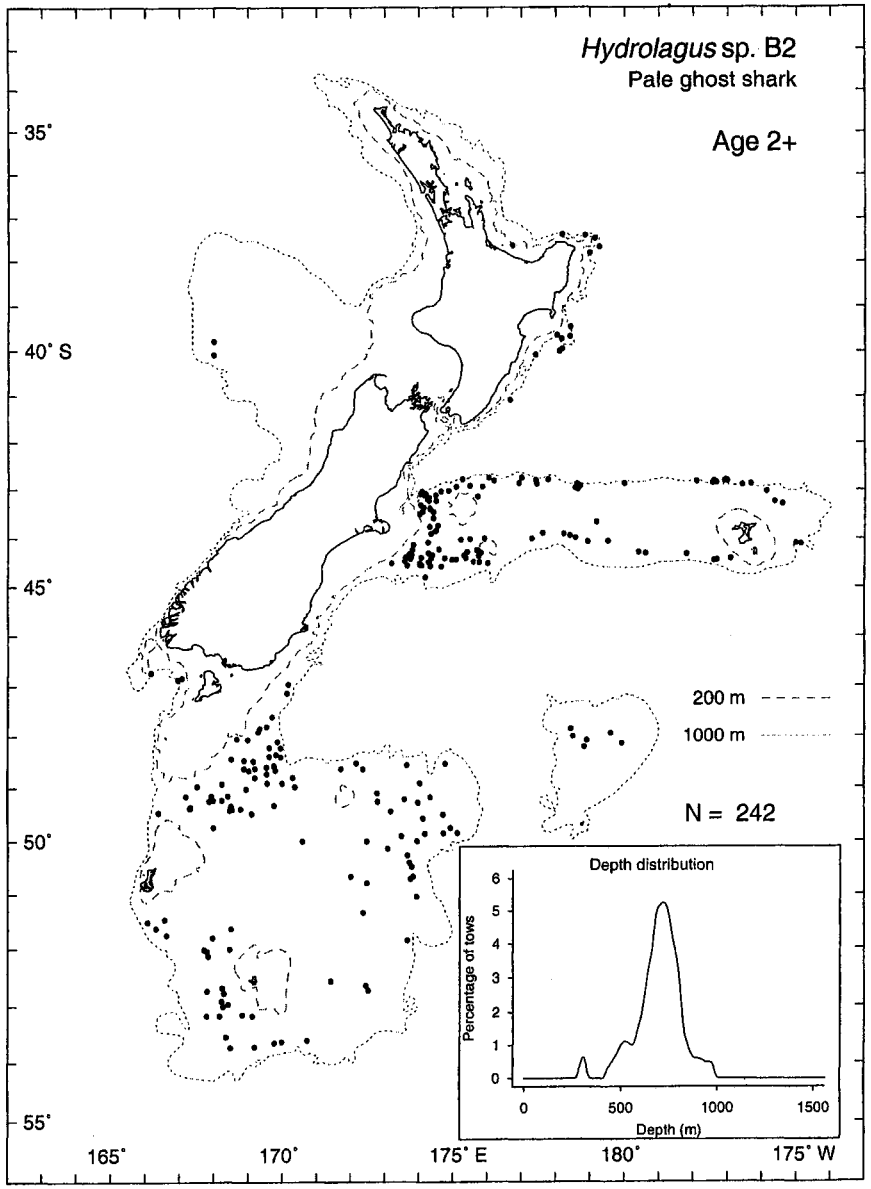


Groups i and ii are arbitrary and each may represent several year classes.

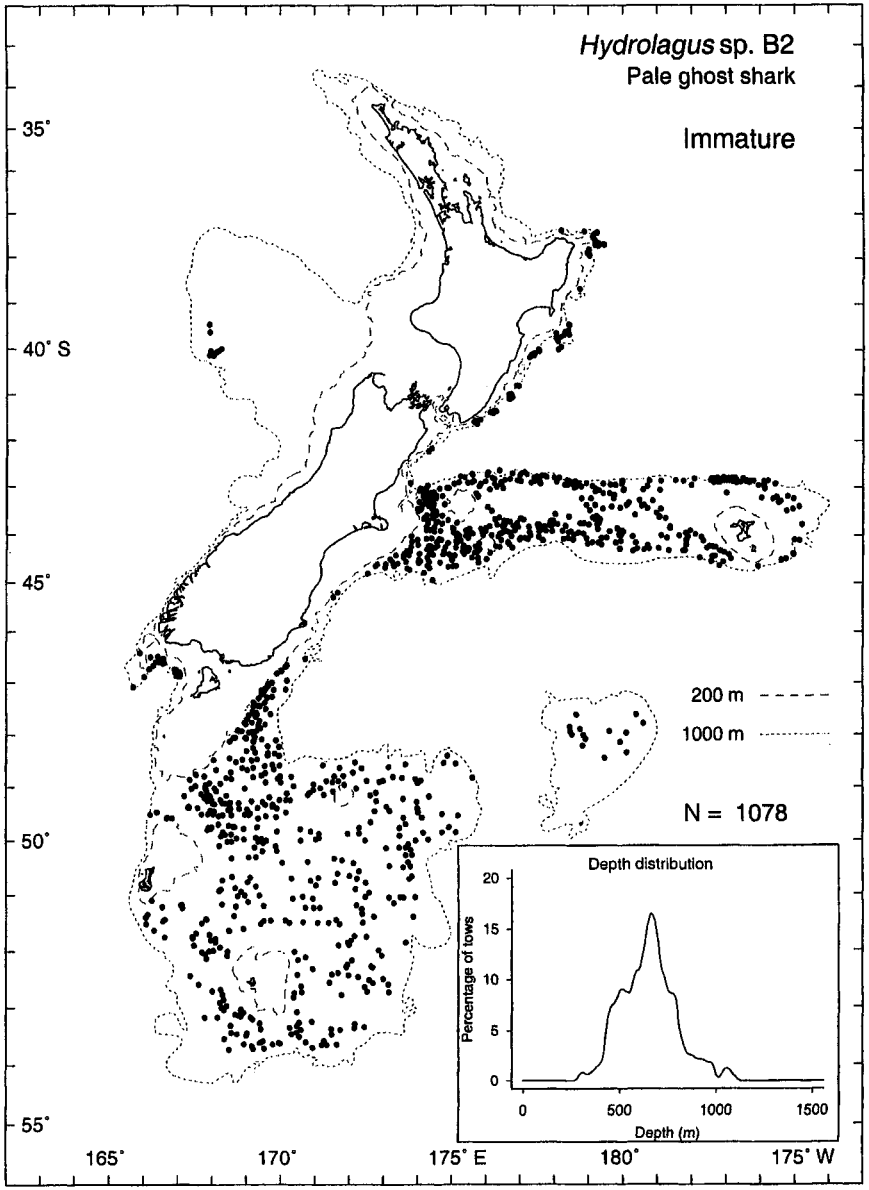

Hydrolagus novaezealandiae
Dark ghost shark
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 738
Depth distribution
Percentage of tows
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

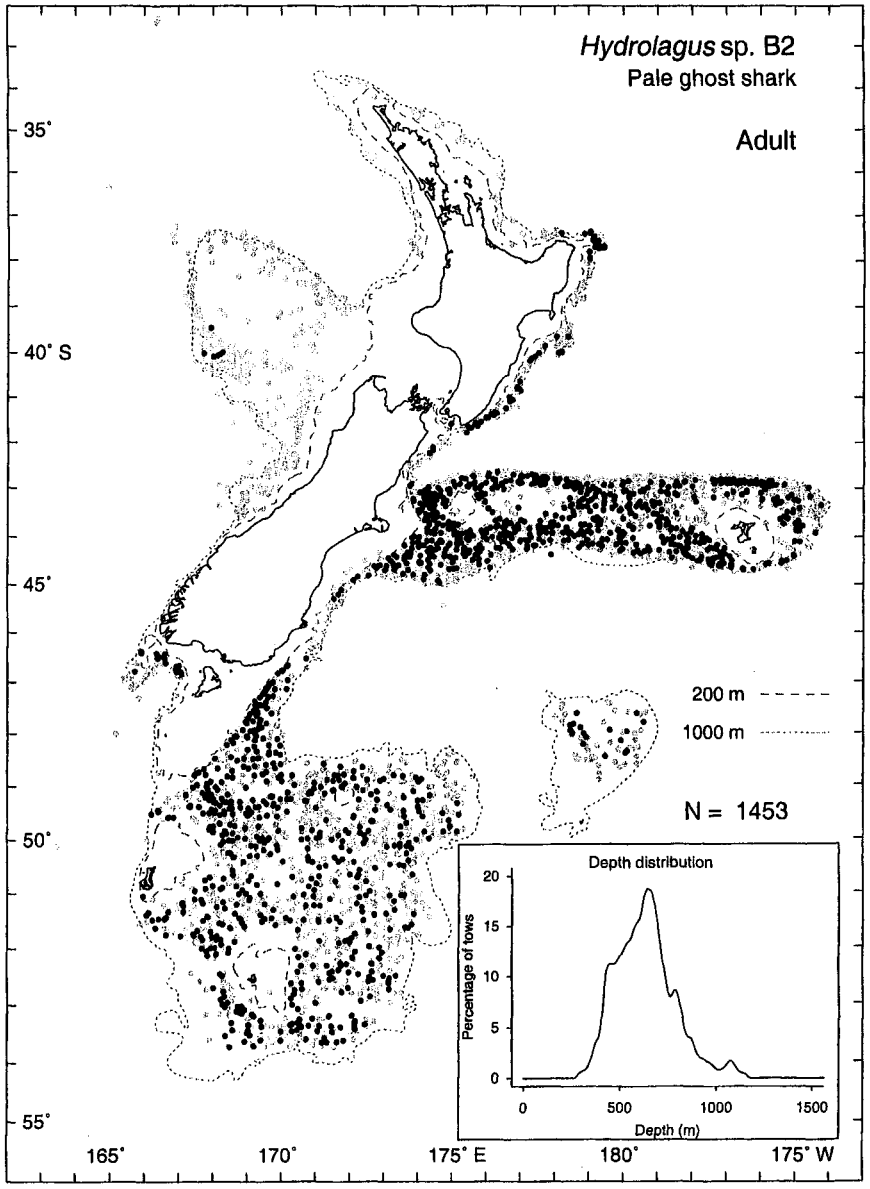

Hydrolagus novaezealandiae
Dark ghost shark
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 835
Depth distribution
Percentage of tows
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

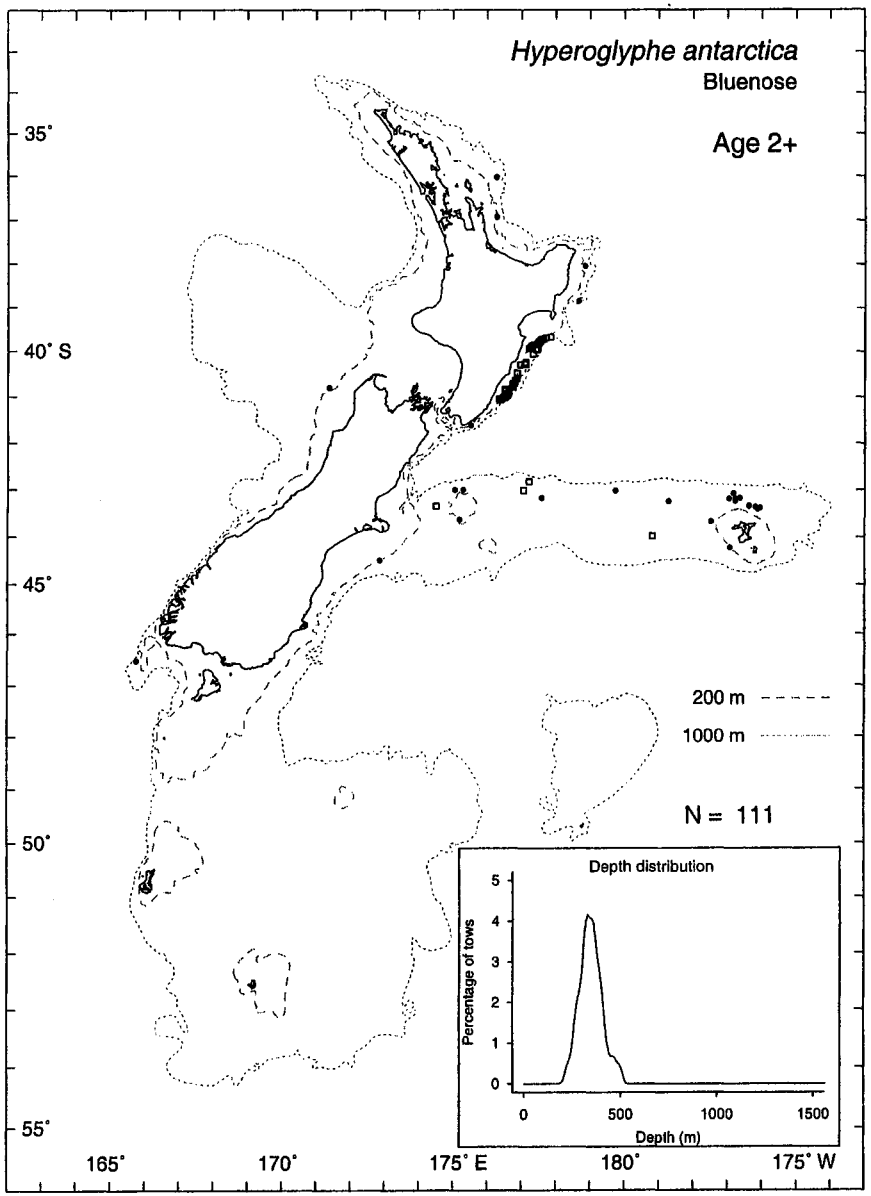


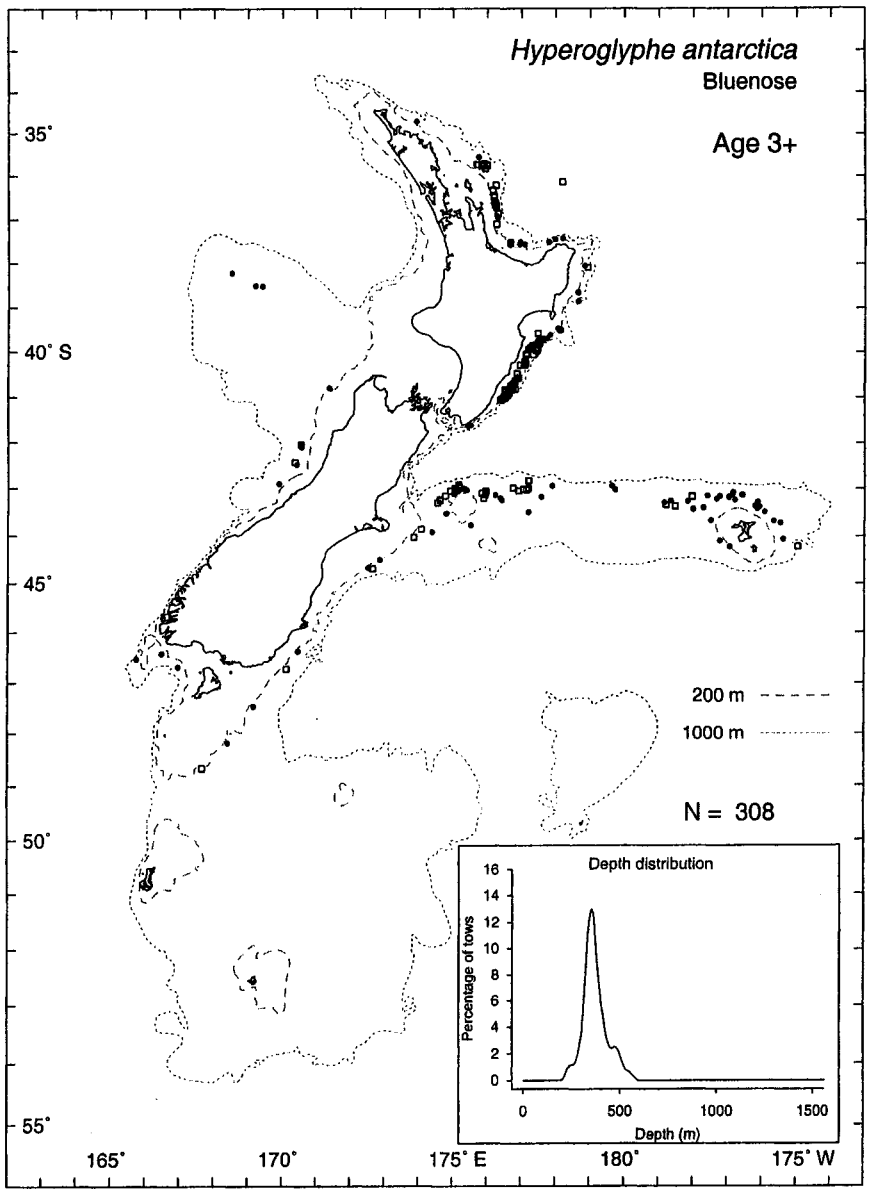


Groups i and ii are arbitrary and each may represent several year classes.

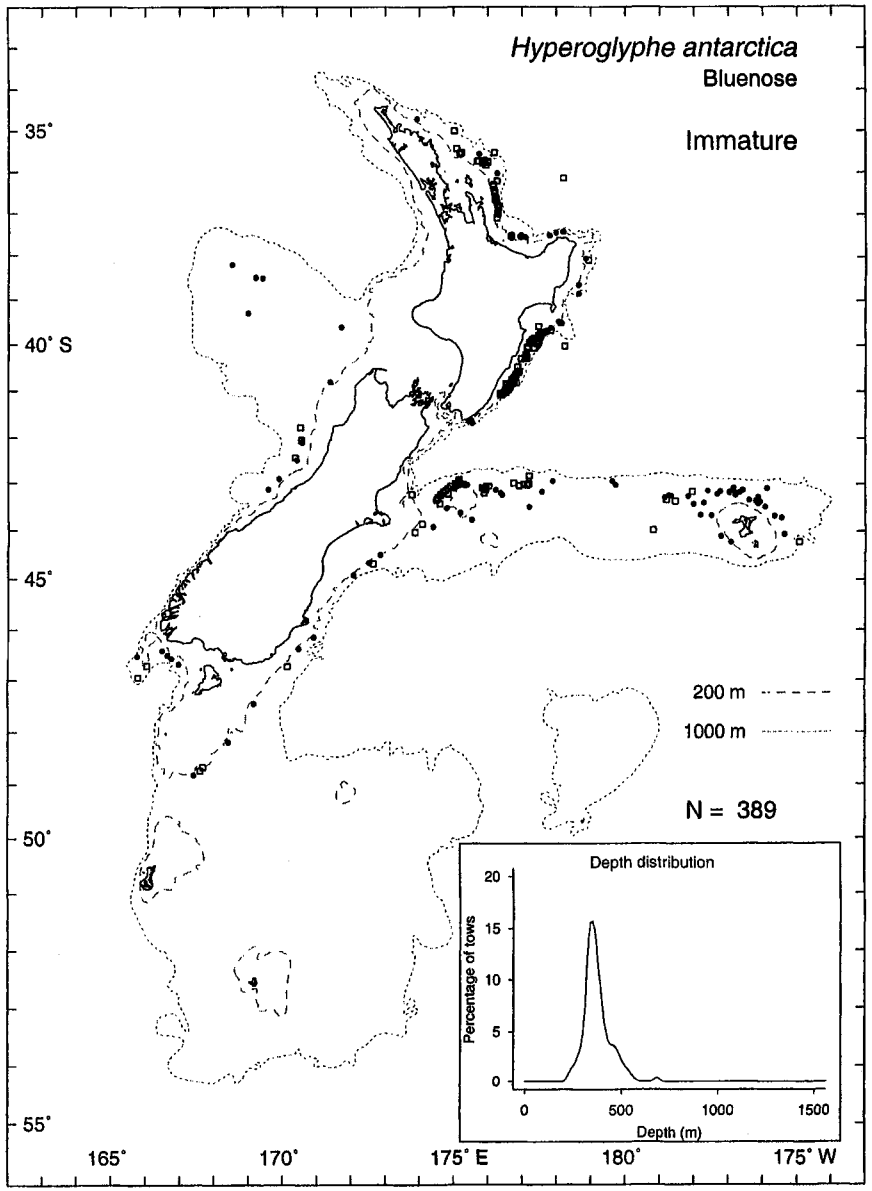

Hydrolagus sp. B2
Pale ghost shark
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1078
Depth distribution
Percentage of tows
0
5
10
15
20
0
500
1000
1500
Depth (m)

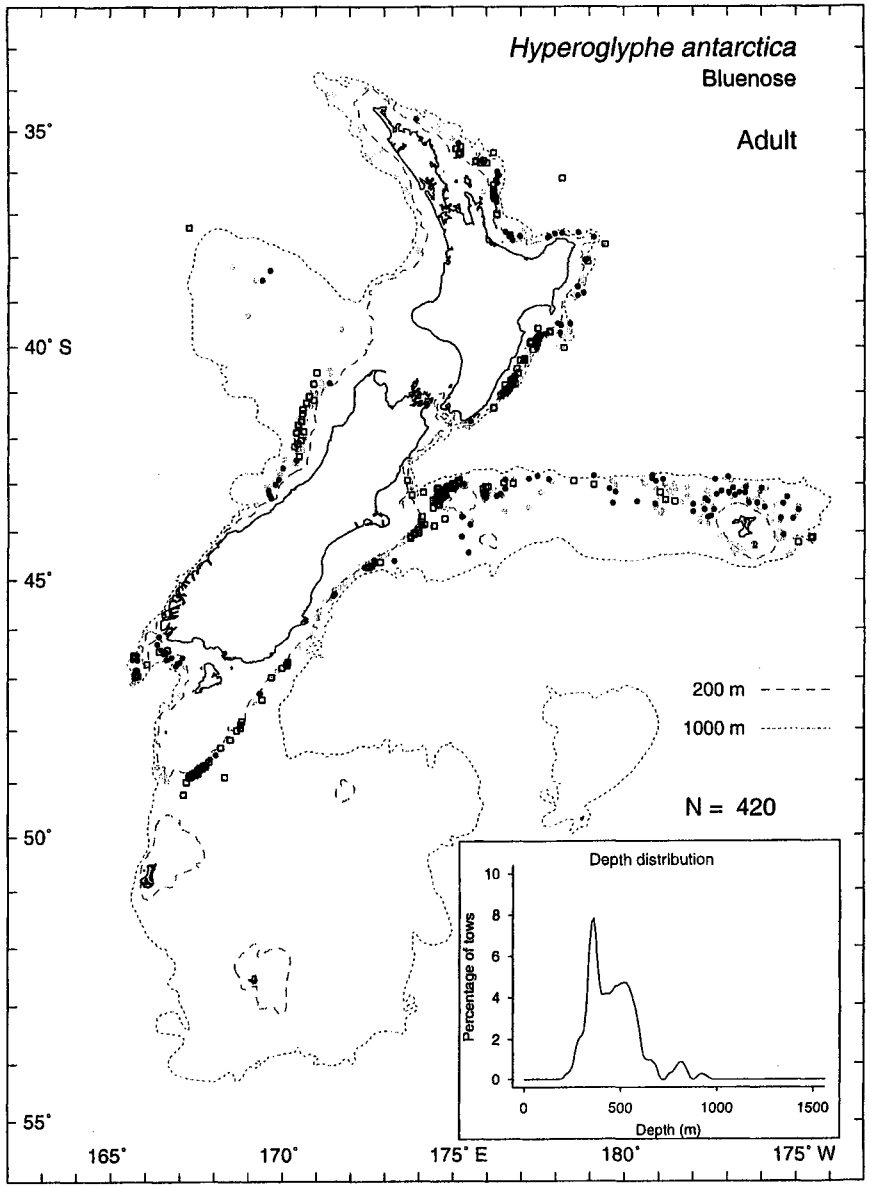

Hydrolagus sp. B2
Pale ghost shark
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1453
Depth distribution
Percentage of tows
0
5
10
15
20
0
500
1000
1500
Depth (m)

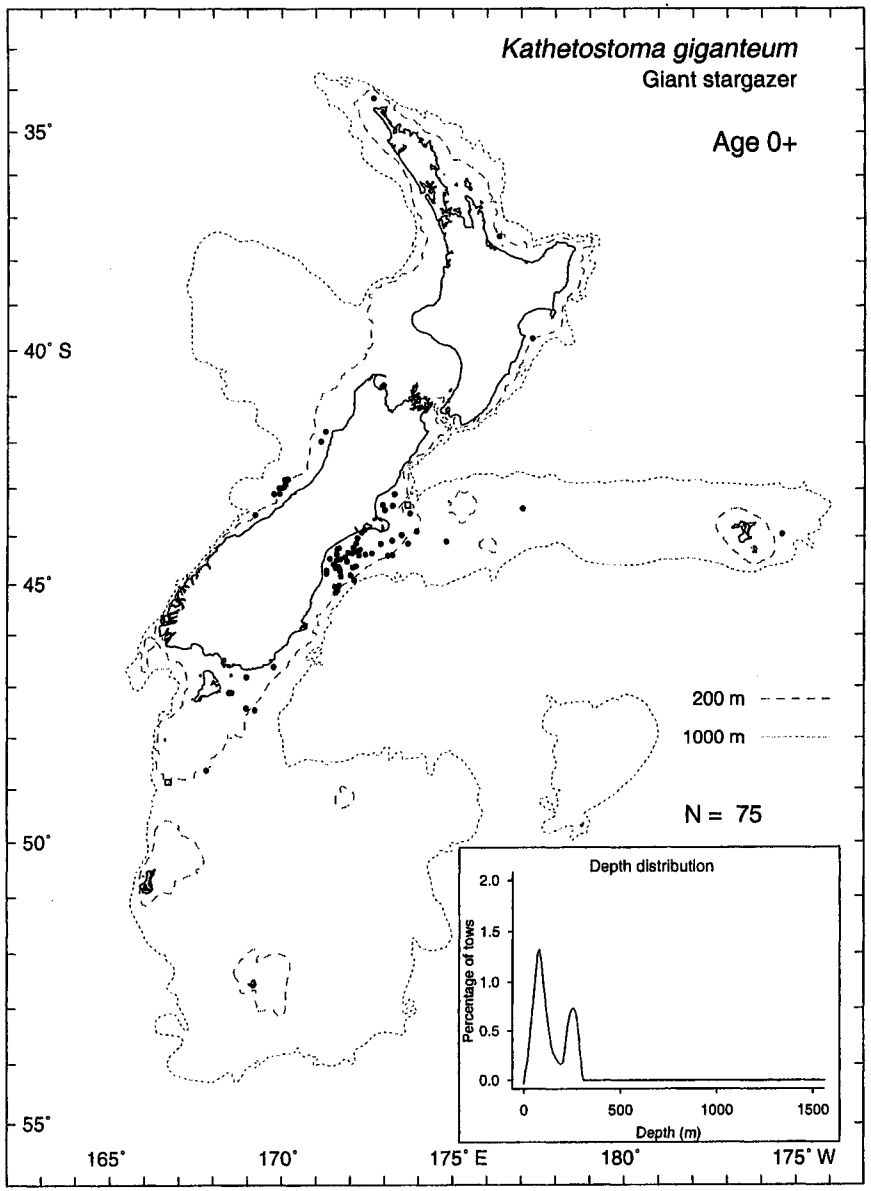


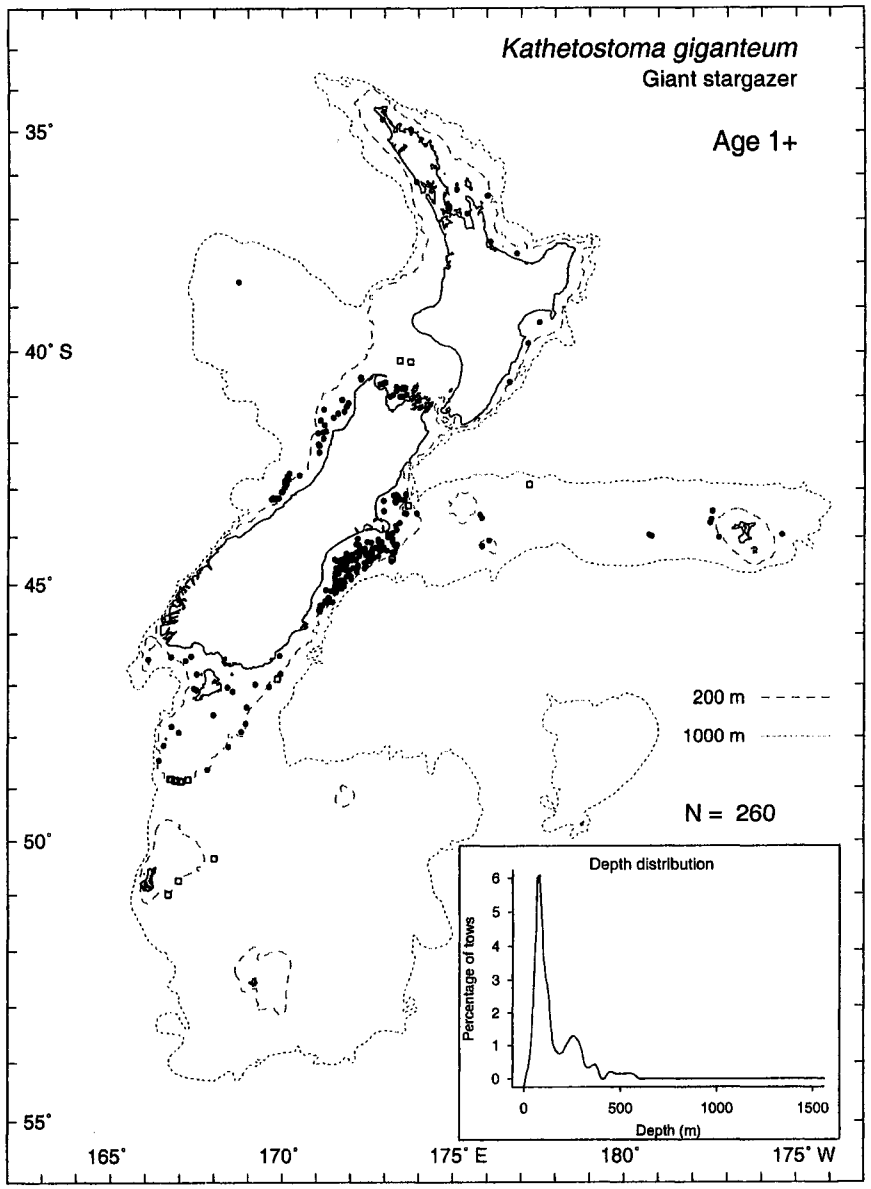


Fish younger than age 2 (about 47 cm) are not caught on the bottom.

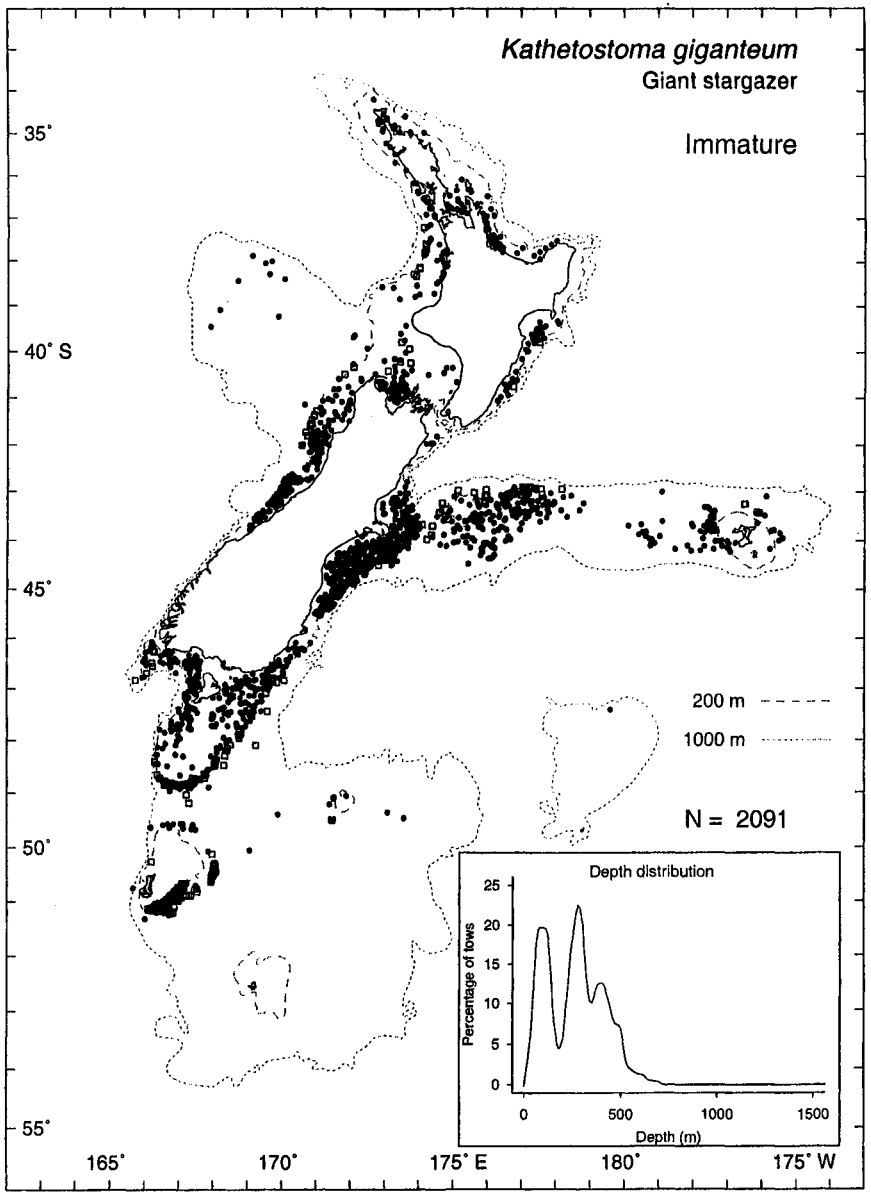

Hyperoglyphe antarctica
Bluenose
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 389
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
500
1000
1500

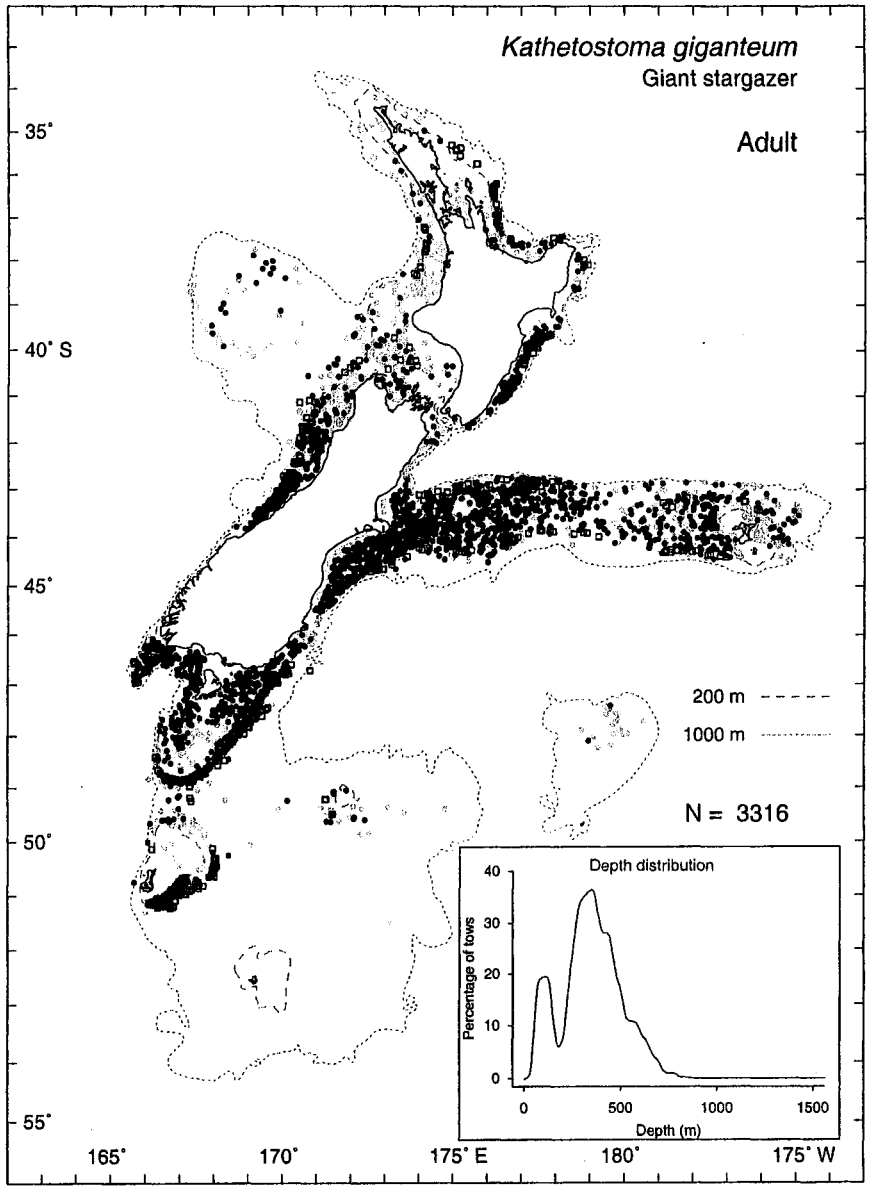

Hyperoglyphe antarctica
Bluenose
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 420
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
500
1000
1500

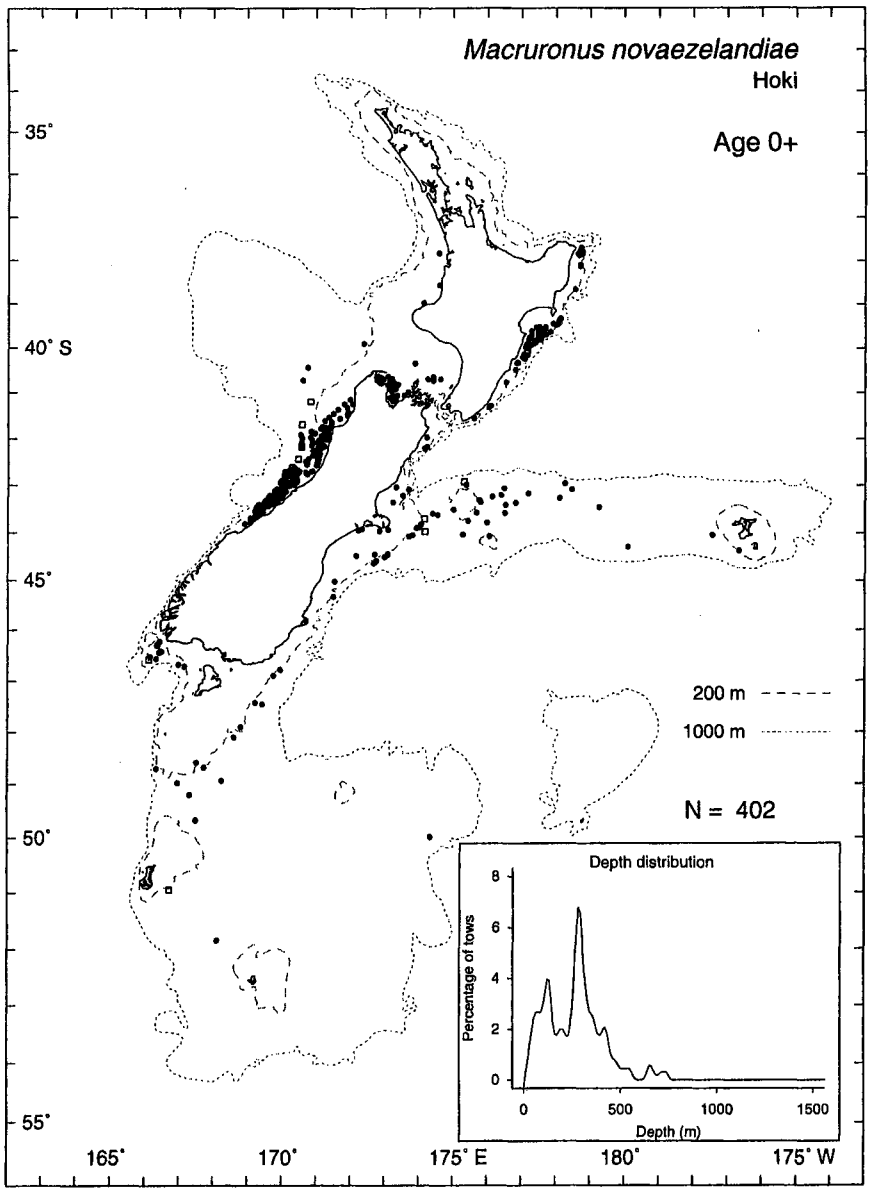


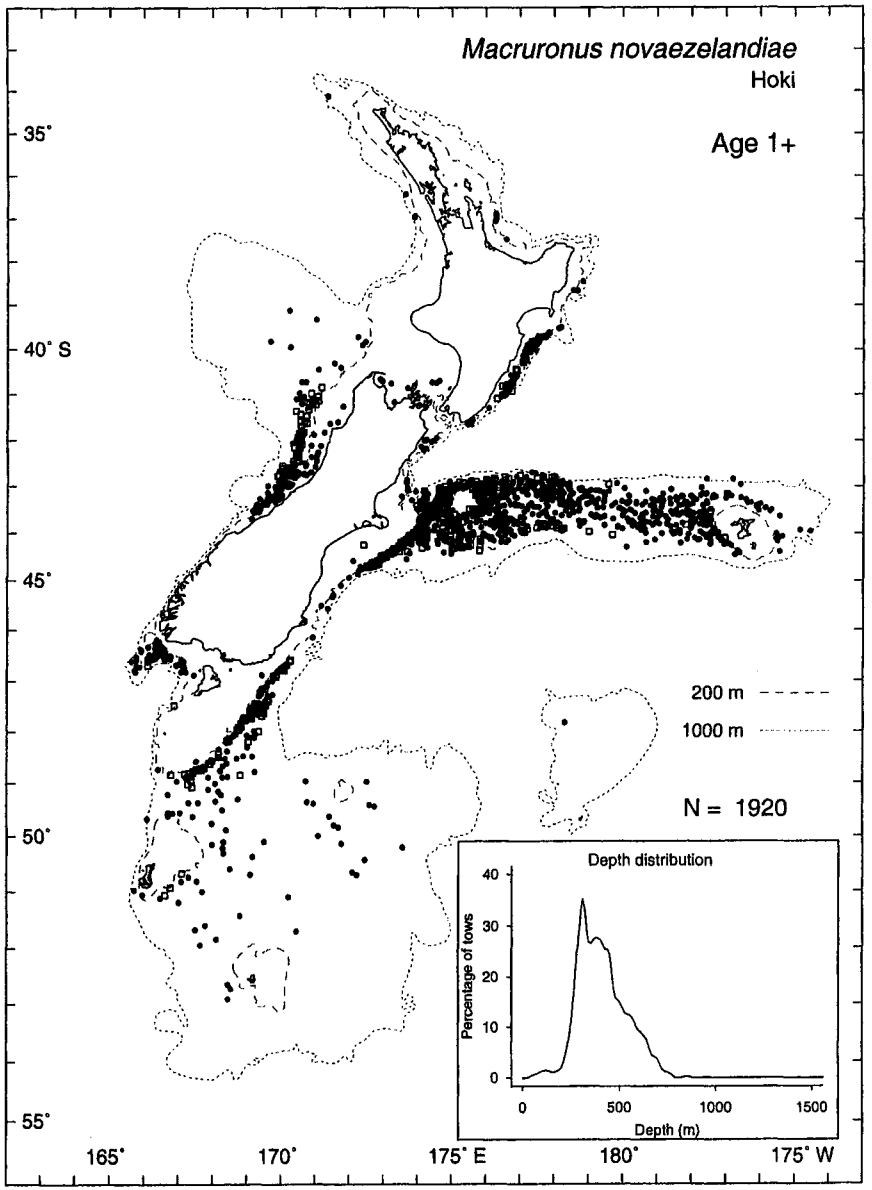


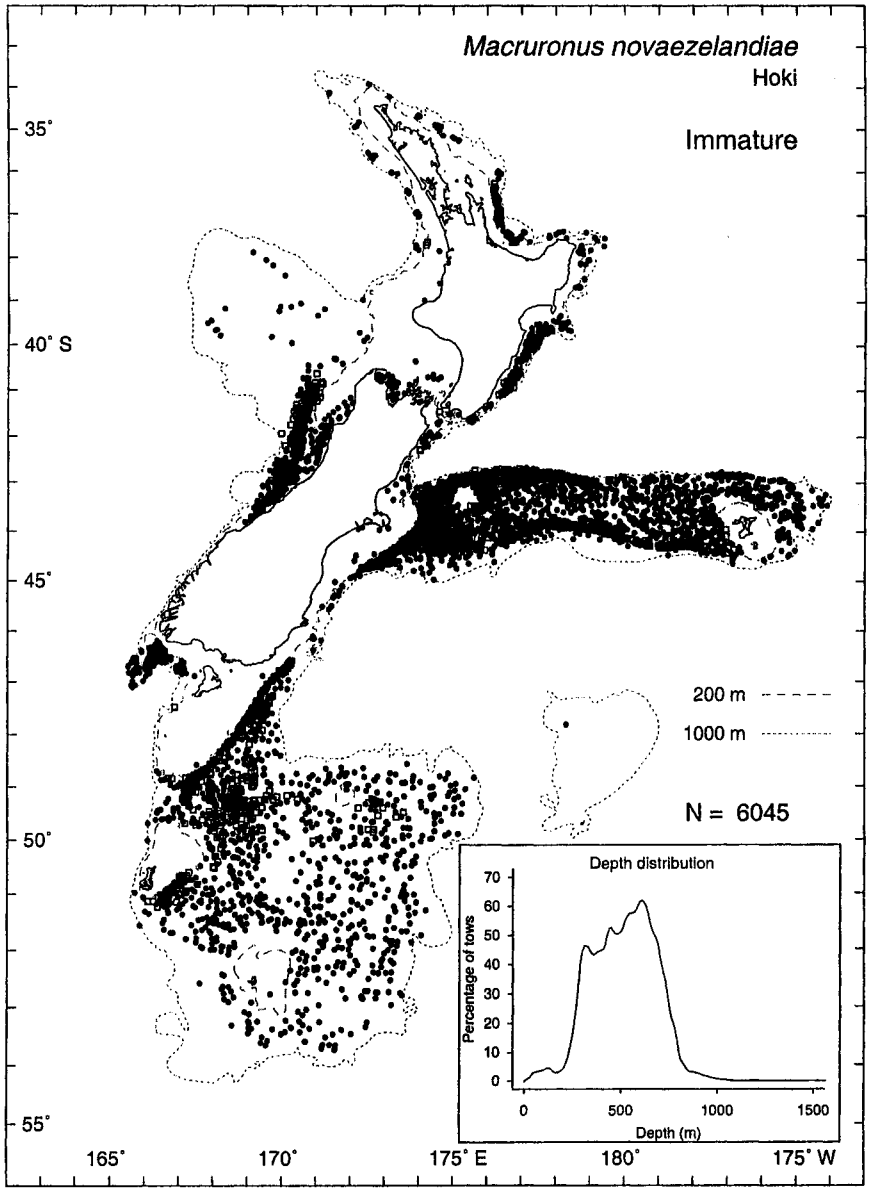
Some records represent other stargazer species, particularly the banded stargazer, *Kathetostoma* sp., which was not recorded separately until 1986.

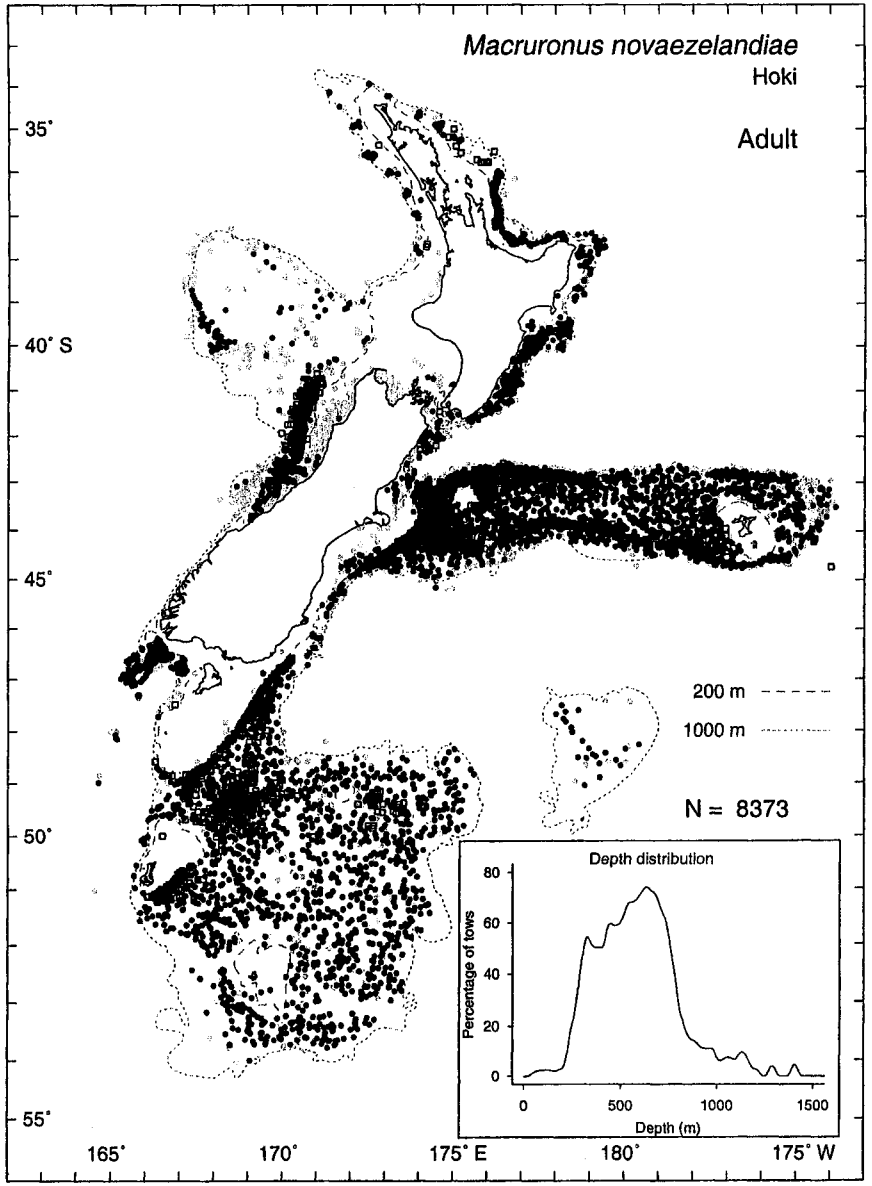

Kathetostoma giganteum
Giant stargazer
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2091
Depth distribution
Percentage of tows
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

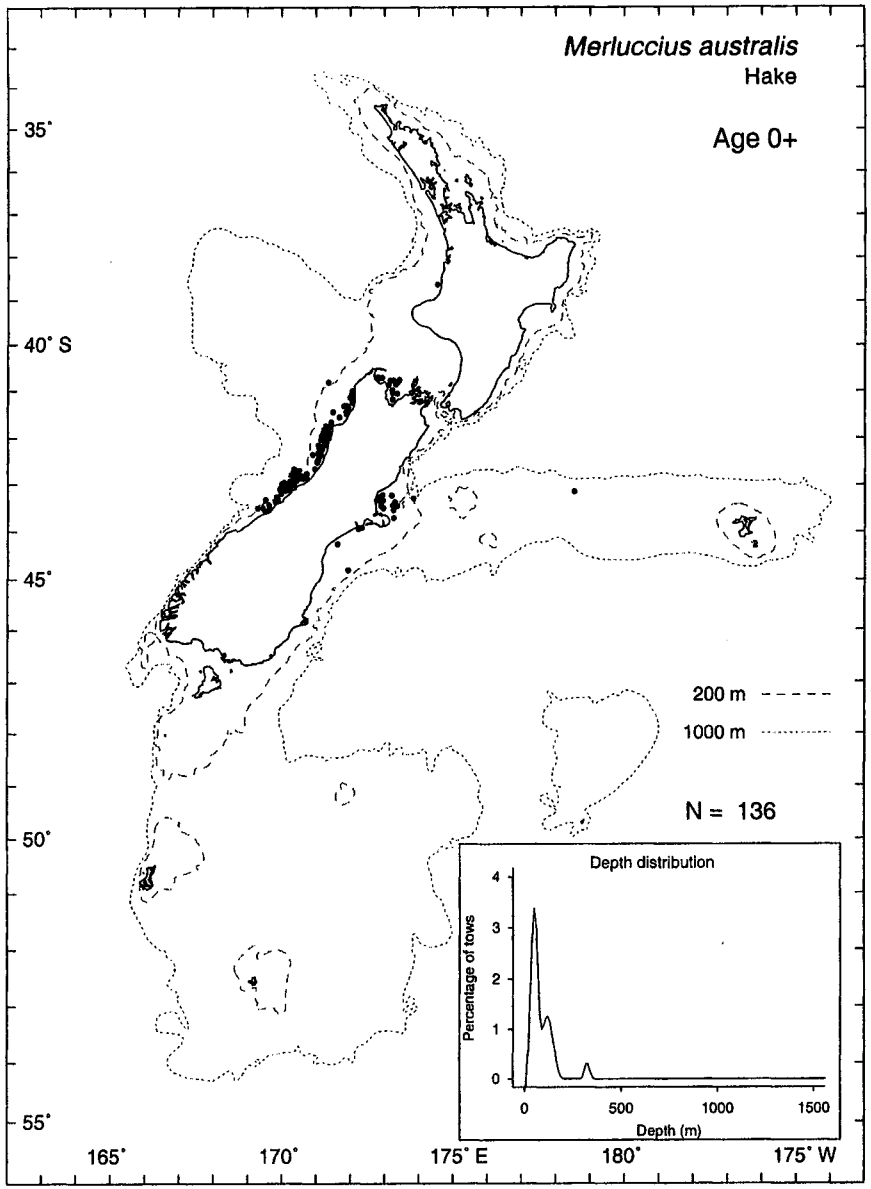

Kathetostoma giganteum
Giant stargazer
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3316
Depth distribution
Percentage of tows
40
30
20
10
0
0
500
1000
1500
Depth (m)

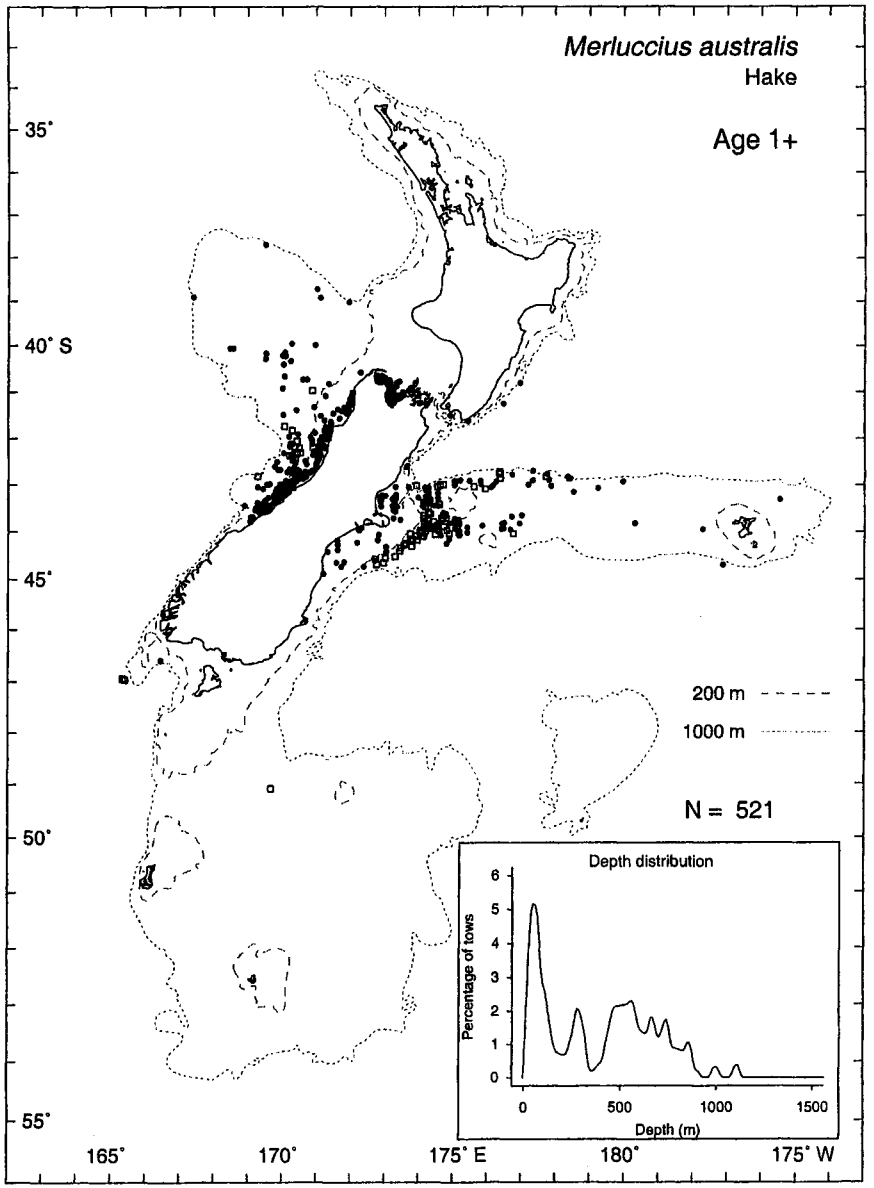

Macruronus novaezelandiae
Hoki
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 402
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
0
500
1000
1500

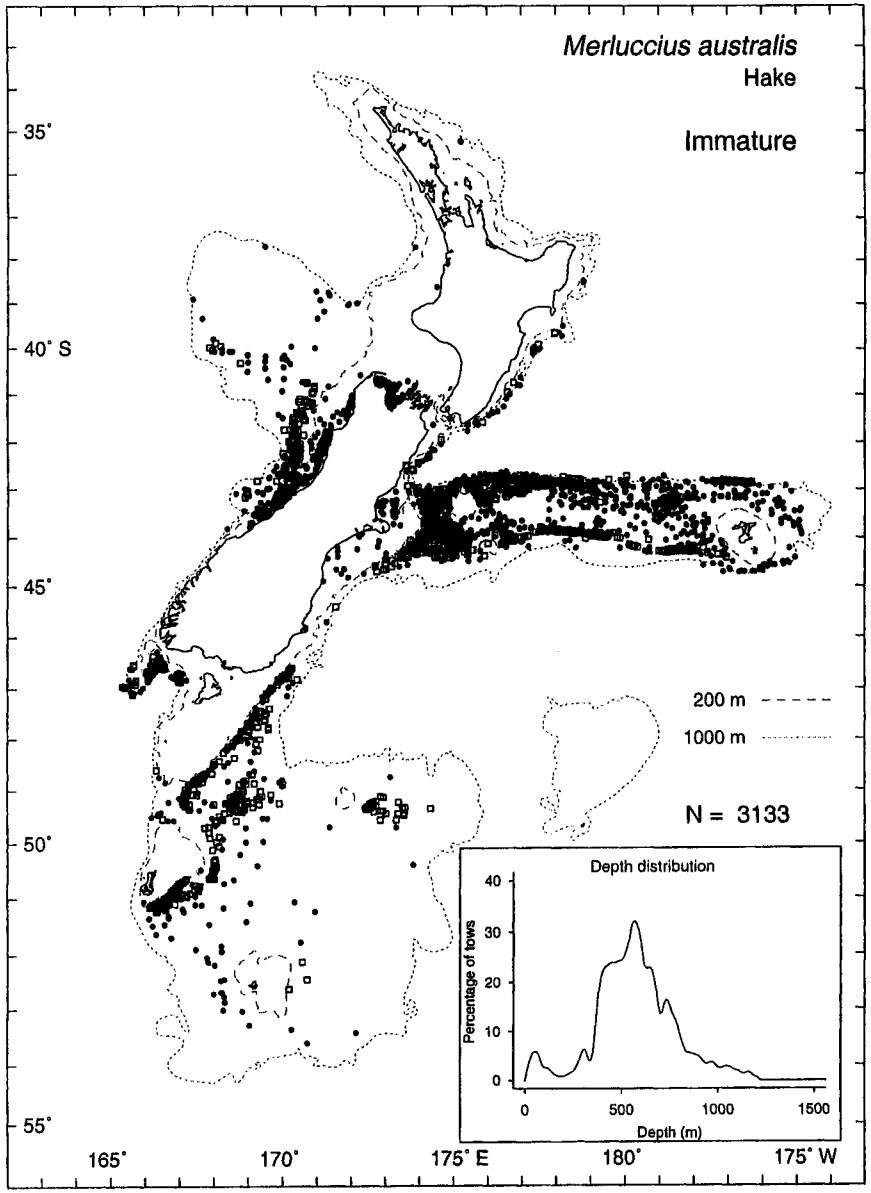

Macruronus novaezelandiae
Hoki
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1920
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
0
500
1000
1500

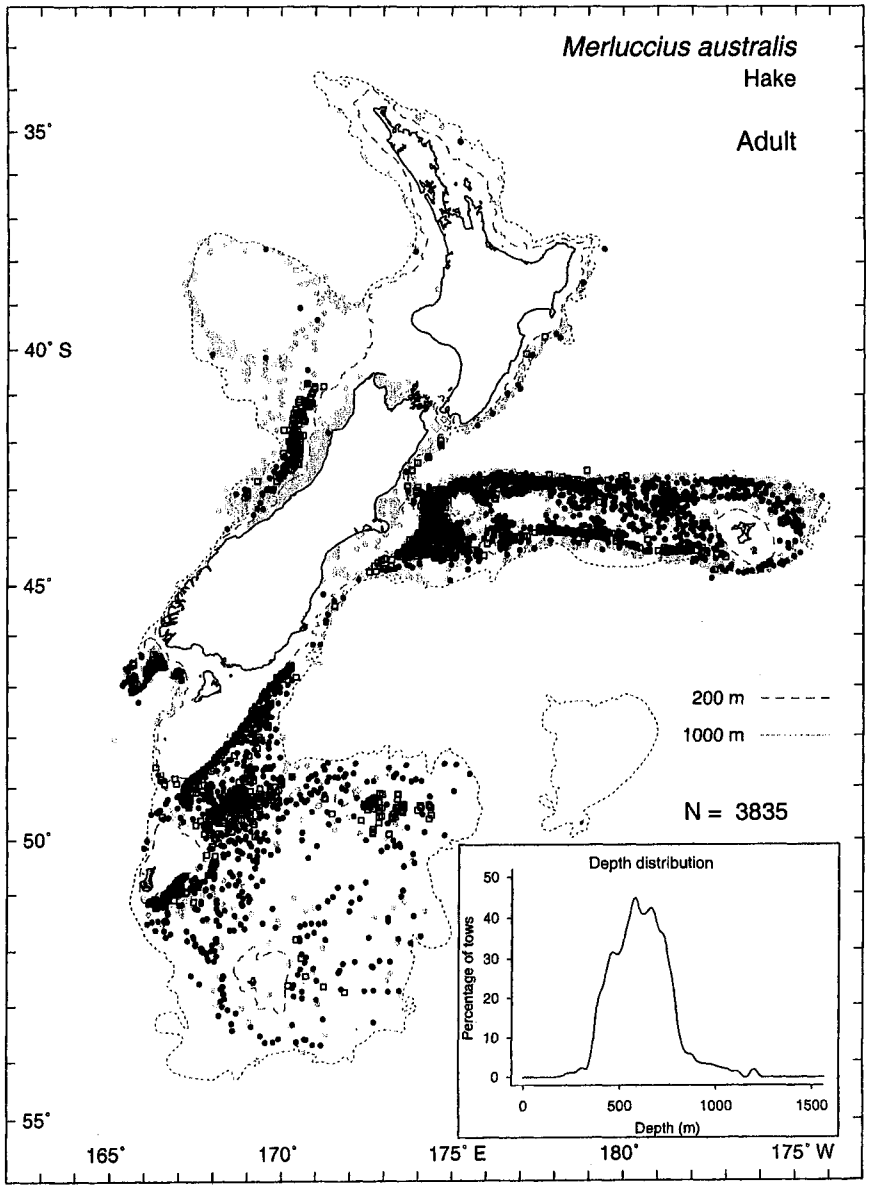

Macruronus novaezelandiae
Hoki
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 6045
Depth distribution
Percentage of tows
0
10
20
30
40
50
60
70
0
500
1000
1500
Depth (m)

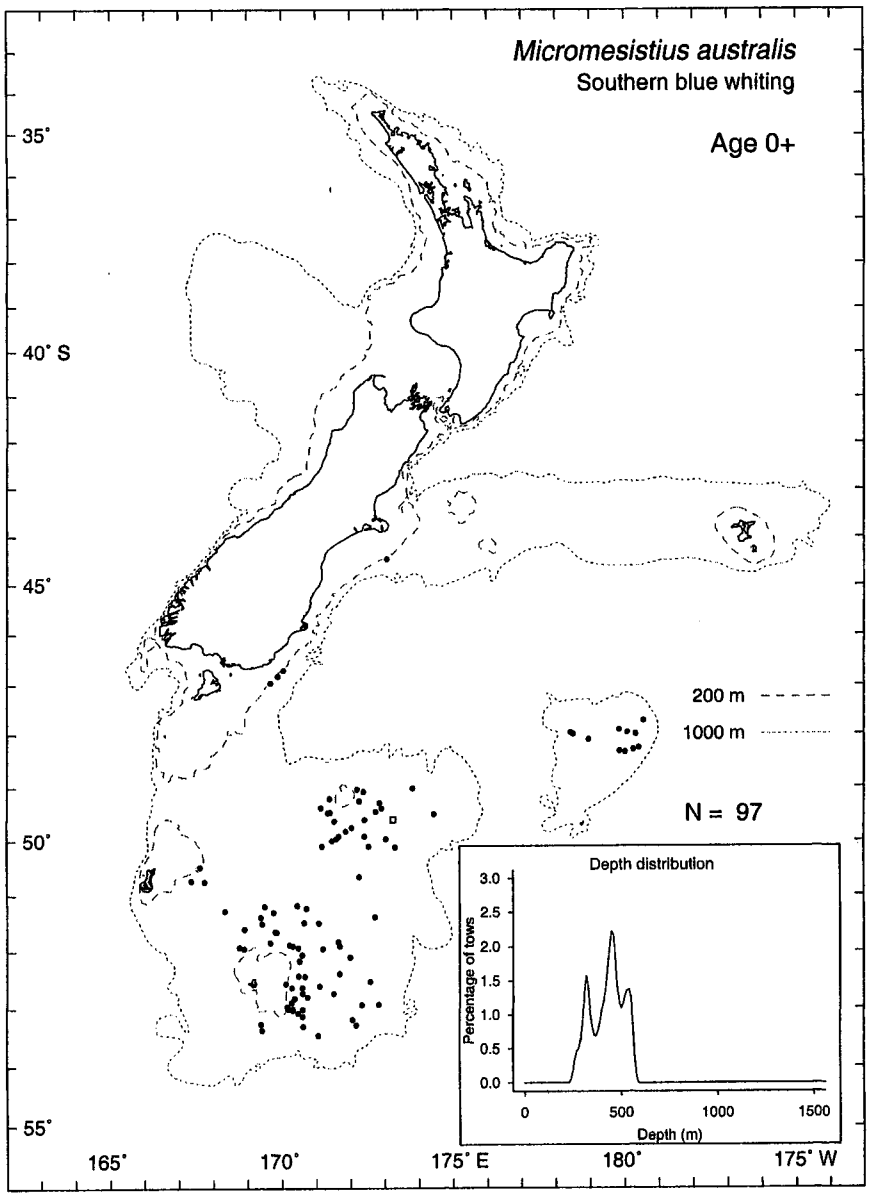

Macruronus novaezelandiae
Hoki
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 8373
Depth distribution
Percentage of tows
0
20
40
60
80
0
500
1000
1500
Depth (m)

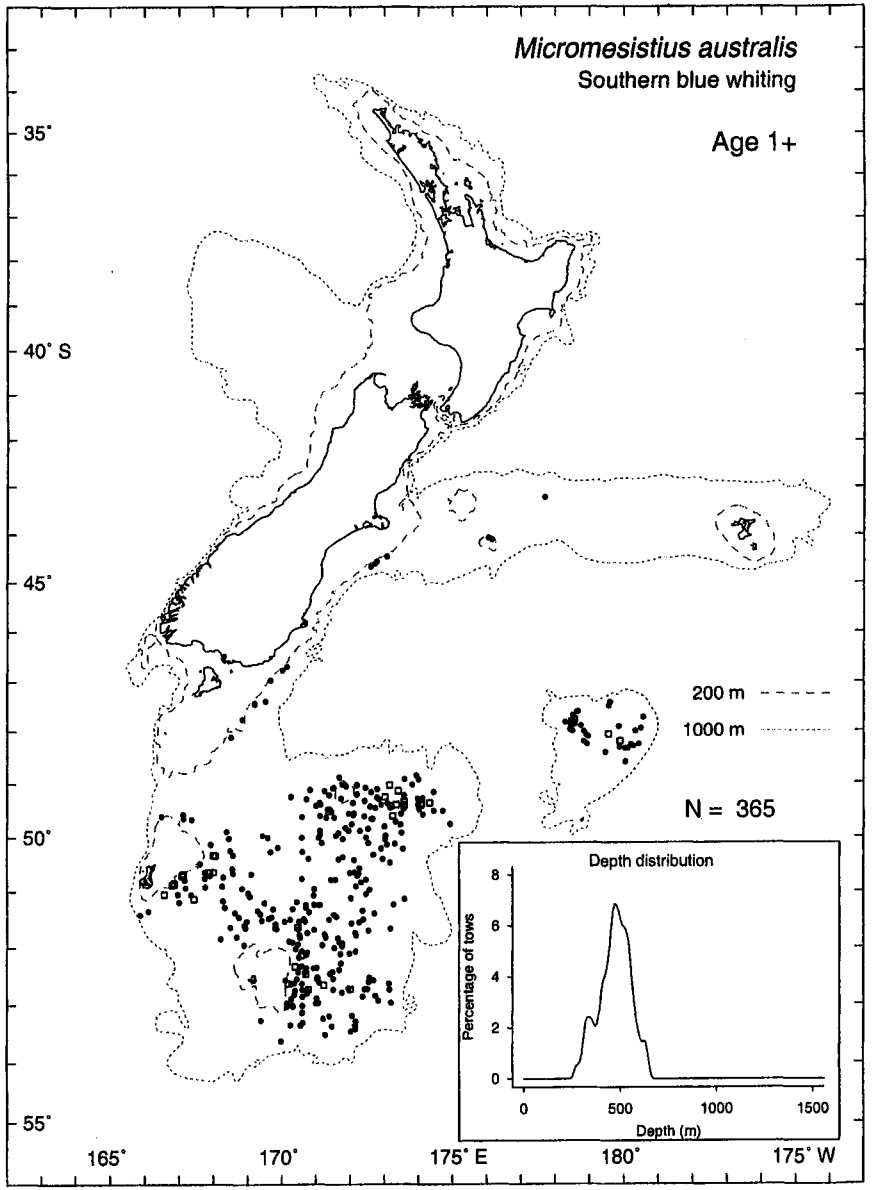

Merluccius australis
Hake
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 136
Depth distribution
Percentage of tows
0
1
2
3
4
0
500
1000
1500
Depth (m)

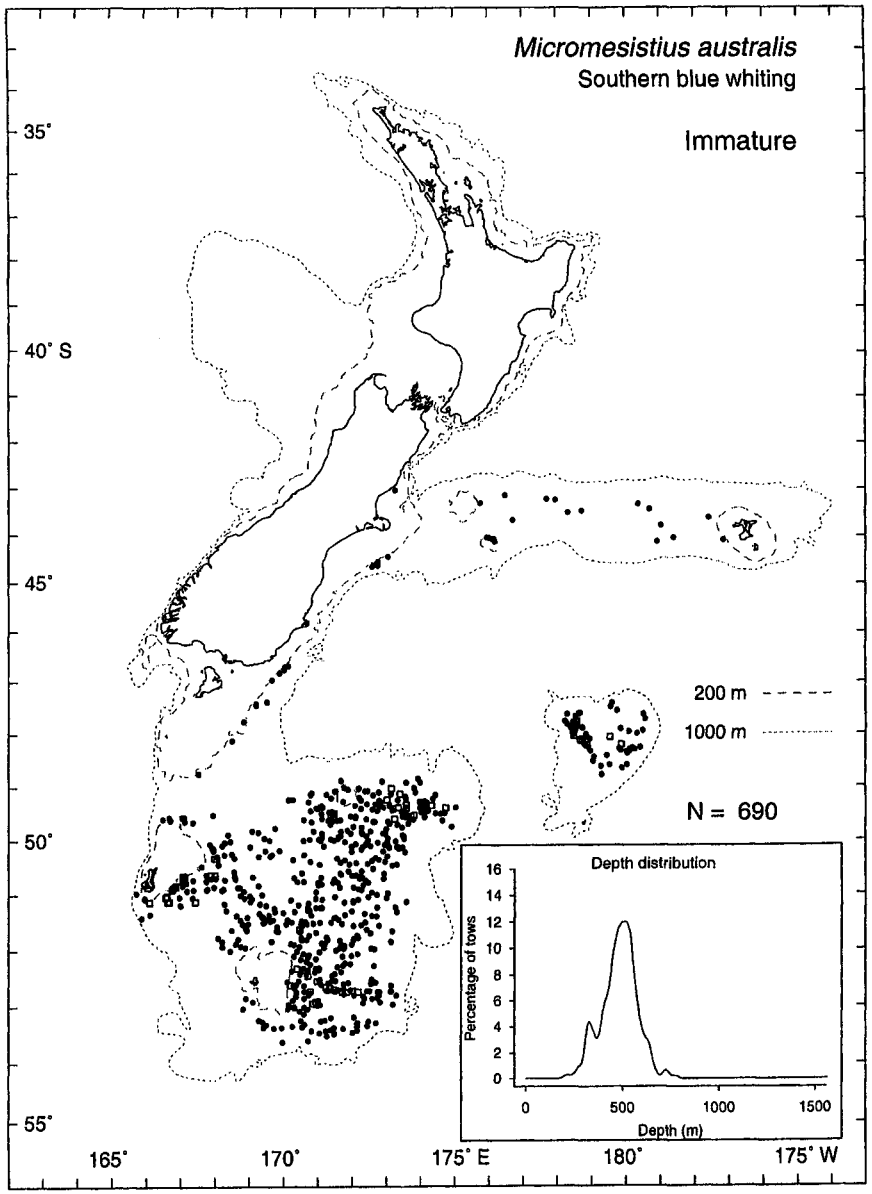

Merluccius australis
Hake
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 521
Depth distribution
Percentage of tows
0
1
2
3
4
5
6
0
500
1000
1500
Depth (m)

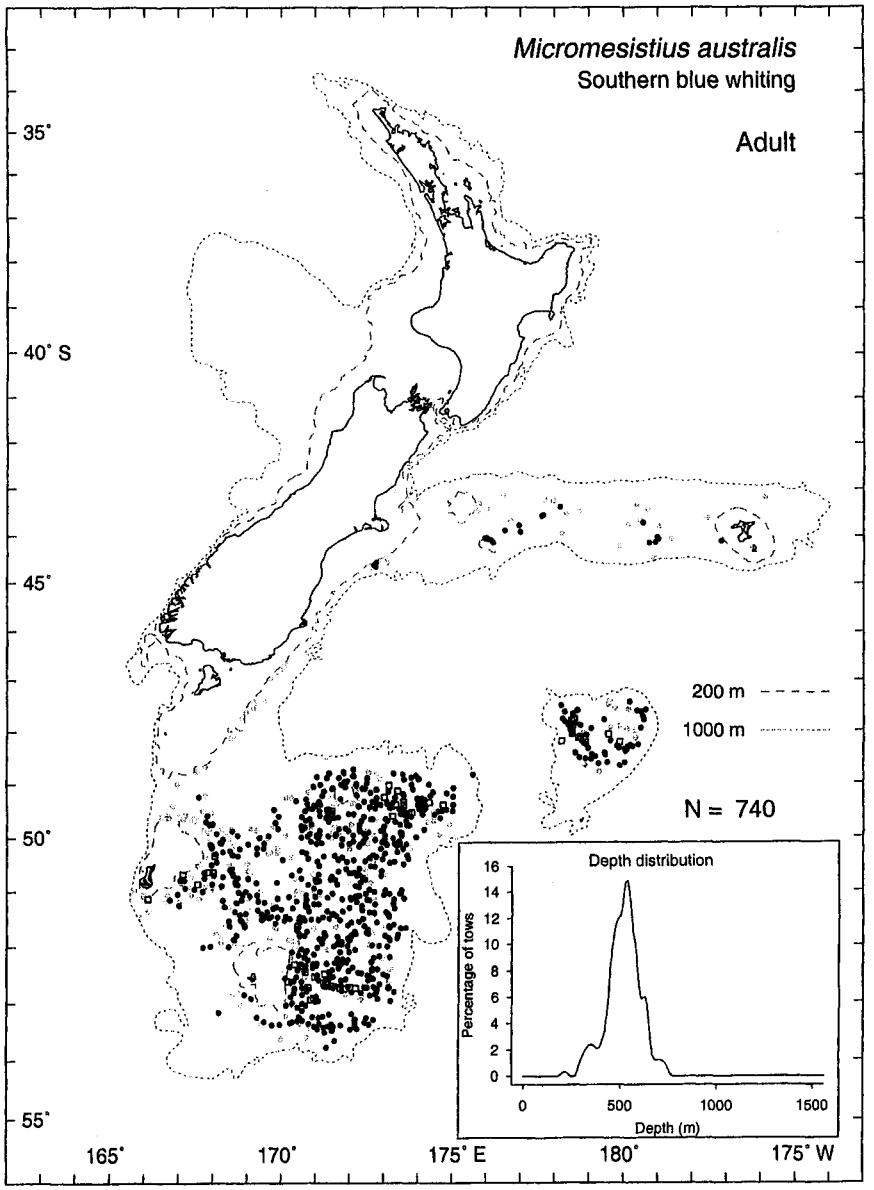

Merluccius australis
Hake
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3133
Depth distribution
Percentage of tows
0
10
20
30
40
0
500
1000
1500
Depth (m)

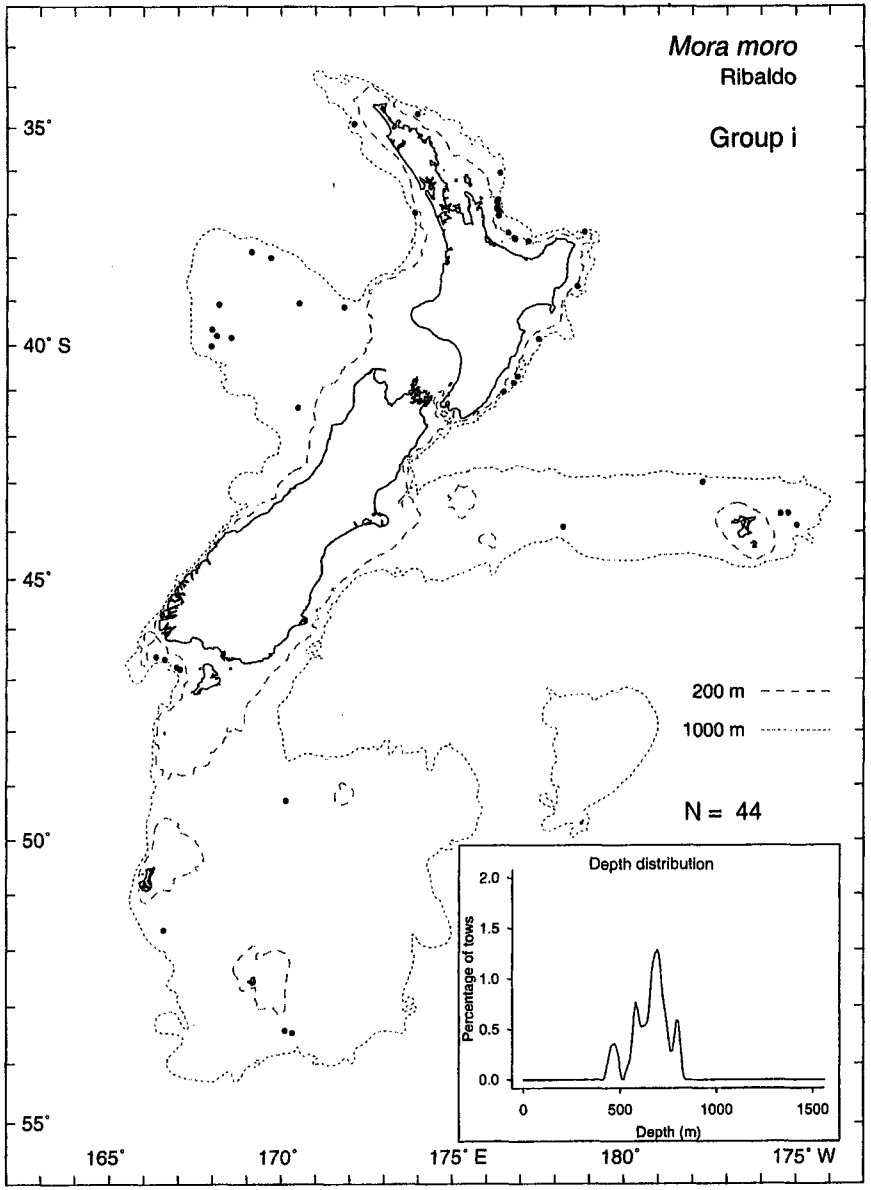

Merluccius australis
Hake
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3835
Depth distribution
Percentage of tows
0
10
20
30
40
50
0
500
1000
1500
Depth (m)

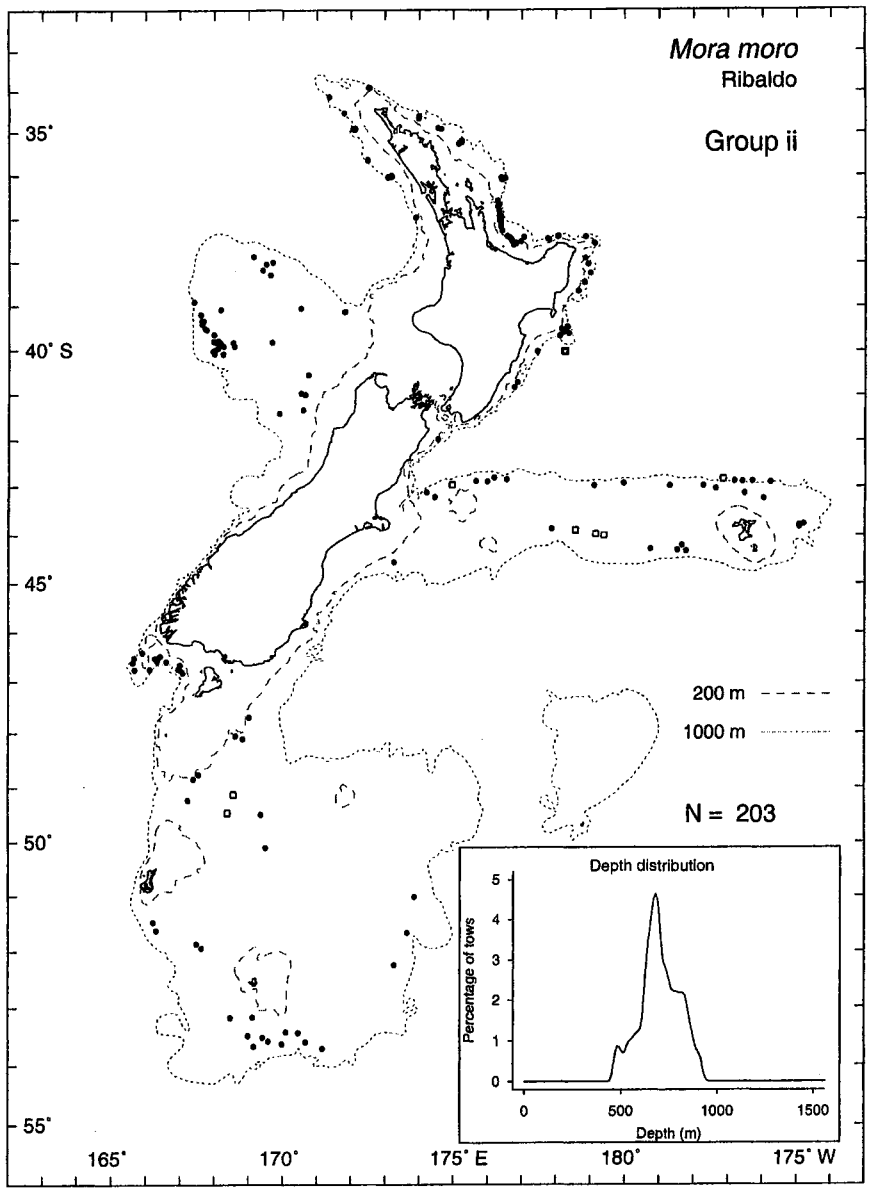

Micromesistius australis
Southern blue whiting
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 97
Depth distribution
Percentage of tows
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)


Micromesistius australis
Southern blue whiting
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 365
Depth distribution
Percentage of tows
8
6
4
2
0
0
500
1000
1500
Depth (m)

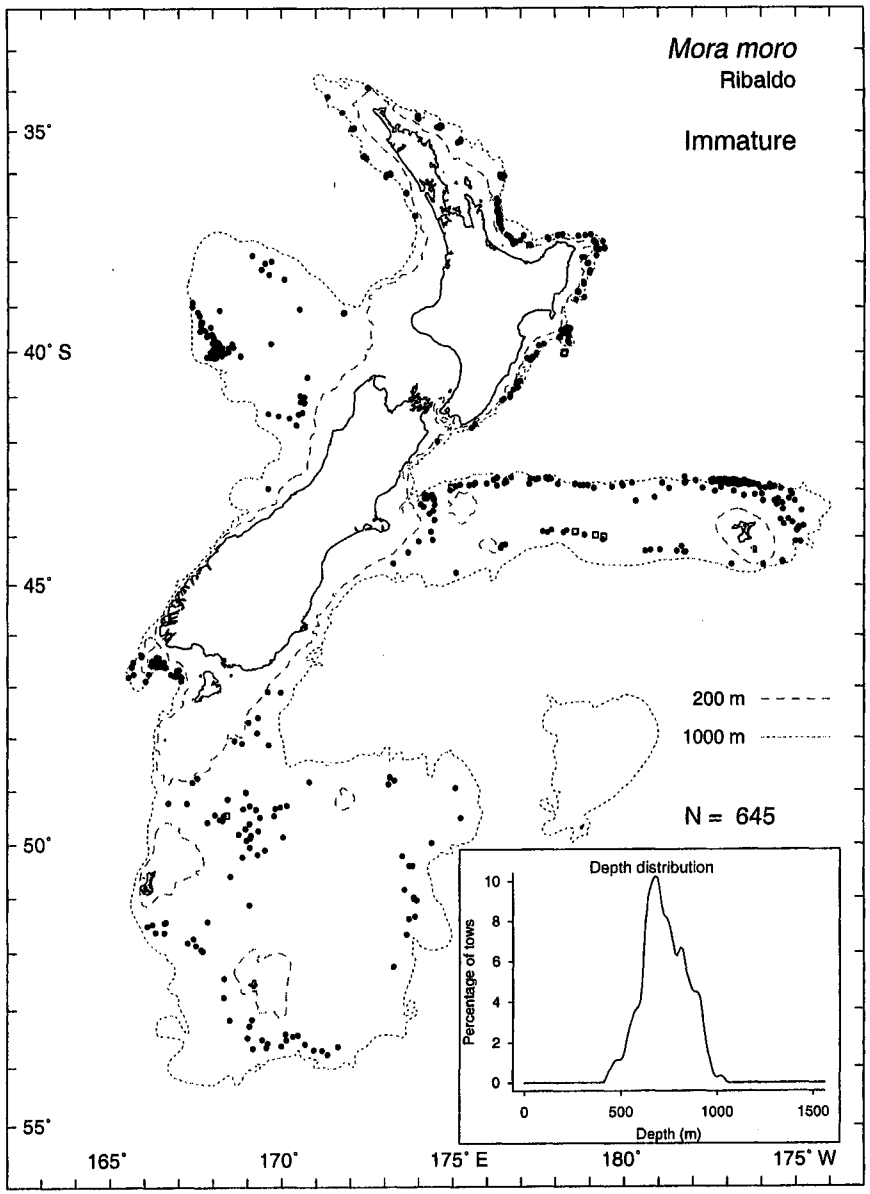

Micromesistius australis
Southern blue whiting
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 690
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10
12
14
16

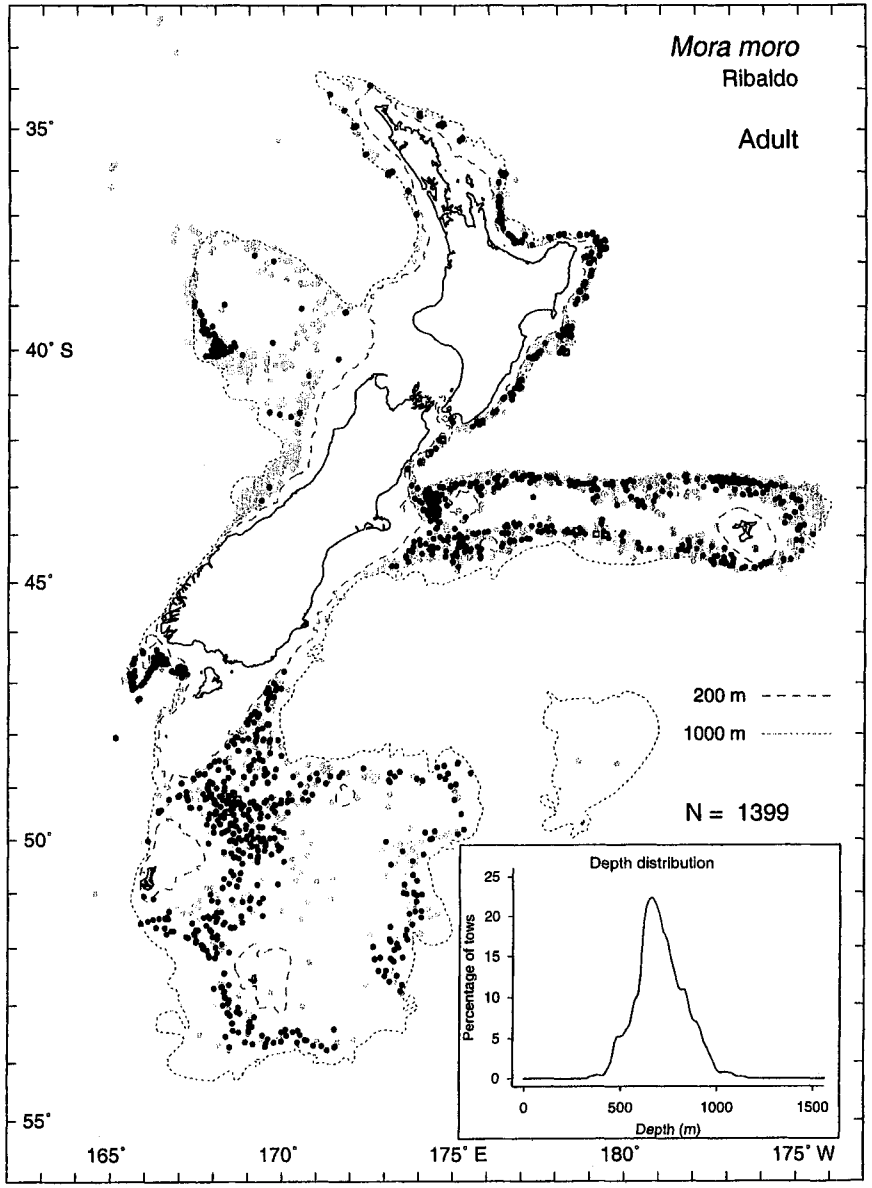

Micromesistius australis
Southern blue whiting
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 740
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10
12
14
16

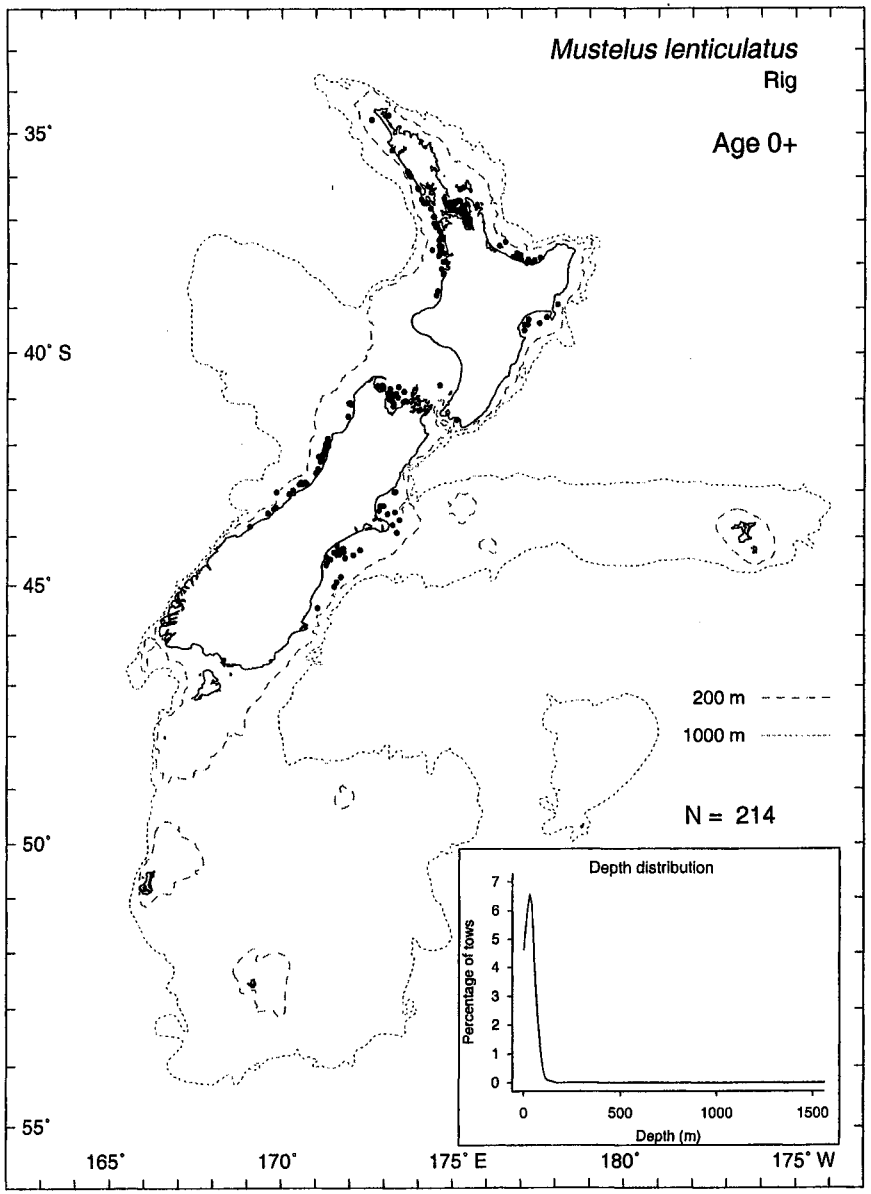


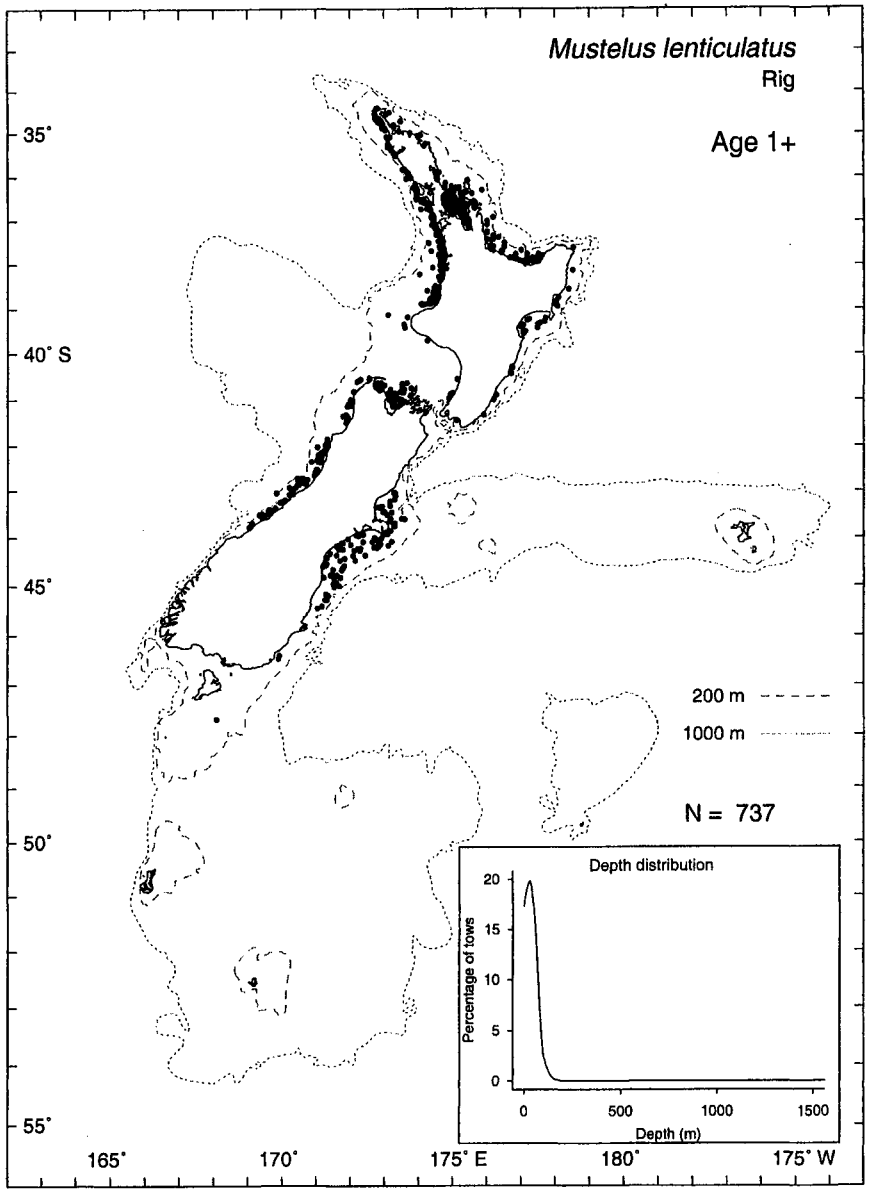


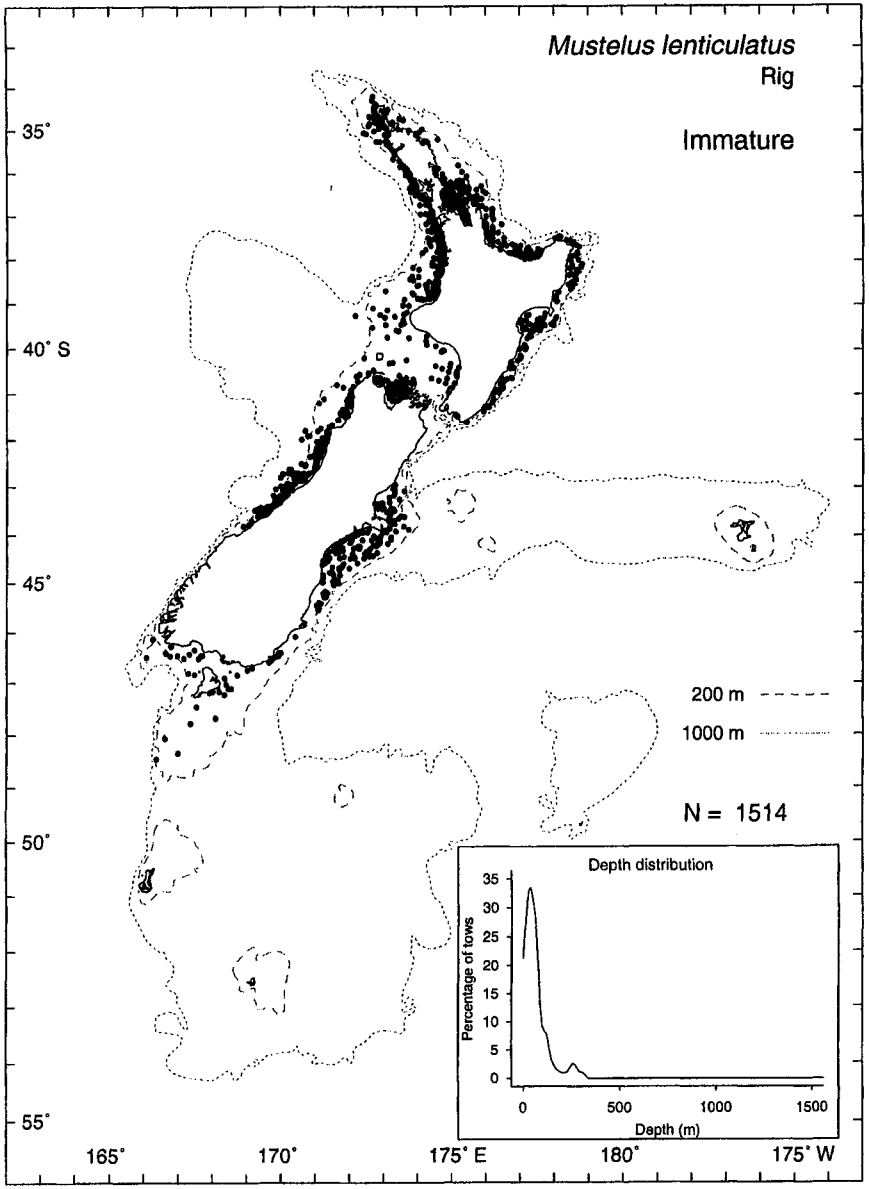
Groups i and ii are arbitrary and were determined from length frequency modes.

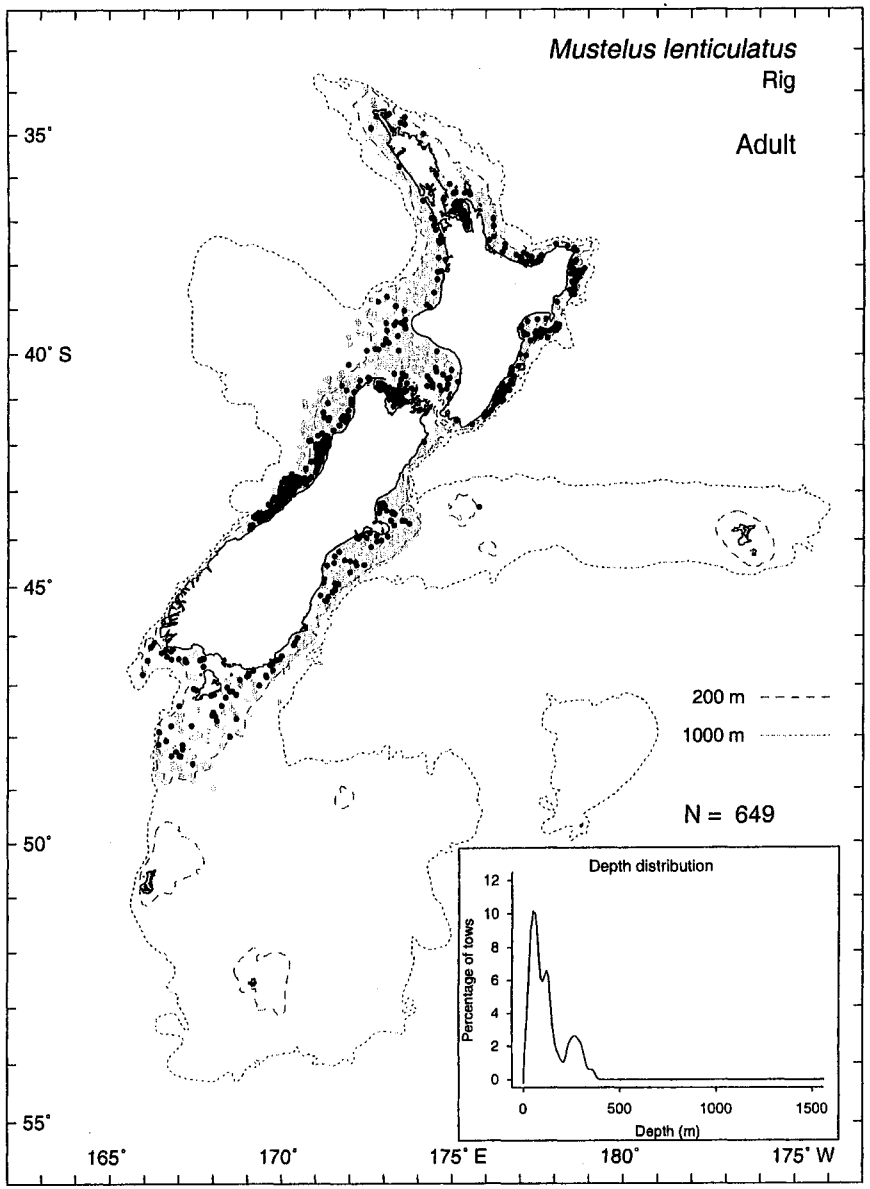

Mora moro
Ribaldo
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 645
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
0
500
1000
1500

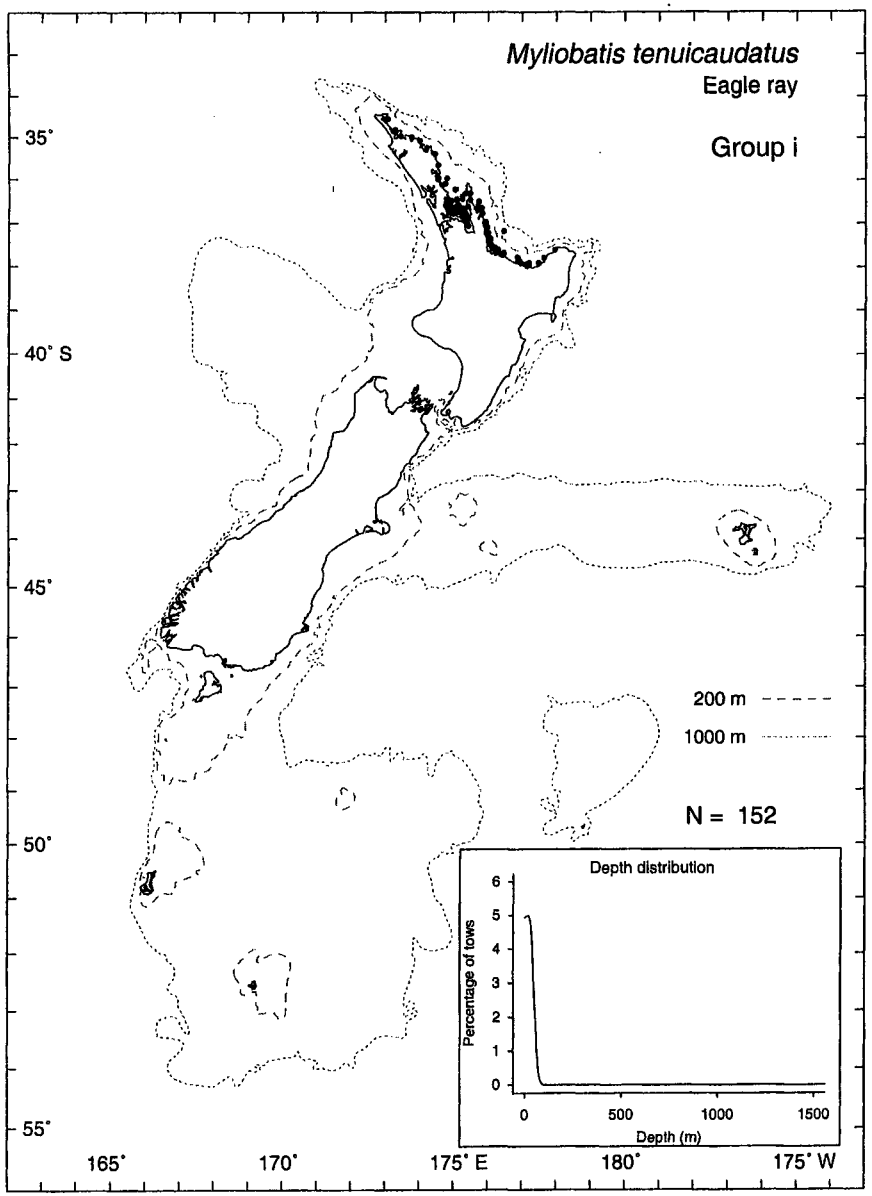

Mora moro
Ribaldo
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1399
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
0
500
1000
1500

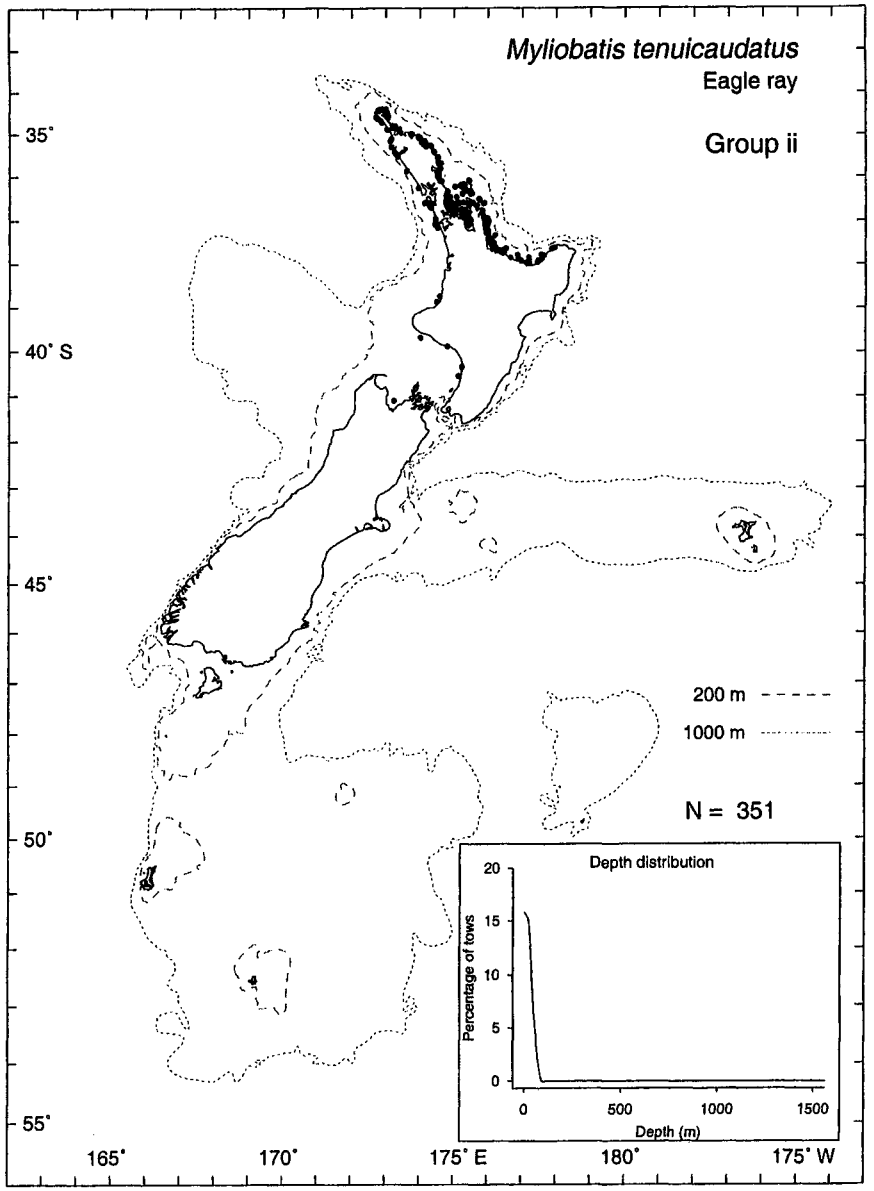

Mustelus lenticulatus
Rig
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 214
Depth distribution
Percentage of tows
0
1
2
3
4
5
6
7
0
500
1000
1500
Depth (m)


Mustelus lenticulatus
Rig
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 737
Depth distribution
Percentage of tows
0
5
10
15
20
0
500
1000
1500
Depth (m)

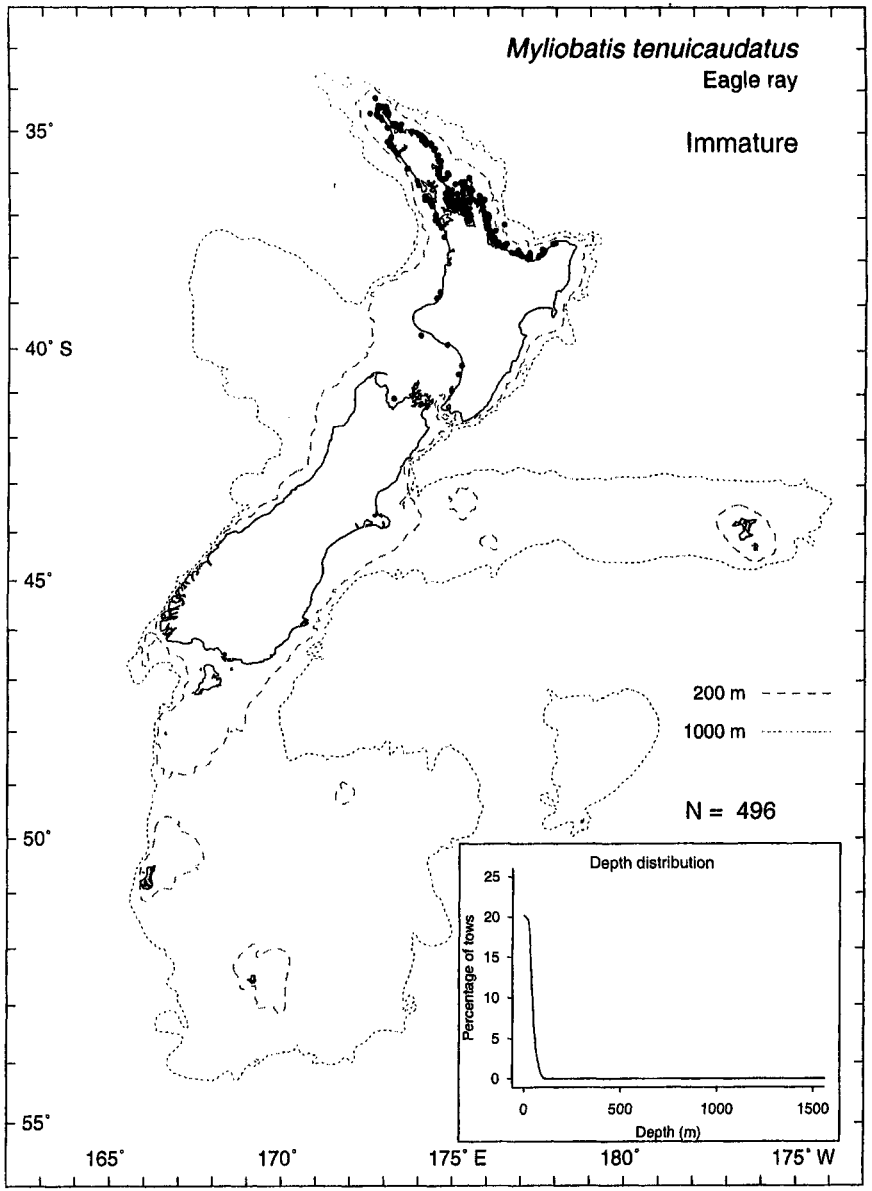

Mustelus lenticulatus
Rig
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1514
Depth distribution
Percentage of tows
Depth (m)

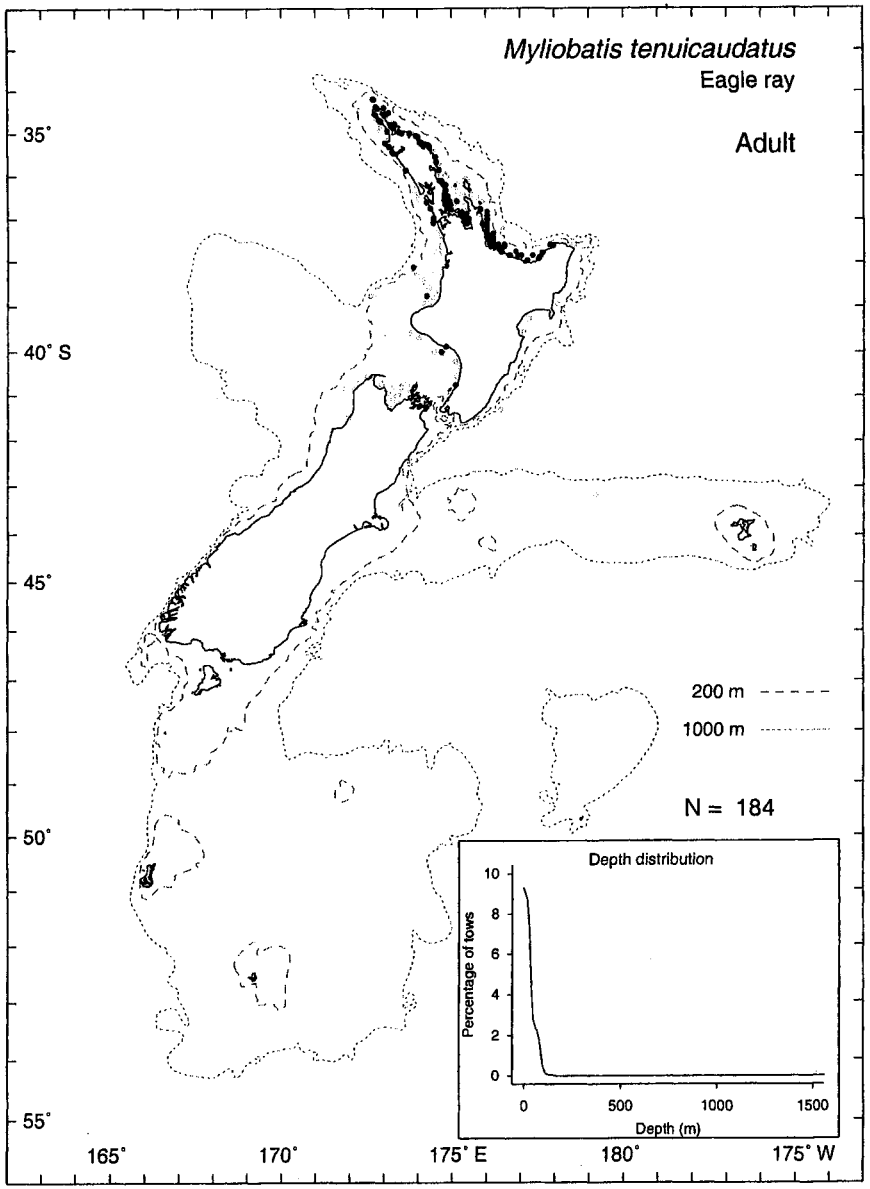

Mustelus lenticulatus
Rig
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 649
Depth distribution
Percentage of tows
Depth (m)

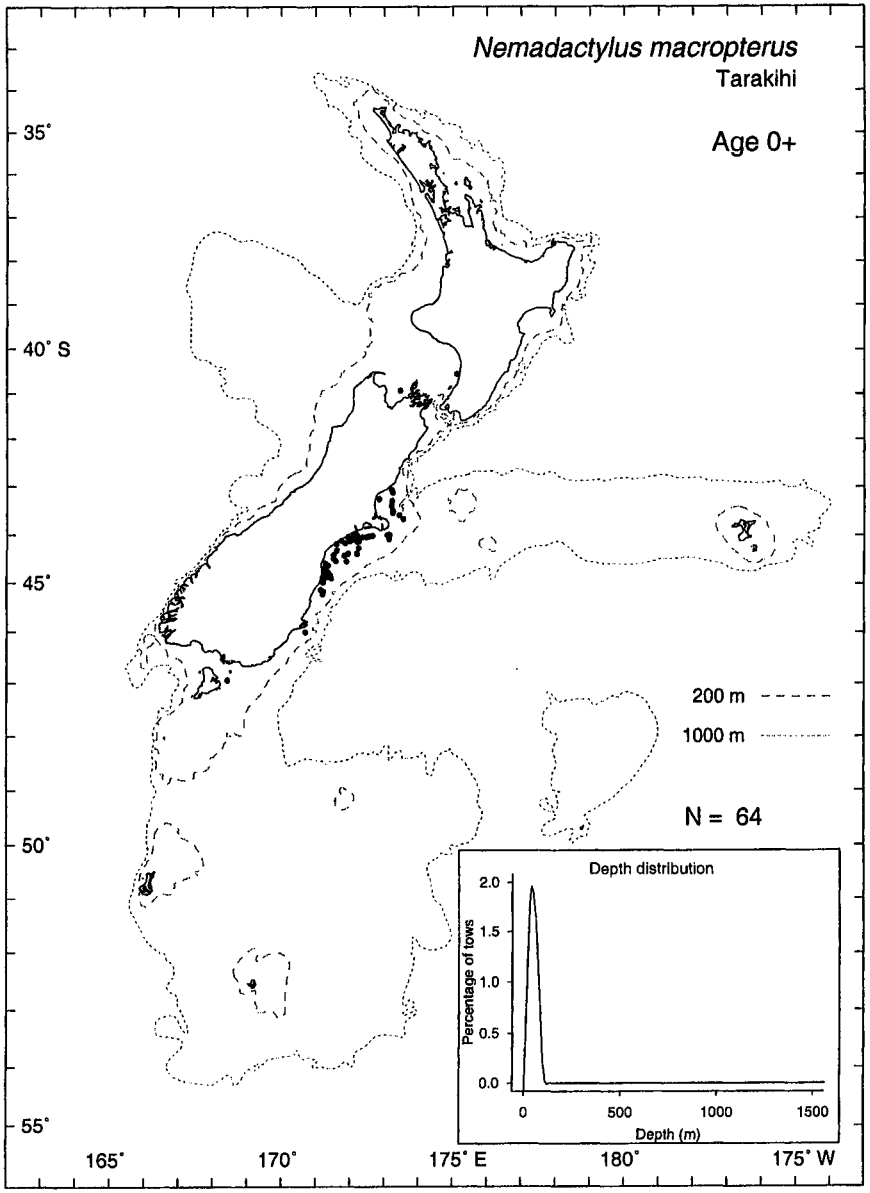


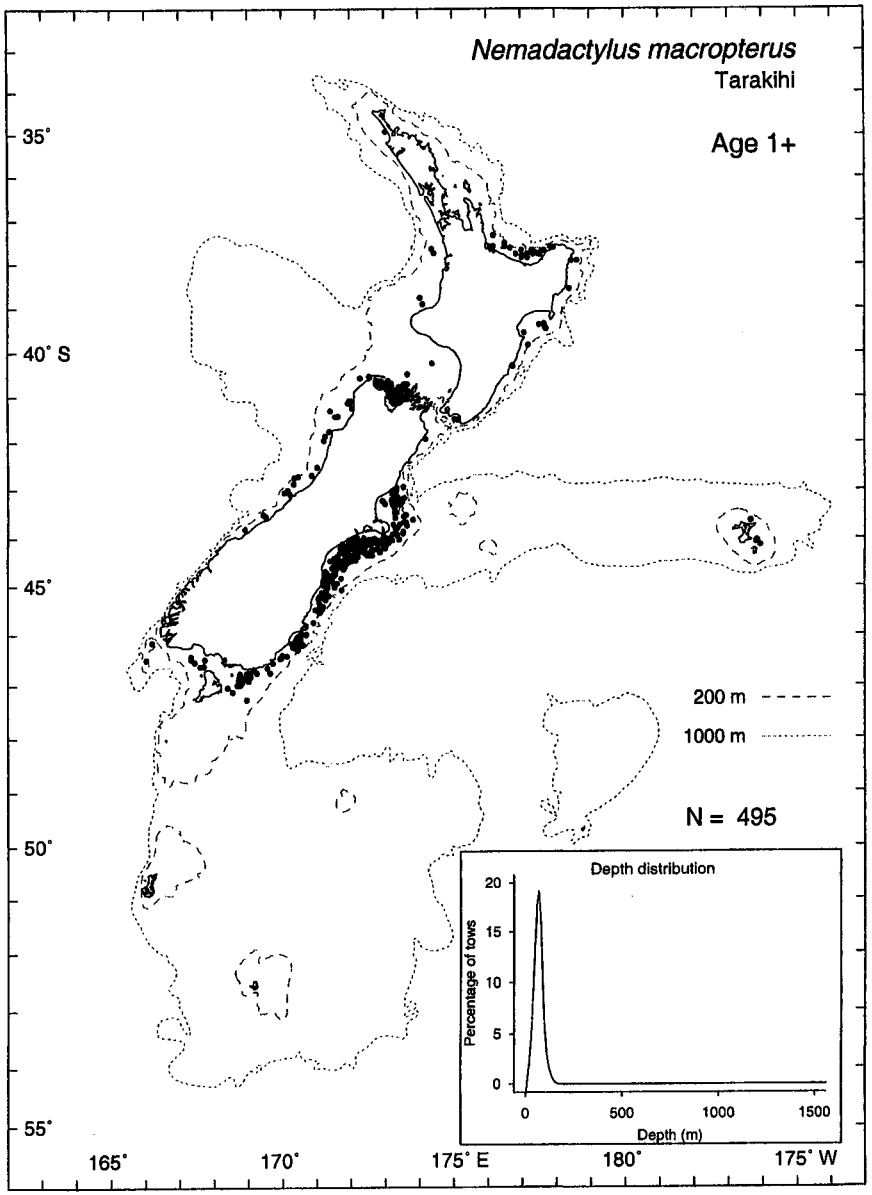


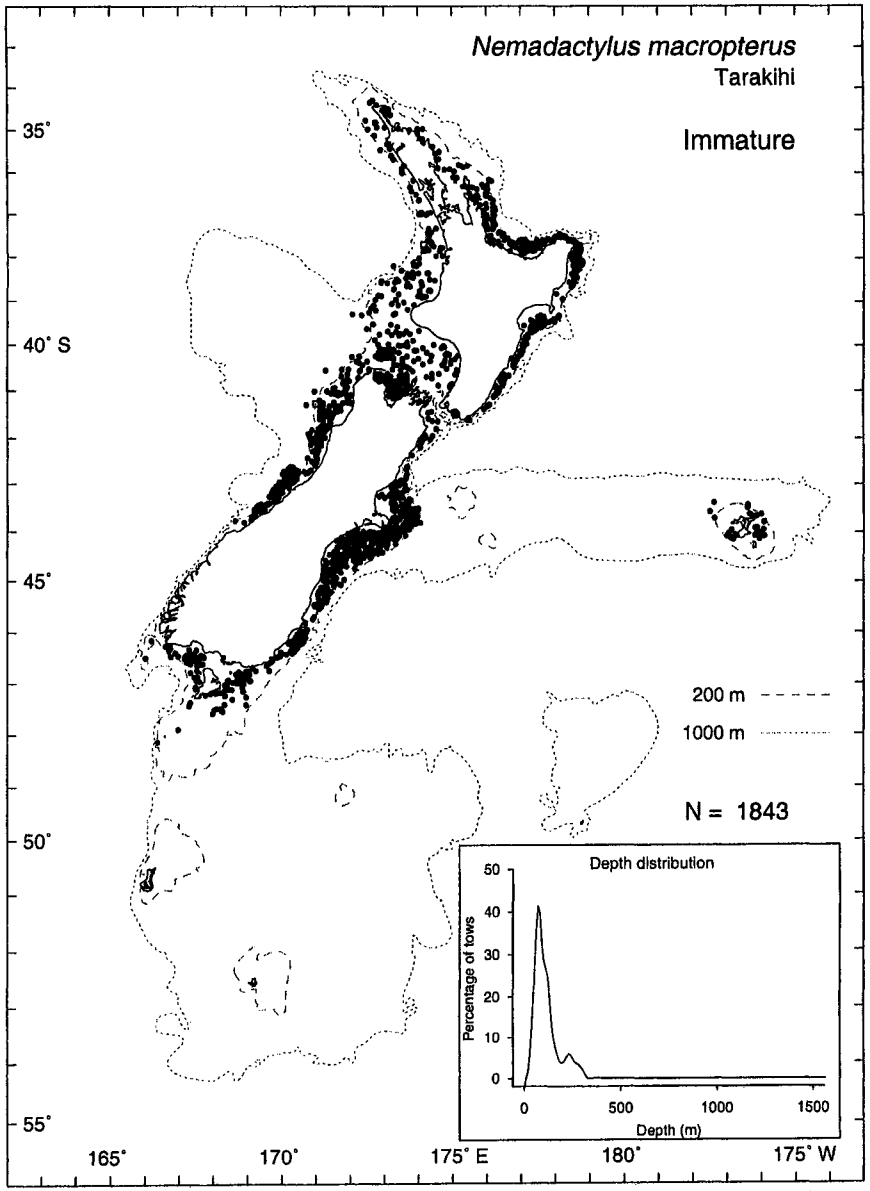
Groups i and ii may approximate ages 0+ and 1+.

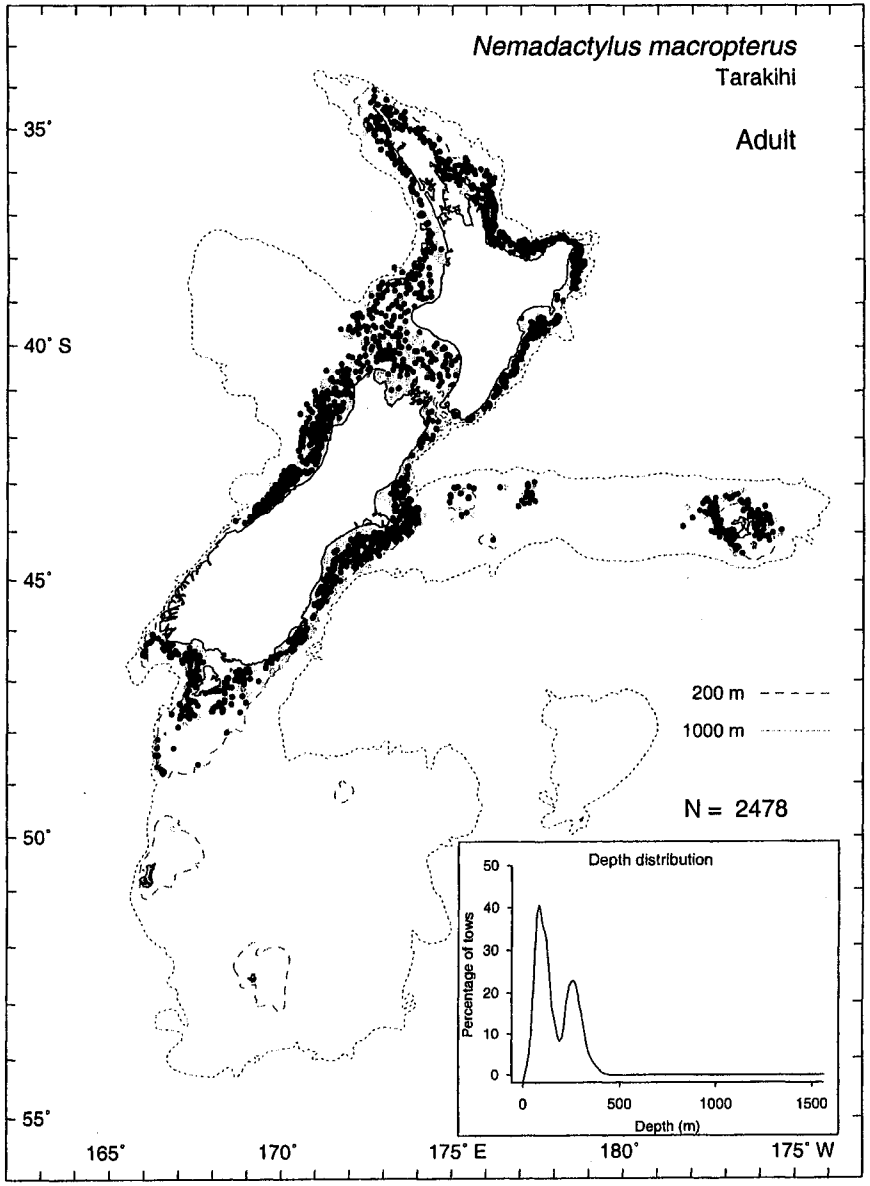

Myliobatis tenuicaudatus
Eagle ray
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 496
Depth distribution
Percentage of tows
25
20
15
10
5
0
0
500
1000
1500
Depth (m)


Myliobatis tenuicaudatus
Eagle ray
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 184
Depth distribution
Percentage of tows
10
8
6
4
2
0
0
500
1000
1500
Depth (m)


Nemadactylus macropterus
Tarakihi
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 64
Depth distribution
Percentage of tows
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)


Nemadactylus macropterus
Tarakihi
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 495
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)


Nemadactylus macropterus
Tarakihi
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1843
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
0
500
1000
1500


Nemadactylus macropterus
Tarakihi
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2478
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
0
500
1000
1500

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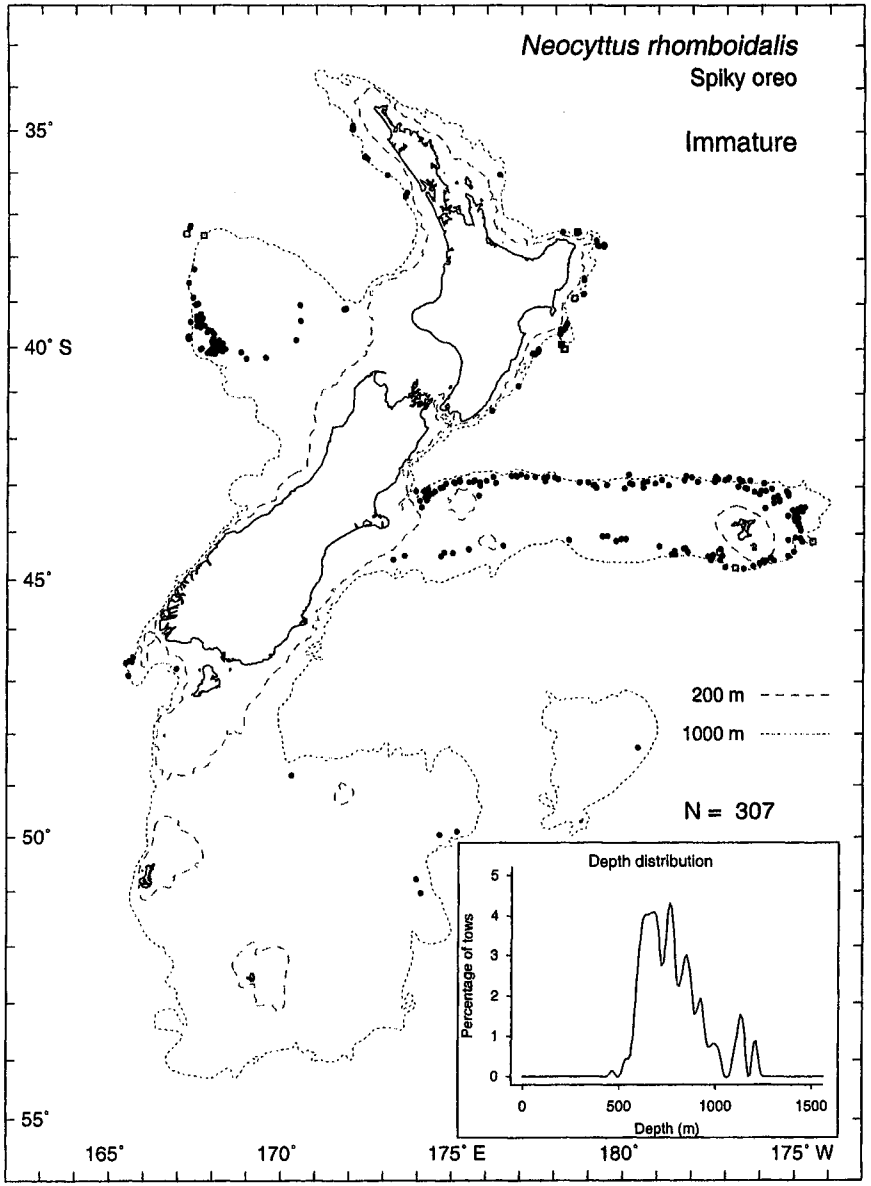
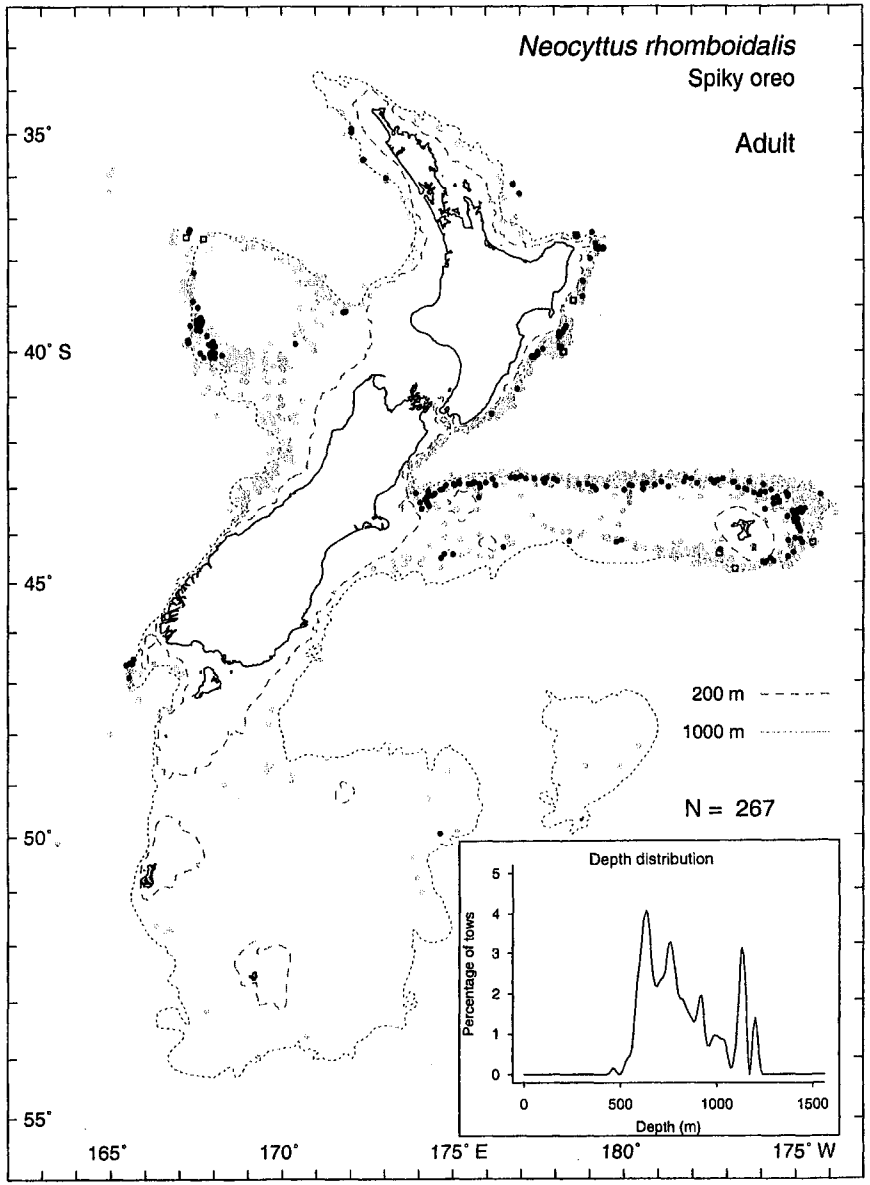
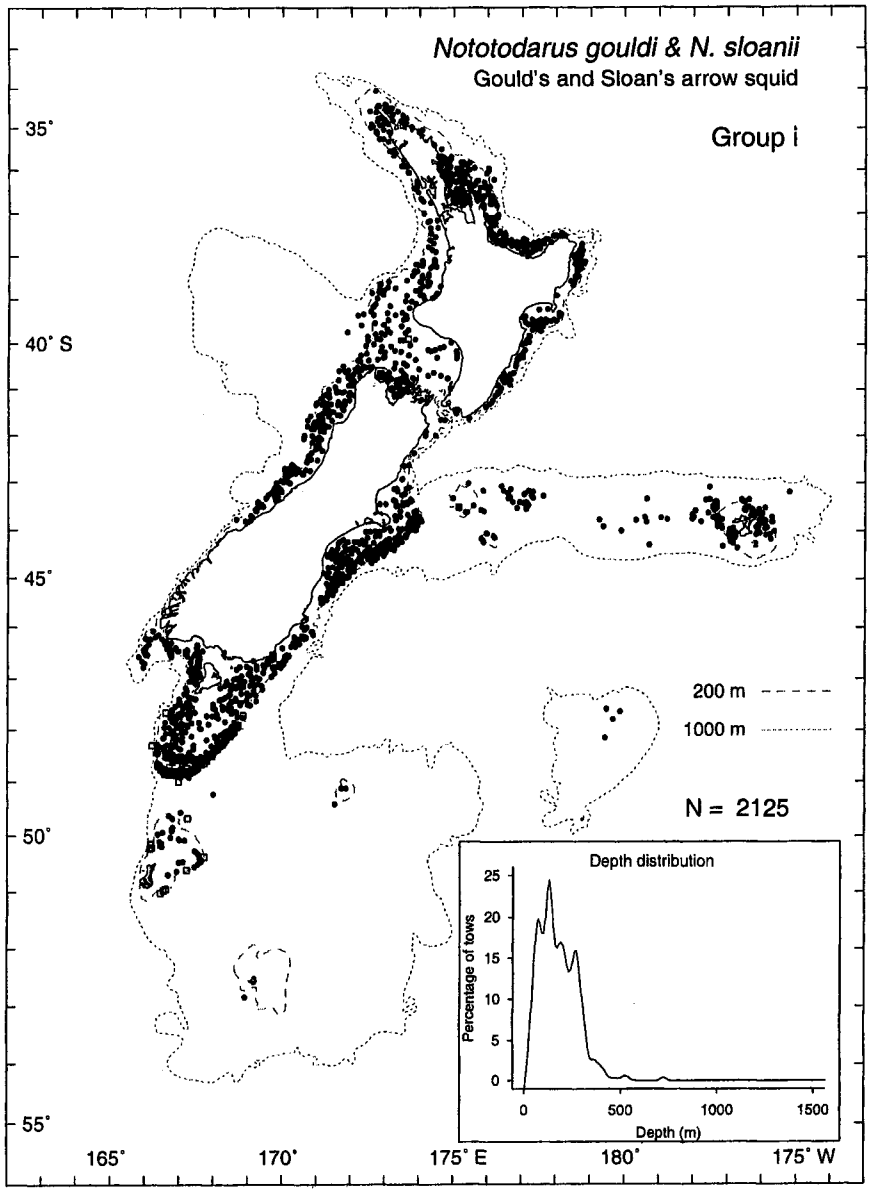
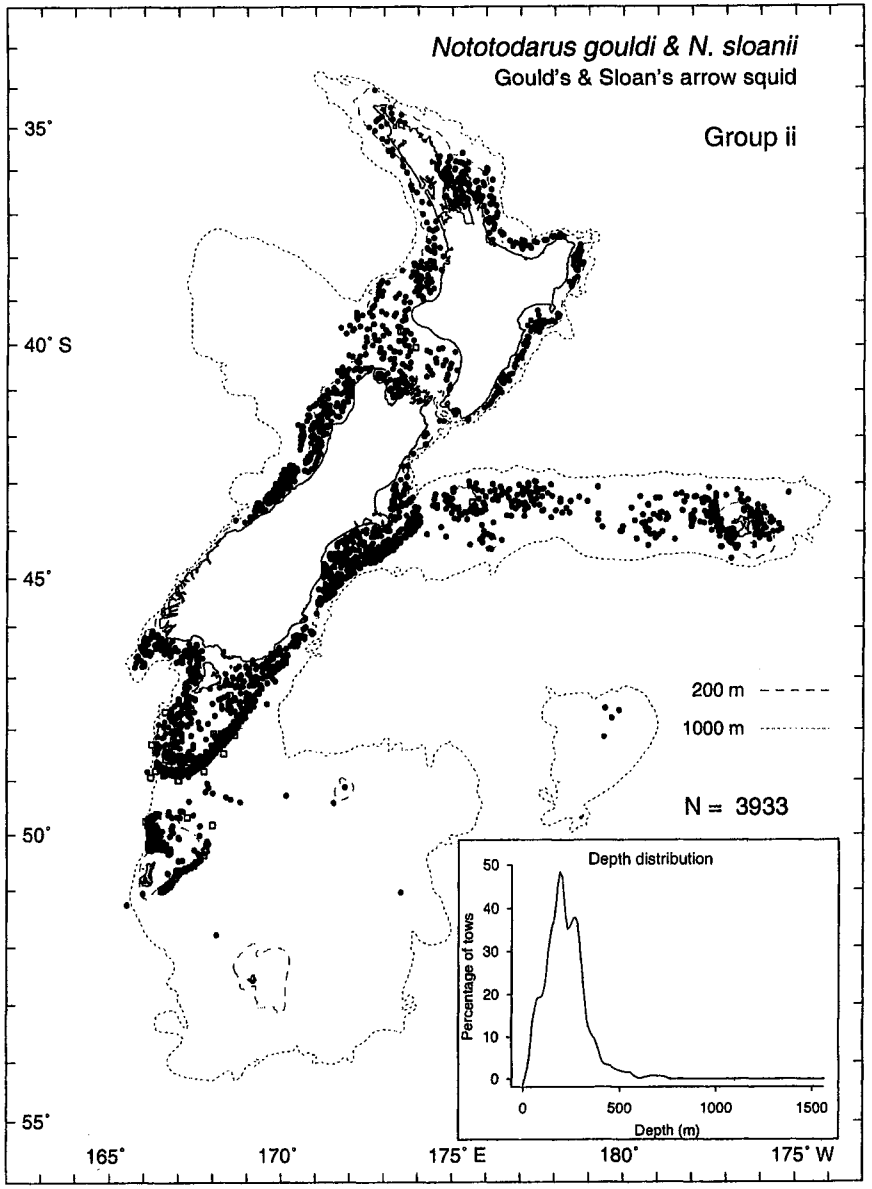
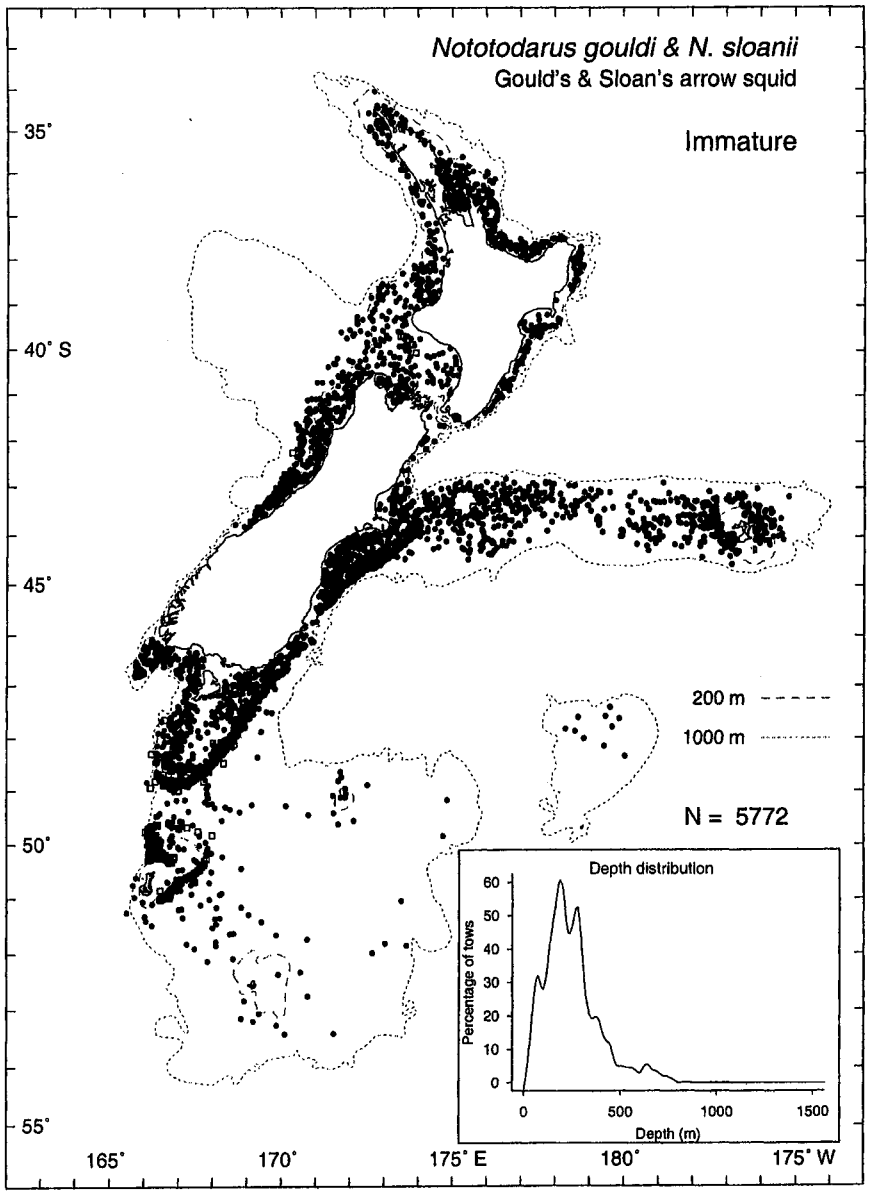


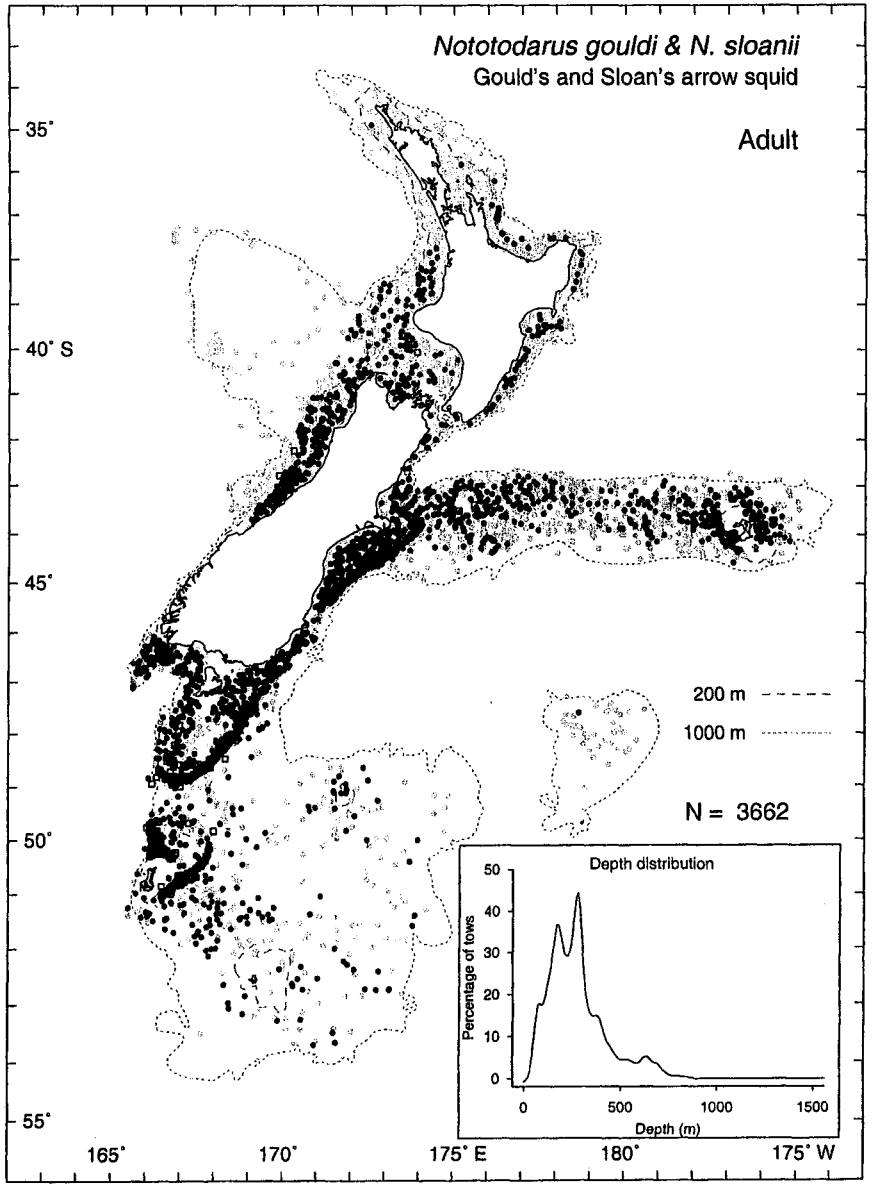


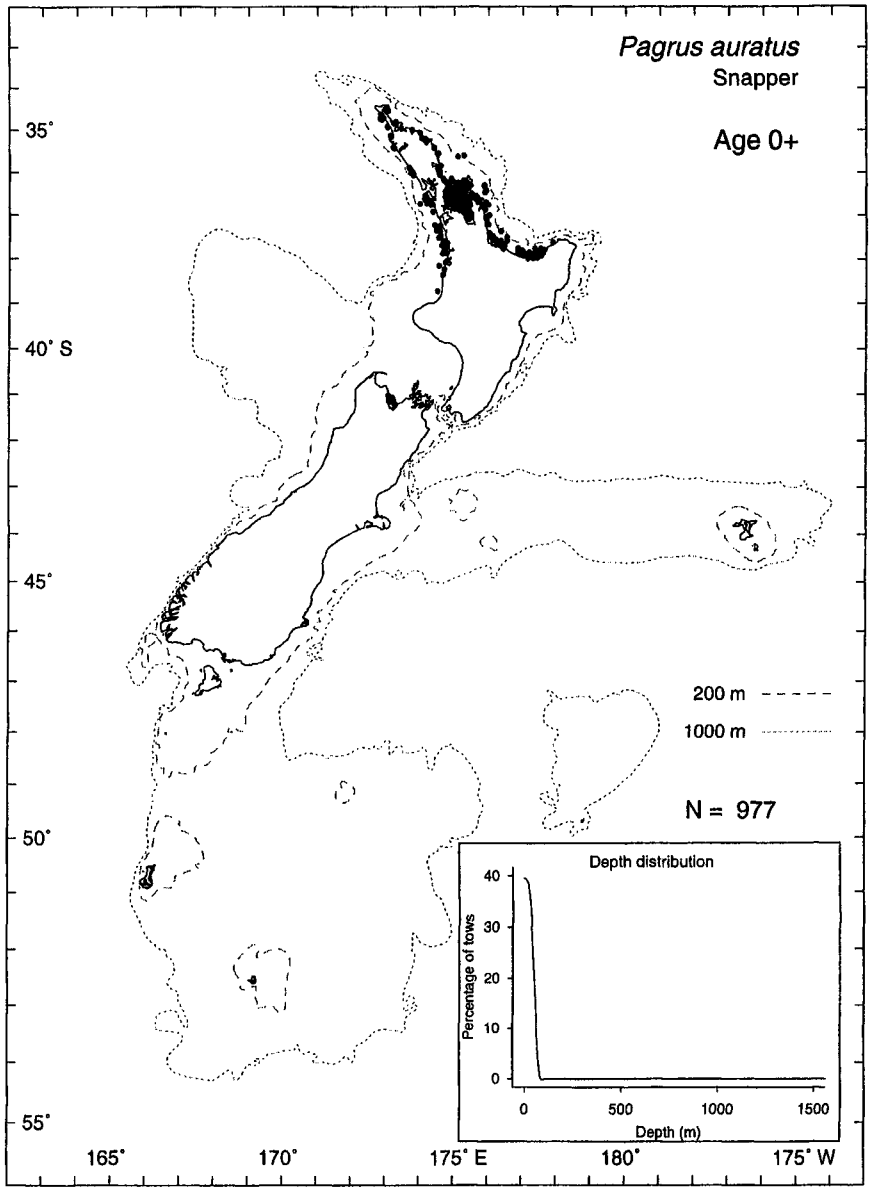
Juvenile plots are not presented for this species.

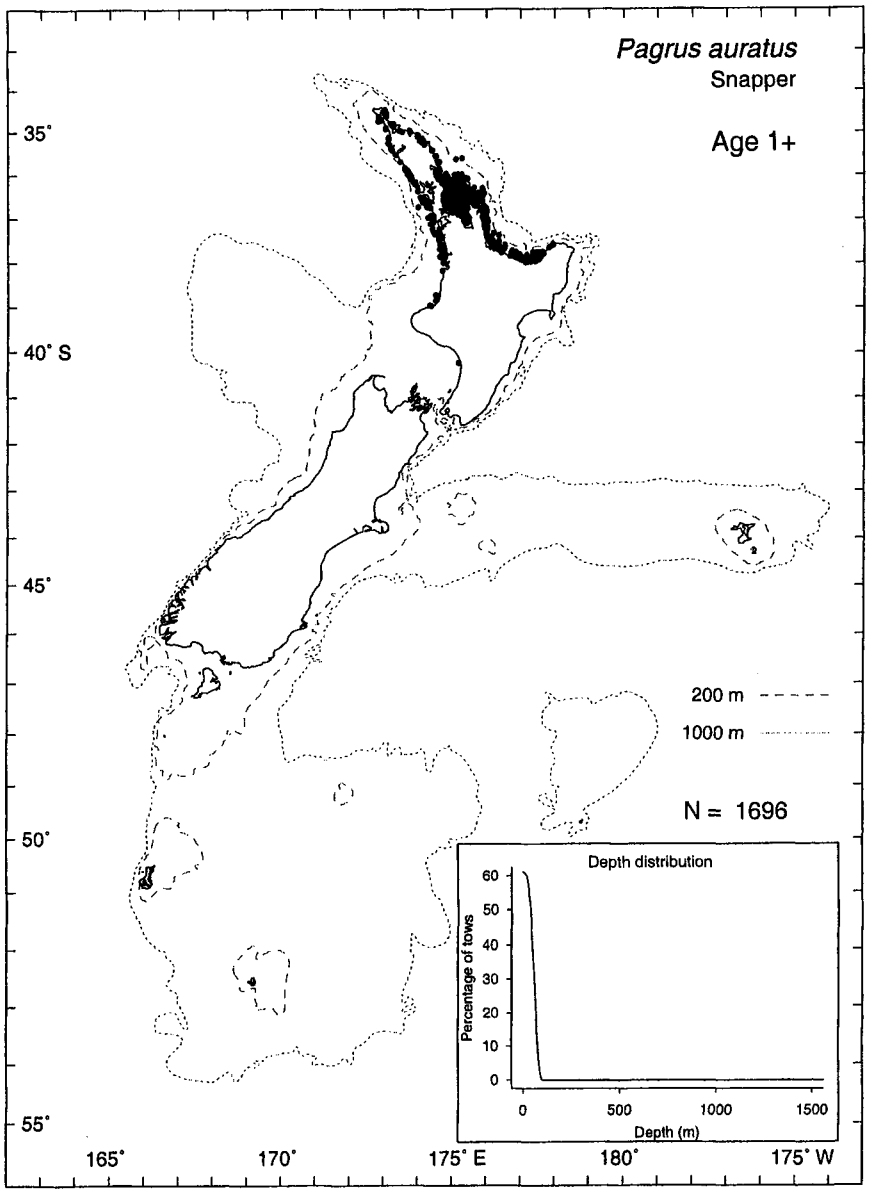

Nototodarus gouldi & N. sloanii
Gould's and Sloan's arrow squid
Group i
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2125
Depth distribution
Percentage of tows
0
5
10
15
20
25
0
500
1000
1500
Depth (m)

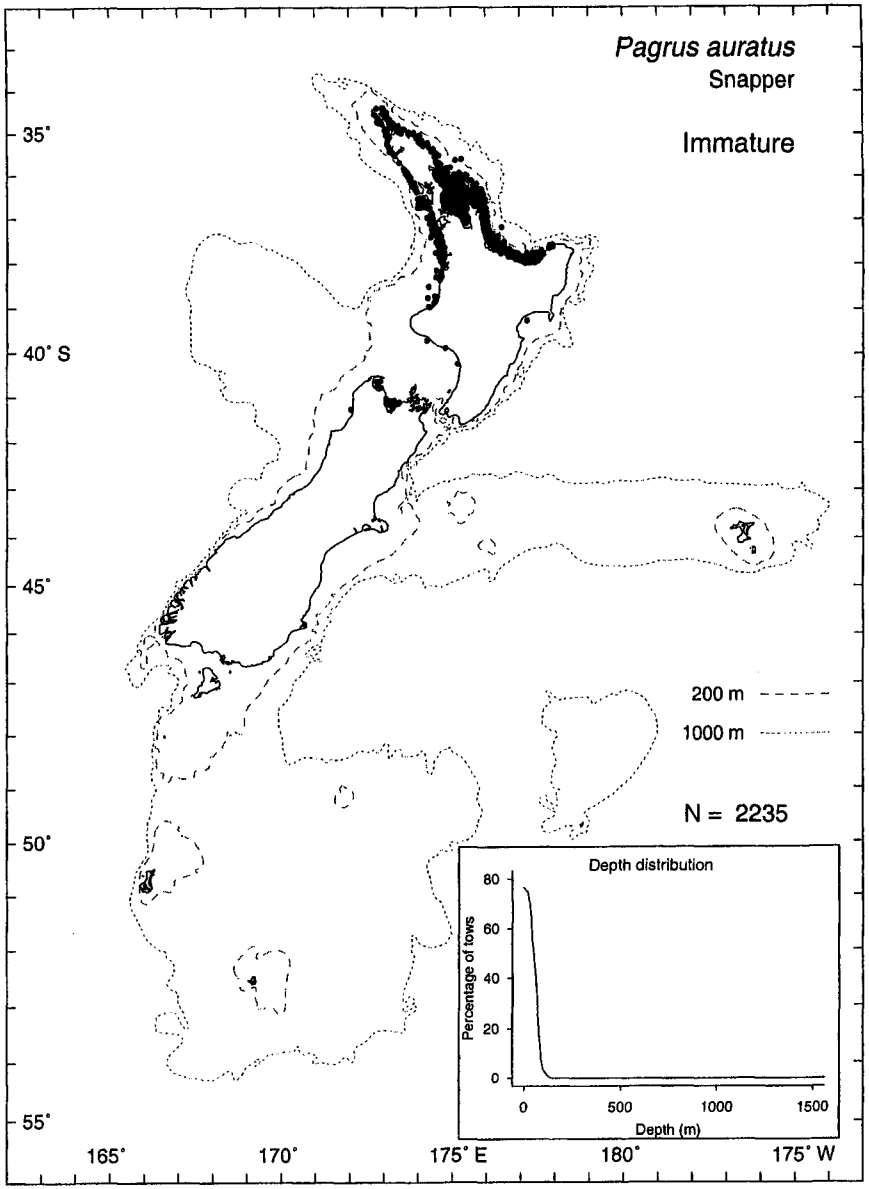

Nototodarus gouldi & N. sloanii
Gould's & Sloan's arrow squid
Group ii
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3933
Depth distribution
Percentage of tows
0
10
20
30
40
50
0
500
1000
1500
Depth (m)

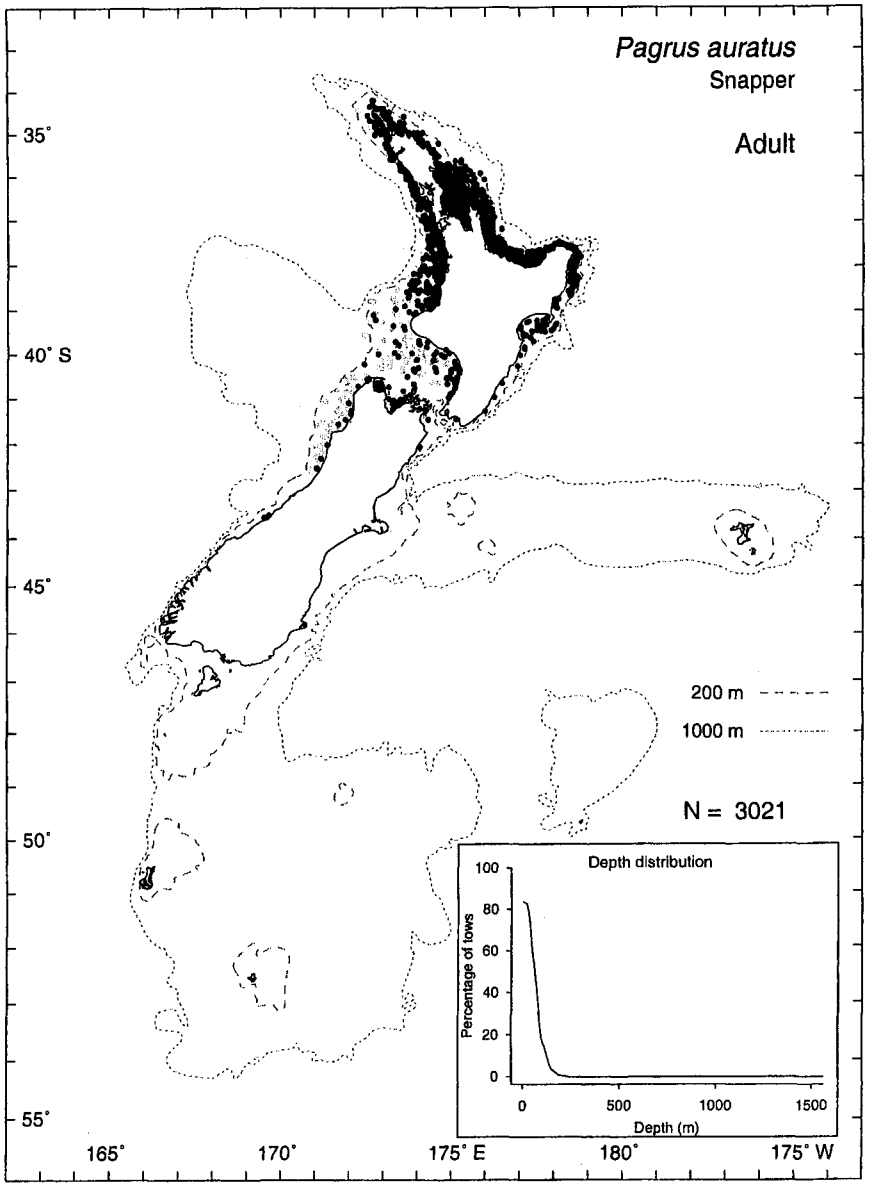

Nototodarus gouldi & N. sloanii
Gould's & Sloan's arrow squid
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 5772
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
60
500
1000
1500


Nototodarus gouldi & N. sloanii
Gould's and Sloan's arrow squid
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3662
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
500
1000
1500


Pagrus auratus
Snapper
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 977
Depth distribution
Percentage of tows
0
10
20
30
40
0
500
1000
1500
Depth (m)


Pagrus auratus
Snapper
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1696
Depth distribution
Percentage of tows
0
10
20
30
40
50
60
0
500
1000
1500
Depth (m)


Pagrus auratus
Snapper
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2235
Depth distribution
Percentage of tows
0
20
40
60
80
0
500
1000
1500
Depth (m)


Pagrus auratus
Snapper
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3021
Depth distribution
Percentage of tows
0
20
40
60
80
100
0
500
1000
1500
Depth (m)

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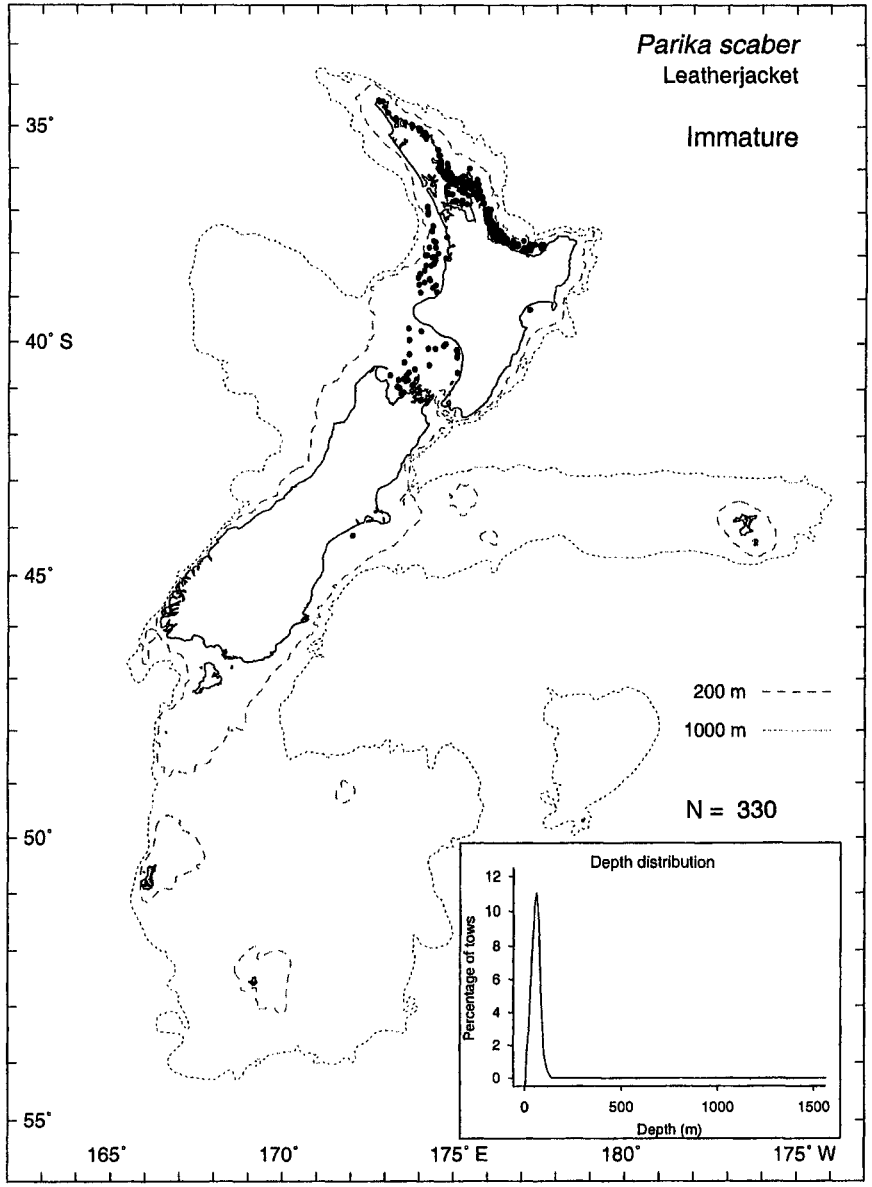
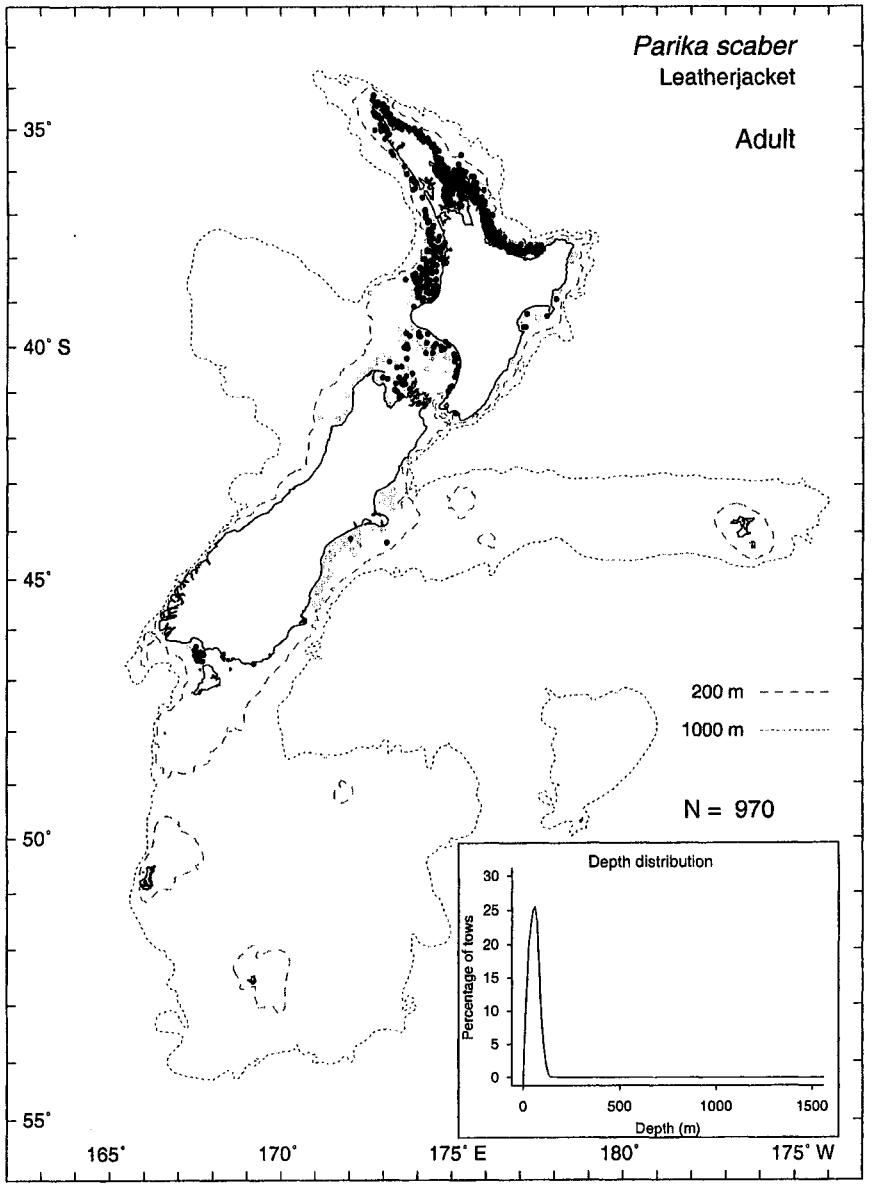
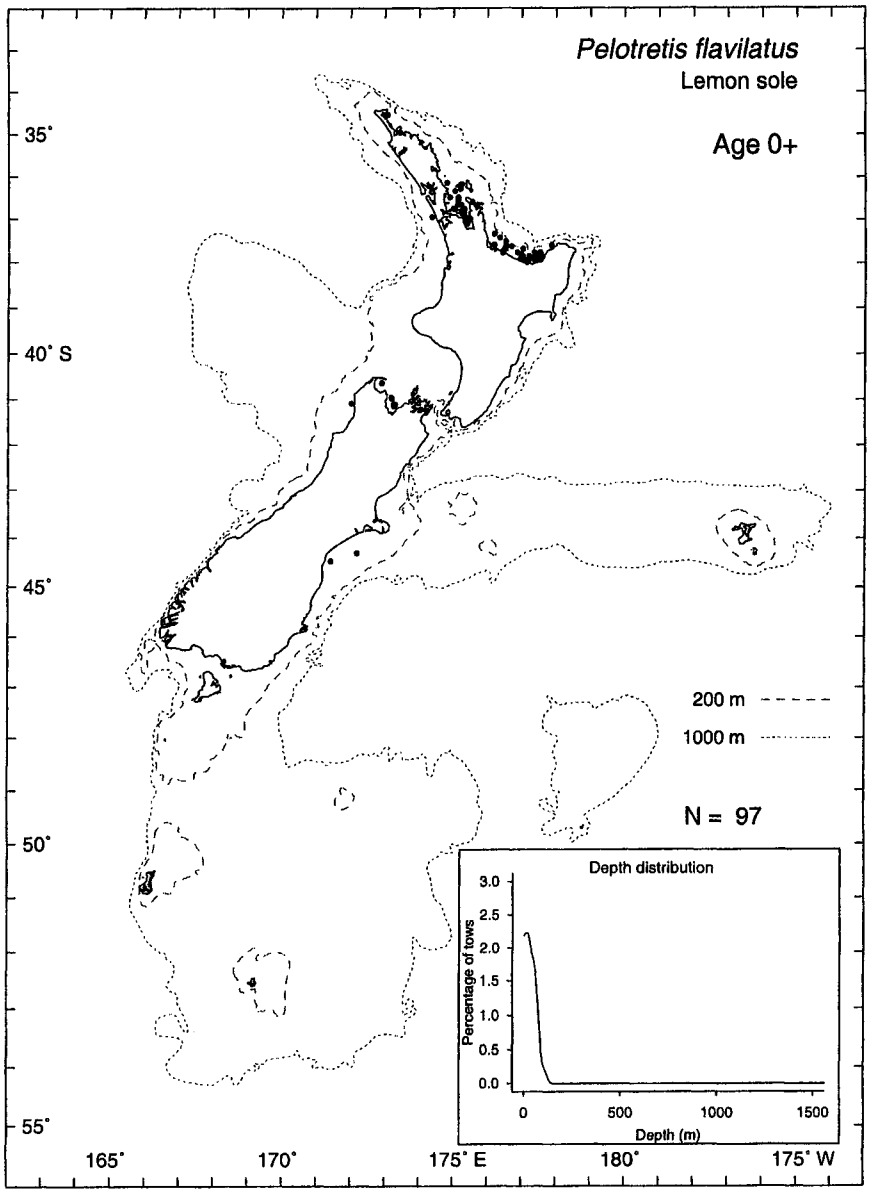
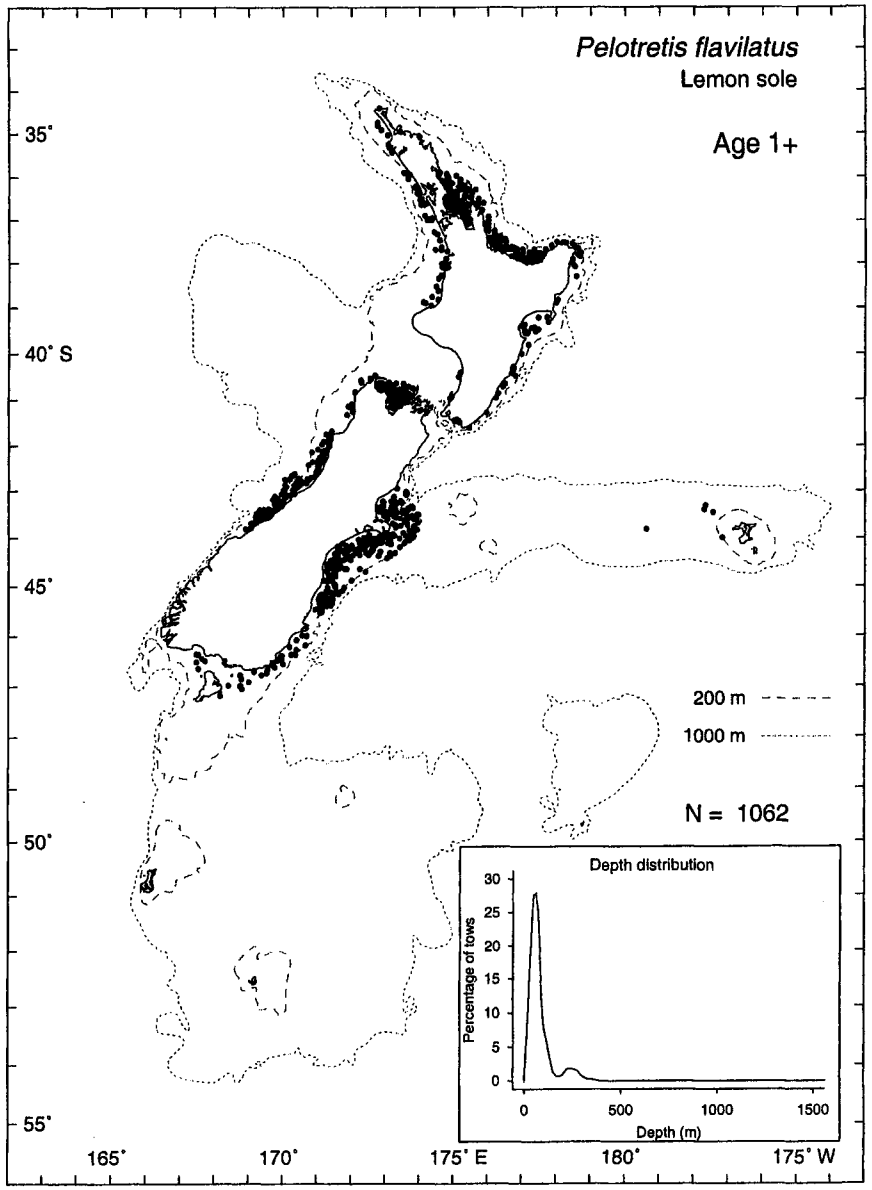
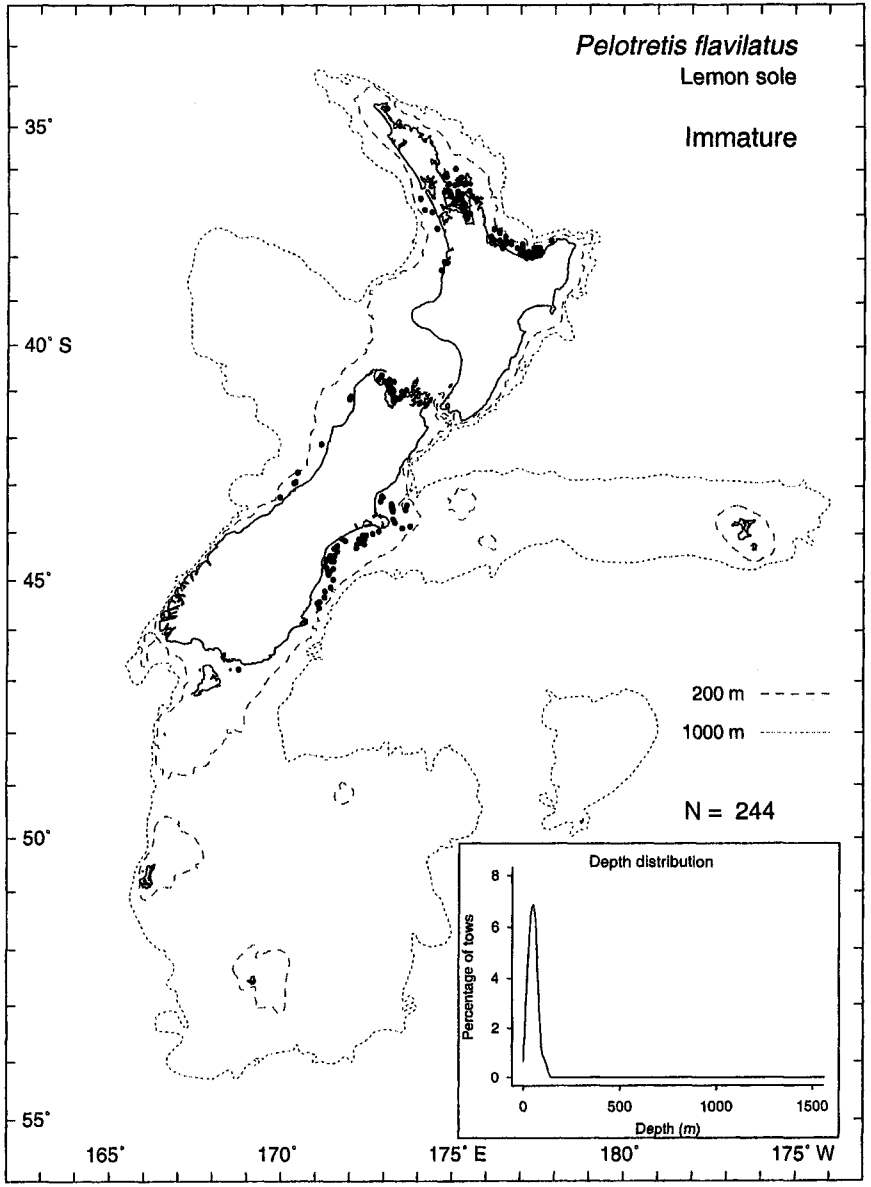


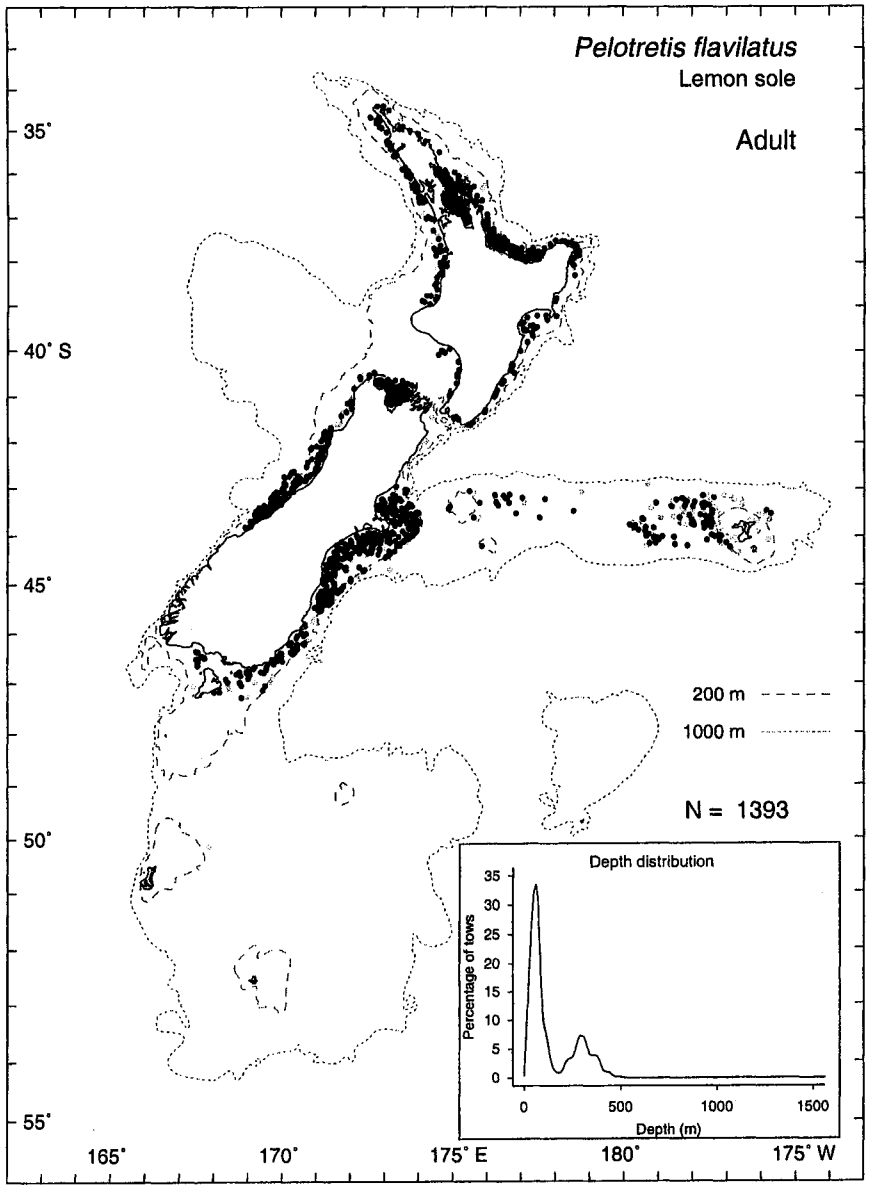


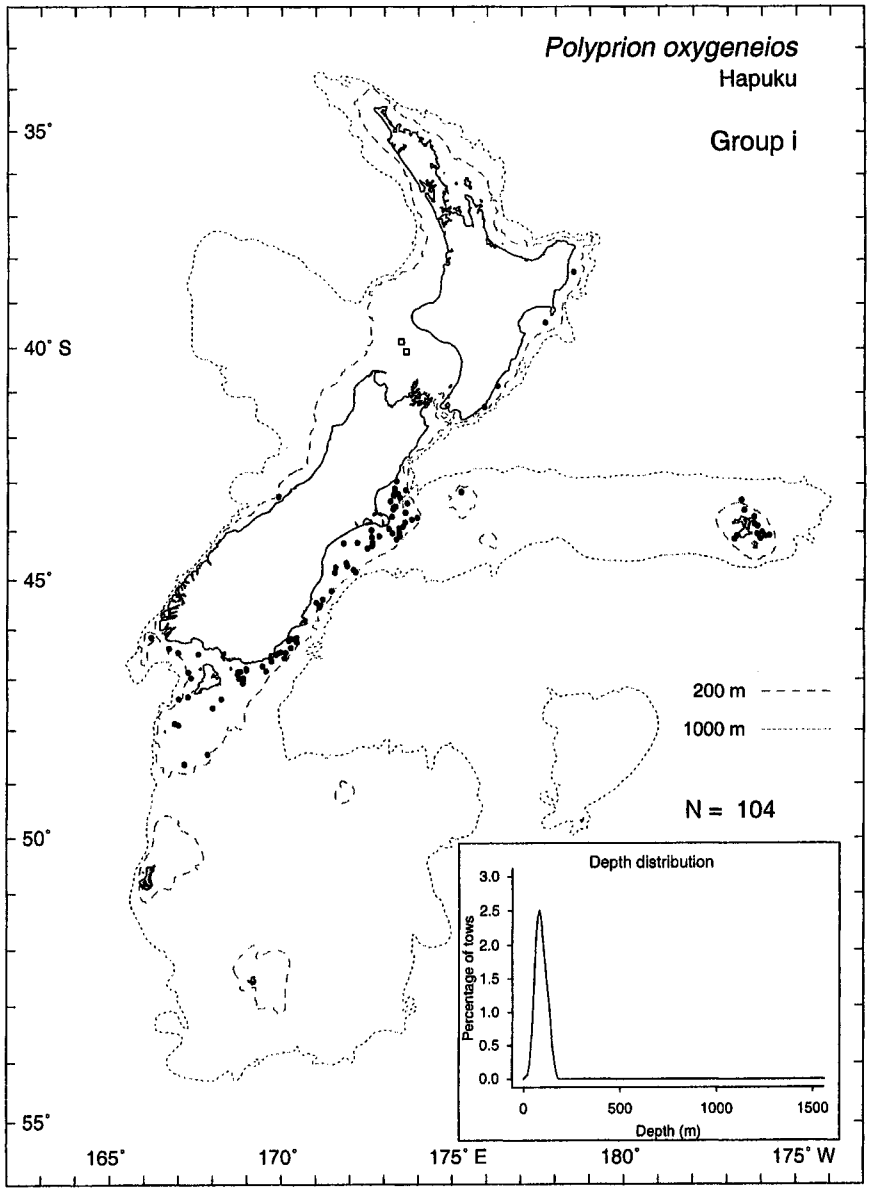
Juvenile plots are not presented for this species.

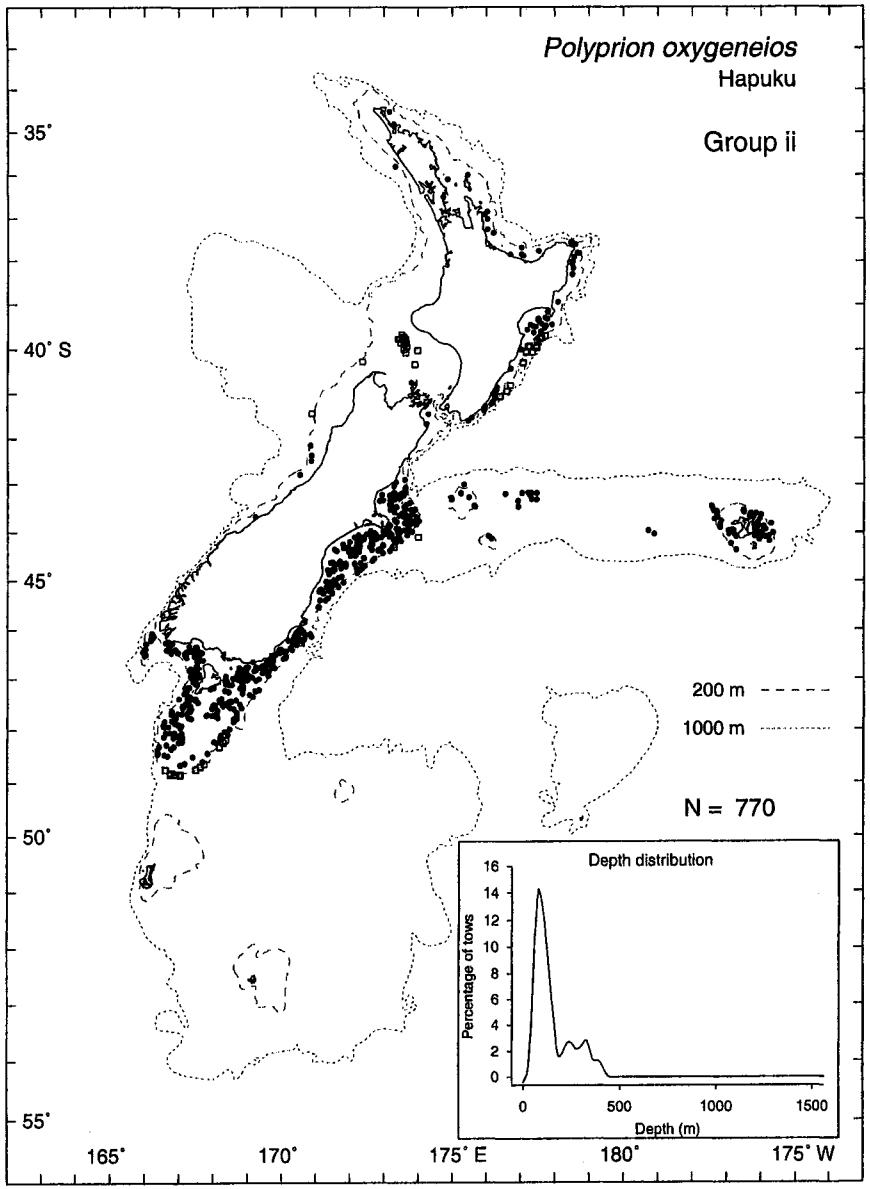

Pelotretis flavilatus
Lemon sole
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 97
Depth distribution
Percentage of tows
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)


Pelotretis flavilatus
Lemon sole
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1062
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

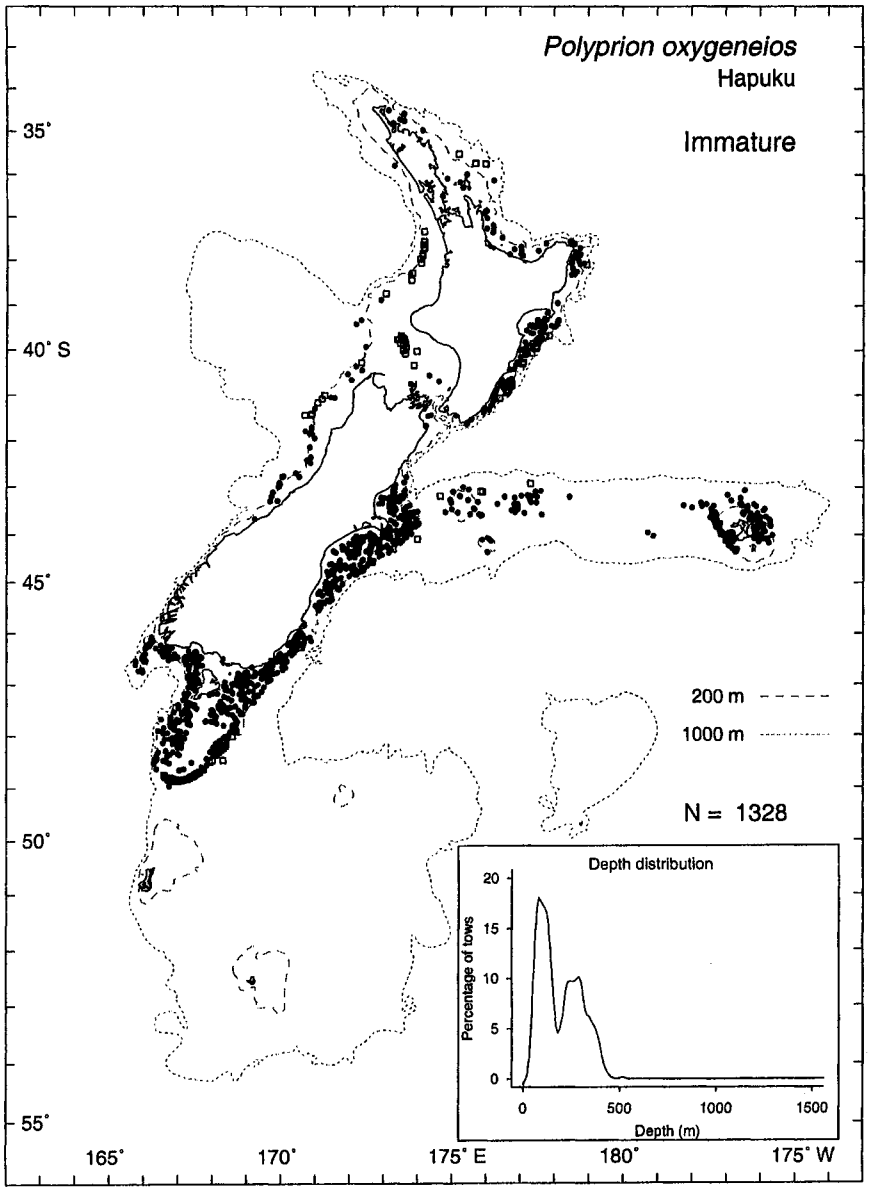

Pelotretis flavilatus
Lemon sole
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 244
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
2
4
6
8

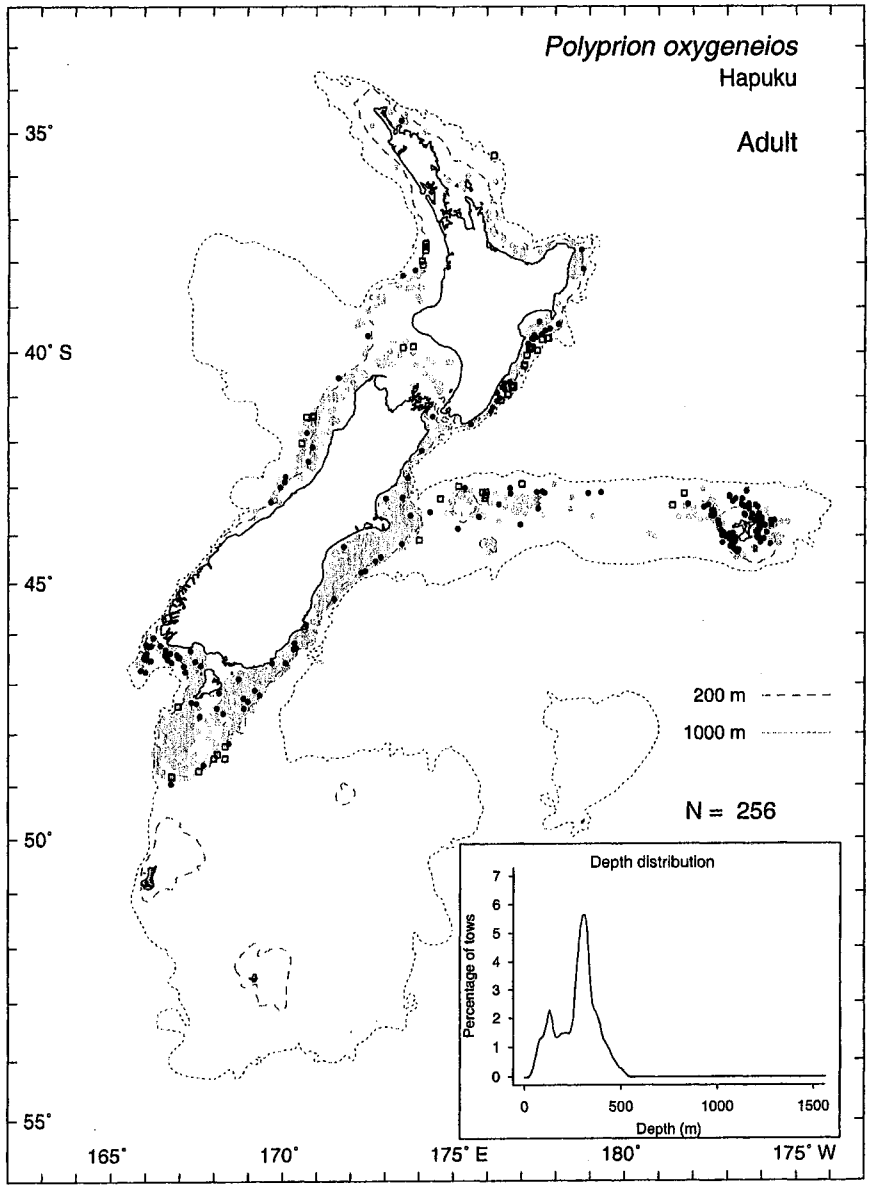

Pelotretis flavilatus
Lemon sole
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1393
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
5
10
15
20
25
30
35

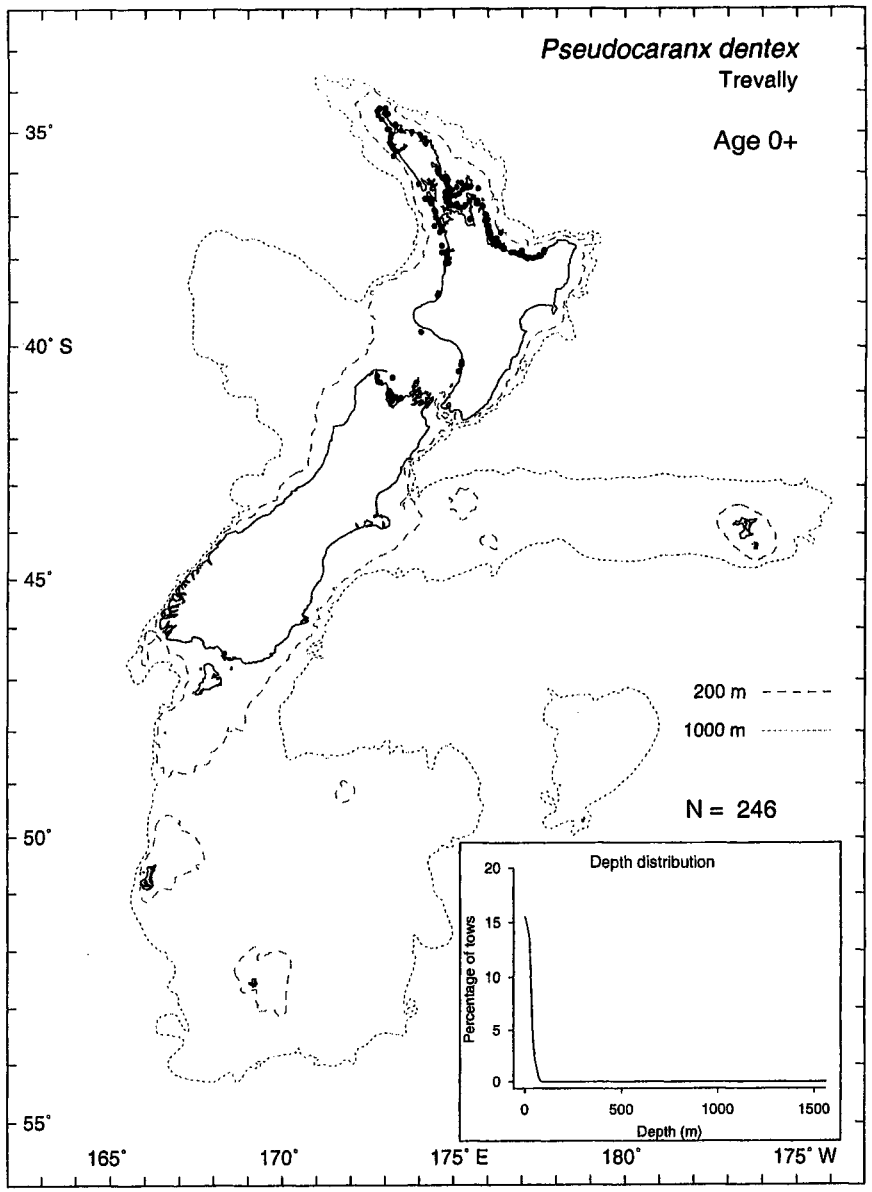


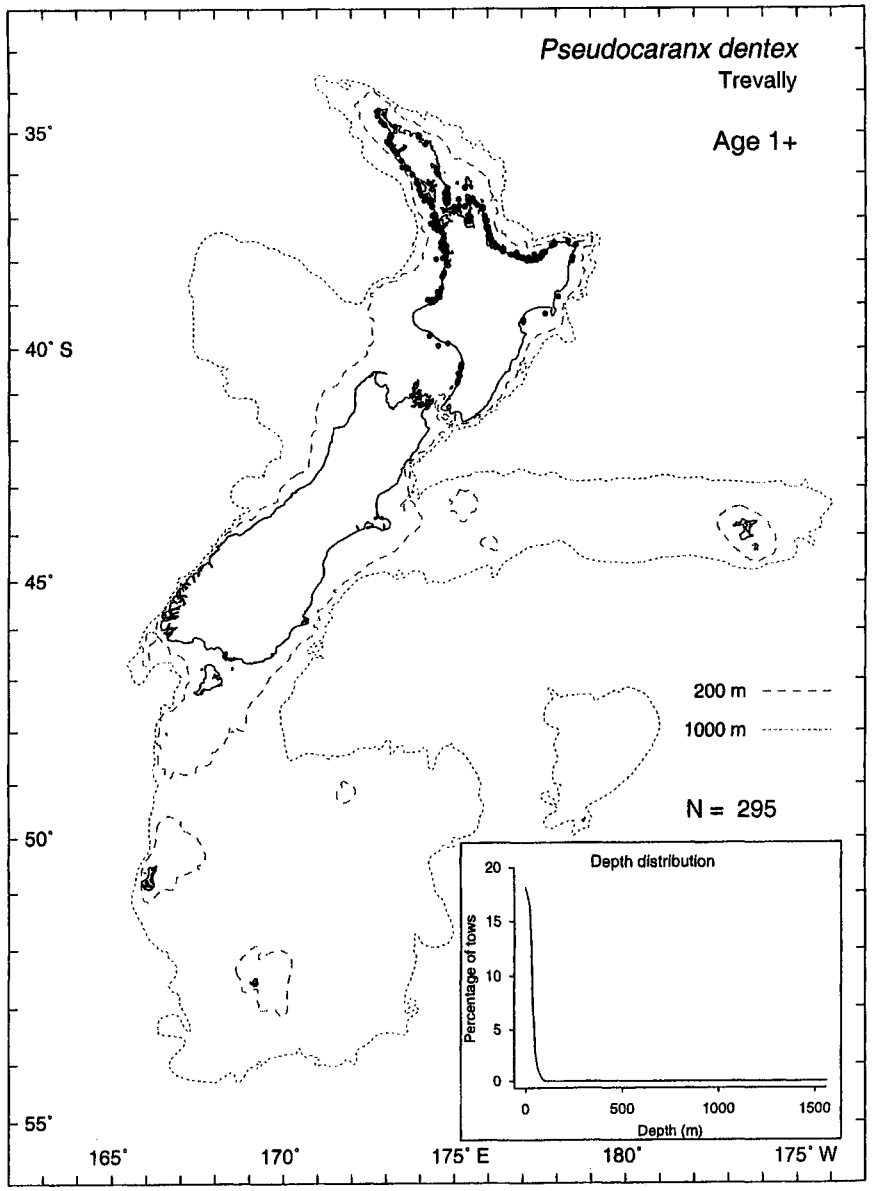


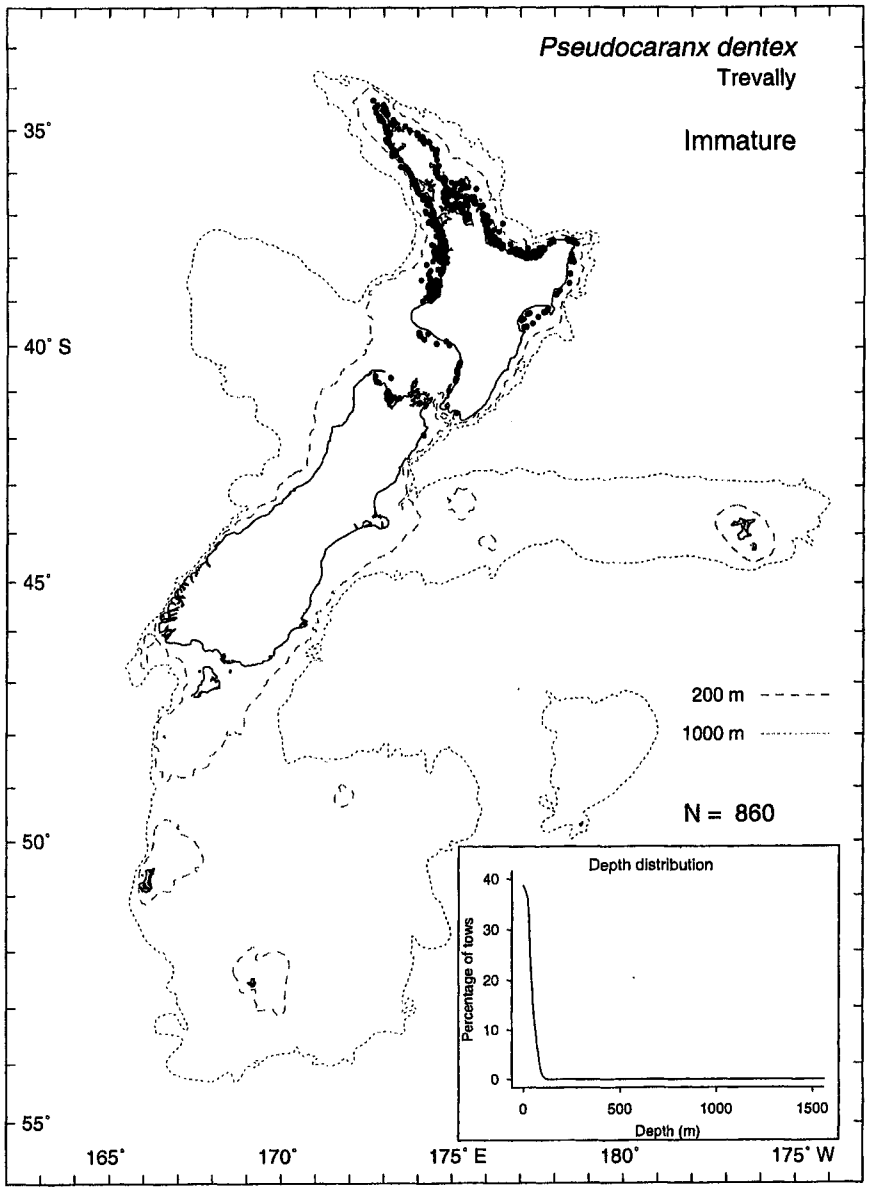
Groups i and ii are arbitrary and each may represent several year classes.

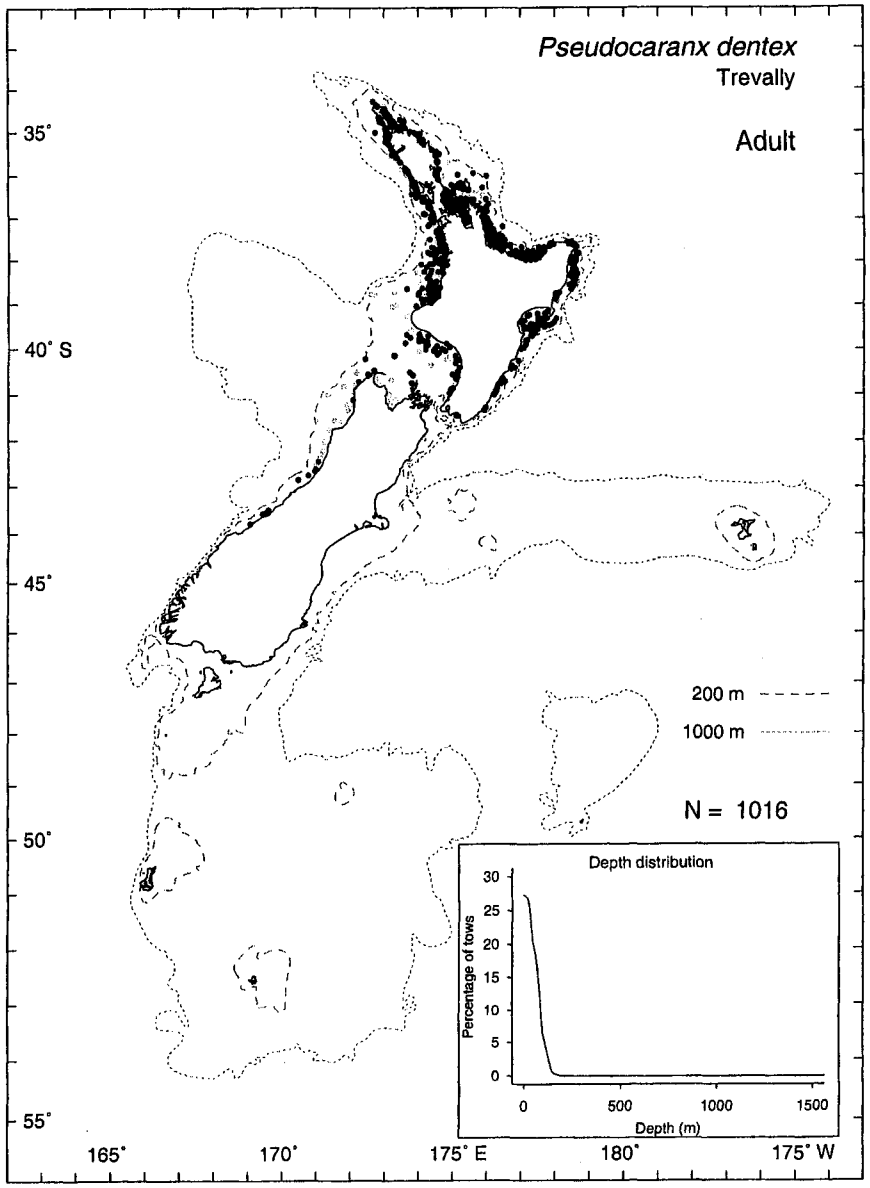

Polyprion oxygeneios
Hapuku
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1328
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
500
1000
1500


Polyprion oxygeneios
Hapuku
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 256
Depth distribution
Percentage of tows
Depth (m)
0
1
2
3
4
5
6
7
500
1000
1500


Pseudocaranx dentex
Trevally
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 246
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)


Pseudocaranx dentex
Trevally
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 295
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)


Pseudocaranx dentex
Trevally
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 860
Depth distribution
Percentage of tows
40
30
20
10
0
0
500
1000
1500
Depth (m)


Pseudocaranx dentex
Trevally
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1016
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

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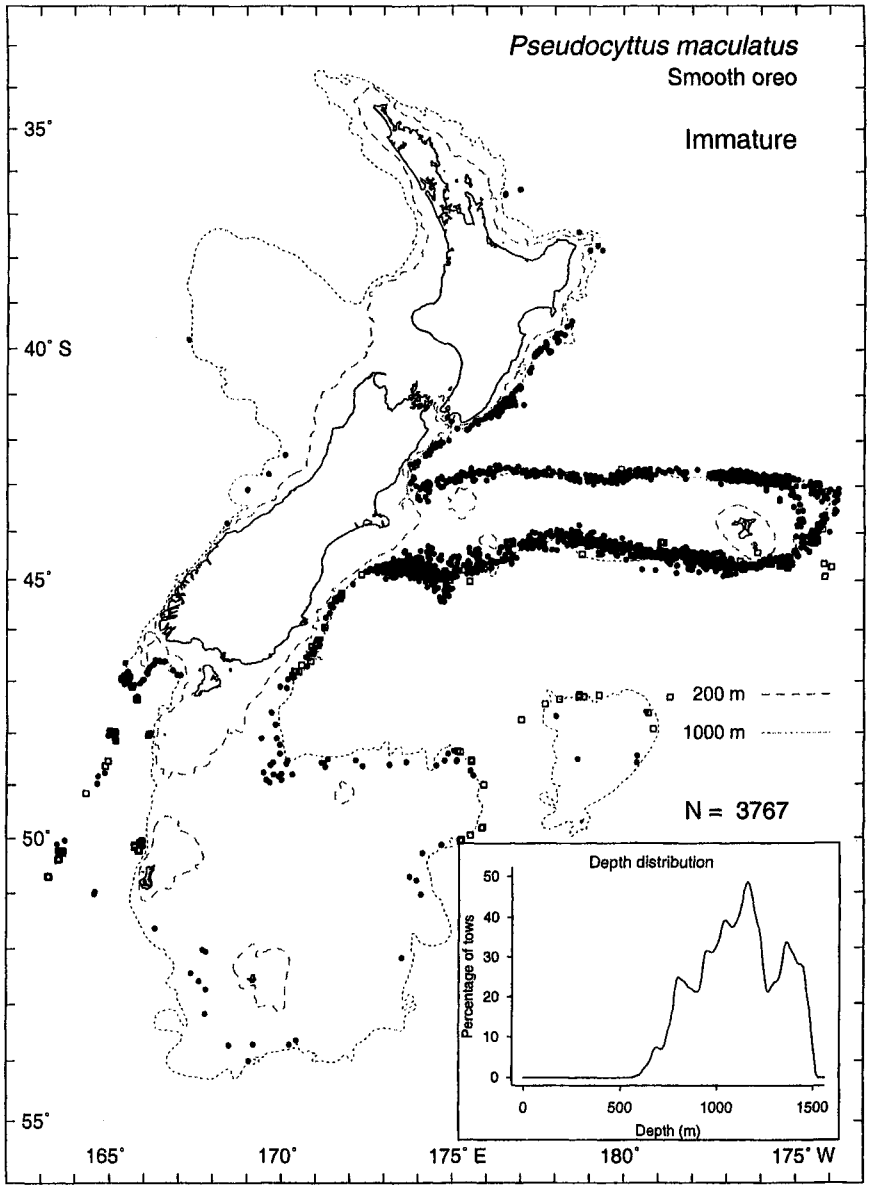
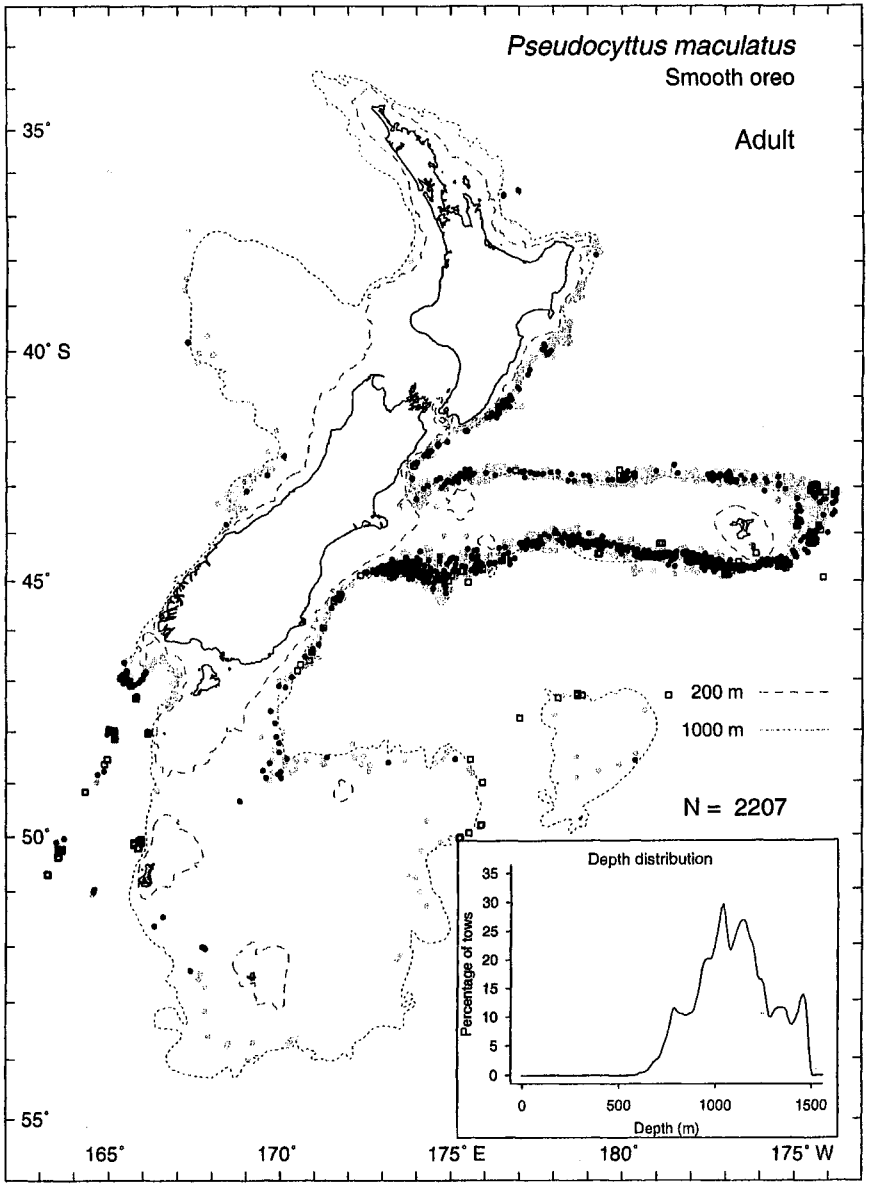
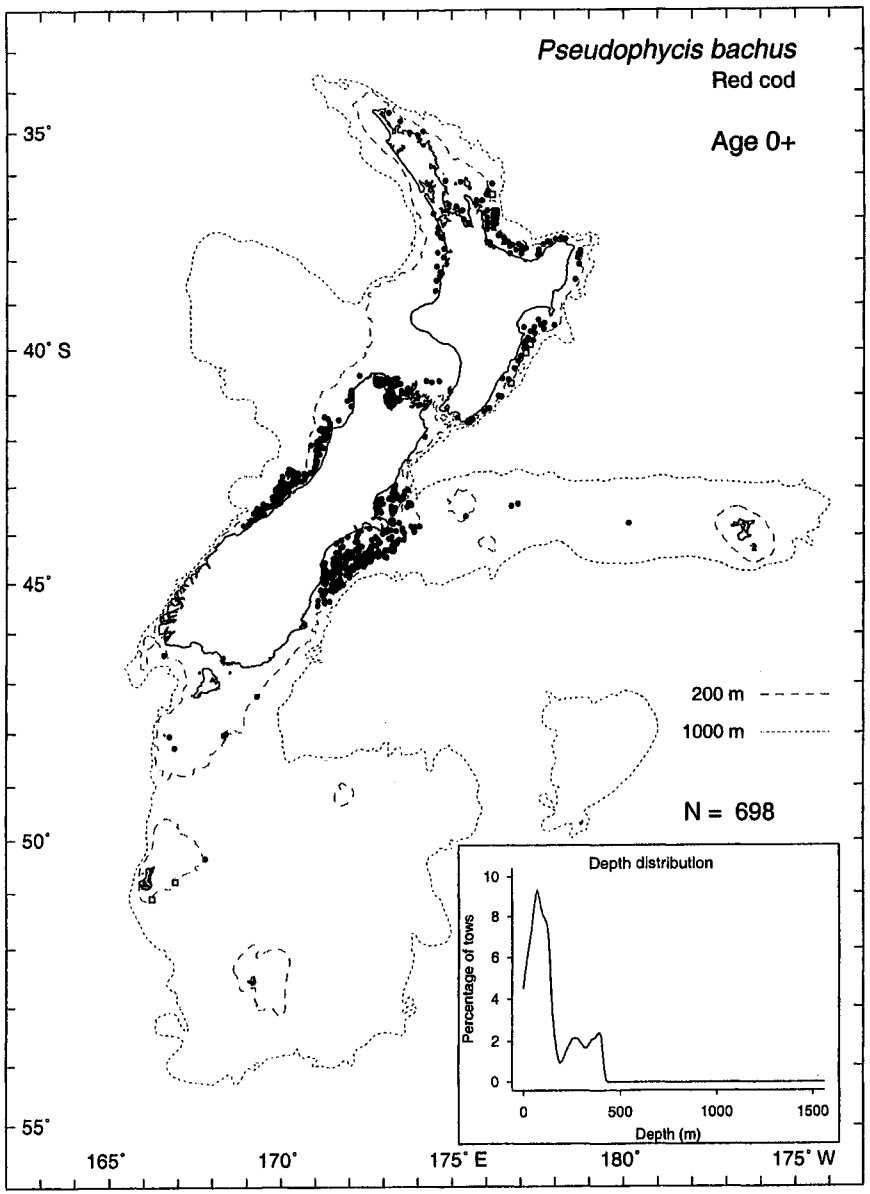
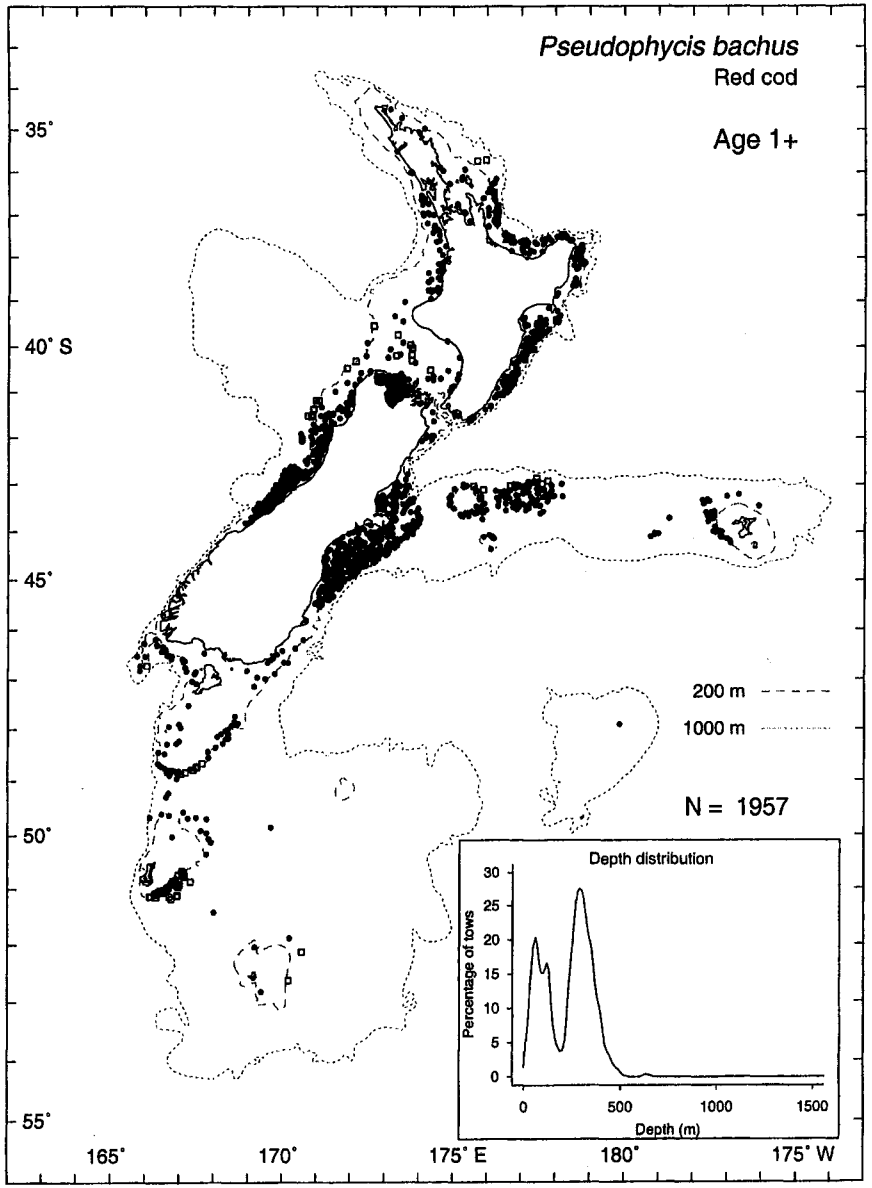
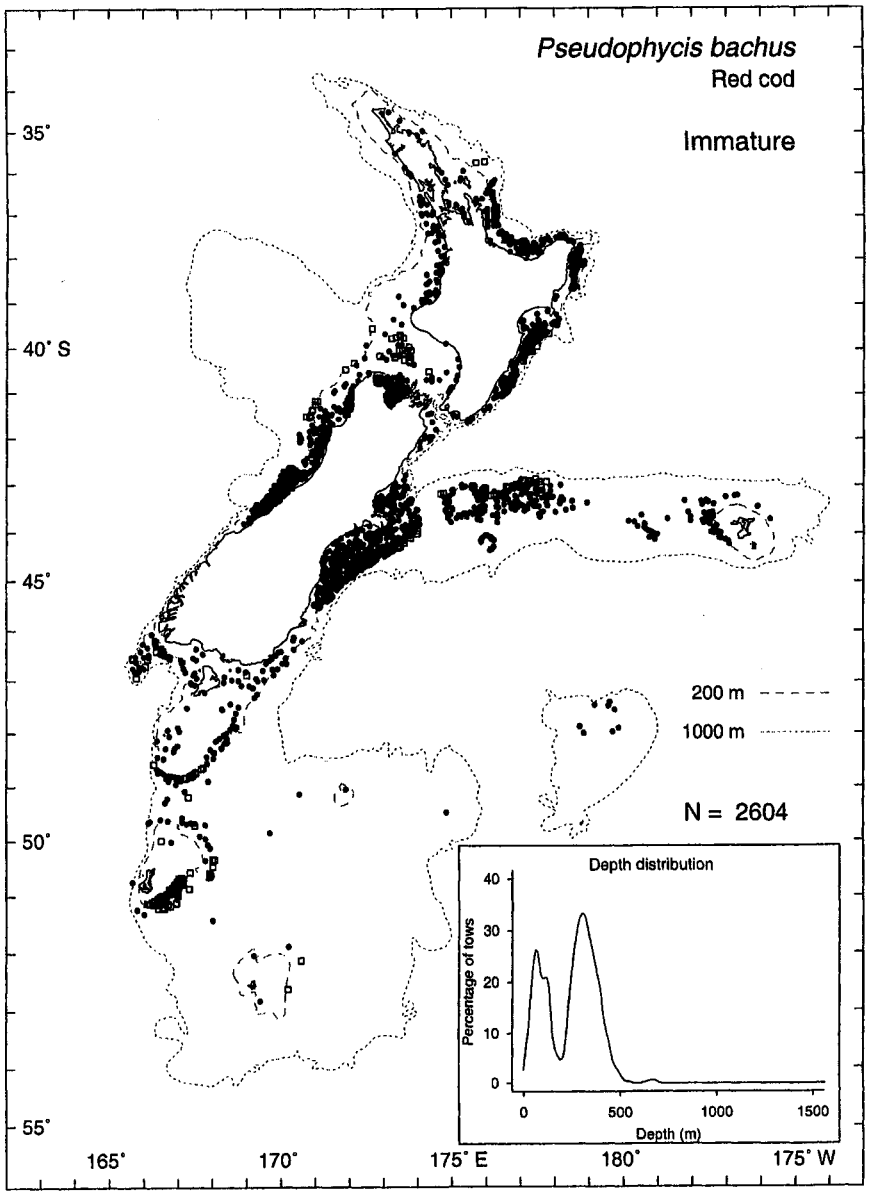


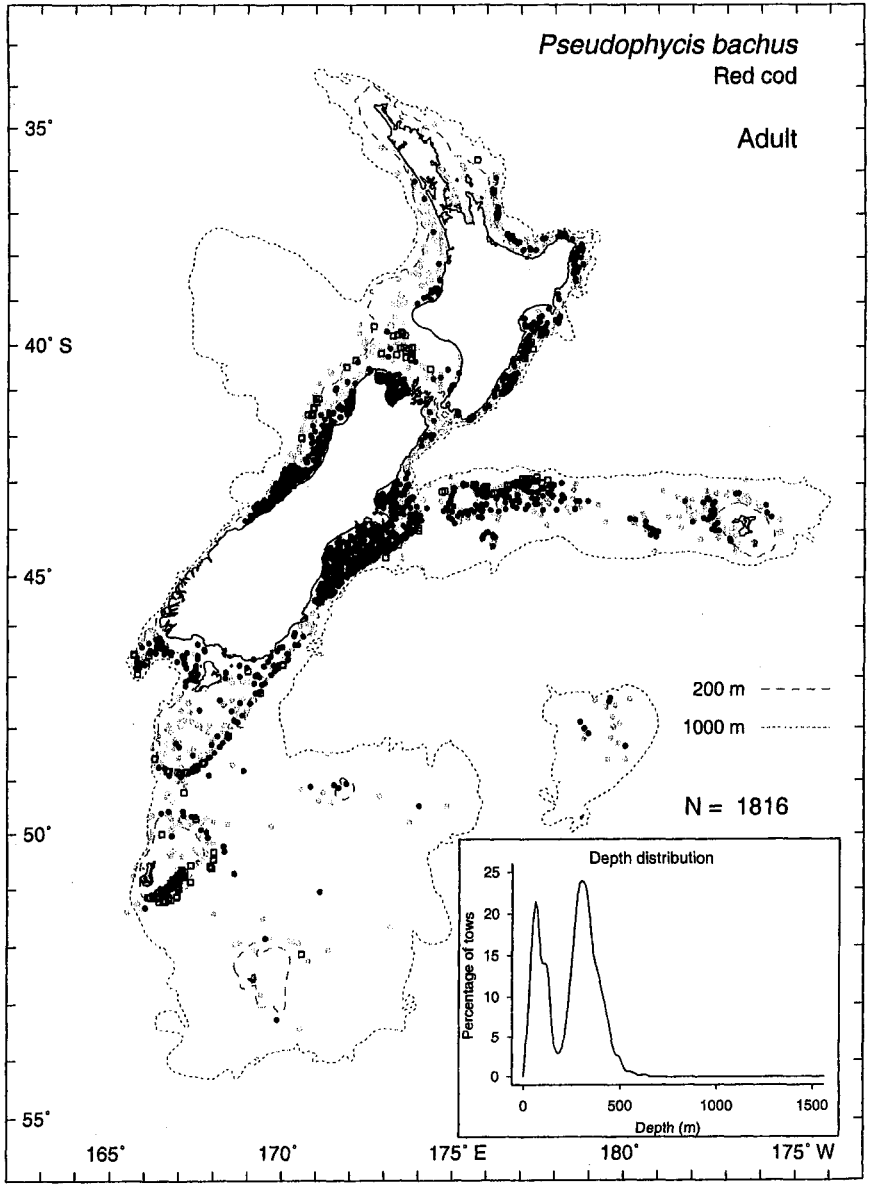


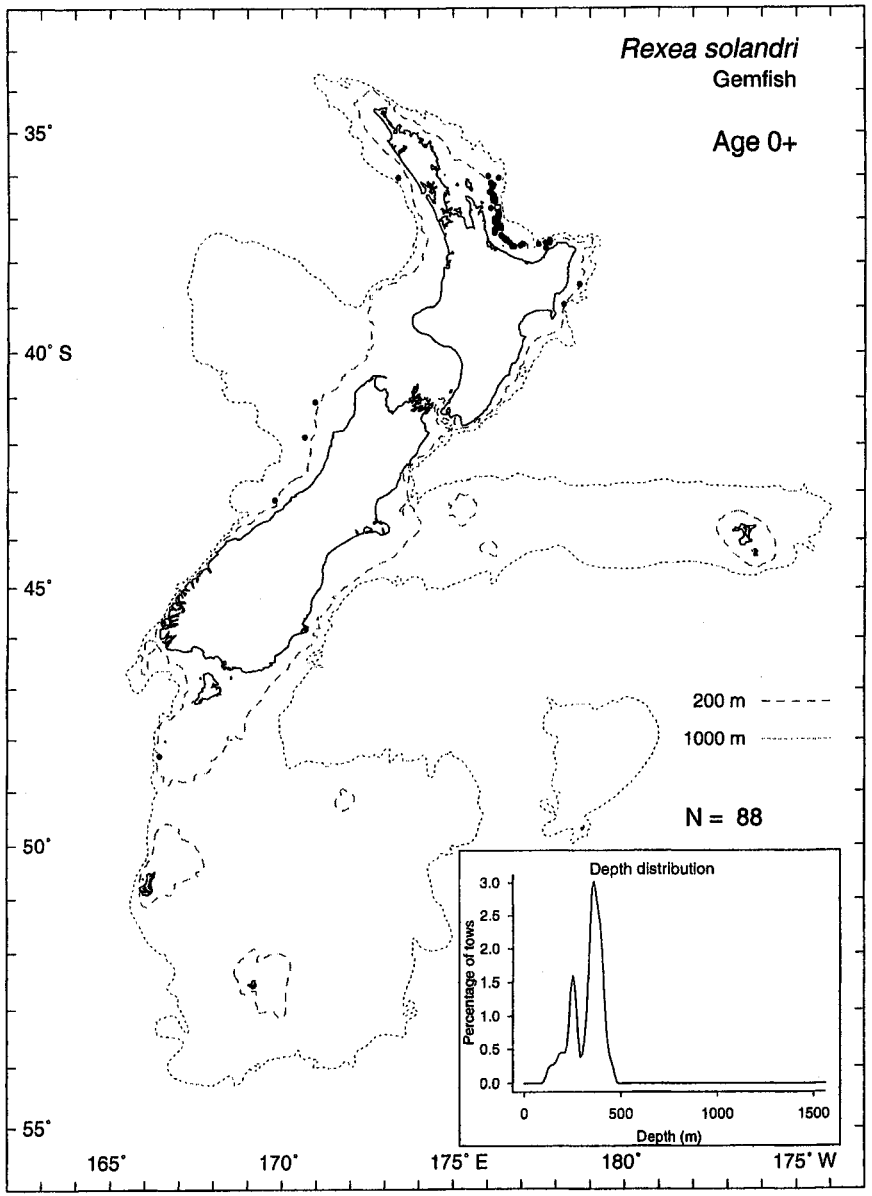
Juvenile plots are not presented for this species.

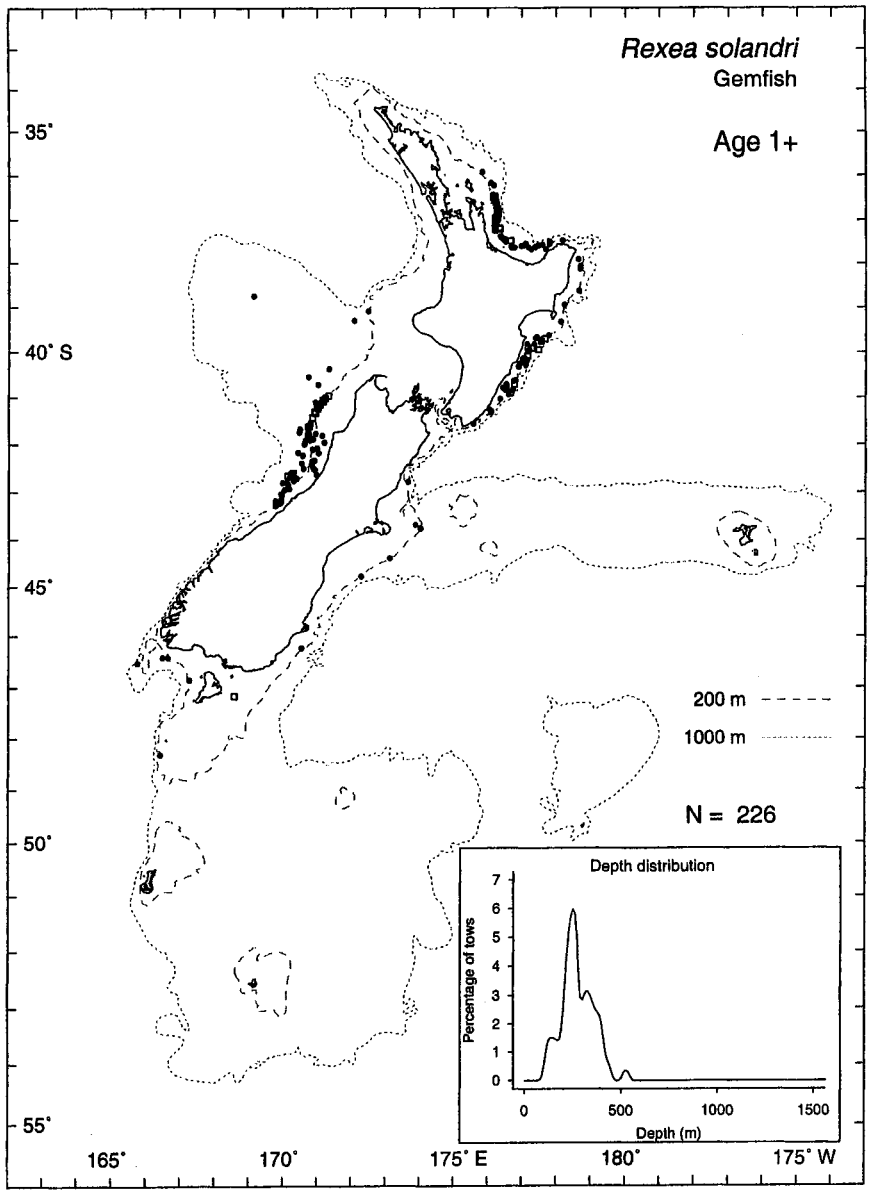

Pseudophycis bachus
Red cod
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 698
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
0
500
1000
1500

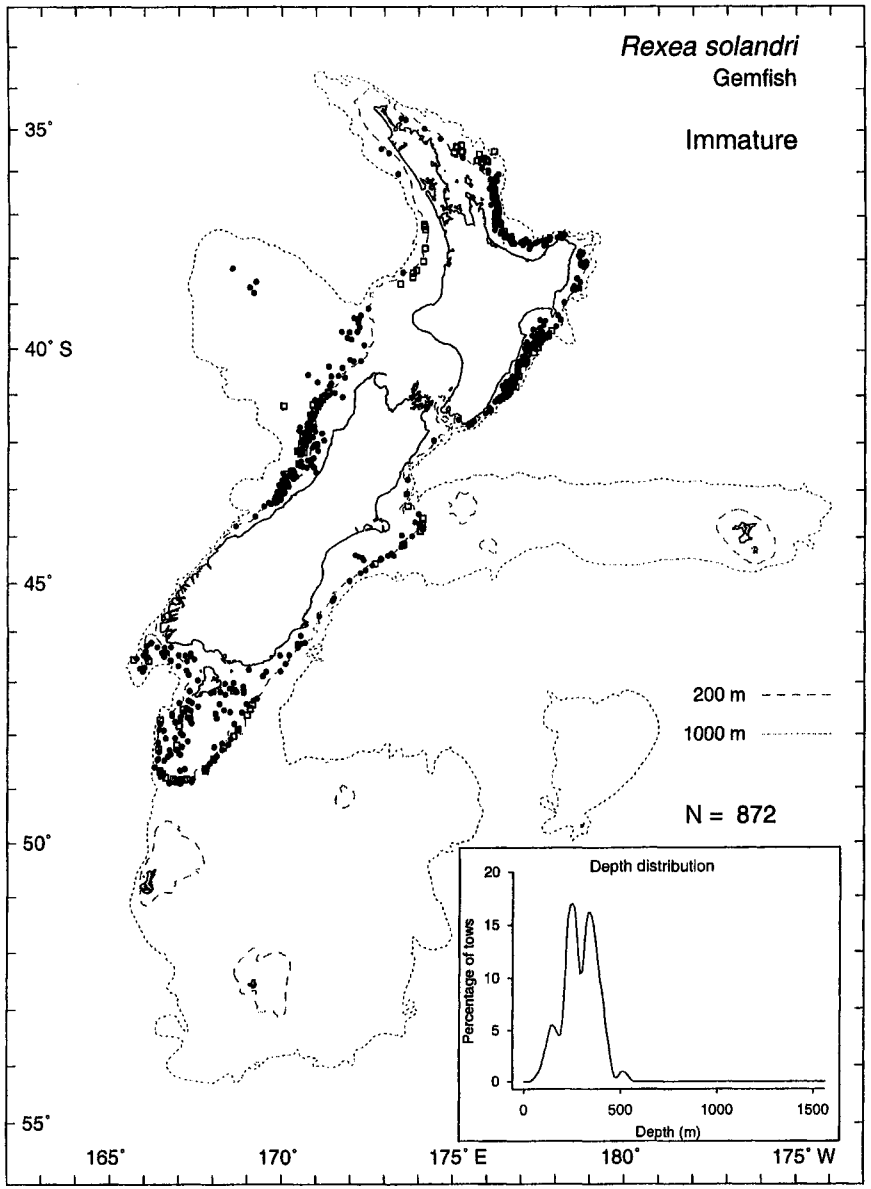

Pseudophycis bachus
Red cod
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1957
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
0
500
1000
1500

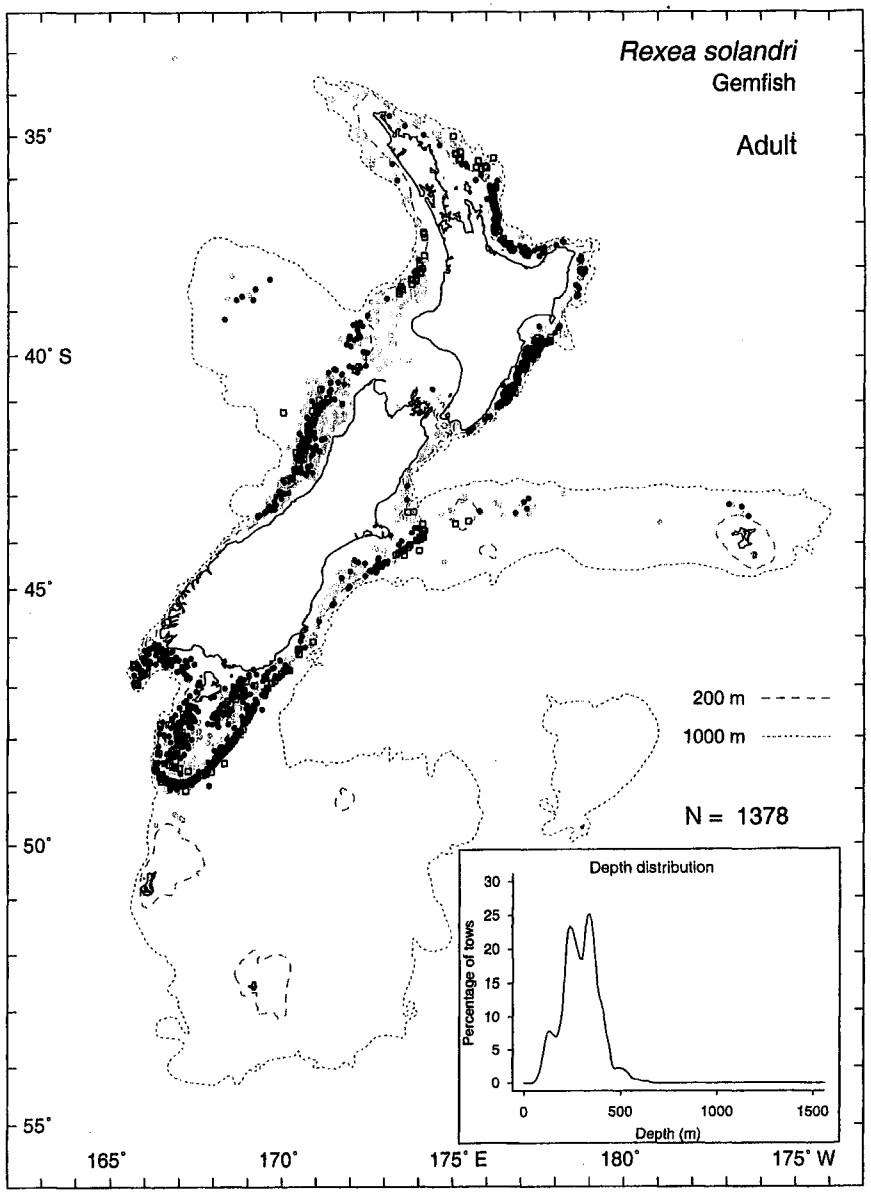

Pseudophycis bachus
Red cod
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2604
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
10
20
30
40

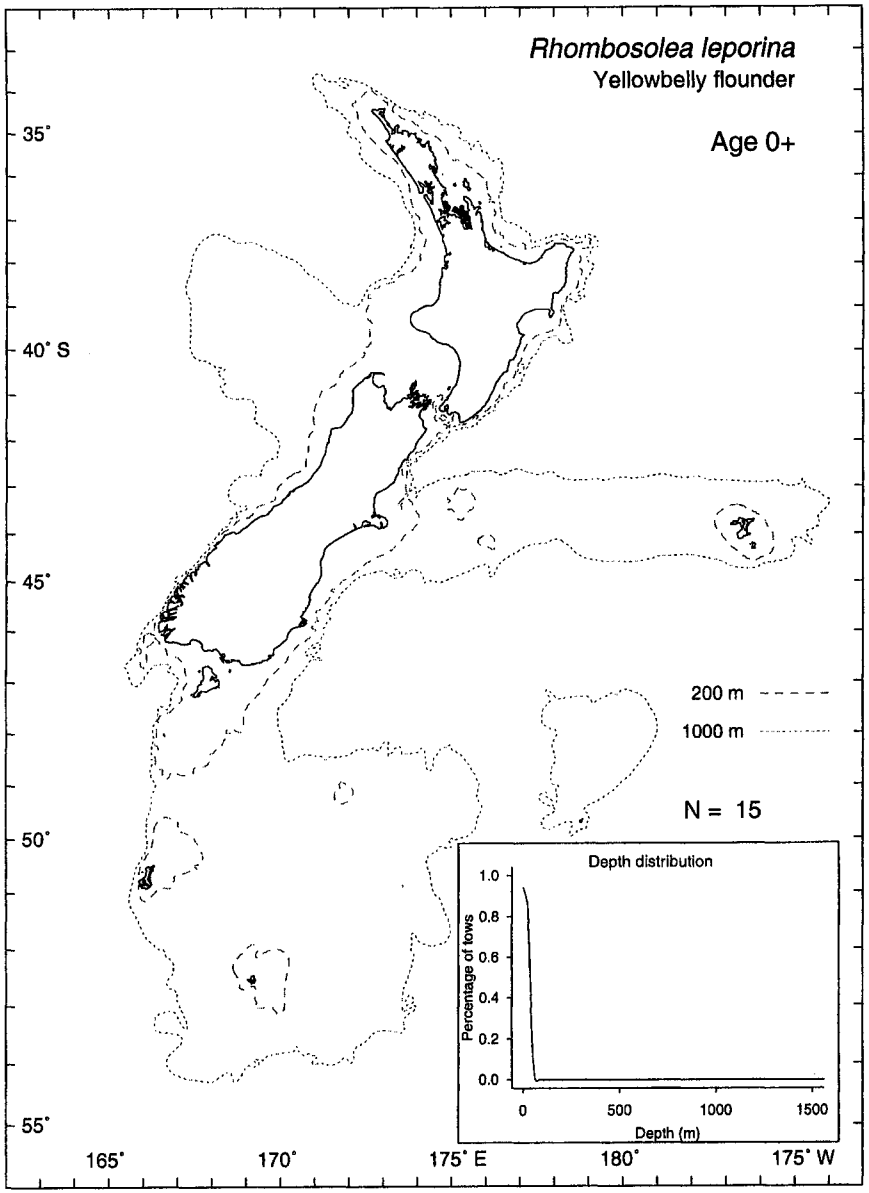

Pseudophycis bachus
Red cod
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1816
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
5
10
15
20
25

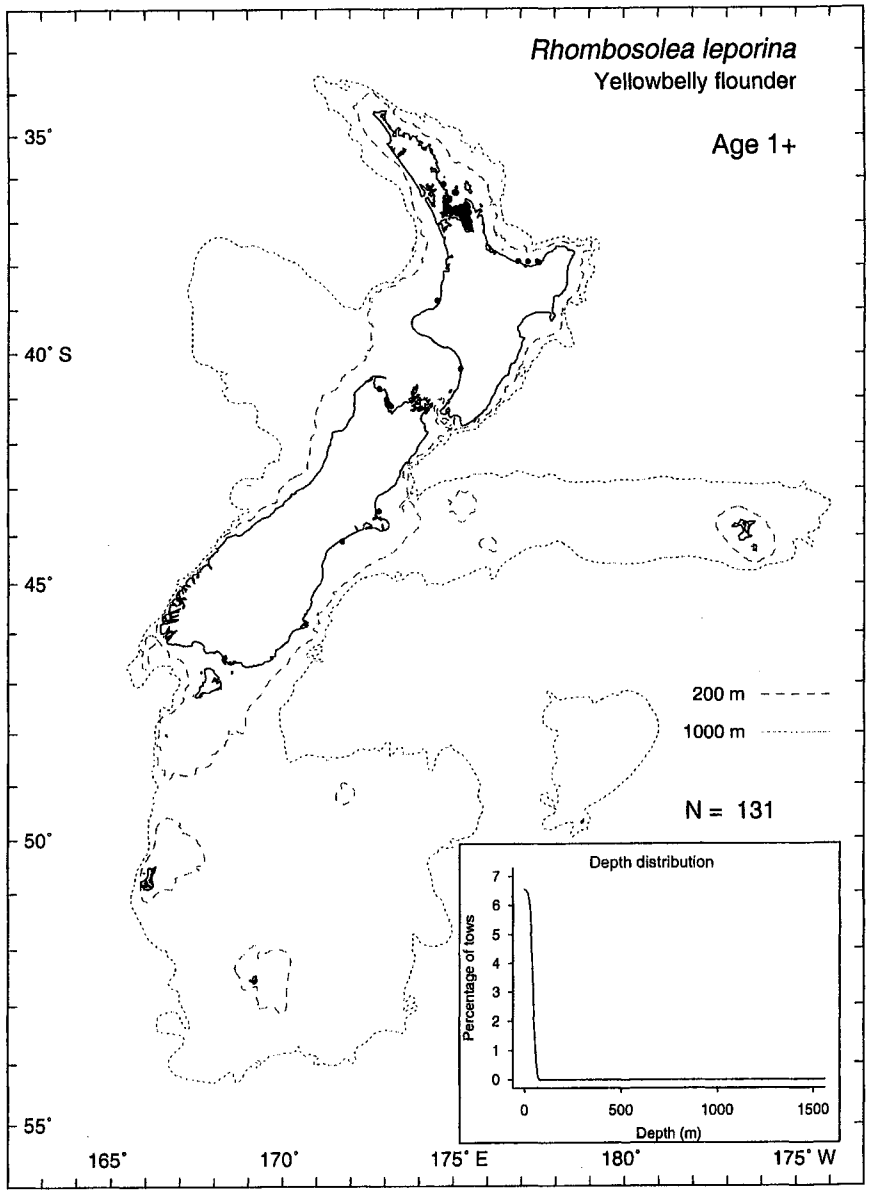

Rexea solandri
Gemfish
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 88
Depth distribution
Percentage of tows
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)

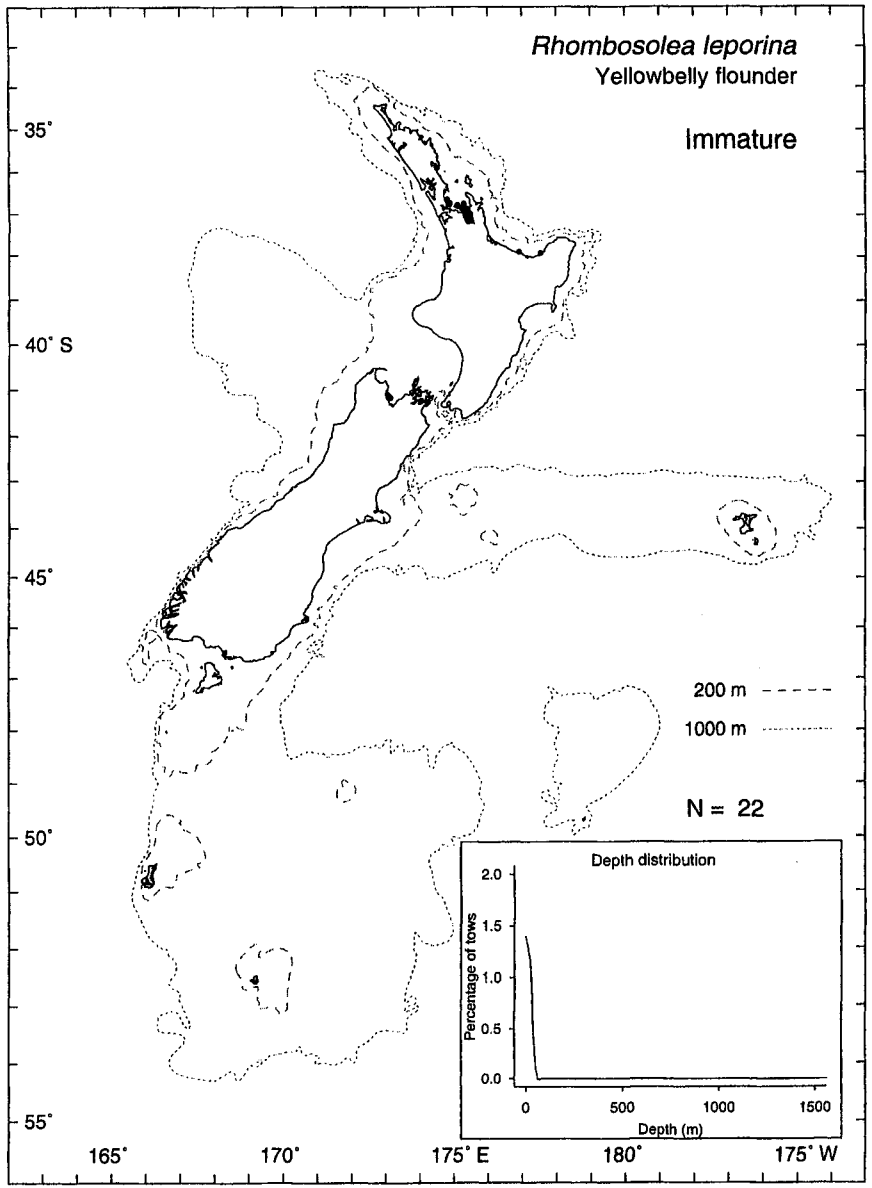

Rexea solandri
Gemfish
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 226
Depth distribution
Percentage of tows
7
6
5
4
3
2
1
0
0
500
1000
1500
Depth (m)

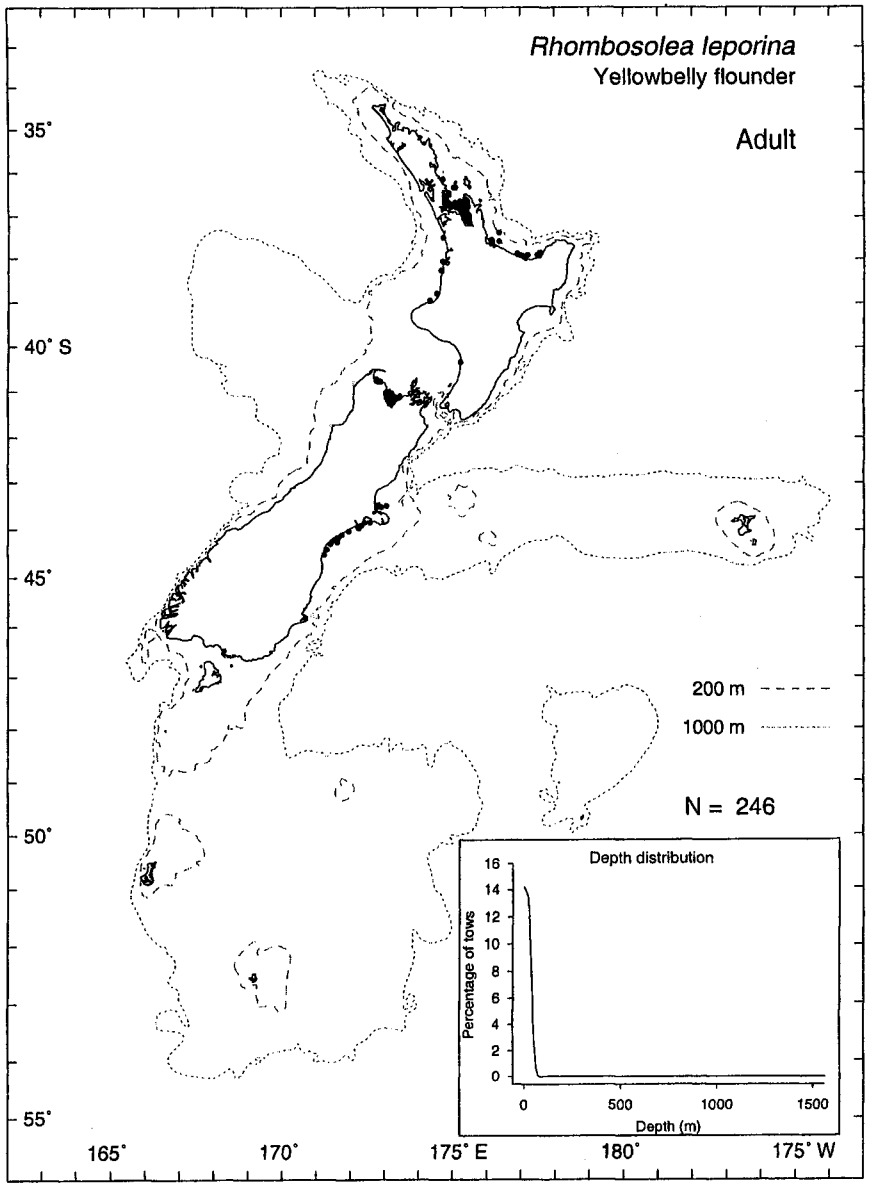

Rexea solandri
Gemfish
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 872
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
500
1000
1500

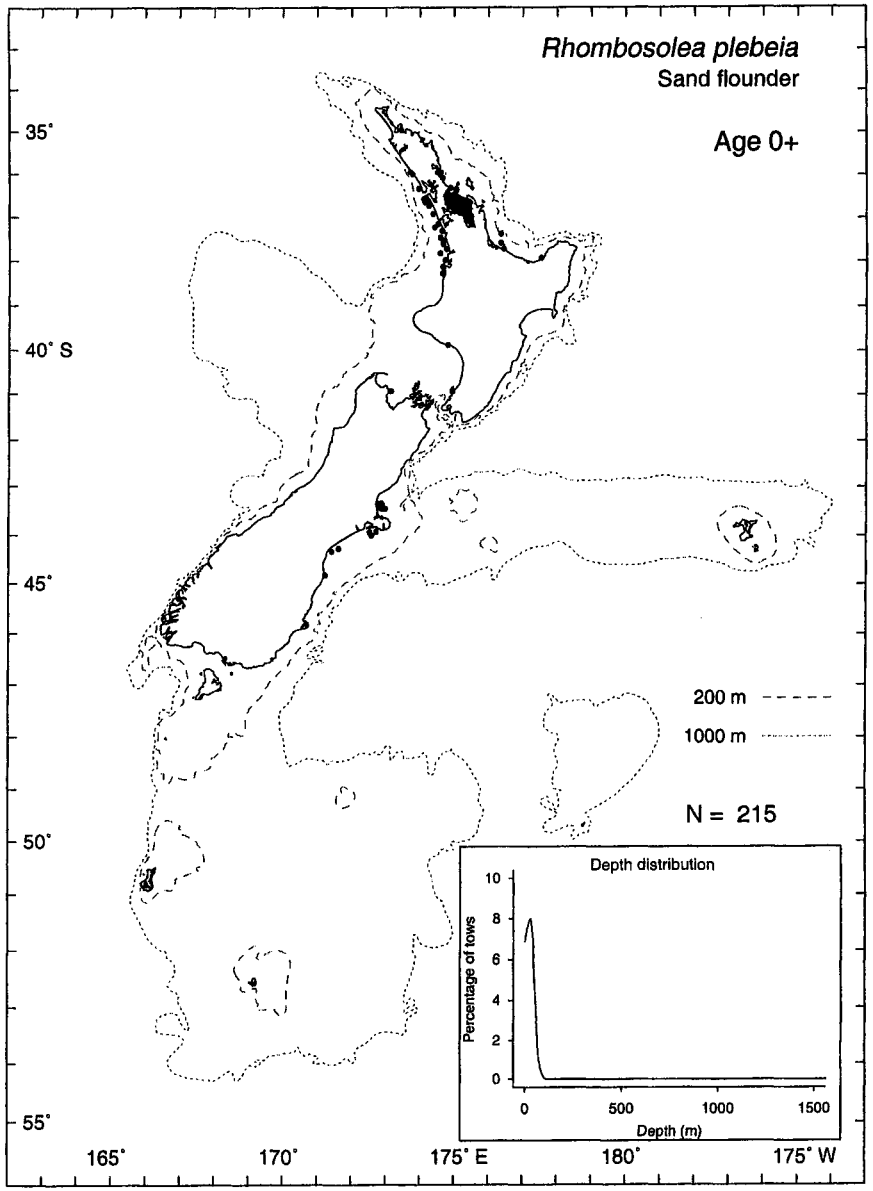

Rexea solandri
Gemfish
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1378
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
500
1000
1500

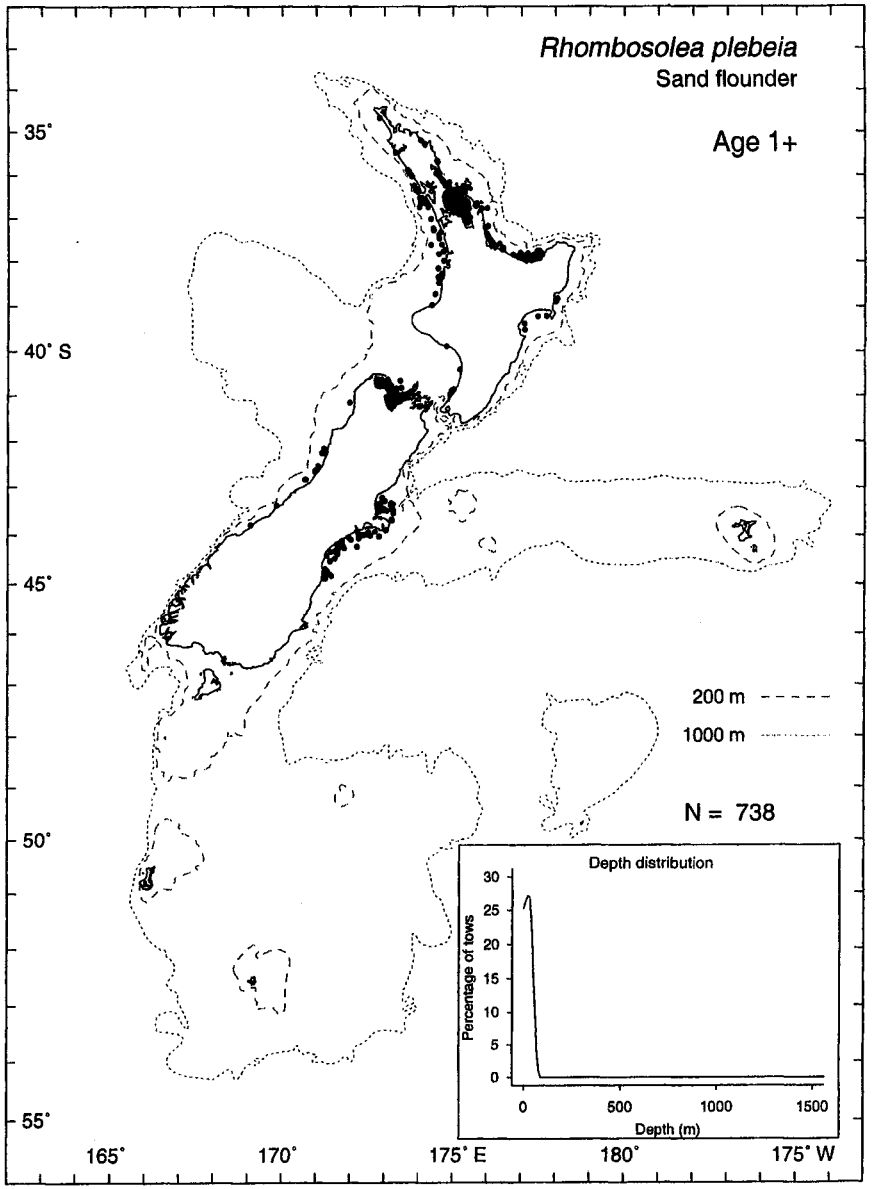

Rhombosolea leporina
Yellowbelly flounder
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 15
Depth distribution
Percentage of tows
1.0
0.8
0.6
0.4
0.2
0.0
0
500
1000
1500
Depth (m)

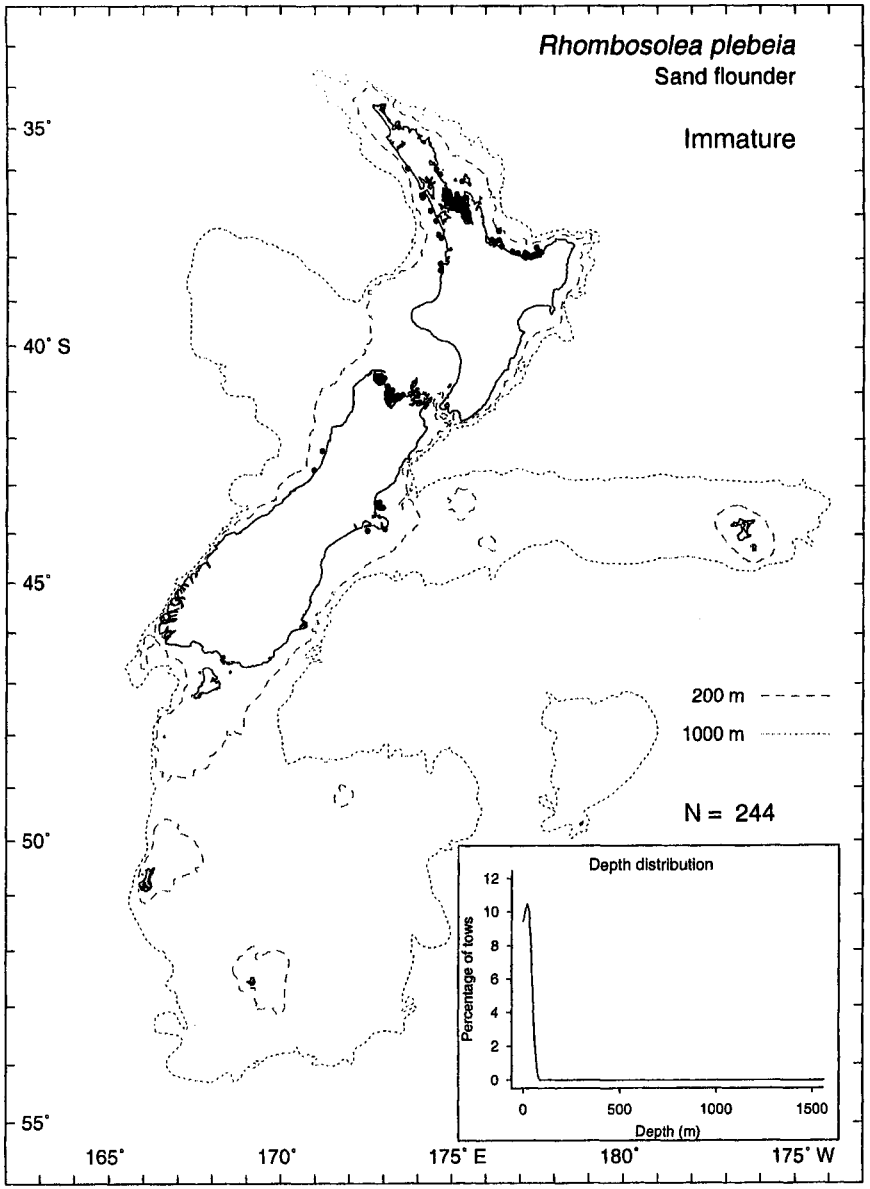

Rhombosolea leporina
Yellowbelly flounder
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 131
Depth distribution
Percentage of tows
7
6
5
4
3
2
1
0
0
500
1000
1500
Depth (m)

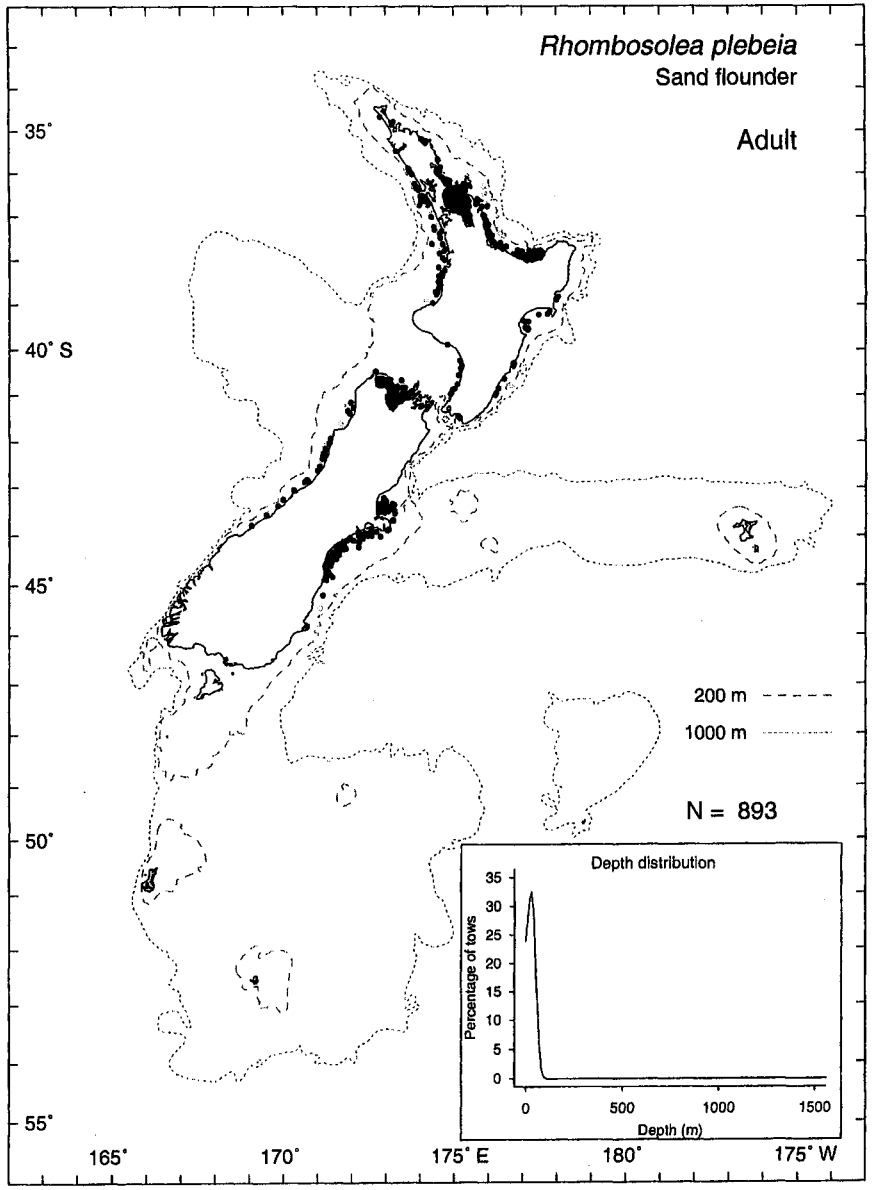

Rhombosolea leporina
Yellowbelly flounder
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 22
Depth distribution
Percentage of tows
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)

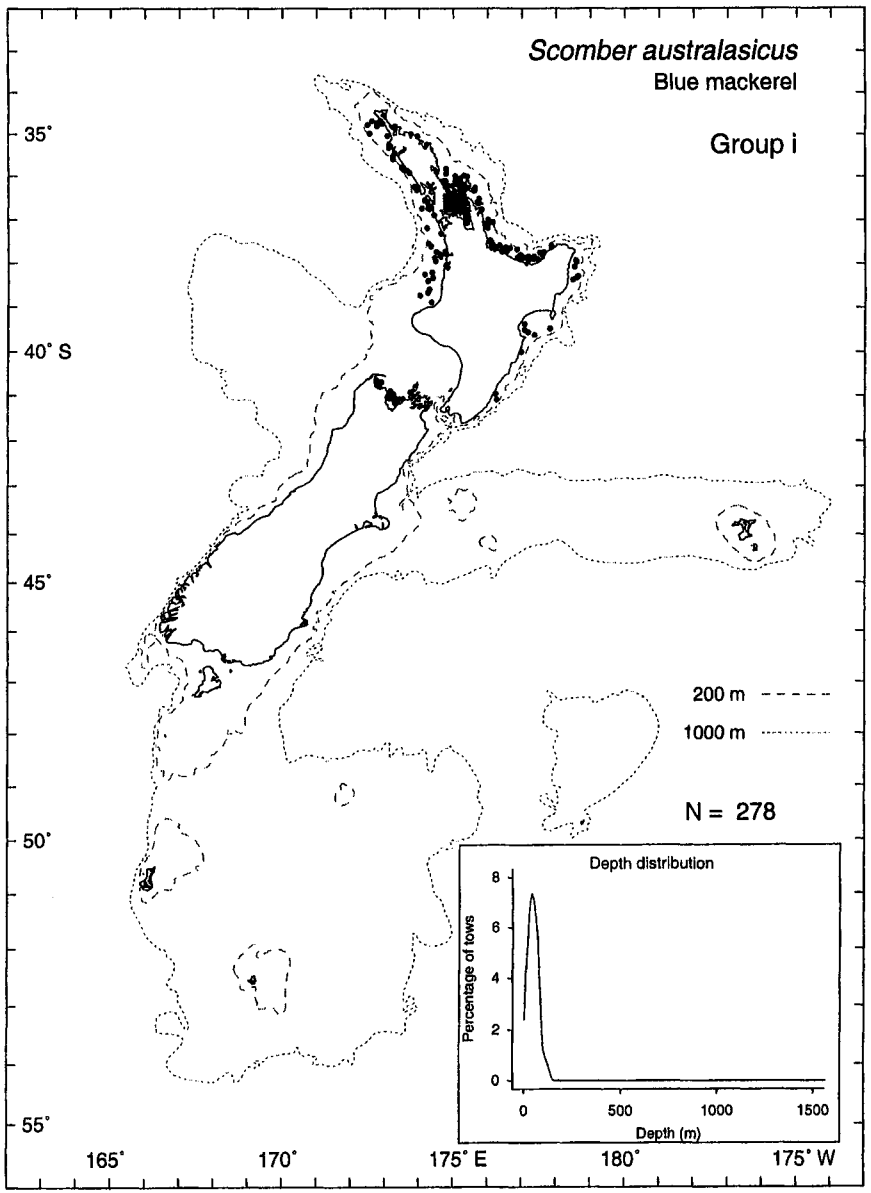

Rhombosolea leporina
Yellowbelly flounder
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 246
Depth distribution
Percentage of tows
16
14
12
10
8
6
4
2
0
0
500
1000
1500
Depth (m)

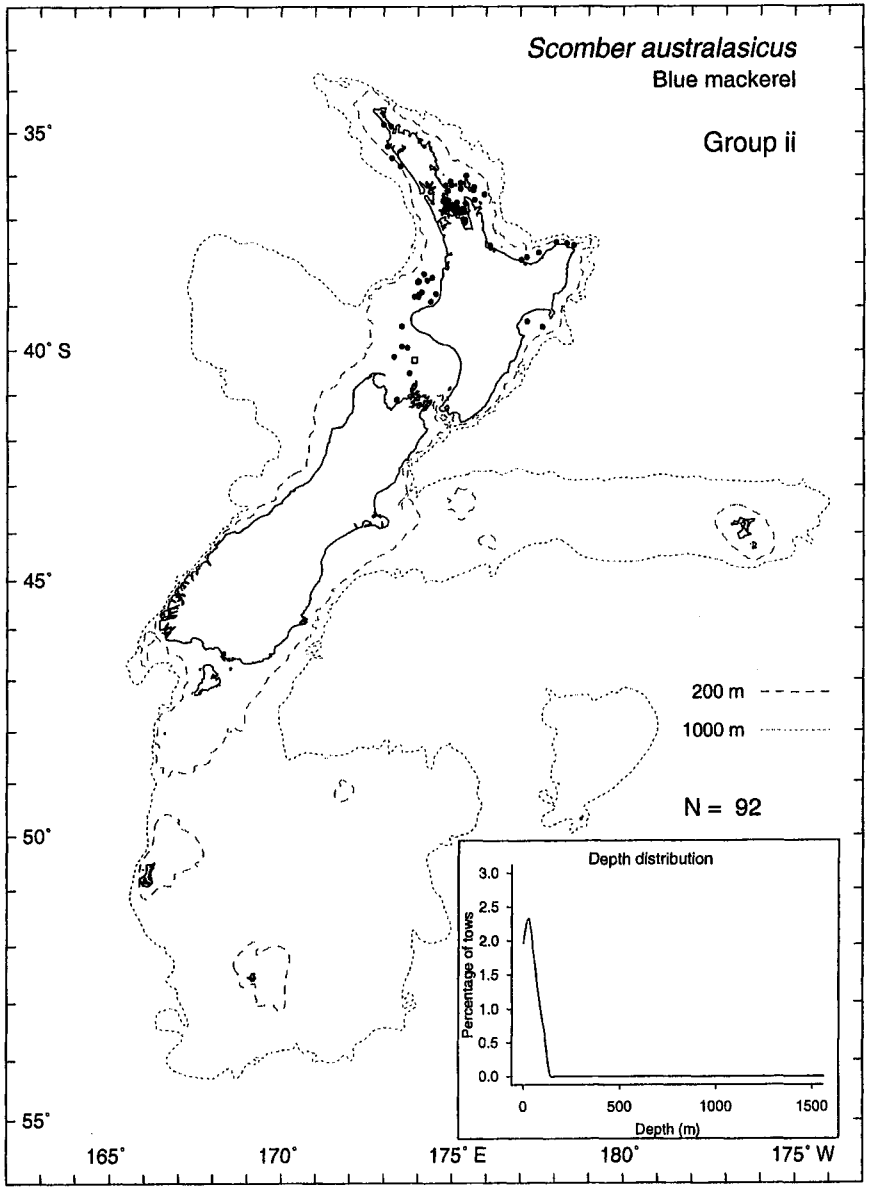

Rhombosolea plebeia
Sand flounder
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 215
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
0
500
1000
1500


Rhombosolea plebeia
Sand flounder
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 738
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
0
500
1000
1500

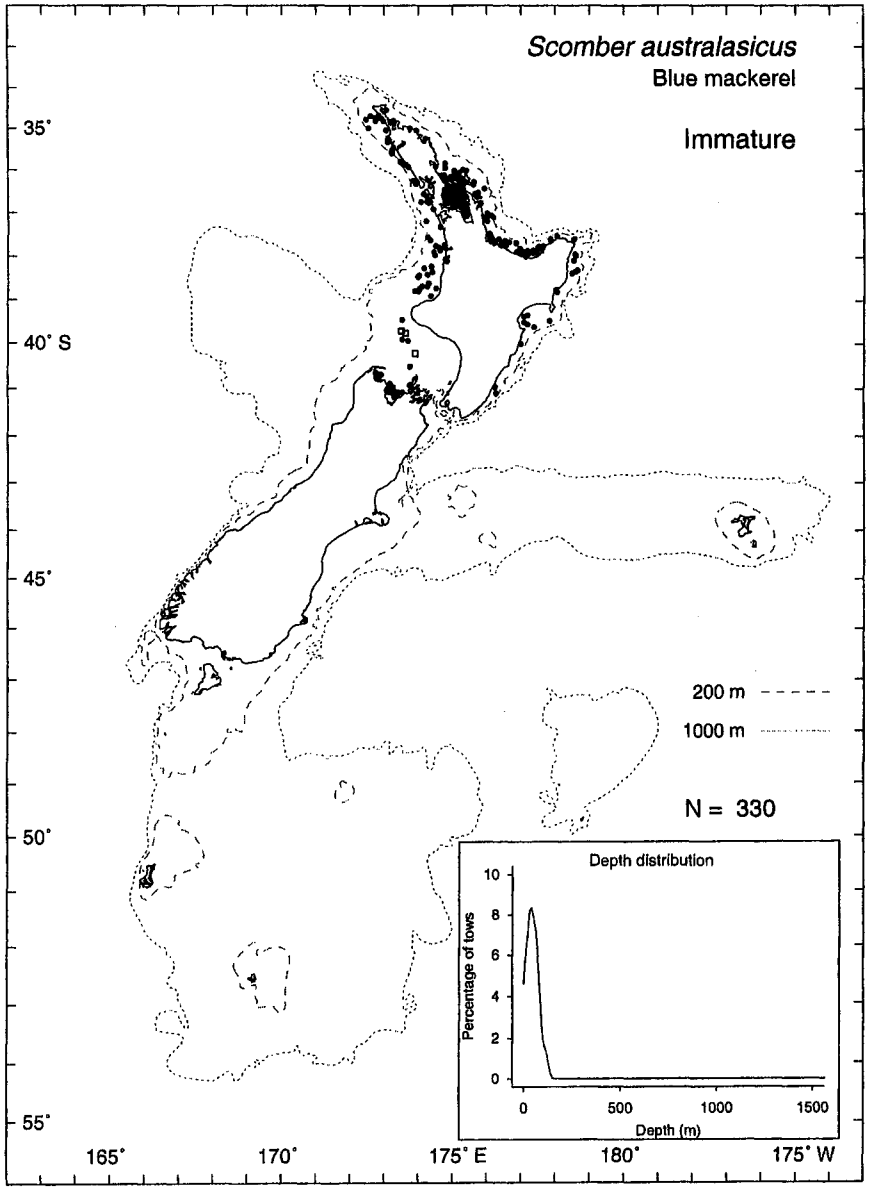

Rhombosolea plebeia
Sand flounder
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 244
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10
12

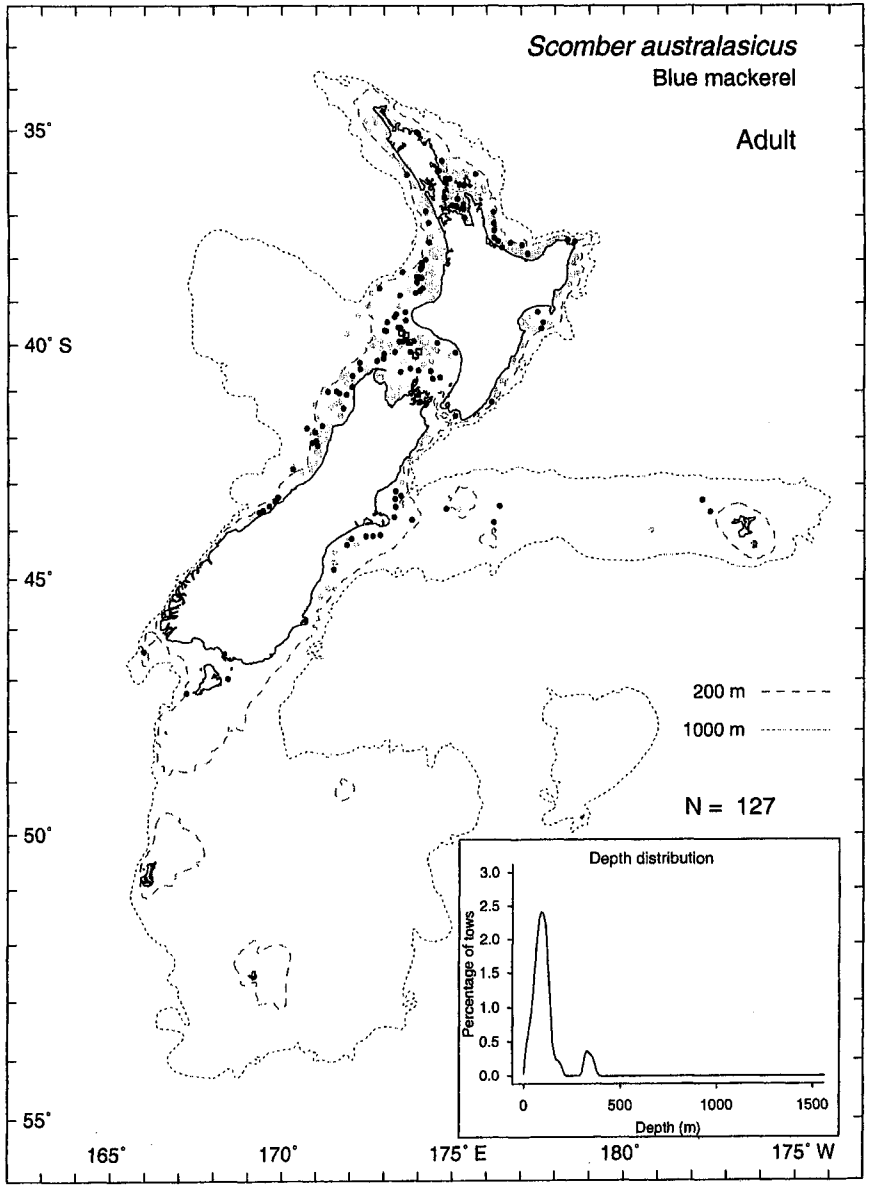

Rhombosolea plebeia
Sand flounder
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 893
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
5
10
15
20
25
30
35

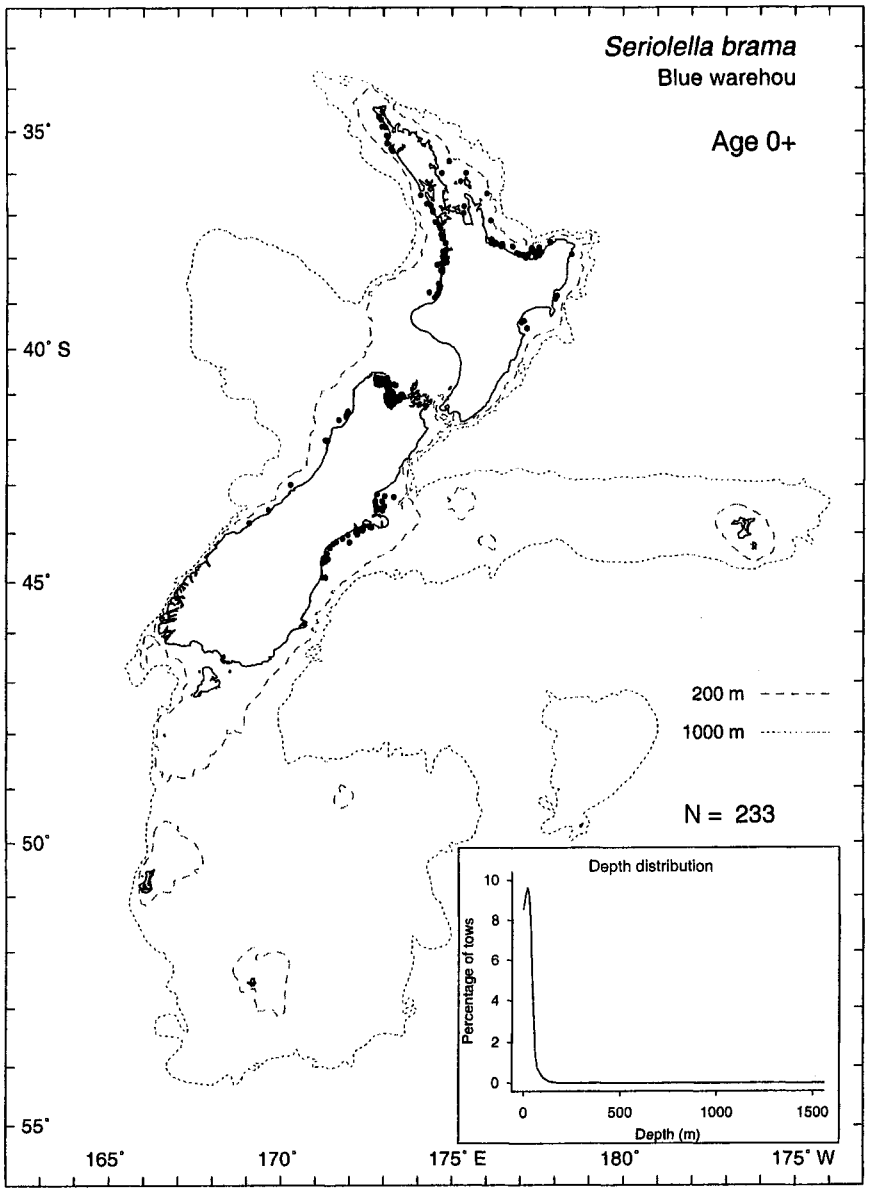


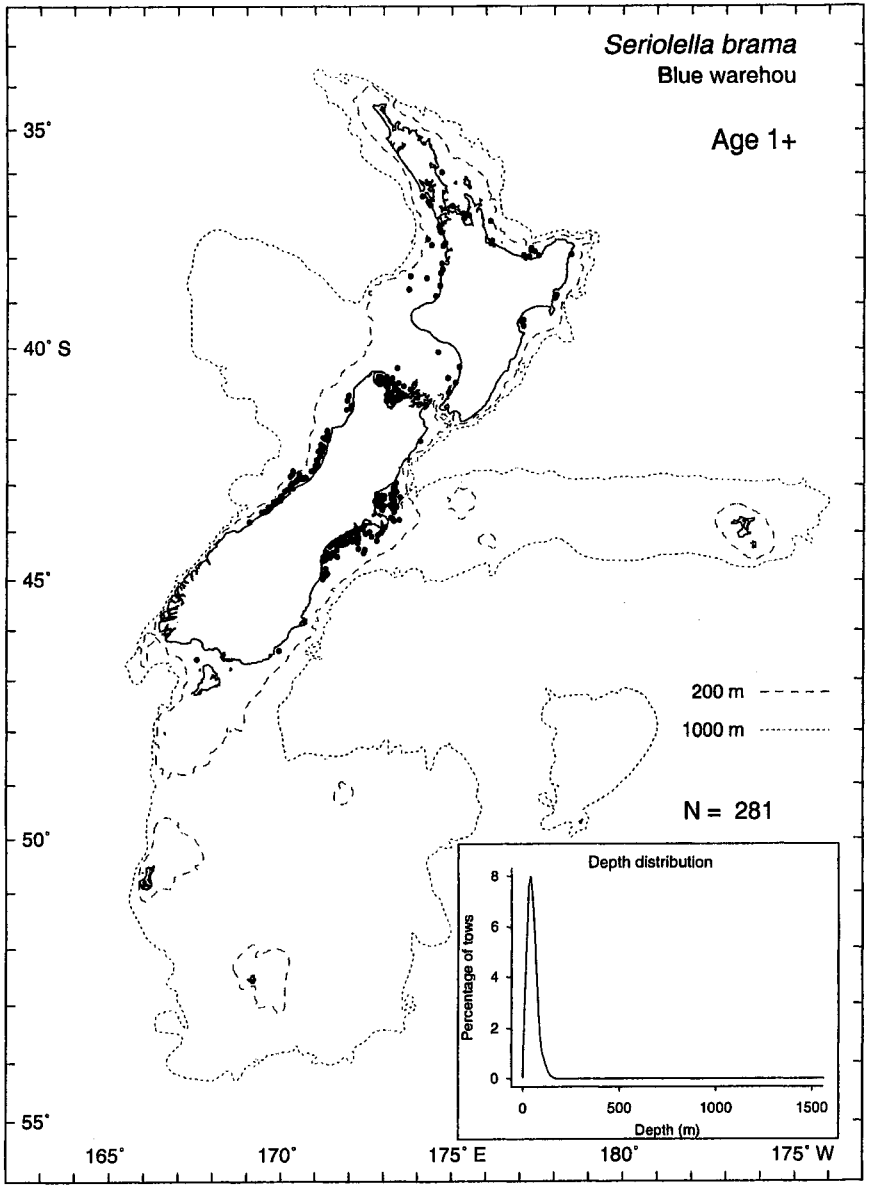


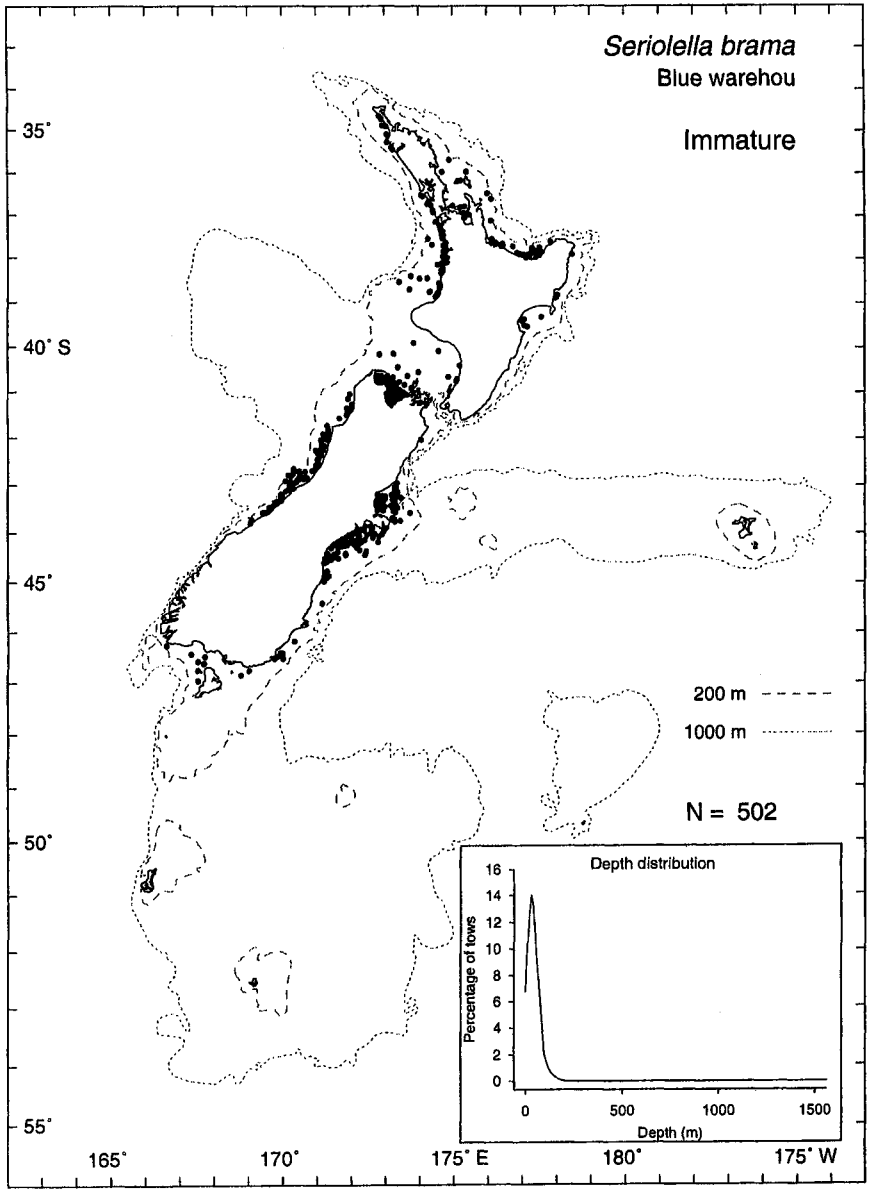
Groups i and ii may approximate ages 0+ and 1+.

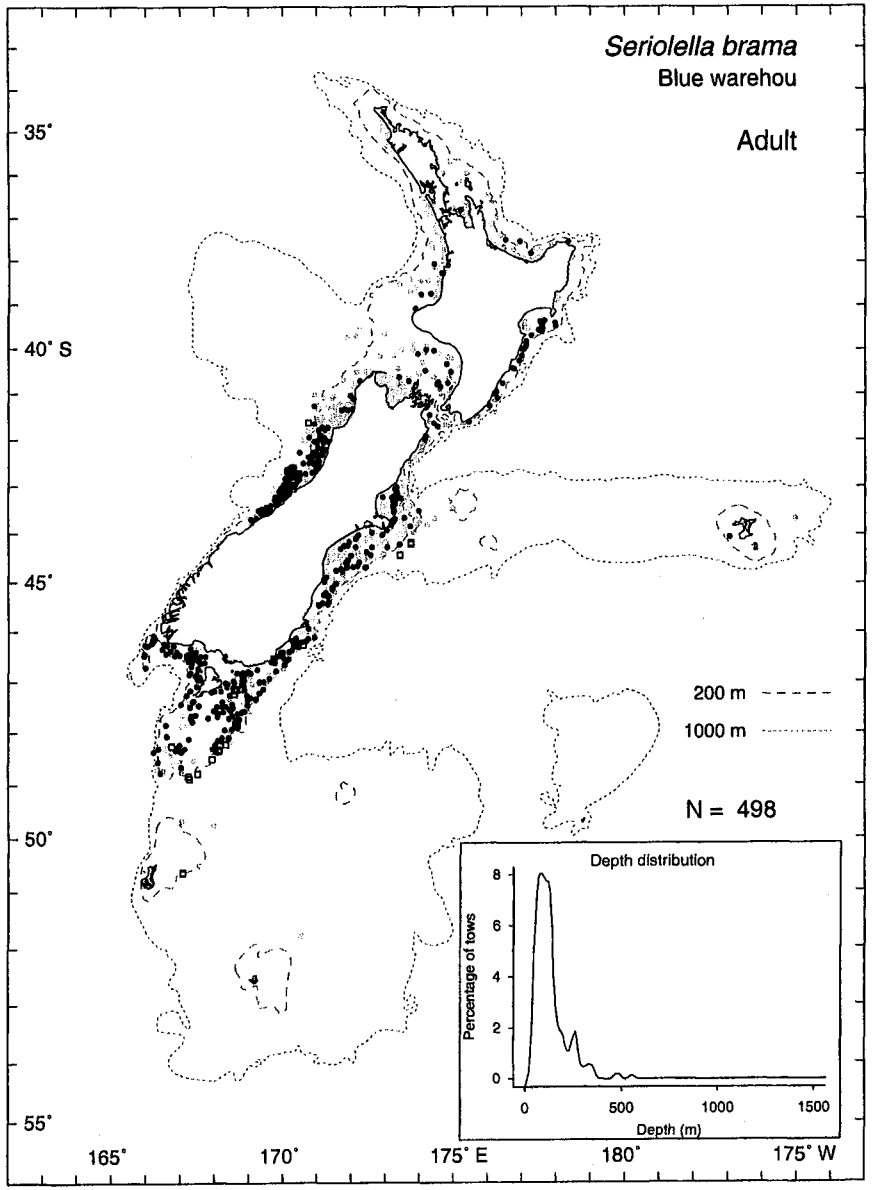

Scomber australasicus
Blue mackerel
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 330
Depth distribution
Percentage of tows
10
8
6
4
2
0
0
500
1000
1500
Depth (m)

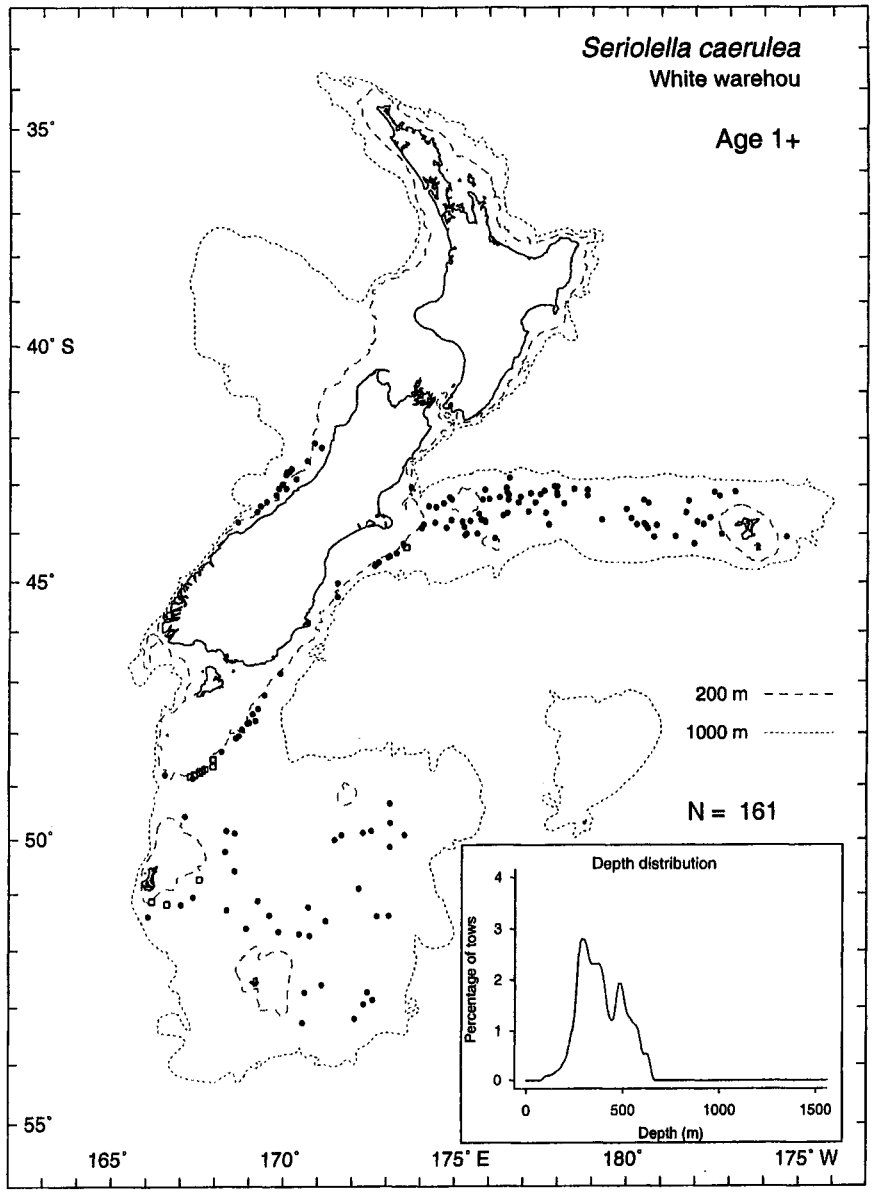

Scomber australasicus
Blue mackerel
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 127
Depth distribution
Percentage of tows
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)

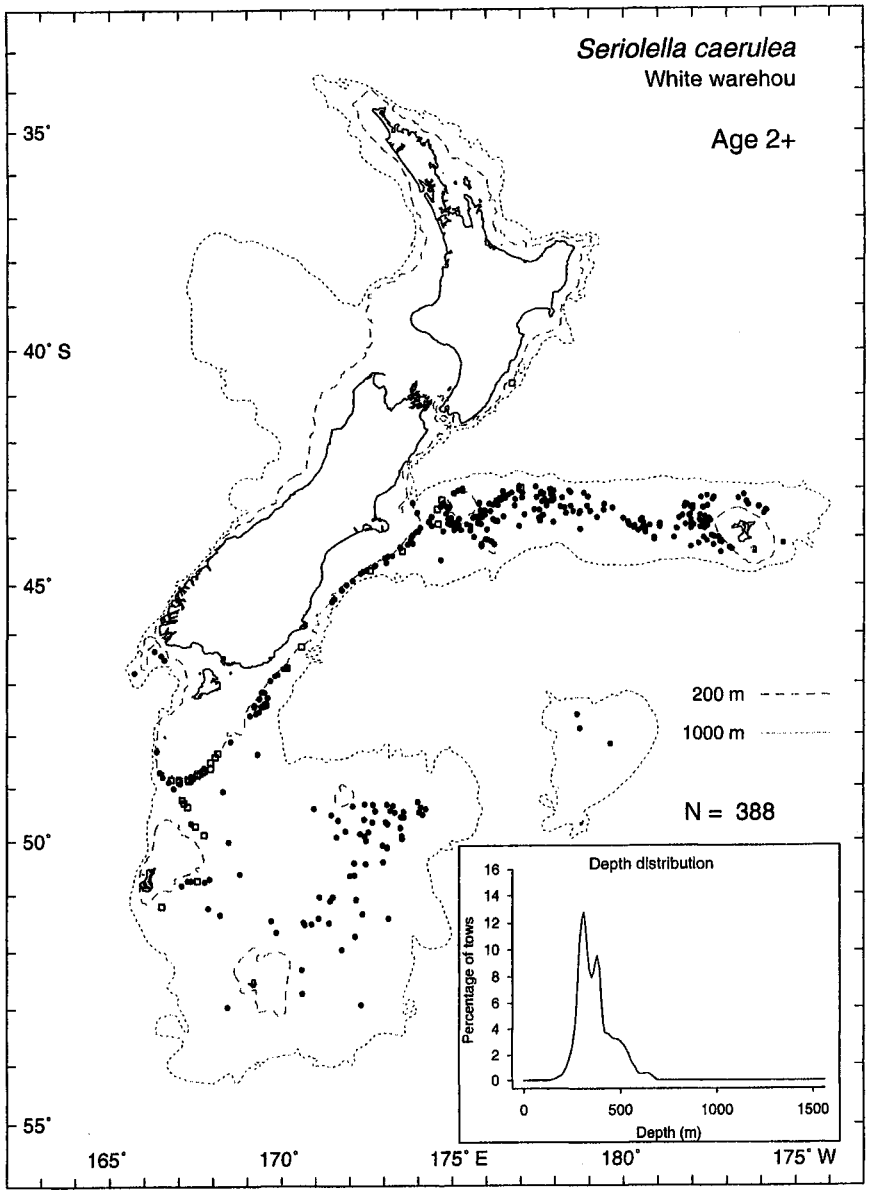

Seriolella brama
Blue warehou
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 233
Depth distribution
Percentage of tows
0
2
4
6
8
10
0
500
1000
1500
Depth (m)

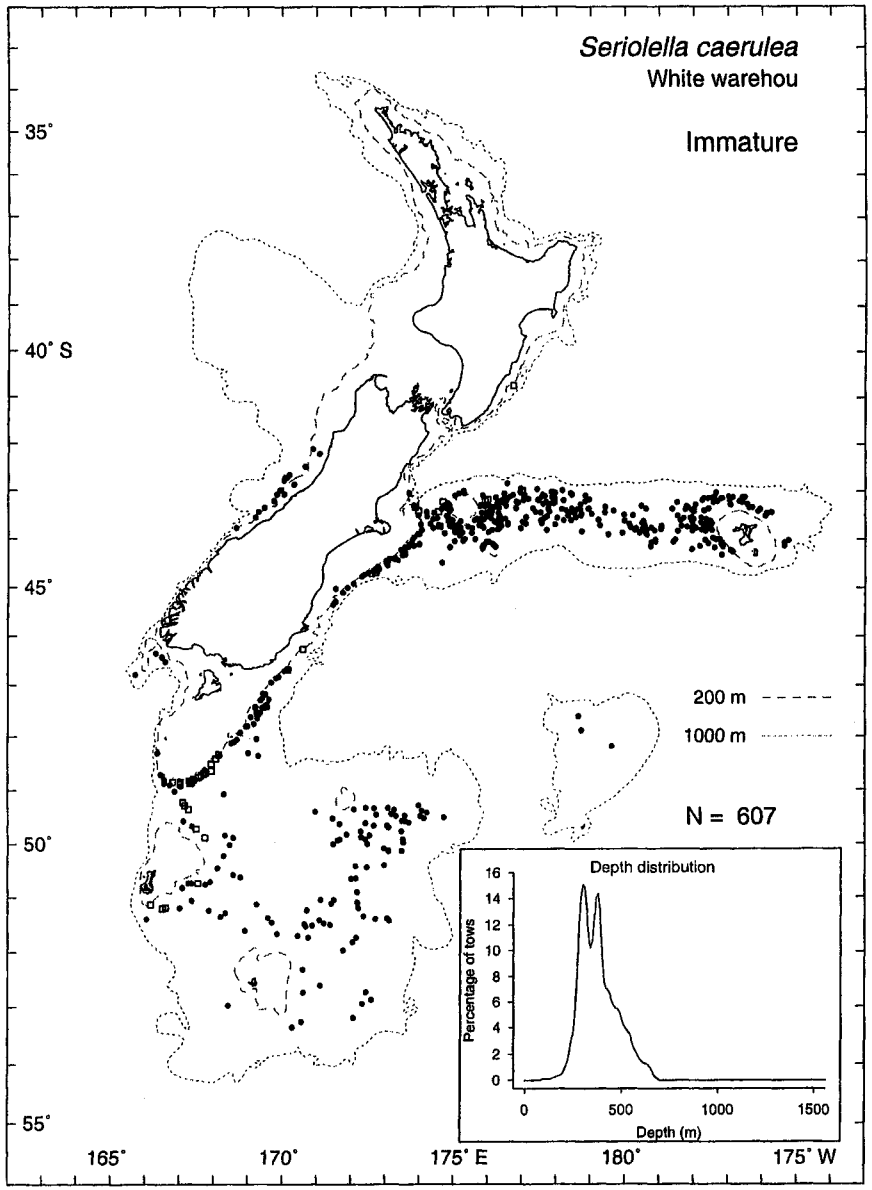

Seriolella brama
Blue warehou
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 281
Depth distribution
Percentage of tows
0
2
4
6
8
0
500
1000
1500
Depth (m)

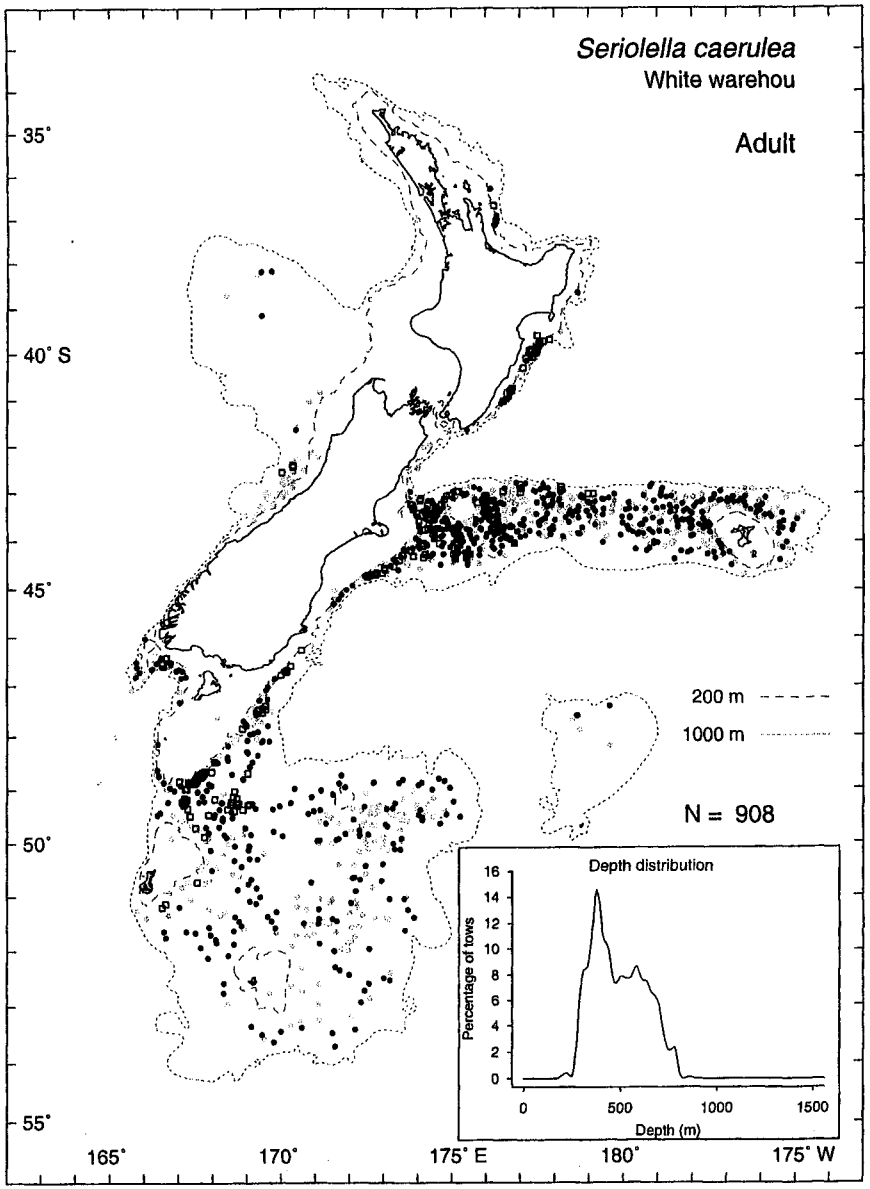

Seriolella brama
Blue warehou
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 502
Depth distribution
Percentage of tows
16
14
12
10
8
6
4
2
0
0
500
1000
1500
Depth (m)

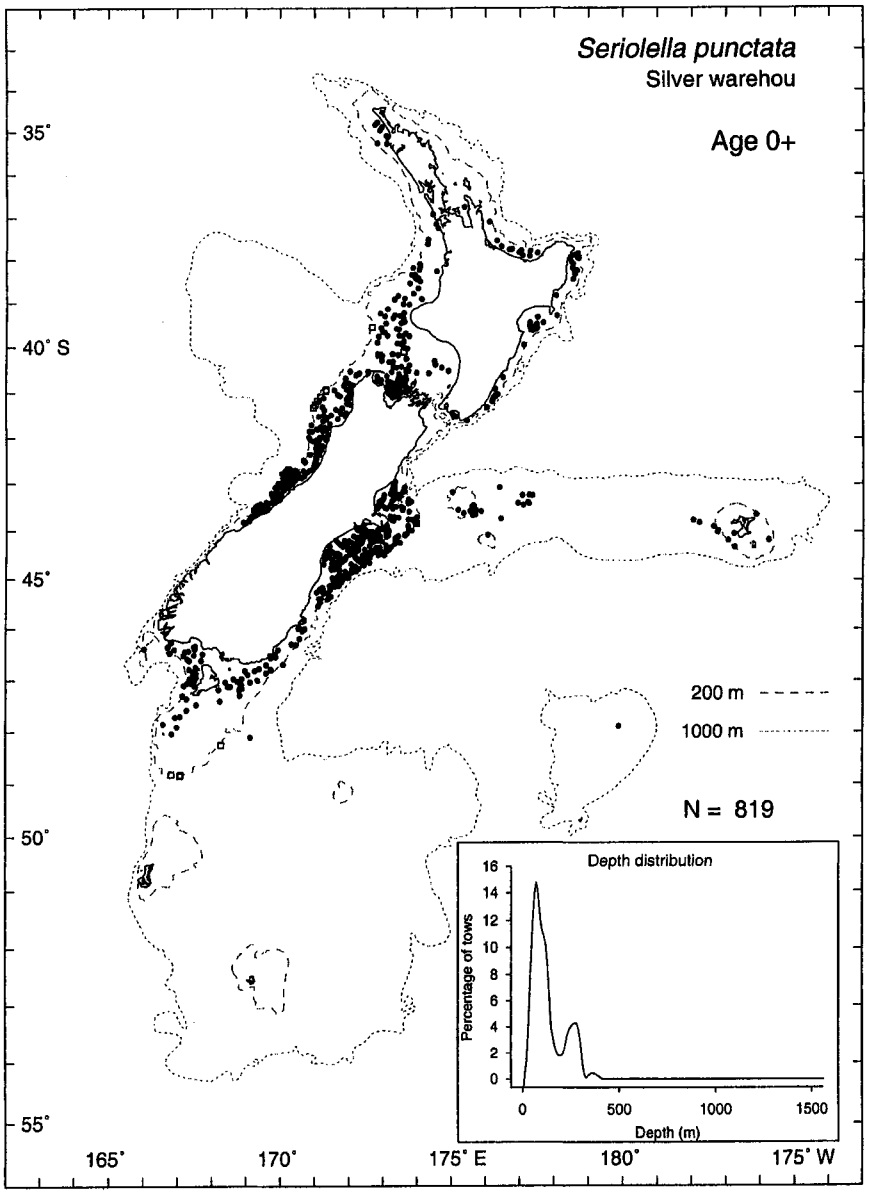

Seriolella brama
Blue warehou
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 498
Depth distribution
Percentage of tows
8
6
4
2
0
0
500
1000
1500
Depth (m)

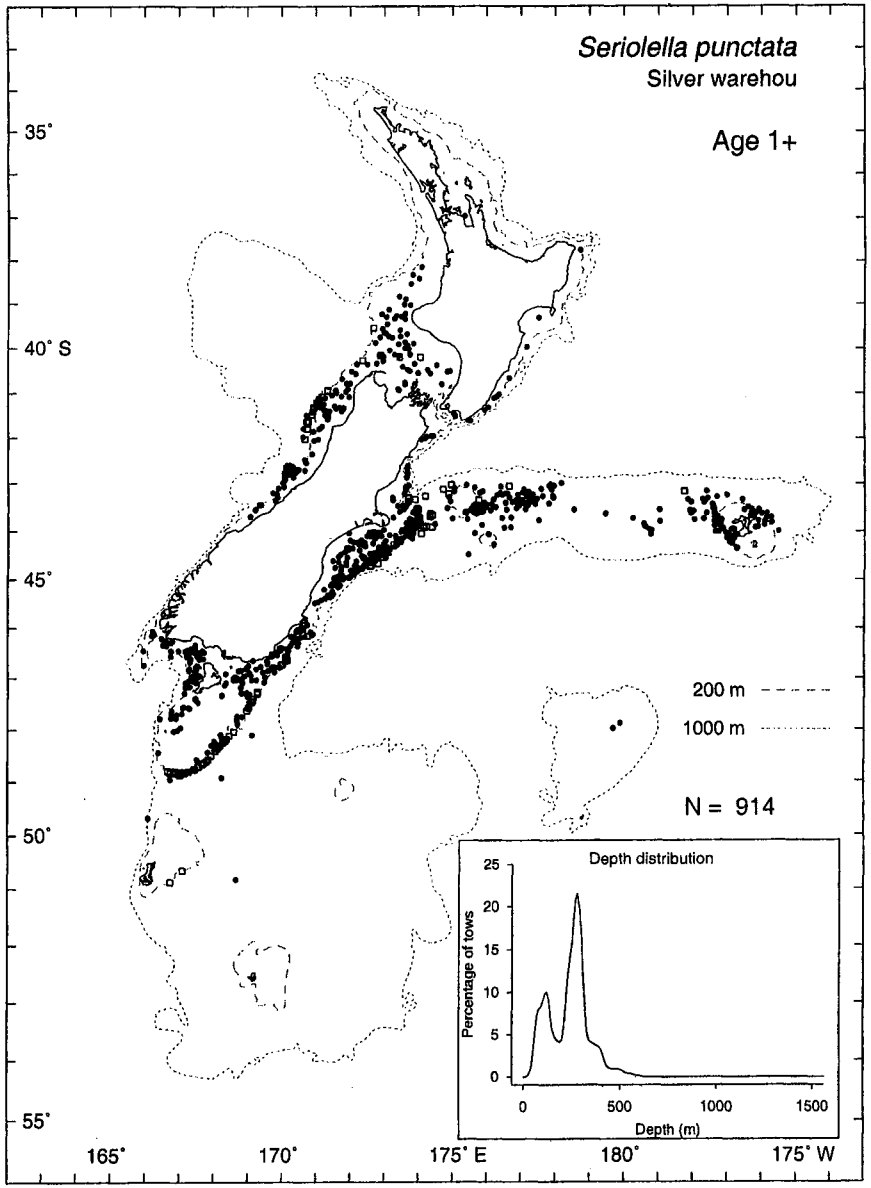

Seriolella caerulea
White warehou
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 161
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
1
2
3
4

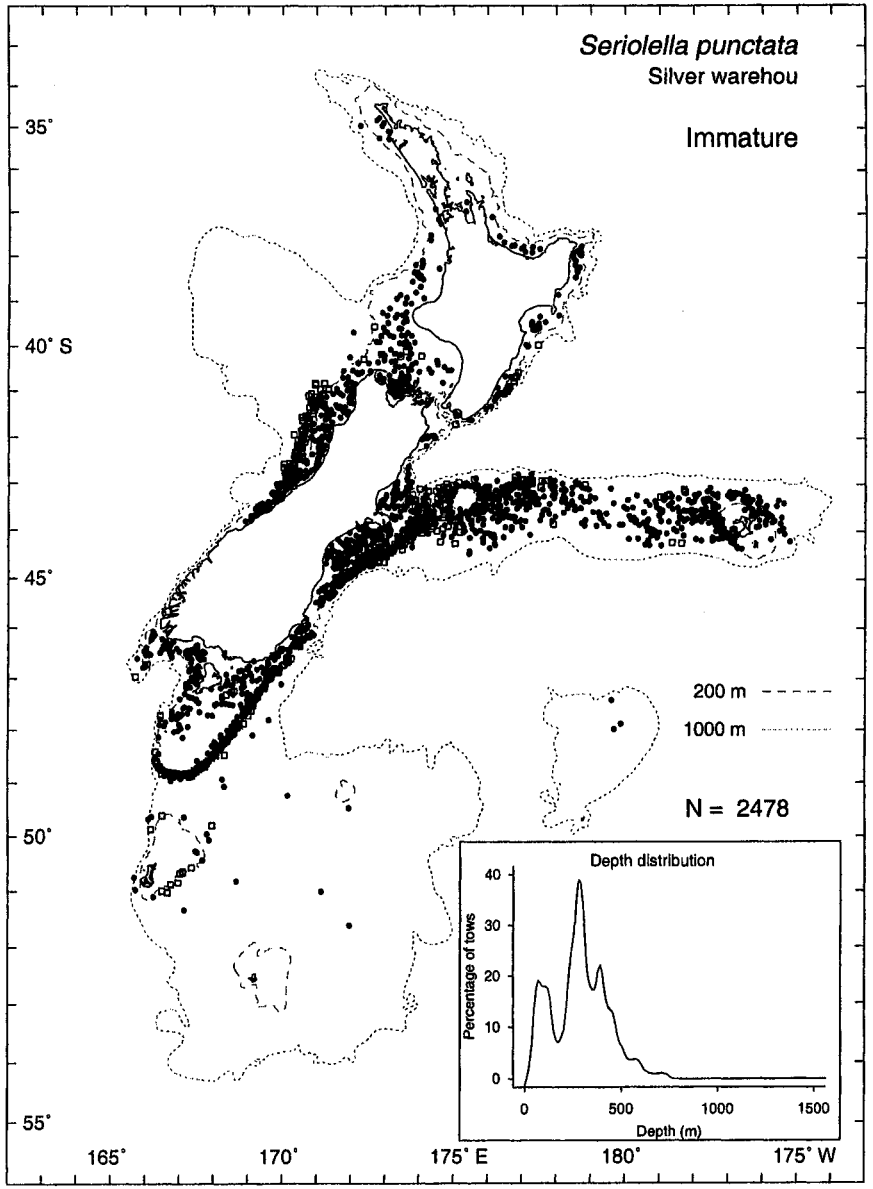

Seriolella caerulea
White warehou
Age 2+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 388
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10
12
14
16

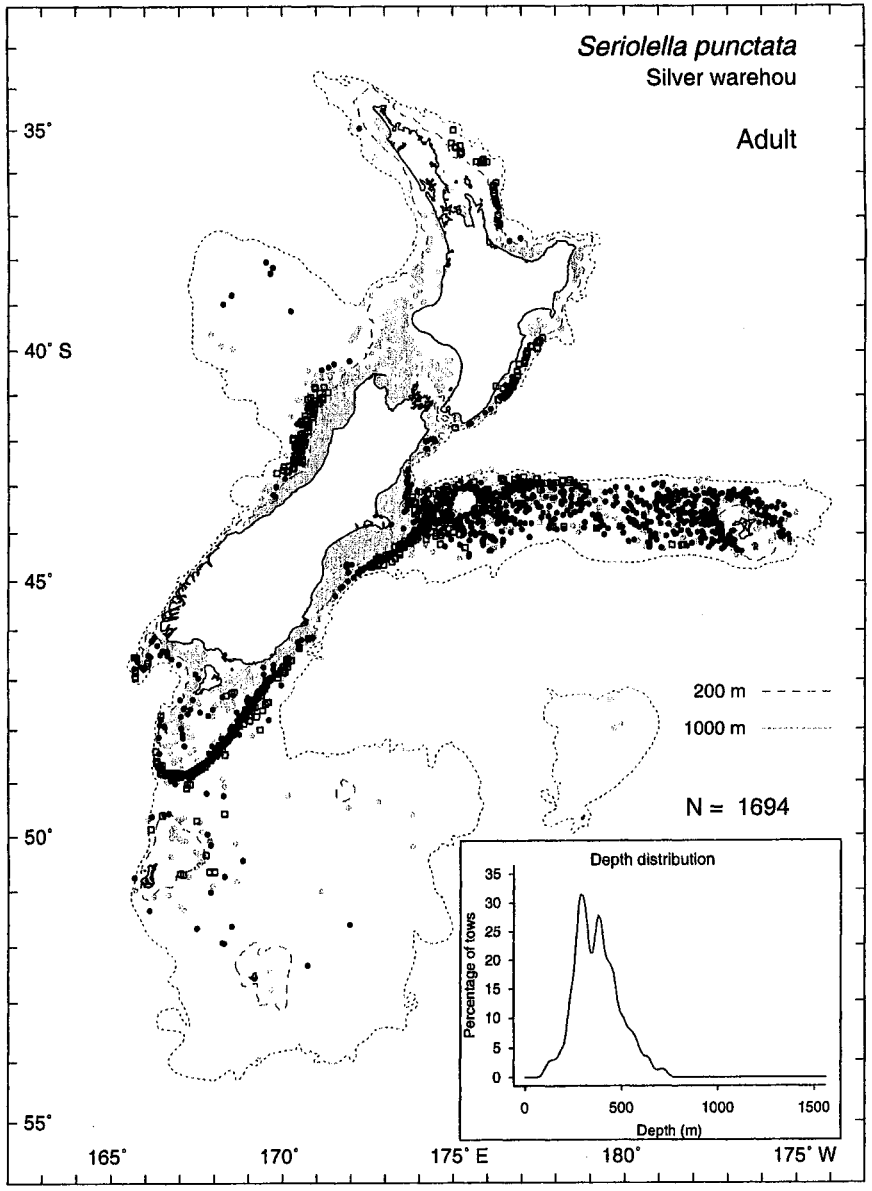

Seriolella caerulea
White warehou
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 607
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
12
14
16
0
500
1000
1500

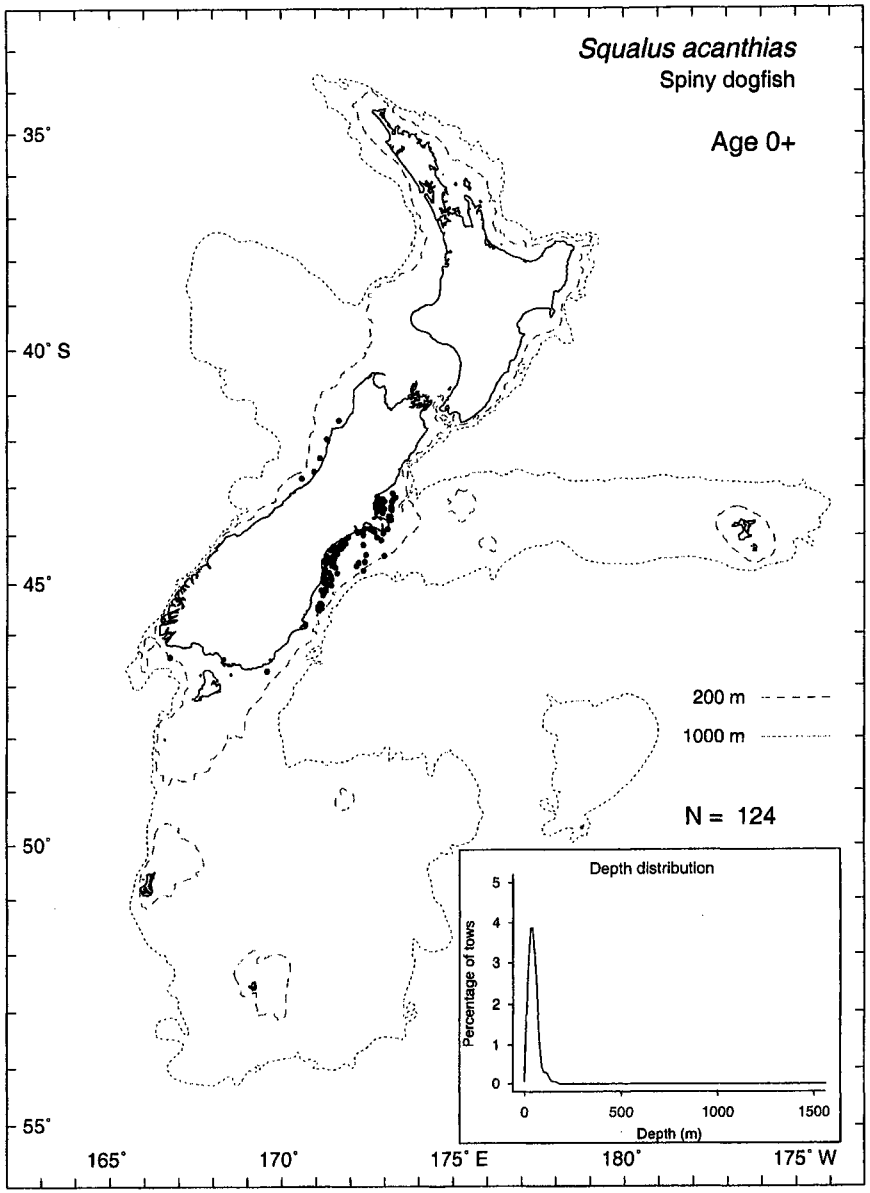

Seriolella caerulea
White warehou
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 908
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
12
14
16
0
500
1000
1500

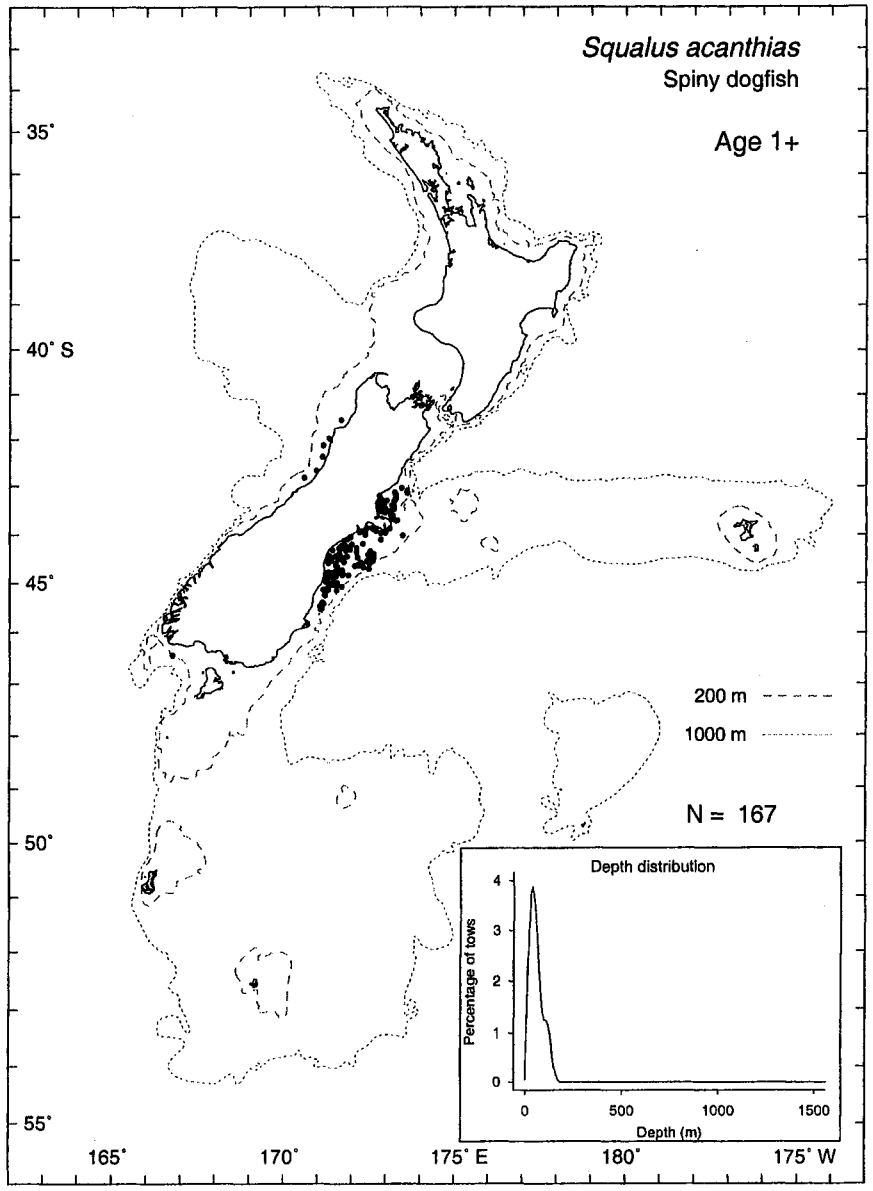

Seriolella punctata
Silver warehou
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 819
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
12
14
16
0
500
1000
1500

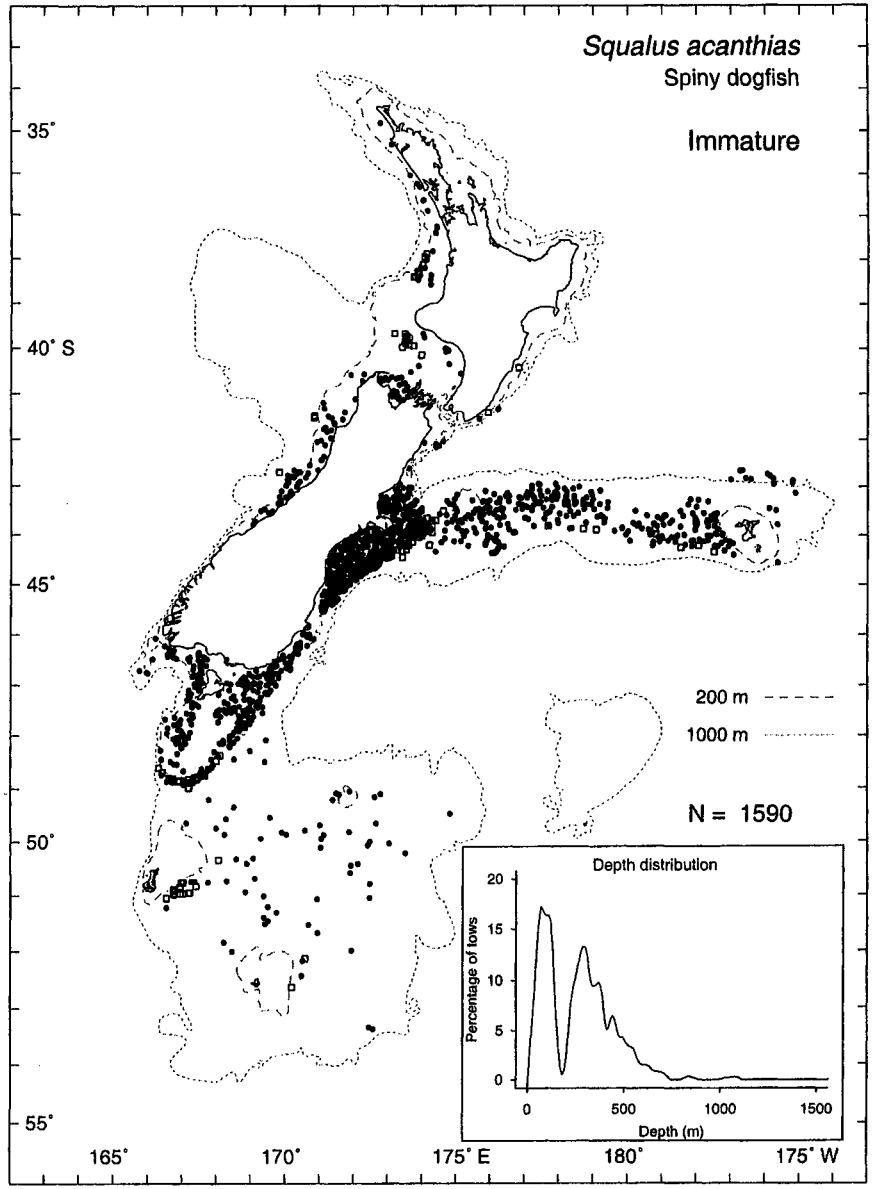

Seriolella punctata
Silver warehou
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 914
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
0
500
1000
1500

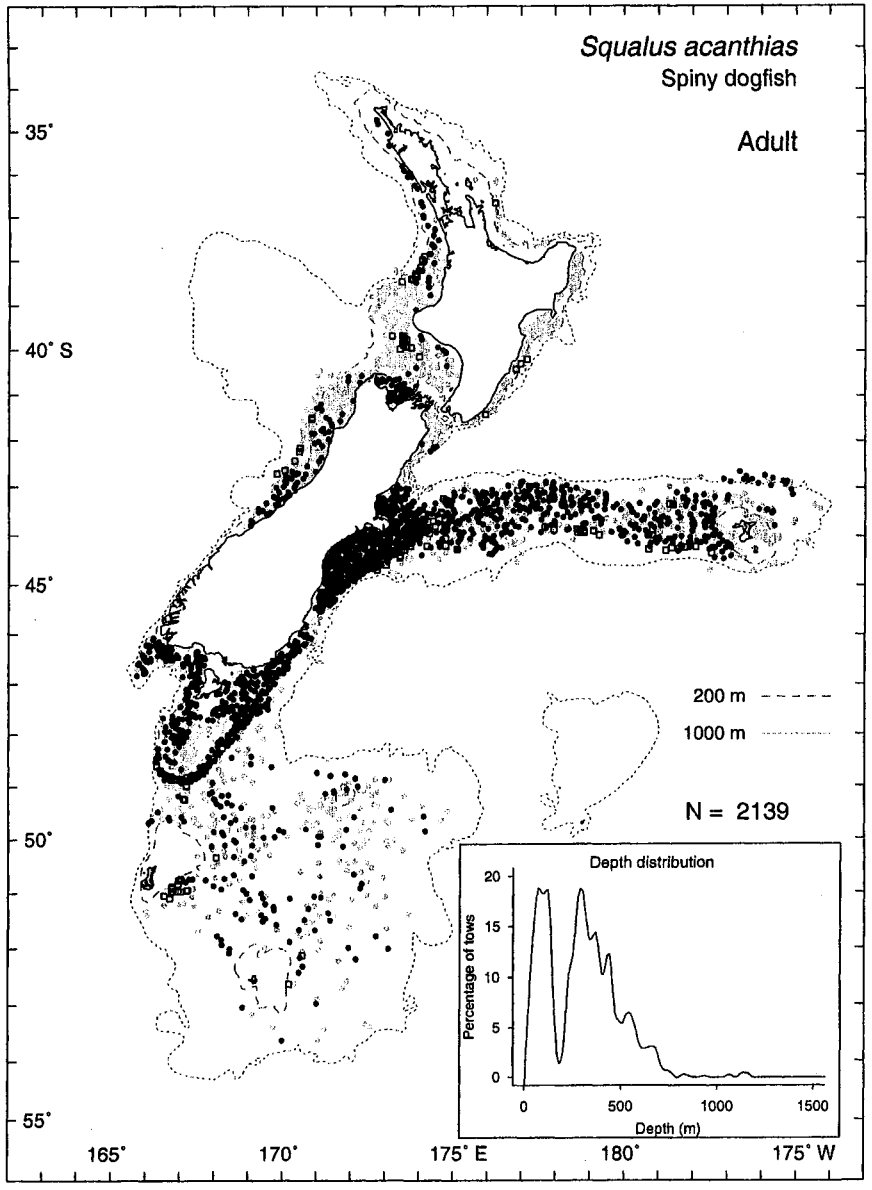

Seriolella punctata
Silver warehou
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2478
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
500
1000
1500

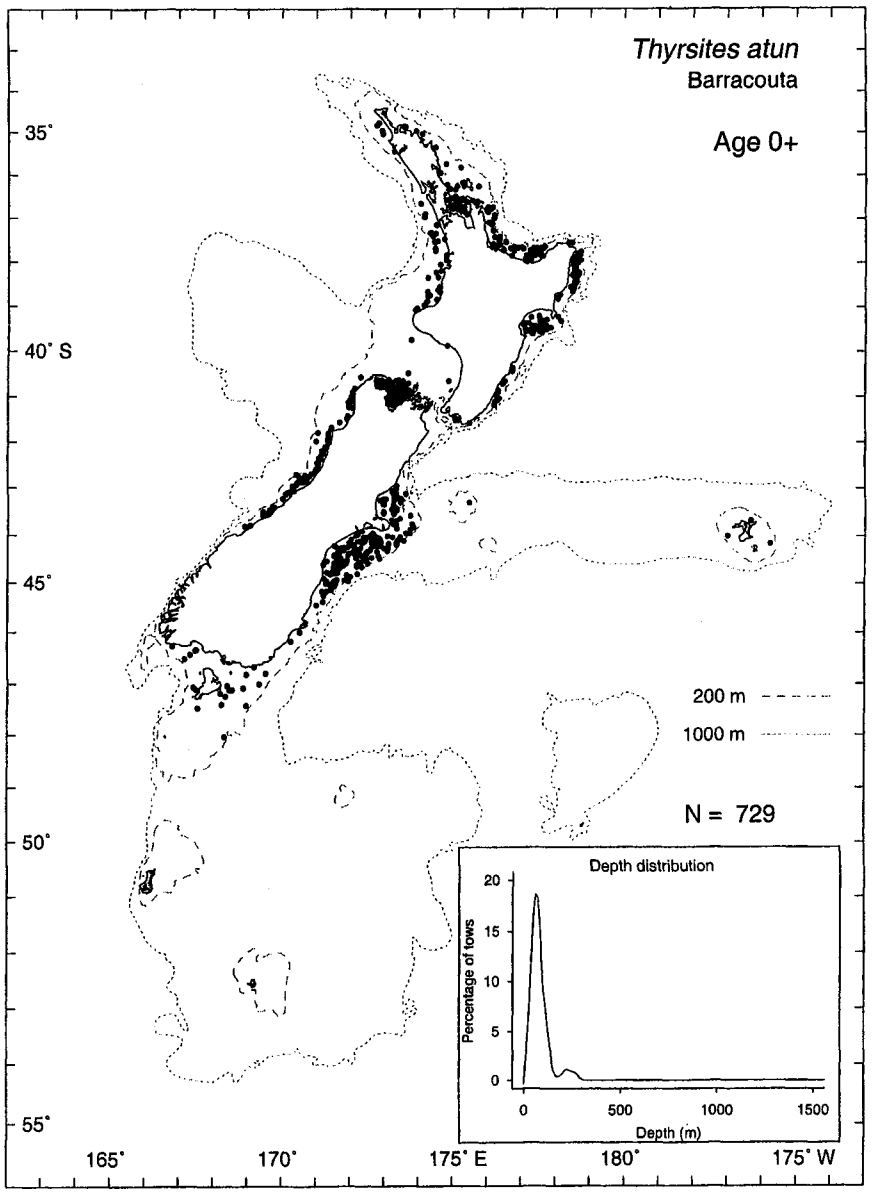

Seriolella punctata
Silver warehou
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1694
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
35
500
1000
1500

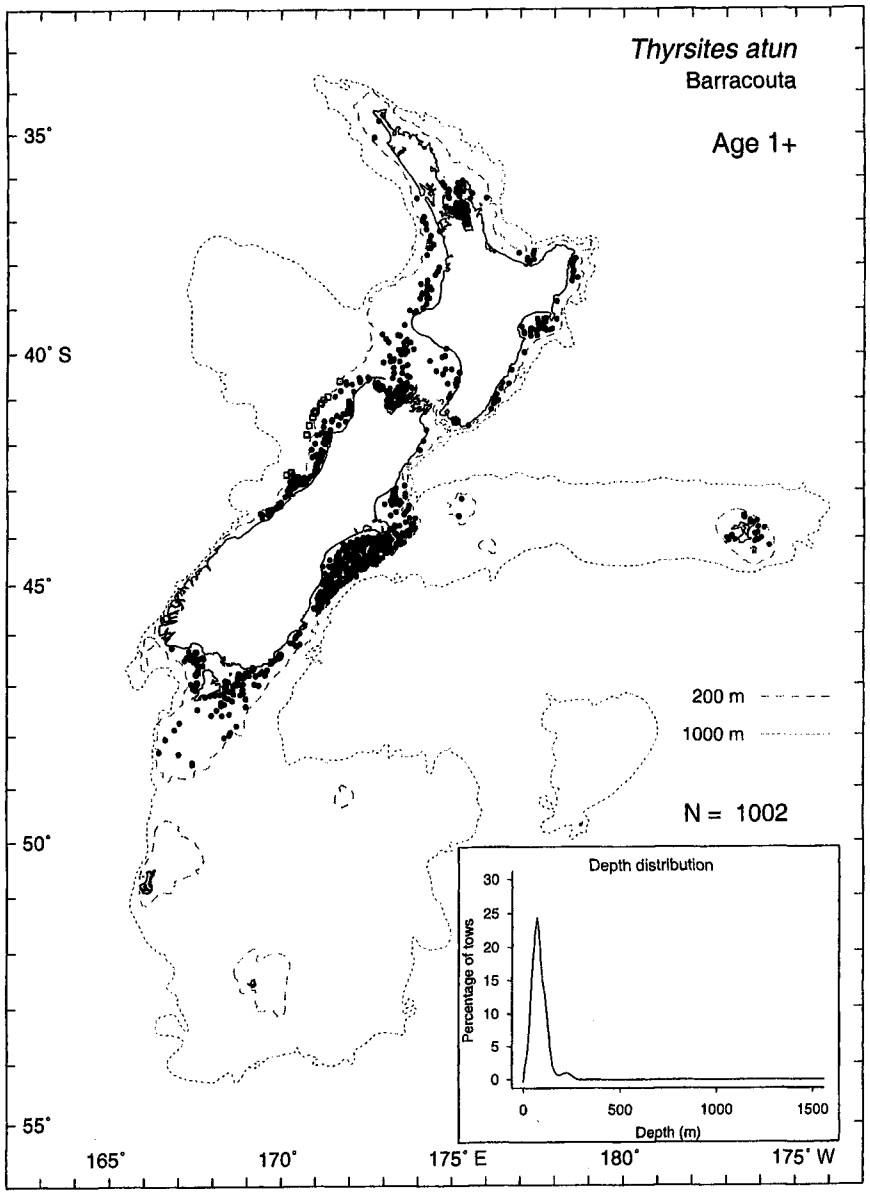

Squalus acanthias
Spiny dogfish
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 124
Depth distribution
Percentage of tows
0
1
2
3
4
5
0
500
1000
1500
Depth (m)

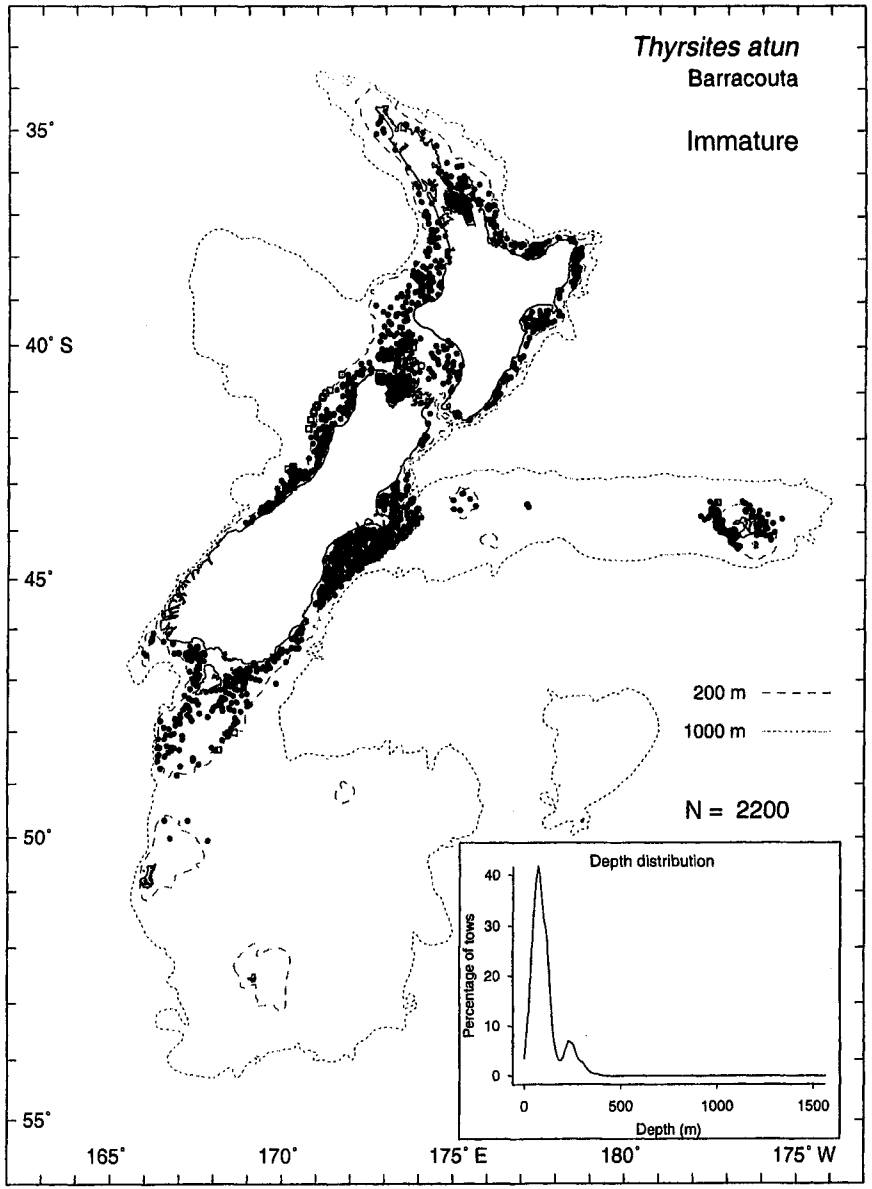

Squalus acanthias
Spiny dogfish
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 167
Depth distribution
Percentage of tows
0
1
2
3
4
0
500
1000
1500
Depth (m)

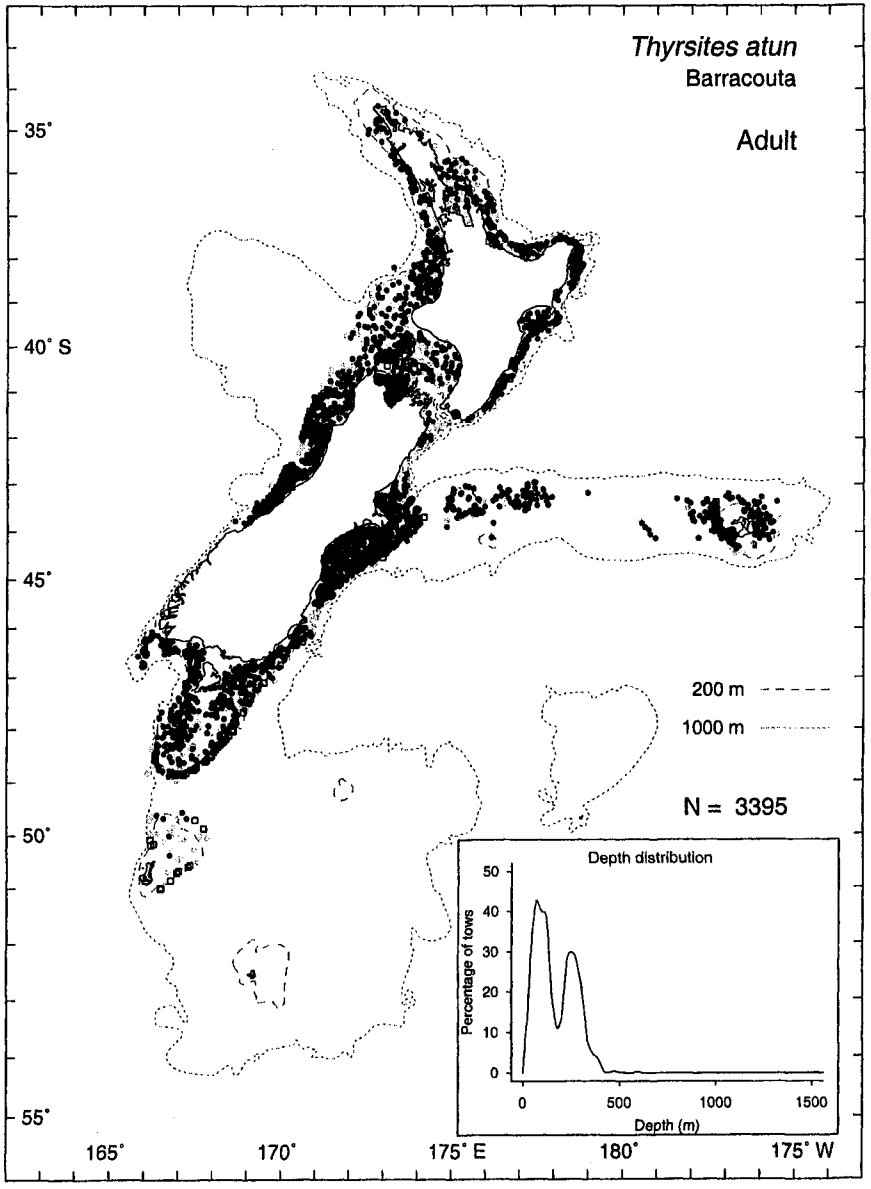

Squalus acanthias
Spiny dogfish
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1590
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)

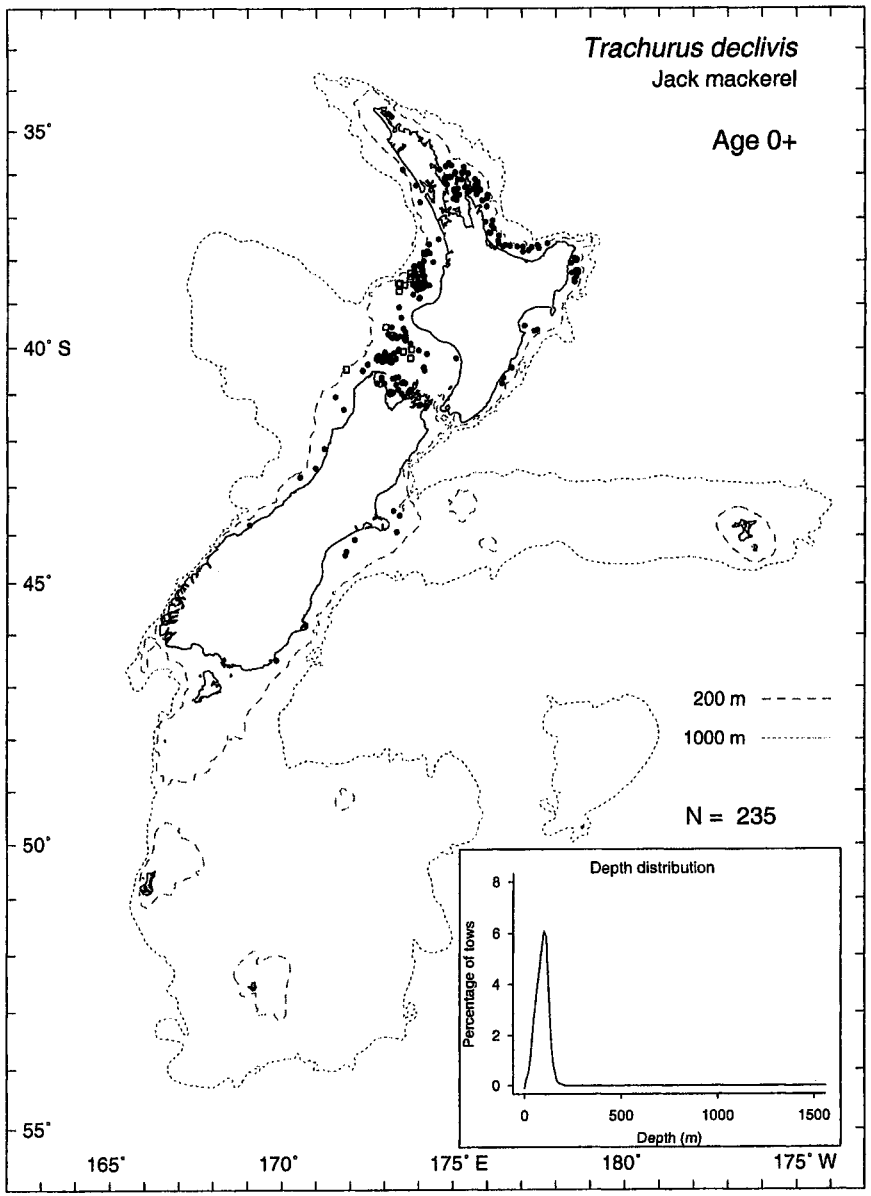

Squalus acanthias
Spiny dogfish
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2139
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)

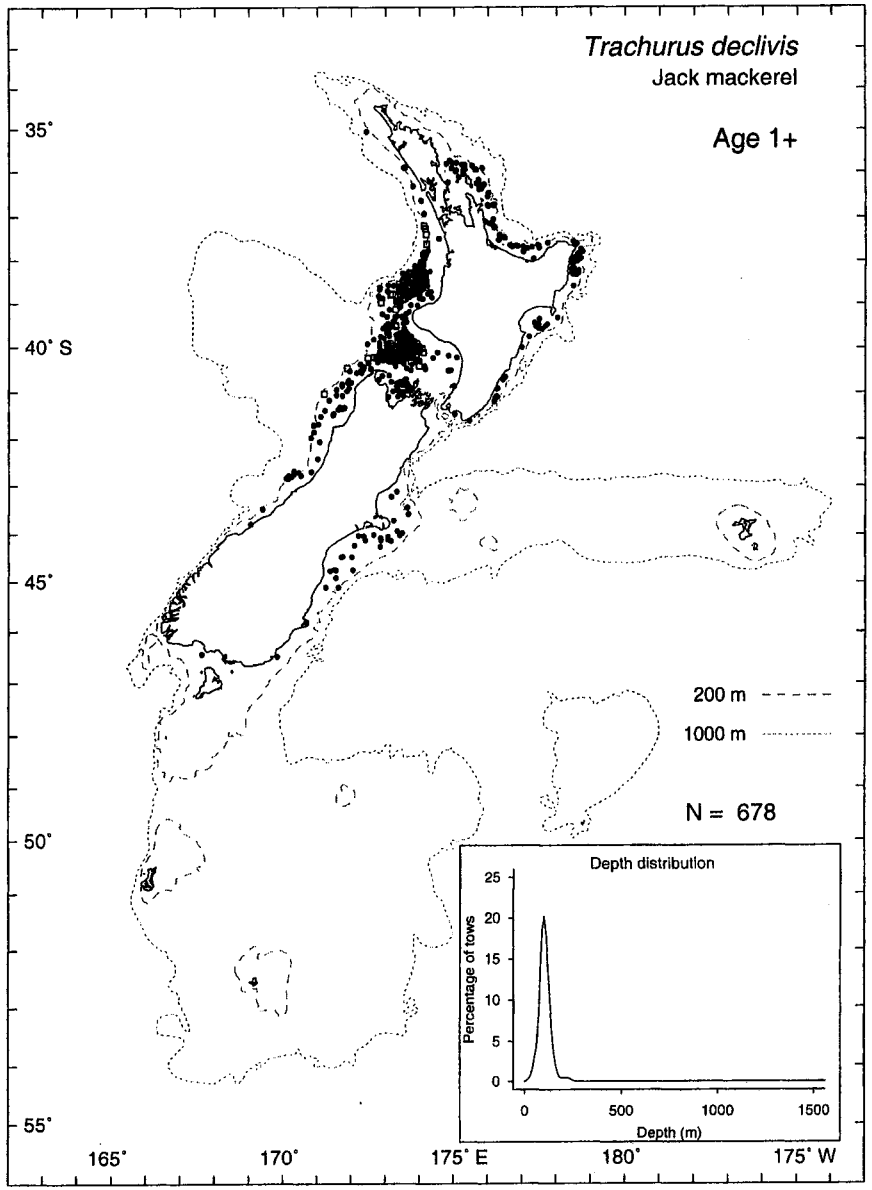

Thyrsites atun
Barracouta
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 729
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)

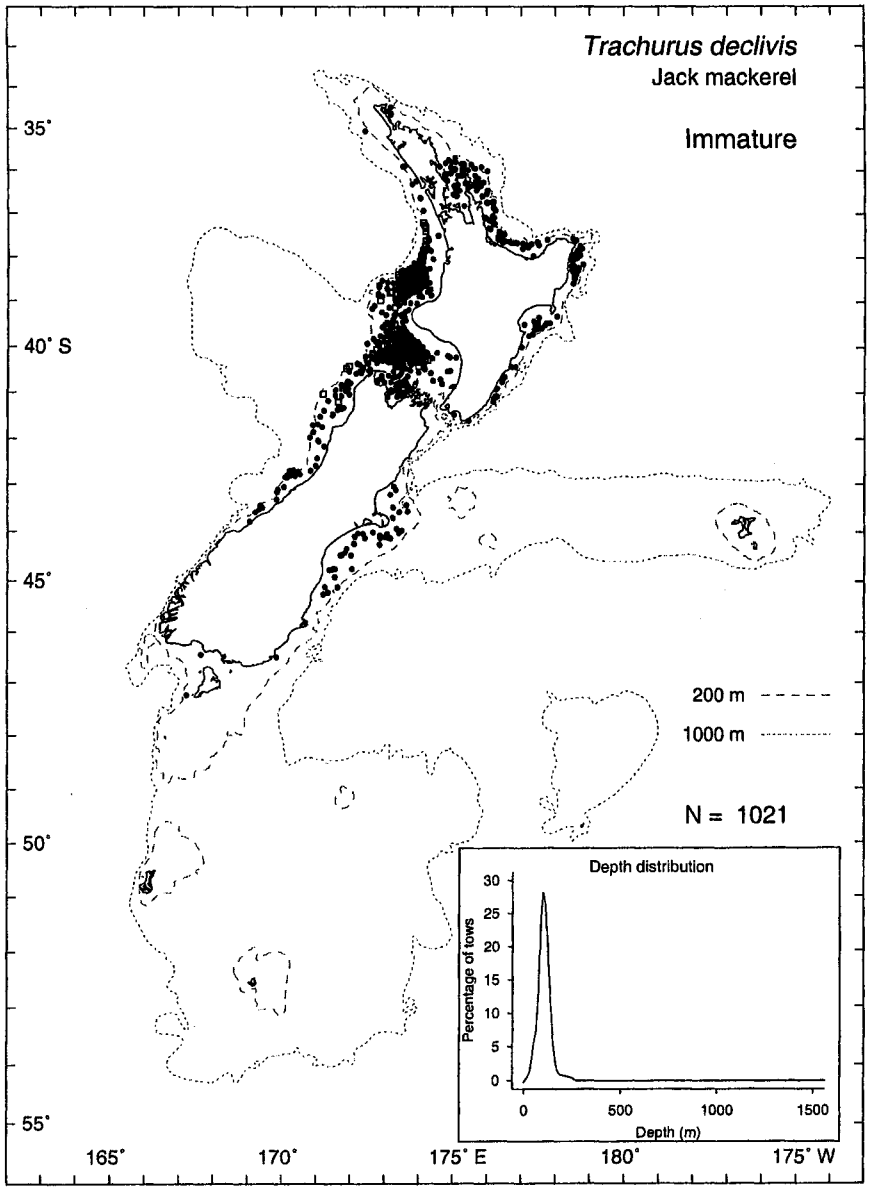

Thyrsites atun
Barracouta
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1002
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

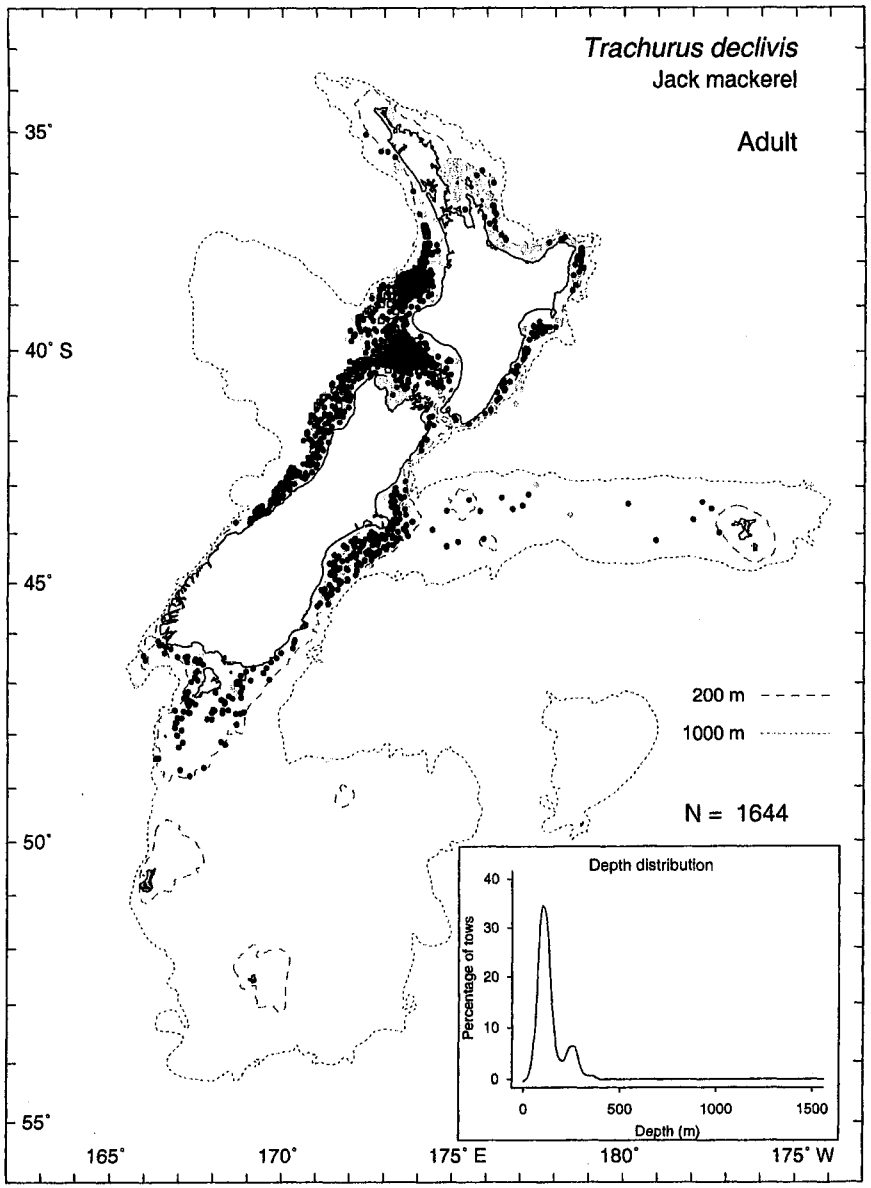

Thyrsites atun
Barracouta
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2200
Depth distribution
Percentage of tows
0
10
20
30
40
0
500
1000
1500
Depth (m)


Thyrsites atun
Barracouta
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3395
Depth distribution
Percentage of tows
0
10
20
30
40
50
0
500
1000
1500
Depth (m)


Trachurus declivis
Jack mackerel
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 235
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8


Trachurus declivis
Jack mackerel
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 678
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
5
10
15
20
25


Trachurus declivis
Jack mackerel
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1021
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
5
10
15
20
25
30


Trachurus declivis
Jack mackerel
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1644
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
10
20
30
40

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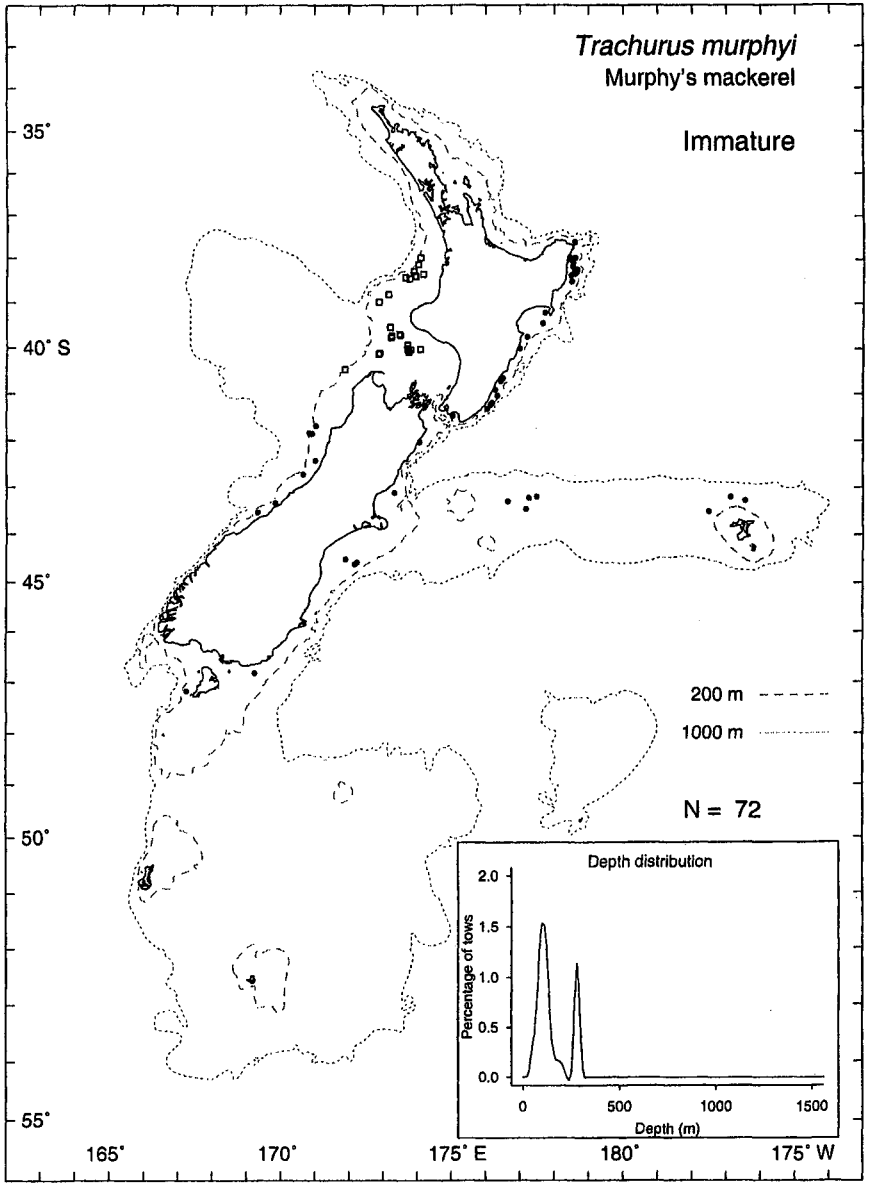
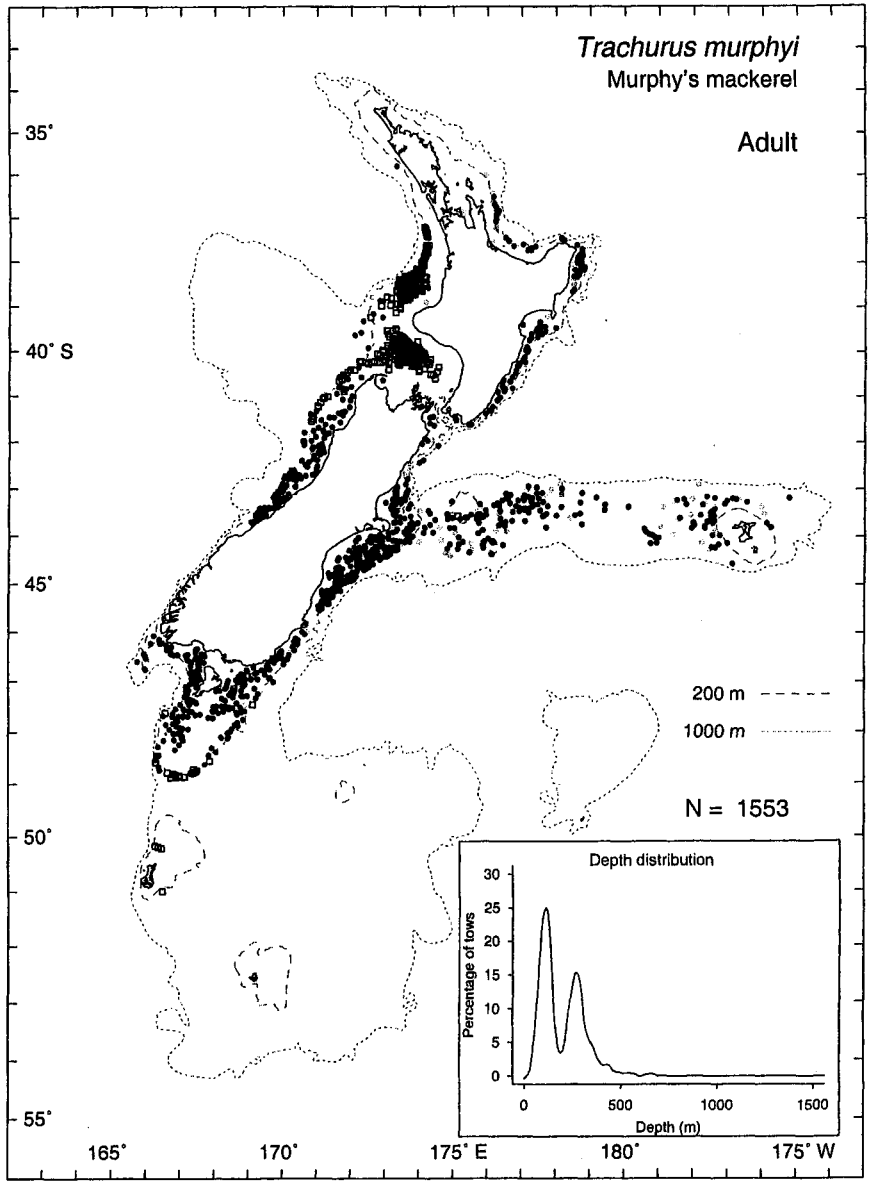
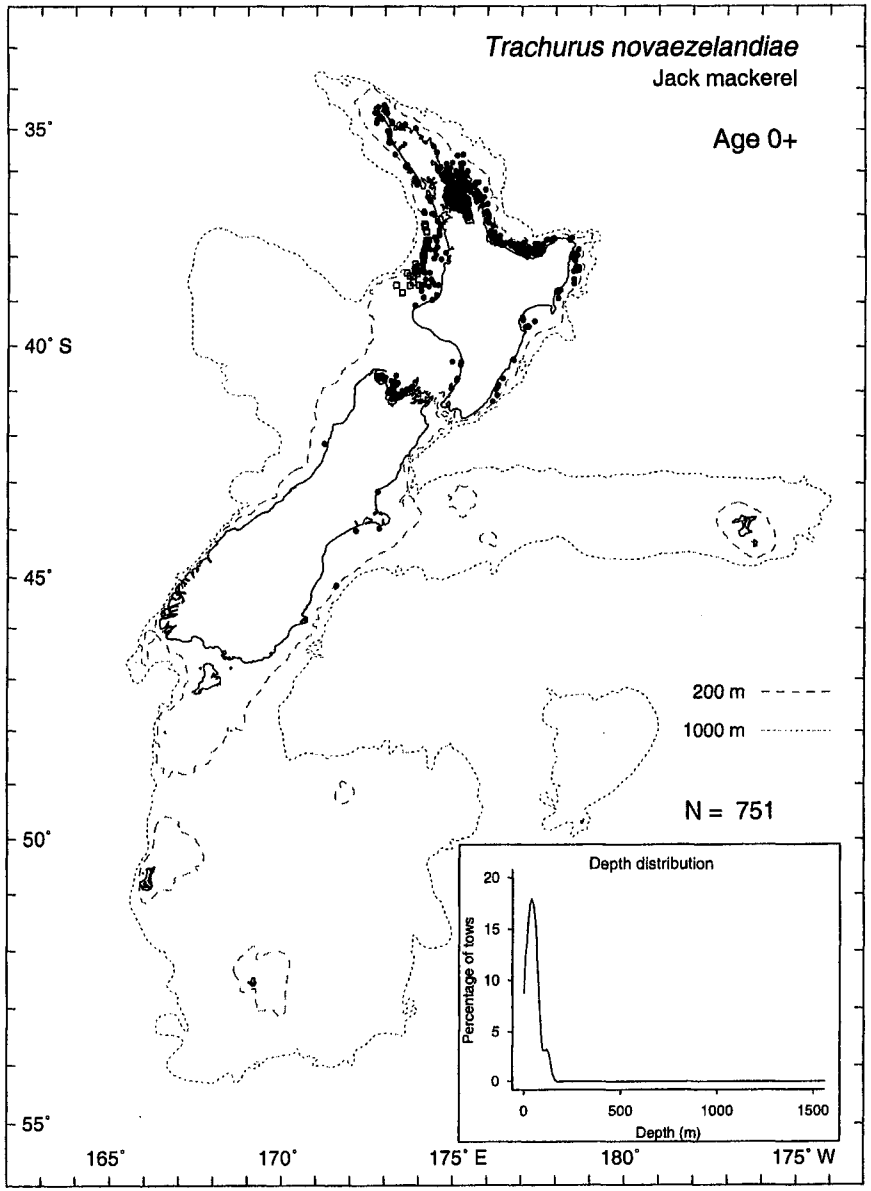
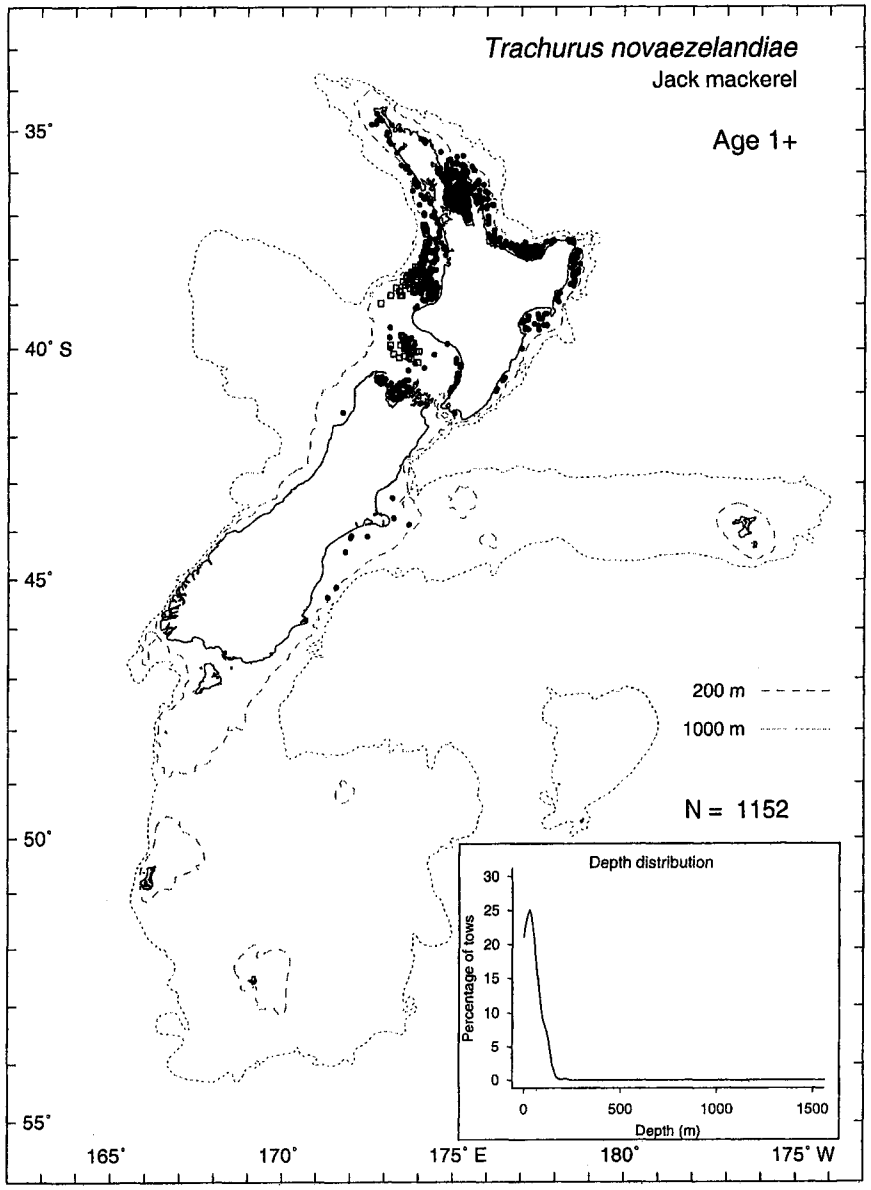
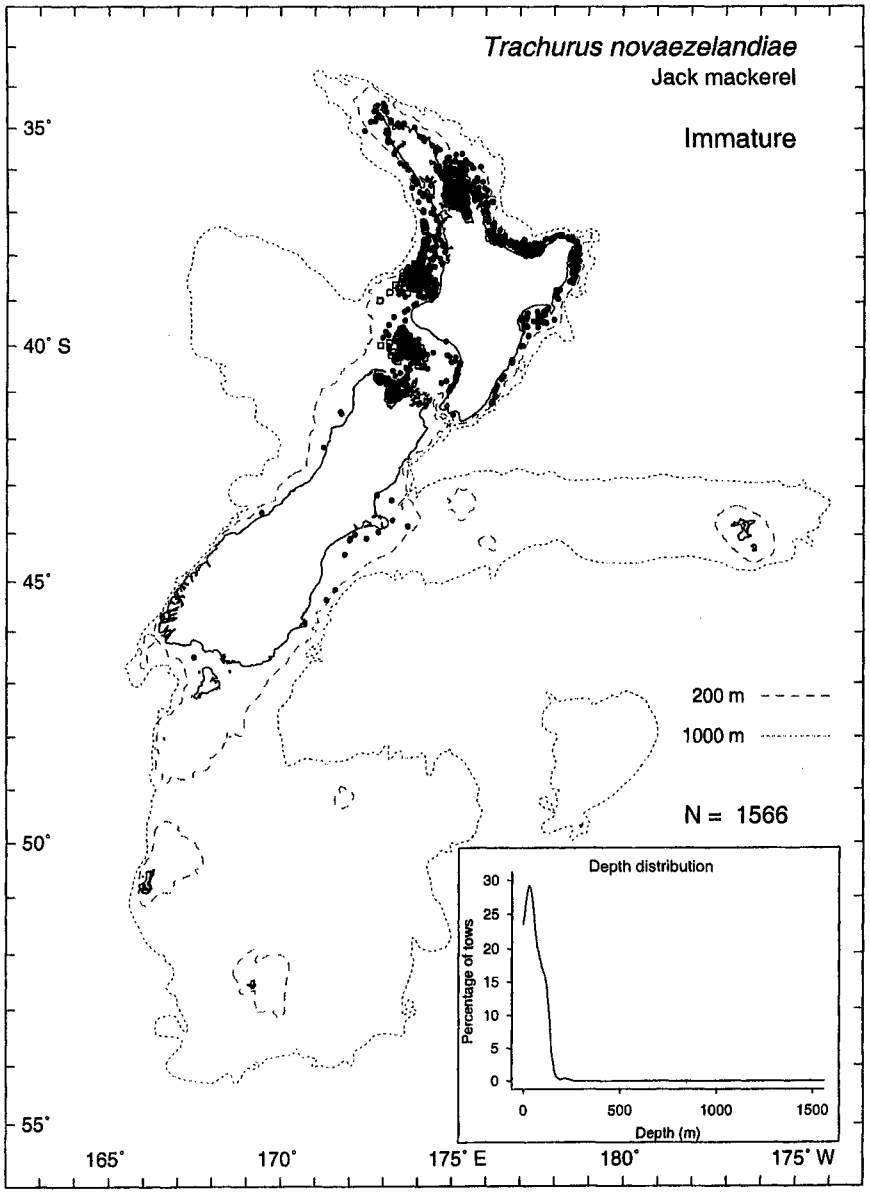


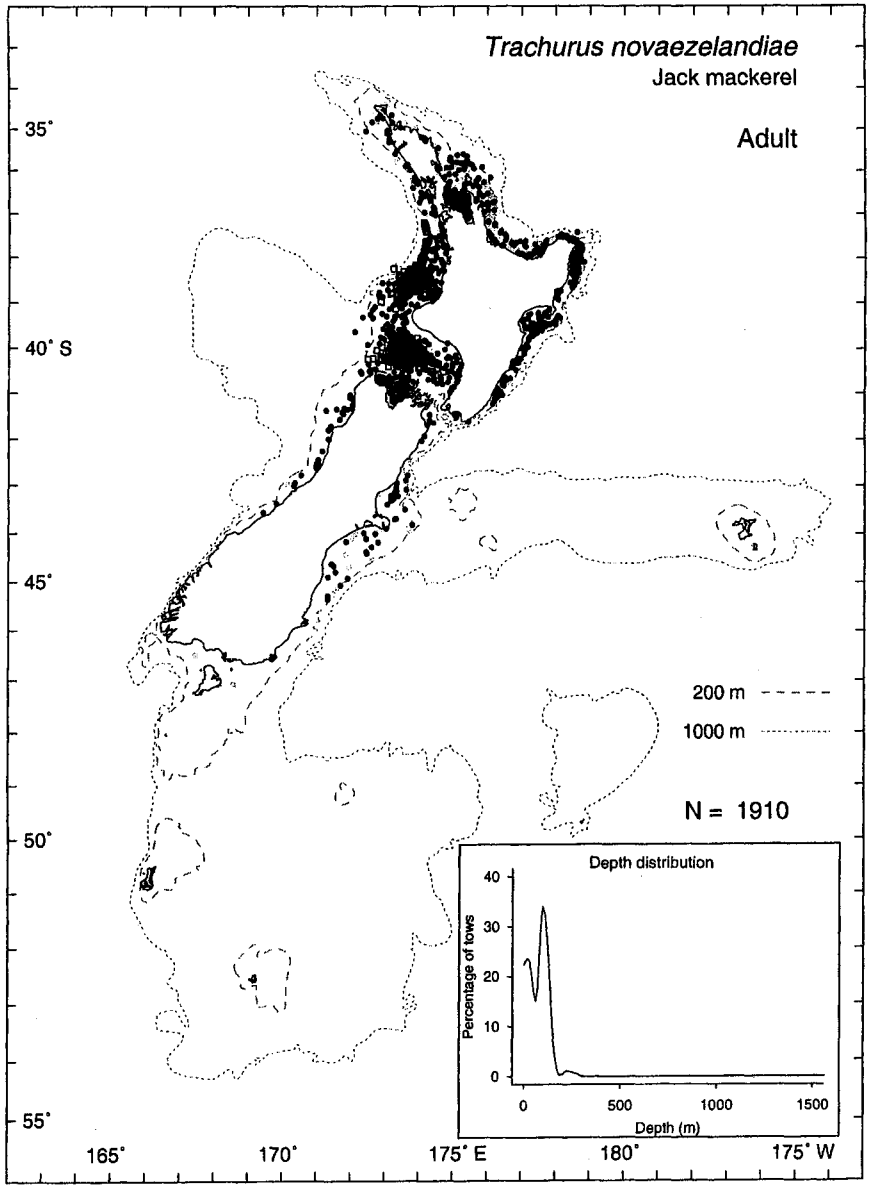


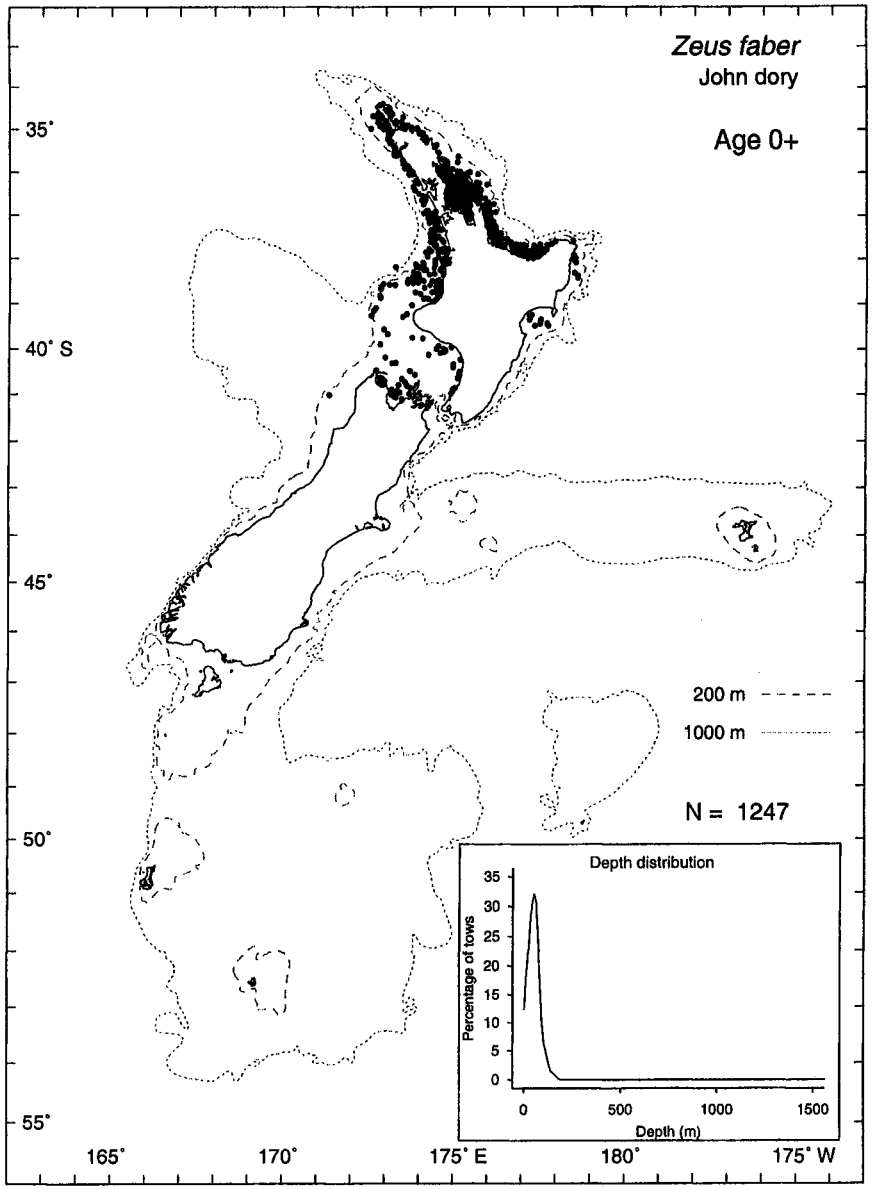
Size at maturity is based on *T. declivis*. Stepien & Rosenblatt (1996) suggested that *T. murphyi* may not be a separate species from *T. symmetricus*. Juvenile plots are not presented for this species.

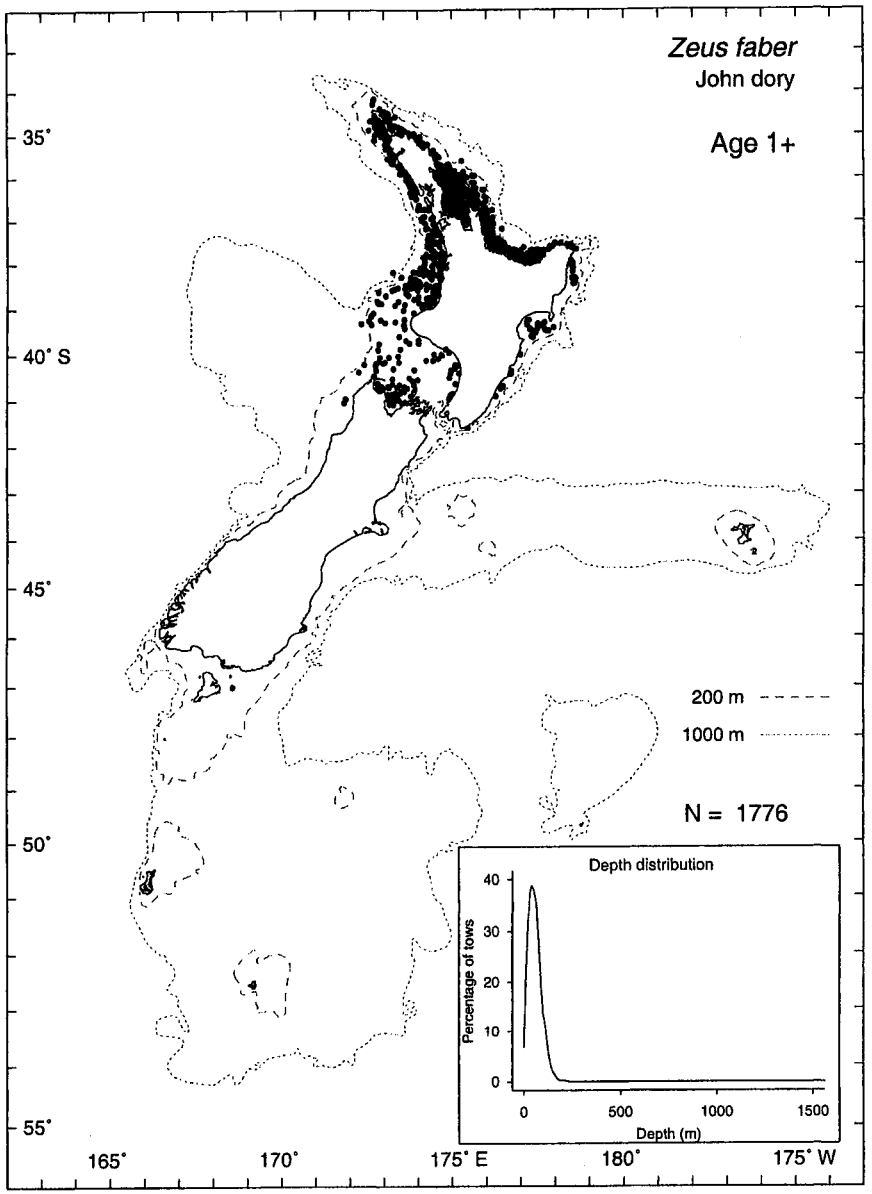

Trachurus novaezelandiae
Jack mackerel
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 751
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)

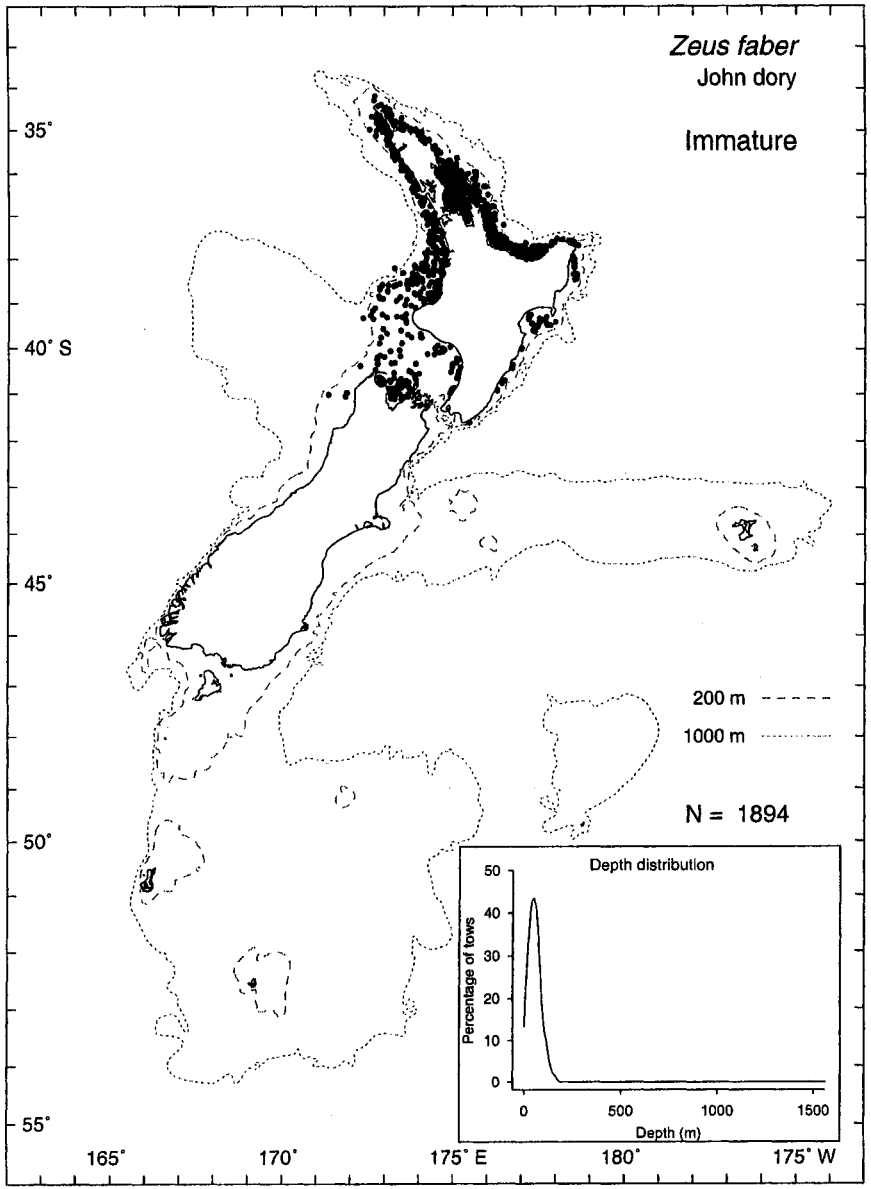

Trachurus novaezelandiae
Jack mackerel
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1152
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)

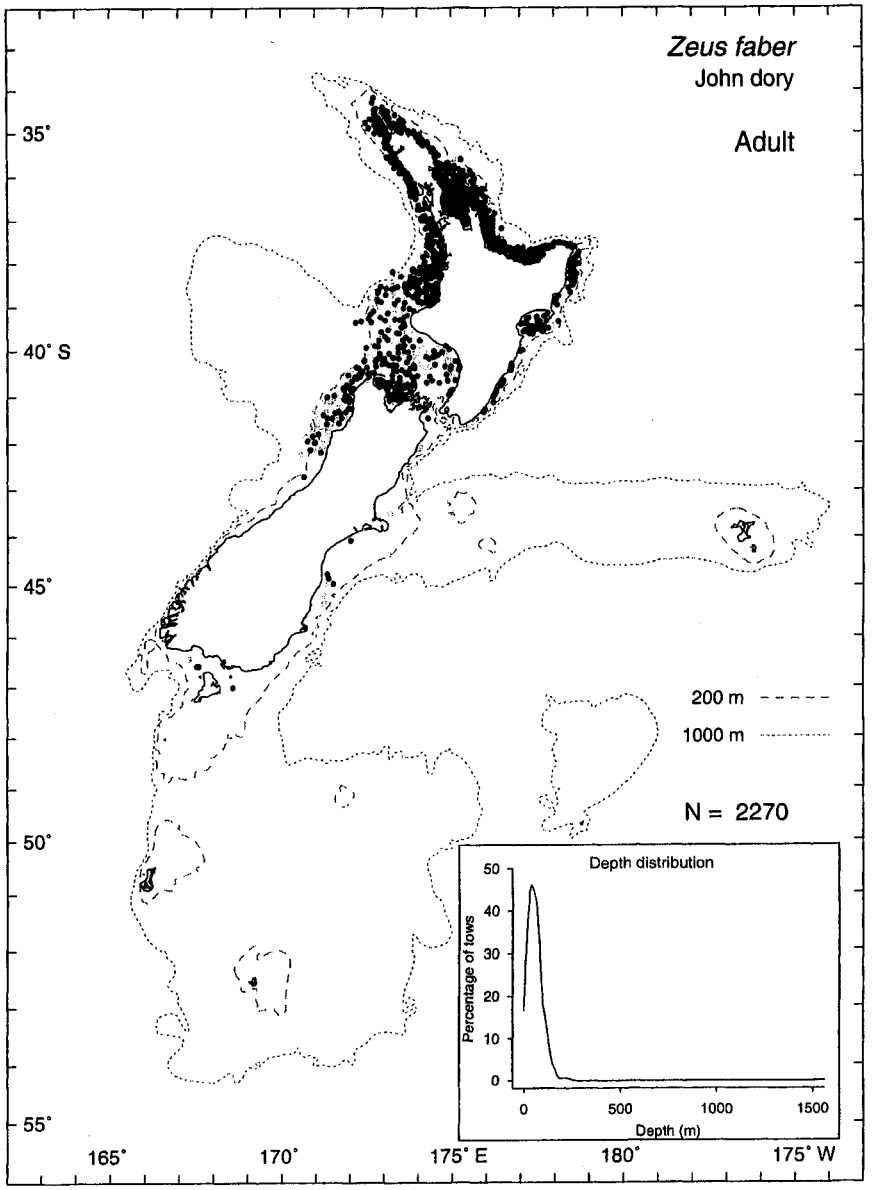

Trachurus novaezelandiae
Jack mackerel
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1566
Depth distribution
Percentage of tows
30
25
20
15
10
5
0
0
500
1000
1500
Depth (m)


Trachurus novaezelandiae
Jack mackerel
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1910
Depth distribution
Percentage of tows
40
30
20
10
0
0
500
1000
1500
Depth (m)


Zeus faber
John dory
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1247
Depth distribution
Percentage of tows
0
5
10
15
20
25
30
35
0
500
1000
1500
Depth (m)


Zeus faber
John dory
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1776
Depth distribution
Percentage of tows
0
10
20
30
40
0
500
1000
1500
Depth (m)

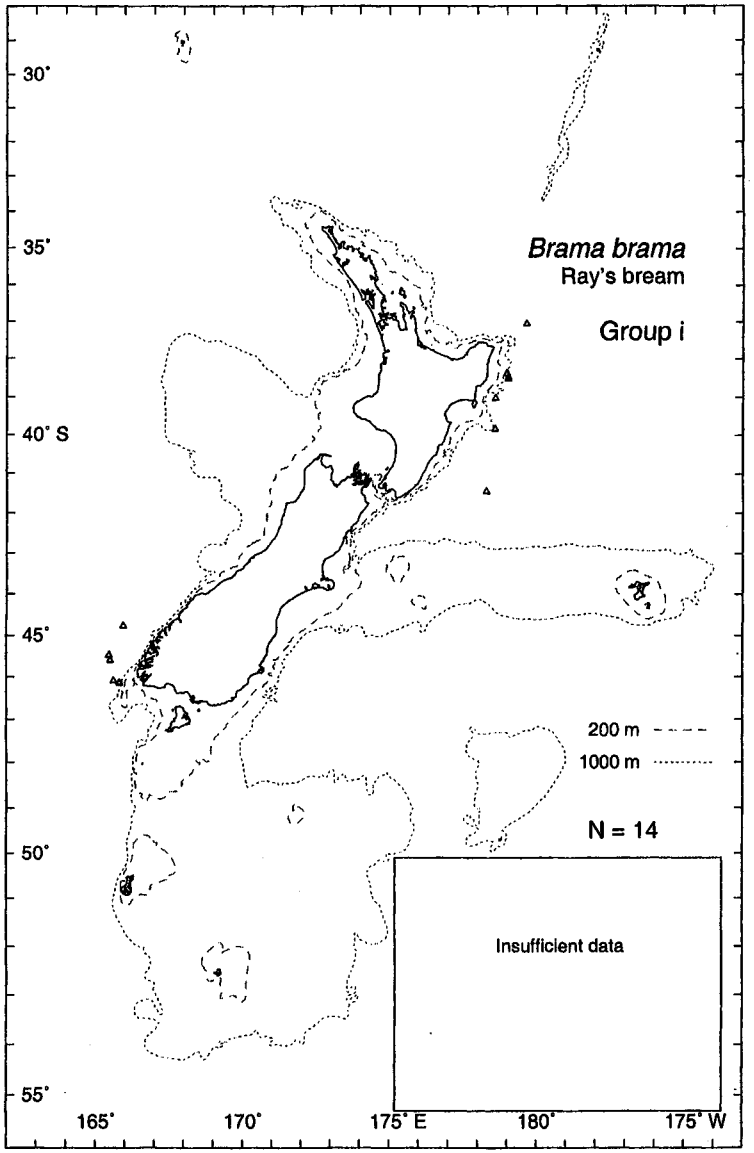

Zeus faber
John dory
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 1894
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
0
500
1000
1500

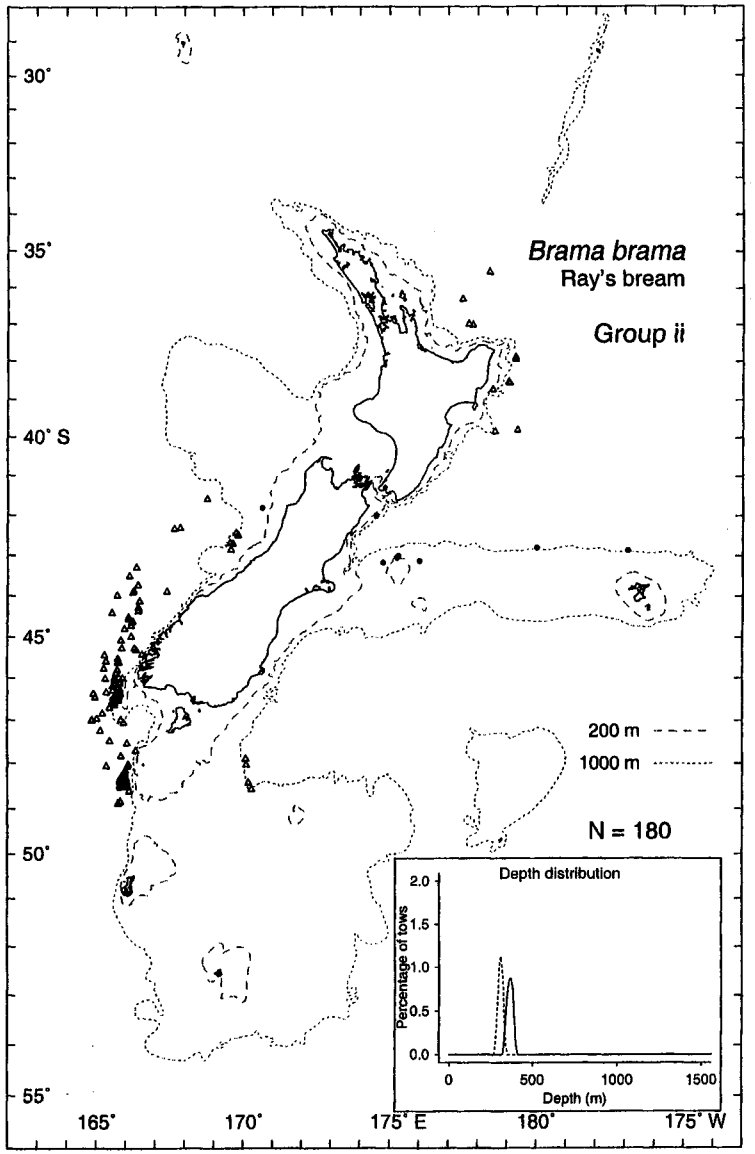

Zeus faber
John dory
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2270
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
0
500
1000
1500

Midwater trawl and tuna longline distributions

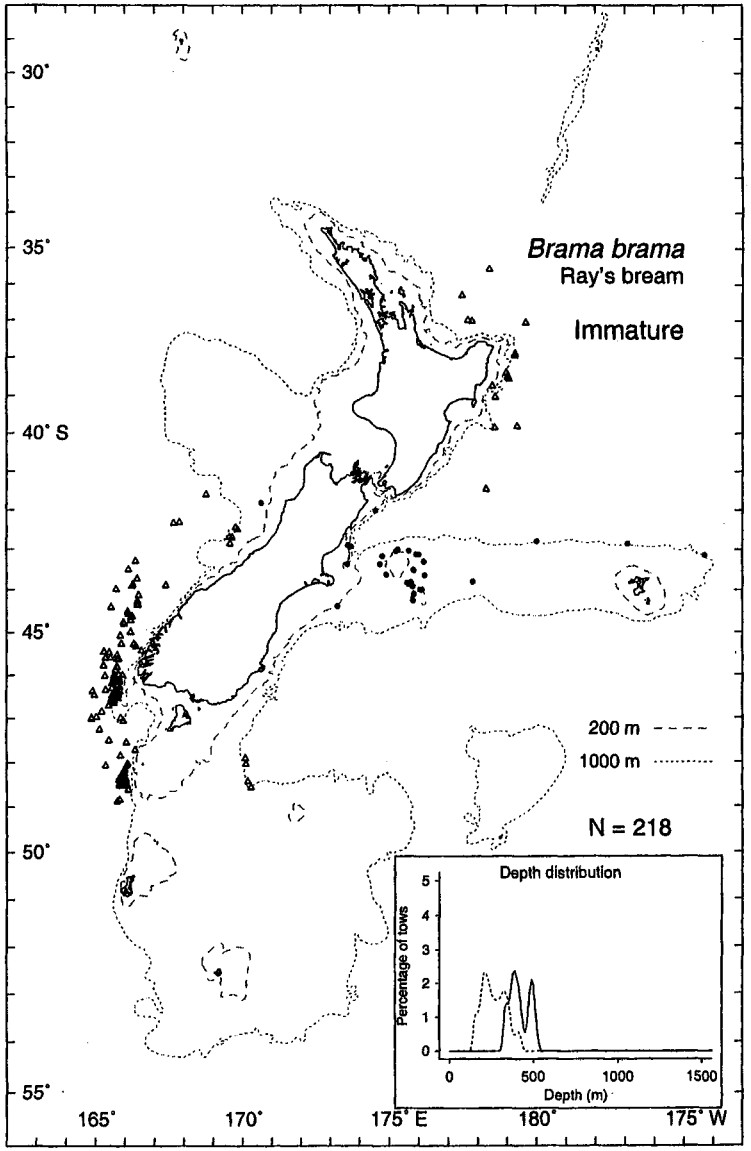
Key to symbols and shading in the distribution plots

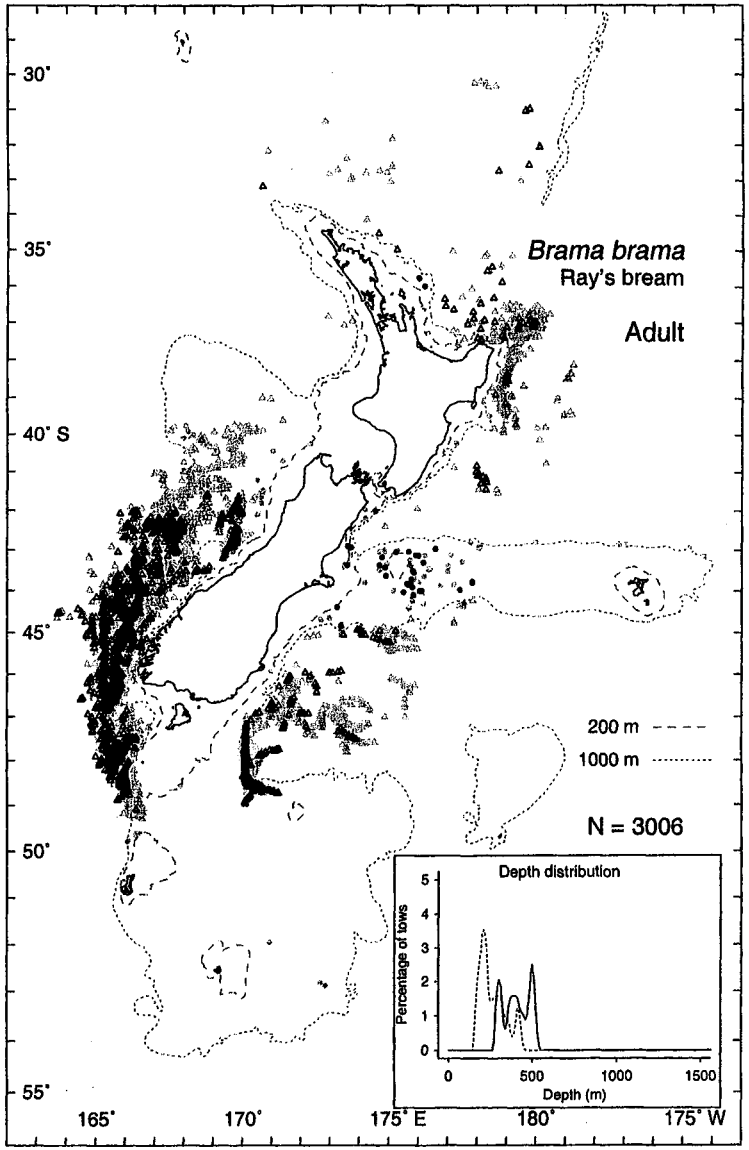
●	Research midwater tow
□	Observer midwater tow
△	Tuna longline set
Black	Position where the life history stage occurs
Grey	Position where the species occurs

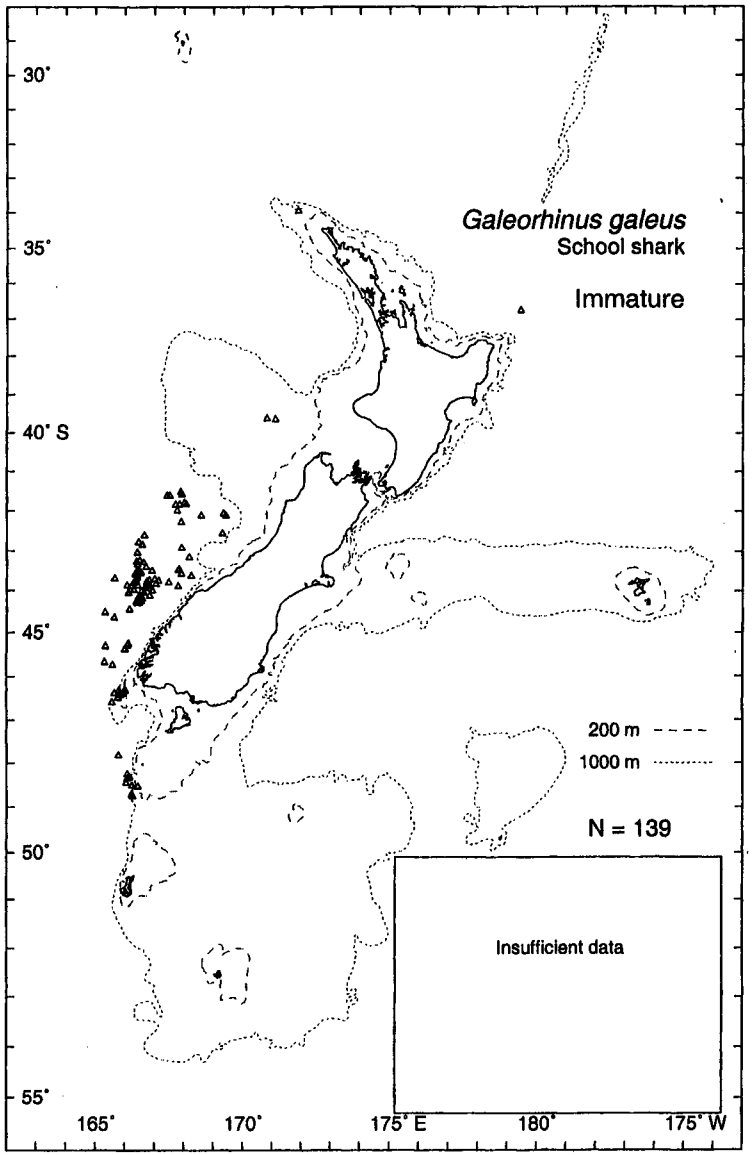


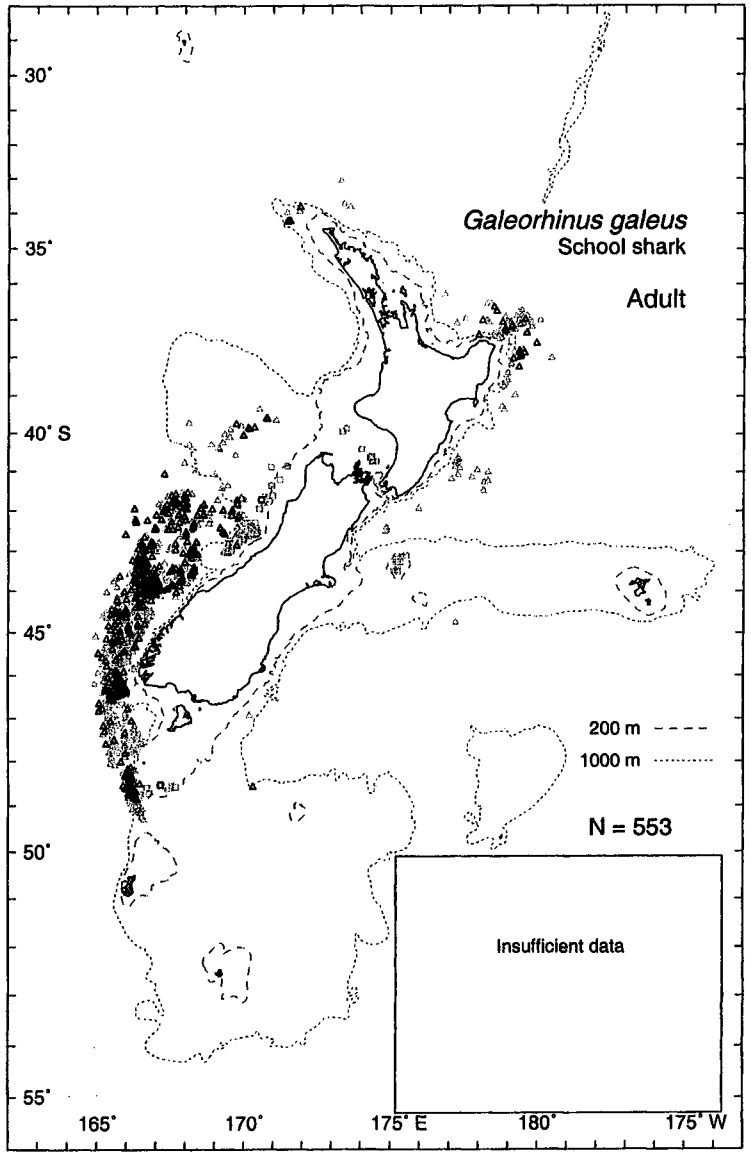


May include some other pomfrets (Bramidae). Groups i and ii are arbitrary and were determined from length frequency modes.

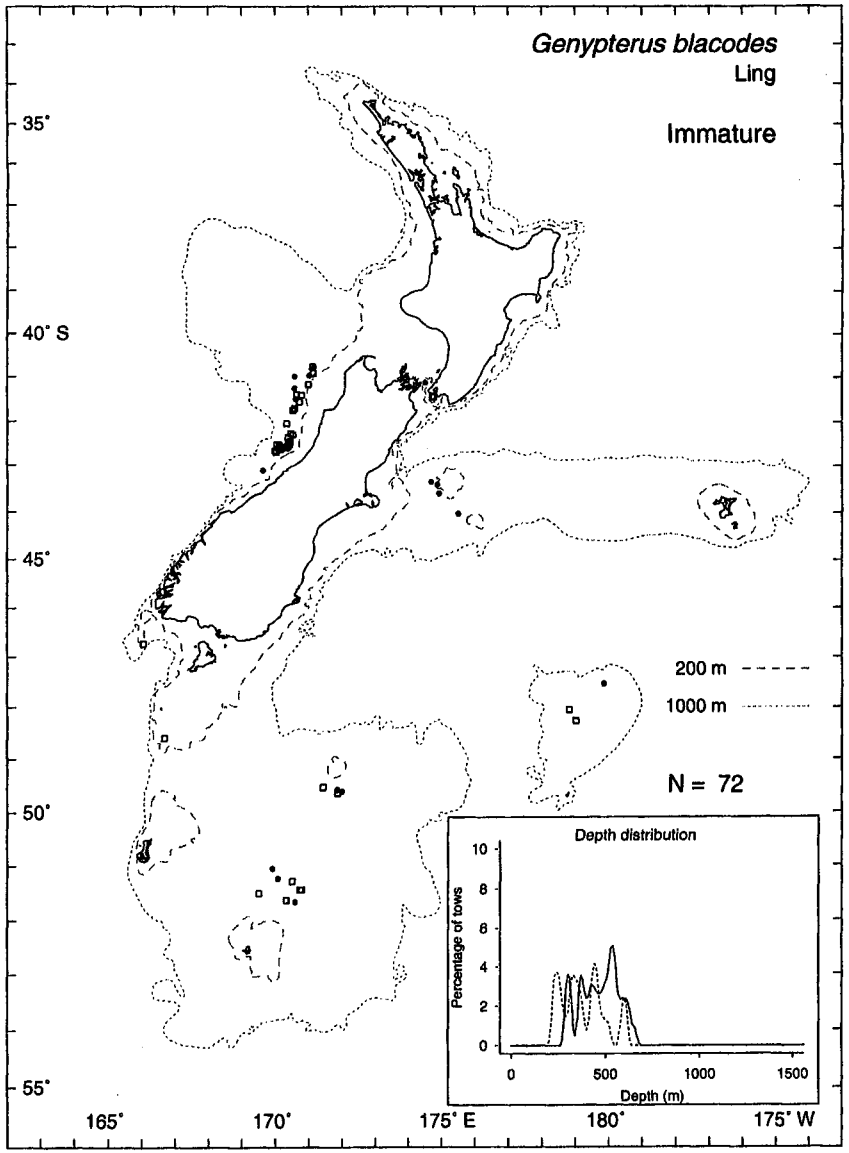

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
Brama brama
Ray's bream
Immature
200 m
1000 m
N = 218
Depth distribution
Percentage of tows
0
1
2
3
4
5
0
500
1000
1500
Depth (m)

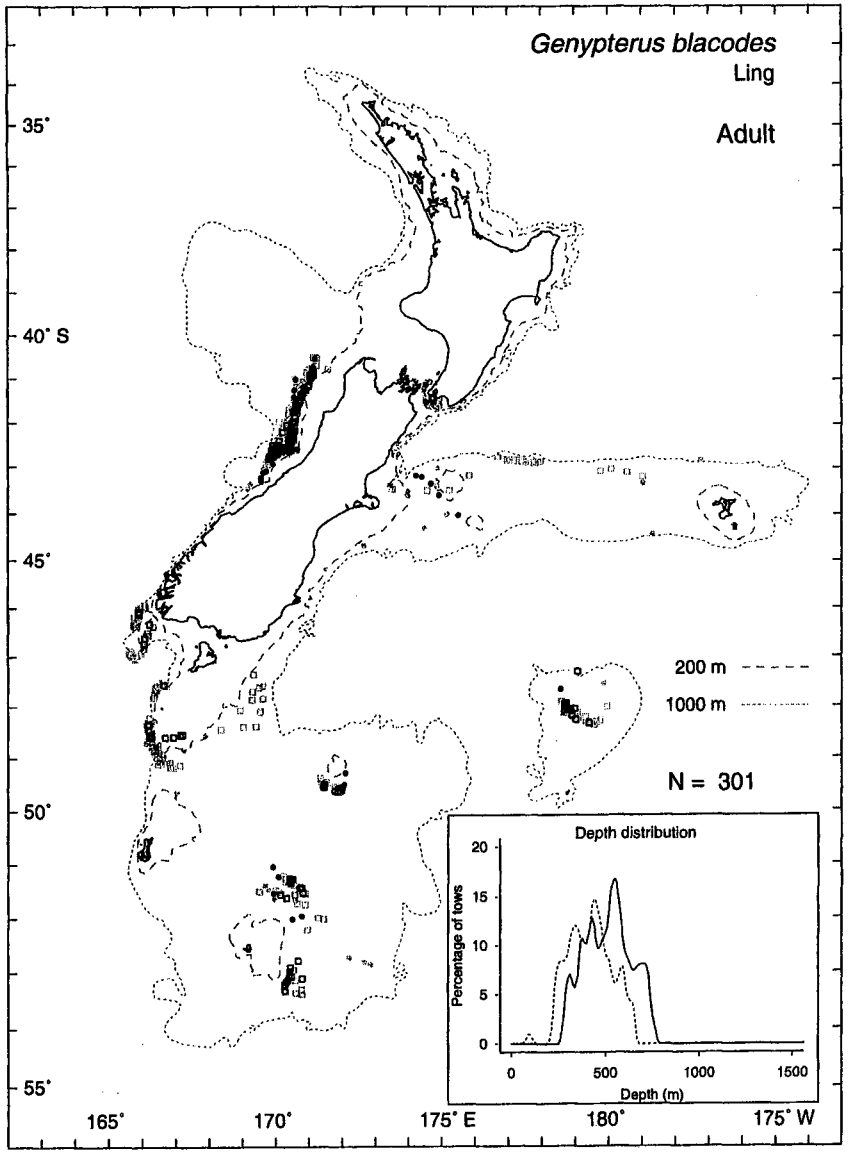

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
Brama brama
Ray's bream
Adult
200 m
1000 m
N = 3006
Depth distribution
Percentage of tows
0
1
2
3
4
5
0
500
1000
1500
Depth (m)





Juvenile plots are not presented for this species.





Juvenile plots are not presented for this species.

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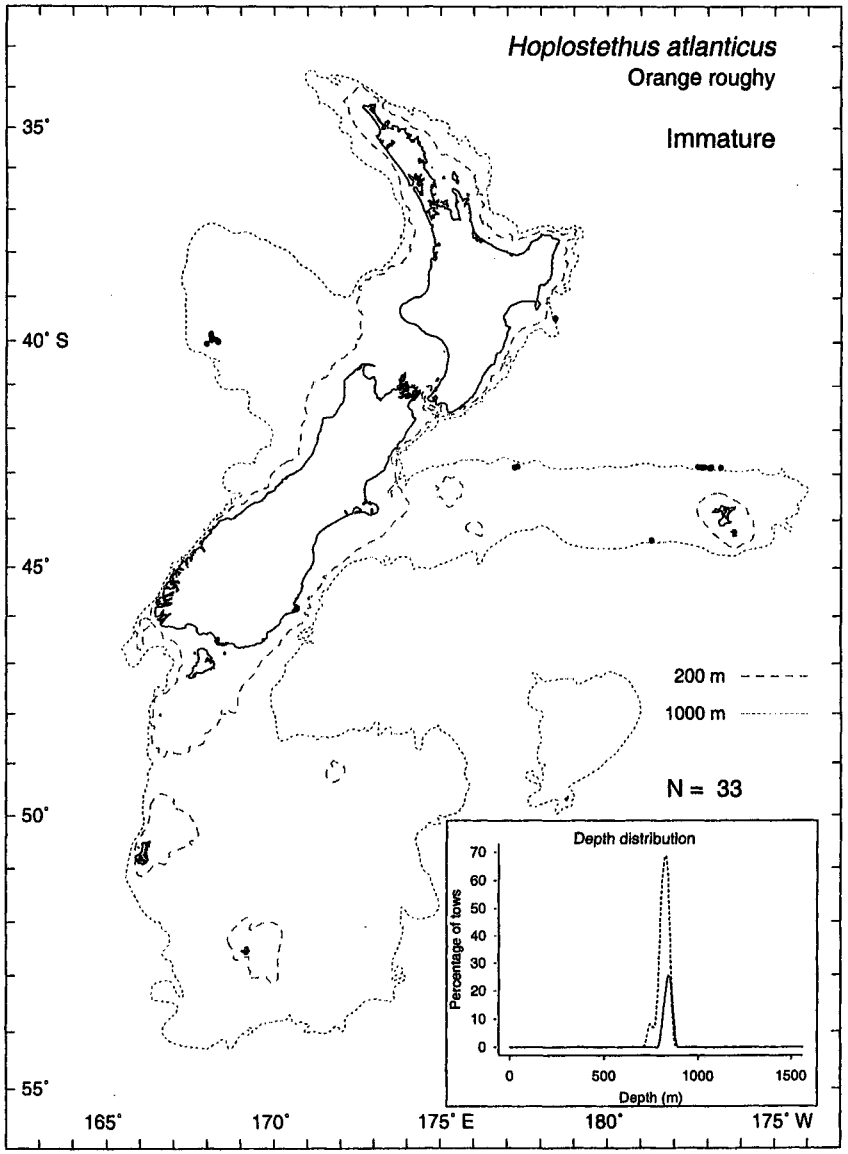
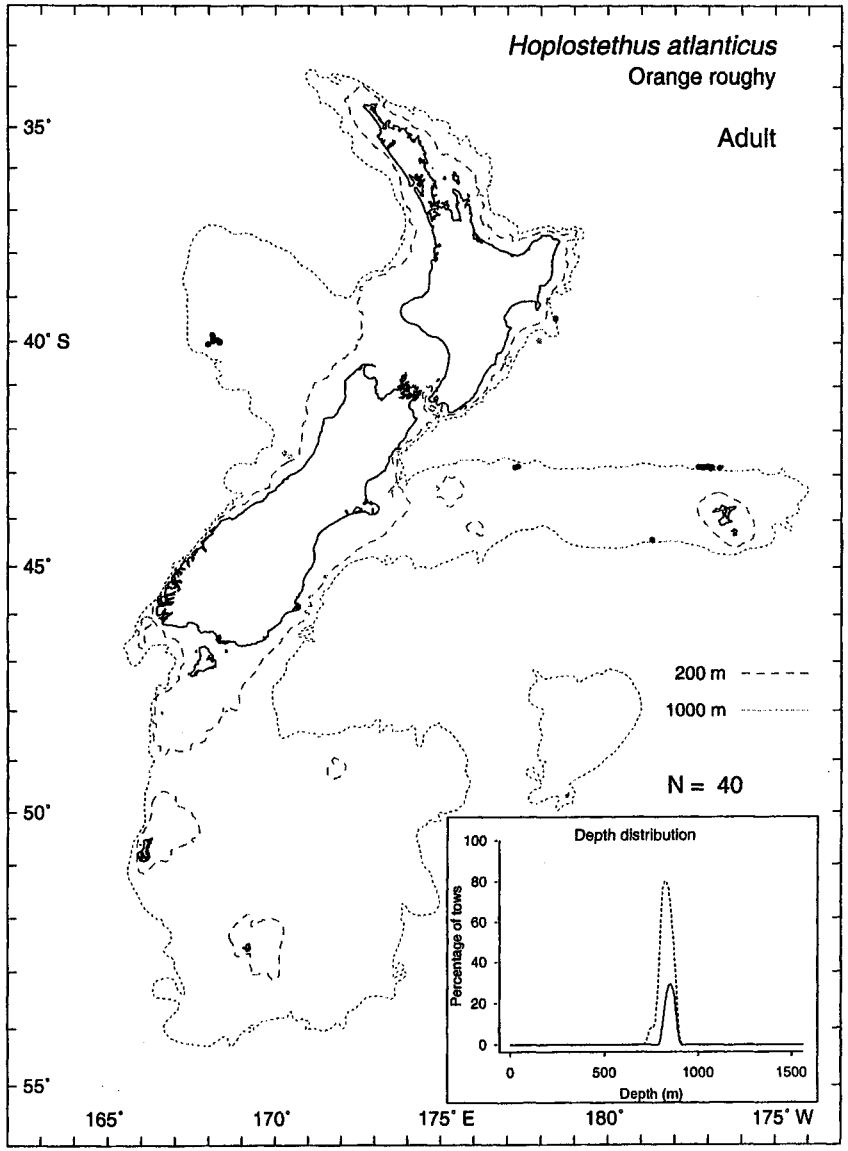
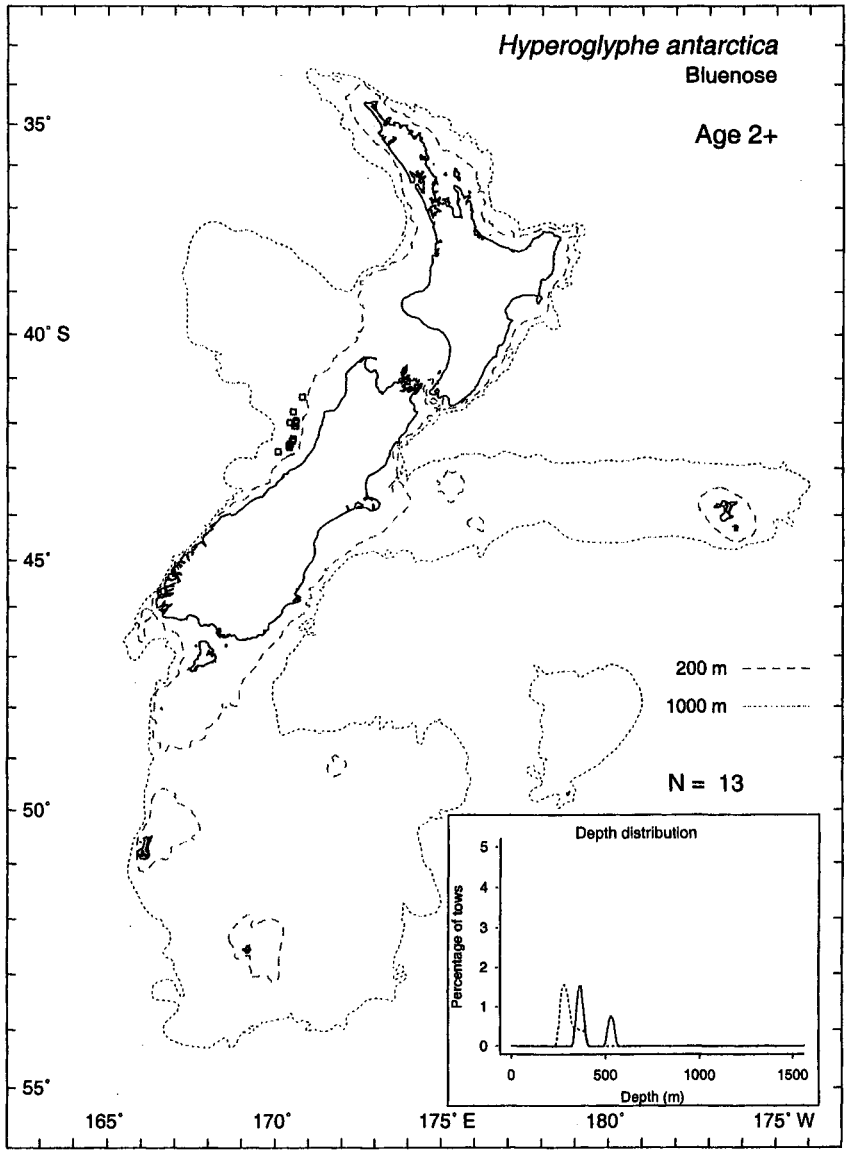
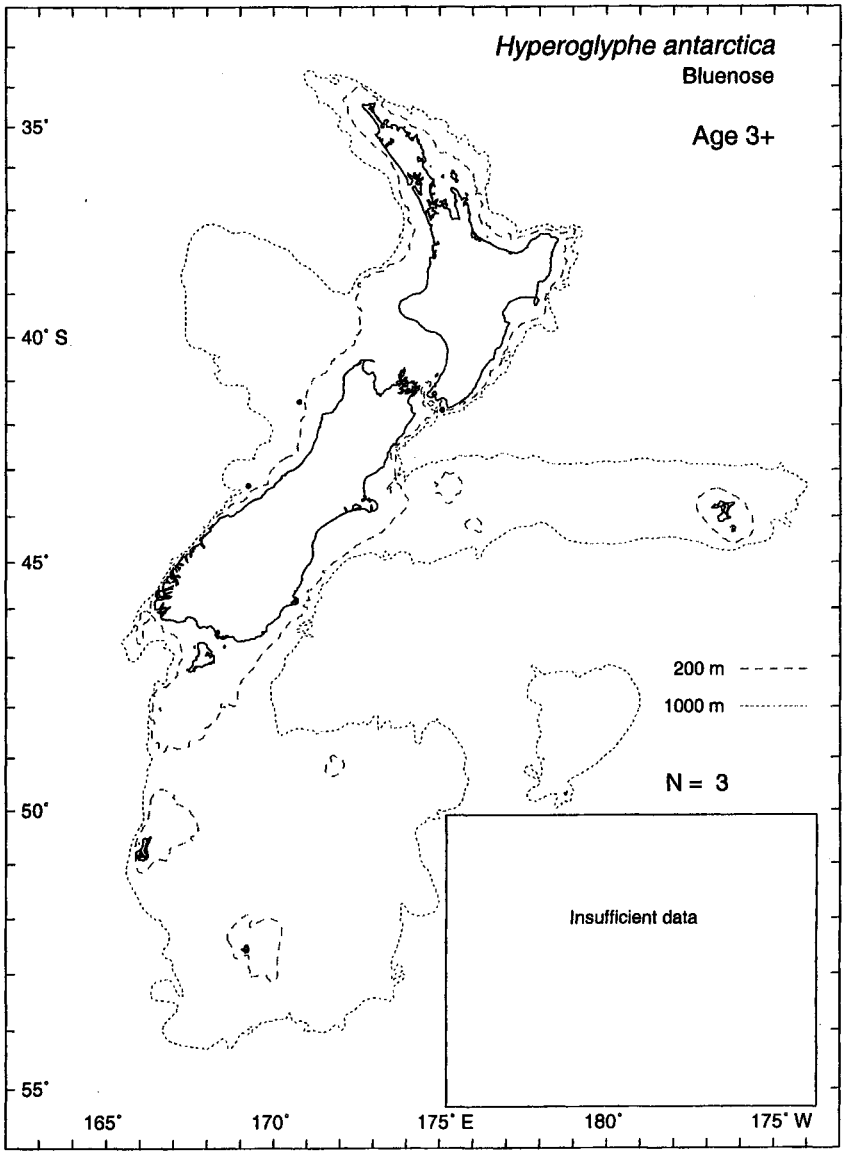
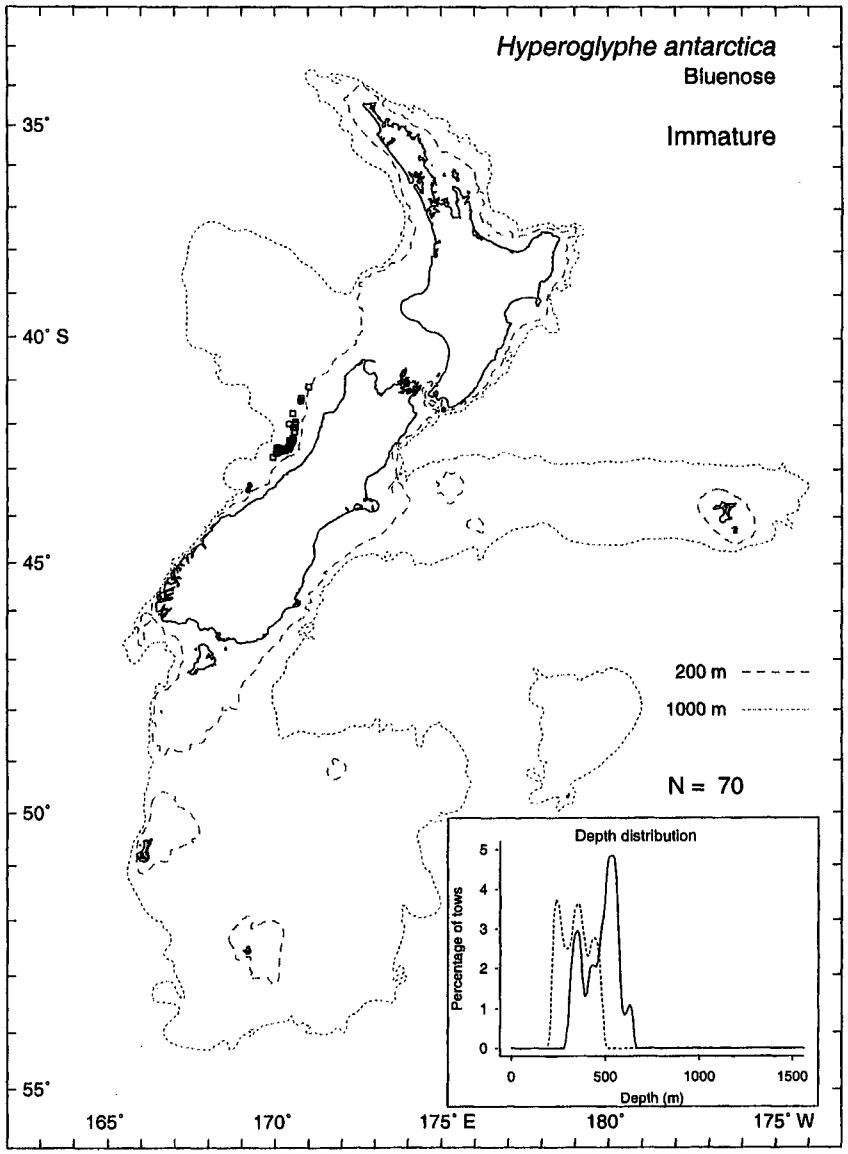


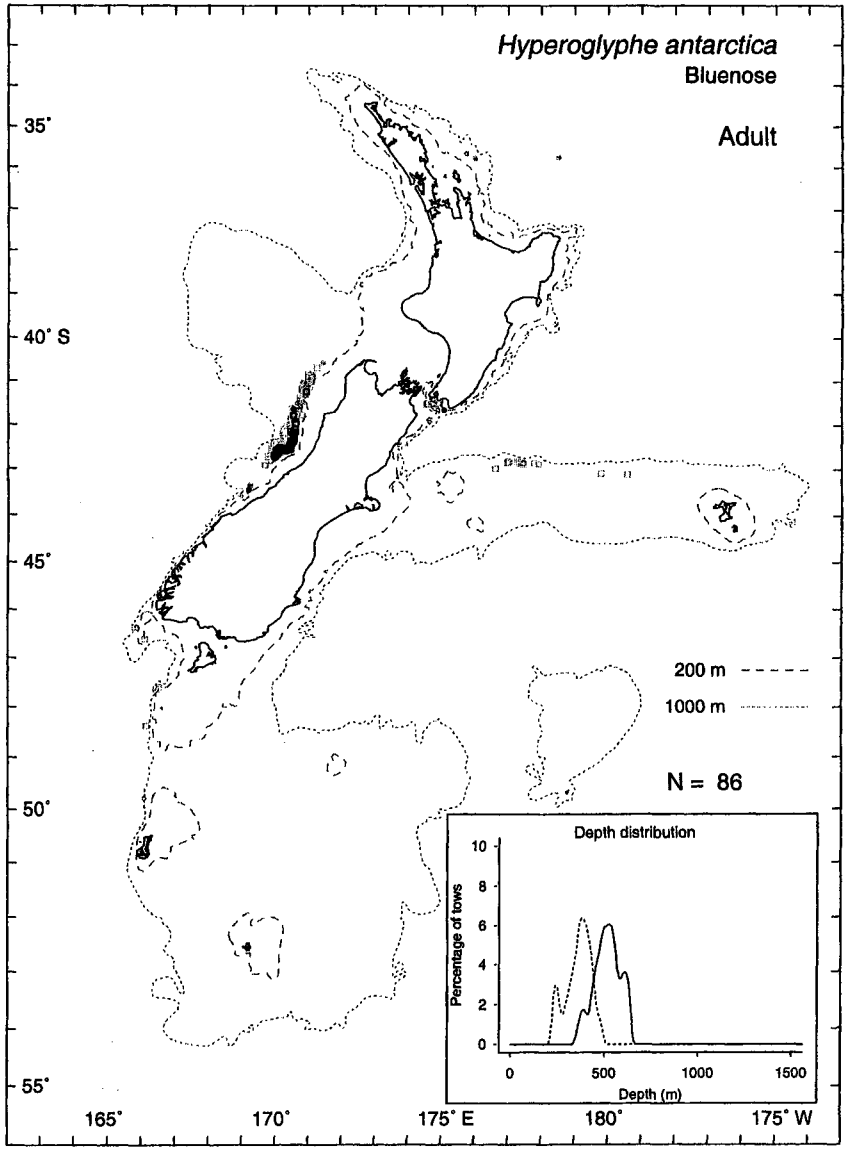


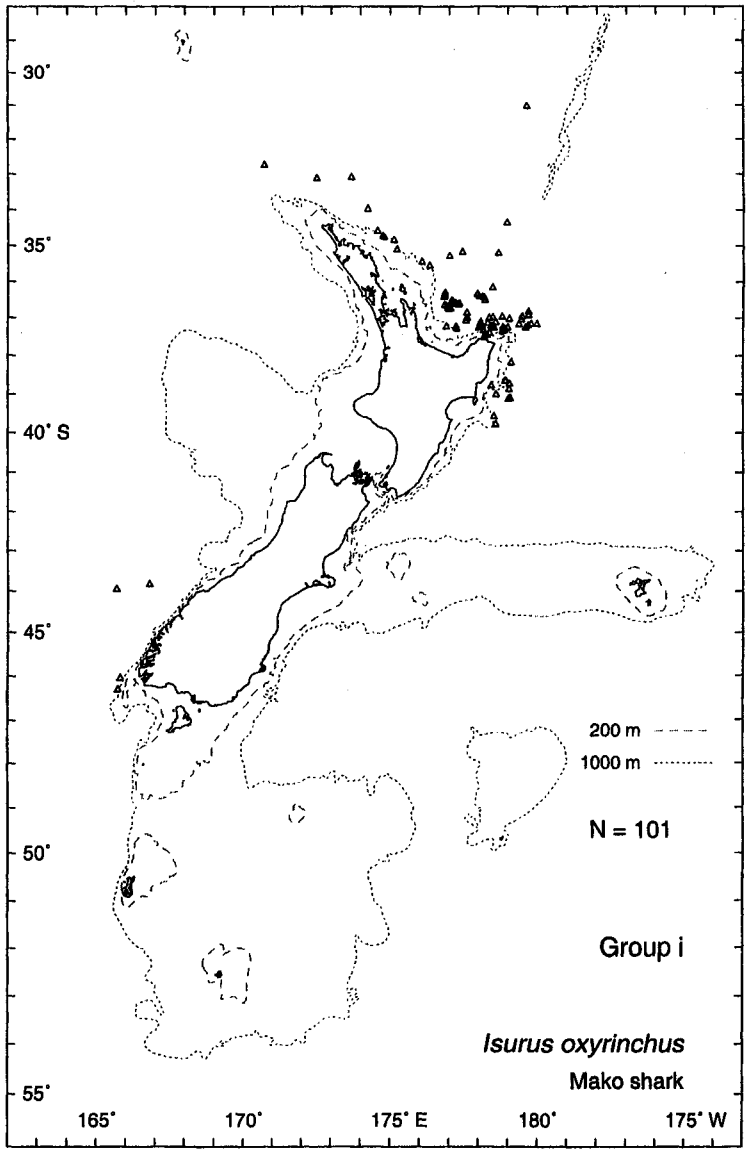
Juvenile plots are not presented for this species.

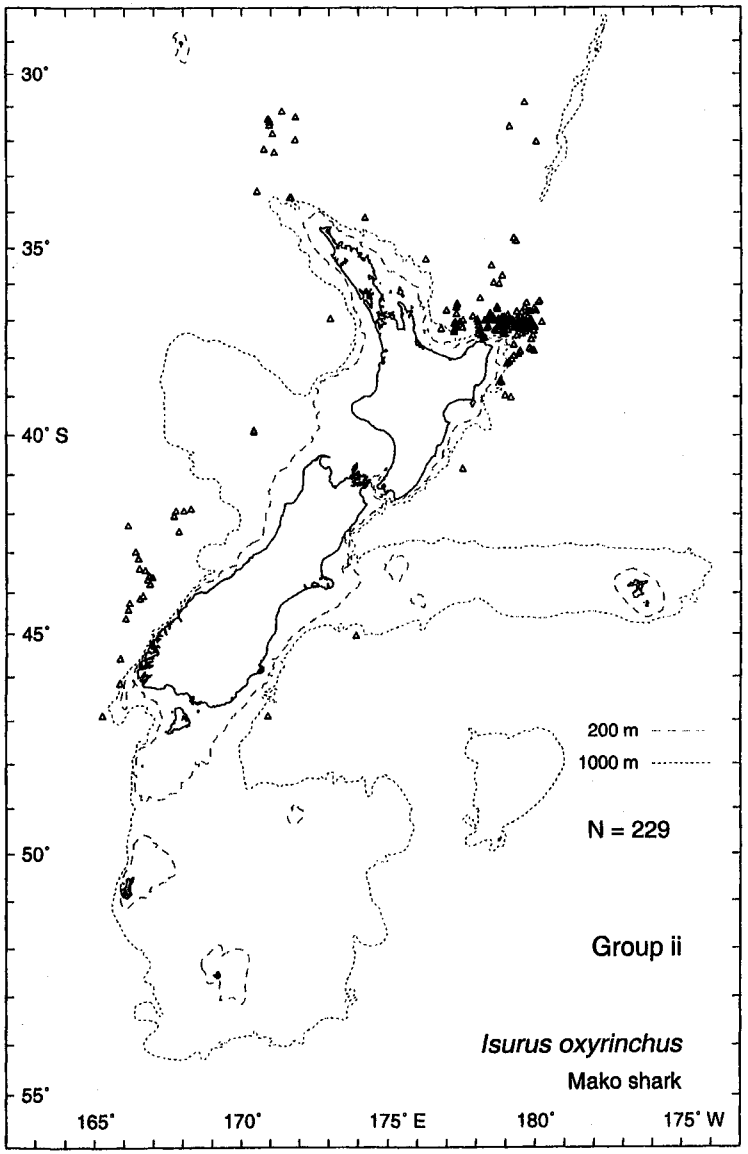

Hyperoglyphe antarctica
Bluenose
Age 2+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 13
Depth distribution
Percentage of tows
0
1
2
3
4
5
0
500
1000
1500
Depth (m)


Hyperoglyphe antarctica
Bluenose
Age 3+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 3
Insufficient data

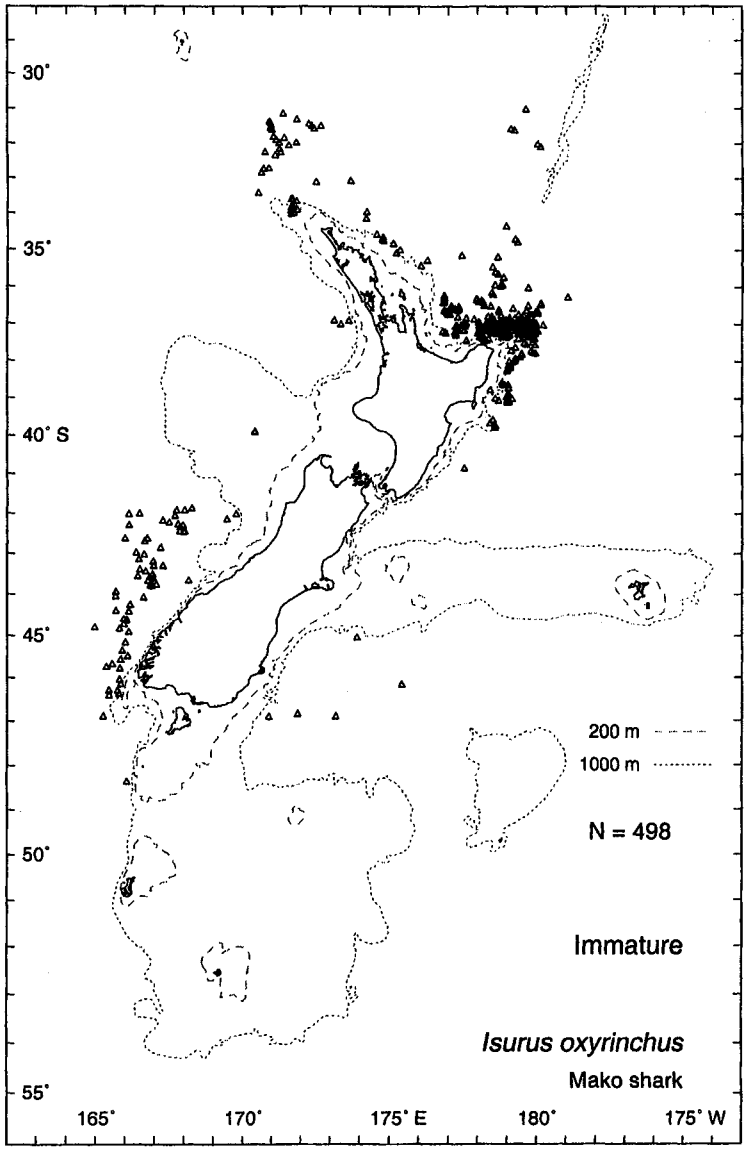

Hyperoglyphe antarctica
Bluenose
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 70
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
1
2
3
4
5

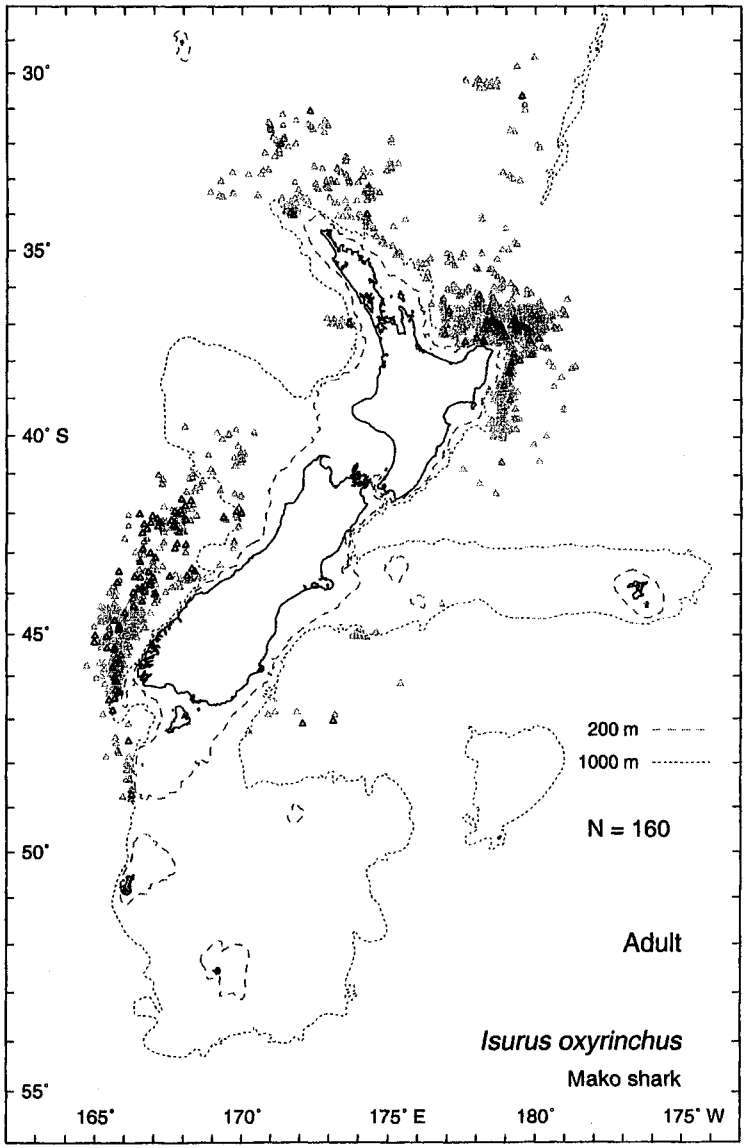

Hyperoglyphe antarctica
Bluenose
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 86
Depth distribution
Percentage of tows
Depth (m)
0
500
1000
1500
0
2
4
6
8
10

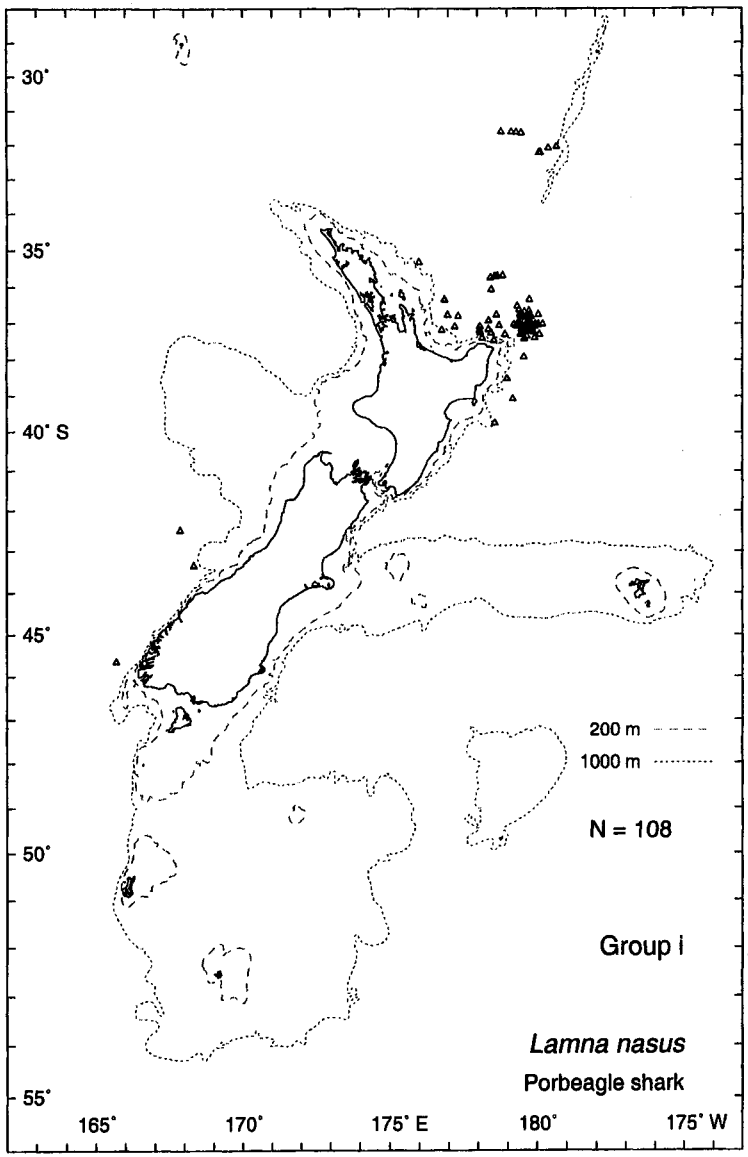


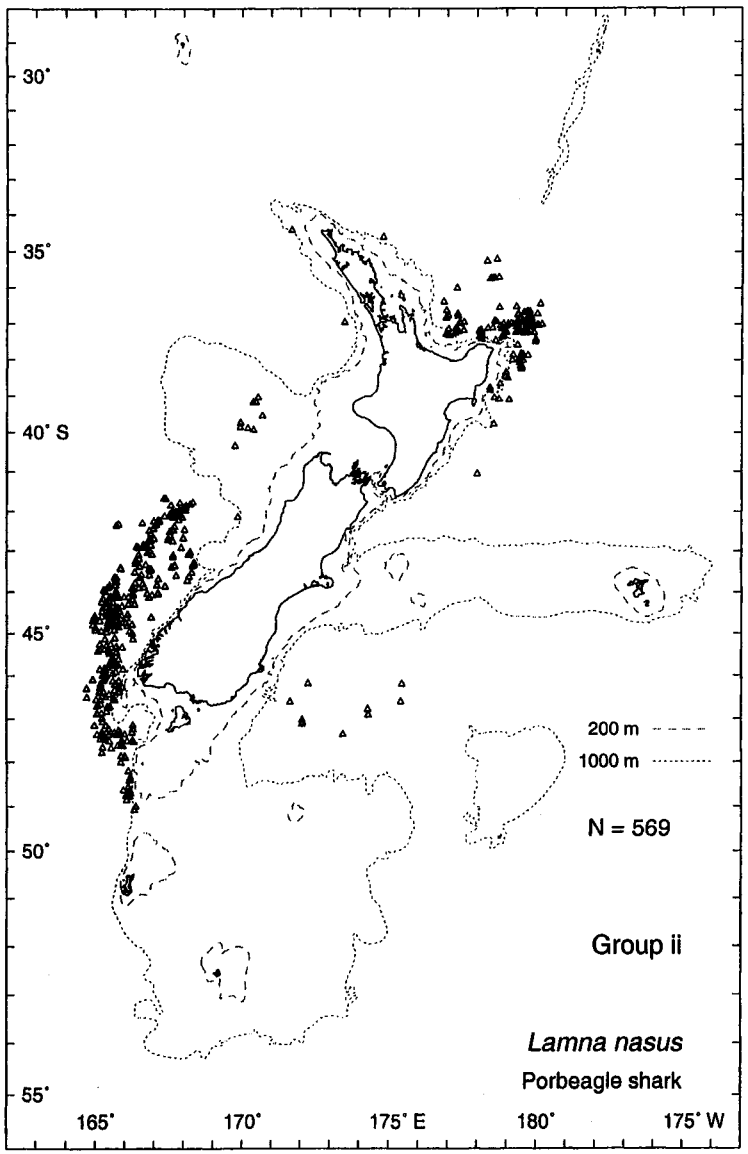


Groups i and ii may approximate ages 0+ and 1+.

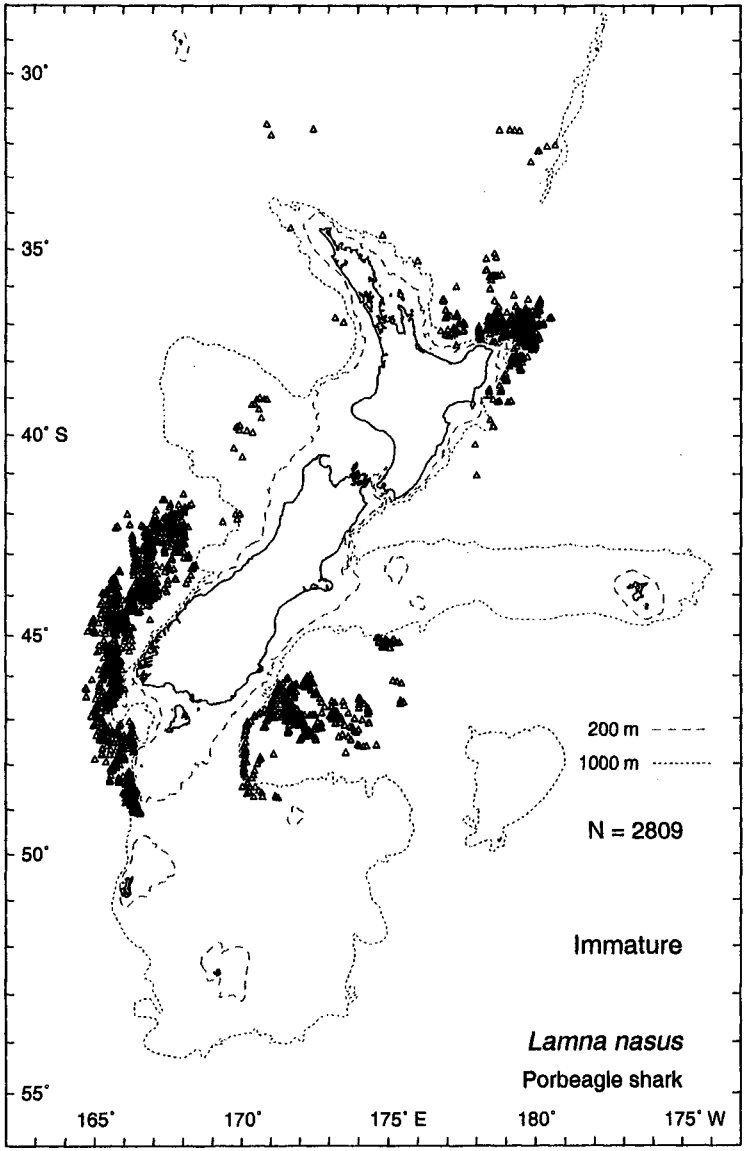

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 498
Immature
Isurus oxyrinchus
Mako shark

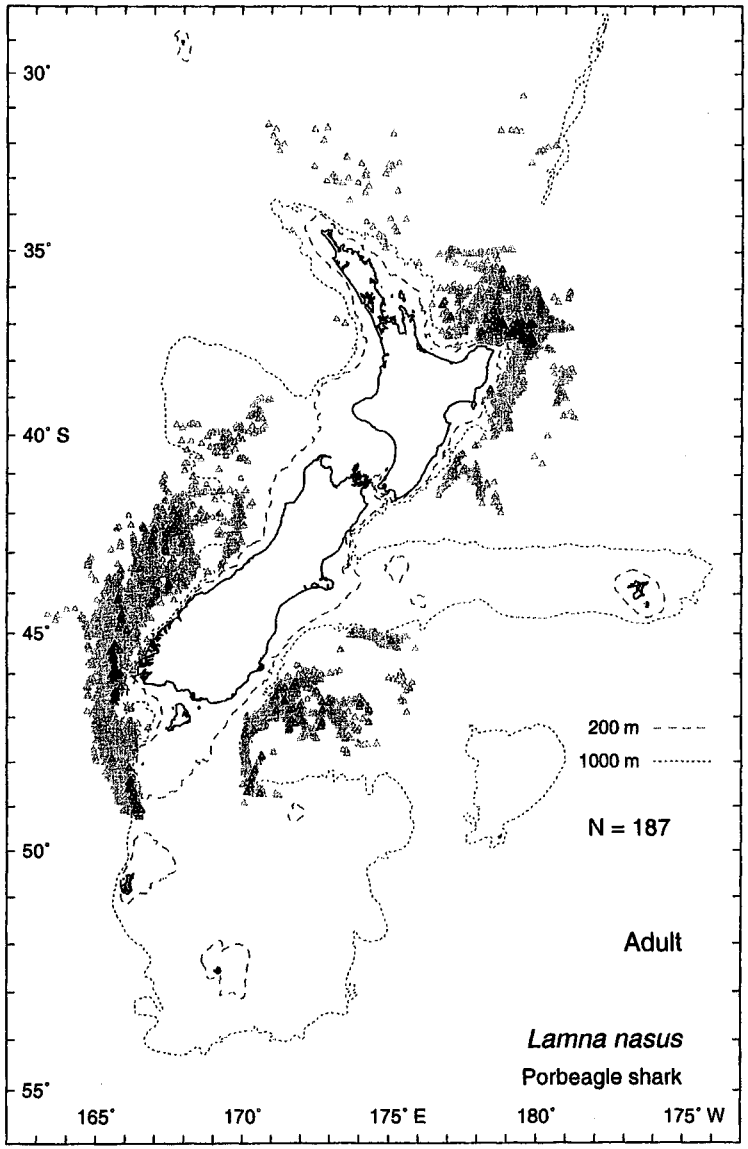

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 160
Adult
Isurus oxyrinchus
Mako shark

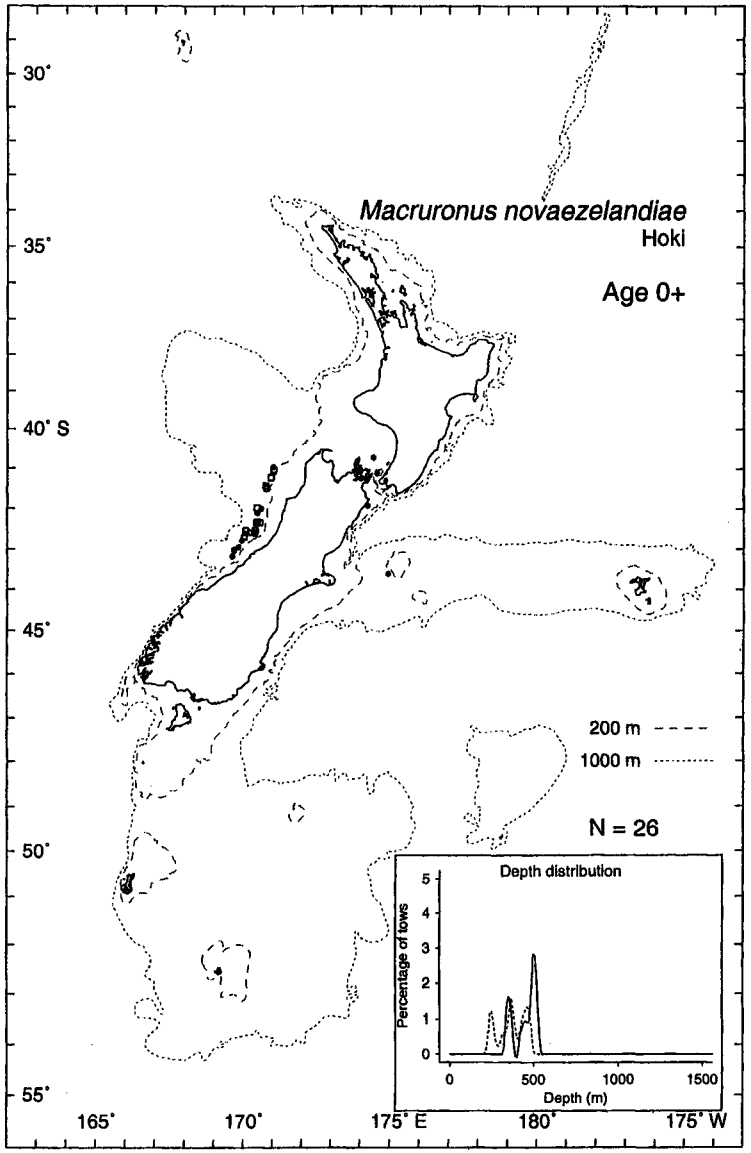


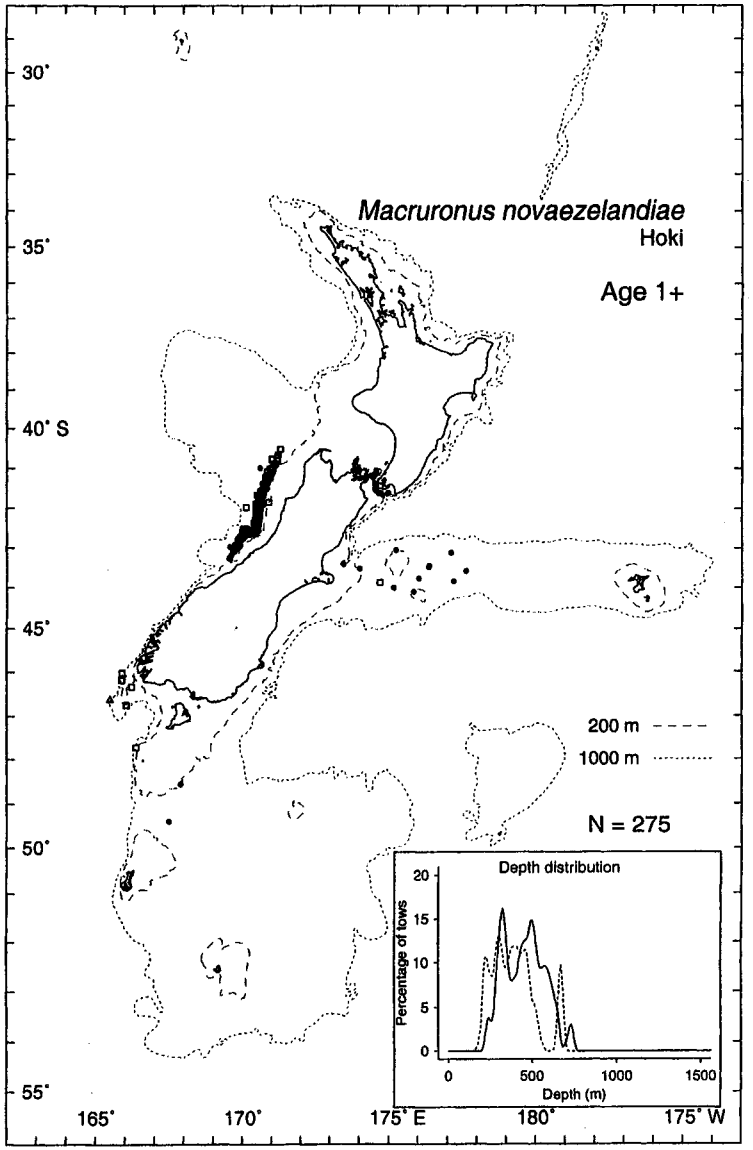


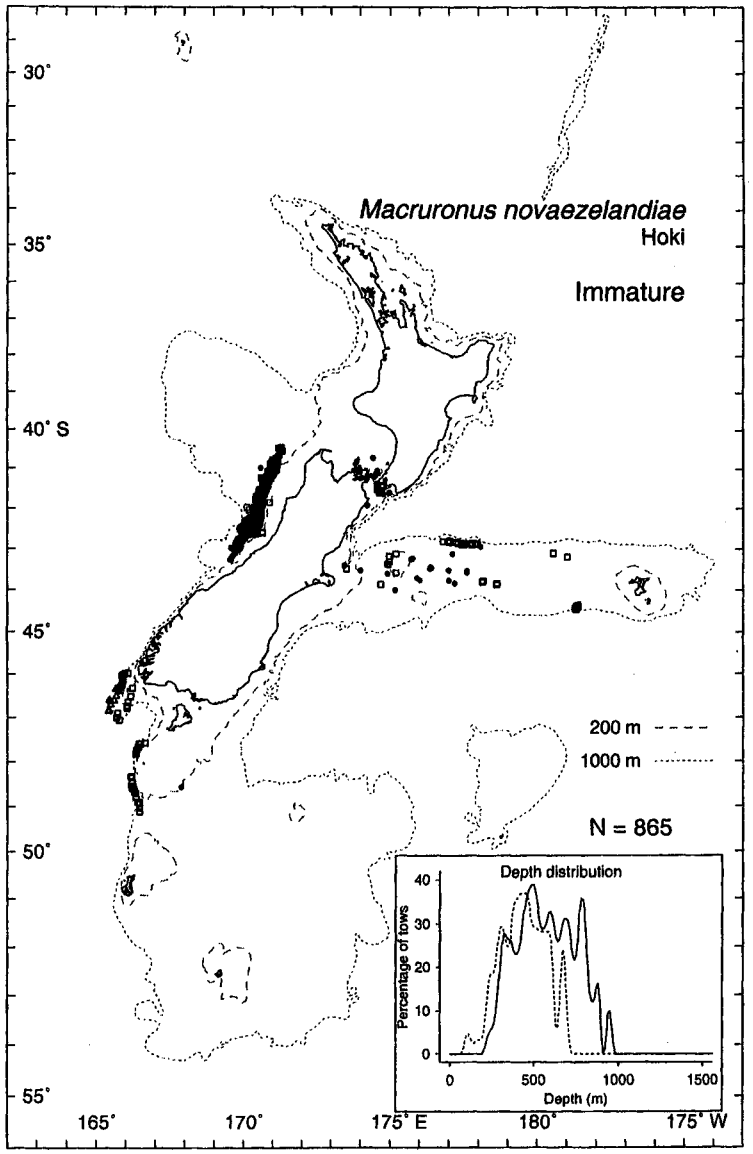
Groups i and ii may approximate ages 0+ and 1+.

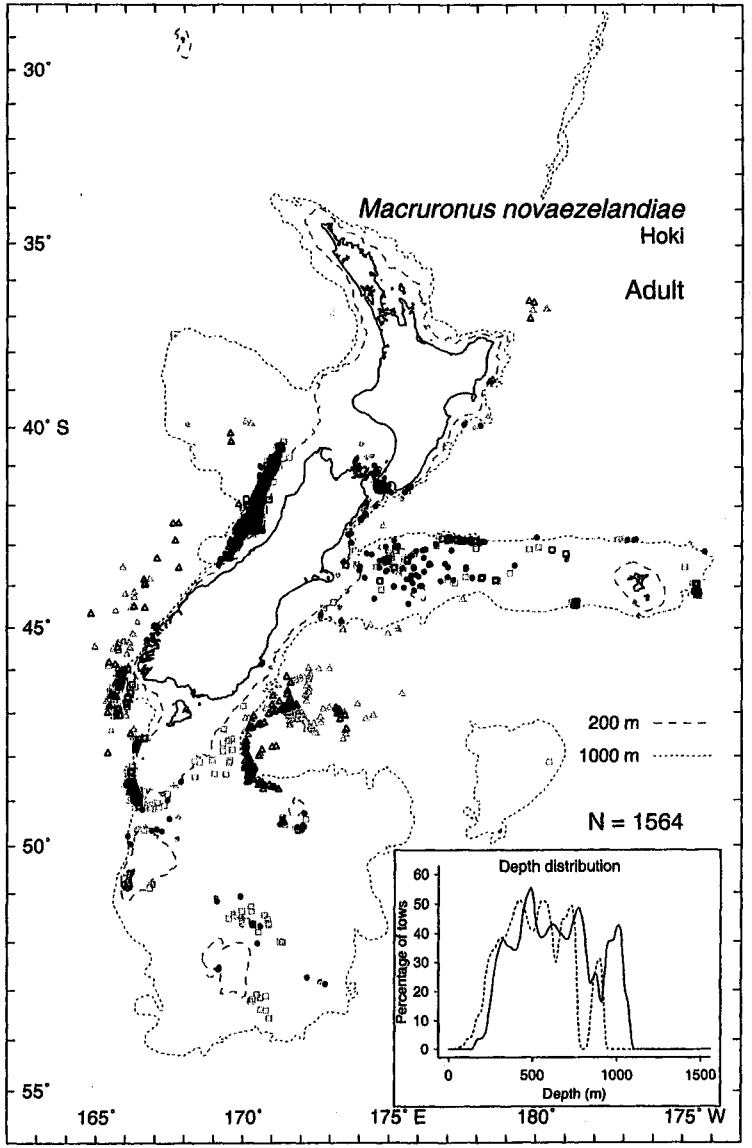

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 2809
Immature
Lamna nasus
Porbeagle shark

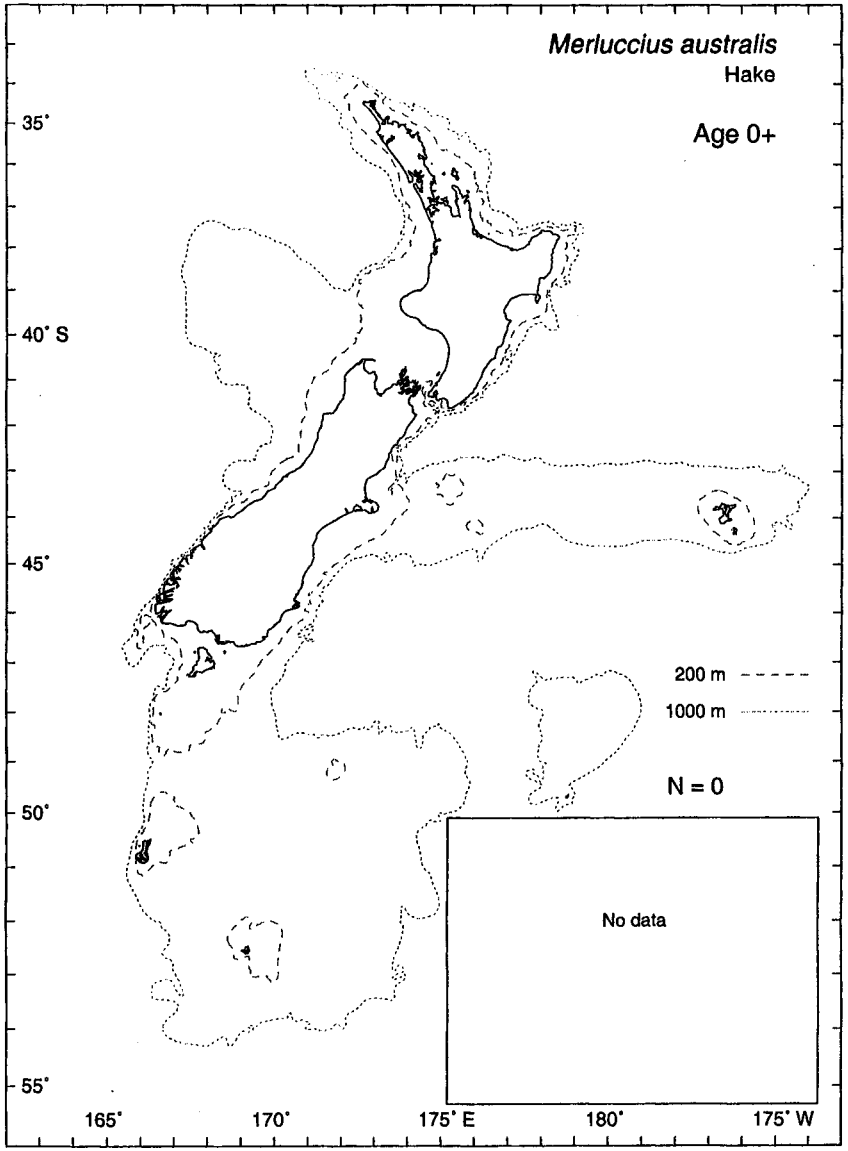

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 187
Adult
Lamna nasus
Porbeagle shark

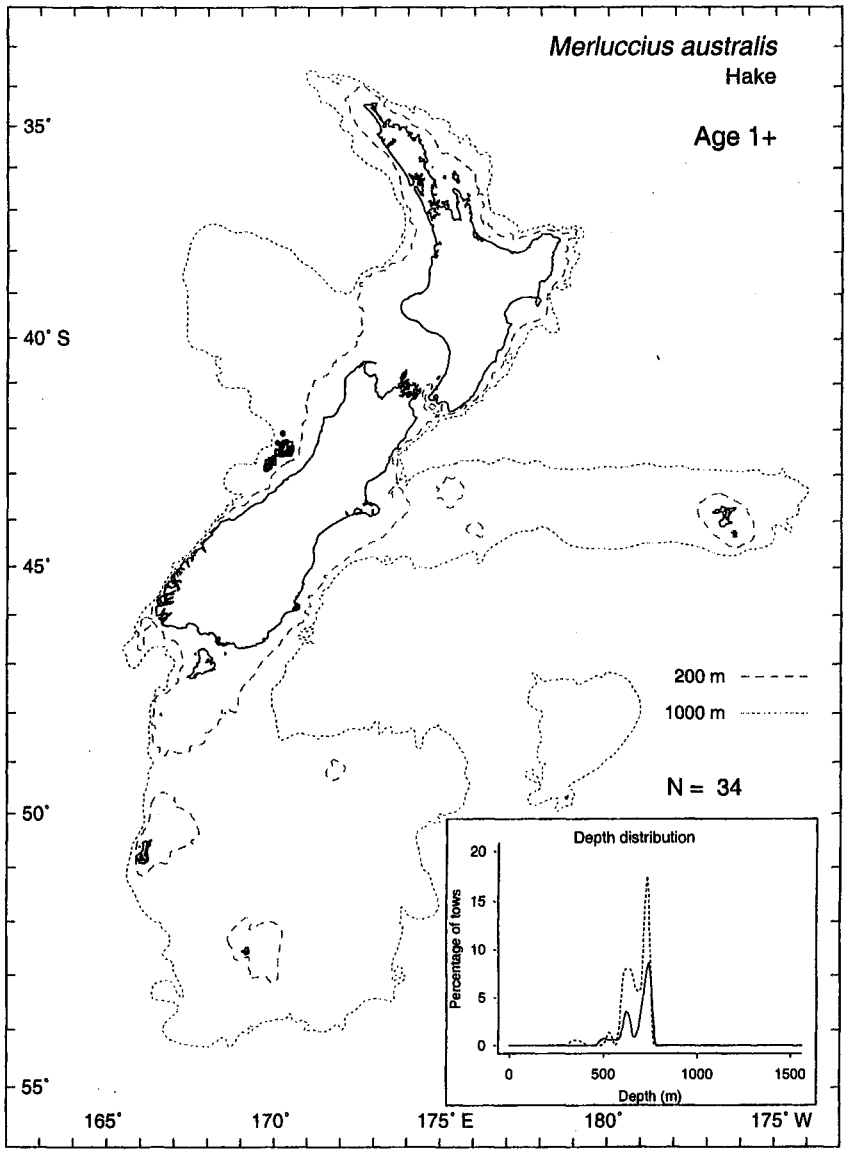

Macruronus novaezelandiae
Hoki
Age 0+
200 m
1000 m
N = 26
Depth distribution
Percentage of tows
Depth (m)
30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W

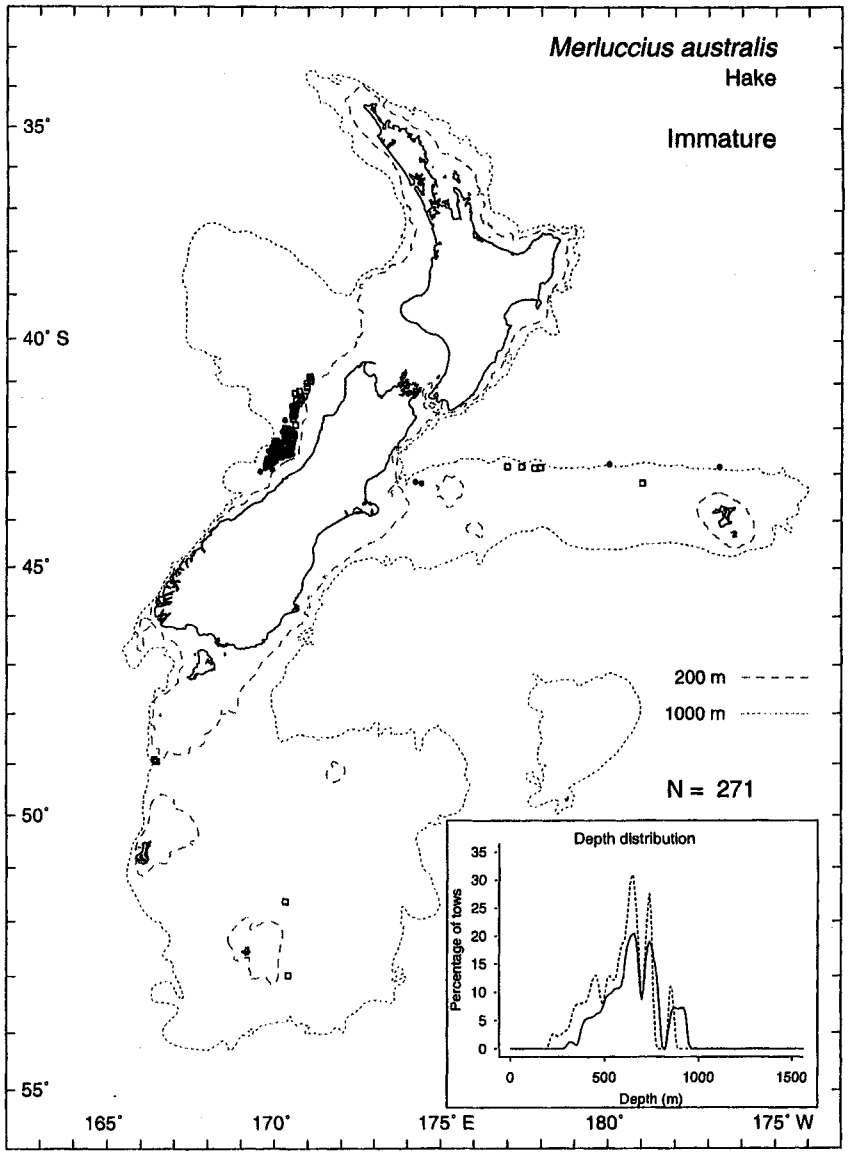

Macruronus novaezelandiae
Hoki
Age 1+
200 m
1000 m
N = 275
Depth distribution
Percentage of tows
Depth (m)
30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W

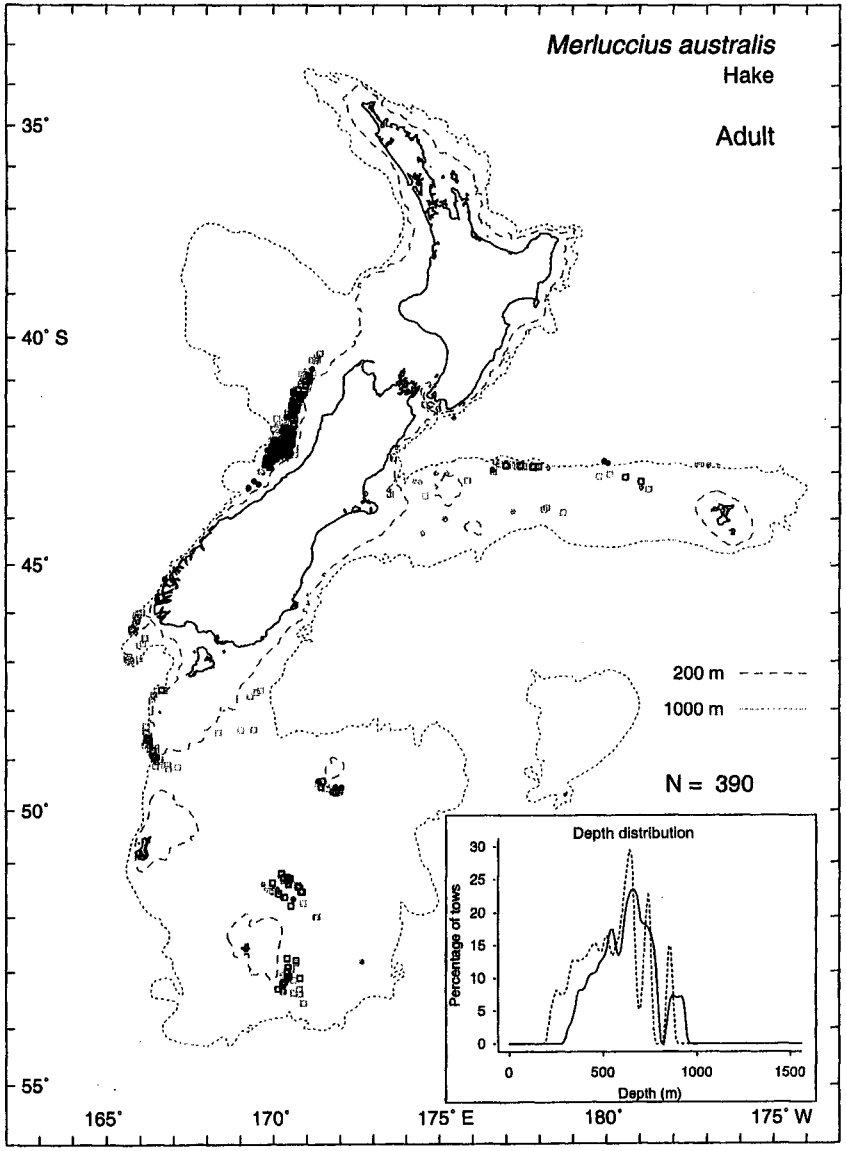

Macruronus novaezelandiae
Hoki
Immature
200 m
1000 m
N = 865
Depth distribution
Percentage of tows
Depth (m)
30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W

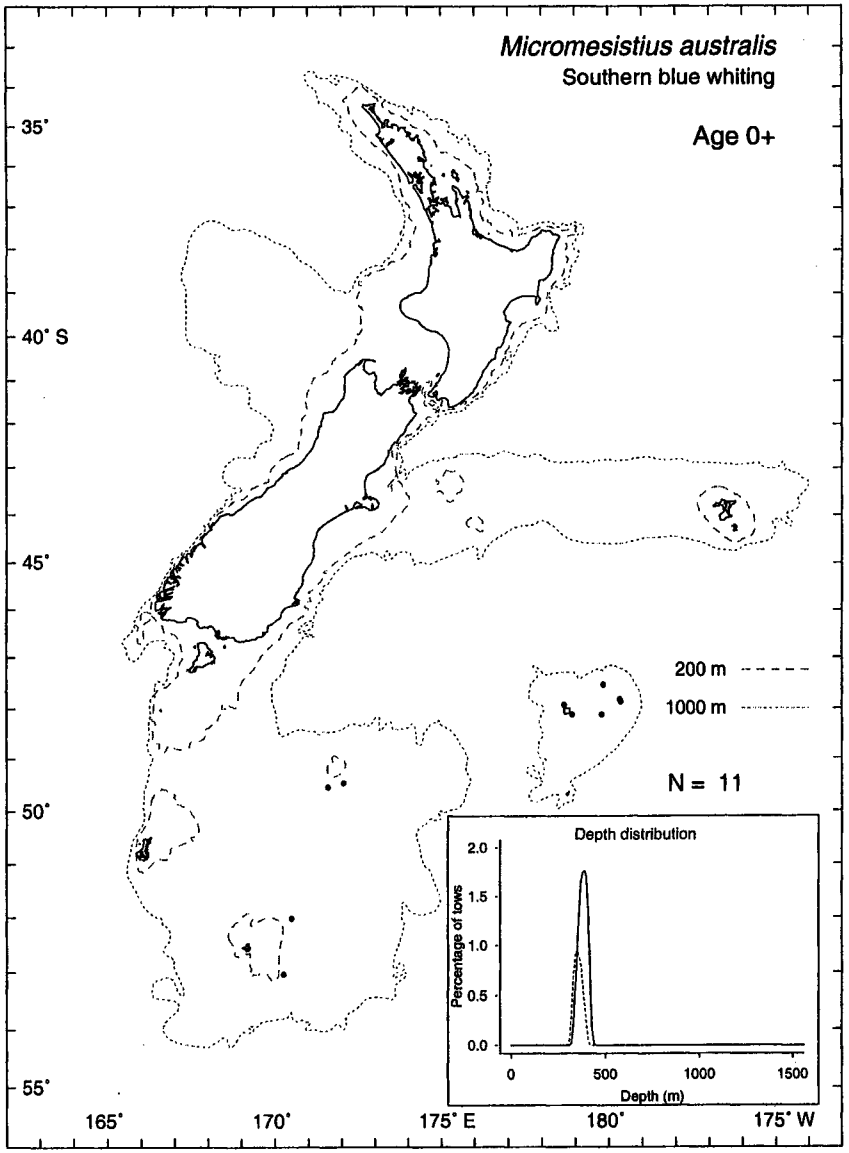

Macruronus novaezelandiae
Hoki
Adult
200 m
1000 m
N = 1564
Depth distribution
Percentage of tows
Depth (m)
30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W

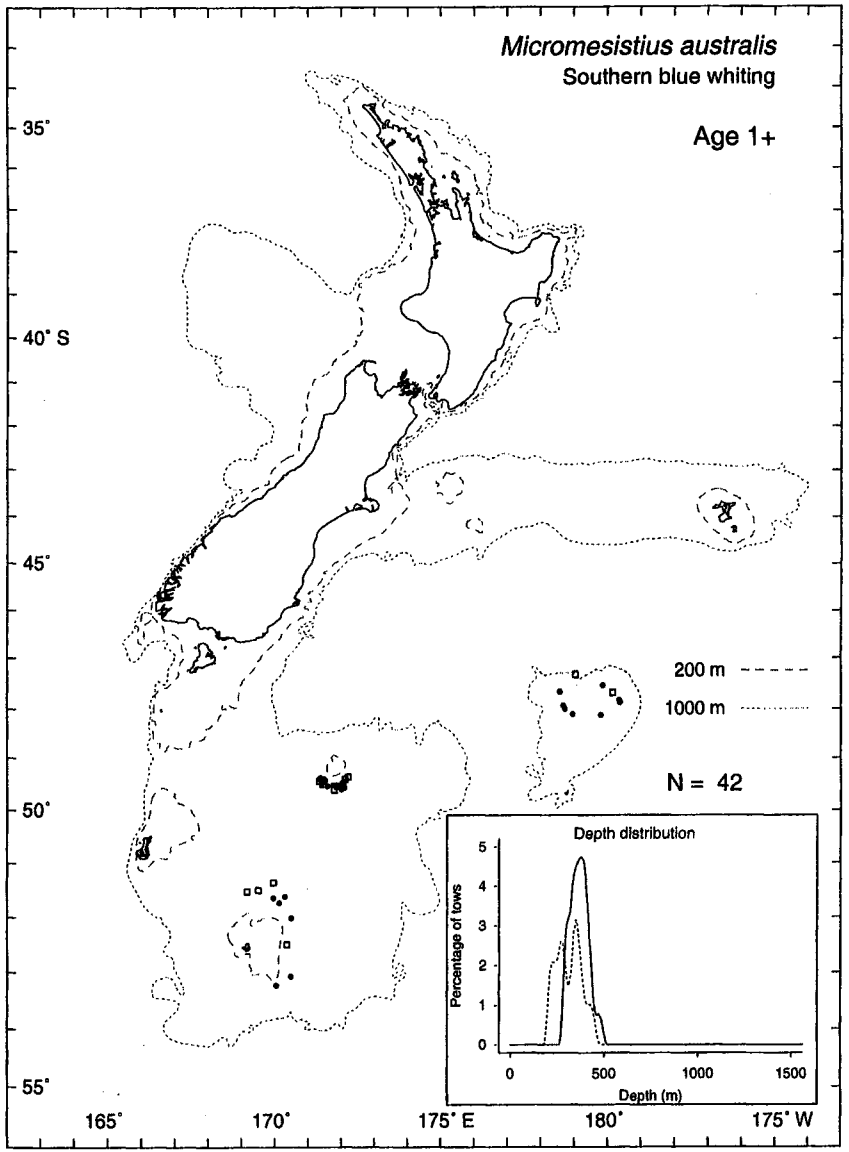

Merluccius australis
Hake
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 0
No data

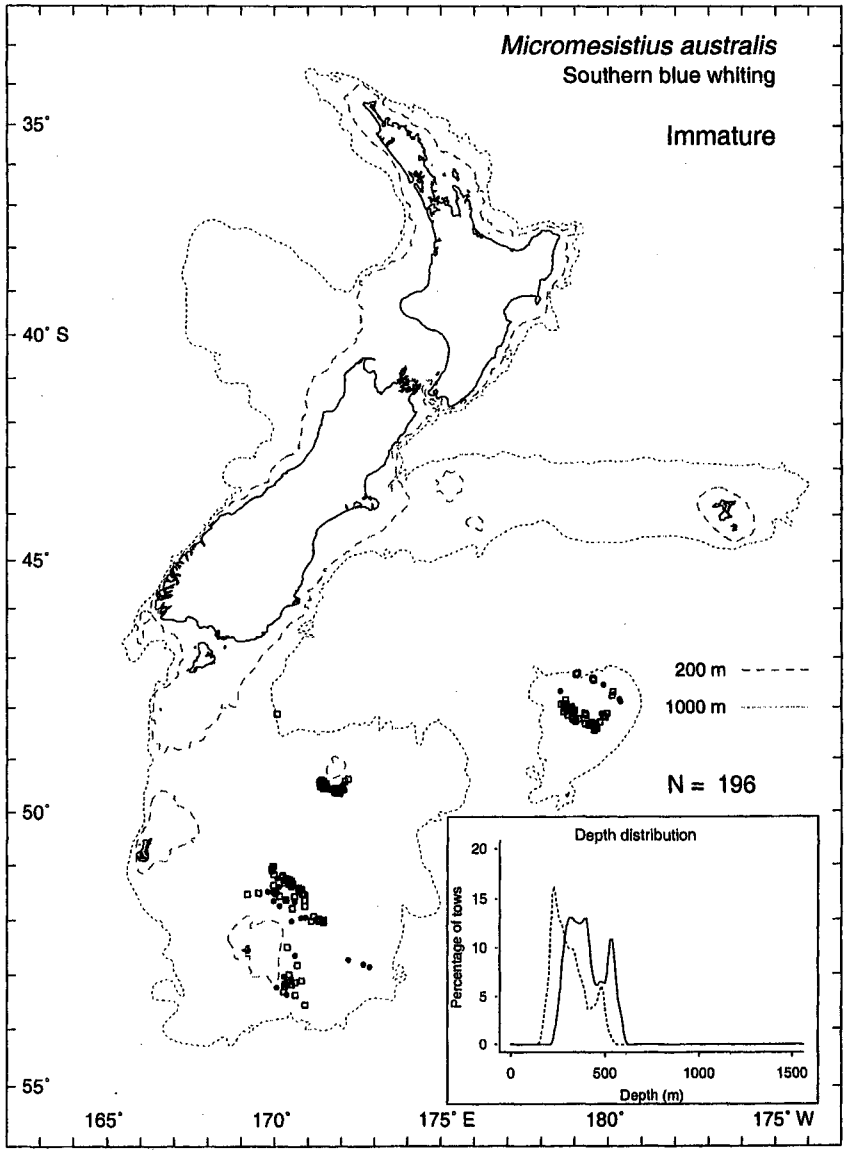

Merluccius australis
Hake
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 34
Depth distribution
Percentage of tows
20
15
10
5
0
0
500
1000
1500
Depth (m)

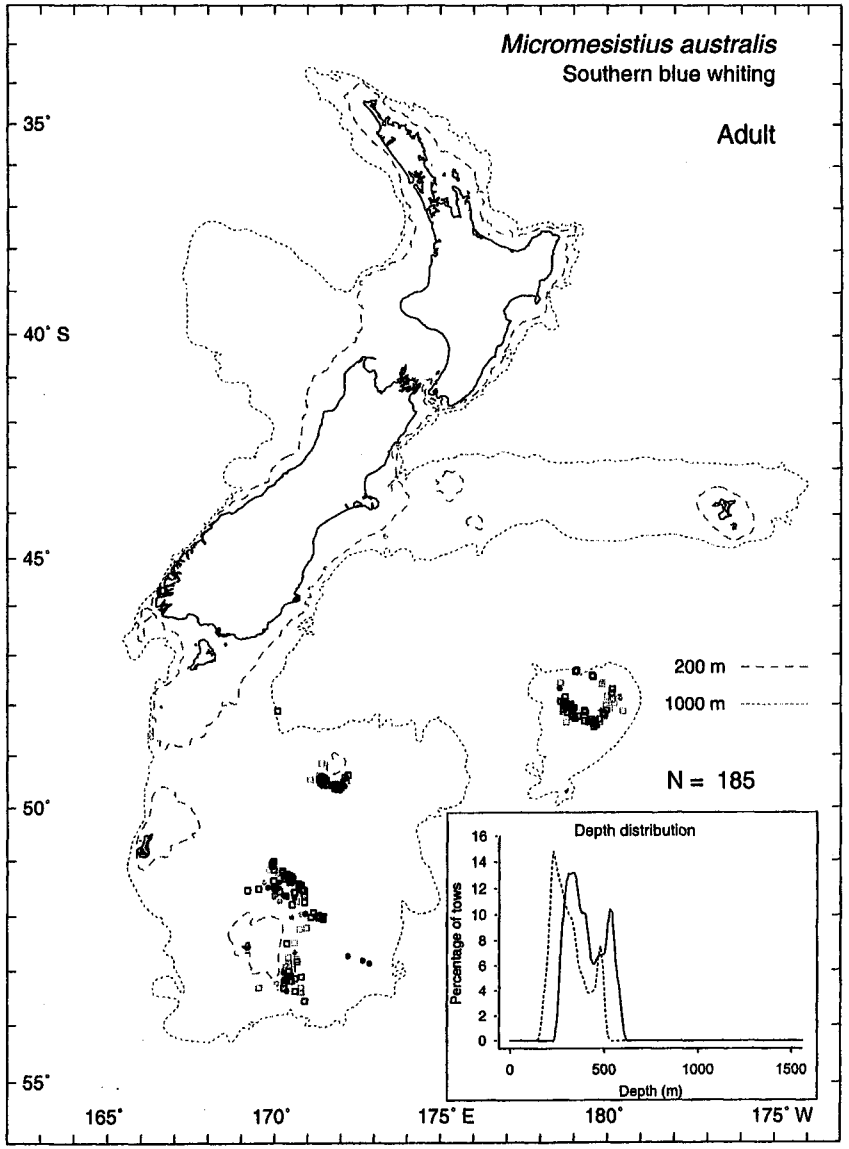

Merluccius australis
Hake
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 271
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
35
0
500
1000
1500

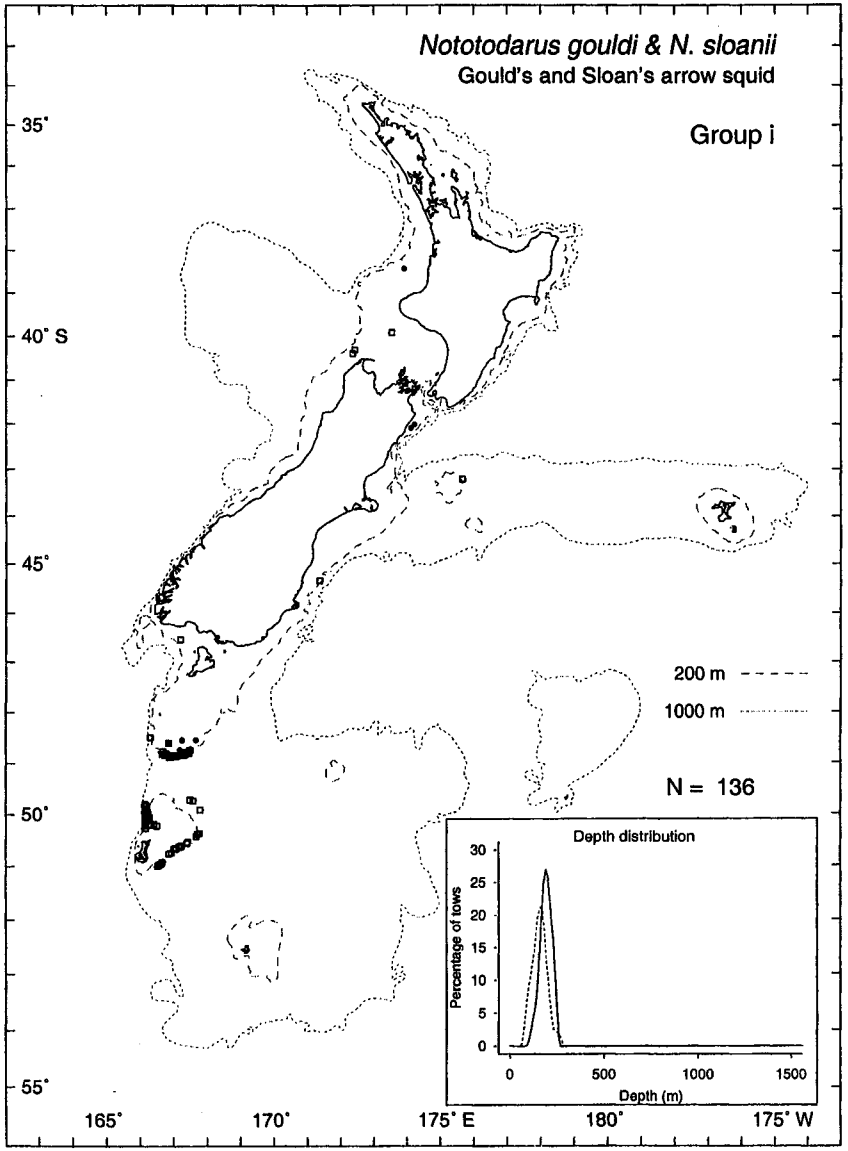

Merluccius australis
Hake
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 390
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
25
30
0
500
1000
1500

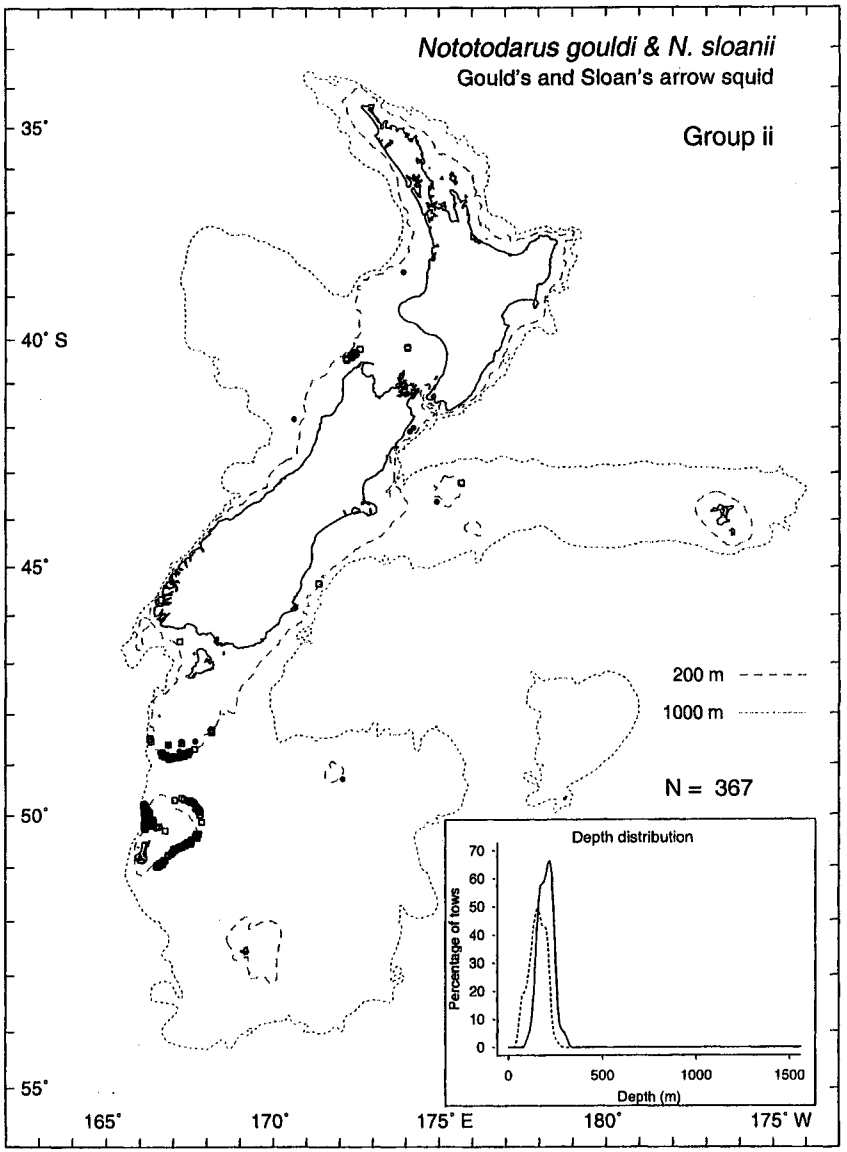

Micromesistius australis
Southern blue whiting
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 11
Depth distribution
Percentage of tows
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Depth (m)


Micromesistius australis
Southern blue whiting
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 42
Depth distribution
Percentage of tows
5
4
3
2
1
0
0
500
1000
1500
Depth (m)

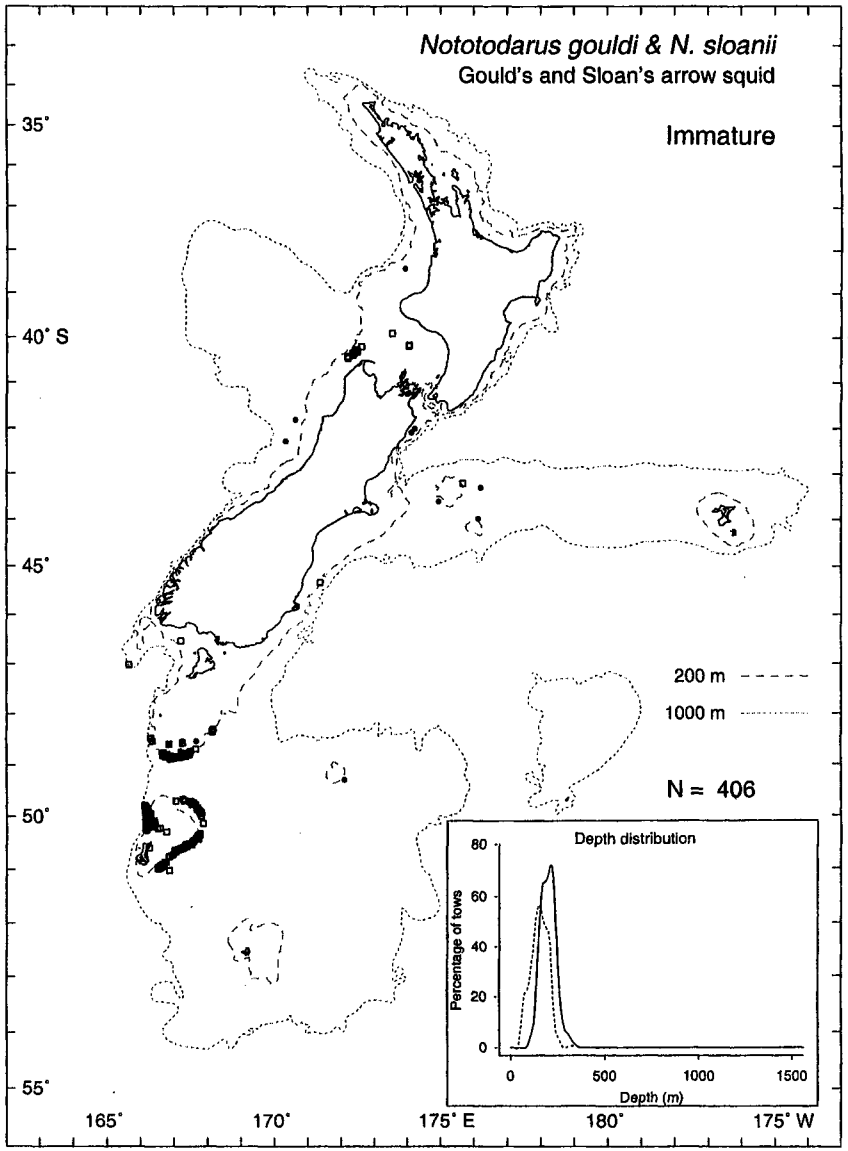

Micromesistius australis
Southern blue whiting
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 196
Depth distribution
Percentage of tows
Depth (m)
0
5
10
15
20
0
500
1000
1500

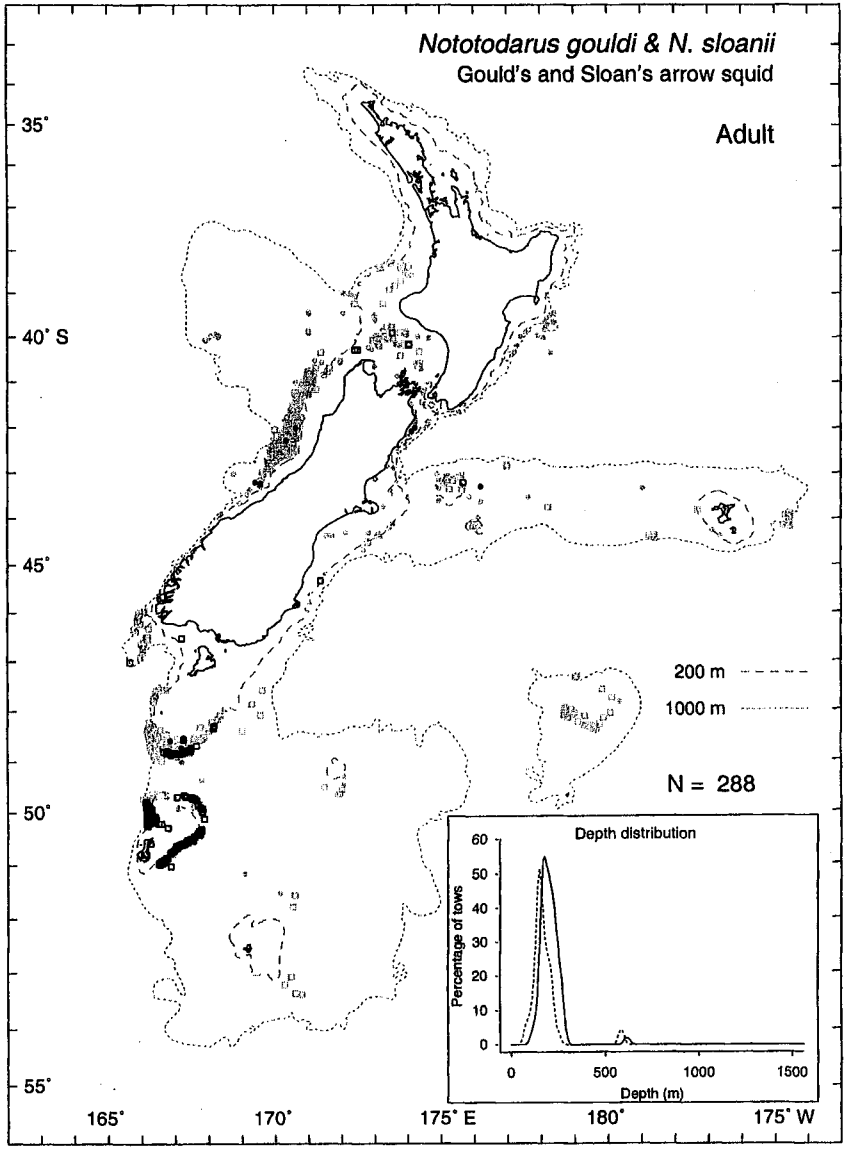

Micromesistius australis
Southern blue whiting
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 185
Depth distribution
Percentage of tows
Depth (m)
0
2
4
6
8
10
12
14
16
0
500
1000
1500

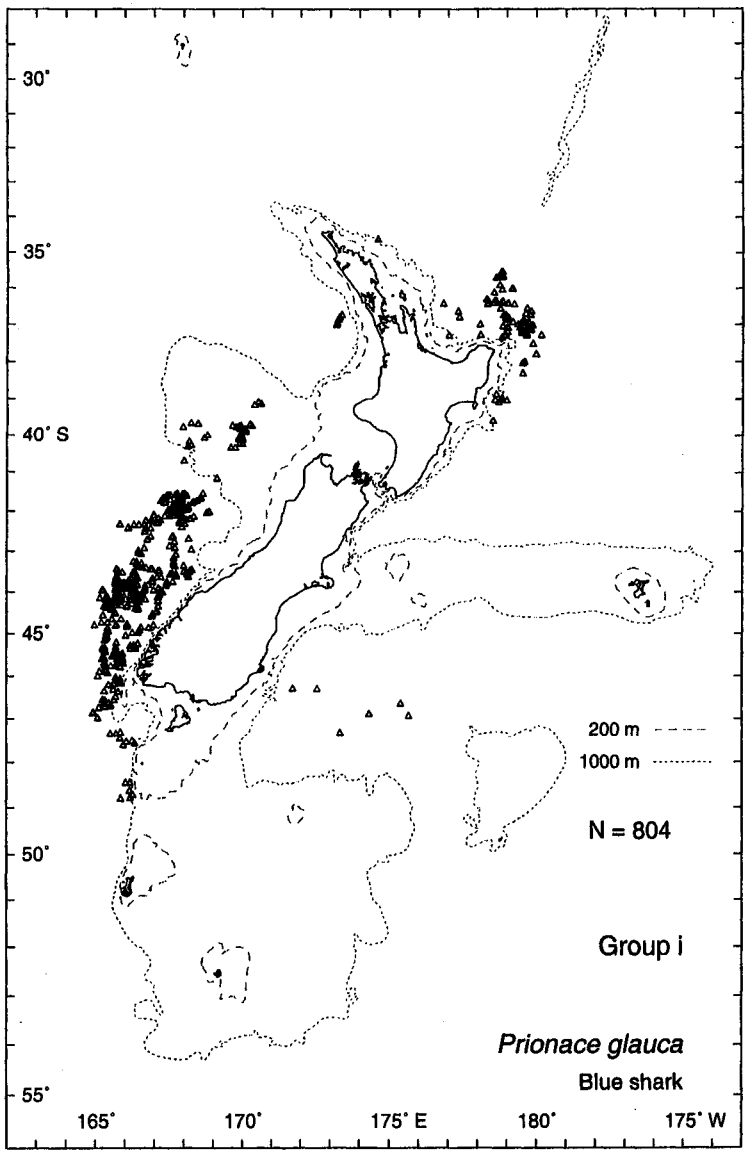


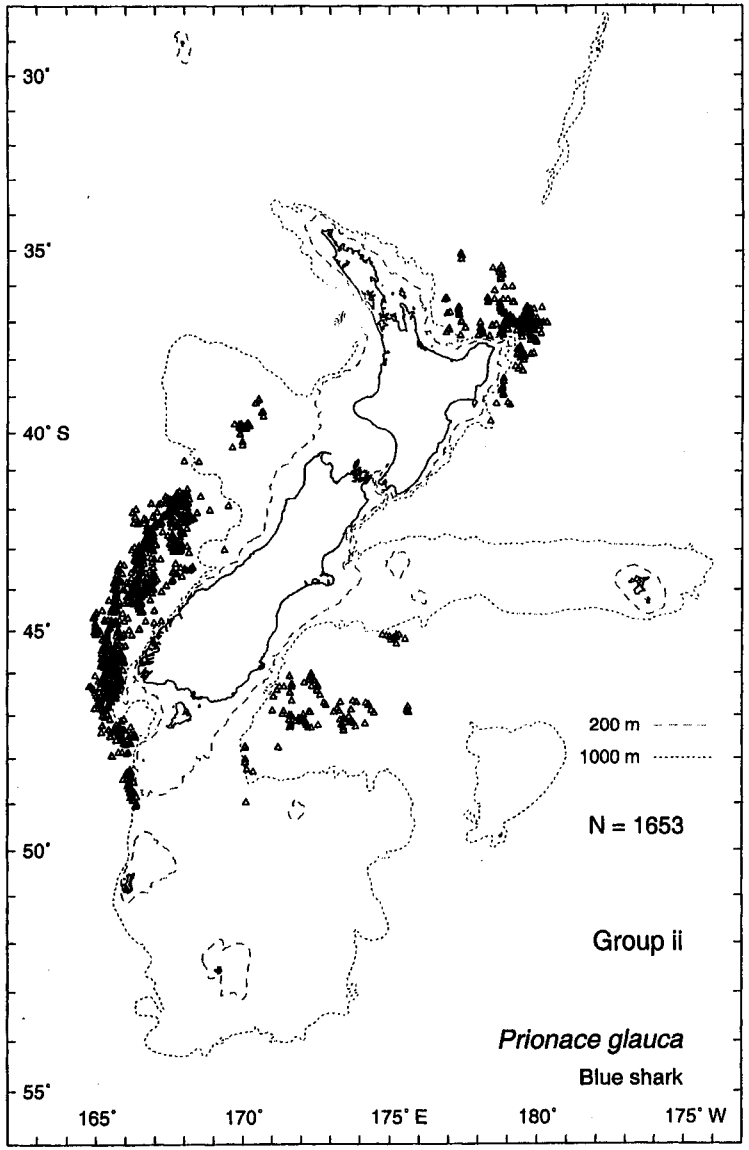


Groups i and ii are arbitrary and were determined from length frequency modes.

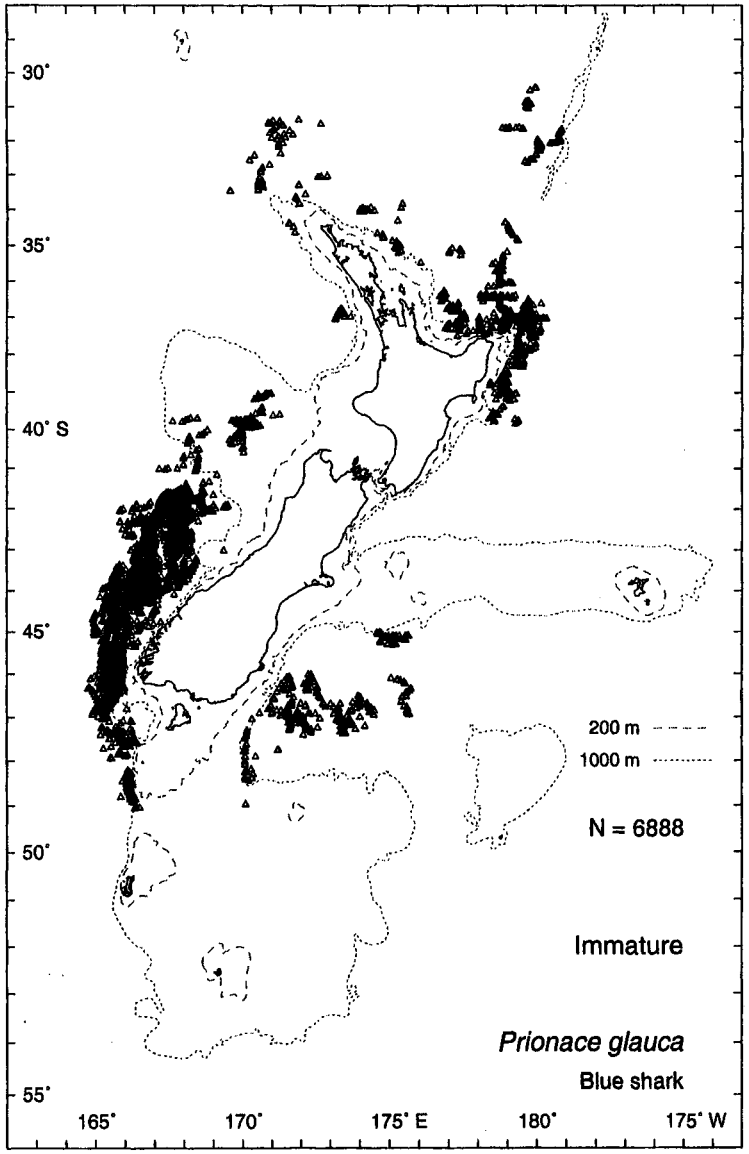

Nototodarus gouldi & N. sloanii
Gould's and Sloan's arrow squid
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 406
Depth distribution
Percentage of tows
Depth (m)
0
20
40
60
80
500
1000
1500

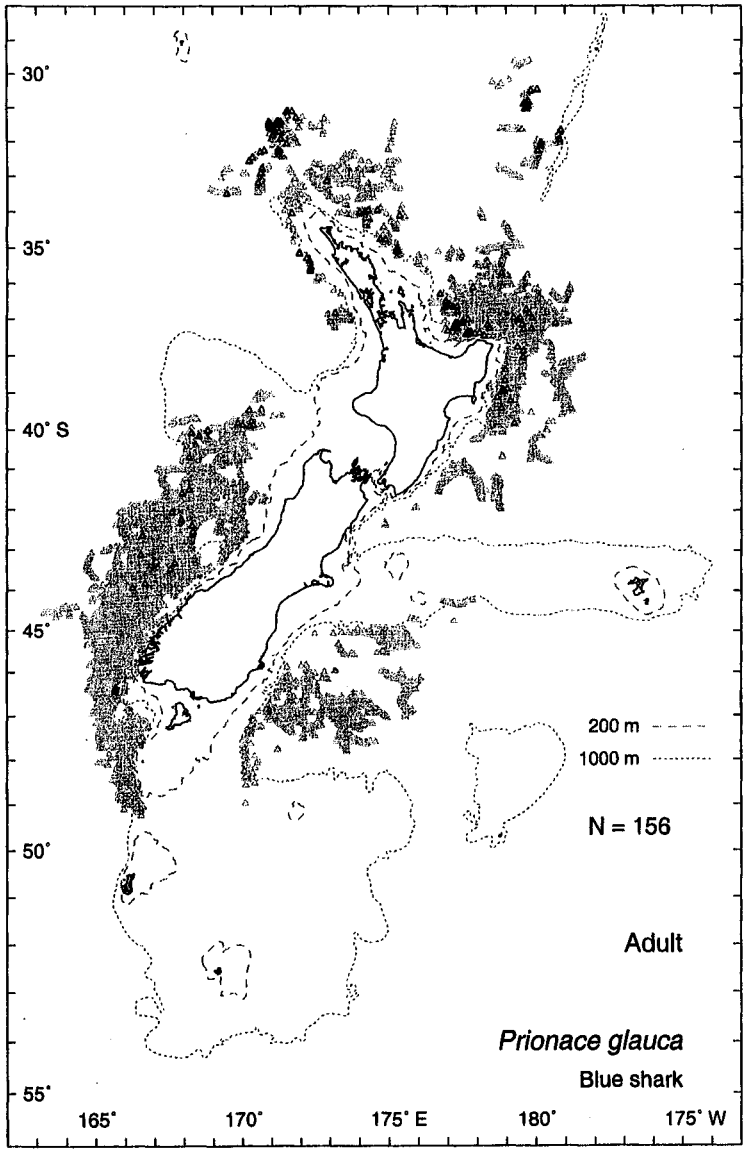

Nototodarus gouldi & N. sloanii
Gould's and Sloan's arrow squid
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 288
Depth distribution
Percentage of tows
Depth (m)
0
10
20
30
40
50
60
500
1000
1500

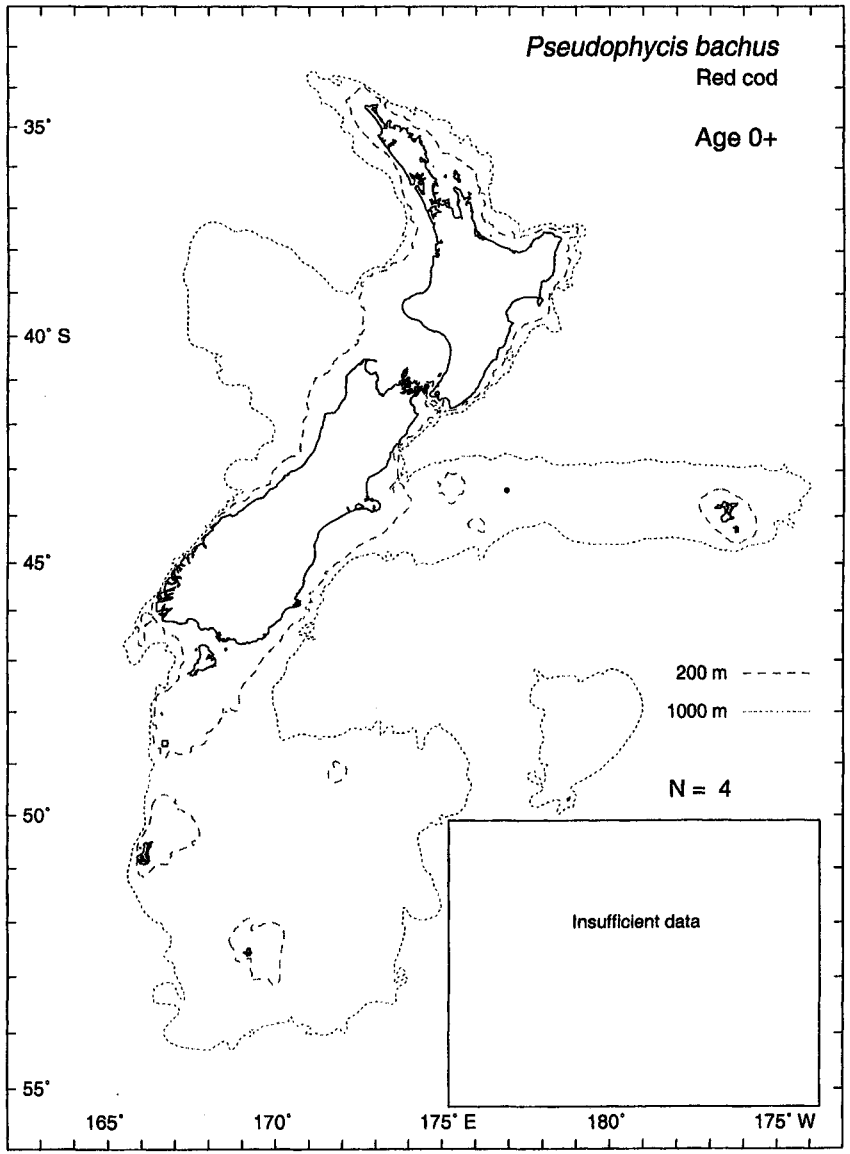


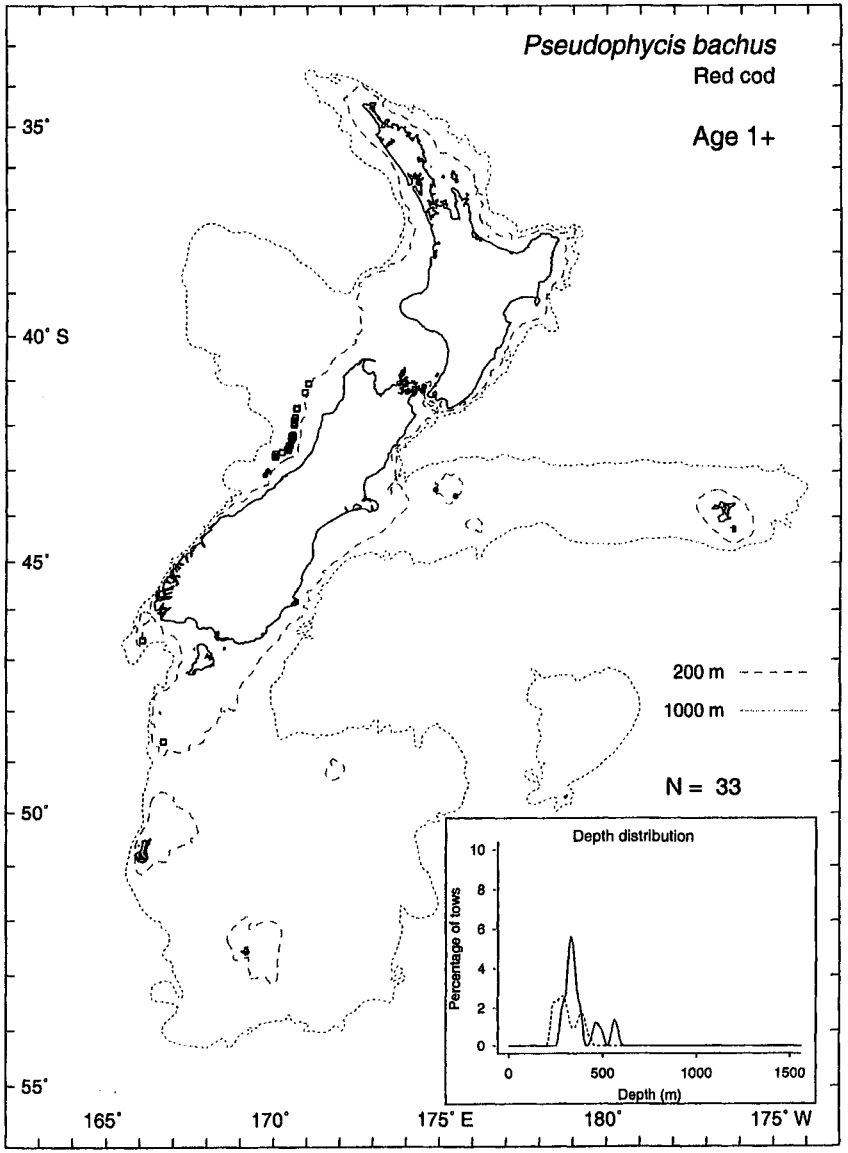


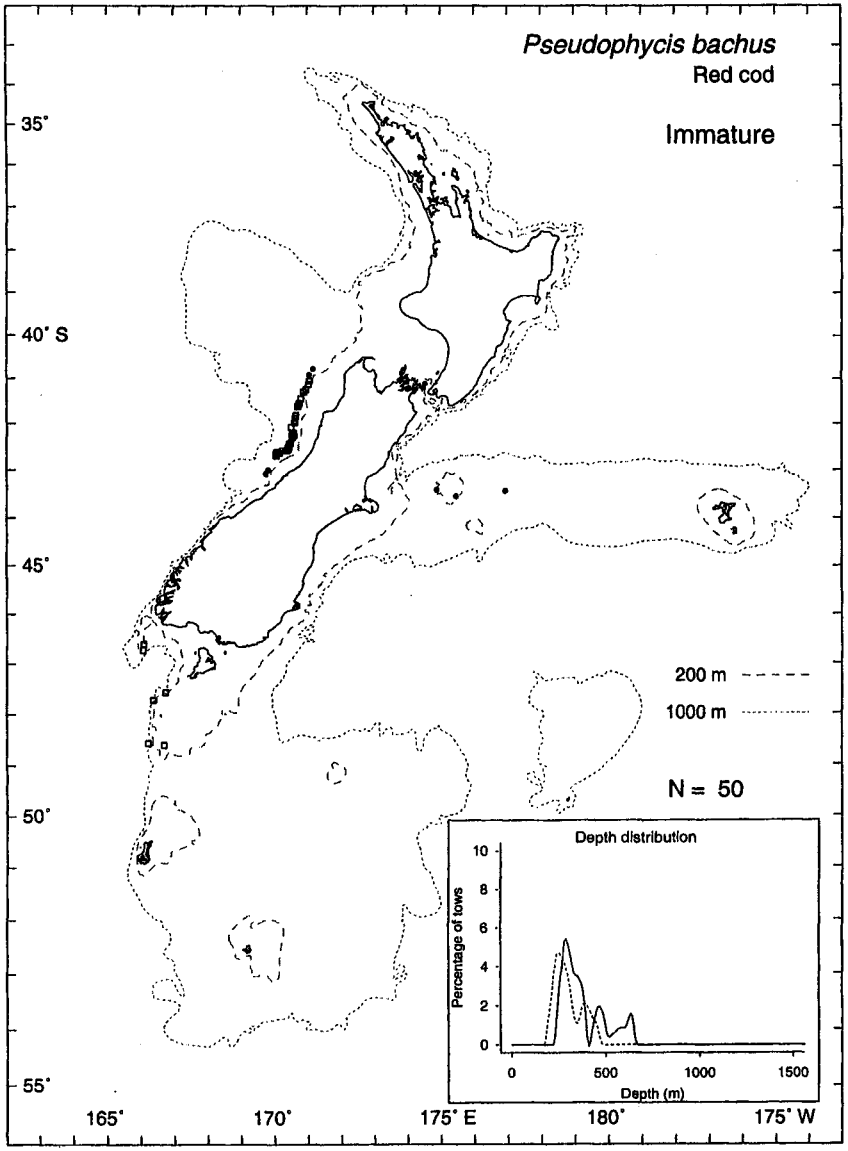
Groups i and ii may approximate ages 0+ and 1+.

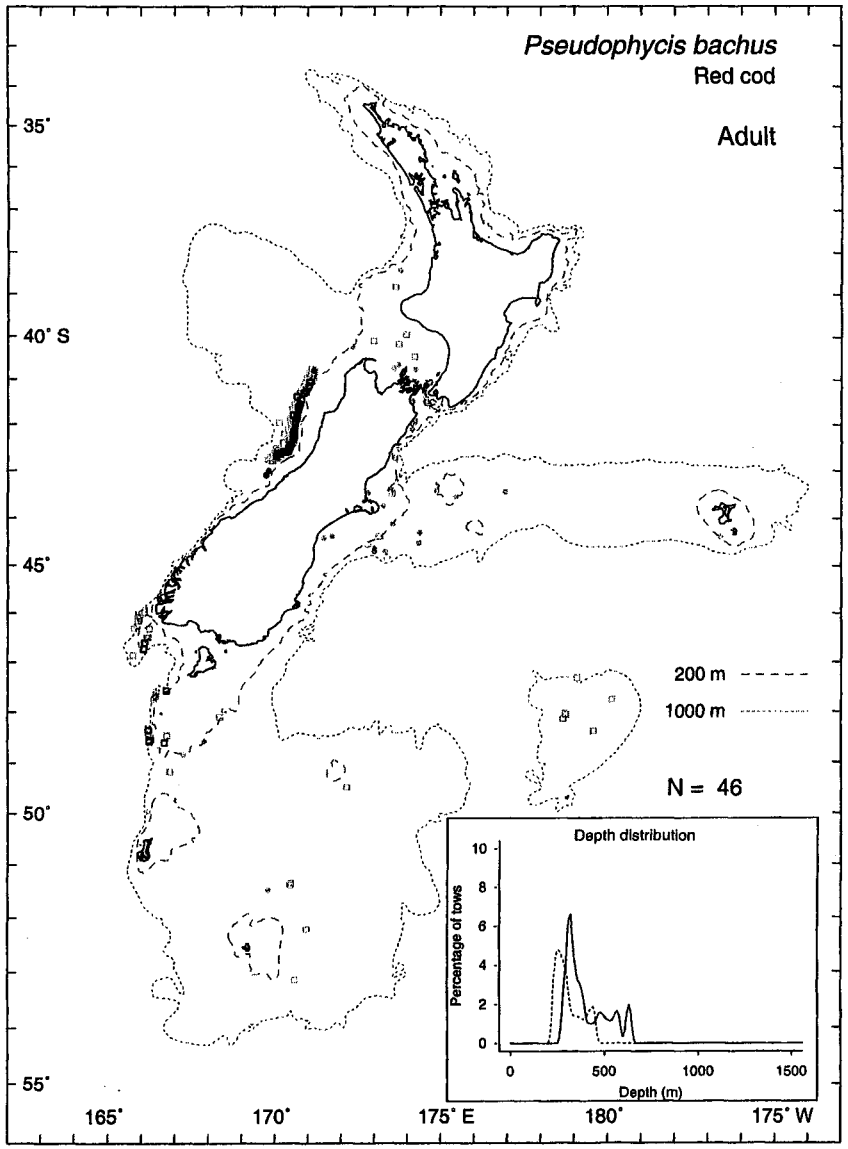

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 6888
Immature
Prionace glauca
Blue shark

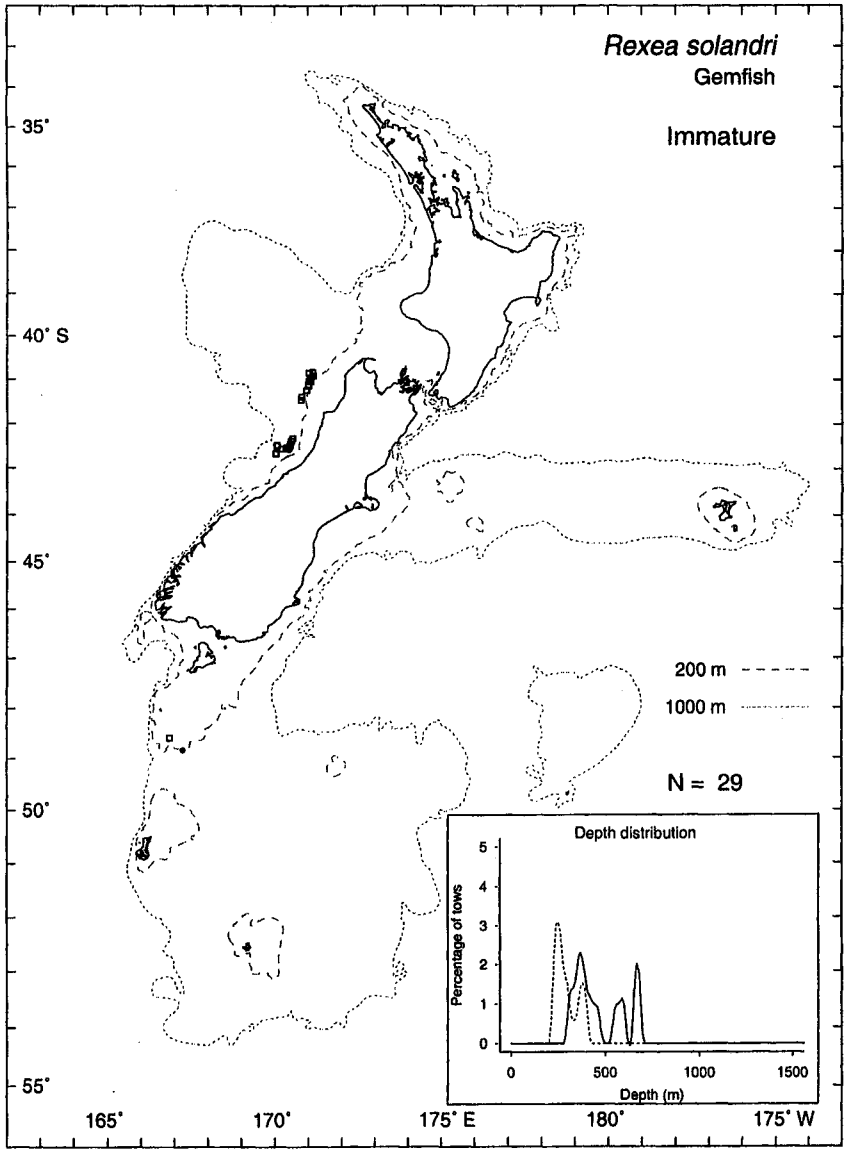

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 156
Adult
Prionace glauca
Blue shark

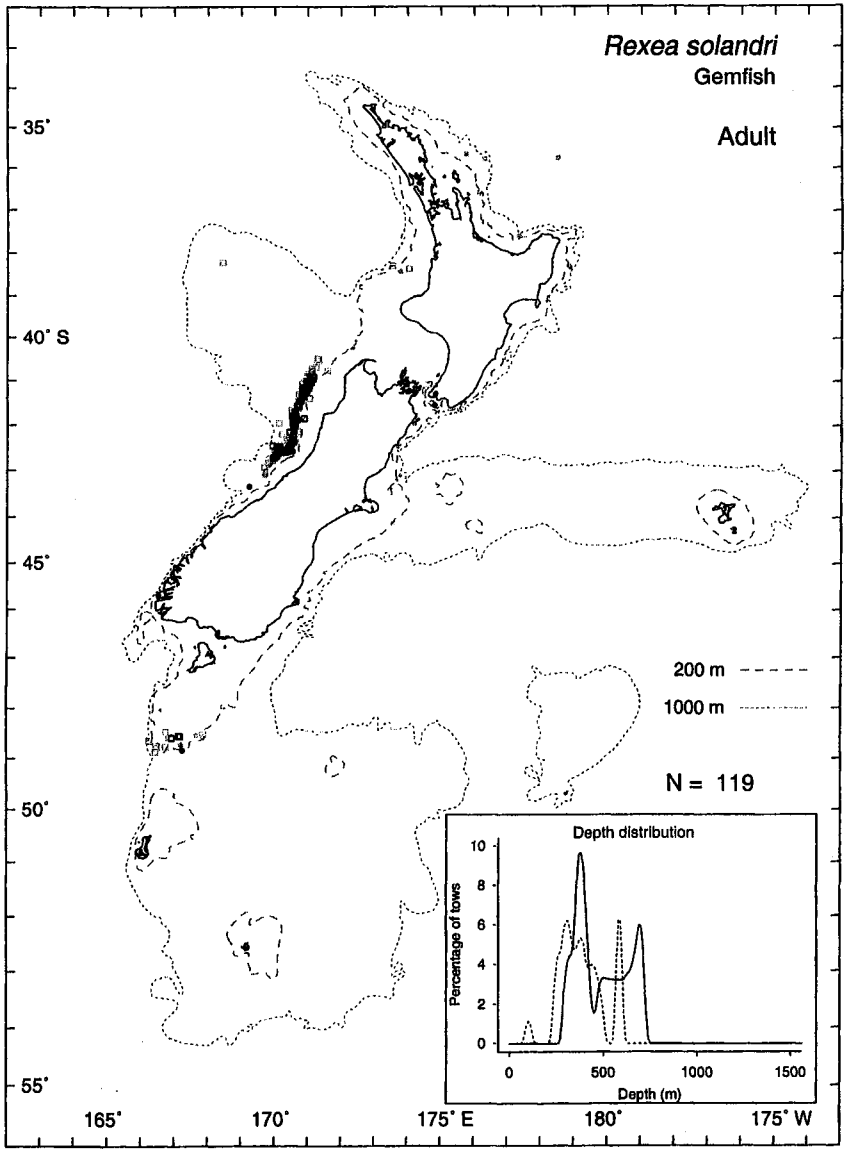

Pseudophycis bachus
Red cod
Age 0+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 4
Insufficient data


Pseudophycis bachus
Red cod
Age 1+
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 33
Depth distribution
Percentage of tows
10
8
6
4
2
0
0
500
1000
1500
Depth (m)

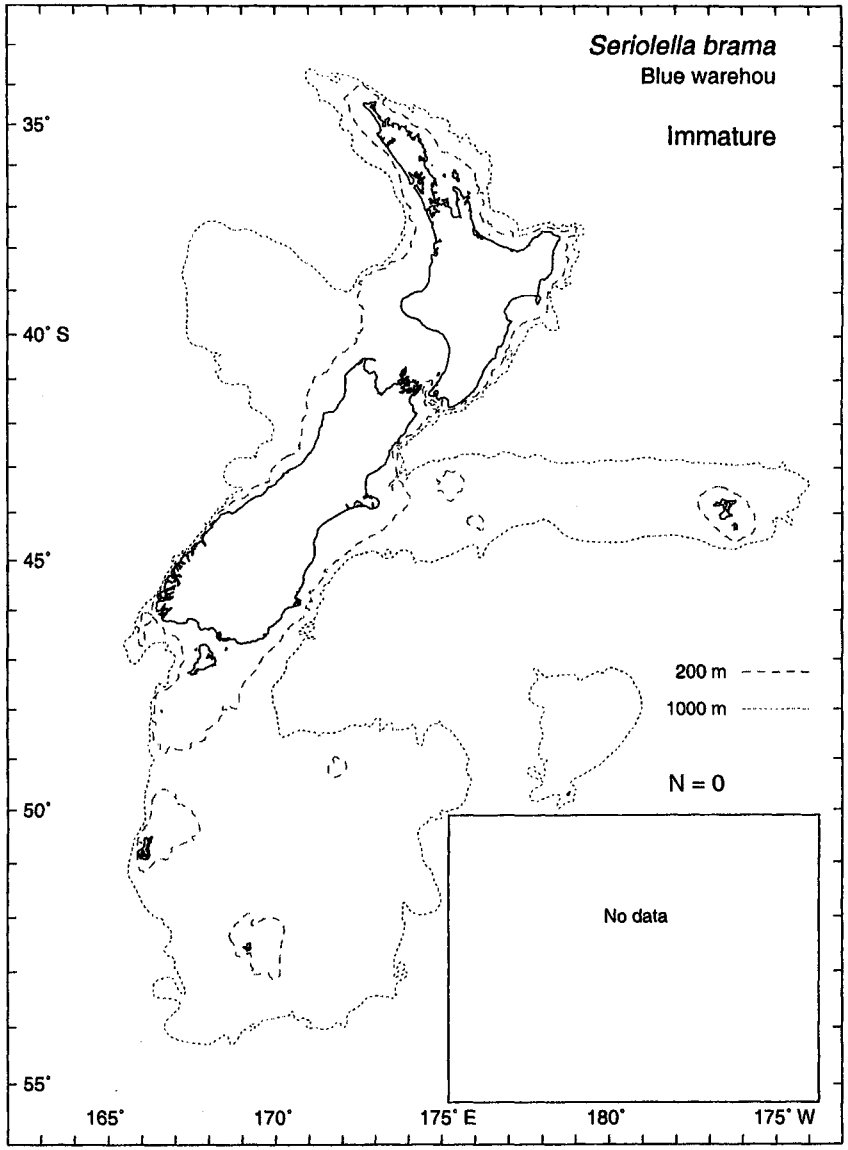

Pseudophycis bachus
Red cod
Immature
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 50
Depth distribution
Percentage of tows
0
2
4
6
8
10
0
500
1000
1500
Depth (m)

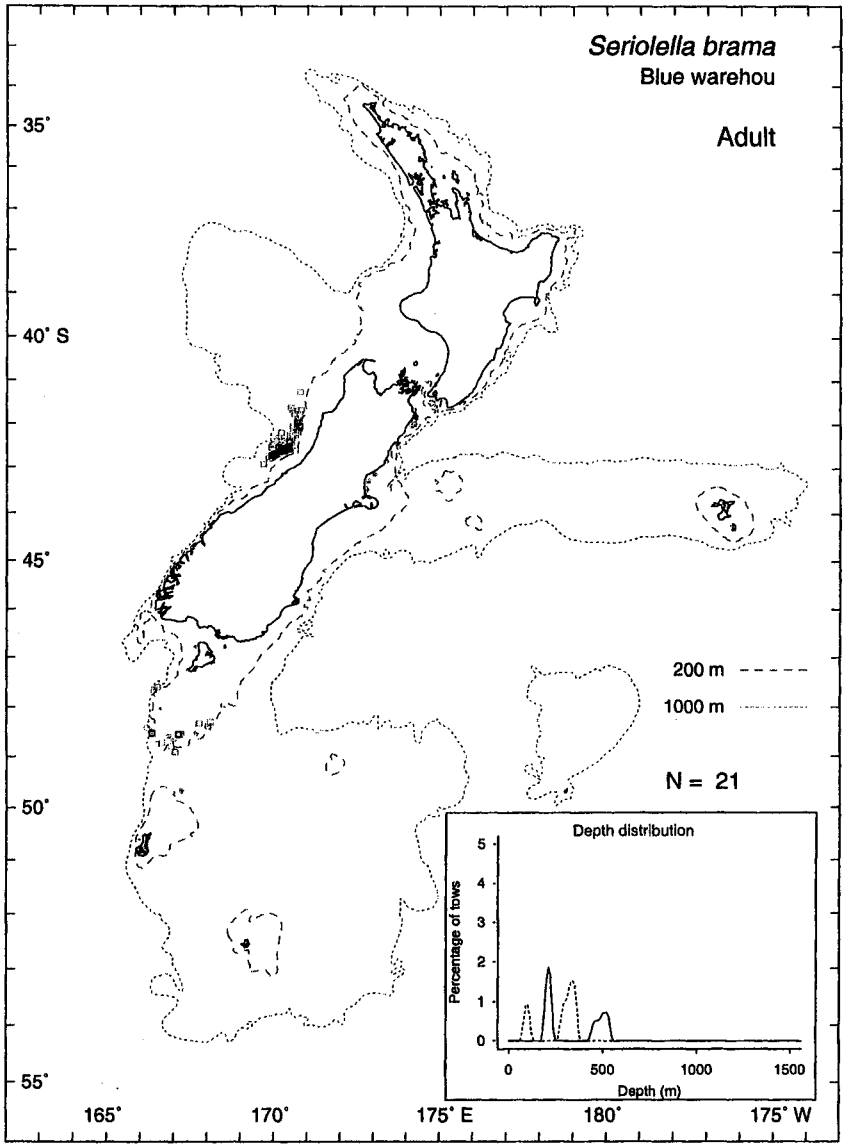

Pseudophycis bachus
Red cod
Adult
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 46
Depth distribution
Percentage of tows
0
2
4
6
8
10
0
500
1000
1500
Depth (m)



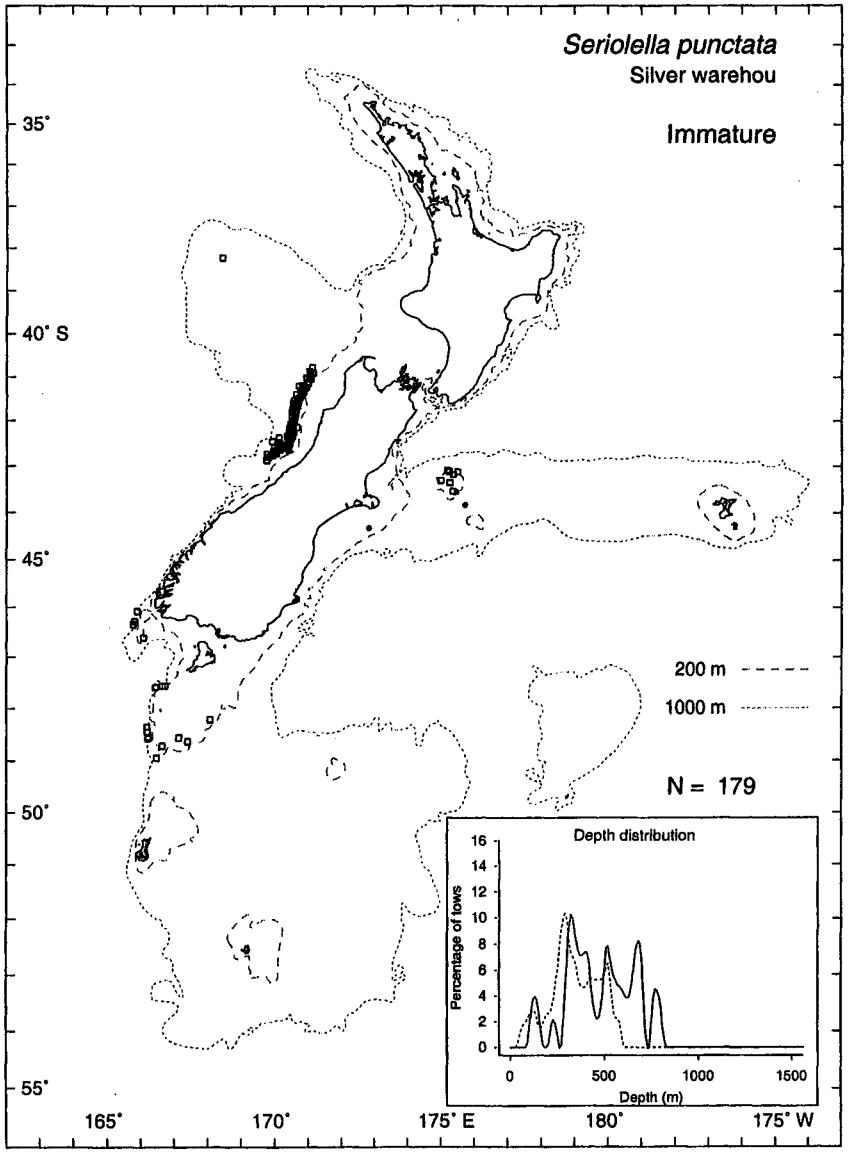


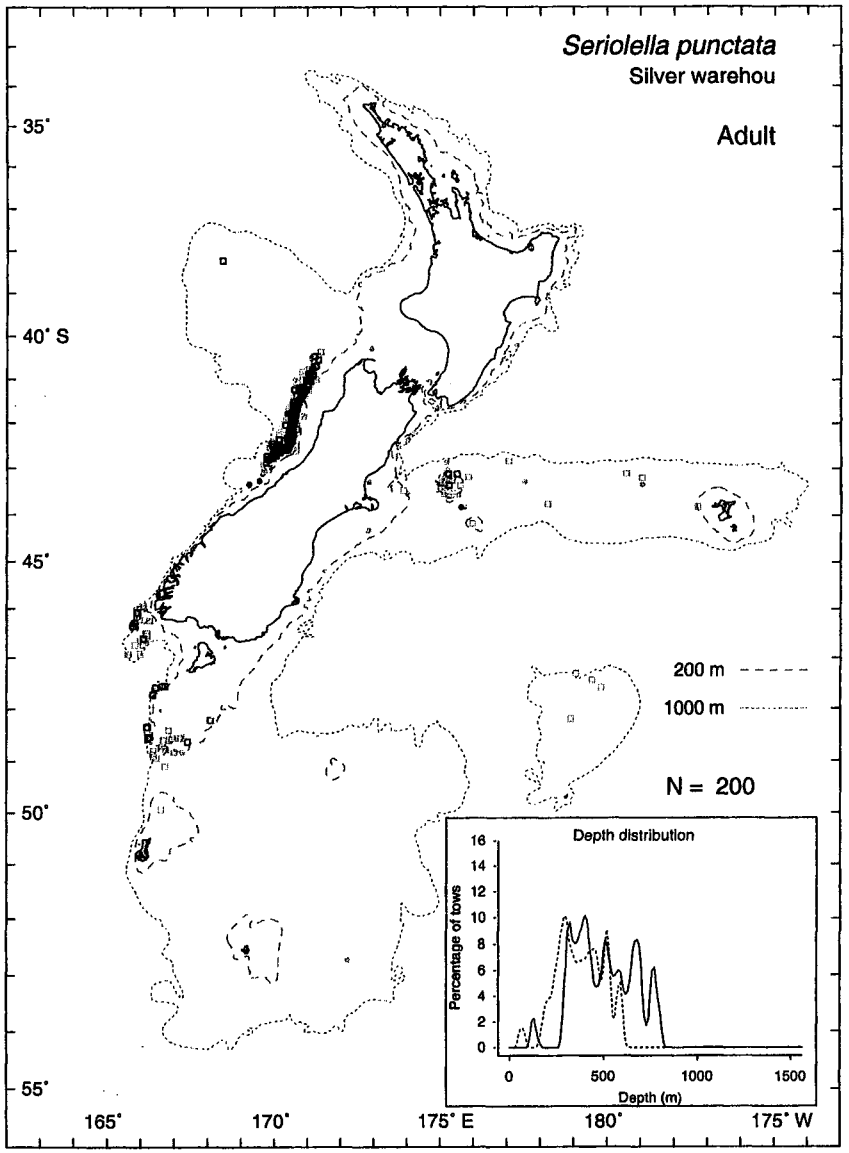
Juvenile plots are not presented for this species.



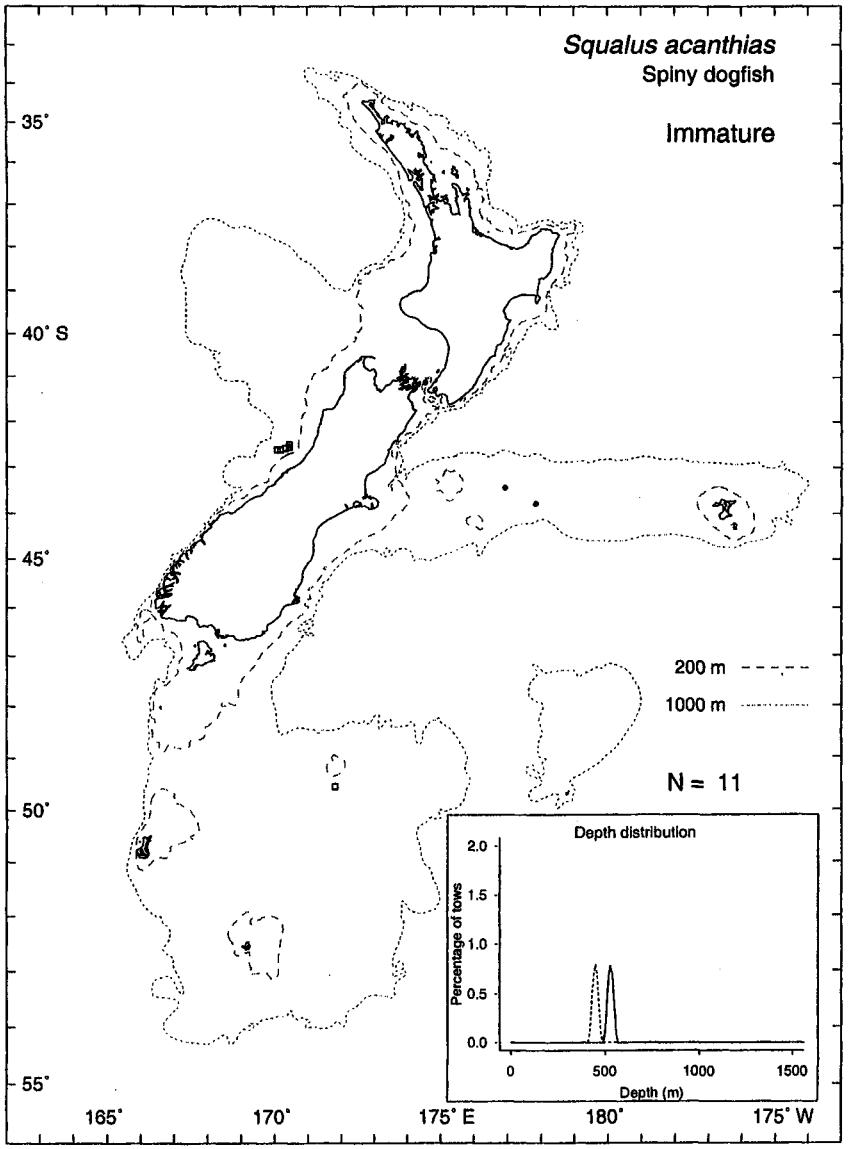


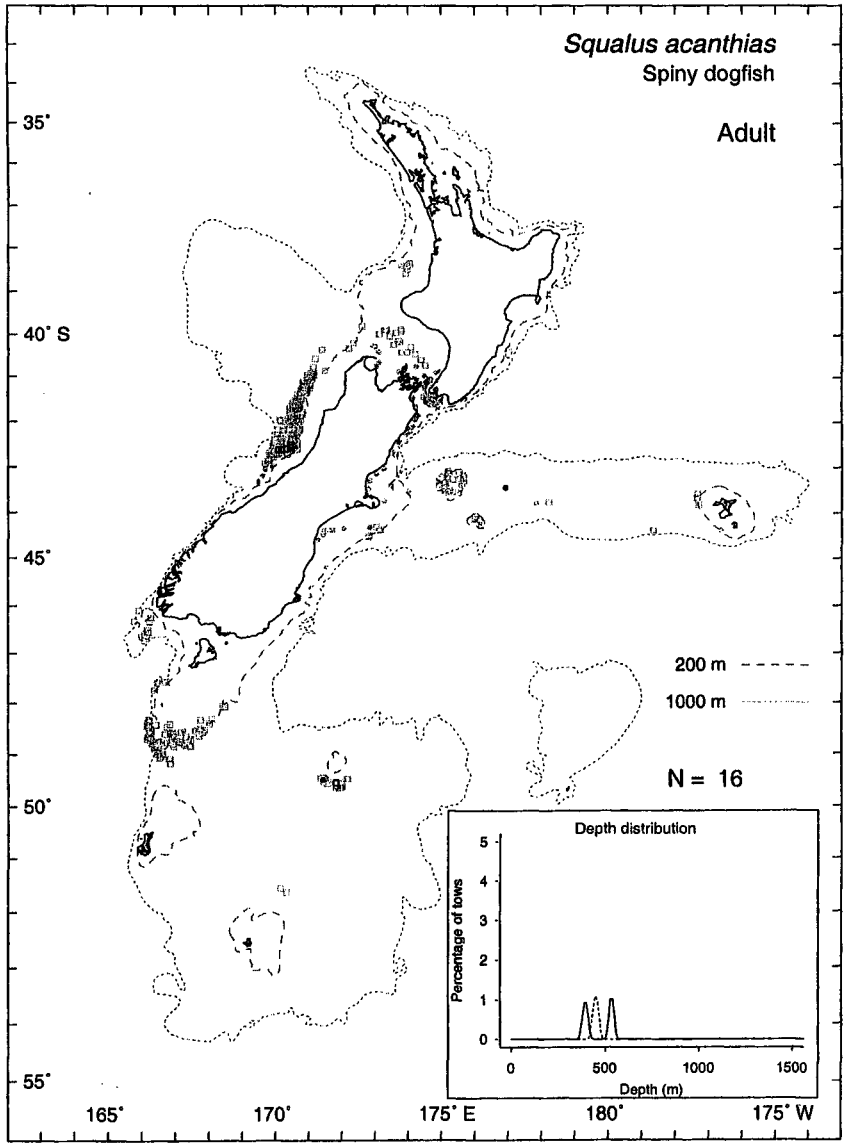
Juvenile plots are not presented for this species.



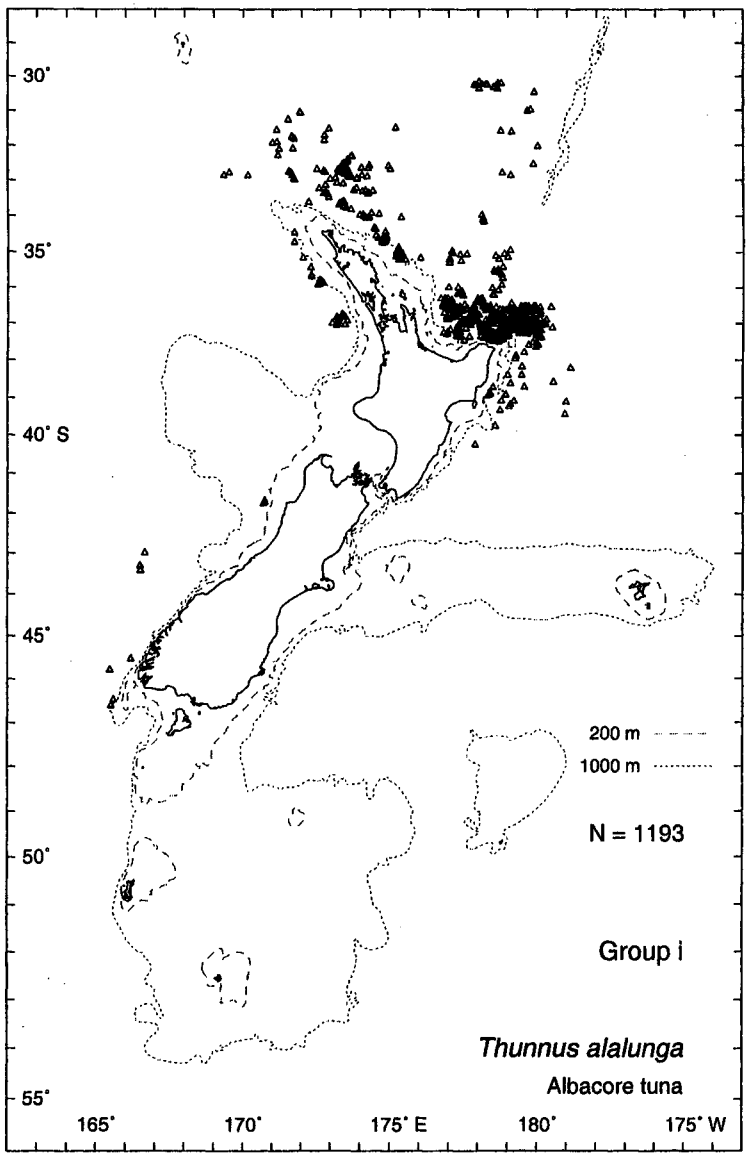


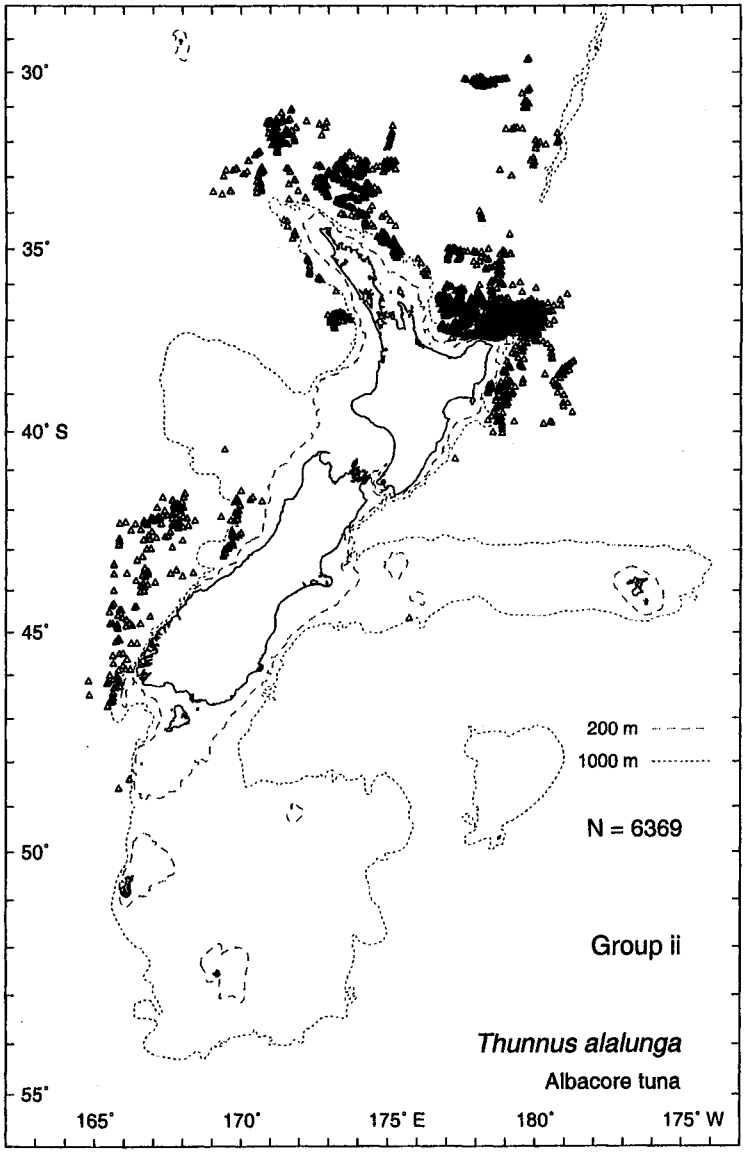
Juvenile plots are not presented for this species.



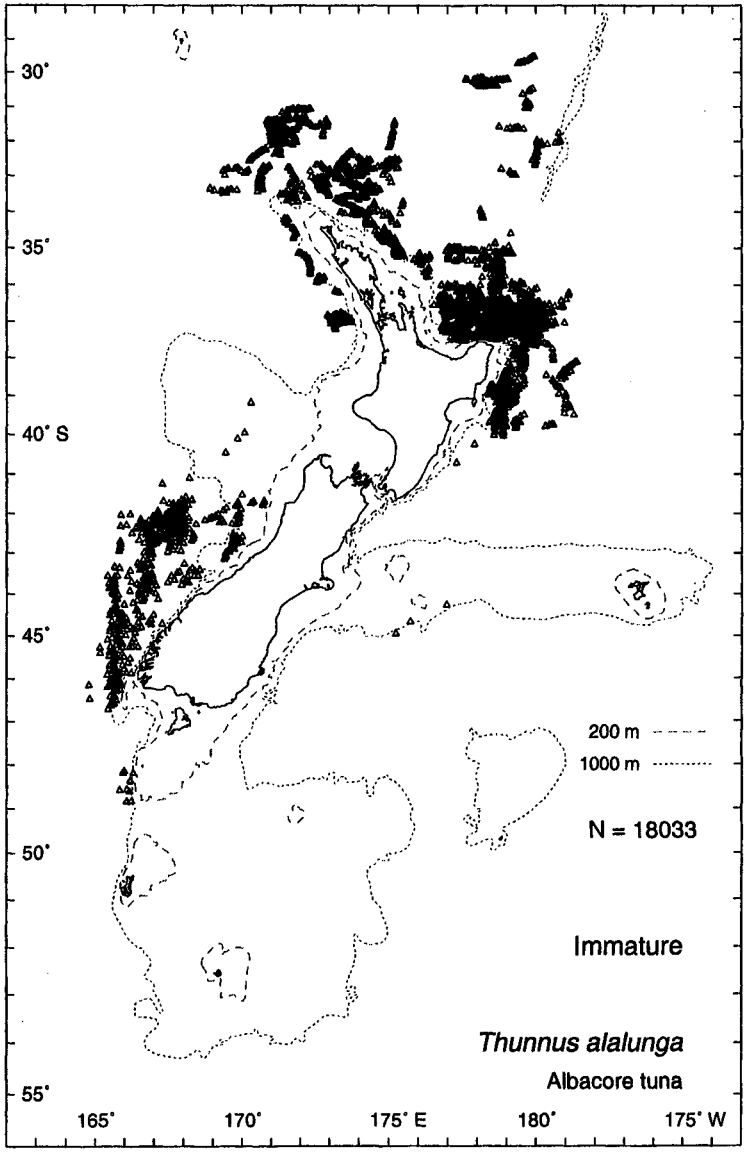


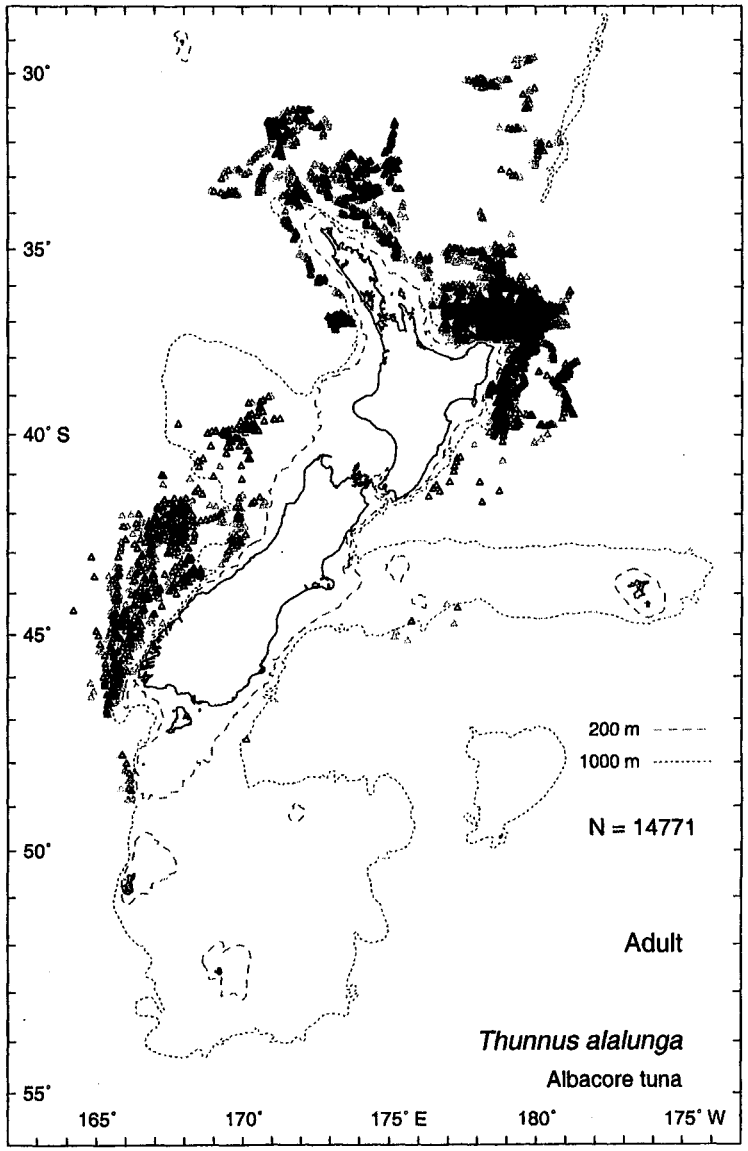
Juvenile plots are not presented for this species.

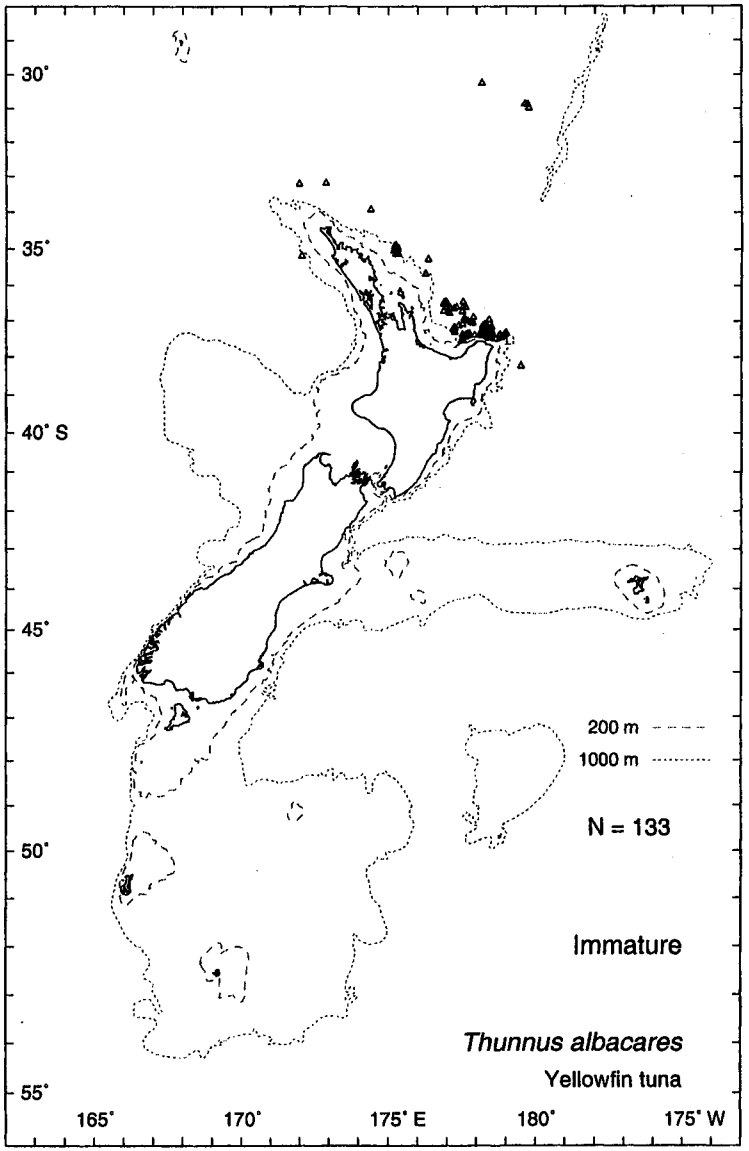


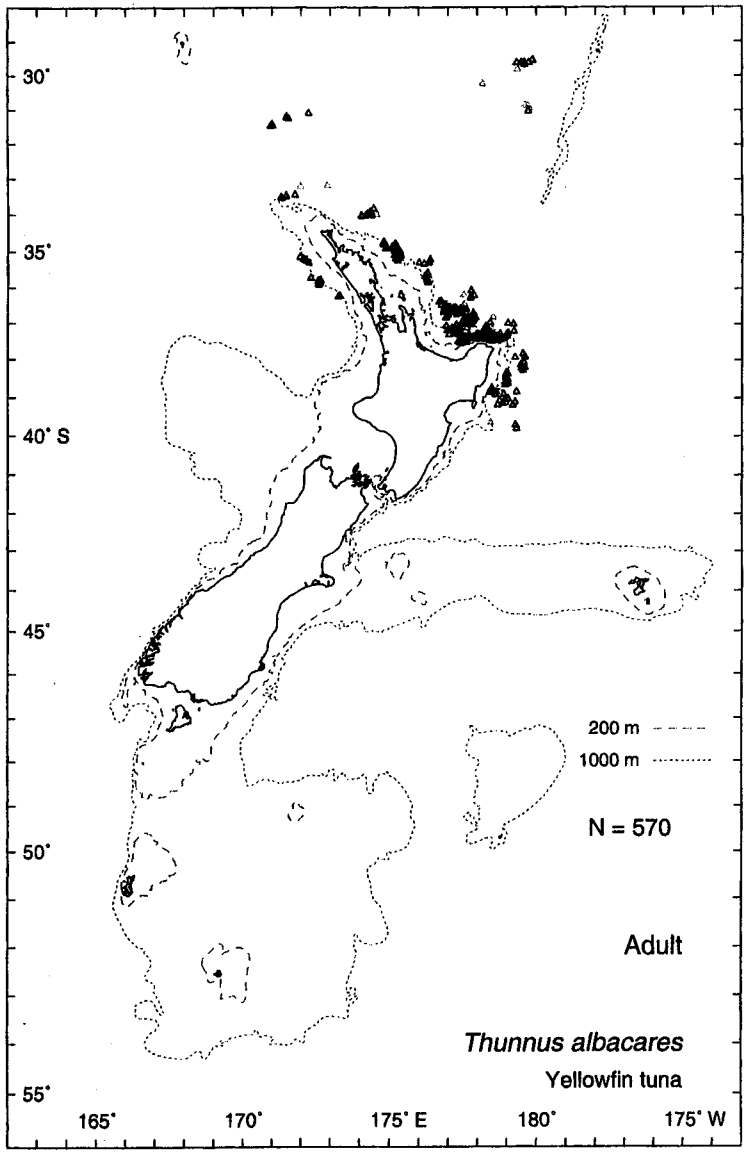


Groups i and ii are arbitrary and were determined from length frequency modes and may contain several year classes. The youngest cohorts are not represented in the fishery.

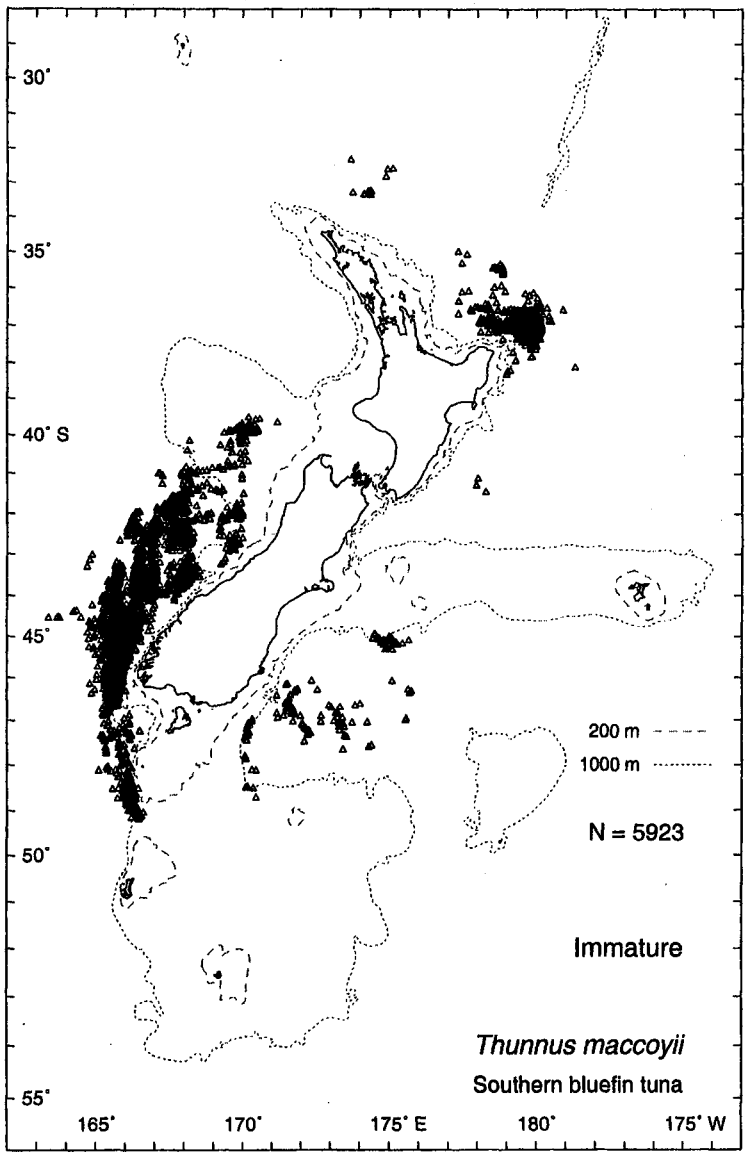

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 18033
Immature
Thunnus alalunga
Albacore tuna

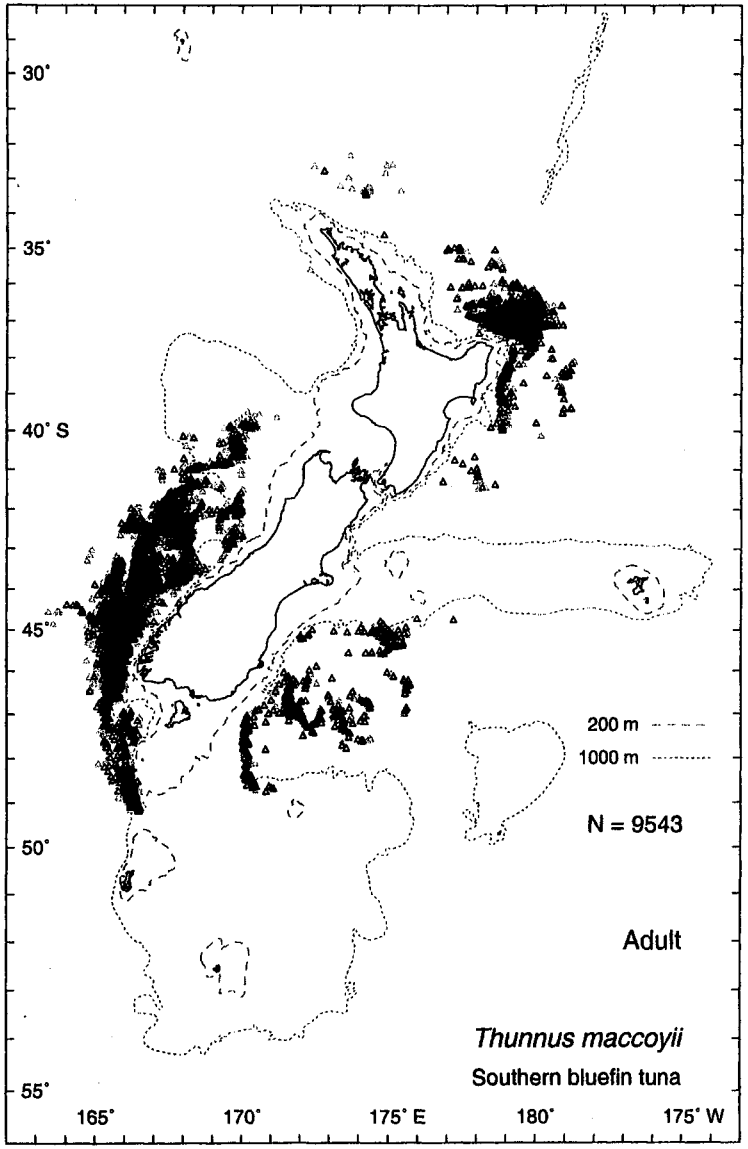

30°
35°
40° S
45°
50°
55°
165°
170°
175° E
180°
175° W
200 m
1000 m
N = 14771
Adult
Thunnus alalunga
Albacore tuna



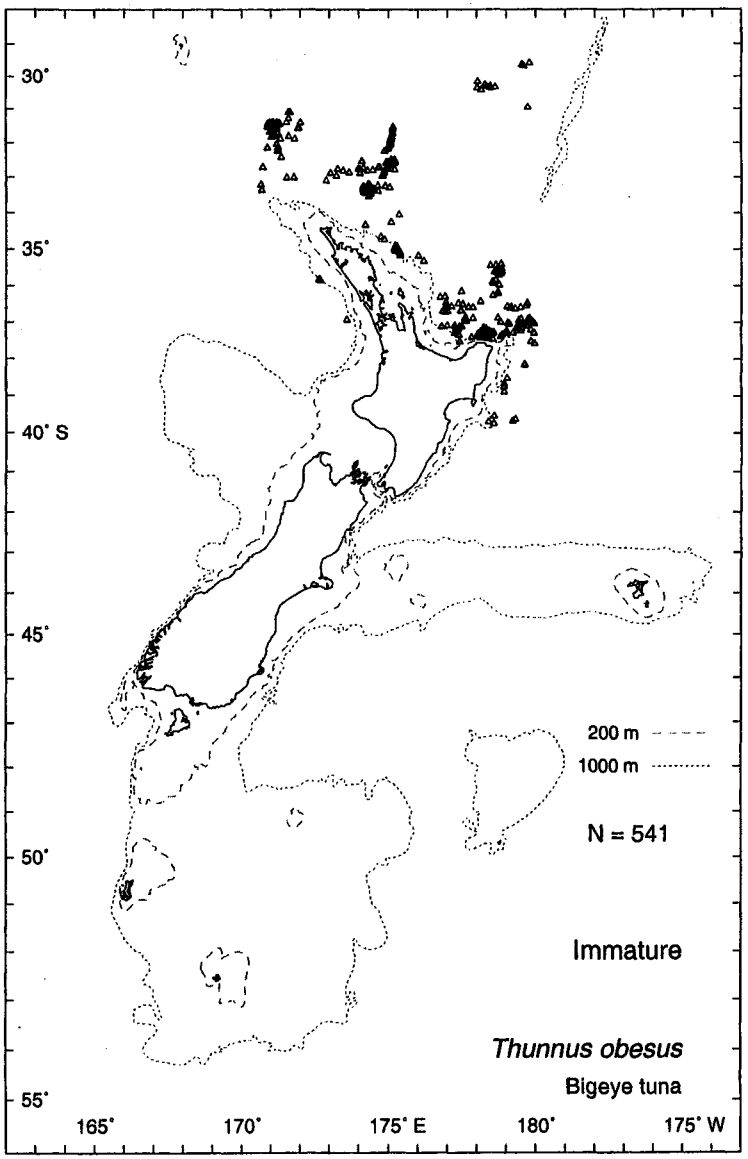


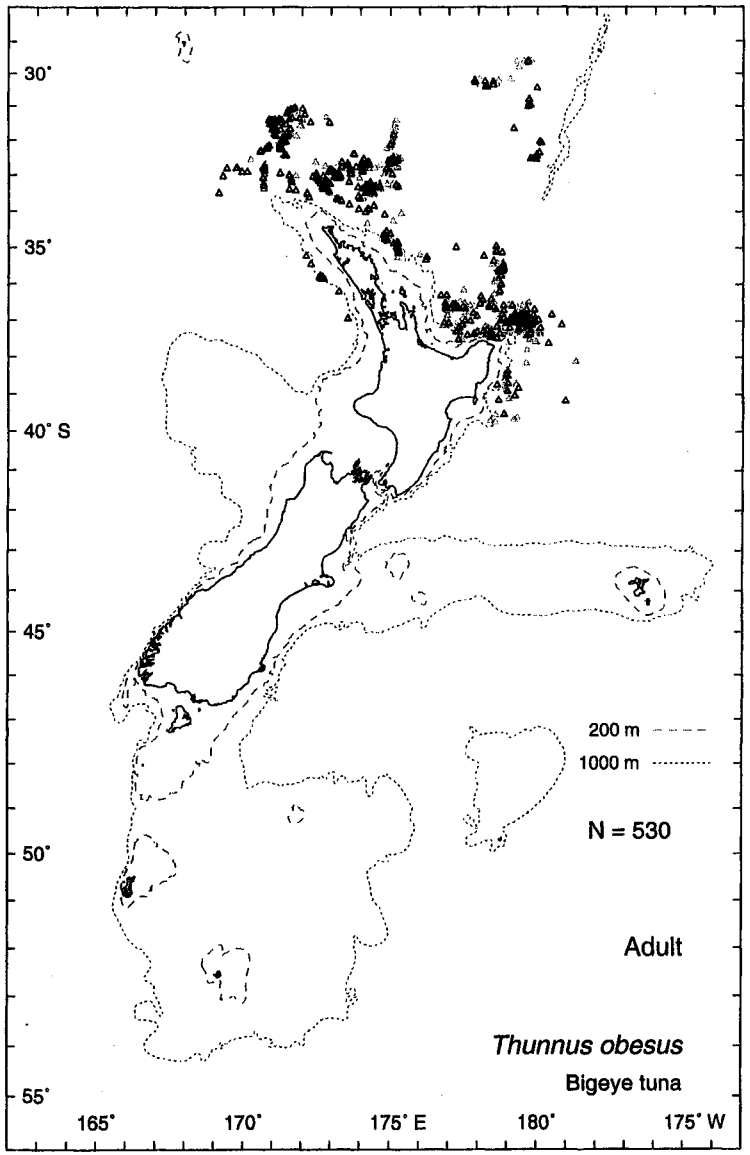
Juvenile plots are not presented for this species.



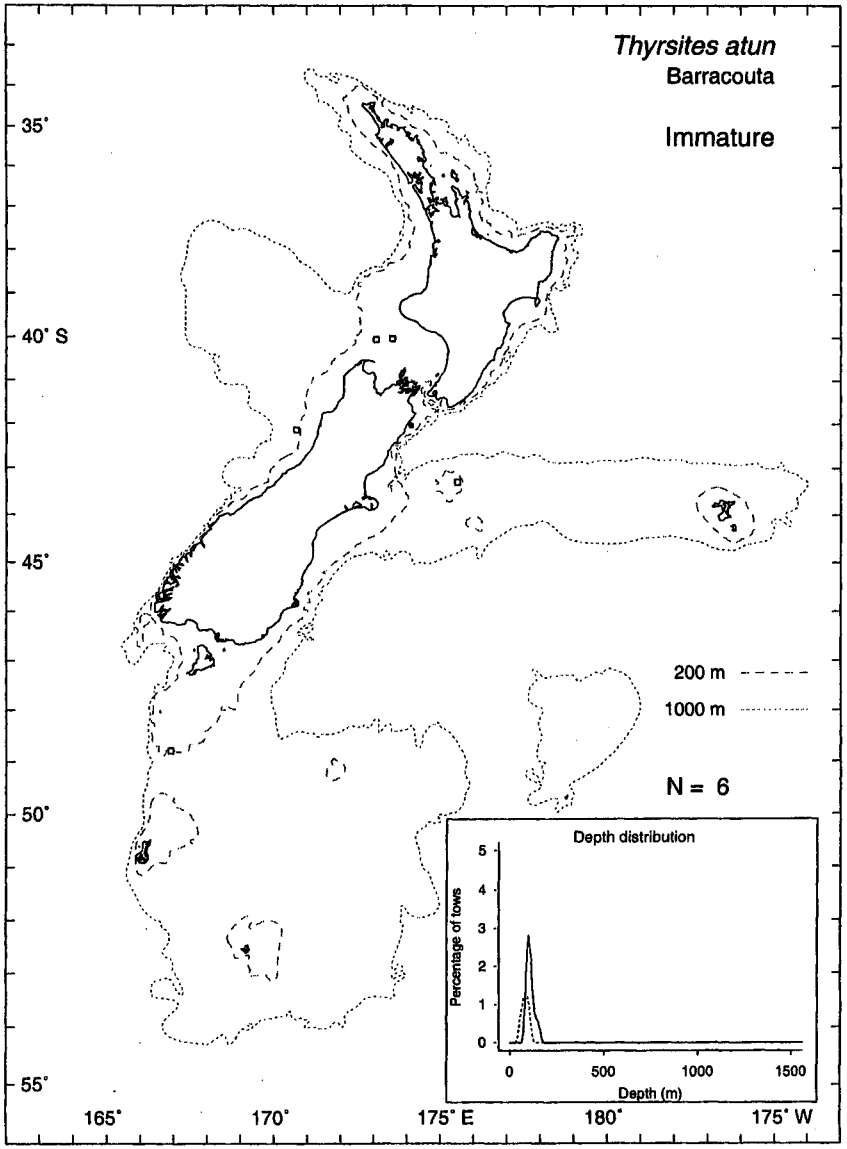


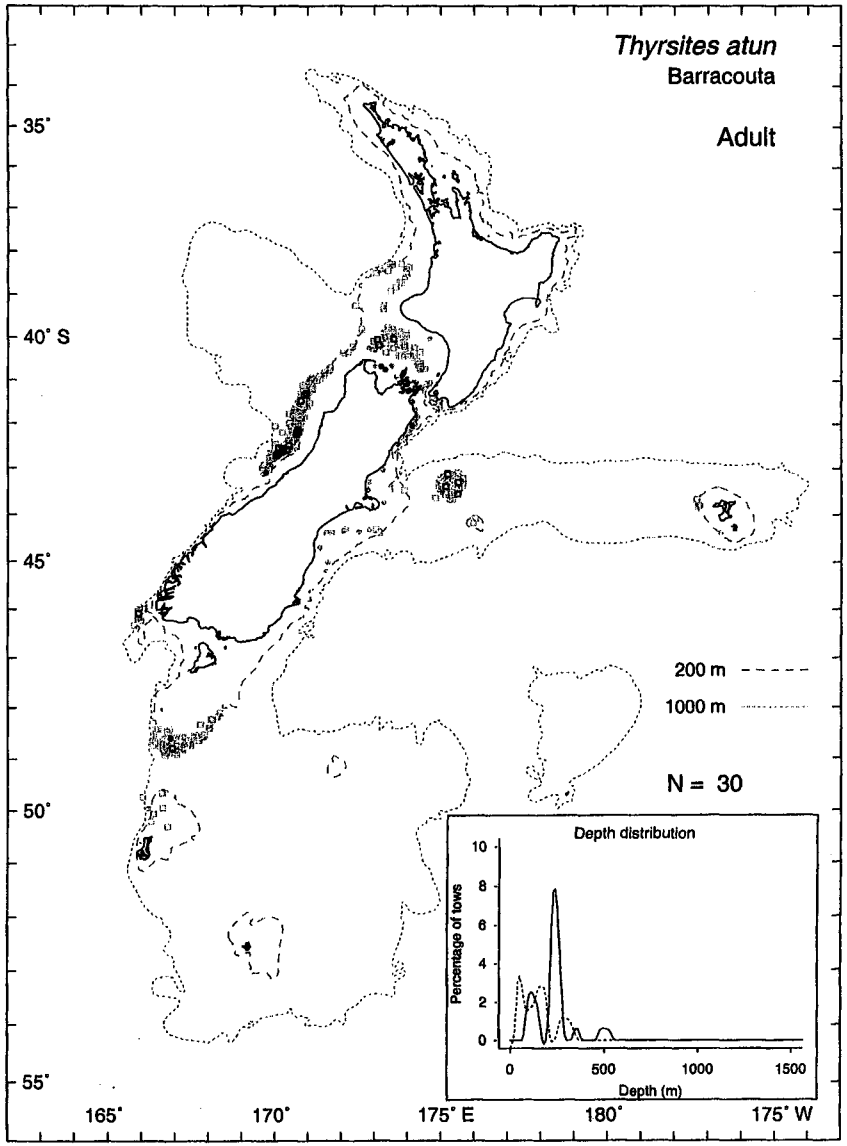
Juvenile plots are not presented for this species.



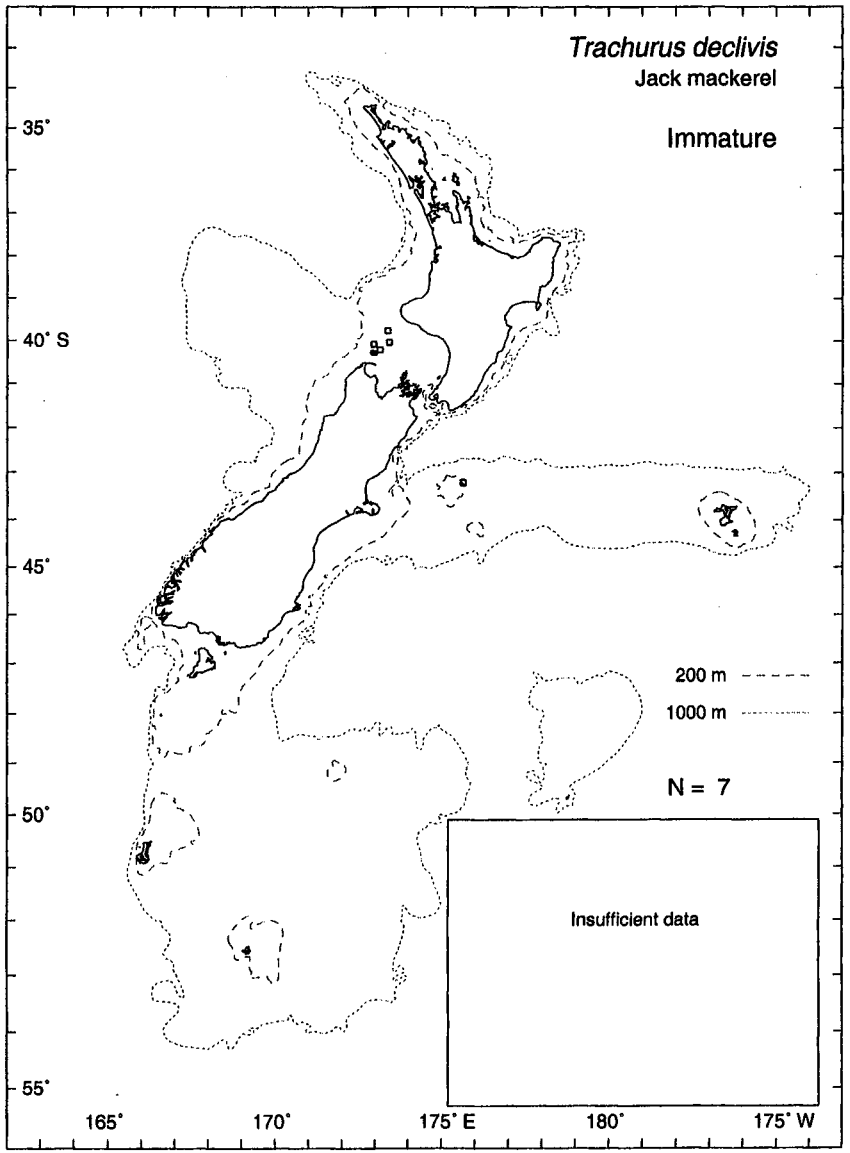


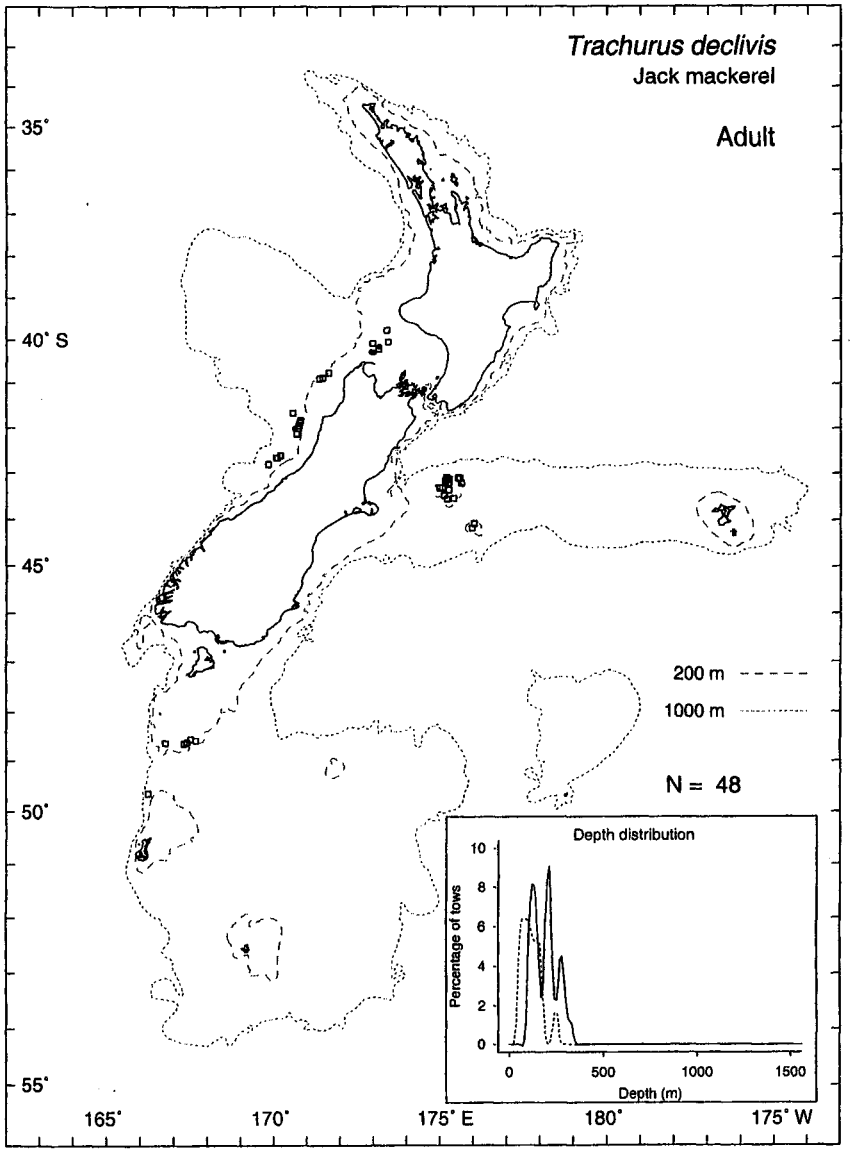
Juvenile plots are not presented for this species.



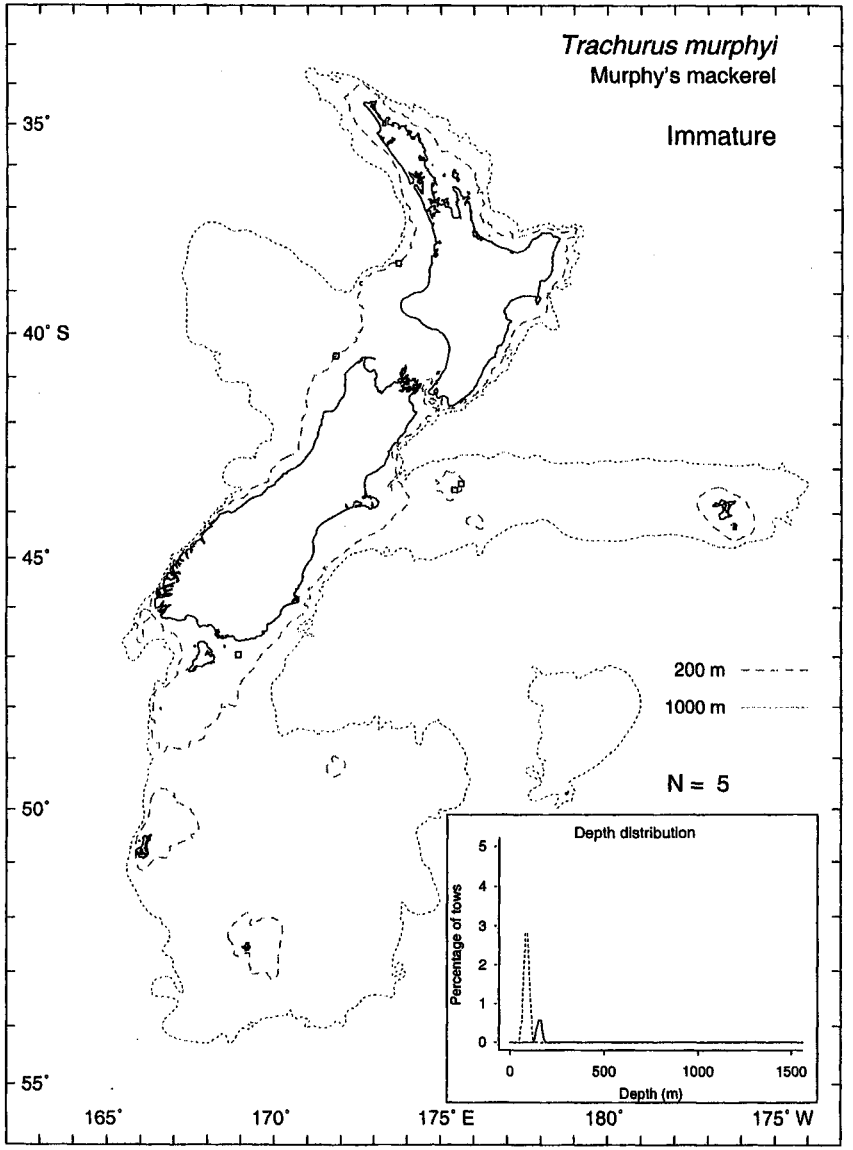


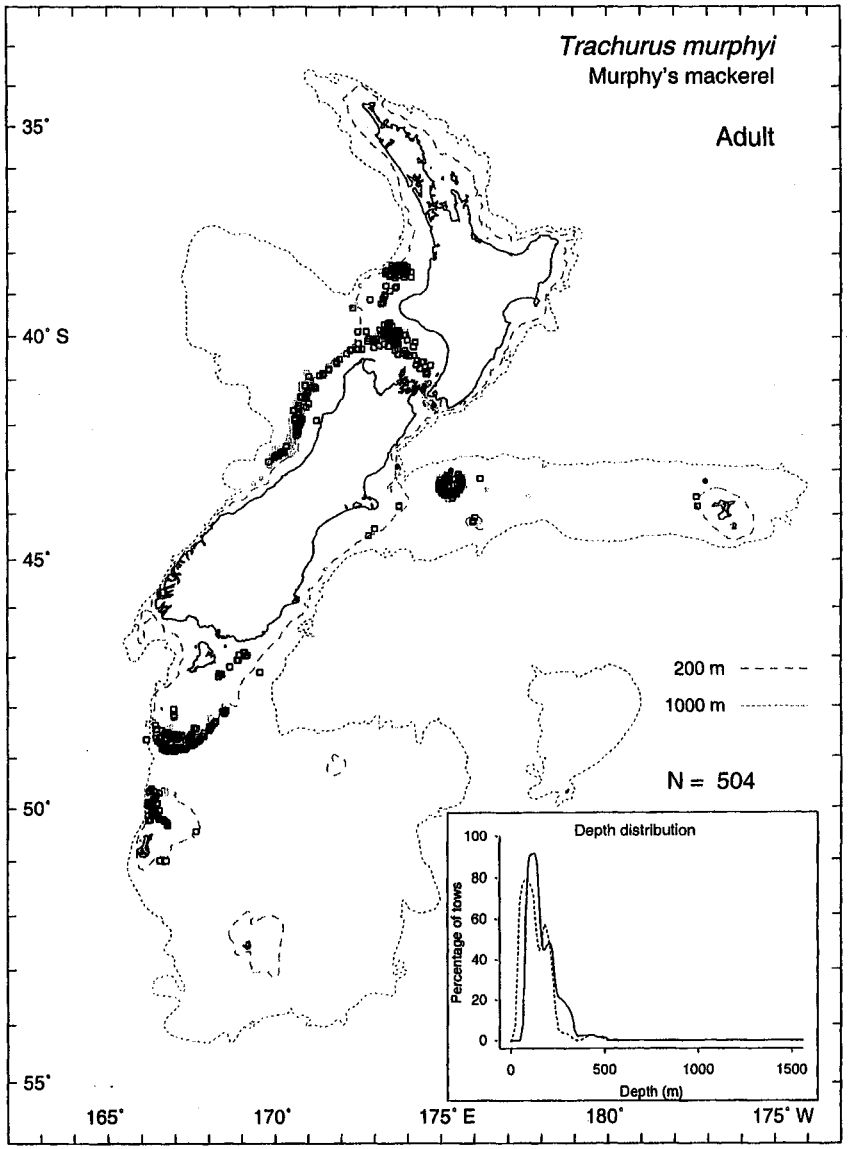
Juvenile plots are not presented for this species.



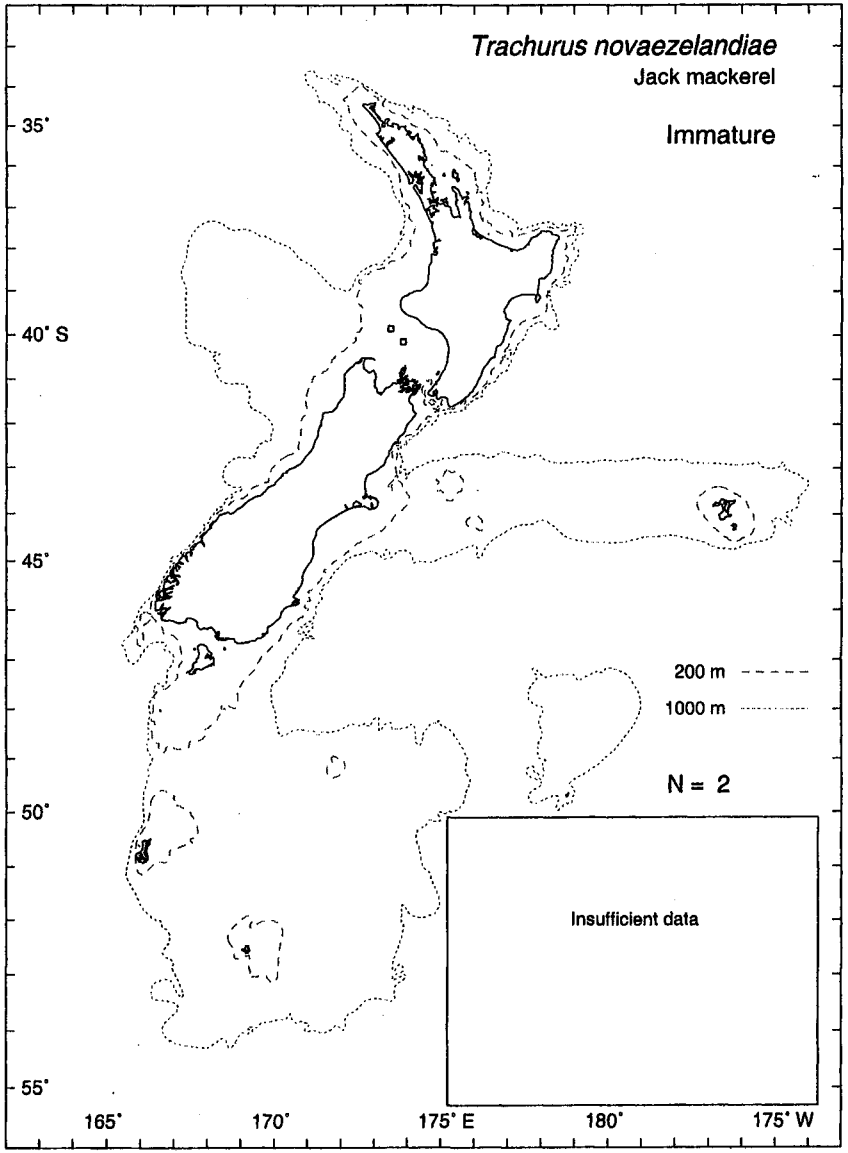


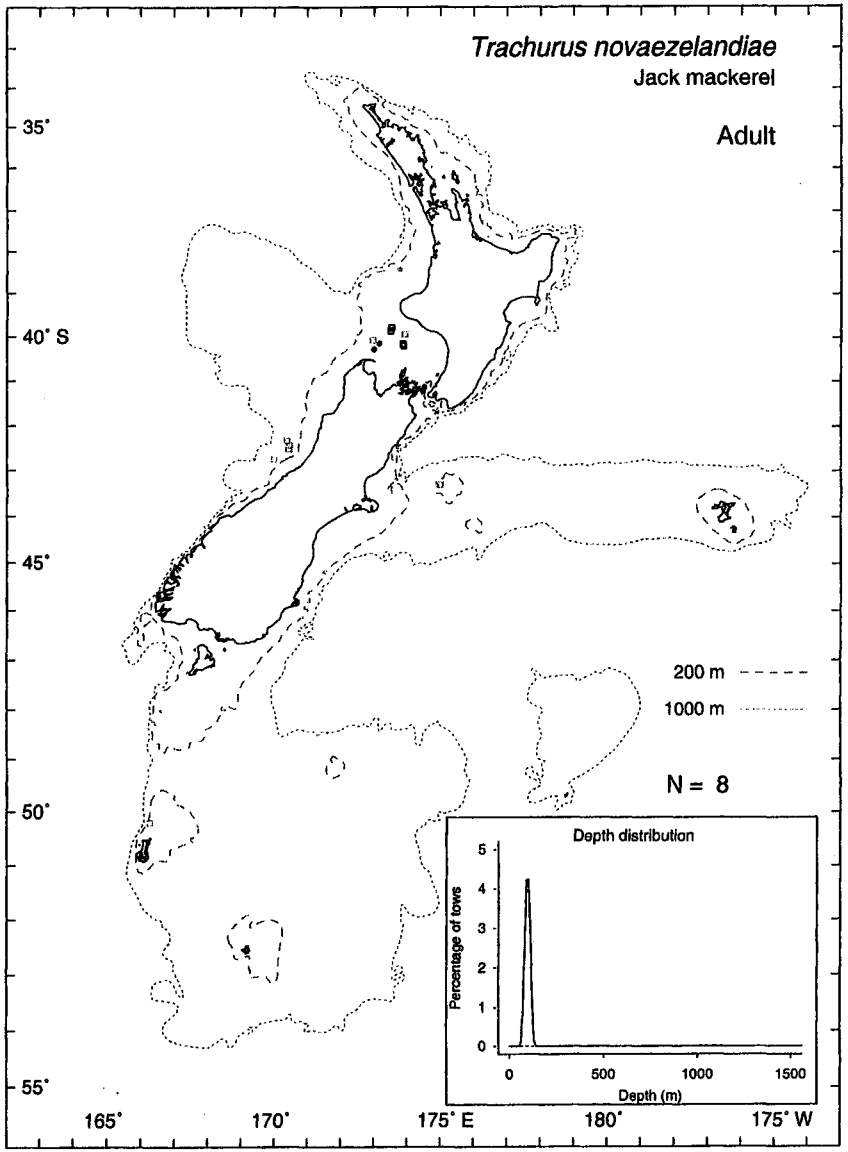
Juvenile plots are not presented for this species.



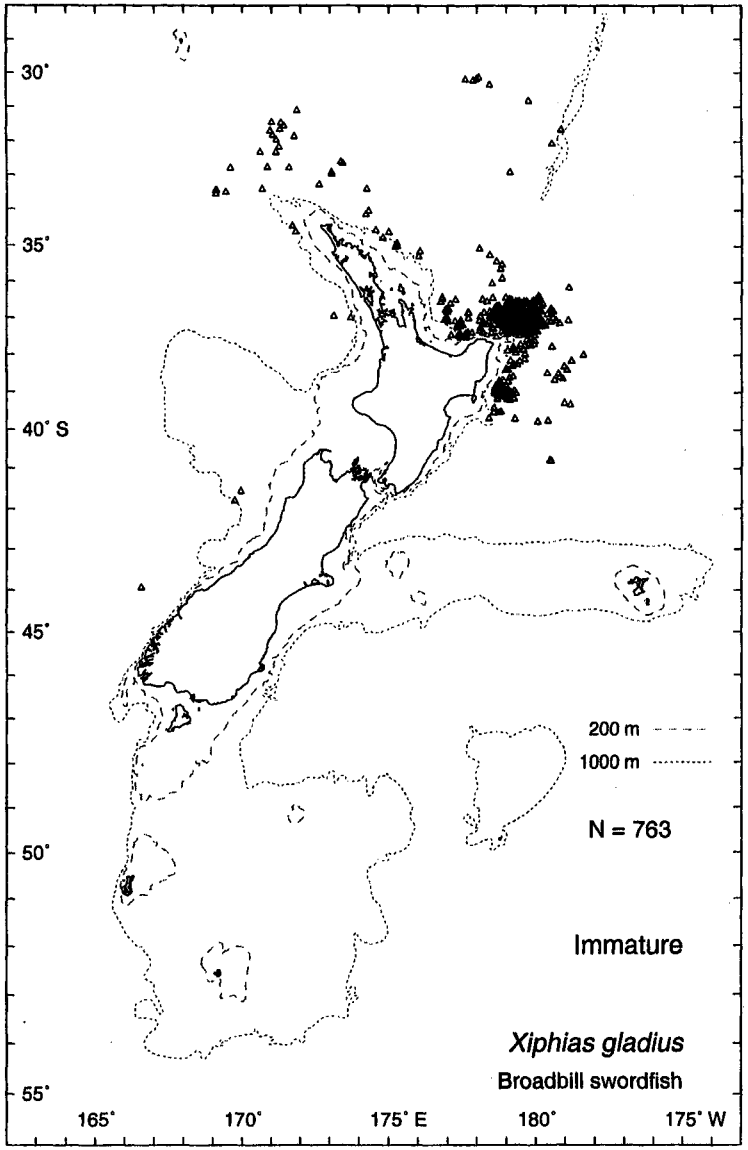


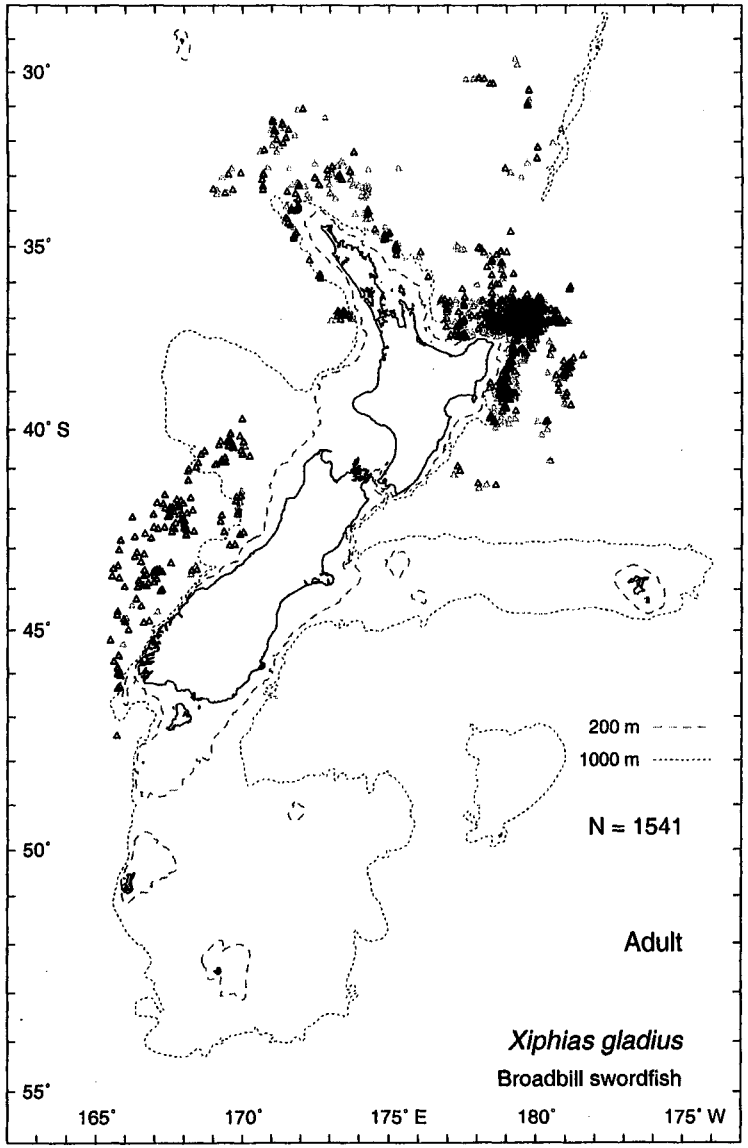
Size at maturity is based on *T. declivis*. Stepien & Rosenblatt (1996) suggested that *T. murphyi* may not be a separate species from *T. symmetricus*. Juvenile plots are not presented for this species.





Juvenile plots are not presented for this species.





Juvenile plots are not presented for this species.

Indexes

Index 1: **Common names. Names in bold are as used on the plots, those not bolded are other occasionally used New Zealand common names. Section refers to the distribution maps (Bottom, bottom trawl; MW, midwater trawl; TLL, tuna longline); the Figure numbers refer to the overall length frequencies.**

		Section	
Common name	**Scientific name**	**Bottom**	**MW & TLL**
Albacore tuna	*Thunnus alalunga*		4
Alfonsino	*Beryx splendens*	3a	
Arrow squid	*Nototodarus gouldi & N. sloanii*	2b	2b
Barracouta	*Thyrsites atun*	2c	2c
Bigeye cardinalfish	*Epigonus telescopus*	3a	
Bigeye tuna	*Thunnus obesus*		4
Black oreo	*Allocyttus niger*	3a	
Blue grenadier	*Macruronus novaezelandiae*	1	1
Blue mackerel	*Scomber australasicus*	3c	
Blue shark	*Prionace glauca*		4
Blue warehou	*Seriolella brama*	2c	2c
Bluenose	*Hyperoglyphe antarctica*	2a	2a
Bonita	*Hyperoglyphe antarctica*	2a	2a
Broadbill swordfish	*Xiphias gladius*		4
Cardinalfish	*Epigonus telescopus*	3a	
Chilean mackerel	*Trachurus murphyi*	2d	2d
Common warehou	*Seriolella brama*	2c	2c
Creamfish	*Parika scaber*	3b	
Dab	*Rhombosolea plebeia*	3c	
Dark ghost shark	*Hydrolagus novaezealandiae*	3a	
Deepsea cod	*Mora moro*	3b	
Eagle ray	*Myliobatis tenuicaudatus*	3b	
Elephantfish	*Callorhinchus milii*	3a	
English hake	*Merluccius australis*	2a	2a
English mackerel	*Scomber australasicus*	3c	
Gemfish	*Rexea solandri*	2b	2b
Ghost shark	*Hydrolagus novaezealandiae*	3a	
Giant stargazer	*Kathetostoma giganteum*	3b	
Googly eyed cod	*Mora moro*	3b	
Grey shark	*Galeorhinus galeus*	1	1
Groper	*Polyprion oxygeneios*	3c	
Gummy shark	*Mustelus lenticulatus*	3b	
Gurnard	*Chelidonichthys kumu*	3a	
Hake	*Merluccius australis*	2a	2a
Hapuku	*Polyprion oxygeneios*	3c	
Hoki	*Macruronus novaezelandiae*	1	1
Jack mackerel	*Trachurus declivis*	2d	2d
	Trachurus novaezelandiae	2d	2d
Jack mackerel	*Trachurus murphyi*	2d	2d
John dory	*Zeus faber*	3c	
Kahawai	*Arripis trutta*	3a	
Leather jacket	*Parika scaber*	3b	
Lemon sole	*Pelotretis flavilatis*	3c	
Ling	*Genypterus blacodes*	2a	2a
Lookdown dory	*Cyttus traversi*	3a	

Index 1 — continued

Common name	Scientific name	Bottom	MW & TLL
Mako	*Isurus oxyrinchus*		4
Monkfish	*Kathetostoma giganteum*	3b	
Murphy's mackerel	*Trachurus murphyi*	2d	2d
New Zealand hake	*Merluccius australis*	2a	2a
Orange roughy	*Hoplostethus atlanticus*	2a	2a
Pale ghost shark	*Hydrolagus sp.* B2	3b	
Peruvian mackerel	*Trachurus murphyi*	2d	2d
Pioke	*Mustelus lenticulatus*	3b	
Porbeagle shark	*Lamna nasus*		4
Ray's bream	*Brama brama*	1	1
Red cod	*Pseudophycis bachus*	2b	2b
Red gurnard	*Chelidonichthys kumu*	3a	
Ribaldo	*Mora moro*	3b	
Rig	*Mustelus lenticulatus*	3b	
Sand flounder	*Rhombosolea plebeia*	3c	
School shark	*Galeorhinus galeus*	1	1
Shovelnose dogfish	*Deania calcea*	3a	
Silver trumpeter	*Callorhinchus milii*	3a	
Silver warehou	*Seriolella punctata*	2c	2c
Slender mackerel	*Trachurus murphyi*	2d	2d
Smooth dory	*Pseudocyttus maculatus*	3c	
Smooth oreo	*Pseudocyttus maculatus*	3c	
Smoothhound	*Mustelus lenticulatus*	3b	
Snapper	*Pagrus auratus*	3b	
Snoek	*Thyrsites atun*	2c	2c
Southern blue whiting	*Micromesistius australis*	2b	2b
Southern bluefin tuna	*Thunnus maccoyii*		4
Southern kingfish	*Rexea solandri*	2b	2b
Southern spiny dogfish	*Squalus acanthias*	2c	2c
Spiky oreo	*Neocyttus rhomboidalis*	3b	
Spiny dogfish	*Squalus acanthias*	2c	2c
Spotted dogfish	*Mustelus lenticulatus*	3b	
Spotted oreo	*Pseudocyttus maculatus*	3c	
Spotted smoothhound	*Mustelus lenticulatus*	3b	
Spotted warehou	*Seriolella punctata*	2c	2c
Stargazer	*Kathetostoma giganteum*	3b	
Tarakihi	*Nemadactylus macropterus*	3b	
Tope	*Galeorhinus galeus*	1	1
Trevally	*Pseudocaranx dentex*	3c	
White warehou	*Seriolella caerulea*	3c	
Yellow flounder	*Rhombosolea leporina*	3c	
Yellowbelly flounder	*Rhombosolea leporina*	3c	
Yellowfin tuna	*Thunnus albacares*		4

Index 2: **Alphabetical list of families and species**

Group	Family	Species or species group
Cephalopoda	Ommastrephidae	*Nototodarus gouldii & N. sloanii*
Chondrichthyes	Callorhynchidae	*Callorhinchus milii*
	Carcharhinidae	*Prionace glauca*
	Centrophoridae	*Deania calcea*
	Chimaeridae	*Hydrolagus novaezealandiae*
		Hydrolagus sp. B2
	Lamnidae	*Isurus oxyrinchus*
		Lamna nasus
	Myliobatidae	*Myliobatis tenuicaudatus*
	Squalidae	*Squalus acanthias*
	Triakidae	*Galeorhinus galeus*
		Mustelus lenticulatus
Teleostei	Arripidae	*Arripis trutta*
	Berycidae	*Beryx splendens*
	Bramidae	*Brama brama*
	Carangidae	*Pseudocaranx dentex*
		Trachurus declivis
		Trachurus murphyi
		Trachurus novaezelandiae
	Centrolophidae	*Hyperoglyphe antarctica*
		Seriolella brama
		Seriolella caerulea
		Seriolella punctata
	Cheilodactylidae	*Nemadactylus macropterus*
	Epigonidae	*Epigonus telescopus*
	Gadidae	*Micromesistius australis*
	Gempylidae	*Rexea solandri*
		Thyrsites atun
	Merlucciidae	*Maruronus novaezelandiae*
		Merluccius australis
	Monacanthidae	*Parika scaber*
	Moridae	*Mora moro*
		Pseudophycis bachus
	Ophidiidae	*Genypterus blacodes*
	Oreosomatidae	*Allocyttus niger*
		Neocyttus rhomboidalis
		Pseudocyttus maculatus
	Pleuronectidae	*Pelotretis flavilatus*
		Rhombosolea leporina
		Rhombosolea plebeia
	Polyprionidae	*Polyprion americanus*
	Scombridae	*Scomber australasicus*
		Thunnus alalunga
		Thunnus albacares
		Thunnus maccoyii
		Thunnus obesus
	Sparidae	*Pagrus auratus*
	Trachichthyidae	*Hoplostethus atlanticus*
	Triglidae	*Chelidonichthys kumu*
	Uranoscopidae	*Kathetostoma giganteum*
	Xiphiidae	*Xiphias gladius*
	Zeidae	*Cyttus traversi*
		Zeus faber

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