



ISSN 1175-1584

MINISTRY OF FISHERIES
Te Tautiaki i nga tini a Tangaroa

**Descriptions of black oreo and smooth oreo fisheries in
OEO 1, OEO 3A, OEO 4, and OEO 6 from
1977-78 to the 1997-98 fishing year**

A. C. Hart
R. P. Coburn
P. J. McMillan
I. J. Doonan

Descriptions of black oreo and smooth oreo fisheries in
OEO 1, OEO 3A, OEO 4, and OEO 6 from
1977-78 to the 1997-98 fishing year

A. C. Hart
R. P. Coburn
P. J. McMillan
I. J. Doonan

NIWA
PO Box 14 901
Wellington

**Published by Ministry of Fisheries
Wellington
2000**

ISSN 1175-1584

©
**Ministry of Fisheries
2000**

Citation: Hart, A.C., Coburn, R.P., McMillan, P.J. & Doonan, I.J. 2000:
Descriptions of black oreo and smooth oreo fisheries in OEO 1, OEO 3A,
OEO 4, and OEO 6 from 1977–78 to the 1997–98 fishing year.
New Zealand Fisheries Assessment Report 2000/23. 43 p.

This series continues the informal
New Zealand Fisheries Assessment Research Document series
which ceased at the end of 1999.

EXECUTIVE SUMMARY

Hart, A.C., Coburn, R.P., McMillan, P.J., & Doonan, I.J. 2000: Descriptions of black oreo and smooth oreo fisheries in OEO 1, OEO 3A, OEO 4, and OEO 6 from 1977-78 to the 1997-98 fishing year.

New Zealand Fisheries Assessment Report 2000/ 23. 43 p.

Descriptions of black oreo and smooth oreo fisheries in oreo management areas OEO 1, OEO 3A, OEO 4, and OEO 6 are presented with data from the 1977-78 to the 1997-98 fishing years.

The analyses summarise MFish commercial tow-by-tow estimated catch data. All tows used in the analyses either targeted or caught unspecified oreo (OEO), black oreo (BOE), or smooth oreo (SSO).

Regions of fishing activity were analysed separately within the large management areas OEO 1 and OEO 6. For OEO 1 these fisheries were Southland, Puysegur, Snares, and OEO 1 north of 45° S. Fisheries in OEO 6 included Pukaki Rise (East and West), Bounty Plateau, and the Auckland Island hills.

Trends in fleet composition, vessel tonnage, target species, catch, and catch rate are reported for each fishery in OEO 1 and OEO 6. Reported catch rates are unstandardised target catch per tow. In several fisheries within OEO 1, OEO 6, and OEO 4 oreos were caught as a bycatch of orange roughy target fishing making examination of trends in target catch rate difficult. Analysis of catch rate data for use in stock assessment would require further study addressing species interaction issues.

1. BACKGROUND

Smooth oreo and black oreo have been commercially fished in New Zealand waters since 1972, making this probably the oldest New Zealand deepwater fishery. The largest oreo fishery is on the South Chatham Rise, but other areas with substantial oreo catch occur throughout the EEZ as a result of target oreo fishing or as bycatch in orange roughy fisheries. This report summarises commercial oreo catch data for the main oreo fisheries around New Zealand. This work was undertaken by NIWA as part of the Ministry of Fisheries Project OEO9802 (Oreo stock assessment) for the 1998–99 fishing year.

2. OBJECTIVE

To update the descriptive analysis of the commercial catch and effort data for black and smooth oreos from selected fisheries with the inclusion of data up to the end of the 1997–98 fishing year. These fisheries include OEO 1, OEO 3A, OEO 4, and OEO 6.

3. METHODS

Descriptive analyses of oreo catch and effort were updated from those reported by Hart *et al.* (1998) by including new data from the 1997–98 fishing year and revised data from the 1996–1997 fishing year for OEO 1, OEO 3A, OEO 4, and OEO 6. The oreo management areas (OEO 1 to OEO 6) are shown in Figure 1.

Management areas OEO 1 and OEO 6 cover large geographical regions and parts of these areas were fished spasmodically or for only a short period. Within each management area, regions of fishing activity were characterised as “fisheries” and were analysed separately. This was done to simplify the analysis and does not imply biological stocks. For OEO 1 these fisheries are Southland, Puysegur, Snares, and OEO 1 north of 45° S. Fisheries in OEO 6 are Auckland Island hills, Bounty Plateau, Pukaki Rise (East), and Pukaki Rise (West). These fisheries are shown in Figures 2 and 3. Fisheries within OEO 3A and OEO 4 were not identified.

3.1 Standard data analysis

For each fishery identified within OEO 1 and OEO 6, and for OEO 3A and OEO 4 separately, a standard set of analyses is presented. Results for each fishery are presented in a summary and in tables.

The tables contain:

- 1) The percentage of combined oreo (smooth oreo, SSO; black oreo, BOE; and smooth oreo plus black oreo plus spiky oreo, OEO) catch by nation by fishing year. All fishing years used in this report are 1 October to 30 September. “Nation” is nationality of the vessel(s) catching or targeting oreos. DOM = New Zealand, JAP = Japanese, KOR = Korean, NOR = Norwegian, POL = Polish, RUS = Russian, SOV = Union of Soviet Socialist Republics, and OTH = other.
- 2) The percentage of combined oreo catch by vessel tonnage class by fishing year.
- 3) The number of tows where combined oreo was caught, the number of tows where oreos were targeted, and percentage of tows by target species for all tows targeting or catching oreos, by fishing year.
- 4) The catch in tonnes (t) of unspecified oreo, smooth oreo and black oreo.
- 5) The CPUE (target catch per tow) and number of target tows by species and fishing year. OEO target catch per tow is the sum of all oreo catch from tows where OEO was the nominated target species divided by the sum of the number of tows targeting OEO.

Trends in fleet composition, vessel tonnage, target species, catch, and catch rate are reported for each fishery within OEO 1 and OEO 6 and for OEO 3A and OEO 4. More detailed information on the OEO 3A and OEO 4 black and smooth oreo stocks including stock structure, abundance, and sustainable catch levels was provided in past stock assessments (e.g., Annala *et al.* 1999).

Note that in the tables catches less than 0.5 t were rounded to zero. Zero t also included tows with no recorded catch. Catch rates less than 0.1 t per tow were rounded to zero. Zero t per tow also included tows with no recorded catch. The first fishing year listed in each table was the year where recorded annual total catch was 1 t or more.

3.2 Data sources

Commercial tow-by-tow estimated catch data for all tows that targeted or caught unspecified oreo, black oreo, or smooth oreo were requested from MFish and were transferred and loaded into an Empress database at NIWA, Greta Point. Data from small vessels not completing tow-by-tow catch returns were not included in this analysis. Estimated catch from tow-by-tow data averaged 80% of reported landed catch for OEO 1, 92% for OEO 3A, 98% for OEO 4, and 89% for OEO 6, with variation year by year (Tables 1 and 43).

The data used in this study were checked by MFish, and also by NIWA, but some errors remain and can be seen in Figure 2 where some tow positions are on land or in water too shallow or too deep to have been oreo tows. The erroneous data were not considered in the analyses.

4. RESULTS

Data from the oreo fisheries from 1977–78 onwards were used in the analyses. The fisheries and the trawl locations for all trawls that targeted or caught oreos in OEO 1 and OEO 6 from 1977–78 to 1996–97 are presented in Figures 2 and 3 and the trawl locations for the 1997–98 fishing year in Figures 4 and 5.

The TACC for OEO 6 was increased from 3000 to 6000 t in 1995–96 to encourage exploratory fishing for orange roughy and oreos in the Subantarctic region. The OEO 1 fishstock was subject to an adaptive management programme but reverted back to the previous TAC levels (5033 t) in 1998–99. There was a voluntary agreement between the Fishing Industry and the Minister of Fisheries not to fish for oreos (and orange roughy) in the Puysegur area in 1998–99. Total reported landings of oreos and TACs for OEO 1 and OEO 6 are given in Table 2 and those for OEO 3A and OEO 4 are in Table 44.

4.1 OEO 1 – Southland

Summary

This is primarily a target oreo fishery on flat bottom and dropoffs along the eastern continental slope of the South Island from Timaru to Southland on ground characterised by undersea canyons. It is the largest of the oreo fisheries in OEO 1 and OEO 6 with data from 4989 tows. Peak annual catch was 5302 t in 1985–86. Catches from 1986–87 to 1997–98 have fluctuated with another high of 4786 t in 1991–92 and a low of 265 t in 1988–89. Catch rates of smooth oreo and unspecified oreo were mostly higher in the mid 1980s and early 1990s than in the late 1990s. Catch rates of black oreo have remained similar throughout.

Area

The Southland fishery is contained in a polygon that has a northernmost point at 44° 41.3' S, 170° 51.0' E and a southernmost point at 47° 38.1' S, 170° 20.9' E (*see* Figure 2). This fishery includes

part of OEO 3A due to fishing extending north past the OEO 1-OEO 3A boundary line at 46° S in the last few years of the fishery.

Nation

This area was fished solely by foreign licensed and joint venture vessels up to 1985–86. Soviet vessels took most of the catch from 1977–78 to 1987–88. New Zealand catch then increased to become almost the total component from 1991–92 on (Table 3).

Vessel tonnage

Changes in catch by vessel tonnage reflected the change from large Soviet vessels (greater than 2000 t) at the beginning of the fishery to small and medium New Zealand vessels from about 1987–88 on (Table 4). Ten or more vessels were involved in the fishery from 1984–85 to 1995–96, which peaked at 21 vessels in 1992–93.

Target species

The main target was oreos but a small percentage of oreo was caught by tows that targeted orange roughy. The target species switched from mainly black oreo to mainly smooth oreo in 1987–88. An increasing percentage of the unspecified oreo target catch was reported from 1990–91 on (Table 5).

Catch and catch rate

Annual reported catches of black oreo fluctuated throughout the time series with a median of 389 t (1983–84 to 1996–97) and a peak of 2106 t in 1983–84. Smooth oreo made up the largest proportion of oreo catch since 1985–86, except in 1996–97 when the black oreo catch was larger. Total catch of smooth oreo fluctuated about a median of 760 t (from 1983–84 to 1996–97) and peaked at 4244 t in 1985–86 (Table 6).

Black oreo catch rates from 1983–84 to 1986–87, when black oreo was the main target species, showed a downward trend in tonnes per tow. The remaining black oreo catch history has insufficient target tows to derive long term trends in CPUE. A relatively unbroken series of target tows for smooth oreo from 1984 on shows an inconsistent trend in target catch rate, although the last six years have low values compared with the previous nine. Target catch rate of unspecified oreo from 1991–92 onward also showed an erratic but generally downward trend (Table 7).

4.2 OEO 1 – Puysegur

Summary

This fishery occurs on the hills and slope of the Puysegur Bank area where oreos are caught as the main bycatch of the orange roughy fishery in this area. First reported target fishing for orange roughy was in 1989–90. Oreo catch switched from mainly black oreo to mainly smooth oreo after 1992–93. Oreo target catch rates were variable, and were low for smooth oreo compared to other smooth oreo fisheries. Catch dropped to 19 t in the 1997–98 fishing year as a result of a voluntary closure of this fishery.

Area

Between 46° 25.2' S–47° 30.5' S and 164° 46.0' E–166° 29.5' E (see Figure 2).

Nation

Fishing was carried out entirely by New Zealand vessels apart from eight tows by the Japanese in the 1980s (Tables 8 and 10).

Vessels

Vessel sizes were mainly under 2000 t (Table 9).

Target species

Oreos were largely a bycatch of the orange roughy fishery, except in 1990–91 when tows catching oreos mainly targeted black oreo and unspecified oreo (Table 10).

Catch and catch rate

Catches of black oreo were higher than those for smooth oreo up to 1992–93, after which smooth oreo predominated. Peak oreo catch was in 1991–92 (Table 11). Catch per tow data from targeted tows are available for few years and are variable. Smooth oreo catch rate ranged from 0.28 to 1.95 t per tow, lower than the catch rate for black oreo in Puysegur, and lower than in most other fisheries in OEO 1 and OEO 6 (Table 12).

4.3 OEO 1 – Snares

Summary

This is a hill fishery for orange roughy and oreos west of the Snares Islands. The fishery was started in 1990–91 by New Zealand vessels and is closely associated with the Puysegur fishery. Most oreo were caught as a bycatch of orange roughy fishing with black oreo being the largest component of oreo catch. There was a switch to mainly targeting unspecified oreo in the last two fishing years. Black oreo catch peaked at 2298 t in 1992–93. There are insufficient data to infer trends in target CPUE for black oreo and smooth oreo. Target catch rate for unspecified oreo dropped markedly in 1997–98.

Area

Between 47° 41.9' S–48° 24.6' S and 164° 29.1' E–165° 42.5' W (*see* Figure 2).

Nation

This fishery was carried out entirely by New Zealand vessels (Table 13).

Vessels

Mainly medium sized (1000–2000 t) vessels (Table 14). The number of vessels in the fishery peaked at 10 in 1993–94.

Target species

Between 40 and 60% of tows targeted black oreo or smooth oreo, except in 1993–94 when it was about 20%. The rest targeted orange roughy. In the last two fishing years the target species switched to mainly unspecified oreo (Table 15).

Catch and catch rate

Black oreo was the dominant oreo species reported caught and this dominance is also reflected by research relative abundance data for this area. Oreo catch peaked in 1992–93 at 2298 t of black oreo and 720 t of smooth oreo (Table 16). Catch rates for unspecified oreo target tows were considerably lower in 1997–98 than preceding years. The bycatch nature of the fishery resulted in insufficient oreo target catch to derive long-term trends in target CPUE (Table 17).

4.4 OEO 1 – North of 45° S

Summary

Oreo was mainly caught as a bycatch to orange roughy fishing on the west coasts of the North and South Islands, the Challenger Plateau, and the east coast of the North Island. A fishery recently developed within this area concentrating on deep hills on the abyssal plain north of the mid Chatham Rise with reported catch from only the last three years. This area is not reported on in detail due to the sensitivity of these data. For the larger area north of 45° S, unspecified oreo was the main target species for trawls catching oreos in the last three fishing years. Some smooth oreo target fishing by New Zealand vessels started in 1989–90 with some unspecified oreo target fishing from 1995–96 to 1997–98. Insufficient data are available to characterise separate fisheries within this area, other than for the abyssal hills fishery, or to infer trends in CPUE for black oreo and smooth oreo.

Area

This area comprises the remainder of oreo management area OEO 1 north of 45° S (*see* Figure 2).

Nation

This fishery was carried out by vessels of various nationalities from 1977–78 to 1981–82, and by mostly New Zealand vessels from 1982–83 (Table 18).

Vessels

A mix of vessel sizes was used throughout the fishery (Table 19). New Zealand vessels were mainly under 1000 t.

Target species

Oreos were caught during target fishing for other species or orange roughy between 1977–78 and 1980–81. The main target species in the remainder of the time series was orange roughy. There was some targeting of smooth oreo from 1989–90 onwards, with substantial targeting of unspecified oreo from 1995–96 on (Table 20).

Catch and catch rate

Smooth oreo was the main oreo species caught in this fishery, with peak catch of 724 tonnes in 1996–97 (Table 21). The bycatch nature of the fishery resulted in insufficient oreo target catch to derive long term trends in target CPUE (Table 22).

4.5 OEO 6 – Auckland Islands

Summary

A target hill fishery for smooth oreo and orange roughy. This was mainly carried out by New Zealand vessels from 1992–93 on. The peak smooth oreo catch was 555 t in 1994–95. There were insufficient target catch rate data to derive long term trends in CPUE.

Area

This fishery lies between 49° 25.9' S–51° 37.5' S and 164° 11.3' E–167° 11.9' E (*see* Figure 3).

Nation

There was limited Soviet fishing in 1981–82 and 1985–86. New Zealand fishing on hills took place from 1992–93 on (Tables 23 and 25).

Vessels

This fishery included a variety of vessel sizes (Table 24). There was a maximum of six vessels in 1993–94.

Target species

Smooth oreo and smooth oreo plus unspecified oreo were the main target species for trawls catching oreos in 1992–93 and 1994–95 respectively. Oreo was caught as a bycatch of orange roughy target fishing for the remainder of the time period (Table 25).

Catch and catch rate

Catches of black oreo were small or zero. Catches of smooth oreo were in the hundreds of tonnes between 1992–93 and 1997–98 with a peak of 555 t in 1994–95 (Table 26). Target catch rate data for smooth oreo are represented by only two years of substantial fishing (1992–93 and 1994–95) and there are insufficient data to derive long term trends in CPUE (Table 27).

4.6 OEO 6 – Bounty Plateau

Summary

This is a flat bottom and dropoff target oreo fishery along the north slope of the Bounty Plateau. It was fished infrequently by foreign vessels in early years, with increased New Zealand effort and a peak total oreo catch of 1282 tonnes in 1994–95. There are insufficient target tows to derive long term trends in CPUE.

Area

This fishery lies between 46° 29.3' S–47° 60.0' S and 176° 23.8' E–178° 8.4' W (*see* Figure 3).

Nation

Soviet vessels undertook some trawling in the early 1980s with a peak of 59 tows in 1983–84. Only New Zealand vessels were involved from 1990–91 onward (Table 28).

Vessels

Most vessels fishing in this area were over 1000 t, except in 1995–96 and 1996–97 (Table 29). A maximum of five vessels was involved in 1983–84, 1993–94 and 1994–95.

Target species

Soviet vessels targeted black oreo and smooth oreo with similar catches of each species in 1983–84. New Zealand vessels mainly targeted smooth oreo and unspecified oreo, but there was some targeting of orange roughy after 1993–94 (Table 30).

Catch and catch rate

The Soviet catch in 1983–84 was 628 t of black oreo and 525 t of smooth oreo. New Zealand catches of smooth oreo increased in recent years due to exploratory fishing in OEO 6 (Table 31). There are five sequential fishing years from 1993–94 to 1997–98 with over 10 target tows, from which there is some evidence of a declining unspecified oreo target CPUE trend (Table 32).

4.7 OEO 6 – Pukaki Rise (east)

Summary

This is a flat bottom and dropoff target oreo fishery along the northeast slope of the Pukaki Rise. It was fished by Soviet vessels from 1978–79 to 1985–86, mainly catching black oreo. Peak black oreo catch was 3118 t in 1980–81. Substantial New Zealand fishing began in 1994–95. The target species switched to mainly orange roughly in 1995–96 and 1996–97. Soviet black oreo target CPUE and New Zealand unspecified oreo target CPUE had a declining trend.

Area

This fishery lies between 47° 57.8' S–50° 17.6' S and 174° 20.1' E–176° 27.2' E (*see* Figure 3).

Nation

This fishery involved mainly Soviet vessels from 1980–81 to 1985–86 and New Zealand vessels from 1994–95 to 1997–98 (Tables 33 and 35).

Vessels

Large Soviet vessels (over 2000 t) were used in this fishery with midsized New Zealand vessels (1000–2000 t) in later years (Table 34).

Target species

Soviet vessels mostly targeted black oreo from 1980–81 to 1985–86 and New Zealand vessels targeted unspecified oreo in 1994–95 and 1997–98, and orange roughly from 1995–96 to 1996–97 (Table 35).

Catch and catch rate

There were two years of substantial catch of black oreo between 1980–81 and 1981–82 by Soviet vessels. Similar sized catches of black oreo and smooth oreo were reported by New Zealand vessels from 1994–95 to 1997–98 (Table 36). There was a declining trend in target CPUE for black oreo from 1980–81 to 1985–86. Target catch per tow for unspecified oreo declined from 1994–95 to 1997–98 but remained relatively high (Table 37).

4.8 OEO 6 – Pukaki Rise (west)

Summary

This is a flat bottom and dropoff target oreo fishery along the north slope of the Pukaki Rise. Korean and Soviet vessels took substantial catches in 1983–84 and 1984–85. There was a low level of fishing effort by all nations for the remainder of the time series. Main target species was black oreo or other species. The peak black oreo catch of 1196 t was in 1984–85. There was little New Zealand fishing in the area and there are insufficient data available to infer a trend in target CPUE.

Area

This fishery lies between 47° 55.5' S–49° 43.2' S and 167° 52.1' E–173° 16.5' E (*see* Figure 3).

Nation

Effort by Koreans plus Soviets peaked in 1983–84 and by Koreans only in 1984–85. Various nationalities fished in other years, including Norway and New Zealand (Tables 38 and 40).

Vessels

Large Soviet vessels (over 2000 t) were used from 1978–79 to 1983–84 and small Korean vessels (under 1000 t) from 1983–84 to 1985–86. Various sized vessels fished from 1987–88 to 1996–97. Mainly large (over 2000 t) New Zealand vessels fished in 1997–98 (Table 39).

Target species

There was targeting of species other than oreos or orange roughy throughout the time series. Black oreo and other species were targeted during the main period of fishing from 1977–78 to 1985–86. There was some target fishing for orange roughy in 1992–93 and 1995–96 (Table 40).

Catch and catch rate

Substantial catches of black oreo were made in 1983–84 and 1984–85 with a peak catch of 1196 t in 1984–85 (Table 41). There are insufficient data to infer trends in oreo target CPUE (Table 42).

4.9 OEO 3A and OEO 4 – South Chatham Rise

Summary

This fishery is a flat bottom, dropoff, and hill fishery with target oreo fishing predominating at the west end of the south Chatham Rise (OEO 3A), and oreo bycatch to orange roughy fishing at the southeast end (OEO 4). It is the largest (14 832 t in 1980–81) and oldest (1972 to the present) deepwater fishery in the EEZ. It was dominated by Soviet vessels in the early years, but is now almost entirely fished by New Zealand vessels. Standardised CPUE analyses for black oreo and smooth oreo in OEO 3A are given by Coburn *et al.* (1999) and Doonan *et al.* (1999) respectively.

Area

The OEO 3A fishery encompasses the Chatham Rise west of 176° E, excluding the part of management area OEO 3A that falls within the Southland fishery. The OEO 4 fishery is on the Chatham Rise east of 176° E (*see* Figure 2).

Nation

The OEO 3A fishery was dominated by Soviet/Russian vessels up to 1986–87, then by New Zealand vessels (Table 45). The OEO 4 fishery was predominantly Soviet/Russian up to 1984–85 and New Zealand thereafter (Table 46).

Vessels

Soviet vessels in OEO 3A and OEO 4 were mainly large (over 2000 t) and New Zealand vessels a mix of small (under 1000 t) and medium sized (under 2000 t) (Tables 47 and 48).

Target species

Soviet vessels (mainly) fishing in OEO 3A initially targeted unspecified oreo, then black oreo, then increasingly smooth oreo. New Zealand vessels targeted smooth oreo initially then unspecified oreo (Table 49). In OEO 4 Soviet vessels initially targeted unspecified oreo, then black oreo, then orange roughy. New Zealand vessels mostly targeted orange roughy (Table 50).

Catch and catch rate

In OEO 3A black oreo dominated catches from 1979–80 to 1983–84, reflecting the Soviet preference for that species. Smooth oreo predominated all but four of the remaining years (Table 51). In OEO 4

black oreo catches were predominant from 1978–79 to 1980–81 with smooth oreo then predominant to 1997–98 (Table 52).

Target catch per tow for black oreo in OEO 3A declined initially but fluctuated in later years while that for smooth oreo appears to have declined (Table 53). More detailed analysis of black oreo CPUE was given by Coburn *et al.* (1999) and smooth oreo CPUE by Doonan *et al.* (1999). Target catch per tow for black oreo in OEO 4 fluctuated and there are too few data in the last 10 years of the fishery to comment. Target catch per tow for smooth oreo appears to have declined in the early years (1979–80 to 1990–91) but fluctuated in later years, where the number of target tows also fluctuated (Table 54).

5. REFERENCES

- Annala, J.H., Sullivan, K.J., & O'Brien, C.J. (Comps) 1999: Report from the Fishery Assessment Plenary, April 1999: stock assessments and yield estimates. (Unpublished report held in NIWA library, Wellington.) 430 p.
- Coburn, R. P., Doonan, I. J., & McMillan, P. J. 1999: Black oreo abundance indices from standardised catch per unit of effort data for OEO 3A. N.Z. Fisheries Assessment Research Document 99/32. 18 p. (Draft report held in NIWA library, Wellington.)
- Doonan, I. J., McMillan, P. J., Coburn, R. P., & Hart, A. C. 1999: Assessment of OEO 3A smooth oreo for 1999–2000. N.Z. Fisheries Assessment Research Document 99/45. 21 p. (Draft report held in NIWA library, Wellington.)
- Hart, A. C., Coburn, R. P., McMillan, P. J., & Doonan, I. J. 1998: Description of black and smooth oreo fisheries in OEO 1, OEO 3A, OEO 4 and OEO 6. Final Research Report for Ministry of Fisheries Project OEO9702, Objective 1. 52 p. (Unpublished report held in NIWA library, Wellington.)

Table 1: Total reported oreo catch combined for oreo management areas OEO 1 and OEO 6, total oreo catch from the tow-by-tow database, and percentage data captured in tow-by-tow database. -, no value

Fishing year	OEO 1 total oreo catch		OEO 6 total oreo catch		Percentage captured in tow-by-tow data	
	Reported	Tow-by-tow	Reported	Tow-by-tow	OEO 1	OEO 6
1978-79*	2 808	2 818	17	3	100.4	17.6
1979-80*	143	130	18	20	90.9	111.1
1980-81*	467	480	283	0	102.8	0
1981-82*	21	1	4 380	3 221	4.8	73.5
1982-83*	162	15	765	1 929	9.3	252.2
1983-83#	39	0	354	436	0	123.2
1983-84†	3 241	3 424	3 568	3 092	105.6	86.7
1984-85†	1 480	1 747	2 044	1 853	118.0	90.7
1985-86†	5 390	5 724	126	126	106.2	100.0
1986-87†	532	296	0	0	55.6	-
1987-88†	1 193	1 047	197	249	87.8	126.4
1988-89†	432	266	0	0	61.6	-
1989-90†	2 069	1 628	0	0	78.7	-
1990-91†	4 563	3 373	288	304	73.9	105.6
1991-92†	4 156	3 292	33	17	79.2	51.5
1992-93†	5 739	5 404	815	599	94.2	73.5
1993-94†	4 910	4 395	983	872	89.5	88.7
1994-95†	1 483	1 137	2 528	2 232	76.7	88.3
1995-96†	4 783	3 824	4 435	3 823	79.9	86.2
1996-97†	5 181	4 168	5 645	5 188	80.5	91.9
1997-98†	2 679	1 808	5 219	3 933	67.5	75.4

Source: FSU from 1977-78 to 1987-88; QMS/ITD from 1988-89 to 1997-98. *, 1 April to 31 March; #, 1 April to 30 September; †, 1 October to 30 September.

Table 2: Total reported landings (t) for all oreo species combined for oreo management areas OEO 1 and OEO 6 from 1978-79 to 1995-96 and TACs (t) from 1982-83 to 1997-98. -, no value

Fishing year	OEO 1		OEO 6	
	Landings	TAC	Landings	TAC
1978-79*	2 808	-	17	-
1979-80*	143	-	18	-
1980-81*	467	-	283	-
1981-82*	21	-	4 380	-
1982-83*	162	-	765	-
1983-83#	39	-	354	-
1983-84†	3 241	-	3 568	-
1984-85†	1 480	-	2 044	-
1985-86†	5 390	-	126	-
1986-87†	532	4 000	0	3 000
1987-88†	1 193	4 000	197	3 000
1988-89†	432	4 233	7	3 000
1989-90†	2 069	5 033	0	3 000
1990-91†	4 563	5 033	288	3 000
1991-92†	4 156	5 033	33	3 000
1992-93†	5 739	6 044	815	3 000
1993-94†	4 910	6 044	983	3 000
1994-95†	1 483	6 044	2 528	3 000
1995-96†	4 783	6 044	4 435	6 000
1996-97†	5 181	6 044	5 645	6 000
1997-98†	2 679	6 044	5 219	6 000

Source: FSU from 1977-78 to 1987-88; QMS/ITD from 1988-89 to 1997-98. *, 1 April to 31 March; #, 1 April to 30 September; †, 1 October to 30 September.

Table 3: Southland. Percentage of oreo catch (combined) by nation and fishing year. NA, unknown nationality; DOM, New Zealand; JAP, Japan; KOR, Korea; NOR, Norway; RUS, Russia; SOV, Soviet

	NA	DOM	JAP	KOR	NOR	RUS	SOV
1977-78	31	0	0	0	0	15	54
1978-79	0	0	0	0	0	23	77
1979-80	0	0	0	0	0	48	52
1980-81	0	0	0	0	0	100	0
1981-82	0	0	100	0	0	0	0
1982-83	0	0	0	0	0	0	0
1983-84	0	0	0	5	0	0	95
1984-85	0	0	6	47	0	0	47
1985-86	0	0	4	22	0	0	74
1986-87	0	17	0	35	0	0	48
1987-88	0	36	19	4	0	0	41
1988-89	0	81	0	19	0	0	0
1989-90	0	42	0	10	49	0	0
1990-91	0	58	0	7	35	0	0
1991-92	0	100	0	0	0	0	0
1992-93	0	100	0	0	0	0	0
1993-94	0	100	0	0	0	0	0
1994-95	0	84	0	16	0	0	0
1995-96	0	77	0	22	0	0	0
1996-97	0	84	0	16	0	0	0
1997-98	0	79	0	21	0	0	0

Table 4: Southland. Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1977-78	7	0	0	93
1978-79	0	0	0	100
1979-80	0	0	0	100
1980-81	0	100	0	0
1981-82	0	0	0	100
1982-83	0	0	0	0
1983-84	0	5	0	95
1984-85	0	47	6	47
1985-86	0	22	4	74
1986-87	0	52	0	48
1987-88	0	14	26	60
1988-89	0	74	26	0
1989-90	0	98	2	0
1990-91	0	55	45	0
1991-92	0	94	5	0
1992-93	0	84	15	0
1993-94	0	51	49	0
1994-95	0	79	21	0
1995-96	0	64	36	0
1996-97	0	94	6	0
1997-98	0	71	29	0

Table 5: Southland. Number of tows where oreos were caught (n.total), the number of oreo target tows (n.target) and percentage of tows by target species for all tows catching oreos, by fishing year. OEO, unspecified oreo; SSO, smooth oreo; BOE, black oreo; ORH, orange roughly; Other, other species

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1977-78	406	314	77	0	0	0	23
1978-79	29	28	0	0	97	0	3
1979-80	86	85	84	3	12	0	1
1980-81	1	0	0	0	0	0	100
1981-82	1	0	0	0	0	0	100
1982-83	1	1	0	0	100	0	0
1983-84	502	498	0	55	45	0	1
1984-85	244	241	0	36	62	0	1
1985-86	800	797	6	71	23	0	0
1986-87	101	101	0	43	57	0	0
1987-88	226	220	0	85	12	0	3
1988-89	31	27	10	55	23	13	0
1989-90	164	161	6	92	0	0	2
1990-91	156	150	16	79	1	0	4
1991-92	474	466	34	61	3	1	0
1992-93	356	336	29	64	1	5	0
1993-94	226	209	61	23	9	6	1
1994-95	172	163	85	7	3	4	1
1995-96	341	317	64	14	14	7	0
1996-97	535	531	51	39	10	0	1
1997-98	137	123	66	22	2	9	1

Table 6: Southland. Catch of unspecified oreo, smooth oreo, and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1977-78	2 747	0	0
1978-79	0	13	113
1979-80	410	1	67
1980-81	0	0	0
1981-82	0	0	0
1982-83	0	0	0
1983-84	0	1 268	2 106
1984-85	0	883	1 004
1985-86	0	4 244	1 058
1986-87	0	156	148
1987-88	0	915	138
1988-89	0	196	69
1989-90	0	586	187
1990-91	1	661	389
1991-92	150	3 454	1 182
1992-93	234	860	238
1993-94	43	632	228
1994-95	5	456	389
1995-96	113	1 087	744
1996-97	23	610	1 625
1997-98	10	330	185

Table 7: Southland. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	<u>OEO</u>	<u>n</u>	<u>SSO</u>	<u>n</u>	<u>BOE</u>	<u>n</u>
1977-78	6.59	314	0	0	0	0
1978-79	0	0	0	0	3.91	28
1979-80	6.59	72	0.19	3	0.20	10
1980-81	0	0	0	0	0	0
1981-82	0	0	0	0	0	0
1982-83	0	0	0	0	0	1
1983-84	0	0	3.37	274	5.69	224
1984-85	0	0	6.71	89	5.47	152
1985-86	3.68	51	6.83	566	3.48	180
1986-87	0	0	1.74	43	2.26	58
1987-88	0	0	4.57	192	2.39	28
1988-89	0.12	3	7.51	17	7.09	7
1989-90	8.61	10	3.85	151	0	0
1990-91	10.02	25	4.98	124	0	1
1991-92	9.27	163	8.97	291	4.27	12
1992-93	4.69	105	2.69	229	4.28	2
1993-94	4.94	138	2.07	51	1.69	20
1994-95	5.54	146	1.22	12	1.40	5
1995-96	6.57	219	2.13	49	5.36	49
1996-97	4.25	273	1.61	206	4.24	52
1997-98	3.29	90	3.44	30	4.67	3

Table 8: Puysegur. Percentage oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	<u>DOM</u>	<u>JAP</u>
1983-84	0	100
1984-85	0	0
1985-86	0	100
1986-87	0	100
1987-88	0	0
1988-89	0	0
1989-90	100	0
1990-91	100	0
1991-92	100	0
1992-93	100	0
1993-94	100	0
1994-95	100	0
1995-96	100	0
1996-97	100	0
1997-98	100	0

Table 9: Puysegur. Percentage oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1983-84	0	0	0	100
1984-85	0	0	0	0
1985-86	0	0	100	0
1986-87	100	0	0	0
1987-88	0	0	0	0
1988-89	0	0	0	0
1989-90	0	0	100	0
1990-91	0	1	99	0
1991-92	0	45	55	0
1992-93	0	67	16	18
1993-94	0	14	61	25
1994-95	0	13	87	0
1995-96	0	53	47	0
1996-97	0	19	81	0
1997-98	0	100	0	0

Table 10: Puysegur. Number of tows where oreos were caught, number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1983-84	3	0	0	0	0	0	100
1984-85	0	0	0	0	0	0	0
1985-86	1	0	0	0	0	0	100
1986-87	4	0	0	0	0	0	100
1987-88	0	0	0	0	0	0	0
1988-89	0	0	0	0	0	0	0
1989-90	70	6	0	9	0	91	0
1990-91	231	159	24	10	35	31	0
1991-92	535	54	0	8	1	90	0
1992-93	464	143	15	9	7	69	0
1993-94	472	20	4	1	0	96	0
1994-95	123	48	39	0	0	61	0
1995-96	209	51	21	4	0	75	0
1996-97	132	43	33	0	0	67	0
1997-98	4	4	100	0	0	0	0

Table 11: Puysegur. Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1983-84	0	0	0
1984-85	0	0	0
1985-86	0	0	0
1986-87	0	0	0
1987-88	0	0	0
1988-89	0	0	0
1989-90	0	178	660
1990-91	15	403	1 687
1991-92	147	477	1 806
1992-93	271	417	1 214
1993-94	18	1 022	884
1994-95	0	459	69
1995-96	0	445	165
1996-97	3	244	126
1997-98	19	0	0

Table 12: Puysegur. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	OEO	n	SSO	n	BOE	n
1983-84	0	0	0	0	0	0
1984-85	0	0	0	0	0	0
1985-86	0	0	0	0	0	0
1986-87	0	0	0	0	0	0
1987-88	0	0	0	0	0	0
1988-89	0	0	0	0	0	0
1989-90	0	0	0.50	6	0	0
1990-91	13.5	56	0.53	22	8.35	81
1991-92	0	2	0.86	44	4.81	8
1992-93	2.98	69	1.95	42	7.29	32
1993-94	5.41	17	0.50	3	0	0
1994-95	4.57	48	0	0	0	0
1995-96	7.75	43	0.28	8	0	0
1996-97	6.60	43	0	0	0	0
1997-98	4.63	4	0	0	0	0

Table 13: Snares. Percentage of oreo catch (combined) by nation and fishing year. See Table 3 for abbreviation

	DOM
1990-91	100
1991-92	100
1992-93	100
1993-94	100
1994-95	100
1995-96	100
1996-97	100
1997-98	100

Table 14: Snares. Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1990-91	0	0	100	0
1991-92	0	43	57	0
1992-93	0	30	62	8
1993-94	0	9	46	45
1994-95	0	22	76	2
1995-96	0	46	54	0
1996-97	0	18	85	0
1997-98	0	56	44	0

Table 15: Snares. The number of tows where oreos were caught, number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1990-91	20	10	40	10	0	50	0
1991-92	21	9	0	43	0	57	0
1992-93	387	244	37	10	16	37	0
1993-94	343	68	15	3	1	80	0
1994-95	61	36	54	0	5	41	0
1995-96	127	63	37	9	3	49	2
1996-97	92	68	66	7	1	25	1
1997-98	51	44	69	14	4	14	0

Table 16: Snares. Catch of unspecified oreo, smooth oreo, and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1990-91	0	38	189
1991-92	0	99	274
1992-93	0	720	2 298
1993-94	10	656	1 687
1994-95	5	114	181
1995-96	0	237	561
1996-97	12	251	455
1997-98	59	25	68

Table 17: Snares. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	OEO		SSO		BOE	
	t/tow	n	t/tow	n	t/tow	n
1990-91	19.50	8	0.09	2	0	0
1991-92	0	0	8.80	9	0	0
1992-93	6.98	143	1.55	38	7.52	63
1993-94	10.32	53	3.96	10	2.90	5
1994-95	5.33	33	0	0	1.26	3
1995-96	9.17	47	0.91	11	2.93	4
1996-97	9.78	61	0.17	6	3.00	1
1997-98	2.16	35	1.56	7	3.00	2

Table 18: North of 45° S. Percentage of oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	KOR	NOR	RUS	SOV
1977-78	0	0	0	100	0	0	0
1978-79	58	0	40	1	0	0	0
1979-80	0	0	99	1	0	0	0
1980-81	0	0	14	2	0	84	0
1981-82	0	0	13	0	0	0	86
1982-83	0	90	10	0	0	0	0
1983-84	0	80	1	0	0	0	19
1984-85	0	94	6	0	0	0	0
1985-86	0	100	0	0	0	0	0
1986-87	0	99	0	0	0	0	0
1987-88	0	80	19	0	0	0	0
1988-89	0	96	4	0	0	0	0
1989-90	0	98	0	2	0	0	0
1990-91	0	95	0	0	4	0	0
1991-92	0	100	0	0	0	0	0
1992-93	0	98	1	0	1	0	0
1993-94	0	100	0	0	0	0	0
1994-95	0	100	0	0	0	0	0
1995-96	0	99	0	0	1	0	0
1996-97	0	99	0	0	1	0	0
1997-98	0	100	0	0	0	0	0

Table 19: North of 45° S. Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1977-78	0	100	0	0
1978-79	58	1	40	0
1979-80	0	1	99	0
1980-81	0	86	11	3
1981-82	0	0	6	94
1982-83	0	21	68	10
1983-84	0	80	0	20
1984-85	0	94	0	6
1985-86	0	98	2	0
1986-87	0	100	0	0
1987-88	0	87	13	0
1988-89	0	77	20	4
1989-90	0	97	3	0
1990-91	0	80	19	0
1991-92	0	86	14	0
1992-93	0	98	2	0
1993-94	0	90	2	8
1994-95	0	89	11	0
1995-96	0	96	4	0
1996-97	0	84	16	0
1997-98	0	100	0	0

Table 20: North of 45° S. The number of tows where oreos were caught, the number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1977-78	11	0	0	0	0	0	100
1978-79	189	0	0	0	0	0	100
1979-80	186	0	0	0	0	0	100
1980-81	10	0	0	0	0	0	100
1981-82	144	0	0	0	0	38	62
1982-83	162	1	1	0	0	76	23
1983-84	1 196	2	0	0	0	90	10
1984-85	840	6	0	1	0	78	22
1985-86	383	31	0	8	0	80	12
1986-87	418	1	0	0	0	78	22
1987-88	453	2	0	0	0	86	13
1988-89	218	8	0	2	1	85	11
1989-90	178	54	1	30	0	65	5
1990-91	240	31	3	10	0	80	7
1991-92	389	22	1	5	0	90	4
1992-93	466	42	0	9	0	88	3
1993-94	748	16	0	1	0	87	11
1994-95	495	17	1	3	0	84	13
1995-96	374	123	27	6	0	54	13
1995-96	503	267	38	15	0	31	16
1997-98	318	169	45	8	0	39	8

Table 21: North of 45° S. Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1977-78	1	0	0
1978-79	0	0	11
1979-80	0	0	5
1980-81	0	1	0
1981-82	0	31	6
1982-83	158	28	2
1983-84	163	80	24
1984-85	21	76	12
1985-86	4	100	7
1986-87	0	102	4
1987-88	1	54	6
1988-89	8	46	29
1989-90	0	191	6
1990-91	2	152	29
1991-92	1	223	42
1992-93	12	211	13
1993-94	44	185	49
1994-95	21	111	51
1995-96	21	178	5
1996-97	65	724	6
1997-98	7	197	3

Table 22: North of 45° S. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	OEO		SSO		BOE	
	t/tow	n	t/tow	n	t/tow	n
1977-78	0	0	0	0	0	0
1978-79	0	0	0	0	0	0
1979-80	0	0	0	0	0	0
1980-81	0	0	0	0	0	0
1981-82	0	0	0	0	0	0
1982-83	1.08	1	0	0	0	0
1983-84	0	0	12.04	2	0	0
1984-85	0	0	1.32	6	0	0
1985-86	0	0	1.01	30	0.38	1
1986-87	0.03	1	0	0	0	0
1987-88	0	0	0.69	2	0	0
1988-89	0	0	0.24	5	2.79	3
1989-90	5.70	2	1.46	52	0	0
1990-91	1.40	8	1.79	23	0	0
1991-92	0.23	3	0.95	19	0	0
1992-93	0	1	0.91	41	0	0
1993-94	1.54	3	0.31	11	0.04	2
1994-95	0.57	3	0.51	14	0	0
1995-96	0.84	102	1.51	21	0	0
1996-97	0.83	193	7.90	74	0	0
1997-98	0.44	144	4.08	25	0	0

Table 23: Auckland Islands. Percentage oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	DOM	SOV
1981-82	0	100
1982-83	0	0
1983-84	0	0
1984-85	0	0
1985-86	0	100
1986-87	0	0
1987-88	0	0
1988-89	0	0
1989-90	0	0
1990-91	100	0
1991-92	0	0
1992-93	100	0
1993-94	100	0
1994-95	100	0
1995-96	100	0
1996-97	100	0
1997-98	100	0

Table 24: Auckland Islands. Percentage oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1981-82	0	0	0	100
1982-83	0	0	0	0
1983-84	0	0	0	0
1984-85	0	0	0	0
1985-86	0	0	0	100
1986-87	0	0	0	0
1987-88	0	0	0	0
1988-89	0	0	0	0
1989-90	0	0	0	0
1990-91	0	0	100	0
1991-92	0	0	0	0
1992-93	0	15	0	85
1993-94	0	11	0	88
1994-95	0	56	44	0
1995-96	0	100	0	0
1996-97	0	74	5	22
1997-98	0	72	27	0

Table 25: Auckland Islands. The number of tows where oreos were caught, the number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1981-82	6	5	0	50	33	0	17
1982-83	0	0	0	0	0	0	0
1983-84	0	0	0	0	0	0	0
1984-85	0	0	0	0	0	0	0
1985-86	3	2	0	0	67	0	33
1986-87	0	0	0	0	0	0	0
1987-88	0	0	0	0	0	0	0
1988-89	0	0	0	0	0	0	0
1989-90	0	0	0	0	0	0	0
1990-91	2	0	0	0	0	100	0
1991-92	0	0	0	0	0	0	0
1992-93	68	54	0	79	0	18	3
1993-94	103	9	0	9	0	91	0
1994-95	260	166	33	31	0	36	0
1995-96	177	29	5	11	0	84	0
1996-97	109	24	11	11	0	78	0
1997-98	123	11	9	0	0	91	0

Table 26: Auckland Islands. Catch of unspecified oreo, smooth oreo, and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1981-82	0	10	35
1982-83	0	0	0
1983-84	0	0	0
1984-85	0	0	0
1985-86	0	30	2
1986-87	0	0	0
1987-88	0	0	0
1988-89	0	0	0
1989-90	0	0	0
1990-91	0	0	0
1991-92	0	0	0
1992-93	0	315	0
1993-94	28	274	1
1994-95	0	555	4
1995-96	0	503	1
1996-97	10	267	0
1997-98	5	280	3

Table 27: Auckland Islands. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	<u>OEO</u>	<u>n</u>	<u>SSO</u>	<u>n</u>	<u>BOE</u>	<u>n</u>
1977-78	0	0	0	0	0	0
1978-79	0	0	0	0	0	0
1979-80	0	0	0	0	0	0
1980-81	0	0	0	0	0	0
1981-82	0	0	3.33	3	15.00	2
1982-83	0	0	0	0	0	0
1983-84	0	0	0	0	0	0
1984-85	0	0	0	0	0	0
1985-86	0	0	0	0	0.37	2
1986-87	0	0	0	0	0	0
1987-88	0	0	0	0	0	0
1988-89	0	0	0	0	0	0
1989-90	0	0	0	0	0	0
1990-91	0	0	0	0	0	0
1991-92	0	0	0	0	0	0
1992-93	0	0	4.56	54	0	0
1993-94	0	0	4.03	9	0	0
1994-95	1.58	85	1.04	81	0	0
1995-96	2.28	9	2.82	19	0	0
1996-97	0.80	12	6.34	12	0	0
1997-98	3.16	11	0	0	0	0

Table 28: Bounty Plateau. Percentage oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	SOV
1980-81	13	0	0	87
1981-82	0	0	0	0
1982-83	0	0	0	0
1983-84	0	0	0	100
1984-85	0	0	0	0
1985-86	0	0	0	0
1986-87	0	0	0	0
1987-88	0	0	100	0
1988-89	0	0	0	0
1989-90	0	0	0	0
1990-91	0	100	0	0
1991-92	0	0	0	0
1992-93	0	100	0	0
1993-94	0	100	0	0
1994-95	0	100	0	0
1995-96	0	100	0	0
1996-97	0	100	0	0
1997-98	0	100	0	0

Table 29: Bounty Plateau. Percentage oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1980-81	0	0	0	100
1981-82	0	0	0	0
1982-83	0	0	0	0
1983-84	0	0	0	100
1984-85	0	0	0	0
1985-86	0	0	0	0
1986-87	0	0	0	0
1987-88	0	0	0	100
1988-89	0	0	0	0
1989-90	0	0	0	0
1990-91	0	0	100	0
1991-92	0	0	0	0
1992-93	0	0	100	0
1993-94	0	13	0	87
1994-95	0	23	77	0
1995-96	0	77	23	0
1996-97	0	64	36	0
1997-98	0	35	65	0

Table 30: Bounty Plateau. The number of tows where oreos were caught, the number of oreo target tows (OEO, SSO, BOE) and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1980-81	8	8	38	63	0	0	0
1981-82	0	0	0	0	0	0	0
1982-83	1	1	0	0	100	0	0
1983-84	59	58	0	42	56	0	2
1984-85	0	0	0	0	0	0	0
1985-86	2	2	0	50	50	0	0
1986-87	0	0	0	0	0	0	0
1987-88	2	2	0	100	0	0	0
1988-89	0	0	0	0	0	0	0
1989-90	0	0	0	0	0	0	0
1990-91	6	6	0	100	0	0	0
1991-92	0	0	0	0	0	0	0
1992-93	10	10	100	0	0	0	0
1993-94	24	24	4	96	0	0	0
1994-95	162	155	42	54	0	4	0
1995-96	154	127	77	5	0	17	1
1996-97	170	160	94	0	0	6	0
1997-98	63	48	76	0	0	24	0

Table 31: Bounty Plateau. Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1980-81	3	0	0
1981-82	0	0	0
1982-83	0	0	0
1983-84	0	525	628
1984-85	0	0	0
1985-86	0	0	0
1986-87	0	0	0
1987-88	0	18	0
1988-89	0	0	0
1989-90	0	0	0
1990-91	0	20	78
1991-92	0	0	0
1992-93	0	81	0
1993-94	0	434	3
1994-95	30	1 252	0
1995-96	48	732	2
1996-97	464	98	0
1997-98	7	266	8

Table 32: Bounty Plateau. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	OEO	n	SSO	n	BOE	n
1980-81	1.08	3	0.10	5	0	0
1981-82	0	0	0	0	0	0
1982-83	0	0	0	0	0	1
1983-84	0	0	15.37	25	15.63	33
1984-85	0	0	0	0	0	0
1985-86	0	0	0	1	0	1
1986-87	0	0	0	0	0	0
1987-88	0	0	8.84	2	0	0
1988-89	0	0	0	0	0	0
1989-90	0	0	0	0	0	0
1990-91	0	0	3.33	6	0	0
1991-92	0	0	0	0	0	0
1992-93	8.10	10	0	0	0	0
1993-94	55.00	1	16.61	23	0	0
1994-95	11.19	68	5.67	87	0	0
1995-96	5.28	119	14.11	8	0	0
1996-97	3.49	160	0	0	0	0
1997-98	1.28	48	0	0	0	0

Table 33: Pukaki Rise (east). Percentage of oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	RUS	SOV
1978-79	0	0	0	100	0
1979-80	0	0	0	0	0
1980-81	69	0	0	4	27
1981-82	18	0	0	0	82
1982-83	0	0	0	0	100
1983-84	0	0	0	0	100
1984-85	0	0	3	0	97
1985-86	0	0	0	0	100
1986-87	0	0	0	0	0
1987-88	0	0	100	0	0
1988-89	0	0	0	0	0
1989-90	0	100	0	0	0
1990-91	0	100	0	0	0
1991-92	0	0	0	0	0
1992-93	0	100	0	0	0
1993-94	0	0	0	0	0
1994-95	0	100	0	0	0
1995-96	19	81	0	0	0
1996-97	0	100	0	0	0
1997-98	1	99	0	0	0

Table 34: Pukaki Rise (east). Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1978-79	0	0	0	100
1979-80	0	0	0	0
1980-81	0	1	0	99
1981-82	0	0	0	100
1982-83	0	0	0	100
1983-84	0	0	0	100
1984-85	0	0	0	100
1985-86	0	0	0	100
1986-87	0	0	0	0
1987-88	0	0	0	100
1988-89	0	0	0	0
1989-90	0	0	100	0
1990-91	0	100	0	0
1991-92	0	0	0	0
1992-93	0	0	100	0
1993-94	0	0	0	0
1994-95	0	0	100	0
1995-96	0	7	74	19
1996-97	0	23	66	11
1997-98	0	9	91	0

Table 35: Pukaki Rise (east). The number of tows where oreos were caught, the number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1978-79	4	0	0	0	0	0	100
1979-80	0	0	0	0	0	0	0
1980-81	576	564	4	1	93	0	2
1981-82	476	476	12	3	85	0	0
1982-83	106	106	0	0	100	0	0
1983-84	85	84	8	41	49	0	1
1984-85	169	169	0	4	96	0	0
1985-86	9	9	0	22	78	0	0
1986-87	0	0	0	0	0	0	0
1987-88	1	1	0	100	0	0	0
1988-89	0	0	0	0	0	0	0
1989-90	1	0	0	0	0	0	100
1990-91	1	1	0	100	0	0	0
1991-92	0	0	0	0	0	0	0
1992-93	1	0	0	0	0	100	0
1993-94	0	0	0	0	0	0	0
1994-95	29	29	100	0	0	0	0
1995-96	333	88	22	5	0	69	5
1996-97	606	97	14	2	0	84	0
1997-98	426	292	69	0	0	31	0

Table 36: Pukaki Rise (east). Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1978-79	0	0	5
1979-80	0	0	0
1980-81	62	1	3 118
1981-82	0	41	1 830
1982-83	0	0	402
1983-84	0	229	212
1984-85	0	58	364
1985-86	0	1	19
1986-87	0	0	0
1987-88	0	2	0
1988-89	0	0	0
1989-90	0	0	0
1990-91	0	1	5
1991-92	0	0	0
1992-93	0	1	1
1993-94	0	0	0
1994-95	0	119	210
1995-96	0	1 167	1 146
1996-97	53	1 465	1 898
1997-98	40	937	1 597

Table 37: Pukaki Rise (east). Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	<u>OEO</u>	<u>n</u>	<u>SSO</u>	<u>n</u>	<u>BOE</u>	<u>n</u>
1978-79	0	0	0	0	0	0
1979-80	0	0	0	0	0	0
1980-81	2.83	22	0.32	4	5.70	538
1981-82	2.40	59	1.34	13	4.14	404
1982-83	0	0	0	0	3.79	106
1983-84	1.84	7	6.29	35	1.68	42
1984-85	0	0	1.57	6	2.21	163
1985-86	0	0	0.39	2	2.68	7
1986-87	0	0	0	0	0	0
1987-88	0	0	1.60	1	0	0
1988-89	0	0	0	0	0	0
1989-90	0	0	0	0	0	0
1990-91	0	0	0.50	1	0	0
1991-92	0	0	0	0	0	0
1992-93	0	0	0	0	0	0
1993-94	0	0	0	0	0	0
1994-95	11.34	29	0	0	0	0
1995-96	9.77	72	6.06	16	0	0
1996-97	7.20	82	0	0	0	0
1997-98	6.78	292	0	0	0	0

Table 38: Pukaki Rise (west). Percentage oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	KOR	NOR	OTH	RUS	SOV
1977-78	100	0	0	0	0	0	0	0
1978-79	36	0	5	0	0	0	58	0
1979-80	96	0	4	0	0	0	0	0
1980-81	0	0	0	0	0	0	84	16
1981-82	60	0	0	0	0	0	0	40
1982-83	0	0	0	0	0	0	0	100
1983-84	0	0	0	51	0	0	0	49
1984-85	0	0	0	100	0	0	0	0
1985-86	0	0	0	100	0	0	0	0
1986-87	0	0	0	0	0	0	0	0
1987-88	0	0	100	0	0	0	0	0
1988-89	0	0	0	0	0	0	0	0
1989-90	0	8	0	0	92	0	0	0
1990-91	0	84	0	0	16	0	0	0
1991-92	0	0	0	0	100	0	0	0
1992-93	0	94	0	0	6	0	0	0
1993-94	0	0	0	0	100	0	0	0
1994-95	0	45	0	0	55	0	0	0
1995-96	0	90	0	0	10	0	0	0
1996-97	0	77	0	0	20	0	4	0
1997-98	0	63	0	0	13	23	0	0

Table 39: Pukaki Rise (west). Percentage oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1977-78	100	0	0	0
1978-79	4	0	1	95
1979-80	96	0	4	0
1980-81	0	0	0	100
1981-82	0	5	0	95
1982-83	0	0	0	100
1983-84	0	51	0	49
1984-85	0	100	0	0
1985-86	0	100	0	0
1986-87	0	0	0	0
1987-88	0	0	0	100
1988-89	0	0	0	0
1989-90	0	8	74	18
1990-91	0	0	100	0
1991-92	0	3	55	42
1992-93	0	41	57	2
1993-94	0	55	45	0
1994-95	0	53	10	38
1995-96	0	16	61	23
1996-97	0	81	19	0
1997-98	0	7	32	61

Table 40: Pukaki Rise (west). The number of tows where oreos were caught, the number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1977-78	1	0	0	0	0	0	100
1978-79	17	8	24	0	24	0	53
1979-80	4	0	0	0	0	0	100
1980-81	7	5	0	14	57	0	29
1981-82	6	4	0	17	50	0	33
1982-83	3	3	0	0	100	0	0
1983-84	87	80	0	28	64	1	7
1984-85	125	43	0	1	34	0	66
1985-86	30	30	0	10	90	0	0
1986-87	0	0	0	0	0	0	0
1987-88	12	12	0	100	0	0	0
1988-89	0	0	0	0	0	0	0
1989-90	3	1	0	33	0	0	67
1990-91	24	0	0	0	0	0	100
1991-92	13	0	0	0	0	0	100
1992-93	21	2	10	0	0	43	48
1993-94	5	0	0	0	0	0	100
1994-95	22	1	5	0	0	5	91
1995-96	15	2	13	0	0	20	67
1996-97	20	1	5	0	0	0	95
1997-98	20	0	0	0	0	0	100

Table 41: Pukaki Rise (west). Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1977-78	3	0	0
1978-79	6	0	11
1979-80	0	3	0
1980-81	0	0	5
1981-82	0	0	12
1982-83	0	0	21
1983-84	0	321	800
1984-85	0	252	1 196
1985-86	0	29	51
1986-87	0	0	0
1987-88	0	230	0
1988-89	0	0	0
1989-90	0	0	0
1990-91	0	1	2
1991-92	1	2	1
1992-93	1	28	18
1993-94	0	0	0
1994-95	0	2	2
1995-96	0	7	7
1996-97	0	9	1
1997-98	0	2	3

Table 42: Pukaki Rise (west). Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	OEO		SSO		BOE	
	t/tow	n	t/tow	n	t/tow	n
1977-78	0	0	0	0	0	0
1978-79	1.34	4	0	0	0	4
1979-80	0	0	0	0	0	0
1980-81	0	0	0	1	0.43	4
1981-82	0	0	0	1	2.84	3
1982-83	0	0	0	0	6.84	3
1983-84	0	0	3.10	24	10.61	56
1984-85	0	0	0.48	1	9.23	42
1985-86	0	0	0.89	3	1.85	27
1986-87	0	0	0	0	0	0
1987-88	0	0	19.16	12	0	0
1988-89	0	0	0	0	0	0
1989-90	0	0	0.02	1	0	0
1990-91	0	0	0	0	0	0
1991-92	0	0	0	0	0	0
1992-93	12.50	2	0	0	0	0
1993-94	0	0	0	0	0	0
1994-95	0.60	1	0	0	0	0
1995-96	3.50	2	0	0	0	0
1996-97	7.45	1	0	0	0	0
1997-98	0	0	0	0	0	0

Table 43: Total reported oreo catch combined (t) for oreo management areas OEO 3A and OEO 4, total oreo catch from tow-by-tow data (t) and percentage data captured in tow-by-tow data

Fishing year	OEO 3A total oreo catch		OEO 4 total oreo catch		Percentage captured in tow-by-tow data	
	Reported	Tow-by-tow	Reported	Tow-by-tow	OEO 3A	OEO 4
1978-79*	1 366	1 360	8 041	8 150	99.5	101.4
1979-80*	10 958	8	680	652	0.1	95.9
1980-81*	14 832	15 076	10 269	5 057	101.6	49.2
1981-82*	12 750	21 497	9 296	8 625	168.6	92.8
1982-83*	8 576	6 493	3 927	7 217	75.7	183.8
1983-83#	4 409	9 162	3 209	6 041	207.8	188.3
1983-84†	9 190	9 090	6 104	6 158	98.9	100.9
1984-85†	8 284	6 613	6 390	6 420	79.8	100.5
1985-86†	5 331	4 721	5 883	5 826	88.5	99.0
1986-87†	7 222	7 087	6 830	6 813	98.1	99.8
1987-88†	9 049	8 932	8 674	8 539	98.7	98.4
1988-89†	10 191	8 587	8 447	7 524	84.2	89.1
1989-90†	9 286	7 850	7 348	5 804	84.5	79.0
1990-91†	9 827	8 727	6 936	6 114	88.8	88.1
1991-92†	10 072	5 021	7 457	6 493	49.8	87.1
1992-93†	9 290	7 480	7 976	6 241	80.5	78.2
1993-94†	9 106	8 241	8 319	6 869	90.5	82.6
1994-95†	6 600	5 626	7 680	6 488	85.2	84.5
1995-96†	7 786	7 038	6 806	5 834	90.2	85.7
1996-97†	6 991	6 655	6 962	6 135	95.2	88.1
1997-98†	6 330	4 202	7 011	5 954	66.4	84.9

Source: FSU from 1977-78 to 1987-88; QMS/ITD from 1988-89 to 1997-98. . *, 1 April to 31 March; #, 1 April to 30 September; †, 1 October to 30 September.

Table 44: Total reported landings (t) for all oreo species combined for OEO 3A and OEO 4 from 1978-79 to 1997-98 and TACs (t) from 1982-83 to 1996-98

Fishing year	OEO 3A		OEO 4	
	Landings	TAC	Landings	TAC
1978-79*	1 366	-	8 041	-
1979-80*	10 958	-	680	-
1980-81*	14 832	-	10 269	-
1981-82*	12 750	-	9 296	-
1982-83*	8 576	10 000	3 927	6 750
1983-83#	4 409	-	3 209	-
1983-84†	9 190	10 000	6 104	6 750
1984-85†	8 284	10 000	6 390	6 750
1985-86†	5 331	10 000	5 883	6 750
1986-87†	7 222	10 000	6 830	6 750
1987-88†	9 049	10 000	8 674	7 000
1988-89†	10 191	10 000	8 447	7 000
1989-90†	9 286	10 106	7 348	7 000
1990-91†	9 827	10 106	6 936	7 000
1991-92†	10 072	10 106	7 457	7 000
1992-93†	9 290	10 106	7 976	7 000
1993-94†	9 106	10 106	8 319	7 000
1994-95†	6 600	10 106	7 680	7 000
1995-96†	7 786	10 106	6 806	7 000
1996-97†	6 991	6 600	6 962	7 000
1997-98†	6 330	6 600	7 011	7 000

Source: FSU from 1977-78 to 1987-88; QMS/ITD from 1988-89 to 1997-98. . *, 1 April to 31 March; #, 1 April to 30 September; †, 1 October to 30 September.

Table 45: OEO 3A, excluding data from the Southland fishery. Percentage of oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	KOR	NOR	RUS	SOV
1977-78	3	0	0	0	0	3	94
1978-79	99	0	1	0	0	0	0
1979-80	2	0	1	0	0	60	37
1980-81	4	0	0	0	0	24	72
1981-82	0	0	1	0	0	0	99
1982-83	0	1	1	1	0	0	98
1983-84	0	2	6	6	0	0	86
1984-85	0	6	16	4	0	0	73
1985-86	0	17	16	16	0	0	51
1986-87	0	26	5	14	0	0	55
1987-88	0	48	17	9	0	0	26
1988-89	0	67	11	9	0	0	13
1989-90	0	91	2	7	0	0	0
1990-91	0	96	0	1	3	0	1
1991-92	0	97	0	3	0	0	0
1992-93	0	100	0	0	0	0	0
1993-94	0	96	0	4	0	0	0
1994-95	0	96	0	4	0	0	0
1995-96	0	93	0	3	0	0	0
1996-97	0	96	0	4	0	0	0
1997-98	0	98	0	2	0	0	0

Table 46: OEO 4. Percentage of oreo catch (combined) by nation and fishing year. See Table 3 for abbreviations

	NA	DOM	JAP	KOR	NOR	POL	RUS	SOV
1977-78	41	0	0	0	0	0	44	15
1978-79	2	0	2	0	0	0	75	20
1979-80	0	0	1	0	0	0	59	40
1980-81	0	0	1	0	0	2	48	49
1981-82	0	0	1	0	0	0	0	99
1982-83	0	17	9	0	0	0	0	74
1983-84	0	25	23	4	0	0	0	48
1984-85	0	31	29	5	0	0	0	34
1985-86	0	42	32	5	0	0	0	21
1986-87	0	59	25	0	0	0	0	16
1987-88	0	76	15	6	0	0	0	4
1988-89	0	84	11	2	0	0	0	4
1989-90	0	95	5	0	0	0	0	0
1990-91	0	98	0	2	0	0	0	0
1991-92	0	99	0	0	1	0	0	0
1992-93	0	100	0	0	0	0	0	0
1993-94	0	100	0	0	0	0	0	0
1994-95	0	97	0	0	3	0	0	0
1995-96	0	99	0	0	1	0	0	0
1996-97	0	100	0	0	0	0	0	0
1997-98	0	98	0	0	2	0	0	0

Table 47: OEO 3A, excluding data from the Southland fishery. Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1977-78	0	0	0	100
1978-79	0	1	0	99
1979-80	1	11	0	88
1980-81	4	21	0	75
1981-82	0	19	0	81
1982-83	0	27	1	72
1983-84	0	27	15	59
1984-85	0	24	15	60
1985-86	0	38	15	48
1986-87	0	25	16	59
1987-88	0	29	29	41
1988-89	0	26	50	24
1989-90	0	36	62	2
1990-91	0	55	44	1
1991-92	0	47	52	0
1992-93	0	50	35	14
1993-94	0	61	35	4
1994-95	0	45	55	0
1995-96	0	66	31	3
1996-97	0	83	17	0
1997-98	0	91	7	2

Table 48: OEO 4. Percentage of oreo catch (combined) by vessel tonnage class by fishing year. NA, unknown tonnage class

	NA	< 1 000 t	< 2 000 t	> 2 000 t
1977-78	34	0	0	66
1978-79	2	0	0	98
1979-80	0	1	0	99
1980-81	0	3	0	97
1981-82	0	5	1	94
1982-83	0	6	22	72
1983-84	0	6	39	55
1984-85	0	12	49	39
1985-86	0	22	43	35
1986-87	0	24	46	30
1987-88	0	22	64	15
1988-89	0	23	62	15
1989-90	1	32	63	5
1990-91	0	57	42	0
1991-92	0	52	47	1
1992-93	0	56	44	0
1993-94	0	48	46	6
1994-95	0	54	35	10
1995-96	0	53	43	4
1996-97	0	63	19	18
1997-98	0	65	16	19

Table 49: OEO 3A, excluding data from the Southland fishery. Number of tows where oreos were caught, number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1977-78	179	168	94	0	0	0	6
1978-79	4	1	25	0	0	0	75
1979-80	1 786	1 336	19	9	46	0	25
1980-81	3 152	2 655	21	2	61	1	15
1981-82	1 033	973	4	6	84	3	3
1982-83	1 811	1 551	0	8	78	10	4
1983-84	2 343	1 863	0	19	61	9	12
1984-85	1 496	1 029	1	24	44	22	9
1985-86	1 430	728	1	27	23	43	6
1986-87	1 768	1 315	0	28	46	22	3
1987-88	2 004	1 561	1	39	38	19	3
1988-89	1 677	1 270	19	36	21	22	2
1989-90	1 740	1 297	7	61	6	23	3
1990-91	2 231	1 685	8	63	4	16	9
1991-92	1 046	482	13	19	14	47	7
1992-93	1 455	986	34	28	6	31	2
1993-94	1 968	1 214	40	10	12	34	4
1994-95	1 435	1 026	55	12	4	23	6
1995-96	2 171	1 832	69	9	6	9	7
1996-97	2 173	1 759	64	10	6	11	8
1997-98	1 628	1 069	49	16	0	13	21

Table 50: OEO 4. The number of tows where oreos were caught, the number of oreo target tows and percentage of tows by target species for all tows catching oreos, by fishing year. See Table 5 for abbreviations

	n.total	n.target	Target species (%)				
			OEO	SSO	BOE	ORH	Other
1977-78	872	856	98	0	0	0	2
1978-79	297	149	11	0	39	14	36
1979-80	567	345	49	8	5	5	34
1980-81	2 144	1 065	34	2	14	25	25
1981-82	1 442	1 255	16	22	49	9	4
1982-83	1 738	674	0	23	16	60	1
1983-84	1 420	844	0	39	20	36	5
1984-85	2 088	868	0	29	13	55	3
1985-86	1 918	721	0	27	10	59	3
1986-87	2 254	996	0	31	13	52	3
1987-88	2 546	922	0	30	6	55	9
1988-89	2 949	484	3	11	3	83	1
1989-90	2 119	585	1	26	0	68	4
1990-91	1 756	456	4	21	0	69	6
1991-92	1 709	249	2	13	0	76	9
1992-93	1 472	177	4	8	0	87	1
1993-94	2 216	67	1	2	0	96	1
1994-95	2 032	140	3	4	0	88	5
1995-96	1 361	238	6	11	0	80	3
1996-97	1 521	454	11	19	0	65	5
1997-98	1 915	372	13	6	0	71	10

Table 51: OEO 3A, excluding data from the Southland fishery. Catch of unspecified oreo, smooth oreo and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1977-78	1 360	0	0
1978-79	8	0	0
1979-80	511	5 882	8 683
1980-81	4 065	1 998	15 434
1981-82	0	795	5 698
1982-83	7	2 293	6 862
1983-84	103	3 524	5 463
1984-85	53	3 812	2 748
1985-86	0	2 639	2 082
1986-87	0	3 105	3 982
1987-88	0	5 894	3 038
1988-89	1	5 871	2 715
1989-90	25	5 462	2 363
1990-91	13	4 554	4 160
1991-92	24	2 808	2 189
1992-93	661	2 963	3 856
1993-94	206	4 253	3 782
1994-95	173	3 404	2 049
1995-96	797	3 089	3 152
1996-97	502	2 730	3 423
1997-98	43	3 070	1 089

Table 52: OEO 4. Catch of unspecified oreo, smooth oreo, and black oreo by fishing year. See Table 5 for abbreviations

	Catch (t)		
	OEO	SSO	BOE
1977-78	8 150	0	0
1978-79	0	106	546
1979-80	1 549	626	2 882
1980-81	2 710	898	5 017
1981-82	0	3 623	3 594
1982-83	60	3 864	2 117
1983-84	15	4 863	1 280
1984-85	8	4 758	1 654
1985-86	0	4 846	980
1986-87	0	5 659	1 154
1987-88	0	7 644	895
1988-89	0	6 430	1 094
1989-90	26	5 339	439
1990-91	65	5 256	793
1991-92	7	4 790	1 696
1992-93	1 053	3 844	1 344
1993-94	548	4 765	1 556
1994-95	109	5 760	619
1995-96	42	5 428	364
1996-97	1	5 603	531
1997-98	3	5 279	672

Table 53: OEO 3A, excluding data from the Southland fishery. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	<u>OEO</u>	<u>n</u>	<u>SSO</u>	<u>n</u>	<u>BOE</u>	<u>n</u>
1977-78	7.87	168	0	0	0	0
1978-79	7.53	1	0	0	0	0
1979-80	7.62	346	15.53	166	5.07	824
1980-81	8.95	666	4.70	75	6.43	1 914
1981-82	7.18	44	2.50	58	6.30	871
1982-83	0	0	8.16	147	4.58	1 404
1983-84	13.39	2	3.69	434	3.25	1 427
1984-85	1.30	13	7.43	353	2.91	663
1985-86	3.93	9	4.43	389	3.27	330
1986-87	0	0	3.97	503	3.38	812
1987-88	5.43	17	5.61	776	2.29	768
1988-89	4.26	319	6.78	600	2.92	351
1989-90	6.29	125	3.35	1 067	4.27	105
1990-91	8.13	181	2.54	1 413	4.78	91
1991-92	8.11	138	7.72	194	4.93	150
1992-93	7.58	501	2.52	403	2.95	82
1993-94	6.50	794	2.38	188	5.54	232
1994-95	5.53	789	1.91	178	4.63	59
1995-96	3.66	1 506	1.92	186	3.36	140
1996-97	3.42	1 400	1.86	220	6.02	139
1997-98	3.00	800	4.59	261	5.26	8

Table 54: OEO 4. Target catch per tow (t/tow) by species and number of target tows (n) by fishing year. See Table 5 for abbreviations

	<u>OEO</u>	<u>n</u>	<u>SSO</u>	<u>n</u>	<u>BOE</u>	<u>n</u>
1977-78	9.32	856	0	0	0	0
1978-79	3.49	33	0	0	2.88	116
1979-80	10.62	275	14.21	44	7.66	26
1980-81	6.33	724	8.84	37	4.96	304
1981-82	5.74	235	5.57	316	4.23	704
1982-83	0	0	3.95	397	3.72	277
1983-84	0	0	4.81	558	2.89	286
1984-85	0	0	3.75	607	1.82	261
1985-86	14.84	5	4.32	525	2.53	191
1986-87	2.58	3	4.15	708	2.27	285
1987-88	1.60	2	4.70	765	2.30	155
1988-89	3.33	91	4.62	318	7.13	75
1989-90	3.65	28	3.49	557	0	0
1990-91	8.76	79	3.80	375	5.68	2
1991-92	11.77	26	5.27	219	4.00	4
1992-93	6.77	56	7.10	120	0	1
1993-94	4.35	26	2.55	38	2.67	3
1994-95	5.00	64	10.21	76	0	0
1995-96	7.11	83	9.16	154	0	1
1996-97	6.84	161	5.80	292	13.55	1
1997-98	5.63	255	8.70	117	0	0

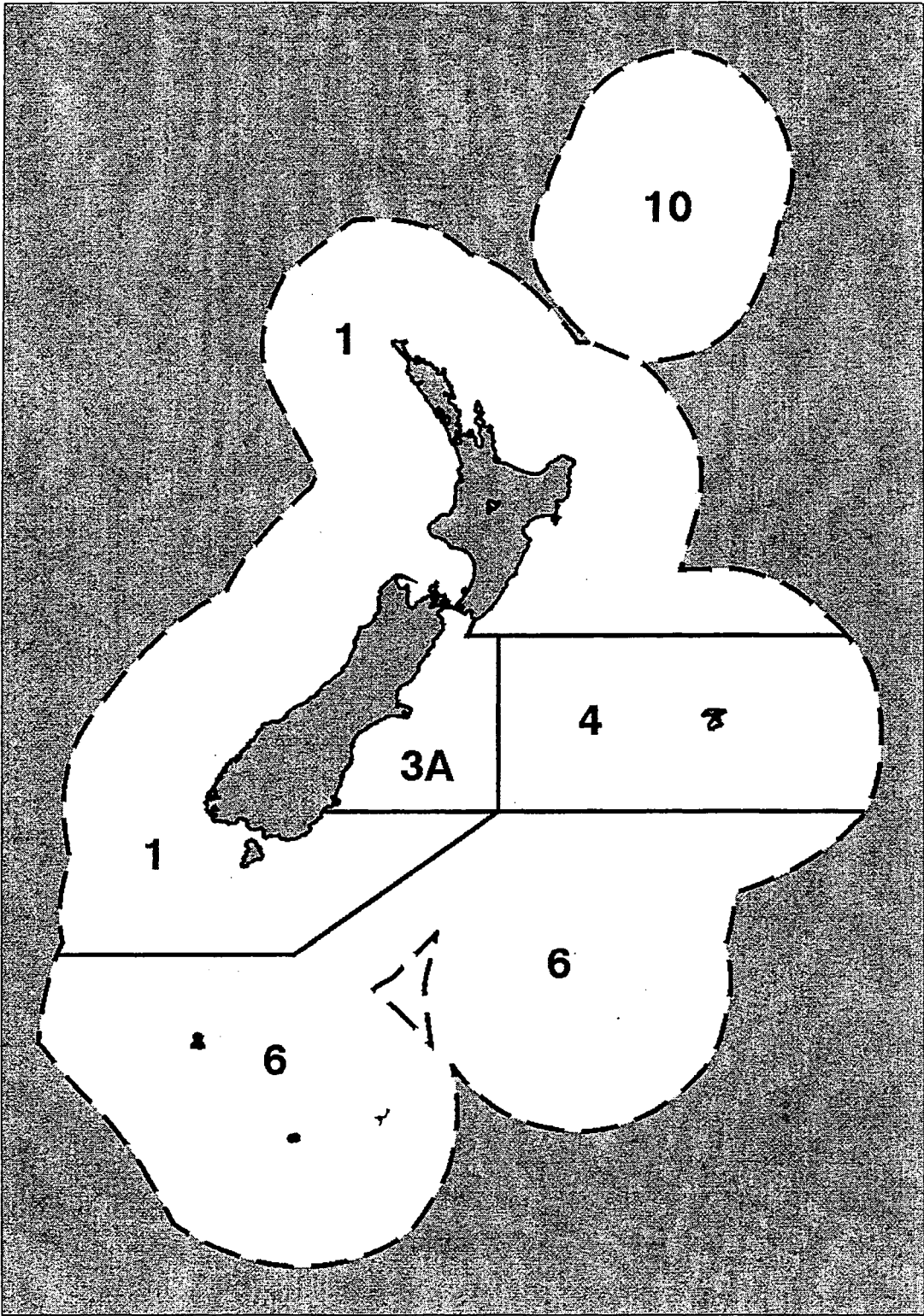


Figure 1: Oreo management areas.

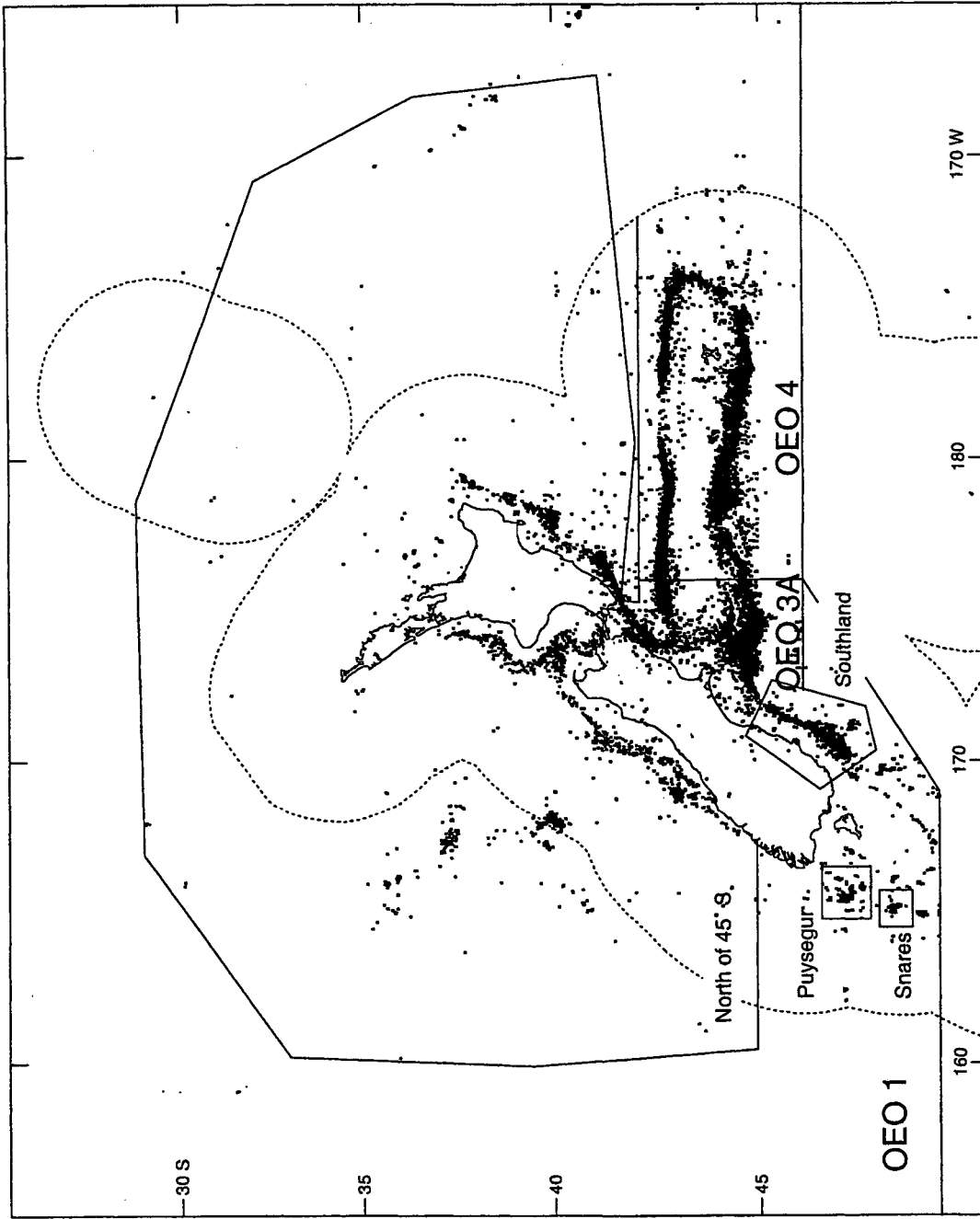


Figure 2: Boundaries of OEO 1 and fisheries (rectangles and polygons) defined in the text and positions of trawls that caught or targeted oreos from 1977-78 to 1996-97 combined (black dots).

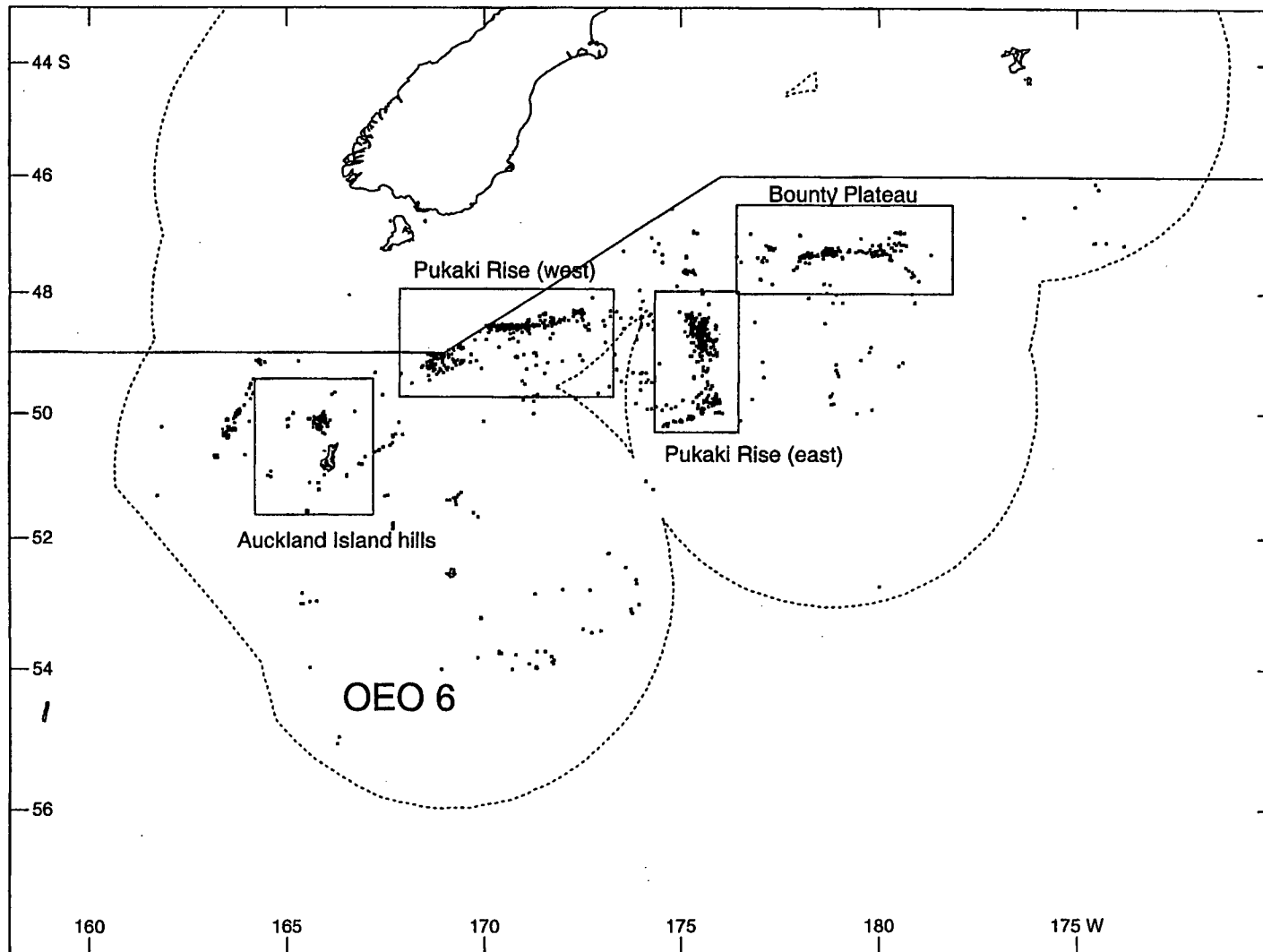


Figure 3: Boundaries of OEO 6 and fisheries (rectangles) defined in the text and positions of trawls that caught or targeted oreos from 1977-78 to 1996-97 combined (black dots).

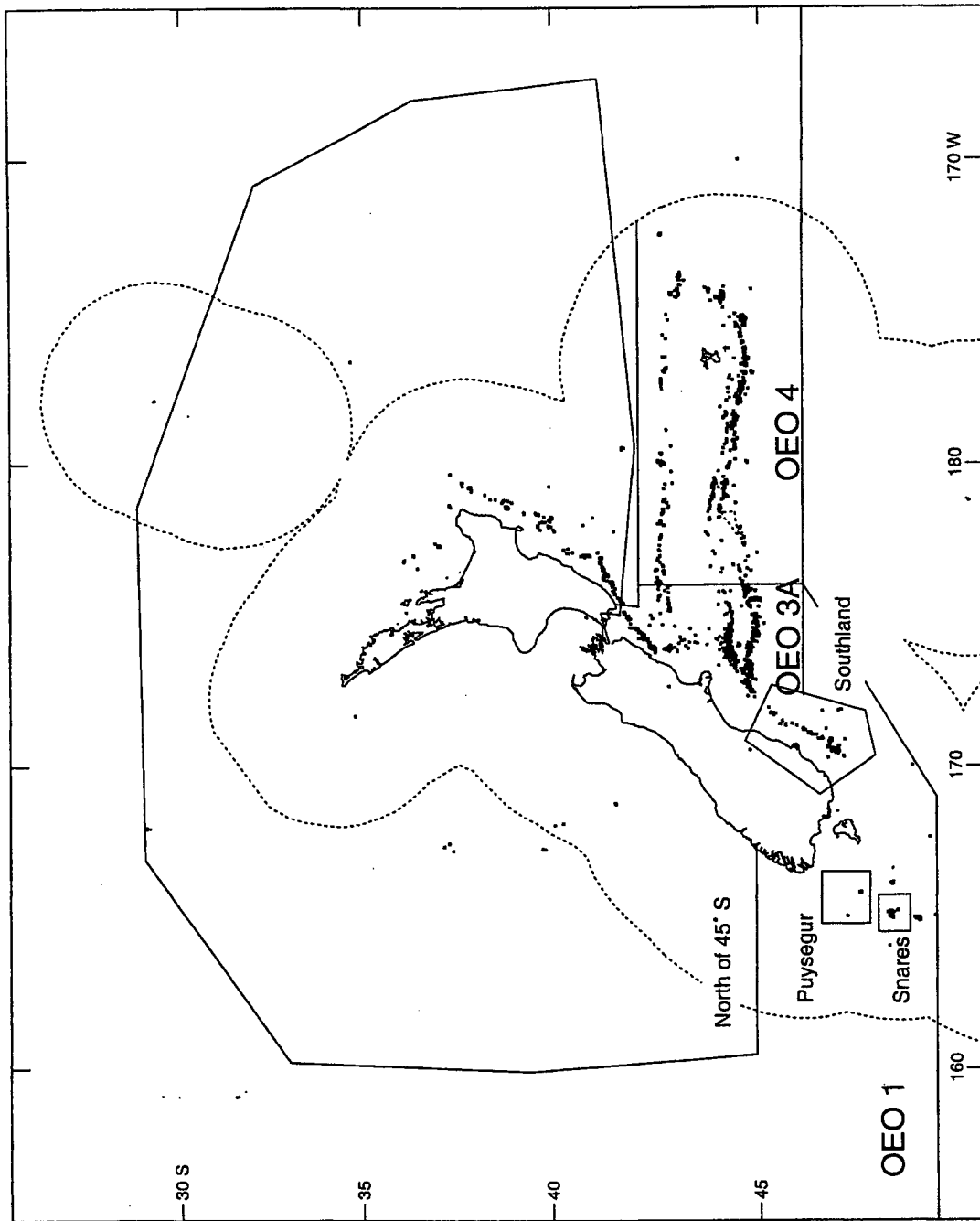


Figure 4: Boundaries of OEO 1 and fisheries (rectangles and polygons) defined in the text and positions of trawls that caught or targeted oecos for the 1997-1998 fishing year (black dots).

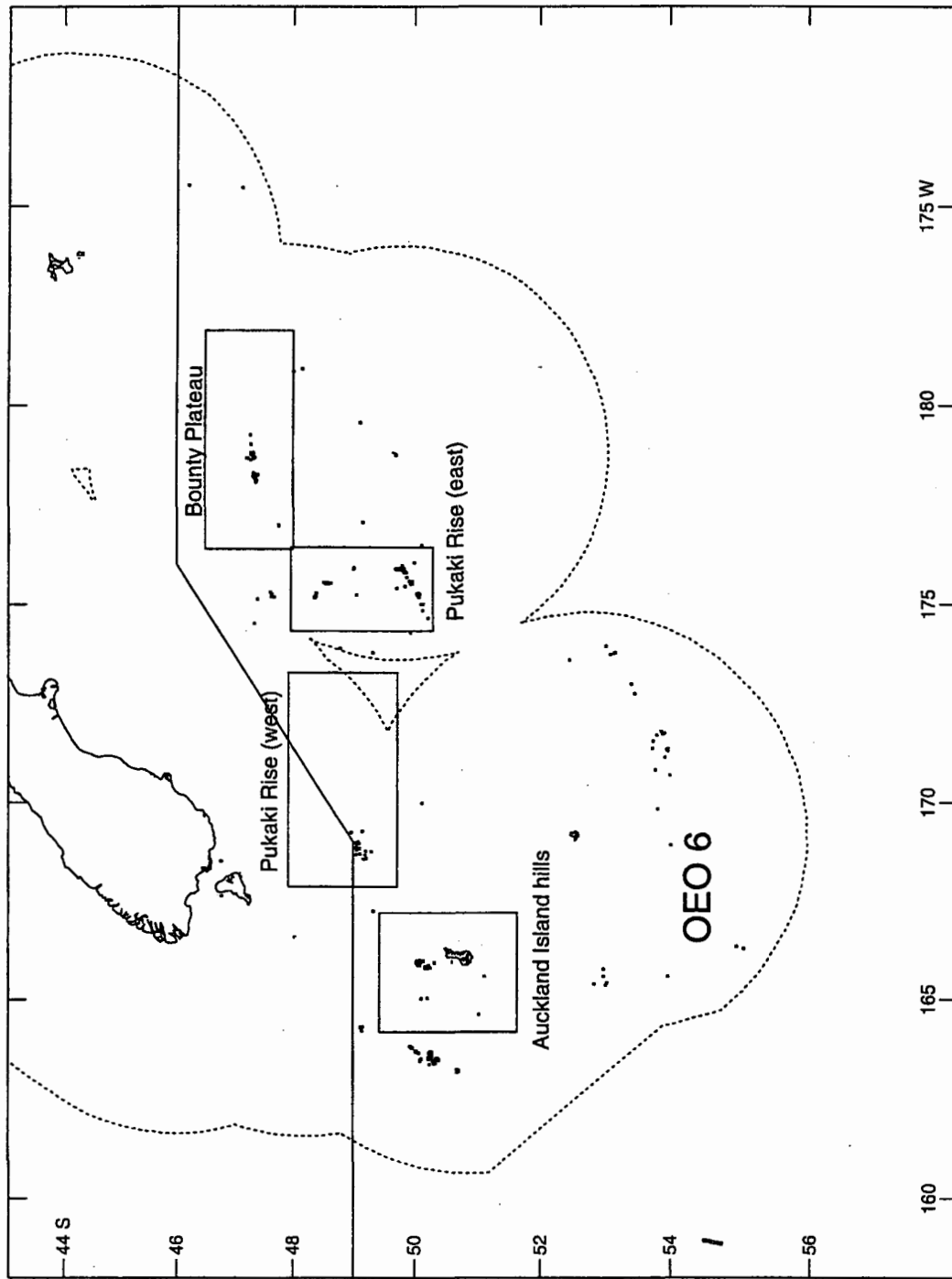


Figure 5: Boundary of OEO 6 and fisheries (rectangles) defined in the text and positions of trawls that caught or targeted oreos for the 1997-1998 fishing year (black dots).