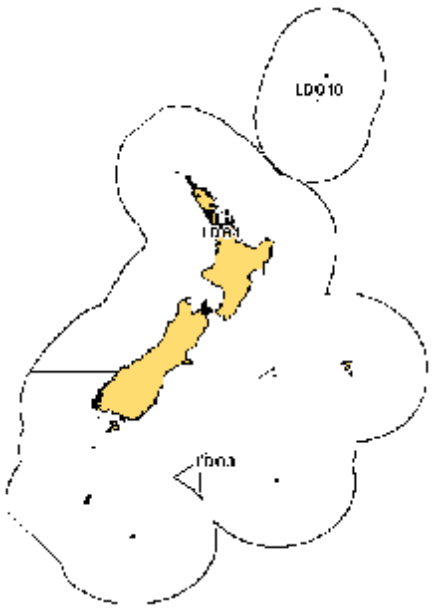
LOOKDOWN DORY (LDO)

(Cyttus traversi)



1. FISHERY SUMMARY

Lookdown dory was introduced into the Quota Management System (QMS) on 1 October 2004 with the allowances, TACs and TACCs as follows:

Fishstock	Recreational Allowance	Māori Customary Allowance	TACC	TAC
LDO 1	0	0	168	168
LDO 3	0	0	614	614
LDO 10	0	0	1	1
Total	0	0	783	783

(a) Commercial fisheries

Reliable landings data are available from 1989–90 onwards, after the introduction of Catch Landing Returns (CLRs) in the previous year (Table 2). Annual landings are also available from Licensed Fish Receiver Returns (LFRRs), and these agree well with CLR figures in most years (within 10%), but differ by 20–27% in 4 of the 12 years with comparable data. Total landings (CLR) have increased steadily from 127 t in 1989–90 to 760 t in 2001–02. Estimated catch as a percentage of recorded landings has only been moderate; it was 60–70% in the early 1990s, but subsequently declined to around 30%. Lookdown dory will often not be included within the top five species in a trawl haul, but the reason for the declining percentage of landings that is recorded as catch is unknown.
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Catches have declined in the last 2 years with TACCs being undercaught in both LDO 1 and LDO 3 in 2004-05 (Table 1). This probably reflects the reduction in the size of the hoki fishery, from which the greatest proportion of lookdown dory has been taken as bycatch.

Table 1: Reported domestic landings (t) of Lookdown Dory by Fishstock and TACC from 2004-05.

Fishstock	LDO 1		LDO 3		LDO 10			
FMA	1,2,7,8&9		3,4,5&6		10		Total	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
2004-05	111	168	272	614	0	1	383	783

Table 2: Reported landings and estimated catch (t) of lookdown dory by fishing year. Also, percentage of landings recorded as catch in the catch effort databases. of –, data not available.

Year	Landings (CLR)	Landings (LFRR)	Estimated catch (t)	% of CLR landings recorded as estimated catch
1989–90	127	161	80	63
1990–91	164	182	105	64
1991–92	249	216	177	71
1992–93	275	264	159	58
1993–94	188	226	117	62
1994–95	283	277	125	44
1995–96	260	276	107	41
1996–97	354	426	173	49
1997–98	564	557	265	47
1998–99	625	640	228	36
1999–00	637	605	215	34
2000–01	694	504	157	23
2001–02	760	–	254	33

Lookdown dory is generally caught by bottom trawling in depths of 200 to 800 m as a bycatch in a range of fisheries including hoki, barracouta, hake, ling, scampi and jack mackerel. A small amount of target fishing is reported from FMA 7. Most of the catch has come from FMA 3 (east coast South Island), FMA 4 (Chatham Rise), and FMA 7 (west coast South Island) (Table 3). Landings from around the North Island have been restricted mostly to a few tonnes from FMA 1 and FMA 2 in each year, as well as from FMA 9 in the last three fishing years. In FMA 5 (Southland) and FMA 6 (Sub-Antarctic) landings have been in the order of 10–30 t over the past six years. No landings have been reported from outside the New Zealand EEZ.

The greatest proportion of the estimated catch of lookdown dory is taken as bycatch in the hoki fishery. For all fishing years and FMAs combined, 83% of lookdown dory catch has been bycatch in the hoki fishery, with other fisheries (barracouta 4%, hake 3%, ling 2% and scampi 2%) catching a smaller fraction (Anderson et al. 2001).

Table 3: Reported historic landings (rounded to nearest tonne) of lookdown dory by FMA and fishing year 1989-90 to 2003-04.

Year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 6	FMA 7	FMA 8	FMA 9	FMA 10
1989-90	2	1	40	20	12	2	51	-	-	-
1990-91	3	4	46	59	10	11	33	<1	-	-
1991-92	1	2	96	75	17	3	55	-	-	-
1992-93	1	4	63	112	10	2	83	-	-	-
1993-94	<1	2	62	50	4	3	67	-	<1	-
1994-95	1	6	73	108	7	3	85	-	<1	-
1995--96	2	4	99	78	11	3	62	-	<1	-
1996-97	7	10	108	110	11	7	100	<1	<1	-
1997-98	5	8	159	272	11	25	82	-	<1	-
1998-99	3	3	161	295	21	17	124	<1	10	-
1999-00	3	5	161	295	21	17	124	<1	10	-
2000-01	2	6	203	318	24	25	111	<1	4	-
2001-02	10	10	181	331	26	28	170	3	2	-
2002-03	8	8	261	365	48	32	167	1	2	-
2003-04	13	8	135	210	22	24	113	3	1	-

Landings of lookdown dory have been well spread out over the year during the 1989–90 to 2001–02 period, with no clear seasonal pattern. Catches are more dependent on fishing activity in the target fisheries, particularly hoki, where it is taken as bycatch.

(b) Recreational fisheries

There is no quantitative information on recreational harvest levels of lookdown dory. Due to the offshore location and depth distribution of lookdown dory recreational catch is thought to be negligible.

(c) Maori customary fisheries

An estimate of current catch is not available but given the offshore location and depth distribution of lookdown dory Maori customary catch is thought to be negligible.

2. BIOLOGY

Lookdown dory (*Cyttus traversi*) belongs to the family Zeidae. This family includes 13 species in seven genera distributed among the Atlantic and Pacific Oceans and the Mediterranean Sea. Lookdown dory also occurs in Australian waters, mostly east and south of Tasmania, where it is known as king dory, and also in South Africa. It is widely distributed throughout New Zealand waters with most records from the Chatham Rise. The geographical and depth distribution of immature (< 33 cm) fish is similar to that of adults (Hurst et al. 2000).

It is one of the less abundant members of a loosely associated group of about 23 common species, which together form the upper slope assemblage of New Zealand's continental shelf (Francis et al. 2002). The main species in this group are hoki, javelin fish, ling, pale ghostshark, sea perch, hake, and longnose spookfish (chimaerid). It was identified as a key species characterising the demersal fish community 350–550 m on the Chatham Rise (Bull et al. 2001).

Juveniles are found in surface waters up to a length of approximately 12 cm (May & Maxwell 1986), at which stage a metamorphosis occurs associated with the transition from a pelagic to a demersal habitat (James 1976). Adults are most common between 400 to 600 m, but have a wide depth range, from 50 to 1 200 m (Anderson et al. 1998). The main prey of lookdown dory are natant decapod crustaceans, followed by euphausid, mysid, galatheid, and nephropsid crustaceans, and fish (Clark & King 1989). Lookdown dory is likely to be prey of larger fish and have occasionally been recorded in the stomachs of large ling.

Trawl survey catch distribution across the Chatham Rise is fairly even, with females ranging from 10 to 55 cm total length, and males ranging from 10 to 40 cm. Lookdown dory show early signs of ripening to spawn in the January surveys (Livingston et al. 2002).

Catch distribution across the Sub-Antarctic is more patchy than across the Chatham Rise, particularly during autumn surveys (O'Driscoll & Bagley 2001). The size ranges are similar to those of the Chatham Rise.

Around the North Island, female lookdown dory are known to mature at about 35 cm (May & Maxwell 1986). Ripe specimens usually seen in autumn and winter but have also been observed in summer (Clark & King 1989). Spent females are more common in winter and especially spring but again have also been recorded in summer and autumn. Although most spawning takes place in autumn and winter it is likely that it is not a discrete event but occurs over much of the year. Research data from other areas are sparse, but show the presence of fish in spawning condition in most months of the year.

Although there are no published studies of age and growth of lookdown dory, preliminary work in Australia suggests this species may live to over 30 years (Stewart and Smith 1992).

3. STOCKS AND AREAS

There is no information on stock structure, recruitment patterns, or other biological characteristics on which to base any fishstock boundaries.

4. ABUNDANCE INDICES

The relative abundance of lookdown dory is measured by hoki trawl surveys of the Chatham Rise and the Sub-Antarctic. Lookdown dory biomass is usually in the top 10 species on the Chatham Rise (Table 4). From 1992 to 2001, there was a significant upward trend in biomass, (Livingston et al. 2002) but lower estimates from recent surveys increase variability in the trend (Livingston & Stevens 2005). Lookdown dory are far less abundant in the Sub-Antarctic and biomass estimates have higher c.v.s (Table 4).

Trends in observed incidental catch of lookdown dory by the commercial fleet on the Chatham Rise from 1989–90 to 1998–99 showed increasing catches of lookdown dory and variable cpue (t per tow) (Livingston et al. 2003).

Table 4. Lookdown dory biomass estimates from *Tangaroa* trawl surveys of the Chatham Rise (January, 200–800 m) and the Sub-Antarctic (summer and autumn series 300–800 m).

	Chatham Rise		Sub-Antarctic		Sub-Antarctic	
	t x 10^3	c.v.	t x 10^3	c.v.	t x 10^3	c.v.
January			Summer		Autumn	
1992	4.80	5.6	1.079	13.0	1.154	40.0
1993	6.44	5.2	1.031	11.0	1.747	44.0
1994	7.66	7.2	0.816	13.0	-	-
1995	4.45	6.7	-	-	-	-
1996	7.54	8.0	-	-	1.042	18.0
1997	6.57	7.6	-	-	-	-
1998	7.02	6.0	-	-	0.489	34.0
1999	7.42	8.2	-	-	-	-
2000	7.65	7.0	0.921	15.2	-	-
2001	7.71	6.5	0.567	19.6	-	-
2002	8.82	11.1	0.446	22.1	-	-
2003	5.90	7.0	0.636	23.7	-	-
2004	6.75	7.7	0.614	28.0	-	-
2005	6.35	9.3	0.707	19.0		
2006	7.82	8.0				

5. STOCK ASSESSMENT

There has been no scientific assessment of the maximum sustainable yield for lookdown dory stocks. Relative biomass estimates are available from annual trawl surveys on the Chatham Rise (1992-2005). These estimates show no decline in recent years.

6. STATUS OF THE STOCK

There are no known sustainability concerns in the lookdown dory fishery. However, it is not known whether recent catches will allow the stock to move towards a size that will support the maximum sustainable yield.

Summary of TACCs (t) and reported landings (t) of lookdown dory for the most recent fishing year.

Fishstock		FMA	2004-05 Actual TACC	2004-05 Reported landings
LDO 1	Auckland (East) (West), Central (East) (West), Challenger	1,2,7,8&9	168	111
LDO 3	South east (coast) (Chatham), Southland, Sub-antartic	3,4,5&6	614	272
LDO 10	Kermadec	10	1	0
Total			783	383

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