FLATFISH (FLA)

(*Colistium nudipinnis*, *Peltorhamphus novaezelandiae*, *Colistium guntheri*, *Rhombosolea retiaria*, *Rhombosolea plebeoa*, *Rhombosolea leporina*, *Rhombosolea tapirina*, *Pelotretis flavilatus*)
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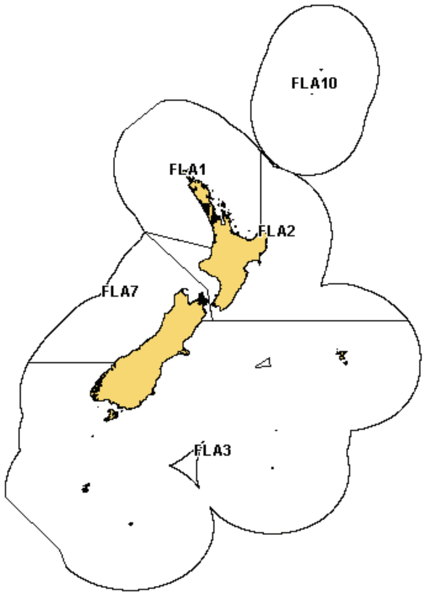

1. FISHERY SUMMARY

1.1 Commercial fisheries

Flatfish ITQ provides for the landing of eight species of flatfish. These are: the yellow-belly flounder, *Rhombosolea leporina*; sand flounder, *Rhombosolea plebeia*; black flounder, *Rhombosolea retiaria*; greenback flounder, *Rhombosolea tapirina*; lemon sole, *Pelotretis flavilatus*; New Zealand sole, *Peltorhamphus novaezeelandiae*; brill, *Colistium guntheri*; and turbot, *Colistium nudipinnis*. For management purposes landings of these species are combined.

Flatfish are shallow water species, taken mainly by the inshore trawl fleet. Set and drag net fishing are important in the northern harbours and the Firth of Thames. Important fishing areas are:

Yellow-belly flounder	–	Firth of Thames, Kaipara and Manukau harbours;
Sand flounder	–	Hauraki Gulf, Tasman/Golden Bay, Bay of Plenty, and Canterbury Bight;
Greenback flounder	–	Canterbury Bight, Southland;
Black flounder	–	Canterbury Bight;
Lemon sole	–	west coast South Island, Otago and Southland;
New Zealand sole	–	west coast South Island, Otago and Canterbury Bight;
Brill and turbot	–	west coast South Island.

TACCs were originally set at the level of the sum of the provisional ITQs for each fishery. Between 1983–84 and 1992–93 total flatfish landings fluctuated between 5160 t and 2750 t; from 1992–93 to 1997–98, landings were relatively consistent, between about 4500 t and 5000 t per year. Landings declined to 2963 t in 1999–2000, the lowest recorded since 1986–87, subsequently increased to a peak of 4051 t for the 2006–07 fishing year and have declined again in 2007–08 to 3629 t. Landings and TACCs are given in Table 1, while Figure 1 shows the historical landings and TACC values for the main FLA stocks. From 1 October 2007 a TAC and allowances were set for the first time in FLA 3. The FLA 3 TACC was reduced by 47% to 1430 t, customary, recreational and other sources of mortality were allocated 5, 150 and 32 t respectively.
The fishery is mainly confined to the inshore domestic trawl fleet except for small incidental bycatch of soles, brill and turbot by deepwater trawlers, and some localised setnetting, particularly in the north.

Table 1: Reported landings (t) of flatfish by Fishstock from 1983–84 to 2006–07 and actual TACCs (t) from 1986–87 to 2007–08. QMS data from 1986–present

Fishstock	FLA 1		FLA 2		FLA 3		FLA 7		FLA 10	
FMA (s)	1 & 9		2 & 8		3, 4, 5 & 6		7		10	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1983–84*	1 215	–	378	–	1 564	–	1 486	–	0	–
1984–85*	1 050	–	285	–	1 803	–	951	–	0	–
1985–86*	722	–	261	–	1 537	–	385	–	0	–
1986–87	629	1 100	323	670	1 235	2 430	563	1 840	0	10
1987–88	688	1 145	374	677	2 010	2 535	1 000	1 899	0	10
1988–89	787	1 153	297	717	2 458	2 552	757	2 045	0	10
1989–90	791	1 184	308	723	1 637	2 585	745	2 066	0	10
1990–91	849	1 187	292	726	1 340	2 681	502	2 066	0	10
1991–92	940	1 187	288	726	1 229	2 681	745	2 066	0	10
1992–93	1 106	1 187	460	726	1 954	2 681	1 566	2066	0	10
1993–94	1 136	1 187	435	726	1 926	2 681	1 108	2 066	0	10
1994–95	964	1 187	543	726	1 966	2 681	1 107	2 066	0	10
1995–96	628	1 187	481	726	2 298	2 681	1 163	2 066	1	10
1996–97	741	1 187	363	726	2 573	2 681	1 117	2 066	0	10
1997–98	728	1 187	559	726	2 351	2 681	1 020	2 066	0	10
1998–99	690	1 187	274	726	1 882	2 681	868	2 066	0	10
1999–00	751	1 187	212	726	1 583	2 681	417	2 066	0	10
2000–01	792	1 187	186	726	1 702	2 681	447	2 066	0	10
2001–02	596	1 187	177	726	1 693	2681	614	2 066	0	10
2002–03	686	1 187	144	726	1 650	2 681	819	2 066	0	10
2003–04	784	1 187	218	726	1 286	2 681	918	2 066	0	10
2004–05	1 038	1 187	254	726	1 353	2 681	1 231	2 066	0	10
2005–06	964	1 187	296	726	1 177	2 681	1 283	2 066	0	10
2006–07	920	1 187	296	726	1 425	2 681	1 411	2 066	0	10
2007–08	704	1 187	243	726	1 369	1430	1 313	2 066	0	10

Fishstock		
FMA (s)	Total	
	Landings§	TACC
1983–84*	5 160	–
1984–85*	4 467	–
1985–86*	3 215‡	-
1986–87	2 750‡	6 050
1987–88	4 072‡	6 266
1988–89	4 299	6 477
1989–90	3 482	6 568
1990–91	2 983	6 670
1991–92	3 202	6 670
1992–93	5 086	6 670
1993–94	4 605	6 670
1994–95	4 580	6 670
1995–96	4 571	6 670
1996–97	4 794	6 670
1997–98	4 657	6 670
1998–99	3 714	6 670
1999–00	2 963	6 670
2000–01	3 127	6 670
2001–02	3 080	6 670
2002–03	3 299	6 670
2003–04	3 206	6 670
2004–05	3 876	6 670
2005–06	3 720	6 670
2006–07	4 051	6 670
2007–08	3 629	5 409

* FSU data.
‡ Includes 11 t Turbot, area unknown but allocated to QMA 7.
§ Includes landings from unknown areas before 1986–87.

Fishers and processors are required to use a generic flatfish (FLA) code in the monthly harvest returns to report landed catches of flatfish species. Although fishers are now instructed to use specific species codes when reporting estimated catches, they often use the generic FLA code. Beentjes (2003) showed that, for all QMAs combined between 1989–90 and 2001–02, about half of the estimated catch of flatfish was recorded using the generic species code FLA, and the remainder was reported using a combination of 12 other species codes (Table 2). Flatfish species that comprised a large proportion of the total estimated catch over the 13 year period included ESO (16%), LSO (12%), SFL (12%) and YBF (6%). Species that are important contributors to catch in each QMA are FLA 1: YBF,

SFL, GFL; FLA 2: ESO, SFL; FLA 3: ESO, LSO, SFL, BFL, BRI; FLA 7: GFL, SFL, TUR (Table 3; codes provided in the caption to Table 2).

Table 2: Total estimated flatfish catch (t) by species and fishing year for all flatfish QMAs combined. Codes: black flounder (BFL), brill (BRI), New Zealand sole (ESO), flatfish not species (FLA, FLO, SOL), greenback flounder (GFL), lemon sole (LSO), sand flounder (SFL), Turbot (TUR), witch (WIT), yellow belly flounder (YBF) (Beentjes 2003).

Year	BFL	BRI	ESO	FLA	FLO	GFL	LSO	SFL	SOL	TUR	WIT	YBF	Total (t)
1989–90	0	0	0	2 750	0	0	0	<1	0	0	<1	<1	2 750
1990–91	114	44	238	1 566	0	75	103	284	0	24	1	182	2 629
1991–92	23	45	384	1 530	0	64	151	336	<1	64	2	209	2 809
1992–93	40	74	904	1 948	0	119	521	688	0	87	3	235	4 619
1993–94	24	54	836	1 457	0	94	446	755	0	63	2	249	3 980
1994–95	66	54	742	1 546	<1	92	466	689	3	69	19	277	4 024
1995–96	95	48	730	1 523	12	50	607	515	15	61	0	154	3 810
1996–97	39	43	731	1 714	32	61	561	477	4	42	5	153	3 863
1997–98	14	33	550	1 718	29	59	714	452	4	39	1	162	3 775
1998–99	24	41	418	1 294	28	45	667	297	4	37	3	202	3 060
1999–00	61	44	355	1 075	7	36	408	247	2	30	1	267	2 534
2000–01	42	42	479	1 086	13	29	392	245	3	40	45	316	2 733
2001–02	85	27	495	1 098	9	35	271	199	1	41	28	210	*2 498
Total	627	550	6 864	20 305	130	759	5 306	5 184	36	595	110	2617	43 084
Percent	1.4	1.3	15.9	47.1	0.3	1.8	12.3	12.0	0.1	1.4	0.3	6.1	

* October 2001 to August 2002

Table 3: Distribution (%) of the total estimated catch of 13 flatfish species by QMA for the period 1989–90 and 2001 02 (Beentjes, 2003). Species codes are provided in the caption to Table 1. Catches were allocated to specific QMAs based on the reported statistical area of catch.

QMA	BFL	BLF	BRI	ESO	FLA	FLO	GFL	LSO	SFL	SOL	TUR	WIT	YBF	All species
FLA 1	6		3	2	27	1	26	2	23	8	2	0	83	22
FLA 2	15		0	8	13	5	12	1	13	79	4	2	2	10
FLA 3	74	99	62	64	41	94	28	92	29	12	26	87	11	48
FLA 7	5	1	34	27	19	1	34	5	36	1	69	11	3	20
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100

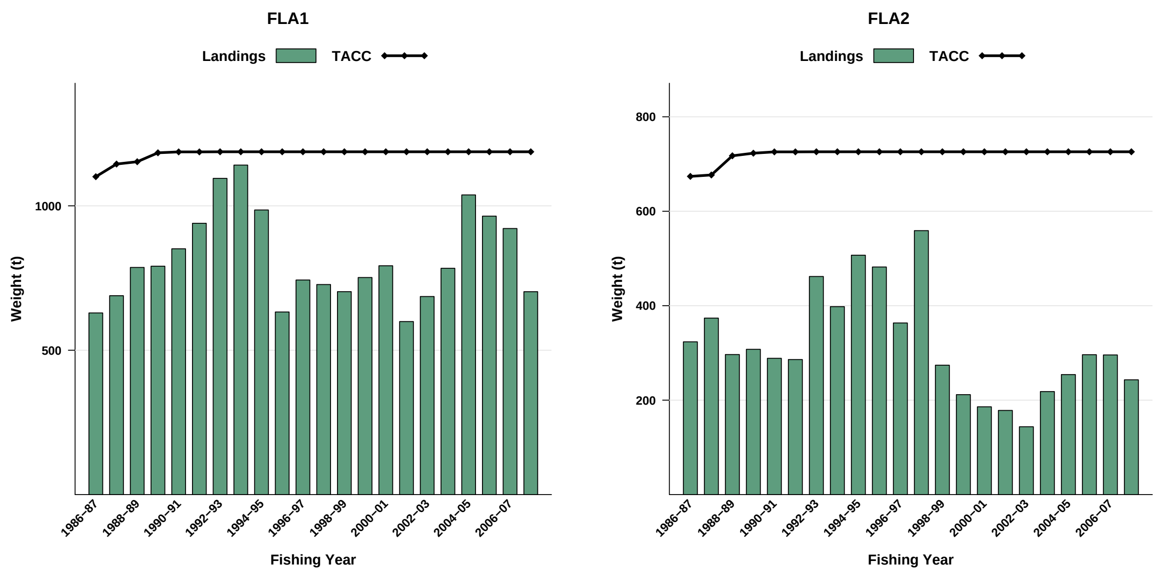

Figure 1: Historical landings and TACC for the four main FLA stocks. Left to right: FLA1 (Auckland) and FLA2 (Central). [Continued on next page]…

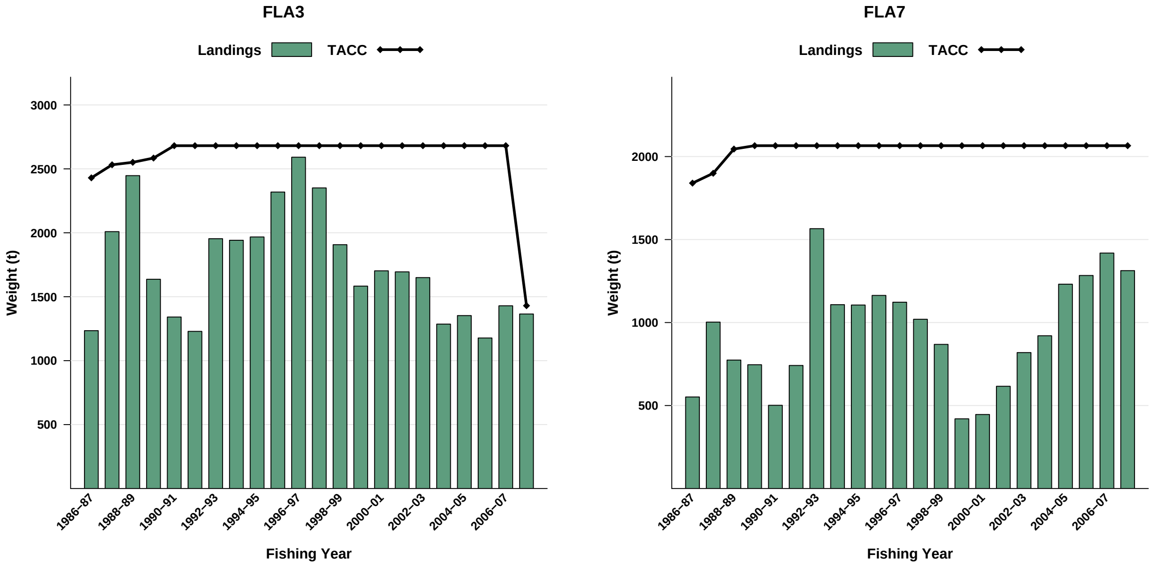

Figure 1 [Continued]: Historical landings and TACC for the four main FLA stocks. FLA3 (South East Coast, South East Chatham Rise, Sub Antarctic, Southland), and FLA7 (Challenger). Note that these figures do not show data prior to entry into the QMS.

1.2 Recreational fisheries

There are important recreational fisheries, mainly for the four flounder species, in most harbours, estuaries, coastal lakes and coastal inlets throughout New Zealand. The main methods are setnetting, drag netting and spearing. In the northern region, important areas include the west coast harbours, the lower Waikato, the Hauraki Gulf and the Firth of Thames. In the Bay of Plenty, Ohiwa and Tauranga Harbours are important. In the Challenger FMA, there is a moderate fishery in Tasman and Golden Bays and in areas of the Mahau-Kenepuru Sound and in Cloudy Bay. In the South-East and Southland FMAs, flatfish are taken in areas such as Lake Ellesmere, inlets around Banks Peninsula and the Otago Peninsula, the Oreti and Riverton estuaries, Bluff Harbour and the inlets and lagoons of the Chatham Islands (for further details see the 1995 Plenary Report). Harvest estimates from recreational surveys are given in Table 4.

Table 4: Estimated number and weight of flatfish, by Fishstock and survey, harvested by recreational fishers. Surveys were carried out in different years in the Ministry of Fisheries regions: South in 1991–92, Central 1992–93, North 1993–94 (Teirney *et al.* 1997) and nationally in 1996 (Bradford 1998) and 1999–00 (Boyd & Reilly 2005). (– Data not available.)

Fishstock	Survey	Number	CV%	Harvest range (t)	Point estimate (t)
1991–92					
FLA 1	South	3 000	–	–	–
FLA 3	South	15 200	31	50–90	–
FLA 7	South	3 000	–	–	–
1992–93					
FLA 1	Central	6 100	–	–	–
FLA 2	Central	73 000	26	20–40	–
FLA 7	Central	37 100	59	10–30	–
1993–94					
FLA 1	North	520 000	19	225–275	–
FLA 2	North	3 000	–	0–5	–
1996					
FLA 1	National	308 000	11	95–125	110
FLA 2	National	67 000	19	13–35	24
FLA 3	National	113 000	14	30–50	40
FLA 7	National	44 000	18	10–20	16
1999–00					
FLA 1	National	702 000	25	203–336	–
FLA 2	National	380 000	49	82–238	–
FLA 3	National	395 000	33	128–252	–
FLA 7	National	114 000	53	23–73	–

The Recreational Technical Working Group concluded that the harvest estimates from the diary surveys should be used only with the following qualifications: a) they may be very inaccurate; b) the

1996 and earlier surveys contain a methodological error; and, c) the 2000 and 2001 estimates are implausibly high for many important fisheries.

1.3 Customary non-commercial fisheries

Quantitative information on the current level of customary non-commercial catch is not available.

1.4 Illegal catch

There is no quantitative information on the current level of illegal catch available.

1.5 Other sources of mortality

Flatfish have always been subject to 'high-grading', and market preference has led to the establishment of 'processor' grading and size limits that are greater than the minimum legal size. Fishers often have no market for lower grade/size flatfish, and legal fish of small size may be discarded. The extent of this source of unrecorded fishing mortality is unknown.

2. BIOLOGY

Some New Zealand flatfish species are fast-growing and short-lived, generally only surviving to 3–4 years of age, with very few reaching 5–6 years, others such as brill and turbot are longer lived, reaching a maximum age of 21 years and 16 years, respectively (Steven *et al*. 2001). However, these estimates have yet to be fully validated. Size limits (set at 25 cm for most species) are generally at or above the size at which the fish reach maturity and confer adequate protection to the juveniles.

Flatfish are shallow-water species, generally found in waters less than 50 m depth. Juveniles congregate in sheltered inshore waters, e.g. estuarine areas, shallow mudflats and sandflats, where they remain for up to two years. Juvenile survival is highly variable. Flatfish move offshore for first spawning at 2–3 years of age during winter and spring. Adult mortality is high, with many flatfish spawning only once and few spawning more than two or three times. However, fecundity is high, e.g., from 0.2 million eggs to over 1 million eggs in sand flounders.

Available biological parameters relevant to stock assessment are shown in Table 5. The estimated parameters in sections 1 & 3 apply only to sand flounder in Canterbury and brill and turbot in west coast South island – growth patterns are likely to be different for these species in other areas and for other species of flatfish.

Table 5: Estimates of biological parameters of flat fish.

Fishstock	Estimate	Source
1. Natural mortality (*M*)		
Brill - West coast South Island (FLA 7)	0.20	Stevens *et al*. (2001)
Turbot - West coast South island (FLA 7)	0.26	Stevens *et al*. (2001)
Sand flounder - Canterbury (FLA 3)	1.1–1.3	Colman (1978)
Lemon sole - West coast South island (FLA 7)	0.62–0.96	Gowing *et al*. (2006)

2. Weight = $a(\text{length})^b$ (Weight in g, length in cm total length).

	Females		Males		
	a	b	a	b	
Brill (FLA 7)	0.01443	2.9749	0.02470	2.8080	Hickman & Tait (unpub.)
Turbot (FLA 7)	0.00436	3.3188	0.00571	3.1389	Hickman & Tait (unpub.)
Sand flounder (FLA 1)	0.03846	2.6584	–	–	McGregor (unpub.)
Yellow-belly flounder (FLA 1)	0.07189	2.5117	0.00354	3.3268	McGregor (unpub.)
New Zealand sole (FLA 3)	0.03578	2.6753	0.007608	3.0728	McGregor (unpub.)

3. von Bertalanffy growth parameters

	Females			Males			
	L_∞	k	t_0	L_∞	k	t_0	
Brill							
West coast South Island (FLA 7)	43.8	0.10	-15.87	38.4	0.37	38.4	Stevens *et al*. (2001)
Turbot							
West coast South island (FLA 7)	57.1	0.39	0.30	49.2	0.34	49.2	Stevens *et al*. (2001)
Sand flounder							
Canterbury (FLA 3)	59.9	0.235	-0.083	37.4	0.781	37.4	Mundy (1968), Colman (1978)
Lemon sole							
West coast South island (FLA 7)	26.1	1.29	-0.088	25.6	1.85	25.6	Gowing *et al*. (2006)

3. STOCKS AND AREAS

There is evidence of many fairly localised stocks of flatfish. However, the inter-relationships of neighbouring populations have not been thoroughly studied. The best information is available from studies of the variation in morphological characteristics of sand flounders and from the results of tagging studies, conducted mainly on sand and yellow-belly flounders. Variation in morphological characteristics indicate that sand flounder stocks off the east and south coasts of the South Island are clearly different from stocks in central New Zealand waters and from those off the west coast of the South Island. There also appear to be differences between west coast sand flounders and those in Tasman Bay, and between sand flounders on either side of the Auckland-Northland peninsula. Tagging experiments show that sand flounders, and other species of flounder, can move substantial distances off the east and south coasts of the South Island. However, among fish tagged in Tasman Bay and in the Hauraki Gulf, none have been recaptured very far from their point of release.

Thus, though the sand flounders off the east and south of the South Island appear to be a single, continuous population, fish in fairly enclosed waters may be effectively isolated from neighbouring populations and should be considered as separate stocks. Examples of such stocks are those in Tasman Bay and the Hauraki Gulf and possibly areas such as Hawkes Bay and the Bay of Plenty. In order to maintain harvesting flexibility, the number of management boundaries placed in the flatfish fishery has been kept to a minimum.

There are no new data which would alter the stock boundaries used in previous assessment documents.

4. STOCK ASSESSMENT

The yield estimates are based on commercial landings data only and have not changed since the 1992 Plenary Report.

4.1 Estimates of fishery parameters and abundance

Standardized CPUE was investigated as a tool for monitoring FLA 1 (Coburn *et al*. 2005) and viable indices were updated with some modification in 2009 (Kendrick & Bentley 2009). The inshore FAWG concluded that the derived indices probably reflect abundance. Less than half of the estimated flatfish catch in each year is identified by species, but at least 90% of flatfish caught in FLA 1 West are likely to be yellow-belly flounder. This is supported by the fact that the preferred muddy bottom habitat of yellow-belly flounder dominates the west coast harbours. There was no evidence of a trend in catch composition during the analysis period (1989–90 to 2003–04)

Three quarters of the west coast catch is taken from Kaipara and Manakau Harbours. Standardized CPUE trends were derived for these two areas using estimated catches described as either YBF or FLA (assumed to be YBF), The Manakau CPUE series declined gradually to the lowest point of the series in 2002–03 and then recovered to a new level just below the mean for the series, at which it has been relatively stable for the last four years (Figure 2). The Kaipara series declined in 1997–98 by about a third, from the level sustained during the early 1990s (Figure 3). There may have been some recovery in the most recent two years, and the 2007–08 index is at about the mean for the series

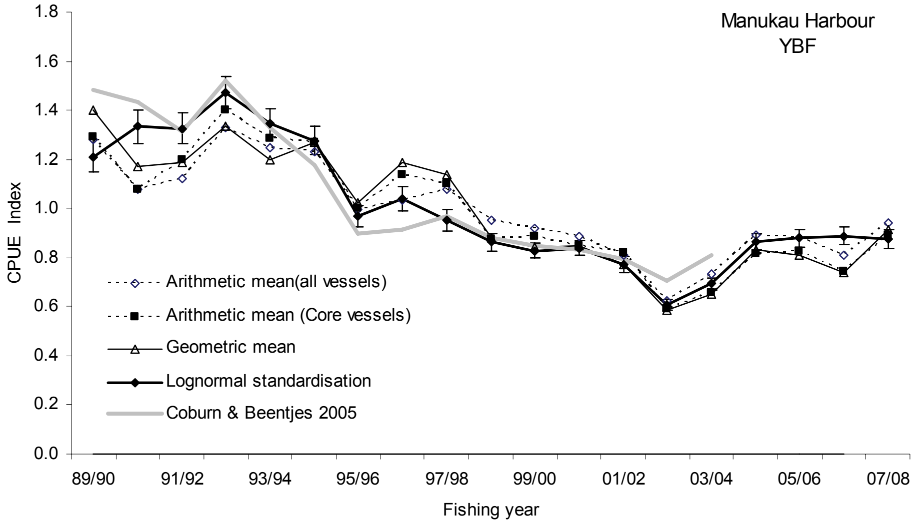

Figure 2: The effect of core vessel selection, and standardisation on the raw CPUE of yellow-belly flounder (FLA or YBF) in the Manukau Harbour setnet fishery. Unstandardised (arithmetic) kg / km of net and the previous indices from a similar model (Coburn & Beentjes 2005) are overlaid for comparison. All series have been rescaled to the geometric mean of the years in common.

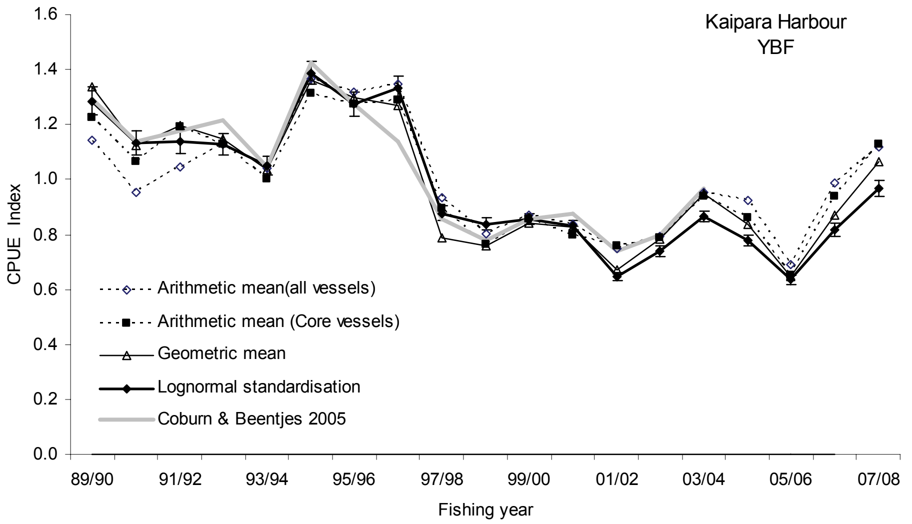

Figure 3: The effect of core vessel selection, and standardisation on the raw CPUE of yellow-belly flounder (FLA or YBF) in the Kaipara Harbour setnet fishery. Unstandardised (arithmetic) kg / km of net and the previous indices from a similar model (Coburn & Beentjes 2005) are overlaid for comparison. All series have been rescaled to the geometric mean of the years in common.

Most of the flatfish catch from FLA 1 East, including a substantial and variable proportion of sand flounder, is taken in the Hauraki Gulf, particularly from the Firth of Thames. Separate indices were calculated for sand and yellowbelly flounder in Statistical areas 005 to 007, and the portion of FLA catch not identified by species was excluded. The Hauraki Gulf yellowbelly CPUE index declined steeply from a peak in 1990–91 to the lowest point for the series in 1995–96. It then fluctuated around the mean for the subsequent eight years and has increased steadily since 2003–04 to a current level that is the highest for the series (Figure 4). The sand flounder index increased from 1990–91 to 1993–94 and then declined steeply to its lowest point in 2002–03 (Figure 5). There may have been some recovery since then and the index is currently just below the original 1990–91 level.

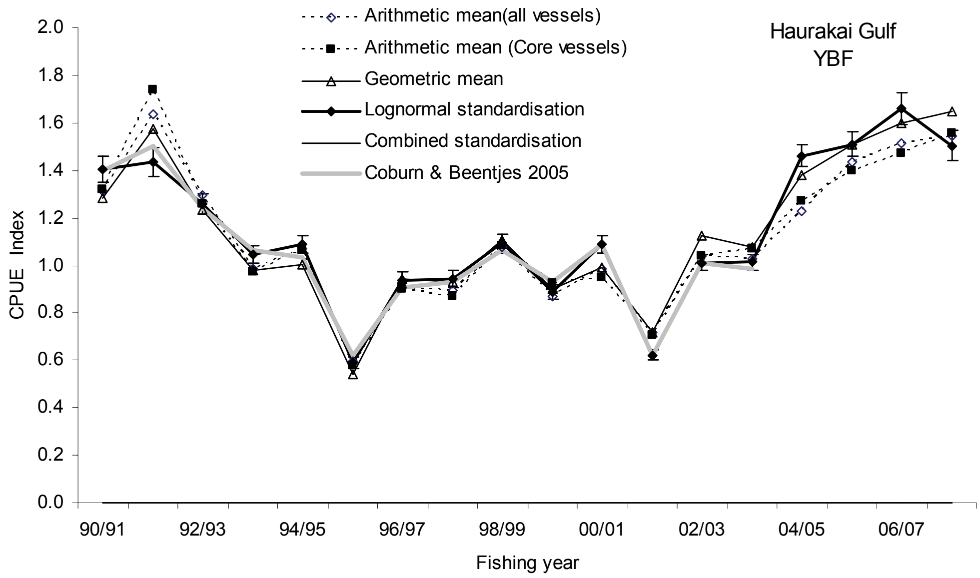

Figure 4: The effect of core vessel selection, and standardisation on the raw CPUE of yellow-belly flounder (YBF only) in the Hauraki Gulf (Statistical areas 005 – 007) setnet fishery. Unstandardised (arithmetic) kg / km of net and the previous indices from a similar model for the Firth of Thames only (Statistical area 007; Coburn & Beentjes 2005) are overlaid for comparison. All series have been rescaled to the geometric mean of the years in common.

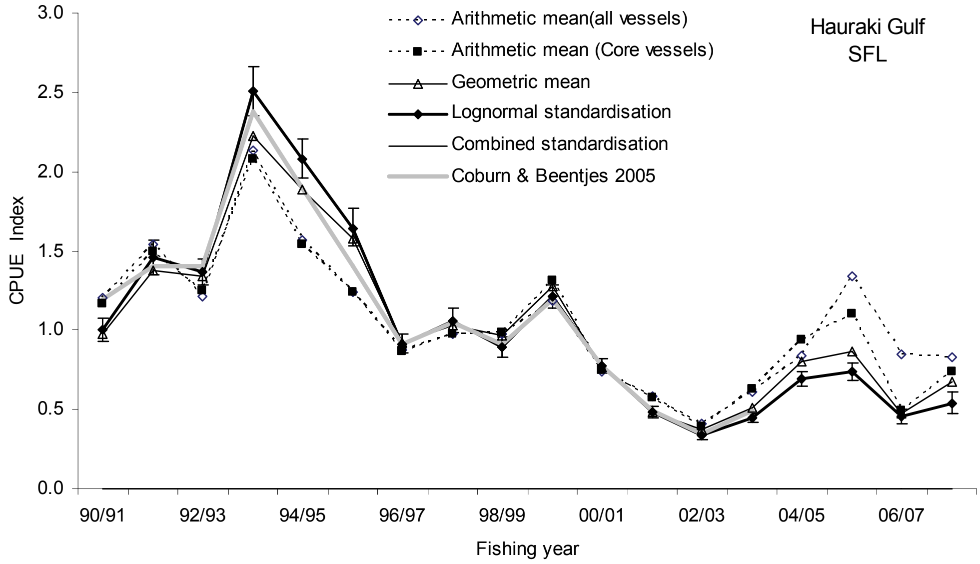

Figure 5: The effect of core vessel selection, and standardisation on the raw CPUE of sand flounder (SFL only) in the Hauraki Gulf (Statistical areas 005 – 007) setnet fishery. Unstandardised (arithmetic) kg / km of net and the previous indices from a similar model for the Firth of Thames only (Statistical area 007; Coburn & Beentjes 2005) are overlaid for comparison. All series have been rescaled to the geometric mean of the years in common.

Coburn et al. 2005 described, a negative relationship between sea surface temperature and sand flounder abundance assuming a 2-year lag between egg production and recruitment. . The abundance of yellowbelly flounder did not appear to be related to temperature in the Firth of Thames.

4.2 Biomass estimates

Estimates of current and reference biomass are not available for any flatfish species.

4.3 Estimation of Maximum Constant Yield (MCY)

MCY was estimated for the generic flatfish grouping (FLA) using the equation, MCY = cY_{AV} (Method 4). Y_{AV} is the reported catch over the period October 1983 to September 1988, and c was set equal to 0.6 based on a single estimate of M = 1.1–1.3. These estimates of MCY were based on reported landings during a period of decreasing effort and were considered conservative. The MCY estimates for each Fishstock are given in Table 6.

Table 6: Yield estimates (t) (rounded to the nearest 10 t) for flatfish.

Parameter	Fishstock	Estimate
MCY	FLA 1	520
	FLA 2	200
	FLA 3	980
	FLA 7	530
	FLA 10	–
	Total	2 230
CAY	All	Cannot be determined

Given that the FLA code is made up of eight different species with very variable life history characteristics and productivity, these estimates are considered to be extremely unrealistic. The level of risk to the individual species populations, or the aggregated Fishstocks, by harvesting the species assemblages at the estimated MCY values cannot be determined.

4.4 Estimation of Current Annual Yield (CAY)

No estimate of CAY is available for flatfish stocks.

4.5 Other Factors

The flatfish complex is comprised of eight species though typically only a few are dominant in any one QMA and some are not found in all areas. For management purposes all species are combined to form a unit fishery. The proportion that each species contributes to the catch is expected to vary annually. It is not possible to estimate MCY for each species and stock individually.

Because the adult populations of most species generally consist of only one or two year classes at any time, the size of the populations depends heavily on the strength of the recruiting year class and is therefore thought to be highly variable. Brill and turbot are notable exceptions with the adult population consisting of a number of year classes. Recent CPUE analyses revealed that although yellow belly flounder are short lived, inter-annual abundance in FLA 1 was not highly variable, suggesting that some factor, e.g., size of estuarine nursery area, could be smoothing the impact of random environmental effects on egg and larval survival.

Flatfish TACCs have purposely been set at high levels so as to provide fishers with the flexibility to take advantage of the perceived variability associated with annual flatfish abundance. For this reason TACCs should not be expected to be reached each year. Recent CPUE analyses revealed that although yellow belly flounder are short lived, inter-annual abundance in FLA 1 was surprisingly stable. These results suggest that a more conservative approach is possible, at least for this stock. Minimum size limits provide protection for spawning fish for some species before they recruit into the fishery.

In certain areas fishers target fishing for flatfish run out of quota for associated bycatch, but use their uncaught flatfish quota to continue target fishing, regardless of bycatch. This is a problem particularly with multi-species trawl fisheries. The high TACCs set for species like flatfish, whose availability is highly variable, provides an incentive to maximise target catch regardless of how much bycatch quota is held.

The inclusion of flatfish in the QMS was based partly on the assumption that a TAC would act to decrease competition for catch in poor years. However, current flatfish TACCs do not effectively decrease competition for fish in years of poor abundance. A number of fishers have entered the fishery through purchase of flatfish ITQ with no, or minimal bycatch quota. This increases competition for flatfish in poor years, both among commercial fishers and between commercial and recreational fishers, accentuating bycatch problems.

Fishing effort can vary with flatfish abundance and the relative profitability of alternative fisheries (e.g., albacore tuna, oysters, rock lobster and snapper).

Flatfish could be managed more appropriately using a CAY approach for each species rather than a generic MCY approach.. Adoption of this strategy would require increased information on flatfish abundance.

5. STATUS OF THE STOCKS

Estimates of current and reference biomass are not available.

Flatfish populations typically consist of only one or two year classes at any time. The sizes of the populations depend heavily on the strength of the recruiting year classes and are therefore expected to be highly variable. For this reason TACCs were set high to allow fishers to take advantage of times of high abundance. Recent CPUE analyses revealed that although yellow belly flounder are short lived, inter-annual abundance in FLA 1 was surprisingly stable. These results suggest that a more conservative approach is possible.

TACCs and reported landings are summarised in Table 7.

Table 7: Summary of yields (t), TACCs (t), and reported landings (t) of flatfish for the most recent fishing year.

Fishstock	QMA	MCY	2007–08 Actual TACC	2007–08 Reported Landings
FLA 1	Auckland (East) (West) 1 & 9	520	1 187	704
FLA 2	Central (East) (West) 2 & 8	200	726	243
FLA 3	South-East (Coast) (Chatham), 3, 4, 5, & 6 Southland and Sub-Antarctic	980	2 681	1 369
FLA 7	Challenger 7	530	2 066	1 313
FLA 10	Kermadec 10	–	10	0
Total		2 230	6 670	3 629

6. FOR FURTHER INFORMATION

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