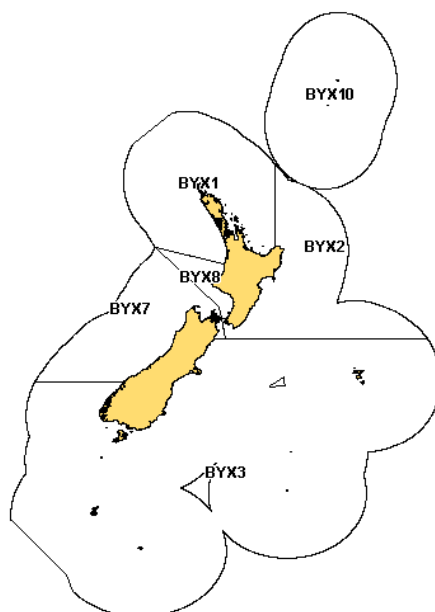


ALFONSINO (BYX)

(Beryx splendens, B. decadactylus)

1. FISHERY SUMMARY

1.1 Commercial fisheries

The alfonsino fishery is essentially confined to BYX 2 & 3. Alfonsino has supported a major mid-water target trawl fishery off the lower east coast of the North Island since 1983 and is a minor bycatch of other trawl fisheries around New Zealand. The original gazetted TACs were based on the 1983–84 landings except for BYX 10 which was administratively set. Recent reported domestic landings and actual TACs are shown in Table 1.

Prior to 1983, alfonsino was virtually an unfished resource. The domestic BYX 2 target fishery was developed during 1981, and was concentrated on the banks and seamount features off the east coast of the North Island, between Gisborne and Cape Palliser. Major fishing grounds include the Palliser Bank, Tuaheni Rise, Ritchie Banks and Paoanui Ridge. In more recent years, the alfonsino catch and effort has decreased from these areas, and an increasing proportion of the annual catch has been taken from the Madden Banks and Motukura Bank.

Increasing volumes of alfonsino are taken as bycatch in the gemfish trawl fishery, which has exploited new grounds in QMA 2. Alfonsino is also taken as bycatch in the orange roughy and hoki fisheries in QMA 2.

The TACC for BYX 1 was increased for the 2001–02 fishing year from 31 t to 300 t when it was included in the adaptive management programme. The new TACC was attained for the first time in 2004–05.

The TAC for BYX 2 was reduced from 1630 to 1274 t during the 1989–90 fishing year but has increased since then to 1575 t as a result of decisions by the Quota Appeal Authority. The TAC for BYX 2 was consistently overcaught by up to 300 t between 1992–93 and 2000–01, only in 2001–02 were the landings less than the TAC, and this was by only 1 t. The TAC was over caught in the 2002–03, 2004–05 and 2005–06 fishing years.

Table 1: Reported domestic landings (t) of alfonsino by Fishstock from 1985–86 to 2004–05 and actual TACs (t) from 1986–87 to 2006–07.

Fishstock FMA (s)	BYX 1		BYX 2		BYX 3		BYX 7	
	1 & 9		2		3, 4, 5 & 6		7	
	Landings	TAC	Landings	TAC	Landings	TAC	Landings	TAC
1985–86*	11	–	1 454	–	3	–	1	–
1986–87†	3	10	1 387	1 510	75	220	4	30
1987–88†	8	27	1 252	1 11	101	1 000	2	30
1988–89†	6	27	1 588	1 630	64	1 00	4	30
1989–90†	24	31	1 496	1 274	147	1 007	21	80
1990–91†	17	31	1 459	1 274	202	1 007	26	81
1991–92†	7	31	1 368	1 499	264	1 007	2	81
1992–93†	6	31	1 649	1 504	113	1 007	12	81
1993–94†	7	31	1 688	1 569	275	1 007	31	81
1994–95†	11	31	1 670	1 569	482	1 010	59	81
1995–96†	11	31	1 868	1 569	961	1 010	66	81
1996–97†	39	31	1 854	1 575	983	1 010	77	81
1997–98†	14	31	1 652	1 575	1 164	1 010	67	81
1998–99†	37	31	1 658	1 575	912	1 010	13	81
1999–00†	25	31	1 856	1 575	743	1 010	24	81
2000–01†	25	31	1 665	1 575	890	1 010	21	81
2001–02†	123	300	1 574	1 575	1 197	1 010	10	81
2002–03†	136	300	1 665	1 575	1 118	1 010	7	81
2003–04†	219	300	1 468	1 575	884	1 010	11	81
2005–05†	300	300	1 669	1 575	1 067	1 010	14	81
2005–06†	195	300	1 633	1 575	1 068	1 010	7	81
2006–07†	66	300	1 644	1 575	945	1 010	21	81
Fishstock	BYX 10							
FMA (s)	10		Total					
	Landings	TAC	Landings	TAC				
1985–86*	0	–	1 469	–				
1986–87†	0	10	1 470	1 800				
1987–88†	0	10	1 364	2 598				
1988–89†	1	10	1 663	2 717				
1989–90†	0	10	1 688	2 422				
1990–91†	0	10	1 664	2 423				
1991–92†	<1	10	1 641‡	2 648				
1992–93†	<1	10	1 780‡	2 653				
1993–94†	0	10	2 001‡	2 718				
1994–95†	0	10	2 223‡	2 721				
1995–96†	0	10	2 906‡	2 721				
1996–97†	0	10	2 953‡	2 727				
1997–98†	0	10	2 898‡	2 727				
1998–99†	0	10	2 624‡	2 727				
1999–00†	0	10	2 648‡	2 727				
2000–01†	0	10	2 601‡	2 727				
2001–02†	0	10	2 904‡	2 925				
2002–03†	0	10	2 927 ‡	2 925				
2003–04†	0	10	2 584 ‡	2 925				
2005–05†	0	10	3 052 ‡	2 925				
2005–06†	0	10	2 903 ‡	2 925				
2006–07†	0	10	2 677 ‡	2 925				

*FSU data.

† QMS data.

‡ Excludes catches taken outside the New Zealand EEZ.

The TACC for BYX 3 was increased for the 1987–88 fishing year from 220 t to 1000 t but annual landings remained low until 1993–94. Since 1995–96, landings have exceeded 900 t, reaching a peak of 1197 t in 2001–02 (187 t over the TAC). The 2002–03 catch of 1118 was also substantially larger than the 1010 t TACC. The marked increase in BYX 3 landings since 1994–95 (Table 1) is due mainly to the development of a target trawl fishery exploiting new grounds in BYX 3, and the discovery of new grounds south-east of the Chatham Islands (where a longline fishery for alfonsino, groper and ling has developed). Currently, most of the BYX 3 catch is taken from the target bottom trawl fishery, operating on a complex of underwater features to the south-east of the Chatham Islands. The target fishery is comprised of a small number of vessels targeting alfonsino during the summer period. The remainder of the BYX 3 catch is taken as a small bycatch of the hoki, orange roughy, and hake target trawl fisheries. The target trawl fishery has an associated bycatch of bluenose (Langley & Walker 2002).

Fishing new grounds in BYX 7 resulted in increased catches in the mid 1990's and total landings of up to 77 t were recorded in 1996–97. However, landings have declined substantially since that time and only 7 t were landed in that area in 2005–06.

1.2 Recreational fisheries

Occasional catches of alfonsino have been recorded from recreational fishers.

1.3 Customary non-commercial fisheries

No quantitative information on the level of customary non-commercial catch is available.

1.4 Illegal catch

No quantitative information on the level of illegal alfonsino catch is available.

1.5 Other sources of mortality

No qualitative information is available.

2. BIOLOGY

Both species of *Beryx* occur throughout the world's tropical and temperate waters, in depths from 25 to 1200 m. In New Zealand waters, most “alfonsino” landings are of alfonsino *B. splendens* and landings of the red bream *B. decadactylus* account for less than 1% of this catch. Red bream is taken mainly in BYX 1 but the biology of this species is poorly known. For the purposes of yield assessment, productivity parameters for alfonsino have been based on *B. splendens*. These species are primarily associated with undersea structures such as the seamounts that occur off the lower east coast of the North Island and on the Chatham Rise, in depths from 300–600 m.

Alfonsino have a maximum recorded age of 17 years and females grow faster than males. Pre-spawning alfonsino have been recorded in New Zealand waters but spawning grounds are unknown. Summer-autumn spawning activity has been noted in the North and South Atlantic and North Pacific Oceans. Juvenile alfonsino have been reported from near New Caledonia, associated with oceanic gyre systems. It is likely that the New Zealand stocks utilise similar pelagic water systems for reproduction and juvenile development. Size-at-sexual maturity is probably about 30 cm fork length (FL) at 4 to 5 years of age. Juvenile fish have been recorded in the pelagic and epipelagic zones in the North Pacific and Indian Oceans. Alfonsino less than 20 cm FL are seldom recorded in New Zealand waters. Differences in length-frequency distributions between fishing grounds off the east coast North Island suggest that some age-specific migration occurs. Fish probably recruit to these grounds at 28–31 cm FL.

Estimates of M from catch curve analysis are not available due to the likelihood that age-specific migration precludes the sampling of the whole population. M was estimated using the equation $M = \log_e 100/\text{maximum age}$, where maximum age is the age to which 1% of the population survives

in an unexploited stock. Using a maximum age of 20 years, M equalled 0.23.

Biological parameters relative to the stock assessment are shown in Table 2.

Table 2: Estimates of biological parameters for alfonsino.

Fishstock	Estimate		Source	
1. Natural mortality (M)	0.23		Stocker & Blackwell (1991)	
BYX 2				
2. Weight = $a(\text{length})$ (Weight in g, length in cm fork length).			Stocker & Blackwell (1991)	
	Both Sexes			
	a	b		
BYX 2	0.0226	3.018		
3. Von Bertalanffy growth parameters			Stocker & Blackwell (1991)	
	Females			
	L_∞	k		t_0
BYX 2	57.5	0.08		-4.10
	Males			
	L_∞	k	t_0	
BYX 2	51.1	0.11	-3.56	

3. STOCKS AND AREAS

There are no new data which would alter the stock boundaries given in previous assessment documents. No information is available as to whether alfonsino is a single stock in New Zealand waters. Overseas data on alfonsino stock distributions suggest that New Zealand fish could form part of a widely distributed South Pacific stock.

4. STOCK ASSESSMENT

There are no new data which would alter the yield estimates given in the 1996 Plenary Report. Yield estimates are based on commercial CPUE data.

4.1 Estimates of fishery parameters and abundance

i) BYX 2

A biomass index derived from a standardised CPUE (log linear, kg/day) analysis of the target trawl fishery represented by 7 core vessels (Blackwell 2000) was calculated for BYX 2. However, the analysis was very uncertain, and the model accounted for only 25% of the variance in catch rates. The results of the standardised analysis were not accepted by the Inshore WG as indices of abundance.

The age composition of the commercial landings in BYX 2 was determined in 1998–99, 1999–00, and 2000–01 and 2002–03, 2003–04 and 2004–05. The commercial catch is dominated by 5–11 year old fish. Without linking age structure to specific fishing grounds the age structure of the catch is unlikely to monitor changes in the population.

ii) BYX 3

The potential to monitor trends in abundance using catch and effort data from the target BYX 3 fishery has recently been investigated (Langley & Walker 2002). However, it was concluded that the high variation in catch rates, the relatively small number of catch and effort records, and the complex nature of the fishery precluded the development of a reliable CPUE index.

4.2 Biomass estimates

Biomass estimates are discussed in the section on estimation of MCY. Estimates of current biomass are not available.

4.3 Estimation of Maximum Constant Yield (MCY)

i) BYX 2

MCY was estimated using the equation $MCY = 2/3 MSY$ (Method 3). MSY was estimated using an age structured model which incorporates a Beverton and Holt stock recruitment relationship with assumed steepness of 0.95 (Stocker & Blackwell 1991). Implicit in the analysis is the assumption that BYX 2 comprises a single stock. Although this assumption may not be strictly correct, the model provides an indicative estimate of yield for BYX 2.

Two values of M (0.20 and 0.23) were used. Two formulations of the catchability coefficient (q) were used ($\ln q$ and q). The results using the two formulations were either identical or very similar, so only the results using q are shown here.

The estimates of MCY are shown in Table 3.

Table 3: Estimates of B_0 , MCY, long-term equilibrium biomass using an $F_{0.1}$ strategy ($B_{0.1}$), and long-term equilibrium yield using an $F_{0.1}$ strategy ($F_{0.1}$ yield); all values in t; figures in parentheses are the 50% confidence intervals.

M	B_0	MCY	$B_{0.1}$	$F_{0.1}$ yield
0.2	19 000 (17 000–21 000)	1 110 (980–1200)	6 600 (5900–7300)	1 480 (1320–1640)
0.23	17 500 (15 500–19 500)	1 200 (1050–1330)	6 000 (5310–6680)	1 610 (1430–1800)

These estimates of MCY have not changed since the 1991 Plenary Report.

The level of risk to the stock by harvesting the population at the estimated MCY value cannot be determined.

ii) Other areas

MCY cannot be determined.

4.4 Estimation of Current Annual Yield (CAY)

No estimates of current biomass are available for any stock and it is not possible to estimate CAY.

4.5 Other yield estimates and stock assessment factors

Long-term sustainable yield using an $F_{0.1}$ fishing strategy was estimated for BYX 2 using the simulation model with the two estimates of M (Table 3). $F_{0.1}$ has been estimated as 0.25 and 0.32 for $M = 0.2$ and $M = 0.23$, respectively, for both sexes combined in BYX 2 (Stocker & Blackwell 1991). The biomass at this long-term equilibrium yield is about 35% B_0 and the $F_{0.1}$ yield is about 8–9% B_0 .

4.6 Other factors

The current assessment for BYX 2 is based upon the historical fishery areas. In recent years the fishery has expanded to new areas not previously fished. Subsequent CPUE analyses have been rejected by Working Groups and it is no longer thought possible to monitor abundance in BYX 2 using trawl CPUE.

Current data on alfonsino movements are inconclusive. It is not known whether the fish on the east coast of the North Island spend some part of their life cycle in other New Zealand waters, or whether the east coast–Chatham Rise region is just one of several pre-reproductive regions. It is possible that the domestic trawl fishery may be exploiting part of a wider South Pacific stock. Catches may be expected to increase in BYX 3 due to the discovery of new grounds. However, the potential for expansion may be constrained by availability of BNS 3 quota to cover likely bluenose bycatch.

Yield estimates are summarised in Table 4.

Table 4: Yield estimates (t).

Parameter	Fishstock	Estimate
MCY	BYX 2	1 110–1 200
F _{0.1} yield	BYX 2	1 320–1 800
CAY	All	Cannot be determined

5. ANALYSIS OF ADAPTIVE MANAGEMENT PROGRAMMES

The Ministry of Fisheries revised the AMP framework in December 2000. The AMP framework is intended to apply to all proposals for a TAC or TACC increase, with the exception of fisheries for which there is a robust stock assessment. In March 2002, the first meeting of the new Adaptive Management Programme Working Group was held. Two changes to the AMP were adopted:

- a new checklist was implemented with more attention being made to the environmental impacts of any new proposal
- the annual review process was replaced with an annual review of the monitoring requirements only. Full analysis of information is required a minimum of twice during the 5 year AMP.

BYX 1

BYX 1 TACC was increased from 31t to 300 t under the AMP in October 2001.

Review of BYX 1 AMP in 2008

AMP History

- BYX 1 entered the QMS with a TACC of 10 t in 1986–87. The TACC rose to 31 t by 1989–90 as a result of quota appeals, at which level it remained through to 2000–01. BYX 1 entered an AMP in 2001–02 with a TACC increase to 300 t, initially for a period of five years, and the TACC has remained at this level since then. BYX 1 will remain under an AMP until this stock is incorporated into a Fisheries Plan.
- Catches generally tracked, although somewhat below, the TACC from 1986–87 to 2004–05. Prior to the AMP, annual catches averaged 16 t, about half the TACC. Catches increased fairly rapidly after entry into the AMP to reach the TACC of 300 t in 2004–05. Since then, catches have declined sharply to 66 t in 2006–07.

Fishery Characterization

- BYX 1 landings share effort mainly with BYX 2, although some trips which land BYX 1 have fished in BYX 3, 7 and 8. Over 1989–90 to 2006–07, trips which recorded at least one landing in BYX 1 reported 1 898t of total landings, of which 67% (1 276t) came from BYX 1 itself, 31% from the adjacent BYX 2 and the remainder from BYX 3, 7 and 8.
- Over 80% of BYX 1 landings have been taken by either bottom (BT) or midwater trawl (MWT), with the balance taken by longline (LL). However, trawl catches have been somewhat sporadic, reflecting infrequent opportunities to direct fishing at this species. The most consistent BYX fishing method over time has therefore been bottom longline (BLL), which has operated in most years to the east of the North Island where alfonsino are taken as a bycatch while target fishing for other species.
- The main fishing areas for BYX 1 have been the East Northland region north of the Hauraki Gulf, followed by the Bay of Plenty running a close second. Only about 15% of landings have come from the west coast North Island (WCNI) region of BYX 1, and none from the Hauraki Gulf itself, as this region is too shallow to support this species. Industry reports that low catches from the WCNI reflect difficult fishing conditions on that coast, rather than absence of alfonsino.

- BYX 1 have been consistently caught in the Bay of Plenty using bottom trawl, with alfonsino taken as a regular bycatch in other target trawl fisheries in this region. The East Northland bottom trawl fishery developed as a target fishery from 2003–04 onwards. However, the majority of bottom trawl effort occurs in the Bay of Plenty. The midwater trawl fishery has only operated occasionally on BYX 1 in the Bay of Plenty.
- The bottom longline fishery has consistently fished the Bay of Plenty and expanded into East Northland from 2000–01 onwards, reflecting changes in the target bluenose longline fishery. Bottom longline effort and landings increased in 2004–05 in both the Bay of Plenty and East Northland. In contrast, bottom trawl effort appears to be declining in the Bay of Plenty in recent years with the demise of the target gemfish fishery.
- Bottom longline landings appear to be distributed across all months in all three regions. Bottom and midwater trawl landings are too sporadic to determine any strong seasonal pattern, but good catches of have been made in all months.
- 83% of all bottom trawl BYX 1 landings are taken by the targeted alfonsino fishery. Midwater trawl fishing is also largely targeted at alfonsino, but about 20% of MWT BYX catches are taken in tows targeted at bluenose. The bottom longline fishery is almost entirely targeted at bluenose, with the some effort targeted at hapuku. Bottom trawl target fishing for alfonsino only started in 2001–02 when the AMP started. Previously, small bycatches of alfonsino were taken in bottom trawls targeted at cardinalfish, orange roughy and other species. Midwater trawl targeting fishing for alfonsino and bluenose also started in 2001–02 with the increase in the TACC.
- Alfonsino targeted bottom trawling occurred on the west coast in Area 103 from 2001–02 to 2003–04, but shifted to East Northland and the east of North Cape in 2003–04. Midwater trawling for alfonsino and bluenose mainly occurs in the eastern Bay of Plenty in Area 010, with reasonably consistent catches from 2001–02 to 2006–07, when the fishery essentially ceased. Alfonsino catches by bluenose targeted longline fishing has occurred consistently in all important statistical areas since 1989–90.
- Depth information from TCEPR forms shows that alfonsino are mainly taken from 440 m to 900 m depth, and primarily between 500 and 750 m (median = 657 m, mean = 650 m), depending on target species.

CPUE Analysis

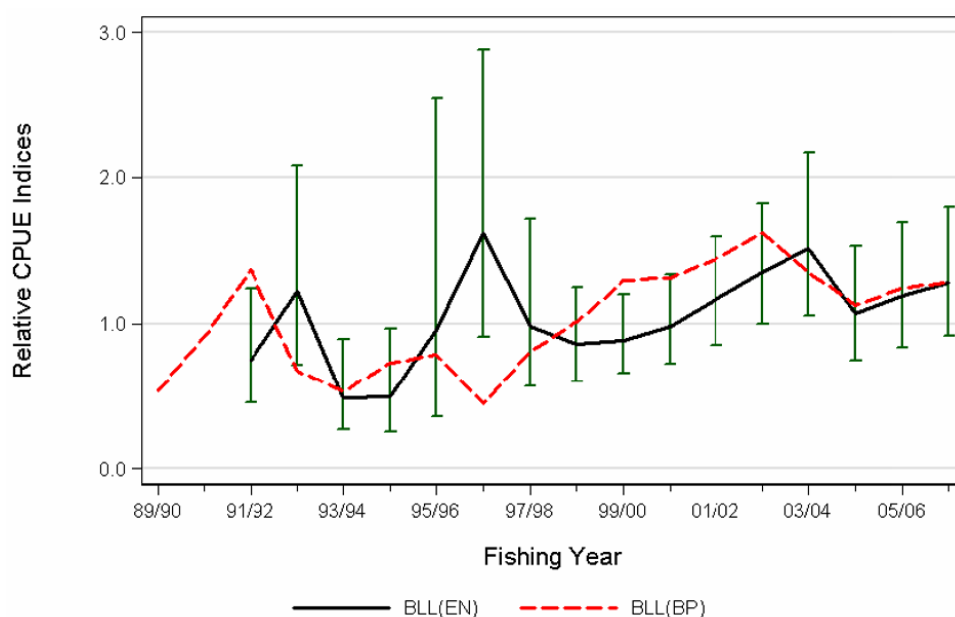


Figure 1. Comparison of the lognormal indices from the two bottom longline CPUE series for BYX 1: a) BLL[EN]: target bluenose/hapuku in East Northland; b) BLL[BP]: target bluenose/hapuku in Bay of Plenty.

- Standardised CPUE analyses for BYX 1 were conducted for two BLL fisheries targeting bluenose or hapuku/bass, and operating in two different areas: BLL(EN) off East Northland, and BLL(BP) in the Bay of Plenty.
- The two bottom longline series show a generally rising trend (Figure 1), but with large error bars as a result of the small amount of data contributing to these series. When superimposed, the two BLL series are similar, indicating that they may be responding to similar signals from alfonsino abundance and/or changes in fishing patterns. However, given the low BLL catch levels, these indices should be interpreted with caution.
- In addition, two trawl indices were evaluated, for bottom or midwater trawling targeting alfonsino or bluenose, and fishing off East Northland, or in Bay of Plenty. These two trawl series have more catch than the BLL series but showed large year-to-year fluctuations, and were considered to be unlikely candidates for monitoring alfonsino abundance in BYX 1.

Logbook Programme

- A bottom trawl logbook programme for BYX 1 was introduced in 2001–02 to implement the monitoring component of the BYX 1 AMP.
- This programme obtained 62% coverage as a ratio of QMR catch in the first year (2001–02), but measured only about 100 fish. Subsequent years had more modest coverage from 2.9% to 17.5%, but measured more fish. A lack of length measurements after 2004–05 has been traced to a confusion in catch reporting between the vessel operators and the service provider, which should be corrected the next time this fishery is reviewed. The number of tows reported ranged from 9 to 27, representing about 30t of estimated catch in three of the four years. Over 90 t of alfonsino catch was observed under this programme, with 65 tows and nearly 1 500 fish being processed for fish length and sex.
- Spatial coverage has not been particularly representative, tending to sample either East Northland or the Bay of Plenty, but never both of these regions in the same year. Seasonal sampling has also been patchy, with some area/month strata not being sampled.
- Logbook data indicate that the depth range fished declines across the regions, with a median depth of 760 m in the Bay of Plenty, dropping to 650 m in East Northland and to 580 m on the west coast.

Effects of Fishing

- The BYX 1 fishery overlaps with the endemic black petrel, *Procellaria parkinsoni*, flesh-footed shearwater *Puffinus carneipes* and grey-faced petrel *Pterodroma macroptera gouldi*. Greatest concerns relate to possible interactions with black petrels which have a low but stable population estimated at between 2 750 and 5 000 breeding pairs (Robertson *et al.* 2003). Black petrels only breed on Little and Great Barrier Islands and have been caught in pelagic longline fisheries off the west coast of South America.
- In 2006–07, the requested inshore trawl coverage in New Zealand was 250 days, but only 106 days were achieved, covering about 0.3% of the 35 064 days fished. Four white capped albatross and 3 unidentified petrel captures were observed. These low levels of observer coverage in inshore fisheries have made it difficult to assess impacts of incidental mortalities on protected species populations with any confidence.
- No known/observed interactions with marine mammals have been recorded for the BYX 1 fishery, but observer coverage has been low.
- There has been an increase in trawling for BYX1 in East Northland where catches have increased from 5 t in 2002–03, to 119 t in 2003–04 and 206t in 2004–05. There has probably been increased seabed impact resulting from this developing fishery. However, comparative information on benthic bio-diversity in fished and unfished areas is not available, and areas impacted before and after implementation of the AMP have not been assessed.

AMP Review Checklist

1. With the decline in BT fishing for BYX 1, and high variability in BT catches and CPUE, there is now less confidence than previously that the BT CPUE index may track abundance. Conversely, despite the low catches and doubts that the BLL series could provide reliable indices of abundance, close coincidence between the two BLL CPUE series suggests that these may be monitoring a common signal, which may reflect stock abundance. However, in overview, CPUE does not appear to be the best candidate for monitoring BYX 1 abundance, and effort should rather be put into developing an effective and representative length and age sampling programme.
2. Initial logbook coverage of the bottom trawl fishery was good, although sampling effort could have been better. However, this programme has not been well reported after 2004–05, and efforts are required to resurrect the programme.
3. No additional analyses were recommended. However, the Working Group recommended that:
 - Given the apparent unsuitability of the current CPUE series for monitoring abundance of BYX 1, efforts should focus on developing and implementing an effective programme to obtain adequate and representative length frequency and age samples across the BYX 1 fishing areas.
4. The current fishery is unlikely to have had much effect on the state of the BYX 1 stock, which is likely to be lightly exploited. Current catch levels are most probably sustainable.
5. No stock assessment has yet been conducted for BYX 1, and the state of the stock in relation to B_{MSY} is not known.
6. Observer coverage levels of the inshore trawl fisheries are low, and the effects of fishing are not currently adequately monitored. Introduction of the ‘*Non-fish/Protected Species Catch Return*’ into the suite of regulated MFish forms from 1 October 2008, may provide a credible source of information on the level of protected species bycatch. However, observer coverage will still be required to validate fisher reporting rates.
7. Given the low observer coverage in this fishery, rates of non-fish bycatch are not known with any confidence, and it is not known whether rates of bycatch are acceptable. High observer coverage in the ORH 1 fishery has reported low encounter rates with protected species, so encounter rates in the BYX 1 fishery would also be expected to be low.
8. The Working Group concluded that this Fishstock did not require referral to the Plenary for review.

6. STATUS OF THE STOCKS

BYX 1

The current fishery is unlikely to have had much effect on the state of the BYX 1 stock, which is likely to be lightly exploited. Current catch levels are most probably sustainable. No stock assessment has yet been conducted for BYX 1, and the state of the stock in relation to B_{MSY} is not known.

BYX 2

For BYX 2, the current TACC (1575 t) is within the range of the $F_{0.1}$ yield estimates of 1320–1800 t calculated in 1991. These $F_{0.1}$ estimates were based upon a CPUE index in the target trawl fishery. As the CPUE for this analysis came from fishing on part of the potential BYX habitat, yields may be under-estimated.

Annual landings from 1986 to 1994–95 remained generally stable, within the estimated range of $F_{0.1}$ yield. Landings since 1995–96 have sometimes been slightly outside the range of $F_{0.1}$ estimates, as a result of expansion of the fishery into other areas. Therefore, recent catch levels and the current TACC appear sustainable. However, it is not known if recent catch levels and the current TACC will allow the stock to move towards a size that will support the MSY.

BYX 3

Alfonsino on the Chatham Rise (BYX 3) were lightly fished prior to 1995–96 and recent catches, although greatly increased, have been less than the TACC. BYX 3 catches have increased in recent years due to the development of new fishing grounds. It is not known if the recent catch levels or the current TACC are sustainable or would allow the stock to move towards a size that would support the MSY.

Yield estimates and reported landings are summarised in Table 5.

Table 5: Summary of yield estimates (t), TACCs (t) and reported landings (t) for Alfonsino for the most recent fishing year.

Fishstock		QMA	MCY	F _{0.1} yield	2006–07	2006–07
					Actual TACC	Reported landings
BYX 1	Auckland (East) (West)	1 & 9	–	–	300	66
BYX 2	Central (East)	2	1 110–1 200	1 480–1 610	1 575	1 643
BYX 3	South–East (Coast) (Chatham), Southland & Sub–Antarctic	3, 4, 5, & 6		–	1 010	945
BYX 7	Challenger	7	–	–	81	21
BYX 8	Central (West)	8	–	–	20	<1
BYX 10	Kermadec	10	–	–	10	0
Total					2 996	2 677

7. FOR FURTHER INFORMATION

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