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National Tuna Fishery Report 2007
AUSTRALIA

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Australian Government

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Summary

Domestic longline activity off eastern Australia continued to decline, with the number of active vessels falling from 152 in 1999 to 61 vessels in 2007. Longline fishing effort also declined, from 12.5 million hooks in 2003 to 8.4 million hooks in 2007. The decreased activity is attributed to high operating costs (driven mainly by high fuel prices and the high cost of squid baits), the strength of the Australian dollar and reduced catch rates of swordfish in inshore areas, around seamounts. Structural adjustment in Australian Government-managed fisheries resulted in the surrender of almost 100 of the more than 200 longline permits originally available in the fishery.

The catch of yellowfin tuna by domestic longliners in 2007 was 1380 t, which was a substantial decline from the 2003 peak catch of 3096 t. The 2007 catch of bigeye tuna (998 t) was double the previous year's catch and close to the peak catch (1050 t) reported in 2001; and the 358 t of striped marlin was down on the 2003 level (634 t). The broadbill swordfish catch remained at low levels (1349 t), partly reflecting limits placed on catch levels of this species. Interest in albacore tuna has waned as a result of poor market prices, with landings falling from 2591 t (2006) to 1916 t in 2007.

The proportion of swordfish taken from outside the Australian Fishing Zone (AFZ) continues to decrease with the decline of the fleet and increased fuel costs. The proportion taken from outside the zone decreased from 12% of the total weight in 2005 to 3% in 2007.

Few purse seiners, troll and pole-and-line vessels operated off southern NSW in 2007. Catch levels were low and cannot be reported here because of confidentiality restrictions (<5 vessels).

Recreational anglers fish for a wide variety of pelagic species. Recreational catches of other marlins continued to be patchy during 2007. Striped marlin catches have been disappointing since the early 2000s. The heavy tackle fishery for large black marlin off Cairns reported a very poor season in 2007, with few smaller black marlin hooked southwards along the Queensland coast.

The Eastern Tuna and Billfish Fishery Statutory Management Plan (including individual allocation of fishing rights in the form of hook limits) is being implemented. Management methods include input controls (such as limited entry, gear and area restrictions) and restrictions on byproduct and bycatch. A maximum catch limit, bycatch limits and a series of trigger catch levels have been introduced to limit swordfish and albacore catches. Mitigation measures are in place to reduce the take of seabirds. A harvest strategy is in development for the fishery.

Acknowledgements

Ms Danielle Williams (NSW Department Primary Industries) provided data on the NSW Gamefishing Program. Dr Jeff Dambacher (CSIRO Marine Research) provided estimates of bycatch levels. Dr Rob Campbell (CSIRO Marine Research) and Ms Kerrie Bennetts (AFMA) provided information on current and past research. Ms Patty Hobsbawn and Mr Phil Sahlqvist (BRS) assisted with extracts from Australian tuna logbooks.

Introduction

This report has been prepared by the Australian Government's Bureau of Rural Sciences (BRS) and describes Australia's tuna and billfish fisheries in the eastern Australian Fishing Zone (AFZ) and adjacent international waters. BRS is responsible for providing policy makers and government agencies with scientific advice for the management of Australia's pelagic resources.

Fishing methods used to catch tunas and billfish off eastern Australia include longline, purse seine, pole-and-line, various 'minor line' gears and recreational fishing.

There are currently no foreign longliners operating in the AFZ. Japan's longliners operated in the eastern AFZ from the late 1950s until November 1997. The Japanese fleet consisted of large (40–55 m) freezer longliners that remained at sea for 2–3 months, setting 2500–3500 hooks each day. Annual fishing effort in the eastern AFZ ranged up to 16 million hooks with up to 100 longliners operating in any one season. After the AFZ became operational in 1979, Japanese activity in the AFZ was licensed under bilateral agreements. As domestic recreational and commercial fisheries for pelagic species grew, Australia progressively restricted areas of access. The bilateral agreement lapsed in 1997.

Annual Fisheries Information

Domestic longline

Background

Domestic longline activity occurred sporadically in what is now the eastern AFZ during 1954–82, with catches sold to canneries and local fish markets. The successful airfreighting of fresh-chilled tuna to Japan in the early 1980s was followed by a marked increase in longline activity. However, many vessels left the fishery in 1988 because yellowfin catch rates off central and southern New South Wales (the centre of activity) had become too variable. There was a rapid expansion in the 1990s in northern Queensland waters, where catch rates of yellowfin and bigeye were high. In the mid 1990s, improved access to swordfish markets in the United States prompted many fishers to move to southern Queensland ports such as Mooloolaba to target swordfish. Longlining for swordfish has declined since early 2005 because of high fuel, bait costs and depletion of swordfish associated with seamounts. There has been a commensurate increase in albacore landings.

With reduced fishing effort and landings, the Gross Value of Production actually increased from AUD28.7 million in 2005–06 to AUD32.6 million in 2006–07 (ABARE, 2008). This decline was largely a result of decreased catches in high value species such as yellowfin and bigeye tuna and swordfish. In addition, the introduction of longlining techniques from Samoa combined with increased operating costs and fluctuating market returns saw many longliners targeting low-value albacore during the first half of 2006. Recent decreases in the price of albacore and a strengthening Australian dollar has prompted some longliners to move back to targeting swordfish.

Catch and Gear

Eastern Tuna and Billfish Fishery (ETBF) longline fishing effort declined from a peak of 12.7 million hooks in 2003 to 8.4 million hooks in 2007. The 2006 structural adjustment resulted in the surrender of almost 100 of the more than 200 longlining permits originally available in the fishery. About 60 vessels reported longlining during 2007. In addition to restructuring, the decreased activity is attributed to high operating costs (driven mainly by fuel prices and cost of squid bait), the strength of the Australian dollar and reduced catch rates of swordfish in inshore areas and around seamounts.

Nominal catch per unit effort (cpue) for domestic-longlined yellowfin peaked at around 27 fish per 1000 hooks in 1987 (when 2 million hooks were set). During 1992–96, catch rates varied between 12 and 18 yellowfin per 1000 hooks, decreasing to less than 8 during 1997 when a significant part of the fleet switched to targeting swordfish. Since 1998, catch rates have varied between 4 in 1999 and 9 in 2002 yellowfin per 1000 hooks.

Nominal catch rates for swordfish and bigeye peaked in 1997 (when 6 million hooks were set) and then fell quickly. Since 2000, catch rates of both species have remained well below their peak, declining to record-low levels in 2006. Catch rates of swordfish in inshore regions declined significantly, and localised depletion became apparent on the inshore 'Brisbane Grounds'. Large vessels had maintained higher catch rates by operating progressively further offshore. Several longliners in the ETBF began to use deep, daytime sets to catch albacore in 2005. They were joined by over 20 ETBF longliners in 2006.The proportion of swordfish taken from outside the AFZ subsequently declined from almost 40% of the total weight in 2004 to less than 10%. Following the brief lapse in swordfish targeting during 2006, catch rates of swordfish briefly increased in 2007. It is unclear why those catch rates increased; whether it was the results of reduced competition among longliners, rebuilding of the stock or short-term fluctuations in local abundance. Nominal catch rates are a crude method for assessing fish stocks, particularly in the case of a multi-species fishery like the ETBF where variations in catch rate may simply reflect altered targeting practices. Nonetheless, increases in total fishing effort have not been matched by increases in total catch over the fishery's history.

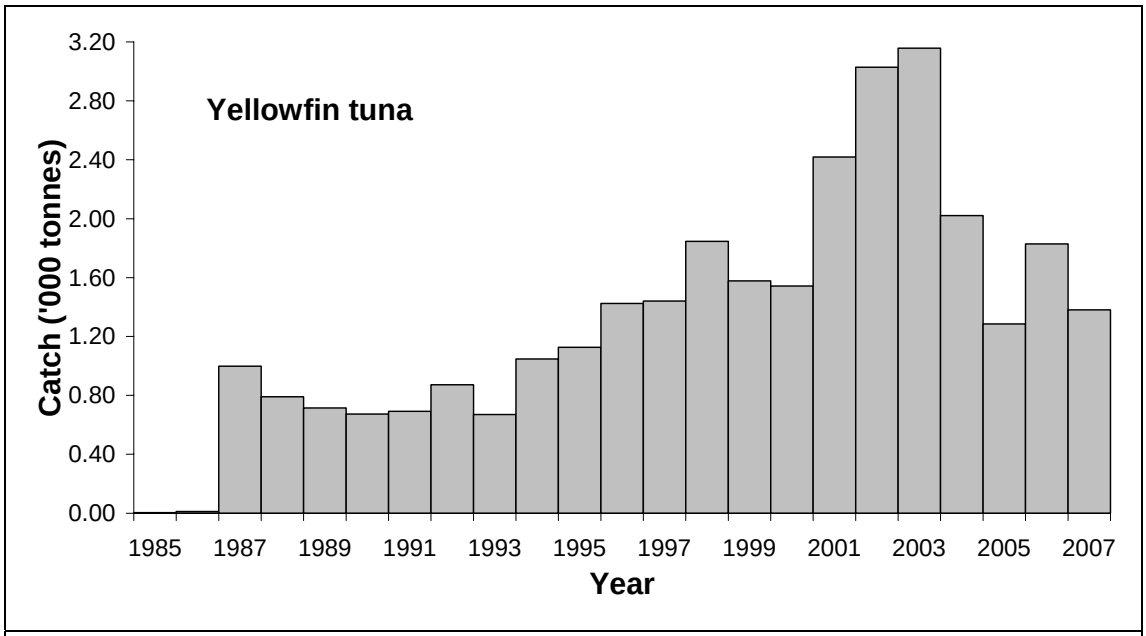
Catches and catch rates of striped marlin increased in the late 1990s. In 1999, recreational anglers reported their best striped marlin season on record. Recreational catches of striped marlin then declined. Commercial longliners also reported high catch rates of large (~80 kg whole weight) striped marlin in 1998–2001, followed by declines. The reasons for these apparent fluctuations in availability in the ETBF are unknown, but may be related to fluctuations in recruitment; migrations; exploitation rates in the ETBF and adjacent waters; targeting; or broad-scale variations in oceanographic or migration patterns.

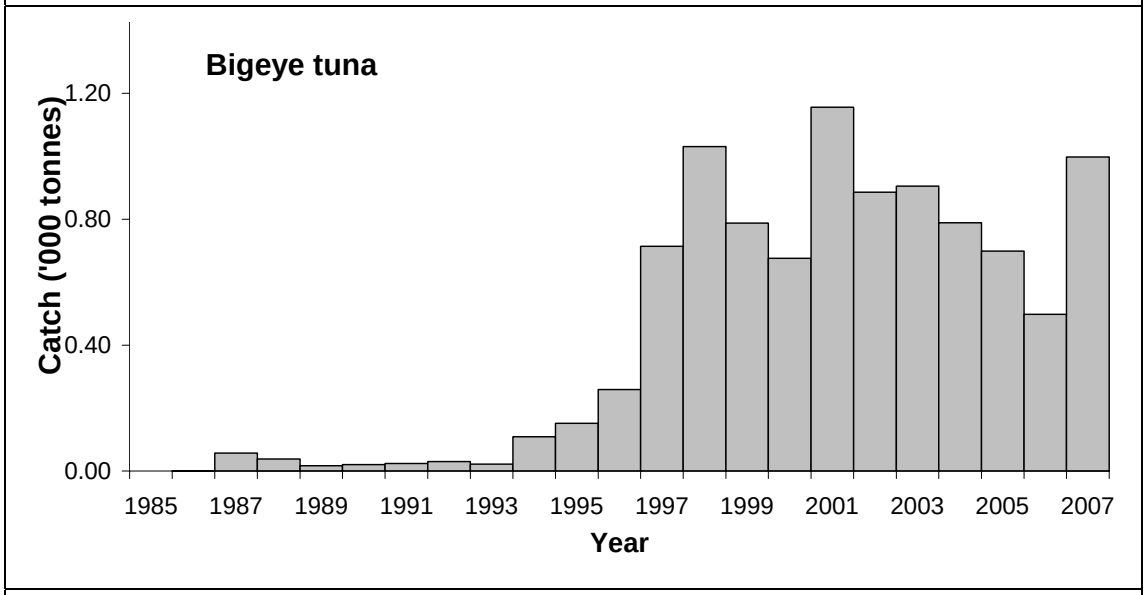
Fishing Fleet and Effort Characteristics

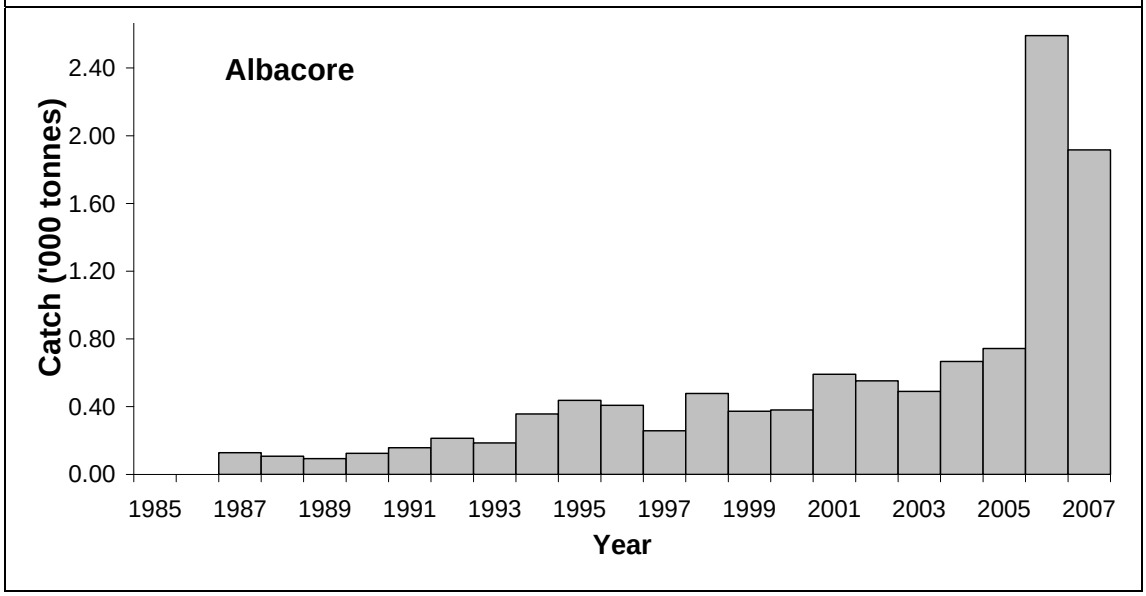
Domestic longliners are generally 15–25 m long. Several larger vessels left the fleet in 2007 as a result of the structural adjustment. The longliners use monofilament gear and, on average, set 1007 hooks each day on 86 days per year. Trip length ranges up to about 20 days, but most are 3–14 days. The catch is stored on ice, in ice slurry, in refrigerated brine or in freezers. Most longliners range 40–300 nm from port, although some swordfish longliners range up to 1000 nm from port. In 2007, 1.4% of longline effort was reported from international waters adjacent to the AFZ.

The expansion of the swordfish sector in the late 1990s resulted in a trebling of annual longline fishing effort. The total number of hooks set in the fishery peaked at 12.2 million hooks in 2003, then fell to 8.4 million in 2007 (Figure 2)**.** The number of active vessels fell from 152 in 1999 to 61 vessels in 2007. Many operators continue to fish for tuna and billfish as part of diversified operations targeting a range of species. This is especially true in the more southerly areas of the fishery.

Longline techniques vary considerably with season and target species. The use of live bait is common among fishers targeting yellowfin tuna, particularly in more southern latitudes (e.g. 30–40 °S). Catches are stored on ice or chilled brine, and trips are usually one week in duration, although longer trips (e.g. 10–20 days) are common among longliners targeting swordfish. Most of the bigeye and yellowfin tuna are airfreighted to Japan, with the remainder sold at sashimi markets in Australia. About 70% of the swordfish are airfreighted to the US, although sales into Japan are increasing. Most of the striped marlin is exported to Japan. Several byproduct species, such as mahi mahi and rudderfish, are exported to Japan and the US.


Yellowfin tuna
Catch ('000 tonnes)
3.20
2.80
2.40
2.00
1.60
1.20
0.80
0.40
0.00
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007
Year


Bigeye tuna
Catch ('000 tonnes)
1.20
0.80
0.40
0.00
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007
Year


Albacore
Catch ('000 tonnes)
2.40
2.00
1.60
1.20
0.80
0.40
0.00
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007
Year

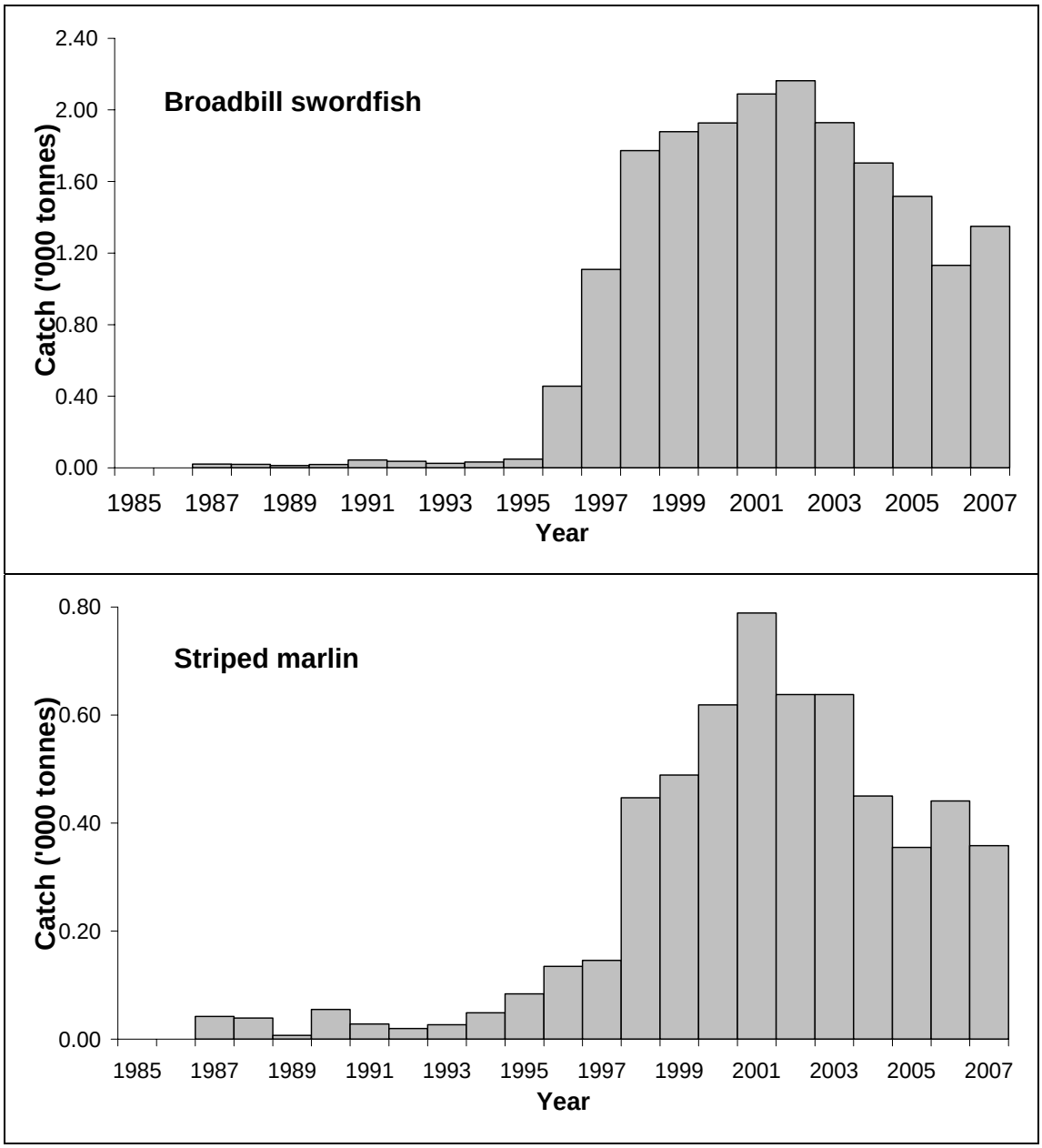


Figure 1: Annual catches of target species reported in logbooks by domestic longliners fishing in the eastern Australian Fishing Zone and adjacent high seas aggregated by calendar year. All catches are metric tonnes (t) and processed weight. Pre–1997 data have been raised for logbook coverage. Catches for 2006 are calculated from Catch Disposal Records (CDRs).

Non-Target Catch

Trip limits for bycatch species are imposed on tuna fishers under agreements between the Australian and relevant State Governments. If sharks are landed, they must have the fins attached.

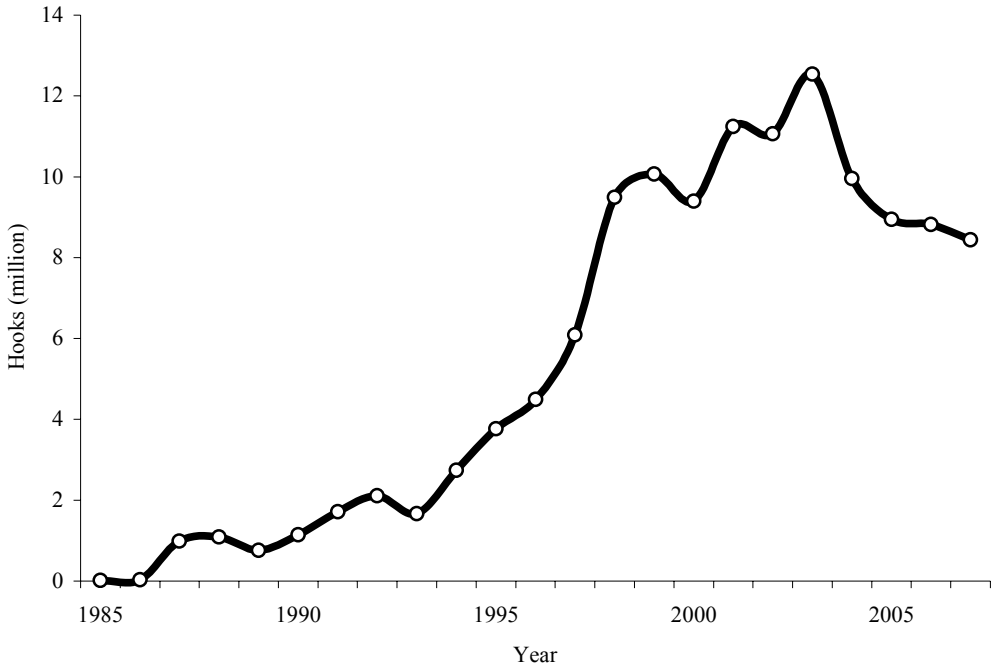


Figure 2: Annual longline fishing effort (millions hooks) reported by Australia's longliners in the eastern AFZ.

A domestic observer program has monitored target and non-target catches since 2001-02 (Table 5). The number of observed wildlife captures has decreased from 240 in 2001-02 to 27 in 2006 . A total estimate of observed and unobserved captures is presented in Table 9, with information on life status detailed in Table 10. Observers monitored 470 919 hooks in the fishery in 2007, which was 5.6% of the total number of hooks reported in logbooks.

Pole-and-line, Purse seine and Minor line

Background

With the introduction of live-bait-and-pole techniques for southern bluefin tuna and sporadic catches of skipjack and yellowfin, the pole-and-line fishery expanded rapidly in the 1950s. The introduction of purse seining in the 1970s boosted catches further. In the eastern AFZ, skipjack are occasionally fished from southern New South Wales to north-eastern Tasmania from November to June, when sea surface temperatures are above 17 °C. Small troll catches of pelagic species have been reported from New South Wales since first European settlement in the late 18th century.

Catch and Gear

Pole-and-line and purse seine catches for 2007 cannot be disclosed because fewer than five vessels operated in 2007. These vessels do not operate outside the AFZ. This fishery had taken significant catches of skipjack tuna in the past, peaking at over 6000 t in 1992, before declining to 1000 t in 1998 and increasing again to about 4000 t in 2000 (Figure **3**). The Eden cannery closed in 1999 and the total catch subsequently fell to about 500 t in 2001 and only 92 t in 2002. Pole-and-line and purse seine catches of skipjack tuna in the eastern AFZ had declined to 183 t in 2004.

Catches in the 'Minor Line' category includes troll, handline and rod-and-reel fisheries (**Table 2**) and vary markedly according to the inshore availability of yellowfin tuna in particular. Regardless, catches are generally a small proportion of the longline catch. In 2006, the purse seine, pole-and-line and minor line methods reported a combined catch of 43 t (**Table 2**). The performance of the minor line fishery is closely aligned with the

experiences of the recreational sector as the two groups use similar methods and often fish in close association.

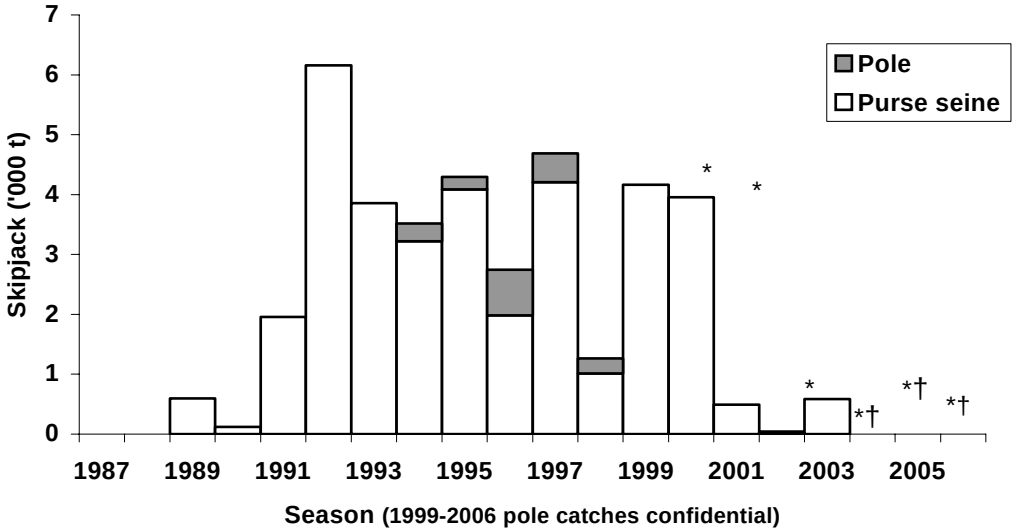


Figure 3: Eastern Tuna and Billfish Fishery annual skipjack tuna catch reported by Australian purse seine and pole-and-line vessels (*confidential pole-and-line data; †confidential purse seine data; <5 vessels).

Fishing Fleet and Effort Characteristics

Most poling vessels are 15–20 m long. Most purse-seiners are 20–25 m long, but several vessels are 40–45 m. Purse seine and pole-and-line fishers often use satellite thermal imagery and spotters in aircraft to locate schools. In 2007 there were no dedicated pole-and-line vessels and less than five purse seiners active in the WCPFC area.

Pole-and-line and purse seine vessels fish for skipjack tuna off the far south coast of New South Wales (35–38°S). In the eastern AFZ, skipjack are fished from southern New South Wales to north-eastern Tasmania from November to June, when sea surface temperatures are above 17°C. There are no dedicated vessels in the minor line fisheries; the catches are reported by vessels involved in other fisheries (e.g., longline) on their way to and from fishing grounds.

Non-Target Catch

Yellowfin tuna are a bycatch of the pole-and-line and purse seine fishery. Regulations restrict their yellowfin tuna bycatch to less than 50% of the total catch in any trip and less than 2% of each vessel's annual catch. The bycatch of yellowfin tuna is usually quite small, amounting to less than 1% of the total catch in most years.

Recreational fishing

Background

Recreational and charter anglers have taken tuna and billfish off eastern Australia since the early 1900s. During the 1970s boats capable of ranging beyond 20 nm became available at reasonable prices and angling for tuna and billfish grew in popularity. The continental shelf is less than 8 nm wide in some places along the southeast coast, and anglers catch tuna and billfish from the shore at several locations. The Game Fishing Association of Australia was formed in 1938. By 2000 it boasted a membership of more than 10 000 anglers, most based on the east coast of Australia. Many gamefishers tag and release much of their catch, especially marlins. A consultative process, involving commercial and recreational fishers, charter operators and State and Australian Governments is developing options for resource sharing.

Catch and Gear

Black marlin catch rates were higher in 1996/97 and 1998/99 fishing seasons when large numbers of small black marlin occurred closer to the coast. Blue marlin catch rates increased in 1997-1999 fishing seasons, possibly due to increased directed effort towards this species (Murphy et al 2002). Striped marlin catch rates in tournaments were relatively steady during 1993–2000, although catch rates in southern latitudes were reported to be exceptionally high in the summer and autumn of the 1998/99 and 1999/2000 seasons (Murphy et al 2002). Recent analyses of charter boat catch rates for striped marlin off the south east coast support this anecdotal evidence (Bromhead et al. 2004).

Recreational striped marlin catches were poor in 2007 although some reasonable catches were taken in tournaments off southern New South Wales. Blue marlin catches were down in terms of numbers but some bigger fish (>250 kg) were landed. The heavy tackle fishery for large black marlin off Cairns reported a patchy fishing season, however, good catches did occur when gamefishers were able to fish. Yellowfin catches inshore were reasonable with some 40–50 kg fish being landed, however, they were not consistent in their availability. As with the commercial sector, the recreational sector reported very few mahi mahi.

Fishing Fleet and Effort Characteristics

There are several hundred charter boats operating off eastern Australia, and many of these take customers fishing for pelagic species from time-to-time. Over 200 charter boats in NSW have a gamefishing endorsement, and a charter boat logbook has operated there since 2000. Tournament monitoring was initiated in 1994. A logbook program is also in place for charter boats that target black marlin off north Queensland.

Research and Statistics

Observer and port sampling programs

Australian Fisheries Management Authority (AFMA) observers have been deployed on domestic longliners since 2001 as part of a program to test the effectiveness of seabird mitigation devices. Since July 2003, observers have been deployed more broadly across the fishery with more general duties, such as the collection of data on fishing gear and the size- and species composition of catches. A total of 4.1% of sets and 4.3% of hooks set were observed between July 2004 and June 2005 (Dambacher 2005). In 2007, observers monitored 470 919 hooks in the fishery, which was 5.6% of the total number of hooks reported in logbooks.

Research activities

The Australian Government and the fishing industry allocate considerable funds to fishery research and monitoring each year. In addition to the logbook and observer programs, key areas of recent and ongoing research include:

Biological Research Projects

- Defining regional connections in south-west Pacific swordfish
- Investigating the size and age composition and spawning activity of albacore tuna in the ETBF
- Population biology and habitat preferences of striped marlin in the south-western Pacific
- Age and growth of swordfish from Australian waters
- Age and growth of bigeye from the eastern and western AFZ
- Biology of, and fisheries for, striped marlin
- Investigation of the origin of yellowfin recruits to the eastern AFZ
- Reproductive dynamics of swordfish in the domestic longline fishery off eastern Australia

Assessment-related Research Projects

- Developing harvest strategies for the ETBF
- Developing robust stock-status indicators
- An analysis of the interactions of domestic longline and recreational gamefish fisheries taking or targeting striped marlin off New South Wales
- Determining the depths fished and the effective longline effort targeted at various species in the ETBF
- Conducting integrated assessment, and developing and evaluating an assessment framework for the ETBF
- Updating the stock assessment of swordfish in the south Pacific Ocean
- Stock assessment of striped marlin in the south-western Pacific Ocean
- Migration and habitat preferences of bigeye on the east coast of Australia
- Dynamics of the interactions of the fishery and swordfish on seamounts off eastern Australia

Ecological Research Projects

- Determining the ecological impacts of longline fishing in the ETBF

Bycatch Research Projects

- Developing and assessing bycatch mitigation devices to reduce interactions of marine mammals with longline and gillnet gears, and using technology to reduce mammal predation on the catch
- The effects of bycatch mitigation measures, such as circle hooks and wire leaders, on target and non-target catches
- A review of byproduct interactions and economics in Australia's tuna and billfish fisheries

Statistical data collection systems

The Australian Government introduced a logbook for Japanese longliners in 1979, and Australian observers were placed on Japan's longliners in the AFZ to verify catch reporting and to collect biological and fisheries data. Japanese longliners no longer operate in the AFZ.

The Australian Government introduced a logbook for domestic longliners in 1986. The logbook has been revised on several occasions. The latest (AL05)was distributed in 2007. Return of logbooks by Australian longliners improved when it became a condition of fishing permits and has been virtually 100% in recent years.

Catch Disposal Records (CDRs) were implemented in the ETBF in January 2006. CDRs are completed by both the fisher and licensed fish receiver at the point of unload to obtain accurate data on fish numbers and verified weight by species. Skippers tend to over-estimate the weights reported in logbooks for most species, so the CDR data have been reported in official statistics since 2007. Weight estimates are also derived from the size-monitoring program, and are likely to be more accurate than logbook data for that part of the time series.

Catch and effort logbooks have been introduced for charter operators in both Queensland and New South Wales (NSW). The NSW Department of Primary Industries also monitored catch and effort data from gamefishing tournaments over the past ten years and a report summarising their observations was released in 2002.

Many anglers who target tuna and billfish voluntarily tag and release under the New South Wales Cooperative Gamefish Tagging Program, which was established in 1973. The data indicate the general distribution of recreational angling activities and trends in catches, masked by changes in effort levels, targeting, reporting of releases and the popularity of tagging. The number of tuna and billfish tagged under the Gamefish Tagging Program varies year-to-year particularly within a given species (Table 4).

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Table 1: Summary of catch and effort reported by Australia's longliners operating the eastern Australian fishing and adjacent high seas aggregated by calendar year. All catches are metric tonnes (t) processed weight. Pre–1997 data have been raised for logbook coverage. 'No. of Vessels' represents the number of longliners returning logbooks. It should be noted that the number of permits in the fishery exceeds these numbers.

Year	No. of vessels	Hooks ('000s)	Yellowfin tuna (t)	SBT (t)	Albacore (t)	Bigeye tuna (t)	Swordfish (t)	Black marlin (t)	Striped marlin (t)	Blue marlin (t)	Sailfish (t)	Spearfish (t)	Other (t)	Total (t)
1986	**32**	**61**	**11**	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**43**
1987	**133**	**1 588**	**998**	**12**	**129**	**57**	**21**	**9**	**42**	**27**	**3**	**3**	**1 223**	**2 524**
1988	**134**	**1 514**	**791**	**23**	**107**	**38**	**19**	**7**	**39**	**18**	**3**	**6**	**83**	**1 134**
1989	**124**	**1 008**	**714**	**3**	**93**	**17**	**13**	**2**	**7**	**0**	**0**	**0**	**49**	**899**
1990	**117**	**1 274**	**674**	**7**	**124**	**21**	**18**	**11**	**55**	**16**	**2**	**2**	**52**	**982**
1991	**111**	**1 822**	**692**	**103**	**158**	**24**	**44**	**10**	**28**	**1**	**1**	**1**	**71**	**1 133**
1992	**124**	**2 393**	**872**	**152**	**214**	**30**	**37**	**6**	**20**	**2**	**2**	**1**	**104**	**1 441**
1993	**109**	**2 065**	**670**	**245**	**186**	**22**	**25**	**0**	**27**	**0**	**0**	**1**	**59**	**1 235**
1994	**110**	**3 274**	**1 047**	**346**	**357**	**109**	**32**	**2**	**49**	**4**	**4**	**4**	**117**	**2 071**
1995	**109**	**3 898**	**1 126**	**244**	**438**	**152**	**49**	**2**	**84**	**4**	**3**	**4**	**174**	**2 280**
1996	**119**	**4 220**	**1 424**	**161**	**408**	**259**	**456**	**<1**	**135**	**9**	**<1**	**<1**	**246**	**3 098**
1997	**137**	**5 606**	**1 441**	**318**	**258**	**714**	**1 109**	**<1**	**146**	**<1**	**<1**	**1**	**220**	**3 783**
1998	**156**	**8 776**	**1 846**	**427**	**478**	**1 031**	**1 772**	**[a]<1**	**447**	**[a]<1**	**2**	**5**	**525**	**6 679**
1999	**145**	**9 661**	**1 577**	**86**	**373**	**788**	**1 878**	**[a] 0**	**489**	**[a] 0**	**2**	**5**	**637**	**5 913**
2000	**140**	**9 355**	**1 543**	**92**	**381**	**676**	**1 927**	**[a] 0**	**619**	**[a] 0**	**5**	**3**	**544**	**5 783**
2001	**159**	**10 711**	**2 418**	**58**	**591**	**1 156**	**2089**	**[a] 0**	**789**	**[a] 0**	**4**	**10**	**902**	**8 013**
2002	**144**	**11 838**	**3028**	**35**	**553**	**886**	**2163**	**[a] 0**	**638**	**[a] 0**	**8**	**20**	**827**	**8 155**
2003	**134**	**12 540**	**3157**	**40**	**490**	**905**	**1 929**	**[a] 0**	**638**	**[a] 0**	**5**	**19**	**743**	**7 916**
2004	**121**	**9 815**	**2021**	**215**	**667**	**789**	**1 703**	**[a] 0**	**450**	**[a] 0**	**1**	**17**	**785**	**6 610**
2005	**97**	**8 949**	**1286**	**32**	**743**	**699**	**1517**	**[a] 0**	**355**	**[a] 0**	**3**	**13**	**592**	**5 239**
2006	**80**	**8 788**	**1829**	**9**	**2591**	**498**	**1132**	**[a] 0**	**441**	**[a] 0**	**3**		**735**	**7273**
2007	**61**	**8 444**	**1380**	**–**	**1916**	**998**	**1349**	**[a] 0**	**358**	**[a] 0**	**–**	**–**	**–**	**–**

[a]Legislation introduced in 1997 requires longliners to release all blue and black marlin, thus restricting the weight data available for those species.
[b] 2006 catch is calculated from Catch Disposal Records (CDRs)

Table 2: ETBF Catch (t) by gear reported in logbooks for 2003-2006.

Species	All Gears				Pole-&-Line & Purse seine				Longline				Other Commercial Methods			
	2003	2004	2005	2006	2003	2004	2005*	2006*	2003	2004	2005	2006	2003	2004	2005*	2006*
Albacore	486	670	757	2430	0	0	0	0	484	667	753	2428	2	3	4	2
Bigeye tuna	890	814	712	453	0	0	0	0	878	789	709	438	12	25	3	15
Black marlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue marlin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Broadbill swordfish	1894	1703	1598	995	0	0	0	0	1894	1703	1596	995	0	0	0	0
Other	567	640	625	583	0	0	0	0	565	623	624	566	2	16	1	17
Sailfish	4	1	3	2	0	0	0	0	4	1	3	2	0	0	0	0
Shark	164	167	121	95	0	0	0	0	164	165	120	95	0	2	1	0
Skipjack	602	181	2	50	597	183	0	0	3	1	2	49	3	0	1	1
Southern bluefin tuna	40	215	38	6	0	0	0	0	40	215	38	6	0	0	0	0
Spearfish	18	17	14	26	0	0	0	0	18	17	14	26	0	0	0	0
Striped marlin	634	450	376	465	0	0	0	0	633	450	375	465	1	0	1	0
Yellowfin tuna	3096	2001	1335	1703	0	6	0	0	3090	1984	1334	1695	6	11	1	8

* 2005 Pole and Line and Purse seine catches have been aggregated with Other Commercial Methods due to domestic confidentiality regulations.

Table 3: ETBF Logbook catches (t) for all methods, including bycatch 2000-05.

Species	Year									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Albacore	258	478	373	381	591	553	490	667	756	2430
Bigeye tuna	714	1031	788	676	1156	886	905	789	712	453
Yellowfin tuna	949	1846	1572	1536	2415	3024	3148	1984	1336	1703
Northern bluefin tuna	1	3	5	8	8	6	12	10	13	5
Southern bluefin tuna	385	573	169	92	58	35	40	215	38	6
Skipjack tuna	6	11	4	2	5	8	3	1	3	50
Broadbill swordfish	1109	1772	1878	1927	2089	2163	1929	1703	1596	995
Striped marlin	146	447	489	619	789	638	638	450	376	465
Black marlin	0	0	0	0	0	0	0	0	0	0
Blue marlin	0	0	0	0	0	0	0	0	0	0
Sailfish	0	2	2	5	4	8	5	1	3	2
Shortbill spearfish	1	5	5	3	10	20	19	17	14	26
Dolphinfish	22	147	123	80	272	280	222	305	189	118
Escolar	3	6	3	3	8	11	87	79	84	64
Moonfish	5	0	5	5	5	8	9	9	11	98
Ray's bream	15	5	7	6	7	10	8	6	29	7
Rudderfish	49	117	159	161	253	277	204	195	154	125
Wahoo	6	14	13	9	11	21	30	12	12	44
Other fish	6	9	5	4	3	2	1	2	11	28
Blue whaler shark	41	49	58	26	34	24	11	22	11	10
Blacktip sharks	0	8	14	7	4	4	9	6	3	4
Bronze whaler shark	8	29	38	28	44	28	26	30	20	15
Dusky whaler shark	0	0	0	2	6	4	2	3	1	2
Oceanic whitetip shark	0	3	8	12	24	22	13	9	6	4
Scalloped hammerhead shark	5	6	6	9	19	15	14	9	1	7
Shortfin mako shark	40	86	163	165	180	96	82	73	64	44
Thresher shark	2	8	5	5	6	2	1	1	1	1
Tiger shark	0	9	12	9	11	7	7	8	6	4
Other sharks	13	15	10	1	1	2	2	3	7	4

Table 4: Summary of the number of tunas and billfishes tagged and released and reported by anglers to the NSW Gamefish Tagging Program.

Common name	1973-80	1980-90	1990-00	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	Total
Marlin, black	1 927	10 700	2 838	1 671	2 417	1 179	583	1 290	4 268	1 838	3304	1373	582	1045	1009	**1416**	**2676**	40116
Marlin, Blue marlin	2	379	117	126	92	140	168	145	172	252	421	337	206	255	189	**369**	**231**	3601
Marlin, Striped marlin	5	461	190	180	220	345	427	1 017	1 172	1 116	1551	1846	674	973	810	**1151**	**1213**	13351
Sailfish	240	4 837	878	1 252	950	1 188	937	845	1 007	1 984	1519	1097	422	318	921	**924**	**569**	19888
Spearfish, shortbill	0	9	2	8	16	12	32	10	1	17	17	9	7	45	19	**15**	**22**	241
Swordfish, broadbill	0	11	4	2	12	3	4	9	1	5	-	-	6	1	0	**0**	**0**	58
Total billfishes	2 174	16 397	4 029	3 239	3 707	2 867	2 151	3 316	6 621	5 212	6812	4662	1897	2637	2948	**3875**	**4711**	65781
Albacore	26	1 911	555	1 179	319	1 486	453	2 732	1 125	992	-	-	402	236	231	**311**	**430**	11647
Bonito, Australian	128	7 308	839	971	944	510	581	509	94	60	-	-	117	69	23	**35**	**16**	12388
Bonito, leaping	2	619	133	79	140	151	244	37	0	0	-	-	-	-	-	**12**	**1**	1418
Tuna, bigeye	1	37	0	1	7	0	15	4	1	1	-	-	0	0	0	**18**	**8**	93
Tuna, dogtooth	6	195	47	13	46	17	6	8	22	7	-	-	10	2	1	**0**	**2**	382
Tuna, longtail	462	1 358	321	155	303	140	223	144	83	98	-	-	122	90	65	**40**	**63**	3667
Tuna, Mackerel (kawakawa)	313	6 627	546	761	931	662	498	610	366	514	-	-	570	671	655	**523**	**592**	14839
Tuna, Skipjack tuna	1 939	7 952	839	380	508	518	731	379	239	245	-	-	237	290	400	**236**	**477**	15370
Tuna, southern bluefin	20	385	161	184	218	73	18	137	73	336	-	-	65	77	24	**19**	**90**	1880
Tuna, yellowfin	521	7 043	1 104	1 761	2 011	1 261	1 825	3 717	1 659	513	-	-	480	1146	651	**427**	**2117**	26236
Total tunas	3 418	33 435	4 545	5 484	5 427	4 818	4 594	8 277	3 662	2 766	-	-	2003	2581	2050	**1621**	**3796**	88477
Total tunas & billfishes	5 592	49 832	8 574	8 723	9 134	7 685	6 745	11 593	10 283	7 978			3900	5218	4998	**5496**	**8507**	159256

Most of the tuna and billfish tagged under the New South Wales Gamefish Tagging Program are released in NSW or Queensland. However, the numbers quoted here are based on data provided by Dr Mike Lowry (NSW Fisheries) that includes small numbers of fish released with NSW Gamefish Program tags in other States and in other countries, such as Papua New Guinea and Fiji.

Table 5: The number of interactions with seabirds, turtles and whales reported by observers on ETBF longliners for July–June annual time periods (Dambacher 2005) and 2006 calendar year (Dambacher pers. comm.). Observers reported that all live animals were released.

Group	Common Name	2001–2002	2002–2003	2003–2004	2004–2005	2006	Total
Seabirds	Flesh-footed shearwater	222	36	17	2	1	278
	Black-browed albatross	2	5	5	1	5	18
	Great-winged petrel	5	5	1	0	0	11
	Wandering albatross	0	2	1	7	1	11
	Short-tailed shearwater	2	2	5	0	0	9
	Wedge-tailed shearwater	2	0	6	0	0	8
	Westland petrel	0	1	4	0	0	5
	Cape petrel	0	0	0	4	0	4
	Shy albatross	1	0	2	1	2	6
	Petrels, prions and shearwaters	1	0	1	0	0	2
	Sooty shearwater	1	0	1	0	0	2
	Great skua	1	0	0	0	0	1
	Buller's albatross	0	0	1	0	1	2
	Grey-headed albatross	0	1	0	0	2	3
	Southern royal albatross	0	0	1	0	0	1
	Yellow-nosed albatross	0	0	1	0	1	2
	Albatrosses (other)	0	1	0	0	1	2
	Subtotal	237	53	46	15	14	365
Turtles	Leatherback turtle	0	2	5	10	8	25
	Green turtle	2	0	0	5	1	8
	Loggerhead turtle	1	0	3	1	2	7
	Pacific (or Olive) Ridley turtle	0	0	1	1	0	2
	Hawksbill turtle	0	0	1	0	0	1
	Turtles (other)[a,b]	–	–	–	–	1	1
	Subtotal	3	2	10	17	12	44
Whales	Short-finned pilot whale	0	0	0	1	0	1
Pinnipeds	Australian fur seal[b]	0	0	0	0	1	1
	Grand total	240	55	56	33	27	411

[a]2006 calendar year: 'Turtles (other)' were undidentified turtles, possibly hard-shelled turtles (Olive Ridley, Hawksbill etc.).

[b]This category was not reported prior to 2006 calendar year.

Table 6. The number of each seabird species caught by ETBF longliners and reported by AFMA observers, 2007. Observers monitored 470 919 hooks in the fishery in 2007, but we caution against raising these numbers to catch rates or catch levels because of the need to adjust estimates for heterogeneity in the distribution and nature of longlining activities and observer coverage.

Species	Number observed
Cape Petrel	3
Great skua	3
Wandering albatross	3
Black browed albatross	2
Total	11

Table 7. The number of each species of marine turtle caught by ETBF longliners and reported by AFMA observers, 2007. Observers monitored 470 919 hooks in the fishery in 2007, but we caution against raising these numbers to catch rates or catch levels because of the need to adjust estimates for heterogeneity in the distribution and nature of longlining activities and observer coverage.

Species	Number observed
Green turtle	5
Leatherback turtle	3
Loggerhead turtle	2
Hawksbill turtle	1
Total	11

Table 8. The number of each shark species caught by ETBF longliners and reported by AFMA observers, 2007. Observers monitored 470 919 hooks in the fishery in 2007, but we caution against raising these numbers to catch rates or catch levels because of the need to adjust estimates for heterogeneity in the distribution and nature of longlining activities and observer coverage.

Species	Number observed
Blue shark	376
Shortfin mako	150
Crocodile shark	95
Bronze whaler shark	53
Tiger shark	39
Oceanic whitetip shark	32
Pelagic thresher shark	23
Dusky shark	21
Bigeye thresher shark	18
Silky shark	13
Hammerhead sharks	11

Species	Number observed
Longfin mako	5
Thintail thresher shark	5
Cookie cutter shark	2
Porbeagle shark	2
Whaler shark	2
Australian blacktip shark	1
Great white shark	1
Scalloped hammerhead shark	1
Total	850

Table 9: Total estimated interactions of seabird, turtle and marine mammals with longline fishing gear in ETBF, 2006 calendar year (Dambacher pers. comm.). All live animals were released.

Group	Common name	Catch percent of total for all species	Estimated interactions*	95% CI percent of estimate
Seabirds	Wandering albatross	0.002%	9	146%
	Buller's albatross	0.000%	1	90%
	Flesh-footed shearwater	0.004%	16	149%
	Black-browed albatross	0.005%	21	80%
	Grey-headed albatross	0.003%	10	125%
	Northern royal albatross	0.000%	1	90%
	Yellow-nosed albatross	0.000%	1	90%
	Shy albatross	0.001%	3	90%
Turtles	Leatherback turtle	0.028%	118	76%
	Green turtle	0.004%	19	122%
	Loggerhead turtle	0.006%	27	165%
	Turtles (other)[a]	0.004%	17	180%
Pinnipeds	Australian fur seal	0.002%	9	146%

*Estimate only for strata with sufficient observer coverage, i.e. ≥10 observed longline sets.

[a]2006 calendar year: 'Turtles (other)' were unidentified turtles, possibly hard-shelled turtles (Olive Ridley, Hawksbill etc.).

Table 10: Life status of observed seabirds, turtles and whales in the ETBF, 2006 calendar year (Dambacher pers. comm.).

Group	Common name	Number observed	Dead	Just-alive	Sluggish-alive	Vigorous-alive
Seabirds	Wandering albatross	1	0%	0%	0%	100%
	Buller's albatross	1	0%	0%	0%	100%
	Flesh-footed shearwater	1	100%	0%	0%	0%
	Black-browed albatross	5	0%	0%	0%	100%
	Grey-headed albatross	2	0%	0%	0%	100%
	Northern royal albatross	1	0%	0%	0%	100%
	Yellow-nosed albatross	1	0%	0%	0%	100%
	Shy albatross	2	50%	0%	0%	50%
Turtles	Leatherback turtle	8	0%	0%	0%	100%
	Green turtle	1	0%	0%	0%	100%
	Loggerhead turtle	2	0%	0%	0%	100%
	Turtles (other)[a]	1	0%	0%	0%	100%
Pinnipeds	Australian fur seal	1	0%	0%	0%	100%

[a]2006 calendar year: 'Turtles (other)' were unidentified turtles, possibly hard-shelled turtles (Olive Ridley, Hawksbill etc.)