National Tuna Fishery Report – Australia

AUSTRALIA'S TUNA AND BILLFISH FISHERIES: CATCH, EFFORT AND FLEET STATISTICS, 2004

Patricia Hobsbawn, Kevin McLoughlin and Peter Ward

Bureau of Rural Sciences
Department of Agriculture, Fisheries and Forestry
Canberra, ACT, Australia

ABSTRACT

Tuna and billfish in eastern areas of the IOTC area of competence are caught by Australian vessels using longline and purse seine as the major fishing methods. Longliners mostly target broadbill swordfish, but also take significant catches of bigeye tuna and yellowfin tuna. Economic circumstances have led to a marked decline in catch and effort in the last two years. A total of 13 Australian longliners fished in the region in 2004, 27 vessels fished in 2003 and 40 in 2002. Longline fishing effort also declined over this period, from approximately 6 million hooks in 2002 to 4 million hooks in 2003 and 1.5 million hooks in 2004. There was a corresponding decline in catches of swordfish (370 t in 2004 compared to 1184 t in 2003), bigeye (91 t in 2004 cf. to 205 t in 2003) and yellowfin tuna (151 t in 2004 cf. 191 t in 2003). The reduction is longline activity is attributed to reductions in market prices and increased operating costs. The purse seine fishery mainly targets southern bluefin tuna that are towed to near-shore cages for fattening (over 5000 t of southern bluefin are caught by those vessels each year). Late season catches of skipjack tuna are also taken by the purse seiners in some years. In 2002, 1144 t of skipjack tuna was caught by purse seine. No skipjack tuna were reported in 2003 but 30 t were reported in 2004. Australia is engaged in a range of research activities that are of direct relevance to management of the domestic fishery and the broader region.

1 – INTRODUCTION

This National Report summarises catch and effort by Australian domestic fisheries in the Eastern Indian Ocean in 2004—the Southern and Western Tuna and Billfish Fishery (SWTBF) that operates mainly with longline and the Southern Bluefin Tuna Fishery (SBTF) using purse seine methods predominantly. Details of active fleet size are also provided where possible. There is also an active recreational fishery operating in this area targeting tuna and billfish species.

2 - LONGLINE FISHERY

Australia's longline fishery operating in the Eastern Indian Ocean is managed at a Commonwealth level (as opposed to being managed by individual states). A complete

set of longline catch and effort data is now available to the end of 2004. All catch and effort statistics were compiled using logbook data. Historically, the main catch in Australia's western waters was taken by Japanese longliners operating in the Australian Fishing Zone (AFZ) under bilateral agreements. They targeted high-value bigeye (*Thunnus obesus*) in the southwest, and yellowfin (*T. albacares*) and striped marlin (*Tetrapturus audax*) in the northwest. These longliners have been excluded from Australian waters since November 1997. A pelagic longline fishery has subsequently developed concentrating on broadbill swordfish (*Xiphius gladius*), in addition to bigeye and yellowfin (Caton and McLoughlin 2004).

2-1 Fishing vessels

The majority of Australian longliners operating in the eastern Indian Ocean are 15–30 m long and set monofilament-longline gear. They store their catch on ice, in ice slurry or in brine spray systems. Trips are generally of 3–10 days' duration with a set of generally less than 1000 hooks before sunrise each day. Daytime setting south of 30°S is banned to minimise interactions with seabirds. Longliners targeting swordfish, the main catch of the fishery, use shallow (20–120 m) night-sets with squid baits and chemical light-sticks. Most longlining activity is within the AFZ, but some vessels fish beyond it. The range offshore is limited for most vessels by their small size and lack of freezer capacity. In the west of Australia, most of the catch is landed at Fremantle, Geraldton and Carnarvon. Most of the southern landings have been made at Albany and, more recently, Port Lincoln. Significant distances between some fishing grounds and ports have resulted in longer trips (of up to 14 days) (Caton and McLoughlin 2004).

The Australian Fisheries Management Authority (AFMA) controls fishing in this region through limited entry. A formal Management Plan is to be introduced for the SWTBF in 2006. AFMA issued a total of 90 domestic longline permits for the fishery in 2002, 2003 and 2004. Only 13 longliners were active (fished more than one day) in this region in 2004 compared to 27 in 2003 and 40 in 2002 (See Table 1). This follows a rapid increase in number of active longliners after 1997 (only 9 active vessels) in line with the expansion of the fishery to a peak of 50 active vessels in 2000.

Recent years have been characterised by the replacement of small (15–20 m) longliners, with the larger vessels able to operate under a wider range of weather conditions and further offshore. The lack of freezer capacity on domestic longline vessels limits the range of operations, but with potentially large catches of bigeye tuna and broadbill swordfish just beyond the AFZ, freezer vessels may be economically viable.

2-2 Fishing Effort

Despite the relatively wide geographic extent of Australia's waters (and coastline) in the eastern Indian Ocean, the commercially valuable tuna and billfish species are rare in the shallow northern region of the AFZ, so fishing activities and effort are concentrated in oceanic waters along the western and southern coasts.

Fishing effort increased from 0.5 million hooks in 1997 to 6.21 million hooks in 2001. In 2003, a decrease in effort occurred (in line with fewer boats fishing) with 3.84 millions hooks set. Subsequently, only 1.52 million hooks were set in 2004.

Longline fishing effort was concentrated off the western and southwestern coastline of Australia between 20ºS and 40ºS. Fishing did not extend beyond the AFZ prior to 1999, but there has been increasing activity recorded outside the AFZ in the period since.

2-3 Catch

The domestic longline fishery in the eastern Indian Ocean had been, up to 2001, one of the most rapidly growing fisheries in Australia: the total catch increased six-fold between 1997 (370 t) and 2000 (2500 t), reflecting a more than 10-fold increase in total effort (0.5 million to 6.2 million hooks). The longline fishery targets swordfish, but also bigeye tuna and yellowfin tuna, with most of the catch exported fresh-chilled to markets in Japan and the USA.

Catches of the principle target species, broadbill swordfish, 370 t in 2004 and 1184 t in 2003 are well down on the 2001 (2135 t) peak catch of swordfish for this fishery since its development. Swordfish annual catches had increased rapidly to this peak from around 235 t in 1998. Yellowfin and bigeye are caught in similar amounts in this fishery, although there is some variation in relative proportions between years. Only 151 t of yellowfin were caught in 2004 and 191 t in 2003, significantly less than in the four previous years (peaking at 557 t in 2001). Catches of bigeye peaked at 433 t in 2000 but only 91 t were caught in 2004 and 205 t in 2003. A number of byproduct species are taken in smaller but still economically significant amounts, e.g., albacore (25 t in 2004 and 66 t in 2003). Data from observers placed on longliners during 2003–04 provides details of the true catch composition (Figure 1). This pilot observer program has been continued in 2005 but placements on vessels have been limited due to the marked effort reduction in the fishery.

Japan's catches in the western Australian AFZ: In 1999 the domestic SWTBF catches first exceeded the historic Japanese average annual AFZ catches for the principal tuna and billfish species. The peak Japanese combined longline catch for albacore, bigeye, yellowfin, swordfish and striped marlin were 1643 t in 1987. The 1987 Japanese peak SWTBF-region catch was dominated by 892 t of bigeye tuna, far greater than their (next largest) 1993 bigeye catch of 384 t. In most years between 1983 and 1997 yellowfin tuna dominated the Japanese catch, but the catches were highly variable, ranging between 3 t and 866 t (Caton and McLoughlin 2004).

3 - PURSE SEINE FISHERY

In the eastern Indian Ocean, purse seiners in the domestic SBTF catch younger age class southern bluefin tuna and tow these to grow-out farms in Port Lincoln (Great Australian Bight – Southern Australia). However, skipjack has occasionally been a late season (March–April) target of purse seiners in the southern bluefin tuna surface fishery, with over 1000 t taken in some years (30 t in 2004).

3-1 Fishing vessels

The farm operations use purse seine vessels to catch SBT, with assistance by former pole-and-line vessels as bait boats and the support of spotter planes (Findlay, 2003).

Six purse seine vessels fished for southern bluefin tuna in the 2003-04 financial year, with the assistance of various live bait, pontoon-towing and feeding vessels. Purse seine fishers often use aircraft and satellite thermal imagery to locate schools. Most purse seine vessels are 20-25m long (two are 40-45m) (Caton and McLoughlin, 2004).

3-2 Fishing Effort

In 2004 purse seiners spent 100 boat days fishing (95 days in 2003).

3-3 Catch

Since 1990, most of the domestic catch of skipjack in the eastern Indian Ocean has been taken by purse seine (lone or assisted by pole and line). Off the South Australian coast, where the southern bluefin tuna fishery operates, skipjack has been a late season (March-April) target of purse seiners and the total annual catch has varied from as low as 27 t to a high of 1400 t in the mid-late 1990s. Most of the skipjack tuna is processed through the cannery at Port Lincoln. In recent years purse seine catch has increased from 486 t in 2000 to 1144 t in 2002. No skipjack catch was reported in 2003 but 30 t was reported in 2004.

Since 1991, when purse seine towing of southern bluefin tuna to grow out farms first commenced in this region, the purse seine catch of SBT has rapidly increased from 138 t (1991) to over 5000 t annually from 1998 onwards (Findlay 2003).

4 - RECREATIONAL FISHERY

Western Australia has a keen recreational game fishery, targeting sailfish (*Istiophorus platypterus*), black marlin (*Makaira indica*), blue marlin (*M. mazara*), striped marlin (*Tetrapturus audax*) and yellowfin tuna. Consideration of recreational fishing interests in the late 1980s had resulted in the prohibition of Japanese longlining within 50 nm of the Western Australian coast. It also led to Japanese agreement that billfish other than swordfish would not be targeted, and that all black and blue marlin taken alive would be released. In 1994 Western Australia passed legislation preventing the landing of all billfish of the family Istiophoridae. However, this legislation was not enforced until December 1999. Meanwhile, in 1998 the Commonwealth banned the retention of blue and black marlin, whether alive or dead, taken anywhere in the AFZ by commercial fishing. Resource sharing arrangements agreed in 2005 have brought about restrictions on the areas to be fished by longline vessels to allow use of these areas by recreational fishers.

5 - RESEARCH

Following is a list of Commonwealth funded research and monitoring projects underway that are relevant to Australia's domestic fisheries operating in the eastern Indian Ocean. Principal investigators and the year of commencement are shown in parentheses.

- SWTBF size monitoring program (Williams 1999)
- Pilot scientific monitoring program for the SWTBF (BRS 2003)

- Scientific assessment for TAC setting advice (CSIRO/BRS 2005)
- Effects of fishing on high-risk bycatch species (BRS/CSIRO 2005)
- A review of byproduct interactions and economics in Australia's tuna and billfish fisheries (BRS 2003)
- Development of a robust set of stock status indicators for the Southern and Western, and the Eastern Tuna and Billfish Fisheries (CSIRO 2002)
- A scientific appraisal of the suitability of underwater setting chute technology as a seabird mitigation measure for Australian tuna longline fisheries (Brothers 2001)
- SWTBF ecological risk assessment (CSIRO 2003)
- On-board chilled storage of broadbill swordfish: assessing and improving post harvest quality (Slattery 2002)

6 - ENVIRONMENTAL ISSUES

Over 60 marine species have been recorded from AFZ longline catches, including tuna and tuna-like fish, billfish, sharks, rays, various other fish, seabirds, and (rarely) sea turtles and marine mammals. When Japanese longliners were operating in the fishery, they retained about 30 species (mainly the tunas, billfishes and sharks) for commercial sale. The bycatch species (most commonly blue shark, *Prionace glauca*) were released or discarded at sea. The 2003–04 pilot scientific monitoring program found that domestic longliners frequently catch blue shark and crocodile shark (*Pseudocarcharius kamoharai*). The latter are quite rare in other longline fisheries. Commercial markets have developed in Australia and overseas for several bycatch species, including escolar or black oilfish (*Lepidocybium flavobrunneum*), oilfish (*Ruvettus pretiosus*) and dolphinfish or mahi mahi (*Coryphaena hippurus*). Several other species, such as wahoo (*Acanthocybium solandri*), have commercial potential. In response to bycatch issues, AFMA formulated a Bycatch Action Plan for the three Australian tuna fisheries (SWTBF, SBTF and the Eastern Tuna and Billfish Fishery).

A 2001 BRS report highlighted high levels of shark bycatch and the widespread practice of 'shark finning' in Australia's tuna fisheries. Fishery-specific arrangements are required to increase knowledge about shark catches and their sustainability. In the interim, AFMA has banned the practice of finning sharks at sea, prohibiting the possession or landing of fins separate from carcasses. AFMA has enforced the landing limit of 20 sharks per vessel per fishing trip, and also banned wire traces (which increase the likelihood of retaining shark).

Catches of sea turtles have been reported in SWTBF logbooks and during interviews with operators. Observers placed on longliners during 2003–04 reported low catch rates of sea turtles.

In August 1998 the Minister for the Environment approved a Threat Abatement Plan to reduce the incidental catch of seabirds by longliners. The chapter on the Eastern Tuna and Billfish Fishery details progress in identifying longline fishing practices intended to reduce the mortality of seabirds. All SWTBF operators are currently required to carry an approved bird-scaring 'tori' line, to use it and set it only at night

when operating south of 30ºS, and to not discharge offal during line setting and hauling.

7 - FURTHER READING

Campbell, R.A., Tuck, G.N., Pepperell, J.G. and Larcombe J.W.P. (1998) *Synopsis on the Billfish Stocks and Fisheries Within the Western AFZ and the Indian Ocean*. Australian Fisheries Management Authority, Canberra, 122 pp.

Campbell, Robert. (2001) Comparison of number of fish measured at processors with number recorded in logbooks. Report to Australian Fisheries Management Authority, Canberra, 22 pp.

Caton, A and McLoughlin, K. (2004) Fishery Status Report 2004. Bureau of Rural Sciences, Canberra, ACT.

Findlay, J. (2003) Australia's 2001-02 southern bluefin tuna fishing season. Working Paper CCSBT-SC/ presented at the Seventh Meeting of the Scientific Committee of the Commission for the Conservation of Southern Bluefin Tuna September 2003,Christchurch New Zealand.

Larcombe, J.W.P., Caton, A., Williams, D.McB. and Speare, P.J. (1997) *Western Tuna and Billfish Fisheries Research*. Bureau of Resource Sciences, Canberra, 205 pp.

Williams, K. (1984) Australian skipjack surveys inconclusive. *Australian Fisheries* 43(20):34–38.

Table 1. The number of Australian longline vessels actively fishing each year in the Eastern Indian Ocean, 1986–2003. Active vessels are defined as vessels that reported fishing on one or more days.

Year	Active vessels
1986	1
1987	3
1988	3
1989	6
1990	7
1991	4
1992	7
1993	9
1994	16
1995	15
1996	11
1997	9
1998	19
1999	37
2000	50
2001	43
2002	40
2003	27
2004	13

Table 2 – Total annual catch (whole estimated weight, scaled up from landed processed weight) for three target species (yellowfin tuna, bigeye tuna and swordfish), three major byproduct species (albacore tuna and rudderfish) and three marlin species caught by Australian fisheries operating in the eastern Indian Ocean, 1986–2004. All catches are for the longline fishery, with the exception of skipjack, which is caught by the purse seine fishery. Note that according to a report by Campbell (2001), data recorded by fishermen in the early years is likely to be a mix of whole and processed weights, therefore the data presented here for years prior to 2000 are likely to underestimate whole weight.

Year	Effort (million hooks)	Yellowfin tuna	Bigeye tuna	Swordfish	Skipjack tuna*	Albacore tuna	Blue shark	Rudder -fish	Blue marlin	Black marlin	Striped marlin
1986	0.05	0.00	16.76	0.49	635.10	14.47	0.00	0.00	0.00	0.00	0.05
1987	0.29	2.55	44.28	0.11	1208.80	9.56	0.00	0.00	0.00	0.02	0.00
1988	0.14	0.23	6.69	0.11	81.90	7.47	0.00	0.00	0.00	0.00	0.00
1989	0.68	157.63	53.79	19.07	2.20	24.89	0.00	0.00	9.37	17.82	27.89
1990	0.35	54.53	32.86	12.44	635.70	4.32	0.00	0.00	4.55	3.90	1.40
1991	0.00	0.72	1.06	0.21	0.00	3.89	0.00	0.00	0.00	0.00	0.00
1992	0.07	7.46	8.51	1.12	334.00	12.04	0.00	0.00	0.00	0.00	0.20
1993	0.36	1.98	26.72	9.64	29.00	33.65	0.00	0.00	0.00	0.00	0.06
1994	0.39	14.06	22.66	26.38	1201.00	40.20	0.00	0.00	0.08	0.42	0.45
1995	0.53	53.16	47.00	46.07	465.00	3.55	0.00	0.00	0.05	0.05	1.86
1996	0.28	89.07	21.68	15.68	335.27	2.55	0.00	6.28	0.00	0.01	2.36
1997	0.52	246.45	42.99	25.35	27.00	16.64	0.03	9.82	1.55	2.59	11.68
1998	1.04	232.06	160.45	235.74	1400.20	23.48	0.44	34.64	0.00	0.00	8.82
1999	3.53	405.06	411.48	1009.55	826.00	20.05	0.41	54.50	0.00	0.00	22.59
2000	6.20	427.40	433.40	1684.90	486.00	30.59	24.15	82.48	0.00	0.00	1.69
2001	6.21	557.46	385.99	2135.62	897.80	93.85	26.11	46.13	0.00	0.00	0.00
2002	5.98	354.64	418.51	1999.76	1144.01	71.97	52.49	31.40	0.00	0.00	0.73
2003	3.84	191.04	205.39	1183.95	0.0	65.62	39.43	18.94	0.00	0.00	0.06
2004	1.52	151.35	90.69	369.69	30.00	25.33	18.77	3.99	0.00	0.00	0.00

*Purse seine catches.

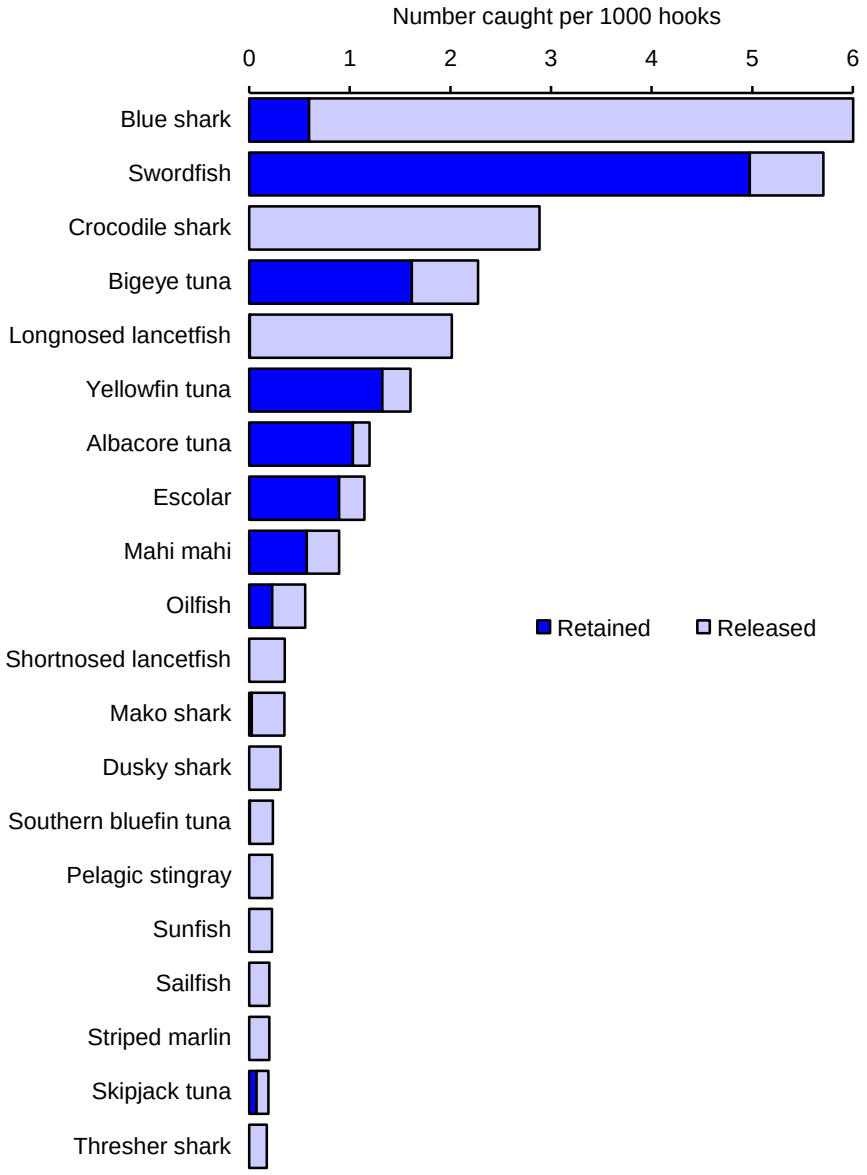

Figure 1. Longline catch rates of the 20 most abundant species reported by observers during 2003–04. Observers reported a further 26 species, which are not shown in this graph. Observers monitored 13 longliner trips, amounting to 104 longline operations and 134 755 hooks. All operations were night sets. Note that the proportion of each species retained and released is shown and that many of the bycatch species were released, in good condition.