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NATIONAL TUNA FISHERY REPORT

AUSTRALIA

August, 2006

National Tuna Fishery Report

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by

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National Fishery Report presented at the Second meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission
(7–18 August 2006, Manila, Philippines)

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SUMMARY

Domestic longline activity off eastern Australia declined in 2005, with the number of active vessels falling from 121 (2004) to 100 (2005). Longline fishing effort also declined, from a peak of 12.5 million hooks in 2003 to 8.6 million hooks in 2005. The decreased activity is attributed to high operating costs (driven mainly by high oil 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.

The catch of yellowfin tuna reported in logbooks by domestic longliners in 2005 was 1286 t, which was a substantial decline from the 2003 peak catch of 3096 t. The 2005 catch of bigeye tuna (702 t) was also less than the peak catch (1050 t) reported in 2001; and the 355 t of striped marlin was down on the 2003 level (634 t). The 2005 broadbill swordfish catch (1517 t) was the lowest since 2001 (1396 t). There is renewed interest in albacore tuna, with increased landings for the canning market.

The proportion of swordfish taken from outside the AFZ has recently decreased with the decline of the fleet and increased fuel costs. The proportion taken from outside the zone decreased from 18% of the total weight in 2004 to 12% in 2005. Smaller proportions of the striped marlin (6%), bigeye tuna (4%) and yellowfin tuna (2%) are taken outside the AFZ because those species are also the target of smaller longliners operating closer to ports.

Few purse seiners and pole-and-line vessels operated off southern NSW in 2005. Catches levels were low but cannot be reported because of confidentiality restrictions.

Striped marlin continued to feature in recreational and charter gamefish catches in 2005, but in fewer numbers than in the late 1990s. Recent years have been excellent for the heavy tackle fishery for large black marlin off Cairns. Good numbers of blue marlin were also reported by east coast gamefishing tournaments.

The Eastern Tuna and Billfish Fishery Statutory Management Plan (including individual allocation of fishing rights in the form of hook-days) is being implemented. Mandatory measures have been introduced to mitigate seabird bycatch, including weighted swivels, tori lines or night setting in certain areas.

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INTRODUCTION

This report describes Australia's tuna and billfish fisheries in the eastern Australian Fishing Zone (AFZ) and adjacent international waters. It was prepared by Mr Jay Hender and Mr Peter Ward for the August 2006 meeting of the Western and Central Pacific Fisheries Commission's Scientific Committee. Jay and Peter are fishery scientists employed by the Australian Government's Bureau of Rural Sciences (BRS) where they are responsible for providing policy makers and government agencies with scientific advice for the management of Australia's pelagic resources. Peter heads Australia's scientific delegation to the Western and Central Pacific Fisheries Commission (WCPFC).

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 after agreement could not be reached on the global Total Allowable Catch for southern bluefin tuna.

1.1 ANNUAL FISHERIES INFORMATION

1.1.1 Domestic longline

Background

Domestic longline activity occurred sporadically in what is now the eastern Australian Fishing Zone (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 and bait costs. There has been a commensurate increase in albacore landings.

With reduced fishing effort and landings, the Gross Value of Production fell to AUD47 million in 2003–04 from AUD79 million in 2001–02 (ABARE, 2005). The Eastern Tuna MAC 61 Chairman's Summary provides the following overview of the fishery's status. "A combination of high fuel prices, relatively high exchange rates, a soft Japanese market and greater competition in both the export and domestic markets is creating financial difficulties in the fishery. Improved catches and fish quality are being offset by increases in bait and fuel prices and a strong improvement in the bottom line will be needed before operators can recommence payments on their loan principal."

Catch and Gear

The catch of yellowfin tuna reported in logbooks by domestic longliners in 2005 was 1286 t, which was a substantial decline from the 2003 peak of 3096 t (Figure 1, Table 1). Nominal catch rates (150 kg per 1000 hooks) were also lower than in recent years and well below those recorded in the early 1990s when yellowfin tuna were the primary target of most longliners. Comparison of nominal catch rates is of limited value due to constant shifts in targeting by longliners in this region.

The 2005 catch of bigeye tuna (702 t) was also less than the peak catch (1050 t) reported in 2001; and the 355 t of striped marlin was down on the 2003 (634 t). The 2005 broadbill swordfish catch (1517 t), the lowest catch since 2001 (1396 t). There is renewed interest in albacore tuna, with 747 t reported by longliners in 2005 (Table 1; Table 2). Landings of albacore for the canning market are increasing.

Fleet, Effort and Fishery Characteristics

Domestic longliners are generally 15–25 m long, although several larger vessels joined the fleet in 2000–03. 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 2005, 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 8.6 million in 2005 (Figure 2). The number of active longline vessels also declined, from 142 in 2002, to 100 in 2005. The declines are attributed to increased operating costs (driven mainly by high oil prices and the high cost of squid baits), the strength of the Australian dollar in relation to the Japanese Yen and US Dollar, and reduced catch rates of bigeye tuna and especially swordfish. 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.

Non-Target Catch

The longline catch composition reported through logbooks from 1997 is presented in Table 3. At 180 t, the reported catches of mahi mahi has declined from its peak of 305 t in 2004. Annual catches of wahoo fluctuated between 9 and 30 t since 1996, with the highest catch recorded in 2003. Logbooks also show substantial catches of blue shark (10 t), bronze whaler (18 t) and shortfin mako (61 t) in 2005. Queensland state laws limit longliners to landing 20 fish (other than tuna, striped marlin and broadbill swordfish) per trip.

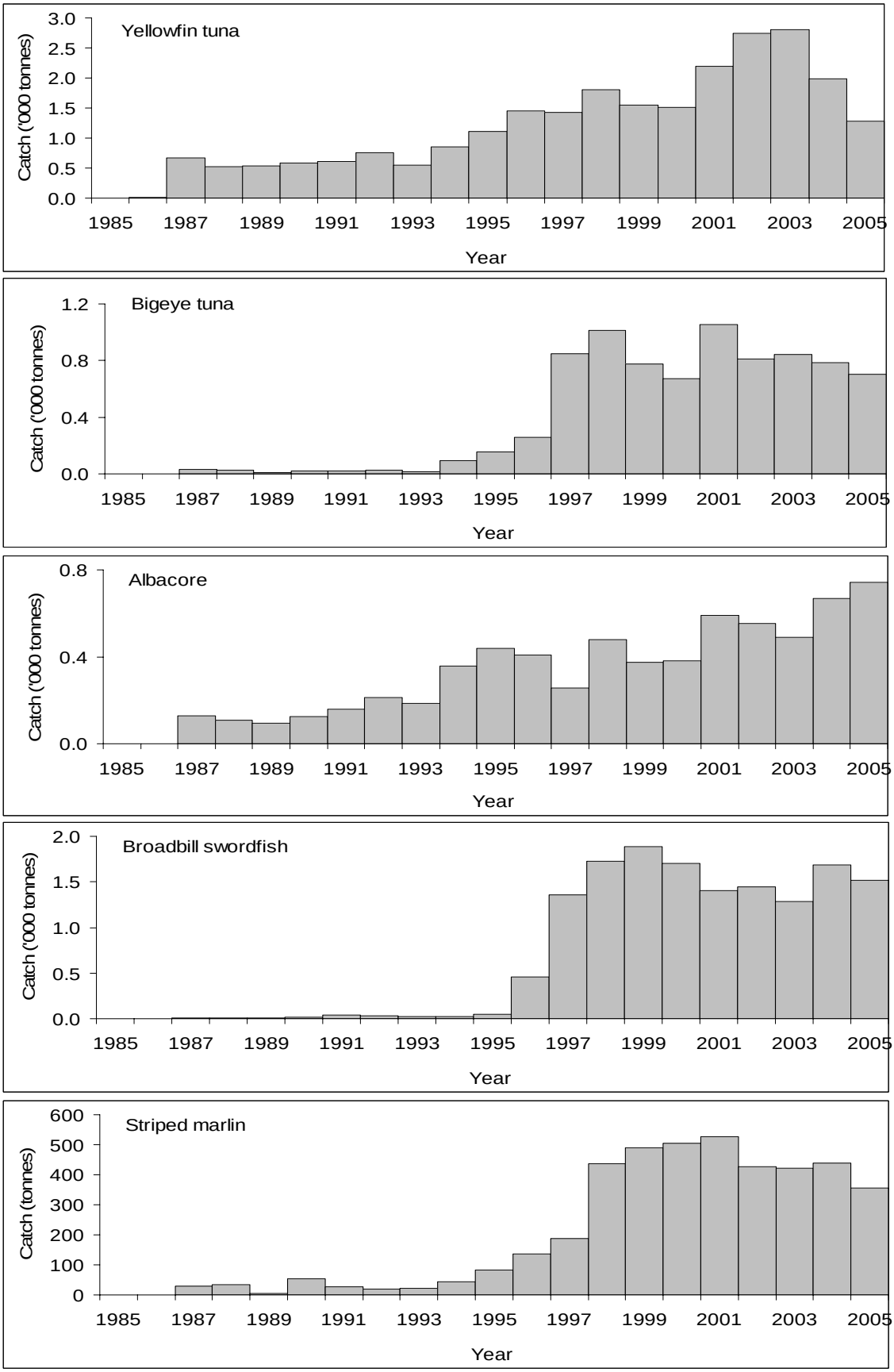

Figure 1: Annual catches of target species reported in logbooks by domestic longliners fishing in the eastern Australian Fishing Zone and adjacent high seas region.

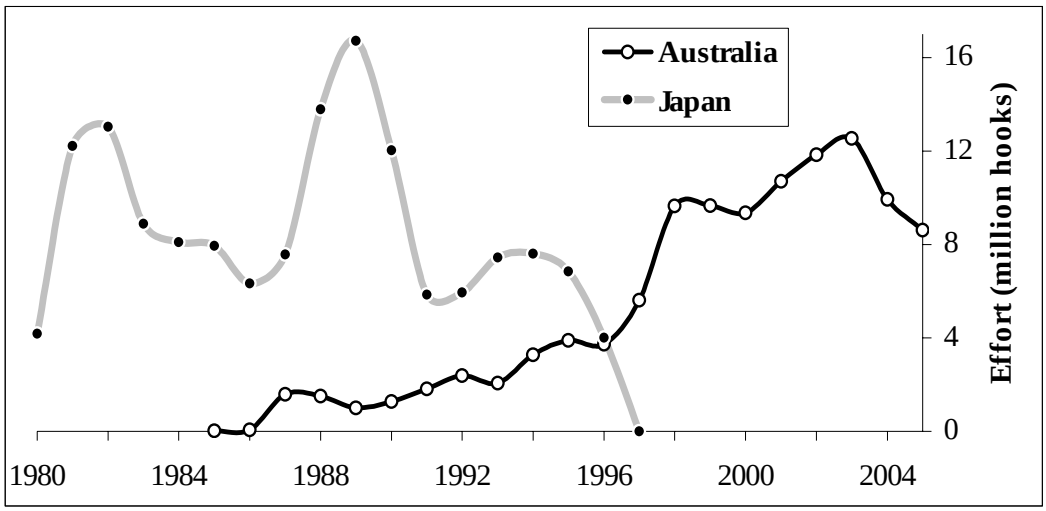

Figure 2: Annual longline effort reported by Australia's longliners (black line) in the eastern AFZ and adjacent high seas and Japan's longliners (grey line) in the eastern AFZ.

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 33 in 2004-05. A total estimate of observed and unobserved captures is presented in Table 6, with information on life status detailed in Table 7.

1.1.2 Pole-and-line, Purse seine and Minor line

Background

With the introduction of live-bait-and-pole techniques for southern bluefin tuna (*Thunnus maccoyii*) and sporadic catches of skipjack (*Katsuwonus pelamis*) 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 settlement.

Catch and Gear

Pole-and-line and purse seine catches for 2005 cannot be disclosed because fewer than five vessels operated in 2005. 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) vary markedly according to the inshore availability of yellowfin tuna in particular. Regardless, catches are generally a small proportion of the longline catch. In 2005, the purse seine, pole-and-line and minor line methods reported a combined catch of 10 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.

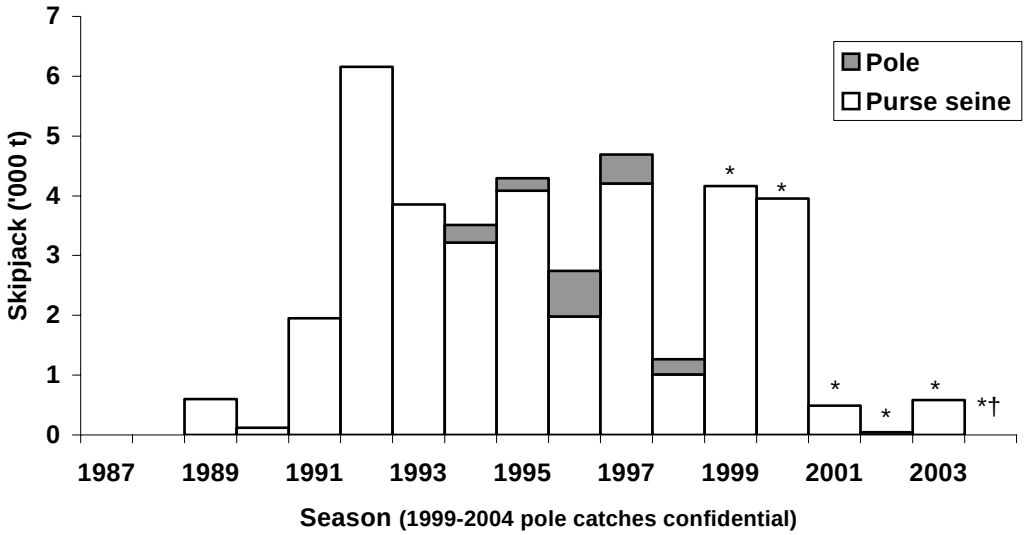

Figure 3: Eastern Tuna and Billfish Fishery annual skipjack tuna catch reported by Australian purse seine and pole-and-line vessels (*confidential pole-and-line data; †confidential purse seine data).

Fleet, Effort and Fishery 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 2005 there were no dedicated pole-and-line vessel 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% in most years.

1.1.3 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.

The interaction between recreational and commercial fleets taking striped marlin by longliners and direct conflicts on inshore live bait collection grounds, has resulted in considerable animosity between the recreational and commercial fishers. This

animosity has resulted in calls for striped marlin to join black and blue marlin as marlin species that may not be retained by commercial fishers. A consultative process, involving commercial and recreational fishers, charter operators and State and Commonwealth Governments is currently developing options for resource sharing.

Catch and Gear

Black marlin catch rates were higher in 1996/97 and 1998/9 seasons when large numbers of small black marlin occurred closer to the coast. Blue marlin catch rates increased in 1997-1999 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 1998/9 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).

Striped marlin continued to feature in recreational and charter gamefish catch records in 2005, but numbers and catch rates have declined significantly since a peak in the late 1990s. Recent years have been good for the heavy tackle fishery for large black marlin off Cairns with good strike rates reported by charter captains. Increased numbers of blue marlin were also a feature of east coast gamefishing tournaments. There have been patches of small black marlin (<20kg, 0+ year class) off Townsville (north Queensland) and similar sized fish made an early appearance off Cape Moreton (south-eastern Queensland).

There was a reasonably strong pulse of small yellowfin tuna off southern NSW in the first half of 2004 and fair but patchy catches of small to medium yellowfin tuna (10kg to 40kg) continued off NSW and southern Queensland into 2005. However, the near absence of larger fish (>50kg) on the 'traditional' fishing areas on the continental shelf along the southeast Australian coast persists.

Fleet, Effort and Fishery 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 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.

1.2 RESEARCH AND STATISTICS

1.2.1 Observer and port sampling programmes

Independent 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 size 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).

1.2.2 Research activities

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

Current Projects

- Determination of the ecological impacts of longline fishing in the ETBF (CSIRO)
- Development of a robust suite of stock status indicators for the Southern and Western and Eastern Tuna and Billfish fisheries (CSIRO)
- Determination of effective longline effort in the ETBF (CSIRO)
- Reduction of interactions by marine mammals with longline and gillnet gears: development and assessment of predation and by-catch mitigation devices (QDPI)
- Archival hard parts collection, a basis for routine ageing of tuna and billfish (CSIRO)
- Mitigation measures to reduce longline interaction with seabirds (AAD, SeaNet)
- Integrated assessment and the development and evaluation of an assessment framework for the ETBF (CSIRO)

Recent projects

- Stock assessment of striped marlin in the south-western Pacific Ocean (BRS, June 2006)
- An analysis of interactions between domestic longline and recreational gamefish fisheries taking or targeting striped marlin off NSW (BRS and NSW DPI, June 2006)
- Analysis of seabird mitigation trials (BRS, June 2006)
- A review of byproduct interactions and economics in Australia's tuna and billfish fisheries (BRS, June 2006)
- Integrated analysis and assessment of the ETBF (CSIRO)
- Migration and habitat preferences of bigeye tuna on the east coast of Australia (CSIRO, May 2005)
- Crossing the line: sea turtle handling guidelines for the longline fishing industry (Belldi Consultancy, Feb 2005)
- Age and growth of broadbill swordfish from Australian waters (CSIRO, Sep 2004)
- New deep setting longline technique for bycatch mitigation (SPC, SeaNet, Aug 2004)
- Assessment of blue shark population status in the western south Pacific (CSIRO, 2004)
- Age and growth of bigeye tuna from the eastern and western AFZ (CSIRO, Dec 2003)
- Development of an operating model and evaluation of harvest strategies for the ETBF (CSIRO, Nov 2003)
- Swordfish-environment-seamount-fishery interactions off eastern Australia (CSIRO, Oct 2003)
- Striped marlin: biology and fisheries (BRS, 2003)
- Investigation of the origin of yellowfin tuna recruits to the eastern AFZ (CSIRO, Nov 2002)

- Reproductive dynamics of broadbill swordfish in the domestic longline fishery off eastern Australia (Aug 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 Gamefish Tagging Program varies year-to-year particularly within a given species (Table 4).

1.2.3 Statistical data collection systems

The Commonwealth 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. The historical longline logbook, radio and observer data from Japanese vessels continues to provide a valuable source of information for fishery assessments and management decision making.

The Commonwealth introduced a logbook for domestic longliners in 1986. The logbook has been revised on several occasions. The latest (AL05), which is designed to also collect information required for a seabird threat abatement plan (TAP), was distributed in 2000. Return of logbooks by Australian longliners improved when it became a condition of fishing permits and has been virtually 100% in recent years.

Catch and effort logbooks have been introduced for charter operators in both Queensland and New South Wales. NSWDPI has also monitored catch and effort data from gamefishing tournaments over the past ten years and a report summarising their observations was released in 2002.

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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.

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	100	8 618	1286	32	743	699	1517	[a] 0	355	[a] 0	3	13	592	5 239

[a]Legislation introduced in 1997 requires longliners to release all blue and black marlin, thus restricting the weight data available for those species.

Table 2: ETBF Catch (t) by gear reported in logbooks for 2002-2005.

Species	All Gears				Pole-&-Line & Purse seine				Longline				Other Commercial Methods			
	2002	2003	2004	2005	2002	2003	2004	2005*	2002	2003	2004	2005	2002	2003	2004	2005*
Albacore	540	486	670	747	0	0	0	0	538	484	667	743	2	2	3	4
Bigeye tuna	861	890	814	702	0	0	0	0	861	878	789	699	0	12	25	3
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	2118	1894	1703	1517	0	0	0	0	2118	1894	1703	1517	0	0	0	0
Other	667	567	640	487	0	0	0	0	666	565	623	486	1	2	16	1
Sailfish	7	4	1	3	0	0	0	0	7	4	1	3	0	0	0	0
Shark	202	164	167	115	0	0	0	0	202	164	165	114	0	0	2	1
Skipjack	116	602	181	3	92	597	183	0	8	3	1	2	16	3	0	1
Southern bluefin tuna	34	40	215	32	0	0	0	0	34	40	215	32	0	0	0	0
Spearfish	19	18	17	13	0	0	0	0	19	18	17	13	0	0	0	0
Striped marlin	623	634	450	354	0	0	0	0	619	633	450	355	4	1	0	1
Yellowfin tuna	2918	3096	2001	1287	0	0	6	0	2914	3090	1984	1286	3	6	11	1

* 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
Albacore	258	478	373	381	591	553	490	667	743
Bigeye tuna	714	1031	788	676	1156	886	905	789	699
Yellowfin tuna	949	1846	1572	1536	2415	3024	3148	1984	1286
Northern bluefin tuna	1	3	5	8	8	6	12	10	13
Southern bluefin tuna	385	573	169	92	58	35	40	215	32
Skipjack tuna	6	11	4	2	5	8	3	1	2
Broadbill swordfish	1109	1772	1878	1927	2089	2163	1929	1703	1517
Striped marlin	146	447	489	619	789	638	638	450	355
Black marlin	0	0	0	0	0	0	0	0	0
Blue marlin	0	0	0	0	0	0	0	0	0
Sailfish	0	2	2	5	4	8	5	1	3
Shortbill spearfish	1	5	5	3	10	20	19	17	13
Dolphinfish	22	147	123	80	272	280	222	305	180
Escolar	3	6	3	3	8	11	87	79	82
Moonfish	5	0	5	5	5	8	9	9	11
Ray's bream	15	5	7	6	7	10	8	6	28
Rudderfish	49	117	159	161	253	277	204	195	152
Wahoo	6	14	13	9	11	21	30	12	12
Other fish	6	9	5	4	3	2	1	2	2
Blue whaler shark	41	49	58	26	34	24	11	22	10
Blacktip sharks	0	8	14	7	4	4	9	6	3
Bronze whaler shark	8	29	38	28	44	28	26	30	18
Dusky whaler shark	0	0	0	2	6	4	2	3	1
Oceanic whitetip shark	0	3	8	12	24	22	13	9	6
Scalloped hammerhead shark	5	6	6	9	19	15	14	9	5
Shortfin mako shark	40	86	163	165	180	96	82	73	61
Thresher shark	2	8	5	5	6	2	1	1	1
Tiger shark	0	9	12	9	11	7	7	8	6
Other sharks	13	15	10	1	1	2	2	3	1

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). All live animals were released.

Group	Common Name	2001-2002	2002-2003	2003-2004	2004-2005	Total
Seabirds	Flesh-footed shearwater	222	36	17	2	277
	Black-browed albatross	2	5	5	1	13
	Great-winged petrel	5	5	1	0	11
	Wandering albatross	0	2	1	7	10
	Short-tailed shearwater	2	2	5	0	9
	Wedge-tailed shearwater	2	0	6	0	8
	Westland petrel	0	1	4	0	5
	Cape petrel	0	0	0	4	4
	Shy albatross	1	0	2	1	4
	Petrels, prions and shearwaters	1	0	1	0	2
	Sooty shearwater	1	0	1	0	2
	Great skua	1	0	0	0	1
	Buller's albatross	0	0	1	0	1
	Grey-headed albatross	0	1	0	0	1
	Southern royal albatross	0	0	1	0	1
	Yellow-nosed albatross	0	0	1	0	1
	Albatrosses (other)	0	1	0	0	1
	Subtotal	237	53	46	15	351
Turtles	Leatherback turtle	0	2	5	10	17
	Green turtle	2	0	0	5	7
	Loggerhead turtle	1	0	3	1	5
	Pacific (or Olive) Ridley turtle	0	0	1	1	2
	Hawksbill turtle	0	0	1	0	1
	Subtotal	3	2	10	17	32
Whales	Short-finned pilot whale	0	0	0	1	1
	Grand total	240	55	56	33	384

Table 6: Total estimated interactions of seabird, turtle and marine mammals with longline fishing gear in ETBF, July 2004–June 2005 (Dambacher 2005). All live animals were released.

Group	Common name	Catch percent of total for all species	Estimated interactions *	95% CI percent of estimate
Seabirds	Cape petrel	0.036%	92	105%
	Wandering albatross	0.033%	85	123%
	Flesh-footed shearwater	0.012%	31	124%
	Black-browed albatross	0.012%	29	195%
	Shy albatross	0.005%	13	172%
Turtles	Leatherback turtle	0.062%	156	69%
	Green turtle	0.020%	50	112%
	Pacific Ridley turtle (Olive Ridley turtle)	0.007%	16	186%
Whales	Shortfinned pilot whale	0.012%	29	193%

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

Table 7: Life status of observed seabirds, turtles and whales in the ETBF, July 2004–June 2005 (Dambacher 2005).

Group	Common name	Number observed	Dead	Just-alive	Sluggish-alive	Vigorous-alive
Seabird	Wandering albatross	7	57%	0%	43%	0%
	Cape petrel	4	0%	0%	0%	100%
	Flesh-footed shearwater	2	50%	0%	0%	50%
	Black-browed albatross	1	100%	0%	0%	0%
	Shy albatross	1	0%	0%	0%	100%
Turtle	Leatherback Turtle	10	0%	0%	30%	70%
	Green turtle	3	0%	0%	33%	67%
	Pacific Ridley turtle (Olive Ridley turtle)	1	0%	0%	0%	100%
Whale	Short-finned pilot whale	1	0%	0%	0%	100%