Australian Government
Bureau of Rural Sciences

Australia - National Report to the Scientific Committee of the Indian Ocean Tuna Commission for the 2007 Calendar Year

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Note: The *Privacy Act 1998* prevents the disclosure of non-aggregated landing data to the public. The Australian Fisheries Management Authority currently has a policy that stipulates the minimum number of vessels required to publish aggregated landing data is five. The number of active vessels in the Western Tuna and Billfish Fishery (WTBF) and Skipjack Fishery (SJF) was less than five in the years 2006 and 2007. As such, total landing data for WTBF longliners and skipjack purse seiners for the years 2006 and 2007 cannot be provided in this report and have been blacked-out "[redacted]" accordingly. Where possible, reference has been made to 2005 catches.

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Executive Summary

Abstract

Pelagic longline and purse seine are the two main fishing methods used by Australian vessels to target tuna and billfish in the Indian Ocean Tuna Commission (IOTC) area. In 2007, only three Australian longliners, from the Western Tuna and Billfish Fishery, operated in the IOTC area and caught [redacted] t of broadbill swordfish, [redacted] t of yellowfin tuna and [redacted] t of bigeye tuna. These catches represent less than 15 percent of the peak catches taken in 2001. The number of active longliners and levels of fishing effort have declined substantially in recent years due to reduced profitability, primarily as a result of lower fish prices and higher operating costs. The estimated catch of southern bluefin tuna in the purse seine fishery was 4822 t in 2007. The 2007 purse seine catch of skipjack tuna was [redacted] t, a decrease of more than 90 percent from that caught in 2001 (1039 t).

Contents

1. General fishery information

Australian fisheries targeting tuna and billfish in the Indian Ocean Tuna Commission (IOTC) area are primarily the pelagic longline fisheries – Western Tuna and Billfish Fishery (WTBF) and Eastern Tuna and Billfish Fishery (ETBF) and the purse seine fisheries – Southern Bluefin Tuna Fishery (SBTF) and the Skipjack Fishery (SJF). These four fisheries are managed by the Australian Government through the Australian Fisheries Management Authority (AFMA). Other methods such as handline, dropline, trolling and gillnetting capture tuna and related species in multi-purpose fisheries, which are managed by the Commonwealth and State governments.

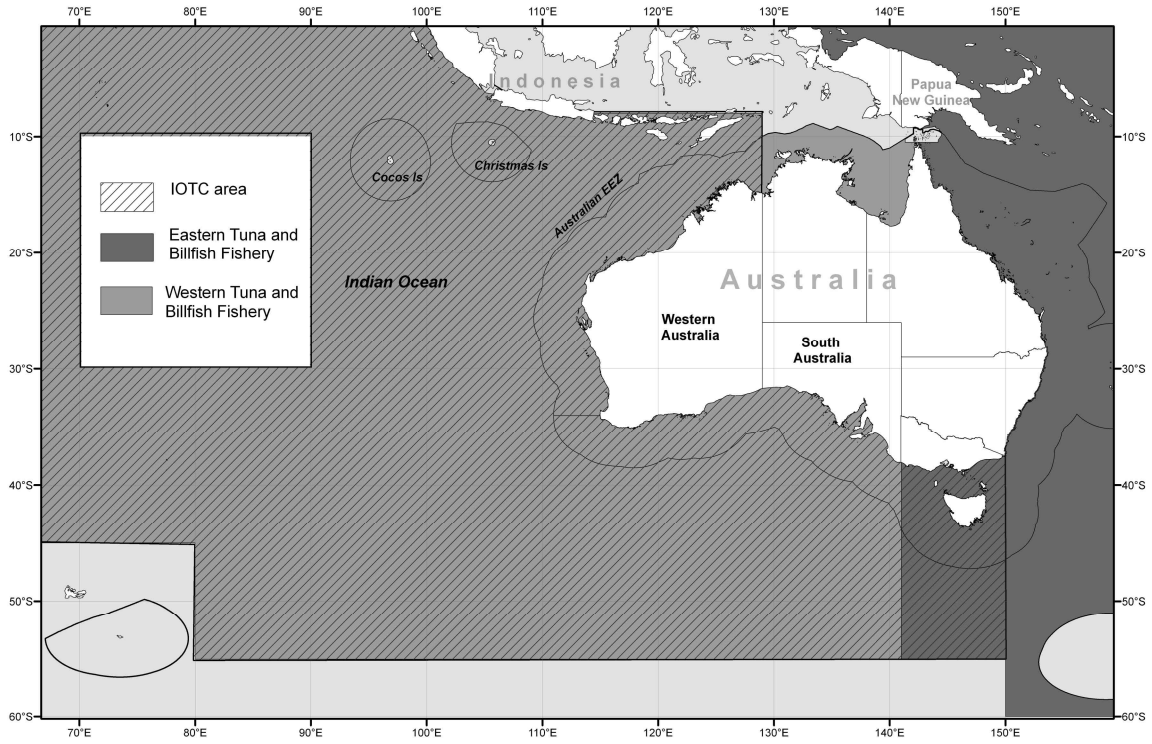


Figure 1: Locations of the Eastern Tuna and Billfish Fishery (ETBF) and the Western Tuna and Billfish Fishery (WTBF) in relation to the Indian Ocean Tuna Commission (IOTC) area.

2. Catch by species and gear

Longline fleet

Australian longline fishing activity and associated catches for tunas and billfishes in the eastern Indian Ocean increased rapidly between 1998 and 2001, especially off Australia's western coast, south of latitude 20°S. Since 2001 however, catches for all species has declined substantially (Table 1). Broadbill swordfish have been the main target species since 1999 (peak catch of 2900 t in 2001) with smaller amounts of yellowfin and bigeye tuna landed each year (Table 1). The swordfish catch declined to 293 t in 2005 and has remained at these lower levels since [redacted] t in 2007). Catches of yellowfin and bigeye tuna have also declined dramatically since 2001 to less than 100 t [redacted] t and [redacted] t respectively in 2007) (Table 1).

Table 1: Total numbers of Australian longline vessels and total catches (tonnes live weight) of tuna and billfish taken by those vessels operating in the IOTC area from 1998 to 2007.

Calendar Year	No. of Longline vessels	Swordfish	Yellowfin tuna	Bigeye tuna
1998	37	337	273	187
1999	49	1426	472	474
2000	61	1798	388	468
2001	45	2900	995	553
2002	44	2005	355	419
2003	36	1766	232	319
2004	22	722	304	174
2005	6	293	34	30
2006	4	[redacted]	[redacted]	[redacted]
2007	3	[redacted]	[redacted]	[redacted]

Purse seine fleet

Purse seine fishing operations by Australian vessels in the IOTC area are dominated by targeting of southern bluefin tuna (SBT) in the Great Australian Bight for grow-out in farm cages at Port Lincoln, South Australia. The estimated catch of southern bluefin tuna in the purse seine fishery was 4822 t in 2007. However, in the 2006-2007 fishing season (1 Dec 2006 to 30 Nov 2007) the actual catch taken was 5234 t (Table 2). In some fishing seasons, purse seine vessels also target skipjack tuna late in the SBT season. Catches of skipjack in 2007 [redacted] t) has decreased by more than 90 percent from that caught in 2001 (1039 t).

Multi-purpose fleets

The multi-purpose fisheries target different species to the longline and purse seine fisheries. In 2007, very small quantities of fish were caught using minor line methods (e.g. handline).

Table 2: Purse seine catches (tonnes live weight) of southern bluefin tuna by Australian vessels fishing in the IOTC area by fishing season and calendar year

Fishing Season	Estimated Catch (t)	Actual Catch (t)	Calendar Year	Estimated Catch (t)
1994–95	2179	2009	-	-
1995–96	2859	3442	-	-
1996–97	3134	2505	-	-
1997–98	3916	3629	1998	3290
1998–99	4418	4991	1999	5120
1999–00	4746	5131	2000	4616
2000–01	5100	5162	2001	5319
2001–02	5400	5230	2002	4920
2002–03	5188	5375	2003	5587
2003–04	5299	4874	2004	5178
2004–05	5225	5215	2005	5330
2005–06	5463	5302	2006	5852
2006–07	5091	5234	2007	4822
2007–08	4530*	5211*	2008	-

*interim figures

3. Fleet structure

Longline fleet

The number of Australian longline vessels operating in the IOTC area has declined substantially since 2000 (61 vessels) with only three vessels operating in 2007 (Table 3). Most of these vessels have operated in the WTBF and very little longline fishing is undertaken in the area of the ETBF west of 150°E (none in 2007). In recent years, the longline fleet has fished mainly within the Australian Exclusive Economic Zone (EEZ) (62.5 percent of total effort in 2007), between 20°S and 35°S. Longline fishing effort by Australian vessels has declined substantially from a peak of 6.25 million hooks in 2000 to less than a million in 2007 (n=[redacted]). The main factor influencing the decline in fishing effort is reduced profitability, caused by lower export prices and higher operating costs, particularly fuel costs.

Most longline vessels range in length from 20 to 35 m and are less than 200 Gross Tonnage (GRT). Ice, ice slurry or brine spray systems are used to chill the catch. The majority of the fishing trips undertaken by WTBF operators are less than 14 days in length ([redacted] trips undertaken in 2007). Vessels undertaking fishing in high seas areas undertake longer voyages, up to 28 days in recent years.

Purse seine fleet

The purse seine fleet has fluctuated from 5-14 vessels since 1998 (Table 3). The focus has been on the capture of SBT for farm cage grow-out. The constant overall quota allocated to Australia by the

Commission for Conservation of Southern Bluefin Tuna (CCSBT) is 5265 t. The purse seine fleets' vessels vary in length from 20 to 45 m.

Table 3: Number of Commonwealth and State longline and purse seine vessels reporting one or more fishing trips in the IOTC area from 1998 to 2007. For the purse seine fleet, the numbers in brackets represent the number of active SBT purse seine vessels from the total number of purse seiners.

Calendar Year	Longline	Purse seine
1998	37	5 (5)
1999	49	7 (7)
2000	61	8 (8)
2001	45	13 (8)
2002	44	9 (7)
2003	36	7 (7)
2004	22	7 (6)
2005	6	8 (8)
2006	4	14 (7)
2007	3	11 (6)

4. National data collection and processing systems

Logbooks

Catch and effort data continues to be collected by daily fishing logbooks for the Australian longline and purse seine vessels operating in the IOTC area. AFMA distributes, collects and processes these logbooks.

Disposal of catch is monitored for the ETBF longline, and the SBT purse seine fisheries but not currently for the WTBF. Catch disposal forms will be introduced for the WTBF when catch limits are introduced in 2009.

Approximately 60 species of fish are recorded in longline logbooks as being captured in the WTBF. The majority of non-target species are caught in low numbers with the notable exceptions of blue shark (*Prionace glauca*) and crocodile shark (*Pseudocarcharias kamoharai*).

Vessel Monitoring System

A Vessel Monitoring System has been required in all Commonwealth managed fisheries since 1 July, 2007, including the WTBF, ETBF, SJF and the SBT fishery.

Observer Program

The Australian Fisheries Management Authority (AFMA) has recruited and trained observers since its establishment in 1992. Approximately 30 observers are currently employed in the AFMA observer program. They are sourced from universities and the maritime industries from around Australia and require the ability to live and work at sea, have demonstrated experience in collecting biological data at sea, and have experience in fisheries research methodologies and collection of associated scientific data. Observers also hold marine radio operators certificate of proficiency (or similar qualifications and/or experience), a sea safety certificate and medical certificate, and have completed an AFMA observer training course.

Western Tuna and Billfish Fishery

A pilot observer program was initiated for the WTBF in 2003 and concluded in 2006. Partial results of the pilot study are provided in Attachments 1a and b and discussed in relevant sections for sharks, seabirds and turtles below. Attachment 1a presents the proportions of retained and released catch of the 19 most abundant species observed in the longline fishery from 2003 to 2006, and Attachment 1b presents their condition on landing. A full list of fish species reported is provided in Attachment 2. The observer coverage during the pilot study amounted to four percent of total longline fishing effort in the IOTC area by WTBF vessels.

In 2007, an ongoing observer program was implemented in the WTBF with a target level of observer coverage set at five percent. In 2007, 1.42 percent of hooks set in WTBF longline operations were observed.

A size monitoring program for the WTBF has been conducted since mid 1999. A contractor collects weights and lengths (where possible) for yellowfin tuna, bigeye tuna and broadbill swordfish from processors in Western Australia. In most years the majority of landings for these three species are monitored by this project due to the low level of fishing effort and catches. Size monitoring of the SBT purse seine catch is carried out when fish are transferred from tow cages to farm cages. When calculating the average weight per tow cage a sample of at least 40 fish (excluding those under 10 kg) from each tow cage are weighed and measured.

Southern Bluefin Tuna Fishery

The ongoing target coverage for the SBT purse-seine fleet operating out of Port Lincoln is 10 percent of the total catch and effort for the fishery. During the 2007–08 quota year, observers spent 98 days at sea and observed purse seiner activities for 46 days and tow activities for 52 days, representing 11.8 percent coverage for all sets.

Eastern Tuna and Billfish Fishery

No ETBF effort occurred in the IOTC area in 2007.

5. Implementation of Scientific Committee recommendations

Australia participates actively in the IOTC Scientific Committee and the associated working parties. Complete data was provided to the IOTC for statistical reporting in June of 2008 including bycatch data and size-frequency data for target tuna and billfish species. Observers continue to be placed on Australian longline vessels fishing in the eastern Indian Ocean to monitor catch and effort reporting, bycatch and wildlife interactions. Bycatch reduction measures are described below.

6. National research programs

The current research priorities for Australia's WTBF against which research proposals will be considered include:

- investigate the stock structure of bigeye tuna and swordfish in the eastern Indian Ocean, with particular emphasis on determining the relationship between fish caught within the WTBF and those caught in nearby waters and the broader Indian Ocean;
- monitor catch and effort by the recreational and charter-fishing sectors targeting highly migratory fishes;

- determine key biological parameters (age, growth, reproduction) required for assessment of Indian Ocean populations of bigeye tuna, yellowfin tuna and swordfish stocks;
- develop a harvest strategy including appropriate target and limit reference points;
- assess the impact and reliance of the WTBF on the pelagic ecosystem, including trophic linkages and the impact of fishing on ecologically related species;
- develop strategies to reduce the damage and loss of catch through predation.

7. Recreational fishery

Western Australia has an active recreational game fishery, targeting blue marlin (*Makaira mazara*), sailfish (*Istiophorus platypterus*), black marlin (*M. indica*), striped marlin (*Tetrapturus audax*) and yellowfin tuna (*Thunnus albacares*). 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 Australian Government banned the retention of blue and black marlin, whether alive or dead, taken anywhere in the AFZ by commercial fishing. In 2005, legislation was introduced by the Australian Government to allow the landing of striped marlin in Western Australia. Impacts from these legislative changes have greatly benefited the recreational fishery.

8. Harvest Strategy

In 2007, the Australian Government introduced a harvest strategy policy to guide sustainability of its fisheries. A copy of the Commonwelath Harvest Strategy Policy can be obtained from www.daff.gov.au. Harvest strategies that incorporate appropriate target and limit reference points are being developed for the WTBF and ETBF.

9. Environmental issues

Ecological Risk Assessments

Ecological risk assessments to identify species at high risk from fishing operations are being undertaken for all Australian Government-managed fisheries and results for the WTBF and ETBF will be considered in management arrangements in 2008. Results for the SBT fishery are expected to be finalised in 2009.

Bycatch and Discard Work Plan

In response to bycatch issues, AFMA has formulated a Bycatch and Discard Work Plan for both the WTBF and ETBF to replace the current bycatch action plans. The work plan outlines a series of measures to improve the monitoring of, and reduce fishery impacts on the bycatch species identified in the Ecological Risk Assessment process as being at high risk from fishing operations. The Bycatch and Discard Work Plan is expected to take effect in late 2008. A Bycatch and Discard Work Plan for the SBT fishery is still in development.

Sharks

NPOA-Sharks

Australia's National Plan of Action for Conservation and Management of Sharks (NPOA-Sharks) was released in 2004 according to guidelines as set out in the International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks). The NPOA-Sharks was designed to provide advice and guidance to fisheries managers, conservation managers and the general public on action needed to ensure that Australia's shark populations are managed sustainably into the future. A copy of the NPOA-Sharks can be obtained from www.daff.gov.au.

Australia's NPOA-Sharks is now due for review and the Australian Government is currently updating the Shark Assessment Report (SAR) which is the scientific basis for the adoption of the Shark Plan. The 2008 SAR builds upon the information provided in the 2001 SAR and aims to identify significant changes that have occurred in fisheries since the release of the 2001 SAR. The assessment includes the presentation and where possible, analyses of:

- resource information (e.g. harvest methods, catch and effort data, and stock assessments);
- management information (e.g. management frameworks, fishery statistics and markets); and,
- law and enforcement information.

The second Australian NPOA-Sharks is expected to be finalised in 2009.

Finning

AFMA prohibits the possession or landing of fins separate from shark carcasses. This policy was implemented in 2000. AFMA has enforced the landing limit of 20 sharks per longline vessel per fishing trip, and also banned wire traces (which increase the likelihood of retaining shark). Longline vessels undertaking single jurisdiction high seas trips may apply for a permit to retain 100 sharks per fishing trip, of which only 80 can be blue sharks.

Sea Turtles

Recovery Plan

A Recovery Plan for Marine Turtles in Australia has been developed by the Department of the Environment, Water, Heritage and the Arts (DEWHA). The overall objective of the plan is to reduce the detrimental impacts on Australian populations of marine turtles and hence promote their recovery in the wild. A copy of the Plan can be obtained from www.environment.gov.au.

While circle hooks are not currently mandatory in Australia's pelagic longline fisheries, AFMA will be considering the impact of such a measure in light of potential implications that such an action may have upon other bycatch species, primarily sharks, in 2009.

Circle Hook Research

The Australian Government conducted experiments to test the effects of circle hooks on longline catches in the ETBF. The commercial longliners fished for yellowfin tuna, bigeye tuna and swordfish in a broad area off south-eastern Queensland out to Lord Howe Island. Crewmembers alternated equal numbers of similar-sized circle hooks and Japanese tuna hooks along each longline. The experimental design, combined with the large sample size (14 trips and more than 95,000 hooks), allowed measurement of the performance of circle hooks.

Key findings included:

- Circle hooks produced higher catch rates of most commercial species such as albacore, yellowfin tuna and striped marlin.
- Circle hooks produced higher catch rates of bycatch, including some shark species.
- For most species, there was no difference in the size of fish caught on circle hooks and tuna hooks.

- Increased financial returns from higher catch rates outweighed the costs of gearing-up with circle hooks.

Interactions

Catches of sea turtles are reported in logbooks and recorded by observers. During the 2003-2006 pilot scientific monitoring program in the WTBF, observers reported eleven sea turtles (four leatherback turtle, four loggerhead turtle, two green turtle and an Olive Ridley turtle) during monitoring that accounted for four percent of total effort in the fishery. All were released alive by crew members.

Observations by observers placed on WTBF longliners during 2007 (1.42 percent) reported 1 loggerhead turtle hooked, that was released alive.

Seabirds

NPOA-Seabirds

In August 1998, the Australian Minister for the Environment approved a Threat Abatement Plan (TAP) to reduce the incidental catch of seabirds by longline fishing activities in Australian waters. The TAP was reviewed in 2006 and is binding in Australian Commonwealth waters under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999). A copy of the TAP can be obtained from www.environment.gov.au.

In 1999, the United Nations Food and Agricultural Organisation (FAO) adopted an International Plan of Action for reducing the Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) to reduce the international catch of seabirds in longline fisheries where this occurs. In recognition of the seabird interactions that occur in Australian longline fisheries, the Australian Government, the states and Northern Territory governments, in cooperation with a number of stakeholders, have developed a draft Australian National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries (NPOA-Seabirds) which will be released nationally for public comment in the near future, and will be available on the Australian Government website www.daff.gov.au for comment. The final Australian NPOA-Seabirds will facilitate a nationally coordinated approach to reduce the incidental catch of seabirds in all longline fisheries within Australia and complements existing measures, such as the TAP.

The draft NPOA-Seabirds lists five key directions to reduce seabird mortality in Australia's longline fisheries:

1. implement appropriate and effective measures to reduce the incidental catch of seabirds in all longline fisheries;
2. develop and maintain a comprehensive understanding of the type and extent of interactions between seabirds and longline fisheries throughout Australia;
3. develop national interaction reporting criteria (logbook, observer and research) to enable the assessment of interactions across fisheries and jurisdictions;
4. facilitate research into, and the development of, mitigation measures for both demersal and pelagic longline fishing methods to reduce the incidental catch of seabirds;
5. raise awareness about incidental catch of seabirds in longline fisheries and effective mitigation measures to reduce adverse interactions.

The draft NPOA-Seabirds outlines a series of actions to reduce the likelihood of seabird mortalities within Australian longline fisheries and provides a clear direction for the collection of information on seabird interactions.

All WTBF and ETBF operators are currently required to carry and use an approved bird-scaring 'tori' line, for use at night (setting gear is only allowed at night) when operating south of 30º S for

the WTBF and 25ºS for the ETBF, and to not discharge offal during line setting and hauling (other minor variations by sector). Similar protocols were implemented by the IOTC in 2008.

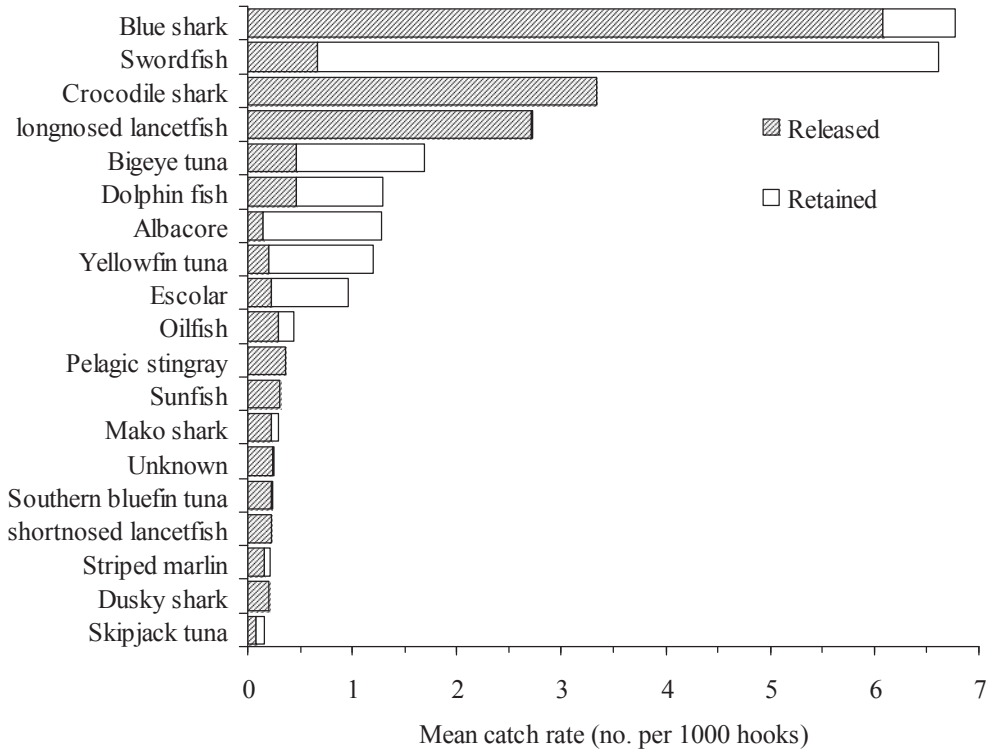
Interactions

During a pilot scientific monitoring program in the WTBF from 2003 to 2006 (four percent coverage), observers reported mortalities of five flesh-footed shearwaters occurred after the birds were hooked during setting. An additional seven flesh-footed shearwaters were entangled in branchlines during longline retrieval but managed to free themselves or were released alive. Other species such as petrels and albatrosses, were often associated with longline retrieval but none were caught.

Observations by observers placed on WTBF longliners during 2007 did not report any incidental catches of seabirds.

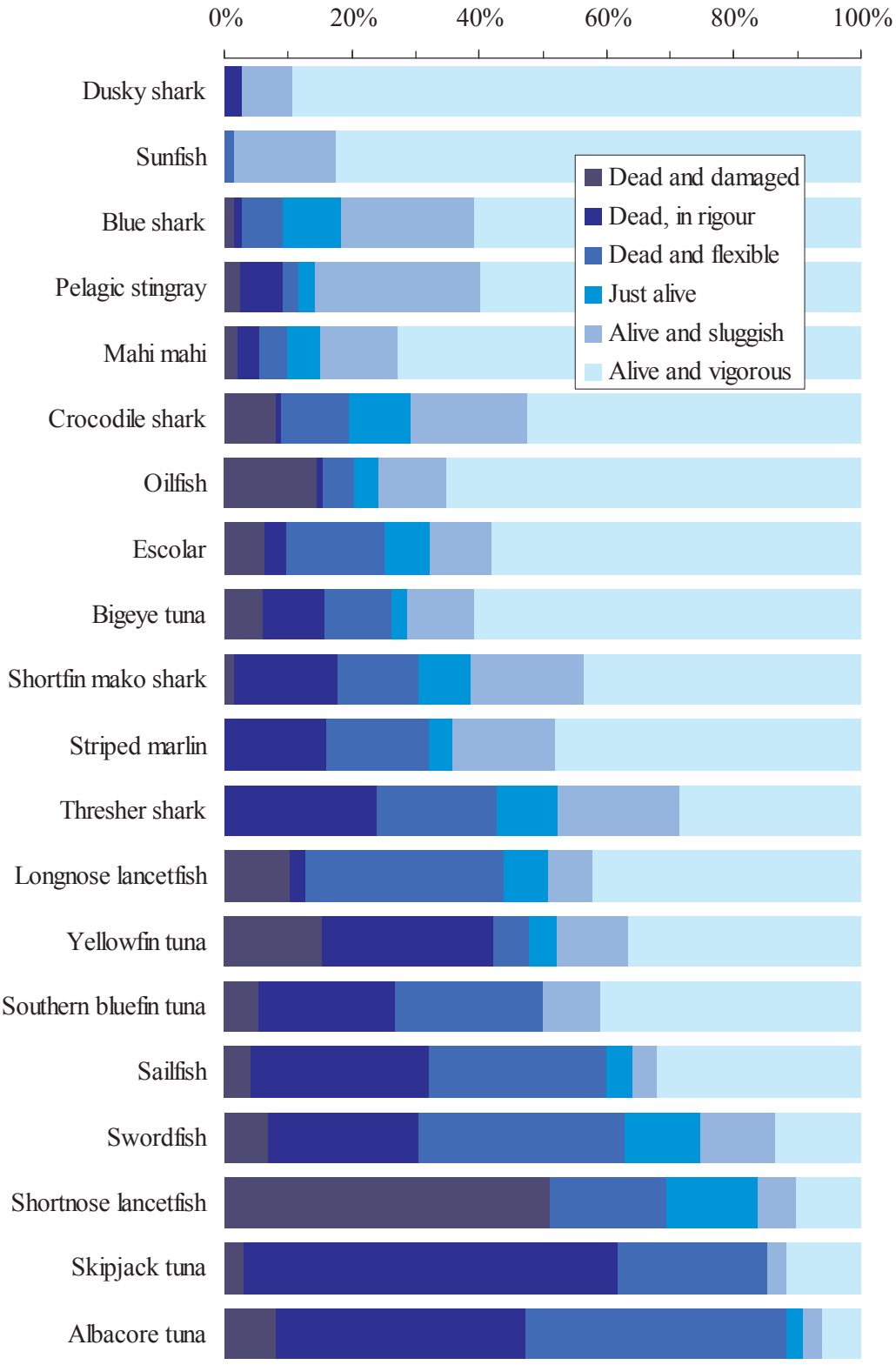
Attachment 1a

Longline catch rates of the 19 most abundant species reported by observers during the pilot scientific monitoring study (2003 to 2006) showing the proportion of each species retained and released. Observers reported a further 46 species, which are not shown in this graph. Observers monitored 18 longline trips, covering 161 daily operations which deployed 217,055 hooks and caught 6610 fish and other animals. The observer coverage amounted to four percent of longline fishing effort during the period. Vessels are not permitted to deploy their longlines during daylight and are required to use tori poles.



Attachment 1b

The percentage of each species reported in each life status at longline retrieval observed during the pilot scientific monitoring study from 2003 to 2006. Only the 20 most frequently caught species are shown.



Attachment 2

Fish species or species groups identified by observers in WTBF retained and released from 2003 to 2006, excluding tuna and swordfish.

FAO SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
WAH	Wahoo	*Acanthocybium solandri*
ALO	Shortnose Lancetfish	*Alepisaurus brevirostris*
ALX	Longnose Lancetfish	*Alepisaurus ferox*
PTH	Pelagic Thresher	*Alopias pelagicus*
BTH	Bigeye Thresher	*Alopias superciliosus*
ALV	Thresher Shark	*Alopias vulpinus*
BEH	Frostfishes	*Benthodesmus spp.*
BRU	Southern Ray's bream	*Brama australis*
POA	Ray's Bream	*Brama brama*
BRA	Pomfret	*Brama spp.*
ALS	Silvertip Shark	*Carcharhinus albimarginatus*
ALS	Silvertip Shark	*Carcharhinus albimarginatus*
FAL	Silky Shark	*Carcharhinus falciformis*
OCS	Oceanic Whitetip Shark	*Carcharhinus longimanus*
DUS	Dusky Shark	*Carcharhinus obscurus*
CCP	Sandbar Shark	*Carcharhinus plumbeus*
CEO	Rudderfish	*Centrolophus niger*
BSK	Basking Shark	*Cetorhinus maximus*
DOL	Dolphinfish	*Coryphaena hippurus*
STI	Pelagic Stingray	*Dasyatis spp*
MAR	Malabar Grouper	*Epinephelus malabaricus*
CVX	Whaler Shark	*Family Carcharhinidae*
TIG	Tiger Shark	*Galeocerdo cuvier*
BUK	Butterfly Mackerel	*Gasterochisma melampus*
GES	Snake Mackerel	*Gemphylus serpens*
ISB	Cookie-cutter Shark	*Isistius brasiliensis*
SFA	Indo-Pacific Sailfish	*Istiophorus platypterus*
SMA	Shortfin Mako	*Isurus oxyrinchus*
POR	Porbeagle	*Lamna nasus*
LEC	Black Oilfish	*Lepidocybium flavobrunneum*
BLM	Black Marlin	*Makaira indica*
RMB	Manta Ray	*Manta birostris*
MOP	Sunfish	*Mola ramsayi*
EOL	Lemon Sole	*Pelotretis flavilatus*
POK	Coley	*Pollachius virens*
BSH	Blue Shark	*Prionace glauca*
OTI	Banded/Spotted Croaker	*Protonibea diacanthus*
PSK	Crocodile Shark	*Pseudocarcharias kamoharai*
OIL	Oilfish	*Ruvettus pretiosus*
BAC	Pickhandle Barracuda	*Sphyraena jello*
BAR	Barracuda	*Sphyraena spp*
SPN	Hammerhead Shark	*Sphyrna spp.*
SPZ	Smooth Hammerhead	*Sphyrna zygaena*
DGS	White-Spotted Dogfish	*Squalus acanthias*
TAL	Big-scale Pomfret	*Taractichthys longipinnis*
SSP	Shortbilled Spearfish	*Tetrapturus angustirostris*
MLS	Striped Marlin	*Tetrapturus audax*
ALK	Alaska Pollack	*Theragra chalcogramma*
GPF	Small-scale Pomfret	*Xenobrama microlepis*