



Australian Government

Australian Fisheries Management Authority

ANNUAL STATUS REPORT

Skipjack Tuna Fishery



September 2008

This report has been prepared by AFMA for consideration by the Department of the Environment, Water, Heritage and the Arts in relation to an approved Wildlife Trade Operation under the *Environment Protection and Biodiversity Act 1999* (EPBC Act).

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 Protecting **our** fishing future

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Introduction

This assessment covers fishing methods in the Skipjack Tuna Fishery (STF) by purse seine and minor line. The STF was declared an approved Wildlife Trade Operation (WTO) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 30 November 2005 for a period of 3 years (to 30 November 2008). A copy of the letter to AFMA, including conditions and recommendations can be found at:

<http://www.environment.gov.au/coasts/fisheries/commonwealth/>

1 Description of the fishery

Skipjack tuna are widely distributed throughout tropical waters of the Indian Ocean and Pacific Ocean.

The Australian fishing zone (AFZ) is at the extreme southern end of their range. Skipjack distribution in the AFZ on the east coast is from far north Queensland to Tasmania, excluding the Great Barrier Reef, off southern Australia from Kangaroo Island in the Great Australian Bight, and up the west coast to Broome.

At a glance	
Principal species	Skipjack tuna (<i>Katsuwonus pelamis</i>) is the only target species in the fishery. The landings of species other than skipjack (which may include bigeye and yellowfin tuna, frigate mackerel, sharks, mahi mahi, rays and marlins) are believed to be much less than 2% of the total landings.
Fishing techniques	Up until 1998 purse seine accounted for around 85% of the total skipjack catch, pole and line for 14%, and longline and minor line methods for the remainder. Since 1999 the pole catch has decreased representing only 1% in 2001 with purse seine accounting for 98% of the catch in that year.
Number of vessels	There are 19 holders of Eastern Skipjack Tuna Fishery (ESTF) permits and 13 holders of Western Skipjack Tuna Fishery (WSTF) permits.
Estimated catch & value	The value of the skipjack fishery is low and variable. Prices have ranged from \$0.63 - \$1.78 per kg over the last 10 years and the total annual value of the fishery ranged from \$0 to \$8.1m over the same period.
Main markets	Skipjack tuna taken in Australian waters is supplied almost exclusively to the cannery in Port Lincoln. The worldwide price for skipjack tuna was depressed in the late 1990s but has recovered somewhat in recent years.
Stock Status	<p>Not overfished and not subject to overfishing (WCPFC, 2008, BRS, 2006)</p> <p>A stock assessment for skipjack tuna in the Western and Central Pacific Ocean (WCPO) was carried out in 2008. The stock assessment indicated that for the broader WCPO skipjack is currently exploited at a moderate level relative to its biological potential.</p> <p>The Indian Ocean Tuna Commission (IOTC) Working Party on Tropical Tunas has not made any specific management recommendations for the skipjack stock. Information suggests that there is no need for immediate concern about the status of skipjack tuna.</p>
Global fisheries	<p>Catches of skipjack tuna have been increasing steadily since 1950. Skipjack has been the dominant species caught in the WCPO for the past decade, making up over two thirds of the total tuna catch. The 2006 skipjack catch was the highest on record at 1,726,702 tonnes. The purse seine component of the catch was (85%), while the pole-and-line was 15%.</p> <p>In the Indian Ocean, skipjack catches have exceeded 400,000 tonnes each year since 1999 and it has become the most important tuna species in this region. Skipjack catches peaked in 2006 at 596,000 tonnes. A large proportion of skipjack caught by purse seiners is taken under fish aggregating devices.</p>

1.1 Target and by-product species

Skipjack tuna is traditionally the only target species in the STF. By-product species may include bigeye tuna, yellowfin tuna, southern bluefin tuna (SBT), frigate mackerel, sharks, mahi mahi, rays and marlins. Bigeye tuna and yellowfin tuna are managed under formal Management Plans: *Eastern Tuna and Billfish Fishery Management Plan 2005* for the Eastern Tuna and Billfish Fishery (ETBF) and the *Western Tuna and Billfish Fishery Management Plan 2005* for the Western Tuna and Billfish Fishery (WTBF). Southern bluefin tuna is also formally managed under the *Southern Bluefin Tuna Fishery Management Plan 1995*.

An overview of skipjack fisheries and by-product species can be found in the Bureau of Rural Sciences (BRS) Fishery Status Reports 2006. A copy is provided at Attachment 1.

1.2 Management arrangements employed in the Fishery

The ESTF and WSTF are currently managed through a permit system. Permits are issued to operators on an annual basis. The fishing season extends from 1 July to 30 June each year. There are currently no catch or effort limits for skipjack tuna as the resource is considered to be underfished at present levels. However, if catch and effort intensity changes significantly, AFMA will review the issues and implement the appropriate alternative management regimes.

The following management arrangements are common to both the ESTF and WSTF:

- entry limited to holders of 12 month, transferable permits;
- operations limited to fishing zones within the two fisheries as specified on permits;
- operations limited to the purse seine fishing method;
- operations limited to target species as specified on permits and incidental catch restrictions as specified on permits;
- catch of yellowfin tuna and bigeye tuna (total combined live weight) is limited to a seasonal catch of 2% of the total live weight of skipjack tuna taken and a trip limit of 50% of the skipjack live weight;
- blue and black marlin must be returned to the sea;
- a maximum trip limit of 20 sharks (shark carcasses must be landed with fins attached);
- dimensions of purse seine nets are fixed, unless approval is gained from AFMA;
- purse seiners may tranship skipjack tuna and incidental catch at sea to another purse seine boat or pole boat, provided that boat is authorised to carry fish taken with another boat or the holder of an ESTF or WSTF (whichever is relevant) skipjack carrier permit;
- all purse seine operators must complete the PS01 Australian Purse Seine Daily Fishing Log;
- all tuna purse seine permit holders may take bait in waters under state jurisdiction, except in NSW waters where bait may only be taken if a NSW fishing entitlement is held.

1.3 Fishing methods employed (gear types)

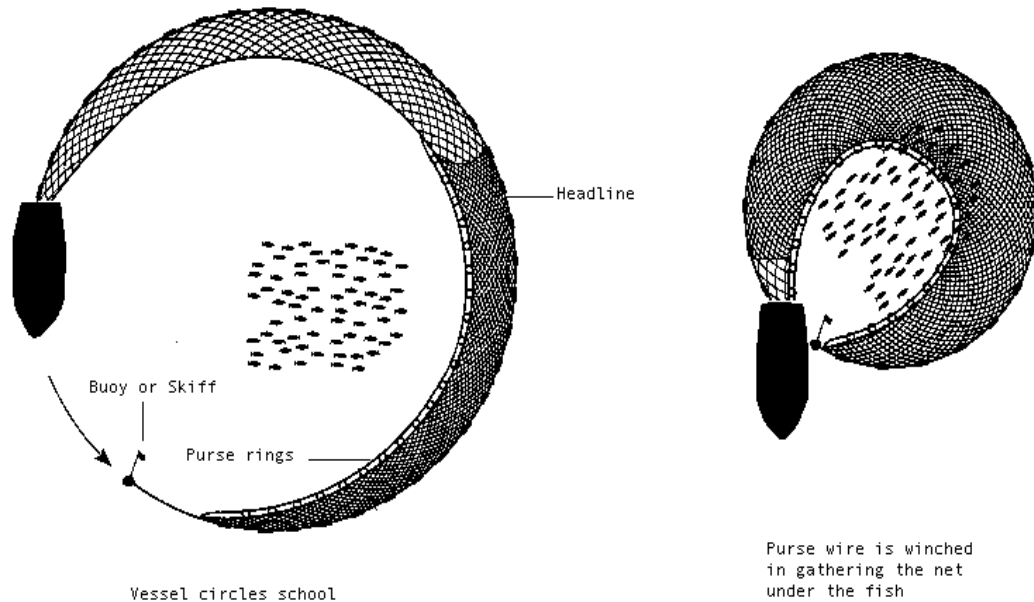
The principal methods used to commercially take skipjack tuna are purse seine fishing or using pole and line.

Purse seine

Purse seining is a method in which a large net is used to encircle surface schools of pelagic fish. When deployed a purse seine net extends like a curtain from its float line on the surface to a depth of about 80 to 350 m. The purse line (heavy wire warp) runs through purse rings attached to the footrope of the net. The net is initially deployed from the purse seine vessel using either a drogue (sea anchor) or powerful skiff to hold one end in position while the vessel steams around the school of fish releasing the rest of the net. The master then finishes shooting the net close to the other end so that the gap can be quickly closed (pursing the net) thus capturing the school of fish (Figure 1). For skipjack tuna the net is gradually hauled on board concentrating the fish so that they can be brailed (scooped) on board.

Purse seining is selective both by use and design. Given the use of accurate echo sounders, spotting planes and increasing knowledge of species behaviour, skippers are usually able to identify the size of a school and estimate the size of fish in the school. Because uniform schools of fish are targeted, the purse seine method is considered to be a highly size and species selective method. Furthermore, although purse seining is an 'active' fishing method, minimal habitat impacts occurs as no contact is made with the substrate.

Figure 1: Purse seine fishing method (Kailola et al, 1993)



Pole and Line

Poling is the method where fish are captured individually using short poles with a line and baited barbless hook or lure (Figure 2). Live bait and fine water sprays are used to enhance feeding behaviour and simulate baitfish activity. Poling methods are used to target varying sizes of surface schooling skipjack tuna and SBT.

Poling is extremely selective as the vessel will either search for or attract specific target species through distributing burly into the water (also known as chumming). Pole operators frequently work in collaboration with purse seine operations but make up a small part of the total effort.

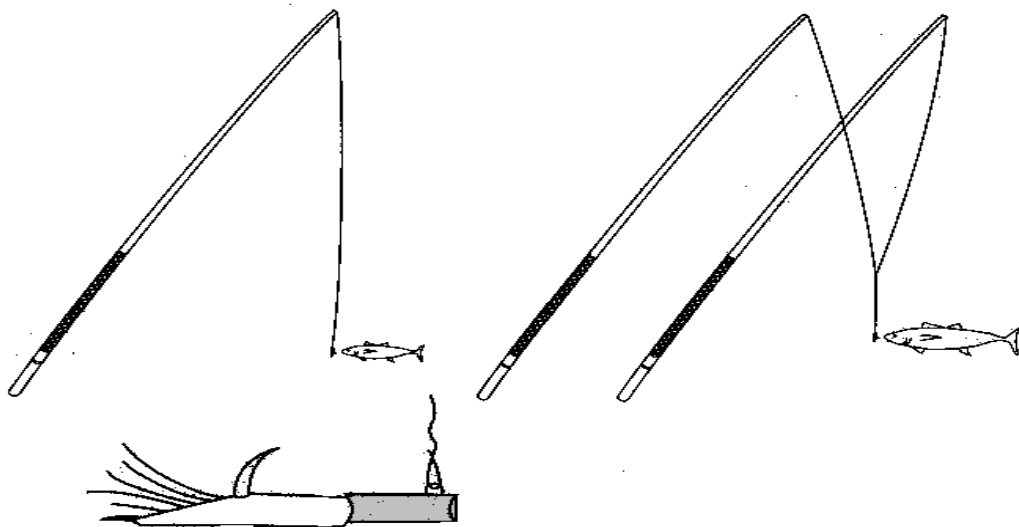


Figure 2: Pole and line gear (AFMA, 2001)

1.4 Fishing area

The skipjack tuna (*Katsuwonus pelamis*) fishery is comprised of the Eastern Skipjack Tuna Fishery (ESTF) and the Western Skipjack Tuna Fishery (WSTF). The area encompassed incorporates the entire AFZ (including waters around Norfolk and Christmas and Cocos (Keeling) Islands, but excluding Heard Island and McDonald Islands and Macquarie Island). The main areas for skipjack fishing inside the AFZ are shown in figure 3.

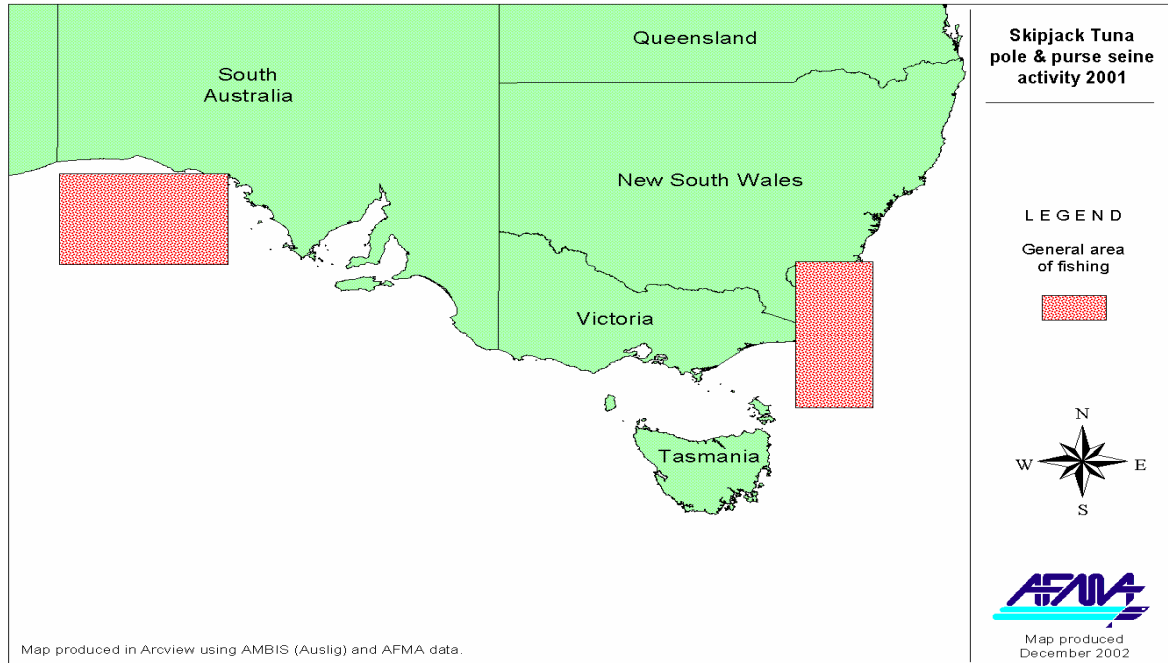


Figure 3: Generalised fishing areas in the domestic Skipjack Tuna Fishery

The areas of competence for both the Indian Ocean Tuna Commission (IOTC) and the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC) are shown in Figure 4.

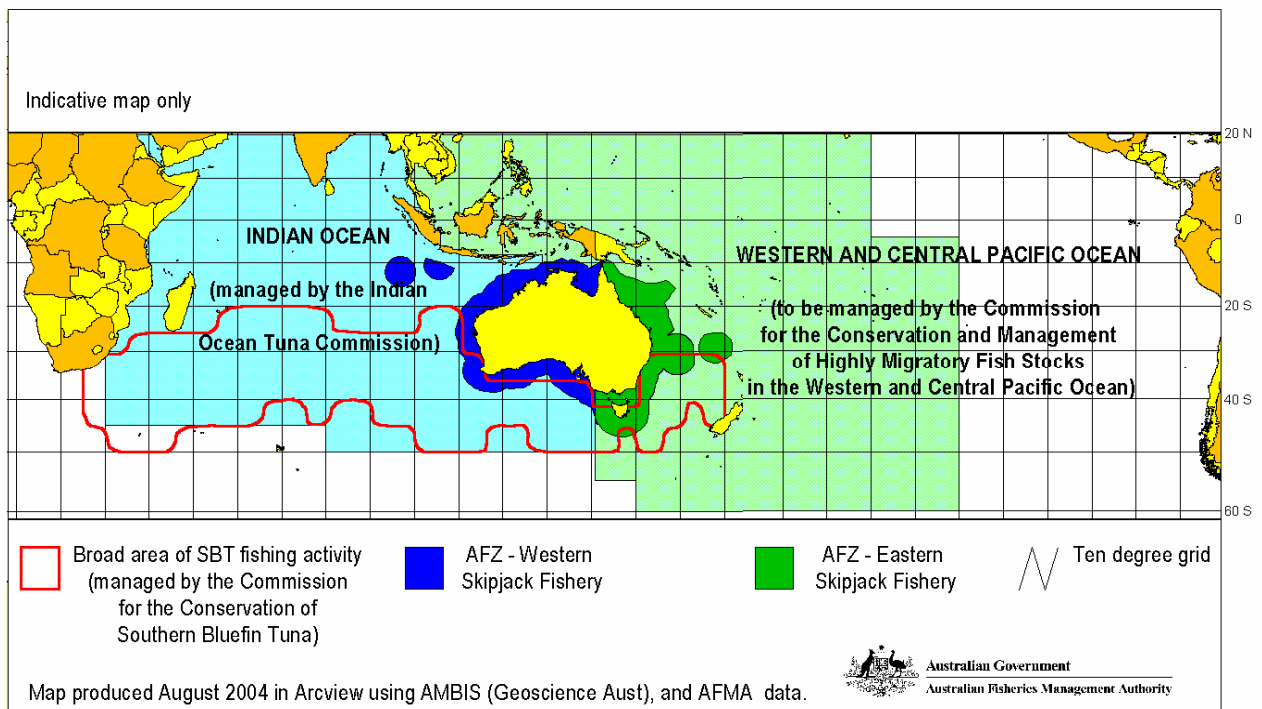


Figure 4: International management areas for skipjack tuna

1.5 Allocation between sectors

There are currently a total of 32 Commonwealth tuna purse seine permits in the fishery. The permits are owned by 18 permit holders, of whom seven hold permits for both the ESTF and WSTF. Table 1 shows the number of active fishing vessels in the ESTF and WSTF.

Year	Eastern skipjack tuna fishery		Western skipjack tuna fishery	
	Pole	Purse seine	Pole	Purse seine
Number of permits	100	19	38	13
2000	6	7	-	4
2001	3	4	2	4
2002	1	2	-	4
2003	1	3	-	-
2004	1	3	-	1
2005	-	-	-	-
2006	-	2	-	3
2007	-	-	-	1

Table 1: Number of domestic vessels recording skipjack catch pole and purse seine since 2000

NSW operators can take unlimited quantities of skipjack tuna inside 3 nautical miles by any method. State fishers in Tasmania are allowed to take up to 10 fish or 40kg, whichever is greater, of any one or a combination of skipjack tuna, albacore tuna, longtail tuna and Ray's bream per trip. State fishers in Victoria, South Australia can take up to 10 fish of any one or a combination of skipjack tuna, albacore tuna, longtail tuna and pomfrets per trip. State fishers in Western Australia can take up to 10 fish of any one or a combination of skipjack tuna, albacore tuna and longtail tuna and commercial fishers in the Northern Territory can take up to 10 fish of any or a combination of skipjack tuna, albacore tuna or pomfrets per trip.

Recreational anglers in NSW, Queensland, WA and SA have unlimited access to skipjack tuna. A possession limit of 30 non-managed fish (including skipjack tuna) applies in the Northern Territory and a combined possession limit of 45 scalefish (excluding baitfish, redbait, jack mackerel and blue mackerel) exists in Tasmania.

1.6 Governing legislation/fishing authority

All fisheries are managed under the *Fisheries Management Act 1991*. The ESTF and WSTF are currently managed through a permit system. Fishing Permits are issued to operators on an annual basis. The fishing season extends from 1 July to 30 June each year.

Australian commitments and obligations under the WCPFC and IOTC are shown as conditions on Fishing Permits.

1.7 Status of export approval/accreditation under the *Environment Protection and Biodiversity Act 1999*.

The STF was declared an approved Wildlife Trade Operation (WTO) under the EPBC Act on 30 November 2005 for a period of 3 years (to 30 November 2008).

2 Management

2.1 Changes to management arrangements (if applicable)

The ESTF and WSTF continue to be managed through an annual permit system. AFMA is currently considering the appropriate future management arrangements which will be considered when the allocation of Statutory Fishing Rights under ETBF and WTBF Management Plans are finalised.

2.2 Compliance risks present in the fishery and actions taken to reduce these risks

AFMA Compliance use a range of tools to gather intelligence and conduct routine surveillance, such as Integrated Computer Vessel Monitoring Systems (ICVMS) to get real time position reports from commonwealth fishing vessels in the AFZ. Compliance monitoring programs also include the use of catch disposal records, fish receiver records and vessel inspections.

Given the low levels of activity a formal compliance risk assessment has not been undertaken for the fishery. The use of the compliance tools, outlined above, is considered by AFMA to be adequate to monitor activity in the fishery. AFMA compliance is being centralised and an assessment of the compliance needs for the skipjack fishery and other small Commonwealth managed fisheries will be undertaken once the new structure is established.

2.3 Consultation processes

In response to the findings of AFMA's Cost Reduction Working Group and the requirement to have fewer Management Advisory Committees (MACs), AFMA is reviewing its approach to determine which of the established MACs is the most appropriate to provide advice to AFMA on the management of skipjack tuna. A decision is expected by the end of 2008.

2.4 Description of cross-jurisdictional management arrangements

The Australian and state/territory governments have negotiated Offshore Constitutional Settlement (OCS) arrangements, which rationalise management, generally on a species basis. Under the terms of these arrangements, the states/Northern Territory generally manage coastal and slow moving species in the inshore areas of the AFZ while the Australian Government manages deepwater and migratory species.

The Australian Government has reached agreement under OCS on jurisdiction over commercial tuna fisheries with the states (except NSW) and the Northern Territory. Under these agreements the Australian Government manages commercial fishing for tuna and tuna like species between the shoreline and three nautical miles. NSW manages tuna and tuna like species in the area of their jurisdiction, between the shoreline and three nautical miles. This means that while state operators in other states and the Northern Territory are limited under the OCS to only a bycatch of tuna and tuna-like species taken in the ESTF, NSW state operators are limited by NSW Fisheries legislation inside three nautical miles.

2.5 Demonstration of compliance with TAP's, recovery plans, etc and also relevant domestic and international agreements (where applicable)

Australia is a Member of the IOTC and WCPFC, and is therefore bound to the conservation and management measures adopted by those Regional Fisheries Management Organisations (RFMOs).

The link between fish caught in the STF and the large stocks of the WCPO and the Indian Ocean is poorly understood. Management of skipjack in the AFZ will be influenced by the decisions of the WCPFC and IOTC. Australia plays an active role in these RFMOs and their Committees.

Pacific Ocean

There are a number of institutional arrangements in place or under development which relate to the stocks of the skipjack tuna in the WCPO. Australia actively participates in all discussions held at these fora.

The Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC)

Australia has been an active participant in the development of a convention for tuna in the WCPO. The WCPFC was established on 19 June 2004.

The main objective of the WCPFC is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the WCPO in accordance with the United Nations Convention on the Law of the Sea (UNCLOS) and the United Nations Fish Stocks Agreement (UNFSA). All species of highly migratory fish stocks (defined as all fish stocks of the species listed in Annex I of the UNCLOS Convention occurring in the Convention Area and such other species of fish as the Commission may determine) within the Convention Area, except sauries. Conservation and management measures under the Convention are to be applied throughout the range of the stocks, or to specific areas within the Convention Area, as determined by the Commission.

Skipjack tuna is one of the key species managed by the WCPFC which will allow for the control of regional levels of fishing activities and a regional approach to monitoring, data collection, research and assessment.

South Pacific Forum Fisheries Committee (FFC)

The Forum Fisheries Agency (FFA)¹ was established under the *South Pacific Forum Fisheries Agency Convention* on 10 July 1979. Although it is not technically a management body, as it has no regulatory functions, the FFA has nevertheless contributed significantly to fisheries management and development in the region. The FFA covers all living marine resources, but has a particular interest in highly migratory fish stocks, including skipjack tuna.

The Forum Fisheries Committee (FFC), on which all members are represented, provides guidance and serves as a forum for the exchange of information on fisheries issues and is the principal decision-making body, but most of the work is carried out through the FFA Secretariat. The principal role of the Secretariat is to collect, analyse, evaluate and disseminate information to the member countries. The Secretariat also provides legal, economic and technical advice, information and assistance in the formulation and implementation of the region's fisheries policies and access agreements.

The Oceanic Fisheries Programme of the Secretariat of the Pacific Community

The Oceanic Fisheries Programme (OFP) was established by the 1980 South Pacific Conference to *"to provide member countries with the scientific information and advice necessary to rationally manage fisheries exploiting the region's resources of tuna, billfish and related species"*. Australia is a significant contributor to the funding of the OFP.

The Standing Committee on Tuna and Billfish (SCTB) advises the OFP on matters related to stock status of tunas including skipjack tuna. The SCTB provides the scientific and stock assessment advice to the WCPFC.

Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America (US Treaty)

Australia is currently a party to the US Treaty, a regional treaty between FFA Member countries and the United States that gives United States purse seiners wide-ranging access to the fishing zones of FFA member countries, including an area in the far north-east of the AFZ.

¹ More information on FFA can be found at the website www.oceanlaw.net/orgs/ffa.htm

It is understood that the US purse seine fleet does not regard the area as a viable fishing ground, mainly due to the likelihood that fishing would be subject to domestic regulations, such as restrictions on yellowfin tuna and bigeye tuna incidental catch (BRS 2002). The fleet also regards the relatively long period of steaming to reach Cairns and the inadequate port facilities in Cairns as a disincentive to fishing in the AFZ.

Indian Ocean

Indian Ocean Tuna Commission (IOTC)

Management of skipjack tuna in the Indian Ocean falls under the IOTC, of which Australia is a member. The IOTC has not introduced any management measures for skipjack tuna. The priority for skipjack in the Indian Ocean is to gain a better understanding of stock structure and status. The IOTC's Working Party on Tropical Tunas (WPTT) oversees the status of the skipjack tuna and other tuna species in the Indian Ocean.

There is no quantitative stock assessment available for the Indian Ocean. The IOTC noted at its 2006 meeting that the range of available stock indicators suggest there is no immediate concern about the status of skipjack tuna in the Indian Ocean (BRS, 2006).

3 Research and Monitoring

3.1 Results of any research completed relevant to the fishery, including how results will be incorporated into management of the fishery

Australian scientists are members of the regional scientific bodies which provide advice on stock assessments and research to the WCPFC and IOTC. Research and assessments are done at a regional level, with Australian scientists actively participating in the Committees and Working Parties of these RFMOs.

In the Pacific the SCTB under the Secretariat of the Pacific Community (SPC) is currently providing the scientific advice on stock status, including skipjack tuna, to the WCPFC.

The SCTB provides a forum for scientists and others with an interest in the tuna stocks of the WCPO to meet to discuss scientific issues related to data, research and stock assessment. Its aims are to:

- coordinate fisheries data collection, compilation and dissemination according to agreed principles and procedures;
- review research on the biology, ecology, environment and fisheries for tunas and associated species in the Western and Central Pacific Ocean;
- identify research needs and provide a means of coordination, including the fostering of collaborative research, to most efficiently and effectively meet those needs;
- review information pertaining to the status of stocks of tunas and associated species in the Western and Central Pacific Ocean, and to produce statements on stock status where appropriate; and
- provide opinion on various scientific issues related to data, research and stock assessment of Western and Central Pacific Ocean tuna fisheries (SPC, 2002)

The principal forum for consideration of research on Indian Ocean tuna and billfish stocks and their associated fisheries is the IOTC Scientific Committee. The Scientific Committee draws on the available expertise from the range of member states to the Commission. The Scientific Committee meets prior to the IOTC's annual sessions and reports on findings and makes recommendations to the Commission. The Scientific Committee administers several working parties including the WPTT which includes skipjack tuna.

3.2 Description of monitoring programs used to gather information on the fishery

AFMA considers the existing data collection, research and monitoring systems for the STF to be appropriate to the scale of the fishery. However, improvements to data acquisition, verification and management processes will continually be made in association with AFMA's general improvement efforts. Principles for data management, collection, verification and analysis are the factors that will underpin all data collection programs for Commonwealth fisheries.

The domestic and international STF data collection, research and monitoring are summarised in Table 3. Logbook records are the main source of data. Domestically, STF operators are required to complete the PS01 catch and effort logbook which records details on catch, effort and gear as well as target, by-product and bycatch species. Wildlife interactions are also recorded in these logbooks. The published information available on the purse seine and pole fishery is limited by the need to protect confidentiality of the relatively small number of active operators.

Operators must record in their AFMA logbook bait used in each shot in the fishery, including bait taken in NSW waters under a NSW Fisheries permit.

Current data information collection is fisheries dependent. The extensive area of waters of the fishery and the migratory nature of skipjack tuna is more conducive to fishery dependent research and monitoring. However, some fishery independent studies have been undertaken and others are underway.

Skipjack tuna has not been a priority research area in either the ETBF or the WTBF strategic research plans. This reflects the low vulnerability of the species to overfishing relative to other target species in the fisheries such as bigeye tuna and broadbill swordfish.

3.3 Results of any collaborative research undertaken for the fishery

Australian scientists are members of the regional scientific bodies which provide advice on stock assessments and research to the WCPFC and IOTC. Research and assessments are done at a regional level, with Australian scientists actively participating in the committees and working parties.

The Scientific Committees of the IOTC and WCPFC discuss the research needs for each fishery. For example, regional tuna tagging programs are underway in both the Indian Ocean and WCPO. The results are used in the stock assessments. The program in the WCPO commenced in 2007 and is scheduled to run for 5 years, with an estimated cost of around \$USD10 million. A similar program in the Indian Ocean has been running since 2005/06.

Further information on the tagging programs and regional tuna research can be obtained from the relevant websites: Pacific Ocean – www.wcpfc.int and Indian Ocean – www.iotc.org

4 Catch data

4.1 Total catch of target species (including retained and discarded catch)

Domestically, skipjack tuna has historically been caught as both target and incidental catch by commercial fishers in the ETBF and WTBF. Skipjack tuna are also caught in a number of state fisheries and Commonwealth fisheries, however these catches make up a small component of the total catch. The total skipjack tuna catch reported in Commonwealth logbooks in the period 2000 – 2007 is shown in Table 2. The bulk of the commercial catch is taken by purse seine and pole and approximately 85% of the catch has been taken in waters of the ETBF.

Year	Annual domestic skipjack tuna catch (tonnes)							
	2000	2001	2002	2003	2004	2005	2006	2007
ESTF	3,929	271	84	596	183	-	44	-
WSTF	486	898	1,144	-	30	-	446	90

Table 2: Annual domestic skipjack tuna catch in the ESTF and WSTF (source: AFMA logbooks)

Table 3: Summary of data collection research and monitoring for the Skipjack Tuna Fishery

Description	Fishery dependent or independent	Information collected	Collection frequency	Provided to
Logbooks: AL05 – longline and some minor line sectors PSO1 – purse seine & pole sector OT03 - minor line sector	Fishery dependent	Shot by shot data on: - fishing effort - catch estimates of Schedule 4 & bycatch species	Ongoing - every shot	AFMA & CSIRO for stock monitoring purposes
SPC information collection from coastal states	Fishery dependent	Catch data from SPC coastal states and FFA observer programs	Ongoing	SPC, AFMA & CSIRO for stock monitoring
Regional Fisheries Management Organisation for the <i>Conservation and Management of Highly Migratory Fish Stocks in the Western & Central Pacific Ocean</i> – will incorporate SPC for scientific advice.		A range of scientific fisheries data	Ongoing	
IOTC - mandatory statistical requirements from member countries	Fishery dependent	A range of scientific fisheries data	Ongoing reporting requirements	IOTC
IOTC Resolution 01/01 Concerning the National Observer Programmes for Tuna Fishing in the Indian Ocean	Fishery dependent	Verified catch data	Ongoing	AFMA, CSIRO, BRS, IOTC
Tagging programs	Fishery dependent	Indian Ocean Tuna Tagging program including skipjack Skipjack tuna were tagged in the western tropical Pacific, in 1991 and 1992, as part of the SPC Regional Tuna Tagging Program. New phase starting in 2007 for a 5 year period. Japan Marine Resources Research Centre (JAMARC tagging programs for tuna species inc. skipjack in the eastern and western Indian Ocean for 21 years).	IOTC program under way	IOTC Results incorporated into the SPC assessment model for skipjack Results from program considered in IOTC assessments of stock status for these species
BRS review of the impact of FADs on tuna and billfish fisheries		Review of scientific literature and current research relevant to FADs	Completed	BRS, NRIFSF

Description	Fishery dependent or independent	Information collected	Collection frequency	Provided to
Vessel monitoring system	Fishery dependent	Vessel position & electronic notification when vessel is nearby/ entering port	Continuous	AFMA
Flight logs from industry spotter planes	Fishery dependent	Species composition and location. Weather conditions	Ad hoc –line with operational needs	Industry info. Available to AFMA on request
<i>Gamefish Tagging Program</i>	Fishery dependent	The main species tagged include black, blue and striped marlin, swordfish, tunas, sharks and other pelagic species	Commenced in 1974 and ongoing. Several thousand tags have been released Australia wide	CSIRO, AFMA, WCPO Commission IOTC
Improved data collection for Indonesian industrial and artisanal tuna fisheries	Fishery dependent	Catch and effort data by species including skipjack tuna	Commence 2002	IOTC
The application of Sea-Viewing Wide Field-of-view Sensor (SeaWiFS) high resolution Ocean Colour data in pelagic fisheries such as skipjack tuna and yellowfin tuna.	Fishery independent	Collaborating fishing vessels are supplying logbook information and, data on fluorescence, temperature and salinity.	Completed	CSIRO
IOTC WPTT application of various indices of environmental variability	Fishery independent	Environmental factors to explain large-scale events and associated environmental fluctuations that affect catchability, local abundance, spatial-temporal distribution and recruitment.	Underway	IOTC

4.2 Total catch of target species taken in other fisheries

Table 4 shows the estimated skipjack tuna catch in tonnes from the area of waters covered by the WCPFC and IOTC

Year	Western and Central Pacific Ocean (tonnes)	Indian Ocean (tonnes)
2000	1,178,230	431,000
2001	1,091,199	434,000
2002	1,272,959	498,000
2003	1,260,078	482,000
2004	1,351,854	465,000
2005	1,473,597	529,000
2006	1,479,600	596,000
2007	1,726,702	not available

Table 4: Regional estimated skipjack tuna catch (tonnes) since 2000 (source: WCPFC and IOTC)

4.3 Catch of by-product species

A Bycatch Action Plan (BAP) for the Tuna Purse Seine Fisheries was completed in 2004. A copy of the BAP is available on the AFMA website at www.afma.gov.au

As the use of fish aggregating devices (FADs) are banned in the domestic skipjack fishery, Australian purse seiners only target free-swimming schools dominated by skipjack. Cannery reports show that the landings of species other than skipjack are much less than 2% of the total landings. Anecdotal reports suggest that incidental catch levels of other species are extremely low (BRS, 2002). Table 5 shows the fish bycatch as reported in AFMA logbooks. Anecdotal information also indicates that purse seiners in the domestic fishery sometimes catch sharks and, very rarely, seals and manta rays (both of which are easily released before the net is retrieved) (Harris & Ward, 1999).

Year	Catch by species (kilograms)		
	Blue Mackerel	Yellowfin Tuna	Striped Marlin
2000	530	2,350	-
2002	-	100	-
2003	-	-	-
2004	-	100	100
2005	-	-	-
2006	-	-	-
2007	-	-	-

Table 5: Reported bycatch kilograms by skipjack pole and purse seine fishers (where skipjack was 75% or more of the total catch) – (source: AFMA logbooks).

These bycatch species are subject to various Commonwealth and state bycatch and management provisions. Any catch of SBT is required to be covered by quota. Purse seine operators in the ESTF and WSTF are subject to a Commonwealth limit of 20 sharks per trip (excluding school, gummy, elephant fish of the species Callorhynchidae, Chimaeridae and Rhinochimaeridae, and sawshark). Under Commonwealth legislation these operators are required to return all blue and black marlin to the sea, irrespective of life status. Catch of dolphinfish and frigate mackerel by Commonwealth operators in the ESTF and WSTF are subject to a limit of 10 fish per trip (alone or in combination with a range of other finfish) in the waters of Queensland, WA and the Northern Territory under OCS agreements with these states.

There are low levels of incidental bycatch during skipjack purse seine operations in the AFZ. Precautionary byproduct limits for yellowfin tuna and bigeye tuna are currently in force under fisheries permits. The total combined live weight of these two species may not amount to more than 50% of the purse seine catch in any one trip and 2% of the total weight of a vessel's seasonal skipjack tuna catch.

4.4 Total catch of bycatch species

See section 4.3

4.5 Harvest by each sector (ie commercial, recreational, indigenous and illegal)

Commercial catches

Estimates of commercial removals are derived from logbooks from the Australian skipjack fishery. Table 2 (domestic) and Table 4 (regional) summarise the skipjack catch by the commercial sector.

Estimates of all removals are factored into the regional stock assessments. It is recognised that there is some unreported and unregulated take from these stocks and, where possible, estimates of these removals are obtained from the vessels and their flag states. These estimates are also factored into the stock assessment process. However the stock assessment for skipjack tuna in the WCPO continues to be hampered by the lack of data on catch, effort and species composition particularly from the Philippines and Indonesia (SCTB, 2002).

While the IOTC has not yet undertaken a quantitative stock assessment for skipjack tuna in the Indian Ocean it has identified that the lack of data from artisanal catch of skipjack needs to be addressed and is encouraging improved data reporting from several regions.

Recreational and Indigenous removals

Recreational and Indigenous take of skipjack tuna in the Australian fishery is not as well known. The main sources of data used to estimate recreational catches are:

- *A National Review of the Recreational Fishing Sector – A Report to Agriculture, Fisheries and Forestry – Australia* (McIlgorm & Pepperell, 1999). This review was aimed at providing an overview of recreational fishing. The document also provides recreational catch estimates.
- *Gamefish tournament catch and effort monitoring* - a joint AFMA/NSW Fisheries funded project to quantify recreational gamefishers catches at organised tournaments on the east coast of Australia².
- *Gamefish Tagging Program*
- State charter fishing data - all states across which waters of the fishery lie have recently developed arrangements to more formally manage charter fishing. The main aim of these arrangements is to develop more reliable estimates of charter fishing removals.
- *National recreational and Indigenous fishing survey* - a joint initiative of the Commonwealth and state/territory Governments to obtain fisheries statistics to support the management of non-commercial fishing in Australia.

4.6 Effort data including information on any trends

Table 6 shows the domestic purse seine effort on skipjack tuna since 2000, expressed as the number of sets.

²More information is available at the NSW Fisheries website www.fisheries.nsw.gov.au

Year	Eastern Skipjack Tuna Fishery	Western Skipjack Tuna Fishery
2000	320	43
2001	74	67
2002	15	56
2003	41	-
2004	21	3
2005	-	-
2006	4	24
2007	-	3

Table 6: Domestic effort (number of purse seine sets) since 2000 (source: AFMA logbooks)

4.7 Spatial issues/trends

Skipjack taken in the main fishing grounds off southern Australia are considered to be at the fringe of the species' generally equatorial distribution. As skipjack do not spawn in waters cooler than 25°C, skipjack off southern NSW and Tasmania must have recruited from lower latitudes. Its abundance in Australian waters is extremely variable. The most important determinants of annual abundance are considered to be sea surface temperature and the availability of prey species. The local abundance of prey is linked to warm eddies and oceanic fronts generated by the East Australian and Leeuwin Currents. Such conditions are, in turn, influenced by broad-scale oceanographic events such as El Nino – Southern Oscillation episodes.

5 Status of target stock

5.1 Resource concerns

There are no resource concerns. Skipjack tuna is not overfished and not subject to overfishing in the WCPO and Indian Ocean (BRS, 2006).

5.2 Results of any stock assessments

Australian scientists are members of the regional scientific bodies which provide advice on stock assessments and research to the WCPFC and IOTC. Research and assessments are done at a regional level, with Australian scientists actively participating in the committees and working parties.

Pacific Ocean

The stock assessment undertaken by SPC provides a sound estimate of the potential productivity of skipjack tuna in the WCPO. The major conclusions from the most recent stock assessment carried out in 2008 were:

- the conclusions are essentially unchanged from the last three stock assessments in 2002, 2003 and 2005;
- that skipjack in the WCPO is currently exploited at a modest level relative to its biological potential;
- overfishing of skipjack is not occurring in the WCPO nor is the stock in an overfished state;
- within the equatorial region, fishing mortality increased throughout the model period and is estimated to be highest in the western region in the most recent years. The impact of fishing is predicted to have reduced recent biomass by about 40% in the western equatorial region and 20% in the eastern region;
- recruitment variability, influenced by environmental conditions will continue to be the primary influence on stock size and fishery performance; and
- continued monitoring and improvement in fisheries statistics is required and in particular better data generally are required for the Philippines and Indonesian fisheries.

Indian Ocean

No quantitative stock assessment is currently available for skipjack tuna in the Indian Ocean. The range of stock indicators available to the IOTC Scientific Committee does not signal that there are any problems in the fishery currently.

The WPTT analysed the various fishery indicators in 2006 to gain a general understanding of the state of the skipjack stock. The indicators were:

- catch trends – the trend in catch indicates a large and continuous increase in the catches of skipjack tuna since the mid 1980s. This is mainly due to the expansion of the Fish Aggregating Device (FAD) – associated fishery in the western Indian Ocean. There is no sign that the rate of increase in the catches of skipjack is diminishing;
- nominal CPUE trends – the catch and nominal catch per unit effort (CPUE) trends of the purse seine fishery for three major skipjack fishing areas (east Somalia, North-west Seychelles and Mozambique channel) have been variable but generally increasing, and the CPUE around that of the early 1990's;
- average weight – the average weights of skipjack taken by various gears have remained relatively stable since 1991; and
- spatial trends – the area exploited by the purse seine fishery has changed little since 1991.

6 Interactions with protected species

6.1 Frequency and nature of interactions

There is some information available on composition and abundance of bycatch species taken in the STF, however, the level of verified data for the fishery is limited. As shown in table 6 the level of effort in the ESTF and WSTF has been low and catches below the thresholds agreed to in the harvest strategy for the fishery.

There are some protected species listed under the EPBC Act that may interact with the tuna purse seine fisheries. The true impacts of these interactions are unknown. An observer program was introduced for the SBT surface fishery during the 2002–2003 fishing season and is ongoing. This verified data is adding to the base knowledge of the fisheries interaction with protected species. The information from the SBT purse seine fishery and that from the broader Pacific Ocean and Indian Ocean provides some background on the possible levels of interaction.

Domestic purse seine fishery

Marine Turtles – There are no recorded (logbook) interactions with marine turtles for tuna purse seine operations within the AFZ.

Seabirds – While seabirds may commonly be present during tuna purse seine operations, to date there have been few records of interactions. Observer records in the SBT fishery detail seven interactions with seabirds, two of which were fatal. The two fatal observations were of an unidentified shearwater (observed floating dead on the water) and a storm petrel (flew into the boat and died). The configuration of the fishing gear makes the likelihood of interactions seabird minimal.

Sharks – Great white sharks (*Carcharodon carcharias*) are protected in Commonwealth waters under the EPBC Act. They are present in the area of the SBT surface fishery, and there are anecdotal reports that cite interactions in Commonwealth waters (for example white sharks entering tow cages or harassing SBT during transport operations). To date there have not been any verified reports of great white sharks interacting with either SBT purse seine nets or tow nets, or with skipjack purse seine nets.

Recovery plans are in place for great white sharks and AFMA is committed to implementing relevant measures. Australia has developed a National Plan of Action (NPOA) for the Conservation and Management of Sharks. Management of shark bycatch in Commonwealth tuna fisheries is consistent with the objectives of the NPOA. Following application of the residual risk process will determine the fishery response to this risk.

Cetaceans and other marine mammals – There have been no logbook or observer reports of purse seine interactions with cetaceans in tuna purse seine fisheries. There are some anecdotal reports of seals interacting with SBT tow cages, by occasionally leaping into and out of cages. There has been a single logbook report of a seal interaction in the SBT fishery. Reports indicate the seal was released alive and vigorous. There have not been any recorded interactions of dolphins with either the purse seine nets or tow cages. It is thought that in temperate areas tuna schools are less associated with other species than in tropical areas, where tuna schools can be associated with a wide range of species. Based on current information the level of marine mammal interaction with Australian tuna purse seine operations is considered low.

Ecological communities – To date no marine ecological communities have been listed as threatened under the EPBC Act.

The final level 2 ERA analysis has been completed by CSIRO. A preliminary residual risk assessment has been undertaken, and will be finalised in 2008. Should the AFMA/CSIRO Ecological risk assessment for Commonwealth fisheries project identify specific areas of data needs, the data collection program will be amended as required.

Pacific Ocean

In response to the need to improve the understanding and management of bycatch, the Scientific Committee of the WCPFC has established a Ecosystem and Bycatch Specialist Working Group.

SCTB 15 recommended that “efforts be made to improve observer coverage in western and central Pacific Ocean pelagic fisheries in order to obtain more reliable statistics on bycatch and to permit risk analysis on bycatch species. Prior to implementation, the objectives for an observer program and the process by which these objectives can be met should be clearly identified.”

A review of ecosystem-bycatch issues for the Western and Central Pacific Region undertaken for the WCPFC (MRAG Americas, Inc. 2002) found that in the broader WCPO purse seine and pole and line fisheries:

- poor reporting of bycatch and discards available from log sheet data and generally low observer coverage preclude definitive estimates of bycatch;
- the incidence of self-reported bycatch is extremely low. While there is little verified data available, observer-reported bycatch rates in the WCPO suggest that the bycatch level is between 0.35 and 0.77% of the total catch with sets on floating objects accounting for higher incidences than school sets;
- the available data provide no evidence of seabirds taken in purse seines;
- purse seines occasionally catch marine turtles, most commonly when fishing on FADs; but evidence suggests that the vessels release the majority of turtles alive; preliminary estimates suggest 105 marine turtle encounters per year in the WCPO purse seine fishery, of these it is expected that less than 20 would result in mortality, given the current level of awareness in the fishery;
- there is little evidence that dolphin-associated sets are made by purse seiners in the SPC area;
- skipjack caught with FADs are often associated with small yellowfin and small bigeye;
- the true catch rates of bycatch species over time is unknown and the biology and population dynamics of nearly all species are poorly known such that impacts of fishing on bycatch species cannot presently be assessed; and
- observer data indicate that a very small percentage (around 0.15% by weight) of the purse seine catch is made up of shark. There is very little data available at a species level however at least 10 species have been observed. The predominant shark species observed in the WTP purse seine fishery are the silky shark and the oceanic white tip.

These observations are generally consistent with the logbook data for the purse seine skipjack fishery in the ETBF and with BRS assessment of bycatch issues in this fishery (BRS 2002).

Indian Ocean

In response to the need to improve the understanding and management of bycatch, the Scientific Committee of the IOTC has established a Working Party on Ecosystems and Bycatch.

Romanov (2001) estimated bycatch in the tuna purse seine fisheries in the western Indian Ocean based on data collected by observers on Russian vessels in the late 1980s and early 1990s. Given the changes in fishing practices in the western Indian Ocean since the mid-1990s the results are directly applicable only up to about 1995. However the results of the study broadly support the findings of bycatch work in the WCPO and are not inconsistent with the limited logbook data available for the western sector of the Australian fishery. Romanov makes the following observations:

- in offshore regions of the western Indian Ocean tuna-dolphin associations are rare, purse seining for them is not practised and there is no dolphin bycatch problem;
- bycatch is not recorded for tuna seiners operating in the western Indian Ocean except bycatches of non-target tuna species;
- the lowest estimated bycatch in the western Indian Ocean tuna purse seine fishery was taken from free schools. The main bycatch associated with free schools was Carcharinid sharks and Mobulidae rays;
- bycatch was highest and most diverse from catches on log associated schools. The main bycatch was rainbow runner, common dolphinfish, triggerfish, carcharinid sharks, wahoo, bill fishes and mackerel scad;
- whale associated schools were characterised by an intermediate level of bycatch, mainly carcharinid and lamnid sharks;
- turtle bycatch and whale mortality in purse seines in the western Indian Ocean are possible, but the probability of the latter is very low;
- no seabird mortality was noted by observers;
- the principal bycatch species identified in the western Indian Ocean purse seine fisheries are the same as those for the Pacific Ocean; and
- bycatch rates (per set and per 1000 tonnes of target species) are similar in the Pacific Ocean and the western Indian Ocean.

6.2 Management action taken to reduce interactions and results of such action

All interactions with listed protected species must be reported by fishers in their logbook and submitted to AFMA. AFMA provides quarterly summary reports of all interactions in Commonwealth fisheries, on behalf of fishers to the Protected Species Unit at DEWHA.

7 Impacts of the fishery on the ecosystem in which it operates

7.1 Results of any Ecological Risk Assessments

A key component in AFMA's move towards Ecosystem Based Fisheries Management (EBFM) has been the undertaking of ecological risk assessments (ERA) for all AFMA-managed fisheries. By assessing the impacts of fishing on all parts of the marine environment, the ERAs encompass an ecosystem-based assessment approach. The ERAs will help to prioritise research, data collection monitoring needs and management actions for fisheries and ensure that they are managed both sustainably and efficiently.

The ERA process for skipjack tuna is not finalised. A rapid level 3 assessment is to be undertaken in the fishery, and this is expected to be completed by the end of 2008.

7.2 Nature of impacts on the ecosystem

The fishery has no direct impact on benthic communities. Fishing methods used in the fishery are described in Part II. Fishing methods used in the SJTF are pelagic and do not interact with the benthos.

SPC has initiated a food web study on the tuna ecosystem of the WCPO. The objective of this study is to provide a model to assess the environmental and fishing impact on the ecosystem and tuna stocks. Diet and trophic level of different components of the ecosystem were established by examining stomach contents and by analysing the isotopic composition of muscle samples. Data from this study will be used in bio-dynamic ecosystem models to allow better modelling of the tuna ecosystem and assessment of the fishing impact on the ecosystem and tuna stocks (Allain, 2002). The results of this project are likely to be transferable to the Indian Ocean fishery where tuna diet studies are also underway.

Impacts on food chains - structures & productivity/flows

There is a basic understanding of the structure of the food chain within which the fishery operates. The SPC's stock assessment processes for skipjack tuna include an estimate of natural mortality. Within these assessments is an estimate of predation.

One of the aims of the data collection program is to collect data to identify species associations and relationships. This program will assist in identifying the impact of the fishery on the food chain. Observers will collect information on the gut content of species caught in the fishery.

Impacts on the physical environment - physical habitat and water quality

The STF is not considered to have a significant impact on physical habitat and water quality. Fishing methods are pelagic and have no direct interaction with the benthos.

Operators are bound by MARPOL regulations, which prohibit the disposal of garbage from ships and boats. These regulations require fishing vessels to make every effort to retrieve all lost or damaged fishing gear.

7.3 Management action taken to reduce impacts and results of such action

The following management measures contribute to ensuring that significant damage to the ecosystem does not arise from the potential impacts described above:

- the nature of the fishing operations where no contact is made with the benthos;
- the gear does not physically capture wildlife which allows species to escape or be assisted to escape;
- a limit on the number of permits available;
- collection of data on all species caught in the fishery;
- the Ecological risk assessment for Commonwealth fisheries to identify areas of concern; and
- several marine protected areas within the area of the fishery, including the Great Barrier Reef Marine Protected Area, the Great Australian Bight Marine Park and Ningaloo Marine Park.

8 Progress in implementing recommendations and conditions resulting from the DEW's assessment of the fishery

8.1 Description of progress in implementing each recommendation and condition

The table at Attachment 2 outlines the progress made against the recommendations and conditions of the assessment as at 30 June 2008.

9 References

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10 List of acronyms

AFMA	-	Australian Fisheries Management Authority
AFZ	-	Australian fishing zone
BAP	-	Bycatch Action Plan
BRS	-	Bureau of Rural Sciences
CPUE	-	catch per unit effort
CSIRO	-	Commonwealth Scientific and Industrial Research Organisation
DEWHA	-	Department of the Environment, Water, Heritage and the Arts
EEZ	-	Exclusive Economic Zone
EPBC Act	-	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESTF	-	Eastern Skipjack Tuna Fishery
ETBF	-	Eastern Tuna and Billfish Fishery
FAD	-	Fish Aggregating Device
FFA	-	Forum Fisheries Agency
FFC	-	Forum Fisheries Committee
FRDC	-	Fisheries Research and Development Corporation
ICVMS	-	Integrated Computerised Vessel Monitoring System
IOTC	-	Indian Ocean Tuna Commission
IUU	-	Illegal, unreported and unregulated
MAC	-	Management Advisory Committee
OCS	-	Offshore Constitutional Settlement
OFP	-	Oceanic Fisheries Program
RFMO	-	Regional Fisheries Management Organisation
SBT	-	Southern bluefin tuna
SCTB	-	Standing Committee on Tuna and Billfish
SPC	-	Secretariat to the Pacific Community
STF	-	Skipjack tuna fishery
TAC	-	total allowable catch
TAP	-	Threat Abatement Plan
UNCLOS	-	United Nations Convention on the Law of the Sea
UNFSA	-	United Nations Fish Stocks Agreement
WCPFC	-	Western and Central Pacific Fisheries Commission
WCPO	-	Western and Central Pacific Ocean
WPTT	-	Working Party on Tropical Tunas
WSTF	-	Western Skipjack Tuna Fishery
WTBF	-	Western Tuna and Billfish Fishery
WTO	-	Wildlife Trade Operation

Recommendations to the Australian Fisheries Management Authority (AFMA) on the ecologically sustainable management in relation to the skipjack tuna fishery

Wildlife Trade Operation - 30 November 2005 to 30 November 2008

Performance Criteria	Level of Achievement as at 30 June 2008	Deadline
<p>Recommendation 1: AFMA to establish a more formal consultative mechanism for the skipjack tuna fishery that is consistent with the consulting and reporting provisions of an AFMA Management Advisory Committee (MAC).</p>	<p>In progress In response to the findings of the cost reduction working group and the requirement to have fewer MACs, AFMA is reviewing its approach to determine which of the established MACs is the most appropriate to provide advice to AFMA on the management of skipjack tuna. A decision is expected by the end of 2008.</p>	None advised
<p>Recommendation 2: By the end of 2006, AFMA to develop a management regime for the skipjack tuna fishery, which includes fishery specific management objectives, performance indicators & performance measures for target, byproduct and bycatch species. AFMA will ensure that adequate information collection systems are put in place to monitor performance against measures and ensure that the fishery is ecologically sustainable.</p>	<p>Achieved. A harvest strategy for the Australian Skipjack Tuna Fishery has been developed. It adopts an agreed set of catch trigger levels which initiate management action. It recognises the current lack of concern regarding overall stock status, the highly variable nature of the fishery and the regional management arrangements through the WCPFC and IOTC which are responsible for skipjack management. The domestic skipjack fishery occurs at the periphery of internationally exploited stocks.</p>	End of 2006
<p>Recommendation 3: AFMA, by the end of 2006, to develop and implement an ongoing robust system to validate effort and catch data on target species, byproduct and bycatch species.</p>	<p>Achieved. The harvest strategy identifies a range of measures for monitoring the fishery, should decision rules regarding catch levels be triggered. This will be the trigger to initiate a greater degree of management intervention. These include verification of catch and bycatch, collection of effort data, observer coverage and collection of size based information. In recent years there have been low levels of activity in the fishery, which requires minimal management intervention. Currently logbooks and catch disposal records are collected to monitor the domestic skipjack catch. Issues such as the validation of bycatch and discard rates will be addressed by the use of Observer coverage and the application of AFMA's Bycatch Policy and responses to the December 2005 Ministerial Direction³.</p>	End of 2006

³ Ministerial direction

<p>Recommendation 4:</p> <p>The Department of Agriculture, Fisheries and Forestry (DAFF) in consultation with AFMA, DEH and other relevant government agencies, to take a proactive role in the Western and Central Pacific Fisheries Commission (WCPFC) and seek to improve the effectiveness of the Indian Ocean Tuna Commission (IOTC) as the regional fishery management forum for managing and conserving the species on which the skipjack tuna fishery relies. DAFF to pursue through these forums the achievement of the following priorities:</p> <ul style="list-style-type: none"> • promote the development of management options that address potential concerns of the IOTC Scientific Committee as they emerge; • develop a process to gain a better understanding of the relationship between the populations of skipjack in Australian waters and other regional populations of skipjack in either the Indian or Pacific Oceans; • endeavour to take measures to improve controls over illegal, unregulated and unreported fishing; • ensure all fishing entities taking skipjack tuna in the Western and Central Pacific and Indian Oceans are members of the WCPFC and/or the IOTC, as applicable; • take measures to verify the catch (target, by-product and bycatch species) of all fishing entities; • endeavour to strengthen stock assessments for SJT; and • pursue a regime to protect ecologically related species, including byproduct and bycatch, from unsustainable fishing pressures. 	<p>DAFF to provide a written response separately.</p>	
<p>Recommendation 5:</p> <p>Within 18 months of the completion of the ecological risk assessment AFMA will identify and implement appropriate management strategies to address fishing impacts identified as being at high risk from the ecological risk assessment process.</p>	<p>In progress</p> <p>The final level 2 ERA analysis has been completed by CSIRO. A rapid level 3 ERA will be completed by the end of 2008. An analysis of the results will be used to prioritise the development and introduction ERM measures in the Skipjack Fishery.</p>	<p>Within 18 months of completion of ERA</p>

<p>Recommendation 6: Within 18 months, AFMA to take account of the harvest of skipjack tuna by all sectors and factor this into the stock assessment process and management of the fishery to ensure sustainable management of the resource.</p>	<p>In progress. See comments under recommendation 3.</p>	<p>Ongoing</p>
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Summary: There have been low levels of activity in the Australian Skipjack Tuna Fishery. The consultative arrangements for the fishery are expected to be finalised by the end of 2008 when skipjack management is expected to be incorporated into one of the existing tuna MACs. The Fishery Harvest Strategy has been completed and catch trigger levels adopted which will be used in determining future management actions.

The harvest strategy recognises that the domestic fishery is on the periphery of internationally exploited stocks in the Pacific Ocean and Indian Ocean. Australia plays a key role at the both the scientific and management meetings of the relevant RFMO which have responsibility for the regional management of the skipjack stocks.