NORTHERN TERRITORY FISHERIES
JOINT AUTHORITY

REPORT FOR PERIOD

1 July 1999
to
30 June 2000

ISSN

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FISHERIES MANAGEMENT ACT 1991
(COMMONWEALTH)

FISHERIES ACT 1988
(NORTHERN TERRITORY)

NORTHERN TERRITORY FISHERIES JOINT AUTHORITY

REPORT OF THE NORTHERN TERRITORY FISHERIES JOINT AUTHORITY

FOR THE PERIOD: 1 JULY 1999 TO 30 JUNE 2000

The Hon Wilson Tuckey MP
Minister for Forestry and Conservation
Parliament House
CANBERRA

The Hon Michael James Palmer
Northern Territory Minister
for Primary Industry and Fisheries
Parliament House
DARWIN

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1. Introduction

This, the thirteenth annual report of the Northern Territory Fisheries Joint Authority (NTFJA), details the functions and activities undertaken from 1 July 1999 to 30 June 2000.

The NTFJA was initially established in February 1983 under the then Federal legislation (Commonwealth *Fisheries Act 1952*) to provide for the Commonwealth and the Northern Territory to jointly manage declared fisheries and fisheries resources in waters adjacent to the Northern Territory. With the passage of an Offshore Constitutional Settlement Agreement of 1987, management responsibility for pearl oysters passed to the NTFJA.

On 3 February 1995, the Northern Territory Fisheries Joint Authority, subject to the provisions of the Commonwealth *Fisheries Management Act 1991* and the Northern Territory *Fisheries Act 1988*, assumed responsibility, in waters adjacent to the Northern Territory, for the following commercial fisheries;

- Demersal fishery;
- Finfish trawl fishery;
- Timor Reef fishery; and,
- Shark fishery.

At that time, management responsibility for pearl oysters passed to the Northern Territory.

The jurisdictional arrangements necessary for the operation of the NTFJA may be found in "The Arrangement between the Commonwealth of Australia and the Northern Territory", published in the Australian Government Gazette of 1 February 1995 and the Northern Territory Gazette of 1 February 1995 (No. S7, 1 February 1995). A copy of this Arrangement is provided at Annex A.

2. Members of the Joint Authority

The members of the NTFJA during the reporting period were:

The Hon Mark Vaile MP
Commonwealth Minister for Agriculture, Fisheries and Forestry
(1 July 1999 to 20 July 1999);

The Hon Warren Truss MP
Commonwealth Minister for Agriculture, Fisheries and Forestry
(21 July 1999 to 30 June 2000); and

The Hon Michael James Palmer
Northern Territory Minister for Primary Industry and Fisheries
(1 July 1999 to 30 June 2000).

Deputies for the NTFJA are:

For the Commonwealth Minister –

Mr Frank Meere
Managing Director
Australian Fisheries Management Authority (AFMA)
(1 July 1999 to 30 June 2000)

Mr Glenn Hurry
Assistant Secretary
Commonwealth Department of Agriculture, Fisheries and Forestry (AFFA)
(1 July 1999 to 30 June 2000)

For the Northern Territory Minister -

Dr Nicholas Rayns
Director of Fisheries
Northern Territory Department of Primary Industries and Fisheries (NTDPIF)
(1 July 1999 to 30 June 2000)

An Aquatic Resource Manager Fisheries Management Officer with NTDPIF provides secretariat services to the NTFJA.

3. Functions and Powers of the Northern Territory Fisheries Joint Authority

Section 62 of the *Fisheries Management Act 1991* together with Section 66 of the Northern Territory *Fisheries Act 1988* provides for the function of the NTFJA, viz:

"keeping constantly under consideration the condition of the fishery, formulating policies and plans for the good management of the fishery, and for the purposes of the management of the fishery exercising the powers conferred on it by the Northern Territory Fisheries Act and co-operating and consulting with the other authorities including other Joint Authorities within the meaning of the Commonwealth Act, in matters of common concern."

The Commonwealth Act also provides that in undertaking these functions, the Joint Authority must pursue the objectives of –

(a) implementing cost-effective fisheries management; and,

(b) ensuring that the exploitation of fisheries resources and the carrying on of any related activities are conducted in an manner consistent with the principles of ecologically sustainable development and the exercise of the precautionary principle , in particular the need to have regard to the impact of fishing activities on non-target species and the marine environment; and,

(c) *maximising economic efficiency in the exploitation of fisheries resources; and,*

(d) ensuring accountability of the fishing industry and to the community generally in its management of fisheries resources.

The Northern Territory Fisheries Act 1988 provides the following objectives for the NTFJA.

(a) ensuring, through proper conservation, preservation and fisheries arrangement measures, that the living resources of the waters to which the Act applies are not endangered or over-exploited; and,

(b) *achieving the optimal utilisation and equitable distribution of those resources.*

Management of the recreational component of NTFJA fisheries resides with the NTDPIF.

4. Meetings of the Northern Territory Fisheries Joint Authority

Meetings of the NTJA are convened on an "as needs" basis, with NTDPIF co-ordinating the "day to day" management under the NT Fisheries Act, on behalf of the NTFJA. The NTFJA did not meet throughout the reporting period.

During the reporting period, the NTFJA considered an "out of session" item concerning an amendment of Fisheries Regulation 141N such that the boundary of the finfish trawl fishery reflects the initial description appearing in the Commonwealth Fisheries Notice made under the *Fisheries Act 1952*. Deputies for the Commonwealth and Northern Territory Members resolved to seek a change to Fisheries Regulation 141N to correct an error in the description of the area of the finfish trawl fishery. This amendment was achieved in 2000.

NTDPIF representatives participated in the annual Northern Australian Fisheries Management Workshop (NAFMW), which was convened in June 2000. The NAFMW is convened annually to consider fisheries management, research and compliance issues in seeking to ensure collaborative and complementary actions in managing fisheries resources throughout northern Australia. The NAFMW is convened under formal Memorandum of Understandings for cooperative management of fish stocks by adjacent resource management Agencies.

5. Advisory Committees

The Northern Territory *Fisheries Act* provides for stakeholder involvement in the formulation of management arrangements and advising the Director of Fisheries on operational arrangements through the appointment of Fishery Management Advisory Committees (FMACs).

Members of the Shark Fishery Management Advisory Committee (SharkFMAC) were appointed in early 1993. The Northern Territory Minister for Primary Industry and Fisheries repealed all appointments to the Demersal Fishery Management Advisory Committee (DemersalFMAC) in 1999, as most of the original members had stood down. At that time, a call for nominations for appointment to the DemersalFMAC was made to the industry association. The industry representative Association is still to nominate members for appointment. Membership to the Timor Reef Fisheries Management Advisory Committee (TimorFMAC) was confirmed in May 1999.

The NTFJA Fishery Management Advisory Committees did not meet throughout the reporting period. Meetings of the Fishery Management Advisory Committees are convened on an "as needs" basis.

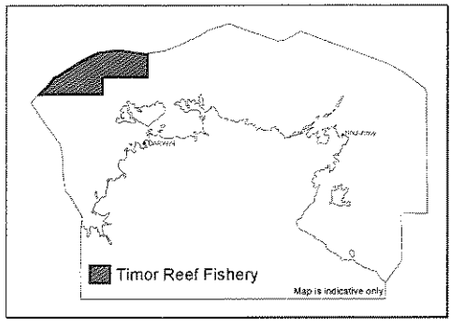
No changes to FMAC membership were effected throughout the reporting period.

6. Condition of the Fisheries

Demersal Finfish Resources.

The demersal finfish resources of the Northern Territory are harvested in the Timor Reef, demersal and finfish trawl fisheries.

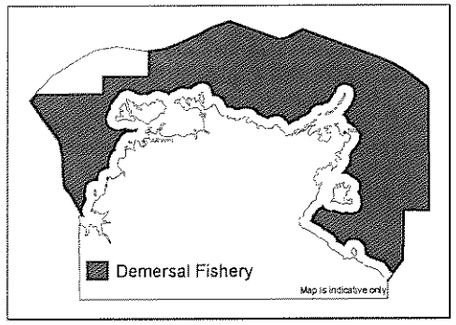
Timor Reef Fishery



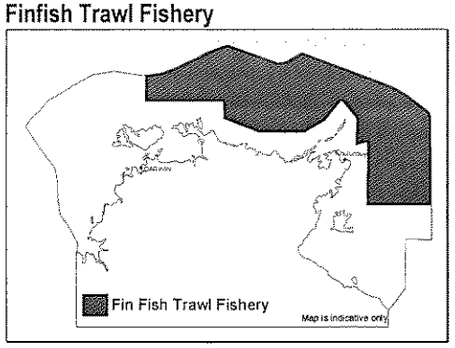
The Timor Reef fishery operates in a remote region to the north and northwest of Darwin to the outer limit of the Australian Fishing Zone (AFZ). The key fish species landed by commercial operators are goldband snapper (*Pristipomoides sp*), red snappers (*Lutjanus malabaricus* & *L. erythropterus*) and cods (*Epinephelus sp*). Commercial operators are using traps in preference to baited lines given improved catch rates.

Demersal Fishery

Access has been granted to sixty operators to participate in the demersal fishery. The demersal fishery operates in waters seaward of 15 nautical miles (nm) from the shore to the outer limit of the AFZ, other than in the area of the Timor Reef fishery. Little commercial activity has been evident since the declaration of this fishery in 1995, other than in the areas immediately adjacent to the Timor Reef fishery. Timor Reef fishers must hold a demersal licence, with most fishing activity in the demersal fishery undertaken by vessels holding both demersal and Timor Reef licences.



Finfish Trawl Fishery



A single trawl operator continues to harvest demersal finfish in offshore waters adjacent to the Northern Territory, to the east of Darwin and includes the northern region of the Gulf of Carpentaria. The principal species landed are red snappers (*L. malabaricus* & *L. erythropterus).*

History

The demersal fish resources of northern Australia have been commercially explored by Japanese stern trawlers during 1959-1963, and extensively fished by Taiwanese pair trawlers from 1971 to 1990. In addition, Thai trawlers operated in the Arafura Sea during 1985-1990 whilst Chinese pair trawlers operated in the Timor Sea in 1989. Feasibility studies by Japanese vessels using droplines saw substantial landings throughout 1975-1982 within the Timor Reef region.

With the passage of the jurisdictional arrangements contained in the Offshore Constitutional Settlement (OCS) of 1988, management responsibility for all line fishing and trapping passed to the Northern Territory.

An industry-sponsored moratorium on the issuance of demersal fishery licences occurred in December 1991. Following concerns that excess fishing capacity may lead to the over-exploitation of goldband snapper stocks, access to the Timor Reef fishery was restricted to participating fishers and licence holders who had previously expressed their interest in entering the fishery.

In 1991, six domestic operators were authorised by the Commonwealth to operate in what was then known as the Northern Trawl Fishery. Further management interventions were introduced to link access with sustainable yield estimates. The remote location and associated high costs of operation hindered the development of the fishery with only one operator maintaining an ongoing interest in the fishery.

The ratification of a revised OCS Agreement in early 1995 saw the NTFJA assume responsibility for the management of the offshore demersal fisheries. At that time, the Timor Reef fishery was annexed from the demersal fishery due to concerns regarding the number of operators that may target goldband snapper and the long term biological sustainability of goldband snapper stocks.

The regulatory controls implemented at that time saw the demersal fishery near shore boundary moved from 2 nm to 15 nm offshore. This approach sought to separate the low capital base inshore coastal fishery from the demersal fishery.

Resources Estimates

Yield estimates have been determined from catch and effort information gathered from Taiwanese, Thai and Chinese trawling activities, trawl research surveys, biological details gathered from commercial fishers and statutory reporting by licensees on their fishing operations.

Resource estimates, initially provided by CSIRO, were updated in 1992 following trawl surveys undertaken by NTDPIF.

A co-operative approach in managing what are likely to be straddling stocks was engendered with the 1992 Joint Australian-Indonesian Workshop on the Arafura Sea Fisheries. As an outcome of this Workshop, sustainable red snappers yield estimates were 7,500 to 19,500 tonnes for the Australian and Indonesian components of the Arafura Sea, 4,000 to 10,000 tonnes for Australian waters of the Arafura Sea and 4,100 to 16,500 tonnes for the Gulf of Carpentaria.

The earlier resource estimates were revised to 3,700 to 6,800 tonnes for the Australian component of the Arafura Sea and between 2,900 and 9,000 tonnes for the Gulf of Carpentaria following the second Australian-Indonesian Workshop held in October 1994.

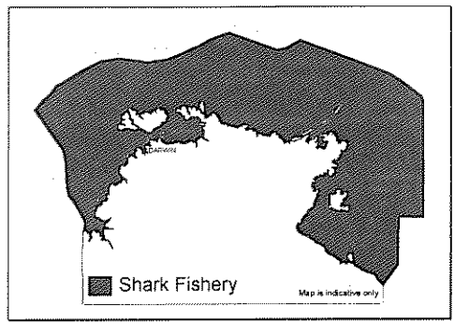
In 1996, the "Towards the Sustainable Use of Northern Territory Fisheries Resources: Review Workshop Led by Carl Walters" further revised these earlier yield estimates for red snappers and goldband snapper. As an outcome of this workshop the biological sustainable harvest for red snappers were revised to 1,500 to 2,500 tonnes for the Arafura Sea, assuming an unfished stock level of 50,000 tonnes. This workshop also found that only a small portion can be harvested each year due to their slow growth rates and low natural mortality. This means that current landings are considerably lower than long-term biological sustainable harvest estimates.

For the Timor Reef goldband snapper fishery, yield estimates range from 300 to 20,000 tonnes or more, due to varying interpretations of previous catch rates, age and survey details. Refinement of the biological sustainable yield estimates for the Timor Reef fishery will only be possible with an improved understanding of the level of mixing between the Australian and Indonesian fisheries, details on fishing effort in both jurisdictions together with the refinement of fishery independent survey techniques.

Shark Fishery

History

The shark resources of northern Australia were commercially fished by a Taiwanese gillnet fleet from 1974 until about mid 1986. Prior to 1978, the Taiwanese fished to within 12 nautical miles of the coast. With the declaration of the Australian Fishing Zone (AFZ) in 1979, the foreign fishing fleets exclusion zone adjacent to Arnhem Land and the Wessel Islands increased to between 40 and 50 nautical miles offshore. Foreign fishing vessels were excluded from the Gulf of Carpentaria in 1979.



A subsequent agreement allowed 30 gillnet vessels to land up to 7000 tonnes of shark throughout northern Australian waters. Fishing operations continued until 1978 with minor changes in overall catch levels. Throughout this time, joint venture arrangements were encouraged in an attempt to seek greater involvement by Australian operators.

Further restrictions were introduced in 1986 in response to declining trends in shark catch rates and concerns about the incidental capture of dolphins. These controls rendered Taiwanese gillnet vessels uneconomical, and despite the permitted use of baited longlines, fishing operations in northern Australian waters ceased in late 1986.

Direct involvement in the Northern Shark Fishery by domestic fishers commenced in the early 1980's. Since 1985 overall landings of all species in the NT shark fishery have been about 600 tonnes pa and reached 872 tonnes in 1992 as fishers sought to meet a minimum catch criteria to retain access to the fishery.

Sharks are also taken as an incidental catch of line, bait and inshore netting operations, and as a non-target species of prawn trawling. Catch limitations have been imposed for some of these fisheries.

Resource Estimates

It is believed that current harvest rates of black tip sharks *Carcharinus tilstoni* (black tip reef shark) and *C. sorrah* (white spot reef shark) in the Northern Territory are near sustainable levels. However there is substantial uncertainty in current harvest rate and stock size estimates, due to substantial reliance on Catch Per Unit Effort (CPUE) data as the primary source of abundance information.

There have been a series of attempts during the 1990s to estimate harvest levels of *C. tilstoni* and *C. sorrah* in the northern Australian region. Evaluation of yield estimates, undertaken at the 1992 Joint Australian-Indonesian Workshop on the Arafura Sea Fisheries and a follow-up Workshop in 1994, proved inconclusive due to inconsistencies in data collection.

The joint NTDPIF-CSIRO Pelagic Fish Stock Assessment program estimated that, in waters adjacent to the Northern Territory, the maximum sustainable yield (MSY) for *C. tilstoni* and *C. sorrah* is 3,400 tonnes annually. This estimated yield consists of 1,900 tonnes in the Arafura and Gulf of Carpentaria zones and 1,500 tonnes in the NT zone.

CSIRO tagging studies suggest that *C. tilstoni* and *C. sorrah* form a single large stock throughout northern Australia. However, movement rates both onshore and offshore are relatively restricted, indicating slow exchange rates (1-10 percent/year) between the northern Australia/Arafura area where most Taiwanese gillnetting took place, versus the Gulf of Carpentaria and Bonaparte Gulf where foreign fishing was either reduced or excluded. Stock boundaries to the north of Australia are also undefined.

In a review[i] of the assessment of the fishery conducted in 1997 analysis of the CPUE time series from logbooks, corrected for shark targeting (CPUE varies with the square root of stock size) suggested that the Taiwanese fishery of the 1970s and 80s reduced the northern Australia/Arafura component of the stock by about 60-70 percent. The analysis further suggested that the Gulf of Carpentaria (GoC) stock component may not have declined by more than 30 percent during the period when the northern Australia/Arafura component was being depleted, ie. there was probably "hyperdepletion" in the overall CPUE statistics due to a substantial part of the stock in the GoC not being available to the Taiwanese fleet due to closures imposed by the Commonwealth.

A combined potential yield estimate for WA, the NT, and Queensland (all stocks) of at least 2000 tonnes per year, with an optimum annual exploitation rate on the gillnet vulnerable component of the stock of 6-7 percent per year. Thus, although there may be a large population of sharks, only a small amount can be sustainably harvested each year. The optimum annual exploitation rate is determined from annual mortality, growth, selectivity, and pup production rate data. Because sharks grow and mature slowly, their annual production is low; however we are quite uncertain of how large a stock this sustainable harvest rate should be applied to in calculations of the annual catch.

Age-structured models suggested that the overall stock (northern Australia/Arafura plus Gulf of Carpentaria components) should have been increasing since the mid-1980s, when Taiwanese catches were greatly reduced. The expected rate of increase was between 5 percent and 10 percent per year, accounting for more recent domestic catches. However, CPUE data from the NT gillnet fishery indicate a substantial decline in relative abundance since the mid 1980s (catches per boat have been increasing slowly, but catches per length of net set have decreased by around 50 percent since 1985).

To reproduce this pattern of decline while still estimating stock sizes in 1985 large enough to account for the Taiwanese catches and impact on relative abundance, we have to assume that there has been a continuing unreported removal of around 1500 tonnes per year from the northern Australian stock component (as compared to an average reported catch of only 300 tonnes per year by all domestic fisheries combined). This may be due to foreign fishing in the Arafura region, perhaps combined with unreported domestic catches.

It is also possible that declines in domestic CPUE have been due to slow depletion of an inshore, resident component of the overall stock, without there being a major impact of recent fishing on the stock as a whole (ie. overall stock may be recovering, but inshore density being reduced by domestic fishing in spite of overall increase).

The tagging work undertaken by CSIRO is not totally inconsistent with this hypothesis, when data is corrected for bias in apparent movement patterns due to higher offshore fishing efforts during the period when the study was conducted. However, if there is a distinctive inshore stock component being fished by NT and Queensland fishers, this stock component has a much lower sustainable yield than we would estimate for the stock as a whole based on the offshore Taiwanese removals.

The assessment unfortunately relied largely on highly dubious CPUE statistics from both the Taiwanese and domestic gillnet fisheries. The validity of CPUE as an index of abundance is questionable for stock management purposes. In the case of the Taiwanese fishery, it is not known whether the observed fishing strategy is linked to the availability of sharks or the targets of other pelagic fish in other regions. There are various reasons to suspect that neither of these fisheries have provided CPUE trends proportional to changes in the actual stock size.

7. Management Arrangements

Timor Reef Fishery

The limited entry management arrangements, a licence reduction program and limits on the type of fishing gear are the principal management controls for the Timor Reef fishery.

To reduce the number of entitlements, new entrants to the fishery must surrender two "restricted" Timor Reef licences for the issue of a (transferable) unrestricted Timor Reef fishery licence, or alternatively, acquire an unrestricted licence.

Timor Reef fishers must also hold a demersal fishery licence.

Demersal Fishery - other than Timor Reef

A limited entry management regime has been established for the demersal fishery, with sixty licences issued. Commercial fishermen may use vertical lines with up to five hooks attached, droplines with 6-40 hooks and fish traps. By-catch restrictions apply to key managed species, including Spanish mackerel and sharks.

Demersal fishery licences are transferable.

Finfish Trawl Fishery

Management controls for the finfish trawl fishery mirror the permit conditions in force prior to the introduction of revised OCS arrangements in early 1995. Area and fishing gear restrictions apply.

Shark Fishery

Management arrangements in place for the shark fishery place limits on the overall number of commercial licensees, together with restrictions on the construction and type of fishing apparatus used.

Commercial operators may use a maximum of 2,500 m of pelagic gillnet constructed of twine not less than 0.9 mm in diameter with a mesh size between 150 mm and 250 mm. Pelagic longline may be used in all regions (restrictions apply to the Coastal zone) of the shark fishery, or demersal longline in the Arafura or Gulf of Carpentaria (GoC) region, provided the total length of all lines used does not exceed 20 nm at any time.

A licence reduction program requires existing licensees to transfer three restricted shark fishery licences to the Territory for the issuance of an unrestricted shark fishery licence. New entrants must acquire an unrestricted licence to participate in the commercial fishery.

8. Fisheries Monitoring, Research, Surveillance and Enforcement

The NTDPIF undertakes a range of tasks on behalf of the NTFJA. Specifically, the NTDPIF has established, and continues to maintain, catch and effort information from commercial fishers operating in NTFJA fisheries. It is from such information, together with available research data, that the condition of the fishery is kept under constant consideration.

The NTDPIF is collaborating with CSIRO and Agriculture, Fisheries and Forestry-Australia in an Australian Centre for International Agricultural Research (ACIAR) assisted project to examine the "*Biology, stock assessment and management of shared snapper fisheries in northern Australia and eastern Indonesia*". This four-year project, which commenced in 1999, seeks to examine the population dynamics, stock structure and biology of goldband and red snappers relevant to the management of stocks shared between Australia and Indonesia. It also aims to identify and explore ways of developing complementary fisheries management strategies that will result in the long-term sustainability of these snapper fisheries. Socio-economic research, undertaken as part of this study, seeks to consider the potential impact of future management arrangements and gather data on the importance of these fishes in southeast Indonesia. As an outcome, the project is to provide the details necessary for complementary conservation, management and utilisation of shared stocks.

Two FRDC projects examining the stock structure of goldband snapper using mitochondrial DNA and otolith microchemistry were completed in 1999. This was a collaborative project between the Northern Territory Fisheries Division, Fisheries Department of Western Australia and Queensland Department of Primary Industries.

For the study adult goldband snapper (*Pristipomoides multidens*) samples were collected from 6 locations in Australia; Exmouth, Pilbra, Broome, Kimberley, Timor and Arafura Seas. These sites correspond to areas of major fishing activity. Opportunistic samples were obtained from Kupang and West Irian Jaya (Indonesia) and Madang (PNG).

Findings from this study suggest that there is significant stock structures between:

- Indonesian and Australian sites
- Indonesian sites
- Australian sites and Kimberley site

This subdivision may be explained by sedentary nature of all life stages, including planktonic eggs, and larvae, and implies localised recruitment. A separate study using otolith microchemistry technique on the same samples has found that the adults are sedentary.

The Natural Heritage Trust (Coasts and Clean Seas) is currently funding a program, entitled "*Impacts of fishing on sharks and rays in northern Australia*", to collate information on northern Australia's elasmobranchs (shark and rays). This has the basic objectives of identifying the species caught by different fisheries (including non-target catches), the magnitude of catches and identifying spatial distributions. The project is a collaboration between federal agencies with interest in the fisheries CSIRO and BRS, and the NT, Qld and WA fisheries agencies. The project is the initial review stage of a larger project examining the sustainability of these catches. A primary objective of the project, which commenced in May 1999, is to identify types of information necessary for management which is not currently provided under the statutory requirements of the various administrations (these might be, for example, species composition or size composition of catches). The project is to be completed by 2002.

The Marine and Fisheries Enforcement Unit of the Northern Territory Police, Fire and Emergency Services undertake surveillance and enforcement functions for NTFJA fisheries, as part of its ongoing tasks in fisheries matters. Operationally, surveillance activities for NTFJA fisheries have been by way of in-port inspections of fishing gear to ensure compliance with effort controls and as an adjunct to compliance activities for other fisheries.

9. Financial Arrangements

The Northern Territory Department of Primary Industry and Fisheries received $52,500 in licence fees for Joint Authority fisheries.

[1] (Walters, C. J., and Buckworth,R. C., *Shark and Spanish Mackerel Stocks Assessed.* Northern Territory Fisheries Industry Council Newsletter, July 1997. **8**(2), 14-15.),

Management Arrangements and Landings for NTFJA Fisheries

Fishery	No. of Restricted Licences	No of Unrestricted Licences	Management Regime	Sustainable Yield Estimates	Landings (1999/2000)
Shark Coastal Arafura GOC	- 7 5 3	8 - - -	Effort Controls Restriction of the total number of licences issued 2500 m of net mesh size 150 mm to 250 mm Longline to 20 nautical miles 3:1 licence reduction program	2000 tonnes for northern Australia	Black Tipped shark 253 t Other shark 173 t Grey mackerel 159 t Spanish mackerel 9t Other 13 t
Demersal	Not Applicable	60	Effort Controls Limit on licences issues Vertical Lines with a maximum of 5 hooks Droplines with 6-40 hooks Restrictions on the possession of sharks and mackerels	Red Snapper – 1500 t	Confidentiality considerations preclude publication of catch data
Timor Reef	8	7	Effort Controls Limit on licences issues Vertical Lines with a maximum of 5 hooks Droplines with 6-40 hooks Transferability on amalgamation of two restricted licences Must hold a Demersal Licence Restrictions on the possession of sharks and mackerels	Gold Band Snapper - 300-20,000 t	Goldband Snapper 205 t Red Snappers 35 t Red Emperor 17 t Other Reef Fish 51 t
Fish Trawl	Not Applicable	1	Effort Controls Restrictions on the use of fishing gear	Refer to Demersal Fishery estimates	Confidentiality considerations preclude publication of catch data

Please note that the details outlined provide a general summary of the management arrangements only and should not be relied upon as a complete description of all legislative requirements. The Northern Territory *Fisheries Act* and Regulations provide precise information about legislative arrangements implemented for the fisheries nominated.