

Trepang Fishery Status Report 2006

Introduction

Trepang fisheries throughout northern Australia date back to at least the 1700s, when Macassans from Celebes (Sulawesi Island group, Indonesia) visited northern Australia to fish for trepang. Activity in the fishery declined around 1880. By 1907, the South Australian Government had ceased issuing licences to Macassans, possibly due to the emergence of a local industry. Landing reports, though scant, suggest the catch was many times higher than current catch levels.

A lower level of commercial exploitation continued until around 1945. Commercial fishers were generally European Australians assisted by Aboriginal people who inhabited the remote Arnhem Land coast. Little subsequent fishing activity was observed until the early 1980s, with virtually no reported exports. Increasing interest in the late 1980s led to the re-opening of the Northern Territory (NT) Trepang Fishery. At that time, six licences were issued for the hand harvesting of trepang.

Initially, the fishery was divided into three separate management areas, with two licensees permitted to operate in each area. Once the fishery was operational, licensees in the far western area indicated that there was insufficient product for their operations to be economically viable, particularly given the more extreme tidal fluctuation in this management area. For this reason the central and western zones were merged. Currently, one management zone extends east of Cape Grey in the Gulf of Carpentaria to the Queensland border (including Groote Eylandt) and the other extends west of Cape Grey to the Western Australian border. Controls were introduced at that time to regulate the number of crew and permitted divers/collectors.

The principal species for the fishery is the sandfish (*Holothuria scabra*). These prefer coastal areas to coral reefs and are often found in beds of sea grass. Sea grass plays an important function in triggering larval settlement. Sexual reproduction is via broadcast spawning which generally occurs in the warm months (December to February). The planktonic larvae of this species spend 10 to 14 days in the water column before settlement. Consequently there is potential for larval dispersal between populations. Genetic studies in Queensland indicate limited genetic variability between shallow and deep populations of sandfish. The latter finding may be consistent with the view that juveniles settle in shallow sea grass beds and then migrate to areas of deeper water during their life span.

The terms trepang, sea cucumber or *bêche-de-mer* are often used interchangeably, although “trepang” actually refers to the high valued dried body wall of sea cucumbers which belong within the taxonomic group of holothurians.

In late 2004, the NT Trepang Fishery was assessed by the Australian Government Department of Environment and Heritage (now known as the Department of Environment and Water Resources, [DEW]). As a result, the fishery received certification as an accredited Wildlife Trade Operation (WTO). This assessment demonstrated that the Trepang Fishery is managed in a manner that does not lead to over-fishing, and that fishing operations have minimal impact on the structure, productivity, function and biological diversity of the ecosystem. The fishery will be reassessed against the Guidelines for the Ecologically Sustainable Management of Fisheries in 2007.

Profile of the Fishery

Commercial

Area

The Trepang Fishery operates in waters seaward of the coast to 3 nautical miles seaward of baselines (i.e. the NT coastline and surrounding islands).

Fishing Method

Sandfish (*Holothuria scabra*) is the most important species for tropical sea cucumber fisheries. Sandfish is one of the few tropical sea cucumber species that prefer coastal areas to coral reefs. Harvesting of sandfish usually takes place by walking at low tides and diving in shallow coastal bays and foreshores. Snorkel, scuba and hookah may be used when diving for trepang. Collection is generally limited to neap tides and the dry season when water visibility improves and cyclone activity is minimal.

Catch

As mentioned earlier, the target species for the fishery is the sandfish (*Holothuria scabra*). Due to the method of operation of the Trepang Fishery, no by-product species are taken.

Total harvest* in the Trepang Fishery was low until the late 1990s, growing from a little over 75 tonnes in 1996 and 1997, to vary in the range of 110.5 to 247 tonnes, responding largely to fishing effort (Table 1; Figure 1). Total harvest reported for 2006 was 169.8 tonnes.

Note* Catch and effort values and derived quantities may differ between annual status reports due to variation in data retrieval procedures and corrections of minor data errors.

Effort

Over the period 1996 to 2006, fishing effort* in the Trepang Fishery was highly variable, with between 172 and 521 days fished per year (Table 1; Figure 2). Effort peaked at the latter value in 1998 and gradually declined to pre-1998 levels in 2001. Effort then increased in 2002 (404 days fished) but declined nearly 30 per cent to only 295 days fished in 2003. Effort declined

Table 1. Catch and effort* for the Trepang Fishery, 1996 to 2006

Year	Catch weight (tonnes – wet weight)	Catch no.	Total catch (tonnes)	Effort (days)	Effort (hours)
1996	12.6 [†]	119077	77.4	279	1244
1997	15.6 [†]	111619	76.4	249	1149
1998	82.3 [†]	51723	110.5	521	2251
1999	199.3 [†]	85610	245.9	365	1751
2000	247.0	N/A	247.0	274	1344
2001	115.0	N/A	115.0	172	799
2002	207.0	N/A	207.0	404	2684
2003	152.3	N/A	152.3	295	2241
2004	102.4	N/A	102.4	255	1471
2005	83.1	N/A	83.1	200	1451
2006	169.8	N/A	169.8	246	1711

[†] Indicates calculated catch

further in 2004 and 2005 to 255 days and 200 days, respectively. However, effort has again increased in 2006 to 246 days.

Fishers report that effort levels reflect fishing conditions, such as turbidity, weather conditions and tidal state, rather than stock abundance or market factors.

For some periods during 1996-99, catches were reported alternatively as numbers or weights. The total catch weight for these years was estimated by multiplying catch declared as a number by a typical individual weight (0.544618 kg).

Catch rates*

Until the mid 1990s the catch rates in the Trepang Fishery were low, with 32 kg/hr and 62 kg/hr recorded in 1996 and 1997, respectively (Figure 2). In 2000 the catch rate for trepang peaked at 183.7 kg/hr. Catch rates declined in 2001 levelling out in subsequent years to between 57 kg/hr (2005) and 99 kg/hr (2006). These catch rates remain greater than the early catch rates for this fishery. With a low number

of participants, catch rates are subject to high variation as a consequence of skippers and crew entering or leaving the fishery, as well as extrinsic factors such as inter-annual variation in water clarity that affects catchability.

Licensees are permitted to harvest all trepang species. Discussions with licensees indicate that the fishery continues to target sandfish in preference to other lower valued species found in tropical waters. A review of trepang fisheries elsewhere indicates that in the event of a population decline in the higher valued species, fishers seek to maintain profitability by targeting lower valued holothurian species.

Such a situation was observed in the Queensland East Coast Bêche-de-mer Fishery, in which commercial fishers targeted white teatfish (*Holothuria fuscogilvia*) and prickly redfish (*Thelenato ananas*), and in the Torres Strait Fishery, where fishers targeted teatfishes (*H. fuscogilvia*, *H. noblis*), prickly redfish and surf redfish (*Actinopyga mauritiana*). No such trend has been observed in the NT Trepang Fishery.

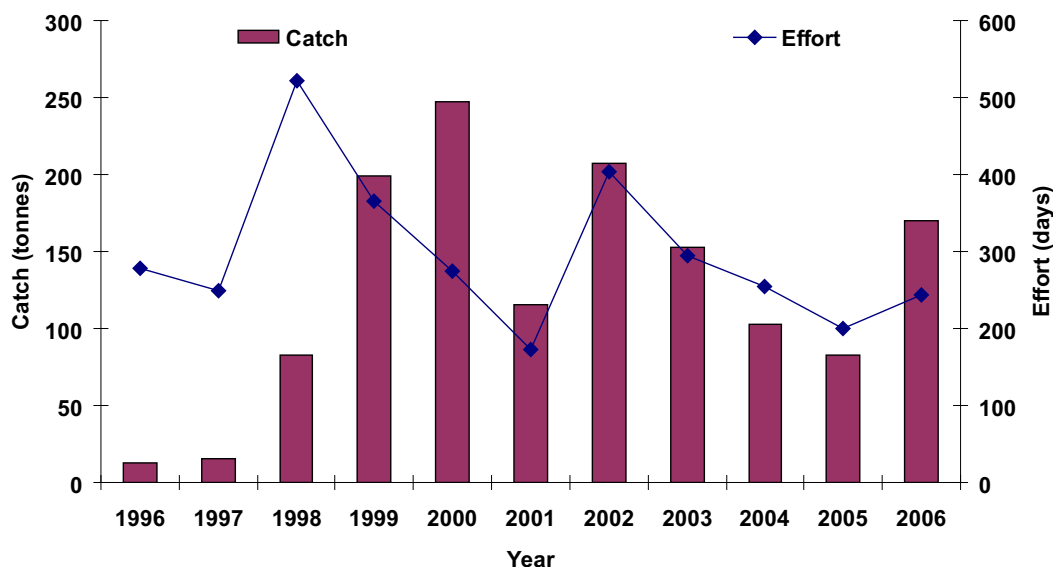


Figure 1. Annual total catch and effort* for the commercial Trepang Fishery, 1996 to 2006

Marketing

With restricted land access to the majority of the NT coastline, all fishing operations are vessel-based. Initial processing includes washing, grading and freezing the harvested product. In a majority of cases the stomach is removed, the remaining product then boiled and the trepang frozen. The processed catch is generally unloaded in Darwin, the only NT port with all season access, and transported to domestic facilities for further processing, which is typically mechanical drying.

With limited domestic markets, the majority of the catch is exported.

Recreational Sector

The recreational take of trepang is not known but likely to be low. No trepang catch was reported by recreational fishers during either of the two recreational fishing surveys conducted in 1995 and 2000-01. The local Asian community may take limited amounts for personal consumption.

Fishing Tour Operator (FTO) Sector

There are no reports of trepang in the catch of FTO clients for 2006.

Indigenous Sector

No take of trepang was reported during the National Recreational Indigenous Fishing Survey of Northern Australia undertaken in 2000-01. Information collected during field trips suggested that trepang is never used as a food source.

Non-retained Species

The targeted hand collection method of fishing for trepang means that there are no non-retained (by-catch) species collected.

Ecosystem Impact

Collection of trepang by hand is likely to have minimal impact on the ecosystem.

Economic Impact

The value of the fishery is confidential as there are fewer than 5 licencees in the fishery.

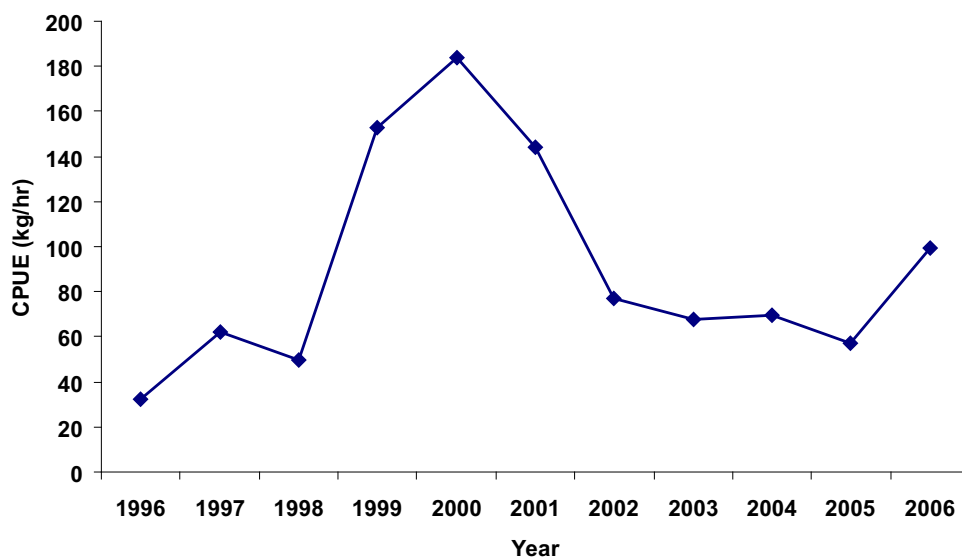


Figure 2. Catch rate for the commercial Trepang Fishery, 1996 to 2006. Catch rates represented here are catch per hour of operation only for those operations where catch was declared in units of weight.

Stock Assessment

Monitoring

Commercial fishers in the Trepong Fishery are required to complete daily reports on fishing effort and the level of harvest by both weight and numbers of individuals. This information provides for future detailed assessment of the status of the Trepong Fishery, including the estimation of the average weight of individual trepong harvested as an indicator of the status of the fishery. However, it is important to note that individual weights of trepong vary substantially as the animal may take in or release substantial volumes of water and the animals have no hard parts that might be a reliable proxy. By reporting total weight and number in the catch, fishers nevertheless provide trend information that is of benefit. Fishers also continue to report fishing locality and statistical grid, so that future assessment and management may address the spatial dynamic attributes of the fishery.

Stock Assessment Methods and Reliability

There is no current stock assessment for trepong. As a consequence, NT Fisheries has adopted a precautionary management approach with a limit of six licences in the fishery able to operate within 3 nautical miles of the baseline. This number of licences together with the natural inhibitors, visibility, accessibility, wet season and cyclonic events, limit the potential for over-fishing.

Current Exploitation Status

Performance measures for the fishery, catch rates and average size, indicate that the current level of harvest has not exceeded appropriate levels.

Future Assessment Needs

A program to develop a series of cooperative industry and student based projects is currently being developed with the fishing industry and Charles Darwin University. A program of

management strategy evaluation (MSE) is to be initiated, to indicate both research directions and monitoring information that would be appropriate for various management options. Research and assessment will seek to assess the status of stocks both within and external to the current fishery area. The availability of suitable students is a current constraint to this work.

Incorporation into Management

Research outcomes indicate that current management and monitoring are adequate. However, future monitoring will depend on information needs identified above and future fishery performance.

Research

Current research is limited to analysis of trends in fishery statistics and assessment and assimilation of research from other areas and jurisdictions. A framework for the MSE described above is being developed.

Management/Governance

Management

Objective

Management of the fishery seeks to satisfy legislative objectives of conserving, enhancing, protecting, utilising and managing the fish and aquatic life resources of the NT. Key management strategies to achieve the objectives of management include:

- limiting the number of commercial licensees to a maximum of six
- having two separate management zones, with not more than three licensees authorised to operate in each zone
- limiting fishing to an area extending from the high water to an imaginary line three nautical miles from baselines
- limiting the number of crew and collectors/divers and

- permitting the harvesting of trepang by hand only.

Analysis and monitoring of catch and effort trends, average weight of trepang caught, the continuation of fishing on the same grounds, operational and logistic constraints together with the continued focus on the premier species, the sandfish, indicate that the current arrangements are appropriate to achieve the management objectives of the NT Trepang Fishery.

In addition, fishing the tropical inshore waters of the NT with its large tidal range (exceeding 8 m in some areas) and distinct wet/dry monsoon season and highly turbid water, also places operational limitations on the fishery and the collection of trepang by hand. Highly turbid water impedes the effectiveness of hand gathering, with commercial operators reporting the inability to harvest trepang during the time of spring (larger) tides and the heavy flooding often associated with the monsoon. As a result of these factors, actual fishing time is limited. These natural inhibitors are taken into consideration by management and acknowledged as providing further protection to the fishery.

The Trepang Fishery is further managed in accordance with the management objectives, performance indicators, triggers and management actions as agreed through industry and the Australian Government assessment process and as part of the WTO accreditation.

Current Issues

Reported catch levels for target sandfish species *Holothuria scabra* throughout 2006 were within acceptable levels.

Over the next 12 months NT Fisheries will be working with the licence owners to develop and implement finer scale data collection and reporting. This will enhance the quality of data collected and mitigate the potential risk of localised depletion of trepang in the fishery.

Compliance

Compliance activities associated with management arrangements for the Trepang Fishery are undertaken by the Marine and Fisheries Enforcement Section (MFES) of the NT Police, Fire and Emergency Services, under the NT *Fisheries Act 1988*.

MFES effectively monitors and enforces the Trepang Fishery management arrangements through the inspection of vessel arrivals and departures through the single port of Darwin. Compliance includes verification of catch returns against processor returns (i.e. requirement for all operators to specify where they are selling their product). MFES has the power, if necessary, to investigate the records of wholesalers and licensees.

In 2006, no significant compliance issues were recorded for this fishery.

Consultation, Communication and Education

Regular consultation occurs between NT Fisheries, licence holders and the NT Seafood Council. In addition, NT Fisheries staff conduct regular visits to the wharf to speak informally with fishers.

Conservation groups and non-government organisations are updated on current fisheries issues, including the Trepang Fishery, through regular meetings with senior fisheries officers. Members of the public, including community and environment/conservation groups are also invited to provide their views to NT Fisheries through the release of public discussion papers and other consultative processes.

NT Fisheries also issue publications in the form of Fisheries Reports and newsletters to inform and educate stakeholders.

Prepared by

Dr Rik Buckworth – Senior Research Scientist
 Dr Andria Handley – Research Director
 Steven Matthews – Aquatic Resource Manager