

NORTHERN TERRITORY TREPANG FISHERY

A REPORT AGAINST THE GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES – 2007



A report prepared for the Department of Environment and Water Resources (DEW) for assessment of the Northern Territory Trepang Fishery under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

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Introduction

In September 2004, the Northern Territory Government's Department of Primary Industry, Fisheries and Mines (DPIFM) submitted a document to the Department of Environment and Water Resources (DEW) for assessment of the NT Trebang Fishery (NTTF) under Part 13 A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The assessment resulted in the fishery being declared an approved Wildlife Trade Operation (WTO) and exempt from the export regulations of the EPBC Act for a period of three years beginning in December 2004.

Following the initial assessment of the NTTF, a substantial level of information is now publicly available regarding the environmental performance of the fishery. In order to focus limited resources on continuous improvement within the fishery and to build on the findings from the initial assessment, the submission requirements were streamlined (by the regulating authority) to align with annual reporting requirements for the fishery.

As part of this new process, Guidelines for the Ecologically Sustainable Management of Fisheries (the Guidelines) were developed, along with accompanying terms of reference. The terms of reference require the preparation of a draft assessment report that assesses all impacts of the fishery on the environment. The draft assessment report is then used to determine if the fishery is ecologically sustainable.

The NTTF is now due for reassessment against the Guidelines. DPIFM has prepared a draft assessment report that includes this document and the annual Fishery Status Reports published since the initial assessment in 2004. In compiling the report, DPIFM has addressed the Guidelines and where necessary, responded to each of the issues outlined.

As a result of the initial assessment of the fishery in 2004, a series of recommendations were agreed to between DEW and DPIFM. These agreed recommendations were focused on ensuring the continuation and enhancement of good management practices. This document specifically addresses these recommendations and provides a response to each.

The document should be read in conjunction with the Annual Fishery Status Reports (available for download from www.nt.gov.au/dpifm/Fisheries) and the initial assessment document that was provided to DEW in 2004.

The following progress has been made by DPIFM in implementing the DEW recommendations:

DEW Recommendation 1

“The Department of Primary Industry, Fisheries and Mines to advise DEW of any material change to the NT Trepang Fishery’s management arrangements that could affect the criteria on which EPBC decisions are based, within 3 months of that change being made.”

DPIFM’s Response

No changes, that could affect the criteria on which EPBC decisions are based, have been made to the NT Trepang Fishery’s management arrangements during the past three years.

DPIFM will advise DEH of any changes to management arrangements within 3 months of that change being made.

DEW Recommendation 2

“DPIFM to cooperate with other jurisdictions in efforts to undertake research on key gaps in the knowledge of trepang biology and ecology.”

DPIFM’s Response

DPIFM are continuing to liaise with Queensland and Western Australia to develop ways of undertaking further cost-effective research. There are strong links between the management arrangements in WA and the NT with the fisheries very similar in species make-up and environment. Additionally, the sole operator across these areas, Tasmanian Seafoods is able to provide a good link to ensure cooperative and complimentary research across the relevant states and territories.

Despite this cooperative research, precautionary management arrangements are in place for the NT Trepang Fishery. Very precautionary arrangements were deliberately developed in acknowledgement of our limited knowledge on trepang biology and ecology. Many information gaps still exist with regard to NT stocks, including life history parameters, abundance, densities and stock structure. To date, the majority of information on hand has been provided by research undertaken on similar species in other jurisdictions. As a consequence, the precautionary management arrangements DPIFM implemented include limiting the fishing area, gear type and a limit of six licensed operators in the fishery (Tasmanian Seafoods currently own all six licences).

Trepang research currently being conducted within the NT.

- Tasmanian Seafoods is currently working on trial hatchery techniques for Sandfish (*Holothuria scabra*), the key target species of the current NT fishery. The research is based on hatchery techniques and rearing of juvenile sandfish. This work is providing a far greater understanding of biological parameters relevant to the NT including growth rates. A project monitoring growth rates in the ocean will commence in November in conjunction with ACIAR, WorldFish and the people of the Warruwi community at Goulburn Is.
- Industry, in collaboration with DPIFM and Charles Darwin University, is working on a genetic study of stocks across the entire Northern Territory coastline. The results of this project should assist in identifying if there is any genetic evidence of geographically distinct trepang stocks in NT waters. It will also determine the geographic extent of mixing of genetic information.
- Late in 2006, work began on an industry-funded pilot survey of NT coastal waters (inside 3nm). The pilot survey involved trialling “stalled plate” trawl gear in waters relevant to the NT. The “stalled plate” or aerofoil design is to create a low pressure site at the opening of the trawl net and assists in minimising contact between the gear and the seabed. Similar gear has been shown to be effective in lifting scallops and clams and therefore it was assumed that the less dense holothurians would also be amenable to the technique.

Such low impact technology limits the gears efficiency. However, providing the catchability coefficient is known there is no reason to seek highly efficient gear (Tasmanian Seafoods and DPIFM have traded efficiency for low seabed impact). Verification of the coefficient is also estimated by direct diver observation of the percentage of trepang caught versus missed by the gear.

The survey involves the entire NT coastline and will offer a broad scale approach to the distribution of trepang stocks in the NT. It is assumed that the data will form the base upon which further fine scale surveys will be conducted to aid in the spatial management and projection of trepang distributions in the NT (For more information refer to recommendation 3).

- The use of GPS data plotters is also being trialled on the tender vessels in the fishery. The plotters are utilised in some abalone fisheries and provide very accurate spatial catch data which will assist in more refined information for management.

DPIFM is aware the key to providing sustainable harvesting of trepang is having reliable information and that sharing information with other jurisdictions is important in making optimal use of available knowledge.

DEW Recommendation 3

*“Within 2 years DPIFM to develop and implement a robust research and ongoing monitoring program to provide more accurate assessments of stock abundance and inform performance measures for the fishery. The research and ongoing monitoring program will also aim to determine whether a second species of sandfish, *H. scabra* var. *versicolor*, is present in the fishery.”*

DPIFM's Response

The development of a scientifically robust research and monitoring program is proceeding in order to provide accurate assessments of stock abundance and assist in the development of suitable performance measures for the fishery. Due to limited financial and human resources, DPIFM has garnered industry support to conduct a large scale research project to collect data on species composition and distribution. The project commenced in late 2006, and should determine whether the species *Holothuria scabra* var. *versicolor* is present within the area of the fishery.

This industry funded, 3rd party audited research project is expected to take four years to complete. The final report will be peer-reviewed and any relevant findings will be incorporated into future management arrangements. It is anticipated that this project will be able to help fill many of the current information gaps on trepang life history parameters, abundance, densities and stock structure.

The project expects to collect data on a range of variables including:

- species and numbers harvested
- length of specimens and a range or weight measurements
- gonad condition
- water temperature/salinity
- weather conditions
- depth fished
- moon and tide phase
- sediment/bottom samples.

The first phase of this project is almost complete with a presence/absence survey of the 10m contour line between the Western Australian and Queensland borders finalised in late 2007. Results of this initial survey were not available at the time of compiling this report. The results will be forwarded to DEW as soon as they become available.

It is recognized at this stage that the relationship between catch rates and abundance are complex and accurate stock assessments will not be straightforward.

DEW Recommendation 4

“DPIFM to develop sustainable yield estimates for the NT Trepang Fishery within 2 years.”

DPIFM's Response

With research projects in developmental stages, valid sustainable yield estimates for the NT Trepang Fishery are not yet available. In the interim, DPIFM considers the current catch levels to be sustainable and the fishery not to be under threat of overfishing. Low effort levels (three active licences) across a broad geographical range provide protection from overfishing and any perceived threat to sustainability.

The status of the fishery is assessed through completion of the Annual Status Report and at the annual Northern Australian Fisheries Management Workshop. As sustainable yield estimates are not available, key variables are monitored to ensure that conditions and trends, principally species composition, catch, effort, CPUE, areas fished, average size of trepang and licensee ownership are consistent with ensuring the sustainability of the NT trepang resources (See Table 1). As sustainable yield estimates become available, further specific indicators and triggers can be developed to monitor the performance of management objectives. In the interim, DPIFM has adopted a precautionary and conservative approach to managing the fishery. The management arrangements aim to reduce the risk from uncertainties by limiting the total number of licences available, fishing capacity, permitted methods and protecting adequate numbers of breeding stock. The adoption of such a strategy aims to ensure there is a high probability of the fishery not exceeding sustainable harvest levels, acknowledging that historical limits were a significant magnitude higher than current catch (See Macnight, 1976).

Table 1. Management Objectives, Performance Indicators, Interim Trigger Points and Management Actions Used in the NT Trepang Fishery

Species/Group	Management objectives	Performance indicators (valid for life of plan)	Interim Limit reference point (valid for life of plan)	Management response to be taken
Target species	Ensure intergenerational equity by maintaining ecologically sustainable annual catches in all sectors	<ol style="list-style-type: none"> 1. Sustainable yield estimates developed 2. Change in total catch 3. Change in CPUE 4. Change in average weight 5. Change in catch composition 6. Change in licence ownership 	<ol style="list-style-type: none"> 1. Triggers to be refined when yield estimates developed 2. Total catch increases to over 300t/year. 3. The rolling three year CPUE average varies by a factor of 30%. 4. Weighted average decreases by more than 20%. 5. Catch of trepang species other than <i>H. scabra</i> increases to over 30% of total catch. 6. Any licences traded. 	<ul style="list-style-type: none"> • Director to be notified within 60 days if trigger reached • An internal examination of cause and implication of reference point being triggered with report prepared within six months to Director • Consultation with industry and other stakeholders on need for alternate management strategy or action if necessary and agreement on line of action • If appropriate, any amended arrangements to be implemented within 12 months of trigger being reached
Byproduct & Bycatch species	Ensure sustainability of byproduct and bycatch species taken in the NT Trepang Fishery	Monitoring logbook Onboard monitoring	NA - no byproduct in fishery	NA

DEW Recommendation 5

“Within 6 months DPIFM to review the current interim limit reference points for sandfish and implement revised limit reference points, to ensure that they provide a precautionary basis to detect changes and impacts to the target stock. The review will take into account available research on sandfish stocks of Australian beche-de-mer fisheries (including research conducted in the Northern Territory) and the biological characteristics of the target species.”

DPIFM's Response

DPIFM researchers and managers, together with industry representatives, have reviewed the current limit reference points for sandfish to determine if they are providing a precautionary basis to detect changes and impacts to the target stock. The review included the latest available literature and known research, and the biological characteristics of the target species.

In summary, the review determined that the multi-faceted approach DPIFM is presently employing ensures the general health of the fishery. The current limit reference points are considered sufficiently precautionary in making certain the fishery will continue to be managed in a manner that will not lead to over-fishing. The current triggers have not been exceeded and it is thus considered inappropriate at this point in time to implement revised limit reference points.

Following are the current triggers for the review of management arrangements and a brief description of recent developments:

1. Triggers to be refined when yield estimates are developed.

At present the triggers cannot be refined as valid yield estimates for target species have not been developed. The current research program should provide more information to assist in determining accurate sustainable yield estimates.

Trigger to remain the same.

2. Total catch increases to over 300 t/year.

The 2006 catch is 169.8 tonnes, well below the trigger of 300 tonnes. As above, until information from the research and monitoring program is available to refine the trigger, it is considered the trigger of 300 tonnes is significantly precautionary and practical in the interim.

It is noted that the current harvest (169.8t) falls well short of the trigger of 300 tonnes. However, it should also be noted that not all licences are

active within the fishery and the trigger level is to allow for expected sustainable growth within the fishery.

Trigger to remain the same

3. The rolling three year average CPUE varies by a factor of 30%.

Fluctuations in CPUE are expected in a developing fishery and can occur for a number of reasons. To even out these variations it is considered appropriate to smooth these perturbations by averaging CPUE over the last three reporting periods and basing any trigger on those figures. Again, during the developmental phase it is more appropriate to look for trends or downswings such as occurred in Torres Strait and Great Barrier Reef (GBR) trepang fisheries. As such the interim trigger point is set so that if there is variation of 30% on the three year average CPUE, a review of management arrangements will occur and appropriate remedial action undertaken (Table 1).

CPUE within the NT Trepang Fishery is also greatly influenced by inter-annual variations in water clarity that affect catchability and prevailing weather patterns which influence effort. As a result, the CPUE can vary considerably over time and therefore the trigger needs to be set at an appropriate level.

The rolling three year average CPUE currently varies by less than 30%.

Trigger to remain the same.

4. Weighted average decreases by more than 20%.

The average weight of trepang harvested since 1996 has remained relatively constant. A decline in the average weight is considered an appropriate trigger as this may indicate a reduction in the average size of individuals in the population. As such a trigger will be activated if the weighted average of *H. scabra* decreases by more than 20% (Table 1).

The average weight of trepang harvested has not decreased by more than 20% but rather increased by 10% in 2006.

Trigger to remain the same.

5. Catch of trepang species other than *H. scabra* increases to over 30% of total catch.

Based on occurrences in other jurisdictions a change to targeting other, or lower grade species has often preceded a collapse, or could be

considered as evidence of overfishing in the fishery. As such, it is considered prudent to put in place a trigger that will be activated if the catch of species other than *H. scabra* increases to more than 30% of the total catch (Table 1). *H. scabra* currently makes up 100% of the reported catch.

No other species of trepang were recorded as harvested over the reporting period.

Trigger to remain the same.

6. Any licences traded.

The NT Trepang Fishery has stable licensing arrangements with Tasmanian Seafoods currently owning all licences. This company also has trepang access rights in other jurisdictions (WA, Qld and the Coral Sea) and spreads its fishing resources throughout these areas. As such there is no “Gold Rush” mentality within the NT industry as there would be little benefit in overexploiting the resource for short term gain. However, if licences were traded the same level of resource stewardship may not necessarily be evident. As such it is considered prudent to put in place a trigger that will be activated if any licences are traded (Table 1).

No licences were traded over the reporting period.

Trigger to remain the same.

The research and monitoring project currently in development for the NT Trepang Fishery aims to provide further information that will help refine these trigger points through a robust and scientifically validated process. When additional information becomes available, more specific indicators and triggers will be developed to monitor the performance of management objectives.

DEW Recommendation 6

“DPIFM to develop and implement finer scale data collection and reporting and management measures to mitigate the risk of localised depletion of trepang in the fishery. These measures will be developed and implemented in consultation with local indigenous communities, conservation groups and industry.”

DPIFM's Response

Fisheries are working with the sole trepang licence owner to develop and implement finer scale data collection and reporting. Tasmanian Seafoods are currently trialling the use of GPS data loggers on tender vessels used within the NT Trepang Fishery. This equipment, (produced by Scielex in Tasmania and used within the abalone industry), will provide detailed spatial information on catches taken within the fishery. It will provide more precise information on the time and spatial dynamics of fishery operations and mitigate the potential risk of localised depletion of trepang in the fishery. To date, however, extreme heat and humidity have caused data logger units to fail. Tasmanian Seafoods have commissioned the production of a unit with an external aerial to trial further in the NT. It is anticipated that this will improve reliability of units under extreme weather conditions.

As the responsibility for the collection of finer scale data rests with the industry, it has been the primary group consulted on the development of this matter. Contributions from other sectors will be welcomed once the fundamentals have been determined.

Generally a broad level of input is actively sought by DPIFM on management issues, especially from the community in general, conservation groups and indigenous communities. Given the size and scope of the NT Trepang Fishery, current consultative processes are considered appropriate and effective.

DEW Recommendation 7

“DPIFM to review the current size limits on target and byproduct species to ensure that they are set in a precautionary manner consistent with available research on the size at first maturity of trepang reproductive biology.”

DPIFM's Response

Sandfish (*H. scabra*) is the most important species for the NT Trepang Fishery being taken in preference to any lower valued species. As a condition of the licence it has a minimum size limit of 16cm. Other holothurians have been identified as possible harvest species and although none have been recorded as being harvested, these species also have minimum size limits set as a condition of the licence.

Current minimum size limits for sandfish have been set in a precautionary manner due to concerns about accurately determining the size at first maturity of trepang.

A trepang aquaculture project being conducted at the Darwin Aquaculture Centre by Tasmanian Seafoods is producing good size class and life history data associated with NT trepang species, in particular, *Holothuria scabra*. It is hopeful that the data produced from this project will aid in developing more accurate minimum size limits for commercially harvested trepang species in the NT. Additionally, further work on growth rates is planned to continue this year with a joint project in collaboration with ACIAR, WorldFish and the people of the Warruwi community on Goulburn Island.

Currently baseline biological data and ongoing data collected through the daily logbook program, continue to provide a valuable record of the average size of individual trepang harvested. Consistent catch levels indicate the current precautionary management arrangements for size limits are appropriate. Any relevant findings that become available with further research will be incorporated into future management arrangements.

It is worth noting that problems exist in attempting to use traditional size based research for trepang as there is difficulty in accurately measuring animals and determining a length/weight relationship. This is due to seasonal variations of condition, gut content and species response to handling.

DEW Recommendation 8

*“Within 2 months of a species other than *H. scabra* being harvested in the fishery, DPIFM to develop a species-specific interim reference point for that species.”*

DPIFM's Response

H. scabra is currently the exclusive target species in the fishery and there are no records of species other than *H. scabra* landed for the fishery. If sufficient quantities of other species become available and they can be harvested sustainably in economic quantities, then a species-specific interim reference point for that species will be developed.

References

MackKnight, C.C. (1976) *The Voyage To Marege': Macassan Trepangers In Northern Australia.*