

Western Australian Trochus Fishery

ECOLOGICAL RISK ASSESSMENT 2010

As a requirement of the Western Australia's Trochus Fishery (the 'Fishery') Ecological Sustainable Development (ESD) certification under the *Environment Protection and Biodiversity Conservation Act 1999*, an ecological risk assessment was undertaken for identified risks based on a tailored component tree for the Fishery (Fletcher *et al*, 2002).

BACKGROUND ON TROCHUS FISHERY

Ardyaloon Incorporated represent the Bardi Jawi and Mayala Native Title holders of One Arm Point and hold the only Exemption to commercially harvest trochus in Western Australia. Trochus has been hand collected under the authority of an Exemption granted under Section 7 of the *Fish Resources Management Act 1994* (FRMA) since 1995. Although the Bardi Jawi and Mayala Native Title Holders have commercially harvested trochus shell from the waters around the Dampier Peninsula and Buccaneer Archipelago since at least the 1960's.

It is a small fishery based on a single target species (*Trochus niloticus*). There are no by-product species retained within the Fishery because all trochus are individually targeted and collected by hand. The collectors can easily identify the trochus because they live on the reef tops and are harvested at low tide. As a result there is little chance for other species to be taken by accident.

Between 2 to 15 tonnes has been reported as exported annually over the past decade. The fishing grounds are located in the remote Kimberley Region of Western Australia and include the Native Title area waters of the Bardi Jawi and Mayala people. The trochus are hand picked off reefs of the Dampier Peninsula and Buccaneer Archipelago, north of Broome, to be sold locally or exported overseas.

The Fishery is managed under an Exemption, permitting Ardyaloon-nominated Aboriginal community members from One Arm Point to take trochus for a commercial purpose in the Bardi Jawi and Mayala Native Title areas, under a set of management arrangements.

The Fishery's management arrangements include:

- restrictions on the area from which trochus can be harvested;
- two community-initiated area closures within the Native Title areas;
- seasonal closures from 1 June to 31 October each year (approx);
- minimum and maximum size limits to protect juvenile and breeding stocks;
- a conservative annual catch limit (quota) of 15 tonnes (based on historic levels of take); and

- An acceptable catch range of up to 72 tonnes, based on the Trochus stock assessment carried out in 2006 (Note agreed catch level set at 15 tonnes annually).

These management arrangements have been developed through a co-management approach between the Department of Fisheries and Ardyaloon.

The Fishery's low impact collection methods result in minimal impact on reef habitat and the wider ecosystem generally, and there is no bycatch in the Fishery.

METHODOLOGY

Scope

Given the small size of the Trochus Fishery and the precautionary management arrangements, only the criteria required for '*Guidelines for the Ecological Sustainable Management of Fisheries*' that cover environmental elements of ESD were generated for this risk assessment process (including i) retained species, ii) non-retained species, and ii) general ecosystem).

Overview

There were three steps involved in completing the ESD report for the Fishery, based upon the national ESD reporting framework (Fletcher *et al.*, 2002).

1. Issues needing to be addressed for the Fishery were determined through an internal workshop. This process was facilitated by adapting the set of generic ESD component trees into a set of trees specific to the Fishery.
2. A risk assessment/prioritisation process was completed that objectively determined the rankings of identified issues, and including justifications for each ranking (**Appendix 1**).
3. An overview assessment of risk ratings was completed, and it was determined that no additional management measures were required for the Fishery, and that the current arrangements were adequately precautionary to ensure the management of the Fishery within ESD standards.

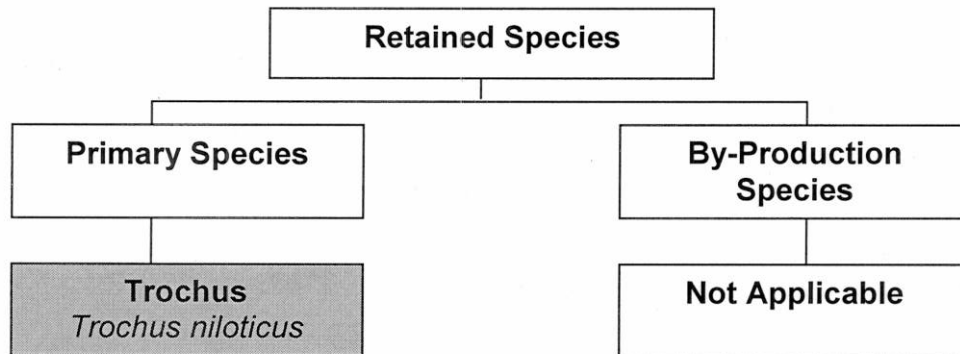
Issue Identification

As a result of workshop with representatives from Ardyaloon Incorporated and the Department of Fisheries in November 2010, the below list of issues were identified for the Trochus Fishery.

Principle 1 –

Objective 1: MAINTAIN VIABLE STOCK LEVEL OF TARGET SPECIES

The Fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability.



There is only one species taken in the Fishery, the target species of Trochus (*Trochus niloticus*).

Due to the precautionary nature of the current Fishery management arrangements (including an annual quota catch limit of 15t that is significantly less than the estimated sustainable catch limit of 72t) it was considered that the Trochus Fishery could be having a **negligible** impact on the stocks under the current management arrangements (C0, L1).

Objective 2: RECOVERY OF STOCKS

Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recover of ecologically viable stock levels within nominated timeframes.

The *Trochus niloticus* stocks in the Fishery are not considered to be below their defined levels.

Principle 2 –

Objective 1: BYCATCH

The Fishery is conducted in a manner that does not threaten bycatch species.

There is no bycatch in this fishery due to the manner in which the species are collected; individually hand collected from the exposed reef tops.

Objective 2: PROTECTED/LISTED SPECIES

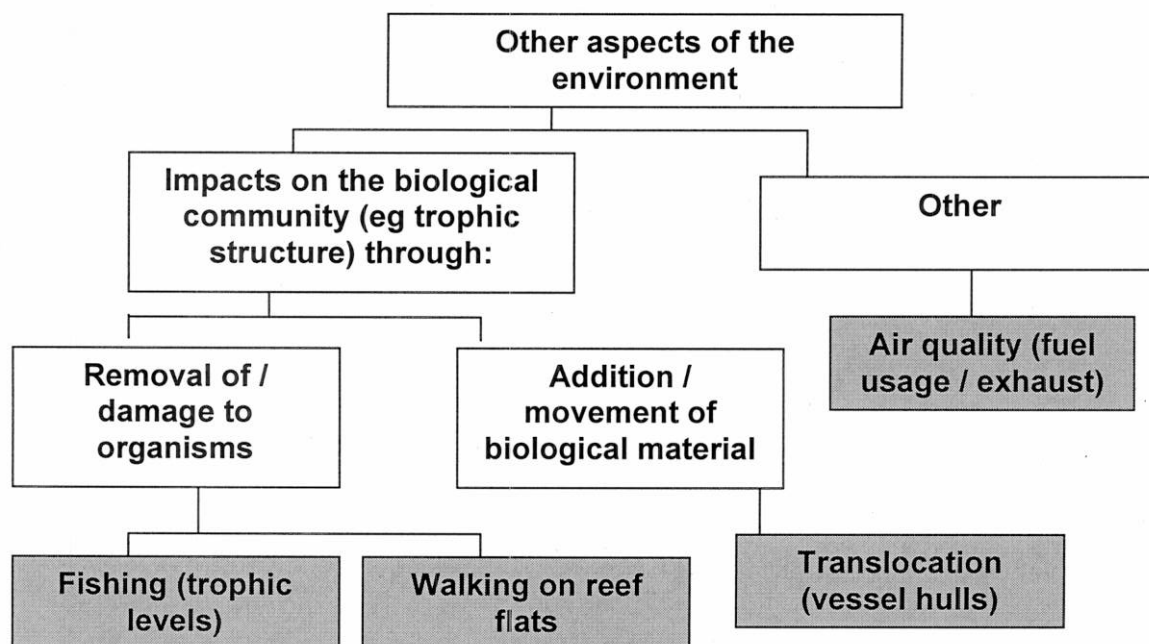
The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids and minimises impacts on threatened ecological communities.

There are no known interactions between the Fishery and any other endangered, threatened, or protected species or threatened ecological communities. Due to the selective fishing method used in this fishery it is unlikely that the Fishery has any interactions with endangered, threatened or protected species.

There are no threatened ecological communities associated with the Fishery.

Objective 3: GENERAL ECOSYSTEM

The Fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally.



Issues relating to the broader ecosystem that were identified for the Trochus Fishery are shown in the above component tree.

Fishing (trophic levels)

The assessment of potential indirect ecosystem impacts that could result from the removal of target species by a fishery should always be considered. In the Fishery the ERA risk rating was considered to be ***negligible (C0, L1)***.

It is unlikely that the Fishery would be able to achieve total removal of target species due to the precautionary management arrangements in place and the low level fishing pressure.

Walking on reef flats, damage of organisms

All trochus are individually targeted and collected by hand on reef flats during low tides. Collectors walk on flat reefs exposed during low tides and take care to walk on natural paths within the reef. Due to the limited number of collectors and the selective harvest method, the ERA risk rating of the impact of collectors walking on reef flats was considered to be **negligible (C0, L2)**.

Translocation (vessel hulls)

Vessels used in the Trochus Fishery are small dinghy's that only travel short distances within the same region to access reef flats in the waters of the coast of the Buccaneer Archipelago. Vessels operating in the fishery do not use ballast water.

Due to the fact that the vessels being used in fishing operations do not travel large distances outside of the area of the Buccaneer Archipelago, the ERA risk rating was considered to be **negligible (C0, L1)**.

Air Quality (fuel usage/ exhaust)

The small dinghy vessels used in the Trochus Fishery produce outboard motor exhaust fumes. Due to the small vessel size, and small scale of the Fishery the ERA risk rating was considered to be **negligible (C0, L1)**.

Summary Table of ERA Risk Assessment Ratings for Identified Issues in the Trochus Fishery.

Principle 1	Risk	Consequence	Rating
<i>Objective 1 – maintain viable stock level of target species</i>			
Ecologically viable stock levels of <i>Trochus niloticus</i>	Remote (1)	Negligible (0)	Negligible
<i>Objective 2 – recovery of stocks</i>	N/A		
Principle 2			
<i>Objective 1 - Bycatch</i>	N/A		
<i>Objective 2 – Protected, listed species</i>	N/A		
<i>Objective 3 – General Ecosystem</i>			
Impact of removing all species	Remote (1)	Negligible (0)	Negligible
Walking on reef flats, damage of organisms	Rare (2)	Negligible (0)	Negligible
Translocation of organisms on vessel hulls	Remote (1)	Negligible (0)	Negligible
Air quality (exhaust fumes)	Remote (1)	Negligible (0)	Negligible

This ERA Risk Assessment process has confirmed the previous assumption that the nature and scale of the Fishery is conducted in a manner that minimises the impact on the ecosystem generally.

References:

Fletcher, W.J., Chesson, J., Fisher, M., Sainsbury, K.J., Hundoe, T., Smith, A.D.M., and Whitworth, B. (2002) *National ESD Reporting Framework for Australian Fisheries: The 'How to' Guide for Wild Capture Fisheries*. FRDC Project 2000/145, Canberra, Australia.

Appendix 1 – consequence and likelihood tables from Fletcher *et al* 2002.

Table 2 The General Consequence Table for use in ecological risk assessments related to fishing (needs to be adapted to specific issue being assessed).

Level	General
Negligible (0)	Very insignificant impacts. Unlikely to be even measurable at the scale of the stock/ecosystem/community against natural background variability.
Minor (1)	Possibly detectable but minimal impact on structure/function or dynamics.
Moderate (2)	Maximum appropriate/acceptable level of impact (e.g. full exploitation rate for a target species)
Severe (3)	This level will result in wider and longer term impacts now occurring (e.g. recruitment overfishing)
Major (4)	Very serious impacts now occurring with relatively long time frame likely to be needed to restore to an acceptable level
Catastrophic (5)	Widespread and permanent/irreversible damage or loss will occur – unlikely to ever be fixed (e.g. extinctions)

Table 3 Likelihood Definitions

Level	Descriptor
Likely (6)	It is expected to occur
Occasional (5)	May occur
Possible (4)	Some evidence to suggest this is possible here
Unlikely (3)	Uncommon, but has been known to occur elsewhere
Rare (2)	May occur in exceptional circumstances
Remote (1)	Never heard of, but not impossible

Table 4 Risk Matrix – numbers in cells indicate risk value, the colours/shades indicate risk rankings (see Table 5 for details)

		Consequence					
		Negligible	Minor	Moderate	Severe	Major	Catastrophic
Likelihood		0	1	2	3	4	5
Remote	1	0	1	2	3	4	5
Rare	2	0	2	4	6	8	10
Unlikely	3	0	3	6	9	12	15
Possible	4	0	4	8	12	16	20
Occasional	5	0	5	10	15	20	25
Likely	6	0	6	12	18	24	30