

**APPLICATION TO THE AUSTRALIAN
GOVERNMENT DEPARTMENT OF THE
ENVIRONMENT, WATER, HERITAGE AND THE
ARTS ON THE
TROCHUS FISHERY**

Against the Guidelines for the Ecologically Sustainable
Management of Fisheries

For Consideration Under Parts 13 and 13A of the
Environment Protection and Biodiversity Conservation Act
1999

October 2008



Department of Fisheries
Government of Western Australia



***DEPARTMENT OF FISHERIES,
WESTERN AUSTRALIA
LOCKED BAG 39,
CLOISTERS SQUARE WA 6850***

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EXECUTIVE SUMMARY

The collection of the topshell trochus (*Trochus niloticus*) from waters around King Sound, Western Australia is assessed against the Commonwealth *Guidelines for the Ecologically Sustainable Management of Fisheries* as required under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*.

Ardyaloon Incorporated represent the Bardi Jawi and Mayala Native Title holders of One Arm Point, and they hold the only current Exemption to commercially harvest trochus. Trochus have been hand collected under the authority of an Instrument of 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 the 1960's.

It is a small fishery based on a single target species (*Trochus niloticus*) with between 2 to 15 tonnes being 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 Trochus Fishery (the Fishery) is managed under an Instrument of 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, in accordance with policy guidelines set out in Appendix 2.

The Fishery's management arrangements include restrictions on the area from which trochus can be harvested, including two community-initiated area closures within the Native Title areas, seasonal closures from 1 June to 31 October each year, minimum and maximum size limits to protect juvenile and breeding stocks, an annual conservative quota of 15 tonnes, and biologically sustainable reference points, which include a catch limit of 72 tonnes, and a catch target of 37 tonnes. 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 wider ecosystem generally, and there is no bycatch in the Fishery.

1. INTRODUCTION

1.1. HISTORY OF FISHERY

The Bardi Jawi and Mayala Aboriginal communities have a significant history in the Trochus Fishery. Trochus have been hand collected under the authority of an Instrument of Exemption granted under Section 7 of the *Fish Resources Management Act 1994* (FRMA) since 1995, however the Bardi Jawi and Mayala Native Title Holders have commercially harvested trochus shell from the waters around the Dampier Peninsula and Buccaneer Archipelago since the 1960's.

The Fishery has a high cultural and economic value to the Bardi Jawi and Mayala Native Title holders at One Arm Point, on the Dampier Peninsula, north of Broome. The Fishery provides nominated community trochus collectors with employment and increased financial independence.

1.2. TARGET SPECIES

The Fishery targets one species (*Trochus niloticus*), and the reported catch in 2005 was 15,000 kg. The maintenance of the trochus stocks, as well as the successful continuation of the Fishery, has been achieved through the combination of the:

- co-management of the fishery between the Department and Ardyaloon;
- a comprehensive suite of management arrangements;
- limited number of licensees (one); and
- central point of export and trade (Ardyaloon Incorporated).

It should be noted that due to the small size of this fishery and the very low risks to the stocks involved (due to the comprehensive co-management framework), the Fishery does not attract a high priority in relation to fisheries research on the targeted species.

The Fishery is a relatively small-scale fishery and has minimal impacts on the broader ecosystem. The Fishery is able to operate over a vast area of water under the Native title areas, however only a limited amount of this available area is targeted by collectors, and two area closures have recently been introduced to provide increased protection to areas previously harvested.

OPERATING DESCRIPTION

1.2.1. LOCATION OF THE FISHERY

1.2.1.1. Licence Area

The Fishery is located at One Arm Point on the Dampier Peninsula and Buccaneer Archipelago, north of Broome (Figure 1). The licence area includes all the waters under the Bardi Jawi and Mayala Native Title Claim areas (Figure 2). The Mayala people allow the Bardi Jawi people to fish within the Mayala Native Title area under an agreement. The Fishery is located in State waters and most of the harvesting is undertaken on the outer reefs during low tides.

1.2.1.2. Operating Description

Ardyaloon Incorporated is the commercial arm of the Ardyaloon Aboriginal Community Council, located at One Arm Point, representing the Bardi Jawi and Mayala Native Title holders. Ardyaloon currently hold the Exemption for the communities, enabling them to commercially harvest and sell trochus. The trochus is sold through Ardyaloon, who market the product and sell to buyers nationally and internationally.

The Ardyaloon Council nominate the individuals (collectors) who can harvest trochus annually on behalf of the Community. The collectors use boats (mostly 4-5m dinghy's) to access the outer reefs from which they hand pick trochus from exposed reef tops during low tides.

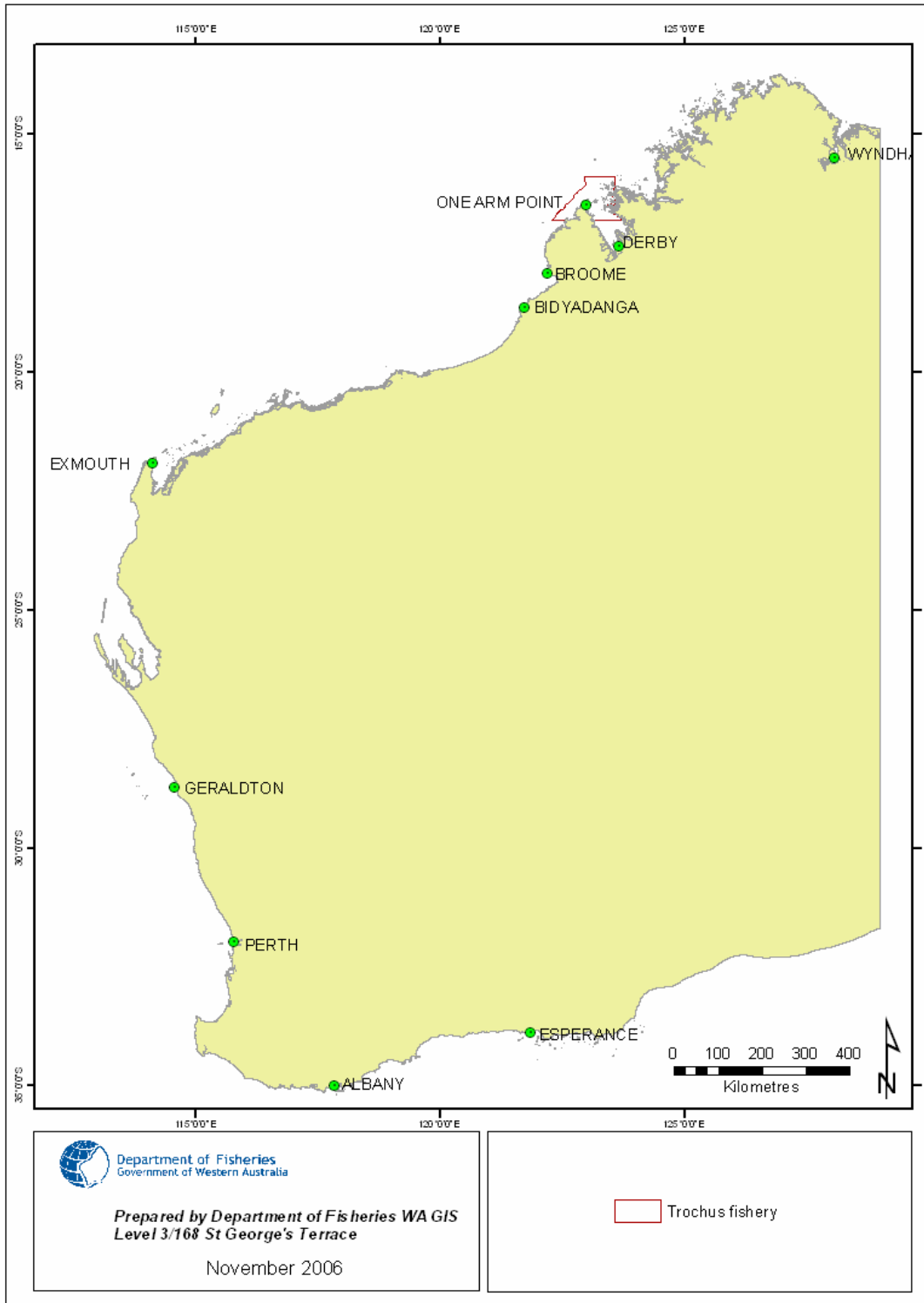


Figure 1 Location of Trochus Fishery within WA.

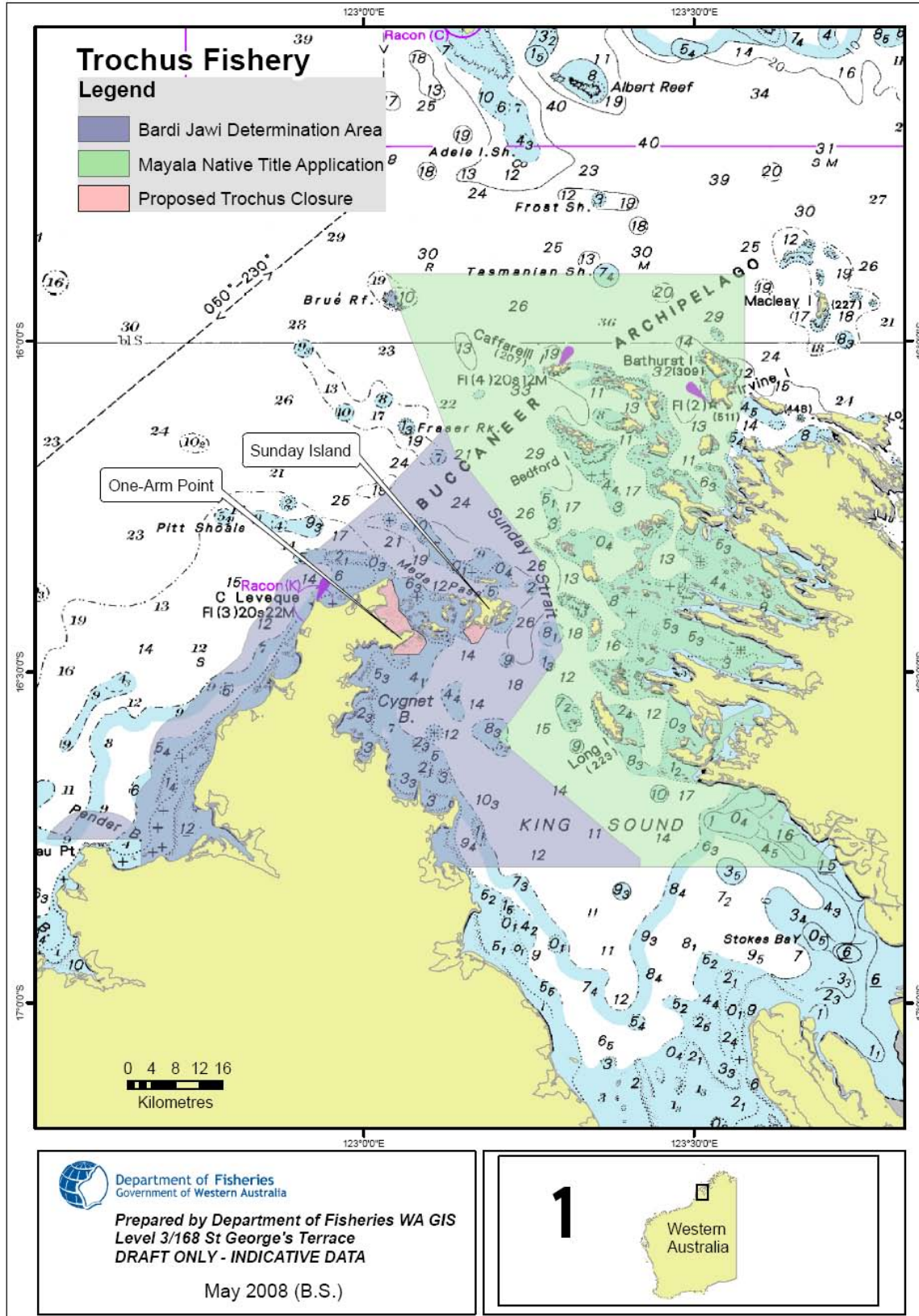


Figure 2 Boundaries of the Trochus Fishery.

1.3. DESCRIPTION OF MANAGEMENT REGIME

1.3.1. MANAGEMENT HISTORY

A summary of the catch history for the Fishery along with a summary of the key management arrangements implemented throughout the history of the Fishery is attached (Appendix 1).

The Fishery is managed under a policy designed specifically for Aboriginal communities (Appendix 2). The policy guidelines dictate the standards for issuing licences to the community to harvest trochus.

Each trochus collector nominated by Ardyaloon Council is required to hold a Commercial Fishing Licence issued by the Department of Fisheries. The trochus collector's are exempt from holding a WA Fishing Boat Licence.

In 1995, four additional licences were issued for a year to non-Indigenous shell collectors. In the following year, these operators were prohibited from taking the *Trochus niloticus* because it was found that the only commercial quantities of trochus were in the waters adjacent to One Arm Point, which caused conflict with the Ardyaloon trochus collector's. The commercial take of trochus is protected by way of a general prohibition notice (Fisheries Notice No. 366) to which Ardyaloon Incorporated are exempt.

In 2001, a new management regime was introduced to the Fishery following concerns of overfishing. A long-term management plan was agreed to, including a co-management approach for the Fishery.

Department of Fisheries compliance presence has increased in recent years with the development of the collaborative Bardi Ranger Program. An ongoing Indigenous ranger program co-funded by the Commonwealth and State is currently underway to give additional protection to the trochus reefs from illegal foreign fishing. This program involves the Bardi Jawi Community, Department of Fisheries and the Australian Customs Service.

In 2007, the Ardyaloon Council and the Department of Fisheries agreed to a revised set of co-management arrangements for the Trochus Fishery including a maximum size limit of 100mm (basal shell diameter), minimum size limit of 75mm (basal shell diameter), two area closures (see Figure 2), an annual quota (15 tonnes) and a five-month seasonal fishing closure. Furthermore, all trochus must be picked from exposed reef (no diving is permitted) and all shell must be sold through one central point.

1.3.2. CATCH AND EFFORT IN THE TROCHUS FISHERY

Figure 3 details the reported catch in the Fishery from 1985 through to 2005. The figure shows that the catch has fluctuated significantly from year to year. The annual catch of trochus is greatly influenced by socio-economic reasons that influence effort and thus the fluctuation can

largely be attributed to this factor. Market price, alternative employment opportunities in the community, and availability of suitable boats have had a significant impact on the catch throughout the years. Refer to Appendix 1.

Between 1985 and 1995, the Fishery reported a catch between 30 to 73 tonnes per year. The higher reported catches coincide with the higher market prices and the availability of additional larger boats in the One Arm Point community. In 1999 the Mayala people closed half of the Fishery that sits within the Mayala Native Title area. Following negotiations between the Bardi Jawi and Mayala Communities, the Mayala reopened this area in 2001. In 2001, the world market price for trochus dropped significantly and less fishing was undertaken during this time.

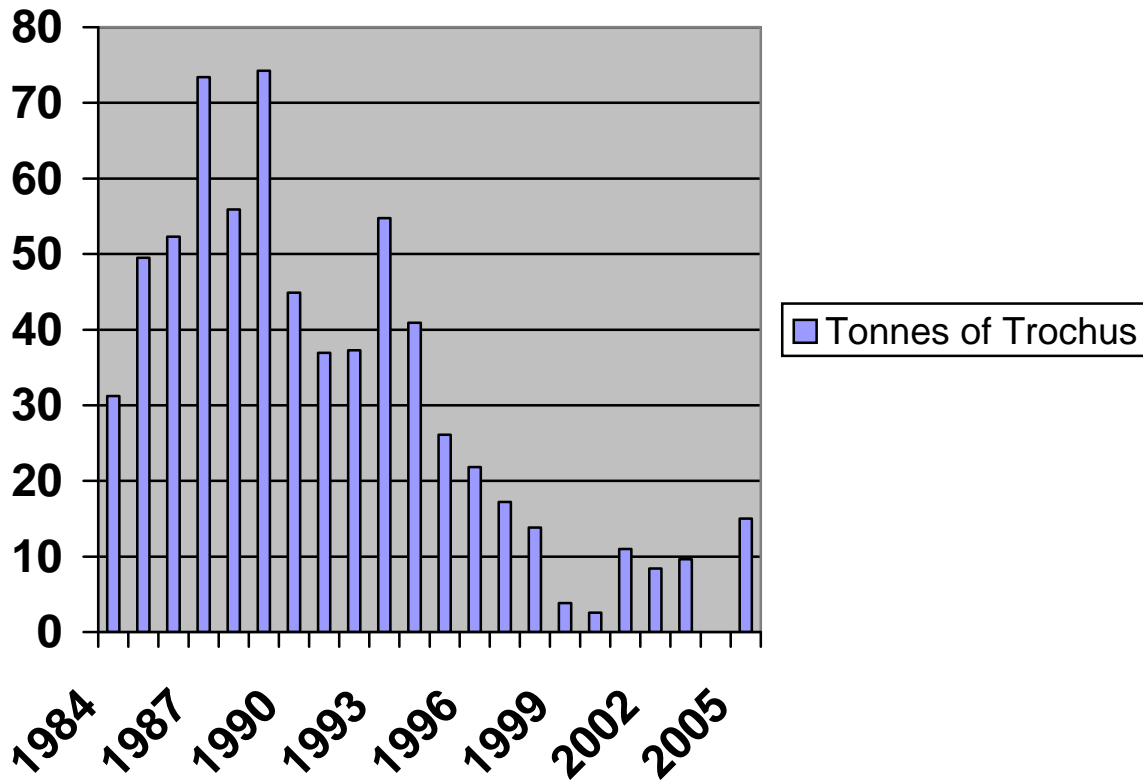


Figure 3 Reported catch of trochus (dry weight in tonnes) from 1985-2005 for the Trochus Fishery.

In more recent years, the Council has limited the catch levels due to poor market prices, even though there has been a high abundance of trochus reported by the trochus collectors. A combination of a lack of community members to collect trochus and reduced market prices has contributed to lower reported catches from 2001 onwards.

1.3.3. ILLEGAL FISHING

During the 1990's illegal foreign fishing was an issue for this fishery. Illegal foreign fishing for trochus in the waters of the Fishery became an issue again in 2005/06. It is believed that each

boat involved in illegal fishing for trochus would take approximately 1 to 2 tonnes in wet weight of trochus. For 2005/06, the illegal take of trochus by illegal foreign fishers was estimated at 15-20 tonnes. Between 1985 and 1995, the Fishery reported between 30 to 73 tonnes per year. Anecdotal evidence from Native Title holders and intelligence gathered from illegal foreign fishers indicates that trochus stocks are relatively abundant in the area of the Fishery.

In 2006 an indigenous marine ranger program was initiated by the Department of Fisheries and the Australian Customs Service, in conjunction with the Bardi Jawi indigenous community at One Arm Point. The operation was mounted in response to the immediate threats posed by illegal foreign fishing to biosecurity and trochus resources in the vicinity of King Sound. The operation involved community members conducting joint surveillance patrols with the Department of Fisheries Officers and Customs Officers.

An ongoing Indigenous ranger program co-funded by the Commonwealth and State is currently underway to give additional protection to the trochus reefs from illegal foreign fishing.

1.4. MAJOR ENVIRONMENTS

1.4.1. PHYSICAL ENVIRONMENT

The Fishery is located in an area that is largely inaccessible by road (Figure 1). There is a gravel road from Broome to One Arm Point that is often accessible only to four-wheel drive vehicles. Apart from Aboriginal communities, there are no settlements in the area. Most access is by boat, though there is a small airstrip at One Arm Point.

The continental coastline on the west side of the Dampier Peninsula is a mixture of rocky headlands, open sandy beaches and bays that have either sandy beaches, or more commonly, mangrove communities in King Sound. The eastern side of the Dampier Peninsula is made up of a combination of rocky headlands and bays, with mangrove systems well developed in this area. The Buccaneer Archipelago extends to the north of One Arm Point, across the top of King Sound and north of the continental mainland to the east. Tides in the region are frequently in excess of 10 m, making navigation treacherous and the water muddy.

The large island to the east of One Arm Point (Figure 1) is Sunday Island. The area between One Arm Point and Sunday Island is one of the largest known area of seagrass in Western Australia. Many of the small bays on islands in the area have a limestone ridge that extends across the mouth of the bay at mid-tide level. As the tide drops, a small lagoon is formed behind the ridge at mid-tide level. Mangroves extend down to the water level, below which seagrass and sandy habitats occur.

The key aspects of the habitat of trochus are:

- Trochus primarily inhabit intertidal and subtidal parts of biogenic limestone reefs. They also inhabit hard rock surfaces, in higher numbers, however this habitat is less common and hence it contributes less to the overall abundance of trochus.
- Reefs are of an algal pavement variety that is relatively solid flat limestone dominated by foliose algae.

1.4.2. ECONOMIC ENVIRONMENT

The Fishery is estimated to be worth approximately \$120,000 (based on \$8.00 per kilo dry shell weight of trochus (currently worth closer to \$10 per kg). The price of shell on the world market varies from year to year which influences the value of the Fishery. The major export markets are South East Asia and Italy, for buttons and other jewellery items. Some trochus shell is polished by community members and sold locally. The small commercial value of the Fishery does not indicate the real value of the fishery to the local participants, who have a cultural link to the Fishery and also have very limited opportunities for financial independence.

1.4.3. SOCIAL ENVIRONMENT

The Fishery is an important part of the One Arm Point Community and their culture. The Fishery has been operating for over 30 years providing the community with employment and financial independence.

1.5. RESEARCH STRATEGY

1.5.1. RECENT/CURRENT RESEARCH

Recent research has addressed the efficacy of reseeded of trochus to enhance the fishery. Two approaches have been employed: reseeded with juvenile trochus and translocating broodstock to reefs with a low abundance of adult trochus. Reseeded juvenile trochus has proven unsuccessful unless the trochus are protected from predation until they have a basal shell width of >20 mm. Translocating broodstock similarly was unsuccessful as significant tides are thought to disperse larvae to other reefs than those on which the adult trochus were placed. A daily research logbook has recently been introduced to the fishery, providing for the collection of finer-scale catch and effort data in the Fishery.

1.5.2. PROPOSED FUTURE RESEARCH

The Department of Fisheries Research Division is currently investigating future funding opportunities to undertake a trochus fishery stock assessment. This assessment will provide information that will be valuable in making future management decisions for the Fishery. At present a Community Coastcare application (Project No: CCO85342) under the “Caring for Country” grants scheme is being considered by DEWHA. The objective of this project is to develop and implement a long-term monitoring and assessment program for the trochus fishery, which includes a daily catch and effort logbook and stock monitoring program.

2. ASSESSMENT OF THE TROCHUS FISHERY MANAGEMENT REGIME AGAINST THE AUSTRALIAN GOVERNMENT GUIDELINES FOR ASSESSING THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

2.1. GENERAL REQUIREMENTS OF THE GUIDELINES

The management arrangements must be:

Documented, publicly available and transparent;

As per the *Fish Resources Management Act 1994* ‘the Chief Executive Officer is to cause a copy of every order, regulation and management plan in force under this act:

- *To be kept at the head office of the Department; and*
- *To be available for inspection free of charge by members of the public at the office during normal business hours.’*

The Fish Resources Management Act 1994, Regulations, and subsidiary legislation (including Fisheries Notice No. 366) can be purchased by interested parties from the State Law Publisher and viewed on their website www.slp.wa.gov.au/statutes/subsidiary.nsf/Fisheries.

Details of all Instruments of Exemption are provided in the Department’s annual report to Parliament.

Once completed, the full ESD Report for the fishery will be made publicly available via publication and electronically from the Departmental website. As a result, the Department of Fisheries is meeting the guideline.

Developed through a consultative process providing opportunity to all interested and affected parties, including the general public;

The fishery is co-managed between the Department of Fisheries and Ardyaloon Incorporated. While the Department of Fisheries gives advice on different management approaches that could be used within the fishery, Ardyaloon works closely with the Department of Fisheries to develop effective fisheries management arrangements for the Fishery.

The Department holds annual meetings with Ardyaloon and community members to discuss management arrangements and other issues.

Ensure that a range of expertise and community interest are involved in individual fishery management committees and during the stock assessment process;

While the Department of Fisheries gives advice on different management approaches that could be used within the fishery, Ardyaloon works closely with the Department of Fisheries to develop effective fisheries management arrangements for the Fishery.

Be strategic, containing objectives and performance criteria by which the effectiveness of the management arrangements are measured;

Performance criteria will be a conservative estimates of biologically sustainable catch limits and catch targets, based on data from fishery independent stock surveys, and current theoretical approaches in fisheries.

Be capable of controlling the level of harvest in the fishery using input and/or output controls;

The Fishery's management arrangements include input controls in the form of a limited entry fishery with only one Exemption holder. The Fishery is also managed by output controls including two area closures, an annual quota, minimum and maximum size limits, a five month seasonal closure, and a limited area of the Fishery (within the Bardi Jawi and Mayala native Title areas).

Contain the means of enforcing critical aspects of the management arrangements;

Department of Fisheries compliance presence has increased in recent years with the development of the collaborative Bardi Ranger Program. An ongoing Indigenous ranger program co-funded by the Commonwealth and State is currently underway to give additional protection to the trochus reefs from illegal foreign fishing. This program involves the Bardi Community, Department of Fisheries and the Australian Customs Service.

Through the combination of having employed operational staff as well as good dialog with the Aboriginal communities, the Department is meeting this guideline.

Provide for the periodic review of the performance of the fishery management arrangements and the management strategies, objectives and criteria;

The Trochus Fishery is reviewed an annual basis by the Department of Fisheries Research Division. The Fishery's annual reported catch and effort data is assessed in order to monitor the sustainability of the Fishery and the trochus stocks.

Following completion of this application the Department will publish it as part of the ESD Report Series which will be available from the Department's website. Future ongoing assessment will be reported as part of the annual State of the Fisheries Report.

Be capable of assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species lives and the fishery operates; and

The current size and method of take of trochus in the fishery is such that formal research into its impact on the marine ecosystem cannot be justified. Given the small size of the Fishery, and the hand collection fishing method, any adverse impact of the Fishery on the marine ecosystem is likely to be minimal.

Require compliance with relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy.

There is no bycatch within this fishery and as a result there is no need to develop a bycatch policy. If there was a change to this then the Department would investigate and, if need be, implement a strategy to ensure it is meeting this guideline.

PRINCIPLE 1 OF THE GUIDELINES

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.

The only species retained in this fishery is the trochus (*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.

An assessment of the current performance of this fishery demonstrates that trochus are being maintained at acceptable levels. Thus, in summary:

- There is a size limit minimum of 75mm and maximum size limit of 100mm (basal shell diameter).
- There is an annual quota of 15 tonnes.
- The conservative estimate of biologically sustainable catch in the fishery is 37 tonnes (shell weight), and the annual quota is only 40% of this.

- There is a 5 month seasonal closure to protect spawning trochus. The season is open from 1 November to 31 May each year. The trochus are hand picked and limited to those animals exposed at low tide on the reef top.
- There is a co-management approach taken with this fishery that provides the Bardi community with a sense of ownership and as a result a responsibility to manage the stocks to ensure they are sustainable.
- There is a strong customary marine tenure aspect to the fishery that enhances the sense of ownership of the Community.

Consequently, it is considered that the Fishery is meeting the requirement of Principle 1. The information relevant to this principle for these species is detailed below.

Information Requirements

1.1.1 There is a reliable information collection system in place appropriate to the scale of the fishery. The level of data collection should be based upon an appropriate mix of fishery independent and dependent research and monitoring.

The Department recently introduced a new daily/trip logbook, which aims to collect finer-scale catch and effort data from the Fishery.

Monitoring Program	Information Collected	Robustness
Catch and fishing effort	Catch records date back to 1985	Moderate

1.1.2 There is a robust assessment of the dynamics and status of the species/fishery and periodic review of the process and the data collected. Assessment should include a process to identify any reduction in biological diversity and/or reproductive capacity. Review should take place at regular intervals but at least every three years.

A recent fishery independent stock survey estimated total harvestable biomass (shell weight) to be 213 tonnes in the fishery. Using reference point analysis, a biologically sustainable harvest estimate was 37 tonnes (dry shell weight). Under a current proposal, it is planned to repeat this survey every 3 years to ensure the most up to date estimates.

1.1.3 The distribution and spatial structure of the stock(s) has been established and factored into management responses.

Trochus inhabit coral reef habitats and live in the intertidal and shallow subtidal areas of coral reefs. The boundaries of the Fishery are restricted to the waters of the Bardi Jawi and Mayala Native Title areas, which includes the waters of the Dampier Peninsula and the Bucaneer Archipelago. The Fishery's target species, *Trochus niloticus*, is only known to be found in commercial abundances in the waters of the Fishery.

1.1.4 There are reliable estimates of all removals, including commercial (landings and discards), recreational and indigenous, from the fished stocks. These estimates have been factored into stock assessments and target species catch levels.

Sector	Catch Data Collected	Frequency
Commercial	Export numbers/catch figures	Monthly
Charter Boat	N/A	N/A
Recreational	N/A	N/A
Indigenous	N/A	N/A
Illegal	Estimated from compliance data.	Annually

Table: Summary of trochus catch data collections for each of the fishing sectors.

The Trochus Fishery is operated by one Aboriginal community, and there is no additional Indigenous take. There are no significant other charter or recreational fishing activities for these species.

New daily/trip logbooks have been introduced to the Fishery, providing for the collection of finer-scale catch and effort data from the Fishery. The daily logbook data is required to be submitted monthly.

Illegal foreign fishing was an issue for the Fishery in the 1990's, and again in 2006. It is believed that boats involved in illegal fishing for trochus takes approximately 1 to 2 tonnes in wet weight of trochus each per boat. For 2005/06, the estimated illegal take of trochus by illegal foreign fishers was estimated at 15-20 tonnes.

In 2006, an indigenous marine ranger program was initiated by the Department of Fisheries in conjunction with the Bardi Jawi indigenous community at One Arm Point. The operation was mounted in response to the immediate threats posed by illegal foreign fishing to biosecurity and trochus resources in the vicinity of King Sound. The ongoing operation involves Aboriginal community members conducting joint surveillance patrols with the Department of Fisheries. The patrols are conducted to coincide with the spring tide periods, the time at which trochus are thought to be at their most vulnerable to illegal foreign fishing.

1.1.5 There is a sound estimate of the potential productivity of the fished stock/s and the proportion that could be harvested.

An effective stock survey has been developed to estimate productivity

In 1989, 74,267kg, of trochus was caught compared to only 2,600kg caught in 2000. The catch of trochus in the Fishery fluctuates from year to year and is influenced primarily by market price, availability of boats, alternative revenue sources for community members, and the market value of Trochus from year to year. Appendix 1 summarises the different situations that have influenced the varied reported catch in the Fishery from 1984 to 2005.

Management Responses

1.1.6 There are reference points (target and/or limit) that trigger management actions including a biological bottom line and/or a catch or effort upper limit beyond which the stock should not be taken.

Preliminary limit and target reference points have been developed for this fishery, based on fishery independent estimates of stock biomass, and current practices in the fisheries research literature. These are as follows.

Limit Reference Point (Maximum Allowable Catch): 62 tonnes

Target Reference Point: 37 tonnes

Current allowable catch (15 tonnes) is below the target reference point, indicating a very conservative management regime.

Further management responses to indications of changes in the Fishery could be to implement one or more of the following actions:

- Further restrict catch limits.
- Introduce extended area closures or seasonal closures.
- Other appropriate management measures.

These actions could be implemented quickly by varying Exemption conditions as provided for under the *Fish Resources Management Act 1994*.

1.1.7 There are management strategies in place capable of controlling the level of take.

The following is a summary of the management arrangements for the fishery:

The management arrangements for this fishery include:

- a) co-management approach between the Department of Fisheries and Ardyaloon Incorporated;
- b) a maximum basal shell diameter size limit of 100mm;
- c) a minimum basal shell diameter size limit of 75mm;
- d) a five-month seasonal closure (1 June to 31 October each year);
- e) area closure near One Arm Point and Sunday Island;
- f) An annual quota (15 tonne); and
- g) Mandatory daily logbook.

In addition, all trochus must be collected from exposed reef (no diving is permitted) and all shell must be sold through one central point (Ardyaloon Incorporated). Ardyaloon Incorporated has responsibility over how many collectors are allowed to fish each year. In addition, all trochus is sold through one entity, Ardyaloon Incorporated, therefore catch figures are easily traceable.

1.1.8 Fishing is conducted in a manner that does not threaten stocks of by-product species.

There are no by-product species taken by this fishery.

1.1.9 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.

The Trochus Fishery is currently managed through input and output controls including seasonal, area, size and catch restrictions. The relatively limited area, combined with the small number of operators in this Fishery and comprehensive management arrangements outlined above make it highly likely that the objective of maintaining adequate stocks of the trochus species will be met.

OBJECTIVE 2. RECOVERY OF STOCKS

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

Under current practices, the fishery is effectively being fished on a stock recovery management regime, with the maximum allowable catch of 15 tonnes being way below the target (37 tonnes) and limit reference points (62 tonnes). This is a clear demonstration of a management capacity to promote recovery of stocks.

PRINCIPLE 2 OF THE GUIDELINES

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.

Information Requirements

2.1.1 Reliable information, appropriate to the scale of the fishery, is collected on the composition and abundance of bycatch.

Not Applicable

Assessments

2.1.2 There is a risk analysis of the bycatch with respect to its vulnerability to fishing.

Not Applicable

Management Responses

2.1.3 Measures are in place to avoid capture and mortality of bycatch species unless it is determined that the level is sustainable (except in relation to endangered, threatened or protected species). Steps must be taken to develop suitable technology if none is available.

Not Applicable

2.1.4 An indicator group of by-catch species is monitored.

Not applicable.

2.1.5 There are decision rules that trigger additional management measures when there is significant perturbation in the indicator species numbers.

Not applicable.

2.1.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.

Given that there are no known interactions of the Trochus Fishery with non-retained species and the selective method of fishing used (collection by hand only on exposed reef tops during low tide), it is likely that the negligible level of interaction will continue.

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.

Information Requirements

2.2.1 Reliable information is collected on the interaction with endangered, threatened or protected species and threatened ecological communities.

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

Assessments

2.2.2 There is an assessment of the impact of the fishery on endangered, threatened or protected species.

Not Applicable.

2.2.3 There is an assessment of the impact of the fishery on threatened ecological communities.

There are no threatened ecological communities associated with the Trochus Fishery.

Management Responses

2.2.4 There are measures in place to avoid capture and/or mortality of endangered, threatened or protected species.

Not Applicable

2.2.5 There are measures in place to avoid impact on threatened ecological communities.

Not applicable given the nature and size of operations.

2.2.6 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.

Given the extremely low levels of interaction of this fishery with protected species, it is more than likely that the current situation of having only negligible impacts on these species will continue.

OBJECTIVE 3. GENERAL ECOSYSTEM

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

Information Requirements

2.3.1 Information appropriate for the analysis in 2.3.2 is collated and/or collected covering the fisheries impact on the ecosystem and environment generally.

There is no data on the Fishery's impact on the ecosystem and the environment generally has been gathered at this time due to the small scale of the Fishery. The scale of the Fishery is such that information is not currently collected on the Fishery's impact on the ecosystem apart from the information collected in the Fishery's catch and effort records and anecdotal information provided by the Aboriginal community trochus collectors.

2.3.2 Information is collected and a risk analysis, appropriate to the scale of the fishery and its potential impacts, is conducted into the susceptibility of each of the following ecosystem components to the fishery.

1. Impacts on ecological communities
 - *Benthic communities*
 - *Ecologically related, associated or dependent species*
 - *Water column communities*
2. Impacts on food chains
 - *Structure*
 - *Productivity/flows*
3. Impacts on the physical environment
 - *Physical habitat*
 - *Water quality*

No information about the role of the trochus in the ecosystem or the effect of their removal has been gathered at this time due to the small scale of the fishery. The Fishery only takes trochus which are hand collected from exposed reef tops at low tide.

Management Response

2.3.3 Management actions are in place to ensure significant damage to ecosystems does not arise from the impacts described in 2.3.1.

Not applicable at present.

2.3.4 There are decision rules that trigger further management responses when monitoring detects impacts on selected ecosystem indicators beyond a predetermined level, or where action is initiated by application of the precautionary approach.

No management responses are required at this time.

2.3.5 The management response, considering uncertainties in the assessment and precautionary management actions, has a high chance of achieving the objective.

Not applicable at present.

3. REFERENCES

Kailola, P.J., Williams, M.J., Phillip C. Stewart, Russell E. Reichelt, Alex McNee, and Christina Grieve. Australian Fisheries Resource. 1993. Bureau of Resource Sciences, Department of Primary Industries and Energy and The Fisheries Research and Development Corporation. Canberra, Australia.

4. GLOSSARY OF ABBREVIATIONS

Council	Bardi Council
CFL	Western Australia Commercial Fishing Licence
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEWHA	Department of the Environment, Water, Heritage and the Arts
EPBC	Environment Protection and Biodiversity Conservation Act, 1999
ESD	Ecologically Sustainable Development
FBL	Western Australia Fishing Boat Licence
FRMA	Fisheries Resources Management Act, 1994
FRMR	Fisheries Resources Management Regulations, 1995
WA	Western Australia
WAFIC	Western Australia Fishing Industry Council

5. APPENDIX

5.1. APPENDIX 1 – BARDI TROCHUS CATCH HISTORY SUMMARY

Year	Catch (kg)	Explanation
1984	31,266	
1985	49,513	
1986	52,310	
1987	73,409	
1988	55,873	
1989	74,267	
1990	44,894	
1991	36,939	
1992	37,275	
1993	54,750	
1994	40,920	
1995	26,087	Four additional operators allowed in fishery, catch from additional operators not available. Indonesian poachers caught in the fishery with approximately 7 tonnes of trochus.
1996	21,848	World trochus prices drop. Additional operators leave fishery.
1997	17,214	Sunday Island (Nilagoon) operations decrease due to community members leaving. Trochus prices remain low.
1998	13,830	Management arrangements trialled to reduce effort within fishery. Co-management approach introduced between the Department and Bardi Aborigines Association. Increase in minimum size limit from 65mm to 75mm.
1999	3,860	Little effort within the fishery. Minimum size limit still in place as well as a 6-month seasonal closure. Spatial closure over half of fishery due to a decision made by the Mayala Native Title Working Group.
2000	2,600	Fishery closed for 10 months and spatial closure over half of the fishery still in place.
2001	11,000	Long-term management plan agreed to with a co-management approach including minimum and maximum size limits, seasonal closure, and no spatial closure. Anecdotal information from pickers indicating that the stocks are recovering. Agreement reached between Bardi and Mayala for Bardi to access Mayala waters. The catch is capped at 11 tonnes by Bardi Administration as a result of marketing difficulties (low prices).
2002	8,400	Poor market price.
2003	9,640	Poor market price.
2004	0	Bardi Council decides to rest the fishery to benefit stocks while market prices are still low.
2005	15,000	Market price increases. Bardi Council in consultation with Department of Fisheries decides to cap catch at 15 tonnes. Indonesian poaching resumed as market price increases and labour market in Malaysia dries up. Estimated illegal take of trochus is 15-20 tonnes.

5.2. APPENDIX 2 - POLICY GUIDELINES; ABORIGINAL COMMUNITY COMMERCIAL FISHING LICENCES

In Western Australia, Aboriginal communities can apply for a Special Aboriginal Community Fishing Licence which authorises Aboriginal communities to fish commercially for mud crab, trochus or beche-de-mer. The following policy guidelines are used by the Department of Fisheries to assess applications for special Aboriginal community fishing licences.

- 1 That “special” non transferable commercial licences be available to isolated Aboriginal Communities;
- 2 That applications from communities located close to population centres be considered on a case by case basis taking into account the proposed fishing area and any permission obtained from another community which may have tribal rights over the proposed fishing area;
- 3 That a licence application by an individual Aboriginal person to take fish for sale be treated in the same way as a licence application from any other Australian;
- 4 That Fishing Boat Licences issued to Aboriginal communities to commercially fish be issued to the corporate body of the community on behalf of the community members;
- 5 That Professional Fishermen’s Licences be issued to individuals nominated by the community to fish under the community licence;
- 6 That the Council of the community be made responsible to determine who is a community member and therefore who can fish under the licence;
- 7 That the species allowed to be taken under the “special” licence arrangement be restricted to beche-de-mer, trochus and mud crabs;
- 8 That Aboriginal communities be permitted to commercially fish mud crabs and beche-de-mer in waters adjacent to traditional lands on which they live or waters adjacent to adjoining land with the permission of the community with tribal rights over the area;
- 9 That Aboriginal communities not be permitted to fish commercially for finfish species unless they purchase a Western Australian Fishing Boat Licence.