



Australian Government

Department of the Environment and Heritage

Assessment of the
Abrolhos Islands and Mid West Trawl Managed Fishery

March 2005

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Assistant Secretary
Marine Environment Branch
Department of the Environment and Heritage
GPO Box 787
Canberra ACT 2601

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This document is an assessment carried out by the Department of the Environment and Heritage of a commercial fishery against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. It forms part of the advice provided to the Minister for the Environment and Heritage on the fishery in relation to decisions under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999*. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Australian Government.

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Assessment of the ecological sustainability of management arrangements for the Abrolhos Islands and Mid West Trawl Managed Fishery

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EXECUTIVE SUMMARY

Background

The Department of Fisheries Western Australia (DFWA) has submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document *Application to the Australian Government Department of the Environment and Heritage on the Abrolhos Islands and Mid West Trawl Managed Fishery* (the submission) was received by the Department of the Environment and Heritage (DEH) in May 2004. The submission was released for a thirty-day public comment period that expired on 2 August 2004. Five public comments were received and DFWA provided a response to the issues raised. No changes were made to the submission as a result of public comment.

The submission reports on the Abrolhos Islands and Mid West Trawl Managed Fishery (AIMWTMF) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. The DEH assessment considers the submission, associated documents, public comments and DFWA's response to the comments.

Table 1: Summary of the Abrolhos Islands and Mid West Trawl Managed Fishery

Area	Western Australian and Commonwealth waters of the Indian Ocean between 27°51'S latitude and 29°03'S latitude on the landward side of the 200 m isobath.
Fishery status	The main target species, saucer scallop, is considered fully exploited.
Target Species	Saucer scallops (<i>Amusium balloti</i>) and western king prawns (<i>Penaeus latisulcatus</i>).
Byproduct Species	Fish (teleosts and elasmobranchs), invertebrates (coral prawns).
Gear	Scallops - twin demersal otter trawl nets (min. mesh size 100 mm). Prawns – nets with a minimum 51 mm mesh, 45 mm mesh cod end.
Season	Scallops - generally from 1 April to 30 June. Prawns - generally from 1 March to 31 October.
Commercial harvest 2003	5840 t scallops (whole weight). No prawn fishing took place in 2003.
Value of commercial harvest 2003	\$19.6 million.
Recreational harvest	None.
Commercial licences issued	17 licences.
Management arrangements	Input controlled through: <ul style="list-style-type: none"> • limited entry; • gear, boat size and crew number restrictions; • temporal and spatial closures.
Export	Mostly exported frozen to Asia.
Bycatch	Various fish and invertebrates.
Interaction with Threatened Species	Potential for interactions with seasnakes, turtles and syngnathids. Reported interactions low.

The fishery for scallops operates mainly in the waters to the east of the Abrolhos Islands in waters deeper than 30 m and also between the islands. The prawn fishery operates in a small area off Port Gregory. The fishery is managed under the *Abrolhos Islands and Mid West Trawl Limited Entry Fishery Notice 1993* (the management plan) that obtains its authority from the *Western Australian Fish Resources Management Act 1994*.

The fishery primarily targets saucer scallops (*Amusium balloti*). It is believed there are separate eastern and western populations of saucer scallops in Australian waters. The western population is widely distributed along the Western Australian Coast.

Saucer scallops are generally found in areas of bare sand in the more sheltered environments found in the lee of islands and reef systems. The species grows rapidly and most appear to live no more than two years and attain a maximum size of around 115 mm. Spawning occurs from August through to February/March. The planktonic larval phase lasts between 12 and 24 days with success determined largely by oceanographic events, particularly the Leeuwin Current. Juvenile scallops settle out as spat and develop a weak attachment to the substrate. Saucer scallops are filter feeders and known predators include pink snapper (*Pagrus auratus*) and octopus.

Landings of saucer scallops are very variable, for example, catches in 2001, 2002 and 2003 were 1182 t, 195 t and 5840 t (whole weight) respectively. This variability appears to be linked to the strength of the Leeuwin Current. Years of a strong current are correlated with low scallop recruitment. Scallops are sold predominantly on the export market.

The western king prawn (*Penaeus latisulcatus*) is a minor target species. The annual catch of western king prawns is low, averaging 600 kg over the 10 years to 2002 and in 2002 totalling 1 t. No prawn fishing took place in 2003. Western king prawns are also distributed widely in Australian waters and are the dominant penaeid species in Western Australian fisheries. The populations found within Western Australian and other Australian waters are thought to be largely independent of each other in terms of dynamics.

Western king prawns live up to 4 years and mature at 6-7 months of age. The species has the ability to spawn numerous times throughout the year. Larvae settle on the sea floor at around one to three weeks and high mortality is incurred at this stage by predation. Development into juveniles is highly dependent on the larvae settling into suitable nursery areas such as shallow sand/mud flats. Western king prawns feed on meiofauna and detritus. Known predators include squid and cuttlefish.

Species currently retained by the fishery as byproduct include fish (teleosts and elasmobranchs) and coral prawns (*Metapenaeopsis* spp.). There is no limit to the quantity of these species that may be retained. However, catches of byproduct species are low, with less than 1 t of mixed finfish and coral prawns taken annually.

The total value of catch in the fishery in 2003 was \$19.6 million, however this fluctuates markedly with the level of scallop catch. There are no recreational or indigenous fisheries for scallops or prawns in the fishery area.

The fishery currently targets scallops with two low-opening demersal otter trawl nets (with a minimum mesh size of 100 mm). Boats targeting prawns tow nets with mesh size not less than 45 mm in the codend and 51 mm in the remainder of the net. Bycatch reduction devices (BRDs) have been mandatory in all nets since 2003. The management plan imposes restrictions on net size, board size, net mesh size and size of trawl gear. The net size is unitised with one headrope unit equating to 4 fathoms. The entire headrope entitlement for the fishery is 46 units or 184 fathoms.

In addition to gear restrictions, the fishery is managed by limited entry (17 licenses) and spatial and temporal closures. The fishery is generally closed between 1 July and 1 April. This closure protects the breeding stock and ensures the fishery is open when meat condition is at its peak in mid-May. Occasionally discrete scallop beds are opened outside of the normal season, for example in 2003 a small area was opened for a week in August.

Some permanent area closures are in place around the Abrolhos Islands in coral areas, encompassing reef observation areas. In the submission, DFWA state that 37% of the licence area is permanently closed to fishing, however public comments received raised concerns about the level of unrestricted and exploratory trawling that takes place in the fishery area.

The level of bycatch from the AIMWTMF is thought to be lower than that in other trawl fisheries, primarily because of the larger mesh size used in the scallop fishery, targeting of scallop aggregations, slower trawling speeds and the relatively short fishing season. However there is little bycatch data available to confirm this. Bycatch species include fish, invertebrates, seasnakes, syngnathids and turtles. Seasnakes and syngnathids are listed marine species under the EPBC Act. Both species of turtle taken in the AIMWTMF, loggerhead turtle (*Caretta caretta*) and green turtle (*Chelonia mydas*), are listed as a threatened species under the EPBC Act and Western Australian legislation.

In preparing its application to DEH, DFWA completed an Ecologically Sustainable Development (ESD) Report for the AIMWTMF using the National ESD Reporting Framework (Fletcher *et al.*, 2002). A comprehensive account of the risk assessment outcomes and current performance of each of the environmental and governance components of that Framework was included in the application as a basis for assessment of the fishery against the Commonwealth *Guidelines for the Ecologically Sustainable Management of Fisheries*. The actions, performance measures and monitoring requirements contained in the ESD Report have been considered during the DEH assessment.

Overall assessment

The material submitted by DFWA demonstrates that the management arrangements for the AIMWTMF meet most of the requirements of the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*.

While the fishery is relatively well managed, DEH has identified a number of risks that must be managed to ensure that their impacts are minimised:

- No objectives, performance indicators or performance measures are in place for the minor target species or any byproduct species/species groups;
- The performance measure for the target species, saucer scallops, outlined in the submission is not measurable and therefore could not be breached and does not appear to be directly related to the sustainability of the stock;
- The submission does not provide any data on bycatch or protected species in the fishery, causing concerns over the quality and quantity of bycatch and protected species data available and the validity of the risk assessments carried out; and
- Unrestricted and exploratory trawling in the AIMWTMF and the negative impact this is having on sensitive benthic habitats.

Recommendations to address these issues have been developed to ensure that the risk of impact is minimised in the longer term. Through the implementation of the recommendations and the continuation of a responsible attitude to the management of the fishery, management arrangements

are likely to be sufficiently precautionary and capable of controlling, monitoring and enforcing the level of take from the fishery while ensuring the stocks are fished sustainably.

The management regime aims to ensure that fishing is conducted in a manner that does not lead to over-fishing and for fishing operations to be managed to minimise their impact on the bycatch and protected species. On balance, the fishery is being managed in an ecologically sustainable manner and is working to address existing problems and minimise environmental risks.

The operation of the fishery is consistent with the objects of Part 13A of the EPBC Act. Given the management arrangements specified in the *Abrolhos Islands and Mid West Trawl Limited Entry Fishery Notice 1993* and the ESD Report for the fishery, DEH considers that the fishery will not be detrimental to the survival or conservation status of the taxon to which it relates in the short term. Similarly, it is not likely to threaten any relevant ecosystem in the short term. DEH therefore recommends that the fishery be declared an approved Wildlife Trade Operation (WTO) with the actions specified in the recommendations to be undertaken by DFWA to contain the environmental risks in the long term. DEH considers that the fishery, as managed in accordance with the management plan, is not likely to cause serious or irreversible ecological damage over the period of the export decision. Specifically, the WTO declaration would allow the export of product from the fishery for a period of 3 years. The WTO declaration will require annual reporting on the progress of implementing the recommendations of this report and other managerial commitments. The implementation of the recommendations will be monitored and reviewed as part of the next DEH review of the fishery in 3 years time.

As the official fishery area encompasses Commonwealth as well as State waters, consideration under Part 13 of the EPBC Act is required regarding the impact of the fishery on listed threatened species, listed migratory species, cetaceans and listed marine species.

Protected species occurring in the fishery area include marine turtles, seasnakes and syngnathids. While the submission does not give specific data on the number of protected species interactions, the actual and potential impact on Part 13 species under the management arrangements is considered low and adequate protection is provided. There are no listed threatened ecological communities in the fishery area.

DEH recommends that the *Abrolhos Island and Mid West Trawl Limited Entry Fishery Notice 1993* be declared an accredited management plan under Sections 208A, 222A, 245 and 265 of the EPBC Act. In making this judgement, DEH considers that the fishery to which the management plan relates does not, or is not likely to, adversely affect the survival in nature of a listed threatened species or a population of that species, or the conservation status of a listed migratory species, cetacean species or listed marine species or a population of any of those species. DEH also considers that the *Abrolhos Island and Mid West Trawl Limited Entry Fishery Notice 1993* requires that all reasonable steps are taken to avoid the killing or injuring of protected species, and the level of interaction under current fishing operations is low. On this basis, DEH considers that an action taken by an individual fisher, acting in accordance with the *Abrolhos Island and Mid West Trawl Limited Entry Fishery Notice 1993*, would not be expected to have a significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

The implementation of recommendations and other commitments made by DFWA in the submission will be monitored and reviewed as part of the next DEH review of the fishery in 3 years time.

Recommendations

1. DFWA to advise DEH of any material change to the AIMWTMF's legislated management plan and/or arrangements that could affect the criteria on which EPBC Act decisions are based, within three months of that change being made.
2. The ESD Report, including all performance measures, responses and information requirements to be incorporated into the management regime and decision making process.
3. DFWA to ensure, where appropriate, that any relevant indigenous, conservation, commercial fishing and recreational interests in the fishery are considered through consultative mechanisms.
4. By the end of 2006, DFWA to develop fishery specific objectives, linked to performance indicators and performance measures for the minor target species (western king prawn) and all byproduct species or species groups based on the best available information.
5. DFWA to incorporate into the management regime, an objective to minimise protected/listed species interactions, to minimise or maintain at sustainable levels the take of other non-retained species and to minimise impacts on the marine environment.
6. DFWA, in its Annual State of the Fisheries Report, to report on the performance of the fishery against performance measures that relate to the sustainability of the fishery, once developed.
7. DFWA to review the performance measure for saucer scallop outlined in the ESD Report to ensure it is measurable and related to the ecological sustainability of the stock.
8. DFWA to implement a system to improve the identification and recording of elasmobranch species taken as byproduct in the AIMWTMF.
9. DFWA to review the current programs for the collection and analysis of bycatch and protected species data in the AIMWTMF to ensure they are sufficient to identify changes in the composition and quantity of bycatch and protected species.
10. To ensure that benthic ecosystems are protected, DFWA to, before the end of 2005, clearly define trawl grounds for the AIMWTMF based on historically productive scallop grounds and suitable benthic habitats and in consultation with conservation, recreational fishing and commercial fishing stakeholders. DFWA to define a robust process for any extension of trawling activity outside of this area, including explicit consideration of the ecological effects on bycatch and benthic habitats and consultation with all relevant stakeholder groups.
11. DFWA to implement an education program to ensure that industry has the capacity to make reports on interactions with protected/listed species at an appropriate level of accuracy.
12. DFWA to review the specifications of the BRD grids used in the AIMWTMF to ensure they are effective at reducing the incidental catch of turtles and other large bycatch species likely to be encountered in the fishery.

PART I - MANAGEMENT ARRANGEMENTS

The Abrolhos Islands and Mid West Trawl Managed Fishery (AIMWTMF) is managed by the Department of Fisheries Western Australia (DFWA).

The management regime is described in the following documents, all of which are, or will be publicly available:

- the *Abrolhos Island and Mid West Trawl Limited Entry Fishery Notice 1993* (also referred to as the management plan);
- the *Western Australia Fish Resources Management Act 1994*;
- the *Western Australia Fish Resources Management Regulations 1995*;
- relevant Gazetted notices and licence conditions.

A number of other documents, including the Ecologically Sustainable Development (ESD) Report for the AIMWTMF, research reports, scientific literature and discussion papers, are relevant to the management of the fishery.

Further information on the fishery and its performance can be found in the following reports:

- The State of the Fisheries Report (annual);
- The Annual report to the Auditor General; and
- Other irregular reports, including the submission to the Department of the Environment and Heritage (DEH).

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Because of the importance of the management plan and documents referred to above to DEH's assessment of the fishery, an amendment to any of these could change the outcomes of the assessment and decisions stemming from it. Decisions resulting from this assessment relate to the arrangements in force at the time of the decision. In order to ensure that these decisions remain valid, DEH needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision.

Recommendation 1: *DFWA to advise DEH of any material change to the AIMWTMF's legislated management plan and/or arrangements that could affect the criteria on which EPBC Act decisions are based, within three months of that change being made.*

The ESD Report, on which the submission is largely based, is an integral part of the management regime. It examines benefits and costs associated with the fishery. It also identifies and assesses risks posed to the fishery and environmental components. The ESD Report documents the performance of the fishery and its management in terms of ecological, economic, social and governance issues. Once finalised, this report will be publicly available in hard copy and on the DFWA website. The management commitments specified in this report have been fundamental in DEH's assessment and consequent recommendations. The ESD Report is not currently a formal component of the legislative arrangements. Although DEH is satisfied that this lack of a legislative base will not cause issues in the fishery in the short term, we recommend that the report be formally incorporated into the management regime and decision making process.

DFWA has advised that it proposes to formally publish the management objectives and performance measures for the fishery as part of a series of Ministerial guidelines, as an adjunct to management plans. The Ministerial Policy Guidelines will provide the policy framework for the management of each fishery. This document will reflect the management objectives, philosophy

and guidance for decision making, including the legislated management plan, the ESD Report, and as relevant, reference to other documents.

Recommendation 2: *The ESD Report, including all performance measures, responses and information requirements to be incorporated into the management regime and decision making process.*

In line with DFWA policy on consultation in smaller fisheries, consultation in the AIMWTMF takes the form of direct annual meetings between Department officers and the fishing industry and through the production of discussion papers on proposed fisheries management arrangements. There is no management advisory committee for the AIMWTMF. These arrangements are likely to provide adequate scope for participation by industry, however, they provide limited opportunity for participation by other stakeholders. In 2003, DFWA initiated a series of public meetings around the State with a view to informing the public about the status of management and research in the State's commercial fisheries. If these meetings are held annually they should go some way to addressing the lack of consultation with stakeholders other than licence holders.

While workshops involving all major stakeholders (industry, conservation, research, government) were held for the Shark Bay Prawn Managed Fishery, the Shark Bay Scallop Managed Fishery and the Exmouth Gulf Prawn Managed Fishery during the development of their ESD Reports, no such workshop was held for the AIMWTMF. The ESD Report for the AIMWTMF was generated from an internal DFWA workshop.

The Western Australian *Fish Resources Management Act 1994* (Section 64) specifies the requirements for consultation prior to determining a management plan. These requirements include that interested persons be invited to comment on the draft plan and to make representations to the Minister on the draft. However, Section 65 of the Act requires only that those specified in the plan itself be consulted when amending the plan. Section 20 of the AIMWTMF management plan requires only licence holders to be consulted before the plan is amended or revoked.

These arrangements are not conducive to broader stakeholder participation or transparency in management decision making. DEH recommends that the interests of all relevant stakeholders should be taken into account when reviewing the management arrangements for the AIMWTMF.

Recommendation 3: *DFWA to ensure, where appropriate, that any relevant indigenous, conservation, commercial fishing and recreational interests in the fishery are considered through consultative mechanisms.*

DEH received a number of public comments on the submission from a variety of stakeholder groups. Given the interest in the fishery, DEH strongly suggests that DFWA consider conducting an external stakeholder workshop for the AIMWTMF as part of the next review of the ESD report.

The legislated management plan for the AIMWTMF does not contain objectives, performance measures or performance indicators. The ESD Report for the AIMWTMF includes an operational objective, a performance indicator and a performance measure for the main target species, scallops. An assessment of the effectiveness of this measure is included in Part Two of this report. No objectives, performance indicators or performance measures have been developed for the minor target species, western king prawn, or any of the byproduct species. In order to assess the performance of the fishery in a strategic and holistic way, DEH recommends that DFWA develop objectives linked to performance criteria for all of these species or species groups, based on the best available information.

Recommendation 4: *By the end of 2006, DFWA to develop fishery specific objectives, linked to performance indicators and performance measures for the minor target species (western king prawn) and all byproduct species or species groups based on the best available information.*

In addition, the ESD Report does not include objectives related to bycatch, protected species or the ecosystem. These are required in order to take a more ecosystem based approach to the management of the AIMWTMF.

Recommendation 5: *DFWA to incorporate into the management regime, an objective to minimise protected/listed species interactions, to minimise or maintain at sustainable levels the take of other non-retained species and to minimise impacts on the marine environment.*

DEH suggests that performance indicators and measures should be capable of detecting and responding to changes in the fishery. This would require ongoing monitoring of the fishery against such performance measures and a clear process for responding to breaches of performance measures. DFWA has advised that if there is a breach in a performance measure, this will be reported in the State of the Fisheries Report. If a breach materially affects the sustainability of the target species or negatively impacts on byproduct, bycatch, protected species or the ecosystem, the breach will be reported to the Minister for Fisheries within three months for subsequent management review and action with timeframes for implementation.

Management of the fishery is based entirely on input controls:

- limited entry, currently with 17 vessels;
- gear, vessel and crew number restrictions;
- a seasonal closure for the whole fishery, generally between 1 July and 1 April. The length of the season is based on pre-season surveys but can be influenced by the western rock lobster season; and
- permanent spatial closures. The submission states that 37% of the licence area is permanently closed.

The majority of the licences are active in the fishery each season. The majority of the catch is taken during the first two to three weeks of the season. Most vessels licensed for the fishery are also licensed for other Western Australia scallop/prawn fisheries. Public comments received on the submission questioned the figure provided by DFWA for the proportion of the fishery permanently closed to trawling. DEH has addressed this issue in **Recommendation 10**.

Compliance and enforcement tools implemented in the fishery include:

- a Vessel Monitoring System (VMS), implemented in 2001, to monitor vessel location and speed. This provides enforcement capability with respect to closed seasons and areas;
- at-sea and land patrols;
- radar watches and aerial surveillance; and
- licence and gear inspections in port prior to the start of the season.

DFWA has aligned the Western Rock Lobster Managed Fishery and the AIMWTMF seasons where possible, in order to maximise the use of limited patrol boat resources. VMS provides comprehensive spatial and temporal coverage of the fleet. DEH considers that these compliance measures contain the means of enforcing critical aspects of the management arrangements for the fishery.

The annual State of the Fisheries Report reviews the major aspects of the AIMWTMF and is published following review by the Western Australian Office of the Auditor General. In the 2003/04 State of the Fisheries Report data on catch and effort was provided and compared with the predicted catch for the 2003 season and the acceptable catch range for the AIMWTMF. The catch for 2003 was above the upper limit of the acceptable catch range, due to exceptional recruitment resulting from good environmental conditions. The State of the Fisheries Report also provides a brief risk rating for bycatch species impact, protected species interactions and ecosystem effects. In addition, the ESD Report will be reviewed every five years. DEH is satisfied that a five-year review of the entire fishery together with annual reviews of the major aspects of the fishery represent an appropriate level of periodic review for the AIMWTMF. To ensure transparency and public accountability in fisheries management, DEH recommends that the State of the Fisheries Report should also report on the performance measures developed through **Recommendation 4** and the objectives developed through **Recommendation 5**.

Recommendation 6: *DFWA, in its Annual State of the Fisheries Report, to report on the performance of the fishery against performance measures that relate to the sustainability of the fishery, once developed.*

A combination of fishery dependent and fishery independent data relating to the target species is collected on a regular basis in the fishery. Discussion of the information collection system can be found in Part Two of this report.

The nature of trawl fishing means that species other than those targeted by the fishery are captured, often in significant quantities. Bycatch assessment and management and an analysis of the fishery's capacity for 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 is contained under Principle Two of this report.

The target species, saucer scallop, occur in two separate populations, eastern and western. Research conducted into these populations has indicated that there are genetic differences between the populations and it is unlikely that there is inter-breeding between the populations. Therefore, there are no cross-jurisdictional issues to be taken into account in the AIMWTMF.

DEH considers that the current management arrangements comply with all relevant threat abatement plans and recovery plans. DEH notes that, in accordance with the National Policy on Fisheries Bycatch, DFWA has committed to develop a Bycatch Action Plan (BAP) for the AIMWTMF. No timeframe has been given for the development and implementation of the BAP. DEH expects that DFWA will also ensure compliance with any future plans or policies as they are developed.

No regional or international management regimes, to which Australia is a party, are of direct relevance to the fishery. The prime international regime affecting the fishery is the United Nations Convention on the Law of the Sea (UNCLOS). The management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery, for example the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate requiring that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the submission, the fishery's compliance with their requirements can be assessed by examination of Part Two of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is explicitly discussed under Principle 2, Objective 3.

DEH considers it is incumbent on all authorities to develop a thorough understanding of the framework of national, regional and international agreements and their applicability to export-based fisheries for which they are responsible.

Conclusion

DEH considers that the AIMWTMF management regime is documented, publicly available and transparent. Some improvements could be made to the consultative process. There is an objective and performance criteria for the main target species, saucer scallop, an assessment of the effectiveness of which is included in Part Two of this report. DEH has recommended that objectives and performance measures also be developed for the minor target species, western king prawn, and byproduct species. Objectives should also be developed for bycatch, protected species and ecosystem impacts.

The management arrangements are adaptable and are capable of controlling the harvest through a variety of input controls appropriate to the size of the fishery. Periodic review of the fishery is provided for, as are the means of enforcing critical aspects of the management arrangements.

The management regime adheres to arrangements established under Australian laws and international agreements.

DEH considers that there is scope to further refine the management arrangements and has provided a number of recommendations for improvements in the longer term.

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

Principle 1: *‘A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover’*

Maintain ecologically viable stocks

Objective 1: *‘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’*

Information requirements

Fishery dependent data are obtained through mandatory submission of monthly catch and effort returns. These data are fed into the Catch and Effort Statistics System (CAESS) to provide information on total catch of all species landed (target and byproduct) and effort (days fished). DFWA considers these data to be moderately robust.

Voluntary daily logbooks have been completed by all operators in the AIMWTMF since 1997. These logbooks collect daily information on hours trawled, estimated catch per trawl and area of operation, providing finer spatial scale catch and effort data than the monthly returns. DFWA considers the data collected are highly robust. Since 2001, VMS data have provided independent and fine scale information on the spatial operations of the fishery. Data on scallop landings are also collected through Processor Unload Returns. These are used to validate the daily logbooks and monthly catch returns.

An annual biological survey measures the abundance of the residual scallop stock and provides an index of post-spawning stock. This fishery independent survey has been conducted annually since 1997. It is used to estimate the catch available for the following season.

Overall, given the range of fishery dependent and fishery independent data gathered by DFWA, DEH considers that there is a reliable information collection system in place appropriate to the scale of the fishery. Continuation of existing data collection and research programs, combined with some extension and refinement of such activities will be important for the future management of the fishery.

Assessment

The correlation between residual abundance and the following year’s catch has been used to maintain the saucer scallop stock for the past 13 years. Since 1997 an annual fishery independent, biological survey of abundance of the residual scallop stock has underpinned the setting of management arrangements for the fishery. Data from voluntary logbooks is used to assess total effort in the fishery and spatial distribution of scallops in the Abrolhos Islands.

The combination of fishers’ monthly returns and voluntary daily logbooks is thought to provide a reliable estimate of total commercial removals of target and byproduct species. The biological survey in particular, underpins the management objective of ensuring that there is sufficient breeding stock at the time of spawning to minimise the risk of recruitment overfishing. DEH is satisfied that this process provides for a robust assessment of the dynamics and status of the fishery and is capable of detecting any reduction in biological diversity and reproductive capacity.

The distribution of both target species is well understood. There appears to be valid grounds to consider the scallop and prawn stocks in the AIMWTMF as functionally separate to other regions where fishing for these species occurs.

Management response

The management regime in the AIMWTMF aims to maintain ecologically viable stock levels through a range of input controls, including:

- limited entry, with licences limited to 17;
- gear restrictions, including unitisation of net size, restrictions on the size of otter boards, mesh, ground chain and try gear;
- crew number restrictions;
- vessel size restrictions;
- a seasonal closure for the whole fishery, generally from July until April; and
- permanent spatial closures. The submission states that 37% of the licence area is closed to fishing.

VMS has been required on all vessels since 2001 and in the 2003 season, bycatch reduction devices (BRDs) became compulsory in all nets.

DEH considers that the combination of input controls and the availability of an established residual stock index for saucer scallops derived from an annual fishery independent survey will ensure adequate protection of the primary target stock.

The submission provides details of the indicator and performance measure for the target species, saucer scallops. The indicator is the residual stock abundance, which is derived from the annual biological survey. The performance measure stated in the submission is “The residual stock index determines a predicted catch that should set the length of the season.” It is not clear how this performance measure is assessed, what would cause this performance measure to be breached and how it is linked to the ecological sustainability of the target stock. A more appropriate performance measure may be something like “The annual catch of saucer scallops does not exceed the catch predicted from the residual stock index.” The issue of performance measures for the AIMWTMF is further confused by what is reported in the State of the Fisheries Report. In the 2002/03 report and the 2003/04 report, the performance of the fishery was assessed against the acceptable catch range, not against the performance measure outlined in the submission. The DFWA submission makes no mention of the acceptable catch range of scallops in the AIMWTMF, how it was derived or why it is thought to be appropriate for the fishery. DEH recommends that DFWA review the performance measure outlined in the ESD Report to ensure it is appropriate and capable of detecting changes in the ecological sustainability of the stock.

Recommendation 7: *DFWA to review the performance measure for saucer scallop outlined in the ESD Report to ensure it is measurable and related to the ecological sustainability of the stock.*

Mixed finfish are retained as byproduct in the scallop and prawn sectors of the AIMWTMF, coral prawns are also taken as byproduct in the prawn sector. The AIMWTMF does not have a list of permitted byproduct. This means that any species, other than protected, threatened or endangered species, may be retained as byproduct if the operators are able to find a market. However, given the limited range of byproduct species taken in the fishery and the low quantities landed (less than 0.5 tonnes of any species landed annually), DEH believes that ongoing monitoring of byproduct through the CAESS returns and the submission of voluntary logbooks by 100% of AIMWTMF operators should be sufficient to alert DFWA, which has a demonstrated history of adaptive management, to any marked changes in the patterns and composition of byproduct.

DEH notes the current lack of data on elasmobranch species taken as byproduct in the fishery and considers this is most likely due to identification problems. One of the key issues identified in the National Plan of Action for the Conservation and Management of Sharks is the need to improve identification of shark species by all resource users. DEH expects that actions included in the Plan will be reflected in management of the AIMWTMF.

Recommendation 8: *DFWA to implement a system to improve the identification and recording of elasmobranch species taken as byproduct in the AIMWTMF.*

Conclusion

DEH considers that the management regime in the AIMWTMF is appropriately precautionary and provides for the fishery to be conducted in a manner that does not lead to over-fishing. DEH considers that the information collection system and stock assessment and management arrangements generally are sufficient to ensure that the fishery is conducted at catch levels that maintain ecologically viable stock levels with acceptable levels of probability.

DEH considers that there is scope to further refine some of the existing assessment and management responses and has provided a number of recommendations for improvements in the longer term.

Promote recovery to ecologically viable stock levels

Objective 2: *‘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’*

This objective is not applicable to the fishery at present. The landings for the AIMWTMF have been variable over the last 17 years, and DEH accepts this is due to the recruitment variability of the target stock, a feature common in scallop fisheries. While DEH has recommended some improvements to the performance measure for saucer scallops, the residual stock index and the acceptable catch range for the fishery can both be used to assess the performance of the fishery with respect to the main target species. DEH is confident that should these performance indicators show a problem with saucer scallops, management responses are sufficient to maintain ecologically viable levels in the short to mid term.

Ecosystem impacts

Principle 2: *‘Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem’*

Bycatch protection

Objective 1: *‘The fishery is conducted in a manner that does not threaten bycatch species’*

Information requirements

The submission states that information regarding the historical level and nature of bycatch in the fishery is limited. Since 1997, fishery specific bycatch data has been obtained from the annual biological surveys of the scallop fishery and voluntary logbooks. In 2004, compulsory reporting of protected species interactions in the AIMWTMF was introduced. However, the submission is unclear about the quantity and quality of bycatch data available from these sources. Some bycatch

information is also drawn from data collected in similar Western Australian fisheries, particularly the Shark Bay Scallop Managed Fishery. Most of the data collection focuses on the scallop sector of the AIMWTMF. No data is available for the prawn sector of the AIMWTMF. As DFWA already has mechanisms in place to collect fishery specific data on bycatch and protected species, DEH recommends that DFWA review these to ensure that the data being collected are sufficient to detect changes in the composition and quantity of bycatch and protected species in the AIMWTMF.

Recommendation 9: *DFWA to review the current programs for the collection and analysis of bycatch and protected species data in the AIMWTMF to ensure they are sufficient to identify changes in the composition and quantity of bycatch and protected species.*

Assessment

Bycatch species include finfish, elasmobranchs (species not identified) and a number of protected or listed species including seasnakes, syngnathids and turtles. The protected species are considered further under Principle Two, Objective Two of this report. Despite the fishery specific data available on bycatch, no data is presented in the submission detailing either the quantity or species composition of bycatch in the AIMWTMF.

The risk assessment conducted by DFWA concluded that the scallop sector has a negligible impact on fish (including teleosts and elasmobranchs) because of the large mesh size (100 mm) used, the aggregating nature of scallops which allows better targeting and the lower trawling speed which allows some stronger swimming species to escape the net. The risk assessment also indicated a negligible impact on invertebrates because of the low number of large invertebrates in scallop trawl areas and the configuration of the trawl gear, which largely precludes the capture of invertebrate species living on or in the substrate. However, without an indication of the quantity and composition of bycatch in the scallop sector of the AIMWTMF, DEH remains concerned about the validity of the risk assessment undertaken. DEH urges DFWA, in the next review of the ESD report, to include fishery specific data on the quantity and composition of bycatch, including protected species, in the AIMWTMF gathered through the annual biological survey and logbook programs.

The submission makes only a brief reference to bycatch in the prawn sector. The major source of bycatch data is the pre-season scallop surveys and these are not applicable to the prawn sector. While DEH acknowledges the very low level of effort in the prawn sector (an average of 13 days annually for the last 10 years), the nets used have a considerably smaller mesh size and the nature and volume of bycatch would be expected to differ from that in the scallop fishery. DEH expects that if effort in the prawn sector increases, DFWA will implement a system to provide data on bycatch from this sector as part of **Recommendation 9**.

Management response

BRDs in the form of grids became compulsory in the AIMWTMF in 2003. While this response was specifically designed to reduce the incidental capture of turtles, the use of BRD grids would also be expected to reduce the catch of other large bycatch species.

DEH notes that the survival of bycatch species that escape through BRDs is still largely uncertain in most, if not all, trawl fisheries in Australia. While such devices may result in a significant reduction in bycatch landed, this does not necessarily translate to a similar reduction in mortality. This is a significant issue in a number of fisheries in Australia and DEH considers that this should be a priority for research in the AIMWTMF and other trawl fisheries in the future.

The submission commits to developing a BAP for the AIMWTMF, however no associated timeframe is provided. DEH expects that DFWA would undertake this as a priority and have the BAP developed and implemented in the fishery within 12 months.

Management of the fishery also relies on constraining the area of the fishery trawled, providing a figure that approximately 4% of the total fishery area was trawled between 1998 and 2002 and that 37% of the fishery area is permanently closed to trawling. The majority of public comments received on the submission raised concerns about the unrestricted nature of trawling in the Abrolhos Islands area and the ecological impacts this was having on bycatch and benthic habitats. Several also questioned the proportion of the fishery that was permanently closed to trawling. Information in the public comments suggested that increased levels of exploratory trawling take place in good scallop seasons and with a record catch of 5840 t in 2003, it is likely that more of the fishery area was fished in this season than in the past. In response to public comments, DFWA stated it was beginning a process to define a broad trawl area available to the scallop sector and remove areas never trawled and areas of sensitive habitat. DEH is supportive of this move, but given the number of public comments received on this issue, is still recommending that DFWA clearly define trawl grounds for the fishery based on historically productive scallop grounds and benthic habitats suitable for otter trawling (ie sandy substrate) in consultation with relevant stakeholders. DEH also recommends that DFWA define a robust process for any extension of trawling activity outside of this area, including explicit consideration of the ecological effects of trawling on bycatch and benthic habitats and consultation with other stakeholder groups including conservation, recreational fishing and other commercial fishing sectors.

Recommendation 10: *To ensure that benthic ecosystems are protected, DFWA to, before the end of 2005, clearly define trawl grounds for the AIMWTMF based on historically productive scallop grounds and suitable benthic habitats and in consultation with conservation, recreational fishing and commercial fishing stakeholders. DFWA to define a robust process for any extension of trawling activity outside of this area, including explicit consideration of the ecological effects on bycatch and benthic habitats and consultation with all relevant stakeholder groups.*

No specific bycatch group or indicator species is being monitored in the AIMWTMF. However, DEH considers that with the collection of fishery specific data through the annual biological survey and voluntary logbooks and the development of an objective related to bycatch (**Recommendation 5**) the performance of the AIMWTMF with respect to bycatch will be monitored and additional management responses implemented if necessary.

Conclusion

DEH considers that it is likely the fishery is conducted in a manner that does not threaten bycatch species, however, there is limited data available on which to base this assessment. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that DFWA would undertake appropriate actions to ensure that bycatch species are not threatened by this fishery.

Several recommendations have been developed to ensure that the risk of unacceptable impact on bycatch species is detected and minimised in the longer term.

Protected species and threatened ecological community protection

Objective 2: *'The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities'*

Information requirements

The submission acknowledges that fishery specific data available from the AIMWTMF on interactions with endangered, threatened and protected species is limited. The current compulsory CAESS report does not provide for the recording of bycatch data. DFWA used information on interactions with these species from the annual biological survey, voluntary logbooks and data from similar fisheries, such as the Shark Bay Scallop Managed Fishery, in undertaking its risk assessment. DEH is confident that one of the outcomes of **Recommendation 9** will be improved fishery specific data on interactions with threatened, endangered and protected species in the AIMWTMF. In addition, DEH notes that DFWA initiated compulsory reporting of interactions with protected/listed species in the AIMWTMF in 2004. DEH recommends that this be coupled with an education program to ensure industry have the capacity to make accurate reports.

Recommendation 11: *DFWA to implement an education program to ensure that industry has the capacity to make reports on interactions with protected/listed species at an appropriate level of accuracy.*

DEH is concerned that the ESD Report does not provide any data on the number of protected species interactions that have been recorded in the fishery, but rather just provides general details of low numbers of catches of seasnakes and occasional incidental catches of syngnathids and turtles. DEH urges DFWA, in the next review of the ESD Report, to include any fishery specific data available on protected species.

Assessment

The risks the AIMWTMF poses to protected species are assessed in the ESD Rreport. The analysis concluded that the fishery was a low risk to seasnakes and syngnathids and a negligible risk to loggerhead and green turtles. No threatened ecological communities are associated with this fishery.

The low risk rating given to seasnakes was based on the relatively low numbers taken in the fishery, the high proportion of those that were returned to the sea alive, the high survival rate recorded in studies of seasnakes returned to the sea and because most species of seasnakes recorded on the lower west coast are not known to be vulnerable.

The low risk to syngnathids is based on the relatively short fishing season and takes into account that the majority of fishery operations in the AIMWTMF occur outside the areas of seagrass and detached algae communities favoured by syngnathids.

The negligible risk rating given to turtles by DFWA is based on the relatively low number of turtles resident in the waters off the Abrolhos Islands and that they do not breed in the area, together with the introduction of BRD grids in the fishery in 2003. Voluntary logbook data indicate that turtles are caught in low numbers in the fishery.

Management response

The submission maintains that the current management arrangements are adequate to ensure that the impact of the fishery on protected species is minimised.

DEH considers that the large mesh size used in the scallop sector, the slow speed of the trawl and the introduction of BRD grids in the fishery in 2003 together with the outcomes of **Recommendation 10** to clearly define and limit the area of operation of trawling will ensure that the fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species.

While all nets in the AIMWTMF have been fitted with BRD grids since the 2003 season, the 200 mm bar spacing in these grids is larger than that used in grid devices in other trawl fisheries in Australia. DEH is highly supportive of the review of and continual improvements to BRD performance and notes that work has been underway in northern Australian prawn fisheries to ensure grid specifications will effectively remove all turtle species likely to be encountered by a fishery. As a result DEH recommends that DFWA review the specifications of the BRD grids used in the AIMWTMF to ensure they are effective at reducing the incidental catch of all turtle species and other large bycatch species likely to be encountered in the fishery.

Recommendation 12: *DFWA to review the specifications of the BRD grids used in the AIMWTMF to ensure they are effective at reducing the incidental catch of turtles and other large bycatch species likely to be encountered in the fishery.*

Conclusion

DEH notes that the submission indicates there are minimal interactions with protected species in this fishery and considers that with the implementation of **Recommendations 10 and 12**, the fishery will be conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species. Should this situation change, or a risk assessment process indicate otherwise, DEH suggests that appropriate actions be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

A recommendation has been developed to ensure that the risk of unacceptable impact on protected species is minimised in the longer term.

Minimising ecological impacts of fishing operations

Objective 3: *'The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally'*

Information requirements

No specific work has been undertaken on the impacts of the fishery on the ecosystem and the environment generally. DFWA conducted a risk assessment of the fishery on the general ecosystem using catch and effort data, gear design, area fished and information on spatial and temporal closures together with evidence from research on the effects of otter trawling on sand and coral communities and trophic structures in similar fisheries environments.

DEH is concerned at the lack of information collection and research covering the fisheries impact on the ecosystem and environment generally. However, DEH understands that this lack of information is the case across a range of Australian and international fisheries and until appropriate research techniques and programs are developed and implemented this will continue to be the case. DEH strongly supports research in this area.

Assessment

As a demersal otter trawl fishery, there is potential for the AIMWTMF to impact on the environment. The ESD Report analysed the risks to general ecosystem components and this assessment will be reviewed every five years. The risk assessment identified a low risk to the environment from the removal of retained and non-retained species. The impact of trawling on sand/shell and corals/sponge habitats was also assessed as low as was the impact of

discarding/provisioning. Impacts associated with translocation and discarding of scallop shells were assessed as negligible.

The main justification for assessing the risk to coral/sponge habitats as low provided in the ESD Report was the large proportion (37%) of the fishery area permanently closed to trawling and the belief that these habitats are not trawled. Public comments received from a range of stakeholder groups suggest that trawling has been occurring over fragile coral and sponge habitats. DEH has made a recommendation to address this concern (**Recommendation 10**) and will be closely monitoring the implementation of the recommendation during the term of this approval. DEH considers that by defining areas suitable for trawling and closing off other areas of the fishery permanently, risks to coral/sponge habitats and the ecosystems they support from the AIMWTMF will be minimised.

Another issue raised in public comments was the discarding of scallop shells into sensitive coral/sponge habitats. The submission acknowledges that the discarding of scallop shells has been an issue in the past when smaller boats were used, but states that currently, with the use of larger boats, shells are discarded over a wide area. DEH considers that the dumping of large amounts of scallop shells on coral and sponge habitats would be causing damage and urges industry to develop a code of practice regarding the discarding of scallop shells.

Management response

DEH considers that with the implementation of **Recommendations 10 and 12** and other current management arrangements, including the compulsory use of BRDs, restrictions on the number of vessels and fishing gear and a relatively short fishing season, the impact of fishing operations on the benthic environment and on the ecosystem generally will be minimised. DFWA considered that none of the issues identified were of sufficient risk to require specific target levels since they were effectively covered by other management arrangements and trigger points, associated with the target species. DEH has addressed the need for specific objectives related to minimising impacts on the marine environment in **Recommendation 5**.

Impacts on water quality through the discharge of plastic wastes and pollution from vessels are controlled under MARPOL legislation. The submission states that the management arrangements for all Western Australia fisheries adhere to MARPOL requirements.

Conclusion

DEH considers that with implementation of **Recommendation 10** and the existing suite of management arrangements, the fishery will be conducted in a sufficiently precautionary manner that minimises the impact of fishing operations on the ecosystem generally.

REFERENCES

Fletcher, W., Chesson, J., Sainsbury, K., Fisher, M., Hundlow, T. and Whitworth, B. (2002) *National ESD Reporting Framework: "The How to Guide" for wild capture fisheries*. FRDC 2000/145. Canberra.

LIST OF ACRONYMS

AIMWTMF	Abrolhos Islands and Mid West Trawl Managed Fishery
BAP	Bycatch Action Plan
BRD	Bycatch Reduction Device
CAESS	Catch and Effort Statistics System
DFWA	Department of Fisheries Western Australia
DEH	Department of the Environment and Heritage
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ESD	Ecologically Sustainable Development
kg	kilogram
m	metre
MARPOL	International Convention for the Prevention of Pollution from Ships
mm	millimetre
t	tonnes
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
WA	Western Australia
WTO	Wildlife Trade Operation