



Assessment of the  
**Western Australia Shark Bay Scallop Fishery**

**Environment Australia**

**December 2002**

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This document is an assessment carried out by Environment Australia of a commercial fishery against the Commonwealth's 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 EPBC. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Commonwealth Government.

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**Assessment of the ecological sustainability of management arrangements for the  
Western Australia Shark Bay Scallop Fishery**

**TABLE OF CONTENTS**

|   |           |
|---|-----------|
| <b>EXECUTIVE SUMMARY .....</b>  | <b>4</b>  |
| Background .....  | 4         |
| Summary of the Shark Bay Scallop Fishery .....  | 4         |
| Byproduct Species.....  | 4         |
| Overall assessment .....  | 6         |
| Recommendations .....   | 7         |
| <b>PART I - MANAGEMENT ARRANGEMENTS .....</b>   | <b>9</b>  |
| Conclusion.....   | 11        |
| <b>PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE<br/>MANAGEMENT OF FISHERIES.....</b> | <b>13</b> |
| <b>STOCK STATUS AND RECOVERY .....</b>  | <b>13</b> |
| <i>Maintain ecologically viable stocks .....</i>  | <i>13</i> |
| Information requirements .....  | 13        |
| Assessment.....   | 13        |
| Management response .....   | 14        |
| Conclusion.....   | 16        |
| <i>Promote recovery to ecologically viable stock levels.....</i>                              | <i>17</i> |
| <b>ECOSYSTEM IMPACTS.....</b>   | <b>17</b> |
| <i>Bycatch protection.....</i>  | <i>17</i> |
| Information requirements .....  | 17        |
| Assessment.....   | 17        |
| Management response .....   | 18        |
| Conclusion.....   | 18        |
| <i>Protected species and threatened ecological community protection .....</i>                 | <i>19</i> |
| Information requirements .....  | 19        |
| Assessment .....  | 20        |
| Management response .....   | 20        |
| Conclusion.....   | 20        |
| <i>Minimising ecological impacts of fishing operations.....</i>                               | <i>21</i> |
| Information requirements .....  | 21        |
| Assessment.....   | 21        |
| Management response .....   | 22        |
| Conclusion.....   | 22        |
| <b>REFERENCES .....</b>   | <b>24</b> |
| <b>LIST OF ACRONYMS.....</b>  | <b>24</b> |

## 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 Environment Australia for the Shark Bay Scallop Fishery* (the submission) was received by Environment Australia (EA) in August 2002 after a period of discussion between DFWA and EA, during which preliminary drafts were refined. The submission was released for a twenty-eight day public comment period that expired on 6 September 2002. Four 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 Western Australia (WA) Shark Bay Scallop (SBS) Fishery against the Commonwealth *Guidelines for the Ecologically Sustainable Management of Fisheries*. The EA assessment considers the submission and associated documents, public comments and DFWA's response to the comments.

### Summary of the Shark Bay Scallop Fishery

|  |  |
|--|--|
| <b>Area</b>                                | Shark Bay in Western Australia   |
| <b>Fishery status</b>                      | The target species is fully fished   |
| <b>Target Species</b>                      | Saucer scallops ( <i>Amusium balloti</i> )   |
| <b>Byproduct Species</b>                   | Not limited. 3.7 tonnes in 2001.<br>Predominantly crabs with some bugs, squid and cuttlefish.  |
| <b>Gear</b>                                | Twin gear otter trawl. 10mm ground chain. 'A' class vessels currently tow two 7 fathom nets however there is provision in the plan for 'B' Class licences to use up to four 6 fathom nets or three 8 fathom nets. Generally 'B' class vessels tow two 8 fathom nets. |
| <b>Season</b>                              | Start triggered by stock abundance of saucer scallops. Formally closed in line with the Shark Bay Prawn fishery, but fishing usually ceases well before this time. Usually closed November to April\May.   |
| <b>Commercial harvest 2001</b>             | 216 tonnes meat weight (scallops only)   |
| <b>Value of commercial harvest 2001:</b>   | \$4.2 million  |
| <b>Recreational and indigenous harvest</b> | No significant recreational or indigenous take of target species.  |
| <b>Commercial licences issued</b>          | 14 'A' class vessels which target only scallops and 27 'B' class vessels which predominantly target prawns in the Shark Bay prawn fishery but may also retain scallops.  |
| <b>Management arrangements</b>             | Input controlled through: limited entry, boat and gear restrictions, and spatial and temporal closures. No quota.  |
| <b>Export</b>                              | Frozen scallop meat is usually sold to Asian markets.  |
| <b>Bycatch</b>                             | Various  |
| <b>Interaction with Threatened Species</b> | Seasnakes – occasionally caught and generally returned alive<br>Syngnathids – approx 1 per night caught across entire fleet<br>Turtles – very few reported captures, returned alive  |

The area of the fishery includes waters of and surrounding Shark Bay, located off the mid-west coast of WA. Part of the fishery area is in Commonwealth waters however the entire fishery is managed by WA under an Offshore Constitutional Settlement (OCS) between the Commonwealth Government and the Government of Western Australia. The Shark Bay region was declared a World Heritage Area in 1991 and this fishery operates within the declared area. Fishers began targeting scallops here in the late 1970s and a dedicated management plan was implemented in 1987.

The fishery targets saucer scallops (*Amusium balloti*). There is no limit to the quantity or species that may be taken as byproduct by the fishery. Species currently retained by the fishery as byproduct include crabs, squid, cuttlefish and bugs.

Saucer scallops are widespread along the western coast of Australia and are also found on the eastern coast from Innisfail in northern Queensland to Jervis Bay in New South Wales. They are harvested in several trawl fisheries throughout their distribution. The DFWA submission states that genetic differences between the eastern and western populations are uncertain, however they are often considered sub-species. This species has been reported reaching three to four years of age, however individuals over two years are only rarely caught in Shark Bay.

They are typically found in bare sand in sheltered environments and have been reported in depths of 10 to 75 metres. The submission cites Kailola et al., 1993 as describing saucer scallops as broadcast spawners releasing gametes into the water column. They mature to first spawning in approximately one year. Recruitment in most scallop populations is usually environmentally driven and high levels of variability in catch are seen in scallop fisheries around the world.

Approximately 216 tonnes (meat weight) of scallops were harvested in the SBS fishery in 2001, at an estimated value of A\$4.2 million. Taking scallops as byproduct began in the Shark Bay Prawn Trawl fishery in 1962 but they were not targeted until the late 1970s. Catch fluctuated greatly since that time, ranging between 121 to 4414 tones of meat weight, at values between A\$2 million and A\$58 million. A specific management plan was introduced in 1987. Scallops are generally sold to Asian markets as frozen meat.

The fishery currently targets the scallops with twin otter trawl gear. There are restrictions on the size of the vessel and the length of the gear. Bycatch reduction devices (BRDs) including turtle exclusions devices (TEDs) will be compulsory in all nets from the commencement of the 2003 season.

Fishery management arrangements include spatial and temporal closures. The area of the fishery is limited to less than 40% of Shark Bay waters. The remaining 60% is closed permanently. In addition to gear limitations, there is limited entry to this fishery. There are 14 Class 'A' licences that solely fish for scallops and an additional 27 Class 'B' licences that are primarily used to target prawns in the Shark Bay Prawn Trawl fishery but may also target and take scallops. There are different gear requirements for Class 'A' and 'B' licences.

As in any trawl fishery, bycatch to target ratios are high with a large variety of species caught. The mesh size of 100mm and slower trawl speeds used in this fishery reduces bycatch to lower levels than the prawn trawl fishery in the same area. Some bycatch species in this

fishery are currently listed protected species under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act). Protected species interactions in this fishery include the direct capture of syngnathids (seahorses and pipefish), seasnakes and loggerhead and green turtles, and the provisioning and possible habituation of dolphins and seabirds. These interactions are assessed under Principle Two of this report.

There is no significant take of scallops by the indigenous and recreational sectors, however some species caught as byproduct and/or bycatch in this fishery are targeted by these users and in other commercial fisheries.

The fishery is managed under the *Shark Bay Scallop Managed Fishery Management Plan 1994*, which obtains its authority from the *WA Fish Resources Management Act 1994*. In addition, an Ecologically Sustainable Development (ESD) workshop was held in 2001 to conduct a risk assessment of this fishery. The outcomes from this workshop are contained in an ESD report. Actions, performance measures and monitoring requirements contained in the ESD report have been considered during the EA assessment.

### **Overall assessment**

The material submitted by DFWA indicates that the fishery operates in accordance with the Commonwealth's *Guidelines for the ecologically sustainable management of fisheries*. EA concurs that the SBS Fishery is a well managed fishery that is unlikely to have an unacceptable or unsustainable impact on the environment in the short to mid term. Recommendations have been developed to ensure that the risk of unacceptable impact is minimised in the longer term. Overall, the sophisticated management regime of real time monitoring, gear restrictions and a seasonal closure based on stock levels suggests that the fishery is being managed in an ecologically sustainable way.

In making this assessment, EA is satisfied that the information collection system, risk assessments, management arrangements and objectives are sufficient to ensure the fishery is conducted in a manner that does not lead to overfishing and that stocks are not currently overfished. Considering the research programs and management arrangements in place, EA is satisfied that fishing operations are managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem. Management of this fishery has a history of reacting appropriately to threats to sustainability and EA is confident that DFWA will continue to provide this high quality management.

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.

A number of protected species occur in the fishery area. EA is satisfied that the monitoring of interactions, assessment of the impacts, current management responses and triggers for future management are sufficient to ensure all persons engaged in fishing are required to take all reasonable steps to minimise impacts. EA considers that the fishery is unlikely to have an unacceptable impact on protected species. EA recommends that this fishery be accredited under Part 13 of the EPBC Act.

The assessment concludes that the fishery is managed in an ecologically sustainable way. EA recommends that the export of species taken in the fishery should be exempt from the export

permit requirements of Part 13A of the EPBC Act, with that exemption to be reviewed in five years.

To further strengthen the effectiveness of the management arrangements for the SBS Fishery, and to contain the environmental risks in the medium to long term, a series of recommendations have been developed. The implementation of these recommendations and other commitments made by DFWA in the submission will be monitored and reviewed as part of the next Commonwealth review of the fishery in five years time.

### **Recommendations**

1. Opportunity should be provided to conservation, community, recreational fishing and world heritage area management interests to participate in the processes of the main advisory body to the WA Fisheries Minister for this fishery. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.
2. The ESD report, including all performance measures, responses and information requirements, should be formally incorporated into the management regime and decision making process within one year, with a clear timeframe for implementation.
3. EA should be informed of any changes to the management plan or managerial commitments in the ESD report.
4. The ESD report should be amended to incorporate time frames for all management responses to breaches of performance measures.
5. The implementation of a decision rule to close the fishery or prevent commencement of the fishing season, when recruitment of scallops is sufficiently low, should be pursued as a priority.
6. Permitted byproduct should be limited to species currently harvested, with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.
7. DFWA should participate in any cross-jurisdictional activities regarding relevant target and byproduct species, including squid.
8. Ongoing monitoring should be implemented sufficient to identify long-term trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.
9. The importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle should be considered when applying the results of biodiversity research to management arrangements.
10. A mechanism should be developed to enable the amendment of management arrangements to respond to new information or future Government plans and policies.

11. All protected species interactions by commercial operations should be reported and coupled with an education program to ensure industry has the capacity to make accurate reports.

## **PART I - MANAGEMENT ARRANGEMENTS**

The SBS Fishery is managed by the Department of Fisheries WA (DFWA). It is the largest scallop fishery in WA, although in some years it may not be the most productive.

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

- The *Shark Bay Scallop Management Plan 1994*
- Shark Bay Scallop Managed Fishery Licence
- The *Shark Bay Scallop Fishery ESD Report*
- The *WA Fisheries Resources Management Act 1994*
- The *WA Fisheries Resources Management Regulations 1995*
- Relevant Gazetted notices and licence conditions

There are a number of other documents, including research reports, scientific literature and discussion papers, which are integral to the management of the fishery.

Performance indicators, measures and actions to address issues when required are specified in the ESD report. An assessment of the effectiveness of these measures is included in Part Two of this report. They are the outcome of a stakeholder risk assessment workshop held for the fishery. This report has not yet been finalised and is not currently a formal component of the legislative management arrangements for the fishery. Nevertheless, the submission indicates that these rules and requirements will be implemented in the fishery to ensure the fishery management regime remains strategic and capable of detecting and addressing unacceptable impacts of fishing activity. The ESD reports contains some triggers for action should performance measures not be met. However, no timeframes are included for the implementation of these actions.

The SBS Management Advisory Committee (the SBSMAC) consists of an independent chair, two Departmental representatives and commercial fishers. It aims to provide information and advice to the Minister on matters related to the protection and management of the fishery. The ESD report, which will be reviewed every five years, was developed with participation from industry, government, recreational/regional groups, non-governmental environmental groups and invited specialists. DFWA have indicated to EA that this workshop will be repeated at the five year review of the ESD report. A fishery management regime should be developed through a consultative process providing opportunity to all interested and affected parties. If the stakeholder workshop is not repeated at the five year review, then DFWA will need to ensure that this consultation will occur through other fora. This is also a requirement of the State fisheries legislation and EA is confident that DFWA will continue to ensure interested parties are consulted appropriately.

Management of the fishery is based entirely on input controls. Such controls include:

- Limited entry with 14 Class 'A' licences and 27 Class 'B' licences;
- Gear and vessel restrictions;
- A seasonal closure for the whole fishery;
- Numerous permanent spatial closures; and
- Several temporal spatial closures.

Compliance and enforcement tools implemented in the fishery include a Vessel Monitoring System (VMS) and random at sea and port inspections. In addition, gear and licences are inspected in port prior to the commencement of the season. Given the high level of

enforcement, compliance in this fishery appears to be very high with only one offence reported in 2000-01. Due to the small number of operators, their involvement in managerial decisions and efforts by DFWA staff to educate operators on their scientific process and basis for management decisions, it is likely that operators feel an ownership of the management arrangements and are therefore far more likely to comply with them. DFWA is in the process of developing a meaningful performance measure relating to compliance in the fishery. EA is satisfied that these compliance measures contain the means of enforcing critical aspects of the management arrangements.

Annual State of the Fisheries reports review the performance of the major aspects of the SBS fishery and are published following review with the WA Office of the Auditor General. In addition, the ESD report will be reviewed every five years. EA is satisfied that a five year review of the entire fishery is suitable while critical aspects are reviewed annually. The annual reviews include an assessment of the target stock. These are discussed more fully in Part Two of this report.

Fishery dependent and independent information relating to the target species is collected on a regular basis in the fishery. Fishery dependent data is obtained through compulsory monthly commercial logbooks, and a voluntary daily reporting system. This commercial data is validated against processor records and will soon be validated against VMS data. DFWA conduct annual independent surveys to identify abundance of pre-recruits in the fishery. In addition, an observer program with minimal coverage has been active in this fishery since 2000. The program has also been operating in the Shark Bay Prawn Trawl fishery since 1998. There are also various projects currently approved or seeking funding which have application to the management of this fishery. These information collection systems are discussed further under Part Two of this report.

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.

EA is satisfied that the current management arrangements comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. However, there is no mechanism in the arrangements that requires compliance with any future plans or policies.

The SBS fishery has been operating within the area of the current Shark Bay World Heritage Area since the early 1970s. Under the EPBC Act, a person may not take an action that has, will have or is likely to have a significant impact on the world heritage values of a declared World Heritage property. People that are taking actions that are a lawful continuation of a use of land, sea or seabed, that was occurring immediately before the commencement of the EPBC Act, may continue to take those actions. An enlargement, expansion or intensification of a use is not a continuation of a use. Shark Bay's listed World Heritage values are located primarily in areas that are protected from or unsuited to trawling. For this reason, and the outcomes of the assessment as listed throughout Part Two of this assessment report, EA is satisfied that fishing activities as currently practiced in this fishery are unlikely to have a significant impact on the world heritage values of Shark Bay in the next five years. Any significant change to existing practices, which is likely to significantly impact on Shark Bay's

World Heritage values, may require approval by the Commonwealth Minister for the Environment and Heritage.

As the fishery area contains Commonwealth waters, operators are required to comply with the International Convention on Marine Pollution (MARPOL). The submission is silent on how fishers and DFWA ensure that these requirements are adequately addressed, however DFWA have specified that the WA Department of Transport does pre-season inspections of vessels to ensure they are seaworthy.

### **Conclusion**

Management arrangements in the WA SBS fishery are reasonably precautionary. DFWA has demonstrated its commitment to the ecologically sustainable management of the fishery by conducting a stakeholder risk assessment workshop and developing the ESD report. It has a history of adapting management arrangements, where required, to address impacts of the fishery and EA is confident that using the ESD report as a guide, they will continue to do so to reasonable levels of precaution in the next five years.

The SBSMAC is the body responsible for providing information and advice to the WA Minister for Fisheries on matters related to the protection and management of the fishery. This body currently consists of an independent chair, industry and DFWA officers. EA considers that other interests and stakeholders should also participate in the processes of the main advisory committee for a fishery. This issue was also raised in public comment submissions. DFWA responded to these comments stating that one new trawl MAC to represent the Shark Bay Scallop, Shark Bay Prawn and Exmouth Gulf Prawn fisheries will be established and will include a member with community sector experience and a member with conservation sector expertise. No timeframe was provided for the establishment of a joint Trawl MAC.

EA considers that in addition to representation from the interest groups proposed, participation should also be sought from recreational fishers and world heritage area management. As this fishery occurs within a declared World Heritage Area, there is potential for conflict between management decisions and conflict between agencies. This potential could be greatly minimised by involving a representative from the management of the World Heritage Area in the processes of the MAC to help provide advice to the group and to the WA Minister for Fisheries. EA therefore recommends that DFWA ensure that processes of the main advisory body to the WA Fisheries Minister for this fishery include participation from conservation, community, recreational fishing and world heritage area management interests. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.

Currently the ESD report is simply a guiding document that has no legislative basis. This document contains a number of detailed and explicit management triggers, decision rules and performance measures. This is the document that outlines the objectives, targets, monitoring requirements and responses of the fishery. The management commitments specified in this report have been fundamental in EA's assessment and consequent recommendations. Although EA is satisfied that this lack of a legislative basis 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, within one year, with a clear timeframe for implementation.

EA considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Due to the importance of the ESD report and Management Plan to EA's assessment of the fishery, an amendment to either could change the outcomes of our assessment. Therefore, EA recommends that DFWA inform EA of any changes to the management plan or managerial commitments in the ESD report.

In addition, many of the triggers contained in the ESD report require specified actions to address a breach of a performance measure. No time-frames are included for the implementation of these actions. EA therefore recommends that these time frames be developed and incorporated into the ESD report in order to ensure prompt and efficient responses to arising issues.

The submission is silent on specific actions and requirements in the fishery related to the prevention of marine pollution from vessels. The ESD workshop concluded that air and water quality issues are of insignificant risk and do not require a managerial response or a justification within the report. Given the nature and scale of the fishery, and the thoroughness of the ESD workshop, EA is satisfied that management arrangements in the fishery ensure that MARPOL obligations are met in this fishery.

#### **Recommendations**

- Opportunity should be provided to conservation, community, recreational fishing and world heritage area management interests to participate in the processes of the main advisory body to the WA Fisheries Minister for this fishery. DFWA should also ensure that any relevant indigenous interests are considered through appropriate consultative mechanisms.
- The ESD report, including all performance measures, responses and information requirements, should be formally incorporated into the management regime and decision making process within one year, with a clear timeframe for implementation.
- EA should be informed of any changes to the management plan or managerial commitments in the ESD report.
- The ESD report should be amended to incorporate time frames for all management responses to breaches of performance measures.

## **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 compulsory monthly logbooks, which 100% of the operators voluntarily complete on a daily basis. Commercial logbooks are validated against processor records and will soon be validated against VMS data. The logbooks contain information on daily and shot-by-shot target and byproduct catch, hours trawled and areas of operation.

Fishery independent surveys are conducted annually to measure the abundance of pre-recruit and residual scallops in the Shark Bay population. This survey is conducted in or around November of each year and the results are used to identify the opening date for the next season. The fishery is normally opened between the start of April to mid-May.

Further fishery independent research is conducted through current and new funding applications. An observer program and a biodiversity research project are discussed under Principle Two of this report.

EA is satisfied that this information system is reliable, appropriate to the scale of the fishery and is based on an appropriate mix of fishery independent and dependent research and monitoring.

### **Assessment**

The submission states that an assessment is conducted based on the pre-recruit and residual scallops in the fishery area in November of each year, using data from a fishery independent survey. These annual assessments are incorporated into the annual State of the Fisheries report which is published after review by the WA Office of the Auditor General. The results of this assessment are used to determine the opening date of the fishery to ensure that there will always be sufficient spawning irrespective of the level of recruitment.

This monitoring and assessment has been operational in the SBS fishery for several decades. Therefore a large data-set is available with which to detect trends in catch and effort and environmental influences. As scallop recruitment can be highly variable as a result of environmental conditions, this dataset is extremely valuable in the management of the stock. EA is satisfied that this allows DFWA to ensure that assessments of the dynamics and status of the fishery are robust and capable of identifying any reduction in biological diversity and reproductive capacity.

Because of the commercial value of the target species, the distribution and spatial structure of the stock are well understood. Saucer scallops are targeted and retained as byproduct in several other fisheries in WA. Management of the stock in this fishery is based on information and indicators from the local area only. Management includes real-time monitoring and adaptive management.

The submission states that there is no significant recreational or indigenous take of the target species. Compliance data, combined with the number of operators and their involvement in managerial decisions, suggests that illegal activity in the fishery is very low. The nature of the fishery, including the investment in boat and fishing gear, makes it unlikely that an unauthorised operator would attempt to trawl illegally. Should it happen, it is likely that it would be detected and reported by DFWA or authorised operators. The implementation of a VMS is now an essential part of the compliance and enforcement strategy, and can be used to validate the assumed levels of compliance with spatial and seasonal management arrangements. Therefore EA considers that the data collection system and assessment undertaken ensures that reliable estimates of commercial removals are available.

The SBS fishing season formally ends at the same time as the season for the Shark Bay Prawn fishery in November. Although scallop fishers could continue to fish until this time, the submission states that it usually becomes uneconomical for them to fish some time before the official end to the season. In fact, in the last five years, fishing has only occurred for two months or less of each year.

Catch in scallop fisheries can be highly variable. This is a result of the high variability in annual recruitment. Over the last 18 years, the meat weight from the fishery has varied from 121t to 4414 t. The submission states that recruitment is largely environmentally driven and the spawning stock size has not been a significant factor at the levels of spawning stock so far experienced. EA is satisfied that this variation is predominantly environmentally driven in this fishery and that the DFWA review and management triggers are sufficient to detect any long term trends.

In 2000, DFWA implemented an acceptable catch range of 250-600 tonnes of meat weight. This range is based on catches from 1995-99 and will trigger a review if a breach occurs. The DFWA 2001-02 annual report states that catch in 2002 was 216 tonnes meat weight. DFWA have clarified that as a result of this breach a review was conducted which concluded the low weight was a result of environmental influences and the impacts of fishing were not significant.

DFWA has committed, in the ESD report, to look into defining a biological bottom line for this fishery where fishing will either not commence or will be terminated. This work will occur in the next few years. Currently the fishing season is driven predominantly by economic concerns where it becomes unfeasible to continue fishing once the scallop catch drops to 6-7 kg/hr or 120-150 kg/day.

### **Management response**

The current SBS fishery management regime aims to maintain ecologically viable stock levels through a range of input controls, designed to regulate the level of harvest from the fishery. These are:

- licences limited to 14 'A' class (scallop targeting only) and 27 'B' class (can target prawn and retain scallop) licences;
- gear restrictions (twin otter gear with 7 fathoms headrope and 100 mm net mesh for 'A' class licences and ground chain of 10 mm and use of BRDs for all vessels);
- a seasonal opening is triggered by an estimate of stock levels from the pre-season survey and closure triggered by tiger prawn catch in the Shark Bay Prawn fishery;
- a ban on day trawling for 'B' Class vessels (apart from start of season); and
- permanent spatial closures to protect prawn nursery and other delicate habitats.

The submission states that all 'A' class operators in the fishery tow two 7 fathom nets in normal operations. 'B' Class licences usually tow two 8 fathom nets however the management plan allows for the use of four 6 fathom nets or three 8 fathom nets for 'B' class only if the operator was a larger vessel. Due to the combination of input controls and triggers as discussed above, EA is confident that such potential increase in fishing power, should it ever occur, will be managed effectively, including the standardisation of catch triggers, to ensure it will not impact the fishery resources to unacceptable levels in the short to mid-term.

Due to the mesh size of 100 mm in 'A' class vessels, only a few species are caught in sufficient numbers to be retained as byproduct. The byproduct landed in 2001 weighed just over 3.7 tonnes. Squid, cuttlefish, blue swimmer crabs, sharks, finfish and bugs have all been taken as byproduct since 1997 and are all taken as byproduct or target species in other commercial fisheries. Blue Swimmer crabs are currently targeted by a developmental trap fishery and can only be taken above 127 mm carapace width which DFWA has identified as well above the size at first maturity. These fisheries have been or will be under assessment by EA in the near future. Byproduct taken by 'B' Class licences has been assessed under the Shark Bay Prawn fishery assessment. The ESD workshop assessed the risk to byproduct species and concluded that it was negligible.

Currently this fishery does not have a list of permitted byproduct species. This means that any species may be retained as byproduct if the operators are able to find a market. Although DFWA has a demonstrated history of adaptive management, will review the risk assessment every five years, and the mesh size minimises the catch of many species, EA believes that unacceptable levels of damage could be caused during that period if markets were to shift to byproduct species. EA therefore recommends that permitted byproduct should be limited to species currently harvested with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.

Ideally, management arrangements affecting a single stock should be under a single jurisdiction, or at least complementary across jurisdictions. EA is satisfied that the majority of species retained in this fishery are fundamentally independent within WA waters.

Concerns were raised in the Northern Fisheries Managers meeting in Darwin in September 2002 that increasing fishing pressure and opportunistic targeting of squid in fisheries around the coast could significantly affect the status of this shared stock. Squid are taken in low amounts in this fishery (75kg in 1998). However, because of the potential for this take to increase and the cumulative impact of squid harvesting in the numerous fisheries along the coast, EA believes it would be beneficial, for both squid stocks and WA governance, for

DFWA to be involved in any cross-jurisdictional actions to address shared stock concerns. EA therefore recommends that DFWA commit to participate in any cross-jurisdictional activities regarding squid. This is a concern applicable to all target and byproduct species that may be affected by cross-jurisdictional issues.

### **Conclusion**

EA is satisfied that the information collection system and stock management arrangements are generally sufficient to maintain ecologically viable stock levels of target and byproduct species within acceptable levels of probability.

While the regime is capable of controlling the level of take from the fishery EA is concerned that even in the years of lowest predicted recruitment, the scallop fishery will remain open for up to six months. There is no biological bottom line beyond which DFWA prevents the opening of the season and scallops being taken. Current technology may make it uneconomical for operators to continue to target scallops during these times, however markets and technology can change and this has potential to significantly impact on scallop stocks. In addition, 'B' Class licences will continue to fish and catch scallops after the stock has become unviable for 'A' Class licences. In the ESD report, DFWA has committed to investigating the development of a limit reference point for the fishery which either closes the fishery or prevents its commencement. EA recommends that DFWA pursue the implementation of a target reference point and decision rule as a priority.

The potential to threaten stocks of byproduct species should be resolved by limiting the species that can be taken. This will prevent changes in fishing practices due to operators targeting species currently not considered as target species when market shifts encourage them to do so. A robust system to manage the addition and removal of species from a permitted byproduct species list should also be developed and implemented to ensure that sustainable harvest of these species is still able to occur. As discussed above, this should be coupled with the implementation of suitable catch triggers, management responses and timeframes for required action.

Concerns regarding cross-jurisdictional management of squid species may not currently be a priority for this fishery. However, EA considers that as squid are taken in several fisheries managed by DFWA, it would be beneficial to governance and environmental concerns if DFWA were to be involved in any action to address these cross-jurisdictional concerns. The benefits of participating in such discussions and responses would also benefit all other target and byproduct species whose stock may be shared with other jurisdictions.

### **Recommendations**

- The implementation of a decision rule to close the fishery or prevent commencement of the fishing season, when recruitment of scallops is sufficiently low, should be pursued as a priority.
- Permitted byproduct should be limited to species currently harvested, with a robust system developed to add or remove species as appropriate. Suitable catch triggers should be developed to ensure any change in targeting behaviour can be detected and addressed as it occurs. Management responses should be clarified, with timeframes for implementation, to address such changes, so that the management arrangements are able to minimise threats to byproduct species.

- DFWA should participate in any cross-jurisdictional activities regarding relevant target and byproduct species, including squid.

## 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. Trigger points and management responses are in place to ensure that the risk of overfishing the target and byproduct stocks remains negligible.

## 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

An FRDC project to research the implementation of Bycatch Reduction Devices (BRDs) began in July 2000. This program included an observer program to record, identify and quantify bycatch in this fishery. In 2002 BRDs were only compulsory in one of the two fishing nets of each commercial vessel. During this time, the observer surveys aimed to measure the difference in bycatch and scallop catch between the two nets.

DFWA is undertaking research to quantify the populations and distributions of all bycatch species within and outside the trawl area of Shark Bay. This research also seeks to identify the distribution of different environments in Shark Bay. This research will be conducted in the next five years.

Independent surveys are used in this fishery to predict the levels of recruitment of the target species to the fishery and to determine the timing of opening the fishing season. Currently, only *ad hoc* bycatch data is collected during these surveys, predominantly reporting catch of large individuals such as sharks.

## Assessment

Observer data from BRD trials in ‘A’ Class vessels in April 2001 concluded that 75-95% of the non-scallop catch was crabs, primarily blue-swimmer crabs of which larger individuals are retained as byproduct. The survey also found that less than 20 individual fish are usually caught per tow (including goatfish, grinders, flathead and gurnard) and the fish are generally less than 15 cm in length. Bycatch in this fishery is significantly less than the Shark Bay Prawn trawl fishery due to the larger mesh size, slower trawl speed and the aggregating nature of the scallops.

The stakeholder ESD risk assessment workshop that was held for ‘A’ class vessels in this fishery analysed the risk to bycatch species. This analysis concluded that the fishery was of

negligible risk to discarded fish and invertebrate species. All issues raised in the ESD report will be reassessed within five years.

Bycatch rates in 'B' Class vessels (that is fishers in the Shark Bay Prawn fishery) are discussed under the submission and assessment report for that fishery and therefore are not discussed in detail in this report. EA is satisfied that this fishery currently meets the objective and recommendations have been made to minimise the risk of unacceptable or unsustainable impact.

### **Management response**

Bycatch reduction devices (BRDs) will be compulsory in all fishing nets from commencement of the 2003 fishing season. They are already compulsory in all nets of 'B' Class vessels. These devices currently consist of a grid (often referred to as a Turtle Exclusion Device (TED)) with a maximum bar grid space of 200 mm. They generally allow the escape of large individuals of species such as turtles, sharks, fish and rays. Additional information received from DFWA indicates that due to the detached weed problem in Shark Bay, vessels are currently trialing flounder grids with a bottom grid gap of 300 mm and other bar spaces of 200 mm. Effectiveness of the current devices has been tested during observer surveys and other research since 2000. The requirement to use these devices is included as a condition of licence.

The survival of bycatch species that escape through BRDs is still largely uncertain in most, if not all, trawl fisheries in Australia. Reducing the catch landed on the vessel of some species does not necessarily equate to an equivalent reduction in fishing mortality of that species. Current technology and competing priorities limit the extent to which researchers can assess these reductions in a single fishery. This is a significant issue in a number of fisheries in Australia and is a consideration that EA considers should be a priority for research in the future.

The submission states that the mesh size of 100 mm and the slow trawl speeds of 2.5 – 3 knots greatly minimises the catch of bycatch species. It also indicates that due to the nature of scallop aggregations fishers are able to target them quite efficiently and minimise interactions with non-target species.

Currently less than 40% of Shark Bay is available for trawling. The submission advises that approximately 11% is extensively trawled for scallops. The capacity of the untrawled habitats to sustain stocks of bycatch species is uncertain. As a result, DFWA is surveying the species within and outside the trawl grounds to determine the relative proportion of refuge areas for these bycatch species. This research should be completed in the next five years.

### **Conclusion**

EA is satisfied that reliable bycatch information is currently collected for the fishery. This system could be improved to ensure that significant impacts on bycatch species can be detected. The annual independent surveys on target species may provide an opportunity to monitor bycatch at regular intervals, noting that they may not be completely representative of commercial operations (especially considering the November survey is outside of the commercial fishing season).

EA recommends that DFWA implements ongoing monitoring sufficient to identify long-term trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.

EA is satisfied that the risks of the impacts of the fishery on bycatch species have been assessed. Measures are in place to avoid capture and mortality of bycatch species. The major areas of concern will be addressed in the short-term by increased independent research. EA recommends that when DFWA applies the results of this research to management arrangements, they also consider the importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle.

#### **Recommendation**

- Ongoing monitoring should be implemented sufficient to identify long-term trends in bycatch between fished and unfished areas to ensure that information used in the risk assessment for the fishery remains based on accurate and current data.
- The importance of specific areas and habitats to applicable bycatch species during all stages of their life cycle should be considered when applying the results of biodiversity research to management arrangements.

#### **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**

Data on protected species interactions have been collected through the observer surveys operating in the fishery since 2000. Previously the only data collected on these species was by the WA Department of Conservation and Land Management and the submission indicates that this information was sparse.

The submission advises that there is provision in the comments section of the commercial logbooks for recording interactions with cetaceans, dugongs, turtles, syngnathids and seasnakes. Currently this commercial reporting is not compulsory within WA waters. Although the submission states that currently there is only limited fishing in Commonwealth waters, commercial reporting of interaction within those waters is a compulsory requirement of Part 13 of the EPBC Act.

Fishery dependent data in this fishery is relatively robust. EA recommends that reporting of protected species interactions from commercial operations should occur. This data may be validated against observer and independent research records to ensure that accurate information is used when monitoring levels of interaction and assessing the impact of the fishery on those species.

One of the biggest barriers to successful commercial reporting of protected species interactions is the capacity of the fishers to identify the species involved. In addition, many operators may not be aware of the importance of reporting for the species involved. Both of these barriers can be reduced through education programs and opportunistic advice from observers and researchers as appropriate.

## **Assessment**

The risks of the fishery to protected species were assessed during the ESD workshop and have been discussed in the ESD report. This analysis concluded that there was a negligible risk to green turtles and a low risk to loggerhead turtles, seasnakes, syngnathids, cetaceans and dugongs. The impact to the environment of provisioning through discards was rated as a low risk with the submission listing several species that could be affected by this provisioning, including seabirds and dolphins. The risk assessment will be reviewed within five years.

An annual assessment of loggerhead turtle catches and status at release is conducted by DFWA and used to measure the performance of this fishery. Similar assessments are not conducted for any other protected species.

## **Management response**

The submission advises that during observer surveys since 1998 in the Shark Bay Prawn fishery, no turtles were caught in any of the nets which had BRD grids fitted. The use of these grids is also believed to reduce discarded fish and therefore the provisioning of dolphins, sharks and seabirds. The devices are required through a condition of licence and have been described further under Objective One of Principle Two. The grids used to minimise turtle catch in this fishery currently consist of bars with spacing of 200 mm. This is somewhat inconsistent with similar devices used in other trawl fisheries in Australia. As a result EA supports rigorous testing and ongoing trials and research to improve the effectiveness of such devices to ensure they are appropriate to meet the objective.

40% of Shark Bay is currently available for trawling. DFWA believe that this, combined with the use of BRDs, allows sufficient refuge areas for protected species that are at risk from the fishery. As mentioned under Principle Two, Objective One, DFWA are conducting research surveys to identify the composition and distribution of species within and outside trawled grounds. This survey will assist in identifying whether the current management responses addressing protected species are sufficient and appropriate.

Current management arrangements are consistent with all threat abatement plans, national plans of action and recovery plans. However, there is no provision in the management plan or the ESD report that requires an amendment to management practices to comply with any future plans of these types. Although DFWA has demonstrated in the past their capacity and willingness to amend arrangements when required, EA recommends that this commitment be formalised in the ESD report or management plan.

## **Conclusion**

The risks to protected species have been identified and assessed and are monitored through a fishery independent system and voluntarily through commercial logbooks. The EPBC Act requires that all protected species interactions in Commonwealth waters be reported to EA. In addition, EA believes that monitoring and managing the impact of fishing on protected species is strengthened when all interactions of the fishery are reported to the relevant State or Commonwealth Department. EA therefore recommends that all protected species interactions from commercial operations should occur and be coupled with an education program to ensure industry have the capacity to make accurate reports.

There are no declared threatened ecological communities in the SBS fishery area and therefore these provisions in the Guidelines are not applicable at this stage.

EA is satisfied that the fishery is generally conducted in a manner that aims to minimise and avoid death or injury to protected species. This system could be strengthened to minimise the risk of unacceptable impact even further through the implementation of the following recommendations.

#### **Recommendation**

- A mechanism should be developed to enable the amendment of management arrangements to respond to new information or future Government plans and policies.
- All protected species interactions by commercial operations should be reported and coupled with an education program to ensure industry has the capacity to make accurate reports.

### **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**

A range of data has been collected in Shark Bay during the 40 year history of the fishery. These data include catch and effort, environmental flows, climatic variations and sediment and habitat classifications. These will continue to be monitored and considered in assessments related to the fishery where appropriate.

The proposed research survey as described under Principle Two, Objective One will provide additional information on habitat and species distribution in and around Shark Bay. This research will be implemented in the next five years.

#### **Assessment**

The ESD workshop analysed the risks to general ecosystem components. This assessment will be reviewed every five years. The assessment identified negligible risk from the discarding of scallop shells, negligible impacts of translocation and negligible impacts of turbidity caused by operation of the fishery. A low risk was identified for the impacts of taking target and byproduct species on the ecosystem and trophic relationships, impacts on sand/shell and coral/sponge habitats, provisioning through the discarding of non-target species. These risks will be reassessed during the review in five years, however current management practices ensure they are adequately addressed.

Concerns were raised during the public comment period that the information used to assess these risks at the workshop was sparse and largely uncertain and that therefore the conclusions were inaccurate. The DFWA response outlined the precaution that was used when utilising the available data. EA concurs with DFWA that in cases where it is impossible to obtain comprehensive information on which to base a decision, that a risk assessment implemented in a precautionary way can provide a suitable decision making system and guide. EA has made several recommendations in this report aiming to improve the information system used when conducting risk assessments.

### **Management response**

40% of Shark Bay is currently available for trawling which means the remaining 60% remains permanently closed. Only 11% of Shark Bay is extensively trawled for scallops. Research is currently underway to identify the habitat and species diversity inside and outside the trawl areas. This research will provide DFWA with an indication of whether or not they are protecting sufficient representative habitat.

Research to identify seagrass beds and other areas of delicate habitat has been conducted in Shark Bay through several research programs in the past. Such habitats that have been identified have been closed to trawling permanently.

As the ESD report concludes that threats to the general environment of the fishery pose only a low risk, there are no performance measures related to these threats. This report will be reviewed in five years and will incorporate data obtained from the habitat and biodiversity identification project that is discussed under Principle Two, Objective One.

The use of BRDs and restrictions on fishing gear aim to reduce the impact of fishing operations on the benthic environment and on the ecosystem generally. Using a ground chain of no larger than 10mm helps to minimise these impacts.

As the risk to the environment from marine and air pollution from fishing operations was considered negligible, the submission is silent on current monitoring, assessment and management arrangements of such impacts. EA is satisfied that the risk assessment workshop was robust enough to ensure short to mid-term risks were identified and addressed. We are confident the DFWA will continue to consider such impacts in their management of the fishery and its impacts.

### **Conclusion**

The environment of Shark Bay, marine and terrestrial, was recognised as outstanding and consequently declared a World Heritage Area in 1991. Shark Bay's listed World Heritage values are located primarily in areas that are protected from or unsuited to trawling. EA is satisfied that fishing activities as currently practiced in this fishery are unlikely to have a significant impact on the world heritage values of Shark Bay in the next five years. Any significant change to existing practices, which is likely to significantly impact on Shark Bay's World Heritage values, may require approval by the Commonwealth Minister for the Environment and Heritage.

As in any trawl fishery, the potential to impact unacceptably and unsustainably on the environment generally is quite high. DFWA has conducted a risk assessment of these issues in this fishery and has implemented actions to address areas of significant concern.

EA is therefore satisfied that the fishery is conducted in a manner that minimises the impact of fishing on the ecosystem generally to the greatest extent practicable in the short to mid-term. EA is satisfied that actions are in place to ensure that mid to long-term risks will be identified in the next five years and all significant issues will be addressed at the next review of the ESD report.

Further actions to strengthen current management of this fishery have been recommended previously in this report. EA is confident that these new actions will contribute to ensuring this objective is met.

## REFERENCES

Kailola, PJ, Williams, MJ, Stewart, PC, Reichelt, RE, McNee, A and Grieve, C (1993) –  
“Australian Fisheries Resources”,  
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## LIST OF ACRONYMS

|          |  |
|----------|--|
| BRD      | Bycatch Reduction Device   |
| DFWA     | Department of Fisheries, Western Australia                           |
| EA       | Environment Australia  |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> |
| ESD      | ecologically sustainable development                                 |
| FRDC     | Fisheries Research and Development Corporation                       |
| MAC      | Management Advisory Committee  |
| MARPOL   | International Convention on Marine Pollution                         |
| OCS      | Offshore Constitutional Settlement                                   |
| SBS      | Shark Bay Scallop  |
| SBSMAC   | Shark Bay Scallop Management Advisory Committee                      |
| TED      | Turtle Exclusion Device  |
| UNCLOS   | United Nations Convention on the Law of the Sea                      |
| VMS      | Vessel Monitoring System   |
| WA       | Western Australia  |