



**Australian Government**

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**Department of the Environment and Heritage**

Assessment of the  
**Western Australia South Coast Trawl Fishery**

**February 2006**

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# Assessment of the ecological sustainability of management arrangements for the Western Australian South Coast Trawl Fishery

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## EXECUTIVE SUMMARY

### Background

The Department of Fisheries, Western Australia (DFWA) submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in July 2005. The document, *Final Application to the Australian Government Department of Environment and Heritage on the South Coast Trawl Fishery* (the submission), was released for a thirty-day public comment period that expired on 29 August 2005. No public comments were received. The submission reported on the South Coast Trawl Fishery (SCTF) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. The Australian Government Department of the Environment and Heritage (DEH) assessed the SCTF based on this submission and, in December 2005, declared the fishery an approved Wildlife Trade Operation (WTO) for a period of three months. This short term WTO resulted from DEH's concern at the lack of formal management arrangements for the SCTF. While the current WTO allows export from the SCTF, it expires on 28 February 2006, and a new decision under Part 13A of the EPBC Act is required to enable export of product from the fishery to continue past this date.

In response to DEH's concerns about the lack of formal management arrangements for the SCTF, DFWA released a document *Management of the Proposed South Coast Trawl Fishery – a Discussion Paper* (the Discussion Paper) for public comment in August 2005. The Discussion Paper proposed a number of management arrangements for the SCTF, which have now been forwarded to the Western Australian Minister for Fisheries for approval. This assessment considers the original submission, associated documents, and the management commitments outlined in the Discussion Paper.

**Table 1: Summary of the SCTF**

<b>Area</b>	Waters adjacent to the south coast of Western Australia (Commonwealth and State waters) between Cape Leeuwin (115°8' east longitude) and 125° east longitude on the landward side of the 200 m isobath. The fishery area also includes all Western Australian waters between 125° east longitude and 129° east longitude (ie the Western Australian/South Australian border).
<b>Fishery status</b>	Unknown.
<b>Target Species</b>	Saucer scallop ( <i>Amusium balloti</i> ) and finfish when scallops are in low abundances.
<b>Byproduct Species</b>	Mainly finfish but also squid, bugs, skates and rays. The Discussion Paper proposes to specifically identify permitted byproduct species within a management plan to be developed for the fishery.
<b>Gear</b>	Demersal and mid-water trawl gear. Gear limitations have been proposed in the Discussion Paper.
<b>Season</b>	Fishing activity occurs year round, although scallop trawling in the area of the Recherche Archipelago is prohibited between 1 December and 31 March each year. As a result of public comments received on the Discussion Paper, DFWA has revised some of the draft management arrangements, and a proposal now exists to implement a total trawling prohibition on the south coast between 1 December and 30 April each year.

<b>Commercial harvest 2003</b>	80 tonnes. Catch demonstrates considerable annual variability. The highest recorded catch from the fishery is 2,722 tonnes in 2000.
<b>Value of commercial harvest 2003</b>	Has ranged from \$5,000 to \$14.3 million, with an average value of about \$1.3 million.
<b>Recreational harvest</b>	No data are recorded for recreational take of scallops, although it is believed to be insignificant. It is likely that some of the finfish taken as byproduct in the SCTF are also taken by recreational fishers, although this take is not quantified.
<b>Commercial licences issued</b>	There are four licences currently operating in the SCTF. The discussion paper proposes access criteria for both scallop class permits and fish class permits, which would effectively create a limited entry to the fishery and result in four scallop class permits and four fish class permits.
<b>Management arrangements</b>	<p>The current management arrangements for the SCTF are limited to a restricted number of licences participating in the fishery and licence conditions defining the area where the fishery can operate, including a seasonal closure in the Recherche Archipelago area.</p> <p>The Discussion Paper proposes a range of new management arrangements to be implemented in the fishery including:</p> <ul style="list-style-type: none"> <li>• the development of an interim management plan;</li> <li>• gear controls for both the finfish and scallop sectors;</li> <li>• the mandatory use of Vessel Monitoring Systems;</li> <li>• the mandatory use of Bycatch Reduction Devices;</li> <li>• a total trawling prohibition on the south coast between 1 December and 30 April each year;</li> <li>• areas near a number of small coastal communities to remain open to scallop trawling between 1 May and 30 November each year; and</li> <li>• a maximum of four boats in the scallop fishery and a maximum of four boats in the fish trawl fishery (ie. the ability for more boats to fish in good scallop years is to be removed).</li> </ul>
<b>Export</b>	Saucer scallops are mainly exported frozen to Asia.
<b>Bycatch</b>	Bycatch is not quantified but is considered to be low.
<b>Interaction with Threatened Species</b>	Considered negligible but there is a lack of information on the fishery and there is no fishery independent monitoring.

The area of the fishery includes all waters of the south coast of Western Australia between Cape Leeuwin (115 degrees 8 minutes east longitude), and 125 degrees east longitude on the landward side of the 200 m isobath, and all Western Australian waters between 125 degrees east longitude and 129 degrees east longitude (i.e. the Western Australian/South Australian border). In practice, however, trawling typically occurs in three key areas including Bremer Bay, the Recherche Archipelago and Israelite Bay. The entire fishery is managed by the State under an Offshore Constitutional Settlement between the Australian Government and the Government of Western Australia.

The fishery primarily targets saucer scallops (*Amusium balloti*). Finfish (leatherjacket, blue mackerel, redfish and queen snapper) are also targeted on occasions when saucer scallops are not found in economically viable quantities. There is no limit to the quantity of saucer scallops or finfish that may be taken in the fishery. A range of finfish (leatherjacket, flathead and gurnard) and invertebrates (squid and bugs) are currently retained by the fishery as byproduct.

The primary target species, *A. balloti*, has a distribution that spans most of the Western Australian coast, having been recorded from Broome in the north to Esperance in the south. There is also an eastern population of saucer scallops inhabiting coastal waters off eastern Australia. This species is harvested in several trawl fisheries throughout its distribution in western waters. Saucer scallops tend to be restricted to areas of bare sand in more sheltered environments found in the lee of islands and reef systems. The species has been reported occurring in depths from 10-75 m in discrete beds up to 15 km in length, at densities of up to 1/m<sup>2</sup> (Dredge 1988; Kailola *et al.* 1994). Spawning of saucer scallops is thought to occur from August until the following February/March. Early growth of

*A. balloti* is rapid and although saucer scallops have been recorded reaching 140 mm in length and living up to 3-4 years, most appear to live no longer than two years and usually attain a maximum size of around 115 mm (Heald 1978; Dredge 1988). A suitable size for commercial harvest (>90 mm shell length) occurs at about 1 year and it is around this stage that juveniles mature and enter the breeding stock (Joll and Caputi 1995).

On occasions, the fishery also targets a range of finfish including leatherjacket (Monacanthidae), blue mackerel (*Scomber australasicus*), redfish (*Centroberyx* sp.) and queen snapper (*Nemadactylus valenciennesi*). Targeted finfish are considered to be common species with broad distributions in Australia's temperate waters. Some of these species are also targeted by other commercial fisheries operating in the region.

Prior to 1 July 1986, when a development plan for trawl fishing was implemented, trawling in the waters off the south coast of Western Australia was relatively unrestricted. At the time of implementation of the plan, a freeze was placed on the number of operators in the fishery, limiting the number of operators to 11. However, the development plan expired on 31 December 1989 and by this date a number of operators had withdrawn from participation in the fishery due to marginal economic returns. By 1993 only four fishing boat licences remained endorsed to use trawl gear in the fishery, and these are the same four licences valid today. Since this time, few changes to the management of the fishery have been made, apart from the Discussion Paper released for public comment in 2005 that proposed a suite of new management arrangements for the fishery.

Over the past 13 years, annual catches of saucer scallops in the SCTF have ranged from only one tonne in 1993 to a high of 2,733 (whole weight) in 2000. Consequently, the value of the fishery has also fluctuated ranging from \$5,000 to \$14.3 million, with an average value of about \$1.3 million. Size and condition of meat play an important role in determining the market value of scallop meat, and consequently these factors greatly influence selection of appropriate seasonal opening dates. The majority of annual catch is destined for export as frozen scallop meat to Asia, principally via Hong Kong markets. Very small quantities of scallops are occasionally left 'roe-on', in the shell or half shell to supply the gourmet seafood market. Estimated direct employment in the fishery for the year 2002 was 16 (4 skippers and 14 crew).

With regard to finfish, the primary species taken off the south coast between 1990 and 2002 was leatherjacket (average 24 tonnes per year). There were also reported catches of Bight redfish (average of approximately 9 tonnes per year) and queen snapper (average of nearly 8 tonnes per year). Blue mackerel catches were also reported in 1999 and 2002 with catches of 10 and 8 tonnes respectively. The average annual catch of all finfish taken by the fish trawl method between 1990 and 2002 was 61 tonnes, with a significant range of total catch in this period, including a high of nearly 197 tonnes of fish taken in 1992 and a low of 1.5 tonnes taken in 1996. Estimated beach value of the 2002 annual catch was valued at \$41,000. It is thought that finfish catch is sold to the Perth market.

The fishery uses demersal trawl gear to target saucer scallops and demersal or mid-water trawl gear to target finfish. Demersal trawl gear arranged in a standard twin otter rig is used to target saucer scallops in relatively shallow water with a sandy bottom (generally less than 40 m depth). Most boats operating in the fishery are reported to use 100 mm mesh to target scallops, although there is no minimum mesh size for trawl nets. Demersal and midwater trawl gear, trawled as a single net, is used to target finfish. Trawling for finfish occurs in a different habitat type (between 100 to 200 m depth) than trawling for scallops.

While the current management arrangements for the fishery are limited to a restricted number of licences participating in the fishery and licence conditions defining the area where the fishery can operate, including a seasonal closure in the Recherche Archipelago area, the Discussion Paper proposes a range of new management arrangements to be implemented in the fishery including:

- the development of an interim management plan;
- gear controls for both the finfish and scallop sectors;
- the mandatory use of Vessel Monitoring Systems;
- the mandatory use of Bycatch Reduction Devices;
- a total trawling prohibition on the south coast between 1 December and 30 April each year;
- areas near a number of small coastal communities to remain open to scallop trawling between 1 May and 30 November each year; and
- a maximum of four boats in the scallop fishery and a maximum of four boats in the fish trawl fishery (ie. the ability for more boats to fish in good scallop years is to be removed).

Data and information on bycatch or interactions with protected species in the SCTF is very limited and much of it has been extrapolated from similar fisheries operating in sub-tropical waters. However, DFWA submit that bycatch and interactions with protected species in this fishery are reported to be either low or negligible. Occasional captures of syngnathids are reported and these interactions are thought to usually result in death. Bycatch of juvenile and adult finfish and invertebrates is also reported to occur in the fishery but these are reported to be at relatively low levels. These interactions are assessed under Principle 2 of this report.

There are no recreational or indigenous fisheries for saucer scallops in the south coast region. Finfish species harvested in this fishery are also caught by other sectors, for example, blue mackerel (*S. australiasicus*) is targeted by the Commonwealth Small Pelagic Fishery in waters off the south coast. Other finfish taken by the fishery, such as redfish, queen snapper, leatherjacket and flathead are also taken by other commercial fisheries operating in the area including the Commonwealth's Great Australian Bight Trawl Fishery and Western Australia's Wetline Fishery and Demersal Gillnet and Longline Fishery.

The fishery is managed by licence conditions that allow operators to operate trawl nets off the south coast of Western Australia east of 115 degrees longitude (Condition 73) and to authorise demersal trawl for scallops in the Recherche Archipelago (Condition 79). Licences are issued under the *Fish Resource Management Act 1994*. The Discussion Paper proposes that a legislated interim management plan be developed for the SCTF.

## **Overall assessment**

The material submitted by DFWA demonstrates that the proposed management arrangements contained within the Discussion Paper on the SCTF meet 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:

- absence of objectives for byproduct, bycatch and protected species and for ecosystem impacts, and absence of performance measures and indicators for byproduct species;
- concern regarding the ability of DFWA to enforce critical aspects of the management arrangements for the fishery, such as spatial and temporal closures and effort restrictions, particularly once new management arrangements are introduced;
- the current fishery dependent data collection system that does not enable fishers to record catch or effort at a fine enough scale and the fact that fishery dependent data is not validated;
- the need for fishery independent data to be collected to support the management information, stock assessment and performance measurement needs of the fishery;
- the absence of any stock assessment or estimate of potential productivity of targeted stocks;
- the lack of consideration of spatial distribution of stocks in the current management regime;
- the lack of bycatch and protected species interactions monitoring; and
- a need to give more consideration to the impacts of the fishery on the ecosystem in which it operates.

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 SCTF, while operating for some time, has been in a developmental stage in terms of the management arrangements in place for the fishery. While some progress has been made in developing management arrangements, they are yet to be implemented and proven to be effective in ensuring ecological sustainability of the fishery. However, DEH recognises that the scale of the fishery currently poses minimal risk and that the new 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 structure, productivity, function and biological diversity of the ecosystem. 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 proposed management regime described in the Discussion Paper and the small scale of the fishery in terms of number of operators and area actually fished, DEH considers that the fishery will not be detrimental to the survival or conservation status of the taxa 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 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 regime 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 two and a half years. A condition has been placed on the WTO for this fishery that an interim management plan, including the commitments made in the Discussion Paper, be developed and implemented within one year of the date of export approval. The WTO declaration will also 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 two and a half 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 sharks, cetaceans, seabirds, syngnathids and seasnakes. While interactions with syngnathids and seasnakes may occur in the SCTF, they are not expected to be common and no such interactions have been reported to date. 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 SCTF management regime 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 regime relates does not, or is not likely to, adversely affect the survival in nature of 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 management regime 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 management regime, 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 and the discussion paper will be monitored and reviewed as part of the next DEH review of the fishery in two and a half years time.

## **Recommendations**

1. DFWA to advise DEH of any material change to the SCTF's legislated management regime that could affect the criteria on which EPBC Act decisions are based, within three months of that change being made.
2. The ESD Report for the SCTF, 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 and recreational interests in the SCTF are considered through consultative mechanisms.
4. DFWA, within 1 year, to incorporate into the management regime for the SCTF specific objectives, performance indicators and performance measures for major byproduct species or species groups, and to review the existing performance measures and indicators for target species. DFWA, within 1 year, to also 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.
5. By mid 2007, DFWA to conduct a compliance risk assessment for the SCTF paying particular attention to compliance with seasonal and area closures and effort restrictions. DFWA to also develop a compliance strategy for the fishery to address these risks.

6. From 2007, DFWA, in its Annual State of the Fisheries report, to report on the performance of the SCTF against performance measures that relate to the sustainability of the fishery, once developed.
7. DFWA to work with relevant jurisdictions, particularly AFMA, to actively pursue consistent and/or complementary management arrangements for, and research into, shared target and byproduct species stocks.
8. Within one year, DFWA to review the current logbook recording requirements and ensure that catch and effort data for target and byproduct species is collected at an appropriate spatial and temporal scale and differentiated for each fishing method permitted in the SCTF.
9. DFWA to develop and implement a robust system to validate catch and effort logbook data in the SCTF.
10. Within one year, DFWA to undertake a risk assessment for target and byproduct species and bycatch that provides a basis for management decisions which are precautionary and recognise the uncertainty and level of risk. DFWA will then develop a strategic research plan for the SCTF that identifies research information needs and priorities to meet the management information, stock assessment and performance needs of the fishery in keeping with the small size and low risk of the fishery. DFWA to regularly review the status of target and byproduct stocks and develop appropriate management responses to reduce risks as necessary.
11. Within one year, DFWA to develop a harvest strategy for scallops taken in the SCTF that is adequately precautionary in terms of spatial management.
12. Within two years, DFWA to develop and implement a system capable of monitoring changes in the composition and quantity of bycatch in the SCTF.
13. Within eighteen months, DFWA to develop a system to allow for the collection of data on protected/listed species interactions by fishers in the SCTF. DFWA to develop and implement an education program for fishers to promote the importance of protected species protection and accurate incident reporting.
14. Should new information determine that the fishery is having significant interactions with any endangered, threatened or protected species, DFWA to develop appropriate measures to mitigate those interactions. Measures should be implemented within 12 months of the information becoming available.

## PART I - MANAGEMENT ARRANGEMENTS

The SCTF is managed by DFWA.

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

- Trawling prohibition (Whole of State) Notice 1992 (Order);
- Surface Trawl Net Fishery (South Coast) Notice 1992;
- Trawling for Scallops (South Coast) Notice 1992;
- Condition 73 and/or 79 on Fishing Boat Licences;
- the Western Australian *Fisheries Resources Management Act 1994*; and
- the Western Australian *Fisheries Resources Management Regulations 1995*.

The proposed new management arrangements are contained within the Discussion Paper *Management of the Proposed South Coast Trawl Fishery – a Discussion Paper*, which has been through a public consultation process.

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Because of the importance of the management regime and documents referred to above to DEH's assessment of the fishery, an amendment could change the outcomes of the assessment and decisions stemming from it. For the SCTF, DEH considers that the management commitments made in the Discussion Paper need to be enforced as a priority. Consequently, a condition will be placed on the WTO for this fishery that an interim management plan containing the management commitments made in the Discussion Paper is developed and implemented within one year of the date of export approval. Therefore, decisions resulting from this assessment relate to the arrangements in force at the time of the decision, as well as to the arrangements that are expected to be in place within one year. 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 SCTF's legislated management regime that could affect the criteria on which EPBC Act decisions are based, within three months of that change being made.*

An Ecologically Sustainable Development (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 will document the performance of the fishery and its management in terms of the ecological, economic, social and governance issues associated with the fishery. This report will be publicly available in document form 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 the management plan that will be developed. The Ministerial Policy Guidelines will provide the policy framework for the management for each fishery. This document will reflect the management objectives, philosophy and guidance for decision making, including the upcoming legislated management plan, the ESD report, and as relevant, reference to other documents.

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

The management regime for the SCTF has been developed in consultation with industry (i.e. Western Australia Fishing Industry Council and industry representatives) but DEH notes there is currently no formal mechanism by which other interested parties such as conservation, community or recreational fishing representatives, can contribute to the management of the fishery. DEH notes that DFWA released a public Discussion Paper in August 2005 to seek public comments on management of the SCTF and commends DFWA for this initiative. However, DEH considers that it would be beneficial for relevant groups to be consulted on a more regular basis.

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

The SCTF is managed under an informal management regime that is guided by the broad management objectives of the *Fisheries Resources Management Act 1994*. The ESD Report for the SCTF contains a number of more specific objectives, performance measures and performance indicators, however DEH notes that these are only relevant to the target species. There are no objectives, performance measures or performance indicators in place to guide management of byproduct or bycatch species, or to minimise interactions with protected species and impacts on the marine environment. DEH considers that the development of such objectives, performance measures and indicators is as integral part of fisheries management and should be incorporated into the ESD Report for the fishery and referred to within the legislated management plan to be developed as part of the WTO conditions for this fishery. DFWA should also review the existing performance indicators and measures for the target species as part of the development of a management plan to ensure they will be adequate in detecting changes in the status of target species and initiating responses.

**Recommendation 4:** *DFWA, within 1 year, to incorporate into the management regime for the SCTF specific objectives, performance indicators and performance measures for major byproduct species or species groups, and to review the existing performance measures and indicators for target species. DFWA, within 1 year, to also 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, once developed, 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 have 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.

The level of harvest in the SCTF is currently controlled only by limiting entry to the fishery and implementing a seasonal closure in the Recherche Archipelago area of the south coast. The Discussion Paper proposes a range of measures to improve the capacity of DFWA to control the level of harvest in the fishery, including:

- setting byproduct trigger limits;
- defining the number of hours that can be fished under each permit when targeting finfish;
- limiting the number of finfish operators in the first year of the Interim Management Plan;
- implementation of a total trawling prohibition on the south coast between 1 December and 30 April each year; and
- a range of area closures for scallop trawling and finfish trawling.

DEH considers that the proposed management arrangements are sound and notes that DFWA have recommended that the Western Australian Fisheries Minister approve their implementation as a priority. DEH considers that the adoption of these management arrangements is key to the SCTF gaining export approval under the EPBC Act and has made it a condition of the WTO for this fishery that they be adopted in a timely manner and given a legislative base by being included in the interim management plan to be implemented within one year of export approval being granted.

DFWA states that there are currently very few restrictions on operators in the SCTF, therefore, there is very little scope for compliance and enforcement activities in the SCTF. It is also stated that the ability to conduct at sea compliance patrols on the south coast is limited because of a lack of suitable patrol boats in the area. DEH is concerned about the capacity of DFWA to enforce critical aspects of the current and proposed management arrangements. DEH notes that DFWA is currently conducting compliance risk assessments for all Western Australian fisheries and given the range of new management arrangements to be implemented in the fishery, DEH considers it important for DFWA to complete such a compliance risk assessment for the SCTF as a priority. In particular, DFWA should consider compliance risks associated with the temporal and spatial closures and effort restrictions that are proposed in the Discussion Paper. Once the compliance risks for the SCTF have been identified, DFWA should develop a compliance strategy to address these risks.

**Recommendation 5:** *By mid 2007, DFWA to conduct a compliance risk assessment for the SCTF paying particular attention to compliance with seasonal and area closures and effort restrictions. DFWA to also develop a compliance strategy for the fishery to address these risks.*

DFWA conducts an annual review of the performance of major aspects of Western Australian fisheries through the completion of the *State of the Fisheries* report. This report is updated and published annually and is also periodically reviewed by the Office of the Auditor General. It forms an essential supplement to the Department's Annual Report and is available on the Departmental website. In addition, the ESD Report for the fishery will be completed and reviewed externally every five years.

DEH considers that the annual reporting conducted by DFWA provides valuable information about the status of fish resources under Western Australian management. However, the SCTF is not currently reported on as an individual fishery. DEH considers that public reporting of performance on a fishery-by-fishery basis would enhance transparency and public accountability. DEH therefore suggests that, for the SCTF, DFWA publicly report against each fishery performance measure on an annual basis (note that a requirement for the development of performance measures for the fishery is expressed in **Recommendation 4**).

**Recommendation 6:** *From 2007, DFWA, in its Annual State of the Fisheries report, to report on the performance of the SCTF against performance measures that relate to the sustainability of the fishery, once developed.*

Fishery-dependent data relating to the target species (both saucer scallops and finfish) is collected and reported in fishers' monthly return sheets. There is no fishery-independent data collected for the fishery. Discussion of the information collection system can be found in Part II of this report.

An analysis of, and recommendations to improve, 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 2 of this report.

Fisheries targeting the western population of saucer scallops are all managed by DFWA. With respect to finfish, however, populations of blue mackerel, redfish, leatherjacket and queen snapper are also targeted in Commonwealth fisheries managed by the Australian Fisheries Management Authority (AFMA) such as the Small Pelagics Fishery. DEH considers that it is important for DFWA to cooperate with other relevant jurisdictions, particularly AFMA, to pursue complementary management and research of shared stocks for all relevant target and byproduct SCTF species.

**Recommendation 7:** *DFWA to work with relevant jurisdictions, particularly AFMA, to actively pursue consistent and/or complementary management arrangements for, and research into, shared target and byproduct species stocks.*

DEH considers that the current management arrangements and the proposed management arrangements are likely to comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. 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. 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 II of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is addressed 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 has made recommendations to ensure that the SCTF management regime is documented, publicly available and transparent, and is developed through a consultative process. The management arrangements are adaptable and underpinned by appropriate objectives for the target species. However, objectives need to be developed for byproduct, bycatch and protected species and for ecosystem impacts, and performance measures and indicators also need to be developed for byproduct species.

The management arrangements are capable of controlling the harvest through a combination of input and output controls appropriate to the size of the fishery. Periodic review of the fishery is provided for and, while there is limited means for DFWA to enforce critical aspects of the management arrangements currently, the compliance risk assessment required under **Recommendation 5** will enable DFWA to better direct compliance resources.

The management regime adheres to arrangements established under Australian laws and international agreements, although DEH has recommended that DFWA cooperate with relevant jurisdictions to pursue complementary management and research of shared stocks.

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**

Catch and effort data have been collected for the fishery since 1987 and DFWA considers that this form of data collection is moderately robust. Fishers are required to submit monthly catch and effort return sheets to DFWA. The information collected includes:

- fishing method;
- fishing areas (block numbers);
- fishing effort (days fished and hours/day);
- catch (species, including bycatch); and
- other comments for a particular month.

Data collected for different trawl methods and individual days is aggregated in monthly catch and effort returns sheets. DEH notes that the long history of catch data collection in the fishery is likely to provide an informative history of the fishery, however DEH has some concerns that catch data are only collected on a monthly basis rather than on a daily basis, or even on an individual shot basis. DEH also considers that data should be collected on a finer spatial scale and differentiated between fishing method (ie. scallop trawling, mid-water finfish trawling and demersal finfish trawling). DEH notes that DFWA have proposed, in the Discussion Paper on the SCTF, to introduce a Vessel Monitoring System to all boats operating in the SCTF and DEH considers that this system would be beneficial in allowing DFWA to gather real time, fine spatial data on fishing effort. However, DEH recommends that DFWA review the logbook recording requirements for the SCTF to enable fishers to provide more robust and meaningful catch and effort data.

**Recommendation 8:** *Within one year, DFWA to review the current logbook recording requirements and ensure that catch and effort data for target and byproduct species is collected at an appropriate spatial and temporal scale and differentiated for each fishing method permitted in the SCTF.*

There appears to be limited capacity for catch data to be cross referenced against processor unload records. However DEH considers that proper validation of catch data is crucial for the SCTF given the reliance on fishery dependent data for assessing the status of the target stocks.

**Recommendation 9:** *DFWA to develop and implement a robust system to validate catch and effort logbook data in the SCTF.*

A number of research projects on biology and ecology have been conducted on saucer scallops in the waters of Western Australia. However, these are mostly focused in regions off the west coast of

Western Australia and there has been very little research on the biology and ecology of saucer scallops stocks on the south coast. DEH notes that some information is also collected from exploratory trawling that is undertaken by industry members to determine the extent of the annual settlement of scallops. However, DEH is concerned that the current information collection system for scallop fishing is only based on fishery dependent data and on research conducted outside the area of the fishery. DEH considers it important that more research is conducted on stocks targeted in the SCTF. DEH considers that key research needs could be identified better after the completion of the risk assessment required under **Recommendation 10** (see Assessment and Management response section), and recommends that, following the completion of the risk assessment, DFWA develop a strategic research plan for the SCTF that identifies research information needs and priorities to meet the management information, stock assessment and performance needs of the fishery (see **Recommendation 10**).

Overall, DEH considers that there is a reliable information collection system in place appropriate to the scale of the fishery. However, continuation of existing data collection, combined with some extension and refinement of such activities and the introduction of research programs will be important for the future management of the fishery.

### **Assessment and Management Response**

No stock assessment or assessment of potential productivity is undertaken for target or byproduct species taken in the SCTF. DFWA performs limited assessment of the fishery using catch and effort data and exploratory trawling undertaken at the beginning of the fishing season provides some assessment of the amount of annual settlement that has occurred and therefore the amount of fishing effort to be undertaken in any year. However, DEH notes that the 2003/04 *State of the Fisheries* report for Western Australia shows that, for the SCTF, neither the stock, the exploitation status nor the breeding stock levels were assessed. DEH recognises the small nature of the SCTF in terms of the number of operators and area actually fished, but considers that a proper and regular assessment of stocks should be undertaken to ensure that the annual catch of either target or byproduct species does not exceed the maximum sustainable yield for those species. This is particularly important for the target species, saucer scallops, given the high natural fluctuations in populations from year to year.

**Recommendation 10:** *Within one year, DFWA to undertake a risk assessment for target and byproduct species and bycatch that provides a basis for management decisions which are precautionary and recognise the uncertainty and level of risk. DFWA will then develop a strategic research plan for the SCTF that identifies research information needs and priorities to meet the management information, stock assessment and performance measurement needs of the fishery in keeping with the small size and low risk of the fishery. DFWA to regularly review the status of target and byproduct stocks and develop appropriate management responses to reduce risks as necessary.*

DFWA state that the distribution and spatial structure of scallops has been well documented and is well known, but has not provided any information on how this is taken into account in management of the fishery. While the area of the fishery is extensive, fishing effort is mainly concentrated in three areas. Investigations into spat settlement have shown that the distribution of larvae is influenced by the strength and direction of winds. In calm summers, scallop beds may be largely self-recruiting, while in windy summers, settling larvae may originate from beds some distance away. This finding is an important consideration in management of scallop fisheries because, as the number of scallop beds is reduced, self-seeding becomes more important as a means of maintaining the viability of individual beds. If high fishing-induced mortality occurs on a scallop bed once it has been fished, the future viability of that bed may be threatened since it cannot be assumed that it will

be replenished by settlement of spat from other beds. DFWA needs to take account of these factors in management of the fishery by considering the proximity of unfished and fished scallop beds, the amount of scallop that can be sustainably harvested from each scallop bed, and the amount that can be harvested whilst ensuring adequate density remains for spawning and recruitment in the fished and nearby scallop beds. In doing so, DFWA should consider the available scientific information regarding maintaining spatially distributed scallop beds and the impacts of fishing on the Western Australian scallop stock.

**Recommendation 11:** *Within one year, DFWA to develop a harvest strategy for scallops taken in the SCTF that is adequately precautionary in terms of spatial management.*

DFWA state that there is unlikely to be any harvest of scallops by the recreational and indigenous sectors and that illegal take is likely to be negligible. DEH considers that DFWA has relatively good information on the level of take of scallops from the SCTF which is likely to be improved as a result of **Recommendations 8 and 9**, and that DFWA appears to take these removals into account. While DFWA note that the level of capture of finfish species is small, DEH has some concern that DFWA has provided no discussion on how removals of finfish harvested in other fisheries are taken into account in management of the SCTF. **Recommendation 10**, which requires a risk assessment for target and byproduct species will require such information to be successfully implemented. DEH has recommended that DFWA work cooperatively with relevant jurisdictions to enhance management of the fishery (**Recommendation 7**) and considers that this will assist in ensuring that all removals of target and byproduct species are taken into account in management of the SCTF.

While the current SCTF management regime is limited in its ability to maintain ecologically viable stock levels, a range of input and output controls have been proposed in the Discussion Paper on the fishery that are likely to achieve this more successfully. These measures are outlined in Table 1 and Part I of this report.

DEH considers that the combination of these input controls should ensure adequate protection of the target stocks, but notes that this is contingent upon DFWA implementing the new management regime in a timely manner, and enforcing it once implemented. DEH has placed a condition on the WTO for this fishery that an interim management plan for the fishery, containing the commitments made in the Discussion Paper, be developed and implemented within one year of export approval being granted. If this condition is not met, the Minister for the Environment and Heritage will be compelled to revoke the WTO for this fishery. The implementation of fishery risk assessment and regular review of the target and byproduct stock status (**Recommendation 10**) and the introduction of a harvest strategy that takes into account the spatial structure of stocks (**Recommendation 11**) is also likely to ensure that ecologically viable stock levels are maintained.

DEH understands that the high variability of scallop stocks can make it difficult to establish meaningful performance measures and trigger points however DEH considers they are necessary to maximise the likelihood of the continued sustainability of the fishery. Currently, the amount of effort expended in the fishery is based on surveys by operators and the likely benefits of continued fishing. While catch is typically limited to about 150 kg/day, this limit is economically driven and is not an ideal way of managing the fishery.

DEH has recommended that DFWA review the performance indicators and measures for target species to ensure that the objectives for management of the fishery can be met, performance of the fishery can be measured and management action taken as required (**Recommendation 4**). DEH has noted DFWA's commitment to monitor the status of the fishery in relation to these performance measures and, in the event that a trigger point is breached, respond appropriately in a timely

manner. While recognising the current low take of byproduct species, DEH has also recommended that a precautionary harvesting objective be developed for byproduct species.

The historical take of byproduct species has been relatively low and it appears that DFWA has directed limited management resources toward byproduct species in the SCTF. DEH agrees that the take has been low and there is unlikely to be a significant threat to these species status from the SCTF currently. However, it is important that management arrangements for byproduct species be implemented in the fishery to ensure that any threat does not increase. DFWA, in its Discussion Paper on the fishery, committed to explicitly list within a management plan for the fishery, those species that are to be classed as permitted byproduct species. DEH considers this is an important first step in limiting the impact to other finfish species that will not be classed as permitted byproduct species. Additional measures that are likely to minimise impacts to byproduct species include a large mesh size that enables small fish species and juveniles of larger fish to escape capture, and the introduction of bycatch reduction devices into the fishery (as proposed in the Discussion Paper). DEH has also recommended that the information collected on byproduct species be improved spatially and temporally (**Recommendation 8**) and that DFWA conduct a fishery risk assessment for byproduct species, as well as target species (**Recommendation 10**). DEH considers that these measures will help to confirm the assessment that the risk to byproduct species is low, and to ensure that this situation remains.

## **Conclusion**

DEH considers that the proposed management regime in the SCTF will be appropriately precautionary and provide 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, although recommendations have been to improve these processes 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. DEH has recommended that DFWA review the existing performance measures and indicators for target species, and develop objectives, performance measures and indicators for byproduct species to avoid the risk of overfishing these stocks (**Recommendation 4**). DEH is confident that DFWA will monitor the fishery in regards to these performance measures and indicators and respond to any threats to sustainability in a timely manner.

## **Conclusion**

DEH considers that the scallop and mixed finfish stocks are not below a defined reference point but should that occur in the future, the fishery is conducted such that there is a high degree of probability the stock would recover to ecologically viable stock levels within nominated timeframes.

## **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**

Limited information has been collected on bycatch taken in the SCTF. Some information is available from research undertaken for the Shark Bay Scallop Managed Fishery (SBSMF), such as a Fisheries Research and Development Corporation (FRDC) funded program that used observers to record, identify and quantify bycatch in that fishery. However, given the different areas in which the SCTF operates compared to the SBSMF, DEH considers that a system to monitor changes in the composition and abundance of bycatch is needed for the SCTF. DEH recognises that such a system should be implemented in keeping with the small size and low risk of the fishery.

**Recommendation 12:** *Within two years, DFWA to develop and implement a system capable of monitoring changes in the composition and quantity of bycatch in the SCTF.*

### **Assessment**

A risk assessment process was conducted for bycatch species taken in the SCTF, which concluded that the SCTF exhibited a negligible risk to discarded fish and invertebrate species. DEH concurs with this assessment. The low risk to these groups is due to the fact that a large (100 mm) mesh size is used in order to avoid the capture of prawns and small scallops. This also allows a large proportion of fish to escape from the net, consequently minimising the amount that are taken as bycatch. Of the finfish that are captured in the nets, teleost species typically exhibit a high mortality rate, while elasmobranchs are more robust and are usually returned alive. The trawlers in the SCTF usually move at a slow speed (typically around 3 knots), which provides a further opportunity for strong swimmers to escape from the net before it is hauled in. Finally, the clumped nature of scallop beds allows fishers to target aggregations of scallops without collecting large amounts of bycatch species.

DEH notes that bycatch abundance can depend on the density of scallop beds, with bycatch from densely populated scallop beds being relatively low compared to more sparse beds. For example, surveys conducted for the Victorian Scallop Fishery demonstrated that bycatch species comprised between 2-6% (by number) in areas where scallops were most abundant, but in areas where scallops were low in abundance, bycatch species were up to 34 times more numerous than scallops (Coleman, 2004). DEH therefore considers that it would be in the interest of the SCTF, both ecologically and economically, for DFWA to develop a means of identifying scallop beds that are most densely populated, and encourages DFWA to consider this as a part of the development of the harvest strategy required under **Recommendation 11**.

DEH notes that bycatch may increase when fishers are targeting finfish species rather than scallops. The improved information collection system required under **Recommendation 8**, whereby catch (including bycatch) should be differentiated between fishing methods, along with the bycatch monitoring program required as part of **Recommendation 12** is likely to provide DFWA with sound information on the nature of bycatch taken in all sectors of the SCTF in the future. DEH expects that DFWA will respond appropriately to any risks to bycatch species in the future.

## Management response

Few management measures are in place in the SCTF specifically to limit impacts to bycatch species, although a number of measures do act to minimise such impacts. As noted above, the gear used in the SCTF has a large mesh size and the average speed at which trawlers operate is just 3 knots, which is likely to provide opportunity for many species to escape capture. In addition, the limited number of operators in the fishery and the combination of seasonal closures is likely to minimise impacts to bycatch species. DFWA have also noted in the Discussion Paper that they intend to introduce a requirement for Bycatch Reduction Devices to be used in the SCTF. This requirement is likely to further reduce the impacts to bycatch species, particularly from those operators targeting finfish species.

No specific group of indicator species has been identified or is being monitored. DEH has recommended that DFWA develop a system that allows for the ongoing monitoring of bycatch species in the SCTF (**Recommendation 12**), and considers that, as information from this system becomes available, DFWA will be able to effectively monitor the composition and abundance of bycatch in the SCTF. DEH expects that DFWA would implement appropriate management responses in the event that bycatch species were found to be significantly impacted by the SCTF.

## Conclusion

DEH considers that there is a high likelihood the fishery is conducted in a manner that does not threaten bycatch species. 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.

A recommendation has 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

As with other bycatch species, there is no mechanism for fishers to record interactions with protected species in the compulsory SCTF logbooks. No other information on protected species interactions has been collected for the SCTF. DEH considers that DFWA needs to develop a system to facilitate the recording of interactions with protected species, particularly given the requirement under the EPBC Act for all such interactions in Commonwealth waters to be reported. DEH also considers that such a system needs to be supported by 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.

**Recommendation 13:** *Within eighteen months, DFWA to develop a system to allow for the collection of data on protected/listed species interactions by fishers in the SCTF. DFWA to develop and implement an education program for fishers to promote the importance of protected species protection and accurate incident reporting.*

## Assessment

Protected species identified as having potential to interact with fishers in the SCTF are syngnathids and seasnakes. While syngnathids exhibit a high level of mortality when they interact with the fishery, DFWA consider the risk to the species to be negligible as a result of the very low numbers of syngnathids that are caught. Results of an observer program completed for the SBSMF demonstrated that the rate of capture averaged at one syngnathid per night across the entire fishing fleet of 14 boats. Obviously, the risk to syngnathids would be even lower in the SCTF given the low number of operators in the fishery and the slow speed of trawl gear. In addition, trawling in the SCTF typically occurs over sandy areas that do not contain the favoured habitat of syngnathids of seagrass and detached algae. Consequently, DEH concurs with DFWA's assessment that impacts to syngnathids as a result of the SCTF are likely to be low. Seasnakes were also identified as having the potential to be caught incidentally in the SCTF. However, only one species of seasnake is known to occur as far south as the area of the SCTF and interactions with seasnakes are unknown in the fishery.

No threatened ecological communities have been identified in the area of the fishery and therefore no assessments are being performed.

While DEH considers interactions with protected species in this fishery are likely to be minimal, should this situation change, or a risk assessment process indicate otherwise, DEH expects that appropriate actions will be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

**Recommendation 14:** *Should new information determine that the fishery is having significant interactions with any endangered, threatened or protected species, DFWA to develop appropriate measures to mitigate those interactions. Measures should be implemented within 12 months of the information becoming available.*

## Management response

No management measures have been introduced into the fishery specifically to minimise impacts with protected species, given that the risk to this group is considered low. However, the nature of the current management arrangements ensures that impacts are minimised. In particular, the small area in which the fishery operates, the slow movement of the trawl gear and the large mesh size used are likely to minimise interactions. DEH has recommended that an ongoing monitoring program of protected species interactions be implemented in the fishery and that this be supported by an education program to ensure that reports are accurate (**Recommendation 13**).

DFWA states that, as monitoring data becomes available, should significant risks associated with protected species be identified, then appropriate mitigation measures will be considered at that time. In this event, DEH has recommended that such mitigation measures be implemented within 12 months (**Recommendation 14**). DEH has also recommended that an objective to minimise protected species interactions be developed (**Recommendation 4**).

## Conclusion

DEH notes that interactions with protected species in this fishery are likely to be minimal and considers that 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. Should this situation change, or a risk assessment process indicate

otherwise, DEH expects that appropriate actions will be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

Recommendations have 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

DFWA considers that appropriate levels of information on the ecosystem impacts of the SCTF are available from research done on similar fisheries in Australia, but no detail of the relevance of these studies is provided within the submission. DEH notes, however, that some research is being conducted in east coast scallop fisheries by the Tasmanian Aquaculture and Fisheries Institute and the FRDC. For example, the FRDC project "Juvenile Scallop Trashing Rates and Bed Dynamics: Testing the Management Rules for Scallops in Bass Strait", is studying the bed dynamics and impact of fishing on scallop beds and aims to determine the impact of fishing on different size classes of scallops, the major bycatch species taken with commercial scallop dredging gear, and the effects of scallop dredging on benthic fauna. While the gear used in those fisheries differs from that used in the SCTF, this study may be somewhat applicable to the SCTF. DEH encourages DFWA to take account of such research when assessing impacts from the SCTF on the general ecosystem.

DEH notes the relative 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

DFWA's risk assessment found that there was low or negligible risk from the fishery on the general ecosystem in which the fishery operates. The risk assessment process considered impacts on trophic interactions, on the benthic biota and impacts from translocation.

Impacts of the fishery on trophic levels and prey species are considered to be low because scallops are unlikely to comprise the sole food source of any prey species, particularly since scallop populations fluctuate widely, even in unfished populations. Due to this variability, species that prey on scallops would need to be highly adaptable and thus the harvest of scallops from a small area is unlikely to have a significant impact on these species. Scallops are filter feeders and therefore are at the lower end of the food chain. In addition, the total biomass taken from the SCTF is relatively small in comparison to the total scallop population. The impacts on trophic levels from the removal of finfish species is likely to be low for the same reasons.

The benthos is the most likely element to be impacted when fishers are targeting scallops. When trawling, otter boards and ground chains make contact with the seafloor, disrupting organisms within the habitat. The justification for the low risk rating given to this impact is that trawling for scallops in the SCTF occurs over sandy areas where scallop aggregations occur. Evidence from video footage in Shark Bay has suggested that trawling over sand has the effect of flattening this

otherwise rippled and three-dimensional substrate. If trawling were to occur in areas containing reef or seagrass, the impact would clearly be much greater. However, the dynamic nature of sand areas, along with the seasonal closures implemented in the fishery are likely to enable trawled areas to recover quickly.

The SCTF also has the potential to contribute to the translocation of material through discarding. However, the low number of discarded species, the low number of operators participating in the fishery and the large area over which any organisms are discarded are likely to minimise this risk.

Impacts to water quality are also likely to be low. Trawling for scallops tends to occur in open-ocean high energy sandy substrates while trawling for finfish occurs within the water column. The SCTF is unlikely to cause any further impacts to water quality than would occur naturally. MARPOL applies to all fisheries and compliance is generally achieved through industry education programs and codes of conduct.

DEH recognises the relatively low impact that the SCTF has on the general ecosystem, but considers that there is scope for DFWA to take more account of the impacts of the fishery on the wider ecosystem in which it operates, particularly in regards to spatial management (as required under **Recommendation 11**) and impacts to benthic communities. DEH has recommended that DFWA conduct a fishery risk assessment for the SCTF and, following the risk assessment, develop a strategic research plan for the fishery (**Recommendation 10**) that addresses the research information needs and priorities. DEH is confident that this process will highlight risks to the ecosystem in which the SCTF operates and that DFWA will implement appropriate management responses as necessary. DEH encourages DFWA to also take account of risk assessments completed for other Australian scallop fisheries, such as the ecological risk assessment conducted by the Commonwealth Scientific and Industrial Research Organisation for the Bass Strait Central Zone Scallop Fishery. While this fishery is not adjacent to the SCTF, it is possible that the results, when available, may raise issues relevant to the target species taken in the SCTF.

### **Management response**

DFWA uses a range of management measures to minimise impacts on the ecosystem from the SCTF. This includes a seasonal closure in an area of the fishery which, as a result of public comment on the Discussion Paper, has been proposed to be extended to a total trawling closure on the south coast for a longer period of time. In addition, the limited entry to the fishery helps to protect the general ecosystem in which the fishery operates by limiting the number of boats and therefore trawl gear. While these measures were not introduced for the purpose of reducing impacts to the ecosystem, they still contribute to this purpose.

DEH has recommended that DFWA conduct a risk assessment for the SCTF and develop a strategic research plan for the fishery (**Recommendation 10**). DEH expects that, if significant impacts to the ecosystem are identified, DFWA will implement appropriate management responses. In this regard, DEH has recommended that DFWA develop an objective for minimising ecosystem impacts (**Recommendation 4**) which will enable DFWA to monitor the performance of the fishery and its impact on the ecosystem and to respond in a timely manner.

### **Conclusion**

DEH considers that the fishery is conducted in a sufficiently precautionary manner to minimise the impact of fishing operations on the ecosystem generally. Recommendations have been developed to

ensure that the risk of significant impact by the fishery on the marine environment generally is minimised in the longer term.

## REFERENCES

- Coleman, N. (2004) Bycatch Monitoring for the Victorian Ocean Zone Scallop Fishery in 2002. *Research Report Series No. 11*, Fisheries Victoria, Australia.
- Dredge, M.C.L. (1988) Recruitment overfishing in a tropical scallop fishery? *Journal of Shellfish Research* **7**(2): 223-239.
- Heald, D. (1978) A successful marking method for the saucer scallop, *Amusium japonicum balloti* Habe in central eastern Queensland. *Australian Journal of Marine and Freshwater Research* **29**: 845-851.
- Joll, L.M. and Caputi, N. (1995) Geographic variation in the reproductive cycle of the saucer scallop, *Amusium balloti* (Bernadi, 1861) (Mollusca: Pectinidae), along the Western Australian coast. *Marine and Freshwater Research* **46**: 779-792.
- Kailola, P.J., Williams, M.J., Stewart, P.C., Reichelt, R.E., McNee, A. & Grieve, C. (1994) *Australian Fisheries Resources*. Bureau of Resource Sciences and Fisheries Research and Development Corporation. Canberra.

## LIST OF ACRONYMS

AFMA	Australian Fisheries Management Authority
DEH	Australian Government Department of the Environment and Heritage
DFWA	Department of Fisheries, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESD	Ecologically Sustainable Development
FRDC	Fisheries Research and Development Corporation
MARPOL	International Convention for the Prevention of Pollution from Ships
SBSMF	Shark Bay Scallop Managed Fishery
SCTF	South Coast Trawl Fishery
WTO	Wildlife Trade Operation