



Australian Government

Department of the Environment and Heritage

Assessment of the
Western Australian Specimen Shell Managed Fishery

May 2005

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

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Assessment of the ecological sustainability of management arrangements for the Western Australian Specimen Shell Managed Fishery

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EXECUTIVE SUMMARY

Background

The Department of Fisheries Western Australia (DFWA) has submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document *Final Application to Australian Government Department of the Environment and Heritage on the Specimen Shell Managed Fishery* (the submission) was received by the Department of the Environment and Heritage (DEH) in February 2005. The submission was released for a thirty-day public comment period that expired on 22 April 2005. One public comment was received. No changes were made to the submission as a result of public comment.

The submission reports on the Western Australian Specimen Shell Managed Fishery (SSMF) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. The DEH assessment considers the submission, associated documents, public comments and DFWA's response to the comments.

Table 1: Summary of the Western Australian Specimen Shell Managed Fishery

Area	Waters adjacent to the State of Western Australia.
Fishery status	Eight species of targeted specimen shells have been identified as potentially vulnerable to over exploitation.
Target Species	A broad range of specimens from the Phylum Mollusca.
Gear	Hand harvest while diving (SCUBA and hookah gear is permitted) and hand collection of beach washed shells
Season	Shells can be collected year round.
Commercial harvest 2000-2003	69,771. 2000; 20372 individual shells 2001; 15193 individual shells 2002; 13100 individual shells 2003; 21106 individual shells
Value of commercial harvest 2003	Unknown.
Recreational harvest	No quantitative information available, but potentially high.
Commercial licences issued	33 licences issued, 5-6 licensees account for 50% of the total effort.
Management arrangements	Input controlled through: <ul style="list-style-type: none">• limited entry;• gear restrictions; and• restricted fishing areas.
Export	Shells collected by operators for hobby purposes, but are permitted to be traded domestically and internationally.
Bycatch	No bycatch is taken in this fishery due to the highly selective nature of harvesting methods.
Interaction with Threatened Species	Considered low. Possible interactions with dugongs and marine turtles through boat strike.

The area of the SSMF includes waters adjacent to the state of Western Australia (WA). The fishery also encompasses waters between the high-water mark and the 200 m isobath, however the majority of fishing occurs in the shallow waters surrounding WA. Part of the fishery area is in

Commonwealth waters however the entire fishery is managed by WA under an Offshore Constitutional Settlement (OCS) agreement between the Australian Government and the Government of Western Australia.

Australia has an estimated 20,000 species of marine, terrestrial and freshwater molluscs (Stanisic, 1991). Only a small number of these are valued amongst specimen shell collectors for the purposes of display, collection, cataloguing and sale. The SSMF targets a broad range of marine shellfish from the Phylum Mollusca. Species may be alive or dead at the time of harvesting and can include beach washed shells.

The SSMF targets shells in the Families Cypraeidae (cowries), Muricidae (murex shells and their relatives), Conidae (cone shells) and Volutidae (volutes). The specimen shells taken in the SSMF are divided into three groups of species; tropical northern species which are part of Indo-West Pacific; temperate southern Australian species; and a small portion (approximately 10%) of the species which are endemic to WA. The endemic species may have part of their range on the north or south coast but tend to be concentrated on the west coast. Some endemic species occur on all three coasts. Between 2000 and 2003, a wide variety of species were collected in the SSMF, most in relatively low numbers.

A total of 69,771 specimen shells were collected in the SSMF during 2000-2003, with yearly totals ranging from 13,100 individual shells in 2002 to 21,106 individual shells in 2003.

Eight species of specimen shell collected in the SSMF have been identified as potentially vulnerable to over exploitation (Ponder and Grayson, 1998).

Table 2: Catch totals for species identified as potentially vulnerable to over exploitation

Identified Species	Catch totals for 2000-2003
<i>Cypraea (Zoila) friendii vercoi</i>	9108
<i>Cypraea (Zoila) marginata (albanyensis)</i>	2103
<i>Cypraea (Zoila) marginata (consueta)</i>	
<i>Cypraea (Zoila) rosselli</i>	508
<i>Cypraea (Zoila) venusta</i>	2980
<i>Cypraea (Austrocypraea) reevei</i>	290
<i>Amoria damoni (keatsiana)</i>	242
<i>Amoria damoni (reevei)</i>	

The *Cypraea* species studied (Ponder and Grayson, 1998), all occur from a depth of a few metres to at least 200 m, possibly 300 m. All of the *Cypraea (Zoila)* species live on sponges, though there is little information on the preference for which particular species of sponge are inhabited.

Cypraea (Austrocypraea) reevei live on bryozoans. In the mid 1970s, the Western Australian Museum undertook a trawling expedition from Fremantle up the west coast to the southern tip of the Abrolhos Islands. The expedition found a sponge zone on the outer continental shelf at depths of 50 m and more. The extent of this zone, both into deeper water and further north and south along the coast is not known (but there are anecdotal reports of a similar zone on the south coast), but it is a prime habitat for *Cypraea (Zoila)* species.

Prior to the proclamation of the Commonwealth *Wildlife Protection (Regulation of Exports and Imports) Act 1982*, in 1984 the SSMF was unregulated. After 1984 measures were implemented in the fishery and regulation occurred by prohibiting collecting in particular areas or by implementing seasonal closures.

The fishery is based primarily on the hand collection of shells while diving in WA. Beach washed shells may also be collected. This technique minimises the potential for damage to shells and therefore maintains the value. It also ensures that the ecosystem impacts from the fishery are minimised. The fishery has limited entry with 33 current licenses. Of these, 24-27 have been active in the fishery, however 5-6 licenses account for 50% of effort in the fishery. No more licenses will be issued.

Due to the highly selective fishing methods employed in the SSMF, this fishery is reported to produce no bycatch or byproduct. The fishing methods are also expected to minimise the likelihood of operators interacting with protected species. No interactions with such species have been reported, and the only potential for interaction with protected species is likely to be through boat strikes. Ecosystem impacts could result from damage to the sea floor during anchoring. However, such impacts are considered to be negligible.

The SSMF is managed under the Western Australian *Specimen Shell Management Plan 1995* and the *Fish Resources Management Regulations 1995* in force under the legislative framework of the Western Australian *Fish Resources Management Act 1994*.

Overall assessment

The material submitted by DFWA indicates that the SSMF operates in accordance with the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. DEH considers that the SSMF 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 impact is minimised in the longer term. Overall, the precautionary management regime of input controls including limited entry, gear restrictions, and restricted fishing areas suggest that the fishery is being managed in an ecologically sustainable way.

In making its assessment, DEH considers that the information collection system, precautionary seasonal closures and management arrangements are sufficient to ensure that the fishery is conducted in a manner that does not lead to over-fishing. Considering the management arrangements in place and the selective and benign characteristics of the harvest method operations, DEH considers that fishing operations are managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem.

The assessment finds that the fishery is managed in an ecologically sustainable way and its operation is consistent with the objects of Part 13A of the EPBC Act. DEH recommends that the export of species taken in the fishery should be exempt from the export requirements of Part 13A of the EPBC Act, with that exemption to be reviewed in 5 years. DEH considers that the fishery, as managed in accordance with the management plan is not likely to cause serious or irreversible ecological damage over this period.

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 area of the fishery include marine turtles and dugongs. However, the nature of the fishing methods makes it highly unlikely that interactions with protected species would occur. The only potential impacts to protected species are those associated with small vessel operations generally, such as boat strikes. However, given the small number of operators within this

fishery, this type of interaction is also considered to be low. Therefore, 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 Western Australian *Specimen Shell Management Plan 1995* 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 plan relates does not, or is not likely to, adversely affect the survival in nature of listed threatened species or 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 Western Australian *Specimen Shell Management Plan 1995* 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 Western Australian *Specimen Shell Management Plan 1995*, would not be expected to have a significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

The assessment also considered the possible impacts on the World Heritage values of the Shark Bay World Heritage Area (WHA). Given that areas of Shark Bay are closed to fishing, the fishery is relatively small in scale and the fishing methods are relatively benign, it is considered that the fishery is unlikely to compromise the World Heritage values for which Shark Bay was listed. On this basis DEH considers that an action taken by an individual fisher, acting in accordance with the SSMF management plan, would not be expected to have a significant impact on the World Heritage values of the Shark Bay WHA.

To further strengthen the effectiveness of the management arrangements for the SSMF, and to contain the environmental risks in the medium to long term, DEH has developed a series of recommendations. The implementation of these and other commitments made by DFWA in the submission will be monitored and reviewed as part of the next DEH review of the fishery in 5 years time.

Recommendations

1. DFWA to advise DEH of any material change to the SSMF's management arrangements that could affect the criteria on which EPBC Act decisions are based, within 3 months of that change being made.
2. DFWA to ensure, where appropriate, that any relevant conservation and recreational interests in the fishery are considered through consultative mechanisms.
3. The ESD Report, including all performance measures, responses and information requirements to be incorporated into the management regime and decision making process.
4. DFWA, in its Annual State of the Fisheries Report, to report on the performance of the fishery against performance measures that relate to the sustainability of the fishery, once developed.
5. Within 18 months, DFWA to develop precautionary performance indicators and performance measures, linked to the existing objectives, for high-risk target species based on the best available information.
6. Within two years, DFWA to develop and implement a compliance strategy which includes clear management actions to address compliance risks identified in the 2003 compliance risk assessment undertaken for the SSMF.

7. DFWA to implement the recording of specimen shell status (alive/dead) in logbook returns.
8. DFWA to review the research information needs and priorities to meet the management information and performance measurement needs of the fishery. Analysis of research needs should take into account any gaps in the basic biological parameters required for the ecologically sustainable management of specimen shell species. DFWA to develop a research strategy to address identified priority areas and explore ways to cooperatively share in or take advantage of research done in other specimen shell fisheries.
9. Within 6 months DFWA to undertake and document:
 - a. a risk assessment to assess the likely extent and impact of the recreational and 'shamature' harvest of specimen shells in Western Australia and factor results of this assessment into the future management of the SSMF; and
 - b. a recreational shell collecting data workshop to assess the data needs, economic availability of data and funding required to provide reliable estimates of the recreational harvest of specimen shells in Western Australia.

PART I - MANAGEMENT ARRANGEMENTS

The Western Australian Specimen Shell Managed Fishery (SSMF) is managed by the Department of Fisheries, Western Australia (DFWA).

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

- the *Specimen Shell Management Plan 1995*;
- the *Fish Resources Management Act 1994* (FRMA);
- the *Fish Resources Management Regulations 1995* (FRMR); and
- relevant Gazetted notices and licence conditions.

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

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

Recommendation 1: *DFWA to advise DEH of any material change to the SSMF's management arrangements that could affect the criteria on which EPBC Act decisions are based, within 3 months of that change being made.*

The SSMF is managed under the *Specimen Shell Management Plan 1995*, which came into force in 1995. In drafting the plan, DFWA consulted with various fishery stakeholders, including the Western Australian Professional Shell Fishermen's Association of Western Australia (WAPSFA) and the WA Fishing Industry Council (WAFIC). The submission notes that any subsequent review or amendments to the management plan would again include a forum of discussion in which interested stakeholder's views and opinions would be formally determined and considered. Meetings held with the SSMF typically involve the WAPSFA, WAFIC and Departmental staff to discuss management, research and compliance issues in the fishery and provide a forum for Industry to raise concerns and participate in decision making regarding the management arrangements of the fishery.

DFWA report that some licensees from the SSMF have recently reactivated the WAPSFA to create a more useful communication base for the fishery, by providing DFWA staff with direct links to the SSMF licensees and being invited to Association meetings. DEH considers this will improve consultation with industry members regarding the management of the SSMF.

DEH recognises that DFWA have ensured good consultation with industry however DEH encourages DFWA to ensure stakeholders such as conservation groups, recreational fishers and the general public are also consulted.

Recommendation 2: *DFWA to ensure, where appropriate, that any relevant conservation and recreational interests in the fishery are considered through consultative mechanisms.*

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.

When finalised 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 for the SSMF 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 is currently in force. The Ministerial Policy Guidelines will provide the policy framework for the management of each fishery.

Recommendation 3: *The ESD Report, including all performance measures, responses and information requirements to be incorporated into the management regime and decision making process.*

DEH notes that ESD Component reports are developed by DFWA and these contain an evaluation of the performance of the fishery based upon the framework described in the Fisheries ESD policy. The ESD report will be reviewed every 5 years. In addition, DEH considers that the “State of the Fisheries” report that is produced annually by DFWA provides valuable information about the status of fish resources under WA management. However, 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 SSMF, 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 3**).

Recommendation 4: *DFWA, in its Annual State of the Fisheries Report, to report on the performance of the fishery against performance measures that relate to the sustainability of the fishery, once developed.*

The ESD report contains a number of objectives specific to the target species taken in the SSMF. It describes a preliminary performance measure for target species, which entails a catch range of 10,000 to 25,000 shells per year.

The SSMF also has a catch rate performance measure of 10 to 40 shells per day. While DEH recognises this is a developmental fishery, under current effort levels (1110 to 1353 days) this would equate to a harvest range of approximately 11,000 and 54,100 shells, before triggering. This is not consistent with the performance measure discussed earlier for catch.

DEH considers that this objective aims to ensure that take of the target species from this fishery is managed in an ecologically sustainable manner, however the broad range of the current performance measures does not appear to be precautionary. DEH considers that precautionary performance measures for key target species would ensure that DFWA is able to monitor the fishery and respond to any changes should they occur. DEH recognises that a wide range of species are taken in the fishery and considers that performance measures could be targeted to those species considered to be at risk of over-fishing.

Recommendation 5: *Within 18 months, DFWA to develop precautionary performance indicators and performance measures, linked to the existing objectives, for high-risk target species based on the best available information.*

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 3 months for subsequent management review and action with timeframes for implementation.

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

- limited entry with 33 licensees;
- gear restrictions;
- rotational closures; and
- restricted fishing areas.

The management plan for the SSMF provides the legislative ability to control the level of harvest within the fishery, through the use of these input controls.

There are currently no mandatory species or size limits for specimen shells taken in this fishery. Species in highest demand are those that are most rare, therefore making them the most valuable. There is also strong economic pressure to select the largest specimen shells as they fetch the highest prices.

There is no documented recreational take in the SSMF fishery, however if the public decide to collect shells for their own private collection they are permitted to do so. DFWA expects that the recreational collection of shells is significant, but mostly consists of dead beach washed shells.

Recommendation 9 has been designed to address this issue.

Rotational closures may also be used to manage local stock depletion. If a closure was implemented, the prime consideration for reopening the closure will be the abundance of specimen shells within the area, in comparison to areas adjacent that are open for specimen shell collection. Rotational and seasonal closures are particularly effective for near shore areas where the cost of enforcement is minimal. To date no rotational closures have been used given the small size of the fishery.

DFWA has limited compliance resources dedicated to the SSMF, however the emphasis of the management framework on specific effort restrictions and licensing requirements (for authorised “collectors”) allow a relatively small effort to ensure some compliance. A number of compliance measures to ensure compliance in the fishery are utilised. These include:

- checks of licences and reporting of catch;
- random inspections of vessels at sea and catch on landing;
- ongoing collection of data on illegal activities;
- comparative data on the relative effectiveness of certain compliance techniques; and
- monitoring of closed areas.

In March 2003, DFWA conducted a compliance risk assessment of the SSMF to identify compliance issues. The objectives of the risk assessment workshop were:

- to identify and assess the severity of the compliance risks associated with the fishery and provide justification for the rankings assigned;
- to identify current and future compliance activities that could be undertaken to prevent the risks identified; and
- to identify any policy, management or legislative deficiencies with the fishery that may impact on the effectiveness of any compliance activities.

DEH notes that the compliance risk assessment undertaken in 2003 raised concerns related to proficient compliance checks under the current management arrangements conducted in the fishery. DFWA states that these gaps and problems relating to compliance within the SSMF will be dealt with when next reviewing the management plan. While DEH commends DFWA for having undertaken a compliance risk assessment, DEH considers it important that DFWA develop a compliance strategy to address these identified risks as a priority.

Recommendation 6: *Within two years, DFWA to develop and implement a compliance strategy which includes clear management actions to address compliance risks identified in the 2003 compliance risk assessment undertaken for the SSMF.*

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

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.

DEH considers that the current management arrangements comply with 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 (UNCLOS). The SSMF management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery, for example the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate requiring that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the submission, the fishery's compliance with their requirements can be assessed by examination of Part Two of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is explicitly discussed under Principle 2, Objective 3.

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

The fishery area encompasses a number of marine parks, including Rowley Shoals Marine Park, Ningaloo Marine Park and Shark Bay Marine Park and Fish Habitat Protection Areas in WA. Specimen shells cannot be taken in all or part of these areas, and are therefore unlikely to have a significant impact on these areas.

The SSMF fishery area encompasses the Shark Bay WHA, however fishing in this area is not permitted. 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. As the SSMF is not permitted to operate in any of the Marine Parks, Aquatic reserves and closed waters or the Shark Bay WHA, the World Heritage values for which Shark Bay was listed are unlikely to be impacted in the next five years. Any significant change to existing practices, which is likely to significantly impact on Shark Bay's World Heritage values, will require approval by the Australian Government Minister for the Environment and Heritage, or his delegate.

Conclusion

DEH considers that the SSMF management regime is documented, publicly available and transparent, and is developed through a consultative process. The management arrangements are capable of controlling the harvest through a combination of input controls appropriate to the size of the fishery. Periodic review of the fishery is provided for, as are the means of enforcing critical aspects of the management arrangements.

The management regime takes into account arrangements in other jurisdictions, and adheres to arrangements established under Australian laws and international agreements.

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

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

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

Maintain ecologically viable stocks

Objective 1: *‘The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability’*

Information requirements

Fishery dependent data are obtained through compulsory daily logbooks, which are provided to DFWA on a monthly basis under the statutory catch and effort system (CAES) and contain information on:

- catch (individuals caught and species type);
- spatial area (10x10 nmile grids); and
- days and hours fished by month and year.

The SSMF has been reporting on a scale of 10x10 nmile blocks since August 2004. Prior to this fishers were required to report on 60x60 nmile grids. The finer scale reporting was implemented predominately due to the multi-species nature of the fishery and to provide more accurate information relating to the distribution of certain species. Licensees have also been voluntarily reporting the number of shells seen versus the number of shells collected for the eight species that were identified as vulnerable by Ponder and Grayson, 1998 (Table 2). DEH commend DFWA for the development and implementation of these management measures, which should assist in maintaining the ecological sustainability of this fishery.

DEH is satisfied that the level of fishery dependent information provided from the SSMF is appropriate to the size of the fishery. However, DEH considers that reporting could be improved through a requirement to record the number of dead and live specimens taken. This requirement is currently in place in the Queensland Marine Specimen Shell Collection Fishery, and DEH considers that such information would give DFWA a better indication of the likely impacts that harvest of specimen shell species may be having on the spawning biomass of target species and on the ecosystem (for example through food chain interactions).

Recommendation 7: *DFWA to implement the recording of specimen shell status (alive/dead) in logbook returns.*

No fishery independent data is collected for the specimen shell fishery because the effort exerted in the fishery currently is not considered to pose any significant environmental threats. DEH recognises this, but considers that management of the fishery would be improved by some research into species taken by the fishery to address current knowledge gaps, particularly in relation to the distribution, biology and stock status of specimen shells in WA. This is particularly important given

that the submission acknowledges that WA waters contain a number of highly valued shells endemic to WA. While extensive research on the target species may not be possible, DFWA should have a clear idea of what research is essential for improved management of the fishery into the future. DEH encourages DFWA to identify the research and performance assessment needs and priorities for the fishery and to articulate these in a strategic research plan that can be used to direct research efforts into the future.

Recommendation 8: *DFWA to review the research information needs and priorities to meet the management information and performance measurement needs of the fishery. Analysis of research needs should take into account any gaps in the basic biological parameters required for the ecologically sustainable management of specimen shell species. DFWA to develop a research strategy to address identified priority areas and explore ways to cooperatively share in or take advantage of research done in other specimen shell fisheries.*

The information provided by the specimen shell harvesters is not validated through formal means, for example through processor returns. However some data validation is obtained through random inspections of vessels at sea and of catch on landings.

Overall, DEH considers that there is a reliable information collection system in place appropriate to the scale of the fishery. However, DEH considers that a strategic approach to future research, and continuation of existing data collection systems will be important for the future management of the fishery.

Assessment

The submission states that DFWA currently monitor the status of the fishery through an analysis of the information contained in the monthly CAES returns. These returns provide DFWA with quantitative information of the catch, effort and catch rates for the fishery on a monthly basis. DFWA state that during the past three years the fishery has maintained or increased the catch rate whilst collecting specimen shells. The 5-6 most consistent fishers tend to fish in areas closest to their homes, and there has been no movement into new areas during recent years to maintain catch rates.

It has not been possible to undertake species-specific population assessments for this fishery due to the very low catch rates and broad spatial and temporal distribution of fishing effort in the commercial fishery. An annual review of the catch of commercially important species and effort in major areas is undertaken to give a general indication of the status of harvested species, including any spatial trends in effort and collection levels.

It is unclear as to what level of effort is sustainable and there is potential for current effort levels to increase given that 50% of effort is accounted for by one fifth of the license holders. DEH is concerned that should effort increase to unsustainable levels there are no triggers currently in place to monitor these trends, and increased effort may create localised depletion within the fishery.

No stock assessment has been conducted for WA specimen shell species, and the submission states that there is currently no research basis from which to determine ecologically sustainable specimen shell effort in WA waters. Analysis of commercial logbook data has shown a trend of decreased effort over the past years. DEH considers that this, combined with the low level of take, means it is likely that only a small proportion of the populations of target species is impacted through harvesting activities.

Preliminary performance measures have been developed for the SSMF which include of a total annual catch range from 10,000 to 25,000 shells, and a catch rate performance measure of 10 to 40 shells per day. Both measures encompass the annual catch range from 2000 to 2003. These preliminary measures have been developed to ensure that any major variations in fishing patterns are noticed and investigated. Though a catch range may be triggered, it is worth noting that it may not necessarily indicate a problem with stock but rather fluctuations in the natural environment or market dynamics. DEH considers that this objective aims to ensure that take of the target species from this fishery is managed in an ecologically sustainable manner, however the broad range of the current performance measures does not appear to be precautionary. The implementation of **Recommendation 5** will ensure that DFWA is able to monitor the fishery and respond to any changes should they occur.

Take by the recreational sector is not documented, however if the public collect shells for their own private collection they are permitted to do so. While the limited entry to the fishery restricts potential take by commercial harvesters, the potential harvest by recreational fishers is much larger and should be taken into account when assessing the stock status of specimen shell species. It is thought that the recreational collection of shells is significant but mostly consists of dead shells.

There are no possession limits for recreational harvest, however DFWA's submission state that with the next review of the management plan a bag/possession limit for the recreational sector of the fishery will be considered.

DEH is concerned that, since there is currently no data collection on take of specimen shells by the recreational sector, the impact of removals by this sector is not taken into account during annual assessments of the fishery.

Recommendation 9: *Within 6 months DFWA to undertake and document:*

- a. *a risk assessment to assess the likely extent and impact of the recreational and 'shamature' harvest of specimen shells in Western Australia and factor results of this assessment into the future management of the SSMF; and*
- b. *a recreational shell collecting data workshop to assess the data needs, economic availability of data and funding required to provide reliable estimates of the recreational harvest of specimen shells in Western Australia.*

DFWA suggest that with approximately 550 species of shells being collected in SSMF, data cannot be obtained on the population levels of all species. However, a report produced by Ponder and Grayson (1998) prompted DEH to consider several taxa of cowries (*Cypraea*) and volutes (subspecies of *Amoria damonii*) to be of possible concern. Enzer investigated these in detail in 2002.

Ponder and Grayson (1998) examined the specimen shell fishery on a national basis. They established a ranking system of five categories to determine those species at highest potential risk to over-fishing. The analysis reached essentially similar conclusions to those reached by Enzer (2002). *Cypraea (Z.) friendii vercoi* was the only species listed as being of potential concern by Enzer (2002) and was also rated as being of highest potential risk by Ponder and Grayson (1998). The submission outlines greater detail into the findings of this report. Enzer (2002), similarly, concluded there is little risk to any of the three subspecies of *Amoria damonii* from the SSMF. The populations of specimen shell species are widely distributed both geographically and from very shallow waters across the entire continental shelf. Only small numbers of each species are collected, and these shells come from only a small portion of the available habitat, therefore there is little concern for

the SSMF impacting significantly on breeding stocks. The WAPSFA states in its “code of practice” that one of its fishing requirements is that molluscs sitting on an egg mass are not allowed to be collected. DEH concludes that this would assist in protecting the spawning stock.

The target species are typically found in deeper waters that are inaccessible to divers (the biological characteristics of these species is discussed in the Executive Summary). The inability of divers to access these deep water populations suggest that these species are at low risk from the SSMF. All of the shells in the fishery come from depths of less than 60 m, and most are from shallower depths. Therefore, DEH considers that as there are areas where specimen shells are unable to be collected and can continue to breed, there is no obvious threat posed by the SSMF to those vulnerable specimen shell species.

Enzer’s (2002) report demonstrated that there is low risk to any of the *Cypraea* species under consideration from the SSMF as all species, even the prized subspecies, occur over wide ranges geographically (in the hundreds or thousands of kilometres). *Cypraea* species have a wide depth distribution from the intertidal zone to a recorded depth of 200 m, where a substantial portion of the population cannot be collected. Even in shallow water, many localities cannot be collected from because of the lack of access to the beach and the small (<8 m) boats used by the fishery. Additionally, collecting is prohibited in many of the more easily reached areas as they are now in marine parks and reserves. Based on the catch data for 2001, *Cypraea (Zoila) venusta*, the species with the highest catch on a square kilometre basis had a catch of only 0.0035 animals/ km², or one individual for every 286 km².

Management response

The current SSMF management regime aims to maintain ecologically viable stock levels through a range of measures. These are outlined in Table 1 and Part One of this report.

A number of management measures are currently in place to control take of specimen shell species in WA. The limited entry in this fishery has resulted in only 33 licenses being issued, of which there are 5-6 fishers who utilise 50% of the effort in the SSMF. DFWA is satisfied that the commercial licence holders are fulfilling the objectives outlined in the management plan. DEH is confident that the limited entry policy in the SSMF will aid in ensuring the ecologically sustainable harvest of specimen shell species.

DEH considers that the management arrangements outlined in the management plan for this fishery, combined with the regulations detailed in the *Fish Resources Management Regulations 1995*, are capable of controlling the level of commercial take of specimen shells in WA, and acknowledges that within current levels of harvesting, there is no indication that the resource is threatened. This is supported by the fact that to date, no rotational closures have been implemented in response to breaches of the precautionary performance measure currently in force.

Recommendation 5 should assist in ensuring that management arrangements in place in the SSMF provide for the ecologically sustainable management of the fishery.

Measures such as gear restrictions, spatial closures, prohibition of the take of molluscs from an egg mass and of those depositing an egg mass, and restrictions on species allowed to be harvested, are measures likely to ensure that the fishery is managed in an ecologically sustainable way. DEH commends DFWA for employing a precautionary approach to this fishery in the absence of knowledge regarding sustainable harvest levels.

Currently, no specific authorities are required for the collection of marine shells for private use by the recreational sector. As noted earlier, DEH is concerned that the recreational take of specimen shells is significantly high and there is currently no estimate of take by the recreational sector. DEH

has made a recommendation addressing the issue of recreational take (see **Recommendation 9**), and is confident that DFWA will use the information generated to adequately manage the specimen shell resource.

In March 2003 a compliance risk assessment workshop identified the need for bag/possession limits for the recreational take of specimen shells. DFWA are considering the implementation of bag/possession limits when the management plan is reviewed.

While the fishery only has 5-6 major fishing operators, there is still potential for localised depletion to occur in the SSMF in the future. DFWA's submission states that the majority of specimen shell collectors fish in areas close to their homes. Effort expended over a small area does render the specimen shell stocks vulnerable to localised depletion, however DEH considers that the current catch rates and relatively small number of operators within the SSMF limit the potential for localised depletion. DFWA state that should localised depletion occur rotational closures may be used to manage this. To date rotational closures have not been used.

No byproduct is authorised to be taken in the SSMF, therefore no information, assessment or management response regarding byproduct is needed for this fishery.

Conclusion

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

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

Promote recovery to ecologically viable stock levels

Objective 2: *'Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes'*

This objective is not applicable to the fishery at present, however without established performance indicators and measures, the point at which specimen shell species are considered overfished is not defined. As noted earlier, DEH consider that reference points are important as they provide a measure against which to assess the sustainability of specimen shell stocks. It is also important that appropriate time frames for management intervention are outlined. A recommendation regarding the development of performance indicators and measures has been made (see **Recommendation 5**).

Conclusion

DEH considers that the specimen shell stock taken in the SSMF is not over-fished. Should over-fishing occur in the future, the fishery is conducted such a way 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

Due to the highly selective nature of the harvesting techniques employed, potential for bycatch is limited. No studies on the potential for the SSMF to impact on bycatch species have been performed. DEH does not consider that such information collection systems are required for this fishery.

Assessment

As noted above, no bycatch has been recorded for the SSMF, primarily due to the harvesting techniques employed. Clearly bycatch would not occur when specimen shells are harvested by hand, which is the predominant method used in the SSMF. DEH considers that discards of target species are also unlikely to occur in this fishery since the requirement for shells to be undamaged means that the commercial harvester usually passes over damaged shells without interaction. Because of the limited ability of the fishery to result in bycatch, no formal bycatch risk assessment has been completed. DEH does not consider that such a risk assessment is necessary for this fishery.

Management response

Impacts to bycatch species are primarily avoided through the use of hand harvesting. In addition, the limited scale of the fishery and the small number of operators helps to avoid bycatch in the SSMF. For these reasons, there are no threat abatement plans, recovery plans or bycatch reduction strategies relevant to the fishery. As noted above, DEH does not consider that specific bycatch minimisation measures are necessary for the fishery.

Conclusion

While no bycatch species are taken in the SSMF currently, DEH expects that should this situation change, or a risk assessment process indicate otherwise, DFWA would undertake appropriate actions to ensure that bycatch species are not threatened by this fishery.

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

Information on protected species interaction is not recorded in the logbooks used in the SSMF. As with bycatch, this is due to the limited opportunity for the fishery to impact on non target species. DEH recognises that interactions with protected species are unlikely to occur in the fishery, and as such, does not consider that a formal recommendation regarding reporting of protected species

interaction is appropriate. In the event of an interaction occurring it must be recorded to both DFWA and DEH.

Assessment and Management Responses

Interactions with protected species in the SSMF are considered unlikely because of the low levels of effort expended and the benign harvesting method (hand harvesting), although interactions with protected species could occur through boat strikes. While recognising that interactions of this nature are possible, DEH considers that since only a small number of vessels operate in the fishery the likelihood that such interactions would be significant is minimal. No threatened ecological communities have been identified as occurring in the area of the SSMF. For these reasons, no assessment has been undertaken and no specific management arrangements relating to ecological communities have been employed in the SSMF, apart from Marine Park closures.

DEH considers that there is no need for a formal risk assessment with regard to protected species for the SSMF, given the low likelihood of interaction with such species. DEH is confident that, if this situation were to change, DFWA would respond appropriately to mitigate such impacts.

Conclusion

DEH notes that there are minimal interactions with protected species in this fishery 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 would be undertaken to ensure the fishery avoids mortality or injury to these species and avoids or minimises impacts on threatened ecological communities.

Minimising ecological impacts of fishing operations

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

Information requirements

No studies have been undertaken to document and quantify the impacts on the ecosystem of activities associated with the SSMF. The submission acknowledges that currently little to no information is collected on the effects of commercial specimen shell fishing on the general ecosystem. While aware of the lack of information collection and research covering the fisheries impact on the ecosystem and environment generally, DEH considers that the amount of information available currently is appropriate to the size and scale of the fishery.

Assessment

Despite the lack of information collected from the SSMF regarding ecosystem impacts, the fishery is generally thought to have minimal impacts on the ecosystem due to the benign collection method and the (low) level of harvest. Consequently, no risk assessment of impacts on the ecosystem has been conducted. DEH concludes that though there is potential for effort in the SSMF to increase, no more licenses are to be issued in the future which suggest that the risk of effort increasing significantly is low in the short term. DEH suggests that DFWA conduct a review on the suitability of current management arrangements and develop appropriate triggers and response processes within nominated timeframes and include a trigger for the activation of latent effort.

The most likely impact on the natural ecosystem would arise from the exploitation of the target species and its impact on the size of the spawning biomass of molluscs. While potentially this could be problematic for this fishery the harvest from the SSMF is fairly low with approximately 20,372 shells harvested in 2003. DEH considers that is of relatively low concern due to the large areas in which they are taken. Therefore DEH considers that it is highly unlikely that the spawning biomass of mollusc species would be significantly impacted.

The SSMF targets the shell portion of mollusc species and as such, the mollusc flesh is discarded. The practise of discarding overboard could potentially impact on the ecosystem by providing a food source to scavenger species, which could disrupt local food chain processes. Given the need for specimen shells to remain in pristine condition, it is unlikely that the operator would hurriedly discard mollusc flesh while onboard, but would rather take the molluscs back to land to be processed properly. Consequently, DEH considers that food chain impacts caused by discarding mollusc flesh overboard are highly unlikely in the SSMF.

The removal of mollusc species could also potentially have an impact on marine food chains, given that a number of species are known to feed on molluscs. However, as noted above, only a small number of specimens are taken in this fishery. The management arrangements currently in place, such as limited entry and fishing restrictions on specimen shell species are likely to ensure that this remains so. For these reasons, DEH considers that impacts to food chain interactions are unlikely to be significant.

Physical habitat, such as reefs, could potentially be damaged through anchoring or through diving activity, while water quality could be impacted by spillage of fuel and oil from vessels and hookah compressors. However, DEH considers that such impacts are likely to be isolated and negligible since there is only a small number of operators and vessels used in this fishery. The submission notes that, if the fishery is found to be impacting on ecological communities, assessment and implementation of mitigation measures will be undertaken as appropriate.

Management response

No evidence has emerged to suggest that shell collection in WA has a significant impact on the ecosystem. The lack of observed impact is likely to be due to the low level of harvest in the fishery, the low number of participants and the benign nature of the harvesting method.

The area of the fishery encompasses the Shark Bay WHA, therefore consideration needs to be given to potential impacts on this matter of national environmental significance by the SSMF. However, DEH considers that the fishery, if operated consistently with the current management regime, is unlikely to have a significant impact on the World Heritage values of Shark Bay.

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

Conclusion

The SSMF encompasses the Shark Bay WHA, and as such, impacts to this matter of national environmental significance have been considered. DEH considers that the spatial restrictions on fishing within Shark Bay, the benign harvesting methods and the level of take, ensure that impacts to this WHA are minimal. On this basis, DEH considers that an action taken by an individual fisher,

acting in accordance with the fishery management regime, would not be expected to have a significant impact on the WHA protected under the EPBC Act.

DEH considers that the fishery is conducted in a sufficiently precautionary manner, particularly through the use of hand harvesting and the low number of operators, and that these measures minimise the impact of fishing operations on the ecosystem generally

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LIST OF ACRONYMS

CAES	Catch and Effort System
DEH	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
FRMA	<i>Fish Resources Management Act 1994</i>
FRMR	<i>Fish Resources Management Regulations 1995</i>
MARPOL	International Convention on Marine Pollution
OCS	Offshore Constitutional Settlement
SSMF	Specimen Shell Managed Fishery
UNCLOS	United Nations Convention on the Law of the Sea
WA	Western Australia
WAFIC	Western Australia Fishing Industry Council
WAPSFA	Western Australian Professional Shell Fishermen's Association
WHA	World Heritage Area

