

# Ecological Assessment of South Australian Commercial Miscellaneous Dive Fishing Activities

REASSESSMENT REPORT INCORPORATING HARVEST OF SEA  
URCHIN, SPECIMEN SHELL, SCALLOP AND TURBO

FOR THE PURPOSES OF PART 13 AND 13(A) OF THE ENVIRONMENT PROTECTION AND  
BIODIVERSITY CONSERVATION ACT 1999

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## Purpose

The purpose of this report is to provide an assessment of commercial South Australian miscellaneous dive fishing activities. This report collates information for the commercial harvest of scallops, turbo, specimen shells and sea urchins. The harvest of these species by divers is now collated as a collective miscellaneous dive fishing activity and includes harvest of native oysters.

This report updates information provided to the Australian Government Department of Environment, Water, Heritage and Arts (now known as Department of the Environment and Energy; DotEE) in 2010 for assessment of the South Australian Scallop and Turbo Fishery, the South Australian Specimen Shell Fishery; and in 2011 for the South Australian Sea Urchin Fishery against the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The report has been prepared by the Fisheries and Aquaculture Division of the Department of Primary Industries and Regions South Australia (PIRSA) in accordance with the *Guidelines for the Ecologically Sustainable Management of Fisheries 2<sup>nd</sup> Edition*, and particularly addresses the level of change that has occurred since the 2010/2011 assessments.

## Background

Miscellaneous dive fishing activities are used in South Australia by fishers to target a range of species harvested by hand using SCUBA, hookah and/or snorkeling gear. Fishers may be assisted by hand held implements.

Miscellaneous dive fishing activities are not formally identified as a discrete fishery under the *Fisheries Management Act 2007*. Rather the activity forms part of the broader Miscellaneous Fishery, noting that some species including native oysters and scallops, are also included as prescribed species in the Marine Scalefish Fishery. Miscellaneous dive fishing activities are mainly regulated under the:

- *Fisheries Management (Miscellaneous Fishery) Regulations 2015*
- *Fisheries Management (General) Regulations 2017*

At the time of developing this policy, PIRSA was considering a number of applications for Exploratory and Developmental fishing permits related to miscellaneous dive fishing activities under the *Fisheries Management (Miscellaneous Developmental Fishery) Regulations 2013*.

PIRSA had developed a policy for the management of miscellaneous dive fishing activities including:

- A description of the biological, ecological and economic characteristics of the activity
- Identification of risks and strategies for addressing those risks identified as high or medium
- Methods for monitoring the performance of the activity and the effectiveness of the management policy, including performance indicators, trigger points for review or action and progress reporting

The policy was finalised in December 2017 following consultation with key stakeholders in the activity. A copy of the policy is attached (PIRSA 2017a, **Attachment 1**).

This policy applies to the commercial harvest of species of scallops, sea urchins, turbo, native oysters, as well as several families of specimen shells. This policy does not include commercial or recreational harvest of any Abalone species by diving. The Abalone Fishery is covered in separate fisheries regulations and management plans.

## Level of assessment

The South Australian Scallop and Turbo, and Specimen Shell fisheries were assessed in 2010 and the list of exempt native specimens was amended to include species taken in the South Australian Scallop and Turbo Fishery, and South Australian Specimen Shell for a period of five years. The South Australian Sea Urchin Fishery was assessed in 2011 and the list of exempt native specimens was amended to include species taken in the South Australian Sea Urchin Fishery for a period of five years. Since the last assessments there have not been significant changes in most areas of interest as outlined in page 5 of the *Guidelines for the Ecologically Sustainable Management of Fisheries 2<sup>nd</sup> Edition (2007)*. Any changes have been communicated to DotEE in annual reports provided by PIRSA.

**Table 1:** Level of assessment required by South Australian Miscellaneous Dive Fishing Activities

Issue	Area of Interest	Yes	No
Fishery	Has there been any change to management arrangements, and/or fishing practices?		X
External Influences	Has there been any change to an environmental issue/influence outside of the fishery management agencies control?		X
Interaction with protected species	Has there been any change in the nature, scale, intensity of impact, and/or management response?		X
Ecosystem impact	Has there been any change in the nature, scale or intensity of impact, and/or subsequent management response?		X
Target Stock Status	Has there been any change in the target stock status?		X
By-product/ bycatch status.	Has there been any change in the by-product and/or bycatch stock status?		X

Considering the above, the level of submission requirement for the South Australian Miscellaneous Dive Fishing Activities is 'Standard'.

## Description of the activity

Miscellaneous dive fishing activities target multiple species harvested by hand using SCUBA, hookah and/or snorkeling gear including scallops, sea urchins, turbo, native oysters. In the future these activities may also apply to collection of specimen shells. Fishers may be assisted by hand held implements.

The area of activity across all species considered in this policy includes marine waters adjacent to the South Australian coast from the Victorian Border to the Western Australian Border except within Aquatic Reserves, Marine Park sanctuary zones or restricted access zones (unless otherwise authorised under the *Marine Parks Act 2007*) and waters seaward of the line of Mean High Water Springs to a depth of 2 m, and if those waters extend past the low water mark, not waters landward beyond the low water mark line.

Commercial fishers utilising miscellaneous dive fishing activities may hold a Miscellaneous Fishery licence granted under *Fisheries Management (Miscellaneous Fishery) Regulations 2015*. Historically, some commercial fishing using diving activities has been undertaken under a Ministerial exemption under section 115 of the *Fisheries Management Act 2007*. There are currently four Miscellaneous Fishery licences and two Ministerial exemptions issued in South Australia for the commercial harvest of species harvested by miscellaneous dive fishing activities.

Management arrangements for managing the activity are included in licence or exemption conditions. Management arrangements currently in place include total allowable catch for some species, spatial restrictions, temporal closures, gear restrictions, limited entry, and a limit on the number of agents allowed to fish at any one time. Reporting of catch and effort is generally required. The management arrangements in place for miscellaneous dive fishing activities are described in the *Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities* (PIRSA 2017a).

The species harvested by miscellaneous dive fishing activities are found in waters throughout South Australia from intertidal, subtidal and shelf waters. They inhabit rocky reefs, seagrass beds, soft sand and mud. They may be dominant herbivores (e.g. sea urchins), or primary prey species for predators (e.g. scallops and turbo). Other species are important filter feeders that are important for water quality (e.g. native oysters).

## Commercial

PIRSA monitors catch and effort of miscellaneous dive fishing activities. However, due to the limited number of commercial fishers harvesting each species or species group, publication of confidential catch and effort information is not possible due to confidentiality requirements set out in the *Fisheries Management Act 2007*.

An ecologically sustainable development (ESD) risk assessment for miscellaneous dive fishing activities, including harvest of sea urchins, specimen shells, turbo and scallops was conducted in 2014 in consultation with key stakeholders using the methodology described by Fletcher et al. (2002). Public consultation on the ESD Risk assessment was carried out in August 2015. This risk assessment identified and prioritised risks according to their severity. The outcomes of this risk assessment has been considered in developing the policy for the management of commercial miscellaneous dive fishing activities. A copy of the ESD risk assessment is provided at **Attachment 2**.

## Scallops

The South Australian fishery for scallop is small-scale with low volumes of harvest of two species, commercial scallop (*Pecten fumatus* also known as king scallop) and queen scallop (*Chlamys bifrons*).

Commercial harvest of scallops has occurred since the 1970s with high variation in total catch and catch rate. There are currently three Miscellaneous Fishery licence holders that are permitted to hand-collect scallops while diving. These licences also allow for the harvest of sea urchins. Marine Scalefish Fishery licence holders are also permitted to harvest scallops but not by diving; hence, have little capacity to commercially harvest this species. The use of scallop dredges is prohibited in South Australia.

Annual commercial catch of scallops in South Australia have fluctuated greatly since commercial harvest began, mainly driven by changes in participation rates of fishers (Ivey et al. 2013). The current management arrangements do include a minimum legal size limit of 6.5 cm for both the recreational and commercial fishery. There are no output controls for commercial harvest of scallops; however, there is no commercial harvest allowed in Coffin Bay.

## Sea urchins

Sea urchins are harvested for their roe which can constitute up to 10% of their body weight. Roe is considered a delicacy in many countries demanding high prices.

There are extensive sea urchin stocks found in Australia, however only three species (*Heliocidaris erythrogramma*, *Centrostephanus rodgersii* and *H. tuberculata*) have been commercially harvested due to variation in roe quality (colour and texture) and recovery rate. In South Australia, the only species currently harvested commercially is the purple sea urchin (*H. erythrogramma*).

The fishery in South Australia developed in the late 1990s. Currently the number of licences provided for the activity has decreased to three. These three licences also allow for the harvest of scallops.

The activity in South Australia usually operates prior to the spawning season between May and December when the quality of roe is optimal (Ivey et al. 2013). Harvesting of sea urchins is undertaken by hand by divers operating from small vessels in inshore waters. Urchins are transported live to Adelaide where they are processed. Harvesters remove approximately 40% of any sea urchins from an area (Ivey et al. 2013). There are no size limits or output controls for the activity.

The total catch of sea urchins in South Australia has fluctuated greatly over the period since the fishery began (Ivey et al. 2013).

### Turbo

Commercial harvest of turbo in South Australia targets turbo (*Turbo undulatus*), a gastropod snail. The product is sold domestically as well as some being exported to overseas markets. Harvest of turbo is currently undertaken all year round. The turbo catch from South Australia has grown since inception in 2000 to 2009 as has catch rates (Ivey et al. 2013). Catch, effort and catch rate has remained fairly stable since 2010 (based on SARDI confidential data).

The activity is currently permitted through exemptions provided to a limited number of fishers. Conditions on the exemptions limit fishing to hand collection with total allowable catches provided to individual fishers who are limited to operations in specific areas of South Australia. PIRSA is considering applications for Exploratory or Developmental Permits for the harvest of turbo.

### Specimen Shells

The Specimen Shell Fishery is based on the capture of multiple species from the following families: Cassidae, Olividae, Spondylidae, Cardiidae, Mactridae, Conidae, Solenidae, Clavagellidae, Carditidae, Marginellidae, Cypraeidae, Cymatiidae, Chitonidae, Naticidae, Neritidae, Harpidae, Turridae, Nassaridae, Columbidae, Patellidae, Voluntidae, Vasidae, Eulimidae, Muricidae, Scalidae, Fasciolaridae, Phasianellidae, Buccinidae, Acmaeidae, Fissurellidae, Siphonariidae, Mitridae, Cancellariidae, Liotiidae, Tellinidae, Thaididae, Triviidae, Trochidae and Veneridae.

Specimen shells are harvested by hand whilst diving to minimise the potential for damage and thereby maintaining the value of the shells, or of beach washed shells. Collection of specimen shells using remotely operated underwater vehicles is currently being considered under an Exploratory Permit application.

The harvest of specimen shells was previously permitted for a small number of fishers with Miscellaneous Fishery licences. There are currently no licences allowing for this activity. PIRSA are currently considering an application for a Exploratory or Developmental Permit for the collection of specimen shells.

### Native Oyster

The Australian native oysters (*Ostrea angasi*) is closely related to the European edible oyster (*O. edulis*) and is currently being developed as an aquaculture species in Australia. This species was once harvested in large numbers but due to a possible parasitic epidemic, the population failed (Edgar 2008).

There is one licensed fisher permitted to take native oysters by diving and by hand. Management includes setting a total allowable catch for the individual operator. A habitat enhancement project involving native oysters on artificial reefs in north-western Gulf St. Vincent is in progress.

## Management Arrangements

The following management arrangements for the harvest of aquatic resources (other than abalone) that include commercial dive fishing activities include:

### Harvest Strategies

- Harvest strategies developed for each species/species group have been developed to ensure the objectives, including sustainable harvest of aquatic resources are met.

- Trigger reference levels identified in harvest strategies for scallops, turbo and specimen shells to addresses risks identified in the ESD risk assessment.

#### Area of Harvest

- Licence/permit holders will have a set of defined areas from which they may operate.
- The area of operation excludes Aquatic Reserves, Marine Park sanctuary zones or restricted access zones (unless otherwise authorised under the *Marine Parks Act 2007*) and waters seaward of the line of Mean High Water Springs to a depth of 2 m, and if those waters extend past the low water mark, not waters landward beyond the low water mark line.
- Closed areas, for example a restriction on commercial harvest of scallops in Coffin Bay.

#### Harvesting activities

- The licence/permit holder may only harvest defined species pursuant to their licence/permit.
- The harvest of specimen shells from egg masses and of those depositing eggs is prohibited.
- Catch limits may apply.
- Minimum legal size limits apply.

#### Gear

- Harvest is restricted to collection by hand, assisted by hand held implements

#### Reporting

- Licence/permit holders provide submit catch and effort records.
- All licence/permit holders are required to complete records of any interactions with threatened, endangered or protected species in the Wildlife Interaction Logbook or as directed by the Minister.

The management arrangements for the miscellaneous dive fishing activities are described in the Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities. This policy includes:

- A description of the activity and the ongoing management arrangements
- Management objectives for miscellaneous dive fishing activities as well as strategies, performance indicators and reference levels for assessing the performance of the activity against the objectives
- A harvest strategy including performance indicators, target and trigger reference points and decision rules.

## Recreational

The recreational harvest for aquatic resources using underwater dive equipment, except for abalone, are limited. In 2013/14 the reported harvest of scallops by recreational fishers was 11.42 tonnes (Giri and Hall 2015) representing a 68% increase from the previous survey of recreational fishing (7.8 tonnes in 2007/08, Jones 2009). No other species relevant to miscellaneous dive fishing activities were reported as harvested by recreational fishers in 2013/14 (Giri and Hall 2015).

Diving was reported to be the method of collection on 1.7% of recreational fisher days (Giri and Hall 2015) noting that this effort would include recreational fishing for abalone and is therefore not representative of the proportion of recreational fishing effort in miscellaneous dive fishing activities.

Management arrangements for recreational fishers include:

- Daily limits on collection of black cowries
- Daily bag and boat limits for scallops
- Minimum legal size limit for scallops
- Prohibition of collection of benthic organisms from intertidal rocky reefs to a depth of 2 metres seaward of the line of Mean High Water Springs.
- Prohibition on collection within Aquatic Reserves, Marine Park sanctuary zones or restricted access zones (unless otherwise authorised under the *Marine Parks Act 2007*).



## External influences

An ecologically sustainable development (ESD) risk assessment of miscellaneous dive fishing activities was conducted by PIRSA using the methodology described by Fletcher et al. (2002). In this assessment all the ecological, economic and social factors that affect the management of the activity were prioritised by stakeholders at a workshop on 30 July 2014 from Negligible to High risk. The outcomes of the ESD risk assessment has informed development of strategies for achieving the objectives described in the report *Ecologically Sustainable Development Risk Assessment of Miscellaneous Dive Fishing Activities* (PIRSA 2017b, Attachment 2).

The outcomes of this assessment identified medium risk of the following external influences on the performance of the activity: physical environment (oceanographic, climate change, temperature and weather); toxins; toxic algae; exotic species; human induced changes (water quality) and other drivers such as economics impacting on operating costs.

## Interaction with protected species

Hand collection by divers is considered to be a benign method of capture and PIRSA is confident that fishers using miscellaneous dive fishing activities avoid capture and mortality of threatened, endangered or protected species. All commercial fishers report any wildlife interactions to PIRSA Fisheries and Aquaculture in wildlife interaction logbooks. The information in these logbooks is collated annually and a report published by SARDI. These reports are provided to DotEE annually. No interactions with protected species has been reported during harvest activities for any miscellaneous dive fishing activities since this reporting began. In addition, the ESD risk assessment of the activity ranked the risk to protected species as Negligible (PIRSA 2017b).

## Target stock status

Due to the limited extent of miscellaneous dive fishing activities the status of any stock harvested is currently not defined as there is insufficient data to conduct an assessment. However due to the low level of harvest and the extent of the stocks, it is considered unlikely that any stock would be at risk of being overfished over the extent of the activity.

## By-product and by-catch stock status

Hand collection by divers is considered to be a highly selective method of capture and PIRSA is confident that the activity avoids the capture and mortality of by-catch and there are no by-product species. In addition, the ESD risk assessment ranked the risk to by-catch species as Low or Negligible.

## Recommendations and conditions

The activities in fulfilment of the recommendations that are common across the previous approvals of the Scallop and Turbo, Specimen Shell and Sea Urchin fisheries are provided in Table 1. Progress towards meeting the recommendations and conditions that are particular to each species are addressed in Table 2, Table 3 and Table 4.

Table 1: Common recommendations and activity

No	Common recommendations	Actions	Progress
1	Operation of the fisheries will be carried out in accordance with the South Australian (SA) <i>Fisheries Management Act (2007)</i> , the <i>Fisheries Management (General) Regulations 2007</i> , and the <i>Fisheries Management (Miscellaneous Fisheries) Regulations 2000</i> .	The fisheries have been carried out in accordance with the <i>Fisheries Management Act 2007</i> and subordinate legislation	Ongoing
2	PIRSA to inform the DotEE of any intended amendments to the management arrangements that may affect the criteria on which EPBC Act decisions are based.	There have been no significant management changes that have required notification to DotEE in relation to miscellaneous dive fishing activities.	Ongoing
3	PIRSA to produce and present reports to DotEE annually as per Appendix B to the Guidelines for the Ecologically Sustainable Management of Fisheries - 2nd Edition.	Progress reports are provided to DotEE	Ongoing

Table 2: Scallop and Turbo (SASTF) – Recommendations/Conditions and activity

No	Proposed Strategies	Actions	Progress
R4	PIRSA to develop and implement a system to validate commercial logbook reporting of catch and effort in the SASTF.	Given the small scale and limited resources of the SASTF, the development and implementation of a system to validate commercial logbook reporting has not been prioritised. Commercial fishers will continue to submit monthly catch and effort returns to PIRSA.	Ongoing
C1	PIRSA to develop and implement a Policy Document outlining: <ul style="list-style-type: none"> <li>the ongoing management arrangements;</li> <li>management objectives; and</li> <li>trigger reference points, indicators and management responses for the Scallop and Turbo Fishery by 12 September 2013.</li> </ul>	<i>A Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities</i> (PIRSA 2017a) has been finalised and includes a description of: <ul style="list-style-type: none"> <li>the ongoing management arrangements;</li> <li>management objectives for the activity including for harvest of scallops and turbo.</li> <li>harvest strategy including performance indicators, target and trigger reference points and decision rules.</li> </ul>	Substantial

C2	PIRSA to conduct an ecological risk assessment (ERA) of the impacts of the Scallop and Turbo Fishery and develop and implement mitigation measures to address identified risks as appropriate by 12 June 2013.	An ESD risk assessment consistent with the ESD principles was undertaken for all species harvested by miscellaneous dive fishing activities including scallops and turbo. A copy of the report is attached.	Completed
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Table 3: Specimen Shell – Recommendations/Conditions and activity

No	Proposed Strategies	Actions	Progress
	There are no unique conditions or recommendations for the Specimen Shell Fishery are	N/A	N/A

Table 4: Sea Urchin – Recommendations/Conditions and activity

No	Proposed Strategies	Actions	Progress
R4	Upon finalisation of the 'Data Summary Miscellaneous Fishery' project, PIRSA to: <ul style="list-style-type: none"> <li>a. provide DotEE with a copy of the final report, subject to confidentiality provisions; and</li> <li>b. outline how the outcomes of the report will be incorporated into the management of the Sea Urchin Fishery.</li> </ul>	South Australian Miscellaneous Fishery Summary of Fisheries Data and Biological Parameters' report has previously been provided to DotEE.  An ESD risk assessment consistent with the ESD principles was undertaken for all species harvested by miscellaneous dive fishing activities including scallops and turbo. A copy of the report is attached.	Complete
R5	PIRSA to develop a Policy Document outlining: <ul style="list-style-type: none"> <li>a. the ongoing management arrangements; and</li> <li>b. management objectives</li> </ul> for the 'Miscellaneous' dive fisheries including, the South Australian Sea Urchin Fishery.	<i>A Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities</i> (PIRSA 2017a) has been finalised and includes a description of: <ul style="list-style-type: none"> <li>• the ongoing management arrangements;</li> <li>• management objectives for the activity including for harvest of scallops and turbo.</li> <li>• Harvest strategy including performance indicators, target and trigger reference points and decision rules.</li> </ul>	Substantial

## References

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PIRSA (2017a). Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities. Primary Industries and Regions South Australia, Adelaide.

PIRSA (2017b). ESD Risk Assessment of Miscellaneous Dive Fishing Activities. Primary Industries and Regions South Australia, Adelaide.

## Attachments

Attachment 1: *A Policy for the Management of the South Australian Commercial Miscellaneous Dive Fishing Activities*

Attachment 2: - ESD Risk Assessment of Miscellaneous Dive Fishing Activities