
South Australian Fisheries Management Series

Ecological Assessment of the South Australian Marine Scalefish Fishery

Reassessment Report

Prepared for the Department of Environment, Water,
Heritage, and the Arts

For the purposes of Part 13 and 13(A) of the Environment Protection and
Biodiversity Conservation Act 1999

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Resources South Australia**

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1 Purpose

This report has been prepared by the Fisheries Division of the Department of Primary Industries and Resources, South Australia.

The purpose of this report is to provide a revised assessment of the management arrangements in place for the South Australian Marine Scalefish Fishery (MSF). This report updates information provided to DEWHA in 2005 for assessment against the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The report has been prepared in accordance with the "Guidelines for the Ecologically Sustainable Management of Fisheries" 2nd Edition, and particularly addresses the level of change that occurred in the fishery since the 2005 assessment.

2 Background

The regulations and policies governing the management of the Marine Scalefish Fishery are;

- The *Fisheries Management Act 2007*;
- The *Fisheries Management (Marine Scalefish Fisheries) Regulations 2006*;
- The *Fisheries Management (General) Regulations 2007*;
- The *Fisheries Management (Fish Processor) Regulations 2006*;
- The *Management Plan for the South Australian Marine Scalefish Fishery*;
- The National Strategy for Ecological Sustainable Development
- The Australian Government 'Guidelines for the Ecologically Sustainable Management of Fisheries' as set out in the Australian Government *Environmental Protection and Biodiversity Conservation Act 1999*;

The Management Plan for the Marine Scalefish Fishery covers all fishing activities related to the MSF undertaken within the South Australian waters. It also provides a broad policy framework and harvest strategy employed to ensure the ecologically sustainable management and development of the MSF. It is intended to provide greater certainty in the day-to-day, and long term management, and decision making processes for all stakeholders (PIRSA, 2006).

The management plan operates for 4 years (2006-10), subject to annual review and amendments as considered necessary by the Fisheries Council, the Director of Fisheries or the Minister for Agriculture, Food and Fisheries. Each Management Plan includes a strategic research and monitoring plan, reviewed every two years. The management plan can be found at PIRSA's website www.pir.sa.gov.au.

3 Level of Assessment

The South Australian Marine Scalefish Fishery was assessed as an approved for Wildlife Trade Operation in 2005. Since last assessment there has not been significant changes in most areas of interest or particular issues as outlined in page 5 of the *Guidelines for the Ecologically Sustainable Management of Fisheries*.

Table 1: Level of assessment required by the South Australian Marine Scalefish Fishery

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

Considering the above, the level of submission requirement for the South Australian Marine Scalefish Fishery is standard plus ancillary.

It is important to note that all changes and progress in the recommendations provided by DEWHA have been communicated to DEWHA through the annual reporting process.

4 Fishery

4.1 Commercial Fishery

The Marine Scalefish Fishery includes most marine species of fish, molluscs, crustaceans, annelids and sharks, but excludes rock lobster, prawns, abalone, blue crabs, and freshwater fish species, all of which are managed separately.

The total catch of marine scalefish species in 2006/07 was 2,978 tonnes, valued at almost \$19.9 million, the average price per kilogram of marine Scalefish species was \$6.66/kg. It is estimated that the total contribution to the South Australian economy was \$30 million for the same period (Econsearch, 2008).

There are more than 50 species of 'Scalefish' taken by commercial fishers in South Australia, however, for the purpose of this report main target species will be considered in three categories, as identified in the Management Plan for the Marine Scalefish Fishery (Noell, *et al.*, 2006)

1. Primary

- a. King George whiting (*Sillaginodes punctata*),
- b. Snapper (*Pagrus auratus*),
- c. Southern Sea Garfish (*Hyporhamphus melanochir*),
- d. Southern calamary (*Sepioteuthis australis*),

2. Secondary:

- a. Yellowfin whiting (*Silago schomburgkii*)
- b. Australian Salmon (western species: *Arripis truttacea*; eastern species: *A. trutta*),
- c. Australian Herring (*Arripis georgianus*)
- d. Mud cockles (*Katelysia* spp.)
- e. Snook *Sphyræna novaehollandiae*
- f. Sand crabs (*Ovalipes australiensis*)
- g. Yellow-eye mullet (*Aldrichetta forsteri*)
- h. Mulloway (*Argyrosomus japonicus*)
- i. Bronze and dusky whalers
- j. Ocean Jackets (*Nelusetta ayraudii*),

3. Tertiary (Catch over the past three years was less than 5t)

- a. Parrotfish (Scaridae spp - undifferentiated)
- b. Trevally (*Pseudocaranx dentex*)
- c. Gummy shark (*Mustelus antarticus*)
- d. Rays and skates
- e. Cuttlefish (*Sepia* spp)

The MSF commercial fishery is an effort managed fishery, primarily managed through input controls however a number of output controls are also used.

Input controls:

- The MSF Fishery is a limited entry fishery with amalgamation on transfer.
- Net endorsements and other gear types are not directly transferable separate from the licence; however gear types and associated numbers of devices are amalgamated upon transfer of licence.
- Gear type and limits on the quantity of gear type apply to all licences type.

- Seasonal and spatial closures.

Output Controls:

- Minimum legal lengths for most species,
- protection of spawning female crabs,
- recreational and charter boat bag, and boat limits, and
- 1000t TAC for Australian salmon by commercial net fishers, with 20 t individual limits.

Given the diversity of the fishery, the heterogeneous mixture of participants and licence conditions, continuing adjustment to the number of MSC Fishery licences, licence conditions, and management arrangements takes place.

Table 2. Summary of management measures for the commercial South Australian Marine Scalefish Fishery

Fishing Sector	Gear Type	King George whiting	Snapper	Garfish	Calamary	Australian salmon	Oceanjackets	Sand crabs	Mud cockles
Marine Scalefish Fishery	Net	(b) Limited number of general net endorsements - no restriction on key species, and netting closures in selected areas of the state.	Not permitted to be harvested with nets.	(a) and limited number of net endorsements in northern Gulf of Saint Vincent to harvest in waters >5 m depth.	(a) and (b)	TAC of 1,000 t, IQ of 20 t per net fishery, with 2 endorsements for larger IQ's.	NA	NA	NA
	Line	(a)	(a) and limited number of licences with longline endorsements and maximum number of hooks.	All licence holders	All licence holders	All licence holders	All licence holders	NA	NA
	Other	NA	NA	Limited number of endorsements to use dab nets	NA	NA	Licence holders with endorsements to use up to 15 traps >60m depth	Licence holders with crab bet endorsements	QUOTA
Commercial Rock Lobster Fishery	Same devices as used in commercial Marine Scale Fishery - full access, access for bait purposes, or no access.	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable	Applicable
Charter Boat Fishery	All gear types except nets and selected aquatic reserves	Bag and boat limits	Bag and boat limits	Bag and boat limits	Bag and boat limits	Bag and boat limits	NA	Bag and boat limits	Bag and boat limits

4.2 *Recreational Fishery*

The South Australian recreational fishery is primarily managed through output controls in the form of daily bag and boat limits and minimum and/or maximum size limits for all key species. Recreational licences are not issued in South Australia. In addition to these output controls, there are a number of spatial and temporal closures that apply to both commercial and recreational fishers.

The most up to date information regarding the participation rates and demographics among recreational fishers is derived from the 2000/01 National Recreational and Indigenous Survey (NRIFS). The NRIFS estimated that 328,000 people over the age of 5 (24% of the population) participated in some form of recreational fishing during the 12 month sampling period (Henry & Lyle, 2003). Species managed within the Marine Scalefish Fishery dominated the composition of the recreational catch. An estimated 66% of the total annual recreational harvest (numbers) and approximately 69% of the total annual recreational fishing effort (events) were comprised of marine scalefish species (Jones and Doonan, 2005).

It is acknowledged that this information is now becoming outdated. A further 12 month, statewide survey is currently underway. Results from this survey will be available in March/April 2009, and will provide valuable information to assist in the on-going management of this sector and their targeted species.

Table 3. Licence holders of South Australian fisheries with access to marine scalefish species.

Fishery Licence Type	No. Licence Holders
Marine Scalefish Fishery Licences	
Marine Scale Fishery	339
Restricted Marine Scalefish Fishery	13
Others With Access to Marine Scalefish Species	
Northern Zone Rock Lobster Fishery	65
Southern Zone Rock Lobster Fishery	153
Total	570

4.3 *Management changes in the fishery*

Since the last assessment in 2005, there have been a number of management changes introduced to the recreational and commercial sectors of the MSF.

Recreational

In addition to the recreational fishing survey currently underway there has been one change to the management of the recreational fishery. The change was in the form of a reduction of the daily bag and boat limits for razorfish. The change was instigated following concerns from local community members that increases in recreational harvest rates were impacting upon local stocks. A complete review was undertaken and the recreational limits were reduced by 50%. There was no change to the commercial limit.

Commercial

A number of management changes have been introduced to the commercial sector of the MSF. Following the net buyback in 2005, complimentary permanent netting closures were implemented in three priority areas; southern Yorke Peninsula, the south west of Spencer Gulf (SG), and the West Coast (Venus Bay region). Furthermore, deep water netting exemptions that were in place to allow the targeting of garfish in waters greater than 5m in Gulf of Saint Vincent (GSV) were revoked in March 2006. These changes were part of a package of measures introduced to ensure the long-term sustainability of southern sea garfish.

PIRSA Fisheries are implementing a quota system to manage the mud cockle component of the fishery. The management framework is based on 3 quota zones, with one zone comprised of three separate regions. The new regulations are due to be implemented in October 2008.

5 External Influences

There have not been any changes to an environmental issue influence outside of the management agencies control.

6 Interaction with Protected Species.

All Commercial fishers must report any wildlife interaction to PIRSA Fisheries and the DEWHA. Interactions include: collision or capture (hooked, netted or entangled), all interaction as well as those that relate to a species actually being landed onboard a vessel during a fishing operation are required to be reported. To assist fishers in this task, PIRSA and SARDI have produced a "Wildlife interaction", identification and logbook, widely distributed amongst all fishers.

A summary of the wildlife interactions extracted from the logbooks is provided in Table 4 below. The table summarise interactions occurring in the 12 months leading up to August 2008.

Table 4. Summary of wildlife interaction in the Marine Scalefish Fishery. August 2007 – August 2008.

Species	Number of interactions	Fait of animal
Cormorant	27	All released/escaped alive
Seal	1	Released/escaped alive
Penguin	1	Released/escaped alive
Dolphin	2	All released/escaped alive
Great white shark	4	3 Released alive 1 Drowned
Seagull	2	All released/escaped alive
Sea Petrel	10	All released/escaped alive
Shag	1	Released/escaped alive
Total number of interactions	48	98% Released/escaped alive

7 Target Stock Status

A research and development strategy is described, in the management plan (p.45). Since last assessment, and consistent with the prioritisation plan described in the Management there has been a comprehensive assessment report for the primary species. Note that all reports are available at www.sardi.sa.gov.au. The dates of the most recent publications are:

- King George whiting, 2005 and updated assessment due in September 2008.
- Southern Calamary, 2006 and 2007.
- Garfish, 2006
- Snapper, 2007

The assessment of the fishery status for each species is based on the use of fishery performance indicators and limit reference points. The indicators and reference points are defined in the management plan however these were updated by the Marine Scalefish Fishery Management Committee in 2006.

The current fishery indicators are:

- Total commercial catch
- Targeted effort and;
- Targeted Catch Per Unit Effort (CPUE)

The existing limit reference points that relate to the indicators are:

- The 3rd highest and 3rd lowest values over the reference period;
- The greatest (%) inter-annual variation (+ and -) over the reference period;
- The greatest rate of change (trend) over periods of three or five years (+ and -) through the reference period, depending on the species.

An annual review of the performance of the Marine Scalefish Fishery, individual species, and the fishery as a whole are undertaken for all primary and secondary species (produced by SARDI to PIRSA fisheries, and available at www.sardi.sa.gov.au).

7.1 *King George Whiting (Sillaginodes punctata)*

The total commercial catch of King George whiting (KGW) for South Australia in the 2006-07 season was 361 tonnes, with a value of AUD \$4.86 million. KGW makes up 13% of the total commercial catch in the fishery, but represents 25% of the total value for the MSF.

King George whiting is targeted by recreational and commercial marine Scalefish fishers. The dominant long-term trend in the last years is a steady decline in commercial fishing effort. The reduction in number of licence holders has resulted in less fishing days. Furthermore the remaining fishers are diversifying their fishing practices resulting in an overall reduction in the commercial catch of KGW over the last 20 years or so (McGarvey, *et al.*, 2005).

CPUE from the commercial fishery is thought to be a particularly significant indicator for the status of the KGW, because the fisheries in several regions, particularly the northern gulfs and west coast bays are largely based on single year class of three-year old fish. Therefore, the estimates effectively constitute measures of year-class strength (McGarvey, *et al.*, 2005). CPUE for the year 2006-07 increased to a third highest for the reference period, following an upward trend (Fowler, *et al.*, 2007).

A Comprehensive Fishery assessment report by SARDI Aquatic Sciences is due early September, 2008.

7.2 *Snapper (Pagrus auratus)*

Snapper contributes to 23% of the total catch of the South Australian MSF and it is the second most valuable species in the fishery valued at AUD \$4.23 million.

According to the 'Fishery Assessment Report to PIRSA Fisheries, 2007' the State-wide commercial catches in 2004-05 and 2005-06 were 507.8t and 538.5t respectively. These are relatively high, and continue the trend of high catches from the commercial sector.

CPUE has consistently increased for the last 4 years, and 2006-07 it is at par with the year 2000-01, highest since 1983-84. Furthermore, all other performance indicators are either not breached or positively breached (Fowler, *et al.*, 2007).

7.3 *Southern calamary (Sepioteuthis australis)*

The southern calamary is the third most valuable species in the MSF (see Figure 1), it contributed AUD \$2.7 million (15%) to the MSF in 2006-07.

Calamary are taken by commercial fishers in most shallow, coastal waters of South Australia. Most of the catch is landed by the hand jig and haul net sectors; however gill nets and dab nets are also used.

Targeted jig CPUE calculated from fishery-dependent catch and effort data is considered the most reliable estimate of relative abundance of southern calamary. Targeted jig CPUE has continued a downward trend for the last three seasons, and was significant enough to breach three of the prescribed limit reference points. Extreme inter-annual variability is typical of squid fisheries and it has been suggested that environmental processes affect spawning and recruitment (Boyle & Roadhouse, 2005). Despite a downward trend, catch rates remained moderately high in the major fishing regions suggesting that calamary are relatively abundant (Steer, Lloyd & Jackson, 2007)

A state based regional survey is being carried out and results will be known by the end of May 2009, and will contribute to understanding spatial and temporal trends in recreational catch and effort.

7.4 *Southern sea garfish (hyporhamphus malanochir)*

In South Australia, the garfish fishery is principally located in the Spencer Gulf (SG) and Gulf St Vincent (GSV). Most of the garfish landed is caught by haul net fishers. Commercial catches from both gulfs are similar, but recreational catch is higher in the GSV.

South Australia's catch for garfish was, 293,000Kg, which represents AUD\$ 1.2 million for the 2006-07 season.

Total catch for the sector has decreased, due to the removal 44.7% of commercial effort introduced in 2005, through the voluntary buy-back of net fishing endorsements for the MSF. As a result of the net buy-back, 61 (54%) fishers accepted the offer and their endorsements were rescinded.

Management of the recreational fishery, where the main gear types are dab nets and hook lime, is based on a bag limit of 60 and boat limit of 180 garfish, together with the minimum legal size of 230mm total length.

8 **By-product and by-catch stock status**

Most of the by-catch in the MSF fishery consists of:

- Undersized fish;
- Legal sized fish that are legislatively required to be returned to water e.g. when recreational bag/boat limits or commercial quotas are exceeded, or fish that are caught during closed seasons or in closed areas;
- Catch and release fish by recreational fishers; and
- Unwanted catch.

Most of these classifications may apply to the four primary species in the fishery: King George whiting, snapper, southern sea garfish, and southern calamary. Information on the discarded by-catch of these species is derived from a variety of sources including the voluntary information reported by the commercial fishers.

In order to more accurately quantify bycatch within the MSF, PIRSA Fisheries have implemented a bycatch study to gain information about the nature and quantity of bycatch in the fishery. Fishery observers are undertaking trips onboard commercial in both Spencer Gulf and Gulf St. Vincent for commercial fishing activities using the major gear types; handlines, longlines and haul nets. In total there will be 100 observer days completed. The data are currently being analysed and the report is due for completion on 31st December 2008.

9 Additional Information:

South Australian Wild Fisheries Information and Statistics Report, May 2007: Provides an estimate of catch, effort and landed beach price of the commercial fish catch in South Australian waters up to the financial year ending June 2006. It also provides statistical overview highlighting key information and points of interest.

South Australian Fisheries Resources, Current Status and Recent Trends, 2006: It brings together all the available information of key fish stocks managed by the South Australian Government. It provides detail on the biological status of the major fish stocks in South Australian waters and describes the management measures in place to ensure their long term sustainability (published every three years).

10 Recommendations

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

This is an ongoing recommendation. PIRSA continue to notify DEWHA of any material changes to management arrangements.

2. *Within 18 months, PIRSA to develop a process to improve estimates of recreational and Indigenous removals of marine scalefish species, and factor these into the stock assessments and management controls to ensure overall catch levels are sustainable.*

In August 2007 PIRSA commenced a statewide recreational fishing survey. This is a 12 month survey designed to be compatible with the national survey of 2000/01. This has been a massive undertaking by PIRSA Fisheries and a large amount of resources have gone into undertaking this study. Results from the survey will be available March 2009.

SARDI factor the estimated recreational harvest levels into all annual stock assessments.

3. *Within 12 months, PIRSA to develop and implement a robust and comprehensive system to validate catch and effort data.*

PIRSA Fisheries have considered the best and most cost-effective mechanism to address this recommendation. It is recognised that there are significant gaps in the regulations that govern the fish processing sector. PIRSA Fisheries have therefore commenced a review of the Fish Processor Regulations. This review began in March 2008 and is expected to be completed by December 2008.

Onboard observers are not considered a practical long-term way to this issue. However on-board observers are currently being used to quantify bycatch within the MSF and a small component of the on-board sampling being undertaken will continue during 2008/09. The main purpose of the on-board sampling is to assist with data collection for the annual stock assessment; however it also serves to build relationships between the researchers and licence holders. This component of the research program will also provide an informal data validation process.

4. *Within 2 years, PIRSA to develop and refine sustainable yield estimates for target species for each sector of the Marine Scalefish Fishery, particularly King George whiting, snapper, garfish, southern calamary, Australian salmon, ocean jackets, sand crabs and cockles. Estimates should be used to develop sustainable harvest levels and to determine biological trigger points for these species.*

Sustainable yield estimates are not considered to be the appropriate method of managing the species targeted in the Marine Scalefish Fishery. This is an effort managed fishery with limit reference points and general performance indicators in place for all primary and secondary species. Computer based fishery assessment models have been developed for three of the primary species (KGW, snapper and garfish).

PIRSA and the Marine Scalefish Fishery Management Committee reviewed the limit reference points for the fishery in 2006. The new referenced points are described in Section 7.

PIRSA Fisheries have successfully demonstrated the ability of management changes to implement in response to breaches of limit reference points and stock concerns. For example the changes to the size, bag and boat limits for KGW. The most recent stock assessment suggests these changes have assisted in the significant improvement of the stock status. Another example is the response to the concerns over garfish stocks that have seen a significant permanent reduction in the number of net endorsements in the fishery and area closures to ensure the long term sustainability of the stocks.

The implementation of the quota management system for mud cockles is yet another example of management response to breaches of the limit reference points. Whilst it not considered that the stocks are about to collapse it was clear that continues increases in catch and effort could not be sustained.

5. *Within 2 years, PIRSA to develop and activate methods of managing effort across all sectors of the Marine Scalefish Fishery at ecologically sustainable levels.*

PIRSA Fisheries have in place management strategies to limit fishing effort across all sectors of the MSF. Furthermore one of the goals of the management plan is to reduce effort across the commercial fishery. One method used to do this is the licence amalgamation scheme. This requires a new entrant into the fishery to purchase a licence with a minimum number of points on it. If a licence does not have the required points then the entrant must purchase two or more licences to achieve the required point's value.

PIRSA Fisheries have actively managed effort in response to stock sustainability issues demonstrating our capacity and willingness to manage effort across all sectors. Examples of managing effort are provided in recommendation 4.

PIRSA are currently conducting a review of gear definitions and regulations across all sectors of the MSF. This is a comprehensive review that will provide greater clarity and recommendations on the need for further rationalisation of gear endorsements in the fishery

A complete review of recreational bag and boat limits will be conducted following the completion of the recreational survey in March 2009.

6. *(a) Within 18 months, PIRSA to conduct an assessment of species at risk of localised depletion. (b) For species identified at risk, PIRSA to develop a monitoring system sufficient to identify localised depletion processes over small scales and implement appropriate management measures within 2½ years.*

Qualitative risk assessments are conducted on an annual basis using the annual Stock Status report produced by SARDI. Any species at risk will be identified during this process.

The 2007 annual stock status report has been finalised. No management responses were implemented or considered necessary following a review of this report.

As described in the Management changes in the Fishery (Section 4.3), razorfish have been identified as a species at risk of localised depletion. Following concerns regarding the sustainability of the stock in some areas PIRSA Fisheries implemented a reduction to the recreational bag and boat limits. Razorfish make up such a small component of the fishery that it is not considered necessary to implement a monitoring system in this instance.

7. *Within 2 years, PIRSA to develop and implement a system for the quantitative monitoring of bycatch in the Marine Scalefish Fishery, sufficient to identify changes in composition and quantity of bycatch in each sector of the fishery.*

PIRSA Fisheries have implemented a bycatch study to gain information about the nature and quantity of bycatch in the fishery. The final report is due to be released in December 2008.

8. *Within 2 years, PIRSA to develop and implement a system for the quantitative monitoring of bycatch in the Marine Scalefish Fishery, sufficient to identify changes in composition and quantity of bycatch in each sector of the fishery.*

The results of the current bycatch project will be used to conduct an assessment of the requirements for any on-going monitoring of bycatch in the various sectors of the MSF.

9. *Within 18 months PIRSA to develop a mechanism that provides for timely and accurate reporting of interactions with protected species. PIRSA to implement an associated education program to ensure industry has the capacity to make accurate reports.*

This process has been completed and all licence holders now report interactions with threatened, endangered and protected species (TEPS) into a dedicated TEPS logbook.

10. *PIRSA to implement appropriate mitigation measures should new information indicate the fishery is having significant interactions with threatened and protected species or impacts on wider ecological community, within 3 months of the information becoming available.*

PIRSA Fisheries are currently considering options for the assessment and review of TEPS interactions for each of the fisheries.

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