

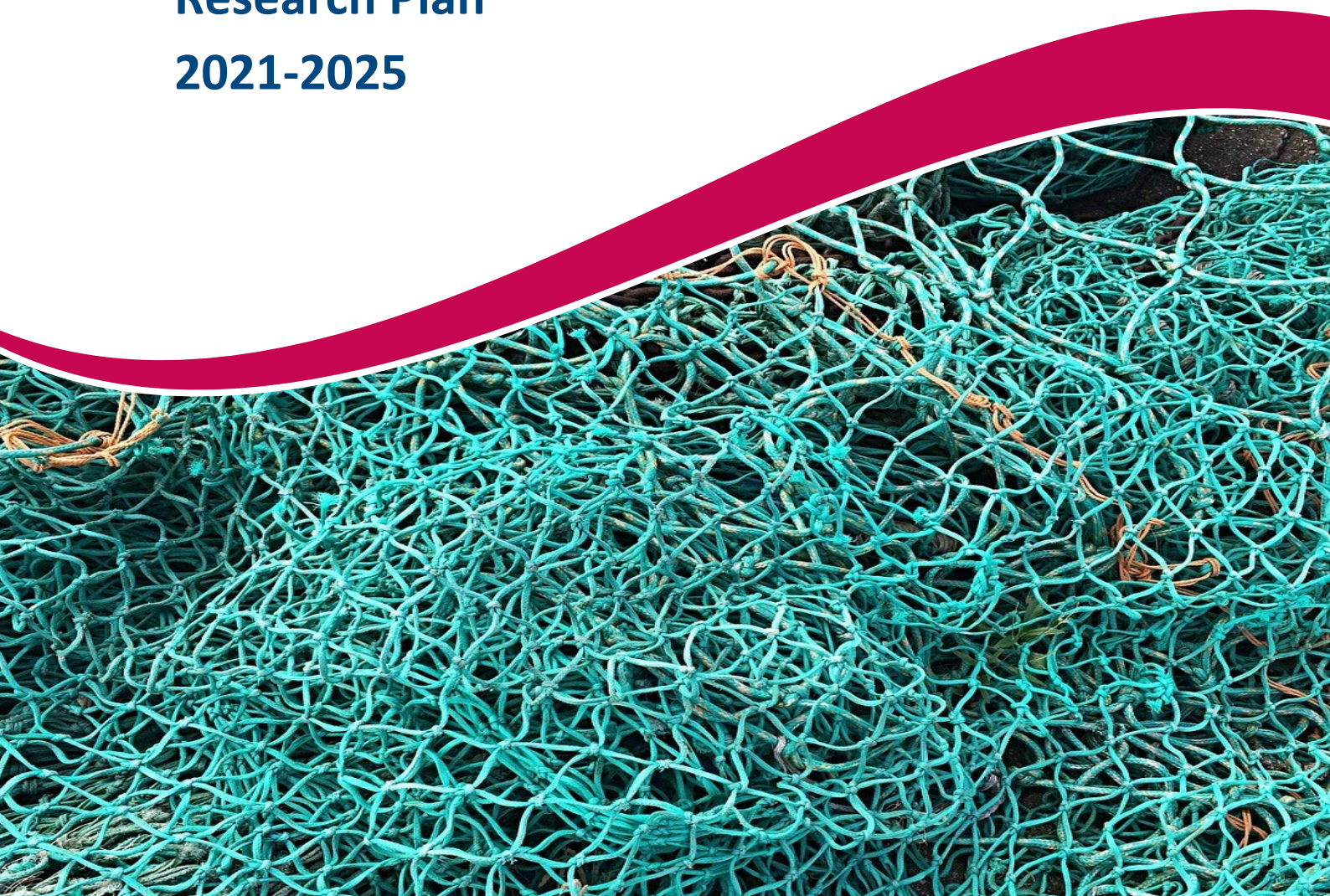


**Australian Government**

**Australian Fisheries Management Authority**

# **Southern and Eastern Scalefish and Shark Fishery**

## **Five Year Strategic Research Plan 2021-2025**



## Contents

1	Introduction .....	3
2	Overview of the Southern and Eastern Scalefish and Shark Fishery .....	3
3	Research framework.....	5
3.1	<i>Roles</i> .....	5
3.2	<i>The research process</i> .....	7
4	AFMA Strategic Research Plan.....	7
4.1	<i>Program 1 – Fishery stocks, biology and the marine environment</i> .....	7
4.2	<i>Program 2 – Economic and Social</i> .....	7
4.3	<i>Program 3 – Development</i> .....	7
4.4	<i>Program 4 – Evaluation</i> .....	7
5	SESSF research priorities 2021-2025 .....	8
5.1	<i>Fishery stocks, biology and the marine environment</i> .....	8
5.2	<i>Economic and Social</i> .....	9
5.3	<i>Development</i> .....	10
5.4	<i>Evaluation</i> .....	10
6	Acronyms .....	11

# 1 Introduction

The *Fisheries Administration Act 1991* provides that AFMA is to establish priorities in respect of research relating to fisheries and arrange for the undertaking of such research. This is supported by the *Southern and Eastern Scalefish and Shark Fishery Management Plan 2003* (Management Plan) performance criteria that cost effective and high quality research (including independent research) is carried out in relation to the fishery in accordance with a five-year strategic research plan.

This *Southern and Eastern Scalefish and Shark Fishery Five Year Strategic Research Plan 2021-2025* (Strategic Research Plan) identifies the research priorities for the fishery over the next five years to:

- assist with the pursuit of the management objectives for the Southern and Eastern Scalefish and Shark Fishery (SESSF), which are consistent with AFMA's objectives; and
- enable the effective implementation and appraisal of management arrangements.

This Strategic Research Plan provides the framework for identifying annual research priorities for the SESSF. The annual research statement should consider the cost-effectiveness, priority and timeframe for undertaking the work. Where research has already been funded the annual research statement should identify this including the source of funding.

This Strategic Research Plan and annual research statements are used by:

- the AFMA Research Committee (ARC) at its annual November meeting to develop the ARC annual research call made in early December;
- the ARC to recommend priorities for potential Fisheries Research and Development Committee (FRDC) funding; and
- FRDC in making its annual call for research expressions of interest each year.

This Strategic Research Plan should be considered along with:

- the SESSF Monitoring and Data Plan which aims to ensure that prioritised research can be supported with data; and
- annual research statements for the SESSF and Great Australian Bight including monitoring and stock assessment schedules.

This Strategic Research Plan will be reviewed following dissemination of the results of the research project *Development and evaluation of multi-species harvest strategies in the SESSF* (FRDC 2018-021).

## 2 Overview of the Southern and Eastern Scalefish and Shark Fishery

The SESSF is a multispecies fishery that extends from the coast off Fraser Island in Queensland south and west to Cape Leeuwin in Western Australia (see Fig. 1). The area covers nearly half of the waters within the Australian Fishing Zone off mainland Australia and Tasmania. Over 20 ports are used by the fleet from New South Wales to Western Australia. The major ports are Ulladulla, Lakes Entrance, Portland, Eden, Hobart,

Adelaide, San Remo and Port Lincoln. The fishery operates in both Commonwealth and state waters under different Offshore Constitutional Settlement arrangements with state governments.

The SESSF includes following fishery sectors:

- Commonwealth Trawl Sector (CTS)
- Great Australian Bight Trawl Sector (GABTS)
- Scalefish Hook Sector
- Shark Hook Sector
- Gillnet Sector
- East Coast Deepwater Trawl Sector (ECDTS)
- Trap Sector.

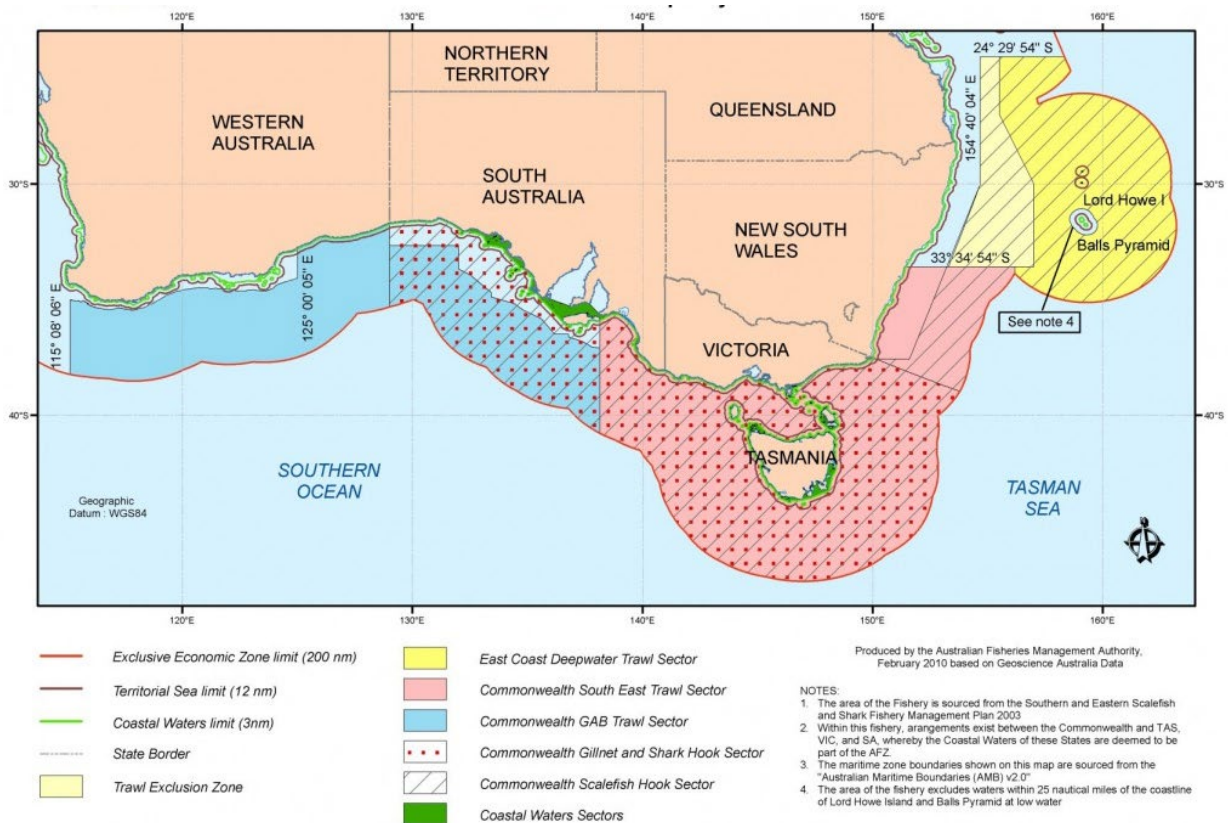
The Gillnet, Scalefish Hook, Shark Hook and Trap Sectors are collectively referred to as the Gillnet, Hook and Trap (GHAT).

In addition, there are several smaller sectors, including the South Australian, Tasmanian, and Victorian coastal waters sectors.

Several methods are used in the fishery, these include demersal otter trawl, Danish seine, demersal longline and gillnet. The main target species in the:

- CTS are tiger flathead, pink ling and blue grenadier
- GABTS are Bight redfish and deepwater flathead
- GHAT are gummy shark, blue eye trevalla and pink ling.

Fig. 1: Area of the Southern and Eastern Scalefish and Shark Fishery (indicative map only)



Further information on the SESSF is available in the latest SESSF Management Arrangements Booklet, which is available on the management arrangements booklets page on the AFMA website at:

[www.afma.gov.au/fisheries-services/fisheries-management-plans](http://www.afma.gov.au/fisheries-services/fisheries-management-plans)

## 3 Research framework

### 3.1 Roles

#### 3.1.1 Resource Assessment Groups

The main function of RAGs is to peer review scientific data and information and provide advice to AFMA on the status of fish stocks, sub-stocks, species (target and non-target species) and the impact of fishing on the marine environment.

The Management Plan provides that RAGs give advice in relation to stock status, research needs, the environment and economics of the fishery.

The overarching resource assessment body in the fishery is the SESSF Resource Assessment Group (SESSFRAG). There are also three fishery specific RAGs:

- South East Assessment Group (SERAG)
- Shark Resource Assessment Group (SharkRAG)
- Great Australian Bight Resource Assessment Group (GABRAG).

#### 3.1.2 Management Advisory Committees

Management Advisory Committees (MACs) are the main advisory bodies to AFMA. They provide advice on a variety of issues including fisheries management arrangements, research, compliance, and management costs.

The MACs provide a link between AFMA and those with an interest in the fishery with members from commercial industry, fisheries management, the scientific community, the recreational sector, the environment/conservation sector and, in some instances, state governments.

MACs provide a broad perspective on management options and are a forum where issues relating to a fishery are discussed, problems identified and possible solutions developed. The MACs consider the advice of RAGs and provide recommendations to the AFMA Commission based on how the options will contribute to meeting the overall objectives for a particular fishery and the pursuit of AFMA's legislative objectives. The South East MAC (SEMAC) and the Great Australian Bight MAC (GABMAC) provide advice on management matters relevant to the SESSF.

### 3.1.3 AFMA Research Committee

The ARC considers essential research priorities that contribute to improved management for fisheries. As part of its role the committee also:

- develops research priorities for Commonwealth fisheries in conjunction with MACs that are consistent with AFMA's management needs and objectives specified in the *Fisheries Administration Act 1991* and *Fisheries Management Act 1991*;
- approves five-year fishery research plans for individual fisheries managed by AFMA;
- advises the AFMA Commission on the allocation of AFMA research funds and accounts and reports against their use;
- monitors biological and economic indicators in Commonwealth fisheries, with an emphasis on sustainability indicators and economic efficiency; and,
- liaise with research providers and funding agencies to make sure AFMA's research priorities are given appropriate weight in the wider allocation of research funds.

The ARC now has a more strategic role in providing strategic advice to the AFMA Commission:

- on major fishery and cross fishery research issues affecting Commonwealth fisheries to support AFMA in meeting its objectives and other legislative requirements;
- on the strategic directions for research relevant to AFMA's information needs; and
- recommending research priorities and projects for potential FRDC funding.

### 3.1.4 Fisheries Research and Development Corporation

The FRDC is a co-funded partnership between its two stakeholders, the Australian Government and the fishing industry.

The FRDC's role is to plan and invest in fisheries research, development and extension (RD&E) activities in Australia. This includes providing leadership and coordination of the monitoring, evaluating and reporting on RD&E activities, facilitating dissemination, extension and commercialisation. The FRDC achieves this through coordinating government and industry investment, including stakeholders to establish and address RD&E priorities. In addition, the FRDC monitors and evaluates the adoption of RD&E to inform future decisions.

In July 2020 the FRDC released its [Fisheries Research and Development Corporation R&D Plan 2020-2025](#).

This plan outlines FRDC investment that will be targeted to achieve five outcomes:

1. Growth for enduring prosperity
2. Best practices and production systems
3. A culture that is inclusive and forward thinking
4. Fair and secure access to aquatic resources
5. Community trust, respect and value.

FRDC is currently updating the process for identifying, assessing and funding priorities; details are available on their website: [www.frdc.com.au](http://www.frdc.com.au).

## 3.2 The research process

For information on prioritising research, calling for and assessing proposal, please view the research timeline at [www.afma.gov.au/research](http://www.afma.gov.au/research).

# 4 AFMA Strategic Research Plan

AFMA has four research programs, which are directed to pursuing AFMA's legislative objectives. These support the SESSF research priorities and are listed below.

## 4.1 Program 1 – Fishery stocks, biology and the marine environment

- Collect appropriate information to support stock assessments.
- Explore alternative species assessment methods and models.
- Assess the impacts of fishing on the marine environment.

## 4.2 Program 2 – Economic and Social

- Development of underutilised fisheries resources.
- Develop the social and economic aspects of commercial, recreational and Indigenous fishing.
- Develop coordinated approach on major fishery and cross fishery economic issues.

## 4.3 Program 3 – Development

- Management development to reduce complexity and promote economic certainty.
- Compliance methodologies to deter illegal fishing and invest in processes and technologies for more cost effective compliance arrangements.

## 4.4 Program 4 – Evaluation

- Monitor and evaluate effectiveness of existing management strategies.

For further information on AFMA's research programs, refer to the '[AFMA Strategic Research Plan 2017-2022](#)'.

## 5 SESSF research priorities 2021-2025

The research priorities listed below for the SESSF have been developed to ensure that there is adaptive management to future proof the fishery. This is particularly important given climate-driven changes, and other external influences, that will require an adaptive approach to research and management.

Other considerations that will be important within the timeframe of this strategic research plan include:

- fleet dynamics, particularly given the multispecies nature of the fishery;
- new and emerging technologies; and
- the finalisation and implementation of a new multi species harvest strategy.

While the research priorities identified below are presented under the four research programs to be consistent with the [AFMA Strategic Research Plan](#), many are crosscutting and may benefit the fishery more broadly.

### 5.1 Fishery stocks, biology and the marine environment

#### Fishery assessments

- Undertake assessment as provided for under the Harvest Strategy Framework (HSF) and development of alternative assessment methods.
- Review key inputs to stock assessments, including updating biological parameters and approaches to standardising CPUE, and incorporate model sensitivity analysis to reduce uncertainty in assessments.
- Understanding multi-species dynamics and interactions (technical and trophic) and implications for single and multi-species assessments.
- Understanding all sources of mortality; improve estimates of discards (for quota and non-quota species) and engage with state fishery agencies to obtain and improve all available commercial and recreational catch data.
- Incorporate selectivity changes into the assessments and consider estimating selectivity patterns for various time-blocks.
- Monitor protected species interactions; develop approaches to obtaining a better understanding of the level of interactions and consider measures that may reduce protected species interactions.
- Habitats and communities; assess the impacts of commercial fishing on habitats and trophic levels, including threats to protected species, including outputs from previous research.

#### Stock structure and distribution

- Further explore differences in stock structure, including stock dynamics and connectivity between regional stocks or populations (e.g. east-west stocks).
- Examine the implications of over-lapping stocks (e.g. where stocks are known to mix between eastern and western regions) for assessment and management purposes including shared access and cross-jurisdictional issues.

#### Fishery independent data

- Identify assessment approaches which utilise fishery independent data as a key index of abundance for key SESSF species, including species managed under stock rebuilding strategies.
- Collect fishery independent data to support stock assessments for key SESSF species, including species managed under stock rebuilding strategies.



### **Climate change, environmental variability and adaptive management<sup>1</sup>**

- Investigate options for cost effective collection of fishing related climate / oceanographic data, adequate to support evaluation of environmental drivers on SESSF stocks<sup>2</sup>.
- Develop methods to incorporate the potential impacts of climate change on species distribution, abundance and productivity in both stock assessments and harvest strategies<sup>3</sup>, recognising that some species will respond differently, even positively, to climate change.
- Identify environmental and oceanographic factors influencing the availability of fish, species recruitment and movement patterns.
- Explore ways of disentangling fishing mortality and climate-change as drivers of declining and non-recovering stocks, noting periods of low catches and failure to recover as expected.
- Consider adaptive management approaches that recognise factors other than commercial fishing as likely contributors to the lack of rebuilding and ongoing decline for several SESSF stocks.
- Consider long-term scenario planning to improve ecological and economic resilience to climate-driven changes in the fishery.

### **Gear and technology**

- Selectivity: further examine the extent and impact of gear changes to assess its effect on gear selectivity and discard rates.
- Gear technology: consideration of efficient harvesting techniques, including improving trawl as an efficient method of capture.
- Catchability: further describe and quantify the nature of changes in fishing practices, including whether any change is best modelled via catchability or is better done through additional factors in the CPUE standardisation or other approaches.
- Mitigation: develop and evaluate mitigation measures to reduce ecological impacts of the fishery, including incidental catch and discards.
- Evaluation and adoption of new and emerging technologies that improve fishery outcomes, including improved catchability of target species or environmental outcomes of both species and habitat.

## **5.2 Economic and Social**

### **Maximising economic returns to the community**

- Measure and monitor progress against Key Performance Indicators.
- Economic targets: investigate how to select economic targets (including proxies) for a multi-species fishery, including the selection of targets for bycatch species, with and without the use of bio-economic models.
- Seek opportunities for the cost-effective and regular collection of key economic information for the SESSF<sup>4</sup> to identify factors which impact on the profitability of individual operators
- Identify market opportunities and improve market access by understanding social and economic drivers and their influence on market demand.

### **Social outcomes**

- Develop social objectives that capture social drivers, impacts, community concerns/perceptions and social benefits.

---

<sup>1</sup> Many of these priorities also have social and economic aspects.

<sup>2</sup> [SMARP](#) recommendation 4.

<sup>3</sup> [Declining indicators](#) recommendation 11

<sup>4</sup> [SMARP](#) recommendation 2

#### **Risk-cost-catch**

- Use the risk-cost-catch framework to understand the cost-effectiveness of both implementing management measures and undertaking stock assessments.
- Consider the trade-off between reducing mortality for rebuilding species and economic and social benefits.
- Consider approaches to understanding social drivers in the fishery.

#### **External influences**

- Understand factors in the SESSF that explain exposure and sensitivity to the impact of external shocks (seismic, market demand), and actions/responses available to management and industry to improve resilience.

## 5.3 Development

#### **Management development to reduce complexity and promote economic certainty**

- Streamline and automate AFMA's data collection, storage, distribution and reporting procedures for all major data sources<sup>5</sup>
- Develop efficient and automated analysis and reporting of fishery and species indicators, including evaluation of triggers for re-assessment of primary and secondary species<sup>6</sup> (MYTAC analysis, discard evaluation etc.).
- Understand implications of changing access arrangements and gear types in the fishery on stock assessments.
- Identify and develop cost-effective alternatives to current monitoring and data collection programs (electronic monitoring, artificial intelligence etc.) to improve collection of key fishery data, including catch and discards of target and bycatch species, and interactions with protected species.

#### **Strategies to improve reporting**

- Develop strategies to improve reporting accuracy of discards and interactions with protected species, in particular by understanding the drivers for reporting.
- Drive change to improve reporting behaviour with a view to improving stock assessments and reporting requirements.

## 5.4 Evaluation

#### **Monitor and evaluate effectiveness of management strategies**

- Quantitatively evaluate the harvest strategy framework.
- Ensure data is of sufficient quantity and quality to support and evaluate management arrangements.
- Develop a set of broad indicators (economic, social and non-technical) and metrics to evaluate performance of the fishery, including community attitudes and market demand.
- Evaluate the ecological and economic consequences of alternative harvest strategies (e.g. adjusting TACs annually or for multiple years) and decision rules/harvest strategies.
- Undertake reviews of past management decisions to assess the impact of those decisions on the fishery against the expected outcomes.

---

<sup>5</sup> [SMARP](#) recommendation 12

<sup>6</sup> [SMARP](#) recommendation 20

## 6 Acronyms

AFMA	Australian Fisheries Management Authority
SESSF	Southern and Eastern Scalefish and Shark Fishery
CTS	Commonwealth trawl sector
GAB	Great Australian Bight
GHAT	Gillnet, Hook and Trap
RAG	Resource Assessment Group
MAC	Management Advisory Committee
GABMAC	Great Australian Bight Management Advisory Committee
SEMAC	South East Management Advisory Committee
TAC	Total allowable catch
SFR	Statutory Fishing Right
SMARP	Strategic Monitoring and Assessment Project
ITQ	Individual transferable quotas
GVP	Gross Value of Production
R&D	Research and Development
HSF	Harvest Strategy Framework
FIS	Fishery Independent Survey
ERA	Ecological risk assessment
ERM	Ecological risk management
TEP	Threatened, endangered and protected
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
FRDC	Fisheries Research Development Corporation
ARC	AFMA Research Committee
CSIRO	Commonwealth Scientific and Industrial Research Organisation