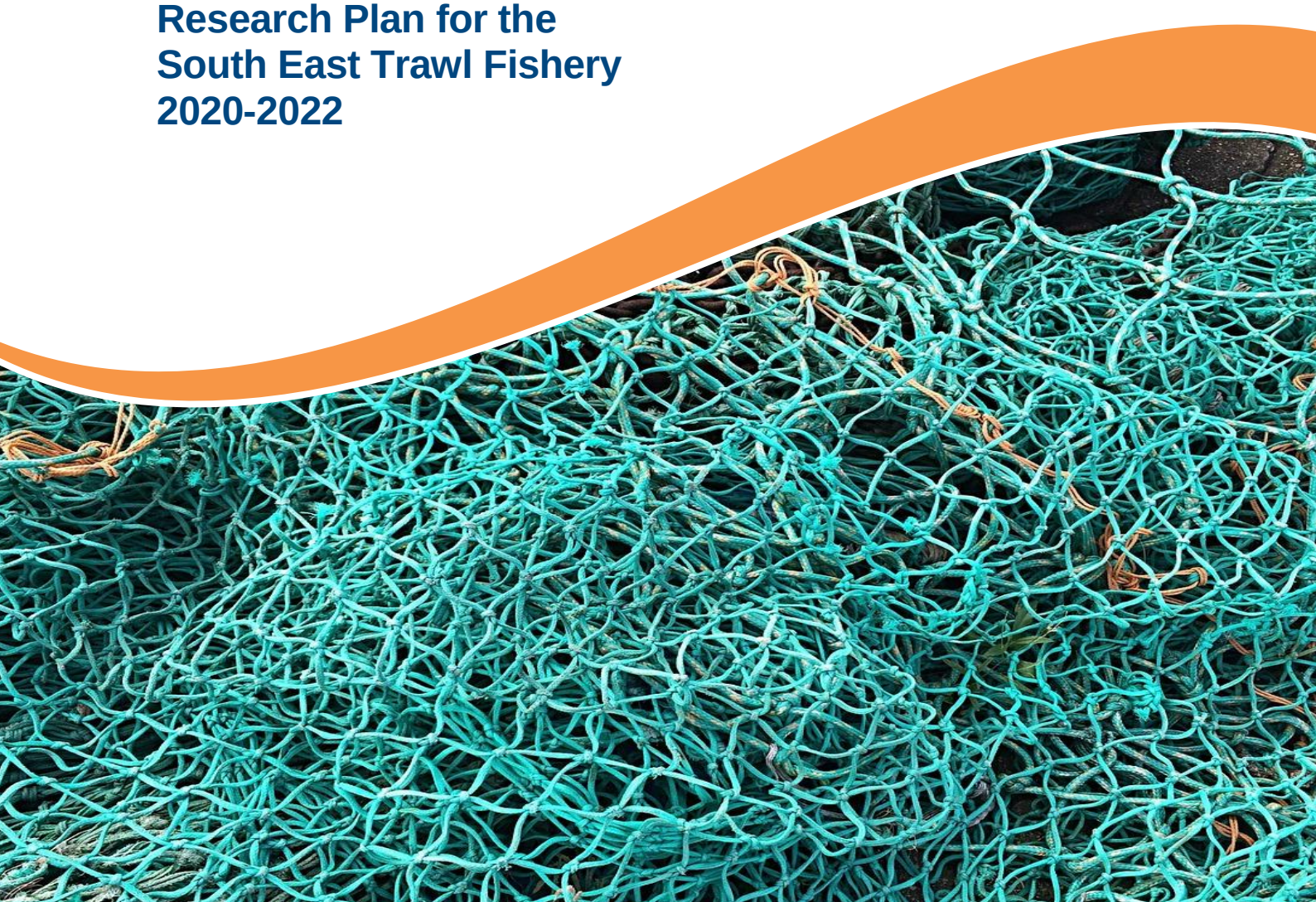
Australian Government

Australian Fisheries Management Authority

Western Orange Roughy Research Plan

Research Plan for the South East Trawl Fishery 2020-2022



Contents

1 Introduction 3

2 Objectives 4

3 Methods 5

3.1 Scientific permit application process 5

3.2 Research Catch Allowance 6

3.3 Areas surveyed 6

3.4 Quota 7

3.5 Collection of data 8

3.6 Observers 9

3.7 Bycatch 9

3.8 Temperature logging 9

3.9 Data handling and storage 10

Appendix A: Collection of biological data from Orange Roughy 11

1 Introduction

Orange roughy (*Hoplostethus atlanticus*) is a deepwater fish that is widely distributed in international waters. In Australia, orange roughy are found in waters from Tasmania to southern Western Australia, with small catches reported from waters off New South Wales. The species forms dense aggregations at spawning times, usually associated with hills or seamounts, however this is known to vary in timing and magnitude across various stocks. Relatively little is known about the environmental factors that drive these aggregations, such as water temperature, moon phase or why they are associated with bottom features.

The species is long lived and slow to mature, making it particularly vulnerable to overfishing; but this is mitigated by the ability to assess spawning aggregation biomass in some areas, with the most recent being that of the eastern stock on the St Helens and St Patrick hills off the east coast of Tasmania. New Zealand has taken advantage of this approach and has used Australian Acoustic Optical System (AOS) technology from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to assess and manage their stocks. Most New Zealand orange roughy stocks are now Marine Stewardship Council (MSC) accredited and have achieved a price premium over Australian fish in the marketplace.

The Western Orange Roughy Zone in the Southern and Eastern Scalefish and Shark Fishery (SESSF) was the first region in Australia to be fished intensely for orange roughy. This occurred from the late 1980s through to the mid-1990s; with over 21,500 tonnes removed from this zone between 1986 and 1996. The southern zones started to be exploited more seriously from 1989 onwards with 68,276 tonnes removed between 1989 and 2006.

As a result of the rapid depletion of the stocks in the south-east, orange roughy was listed as Conservation Dependant under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in November 2006. The listing required additional measures to address specific objectives and requirements of the *Orange Roughy Conservation Program 2006* (the Conservation Program). The Conservation Program was reviewed by AFMA in 2014, and orange roughy stocks are now managed under the *Orange Roughy Stock Rebuilding Strategy 2014* (the Strategy). Only two orange roughy stocks in south east Australia – the Cascade and Eastern zones (excluding the Great Australia Bight - GAB) are assessed as having a biomass above the limit reference point and can be targeted.

Management actions set out in the Strategy maintain low fishing mortality to support rebuilding, while continuing to monitor and assess the stocks. This is done through:

- deep water closures within the SESSF to protect orange roughy and some other deep water species, while providing access and flexibility to industry for species that are commercially sustainable;
- allowing targeted fishing for (the two) orange roughy stocks that are assessed as being above the limit reference point of 20 per cent of the unfished spawning biomass;
- restricting effort by limiting entry to existing fisheries (i.e. no new fishing concessions are created and, in order to fish in a fishery, an existing concession must be leased or purchased); and
- research and monitoring to support stock assessments and to ensure the Strategy meets its primary objective: to return all orange roughy stocks to levels where they can be harvested in an ecologically sustainable manner consistent with the Commonwealth

Fisheries Harvest Strategy Policy and ultimately maximise the economic returns to the Australian community.

Relevant Resource Assessment Groups (RAGs) have concentrated on assessing stocks of the major orange roughy fisheries in south east Australia, around Tasmania and the Cascade Plateau.

These assessments rely on a time-series of catch and Catch per Unit of Effort (CPUE) data, as well as biological information on the size, age and sex structure of the population. The more robust eastern orange roughy stock assessment also relies on independent estimates of relative or absolute abundance obtained through either egg surveys or acoustic surveys of the winter spawning aggregations using either vessel-mounted or towed-body systems (AOS). Such surveys have been successfully conducted on stocks off Tasmania (Kloser et al. 1996).

In contrast to south east Australia, few resources have been allocated to determine the status of orange roughy stocks in the western zone (west of Tasmania, but east of the GAB). Nor have there been any independent surveys undertaken to gain an independent estimate of abundance of the western stock.

An orange roughy workshop was held during the March 2017 Southern and Eastern Scalefish and Shark Resource Assessment Group (SESSFRAG) meeting. It was agreed that CSIRO would attempt an updated CPUE standardisation for catch and effort data for the western orange roughy zone to determine whether the stock was showing signs of recovery. In November 2017, CSIRO produced the report *Statistical CPUE Standardisations for Western Zone Orange Roughy (1989-2006).* An upturn in CPUE was apparent and CSIRO suggested that there would be potential value in further explorations of the current status of the western zone orange roughy stock; including collection of age-samples and acoustic surveys for comparison to the eastern stock.

The focus of this Western Orange Roughy Research Plan (the Research Plan) is to collect catch and effort data, as well as biological information on the age and size structure of the western orange roughy stock, which will ultimately support a future assessment of the stock's status. The information to be collected is important in developing a robust set of indicators and reference points for orange roughy in the future. This information, integrated with the objectives of the *Commonwealth Harvest Strategy Policy 2018* and the SESSF Harvest Strategy, will ultimately determine when commercial fishing for western orange roughy can resume and what level of fishing would be considered sustainable.

2 Objectives

The aim of the Research Plan is to assess the status of the western orange roughy stock and determine sustainable harvest levels for commercial fishing under the SESSF Harvest Strategy. This will be achieved by collecting robust scientific information including biological data, in each western orange roughy research area.

Specifically, the objectives are to:

1. Collect appropriate data to enable future stock assessments to be completed, including:

a. biologicals (length and age) from each of the three western zone orange roughy research areas:
    i. 1,000 length measurements
    ii. 1,000 otoliths
b. accurate catch and effort information,
c. total catch species composition.

2. Achieve Objective (1) whilst ensuring the Research Plan meets AFMA's relevant legislative objectives, including maximising net economic returns through the efficient and cost effective management of fisheries in a precautionary and accountable manner.

The collection and analysis of biological data, including age composition, combined with catch and CPUE data will, in time, provide data to support a Tier 1 stock assessment. The AFMA Commission has emphasised the importance of ensuring the minimum data requirements are adhered to and indicated that without this data, further research to ascertain orange roughy rebuilding may not be feasible.

To achieve the objectives of the Research Plan, AFMA will engage the South East Trawl Fishing Industry Association (SETFIA) through an existing co-management agreement to coordinate the collection and transfer of data to AFMA. The technical arrangements and data collection requirements will be detailed and agreed to in the Western Orange Roughy Data Collection (WORDaC) agreement.

3 Methods

3.1 Scientific permit application process

Access to the western orange roughy zone will be permitted under scientific permits granted by AFMA under s33(1) of the *Fisheries Management Act 1991*.

To fish for orange roughy under the Research Plan, proponents must submit a scientific permit application including the proposed sampling design/survey plans. The permit will allow operators to enter the western orange roughy zone and target orange roughy; provided they meet the data collection requirements described under Objectives 1 and 2, which will be stipulated in the conditions of their scientific permit.

Up to five scientific permits can be granted under the Research Plan each year. Until more is understood about the stock biomass, it is not known if more than five vessels is precautionary. Under the co-management arrangement, SETFIA will coordinate the scientific permit application process. AFMA and SETFIA will jointly review permit applications. AFMA will allocate permits based on a variety of factors (in line with the selection criteria used for previous surveys), including but not limited to:

- the skipper's experience fishing for orange roughy; particularly fishing for western orange roughy;
- whether the operator has previously demonstrated proactive engagement in the industry (through associations, meetings, operational surveys, RAG and Management Advisory Committee (MAC) involvement and industry workshops), compliance history; and

- the capability of their vessel for fishing for orange roughy; particularly fishing for western orange roughy.

Scientific permits can only be allocated for six months, and will be allocated each year so that surveys are undertaken over the same six month period each year (to capture seasonality), noting the timing of peak catches is unknown at this stage.

3.2 Research Catch Allowance

In the first year of the Research Plan, a Research Catch Allowance (RCA) will be allocated under scientific permits. In the second and third years of the Research Plan, the RCA will be reviewed by the South East RAG (SERAG) taking into account the minimum data requirement to provide a signal of stock status. This will then be considered by the South East MAC (SEMAC) before final consideration by the AFMA Commission. AFMA will monitor catches and set trigger limits accordingly.

The RCA will be managed on a competitive basis (i.e. not distributed as equal allocations). Successful applicants will be provided with an equal opportunity to fish for western orange roughy, up to the RCA or triggers for the individual research areas. When catches of western orange roughy approach either of these triggers or the SESSF trigger limit for gulper sharks (refer to section 3.7 ‘Bycatch’), all scientific permits will be revoked and fishing in one or all research areas will cease.

This system provides the highest likelihood of collecting the maximum amount of representative data.

3.3 Areas surveyed

In 2007, AFMA implemented a 700m depth closure to trawling across the Commonwealth Trawl Sector (CTS), as a means of preventing targeted orange roughy fishing. The orange roughy western zone is the part of the fishery beginning at longitude 138° 08` 05” E, and running south east along the coastline of South Australia, Victoria and western Tasmania to latitude 42° 00’ 00” S.

Three representative research areas have been identified, based on historical western orange roughy fishing (referred to as ‘sampling strata’ in Figure 1). Western orange roughy research areas include:

- Area 1: ‘Northern’
- Area 2: ‘Central’
- Area 3: ‘Southern’

Vessels that are allocated a scientific permit are provided access to the western orange roughy research areas, where they may fish in accordance with the Research Plan. Fishing effort will be limited across areas to provide a representative spread of data collection. For example, if a 200 t RCA is allocated, no more than 100 t can be caught from within a single area.

Each year SERAG will be asked to provide advice on research catch allowance, as well as the total catch that can be caught within a single area. This will be reviewed and detailed in scientific permits each year.

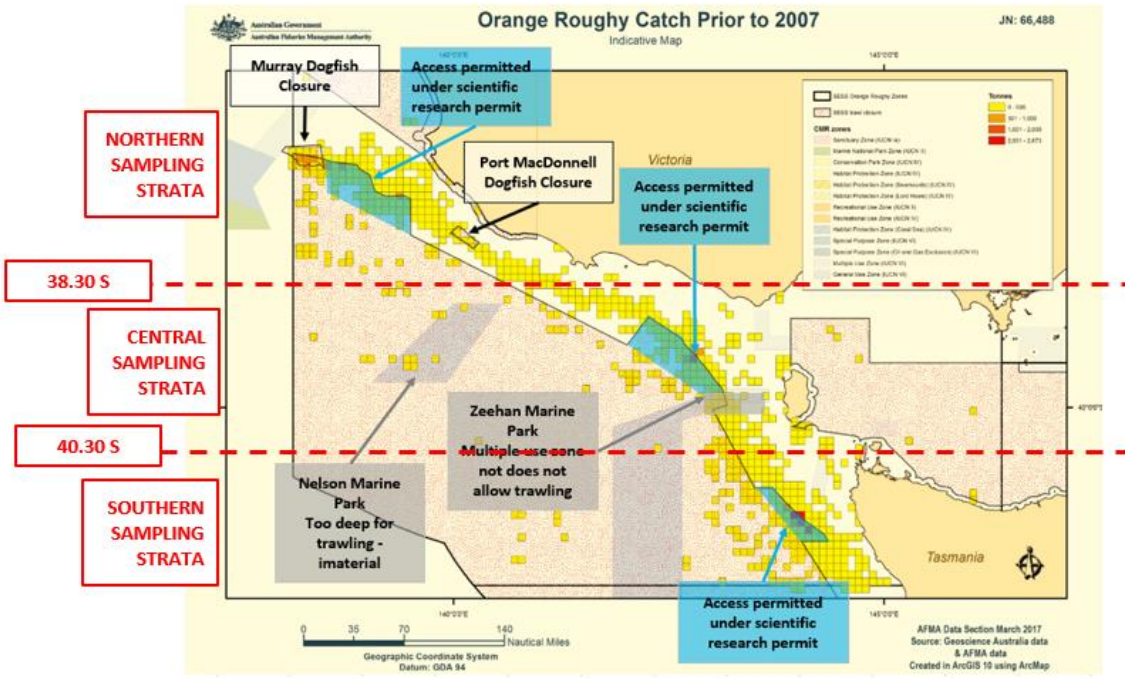


Figure 1: Proposed western orange roughy research areas, overlaid against historical western orange roughy catches.

3.4 Quota

Western orange roughy quota cannot be consumed while a vessel is fishing under a scientific permit. That quota is intended as an incidental bycatch quota only and is not intended for targeted fishing.

All by-product quota species landed during western orange roughy research trips will need to be covered under existing quota. This provides western orange roughy quota owners, many of whom hold quota for related deepwater stocks, with a revenue stream and spreads the economic benefit of the Research Plan.

Deepwater Shark (western)

It is predicted that deepwater shark (western) will be caught during western orange roughy research trips. Catches of deepwater shark (western) can be debited from existing quota; which is currently significantly under-caught.

Smooth Oreo

Catches of smooth oreo (other) are expected to be small and can be debited from existing quota.

Oreo (basket)

Catches of oreo (basket) are predicted to be significant (between 100-200 tonnes). Oreo (basket) quota is currently 50 per cent under-caught; providing approximately 100 tonnes of available quota. If this is likely to be exceeded, AFMA will return to seek SERAG advice. Increasing the quota without further RAG consideration is not precautionary. Targeting of oreo (basket) under the Research Plan is not permitted.

3.5 Collection of data

When catches of western orange roughy are taken in a research area under a scientific permit, data (logbook catch and effort, catch composition and biologicals[1]) must be collected as outlined in the conditions on the scientific permit. It is expected that analyses of collected data will in the future provide an indication of the sustainable exploitation level of the stock. Data collection efforts are to be limited across the research areas to provide a representative spread of data.

3.5.1 Catch and effort

Catch and effort information will consist of standard data collected in daily fishing logbooks. Operators are encouraged to be as accurate as possible when estimating catch by shot. Individual shots must be cased, and ideally will be weighed on board and then a standard case weight extrapolated across case counts. Traditional eye-ball estimates will not be sufficient.

Operators will be required to:

- load **ungraded** western orange roughy samples into standard 25 kg cases. The case must be identified with individually numbered tags (provided by the project). The tags will link the case back to the shot in the AFMA database that also contains other relevant information including vessel name, date, time, location and depth. The fish aging contractor will also use this unique tag number to enter age data from sampled otoliths. The linking of samples to a shot/vessel/place/time allows stock assessors to better standardise data if required.
- record tag numbers on a supplied hard copy form.
- pre-report intended landings to the SETFIA WORDaC Coordinator.

The WORDaC Coordinator will co-ordinate a trained port sampler (likely at the Melbourne Fish Markets, given the absence of a co-operative in Portland) to collect otoliths and length frequencies. Data will be entered via an existing application using waterproof electronic tablets and will be sent periodically to AFMA by the WORDaC Coordinator. The SIDaC (shark industry data collection) project collected 7,000 samples via this method in 2019 and data is entered into the AFMA database. SETFIA will report achievements against the data plan quarterly to AFMA, and as required to the relevant RAG.

3.5.2 Biological data

Noting the unpredictable nature of orange roughy fishing, the Research Plan aims to collect 1,000 otoliths and 1,000 length frequencies per annum from each research area. Otoliths and length frequency measurements must **not** be collected from the same fish – this means that 6,000 fish will be sampled per year (2,000 fish from each research area). Separate fish must be sampled for otoliths and lengths because:

- failure to do so may result in insufficient length frequencies in the future stock assessments; and
- length sampling should be proportionate to the catch; whereas otolith collection should ensure a representative sample across the lengths to develop an age-at-length-key.

[1] Described in section 3.5.2: Biological data

On observed and unobserved trips, otoliths and length frequencies are to be extracted at the rate of 50 kg (approximately two cases) per shot. This is approximately 67 fish per shot, at the expected average individual fish weight of 750 g.

Information from other orange roughy fisheries indicates that individual orange roughy shots may not be representative of the actual size/age structure of the entire aggregation. For this reason it is better to collect the biological data from numerous small (5-10 tonne) shots rather than one large (50 tonne) shot. Whilst fishing under a scientific permit, skippers should endeavour to collect data from multiple shots in each research area.

AFMA and SETFIA reserve the right to vary the data collection guidelines (up or down) under the Research Plan to meet the SERAG proposed data collection target of 2,000 for each of the three research areas – 6,000 fish in total.

3.6 Observers

As per management arrangements in the eastern zone, permit holders will be required to take an AFMA approved observer on the first two trips, and then after this as directed by AFMA, when fishing for western orange roughy under this Research Plan. To arrange an observer, the vessel must give the AFMA Observer Section at least 72 hours' notice of an intention to depart on a fishing trip by telephone (02 6225 5506, or 0427 016 859) or by email: observers@afma.gov.au.

3.7 Bycatch

Fishing for western orange roughy in deepwater closures increases the potential of catch and interactions with high risk species (identified by Ecological Research Assessments, ERA); including gulper sharks managed under the Upper Slope Dogfish Management Strategy (USDMS). The USDMS provides for non-retention of four species, Harrisson's dogfish, southern dogfish, endeavour dogfish and greeneye spurdog. Currently, there is a SESSF-wide trigger of 4.5 tonnes total for gulper sharks. If this trigger is reached, all permits will be revoked.

Other potential by-product species include the following three quota species:

- deepwater shark (western)
- oreo (basket)
- smooth oreo

Operators with a scientific permit must debit catches of these species from existing quota (section 3.4 'Quota').

3.8 Temperature logging

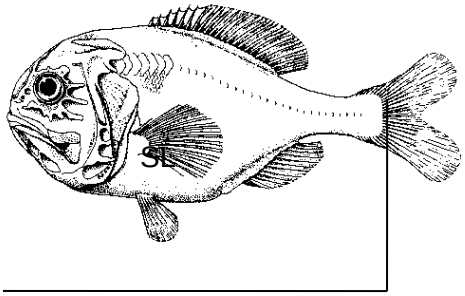
All vessels possessing a scientific permit and undertaking shots for western orange roughy as part of this Research Plan should endeavour to record water temperature at fishing depth and/or fit temperature loggers to the headline of the net in order to collect water temperature depth profiles. The ability to collect this data will be considered when allocating permits.

3.9 Data handling and storage

SETFIA and AFMA will ensure that all information collected under the Research Plan is made available within the AFMA database and approved by the AFMA Database Manager.

Appendix A: Collection of biological data from Orange Roughy

Always use Standard Length (SL) as the measurement criteria for Orange Roughy.

Species	Scientific name	CAAB
Orange Roughy	*Hoplostethus atlanticus*	255009
		AFMA: ORO

Measure each fish to the nearest cm mark on the measuring tape.

Rounding rule: 34.5 cm – 35.4 cm = 35 cm.