Australian Government

Australian Fisheries Management Authority

Southern Squid Jig Fishery
Harvest Strategy 2022

Contents

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Version	Updates	Author	Date
02	Replaces SSJF Harvest Strategy 2007		

Introduction

The purpose of this Southern Squid Jig Fishery Harvest Strategy (the Harvest Strategy) is to provide a framework for setting harvest levels in the Southern Squid Jig Fishery (SSJF). This Harvest Strategy updates and replaces the SSJF Harvest Strategy 2007 (2007 Harvest Strategy).

The Australian Fisheries Management Authority (AFMA) is responsible for efficient management and sustainable use of Commonwealth fisheries on behalf of the Australian community. AFMA operates under a range of legislative instruments including the *Fisheries Management Act 1991* (FMA), the *Fisheries Administration Act 1991* (FAA) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Their implementation is supported by fisheries policies and guidelines, including the *Commonwealth Fisheries Harvest Strategy Policy 2018* (Harvest Strategy Policy).

The Harvest Strategy Policy and the *Guidelines for the Implementation of the Commonwealth Fisheries Harvest Strategy Policy 2018* (the Harvest Strategy Guidelines) were updated in 2018 and provide a framework for applying an evidence-based, precautionary and transparent approach to setting harvest levels in Commonwealth fisheries. It defines biological and economic objectives for Commonwealth fisheries and identifies reference points to be used in harvest strategies to achieve these objectives.

Harvest strategies consistent with this policy provide industry and the Australian community with confidence that Commonwealth commercial fish stocks are being managed for long-term ecological sustainability and economic viability.

AFMA implements the Harvest Strategy Policy through fishery specific harvest strategies and supporting management arrangements. These harvest strategies, in combination with other elements of the Commonwealth fisheries management system constitute a comprehensive approach to ecosystem-based fisheries management.

The Harvest Strategy Policy recognises that in low effort fisheries the risk to stocks are considered to be low. As such, it allows for a low cost and precautionary approach to be implemented through the fishery specific harvest strategy. This is consistent with the principles of the risk-cost-catch trade off.

For the SSJF, in the absence of explicit biological or economic targets, catch and effort triggers have been established based on historic catch. Catch is not considered to be explicitly capped or constrained through the Harvest Strategy but the triggers provide a predefined threshold that results in corresponding actions.

With a harvest strategy in place, AFMA and industry are able to operate with greater confidence, management decisions are more transparent, and there are few unanticipated outcomes necessitating ad-hoc management responses.

Fishery description

The SSJF is a low impact, single method, single species fishery that covers almost half of the Australian Fishing Zone (AFZ). The SSJF is located off New South Wales, Victoria, Tasmania and South Australia; with a small area of oceanic water off southern Queensland (Figure 1). The major landing ports are located in Portland (Victoria), Queenscliff (Victoria) and Triabunna (Tasmania).

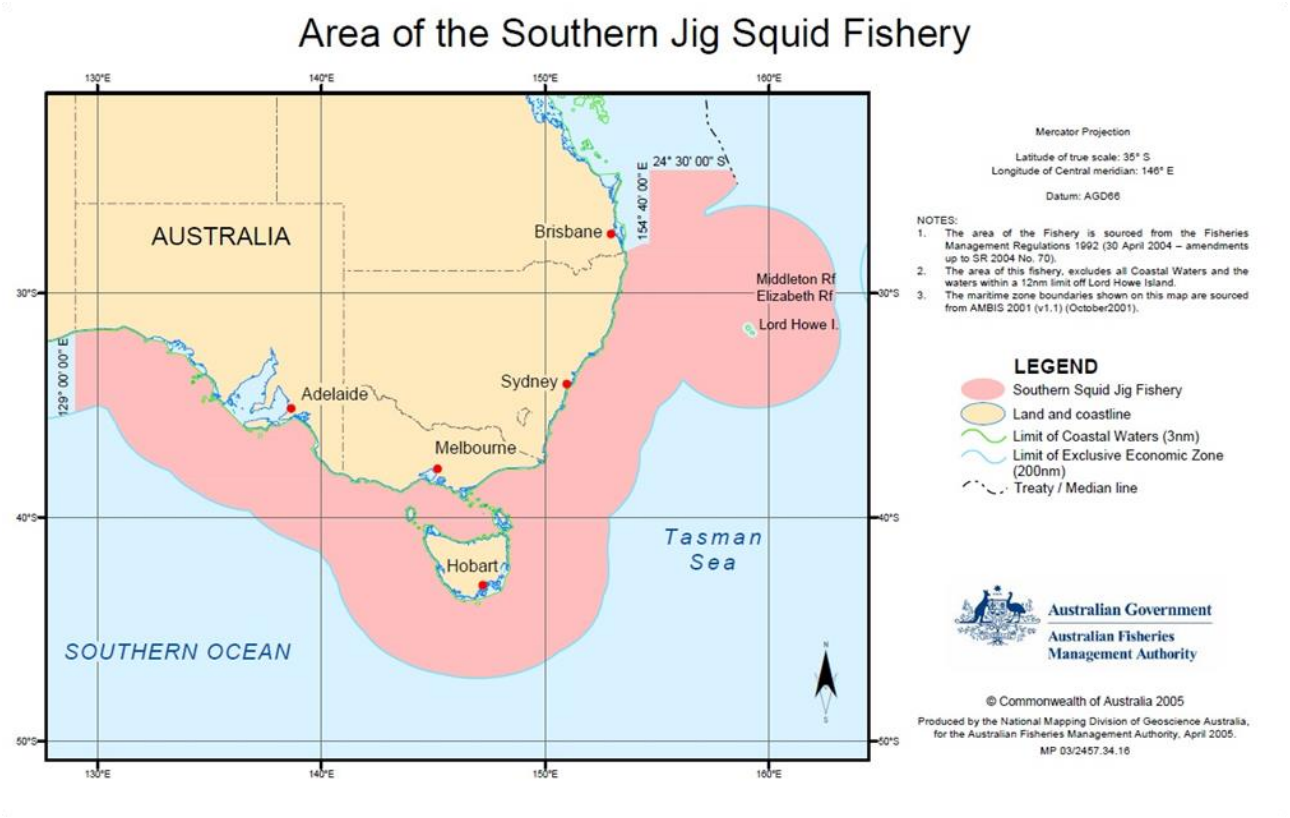

Figure 1 Area of the Southern Squid Jig Fishery

Key commercial species

The Harvest Strategy Policy considers all species landed and sold in Commonwealth fisheries to be commercial species, categorised as either key commercial or byproduct. Gould's squid (*Nototodarus gouldi*, also known as arrow squid) is the key commercial species targeted in the SSJF. Retention of byproduct species is allowed in the SSJF, but there tends to be limited byproduct landed.

Key commercial stocks are those stocks that are most relevant to the objective of maximising net economic returns to the Australian community from that fishery. Harvest strategies are developed for key commercial stocks, which use an indicator of stock condition and one or more harvest control rules to pursue predefined targets and avoid predefined limits.

Byproduct stocks, by definition, make some contribution to the economic performance of a fishery, but not enough such that the benefits of managing these stocks to a target outweigh the costs of estimating or implementing that target through formal harvest control rules. The *Commonwealth Fisheries Bycatch Policy 2018* (Bycatch Policy) and the SSJF Bycatch and Discarding Workplan 2021 provide further detail on the approach to managing byproduct species.

Management Arrangements

Management arrangements in the SSJF are primarily implemented to manage effort, including restricting the number of boats and regulating gear type. The permitted fishing gear in the SSJF is a 'standard squid jigging machine,' which is defined in the *Southern Squid Jig Management Plan 2005* (Management Plan) as:

"*…a squid jigging machine that has two elliptical spools with one jig line on each spool.*"

There are no restrictions on the amount of line, number or type of squid jigs that can be used with each standard jig machine.

Squid jig boats operate in continental shelf waters in depths of between 50 to 100 metres. Overhead lights are used to create an area of illumination around the boat, with a shaded area directly under the boat. The lines are set with barbless lures on monofilament fishing lines and are suspended from elliptical rollers which jig the line up and down in the water, through both the lit and shaded areas. Gould's squid gather in the shaded area and dart into the light to take the lures.

Prior to the start of each fishing year (1 January – 31 December), an annual Total Allowable Effort (TAE) is set by AFMA, in consultation with the Squid Resource Assessment Group (SquidRAG) and the South East Management Advisory Committee (SEMAC). The TAE determines the total number of standard jigging machines that can be used in the SSJF during the relevant fishing year. Byproduct and bycatch levels are also discussed annually by the SquidRAG as part of the TAE setting process.

Harvest Strategy objectives

Owing to the diverse nature of Commonwealth fisheries, the Harvest Strategy Policy allows flexibility in using harvest strategies to meet the needs of each fishery while still meeting the objectives.

The objectives of the Harvest Strategy Policy are the ecologically sustainable and profitable use of Australia's Commonwealth fisheries resources (where ecological sustainability takes priority) – through the implementation of harvest strategies.

In pursuit of the Harvest Strategy Policy objectives, operational objectives have been developed for this Harvest Strategy.

Biological

- Ensure exploitation of fisheries resources and related activities are conducted in a manner consistent with the principles of ecologically sustainable development, including the exercise of the precautionary principle.
- Ensure fishing is conducted in a manner that does not lead to overfishing — where overfishing of a stock is identified, action will be taken immediately to cease overfishing.
- Minimise discarding of commercial species as much as possible.

Economic

- Maximise net economic returns to the Australian community from management of Australian fisheries —always in the context of maintaining commercial fish stocks at sustainable levels.

Ecosystem

- Ensure consistency with the EPBC Act and the *Guidelines for the Ecologically Sustainable Management of Fisheries* (2nd edition).

Multi-fishery management

Gould's squid are the key commercial species in the SSJF and are also taken as byproduct in the Commonwealth Trawl Sector (CTS) and Great Australian Bight Trawl Sector (GABTS) of the Southern and Eastern Scalefish and Shark Fishery (SESSF); and taken as byproduct in Tasmanian state managed fisheries. In Commonwealth fisheries, management controls relating to Gould's squid only apply to the SSJF. There are currently no restrictions in terms of effort or catch limits in the trawl sectors of the SESSF, unless the relevant triggers for the SESSF trawl sectors in this Harvest Strategy, as outlined below, are reached.

Annual catch and effort triggers

In the absence of biomass estimates from surveys or stock assessment, and in place of target and limit reference points, a range of triggers have been established. These serve as a check against controlled expansion, whereby the limit trigger may not be revised without investing in an assessment of the fishery. The lower and intermediate trigger levels are not associated with 'hard' decision rules to limit the fishery, but rather invoke investment in greater data monitoring and/or analysis to better inform the management of the fishery.

The intention of the catch and effort triggers in this Harvest Strategy are to ensure the fishery remains sustainable, including in the event of fishery expansion, while not impeding further development of the fishery and economic returns to the Australian community.

To mitigate against over- exploitation during periods of low availability of squid, when self-regulation is not evident, there is also a low availability trigger based on effort and Catch per Unit of Effort (CPUE).

The annual catch and effort triggers in this Harvest Strategy preserve the in-year catch and effort triggers from the 2007 Harvest Strategy and include an additional end-of-year catch and effort trigger (SSJF lower catch and effort trigger). These triggers are described in detail below and apply to either the SSFJ or the SSJF and the SESSF combined.

The 2007 Harvest Strategy triggers are based on historic annual catch by foreign squid fishing boats off southern Australia during the late 1970s – early 1980's; and on Australian trawl boats in the SESSF during the 1990's. Following the cessation of foreign boats targeting squid in Australia, effort in the SSJF has been typically low, and considerably less than the highest historical annual catches used to inform the 2007 Harvest Strategy triggers.

The additional trigger introduced in this Harvest Strategy was developed in consultation with SquidRAG and SEMAC. The *SSJF lower catch and effort trigger* (end-of-year) is the average annual catch of Gould's squid in the SSJF (360 t) and the average annual total number of fishing days by the fishery (213 days), respectively, between 2017 and 2021.

If the triggers outlined in this harvest strategy are not reached, SquidRAG will consider the available catch and effort data as part of the Total Allowable Effort setting process to ensure there are no sustainability concerns associated with recent catches. Where available, state catches will also be considered to provide context to the level of Commonwealth catch and effort.

SSJF – lower catch and effort trigger (end-of-year)

Catch and effort trigger: 360 t (total catch by SSJF) and/or 213 days (total days fished by SSJF)

Action: When providing advice on a TAE for the following fishing year, SquidRAG to consider and provide advice on the analysis of catch in the fishery including:

- total catch and fishing days by fishing year and catch per unit effort (CPUE, kg per fishing day) for current and previous nine fishing years;
- total catch and fishing days by month for current and previous four fishing years and CPUE;
- spatial distribution of catch and effort (fishing days).

Decision rule: If any sustainability concerns are identified a management response will be considered which may include, but is not limited to, effort limits or investing in additional analysis.

SSJF – Intermediate catch trigger (within fishing year)

Catch Trigger: 3000 t (total catch by SSJF)

Action: Assess level of effort

Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA

Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis

Obtain additional biological information, in order to distinguish which cohort is being exploited

Invest in research and development: implement a research program involving a full evaluation of monitoring data; evaluate appropriateness of pre-fishing year or within fishing year management approaches and/ or a survey

Decision rule: If no indication of impact (depletion), move onto next trigger. Noting that impact is best quantified in terms of the number of squid, rather than biomass, as biomass will increase during the fishing year due to growth.

If evidence of impact (depletion), review the suitability and possibly revise trigger values

SSJF – Intermediate effort trigger (within fishing year)

Effort Trigger: 30 boats (SSJF fleet)

Action: Assess level of catch

Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA

Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis

Obtain additional biological information, in order to distinguish which cohort is being exploited

Invest in research and development: implement a research program involving a full evaluation of monitoring data; evaluate appropriateness of pre-fishing year or within fishing year management approaches and/ or a survey

Decision rule: If no indication of impact (depletion), move onto next trigger. Noting that impact is best quantified in terms of the number of squid, rather than biomass, as biomass will increase during the fishing year due to growth.

If evidence of impact (depletion), review the suitability and possibly revise trigger values

Combined SSJF and SESSF – intermediate catch trigger (within fishing year)

Catch Trigger: 4000 t (total catch by SSJF and SESSF trawl sectors combined)

Action: Assess level of effort

Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA

Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis

Obtain additional biological information, in order to distinguish which cohort is being exploited

Invest in research and development: implement a research program involving a full evaluation of monitoring data; evaluate appropriateness of pre-fishing year or within fishing year management approaches and/ or a survey

Decision rule: If no indication of impact (depletion), move onto next trigger. Noting that impact is best quantified in terms of the number of squid, rather than biomass, as biomass will increase during the fishing year due to growth.

If evidence of impact (depletion), review the suitability and possibly revise trigger values

SSJF – Limit catch trigger (within fishing year)

Catch Trigger: 5000 t (total catch by SSJF)

Action: TAC should not be increased until the fishery is reassessed using a depletion analysis

Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA

Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis

Invest in research and development: implement a research program involving a full evaluation of monitoring data; evaluate appropriateness of pre-fishing year or within fishing year management approaches and/ or a survey

Decision rule: No increase in catch unless it can be demonstrated that it is sustainable

If no implication of impact (depletion) retain and/or consider revised trigger

If evidence of impact (depletion) consider cap in effort/ catch

Combined SSJF and SESSF – Limit catch trigger (within fishing year)

Catch Trigger:	5000 t (total catch by SSJF and SESSF trawl sectors combined)
Action:	TAC should not be increased until the fishery is reassessed using a depletion analysis
	Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA
	Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis
	Invest in research and development: implement a research program involving a full evaluation of monitoring data; evaluate appropriateness of pre-fishing year or within fishing year management approaches and/ or a survey
Decision rule:	No increase in catch unless it can be demonstrated that it is sustainable
	If no implication of impact (depletion) retain and/or consider revised trigger
	If evidence of impact (depletion) consider cap in effort/ catch

SESSF – limit catch trigger (within fishing year)

Catch Trigger:	2000 t (total catch by SSJF)
Action:	Convene a special meeting of SquidRAG involving members representing the SSJF, SESSF and others as deemed necessary by AFMA
	Undertake a full spatial (specific areas of localised fishing) and non-spatial (whole fishery) depletion analysis
Decision rule:	No increase in catch unless it can be demonstrated that it is sustainable
	If no implication of impact (depletion) retain and/or consider revised trigger
	If evidence of impact (depletion) consider cap in effort/ catch

Overriding limit triggers (within fishing year)

Limit riggers may be overridden to enable industry to take advantage of 'boom' fishing years, during which the fleet fishing at full capacity is unlikely to adversely impact the stock. A 'boom' is defined by the following 'exceptional circumstances' criteria within one lunar month:

- Average CPUE increased by twofold or greater;
- catch has been documented as occurring in the middle of the day; and
- irrespective of moon phase at night.

Decision rule:	If the fishery shows expansion without the "boom" criteria being met, the fishery will be subject to the suite of triggers described above (presumably, such expansion would occur as a direct result of market changes).

Low availability trigger (within fishing year)

To avoid over-exploitation during periods of low availability, the following criteria form a "low availability" trigger:

- effort is very high, defined as in excess of 45 boats[1], but average CPUE per trip is low (<20% of long-term average),
- there is no evidence of high squid density elsewhere (across any and all fisheries, including state fisheries, i.e. whole of stock consideration, in terms of ad-hoc checking of catches across the whole of the fishery and the SESSF), and
- there is no evidence of self-regulation within one month (as evidenced by 'peripheral' boats ceasing fishing within approximately two weeks of low catches occurring, quantitatively equated to effort decreasing to below 30 boats).

Decision rule: Impose spatial closures

Monitoring

AFMA will monitor catch and effort against the triggers using data from logbook and catch disposal records throughout the fishing year. In addition, the end-of-year lower catch and effort trigger will be reviewed prior to SquidRAG providing TAE advice for the following fishing year. Where data suggests the end-of-year trigger is reached, the corresponding actions will be undertaken.

Harvest Strategy Review

This Harvest Strategy will be reviewed every five years, or earlier if:

- a marked change in catch or fishing behaviour;
- new information that substantially changes the understanding of the fishery;
- external drivers have unexpectedly increased the risk to a fishery and fish stocks, including environmental or climate drivers that have substantially altered the productivity characteristics (growth or recruitment) of the stock; and
- performance indicators show that harvest strategies are not working effectively and that the intent of the Harvest Strategy Policy is not being met.

[1] The 30 boat trigger would have already been reached in the lead up, however note that the 30 boat decision rule is focused on a different objective and relates to a more immediate response.