Tasmanian Sardine Fishery Policy Paper

Developing a Sustainable Commercial Sardine Fishery

December 2025

Marine Resources
Department of Natural Resources and Environment Tasmania

Tasmanian Government

In recognition of the deep history and culture of these islands, we acknowledge all Tasmanian Aboriginal people as continuing custodians of this Land and Sea Country and pay our respect to elders past and present.

Table of Contents

Introduction 4
Policy Paper 6
Have your say 7
Timeframes 7
Where and how fishing will occur 8
Australian sardine in coastal waters 10
Who will get a licence to fish in the Tasmanian sardine fishery 11
Precautionary catch limits 12
Harvest Strategy for a Tasmanian sardine fishery 16
Future research programs 18
    Stock assessment program 19
    Biological studies 21
    Ecological risk and marine ecosystem impacts 22
    Southern Bluefin Tuna 24
Providing feedback 28
Definitions and terms 29
Bibliography 28
Further relevant reading 29

Introduction

Tasmania has a unique opportunity to develop a sustainable commercial fishery targeting Australian sardines.

A recent stock assessment survey undertaken by the Institute for Marine and Antarctic Studies (IMAS) indicates the biomass of the south-eastern stock of Australian sardine to be in the order of 208,000 tonnes.[1] Further, ecosystem modelling across south-east Australia indicates the marine food web is not highly dependent on Australian sardine.[2] Rarely do we have stock assessments or such depth of biological or ecological knowledge before a commercial fishery begins. This presents a rare opportunity to safely and sustainably develop a commercial fishery, guided by scientific advice from its onset, without significant impact on either the stock or the broader marine ecosystem.

Following the results of the scientific research, in December 2024 the Tasmanian Government produced Development Guidelines; a clear set of principles that will guide decision-making in developing a Tasmanian sardine fishery (TSF).[3] It includes information about how and what government will consider in the fishery's development (see Figure 1).

The four key principles for developing a Tasmanian sardine fishery

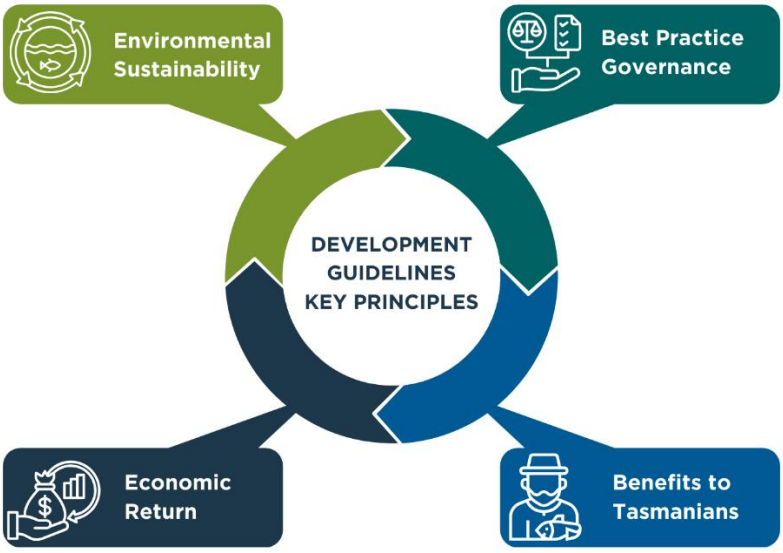


Figure 1. The four key principles for developing the TSF: ecosystem sustainability, best practice governance, economic return, and benefits to Tasmanians.

1 Tim M. Ward et al., "Research to support the development of a Tasmanian Sardine Fishery", Final Report for Fisheries Research Development Project 2023-005 by the Australian Institute of Marine and Antarctic Studies, University of Tasmania, 2024, 32 pp.

2 Anthony D.M. Smith, "Review and update of harvest strategy settings for the Commonwealth Small Pelagic Fishery - Single species and ecosystem considerations", Final Report of FRDC Project No. 2013/028, CSIRO, 2015, 74 pp.

3 NRE Tas, "Development Guidelines for a New Tasmanian Sardine Fishery", 2024

In early 2025, the Tasmanian Government held seven information sessions around the State. This was an opportunity for the community to learn and ask questions about the scientific research, the Development Guidelines and the next steps in developing a fishery.

From these sessions, a range of questions and topics of interest were raised by attendees. These primarily related to stock sustainability, ecosystem impacts, ongoing scientific research, consideration of other marine users, benefits for Tasmanians and support for a human consumption market. These were summarised and addressed on the Department of Natural Resources and Environment Tasmania's website, fishing.tas.gov.au/sardines.

Policy Paper

The Tasmanian Government is committed to delivering a commercial TSF that provides tangible benefits to Tasmania and takes into consideration public feedback on its design.

This Policy Paper is the next stage in providing clarity, transparency and certainty for the Tasmanian community and industry about the Government's intentions for how a TSF will be developed in line with our long-term vision for the fishery: a profitable, socially responsible, ecologically sustainable commercial fishery that delivers tangible long-term economic benefits to the Tasmanian community.

This Policy Paper has been developed with this vision in mind and centres on the following key areas, outlining the Government's approach and rationale:

- **Where and how fishing will occur**
- **Who will be able to fish for sardines**
- **Precautionary catch limits**
- **Harvest strategy**
- **Future research programs**

Have your say

The Policy Paper provides information and intentions for how we will develop a draft management plan for the TSF. The draft management plan will be prepared in accordance with the provisions of the *Living Marine Resources Management Act 1995*.

We are asking for your feedback on the policies outlined within this Policy Paper. To find out how you can do this, see the 'Providing Feedback' section at the end of this Paper, and make a submission.

Timeframes

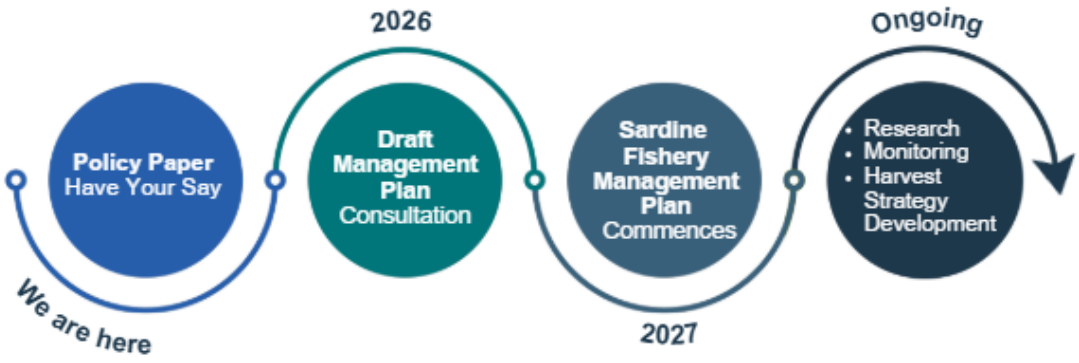


Figure 2. Estimated timeline of fishery development, noting the timeframes are subject to change. The stages involve release of this policy paper, consultation on a draft Management Plan in 2026, and the Sardine Fishery Management Plan commencing in 2027. Once the fishery is established there will be ongoing monitoring, research and development of a harvest strategy for the fishery.

Where and how fishing will occur

Governance

Policy Proposal

- **A new specific sardine fishery management plan will be created to enable commercial sardine fishing.**
- **Under this management plan, the fishery will operate only in offshore waters**, see Figure 3.
- **Under this management plan, sardines in offshore waters will only be permitted to be caught with a purse seine net.**

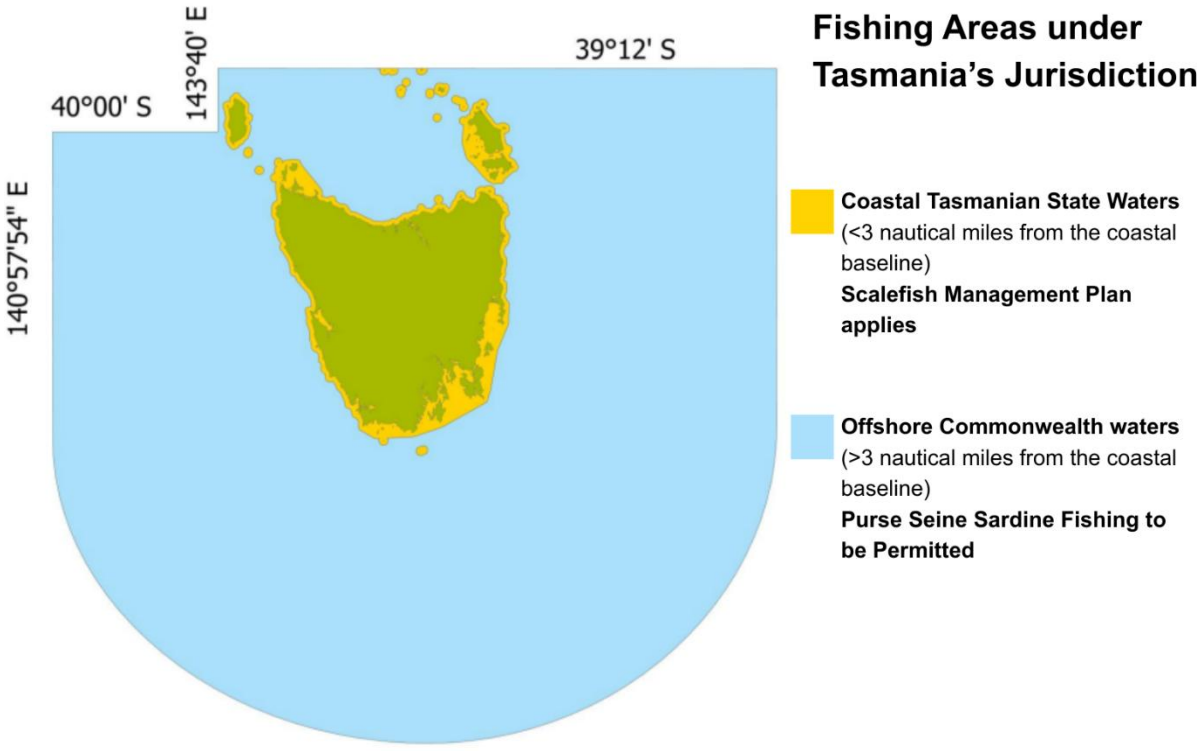


Figure 3. Tasmanian coastal waters (yellow) are within 3 nautical miles of the baseline[4] and where fishing occurs under the existing Scalefish Management Plan. The offshore waters to which Tasmanian law applies under a fisheries arrangement with the Commonwealth of Australia (blue) are outside coastal waters and where the TSF is proposed to operate under the new specific sardine fishery management plan.

[4] LIST Maritime Boundary Coastal Waters Area depicts the area covered by the Scalefish Management Rules: https://maps.thelist.tas.gov.au/listmap/app/list/map?bookmarkId=1215834

Rationale

Developing a fishery that reduces overlap with key fishing areas and potential overlap with other marine resource users were all outlined as key areas for consideration in the Development Guidelines. These aspects of the TSF were strongly reflected across the Information Sessions held earlier this year.

With this in mind, targeted commercial sardine fishing in the TSF will be restricted to offshore waters. This means there will only be commercial sardine fishing under the newly developed rules for Australian sardine in offshore waters, i.e. no fishing within three nautical miles (5.56 km) from any part of the State, including the Bass Strait islands. However, existing bycatch rules for Australian sardine in Tasmanian coastal waters will remain, see the section below titled ‘Australian sardine in coastal waters’. This policy has been based on the following factors.

Firstly, it will reduce overlap between commercial TSF operations and those who usually fish the more accessible coastal waters. This means fewer interactions between recreational fishers and other commercial fisheries, such as those operating under a general scalefish licence, who are restricted to fishing within coastal waters.

Secondly, it was evident from the independent stock assessment surveys conducted in December 2023 and January 2024, which covered a total area of almost 150,000 km^2 and included waters off Tasmania, Victoria and southern New South Wales, that the highest density of spawning sardines was found in the offshore waters of Bass Strait (see Figure 4). Therefore, it is logical the TSF will predominately operate in these waters.

Additional arrangements to protect Threatened, Endangered and Protected (TEP) species interactions are also being investigated. Further information is within the Ecosystem section of this Paper.

Considering this, the new TSF management plan will be created specifically to enable commercial sardine fishing only in offshore waters, more than three nautical miles away from Tasmanian shores.

This management plan will also specify that the only gear allowed will be a purse seine net. This is a method of fishing which is highly selective, has low bycatch risk, and negligible impact on benthic habitats due to the nets typically having minimal contact with the seafloor. Importantly, the use of trawl fishing for Australian sardine within the TSF will not be permitted.

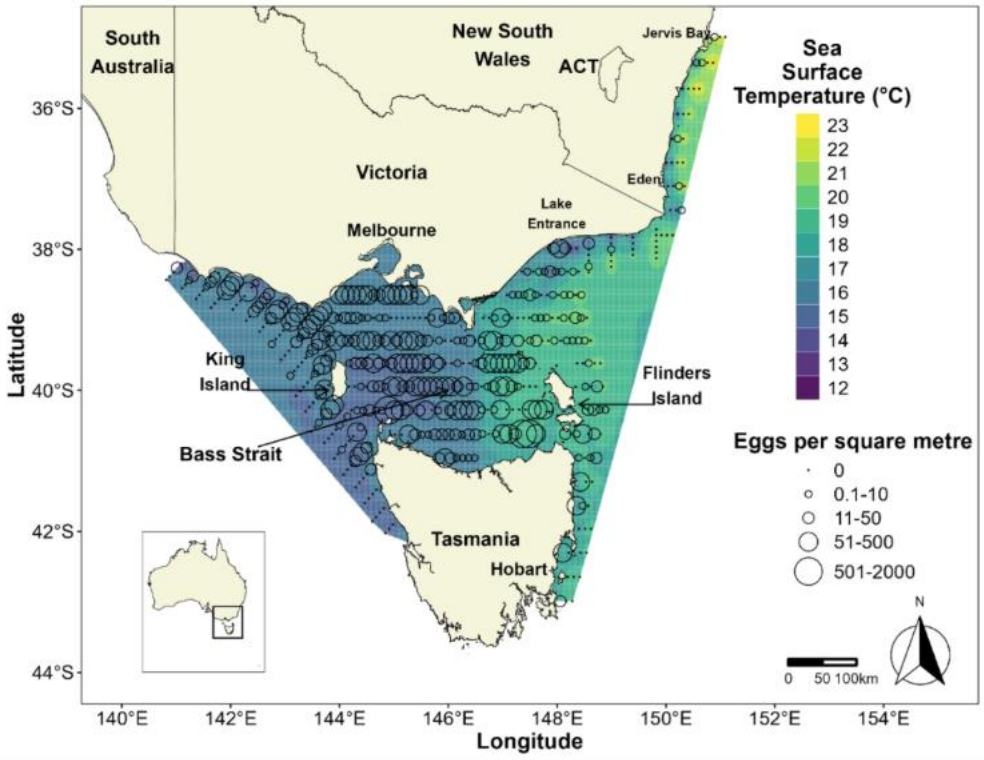


Figure 4. Location and density of live Australian sardine eggs and *in situ* measurements of sea surface temperatures at sites sampled in Bass Strait from December 2023 and January 2024 IMAS survey. Source: Ward *et al 2024.*

Australian sardine in coastal waters

Separate to the specific sardine fishery management plan, a bycatch trip limit allows the catch of sardine in coastal waters by scalefish licence holders, using existing permitted gear methods (purse seine, beach seine and Danish seine). This will continue to be managed under the Scalefish Management Plan which governs bag limits for recreational fishers and possession limits in coastal waters for scalefish fishers. Any changes to these rules will be in-line with regular statutory processes, including consultation.

Who will get a licence to fish in the Tasmanian sardine fishery

Governance and Economic Return

Policy Proposal

The licensing framework the Tasmanian Government is developing will have emphasis on the fishery:

- **Providing a fair and equitable process to determine the allocation of commercial sardine licences.**
- **Maximising long-term economic return, such as employment and investment.**
- **Supporting social benefits, for example access to affordable, healthy and sustainable protein.**
- **Achieving cost recovery, whereby operational, management and research costs are paid by industry.**

Rationale

This new fishery allows a unique opportunity to design an equitable framework to determine how allocation to operate in the TSF takes place. Importantly, it will be designed in a way that best delivers tangible and long-term economic and social benefits to the Tasmanian community, including employment and investment opportunities, as well as the stimulation of economic activity directly and indirectly resulting from the TSF.

In conjunction with development of the management plan, consideration will be given to the potential social and economic benefits and how Tasmania might realise economic value from development of the TSF. Consideration will also be given to cost recovery mechanisms and implementation. This is anticipated to be achieved via the licensing framework designed for the fishery and likely come into effect once the fishery is fully established.

Precautionary Catch Limits

Ecosystem Sustainability & Governance

Policy Proposal

The Tasmanian Government will set an initial catch limit of no greater than 7,500 tonnes per year, based on:

- **A maximum harvest rate of 5%.**
- **Applying the harvest rate to the lower "target reference point" of 150,000 tonnes, rather than the estimated spawning biomass of 208,000 tonnes, providing for an ecological allocation.**

Rationale

The success and sustainability of similar Australian fisheries, such as the South Australian Sardine Fishery (SASF) and the Commonwealth Small Pelagic Fishery (SPF), is contingent on regular and robust stock assessments that have clear decision rules linked to a contemporary harvest strategy. Such processes are not only critical for evaluating ecological sustainability, but also important for broader community confidence for how these fisheries operate.

A study conducted in 2015 undertook ecosystem and population modelling to evaluate and provide advice on catch limits for the target species in the SPF, including Australian sardine.[5] It also investigated management measures for these species to continue supporting optimal ecosystem function. The results indicate a harvest rate (i.e. the percentage of spawning biomass that can be harvested) of up to 33% is ecologically sustainable for Australian sardine, without significant impact on the marine ecosystem. Importantly, this maximum harvest rate would only be appropriate if stock assessments were conducted at least every five years.

While a harvest rate of 33% is shown to be ecologically sustainable in south-eastern Australia, in practice Australian fisheries have set more conservative harvest rates, i.e., up to 20% in the SPF and up to 27.5% in the SASF. Again, higher harvest rates are only applied when frequent stock assessment surveys are conducted to ensure the stock biomass is above target reference points.

5 Anthony D.M. Smith, "Review and update of harvest strategy settings for the Commonwealth Small Pelagic Fishery - Single species and ecosystem considerations". Final Report of FRDC Project No. 2013/028, CSIRO, 2015, 74 pp.

Further, the harvest rates in the SASF are applied to a lower target reference point (~67% of the estimate of spawning biomass), rather than directly to the estimate of spawning biomass.[6] Such an approach ensures a further ecological allocation and provides stability in setting catch limits.

In summary, these Australian fisheries apply several layers of precaution to commercial catch limits for Australian sardine. An even more conservative approach will be used to set initial catch limits for the TSF.

Tasmania's spawning biomass of sardine has been estimated at approximately 208,000 tonnes, with a 95% confidence interval of 158,000 and 260,000 tonnes.[7] This means there is very high confidence that the actual biomass sits between 158,000 and 260,000 tonnes. In this same report, a maximum harvest rate of 15% was recommended which would result in a theoretical catch limit of up to 31,500 tonnes.

Through the *Development Guidelines,* the Tasmanian Government committed to precautionary catch limits that are informed by current and independent research.[8]

It is therefore intended that a low harvest rate (i.e., 5%) applies to the lower confidence interval of the biomass estimate rather than to the estimated spawning biomass of 208,000 tonnes. For simplicity this is rounded to 150,000 tonnes and is referred to as the target reference point. This is illustrated below at Figure 5.

6 PIRSA, "Summary Report – Draft Management Plan for the South Australian Commercial Sardine Fishery. Report pursuant to section 44(2) of the Fisheries Management Act 2007", 2002

7 Ward et al., "Research to support the development of a Tasmanian Sardine Fishery", 2024

8 NRE Tas, "Development Guidelines for a New Tasmanian Sardine Fishery", 2024

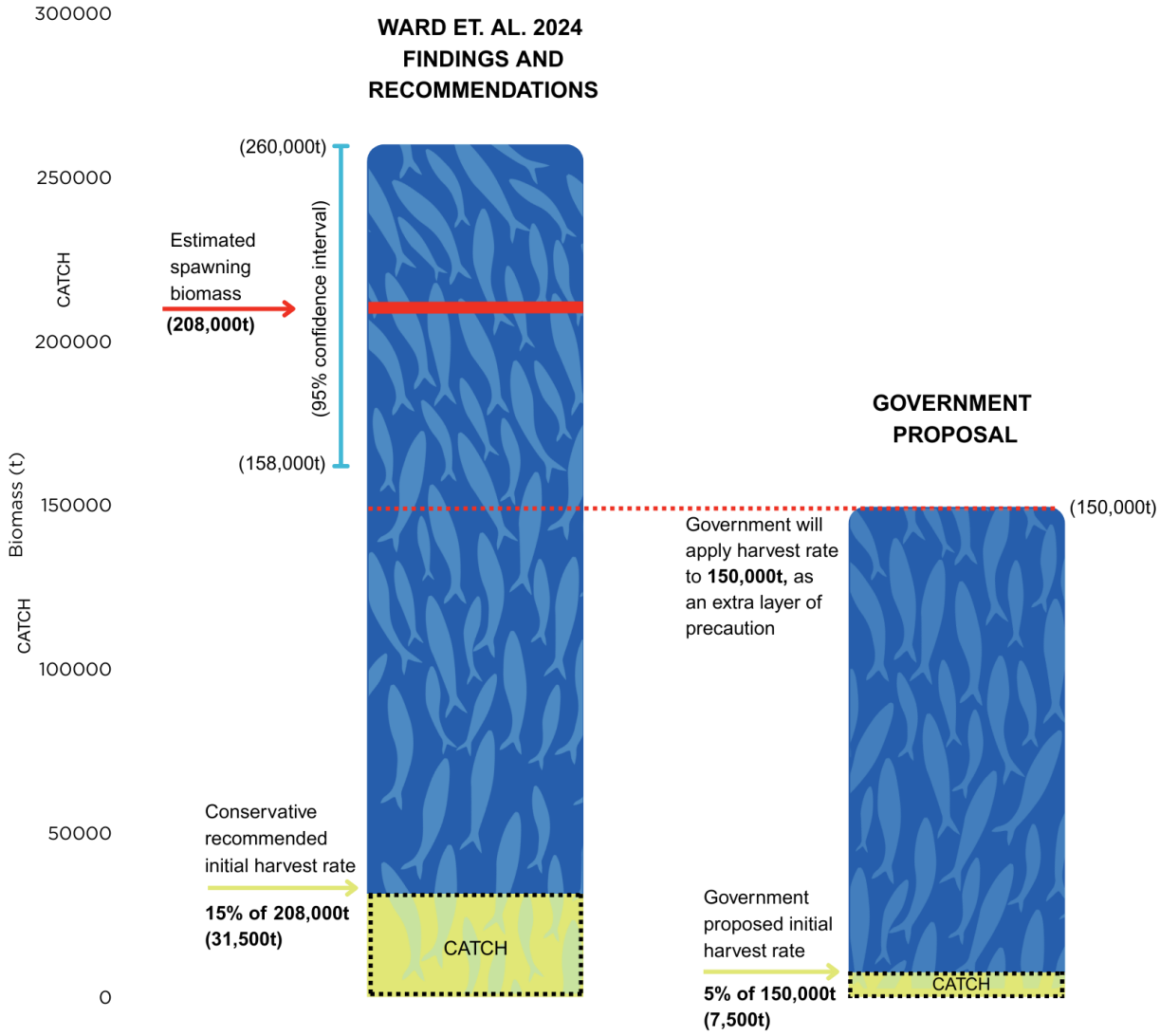


Figure 5. Sustainable catch limits recommended by Ward et al 2024 (15% of 208,000 t) and precautionary catch limits proposed by Government (5% of 150,000 t).

It is proposed that the TSF will commence with a target reference point of 150,000 tonnes (approximately 75% of the spawning biomass) and a 5% harvest rate will be applied to this estimate, see Figure 5. This would allow for an initial catch limit of no more than 7,500 tonnes.

This highly precautionary approach would be maintained until further stock assessments are conducted, providing information on the temporal stability of the Bass Strait stock and indicating that it is sustainable to increase the harvest rate.

Further, it is proposed that the TSF could continue fishing at this precautionary initial catch limit without the need for further fishery-independent stock assessments. This is provided there is an annual review of the catch and effort from the TSF. This approach

is consistent with the SPF Harvest Strategy, which allows a harvest rate of 5% to continue indefinitely without updated Daily Egg Production Method (DEPM) surveys.[9]

9 Australian Fisheries Management Authority, "Small Pelagic Fishery Harvest Strategy", 2025

Harvest Strategy for a Tasmanian sardine fishery

Governance

Policy Proposal

Tasmanian Government will develop a harvest strategy for the TSF within the first two years of the fishery commencing.

Rationale

The Tasmanian Government is committed to developing harvest strategies for key fisheries. Harvest strategies are frameworks for sustainable fisheries management. They establish clear guidelines for management actions that are to occur in response to changes in the fishery to achieve agreed ecological, social and economic objectives.

The development of a harvest strategy is consistent with having best practice management arrangements in place, in-line with the Development Guidelines and recommendations through the IMAS report.

The TSF harvest strategy will be developed in accordance with the Tasmanian Wild Fisheries Harvest Strategy Policy and Harvest Strategy Policy Implementation Guidelines.[10,11] The TSF harvest strategy will set clear decision rules for setting catch limits in line with stock assessment outcomes, to avoid ad-hoc, reactionary, or delayed decisions. The development of harvest strategy objectives will require engagement and consultation with community and fishery stakeholders but will be consistent with similar established harvest strategies (e.g., SASF, SPF and existing Tasmanian harvest strategies). The benefits of this approach include:

- More transparent, predictable and timely decisions on catch limits.
- Stability in the TSF which supports longer term business planning by fishers.
- Enhanced stewardship through consultative strategy development.
- Improved community confidence in fishing.
- Responsiveness to potential ecological, economic, social and cultural impacts.
- Improved transparency in status reporting for the TSF.

10 NRE Tas, "Tasmanian Wild Fisheries Harvest Strategy Policy Implementation Guidelines", 2024

11 NRE Tas, "Tasmanian Wild Fisheries Harvest Strategy Policy", 2024

The TSF harvest strategy will be a living document that specifies the necessary management actions to achieve the agreed ecological, economic and social objectives. The harvest strategy will demonstrate to the Tasmanian community that the fishery is managed in line with best practice. Further, the development of a harvest strategy is an important step towards seeking accreditation through independent assessment programs such as through the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) or Marine Stewardship Council (MSC).

Future research programs

There is a significant amount of scientific work that has been conducted on sardine species globally and within Australia. This includes the recent comprehensive survey of Bass Strait undertaken by IMAS, which builds on outcomes from two studies completed on western and eastern Bass Strait in 2016 and 2019.

This means that we are in a unique and desirable position of having access to more scientific data, research and knowledge than is typically available when designing a new fishery.

However, when developing a fishery like the TSF, there is a great opportunity to benefit and maximise scientific return to enhance what we currently understand about our marine environment. In considering this, the Tasmanian Government has identified further research opportunities to support the sustainable development and growth of a sardine fishery. These research streams may occur as part of ongoing monitoring and research alongside the fishery being operational.

Details on the proposed programs are outlined below.

Image: DEPM Survey Sampling, Dr Tim Ward, IMAS

Stock Assessment Program

Daily Egg Production Method

Policy proposal

The Tasmanian Government is proposing an additional stock assessment survey would be required to increase initial harvest rates above 5%.

Rationale

A comprehensive survey of Australian sardine conducted by IMAS during December 2023 and January 2024 estimates the spawning biomass of the south-eastern sardine stock to be approximately 208,000 tonnes. This survey expanded on the previous partial surveys conducted in 2016 and 2019. These two surveys estimated the spawning biomass to be in the order of 30,000 tonnes and 185,000 tonnes in the western and eastern component of Bass Strait (respectively).[12]

The survey used a method called the Daily Egg Production Method (DEPM) to calculate the spawning biomass. In simple terms, it estimates the number of eggs produced each day in the spawning area and then uses this information to determine the number of adult fish needed to produce those eggs. This is illustrated at Figure 7 (see Further Relevant Reading).

As outlined in the Development Guidelines, any changes to management arrangements including catch limits will be directly linked to and informed by outcomes from periodic stock assessments, and be consistent with the harvest strategy for the fishery. This approach is illustrated at Figure 6.

12 Tim M. Ward et al., "Spawning biomass of the eastern component of the south-eastern stock of Sardine (*Sardinops sagax*) in 2019", 2022, Report prepared for The Tasmanian Department of Primary Industries, Parks, Water and Environment by the Institute for Marine and Antarctic Studies, University of Tasmania, 2022, 28pp.

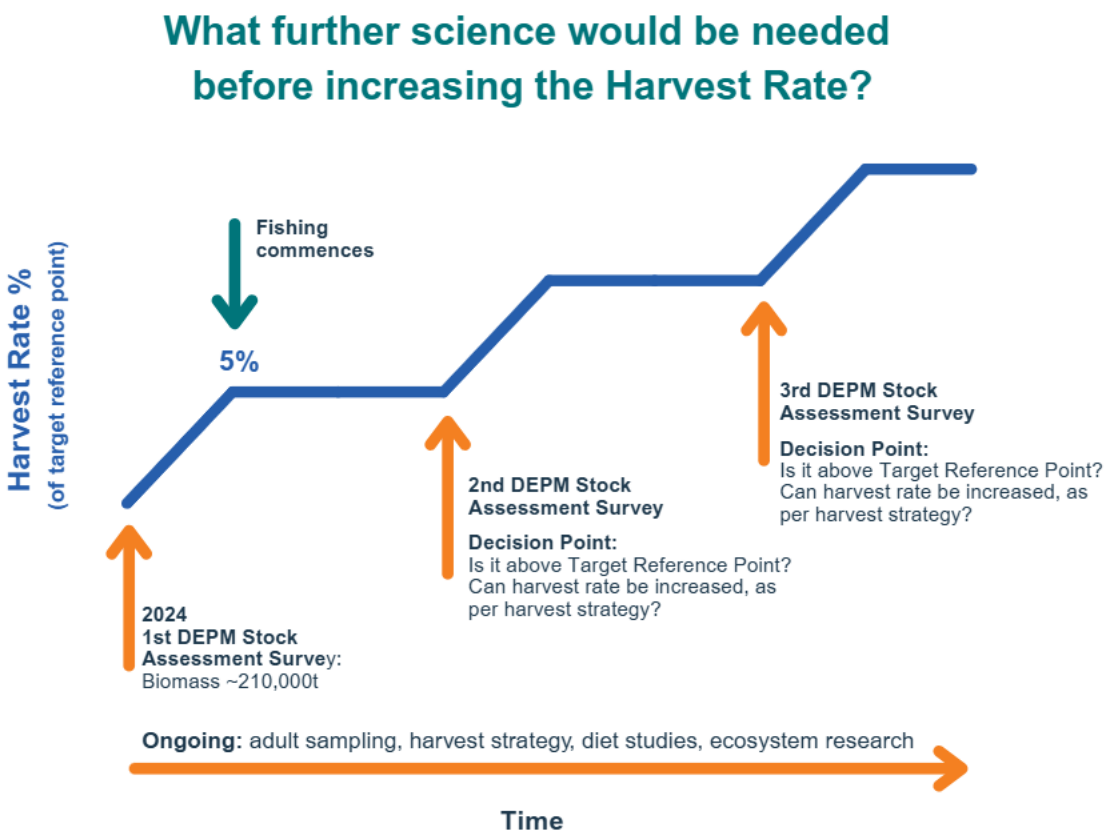


Figure 6. Proposed stepped approach to increase harvest rate, subject to outcomes from further DEPM surveys.

Undertaking a further DEPM survey prior to fishing is not warranted as the proposed harvest rate is conservative and the stock has been surveyed three times (two partial and one comprehensive). **The harvest rate will not be increased above the initial 5% until another DEPM survey is undertaken.** This policy recognises that the long-term sustainability of the sardine stock is essential to the ongoing success of the TSF and aligns with community expectations.

Biological studies

Adult reproductive biology of the south-eastern stock

Policy Proposal

The Tasmanian Government will facilitate research to obtain data on the reproductive biology of Australian sardine in Bass Strait, as part of ongoing, routine monitoring and research for the fishery.

Rationale

There has been a significant body of research undertaken to determine the reproductive biology of adult sardines, including a number of studies on the neighbouring sardine stock accessed by the SASF. This sardine stock has been studied and fished commercially for many years unlike the stock in Bass Strait. Annual surveys in South Australia are undertaken to provide long-term average biological values on adult spawning parameters.[13]

While it is recognised these biological values can vary over different years and environmental conditions, the international literature shows on average these parameters are consistent across the globe for *Sardinops* species, like the Australian sardine.[14,15]

While it is therefore appropriate to use the long-term values collected from the neighbouring South Australian stock, the Tasmanian Government will support a multi-year sampling program in Tasmania. This will commence alongside fishing to confirm the reproductive biology of the south-eastern stock.

This policy aligns with the Development Guidelines which state the importance of management measures being informed by independent science and community and stakeholder engagement.

13 Tim M. Ward et al., "Large sardine resource discovered off south-eastern Australia: Potential risks, challenges and benefits of establishing a new fishery", 2023, Marine Policy, Volume 175, Pages 106654

14 Konstantinos Ganias et al., "Biology and Ecology of Sardines and Anchovies", 2014, CRC Press, 394 pp.

15 Stylianos Somarakis et al., "Spawning stock, egg production and larval survival in relation to small pelagic fish recruitment", 2019, Marine Ecology Progress Series 617-618, 113-136.

Ecosystem

Ecological risk and marine ecosystem impacts

Policy Proposal

The Tasmanian Government will engage subject matter experts to inform the development of management arrangements that mitigate potential ecological risks for the Tasmanian sardine fishery.

Rationale

The well-established SASF and SPF are both assessed as posing low ecological risks to Australian sardine and other ecological components.[16,17] Both fisheries are assessed under the *Environment Protection and Biodiversity Conservation Act 1999*, and the current management practices are considered sufficient to ensure ecological sustainability.[18] While interactions with TEPs like dolphins have occurred in the SASF, management measures in place via an observer program and industry-led Code of Practice have significantly reduced interactions. [19,20]

The SASF and SPF are managed with consideration for ecosystem impacts. Significant research has been undertaken into the role of sardines as a low trophic level species, i.e. a part of the diet of other species. This research indicates that sustainable commercial fishing for small pelagic species, including Australian sardine, has only minor impacts on other parts of the ecosystem.[21] It has also demonstrated that marine predators opportunistically feed on a range of species and are not highly dependent on sardines as a sole food source in the south-eastern marine ecosystem. This means that species like seals, marine birds (including penguins), dolphins and pelagic finfish like tuna, switch their diets depending on what species are available.[23]

16 PIRSA, "2021 Review of the ESD Risk Assessment of the South Australian Sardine Fishery", 2022, Department of Primary Industries and Regions South Australia.

17 AFMA, "Ecological Risk Management Report for the Purse-Seine Sector of the Small Pelagic Fishery", 2010

18 DCCEEW, "Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition", 2007, Department of Climate Change, Energy, the Environment and Water.

19 South Australian Sardine Industry Association (SASIA), "Wildlife Interactions Code of Practice 2023", 2023

20 Roger Kirkwood & Simon Goldsworthy, "Assessment of dolphin interactions, effectiveness of Code of Practice and fishing behaviour in the South Australian Sardine Fishery in 2024", Report to PIRSA Fisheries and Aquaculture, SARDI Research Report Series No. 1254.

21 Anthony D.M. Smith, "Review and update of harvest strategy settings for the Commonwealth Small Pelagic Fishery - Single species and ecosystem considerations", Final Report of FRDC Project No. 2013/028, CSIRO, 2015, 74 pp.

The existing research provides an excellent starting point in designing management arrangements for the Tasmanian sardine fishery. However, increasing understanding and managing potential risk and ecosystem impacts specific to Tasmania remains of the utmost importance to delivering an ecologically sustainable fishery and seeking DCCEEW and MSC certification.

The initial sardine management plan will be informed by existing management plans for the SPF and SASF, including ecological risk assessments, observer programs and Codes of Practice to minimise interactions with Threatened, Endangered and Protected Species (TEPS). Over time, it will improve the standards for identifying and mitigating any risks to the marine ecosystem, consistent with recommendations from IMAS that electronic monitoring and independent observers should be a key component of a future fishery.

Further, and in line with the Development Guidelines, the Tasmanian Government will engage with subject matter experts to ensure the TSF maintains a healthy and resilient marine ecosystem and minimises potential impacts to the trophic system (food chain) and other ecological components specific to Tasmania.

Recreational fishing

Southern Bluefin Tuna

Policy Proposal

The Tasmanian Government will establish a citizen science program to better understand the diet of Southern Bluefin Tuna and key recreational fishing areas.

Rationale

Southern Bluefin Tuna (SBT) have a long and variable history in Australia, with fisheries management changes successfully recovering the stock to sustainable status.[22] As a result, a recreational SBT fishery in Tasmania continues to grow and is particularly valued by recreational fishers. In South Australia, a commercial SBT Fishery operates alongside the SASF and a vibrant recreational SBT fishery, demonstrating that different interests can co-exist.

SBT diets have been collected and analysed for south-eastern Australia in the past. The diet data indicate that SBT feed opportunistically on any available pelagic prey, such as small pelagic fish (including sardines, redbait and jack mackerel) and squids.[23] Samples collected for eastern Tasmania in the 1990s were found to be substantially similar to those analysed in the 1940s, with a wide variety of prey that changed from year to year depending on what species was most available.

For example, in the 1990s jack mackerel was a predominant species found in SBT stomach contents, coinciding with high catch rates in the jack mackerel fishery off Tasmania. On the other end of the spectrum, sardines were only found on average in 2% of small and 6% of large SBT. Importantly, there was wide variability across the different years, ranging from 0-23% and 0-40% respectively, reflecting the opportunistic feeding habits of SBT. [25]

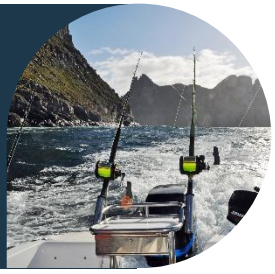
There have been oceanographic shifts in south-eastern waters over the last thirty years, likely affecting the distribution and abundance of species that live there.[25] With confirmation of the large sardine biomass in south-eastern Australia it is expected the contribution of sardine to the diet of SBT has also increased.

22 DCCEEW, "Southern Bluefin Tuna Delisted as a Threatened Species", 2024

23 Cathy M. Bulman, Beth A. Fulton and Anthony D.M. Smith, "Summary of Southern Bluefin Tuna diet studies in relation to SPF species", 2015, CSIRO

In acknowledgement of the time passed since tuna diets were studied, the Tasmanian Government intends to work with recreational fishers to update and confirm dietary information for SBT, which will be valuable for future ecosystem modelling research.

Notwithstanding, it is highly unlikely that sustainable fishing for Australian sardine would have an adverse impact on SBT. This is because SBT is a highly-migratory-species that forage widely, with even greater mobility than Australian sardine.[24]



24 DCCEEW, “Report of the Expert Panel on a Declared Commercial Fishing Activity: Final (Small Pelagic Fishery) Declaration 2012 - Chapter 6”, 2014

Providing Feedback

We are seeking feedback on the proposed policies outlined in this paper. These will inform the draft management plan, which will be developed in 2026. A draft management plan will follow statutory consultation processes, so you will have the opportunity to provide more feedback on the draft management plan for the TSF in 2026.

We have created a form to collect feedback responses, with some prompting questions. This will help you understand what areas we are seeking feedback on that will help shape the TSF.

To submit your feedback, go to fishing.tas.gov.au/sardines

For other enquiries about the policy paper or developing a TSF, email sardine.enquiries@nre.tas.gov.au.

Definitions and Terms

Catch Limit: A restriction placed on the amount (in tonnes) of a stock that can be taken, also known as Total Allowable Catch (TAC).

Confidence Intervals: A range of values that is likely to contain the true value of an unknown population parameter**.** i.e. Researchers can be 95% sure that the spawning biomass of sardines in the south-eastern stock is between 157,791-259,673 tonnes

Daily Egg Production Method (DEPM): A method commonly used in fisheries science worldwide to determine the biomass of fish in a stock, by surveying the number of eggs in the water column across a geographical area. A model then calculates what the spawning biomass must have to be, to have produced that many eggs, based on what we know about their fecundity, sex ratio, and other factors. Learn more.

Harvest Rate: The amount (percentage) of a stock that is removed by fishing. For example, a harvest rate of 5% means that 5% of the stock is caught through fishing.

Harvest Strategy: A harvest strategy is a framework that integrates monitoring, assessment, and decision-making processes to achieve ecological, economic, social, and cultural management objectives for a fish stock. Learn More

Management Plan: Contains a set of rules made under the *Living Marine Resources Management Act 1995* that govern what legally can and can't happen in a specific fishery (i.e. where and when the fishery can operate, what gear can be used, what species can be caught and how much, the maximum vessel size allowed and the type of records to be kept and submitted etc).

Spawning Biomass: The combined weight (tonnes) of all individuals in a fish stock that have reached sexual maturity and are capable of reproducing.

Stock Assessment Surveys: Scientific research undertaken through sampling across the geographical area to determine the biomass of fish in a stock. In the context of this paper this term is used interchangeably with DEPM.

Stock: A group of fish of the same species that live in a distinct geographical area and interbreed. While there can be some movement between stocks, they are largely isolated and are defined for the purpose of managing a fishery. In this case, we are referring to the south-eastern stock of Australian sardine.

Target Reference Point: the ideal position we aim to achieve and maintain for a fish stock or fishery to ensure the long-term sustainability of the resource.

Threatened, Endangered and Protected (TEP): refers to the conservation status of species and ecological communities, categorised by their risk of extinction and the level of protection available.

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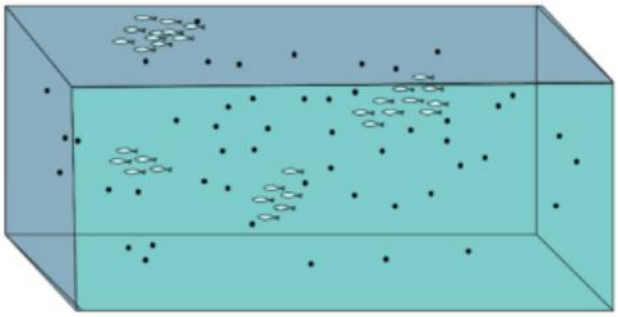
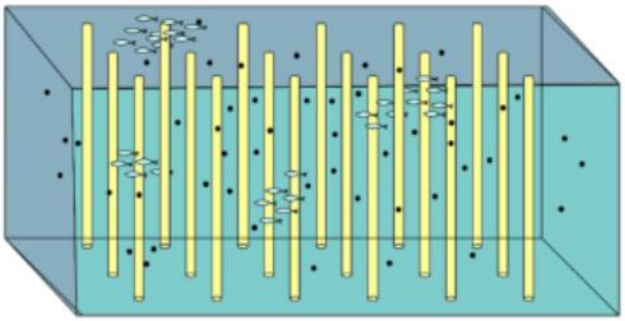
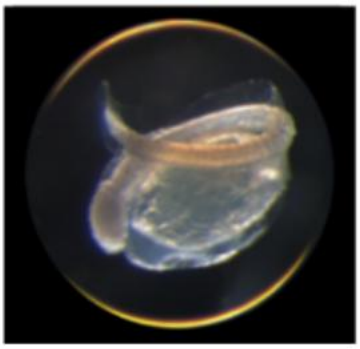


Fish spawning in a body of water

Plankton nets for fish egg sampling

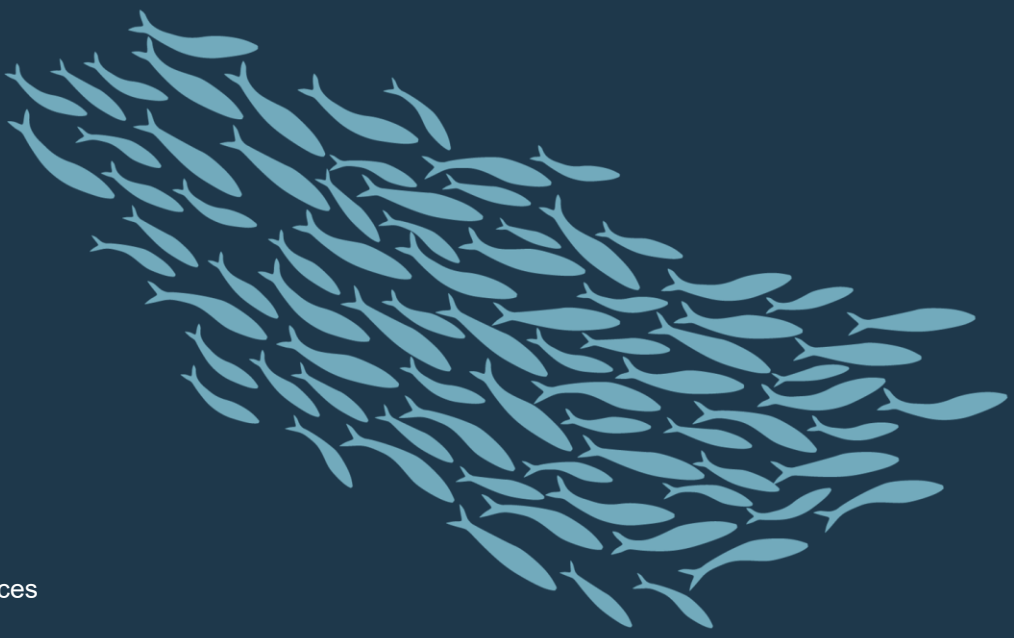


Sampling water column for fish eggs



Easily-identifiable sardine egg

Figure 7. Visual depiction of the Daily Egg Production Method. Source: Ward *et al* 2024 and Ward (Presentation - Community Information Session) 2024.



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