



Australian Government
Australian Fisheries Management Authority

Shark Gillnet

Bycatch and Discarding Workplan
2018 - 2019

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1 Introduction

In carrying out its functions, the Australian Fisheries Management Authority (AFMA) must pursue objectives in the *Fisheries Management Act 1991* including having regard to the impact of fishing activities on non-target species and the long term sustainability of the marine environment.

This *Automatic Longline Bycatch and Discarding Workplan 2014-16* aims to:

- respond to high ecological risks assessed through AFMA's Ecological Risk Assessment process
- avoid interactions with species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- reduce discarding of target and non-target species to as close to zero as practically possible
- minimise overall bycatch in the fishery over the long-term.

Under the Southern and Eastern Scalefish and Shark Fishery Management Plan 2003, AFMA is required to develop and implement a bycatch action plan (now referred to as a Bycatch and Discarding Workplan) to ensure that information is gathered about the impact of fishing on bycatch species, that all reasonable steps are taken to minimise incidental interactions with Threatened, Endangered and Protected (TEP) species, and that the ecological impacts of fishing on habitats are minimised.

Discarding of target species will be broadly approached through monitoring discarding rates as a critical input to stock assessment and harvest strategies and developing other incentives and/or strategies to improve product utilisation.

This 2018-19 Bycatch and Discarding Workplan is relevant to operators fishing with gillnets in the Gillnet, Hook and Trap (GHAT) sector of the larger Southern and Eastern Scalefish and Shark Fishery (SESSF).

Previous actions finalised from the 2016-17 Bycatch and Discard Workplan include the development of the Australian Sea Lion Management Strategy, distribution of I.D guides for whaler sharks and delivering a nationally recognized training course "Implement and monitor environmentally sustainable work practices" to industry members operating in the shark gillnet and shark hook sector of the GHAT fishery. Progress against action items from the 2014-16 Bycatch and Discarding Workplan are available on the AFMA website at <http://www.afma.gov.au/managing-our-fisheries/environment-and-sustainability/bycatch-and-discarding/>.

Action items to help reduce bycatch in the fishery are detailed in Table 2. The action items have taken into consideration high risk species flagged through the ERA process, as well as highlighting areas where there is a lack of information to assist in management decisions.

This workplan should be read in conjunction with:

- *Commonwealth Policy on Fisheries Bycatch 2000 and AFMA's Program for Addressing Bycatch and Discarding in Commonwealth Fisheries: an implementation Strategy 2008*
- *Southern and Eastern Scalefish and Shark Fishery Management Plan 2003*
- *Ecological Risk Management – Report for the gillnet sector of the Gillnet Hook and Trap Fishery, Australian Fisheries Management Authority, Canberra, Australia April 2010*
- *Commonwealth Fisheries Harvest Strategy Policy and Guidelines 2007.*

2 Fishery description

Shark gillnet fishing forms part of the Gillnet, Hook and Trap Fishery (GHATF), a sector of the Commonwealth Southern and Eastern Scalefish and Shark Fishery (SESSF). Shark gillnetting uses demersal gillnets to target gummy shark. Shark gillnetting occurs in the area from the NSW/Victorian border to the South Australian/Western Australian border including waters around Tasmania; from the low water mark to the extent of the Australian Fishing Zone (AFZ) (Appendix A). Current management arrangements allow fishing outside of internal waters and restrict all gillnet operations to waters shallower than 183m.

The shark fishery has traditionally supplied fish for local markets with a large proportion of the catch sold in southern Australia. Gillnet operators in the GHAT are permitted to use unlimited (outside 3nm) with 6 inch mesh not including the ASL zones. In South Australian waters the total combined headrope length of gillnet must not exceed 4,200 metres. If operators wish to use a greater mesh drop, the headrope length is reduced using a ratio which is specified in Statutory Fishing Right (SFR) conditions.

There are currently 61 Commonwealth gillnet boat concessions and 18 South Australian and 34 Tasmanian Coastal Waters Permits that allow gillnetting.

3 Process for workplan development

The 2018-19 Shark Gillnet Bycatch and Discard Workplan is designed to build upon the progress made under 2016-17 Workplan and to identify strategies to assist in continuing to reduce overall bycatch and discarding. Species assessed as high risk under the 2012 ERA remain a key focus of this workplan in addition to broader bycatch and discard challenges across the sector.

The draft of the SESSF Gillnet Hook and Trap Sector was disseminated in December 2018 with amendments being expected throughout first half of 2019. Fisheries Management Strategies (FMS) will be developed under AFMA's revised Ecological Risk Management Framework and will contain updated bycatch and discard workplan with a focus on species assessed as high risk under the revised assessment. Due to the impending finalisation of the ERA, this workplan will only cover a 12 month period.

In anticipation of updated Gillnet ERA results in late 2018, the 2018-19 Gillnet Bycatch and Discard Workplan will prioritise activities that have been carried over from the 2016-17 Workplan and include other low cost activities that are already partially underway at the time of writing. All other activities listed will have a lower prioritisation. It is expected that these will be carried over into the next workplan once the outputs of the new ERA is finalised.

4 Interim workplan activities

The activities to be completed as part of this Workplan are detailed as action items in Table 4. Generally they aim to:

- Mitigate interactions with TEP species by providing details of best practice industry standards for gillnet fishing and gear configuration
- Monitor environmental performance on an individual boat basis to promote responsible resource use and stewardship
- Ensure accurate reporting of interactions with TEP species whilst maintaining cost efficiency through the use of Electronic Monitoring

Additional action items may be added during the period of this Workplan if they are consistent with the objectives and there is capacity to undertake further projects.

5 Ecological Risk Assessment Results

The Ecological Risk Assessment (ERA) process is undertaken to determine the impact of fishing on marine species and habitats. Assessment of marine species are based on a series of parameters including life history, biological productivity and susceptibility to fishing gear. It involves a hierarchy of risk assessment methodologies progressing from a comprehensive, largely qualitative analysis at Level 1, through a Level 2 Productivity Susceptibility Assessment (PSA) and bSAFE which has now been reclassified as the preferred Level 2 method to a quantitative analysis at Level 3 Sustainability Assessment for the Effects of Fishing. This approach is a means of screening out low impact activities and low risk species and focusing more intensive and quantitative analyses on those species assessed as being of higher potential risk from the impact of fisheries. For the detailed methodology please refer to *Guide to AFMA's Ecological Risk management 2017* see <https://www.afma.gov.au/sustainability-environment/ecological-risk-management-strategies>

Table 1: High risk species groups identified from the bSAFE with residual risk information for the Shark gillnet sector.

Scientific Name	Common Name	Role in Fishery	Highest Level of Assessment	Risk Score	Addressed in Action Item (see Table 3)
<i>Leptomothrax gaimardii</i>	Great spider crab		bSAFE	high	

<i>Carcharodon carcharias</i>	White shark	TEP	bSAFE	Extreme	
<i>Archarias Taurus</i>	Grey nurse shark	TEP	bSAFE	Extreme	
<i>Tursiops truncatus</i>	Common Dolphin	TEP	bSAFE	High	Afforded protection through the Dolphin Mitigation Strategy
<i>Tursops aduncus</i>	Indian Ocean bottle nose dolphin	TEP	bSAFE	High	Afforded protection through the Dolphin Mitigation Strategy

6 Existing measures to reduce bycatch

6.1 Gear

Fishing concession conditions specify minimum gear requirements in the shark gillnet sector to reduce interactions with non-target, bycatch and TEP species. The requirements are:

- the total headrope length of gillnet, or, if more than one net is used, the total combined headrope length of gillnet that may be deployed from a boat at any time (that is, that may be in the water at any one time) in South Australian waters must not exceed 4,200 metres
- The total headrope length of gillnet, or, if more than one net is used, the total combined headrope length of gillnet that may be deployed from a boat at any one time (that is, that may be in the water at any one time) in all other areas of the Commonwealth Gillnet Sector must not exceed 6,000 metres
- the depth or 'drop' of a net must not exceed 20 meshes.
- a mesh in a gillnet must be:
 - i. greater than or equal to 150 millimetres in width; and
 - ii. less than or equal to 165 millimetres in width

A reduction in net drop to 20 meshes mitigates any further increase in net drop regardless of headrope length. This is likely to mitigate any potential increase in the catch of shark species which demonstrate pelagic behavioural characteristics by reducing the height of the net to only target demersal species.

6.2 Removal of biological material

AFMA has implemented provisions prohibiting the discharge of offal from vessel while setting gillnets and requiring biological material to be removed from nets before they are set. Such practices have been identified as potential ways to reduce interactions with TEP species.

6.3 Areas Closures

There are a number of spatial closures to protect gummy shark, which also offers protection for some bycatch species. Shark gillnet operators are excluded from fishing deeper than 183m. This closure was implemented primarily to prevent targeting of adult school shark, but also in effect protects gulper shark populations which were historically targeted. Extensive coastal water closures in South Australia were implemented to protect breeding schools, however these areas are likely to offer some protection to Australian and white sharks. All Victorian coastal waters are currently closed to targeted commercial shark fishing, offering protection to gummy, school, elephant and saw sharks in waters out to 3nm.

Table 2. Spatial closures which have been implemented to protect TEP and high risk species are detailed in the table below.

Closure Area	Species Protected
Murat Bay	Closed to gillnet methods to protect stocks of Bronze Whalers, Snapper and Mulloway.
Seal Bay	Closed to all fishing to protect the breeding grounds of Australian Sea Lions.
Pages Island	Closed to all fishing to protect White Sharks and Australian Sea Lions
Head of GAB	Closed to all fishing to protect school shark populations.
Backstairs Passage	Closed to gillnet methods to protect school shark breeding stock
Kangaroo Island	Closed to all fishing methods to protect school shark breeding stock.
Victor Harbour to Victoria Border	Closed to all fishing methods to protect school shark breeding stock
Shark Hook and Gillnet Deepwater Closure	Closed to gillnet methods protecting large school shark and prevent targeting of deepwater sharks.

SESSF operators are also required to adhere to spatial closures implemented under the South-East Commonwealth Marine Reserve Network.

Further information regarding the closure can be found at www.afma.gov.au.

6.4 Dolphin Strategy

In order to minimise dolphin interactions in the gillnet fishery AFMA, in conjunction with the Marine Mammal Working Group, has developed a Dolphin Mitigation Strategy. The Dolphin Strategy included measures that improve information on dolphin bycatch across the fishery and ensure that all fishers are doing all that they can to minimise their bycatch below a specified bycatch rate. AFMA will monitor dolphin bycatch for each fisher and there will be a management response for any dolphin mortality. The management responses will start with a review of the circumstances surrounding the bycatch event and

will escalate to exclusion from fishing with gillnets in the affected area for a period of time if the bycatch rate is exceeded. This approach provides strong incentives to minimise dolphin bycatch and ensures that those fishing responsibly are not impacted by those who may have problems with dolphin bycatch.

As part of the dolphin mitigation strategy operators must:

- The holder must not use the nominated boat to fish using gillnets unless the boat has an AFMA-approved Dolphin Mitigation Plan.
- The holder must have their Dolphin Mitigation Plan re-approved by AFMA for the nominated boat before commencing fishing with gillnets if there are any changes made by the holder to an AFMA-approved Dolphin Mitigation Plan.
- This concession may be suspended without further notice to the holder if the nominated boat departs on a gillnet fishing trip without an AFMA-approved Dolphin Mitigation Plan.
- For each fishing trip the holder must:
 - a) carry a copy of the AFMA-approved Dolphin Mitigation Plan on the nominated boat;
 - b) comply with the measures and requirements contained in the AFMA-approved Dolphin Mitigation Plan;
 - c) ensure each member of the crew on board the nominated boat is briefed on the content, intent and purpose of the AFMA-approved Dolphin Mitigation Plan; and
 - d) ensure each member of the crew on board the nominated boat complies with the measures and requirements of the AFMA-approved Dolphin Mitigation Plan.

6.5 Australian Sea Lion Management Strategy

The Australian sea lion (ASL) was listed as threatened (vulnerable) under the EPBC Act in 2005. The ASL Strategy was developed to reduce and monitor interactions between ASLs and gillnets used by Commonwealth shark fishers in the SESSF, namely the shark gillnet fishery in the GHAT. After the Strategy was introduced, AFMA further consulted with the Commonwealth Marine Mammal Working Group which provided advice on the effectiveness of the adaptive management component of the Strategy. The key objectives of the ASL strategy are to significantly reduce the ecological risk the SESSF poses to Australian sea lions and enable their recovery. To do this, the following management measures have been implemented.

- Gillnet closures around all sea lion breeding colonies in South Australian waters spanning 18,500km²
- 100 per cent monitoring of all gillnet fishing effort in South Australian waters

- The setting of Australian sea lion mortality limits that act to trigger additional closures if unacceptable levels of interaction occur
- An ongoing review of gillnet fishing practices, including allowing eligible gillnet operators to use hook methods instead of gillnets
- An industry initiative to develop and implement a gillnetting code of conduct with assistance from AFMA and the Commonwealth Fisheries Association

Closures

Baseline closures are maintained around all 51 colonies in South Australia of at least four nautical miles (7.3km). The 7.3km baseline closures cover an approximate 3500 km² of sea lion foraging area around colonies. These closures preclude fishing in the area in which approximately 40% of all historically observed sea lion interactions have occurred.

Additional closures are in placed around select colonies which increases that closure are to an extra 17 colonies and push radial closures from four nm to 11nm surrounding these colonies

Monitoring

All gillnet fishing effort in South Australia is monitored through either on board scientific observers and through Electronic Monitoring systems

Gear Restrictions

A broad range of mesh sizes were permitted in the apt however over time the mesh restriction has been refined and only a narrow range is now permitted, Shark fishers are now restricted to nets with a mesh size between 150mm and 165mm in width. Commonwealth fishers targeting shark in state waters, such as those holding coastal waters permits, are further restricted to 1800m of net.

Adaptive Management

The Strategy includes adaptive management zones which implement significant spatial closures if unacceptable levels of Australian sea lion interactions occur within a fishing season.

6.6 Australian/ New Zealand Fur Seal

AFMA collects data on interactions with protected species through its monitoring programs

A code of conduct has been developed and adopted by some of the fishing industry to minimise interactions with seals, the codes can include

- Actively steaming away from areas where seals are sighted
- Disposal of offal while the vessel is not fishing

7 Bycatch Workplan Action Items

Table 3: Action items for the Shark Gillnet 2018-19 Bycatch and Discard Workplan

Action Items	Risk/Issue to be addressed (workplan object.)		Timeframe	Cost \$	Responsible Parties	Performance Indicators	Milestones
1. AFMA to develop and implement Dolphin Management Strategy	Dolphin Bycatch		Strategy implemented in stages and at review ay 18 months		AFMA fisheries management staff	Regulations implemented Regulations enforced by AFMA	Mitigation plans written and assessed
2. Develop and distribute best practice guidelines for minimising marine mammal interactions	Marine Mammal interactions						
3. Conduct survey after best practice guidelines distributed	Minimise marine mammal bycatch						
4. Develop and distribute best practice fact sheet for minimising seabird interactions	Minimise seabird interactions				AFMA Fisheries Management staff		
5. Regulate the drop in gillnets in 20 meshes					AFMA compliance	Regulations enforced by AFMA	
6. Develop and distribute handling	Improve understanding of		Dec 2017	TBD	AFMA Bycatch Program	Project is implemented	Project design (June 2017)

Action Items	Risk/Issue to be addressed (workplan object.)		Timeframe	Cost \$	Responsible Parties	Performance Indicators	Milestones
guide for sharks and rays	chondrichthyan catch composition in the CTS for ERA assessment				AFMA Trawl Management Team CSIRO SETFIA	and results are made available for ERA purposes	Data collected (July 2017 – ERA) Input to ERA

8 Summary

The proposed projects are to design and develop mitigation strategies and undertake work that will contribute towards future mitigation strategies, to fill critical information gaps about bycatch at risk, or about bycatch and discarding more generally. These strategies will be incorporated into a more strategic approach to the management of bycatch and discarding within the fishery. On the annual review of the Workplan, further research priorities and projects can be added if consistent with the overall aim of the Workplan and there is a capacity to fund any further projects.

AFMA and industry will continue to work co-operatively to reduce bycatch, minimise discarding and improve monitoring within the fishery.

8.1 SESSF Quota Species

Although classified as high risk through the ERA process, sawshark and school shark are both SESSF quota species, and are assessed under the Commonwealth Harvest Strategy Policy. Sawshark is assessed using a Tier 4 analysis, which determines a Recommended Biological Catch (RBC) by selecting Catch Per Unit Effort (CPUE) reference points that are then used as proxies for the estimated limit reference point B_{LIM} and target reference point B_{TARG} . School Shark is assessed as a Tier 1 species which is a full quantitative stock assessment. The close kin mark recapture (CKMR) has also been applied to school shark for estimating abundance and other demographic parameters. The CKMR data provides a fishery-independent estimate of absolute abundance, productivity and spawning stock trend.

School Shark is currently under a rebuilding strategy, as the stock is estimated to be below 20% of unfished spawning stock biomass.

9 Review Process

Bycatch and Discarding Workplans are largely output focused. The action items included here are only some of the measures AFMA undertakes as part of the Ecological Risk Management (ERM) Strategy and it is difficult to measure the specific contribution of an action item to the overall objectives of the ERM Strategy. As part of the ERM Strategy AFMA have specific and measureable objectives with outcomes to be quantitatively assessed as part of the annual review.

This workplan will be reviewed at:

- 6 months to check that the progress of action items is on track
- 12 months to
 - ensure actions are progressing well
 - ensure that objectives are being met
 - determine if any additional actions can be taken

- 18 months to check that the progress of action items is on track
- 24 months to assess the effectiveness of the workplan actions in addressing the associated bycatch risks.
- At the end of the two year period the outcomes of this workplan will be reported to the Department of the Environment and a new workplan will be developed and implemented to determine actions for subsequent Workplans.

At the end of the workplan period the outputs of this Workplan will be reported to the Department of Environment and a new Workplan will be developed and implemented.

Appendix A

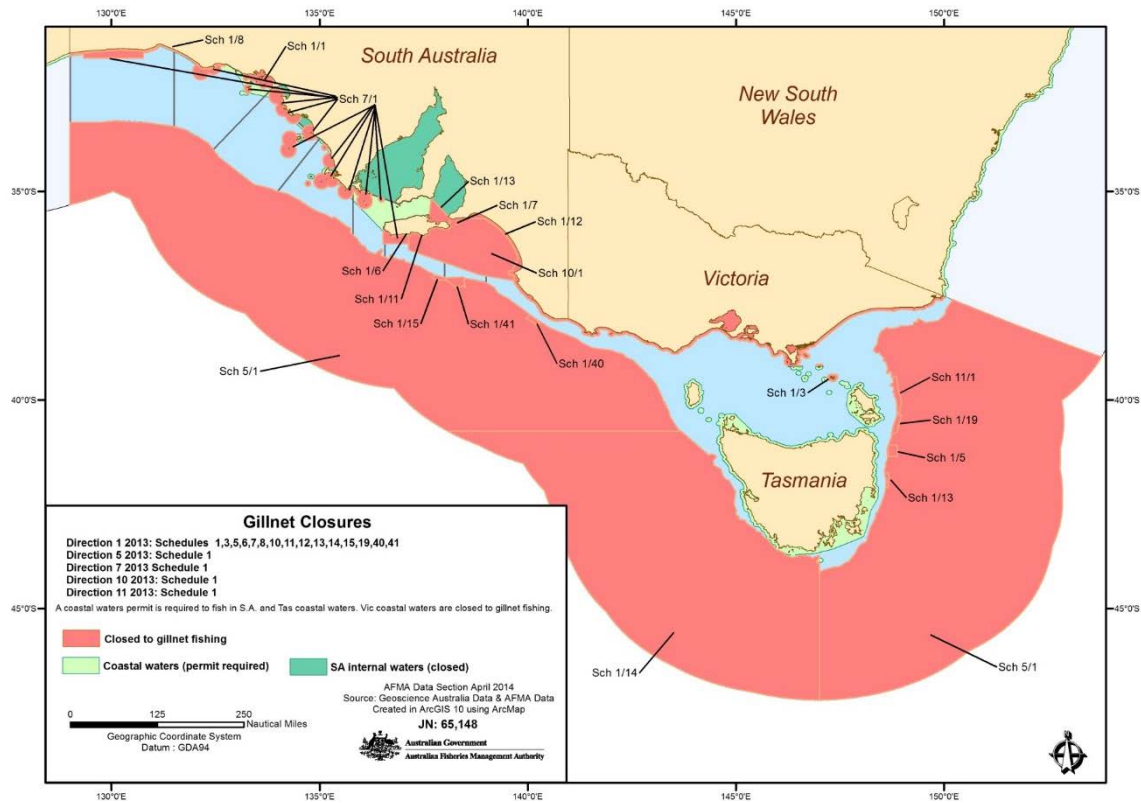


Figure 1: Map of the Commonwealth Shark Hook and Gillnet Fishery

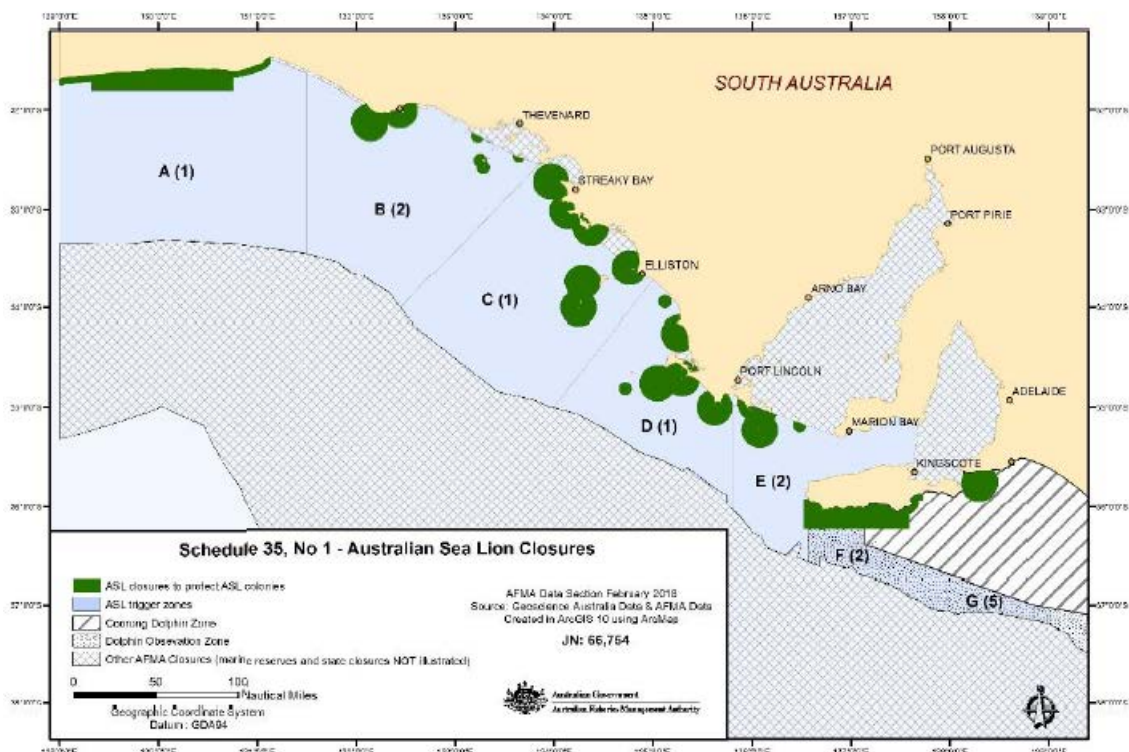


Figure 2: Closures under the ASL Management Strategy

