Australian Government

Australian Fisheries Management Authority

Principles for prioritising survey beds

Bass Strait Central Zone Scallop Fishery (March 2021)

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Background

In accordance with the Bass Strait Central Zone Scallop Fishery (BSCZSF) Harvest Strategy (the Harvest Strategy), prior to the start of the fishing season each year, the Industry Co-Management Committee (the Committee), on behalf of industry, advise the Australian Fisheries Management Authority (AFMA) how to proceed with the opening of the season, either:

1. open the season with a default Total Allowable Catch (TAC) of 150 t and then decide if a biomass survey should be conducted (noting that the TAC cannot increase above 150 t unless a biomass survey is done); or
2. keep the fishery closed (TAC set at zero tonnes) and undertake a biomass survey to determine biomass estimates using a 150 t research catch allowance.

In accordance with the Harvest Strategy, the TAC will not be increased above 150 t unless a biomass estimate, as determined by the research survey (biomass survey), is able to identify an area or scallop bed containing at least 1,500 t biomass of high density scallops with a minimum size of 85 mm.

The objective of the biomass survey are to:

1. coordinate a fishery survey to measure the size distribution and calculate scallop biomass estimates to assess the potential for commercial catch rates in the BSCZSF;
2. inform the assessment of fishery impacts on bycatch.

During the planning phase, the research provider produces a 'proposed scallop survey design' that details previous biomass survey areas, recent commercial catches, a list of proposed beds to survey and any exploratory marks provided by industry. This proposed biomass survey design is then provided to the Committee and the Scallop Resource Assessment Group (ScallopRAG) to assist providing recommendations to AFMA on which beds to survey.

To provide greater flexibility in deciding which beds should be closed each year, the biomass survey has expanded from four beds in 2015 to twelve in 2019. The number of beds that can be sampled each year is limited, due largely to time and budget constraints. During periods where the number of known commercially viable beds, including exploratory marks identified by industry, exceeds the maximum number of beds that can be surveyed, there is a need to prioritise the beds.

While the biomass survey could be completed with less vessels, typically four vessels are used to allow for the pre-season scallop catch to be distributed to different processors.

This document is intended to assist the Committee and ScallopRAG with their recommendations each year. These principles may be reviewed by the Committee, ScallopRAG and AFMA as part of the prioritisation process. A summary of the principles for prioritising scallop beds for the biomass survey can be found at Appendix 1.

This document was approved as final by ScallopRAG at their March 2021 meeting.

Principles for prioritising survey beds

Number of beds to be surveyed

It may not be possible that all commercially viable beds and exploratory marks are surveyed each year due to budget constraints and time. Under the current biomass survey design, a maximum of 12 beds can be fully surveyed.

It may not be necessary to survey the maximum number of beds each year, and this should be considered based on the results of previous biomass surveys and current economics of the fishery. However, it is important to keep in mind that only beds which are surveyed can be considered for closures each year.

Geographical regions

The BSCZSF is currently divided into three broad geographical regions; Flinders Island, Apollo Bay and King Island. Growth rates, length frequency and recruitment success has been shown to vary across these regions. In order to capture the dynamics of the fishery, the biomass survey should, where possible, include beds across the three broad geographical regions, noting the need to be flexible and recognising the cost and resourcing implications of doing so.

Exploratory marks

Prior to the biomass survey, industry members are asked for recommendations of marks that could be considered for surveying. These are considered 'exploratory' marks and are informed by fishing activity during the prior season. If these marks are explored during the biomass survey, they may yield beds considered worthwhile surveying. As there is a limited number of beds that can be surveyed, one of the other beds which had been planned to be surveyed may be removed from the schedule. To allow for this decision to be made quickly, the biomass survey beds should be prioritised, with the lowest priority beds subject to removal if exploratory beds are favoured.

If the first five exploratory shots yield less than 50 kg per shot on average, then subject to the discretion of the skipper and observer on board, the survey boat would move on to the next area and no biomass estimate would be obtained. If an exploratory mark does not yield beds considered worthwhile surveying, the biomass survey schedule will continue as planned.

Bed of juvenile scallops

Exploratory marks provided by industry may be identified as containing high densities of juvenile scallops. There is interest in identifying areas of significant recruitment and the growth of these beds, however precaution needs to be taken to minimise disturbance to reduce mortality of small scallops through survey activities. Consideration should be given to potential cost of mortality compared to the value in surveying these juvenile scallop beds, noting these scallops would not contribute to the closures as the minimum size under the Harvest Strategy is 85 mm.

If an exploratory mark is identified as containing juvenile scallops, there are two options:

1. Do not sample the bed in order to preserve it; or
2. Conduct a small survey of the area with a minimal number of shots to obtain length frequencies.

If an area containing a high density of juvenile scallops is identified during the biomass survey, the following method followed during the 2019 biomass survey may be adopted.

- Set a relatively small survey area with no more than 20 sampling sites.
- As juvenile scallops would pass through normal dredge meshes, small mesh (25 mm x 25 mm) panels used to cover half of the dredge, with the dredge separated internally so that the catch on each side of the dredge is kept separate.
- Catch recorded separately for each side of the dredge, and where available, at least 35 scallops from each side measured.
- No biological samples taken, little interest in weights, gonad stage and discard rates.
- An estimate of commercial scallop biomass calculated using both the covered and uncovered side of the dredge, however, due to sample size, there is a high degree of uncertainty around these estimates.

Annual survey beds

The Harvest Strategy requires that an area of either 1500 t (Tier 1) or 3000 t (Tier 2) consisting of one or more defined, substantial beds of scallops of a size limit of 85 mm of high density will be closed to fishing for the entire season.

Beds which are considered to have a good time series and are typically fished (even if closed for one season) will be surveyed annually based on age, tonnage and density of the bed from previous biomass surveys and its capacity to contribute to closure arrangements under the Harvest Strategy for the upcoming season. For example, a mature, high tonnage and high density bed is valuable in terms of a closure under the Harvest Strategy.

Biennial survey beds

While some surveyed beds may not contribute significantly to the closure requirements under the Harvest Strategy, there is value in maintaining a time series to monitor changes as a way of predicting how beds change over time.

Where new high priority beds are identified to be surveyed, beds which are considered to have a good time series, but aren't currently fished, may be surveyed on alternating years based on the age, tonnage and density of the bed from previous biomass surveys.

ScallopRAG and the Committee will prioritise which beds will be surveyed each year, and those which can be surveyed biennially, with a view to maintaining up to date information on bed dynamics whilst allowing for flexibility when planning the survey.

Excluding or prioritising similar scallop beds

On occasion there may be two or more beds that have similar characteristics and a decision is required about which of the beds should be surveyed in a given year. Additionally, over time the characteristics of a scallop bed may change, such that it can no longer contribute to closures under the Harvest Strategy. In each of these cases, ScallopRAG and the Committee should consider characteristics such recruitment, proximity to recent commercial fishing effort, and the most recent estimate of biomass when deciding to exclude a bed from the survey, either for a year or indefinitely.

Appendix 1- Principles for prioritising scallop beds for survey

1. Under the current survey design, a maximum of 12 beds can be fully surveyed. The number of beds which can be surveyed in a given year may be limited by either the survey design (12 beds), or because there has been a decrease in the known biomass, meaning less than 12 beds are surveyed.
2. Where possible, the annual biomass survey will include beds that represent the spatial extent of the fishery.
3. Beds should be prioritised, with the lowest priority beds to be replaced by exploratory marks if they are identified as being viable to be fully surveyed
4. If an exploratory mark does not yield scallop beds considered worthwhile surveying, the survey schedule will continue as planned.
5. If a bed of juvenile scallops is identified, and the benefit of sampling the area outweighs the potential cost of mortality, conduct a small survey of the area with a minimal number of shots to obtain length frequencies
6. Beds that are considered to have a good time series and are typically fished (even if closed for one season) will be surveyed annually based on age, tonnage and density of the bed from previous surveys and its capacity to contribute to closure arrangements under the Harvest Strategy for the upcoming season
7. Beds that are considered to have a good time series but aren't currently fished may be surveyed on alternating years based on the age, tonnage and density of the bed from previous surveys and its capacity to contribute to the closure arrangements under the Harvest Strategy for the upcoming season if there new beds of a higher priority to be surveyed.
8. Where two or more scallop beds with similar characteristics need to be prioritised, consideration should be given to signs of recruitment, proximity to recent commercial fishing, and the estimated biomass of the beds when they were most recent surveyed.

Appendix 2- Previously surveyed scallop beds

Bed name	Description	Years surveyed	Years closed[1]
Flinders Island	FI-1 was called the "Flinders Island" bed during the 2015 survey. For the 2016 and 2017 surveys, the area was expanded and spilt into the two beds (FI-1 and FI-2). Two additional smaller beds were added to the northern boundary of FI2 in 2017, however because of low densities, these were dropped for the 2018 survey. For the 2018 survey, FI-1 and FI-2 were combined into a single large bed. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2015 –modified, 2016, 2017, 2018 –modified, 2019	2015, 2016, 2017, 2018, 2019, 2020
King Island- 5 small	Originally a larger area that was surveyed in 2016, KI-5S was formed by extending the eastern boundary of KI-New south to -40˚S, and including the area of KI-5 to the east of that. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2016 –modified, 2017, 2018, 2019	2016, 2018
King Island- Middle	This bed remained unchanged from 2015, 2016, 2017 and 2018.	2015, 2016, 2017, 2018	2015
King Island New	KI-New was a bed that was defined for management proposes (it formed the initial closure) after the 2016 survey, covering at least parts of three different beds surveyed in 2016. It comprised parts of a bed called KI-East which was surveyed during 2015, and again in 2016, along with two new adjacent beds, KI-4 and KI-5. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2016 –modified, 2017, 2018, 2019	2015 (KI east portion), 2016, 2018
King Island- 6	Examination of 2018 commercial catch and effort data revealed significant catches in a large area at approximately longitude 144˚ 17', latitude 39˚ 32'. The vessels mapped out this area to provide a smaller area with high density scallops. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2018, 2019	2020

[1] Voluntary closures to protect juvenile scallop beds not included

King Island- 7	Examination of 2018 commercial catch and effort data revealed significant catches in a large area at approximately longitude 144˚ 36', latitude 39˚ 38'. The vessels mapped out this area to provide a smaller area with high density scallops. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2018, 2019	2019, 2020
King Island- 8	Examination of 2019 commercial catch and effort data revealed significant catches in a large area at approximately longitude 144˚ 10', latitude 39˚ 31'. Within the general area of this effort, there were three main patches of densely populated scallop beds separated by areas of low density and an underwater cable. The two largest of these small areas were selected to survey.	2019	
King Island- 9	Examination of 2019 commercial catch and effort data revealed significant catches in a large area at approximately longitude 144˚ 21', latitude 39˚ 35'. The final boundaries were set based on a combination of fishing effort by the survey vessel in the previous year and exploratory fishing.	2019	
King Island-Blue dot extended	During the TAC setting by the MAC for the 2016 season, industry provided information regarding a dense bed of small scallops that would be more suitable for closure than the KI-New bed. This bed titled King Island Blue Dot was mapped out and then surveyed during August of 2016. The area was expanded north and west to form an area closure that replaced the closure of KI-New. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2017, 2018, 2019	2016, 2018, 2019, 2020
King Island-JH	An industry member provided two marks that bound a line of exploratory shots that contained relatively high densities of juvenile scallops (~50 mm). Being the most recent sign of significant recruitment there was interest in tracking the growth of this bed, however there was some sensitivity around the potential to disturb the bed by surveying it. As a compromise, a relatively small survey area was set with only 20 sampling sites.	2019	2020
King Island-Blue dot south east	Examination of 2019 commercial catch and effort data revealed significant catches in a large area at approximately longitude 145˚ 00, latitude 39˚ 49. The final boundaries were set based on a combination of fishing effort by the survey vessel in the previous year and exploratory fishing.	2019	

Apollo Bay- 1	Seven exploratory marks off King Island were provided by industry in 2017 to be explored and considered for additional survey beds. Only one of those showed enough promise to survey, and the skippers mapped out area, splitting it into two beds. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2017, 2018, 2019	2017, 2019, 2020
Apollo Bay- 2	Seven exploratory marks off King Island were provided by industry in 2017 to be explored and considered for additional survey beds. Only one of those showed enough promise to survey, and the skippers mapped out area, splitting it into two beds. The bed boundaries remained unchanged in 2019 from the 2018 survey.	2017, 2018, 2019	2017, 2018