

TROPICAL ROCK LOBSTER RESOURCE ASSESSMENT GROUP (TRLRAG) Thursday Island	MEETING 37 9 October 2024
PRELIMINARIES	Agenda Item 1 For NOTING and DECISION

RECOMMENDATIONS

1. That the RAG **NOTE**:
 - a. an acknowledgement of Traditional Owners;
 - b. the Chair's welcome address;
 - c. apologies received from members unable to attend.
2. That the RAG consider and **ADOPT** the draft agenda, which was circulated to members on 5 September 2024.
3. That RAG members and observers:
 - a. **DECLARE** all real or potential conflicts of interest in the Torres Strait Rock Lobster Fishery at the commencement of the meeting (**Attachments 1a** and **1b**);
 - b. **DETERMINE** whether the member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict;
 - c. **ABIDE** by decisions of the RAG regarding the management of conflicts of interest; and
 - d. **NOTE** that the record of the meeting must record the fact of any disclosure, and the determination of the RAG as to whether the member may or may not be present during discussion of, or decisions made, on the matter which is the subject of the conflict.
4. That the RAG **NOTE** the status of actions arising since TRL RAG 35 (**Attachment 1c**).
5. That RAG members **NOTE** the out of session correspondence since TRL RAG 35 (held on 12-13 December 2023 (**Attachment 1d**)).

BACKGROUND

6. As at 25 September 2024, no apologies had been received.
7. This meeting was noted by members at TRL RAG 36 (held on 11 July 2024) and a draft agenda was circulated to members on 5 September 2024.

Declarations of interest

8. Consistent with the *Protected Zone Joint Authority (PZJA) Fisheries Management Paper No. 1* (FMP1), which guides the operation and administration of PZJA consultative forums, members are asked to declare any real or potential conflicts of interest.
9. RAG members are asked to confirm the standing list of declared interests (**Attachments 1c** and **1d**) is accurate and provide an update to be tabled if it is not.

10. FMP1 recognises that members are appointed to provide input based on their knowledge and expertise and as a consequence, may face potential or direct conflicts of interest. Where a member has a material personal interest in a matter being considered, including a direct or indirect financial or economic interest; the interest could conflict with the proper performance of the member's duties. Of greater concern is the specific conflict created where a member is in a position to derive direct benefit from a recommendation if it is implemented.
11. When a member recognises that a real or potential conflict of interest exists, the conflict must be disclosed as soon as possible. Where this relates to an issue on the agenda of a meeting this can normally wait until that meeting, but where the conflict relates to decisions already made, members must be informed immediately. Conflicts of interest should be dealt with at the start of each meeting. If members become aware of a potential conflict of interest during the meeting, they must immediately disclose the conflict of interest.

Where it is determined that a direct conflict of interest exists, the forum may allow the member to continue to participate in the discussions relating to the matter but not in any decision making process. They may also determine that, having made their contribution to the discussions, the member should retire from the meeting for the remainder of discussions on that issue. Declarations of interest, and subsequent decisions by the forum, must be recorded accurately in the meeting minutes.

Actions arising

12. Updates are provided on the status of actions arising from previous TRLRAG meetings and relevant TRLWG meetings at **Attachment 1a**.

Out of session correspondence

13. Correspondence between AFMA and the RAG was circulated out-of-session since the TRLRAG 35 on 12-13 December 2023 is provided in **Attachment 1b**.
14. Out-of-session correspondence was not covered at TRLRAG 36 (11 July 2024) due to time constraints in a virtual format. Copies of this correspondence can be requested at any time from the TRLRAG Executive Officer.

TRLRAG Declarations of interests from most recent meetings

Name	Position	Declaration of interest
Members		
Ian Knuckey	Chair	Full declaration of interests provided at Attachment 1b.
Eva Plaganyi	Scientific Member	Lead scientist for PZJA funded TRL research projects conducted by CSIRO. Contribute to other Torres Strait research projects that receive research funding, including currently Shared science and Indigenous knowledge to support fisheries capacity building in Torres Strait. No other interests in the fishery. Independent scientific member of HCRAG and NPFRAG.
Andrew Penney	Scientific Member	<p>Director of Pisces Australis Pty Ltd, an Australian registered marine/coastal research and management consultancy based in Canberra - interests in any opportunities in this regard.</p> <p>Currently Principal Investigator on FRDC Projects Nos 2017-180: Design and implementation of an Australian National Bycatch Report: Phase 1 – Scoping; and 2019-036: Implementation of dynamic reference points and harvest strategies to account for environmentally-driven changes in productivity in Australian fisheries, potentially red leg banana prawns or TRL.</p> <p>Independent scientific member on the AFMA Southeast RAG, the Tropical Rock Lobster RAG and the Small Pelagic Fishery RAG. Member of the AFMA ERA Technical Working Group.</p> <p>No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations.</p>
Les Pitt	Traditional Inhabitant Member – Kemer Kemer Meriam	Traditional Inhabitant Member Kemer Kemer Meriam, TIB licence holder and runs an independent freezer facility on Erub Island. Board member of Zenadth Kes Fisheries.
Charles David	Traditional Inhabitant Member - Kulkalgal	Traditional Inhabitant Member Kulkalgal, TSRA Fisheries Advisory Committee and Zenadth Kes Fisheries member.
Patrick Mooka	Traditional Inhabitant Member – Guda maluylgal	Traditional Inhabitant Member, Guda maluylgal. Zenadth Kes Fisheries member.
Jermaine Reuben	Traditional Inhabitant Member - Maluyilgal	Traditional Inhabitant Member Maluyilgal, TIB licence holder. Zenadth Kes Fisheries member.
Thomas Fujii	Traditional Inhabitant Member - Kaiwalalgal	Traditional Inhabitant Member Kaiwalalgal. Queensland East Coast TRL and TIB licence holder. Zenadth Kes Fisheries member.

Attachment 1a

Brett Arlidge	Industry Member	Director of MG Kailis Pty Ltd. MG Kailis Pty Ltd is a holder of 5 TVH licences. Seafood buyer from Torres Strait, QLD and PNG TRL fisheries.
Ken McKenzie	Industry Member	TVH licence and quota holder. Queensland East Coast TRL licence and quota holder.
Damian Miley	TSRA Member	TSRA Fisheries Project Manager, TSRA holds multiple TVH TRL fishing license on behalf of Torres Strait Communities but does not benefit from them. No personal pecuniary interest.
Jenny Keys	QDAF Member	Queensland Fishery manager of tropical rock lobster fishery, aquarium and coral fisheries. Nil interests.
Steven Harris	AFMA Member	Nil interests.
Georgia Langdon	Executive Officer	Senior Management Officer for Tropical Rock Lobster Fishery. Nil interests.
Observers		
Joseph Posu	PNG National Fisheries Authority	Nil interests.
Yen Loban	TSRA Fisheries Portfolio member	Traditional Owner. TSRA Board member and TSRA Fisheries Portfolio member. Chair of Zenadth Kes Fisheries
Quinten Hirakawa	TSRA	TSRA employee, TIB license holder with a TRL endorsement.
Brooke D'Alberto	Australian Bureau of Agricultural Resource Economics and Sciences	Nil interests.

Declaration of interests
Dr Ian Knuckey – August 2024

Ian Knuckey positions:

Director –	Fishwell Consulting Pty Ltd
Director –	Olrac Australia (Electronic logbooks)
Chair –	Northern Prawn Fishery Resource Assessment Group
Chair –	Tropical Rock Lobster Resource Assessment Group
Chair –	Victorian Rock Lobster and Giant Crab Assessment Group
Chair – Group	Victorian Central Zone Abalone Fisheries Resource Advisory
Chair – Committee	Gulf of St Vincent's Prawn Fishery MAC Research Scientific
Scientific Member –	Northern Prawn Management Advisory Committee
Scientific Member – Committee	Gulf of St Vincent's Prawn Fishery Management Advisory
Scientific Member –	Tropical Tuna Resource Assessment Group
Scientific Member –	SESSF Resource Assessment Group
Member –	The Geelong Agri Collective

Fishwell current projects:

AFMA 2022-	Annual monitoring, reporting and assessment of SPF marine mammal interactions, including effectiveness of mitigation measures
AFMA 2020-0807	Bass Strait Scallop Fishery Survey – 2024/ 25
FRDC 2019-027	Improving and promoting fish-trawl selectivity in the SESSF and GABTS
FRDC 2018-021	Development and evaluation of SESSF multi-species harvest strategies
Traffic Project	Shark Product Traceability
Sea Cucumber Ass. Australia Bay	Design and implementation of various sea cucumber dive surveys. Queensland Gulf of Carpentaria Developmental Fin Fish Trawl Fishery

Actions arising from previous TRL RAG meetings

#	Action Item	Meeting	Responsible Agency/ies	Due Date	Status
1.	CSIRO to investigate the length frequency conversion factors from the catch weight data provided by MG Kailis.	TRLRAG25 (11-12 December 2018)	CSIRO	2019	Complete CSIRO provided a verbal update TRLRAG 35.
2.	Considering assessment timelines, PNG NFA to provide CSIRO with a best estimate of PNG catches by mid-November. CSIRO to liaise closely with PNG regarding reporting timeframes and provision of catch data. In parallel, the RAG data sub-group to examine ways to adjust the stock assessment model to account for delayed catch data from PNG.	TRLRAG25 (11-12 December 2018)	PNG NFA CSIRO AFMA RAG Data Sub-Group	2019	Ongoing PNG will provide a summary of TRL catch by month and processed weight from the PNG TRL fishery at or prior to the TRLRAG38 meeting. The RAG may need to consider using an extrapolation approach to estimating total PNG catch in the absence of complete data sets on an ongoing basis. AFMA continues to liaise with PNG NFA to obtain best estimate catch data and logbook data as inputs to the eHRC calculations and stock assessment models. AFMA suggests delete this action item as it is now considered business as usual.
3.	That the TRL RAG data subcommittee discuss which TVH CPUE series are the best to use within the model.	TRLRAG25 (11-12 December 2018)	AFMA RAG Data Sub-Group	2019	AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group) The RAG Data Sub-Group last met on 18 June 2019, however this item was not considered. This item remains on the agenda for the Data Sub-group.
4.	AFMA and CSIRO to work closely with industry to develop an index or key of diver names and 'clean up' the data diver name dataset to feed in to the	TRLRAG27 (10-11 Dec 2019)	AFMA CSIRO	TRLRAG29	AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group)

#	Action Item	Meeting	Responsible Agency/ies	Due Date	Status
	next seasons' CPUE standardisation.				CSIRO will provide an update on this action at the meeting – necessity and feasibility to be discussed by the RAG.
5.	That the RAG (or RAG Data Sub-Group) determine whether there are better measures of effort in the fishery (hours vs days; time spent travelling, searching and actively fishing), and clarifying “number of fishers/divers” on TDB02 catch disposal record book.	TRLRAG27 (10-11 Dec 2019)	TRLRAG Data Sub-group	TRLRAG29	AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group) This item remains on the agenda for the Data Sub-group. The next RAG Data Sub-group meeting will be discussed under Agenda Item 11 .
6.	The TRL RAG Data Sub-group to look at ways to facilitate the reporting of discards and mortality on CDRs and Logbooks	TRLRAG 32 (15 Dec 2021)	TRLRAG Data Sub-group	2023	AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group) To be placed on the agenda for the next RAG Data Sub-group meeting – to be discussed under Agenda Item 11 .
7.	NFA to be invited to the next data sub-group meeting	TRLRAG 33 (13-14 Dec 2022)	AFMA	2023	AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group) The RAG Data Sub-group did not meet as planned in 2023, but an invitation will be extended to NFA for the next meeting.
8.	CSIRO to discuss potential survey with NFA	TRLRAG 33 (13-14 Dec 2022)	CSIRO/NFA	Ongoing	Ongoing. Update to be provided at the meeting.

#	Action Item	Meeting	Responsible Agency/ies	Due Date	Status
9.	AFMA to look at how discards are captured in the East Coast, and pass this along to the data sub-group to be considered on their agenda	TRLRAG 33 (13-14 Dec 2022)	AFMA/QDAF	2023	<p>AFMA suggests removing this action (noting it will be kept in a separate agenda for the RAG Data Sub-group)</p> <p>QDAF informed AFMA that discards are not recorded in the QLD logbook. The RAG Data Sub-group were not able to meet in 2023 as planned, but this will be provided ahead of the next RAG Data Sub-group meeting.</p>
10.	Ben Liddell to provide further information to CSIRO on two migrations of TRL in the year.	TRLRAG 33 (13-14 Dec 2022)	AFMA		<p>Ongoing.</p> <p>Update to be provided at TRLRAG 38 meeting.</p>

Out of session correspondence since TRL RAG 35 (12-13 December 2023)

Date	Item
6 March 2024	AFMA advised RAG members that two PNG Treaty endorsements had been approved by the AFMA delegate
8 March 2024	AFMA advised RAG members that the Australian TRL TAC for the 2023-24 fishing season had been increased to 357.75 tonnes subject to RAG advice and agreements between AFMA and PNG National Fisheries Authority.
30 May 2024	AFMA circulated a call for beche-de-mer research scopes on behalf of the TSSAC Executive Officer
7 June 2024	AFMA sought availability from RAG members for TRLRAG 36 video conference on research priorities
26 June 2024	AFMA circulated a Microsoft Teams meeting link for TRLRAG 36
28 June 2024	AFMA circulated the meeting papers for TRLRAG 36
26 July 2024	AFMA wrote to traditional inhabitant members of the RAG seeking interest to participate in an out of session technical discussion to further develop an economics related project for possible TSSAC consideration (as an Action Item from TRLRAG 36)
12 August 2024	AFMA apologised for the oversight in not circulating the meeting link for the out of session technical discussion on an economics project.
14 August 2024	AFMA sought comments from RAG members on the draft meeting record for TRL RAG 36; provided an overview of the technical discussion to further develop an economics project that took place on 7 August 2024, and sought comment from RAG members on a draft research scope for the TRL survey and scientific assessment project as per TRLRAG 36 advice and prioritisation.
15 August 2024	AFMA circulated a meeting placeholder for TRLRAG 37 for 9 October 2024 and a TRL Harvest Strategy Information sessions for 8 October 2024 and sought availability of members for these dates.
16 August 2024	AFMA circulated a Microsoft Teams link for a follow up TRL RAG discussion on an economics research project originally scheduled for 23 August 2024. Following declines for a number of members, AFMA sent a revised time and date for 30 August 2024.
20 August 2024	AFMA send a reminder to RAG members seeking comment on the draft TRLRAG 36 meeting record and the draft TRL research project scope.
23 August 2024	AFMA re-circulated a meeting update for the TRL RAG technical discussion on an economics project for 30 August 2024.
28 August 2024	AFMA circulated a final meeting record for TRLRAG 36.
5 September 2024	AFMA circulated a draft agenda for TRLRAG 37 to members for comment

17 September 2024	AFMA circulated information on the 2025-26 Torres Strait Fisheries call for research
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TROPICAL ROCK LOBSTER RESOURCE ASSESSMENT GROUP (TRLRAG) Thursday Island	MEETING 37 9 October 2024
UPDATES FROM MEMBERS	Agenda Item 2 For NOTING

RECOMMENDATIONS

1. That the RAG **NOTE** updates provided by:
 - a) Traditional inhabitant and industry members;
 - b) Scientific members;
 - c) Government agencies;
 - d) Papua New Guinea National Fisheries Authority (PNG NFA) representatives; and
 - e) Native Title body representatives (if in attendance).

BACKGROUND

2. Verbal reports are sought from traditional inhabitant, industry and scientific members under this item, with particular emphasis on market and export impacts to the current 2023-24 fishing season.
3. It is important that the RAG develops a common understanding of any strategic issues, including economic, fishing and research trends relevant to the management the TRL Fishery. This includes within adjacent jurisdictions. This ensures that where relevant, the RAG is able to have regard for these strategic issues and trends.
4. RAG members are asked to provide any updates on trends and opportunities in markets, processing and value adding. Industry is asked to contribute advice on economic and market trends where possible. Scientific members are asked to contribute advice on any broader strategic research projects or issues that may be of interest to the Torres Strait in future.
5. Government agency members are asked to provide updates relevant to the TRL Fishery.
6. AFMA has a standing invite for officials from the PNG National Fisheries Authority (NFA) and a Native Title Body representative to attend all PZJA advisory committee meetings. If in attendance, updates are welcome from these participants.

TROPICAL ROCK LOBSTER RESOURCE ASSESSMENT GROUP (TRLRAG) Thursday Island	MEETING 37 9 October 2024
AMENDING THE eHCR FOR FUTURE SEASONS	Agenda Item 3 For DISCUSSION and ADVICE

RECOMMENDATIONS

1. That the RAG:
 - a) **NOTE** and **DISCUSS** the presentation from CSIRO on options for an amended empirical Harvest Control Rule (eHCR) under the [TRL Harvest Strategy 2019 \(Attachment 3a\)](#), to be applied in future seasons, starting with the 2024-25 fishing season.
 - b) **NOTE** that formally amending the TRL Harvest Strategy will require a PZJA decision (see expected timeline **Attachment 3b**) however, it is anticipated that pending advice from this RAG, the revised eHCR will be applied at TRLRAG 38 (10-11 December 2024) in calculating a recommended biological catch (RBC) for the 2024-25 fishing season and that subject to caretaker periods for both the TSRA and Queensland Governments, a PZJA decision to formally amend the TRL Harvest Strategy will be sought at the earliest opportunity (likely early 2025).
 - c) **RECOMMEND** a way forward in amending the eHCR, including any additional analyses, if necessary, to be applied at TRLRAG 38 when providing advice on a RBC for the 2024-25 season and beyond.

KEY ISSUES

2. The RAG should note that this agenda item was discussed (though not to the full extent) at TRL RAG 35 (12-13 December 2023) which was substantially disrupted by Cyclone Jasper. As such, no formal advice was provided by TRL RAG 35 and so RAG members are being asked to reconsider updated testing and analysis of options as undertaken by CSIRO in the intervening period. A copy of CSIRO's presentation from TRL RAG 35 is provided at **Attachment 3c (separate)**.
3. Although designed to give industry confidence in decision making, harvest strategies are intended to undergo regular review and may require ongoing refinement. This is especially true in the rapidly changing conditions (economic and environmental) that we are likely to experience in the coming years.
4. When the TRL Harvest Strategy, with the eHCR as a critical component, was implemented in 2019 the large-scale disruptions to the TRL Fishery and significant socio-economic pressures as experienced in recent years were not anticipated nor accounted for in the design. A non-technical summary of the eHCR is provided at **Attachment 3d (separate)**.

Lower-than-expected average catch multiplier

5. In recent seasons, the TRL Fishery has experienced a series of disruptions to both the export market and the fishing sector which has resulted in lower-than-expected trends in total catch of TRL against the global TAC.

6. TRL RAG has previously discussed the implications of a lower-than-expected average catch multiplier on the eHCR, which in one season may not be as influential given the total catch is averaged over a five-year period. However, in circumstances where the negative average total catch trend continued (i.e. since 2019-20), it can start to drive the RBC estimates down.
7. The RBC values for the past three fishing seasons have been calculated using an ad-hoc method whereby the actual catch value for anomalous seasons was substituted with the total fishery TAC, to account for these exceptional circumstances.
8. Although justifiable in anomalous exceptional circumstances where no biological risk to the stock was identified, implementing an ad-hoc approach is not suitable on an ongoing basis.
9. TRL RAG 32 recommended that revision of the eHCR be investigated, and the CSIRO have analysed options to this effect. Recognising the impact of recent conditions on the fishery, and unanticipated effect of such conditions on the eHCR (and by extension the application of the TRL Harvest Strategy) the RAG is being asked to consider these options and recommend a way forward. A revised eHCR will allow the RAG to continue to provide well informed and reliable advice on the RBC, starting with the 2024-25 fishing season.
10. Any formal revision on the eHCR will have to go through a formal approval process, including through the PZJA, as detailed in **Attachment 3b**.

BACKGROUND

Harvest Strategy review

11. The [Commonwealth Fisheries Harvest Strategy Policy and Guidelines](#), upon which the TRL Harvest Strategy (**Attachment 3a**) is based as best practice, specifies that harvest strategies are to be reviewed every five years but may be reviewed earlier if necessary.
12. Section 2.13 of the TRL Harvest Strategy provides guidance on when a review may be required earlier than 5 years, including relating to changing external drivers.
13. As external drivers, ongoing market and economic pressures recently encountered in the fishery are beyond what was considered when the eHCR was developed and warrant a revision of the eHCR, TRL RAG recommended this revision at their 32nd meeting in December 2021.

The empirical Harvest Control Rule (eHCR)

14. The eHCR is an integral component of the TRL Harvest Strategy that is used to rapidly determine an RBC each fishing season.
15. The eHCR formula is the multiple of the average annual catch over the last five years (using available catch from TIB, TVH and PNG sectors), and a statistic which measures the relative performance of the fishery based on the following data inputs:
 - a) the pre-season survey index of abundance of juvenile recruiting 1+ lobsters (70 per cent weighting);
 - b) the pre-season survey index of abundance of newly recruited 0+ lobsters (10 per cent weighting);
 - c) the standardised CPUE index from the TVH sector (10 per cent weighting)

- d) the standardised CPUE index from the TIB sector (10 per cent weighting).
16. CSIRO have developed an eHCR RBC calculator to assist stakeholders in understanding how the eHCR works (**available on request**). A non-technical summary explaining the design of the eHCR is also provided at **Attachment 3d (separate)** and a copy of the published peer-reviewed paper “*Evaluating an empirical harvest control rule for the Torres Strait Panulirus ornatus tropical rock lobster fishery*” is provided at **Attachment 3e (separate)**.



Australian Government
Australian Fisheries Management Authority

Torres Strait Tropical Rock Lobster Fishery Harvest Strategy

November 2019

This harvest strategy is based on outcomes from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Oceans and Atmosphere Division project, *Torres Strait Tropical Rock Lobster (TRL) fishery surveys, stock assessment, harvest control rules and RBC*. The project was funded by the Australian Fisheries Management Authority (AFMA).

AFMA Project No. 2016/0822.

Project Authors: Éva Plagányi (Principal Investigator), Darren Dennis, Roy Deng, Robert Campbell, Trevor Hutton, Mark Tonks

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GLOSSARY

Types of reference points:

Reference Point	Description
Metarule	A rule that describes how the RBCs obtained from an assessment should be adjusted in calculating a recommended TAC
Target	The desired state of the stock or fishery (for example, MEY or B_{TARG}) ¹
Limit	The level of an indicator (such as biomass or fishing mortality) beyond which the risk to the stock is regarded as unacceptably high ¹
MEY	The sustainable catch or effort level for a commercial fishery that allows net economic returns to be maximised. In this context, maximised equates to the largest positive difference between total revenue and total cost of fishing ¹
MSY	The maximum average annual catch that can be removed from a stock over an indefinite period under prevailing environmental conditions ¹

Notation:

Notation	Description
B	Spawning biomass - the total weight of all adult (reproductively mature) fish in a population ¹
B_0	The unfished spawning biomass (determined from an appropriate reference point)
F	Fishing mortality rate
B_{LIM}	Biomass limit reference point - the point beyond which the risk to the stock is regarded as unacceptably high ¹
B_{TARG}	Biomass target reference point - the desired biomass of the stock ¹

Other acronyms:

Acronym	Description
CPUE	Catch per unit effort
eHCR	Empirical Harvest Control Rule
HCR	Harvest Control Rule - pre-determined rules that control fishing activity according to the biological and economic conditions of the fishery (as defined by monitoring or assessment). Also called 'decision rules'. HCR are a key element of a harvest strategy ¹
HSP	<i>Commonwealth Fisheries Harvest Strategy Policy: Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries</i> (June 2018)
HS	Torres Strait Tropical Rock Lobster Fishery Harvest Strategy
PZJA	Protected Zone Joint Authority

¹ Definition sourced from the *Commonwealth Fisheries Harvest Strategy Policy: Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries* (June 2018)

MSE	Management Strategy Evaluation - a procedure whereby alternative management strategies are tested and compared using simulations of stock and fishery dynamics ¹
RBC	Recommended Biological Catch
TRLRAG	Protected Zone Joint Authority Tropical Rock Lobster Resource Assessment Group
TRLWG	Protected Zone Joint Authority Tropical Rock Lobster Working Group
TAC	Total Allowable Catch- the annual catch limit set for a stock, species or species group. Used to control fishing mortality within a fishery ¹
Tiered approach	A framework that uses different control rules to cater for different levels of uncertainty about a stock
TIB	Traditional inhabitant boat
TVH	Transferrable vessel holder
TRL	Tropical Rock Lobster
TSPZ	Torres Strait Protected Zone

OVERVIEW

The Torres Strait Tropical Rock Lobster Fishery (the Fishery) Harvest Strategy (HS) sets out the management actions needed to achieve the agreed Fishery objectives. The HS describes the performance indicators used for monitoring the condition of the stock, the fishery-independent survey and stock assessment procedures and the rules applied to determine the recommended biological catch (RBC) and the total allowable catch (TAC) each fishing season.

The HS uses a single tier approach with an empirical harvest control rule (eHCR) that is used to determine a RBC. The eHCR uses the pre-season survey index of abundance of juvenile (1+) and newly recruited (0+) Tropical Rock Lobster (TRL) and the catch per unit effort (CPUE) indices for the traditional inhabitant boat (TIB) and transferrable vessel holder (TVH) fishing sectors. The eHCR has been extensively tested using Management Strategy Evaluation (MSE) (Plagányi *et al.* 2018). The RBC is the best available scientific advice on what the total fishing mortality (landings from all sectors and discards) should be for the stock. The RBC is used to negotiate Australia-Papua New Guinea catch sharing and recommend TACs (an enforced limit on total catches).

The HS meets the requirements of the *Commonwealth Fisheries Harvest Strategy Policy: Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries* (June 2018) (HSP) by applying a precautionary approach to the reference points and measures to be implemented in accordance with the reference points. This is reflected in the use of proxy reference points that are more precautionary than those specified in the HSP. The eHCR is designed to decrease exploitation rate as the stock size decreases below the target reference point. The HS uses a biomass target reference point equal to recent levels (2005-2015) that take account of the fact that the resource is shared and important for the traditional way of life and livelihood of traditional inhabitants and is biologically and economically acceptable. The HS proxies are B_{LIM} is 32% of B_0 , B_{TARG} is 65% of B_0 .

Further work for the HS will include the development of a tiered approach. The tiered approach applies different types of control rules to cater for different amounts of data available and to account for changes to uncertainty on stock status. A tiered approach adopts increased levels of precaution that correspond to increasing levels of uncertainty about the stock status, in order to maintain the same level of risk across the different tiers.

The status of the stock and how it is tracking against the HS, is reported to the Tropical Rock Lobster Resource Assessment Group (RAG), Tropical Rock Lobster Working Group (TRLWG) and the Protected Zone Joint Authority (PZJA). The stock assessment is conducted periodically to evaluate stock status relative to reference levels and, in doing so, performance of the eHCR. The stock assessment includes considerations of the catch rates in current and previous fishing seasons, how the catches compare to the RBCs, stock status indicators in relation to the reference points and an RBC for the upcoming fishing season.

1 BACKGROUND

This Torres Strait Tropical Rock Lobster Fishery (the Fishery) Harvest Strategy (HS) has been developed in accordance with the *Commonwealth Fisheries Harvest Strategy Policy: Framework for applying an evidence-based approach to setting harvest levels in Commonwealth fisheries* (June 2018) (HSP) and consistent with objectives of the *Torres Strait Fisheries Act 1984* (the Act).

The Fishery HS takes into account key fishery specific attributes including:

- a) there is potential for large, unpredictable inter-annual variations in availability and abundance of Tropical Rock Lobster (TRL);
- b) TRL is a shared resource important for the traditional way of life and livelihood of traditional inhabitants, commercial and recreational sectors (Tropical Rock Lobster Resource Assessment Group (TRLRAG) 20, 4-5 April 2017); and
- c) advice from the TRLRAG industry members to maintain stock abundance at recent levels (2005-2015) (TRLRAG 17, 31 March 2016).

1.1 COMMONWEALTH FISHERIES HARVEST STRATEGY POLICY

The objective of the HSP is the ecologically sustainable and profitable use of Australia's Commonwealth commercial fisheries resources (where ecological sustainability takes priority) - through implementation of harvest strategies.

To pursue this objective the Australian Government will implement harvest strategies that:

- a) 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
- b) 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
- c) maintain key commercial fish stocks, on average, at the required target biomass to produce maximum economic yield from the fishery
- d) maintain all commercial fish stocks, including byproduct, above a biomass limit where the risk to the stock is regarded as unacceptable (B_{LIM}), at least 90 per cent of the time
- e) 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
- f) minimise discarding of commercial species as much as possible
- g) are consistent with the *Environment Protection and Biodiversity Conservation Act 1999* and the *Guidelines for the Ecologically Sustainable Management of Fisheries*.

For fisheries that are managed jointly by an international organisation or arrangement, the HSP does not prescribe management arrangements. This includes management arrangements for commercial and traditional fishing in the Torres Strait Protected Zone (TSPZ), which are governed by provisions of the Torres Strait Treaty and the *Torres Strait Fisheries Act 1984*. However, it does articulate the government's preferred approach.

The HSP provides for the use of proxy settings for reference points to cater for different levels of information available and unique fishery circumstances. This balance between prescription and flexibility encourages the development of innovative and cost effective strategies to meet key policy objectives. Proxies, including those that exceed the minimum standards, must be demonstrated to be compliant with the HSP objective.

With a harvest strategy in place, fishery managers and stakeholders are able to operate with pre-defined rules, management decisions are more transparent, and there are likely fewer unanticipated outcomes necessitating hasty management responses. However, due to the inherently natural variability of TRL abundance there may be a need for significant changes in recommended catch on an annual basis.

1.2 DEVELOPMENT OF THE TRL HARVEST STRATEGY

The HS has been developed in consultation with the TRLRAG (meeting no. 17 on 31 March 2016; meeting no. 18 on 2-3 August 2016; meeting no. 19 on 13 December 2016; meeting no. 20 on 4-5 April 2017; meeting no. 22 on 27-28 March 2018; meeting no. 24 on 18-19 October 2018; and meeting no. 25 on 11-12 December 2018; out of session 16 September-9 October 2019) and TRLWG (meeting no. 6 on 25-26 July 2017; meeting no. 9 on 19-20 February 2019; out of session 16 September-9 October 2019). This HS replaces the interim HS developed for the Fishery in 2008.

2 TRL FISHERY HARVEST STRATEGY

2.1 SCOPE

This HS applies to the whole Fishery and it takes into account catch sharing arrangements between Australia and Papua New Guinea (PNG).

The HS outlines the control rules used to develop advice on the recommended biological catch (RBC) and to recommend total allowable catches (TACs) (an enforced limit on total catches). The HS sets the criteria that pre-agreed management decisions will be based on in order to achieve the HS objectives.

Over time the HS may be amended to use a tiered approach to cater for different amounts of data available and different types of assessments (for example mid-season surveys and annual assessments). Underpinning a tiered HS is increased levels of precaution with increasing levels of uncertainty about the stock status. Each tier has its own harvest control rule (HCR) and associated rules that are used to determine a RBC.

2.2 OBJECTIVES

The operational objectives of the HS are to:

- a) Maintain the stock at (on average), or return to, a target biomass point B_{TARG} equal to recent levels (2005-2015) that take account of the fact that the resource is shared and important for the traditional way of life and livelihood of traditional inhabitants and is biologically and economically acceptable.
 - o The agreed B_{TARG} is more precautionary than the default proxy B_{MEY} (biomass at maximum economic yield) level as outlined in the HSP.
- b) Maintain the stock above the limit biomass level (B_{LIM}), or an appropriate proxy, at least 90 per cent of the time.
 - o The agreed B_{LIM} is more precautionary than the default proxy HSP B_{LIM} .
- c) Implement rebuilding strategies, if the spawning stock biomass is assessed to fall below B_{LIM} in two successive years.

2.3 RECOMMENDING TACs FROM RBCs

The RBC is the recommended total catch of TRL (both retained and discarded) that can be taken by all sectors within the TSPZ and waters declared as areas outside but near to the TSPZ, including Australian and PNG fishers. The HSP states that when setting the TAC for the next fishing season the HS should take into account all sources of fishing mortality.

The HS does not include catches taken by non-commercial fishing sectors, for example traditional, recreational or research catches. The TRLRAG recommended at meeting no. 18 on 2-3 August 2016 that non-commercial catches not be estimated in the stock assessment model or when setting the TAC at this time, noting the likely low level of overall catch and

the lack of accurate data. However, if unaccounted fishing mortality were to increase significantly this may impact on the performance of the stock assessment. The HS may be updated in the future to account for changing circumstances in the Fishery, the review provisions are described in **Section 2.13**.

2.4 MONITORING

Biological data for the Fishery are monitored by a range of methods listed below. Currently there is no ongoing monitoring strategy in place to collect economic information.

Fishery independent surveys

A key component of the monitoring program is the fishery-independent survey which provides a time-series of relative abundance indices for TRL. Fishery-independent surveys have been conducted in the Fishery since 1989. Historically (1989-2014 and 2018), mid-season (July) surveys focused on providing an index of abundance of the spawning (age 2+) and juvenile (age 1+) lobsters. Mid-season surveys have been replaced with pre-season (November) surveys (2005-2008; 2014 to current) which focus on providing an index of recruiting (age 1+) lobsters as close as possible to the start of the fishing season to support the transition to quota management and setting of a TAC. Pre-season surveys also provide indices of recently-settled (age 0+) lobsters, which may become useful under quota management as they allow forecasting of stock one year in advance and are used in the eHCR.

Catch and effort information

Fishers in the transferrable vessel holder (TVH) sector are required to record catch and effort information in the Torres Strait Tropical Rock Lobster Daily Fishing Log (TRL04). The following data are recorded for each TVH fishing operation: the port and date of departure and return, fishing area, fishing method, hours fished and the weight (whole or tails) of TRL retained. Fishers in both the TVH and traditional inhabitant boat (TIB) sectors are required to record catch information in the Torres Strait Fisheries Catch Disposal Record (TDB02). The provision of effort information under the TDB02 is voluntary. Some processors previously (2014-2016) reported aggregate TIB catch information directly to AFMA predominantly through the Torres Strait Seafood Buyers and Processors Docket Book (TDB01).

2.5 INTEGRATED STOCK ASSESSMENT MODEL

The stock assessment model (termed the 'Integrated Model') (Plagányi *et al.* 2009) was developed in 2009 and is an Age-Structured Production Model, or Statistical Catch-at-Age Analysis (SCAA) (e.g. Fournier and Archibald 1982). It is a widely used approach for providing RBC advice and the associated uncertainties.

The model integrates all available information into a single framework to assess resource status and provide a RBC. The model addresses all of the concerns highlighted in a review of the previous stock assessment approach (Bentley 2006, Ye *et al.* 2006, 2007). The model

is fitted to the mid-season and pre-season survey data and TIB and TVH catch per unit effort (CPUE) data. The growth relationships used in the model were revised from the previous stock assessment model (Ye *et al.* 2006) to ensure that the modelled individual mass at age more closely resembled field measurements. The model has been used as an Operating Model in a Management Strategy Evaluation (MSE) framework to support the management of the Fishery (Plagányi *et al.* 2012, 2013, 2018).

The stock assessment model is non-spatial and assumes (conservatively) that the Torres Strait Tropical Rock Lobster Fishery stock is independent of the Queensland East Coast Tropical Rock Lobster Fishery stock. A spatial version of the model has been developed as part of an earlier MSE project, and can be used to investigate plausible linkages between these stocks (Plagányi *et al.* 2012, 2013).

The model includes three age-classes only (0+, 1+ and 2+ age lobsters) as it is assumed that lobsters migrate out of the Torres Strait in October each year. Torres Strait TRL emigrate in spring (September-November) and breed during the subsequent summer (November-February) (MacFarlane and Moore 1986; Moore and Macfarlane 1984). A Beverton-Holt stock-recruitment relationship is used (Beverton and Holt 1957), allowing for annual fluctuation about the average value predicted by the recruitment curve. The model is fitted to the available abundance indices by maximising the likelihood function. Quasi-Newton minimisation is used to minimise the total negative log-likelihood function (using the package AD Model Builder™) (Fournier *et al.* 2012).

2.6 EMPIRICAL HARVEST CONTROL RULE

The empirical harvest control rule (eHCR) recommended by the TRLRAG uses the pre-season survey 1+ and 0+ indices, both standardised CPUE indices (TVH and TIB), applies the natural logarithms of the slopes of the five most recent years' data and the average catch over the past five years, with an upper catch limit of 1,000 t. The relative weightings of the eHCR indices are 70 per cent pre-season survey 1+ index, 10 per cent pre-season survey 0+ index, 10 per cent TIB sector standardised CPUE and 10 per cent TVH sector standardised CPUE.

The basic formula is:

$$RBC_{y+1} = wt_s1 \cdot (1 + s_y^{presurv,1}) \cdot \bar{C}_{y-4,y} + wt_s2 \cdot (1 + s_y^{presurv,0}) \cdot \bar{C}_{y-4,y} \\ + wt_c1 \cdot (1 + s_y^{CPUE,TVH}) \cdot \bar{C}_{y-4,y} + wt_c2 \cdot (1 + s_y^{CPUE,TIB}) \cdot \bar{C}_{y-4,y}$$

Or if $RBC_{y+1} > 1000t$, $TAC_{y+1} = 1000$.

Where:

$\bar{C}_{y-4,y}$ is the average achieved catch during the past 5 years, including the current year i.e. from year $y-4$ to year y ,

$S_y^{presurv,1}$ is the slope of the logarithms of the preseason survey 1+ abundance index, based on the 5 most recent values;

$S_y^{presurv,0}$ is the slope of the logarithms of the preseason survey 0+ abundance index, based on the 5 most recent values;

$S_y^{CPUE.TVH}, S_y^{CPUE.TIB}$ is the slope of the logarithms of the TVH and TIB CPUE abundance index, based on the 5 most recent values;

$wt_s1, wt_s2, wt_c1, wt_c2$ are tuning parameters that assign relative weight to the preseason 1+ (wt_s1) and 0+ (wt_s2) survey trends compared with the CPUE TVH (wt_c1) and TIB (wt_c2) trends.

2.7 REFERENCE POINTS

The HS reference points are:

- a) The unfished biomass B_0 is the model-estimate of spawning stock biomass in 1973 (start of the Fishery). $B_0 = B_{1973}$.
- b) The target biomass B_{TARG} is the spawning biomass level equal to recent levels (2005-2015) that take account of the fact that the resource is shared and important for the traditional way of life and livelihood of traditional inhabitants and is biologically and economically acceptable. B_{TARG} is the proxy for B_{MEY} , $B_{TARG} = 0.65 B_0$.
 - o The agreed B_{TARG} is more precautionary than the default proxy B_{MEY} (biomass at maximum economic yield) level as outlined in the HSP. The TRLRAG noted a B_{TARG} higher than the HSP default was considered important for the Fishery because: 1) the stock is a shared resource that is particularly important for traditional fishing; 2) the stock has high variability; and, 3) all industry members recommended the HS maintain the stock around the relatively high current levels (TRLRAG meeting no. 17, 31 March 2016 and meeting no. 18, 2-3 August 2016).
- c) The limit biomass B_{LIM} is the spawning biomass level below which the risk to the stock is unacceptably high and the stock is defined as 'overfished'. B_{LIM} is agreed to be half of B_{TARG} , $B_{LIM} = 0.32 B_0$.
 - o The agreed B_{LIM} is more precautionary than the default proxy HSP B_{LIM} .
- d) If the limit reference point (B_{LIM}) is triggered in two successive years then the Fishery is closed.
- e) The target fishing mortality rate F_{TARG} is the estimated level of fishing mortality rate that maintains the spawning biomass around B_{TARG} . $F_{TARG} = 0.15$.

- $F_{TARG} = 0.15$ is the target fishing mortality rate that corresponds to an optimal level in terms of economic, biological and social considerations (TRLRAG meeting no. 18, 2-3 August 2016).

Rational for reference points

The HSP recognises that each stock/species/fishery will require an approach tailored to the fishery circumstances, including species characteristics. The HSP identifies that the selection of reference points within harvest strategies need to be realistic with respect to the scale or nature of the fishery and the resources available to manage it. Reference points should be set at levels appropriate to the biology of the species and the proper functioning of the broader marine ecosystem. Further, stocks that fall below B_{LIM} will be subject to the recovery measures stipulated in the HSP. A number of adaptive management approaches may be used to deal with this, such as pre-season surveys to provide estimates of abundance to which the eHCR is applied.

The Fishery is characterised by a highly variable stock where majority of the catch (since 2001 due to the introduction of a minimum size limit) is from a single cohort. The stock assessment model and MSE testing have identified the target biomass should be set between 65 and 80 per cent of the unfished biomass to account for the importance of the stock for the traditional way of life and livelihood of traditional inhabitants and to achieve biological and economic objectives. The HS's higher average target biomass level, compared to the default HSP target of 0.48 per cent of unfished biomass, reduces the risk of recruitment being compromised.

The unfished biomass (B_0) is calculated within the stock assessment model, the value of unfished biomass and target biomass have therefore varied over time in response to annual data updates and model parameter settings and estimates. Estimates of unfished biomass and target biomass are particularly sensitive to changes to parameter h , which determines the steepness of the stock-recruit relationship, and the input parameter that controls the level of stock-recruit variability.

Independent of variability to the unfished biomass value, the target fishing mortality rate $F_{TARG} = 0.15$ is applied to maintain the spawning biomass around the biomass target reference point (B_{TARG}), which is the average level over the past two decades. This is assumed to be a proxy for B_{MEY} because stakeholders agreed that this target level corresponded to an optimal level in terms of economic, biological and social considerations (TRLRAG meeting no. 18, 2-3 August 2016).

The biomass limit reference point (B_{LIM}) is 32 per cent of unfished biomass. The higher limit reference point, compared to the HSP proxy of 20 per cent of unfished biomass, is supported by recommendations of similar limit reference points for other highly variable species such as forage fish (Pikitch *et al.* 2012). Due to the changing values of unfished biomass and target biomass the value of the limit reference point, taken as half the target reference point, has previously varied between 32 and 40 per cent of unfished biomass.

Recent MSE testing identified that a limit reference point of 40 per cent unfished biomass is too conservative, it would result in the limit reference point being breached more frequently and add unnecessary precaution to the HS. The TRLRAG agreed to set the limit reference

point at 32 per cent of unfished biomass with the condition that if the stock falls below the limit reference point in two successive years it triggers a Fishery closure. The eHCR is more precautionary than the HSP criterion to 'maintain all commercial fish stocks, including byproduct, above a biomass limit where the risk to the stock is regarded as unacceptable (B_{LIM}), at least 90 per cent of the time'. The HSP provides for the designation of a limit reference point above the proxy (B_{20}) where this has been estimated or is deemed appropriate.

2.8 eHCR AND STOCK ASSESSMENT CYCLE

The eHCR and stock assessment cycle is as follows:

- The eHCR is run in November each year to provide a RBC by 1 December for the following fishing season.
- A stock assessment is run on a three year cycle by March, unless the stock assessment is triggered by a decision rule (**Section 2.10**). The stock assessment determines the Fishery stock status and evaluates the performance of the eHCR and identifies if any revisions to the eHCR are required.
- If the eHCR needs to be revised, the stock assessment is conducted annually to estimate the RBC until the revised eHCR is agreed.

2.9 DATA SUMMARY

The annual data summary reviews the nominal and standardised CPUE from the TIB and TVH sectors, as well as total catch from all sectors, the size-frequency information provided from a sub-sample of commercially caught TRL and the fishery-independent survey indices of 0+ and 1+ age lobsters. The data summary is used as an indicator to identify if catches correspond to the RBC, and to monitor CPUE.

2.10 DECISION RULES

The decision rules for the HS are:

Maximum catch limit

- The eHCR includes a maximum catch limit of 1000 t. Once the HS is implemented the cap will be reviewed after three years using MSE testing with the updated stock assessment model.

Pre-season survey trigger

- If in any year the pre-season survey 1+ index is 1.25 or lower (average standardised number of 1+ age lobsters per survey transect) it triggers a stock assessment.

Biomass limit reference point triggered

- If the pre-season survey trigger is triggered in the first year, a stock assessment update must be conducted in March.
 - If after the first year the stock is assessed below the biomass limit reference point, it is optional to conduct a mid-season survey, the pre-season survey must continue annually.
- If the pre-season survey trigger is triggered two years in a row, a stock assessment must be conducted in December (of the second year).

Fishery closure rules

- If the stock assessment determines the stock to be below the biomass limit reference point in two successive years, the Fishery will be closed to commercial fishing.
 - MSE testing of the eHCR has shown that it is extremely unlikely (<1%) for the Fishery to be closed based on its current performance (Plagányi *et al.* 2018).

Re-opening the Fishery

- Following closure of the Fishery, fishery-independent mid-season and pre-season surveys are mandatory. The Fishery can only be re-opened when a stock assessment determines the Fishery to be above the biomass limit reference point (**Attachment A, Figure 5**).

Based on the decision rules, there are four alternative possible scenarios (**Section 2.11**) that may occur under the application of the eHCR. Graphic representations of the four scenarios are provided in **Attachment A**.

2.11 DECISION RULE SCENARIOS

Scenario 1 – Pre-season survey trigger not triggered and the eHCR does not require revision

- The pre-season survey trigger is not triggered.
- The eHCR RBCs appear to remain within ranges tested by MSE.
- The updated stock assessment does not indicate any need for revision of the eHCR.
- Application of the eHCR continues unchanged.
- A graphic representation of Scenario 1 is provided in **Attachment A, Figure 1**.

Scenario 2 – Pre-season survey trigger not triggered, eHCR and stock assessment require revision

- The pre-season survey trigger is not triggered.

- The eHCR RBCs appear to remain within ranges tested by MSE.
- The updated stock assessment indicates the eHCR recommended RBCs are outside the revised ranges tested by MSE, indicating that the eHCR should be revised.
- Annual RBCs need to be set using annual stock assessments until a revised eHCR has been agreed, after which the revised eHCR is applied.

A graphic representation of Scenario 2 is provided in **Attachment A, Figure 2**.

Scenario 3– Pre-season survey trigger is triggered, eHCR is reviewed by stock assessment and the biomass limit reference point is not breached

- The pre-season survey trigger is triggered in one year.
- A stock assessment update (March) is required to confirm if the biomass limit reference point has been breached. This assessment update determines that the biomass limit reference point has not been breached.
- If the biomass limit reference point is breached once, discussions will be held on preventative measures to reduce the risk of closure.
- The eHCR RBC is applied and consideration is given to revising the eHCR to prevent future incorrect indications that the biomass limit reference point may have been breached.
- The stock assessment continues on a three year cycle, unless triggered to occur by a decision rule.
- A graphic representation of Scenario 3 is provided in **Attachment A, Figure 3**.

Scenario 4 – Pre-season survey trigger is triggered, stock assessment confirms the biomass limit reference point is breached

- The pre-season survey trigger is triggered in one year.
- A stock assessment update (March) is required to confirm if the biomass limit reference point has been breached. This assessment update determines that the biomass limit reference point has been breached.
- The pre-season survey trigger is triggered for a second successive year.
- A second stock assessment update (December) is required to confirm whether the biomass limit reference point has been breached a second time. This assessment update determines that the biomass limit reference point has been breached a second time.
- The commercial fishery is closed until an assessment update confirms that the stock has recovered to above the biomass limit reference point.
 - If the Fishery is closed to commercial fishing, discussions are held on future management arrangements.

- Fishery-independent mid-season and pre-season surveys are mandatory and conducted on an annual basis. The Fishery will only re-open when the Fishery is assessed to be above the biomass limit reference point by the stock assessment.
 - The eHCR must be revised before being re-implemented to reduce the risk of the Fishery breaching the biomass limit reference point and for the eHCR to incorporate rebuilding requirements.
- A graphic representation of Scenario 4 is provided in **Attachment A, Figure 4**.

2.12 GOVERNANCE

The status of the Fishery and how it is tracking against the HS is reported to the TRLRAG, TRLWG and the PZJA as part of the yearly RBC and TAC setting process.

2.13 REVIEW

Harvest strategies are to be reviewed every five years. However, it may be necessary to amend harvest strategies earlier if:

- a marked change in stocks targeted occurs, leading to a change in which stocks are categorised as key commercial
- new information substantially changes understanding of the fishery, leading to revised estimates of indicators relative to reference points
- 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
- performance indicators show that harvest strategies are not working effectively, and that the intent of the HSP is not being met.

Early review may be triggered when either:

- harvest strategies are implemented without formal testing or evaluation using methods such as MSE
- MSE testing did not take adequate account of the changes in risk factors subsequently observed, or
- subsequent estimates of the performance indicators used in the HCR are biased or uncertain to the extent that application of the control rule using these indicators fails to appropriately adjust fishing pressure.

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Torres Strait Tropical Rock Lobster Fishery – alternative annual Harvest Control Rule application scenarios

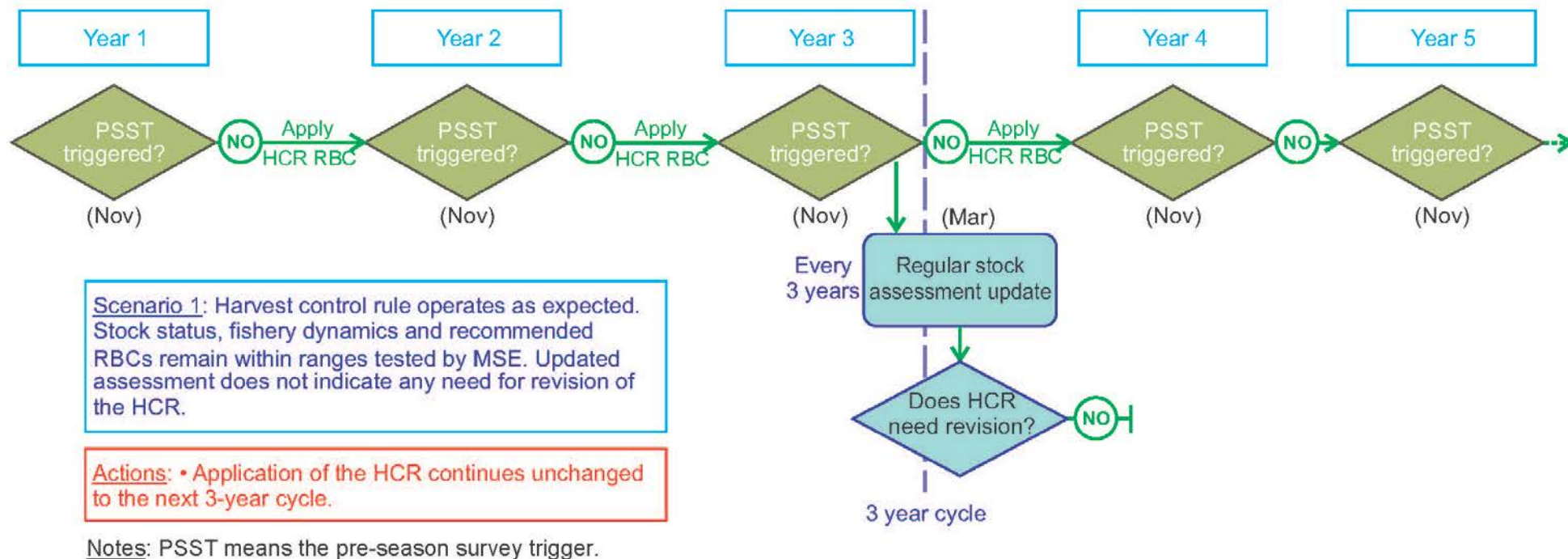


Figure 1. Torres Strait Tropical Rock Lobster Fishery decision rule scenario 1.

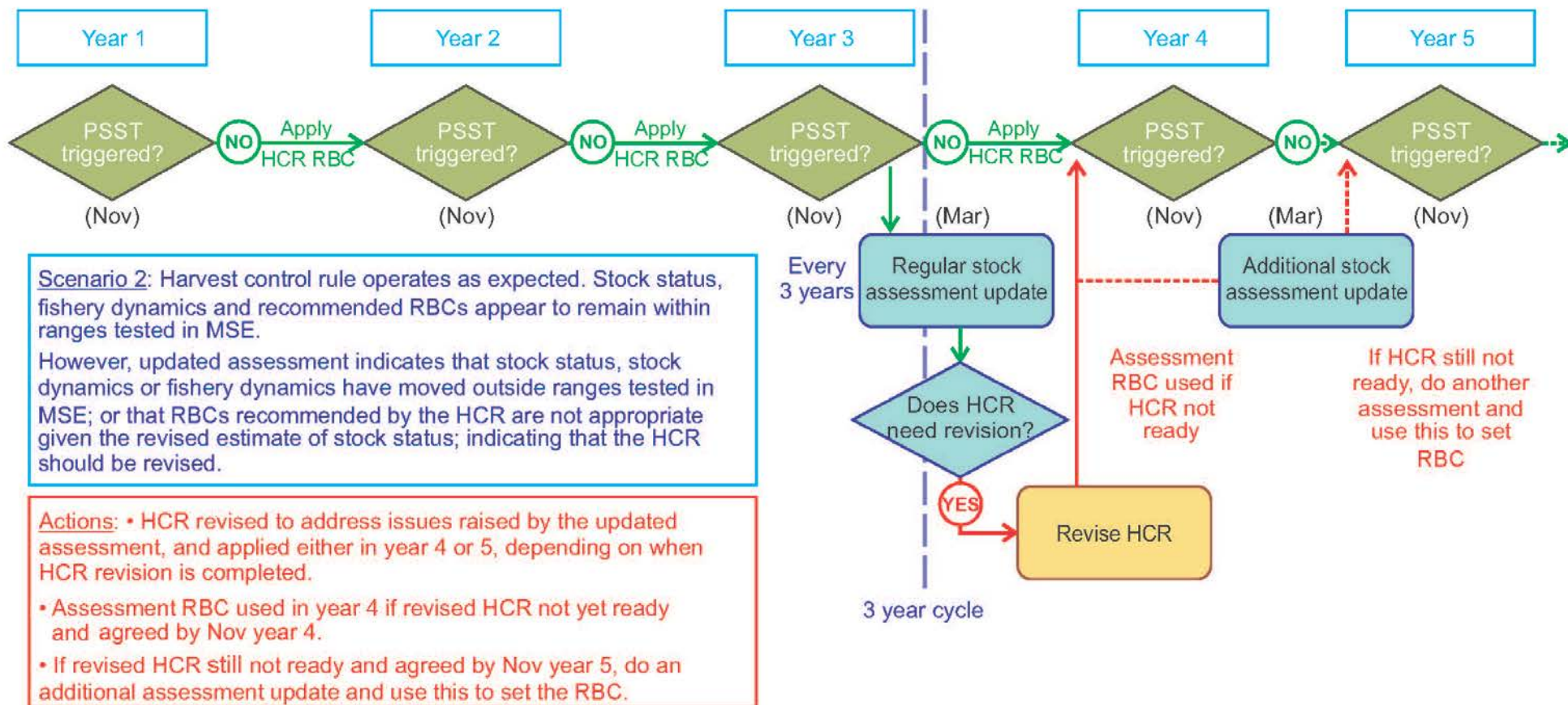
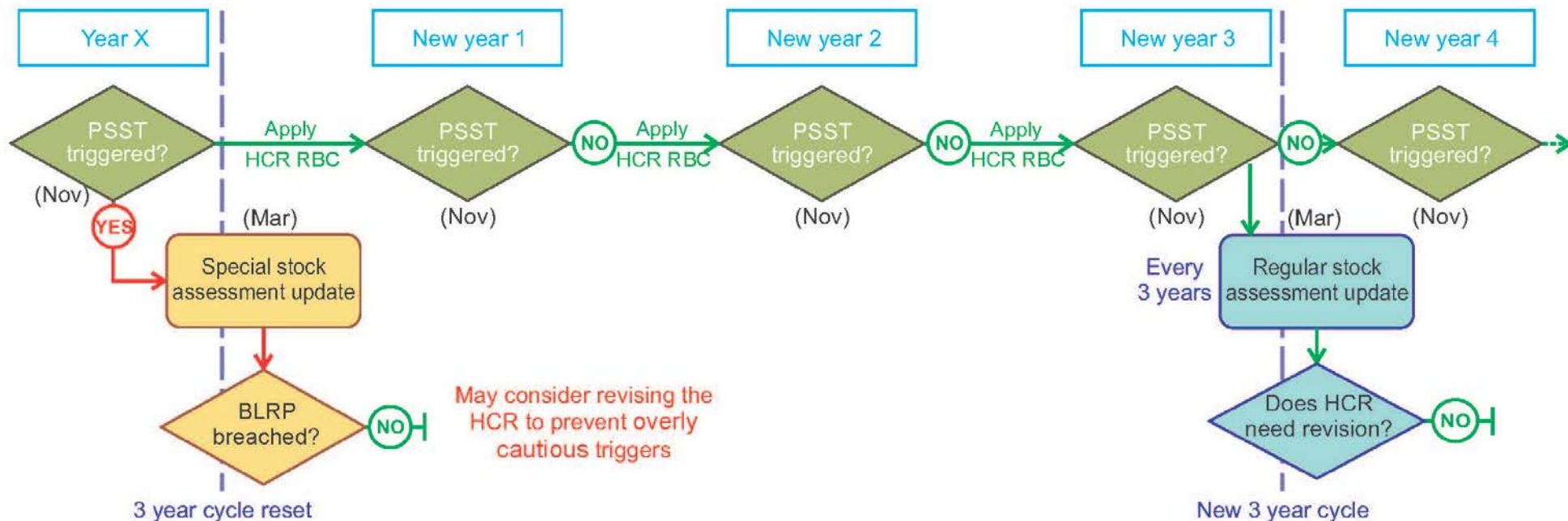


Figure 2. Torres Strait Tropical Rock Lobster Fishery decision rule scenario 2.

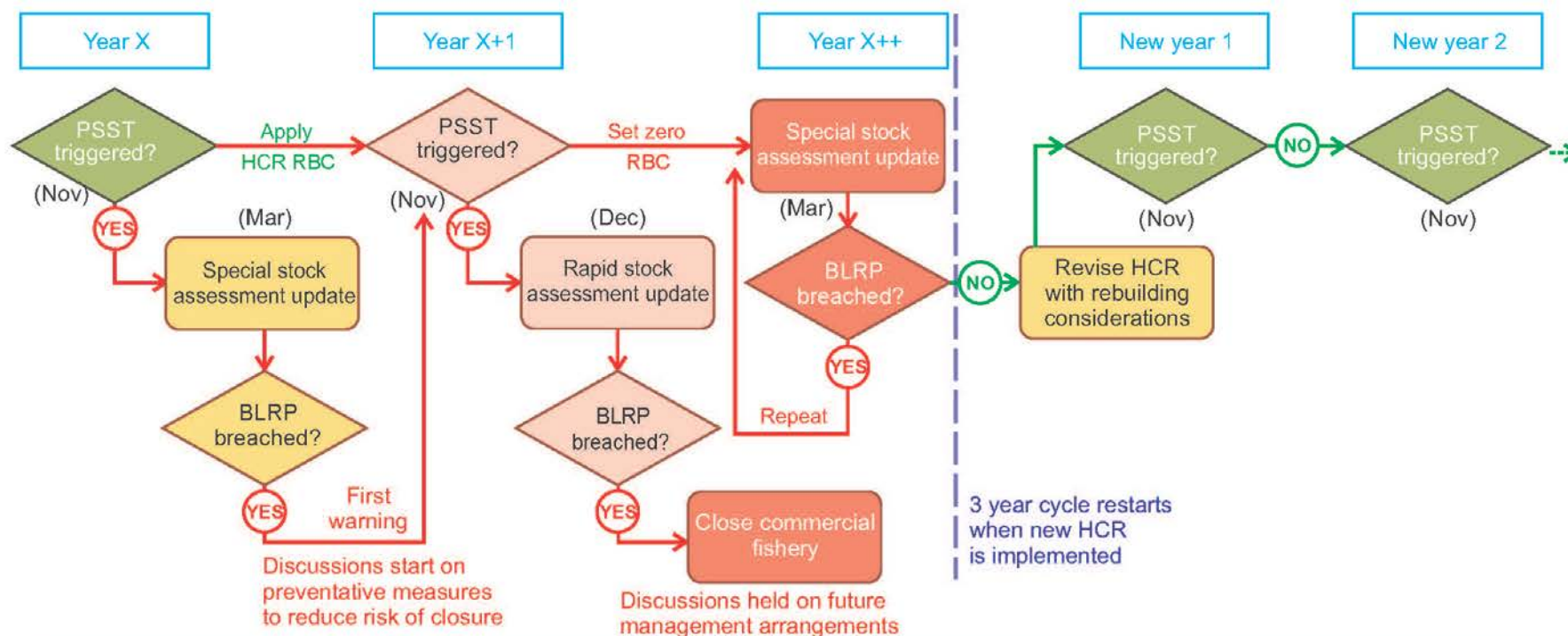


Scenario 3: Application of the HCR in a particular year results in the PSST being triggered, requiring a special assessment update to confirm whether the BLRP has been breached. However, this assessment update determines that the BLRP has not been breached.

Actions: • Application of the HCR continues unchanged, although consideration may be given to revising the HCR to prevent overly cautious triggering of the PSST (refer to Scenario 2).
 • The three-year cycle is reset, postponing the next regular assessment update to retain the 3 year spacing between assessments, provided the PSST is not triggered again in that period.

Notes: PSST means the pre-season survey trigger. BLRP means biomass limit reference point.

Figure 3. Torres Strait Tropical Rock Lobster Fishery decision rule scenario 3.



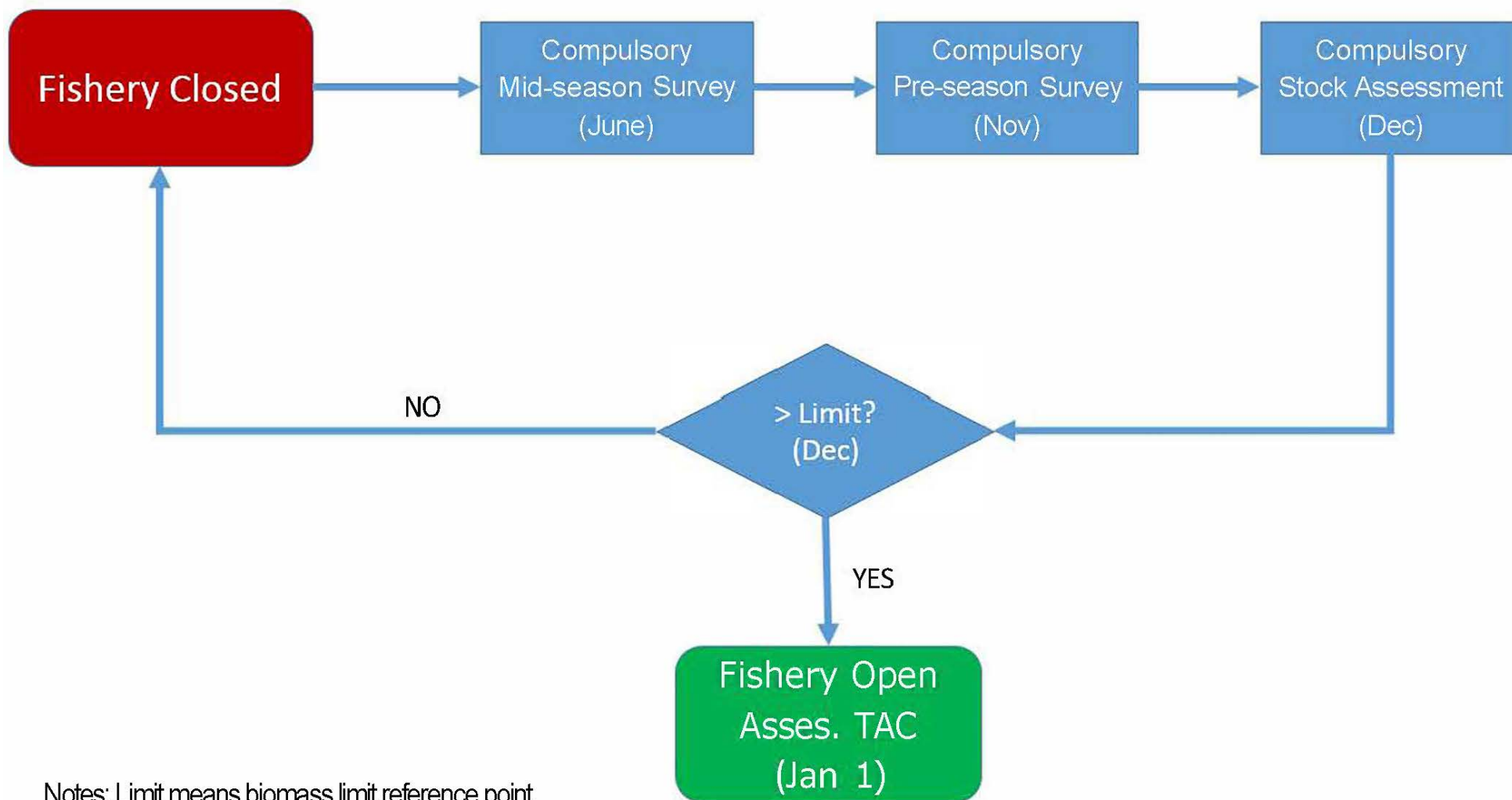
Scenario 4: Application of the HCR in a particular year results in the PSST being triggered, requiring a special assessment update to confirm whether the BLRP has been breached. Special assessment update confirms that the BLRP has indeed been breached. Application of the HCR the following year results in the PSST being triggered for the second successive year, requiring a second rapid assessment update to confirm whether the BLRP has been breached a second time. Assessment update confirms that the BLRP has been breached again. The commercial fishery is closed until an assessment update confirms that the stock has recovered to above the BLRP.

Actions:

- When it has been confirmed that the BLRP has been breached the first time, discussions will be held on preventative measures to reduce the risk of closure.
- If it is confirmed that the BLRP has been breached for a second year and that the commercial fishery must be closed, discussions will be held on future management arrangements to reduce the risk of future closures.
- If the fishery is closed, annual assessments will be done until an assessment update confirms that the stock has recovered to above the BLRP.
- Before being re-implemented, the HCR will be revised to reduce the risk of breaching the BLRP in future and to incorporate rebuilding requirements.

Notes: PSST means the pre-season survey trigger. BLRP means biomass limit reference point.

Figure 4. Torres Strait Tropical Rock Lobster Fishery decision rule scenario 4.



Notes: Limit means biomass limit reference point.

Figure 5. Torres Strait Tropical Rock Lobster Fishery closure and re-opening rule.

Process for formally amending the eHCR and TRL Harvest Strategy

STEP	TASK	TIMING (Indicative only, subject to capacity)
1	CSIRO present potential options Consider options for amending the eHCR.	TRLRAG37 – October 2024
2	RAG discuss options and recommend a way forward After CSIRO’s presentation, the RAG can discuss and recommend an agreed way to amend the eHCR to be applied in setting the 2024-25 RBC and beyond.	TRLRAG37 – October 2024
3	AFMA to prepare draft updates to the Harvest Strategy Having regard to the advice from TRLRAG 37, AFMA will prepare draft amendments to the Harvest Strategy in preparation for TRLRAG and WG review in December 2024.	Out of session Oct/Nov 2024
4	RAG to provide advice on 2024-25 season RBC and review of draft changes to Harvest Strategy Having regard to the advice from TRLRAG 37 and noting that formally amending the Harvest Strategy through a PZJA decision is expected in early 2025, the RAG can apply the new agreed eHCR/method to calculate the 2024-25 RBC.	TRLRAG38 – December 2024
5	WG to provide advice on 2024-25 season TAC The WG will consider the draft amendments to the Harvest Strategy and having regard to the advice from TRLRAG 37 and 38, provide advice on a TAC for the 2024-25 fishing season.	TRLWG 17 – December 2024
6	Update provided to the DCCEEW As per Condition 3 of the TRL List of Exempt Native Species (LENS) approval under the Environment Protection Biodiversity and Conservation Act (EPBC Act), AFMA will update the Department of Climate Change, Energy, the Environment and Water (DCCEEW) regarding the intended updates to the Harvest Strategy, and feed any comments or questions back to the RAG.	Early January 2025
7	Public/community consultation Letter detailing the proposed change to be sent to all licences holders and made available on the PZJA website. There may also be the opportunity to provide an update during community visits if these occur.	Early January 2025
8	RAG and WG consider outcomes from public consultation period and final draft amendments to Harvest Strategy Having regard to any comments received during the public comment period, the RAG and WG will have an opportunity to consider final draft amendments to the Harvest Strategy.	Out of session
9	PZJA approve amendments to Harvest Strategy	Earliest opportunity 2025
10	Update provided to DCEEW AFMA to provide a further update to DCEEW following PZJA approval and finalisation of the amendments to the harvest strategy.	Mid 2025

TROPICAL ROCK LOBSTER RESOURCE ASSESSMENT GROUP (TRLRAG) Thursday Island	MEETING 37 9 October 2024
DATE AND VENUE FOR NEXT MEETINGS	Agenda Item 5 For NOTING

RECOMMENDATIONS

1. That the RAG **NOTE** the dates, locations and key agenda items for upcoming RAG meetings.

Date	Key agenda items
10-11 Dec 2024 Thursday Island	TRLRAG (meeting 38) <ul style="list-style-type: none"> • Consider the Climate Risk Framework • Consider results of the November 2024 pre-season survey • Consider CPUE analyses for the 2023-24 fishing season • Consider the recommended biological catch (RBC) estimates derived through the application of the revised empirical harvest control rule (eHCR) under the TRL Harvest Strategy (as per advice from TRLRAG 37) and provide advice on a RBC for the 2024-25 fishing season
March/April 2025 (TBC)	TRLRAG Data Sub-Group (meeting 2) <ul style="list-style-type: none"> • Assess and identify improvements to fisher dependent data inputs to the Torres Strait TRL Fishery assessment framework • Consider a draft data plan
July 2025	TRLRAG 39 <ul style="list-style-type: none"> • Discuss research priorities
December 2025 Thursday Island	TRLRAG (meeting 40) <ul style="list-style-type: none"> • Consider results of the November 2024 pre-season survey • Consider CPUE analyses for the 2023-24 fishing season • Consider the preliminary stock assessment update for the Torres Strait Tropical Rock Lobster Fishery • Consider the recommended biological catch (RBC) estimates derived through the application of the empirical harvest control rule (eHCR) under the TRL Harvest Strategy and provide advice on a RBC for the 2025-26 fishing season • Consider any intersessional work undertaken by CSIRO