

4th meeting of the Hand Collectables Resource Assessment Group (HCRAg 4)

14 August 2024 – 0900-1200

Microsoft Teams (please refer to the meeting request for joining details)

Draft Agenda

Agenda Item	Action required	Speaker	Time
1. Opening prayer, acknowledgement of country, welcome and apologies	Information	Chair	0900 4 minutes
The Chair will welcome HCRAg members and observers to HCRAg 4.			
2. Adoption of agenda	Decision	Chair	0904 1 minute
The HCRAg is invited to consider and adopt the draft agenda.			
3. Declarations of interests	Decision	Chair	0905 10 minutes
HCRAg members and observers are invited to declare any real or potential conflicts of interests and decide whether a member may or may not be present during the discussion of or decisions made on matters which are the subject of a conflict.			
4. Actions arising from previous meetings	Discussion	AFMA	0915 5 minutes
The HCRAg is invited to note the status of action items arising from previous meetings.			
5. Status of Wildlife Trade Operation approval and CITES listings	Information	AFMA	0920 20 minutes
The HCRAg is invited to note the status of the re-assessment of the export approval for the Torres Strait Beche-de-mer Fishery (BDM Fishery) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , including the assessment of species that have been listed under the <i>Convention on International Trade in Endangered Species of Wild Fauna and Flora</i> .			
6. Research priorities for 2025/26	Recommendation	AFMA	0940 80 minutes
The HCRAg is invited to review the draft five-year research plan for Torres Strait hand collectable fisheries and recommend research priorities to the Torres Strait Scientific Advisory Committee for funding in 2025/26 and beyond. The HCRAg may also be asked to consider any proposals received as a result of a call for research released in May 2024.			
7. Review of the BDM Fishery Harvest Strategy	Recommendation	AFMA	1100 20 minutes
The HCRAg is invited to consider proposed amendments to the BDM Fishery Harvest Strategy to give effect to carryover of undercaught TAC for black teatfish.			
8. Ugar aquaculture project	Discussion	TBA	1120 30 minutes
The HCRAg is invited to note updates concerning a project to assess the feasibility of establishing an			

Agenda Item	Action required	Speaker	Time
Indigenous-led business to reproduce and grow sea cucumbers on Ugar and provide advice regarding the data and assessment needed to support the re-opening of fishing for sandfish in the waters surrounding Ugar.			
9. Other business	Discussion	All members	1150 5 minutes
The HCRA is invited to nominate any other business for discussion.			
10. Next meeting	Discussion	AFMA	1155 5 minutes
The HCRA is invited to discuss a suitable date for the next meeting.			

The Chair must approve the attendance of all observers at the meeting. Individuals wishing to attend the meeting as an observer must contact AFMA (fisheriesTI@afma.gov.au).

The meeting will be recorded for the purpose of developing the meeting minutes and will be deleted once the meeting minutes have been finalised.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
OPENING PRAYER, ACKNOWLEDGEMENT OF COUNTRY, WELCOME AND APOLOGIES	Agenda Item 1 For INFORMATION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG) **NOTE** the:
 - a. Acknowledgement of Country;
 - b. the Chair's welcome address;
 - c. apologies received from HCRAAG members unable to attend.

APOLOGIES

2. The following members have provided their apologies:
 - a. Jenny Keys - QDAF Member.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
ADOPTION OF AGENDA	Agenda Item 2 For DECISION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG) **CONSIDER** and **ADOPT** the draft agenda provided at **Attachment 2a**.

BACKGROUND

2. A draft agenda for this meeting was circulated to members and observers on 25 July 2024. The agenda was revised to take into account comments received. The revised draft agenda is provided at **Attachment 2a**.

4th meeting of the Hand Collectables Resource Assessment Group (HCRAAG 4)

14 August 2024 – 0900-1200

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Agenda Item	Action required	Speaker	Time
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The Chair must approve the attendance of all observers at the meeting. Individuals wishing to attend the meeting as an observer must contact AFMA (fisheriesTI@afma.gov.au).

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TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
DECLARATIONS OF INTERESTS	Agenda Item 3 For DECISION

RECOMMENDATIONS

1. That Hand Collectables Resource Assessment Group (HCRAAG) members:
 - a. **DECLARE** all real or potential conflicts of interest in Torres Strait hand collectable fisheries at the commencement of the meeting (**Table 1**);
 - b. **DETERMINE** whether members that have declared a conflict of interest may or may not be present during discussion of or recommendations made on the matter which is the subject of the conflict;
 - c. **ABIDE** by decisions of the HCRAAG 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 HCRAAG as to whether the member may or may not be present during discussion of, or recommendations made, on the matter which is the subject of the conflict.

BACKGROUND

2. 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.
3. HCRAAG members are asked to confirm the standing list of declared interests (**Table 1**) is accurate and provide an update to be tabled if it is not.
4. 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.
5. 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.
6. 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.

Table 1. Declarations of interest for HCRA members and observers.

Name	Position	Declaration of interest
Members		
Delahay Miller	Chair	No interests in Torres Strait fisheries.
Dr Eva Plaganyi	Scientific Member	<p>Employed by CSIRO and from time to time her organisation CSIRO receives funding to undertake research relating to Torres Strait fisheries as well as other Australian and international fisheries.</p> <p>Scientific Member on the TRL and Northern Prawn RAGs.</p> <p>Lead scientist for PZJA funded TRL research projects conducted by CSIRO.</p> <p>Co-investigator on the TSSAC project 'Understanding climate variability and change relevant to key fisheries resources in the Torres Strait and adaptation and mitigation strategies'</p>
Tim Skewes	Scientific Member	<p>Independent consultant. Previously employed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).</p> <p>Previous principal scientist and co-investigator for Torres Strait Scientific Advisory Committee (TSSAC) and Torres Strait Regional Authority (TSRA) funded projects focused on the sea cucumber, tropical rock lobster (TRL), finfish and traditional fisheries in the Torres Strait.</p> <p>Member on the TSSAC.</p> <p>Involved in the TSSAC endorsed research project 'Measuring non-commercial fishing catches (traditional subsistence fishing) in the Torres Strait in order to improve fisheries management and promote sustainable livelihoods' which is funded by the FRDC.</p>
Professor Steven Purcell	Scientific Member	<p>Scientific Member on the Hand Collectables Working Group (HCWG).</p> <p>Employed full-time by Southern Cross University as a teaching-research academic. Has interest in invertebrate fishery research has previously worked in the assessment of sea cucumber fisheries in the Pacific and New Caledonia, and on restocking/sea-ranching research.</p> <p>Specialist in sea cucumber ecology and fisheries.</p> <p>Currently involved in a sea cucumber population assessment in French Polynesia in partnership with Ginger-Soproner and CREOCEAN.</p> <p>As of 2023, acting as the global focal-point on <i>Sustainable Use</i> within the International Union for the Conservation of Nature (IUCN) Species Survival Commission's Sea Cucumber Specialist Group.</p> <p>2023–2025 contracted by ADECAL-Technopole as the Scientific Member on a sea cucumber fishery advisory committee in New Caledonia.</p>

John Tabo	Traditional Inhabitant Member, Kemer Kemer Meriam	Traditional Inhabitant Boat (TIB) licence holder with finfish, beche-de-mer (BDM), TRL and trochus entries. ZK Fisheries member.
Toshie Kris	Traditional Inhabitant Member, Maluialgal	TIB licence holder with TRL and Spanish mackerel entries. ZK Fisheries member.
Nicholas Pearson	Traditional Inhabitant Member, Kulkaikal	TIB licence holder with BDM and TRL entries. Family owns a TRL and BDM commercial fishing company. Member of the TSRA Board and ZK Fisheries.
Pabai Pabai	Traditional Inhabitant Member, Gudumalulgal	Previously held a TIB licence and is considering renewing. Interested in taking up commercial fishing in the future. ZK Fisheries member.
Graham Hirakawa	Traditional Inhabitant Member Kaiwalagal	TIB licence holder with Spanish mackerel, pearl shell and TRL entries. ZK Fisheries member.
Steven Harris	AFMA Member	Employed by AFMA, no pecuniary interests or otherwise.
Damian Miley	TSRA Member	Employed by TSRA, no personal pecuniary interests or otherwise. TSRA holds finfish and TRL quota on behalf of Traditional Inhabitants.
Jenny Keys	QDAF Member	Employed by QDAF, no pecuniary interests in the fisheries being discussed at this meeting.
Joseph Posu	PNG NFA Member	Employed by the PNG Government. PNG shares some fish stocks with Australia and both countries have the option to enter into catch sharing arrangements for Article 22 fisheries under the Torres Strait Treaty. Nil financial interests in Torres Strait fisheries.
Executive Officer		
Natalie Couchman	Executive Officer	Employed by AFMA, no pecuniary interests or otherwise.
Observers		
Ned David	Malu Lamar (Torres Strait Islander) Corporation RNTBC (Malu Lamar)	Chairperson of Malu Lamar.
Ian Butler	Australian Bureau of Agriculture and Resource Economics (ABARES)	Employed by the Australian Bureau of Agricultural and Resource Economics and Science (ABARES), Department of Agriculture, Forestry and Fisheries (DAFF). No pecuniary interests or otherwise.
Leo Dutra	CSIRO	TBC
Rocky Stephen	Fisher	TBC

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
ACTIONS ARISING FROM PREVIOUS MEETINGS	Agenda Item 4 For DISCUSSION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG):
 - a. **NOTE** the progress against actions arising from previous meetings (**Attachment 4a**).
 - b. **NOTE** the final meeting record for the 3rd meeting of the HCRAAG (HCRAAG03) held on 17-18 October 2023 (**Attachment 4b**).

BACKGROUND

Actions arising

2. Updates are provided on the status of actions arising from previous HCRAAG meetings at **Attachment 4a**.

Meeting record

3. The draft meeting record for HCRAAG03 was provided out-of-session for comment on 17 January 2024. Comments were received and incorporated. The record was finalised out-of-session following the closure of the comment period and circulated to members on 19 February 2024. The final meeting record is provided at **Attachment 4b** for information.

Progress against actions arising from previous meetings

#	Meeting	Action item	Responsibility	Status
1.6	HCRA01 (6-7 October 2021)	RAG to review recent information for the Queensland Crab Fishery as a precursor to better understanding the status of the crab stock in the Torres Strait.	AFMA and QDAF	<p>In progress</p> <p>AFMA will continue to liaise with Queensland Fisheries on any new information that becomes available to inform a better understanding of the crab stock(s) in the Torres Strait.</p> <p>At HCRA02, it was agreed that this action item is to be revisited when the stock assessments for Queensland mud crab fishery stocks are finalised.</p> <p>In the interim, information on the crab fisheries managed by Queensland can be accessed at the links below:</p> <p>Crab harvest strategies</p> <p>Blue Swimmer Crab Harvest Strategy 2021-2026</p> <p>Mud Crab Fishery Harvest Strategy 2021-2026</p> <p>Stock assessments</p> <p>Stock assessment program</p>
2.1	HCRA02 (27-28 September 2022)	TSRA to liaise directly with QDAF on aquaculture development opportunities and for an overview of the approval requirements.	TSRA	<p>In progress</p> <p>Update to be provided at the meeting.</p>
2.6	HCRA02 (27-28 September 2022)	TSRA to lead initial engagement with Iama and Tudu Island Traditional Owners, fishers and other relevant stakeholders to re-confirm support for a sandfish stock survey.	TSRA	<p>In progress</p> <p>Update to be provided at the meeting.</p>
2.7	HCRA02 (27-28	AFMA:	AFMA	<p>Completed</p>

	September 2022)	<ul style="list-style-type: none"> a. to develop a draft scope for the survey of sandfish, deepwater redfish, hairy black fish and other commercially relevant hand collectable species known to occur on Warrior Reef (e.g. pearl shell) for HCRA and TSSAC consideration; b. in conjunction with the Traditional Inhabitant Member for Kulkalgal, to continue engagement and consultation with lama and Tudu Island Traditional Owners, fishers and other relevant stakeholders on the proposed approach and any project proposal submitted; a. engage with the PNG NFA on potential cross-border collaboration and co-funding opportunities for sandfish stock survey on Warrior Reef. 		<ul style="list-style-type: none"> a. On 23 June 2023, AFMA circulated a draft Five-year Research Plan for Torres Strait Hand Collectable Fisheries: 2024/25-2028/29 and associated draft scopes, for member comment. This included a scope for a scientific stock survey of sandfish and other sea cucumber species on Warrior Reef. TSSAC considered the scope at their meeting on 22-23 August 2023. The scope has been included in calls for research released on 8 September 2023 and 30 May 2024. <p>In progress</p> <ul style="list-style-type: none"> b. Pending outcome of action 2.6. AFMA will continue to engage and consult with affected stakeholders, including with lama and Tudu Island Traditional Owners and fishers as the TSSAC process progresses. <p>In progress</p> <ul style="list-style-type: none"> c. AFMA sought collaboration and co-funding for the proposed sandfish survey at bilateral meetings held with the PNG National Fisheries Authority (NFA) from 25-28 July 2023. AFMA will continue to pursue collaboration with PNG on this matter. The project scope also details that researchers should seek to collaborate with the PNG NFA to undertake the survey, to include the proportion of the sandfish stock found on Warrior Reef in the PNG sea cucumber fishery.
2.10	HCRA02 (27-28 September 2022)	Queensland Member to clarify access requirements with the QDAF general fisheries permit (GFP) section for Ashmore Reef, in particular how this area might be accounted for appropriate sea country ownership by Mer and whether any other overlapping sea country claims have been identified.	QDAF	<p>Completed</p> <p>Fisheries Queensland manages commercial fishing for sea cucumbers at Ashmore and Boot Reefs on behalf of the Commonwealth in Commonwealth waters. Ashmore Reef is managed under the <i>Fisheries (Commercial) Regulations 2019</i> as part of the Queensland Sea Cucumber Fishery. There are no longer any general fisheries permits in place to fish for sea cucumbers at Ashmore Reef. To fish for sea cucumbers at Ashmore and Boot Reefs, fishers are required to have a “B1” symbol for sea cucumber as well as quota. This is a closed fishery</p>

				<p>with limited entry and quota and all symbols and quota are currently in use. Entry to the fishery would require buying a symbol and quota off an existing holder.</p> <p>Aboriginal and Torres Strait Islanders can apply for a Queensland indigenous fishing permit to trial commercial fishing. More information can be found on the QDAF website at https://www.daf.qld.gov.au/business-priorities/fisheries/traditional-fishing/aboriginal-and-torres-strait-islander-commercial-fishing</p> <p>The WTO conditions for the Queensland Sea Cucumber Fishery do not allow for the collection of white teatfish from the Coral Sea Marine Park which includes Ashmore and Boot Reefs.</p>
3.1	HCRAG03 (17-18 October 2023)	AFMA to pursue the attendance of compliance officers at community consultation meetings where possible, so that concerns regarding illegal fishing can be discussed with community members.	AFMA	<p>In progress</p> <p>AFMA Fisheries Officers will attend community consultation meetings where timing and resources permit. These meetings have yet to occur. AFMA Fisheries Officers regularly visit communities as part of the delivery of the AFMA Compliance Program. Concerns can also be raised at any time by:</p> <ol style="list-style-type: none"> calling the 24 hour CRIMFISH hotline on 1800 274 634 emailing intelligence@afma.gov.au submitting an online form.
3.2	HCRAG03 (17-18 October 2023)	AFMA to circulate a copy of the 2023 ABARES Fishery Status Reports to the RAG once it is released.	AFMA	<p>Completed</p> <p>ABARES' 2023 Fishery Status Reports can be found on the ABARES website at https://www.agriculture.gov.au/abares/research-topics/fisheries/fishery-status</p>
3.3	HCRAG03 (17-18 October 2023)	TSRA to provide more information to the RAG on the next stage of the WAPIL project.	TSRA	<p>Pending</p> <p>Update to be provided at the meeting.</p>

3.4	HCRAG03 (17-18 October 2023)	Mr Sereako Stephen to circulate the management protocol to the RAG once finalised.	Mr Sereako Stephen	Pending Management protocols still under development, to be provided to the RAG once finalised.
3.5	HCRAG03 (17-18 October 2023)	AFMA to provide the adaptation to climate change guidebook to the next RAG meeting for discussion.	AFMA	In progress To be considered at the next meeting of the HCRAG in September 2024.
3.6	HCRAG03 (17-18 October 2023)	Catch per unit effort analyses to be included in the analysis of black teatfish data collected during the 2024 opening.	AFMA	In progress To be progressed for the next meeting of the HCRAG in September 2024.
3.7	HCRAG03 (17-18 October 2023)	AFMA to undertake further education with fishers on the importance of the voluntary Part B section of the catch disposal record as well as minimum legal size requirements.	AFMA	Completed AFMA provided attendees to pre-season briefings held on Mer, Erub and Masig prior to the 2024 black teatfish opening, with information and handouts on the importance of voluntary information and minimum legal size limit requirements. AFMA Fisheries Officers also provide ongoing education on the importance of voluntary information and minimum legal size limit requirements, including during the 2024 black teatfish opening.
3.8	HCRAG03 (17-18 October 2023)	Size frequency sampling program to collect data during the 2024 black teatfish opening on the prevalence of the white teatfish colour variant in the BDM Fishery.	AFMA	Completed Sampling protocols were updated to include the collection of this data during the 2024 black teatfish opening. Analysis on the data collected by the size frequency sampling program will be presented for consideration at the next meeting of the HCRAG in September/October 2024.
3.9	HCRAG03 (17-18)	Sampling protocols for the size frequency sampling program to be updated for the 2024 black teatfish opening to include species identification between	AFMA	Completed Sampling protocols for the 2024 black teatfish opening were updated to include to include species identification between

	October 2023)	black teatfish and the white teatfish and to ensure a consistent method of measuring animals.		black teatfish and the white teatfish and to ensure a consistent method of measuring animals. Analysis on the data collected by the size frequency sampling program will be presented for consideration at the next meeting of the HCRA in September/October 2024.
3.10	HCRA03 (17-18 October 2023)	AFMA to develop a ruler for boats showing the minimum legal size for the key sea cucumber species in the BDM Fishery.	AFMA	Pending Updates to minimum legal size limits have been required as part of WTO conditions for the BDM Fishery. The need to review MLS limits has also been identified by HCRA at the last meeting. The outcomes of this work will need to be finalised before a ruler is developed.
3.11	HCRA03 (17-18 October 2023)	QDAF to circulate updated research concerning white teatfish in the Queensland Sea Cucumber Fishery to the RAG once it is published.	QDAF	Pending Updated research to be provided once published.
3.12	HCRA03 (17-18 October 2023)	Professor Steven Purcell to provide to CSIRO research concerning growth rates and age at maturity for white teatfish, once this research is finalised.	Professor Steven Purcell	Completed Published results about the growth rates of white teatfish juveniles were supplied by Dr Purcell to CSIRO. These were based on cultured white teatfish juveniles grown in natural reef habitats in French Polynesia, and provide new data on growth rates and mortality rates to support stock assessment modelling. The publication also included data on growth rates of black teatfish juveniles in natural reef habitats. The mark-recapture study on white teatfish in New Caledonia was only just completed in early May 2024. The data will still need to be collated from the field observations and then modelling performed to determine growth rates, natural mortality rate and age at first sexual maturity. This is anticipated to be done by the end of 2024.

3.13	HCRAG03 (17-18 October 2023)	AFMA member to include an update on CITES listings and WTO conditions on the agenda for the next meeting.	AFMA	Completed To be discussed under Agenda Item 5.
3.14	HCRAG03 (17-18 October 2023)	AFMA to explore sharing of spatial data with the TSRA to assist the TRSA with targeting its program funding (e.g. WAPIL) to the relevant communities.	AFMA and TSRA	Pending Update to be provided at the meeting.
3.15	HCRAG03 (17-18 October 2023)	Further analysis of the survey and other data for deepwater redfish to determine if there has been a decline in density in specific areas of the Torres Strait, to be provided at the next RAG meeting and examine how the Harvest Strategy could be modified to lower TACs for species at risk.	AFMA	In progress To be progressed for the next meeting of the HCRAG in September 2024.
3.16	HCRAG03 (17-18 October 2023)	AFMA to provide additional data on changes to how many fishers are targeting curryfish each fishing season, to the next RAG meeting.	AFMA	In progress To be considered at the next meeting of the HCRAG in September/October 2024.
3.17	HCRAG03 (17-18 October 2023)	Further analysis on <i>Actinopyga</i> species, including trigger limits, to be provided at the next RAG meeting for further consideration.	AFMA	In progress To be progressed for the next meeting of the HCRAG in September 2024.



Australian Government
Australian Fisheries Management Authority

Torres Strait Hand Collectables Resource Assessment Group

Meeting No. 3

17-18 October 2023

DRAFT Meeting Record

Note all meeting papers and minutes
are available on the PZJA webpage:

www.pzja.gov.au

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1 Acknowledgment of traditional owners, welcome and apologies

1. The meeting was opened in prayer by Mr Sereako Stephen at 9:08am.
2. The Chair welcomed members and observers to the third meeting of the Torres Strait Hand Collectables Resource Assessment Group (the RAG). The Chair acknowledged the Traditional Owners of the land on which the meeting was being held, as well as the lands and seas which the meeting was due to discuss, and paid respect to Elders past, present and emerging.
3. The Chair noted the very full agenda for the RAG and acknowledged that it will be difficult to get through the entire agenda. Members noted that the RAG will be followed by the Hand Collectables Working Group.
4. The Chair noted the following apologies: Mr Joseph Posu (PNG NFA Member) and Mr Ned David, Chair of Malu Lamar (Torres Strait Islander) Corporation Registered Native Title Body Corporate (RNTBC) (Malu Lamar). Mr Sereako Stephen attended as a representative of Malu Lamar.
5. The Chair noted that the Queensland Department of Agriculture and Fisheries (QDAF) Member, Ms Jenny Keys and Scientific member, Mr Tim Skewes, would be participating via video conference. The AFMA member noted that Mr Benjamin (Maluwap) Nona, Traditional Inhabitant (Mer Island) and Mr Daniel Takai, Chief Executive Officer of Zenadth Kes Fisheries Limited (ZK Fisheries), may be joining the meeting.

2 Adoption of agenda

6. The RAG adopted the draft agenda with the addition of an update from Mr Sereako Stephen (**Attachment A**). Members and observers did not object to the meeting being voice recorded for the purposes of developing the meeting record.

3 Declarations of interest

7. The Chair advised members and observers, that as provided in the Protected Zone Joint Authority's (PZJA) *Fisheries Management Paper No. 1* (FMP1), all members must declare all real and potential conflicts of interest in Torres Strait hand collectables fisheries at the commencement of the meeting.
8. Where it is determined that a direct conflict of interest exists, the RAG may allow the member(s) to continue to participate in the discussions relating to the matter but may also determine that, having made their contribution to the discussions, the member should retire from the meeting for the remainder of the discussions and/or the making of recommendations on that issue.
9. Declared conflicts of interest are detailed in **Table 1** below. Each group of members and observers with similar interests were asked to leave the meeting to enable the remaining members to:
 - a. freely discuss the declared interests;
 - b. discuss if the interests preclude the members from participating in any discussions and/or the making of recommendations; and
 - c. agree on any actions to manage declared interests.
10. The scientific members and observers removed themselves from the meeting while the remaining members discussed their participation in the meeting. The Chair and remaining members recognised that although the scientific members may have a real or perceived conflict of interest when discussing research priorities and needs, they have research expertise and knowledge relevant to hand collectables fisheries that is valuable to the development of the RAG's advice on those priorities. They agreed that, if a research project was to be considered, the scientific members should participate in the discussions but not in the recommendation making process.

11. The fishing industry members including the TSRA observer, left the meeting room and the remaining members discussed whether they should be present for the discussions and making of recommendations on items where they may have real or perceived conflicts of interest. The Chair and remaining members agreed that it is important for industry members to be part of the discussion and the recommendation making process as their expertise is valuable to the development of the RAG advice that impacts the industry as a whole. Once more, the meeting agreed that all members are expected to declare conflicts of interest as they arise.
12. Government members and observers exited the room while the remaining members discussed their participation in the meeting and if they may have real or perceived conflicts of interest. The remaining members agreed that the government members should be present for all discussions and recommendations.
13. The Chair left the room and the remaining members discussed whether they should be present for the discussion and recommendation of items where they may have real or perceived conflicts of interest. The remaining members agreed that the Chair should be present for all discussions and recommendations.
14. The RAG agreed to address any additional conflicts of interest should they arise throughout the discussion of agenda items.
15. The AFMA member noted that FMP1 guides how RAGs are formed, what their role is and rules of procedure for meetings, including how they are held and who can attend. The AFMA member stated that a nomination process was followed by the TSRA for Traditional Inhabitant members on the RAG, which involved ZK Fisheries, prior to appointments being made by the Protected Zone Joint Authority (PZJA). Both AFMA and TSRA members stated that they were always looking at opportunities to work better with industry and improve engagement with communities. The TSRA member noted that current Traditional Inhabitant members are halfway through and will finish their term.
16. A Traditional Inhabitant member expressed that he had been informed by some traditional inhabitant fishers that ZK Fisheries does not represent their views. The AFMA member noted that observers are welcome to attend RAG meetings, however FMP1 details that travel expenses and sitting fees are not paid. The AFMA member stated that some Traditional Inhabitant fishers had expressed an interest to attend the meeting and they were informed that they were welcome to attend as observers, however, travel expenses and sitting fees could not be paid. The options to attend via video conference, email views for tabling at the meeting or to directly contact Traditional Inhabitant members with their views were also offered. RAG members noted that, in special circumstances, observers have had their travel expenses paid previously when broader expert advice was required (e.g. development of a harvest strategy). The AFMA member thanked industry for bringing this issue to the attention of the RAG and noted that it could be discussed at the community consultation meetings in early 2024.
17. AFMA and TSRA agreed to canvas support for the Traditional Inhabitant members to go out to communities following each meeting to discuss outcomes and seek views on key issues.

Table 1. Declared conflicts of interest from each attendee.

Name	Position	Declaration of interest
Members		
Sian Breen	Chair	Employed by the QDAF. No pecuniary interest in Torres Strait fisheries but from time to time other QDAF staff members may work on fishery research projects in the Torres Strait (not occurring now).
Tim Skewes	Scientific Member	Independent consultant. Previously employed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Name	Position	Declaration of interest
		<p>Previous principal scientist and co-investigator for Torres Strait Scientific Advisory Committee (TSSAC) and Torres Strait Regional Authority (TSRA) funded projects focused on the sea cucumber, tropical rock lobster (TRL), finfish and traditional fisheries in the Torres Strait.</p> <p>Member on the TSSAC.</p> <p>Involved in the TSSAC endorsed research project 'Measuring non-commercial fishing catches (traditional subsistence fishing) in the Torres Strait in order to improve fisheries management and promote sustainable livelihoods' which is funded by the FRDC.</p>
Dr Eva Plaganyi-Lloyd	Scientific Member	<p>Employed by CSIRO and from time to time her organisation CSIRO receives funding to undertake research relating to Torres Strait fisheries as well as other Australian and international fisheries.</p> <p>Scientific Member on the TRL and Northern Prawn RAGs.</p> <p>Lead scientist for PZJA funded TRL research projects conducted by CSIRO.</p> <p>Co-investigator on the TSSAC project 'Understanding climate variability and change relevant to key fisheries resources in the Torres Strait and adaptation and mitigation strategies'</p>
Assoc Prof Steven Purcell	Scientific Member	<p>Scientific Member on the Hand Collectables Working Group (HCWG).</p> <p>Employed full-time by Southern Cross University as a teaching-research academic. Has interest in invertebrate fishery research has previously worked in the assessment of sea cucumber fisheries in the Pacific and New Caledonia, and on restocking/sea-ranching research.</p> <p>Specialist in sea cucumber ecology and fisheries.</p> <p>Currently involved in a sea cucumber population assessment in French Polynesia in partnership with Ginger-Soproner and CREOCEAN.</p> <p>As of 2023, acting as the global focal-point on <i>Sustainable Use</i> within the International Union for the Conservation of Nature (IUCN) Species Survival Commission's Sea Cucumber Specialist Group.</p> <p>2023–2025 contracted by ADECAL-Technopole as the Scientific Member on a sea cucumber fishery advisory committee in New Caledonia.</p>
John Tabo	Traditional Inhabitant Member, Kemer Kemer Meriam	<p>Traditional Inhabitant Boat (TIB) licence holder with finfish, beche-de-mer (BDM), TRL and trochus entries.</p> <p>ZK Fisheries member.</p>
Toshie Kris	Traditional Inhabitant Member, Maluialgal	<p>TIB licence holder with TRL and Spanish mackerel entries.</p> <p>ZK Fisheries member.</p>

Name	Position	Declaration of interest
Nicholas Pearson	Traditional Inhabitant Member, Kulkalgal	TIB licence holder with BDM and TRL entries. Family owns a TRL and BDM commercial fishing company. Member of the TSRA Board and ZK Fisheries.
Pabai Pabai	Traditional Inhabitant Member, Gudumalulgal	Previously held a TIB licence and is considering renewing. Interested in taking up commercial fishing in the future. ZK Fisheries member.
Graham Hirakawa	Traditional Inhabitant Member Kaiwalagal	TIB licence holder with Spanish mackerel, pearl shell and TRL entries. ZK Fisheries member.
Natalie Couchman	AFMA Member	Employed by AFMA, no pecuniary interests or otherwise.
Damien Miley	TSRA Member	Employed by TSRA, no personal pecuniary interests or otherwise. TSRA holds finfish and TRL quota on behalf of Traditional Inhabitants.
Jenny Keys	QDAF Member	Employed by QDAF, no pecuniary interests in the fisheries being discussed at this meeting.
Executive officer		
Sarah Kirkcaldie	Executive Officer, AFMA	Employed by AFMA, no pecuniary interests or otherwise.
Observers and invited industry participants		
Nicole Murphy	CSIRO employee	Employed by CSIRO and from time to time CSIRO receives funds to undertake research relating to Torres Strait fisheries. Scientific member on the HCWG. Principal Investigator on the project black teatfish sampling and stock assessment, white teatfish stock assessment and the development of conversion ratios for curryfish projects.
Benjamin (Maluwap) Nona	Traditional Inhabitant observer, Mer Island	Holds a TIB licence and owns a private fishing business. Traditional Owner on Mer Island.
Sereako Stephen	Director, Malu Lamar	Director of Malu Lamar, Director of Gur A Baradharaw Kod Sea and Land Council Torres Strait Islander Corporation (GBK), Chair of Ugar Ged Kem Le Zeuber Er Kep Le Corporation RNTBC and Member of the TSRA Board. TIB licence holder.
David Brewer	Acting HCWG Chair	Director of Upwelling P/L (David Brewer Consulting). Chair of Torres Strait Finfish RAG. Scientific member of Torres Strait Finfish Working Group. Scientific member of Northern Prawn Fishery RAG. Current consultancies with Quandamooka Yoolooburrabee Aboriginal Corporation, Newcrest Mining Ltd. Co-investigator on the current Torres Strait 'Non-commercial catch' project. As a fisheries consultant, may apply for funds for Torres Strait fishery research projects in the future where consistent with his role as Chair.

Name	Position	Declaration of interest
Ian Butler	Australian Bureau of Agriculture and Resource Economics (ABARES)	Employed by the Australian Bureau of Agricultural and Resource Economics and Science (ABARES), Department of Agriculture, Forestry and Fisheries (DAFF). No pecuniary interests or otherwise.
Quentin Hirakawa	TSRA Member	Employed by TSRA. Two TIB licences with BDM endorsement. TSRA holds finfish and TRL quota on behalf of Traditional Inhabitants.

4 Action items from other meetings

18. The RAG noted the status of the actions arising from previous HCRAg meetings. In relation to action item 2.4, members noted that a research paper was provided just prior to the meeting concerning the impact of siltation from the Fly River on fisheries (mud crab, barramundi, dugongs) and the broader ecosystem.

5 Out of session correspondence

19. The RAG noted the list of correspondence circulated out of session since its second meeting on 27-28 September 2022. Members noted that majority of the correspondence was regarding the opening of the black teatfish fishery.

6 HCRAg Updates

6.1 Traditional Inhabitant members

20. The RAG noted the following updates from Traditional Inhabitant members:
- The Traditional Inhabitant member for Gudumalulgal noted that a sea country claim is still in progress. The member also noted that fishers had noticed damage to seagrasses around Boigu due to sand and mud incursions. The Scientific member commented that these observations are extremely important particularly given that climate change will make El Nino more extreme affecting water levels and leading to increased sand incursions.
 - The Traditional Inhabitant member for Kulkalgal noted that it was a good black teatfish season although it was slow on the first day. The member noted that the community is looking to fish a greater range of sea cucumber species, noting they currently target black teatfish and curryfish.
 - The Traditional Inhabitant member for Kemer Kemer Meriam noted that only one fisher is opportunistically diving for BDM on Ugar, there are two full time BDM businesses on Erub who are targeting mainly curryfish and three businesses on Mer which have been fishing on and off this year. The member noted that there was a slow start to the black teatfish season with animals being smaller this season and not found in the same spots as last season. The member noted that the vessel *MV Iron Joy* had conducted a coral survey on Ashmore and Boot Reefs. The survey was undertaken by the Great Barrier Reef Marine Park Authority, Parks Australia and James Cook University. A community representative was on the trip and looked at BDM and clamshells.
 - The Traditional Inhabitant member for Maluialgal noted that there is interest in moving the opening of the black teatfish to October and increasing the TAC to 22 tonnes with a closure at 20 tonnes. The member noted the high cost of fuel (\$3.70/litre) is having a significant impact on the community. AFMA welcomed the suggestion to employ local people when undertaking research and noted that there is increasing interest to get communities involved particularly through ZK Fisheries.

- e. The Traditional Inhabitant member for Kaiwalagal noted that TRL fishers are interested in utilising hookah gear to fish for white teatfish. The member expressed concern regarding the take of sandfish on Warrior Reef and stated that there was a need for a greater compliance presence on the water noting that aerial surveillance is not as effective as the planes cannot apprehend illegal fishers. Other members and observers also shared their concerns. The AFMA member encouraged fishers to report suspected illegal fishing to AFMA. While AFMA have received some reports from fishers, including at previous RAG and HCWG meetings, AFMA have no recent quantifiable data that illegal fishing targeting sandfish is happening, to what extent and its impact on the sandfish stock on Warrior Reef. The member further noted that Australia regularly undertakes aerial surveillance and patrols of Warrior Reef including joint patrols with PNG. AFMA are also planning upcoming visits to PNG treaty villages to mark treaty boats. RAG members expressed concern over anecdotal reports of illegal fishing on Warrior Reef and the impacts this could be having on the sandfish stock. The RAG suggested AFMA work closely with PNG to obtain more data on the export of sandfish from PNG, and to collect more data on any illegal catches that are intercepted.

6.2 Scientific members

21. The RAG noted the following update from the Scientific member, Dr Eva Plaganyi:
- a. There is a CSIRO strategic research project underway on improving supply chain resilience to climate change with the TRL Fishery being used as a case study.
 - b. TSRA are funding a new project starting soon that will look at climate change impacts and adaptation options. Laura Blamey will be the lead investigator on this project.
 - c. There will be a science communication day on Thursday island on 16 November 2023 where the 35th annual lobster survey will be celebrated. Members noted that the climate change project will also be discussed.
 - d. Nicholas McClean, University of Technology Sydney, is undertaking a project looking at indigenous engagement in Commonwealth fisheries. The Scientific member noted that they are involved to provide technical expertise with a national workshop being held in Canberra in November 2023. Members noted that Sereako Stephen has provided advice for this project.
 - e. There is a crown-of-thorns starfish outbreak in the Torres Strait (particularly in the East). Members noted this is a concerning problem and the only way to kill them is to inject them with a bile salt solution or vinegar. Fishers should not spear them as they can split and regenerate. CSIRO have historical data from previous outbreaks that could be used to inform the current outbreak, that they are happy to share.
22. Scientific observer, Nicole Murphy, noted that she will be conducting the TRL survey from 1-15 November 2023.
23. Scientific member, Tim Skewes, noted that he is currently working for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) providing information for the non-detriment finding (NDF) for *Convention on the International Trade of Endangered Species of Wild Fauna and Flora* (CITES) listed *Thelenota* species in the BDM Fishery.
24. The RAG noted the following updates from the Scientific member, Assoc Prof Steven Purcell:
- a. The team he was collaborating with completed assessments of the sea cucumber fishery in New Caledonia. There are four reports which include the results of two stock surveys, a comparison of historical export and catch data, and a comparison of the density of sea cucumbers in the 2021/22 survey to the 2003-2007 survey.
 - b. He is currently finalising a report with New Caledonian collaborators on a survey of sea cucumbers in French Polynesia. He was part of the team that surveyed stocks of white teatfish and several other commercially-important sea cucumbers on an atoll in the Tuamotu archipelago to assess whether fishing could re-open and to inform a non-detriment finding for harvests of white teatfish.

- c. In New Caledonia, he has commenced two mark-recapture studies for golden sandfish and white teatfish that will reveal their growth rates and age-at-size curves. Those two studies will be completed in 2024.
 - d. New Caledonian marine scientists with ADECAL, commissioned a study to determine conversion ratios from fresh, gutted, salted and dried for numerous commercially important species. ADECAL also recently finished a research study to determine the size at sexual maturity for various species. Both studies will be highly useful for the Torres Strait fishery.
 - e. He has recently finished a market survey on dried sea cucumber in Hong Kong. The project looked at changes over 10 years, comparing changes in prices to the consumer price index (CPI) in Hong Kong. Some species have declined in value compared to CPI, however, black teatfish, white teatfish and curryfish have increased.
25. The RAG noted the following updates from the acting Chair of the HCWG, David Brewer, who noted that he is working on a community consultation project about collecting traditional and recreational catch data. The project includes giving feedback to communities on catches and changes over time.

6.3 Government members (AFMA, ABARES, TSRA, QDAF)

26. The RAG noted the update provided by AFMA as detailed in the agenda paper, in particular:
- a. The CITES listing of sea cucumber species may have an impact on fishers being able to export product.
 - b. At the last RAG meeting in September 2022, there was discussion concerning three transferable vessel holder (TVH) fishing licence packages that did not have fishery entries. The holder of one of these licence packages was seeking to fish for species groups for the ornamental aquarium trade. At their meeting in October 2022, a decision was made by the PZJA that the three licence packages were inconsistent with the objectives of the Torres Strait Fisheries Act 1984 (the Act), and the policies of the PZJA, and should not be renewed upon their next expiry dates. At the meeting in July 2023, the PZJA agreed to write to the affected parties with a statement of reasons.
 - c. AFMA has been delivering domestic compliance functions in the Torres Strait in accordance with the [National Compliance and Enforcement Program](#). In 2022/23, there were three compliance officers based in the Thursday Island office delivering both domestic and foreign compliance programs. All targets for this period have been met.
 - d. On 13 February 2023, the Assistant Minister to the Prime Minister gave policy approval to amend the Act. At its meeting in July 2023, the PZJA agreed to consider a decision on progressing legislative amendments at its next meeting. This meeting has yet to happen.
 - e. Community consultation meetings will be held early next year. The RAG agreed compliance officers should be in attendance where possible, so that concerns regarding illegal fishing can be discussed.

Action arising 1 – AFMA to pursue the attendance of compliance officers at community consultation meetings where possible, so that concerns regarding illegal fishing can be discussed with community members.

- f. The RAG notes that a sandfish survey has been identified as a priority by the TSSAC and there has been a call for proposals which closes at the end of the month. Members noted that all proposals received will go out-of-session to the RAG for comment. It was noted that for the sandfish survey project, the researcher will need to work closely with communities. A key part of the survey is to include community employment.
27. The RAG noted the update from the ABARES observer that the latest ABARES Fishery Status Reports (FSR) will be released next week. The FSR includes evaluations of 102 fish stocks including Torres Strait fisheries. The AFMA member agreed to circulate a copy of the report once it is released.

Action arising 2 – AFMA to circulate a copy of the 2023 ABARES Fishery Status Reports to the RAG once it is released.

28. The RAG noted the QDAF update on the Queensland Sea Cucumber Fishery as follows:
- a. The fishery is not able to export black teatfish as a result of a negative NDF for the species, due to its CITES listing. This has been a significant set-back for the industry who are now investing a lot of money to support a positive NDF for black teatfish.
 - b. So far, 35% of the black teatfish and 37% white teatfish TACs have been taken this season. There has been no fishing for trochus and pearl species are only taken for broodstock for the aquaculture sector.
 - c. The Ashmore and Boot Reefs fall under Queensland jurisdiction and fishing for white teatfish is not permitted.
29. The RAG noted the TSRA update as follows:
- a. TSRA will be hosting training in November for all Traditional Inhabitant members.
 - b. TSRA are in the process of delivering the next stage of the WAPIL project. TSRA agreed to provide more information to the RAG

Action arising 3 - TSRA to provide more information to the RAG on the next stage of the WAPIL project.

- c. The crown-of-thorns starfish outbreak has increased significantly in recent months. The TSRA will be coordinating a response involving all interested parties, including government agencies and native title bodies. An action plan will be provided to the next TSRA Board meeting for their consideration. The action plan includes training and equipment for divers and fishers to get involved in eradication efforts. This will build on existing participatory planning work.

6.4 Native Title

30. The RAG noted the following updates from Sereako Stephen, Director of Malu Lamar, concerning native title matters:
- a. Malu Lamar recently met with the PZJA regarding the recent sea country determination (Parts B and C of the Torres Strait Regional Seas Claim determined on 30 November 2022) and related native title matters.
 - b. Malu Lamar are progressing a further claim concerning Raine Island.
 - c. The Northern Cape and Torres Strait United Indigenous Corporation RNTBC, which manages the native title rights over Parts B and C of the Torres Strait Regional Seas Claim, met for the first time on 16 October 2023 in Cairns.
 - d. Malu Lamar are developing a management protocol and guide for any activities (including research). Members noted that the document will be finalised and implemented at the end of this year or early next year and will explain how to approach Traditional Owners regarding sea country. Mr Stephen agreed to circulate the protocol to the RAG once finalised.

Action arising 4 – Mr Sereako Stephen to circulate the management protocol to the RAG once finalised.

- e. There is a recent application for an Indigenous Protected Area. The project includes mapping of boundaries and all sacred sites. It is unknown as to what impact this may have on fishing.

6.5 PNG NFA

31. Members noted that Australia met with PNG at bilateral meetings from 25-28 July 2023. Key outcomes relating to hand collectable fisheries were:
- a. Australia and PNG declined to enter into catch sharing arrangements for the 2024 fishing season for pearl shell.
 - b. The meeting noted that undertaking a stock survey of sandfish continues to be a high priority for Australia. AFMA welcomed opportunities to collaborate with the PNG NFA on

complementary research and management strategies for shared sea cucumber stocks, particularly sandfish.

- c. The meeting noted that the PNG BDM Fishery is currently closed. The PNG NFA advised they have recently completed a sea cucumber stock survey, including the Western Province, with a view to re-opening the fishery. NFA advised the survey will be finalised by the end of 2023 and the results will be shared with Australia.
- d. PNG identified the listing of *Thelenota* species under the CITES is an area for collaboration.
- e. As sea cucumber and trochus are not Article 22 fisheries, catch sharing arrangements were not entered into.

7 Status of Wildlife Trade Operation approval and CITES listings

32. Members noted that the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), administered by the DCCEEW, requires the Australian Government to assess the environmental performance of all commercial fisheries, including those in the Torres Strait, and promote ecologically sustainable fisheries management. Wildlife Trade Operation (WTO) approval under the EPBC Act is necessary for Australian commercial fisheries to be able to legally export commercially wild caught seafood from Australia. Members noted that such approvals may be subject to conditions applicable to the responsible management authority and fishers. The AFMA member stated that the BDM Fishery was last assessed in 2020 and was declared as an approved WTO under the EPBC Act until 30 November 2023 subject to several conditions being addressed during the period of the approval. Members noted that the current WTO approval includes additional requirements that need to be met by the PZJA to manage the harvest of black teatfish and white teatfish. One of these conditions places a seasonal total allowable catch (TAC) limit of 20 tonnes and 15 tonnes for black and white teatfish, respectively. Members noted that the fishery is on track to meet all the conditions of the current WTO.
33. The RAG noted that in June 2023, AFMA made an application to DCCEEW for the re-assessment of the BDM Fishery under the EPBC Act. Members noted that AFMA is yet to receive information on the outcome of the new assessment, including any proposed conditions that may be imposed should the fishery be approved as a WTO. As discussed at the BDM Workshop held on 21-22 March 2023, AFMA has sought flexibility in the conditions placed on any future WTO approval, to recognise the science-based TAC setting process in the fishery and remove fixed caps on TACs and recognise current arrangements for undercatch and overcatch.
34. Members further noted that three species currently commercially harvested in the fishery have been listed under Appendix II of CITES:
 - a. The listing for black teatfish (*Holothuria whitmaei*) and white teatfish (*H. fuscogilva*) came into effect on 28 August 2020.
 - b. The listing for prickly redfish (*Thelenota ananas*) and amberfish (*T. anax*) comes into effect on 25 May 2024. The Scientific member noted that it is likely there will be a high priority to complete a stock assessment for prickly redfish and take management action on amberfish.
35. Members noted that species listed under Appendix II of CITES are not necessarily threatened with extinction but may become so unless trade is closely controlled. Listed species may still be traded internationally provided the trade, or a specified level of trade, has been determined to be non-detrimental to the survival of the species in the wild. NDFs for the *Holothuria* and *Thelenota* species, will be considered as part of the process to re-assess the fishery under the EPBC Act.
36. The RAG noted that the Queensland Sea Cucumber Fishery has invested millions in updated science to ensure they are meeting WTO conditions so that the fishery can continue to export sea cucumbers.

8 Climate and ecosystem update

37. The AFMA member stated that the effects of climate change are an ongoing concern in all fisheries globally. Members noted that a program of work is being undertaken in Commonwealth fisheries to ensure that climate impacts are more strategically incorporated into the management of these fisheries to ensure that AFMA continues to meet legislative objectives relating to ecological sustainability. This work is a follow up action from the Adaption of Commonwealth fisheries management framework to climate change project (the climate adaptation project) that looked at the readiness of Commonwealth fisheries management arrangements to the potential impacts of climate change and provided a range of resources to assist with adaptation. The RAG noted that the outcomes of this project have not yet been applied to Torres Strait fisheries.
38. Members noted that over the next few years under an El Nino climate pattern, it is likely that water temperatures will increase which may impact on ecosystems. The AFMA member stated that industry insight is critical to monitor changes.
39. Members noted that El Nino conditions are expected to continue through the 2023/24 summer. Members noted that modelling and predictions show that most fisheries will not perform well with climate change and management needs to be precautionary and conservative. The Scientific member noted that Torres Strait species should cope well with warmer waters, however, they will get closer to their thermal optimum and therefore need to be monitored closely. It was further noted that sea cucumbers should be fairly resilient to climate change effects, however, a climate risk assessment completed by James Cook University highlighted that the black teatfish was at the highest risk due to winter spawning.
40. Members agreed that AFMA would provide the adaptation to climate change guidebook to the next RAG meeting and discuss the tools used by other fisheries to manage the impacts of climate change.

Action arising 5 - AFMA to provide the adaptation to climate change guidebook to the next RAG meeting for discussion.

9 BDM Workshop outcomes

41. Members noted that in recent years the RAG and HCWG have requested a workshop be held to seek broader industry views from active fishers on future management arrangements for the Torres Strait, in particular to:
 - a. identify optimal timing for annual black teatfish openings;
 - b. identify potential options for the better utilisation of the under caught black teatfish TAC;
 - c. understand the benefits and impacts of different options for the better utilisation of the under caught white teatfish TAC, including the use of hookah gear.
42. The BDM Workshop was held on 21-22 March 2023 on Ngurupai (Horn Island). Members noted that TSRA provided logistical support and funding. AFMA thanked TSRA for their support and industry for their attendance and participation. Members noted that workshop participants made a number of recommendations, including:
 - a. An opening date for the 2023 black teatfish fishery opening.
 - b. That a further independent stock survey be undertaken with the design to be informed by input from Traditional Owners and fishers. Members noted that the last survey cost approximately \$400,000.
 - c. The WTO conditions for the BDM Fishery be updated to remove fixed caps on black teatfish and white teatfish TACs to reflect latest science.
 - d. An increase the black teatfish TAC to 22 tonnes. With regards to any remaining under caught TAC in 2023, it was discussed that the fishery be re-opened for the required period later in the year (e.g. one day in November). The remaining TAC will be held in trust by ZK Fisheries, who

will then facilitate an agreement between Traditional Owners as to how it will be caught during the re-opening. Members noted an agreement was unable to be reached for the 2023 season.

- e. An industry proposal for the use of hookah gear to fish for white teatfish. Members noted that the industry proposal will be discussed at the HCWG meeting and agreed that it is of high importance that the right process is followed including Traditional Owner and community consultation, to ensure the sustainability of the fishery is protected for this and future generations.

10 2023 black teatfish opening and future openings

10.1 Outcomes of 2023 opening

43. The RAG noted that the black teatfish fishery opened on 15 May 2023 for three and a half days, resulting in 17.9 tonnes of the 20 tonnes TAC being caught. A total of 36 TIB licence holders participated in the opening and AFMA estimates that the total landed value of the catch was approximately \$0.6 million.
44. The RAG noted a presentation provided by the Scientific observer, Ms Nicole Murphy, regarding the analysis of black teatfish data collected during the 2023 opening (**Attachment B**). Ms Murphy noted that a size-frequency sampling program was undertaken by scientific observers for the second consecutive year during the 2023 opening. Analysis of this and other data collected from the 2021-2023 seasons were undertaken as part of TSRA funded project 2023-0800.
45. Members noted that comparing whole (live) black teatfish length measurements between 2022 and 2023, for whole (live) animals, the average length, maximum length and median length (middle value) decreased in 2023. There was, however, an increase in the average weight measured. There were similar trends for gutted and salted animals, though there was a decrease in the average weight in this group. The RAG discussed the variability in the data for length and weight between years. Ms Murphy explained that this could be due to animals being out of the water for differing and unknown periods of time (e.g. the variation could be due to water loss, evisceration and differences in handling (whether water is drained from animals prior to weighing or how animals are packed into tubs).
46. Ms Murphy stated that the minimum legal size (MLS) for black teatfish is 250 mm, which is measured as the length of the animal in the water in its 'undisturbed state'. Observer data for whole (live) animals show that the percentage of animals below the MLS was 23.6% in 2022 and 34.7% in 2023. Members noted, however, that observer measurements of animals at catch landing points are being recorded at a different time to when MLS should be measured (i.e. in the water). Black teatfish are known to shrink when they are taken out of the water and there are delays before they are landed and able to be measured. During this time, they lose water and eviscerate. To take into account the 'shrinkage' of animals between collection and when they are measured, 10% was applied to length measurements, resulting in 11.4% (in 2022) and 18.4% (in 2023) of black teatfish measuring below the MLS. The RAG noted that black teatfish under the MLS need to remain in the water so that they have the opportunity to spawn. Comparing the length of whole (live) animals measured between years showed that in 2023, there were fewer very large animals measured for the population.
47. The RAG noted that additional size-frequency data from future black teatfish fishery openings will help to improve estimates of stock productivity, as well as provide information on population recruitment (breeding), which is important given sea cucumber recruitment may be sporadic (not regular).
48. The RAG noted that many fishers are leaving the voluntary Part B section of the catch disposal record (CDR) blank, which includes fishing effort, area and method information. The RAG agreed that catch per unit effort (CPUE) analyses should be included in the analysis of next season's data. AFMA also agreed to undertake further education with fishers on the importance of the voluntary Part B section of the CDR as well as MLS requirements.

Action arising 6 - Catch per unit effort analyses to be included in the analysis of black teatfish data collected during the 2024 opening.

Action arising 7 - AFMA to undertake further education with fishers on the importance of the voluntary Part B section of the catch disposal record as well as minimum legal size requirements.

49. Members also discussed how to differentiate between black teatfish and white teatfish, noting there is a colour variant of white teatfish that looks similar to black teatfish. The Scientific member explained that the white teatfish colour variant can be identified by looking at the underside of the animal which is a beige/tan colour and the anal teeth are yellow and tend to be relatively large. Black teatfish are ash grey on the underside and the anal teeth are darker and smaller. The RAG agreed that the scientific observers should collect data during the next opening on the prevalence of the white teatfish colour variants in the BDM Fishery. This should be supported by an update to the sampling protocols concerning species identification. The RAG also agreed the sampling protocols should be reviewed to ensure a consistent method of measuring animals. The RAG further agreed that AFMA should investigate producing a ruler for boats showing the MLS for the key sea cucumber species.

Action arising 8 – Size-frequency sampling program to collect data during the 2024 black teatfish opening on the prevalence of the white teatfish colour variant in the BDM Fishery.

Action arising 9 – Sampling protocols for the size-frequency sampling program to be updated for the 2024 black teatfish opening to include species identification between black teatfish and the white teatfish and to ensure a consistent method of measuring animals.

Action arising 10 – AFMA to develop a ruler for boats showing the minimum legal size for the key sea cucumber species in the BDM Fishery.

10.2 Updates to black teatfish stock assessment modelling

50. The RAG noted a presentation provided by the Scientific member, Dr Eva Plaganyi, regarding the results on updates to the black teatfish surplus production model (used to set the TAC for the 2021 and 2022 trial openings) and the age-structured production model based on historical catches, survey data, and size-frequency data collected during surveys and openings (**Attachment C**). Results from both models were consistent with previous modelling results that, based on the data currently available for the BDM Fishery, an annual 20 tonnes TAC for black teatfish continues to be sustainable, whereas an annual TAC of 30 tonnes was projected to lead to a significant decline towards the limit.
51. The RAG noted that as more data become available, it will be possible to refine and substantially improve modelling results and reduce uncertainty. However, members noted that other factors will need to be taken into consideration in the future when setting TACs including the ecosystem impacts of climate change and possibly the COTS outbreak.
52. The RAG discussed uncertainties around some of the parameters used in the modelling, including natural mortality and age at maturity. It is understood that age at maturity for black teatfish is between 4-8 years, and likely 6 years on average. The age-structured production model groups lengths into different age classes. The data suggests that there are not a lot of animals that are in the older age cohort (10+ years). A range of sensitivities were tested, including different growth, selectivity, mortality assumptions.
53. Members noted that black teatfish are understood to have their main spawning period in June and July with a smaller spawning period in December. Traditional Inhabitant members queried whether fishing after the spawning period would be more beneficial to the stock. The Scientific member noted that that the TAC is only a small percentage of the total spawning biomass and fishing animals above the MLS and at sustainable levels is more important than avoiding the spawning period. Also, animals will also be in poorer condition following spawning.
54. The RAG discussed the MLS for black teatfish (250 mm), noting other jurisdictions have higher MLS.
55. The Chair thanked the Scientific member and observer for their presentations. The RAG noted that under the current WTO conditions the take of black teatfish is restricted to a 20 tonnes TAC.
56. **Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for black teatfish should remain at**

20 tonnes for the 2024 fishing season, with continued close monitoring through the collection of size-frequency data during the 2024 and future openings. It was noted that a later agenda item as well as the HCWG will discuss changes to management arrangements that could maximise the take of the TAC.

57. Members noted the following opportunities for improvements to data used to assess black teatfish:
- a. ongoing collection of size-frequency data during openings;
 - b. CPUE data;
 - c. spatial data;
 - d. Improved conversion factor for shrinkage.
58. **Noting that the high tier decision rules could not be applied to recommend a TAC for the 2024 fishing season, the RAG recommended the BDM Fishery Harvest Strategy be reviewed to clarify the high tier decision rules, to provide for stock assessments that are undertaken out of cycle with fishery independent surveys, to be taken into account in setting TACs.**

10.3 Future openings

59. Members noted that at the BDM Workshop, industry participants were asked to identify the optimal timing for annual black teatfish openings. Although industry participants were able to identify a preferred opening date for 2023, they were unable to advise on the optimal timing for future black teatfish openings, until another survey of the BDM Fishery is undertaken to determine, where and when spawning of key species, including black teatfish, is occurring. Members noted that key factors taken into consideration in setting past opening dates, include:
- a. favourable weather – February to May;
 - b. favourable tides – neap tide preferred, in 2022, the last half day fell on a high tide which was not good for fishing;
 - c. not on the Sabbath or public holiday;
 - d. not during TRL openings – season and hookah;
 - e. avoid spawning – June-July and December.
60. Members noted that as the fishery is only taking a small proportion of the total spawning biomass and animals that are above the MLS, it is not as critical to avoid fishing before the spawning period. Ms Murphy noted that black teatfish from other localities are known to spawn in June and July and there is also an indication that there could be an additional period in December. Members noted that sea cucumbers have a thinner body wall and therefore poorer condition when spawning, however there is no scientific reason to avoid catching them during the spawning period given that they are not less cryptic in the spawning season nor do they form spawning aggregations that could be disrupted by harvesting. Further, only a small percentage of the total spawning biomass is being taken.
61. The RAG noted that a recommendation would be sought at the HCWG meeting on an opening date for the 2024 black teatfish fishery.

Carryover of TAC undercatch

62. The RAG noted that at its last meeting held in November 2022, the HCWG sought advice from the RAG on:
- a. the anticipated duration of an annual 20 tonne catch limit, noting a few more years of data is required to increase certainty on what future annual TACs might be possible;
 - b. the scientific basis for the development and application of undercatch carryover provisions;
and

- c. options for the review of the BDM Fishery Harvest Strategy to include provisions to carry over undercatch and set provisional TACs.
63. The RAG noted that the BDM Fishery is currently undergoing re-assessment under the EPBC Act. If the BDM Fishery is approved as a WTO, this approval will be subject to conditions. AFMA have met with DCCEEW and sought the removal of fixed caps on TACs to enable the carryover of TAC undercatch amounts between fishing seasons and allow for the full implementation of the BDM Fishery Harvest Strategy with respect to TAC overcatch.
64. The AFMA member noted that AFMA has implemented overcatch and undercatch arrangements in a number of Commonwealth fisheries, under AFMA's *Fisheries Management Policy 10*. The general approach is to carryover up to 10% of an undercaught TAC from one season to the following season. It was clarified that the undercatch amount would not be able to be carried over for more than one season (i.e. if it is not caught in the subsequent season, it cannot be carried over again).
65. Scientific members advised that they had no concerns with the development of TAC undercatch carryover provisions for black teatfish. It was noted that the life history of the species was suited to the arrangement (longer lived). It was also noted that management strategy evaluation (MSE) testing showed that the arrangement did not raise sustainability risks for the species.
66. **Taking into account the scientific advice, the RAG agreed with AFMA's recommendation for the development of TAC undercatch carryover provisions for black teatfish to allow for up to 10% of the current fishing season's TAC, if not caught, to be carried over from the current season to the subsequent season.**
67. The AFMA member noted the draft arrangements would be developed for further consideration at HCRAAG and HCWG meetings in 2024. The arrangements will require amendment to the BDM Fishery Harvest Strategy, which will require approval by the PZJA prior to implementation.

11 Outcomes of white teatfish and curryfish research project

68. The RAG noted a presentation provided by the Scientific member, Dr Eva Plaganyi, regarding the results of AFMA funded project 2021-0815, concerning new stock assessment modelling undertaken for white teatfish (**Attachment D**). The RAG noted that the results of the project concerning new processing conversion ratios for curryfish species will be provided for consideration at the next HCRAAG meeting in 2024.
69. The RAG noted that white teatfish is a slow-growing species that has been listed under Appendix II of CITES. In addition, the white teatfish population structure is not well understood. The 2019/20 survey showed 72% of the stock was in deeper waters (>20 m) which is not accessible to free diving. It is also unknown as to the extent of mixing between the shallow and deep water components of the stock.
70. Dr Plaganyi advised that an integrated age-structured production model for white teatfish was developed using historical catch data (available for the period 1995-2022) and fitted to a time-series comprising four survey indices of abundance (2002, 2005, 2009 and 2019, noting that the 1995 survey is not considered adequately representative for white teatfish), the 2019 survey absolute abundance estimate, the survey length frequency data (after converting to age) for three years (2002, 2005 and 2019 - sample size too low in 2009), as well as two measures of the average biomass of the commercial catch.
71. The RAG noted that despite considerable uncertainty, the age-structured model results suggests that the current white teatfish TAC of 15 tonnes is conservative and that an annual catch of 15 tonnes will have a very small effect on the white teatfish population. Members noted that although the results indicated the TAC could be increased, it was recommended a precautionary approach be taken with any increase to be undertaken in a step-wise manner and accompanied by the collection of better data.

72. The industry observer noted that Traditional Inhabitant fishers have put forward a proposal to be able to fish for white teatfish using hookah gear. The Scientific member noted that if white teatfish was allowed to be taken by hookah gear, then the catches from the different methods (e.g. free dive, hookah) would need to be separated in the model. The Chair noted that the industry proposal will be discussed at the HCWG meeting.
73. The QDAF member noted that some white teatfish research was being finalised for the Queensland Sea Cucumber Fishery and agreed to circulate the report once it is published. The Scientific member, Assoc Prof Steven Purcell, also noted research which showed growth rates and age at maturity for white teatfish, different to that used in the modelling. The Scientific member agreed to provide CSIRO with the research reports for their consideration.

Action arising 11 – QDAF to circulate updated research concerning white teatfish in the Queensland Sea Cucumber Fishery to the RAG once it is published.

Action arising 12 – Assoc Prof Steven Purcell to provide to CSIRO research concerning growth rates and age at maturity for white teatfish, once this research is finalised.

74. Members noted that the TAC for white teatfish is currently limited to 15 tonnes under a condition of the BDM Fishery's WTO approval which expires on 30 November 2023.
75. The RAG noted that the BDM Fishery Harvest Strategy states that if fishing effort is low then the TAC should not be increased. Members further noted that if a hookah trial was to be approved the Harvest Strategy would need to be amended as well as the PZJA management arrangements which would involve a consultation period and the HCRAAG would need to consider the proposal again. The Traditional inhabitant observer noted that this issue has been discussed for the last 5 years with very little progress.
76. Members noted that should the industry proposal proceed to a trial, the following data would be needed to support ongoing assessment:
 - a. total catch;
 - b. CPUE;
 - c. length frequency of a (adequate) sub-sample of the catch;
 - d. average mass of a sub-sample of the catch;
 - e. spatial footprint/location of the catch;
 - f. if necessary and possible, a survey 3 to 5 years after the start of more intensive fishing would continue the survey series and update the estimate of standing stock;
 - g. other monitoring methods such as divers carrying data loggers could also be used and these data could potentially be compared with those available for the 2012-2013 fishing period.
77. **Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for white teatfish should remain at 15 tonnes for the 2024 fishing season.** It was noted there is a scientific basis to consider an increase to the TAC should the industry proposal proceed to a trial.
78. As for black teatfish, noting that the high tier decision rules could not be applied to recommend a TAC for the 2024 fishing season, the RAG reiterated their recommendation that the BDM Fishery Harvest Strategy be reviewed to clarify the high tier decision rules, to provide for stock assessments that are undertaken out of cycle with fishery independent surveys, to be taken into account in setting TACs.

12 Total allowable catches for the 2024 fishing season

79. The AFMA member explained the BDM Fishery Harvest Strategy is based on a tiered framework which accounts for improvements in data and information. The Harvest Strategy applies to 18 species (inclusive of the 2 closed species).

80. Members noted that since the BDM Fishery Harvest Strategy was implemented for the 2020 fishing season, new information to inform understanding of the status of commercial sea cucumber species in the BDM Fishery has been collected, including:
- a scientific survey undertaken of the East Torres Strait in 2019/20;
 - catch and effort data collected through the mandatory Fish Receiver System (FRS);
 - stock assessment modelling was undertaken for black teatfish and white teatfish.
81. Members further noted that species summaries were developed to assist the RAG in formulating its advice on TACs for the 2024 fishing season. These summaries are designed to assist the RAG to:
- compile and characterise all relevant information (for example adequacy of survey and catch data for a particular species);
 - confirm the appropriate decision rule tier for each species;
 - apply the BDM Fishery Harvest Strategy decision rules (otherwise known as control rules) within the tier OR recommend further analysis to be undertaken. Given the number of species being reviewed, the RAG is asked to prioritise any recommendations for further analysis across species; and
 - identify any short to medium term data and research needs.
82. Members noted that most species fall under the low tier of the BDM Fishery Harvest Strategy with regards to the decision rule tier to be applied to each species. The AFMA member explained that six species were identified as priority species (black teatfish, white teatfish, prickly redfish, curryfish common, curryfish vastus and deepwater blackfish) for the consideration of the RAG.
83. The AFMA member provided a summary of the BDM Fishery Harvest Strategy and then a summary for each species (**Attachment E**).

Prickly redfish (*Thelenota ananas*)

84. Members noted that the current prickly redfish TAC is 15 tonnes and this was exceeded in 2021 by less than 1% (36 kg overcatch). With reference to the low tier decision rules under the BDM Fishery Harvest Strategy, annual reported catches in the last two fishing seasons have not exceeded the TAC by >20%. Cumulative reported catches for the last three fishing seasons (2020-2022) have not exceeded the TAC by >5% (44.204 tonnes). Therefore no additional actions apply under the decision rules. Members noted that under the decision rules there is no capacity to increase the prickly redfish TAC.
85. Members noted that prickly redfish has been CITES listed and will need a NDF to be able to export in the near future (from May 2024 onwards). Members noted that the NDF is likely to recommend undertaking more research and collecting better data. The AFMA member agreed to include WTO conditions on the agenda for the next meeting.

Action arising 13 - AFMA member to include an update on CITES listings and WTO conditions on the agenda for the next meeting.

86. Members noted that 6.1 tonnes have been landed so far during the 2023 season with fuel prices causing problems and the weather not being ideal. Traditional Inhabitant members explained that any decline in catch is due to operational reasons not the availability of the stock. The industry observer noted that fuel prices are around \$3.70/litre and market prices are only \$7/kg. Members also noted that there is no mechanic or it is very expensive to travel to a mechanic to service outboard motors.
87. Scientific members noted that better data was needed to more closely monitor this species including CPUE, size-frequency and spatial data. Members further noted that the voluntary Part B section of the CDR is not being completed and this should be a focus for future education.

88. The AFMA member agreed to work with the TSRA to see if it can share where catches in the BDM Fishery are coming from to assist the TRSA with targeting its program funding (e.g. WAPIL) to the relevant communities.

Action arising 14 – AFMA to explore sharing of spatial data with the TSRA to assist the TRSA with targeting its program funding (e.g. WAPIL) to the relevant communities.

89. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for prickly redfish should remain at 15 tonnes for the 2024 fishing season, with education needed on the importance of the voluntary Part B section of the CDR.**

Hairy blackfish (Actinopyga miliaris)

90. Members noted that hairy blackfish stock status was discussed at the last RAG meeting and acknowledged that the stock survey needs to be adapted to better target hairy blackfish to get sufficient information to assess its status. ABARES currently list the fishing mortality and biomass as uncertain. The ABARES observer noted the 5 tonnes TAC is concerning given the current low estimated biomass of hairy blackfish measured in the latest survey, but also acknowledged the views of survey scientists that hairy blackfish are difficult to count.
91. Members noted that AFMA will continue to work with industry to improve the quality of catch reporting, particularly with regards to spatial reporting and species identification.
92. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for hairy blackfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.**

Deepwater redfish (Actinopyga echinites)

93. Members noted that under the BDM Fishery Harvest Strategy the current TAC for deepwater redfish is 5 tonnes. Members noted that catches are low compared to estimates of biomass from the last population survey but with an increasing overall trend in average density.
94. The Scientific member noted that recent surveys estimated densities at around 2.5 individuals per hectare, which is far below the regional reference densities recommended for healthy populations by the Pacific Community. The RAG noted that deepwater redfish are not targeted due to low market price, but would be taken opportunistically by fishers. The Scientific member recommended that that a 0 tonne TAC should be set for species assessed at risk on the IUCN Red List (<https://www.iucnredlist.org>), noting deepwater redfish was assessed as Vulnerable. The member further noted that, according to the last CSIRO survey report, the species looks to have declined or disappeared from the Great North East Channel and other areas of the Torres Strait. Another Scientific member advised that a closer scrutiny of the survey and other data is needed see if there has been a decline in density in specific areas of the Torres Strait, noting however that the results of the 2019/20 survey showed an increasing overall trend in density.
95. The AFMA member explained that the IUCN Red List is advisory only and assessments for most species are at a global scale. However, the IUCN listings are used as an important signal to pay closer attention to the management of species of concern. The member also noted that harvest strategy decision rules do not stipulate to set a 0 tonne TAC in this instance.
96. ABARES lists the biomass as uncertain, but not subject to overfishing. Members noted that industry need to improve the quality of catch reporting, particularly with regards to spatial reporting and species identification. The RAG stated that more targeted survey and/or sampling of deepwater redfish is required to get sufficient information to assess its status.
97. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for deepwater redfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.**

98. In making this recommendation the RAG noted the concerns of the Scientific member including their recommendation for a 0 tonne TAC and agreed that additional scrutiny of survey and other data is needed for this species and to examine how the BDM Fishery Harvest Strategy could cater for reduced TACs when species are harvested well below allocated TACs and might be at very low abundance.

Action arising 15 – Further analysis of the survey and other data for deepwater redfish to determine if there has been a decline in density in specific areas of the Torres Strait, to be provided at the next RAG meeting and examine how the Harvest Strategy could be modified to lower TACs for species at risk.

Greenfish (Stichopus chloronotus)

99. Members noted that under the BDM Fishery Harvest Strategy the current TAC for greenfish is 40 tonnes with zero catch taken in the last few years. Under the ABARES status report the greenfish is listed as not subject to overfishing or overfished.
100. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for greenfish should remain at 40 tonnes for the 2024 fishing season.**

Curryfish basket species

Curryfish (common) (Stichopus herrmanni)

101. With reference to the low tier decision rules under the BDM Fishery Harvest Strategy, members noted that the basket TAC (60 tonnes) which includes the common curryfish was not exceeded the last two fishing seasons. Therefore no additional actions apply under decision rules. The AFMA member noted that the catch of the common curryfish has been decreasing as some key fishers have not targeted common curryfish in the last few years. A Traditional Inhabitant member noted that the eastern islands could fish for common curryfish, however, when the TRL season is open, TRL are a more valuable species. Members noted that the common curryfish is very fragile and industry are still developing an optimal processing method. The RAG noted that given the fragile nature of the common curryfish it is not opportunistically fished.
102. The AFMA member agreed to provide additional data on changes to how many fishers are targeting curryfish each fishing season, to inform discussions at the next meeting on what is causing the decline in catches (**action arising 15**).

Action arising 16 – AFMA to provide additional data on changes to how many fishers are targeting curryfish each fishing season, to the next RAG meeting.

Curryfish (vastus) (Stichopus vastus)

103. The AFMA member explained that curryfish vastus has a 15 tonnes species specific trigger. With reference to the low tier decision rules under the BDM Fishery Harvest Strategy, members noted annual reported catches in the last two fishing seasons have not exceeded the TAC or trigger, and therefore no additional actions apply under decision rules.
104. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for curryfish species should remain at 60 tonnes for the 2024 fishing season, with education needed on the importance of species level identification and the voluntary Part B section of the CDR.**

Other basket species

105. The RAG noted that the basket TAC for other species was decreased from 80 tonnes to 50 tonnes with the implementation of the BDM Fishery Harvest Strategy.

Deepwater blackfish (Actinopyga palauensis)

106. The RAG noted that a precautionary approach is needed for deepwater blackfish as their status remains relatively unknown, and they have a patchy distribution and therefore not picked up

well under the current survey design. Members agreed that targeted survey sampling for this species needs to be factored into future stock surveys.

107. The AFMA member noted that the 500 kg species trigger limit for deepwater blackfish was exceeded in 2022 by more than 10% and the low tier joint TAC trigger-limit decision rules apply. These rules state: if the catch of any species exceeds the species-specific trigger by more than 10%, then collect data and information to decide whether: a) to make a change to the basket TAC, or individual species trigger, or b) a species-specific TAC is justified, or c) a closure is deemed necessary, or d) recommend further data be collected (e.g. in the form of a survey, or indicator before any change to the joint TAC or trigger limit is allowed).
108. The ABARES observer noted the ABARES FSR assesses this species as uncertain and expressed their concern that, like several of the other *Actinopyga* species in this fishery, the deepwater blackfish stock may be depleted.
109. The RAG discussed historical species identification and survey issues concerning deepwater blackfish, deepwater redfish, burrowing blackfish and hairy blackfish. The RAG requested that further analysis on *Actinopyga* species, including trigger limits, be provided at the next meeting for further consideration.

Action arising 17 - Further analysis on *Actinopyga* species, including trigger limits, to be provided at the next RAG meeting for further consideration.

Elephant trunkfish (Holothuria fuscopunctata)

110. The AFMA member noted that elephant trunkfish has a species trigger limit 15 tonnes and is included in the 50 tonnes other species basket with no annual reported catches in the last two fishing seasons. The last survey indicated that the biomass of elephant trunkfish was increasing but it is listed as uncertain (fishing mortality and biomass) in the ABARES status report as it is assessed with all basket species.

Lollyfish (Holothuria atra)

111. Members noted that catch of lollyfish increased in 2019, however, further information is required from fishers on recent catches to determine if there are any concerns. The AFMA member noted that lollyfish has a species trigger limit 40 tonnes and is included in the 50 tonnes other species basket with low or no annual reported catches in the last two fishing seasons.

Burrowing blackfish (Actinopyga spinea)

112. Members noted that burrowing blackfish have a 5 tonnes species trigger limit. It is listed as uncertain (fishing mortality and biomass) in the ABARES status report as it is assessed with all basket species. Members noted that there have been no annual reported catches in the last two fishing seasons.

Golden sandfish (Holothuria lessoni)

113. The AFMA member noted that there is a 500 kg species trigger limit. The RAG noted that golden sandfish were not observed during the 2019/20 stock survey or annual TRL surveys. There were no annual reported catches in the last two fishing seasons. The Scientific member noted that golden sandfish has been listed as Endangered by the IUCN Red List (<https://www.iucnredlist.org>).
114. The Scientific member proposed for the TAC for golden sandfish to be reduced to 0 tonnes because densities in the current fishing zones were extremely low and any further opportunistic harvests would put the populations at risk. As it is considered endangered throughout its distribution, caution should be applied. The AFMA member noted that the IUCN Red List is not binding and is advisory in nature.
115. The AFMA member noted that a change to the TAC for golden sandfish, and other species such as *Actinopyga*, based on low catches is not currently part of the BDM Fishery Harvest Strategy decision rules.

Brown sandfish (*Bohadschia vitiensis*)

116. Members noted that no concerns were raised for brown sandfish at the last RAG meeting with no annual reported catches in the last two fishing seasons.

Leopardfish (*Bohadschia argus*)

117. Members noted that leopardfish have a species trigger limit of 40 tonnes with a generally increasing density trend from surveys. There have been low or no annual reported catches in the last two fishing seasons.

Stonefish (*Actinopyga lecanora*)

118. Members noted that stonefish are not recorded in the stock survey and there has been no annual reported catches in the last two fishing seasons.
119. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for other species should remain at 50 tonnes for the 2024 fishing season, noting the next meeting of the HCRAg should discuss further as to why those basket species with low or no catches are not being caught.**
120. **In making this recommendation, the RAG noted concerns raised by the Scientific Member concerning the TAC for golden sandfish.**

Action arising 18 - Next meeting of the HCRAg to discuss further as to why basket species with low or no catches are not being caught.

Closed species**Sandfish (*Holothuria scabra*) and surf redfish (*Actinopyga mauritiana*)**

121. The AFMA member stated that the biomass of sandfish is listed as overfished and surf redfish as uncertain and both remain closed to fishing in the Torres Strait. The RAG and HCWG have previously recommended a research project to undertake a survey of sea cucumber stocks on Warrior Reef area with a focus on sandfish and other commercially important sea cucumber species.
122. **Taking into account the re-opening decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that fishing for sandfish and surf redfish remain closed for the 2024 fishing season.**

Other species

123. Members noted that amberfish have recently been listed under CITES, however there have been no catches of amberfish since 2001. Members noted that both amberfish (*Thelenota anax*) and pinkfish (*Holothuria edulis*) are included in the survey and there are no current concerns.
124. The RAG discussed at various points current MLS for species in the BDM Fishery compared to other jurisdictions and the latest research. **The RAG recommended a review of MLS in the BDM Fishery be undertaken and provided for consideration at the next HCRAg meeting in 2024.**

13 Research priorities for 2025/26

125. Members noted that the research priorities for 2025/26 will be discussed at the next meeting.

14 Updates on other hand collectable fisheries

126. Members noted that the update on other hand collectable fisheries will be presented at the next meeting.

15 Other business

127. An industry member noted that there was increasing interest from Traditional Inhabitant fishers in the west to start fishing in the hand collectibles fisheries.

16 HCRAG priorities and next meeting

128. Members noted that there would be a teleconference in early December 2023 to discuss WTO conditions and also to discuss the outcomes of the call for research proposals. Members noted that proposed dates will be sent to members via email.
129. The Chair thanked members and observers for attending and closed the meeting at 12:15pm on Wednesday 18 October 2023.

List of attachments

Attachment A – Agenda

Attachment B – Presentation regarding analysis of black teatfish data collected during the 2023 opening

Attachment C – Presentation regarding stock assessment modelling for black teatfish

Attachment D – Presentation regarding stock assessment modelling for white teatfish

Attachment E – Presentation regarding total allowable catches for the 2024 fishing season

Summary of actions arising from HCRAAG 3

Item #	Action	Responsibility
3.1	AFMA to pursue the attendance of compliance officers at community consultation meetings where possible, so that concerns regarding illegal fishing can be discussed with community members.	AFMA
3.2	AFMA to circulate a copy of the 2023 ABARES Fishery Status Reports to the RAG once it is released.	AFMA
3.3	TSRA to provide more information to the RAG on the next stage of the WAPIL project.	TSRA
3.4	Mr Sereako Stephen to circulate the management protocol to the RAG once finalised.	Mr Sereako Stephen
3.5	AFMA to provide the adaptation to climate change guidebook to the next RAG meeting for discussion.	AFMA
3.6	Catch per unit effort analyses to be included in the analysis of black teatfish data collected during the 2024 opening.	TBC
3.7	AFMA to undertake further education with fishers on the importance of the voluntary Part B section of the catch disposal record as well as minimum legal size requirements.	AFMA
3.8	Size-frequency sampling program to collect data during the 2024 black teatfish opening on the prevalence of the white teatfish colour variant in the BDM Fishery.	AFMA
3.9	Sampling protocols for the size-frequency sampling program to be updated for the 2024 black teatfish opening to include species identification between black teatfish and the white teatfish and to ensure a consistent method of measuring animals.	AFMA
3.10	AFMA to develop a ruler for boats showing the minimum legal size for the key sea cucumber species in the BDM Fishery.	AFMA
3.11	QDAF to circulate updated research concerning white teatfish in the Queensland Sea Cucumber Fishery to the RAG once it is published.	QDAF
3.12	Assoc Prof Steven Purcell to provide to CSIRO research concerning growth rates and age at maturity for white teatfish, once this research is finalised.	Assoc Prof Steven Purcell
3.13	AFMA member to include an update on CITES listings and WTO conditions on the agenda for the next meeting.	AFMA
3.14	AFMA to explore sharing of spatial data with the TSRA to assist the TRSA with targeting its program funding (e.g. WAPIL) to the relevant communities.	AFMA and TSRA
3.15	Further analysis of the survey and other data for deepwater redfish to determine if there has been a decline in density in specific areas of the Torres Strait, to be provided at the next RAG meeting and examine how the Harvest Strategy could be modified to lower TACs for species at risk.	TBC
3.16	AFMA to provide additional data on changes to how many fishers are targeting curryfish each fishing season, to the next RAG meeting.	AFMA
3.17	Further analysis on <i>Actinopyga</i> species, including trigger limits, to be provided at the next RAG meeting for further consideration.	TBC

Item #	Action	Responsibility
3.18	Next meeting of the HCRAAG to discuss further as to why basket species with low or no catches are not being caught.	AFMA

Summary of HCRAAG 3 recommendations

Agenda Item #	Recommendation
10.2	Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for black teatfish should remain at 20 tonnes for the 2024 fishing season, with continued close monitoring through the collection of size-frequency data during the 2024 and future openings.
10.2	Noting that the high tier decision rules could not be applied to recommend a TAC for the 2024 fishing season, the RAG recommended the BDM Fishery Harvest Strategy be reviewed to clarify the high tier decision rules, to provide for stock assessments that are undertaken out of cycle with fishery independent surveys, to be taken into account in setting TACs.
10.3	Taking into account the scientific advice, the RAG recommended the development of TAC undercatch carryover provisions for black teatfish to allow for up to 10% of the current fishing season's TAC, if not caught, to be carried over from the current season to the subsequent season.
11	Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for white teatfish should remain at 15 tonnes for the 2024 fishing season.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for prickly redfish should remain at 15 tonnes for the 2024 fishing season, with education needed on the importance of the voluntary Part B section of the CDR.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for hairy blackfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for deepwater redfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for greenfish should remain at 40 tonnes for the 2024 fishing season.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for curryfish species should remain at 60 tonnes for the 2024 fishing season, with education needed on the importance of species level identification and the voluntary Part B section of the CDR.
12	Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for other species should remain at 50 tonnes for the 2024 fishing season, noting the next meeting of the HCRAAG should discuss further as to why those basket species with low or no catches are not being caught.
12	Taking into account the re-opening decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that fishing for sandfish and surf redfish remain closed for the 2024 fishing season.

3rd meeting of the Hand Collectables Resource Assessment Group (HCRA3)

17-18 October 2023

TSRA Boardroom (Level 1 Torres Strait Haus, 46 Victoria Parade, Thursday Island)

If joining by Microsoft Teams, please refer to the meeting request for joining details

Draft Agenda

Agenda Item	Action required	Speaker	Time
Day 1 – 17 October 2023 – 0900-1700 AEST			
1. Opening prayer, acknowledgement of country, welcome and apologies	Information	Chair	0900 5 minutes
The Chair will welcome HCRA3 members and observers to HCRA3.			
2. Adoption of agenda	Decision	Chair	0905 1 minute
The HCRA3 is invited to consider and adopt the draft agenda.			
3. Declarations of interests	Decision	Chair	0906 10 minutes
HCRA3 members and observers are invited to declare any real or potential conflicts of interests and decide whether a member may or may not be present during the discussion of or decisions made on matters which are the subject of a conflict.			
4. Actions arising from previous meetings	Discussion	AFMA	0916 10 minutes
The HCRA3 is invited to note the status of action items arising from previous meetings.			
5. Out-of-session correspondence	Information	AFMA	0926 4 minutes
The HCRA3 is invited to note any out-of-session correspondence to the HCRA3 since the last meeting.			
6. HCRA3 updates	Information	All members	0930
6.1. Traditional Inhabitant members			1 hour
6.2. Scientific members			
6.3. Government members (AFMA, ABARES, TSRA, QDAF)			
6.4. Native Title			
6.5. PNG NFA			
HCRA3 members and observers are invited to provide updates on matters relevant to Torres Strait hand collectable fisheries, including fishing conditions, research, management and Native Title matters.			
Morning tea (1030-1045)			
7. Status of Wildlife Trade Operation approval and CITES listings	Discussion	AFMA	1045 15 minutes
The HCRA3 is invited to note the status of the re-assessment of the export approval for the Torres Strait Beche-de-mer Fishery (BDM Fishery) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , including the			

Agenda Item	Action required	Speaker	Time
assessment of species that have been listed under the <i>Convention on International Trade in Endangered Species of Wild Fauna and Flora</i> .			
8. Climate and ecosystem update	Discussion	AFMA	1100 30 minutes
The HCRAAG is invited to note an update on climate and ecosystem changes and discuss their impacts on Torres Strait hand collectable fisheries.			
9. BDM Workshop outcomes	Information	AFMA	1130 30 minutes
The HCRAAG is invited to note the key outcomes from the BDM Workshop held from 21-22 March 2023.			
10. 2023 black teatfish opening and future openings (further time after break)	Recommendation	AFMA + CSIRO	1200 1 hour (further time after break)
10.1.Outcomes of 2023 opening			
10.2.Updates to black teatfish stock assessment modelling			
10.3.Future openings			
The HCRAAG is invited to consider the outcomes of the 2023 black teatfish opening and updates to the black teatfish stock assessment. The HCRAAG is also invited to discuss management arrangements for future openings, including an appropriate total allowable catch (TAC), opening date, reporting and data collection requirements and any other conditions that should apply. Discussions to include consideration of relevant recommendations from the BDM Workshop.			
Lunch (1300-1345)			
2023 black teatfish opening and future openings (continued)	Recommendation	AFMA + CSIRO	1345 1 hour (continued)
11. Outcomes of white teatfish and curryfish research project	Recommendation	CSIRO	1445 1 hour
The HCRAAG is invited to consider the outcomes of research project 2021-0815 and make recommendations to the Hand Collectables Working Group (HCWG) and the Protected Zone Joint Authority (PZJA) regarding their adoption. The project has undertaken new stock assessment modelling for white teatfish and developed new processing conversion ratios for curryfish species.			
Afternoon tea (1545-1600)			
12. Total allowable catches for the 2024 fishing season (further time on Day 2)	Recommendation	AFMA	1600 1 hour (further time on Day 2)
The HCRAAG is invited to review the current monitoring triggers and TACs for sea cucumber species under the guidance of the BDM Fishery Harvest Strategy, taking into account catches during recent fishing seasons and any other relevant information that is available. If required, the HCRAAG is invited to recommend to the HCWG and the PZJA new TACs for the 2024 fishing season.			
Day 2 – 18 October 2023 – 0900-1300 AEST			
Total allowable catches for the 2024 fishing season (continued from Day 1)	Recommendation	AFMA	0900 1 hour (continued from Day 1)
13. Research priorities for 2025/26	Recommendation	AFMA	1000

Agenda Item	Action required	Speaker	Time
			30 minutes
The HCRAg is invited to review the draft five-year research plan for Torres Strait hand collectable fisheries and recommend research priorities to the HCWG and the Torres Strait Scientific Advisory Committee for funding in 2025/26 and beyond.			
Morning tea (1030-1045)			
14. Updates on other hand collectable fisheries	Recommendation	AFMA	1045 1 hour
14.1. Pearl shell			
14.2. Crab			
14.3. Trochus			
The HCRAg is invited to note updates on the other Torres Strait hand collectable fisheries, and if required, make recommendations to the HCWG and the PZJA regarding their management.			
15. Other business	Discussion	All members	1145 15 minutes
The HCRAg is invited to nominate any other business for discussion.			
16. HCRAg priorities and next meeting	Discussion	AFMA	1200 15 minutes
The HCRAg is invited to discuss priorities for the year ahead and a suitable date for the next meeting.			
Lunch (1215-1300)			

The Chair must approve the attendance of all observers at the meeting. Individuals wishing to attend the meeting as an observer must contact AFMA (fisheriesTI@afma.gov.au).

The meeting will be recorded for the purpose of developing the meeting minutes and will be deleted once the meeting minutes have been finalised.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
STATUS OF WILDLIFE TRADE OPERATION APPROVAL AND CITES LISTINGS	Agenda Item 5 For DISCUSSION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG):
 - a. **NOTE** the status of the Wildlife Trade Operation (WTO) approval for the Torres Strait Beche-de-mer (BDM) Fishery under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
 - b. **NOTE** the status of the non-detriment finding (NDF) process for *Convention on the International Trade of Endangered Species of Wild Fauna and Flora* (CITES) listed species in the Torres Strait BDM Fishery;
 - c. **NOTE** the status of the assessment of other Torres Strait hand collectables fisheries under the EPBC Act;
 - d. **PROVIDE ADVICE** concerning the actions taken or proposed to address the current WTO conditions for the Torres Strait BDM Fishery (**Attachment 5a**), noting research requirements arising from the WTO conditions will be further discussed under **Agenda Item 6**.

KEY ISSUES

Status of assessment of the Torres Strait BDM Fishery under the EPBC Act

2. The EPBC Act, administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), requires the Australian Government to assess the environmental performance of all commercial fisheries, including those in the Torres Strait, and promote ecologically sustainable fisheries management. Wildlife Trade Operation (WTO) approval under the EPBC Act is necessary for Australian commercial fisheries to be able to legally export commercially wild caught seafood from Australia. Such approvals may be subject to conditions applicable to the responsible management authority and fishers.
3. The Torres Strait BDM Fishery was first accredited as an approved WTO in June 2005 for a period of three years and was subsequently re-assessed and re-approved in 2008, 2011, 2014, 2017 and 2020.
4. The fishery was last assessed in 2023 and was declared as an approved WTO under the EPBC Act until 30 November 2026, subject to a range of conditions being addressed during the period of the approval. These conditions were updated in May 2024, to give effect to a positive NDF for *Thelenota* species listed under CITES (**Attachment 5b**). Further details of the assessment process can be found on the [DCCEEW website](#).
5. **Attachment 5a** provides a summary of relevant actions taken or proposed to address the current WTO conditions. A number of the conditions will require further research to be undertaken. These will be considered further under **Agenda Item 6**.
6. As raised at the BDM Workshop held on 21-22 March 2023, AFMA sought flexibility in the conditions placed on any future WTO approval, to recognise the science-based TAC setting process in the Torres Strait BDM Fishery, remove fixed caps on total allowable catches (TACs) and recognise current arrangements for undercatch and overcatch. The current WTO conditions no

longer place fixed caps on TACs and allow the overcatch provisions in the Torres Strait BDM Fishery Harvest Strategy to be applied. A proposed undercatch provision for black teatfish is provided for discussion under **Agenda Item 7**.

Appendix II CITES listings of *Holothuria* and *Thelenota* species

7. Three species currently commercially harvested in the Torres Strait BDM Fishery have been listed under Appendix II of the CITES:
 - a. Black teatfish (*Holothuria whitmaei*) and white teatfish (*H. fuscogilva*) – at the 18th CITES Conference of the Parties (CoP) meeting held on 17-28 August 2019, a proposal to include three species of sea cucumber, including black teatfish and white teatfish, in CITES Appendix II was adopted. This listing came into effect on 28 August 2020;
 - b. Prickly redfish (*Thelenota ananas*) – at the 19th CITES CoP meeting held on 14-25 November 2022, a proposal to include *Thelenota* species of sea cucumber, including prickly redfish, in CITES Appendix II was adopted. This listing came into effect on 25 May 2024.
8. Another *Thelenota* species, amberfish (*T. anax*), is found in the area of the Torres Strait BDM Fishery but has not been commercially harvested since 2001 (where 192 kg was caught).
9. CITES is a binding international agreement aimed at preventing international trade from driving unsustainable population decline in species listed under the Convention. Species listed under Appendix II of CITES are not necessarily threatened with extinction, and may still be traded internationally provided the trade, or a specified level of trade, has been determined to be non-detrimental to the survival of the species in the wild. With regards to Australian commercial fisheries, to export CITES listed species for commercial purposes, the species must come from a fishery that is both an approved WTO and has a NDF for the applicable species. In Australia, DCCEEW has responsibility for implementing CITES requirements, given effect through the EPBC Act.
10. To prepare for the listing of *Thelenota* species in May 2024, DCCEEW undertook an assessment of the environmental performance all Australian fisheries that harvest and export these species, including the Torres Strait BDM Fishery. This assessment determined that the harvest and trade of *Thelenota* species from Australia is sustainable, and provided conditions are met, will not be detrimental to, or contribute to trade, which is detrimental to, the survival or recovery of the species. The NDF is subject to a range of conditions, which must be complied with for the species to be accepted by international trading partners. Conditions applicable to the Torres Strait BDM Fishery are included in **Attachment 5a**.
11. DCCEEW have also commissioned an independent expert assessment to review the existing NDF for CITES listed *Holothuria* species. This assessment is still pending and the HCRAAG will be advised of outcomes once published.

Status of assessments for other Torres Strait hand collectables fisheries

12. The following details the status of assessments and details of current approvals for other hand collectables fisheries in the Torres Strait:
 - a. Torres Strait Crab Fishery – not exporting, not active, no assessment;
 - b. Torres Strait Pearl Shell fishery – not exporting, not active, no assessment;
 - c. Torres Strait Trochus Fishery – not exporting, re-assessment to commence in August 2025, current WTO approval expires 3 February 2026.
13. Where a fishery no longer needs export approval, DCCEEW removes it from their assessment schedule. This has been the case for the Torres Strait Crab and Pearl Shell Fisheries. If at a later date, a fishery does need to regain access to overseas markets, DCCEEW will work with AFMA to undertake a new application and assessment process (which typically takes 6 months to complete).

BACKGROUND

14. An independent assessment of all export and all Australian Government managed fisheries is periodically required under the EPBC Act. These assessments ensure that, over time, fisheries are managed in an ecologically sustainable way. Where a fishery's product is exported, the assessment will include consideration of whether to approve the fishery as a WTO.
15. The assessments are conducted against the 2nd edition of the *Guidelines for the Ecologically Sustainable Management of Fisheries* (the Guidelines). The Guidelines outline specific principles and objectives designed to ensure a strategic and transparent way of evaluating the ecological sustainability of fishery management arrangements.
16. The assessment process is designed to incorporate a flow of communication between fishery managers and DCCEEW, in order to facilitate the best outcome for the fishery. Each fishery is unique, and assessment is based on the merits of the combination of management measures in place and fishery specific issues.
17. The status of assessments and details of current approvals for all Torres Strait fisheries can be found on the [DCCEEW website](#).

Progress to date against the WTO conditions for the Torres Strait BDM Fishery

WTO Conditions for the BDM Fishery	Progress as of June 2024
<p>Condition 1</p> <p>Operation of the Torres Strait Bêche-de-mer Fishery must be carried out in accordance with the management regime in force under the <i>Torres Strait Fisheries Act 1984 (Cth)</i>, <i>Torres Strait Fisheries Regulations 1985 (Cth)</i>, <i>Torres Strait Fisheries (Bêche-de-mer) Management Instrument 2022</i> and Torres Strait Bêche-de-mer Fishery Harvest Strategy.</p>	<p>On track</p> <p>The Torres Strait Bêche-de-mer (BDM) Fishery continues to be managed in accordance with management arrangements in force under the <i>Torres Strait Fisheries Act 1984 (the TSF Act)</i>, <i>Torres Strait Fisheries Regulations 1985 (the TSF Regulations)</i>, <i>Torres Strait Fisheries (Bêche-de-mer) Management Instrument 2022 (the Management Instrument)</i> and Torres Strait BDM Fishery Harvest Strategy.</p>
<p>Condition 2</p> <p>The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended material changes to the Torres Strait Bêche-de-mer Fishery management arrangements that may affect the assessment against which <i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i> decisions are made.</p>	<p>On track</p> <p>Any intended material changes to management arrangements will be reported to DCCEEW. A number of these WTO conditions will require amendments to the Management Instrument and Torres Strait BDM Fishery licence conditions.</p> <p>AFMA have discussed the proposed undercatch provision for black teatfish with DCCEEW. This is provided for discussion under Agenda Item 7. Further updates will be provided to DCCEEW as the proposal progresses.</p>
<p>Condition 3</p> <p>The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended changes to fisheries legislation that may affect the legislative instruments relevant to this approval.</p>	<p>On track</p> <p>AFMA, on behalf of the PZJA, have provided DCCEEW an update on proposed amendments to the TSF Act and TSF Regulations on 8 November 2022. The amendment process has commenced and remains pending. The amendments were last considered by the Protected Zone Joint Authority (PZJA) at their meeting on 19 July 2023. A record of the meeting outcomes can be found on the PZJA website. Further updates will be provided to DCCEEW as the amendments progress.</p> <p>A number of these WTO conditions will require amendments to the Management Instrument and Torres Strait BDM Fishery licence conditions.</p>
<p>Condition 4</p> <p>The Australian Fisheries Management Authority must produce and present reports on the Torres Strait</p>	<p>Pending</p> <p>AFMA will provide annual reports to DCCEEW as required by this condition.</p>

<p>Bêche-de-mer Fishery to the Department of Climate Change, Energy, the Environment and Water by November annually, as per Appendix B of the Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition.</p>	
<p>Condition 5</p> <p>As part of the annual reporting requirement referred to in Condition 4, the Australian Fisheries Management Authority must report the following to the Department of Climate Change, Energy, the Environment and Water:</p> <ul style="list-style-type: none"> a) the harvested weight and, where available, the number of individuals, their lengths and locations of harvest for all CITES listed species harvested in the Torres Strait Bêche-de-mer Fishery; and b) any assessments, management changes, or findings relevant to the management of CITES-listed species in the Torres Strait Bêche-de-mer Fishery. 	<p>Pending</p> <p>AFMA will provide the required data and information to DCCEEW as part of the annual report process.</p>
<p>Condition 6</p> <p>The Australian Fisheries Management Authority must:</p> <ul style="list-style-type: none"> a) by November 2024, provide the Department of Climate Change, Energy, the Environment and Water with a proposed timeline for the undertaking and completion of a multi-species stock survey of sea cucumbers in the Torres Strait; and b) by May 2026, have commenced the delivery of a multi-species stock survey of sea cucumbers in the Torres Strait. 	<p>Pending</p> <p>Research priorities, including that detailed in this condition, are provided for discussion under Agenda Item 6.</p>
<p>Condition 7</p> <p>The Australian Fisheries Management Authority must not increase the existing annual 15 tonne total allowable commercial catch limit (TACC) for prickly redfish (<i>Thelelenota</i></p>	<p>On track</p> <p>Consistent with the Torres Strait BDM Fishery Harvest Strategy, the existing annual 15 tonne total allowable commercial catch limit (TACC) for prickly redfish (<i>Thelelenota ananas</i>) will remain in place until evidence, including population modelling, suggests an increased TACC is sustainable.</p>

<p><i>ananas</i>) in the Commonwealth Torres Strait Bêche-de-mer Fishery until evidence, including population modelling, suggests an increased TACC is sustainable.</p>	
<p>Condition 8</p> <p>By 25 May 2025 the Australian Fisheries Management Authority must implement an annual 10 tonne total allowable commercial catch limit (TACC) for amberfish (<i>Thelenota anax</i>) in the Commonwealth Torres Strait Bêche-de-mer Fishery. The Australian Fisheries Management Authority must not increase the TACC unless evidence, including population modelling, suggests an increased TACC is sustainable.</p>	<p>Pending</p> <p>For discussion at the HCRAAG and HCWG meetings in September 2024. The implementation of this condition will require amendments to the Torres Strait BDM Fishery licence conditions. Consistent with the Torres Strait BDM Fishery Harvest Strategy, the TACC for amberfish (<i>Thelenota anax</i>) will remain at 10 tonnes until evidence, including population modelling, suggests an increased TACC is sustainable.</p>
<p>Condition 9</p> <p>By 25 May 2025 the Australian Fisheries Management Authority must establish accurate ratios for converting between all processed and unprocessed forms of prickly redfish (<i>Thelenota ananas</i>) and amberfish (<i>T. anax</i>) used in the Torres Strait Bêche-de-mer Fishery.</p>	<p>Pending</p> <p>Research priorities, including that detailed in this condition, are provided for discussion under Agenda Item 6. Processing conversion factors already exist are in use for prickly redfish. For amberfish, the implementation of this condition will require amendments to the Torres Strait BDM Fishery licence conditions. Noting that this species is not currently caught in the Torres Strait BDM Fishery, existing conversion ratios applied in other jurisdictions or default conversion ratios may be able to be used in the interim. AFMA will further consult with DCCEEW on this condition.</p>
<p>Condition 10</p> <p>Environmental risks to the sustainability of the Torres Strait Bêche-de-mer fishery's management arrangements must be reviewed. This may be undertaken in conjunction with the next scheduled review of the ecological risk assessment for this fishery. Advice on outcomes of this assessment must be provided to Department of Climate Change, Energy, the Environment and Water following completion of the review.</p>	<p>Pending</p> <p>Research priorities, including that detailed in this condition, are provided for discussion under Agenda Item 6. The last ERA was completed in December 2021.</p>
<p>Condition 11</p> <p>By 25 May 2025 the Australian Fisheries Management Authority must commence interagency discussions with</p>	<p>Pending</p> <p>Yet to commence.</p>

<p>the Queensland Department of Agriculture and Fisheries to support coordination of monitoring and management of straddling or otherwise linked stocks in the Torres Strait Bêche-de-mer Fishery, Commonwealth Coral Sea Fishery, and the Queensland Sea Cucumber Fishery (East Coast). This may include review and further development of harvest strategy frameworks and fishery reference points; temporal and spatial closures; size limits; rotational zone size, timing and move-on provisions; research into life history parameters; Management Strategy Evaluation; and conversion ratios; among all three fisheries to reduce risk to species in the region.</p>	
<p>Condition 12 By 25 May 2026 the Australian Fisheries Management Authority must implement an enforceable 50 cm minimum size limit for prickly redfish (<i>Thelenota ananas</i>) and amberfish (<i>Thelenota anax</i>) unless scientific evidence can be provided to substantiate a deviation from this limit.</p>	<p>Pending For discussion at the HCRAg and HCWG meetings in September 2024. The implementation of this condition will require amendments to the Management Instrument. Good scientific evidence is available to support the current minimum size limit of 35 cm for prickly redfish (<i>Thelenota ananas</i>). AFMA will further consult with DCCEEW on this condition.</p>
<p>Condition 13 By 25 May 2025 the Australian Fisheries Management Authority must provide evidence to demonstrate there are biologically appropriate, precautionary, and enforceable biomass limits in harvest strategies for prickly redfish (<i>Thelenota ananas</i>) and amberfish (<i>Thelenota anax</i>) in the Torres Strait Bêche-de-mer Fishery.</p>	<p>Pending For discussion at the HCRAg and HCWG meetings in September 2024. The implementation of this condition may require further analysis of available data for amberfish.</p>
<p>Condition 14 By 25 May 2026 the Australian Fisheries Management Authority must review existing spatial management arrangements to ensure these arrangements are sufficient to manage the risk of localised depletion of sea cucumbers in the Torres Strait Bêche-de-mer Fishery.</p>	<p>Pending For discussion at the HCRAg and HCWG meetings in September 2024.</p>

<p>Condition 15</p> <p>By 25 May 2025 the Australian Fisheries Management Authority must ensure prickly redfish (<i>Thelenota ananas</i>) is managed as a 'Middle Tier' species or above under the harvest strategy for the Torres Strait Bêche-de-mer Fishery.</p>	<p>Pending</p> <p>For discussion at the HCRAg and HCWG meetings in September 2024. AFMA will further consult with DCCEEW on this condition.</p>
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Ms Anna Willock
Deputy Chief Executive Officer
Australian Fisheries Management Authority
GPO Box 7051
CANBERRA ACT 2610

Dear Ms Willock

I am writing to you as Delegate of the Minister for the Environment and Water in relation to the revocation and remaking of the Wildlife Trade Operation (WTO) declarations for the Commonwealth Coral Sea Fishery and Torres Strait Bêche-de-mer Fishery, to allow for continued export of CITES-listed *Thelenota* sea cucumbers.

On 25 November 2022, all *Thelenota* sea cucumbers were listed on Appendix II during the Nineteenth meeting of the CITES Conference of the Parties. Implementation of this listing was delayed until 25 May 2024.

Australia's CITES Scientific Authority has assessed the environmental performance all Australian fisheries that harvest and export these species, including the Commonwealth Coral Sea Fishery and Torres Strait Bêche-de-mer Fishery. This assessment determined that the harvest and trade of *Thelenota* species from Australia is sustainable, and provided conditions are met, will not be detrimental to, or contribute to trade, which is detrimental to, the survival or recovery of the species.

I have attached a copy of the relevant non-detriment finding assessment, which will be published on the department's website in the coming days. This non-detriment finding is subject to a range of conditions, which must be complied with for the species to be accepted by international trading partners.

I have revoked and remade the WTO approval for the Commonwealth Coral Sea Fishery and Torres Strait Bêche-de-mer Fishery, subject to these and pre-existing conditions. The WTO expiry dates remains as 30 November 2026 for the Torres Strait Bêche-de-mer Fishery, and 7 February 2027 for the Commonwealth Coral Sea Fishery. A copy of the conditions from the two WTOs are provided at **Attachments A and B** and have highlighted the new conditions which have been added to the existing WTO in yellow (to help you distinguish the changes).

Please note that a person whose interests are affected by the decisions may apply to the department for the reasons for the decisions and may also apply to the Administrative Appeals Tribunal to have the decision reviewed. I have enclosed information on these processes at **Attachment C**.

Yours sincerely

A handwritten signature in black ink, appearing to read 'BJago'.

Belinda Jago
Branch Head, Ocean and Wildlife Branch
Delegate of the Minister for the Environment and Water
20 May 2024

DCCEEW.gov.au

John Gorton Building - King Edward Terrace, Parkes ACT 2600 Australia
GPO Box 3090 Canberra ACT 2601 ABN: 63 573 932 849

OFFICIAL

Attachment A – Conditions on the declaration of an approved wildlife trade operation – Commonwealth Coral Sea Fishery, May 2024.

Condition 1

Operation of the Commonwealth Coral Sea Fishery must be carried out in accordance with the management arrangements in force under the *Fisheries Management Act 1991* (Cth) and Fisheries Management Regulations 2019 (Cth).

Condition 2

The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended material changes to the Commonwealth Coral Sea Fishery management arrangements that may affect the assessment against which *Environment Protection and Biodiversity Conservation Act 1999* decisions are made.

Condition 3

The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended changes to fisheries legislation that may affect the legislative instruments relevant to this approval.

Condition 4

The Australian Fisheries Management Authority must produce and present reports on the Commonwealth Coral Sea Fishery to the Department of Climate Change, Energy, the Environment and Water by 30 November annually, as per Appendix B of the Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition.

Condition 5

The Australian Fisheries Management Authority must review and publish updated risk assessments for the aquarium and line sectors of the Coral Sea Fishery. The updated risk assessments must consider current risks to target, bycatch and protected species as well as habitats and ecological communities. These assessments must consider currently available science to ensure the target species and fishery as a whole are managed to ensure ecological sustainability.

These risk assessments must be completed by the following dates:

- a) aquarium sector – 30 January 2025
- b) line sector – 30 January 2026

Following the completion of these risk assessments, appropriate management strategies must be implemented by 30 July 2026 for any risks identified as being high or greater and a copy provided to the Department of Climate Change, Energy, the Environment and Water once complete.

Condition 6

By 25 May 2025, the Australian Fisheries Management Authority must establish enforceable measures to ensure the harvest of prickly redfish (*Thelenota ananas*), amberfish (*T. anax*) and surf redfish (*Actinopyga mauritiana*) is appropriately conservative. Specifically, catch triggers must be implemented and the harvest of these species in a fishing season must not exceed:

- i. 12 tonnes for prickly redfish (*Thelenota ananas*)
- ii. 1 tonne for amberfish (*T. anax*)
- iii. 4 tonnes for surf redfish (*Actinopyga mauritiana*) with no more than 2 tonnes to be taken from any one reef per year.

Condition 7

The Australian Fisheries Management Authority must review, update as necessary and publish harvest strategies for the following sectors:

- a) By 25 May 2025 the sea cucumber harvest strategy. This review must consider and demonstrate whether the current biomass limit reference point is appropriate for the target species and provide evidence that the limits are biologically appropriate, precautionary, and enforceable.
- b) By 30 January 2026 the aquarium harvest strategy must be reviewed and updated as necessary.

Condition 8

By 26 May 2026 implement an enforceable 50cm minimum size limit for prickly redfish (*T. ananas*) and amberfish (*T. anax*) unless scientific evidence can be provided to substantiate a deviation from this limit.

Condition 9

By 25 May 2026, the Australian Fisheries Management Authority must review existing spatial management arrangements to ensure these arrangements are sufficient to manage the risk of localised depletion of sea cucumbers in the Coral Sea Fishery.

Condition 10

The Australian Fisheries Management Authority must:

- a) ensure the total allowable catch of species of the family Acroporidae does not exceed the catch limits in the Coral Sea Fishery – Aquarium Sector Harvest Strategy.
- b) by 1 July 2024,
 - revise the current Level 1 catch trigger for Acroporidae in the aquarium sector of the Coral Sea Fishery to include a limit of no more than 15 tonnes of *Acropora* spp. with the remaining 5 tonnes to be distributed between remaining genera in Acroporidae.
 - introduce an annual 10 tonne catch trigger for Acroporidae which requires a review of available information (including catch and effort data) and if either localised or broader sustainability concerns are identified, spatially appropriate management responses are implemented. Within three months of a review occurring, the outcome must be provided to the Department of Climate Change, Energy, the Environment and Water including what information was considered and any management responses required.
- c) by 1 July 2025, introduce effective management arrangements that distribute effort of coral harvest across different reefs in the Coral Sea to avoid localised depletion.
- d) The Australian Fisheries Management Authority must monitor the catch triggers within condition 9a and implement mechanisms that ensure timely reporting of coral catches.

Condition 11

The precautionary harvest and minimum size limits described in conditions 6 and 10 must be maintained until there is enough independent scientific evidence (including population modelling) to justify any increases limits or harvest levels.

Condition 12

By 1 July 2024, the Australian Fisheries Management Authority must require that all catch of CITES listed species (including discards) taken in the Commonwealth Coral Sea Fishery is recorded to a species level (or genus level where appropriate for Acroporidae corals) and that these catches are reported to the Department of Climate Change, Energy, the Environment and Water as part of the annual reporting requirement referred to in Condition 4.

Condition 13

By 13 December 2024, the Australian Fisheries Management Authority must develop, publish and distribute identification guides to licenced fishers for all shark species protected under

the *Environment Protection and Biodiversity Conservation Act 1999* which the Coral Sea Fishery may interact with.

Condition 14

If, during the term of this Wildlife Trade Operation approval, the Coral Sea experiences conditions that are likely to cause severe heat stress and coral bleaching, indicated by six consecutive Degree Heating Weeks, the Australian Fisheries Management Authority must meet with the Department of Climate Change, Energy the Environment and Water and Parks Australia to discuss appropriate management responses. This meeting should be pre-emptive to:

- a) Consider the extent and severity of impact over the Coral Sea; and
- b) Discuss and explore required fisheries management responses to reduce fishing pressure on sensitive target species and enable heat-sensitive target species to recover, particularly coral, marine aquarium fish and sea cucumbers.

Where it is determined by the Department of Climate Change, Energy, the Environment and Water (in consultation with Parks Australia and the Australian Fisheries Management Authority) that the declared bleaching event is unlikely to have severely impacted the Coral Sea, no restrictions to established fishery limits are required.

Condition 15

By 25 May 2025 the Australian Fisheries Management Authority must establish accurate ratios for converting between all processed and unprocessed forms of prickly redfish (*Thelenota ananas*) and amberfish (*T. anax*) used in the Coral Sea Fishery.

Condition 16

Environmental risks to the sustainability of the Coral Sea Fishery's management arrangements must be reviewed. This may be undertaken in conjunction with the next scheduled review of the ecological risk assessment for the fishery. Advice on outcomes of this assessment must be provided to the Department of Climate Change, Energy, the Environment and Water following completion of the review.

Condition 17

By 25 May 2025 the Australian Fisheries Management Authority must commence interagency discussions with the Queensland Department of Agriculture and Fisheries to support coordination of monitoring and management of straddling or otherwise linked stocks in the Commonwealth Coral Sea Fishery, Torres Strait Bêche-de-mer Fishery, and the Queensland Sea Cucumber Fishery (East Coast). This may include review and further development of harvest strategy frameworks and fishery reference points; temporal and spatial closures; size limits; rotational zone size, timing and move-on provisions; research into life history parameters; Management Strategy Evaluation; and conversion ratios; among all three fisheries to reduce risk to species in the region.

Attachment B – Conditions on the declaration of an approved wildlife trade operation – Torres Strait Bêche-de-mer Fishery, May 2024.

Condition 1

Operation of the Torres Strait Bêche-de-mer Fishery must be carried out in accordance with the management regime in force under the *Torres Strait Fisheries Act 1984* (Cth), *Torres Strait Fisheries Regulations 1985* (Cth), *Torres Strait Fisheries (Bêche-de-mer) Management Instrument 2022* and *Torres Strait Bêche-de-mer Fishery Harvest Strategy*.

Condition 2

The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended material changes to the Torres Strait Bêche-de-mer Fishery management arrangements that may affect the assessment against which *Environment Protection and Biodiversity Conservation Act 1999* (Cth) decisions are made.

Condition 3

The Australian Fisheries Management Authority must inform the Department of Climate Change, Energy, the Environment and Water of any intended changes to fisheries legislation that may affect the legislative instruments relevant to this approval.

Condition 4

The Australian Fisheries Management Authority must produce and present reports on the Torres Strait Bêche-de-mer Fishery to the Department of Climate Change, Energy, the Environment and Water by November annually, as per Appendix B of the *Guidelines for the Ecologically Sustainable Management of Fisheries – 2nd Edition*.

Condition 5

As part of the annual reporting requirement referred to in Condition 4, the Australian Fisheries Management Authority must report the following to the Department of Climate Change, Energy, the Environment and Water:

- a) the harvested weight and, where available, the number of individuals, their lengths and locations of harvest for all CITES listed species harvested in the Torres Strait Bêche-de-mer Fishery; and
- b) any assessments, management changes, or findings relevant to the management of CITES-listed species in the Torres Strait Bêche-de-mer Fishery.

Condition 6

The Australian Fisheries Management Authority must:

- a) by November 2024, provide the Department of Climate Change, Energy, the Environment and Water with a proposed timeline for the undertaking and completion of a multi-species stock survey of sea cucumbers in the Torres Strait; and
- b) by May 2026, have commenced the delivery of a multi-species stock survey of sea cucumbers in the Torres Strait.

Condition 7

The Australian Fisheries Management Authority must not increase the existing annual 15-tonne total allowable commercial catch limit (TACC) for prickly redfish (*Thelenota ananas*) in the Commonwealth Torres Strait Bêche-de-mer Fishery until evidence, including population modelling, suggests an increased TACC is sustainable.

Condition 8

By 25 May 2025 the Australian Fisheries Management Authority must implement an annual 10-tonne total allowable commercial catch limit (TACC) for amberfish (*Thelenota anax*) in the Commonwealth Torres Strait Bêche-de-mer Fishery. The Australian Fisheries Management Authority must not increase the TACC unless evidence, including population modelling, suggests an increased TACC is sustainable.

Condition 9

By 25 May 2025 the Australian Fisheries Management Authority must establish accurate ratios for converting between all processed and unprocessed forms of prickly redfish (*Thelenota ananas*) and amberfish (*T. anax*) used in the Torres Strait Bêche-de-mer Fishery.

Condition 10

Environmental risks to the sustainability of the Torres Strait Bêche-de-mer fishery's management arrangements must be reviewed. This may be undertaken in conjunction with the next scheduled review of the ecological risk assessment for this fishery. Advice on outcomes of this assessment must be provided to Department of Climate Change, Energy, the Environment and Water following completion of the review.

Condition 11

By 25 May 2025 the Australian Fisheries Management Authority must commence interagency discussions with the Queensland Department of Agriculture and Fisheries to support coordination of monitoring and management of straddling or otherwise linked stocks in the Torres Strait Bêche-de-mer Fishery, Commonwealth Coral Sea Fishery, and the Queensland Sea Cucumber Fishery (East Coast). This may include review and further development of harvest strategy frameworks and fishery reference points; temporal and spatial closures; size limits; rotational zone size, timing and move-on provisions; research into life history parameters; Management Strategy Evaluation; and conversion ratios; among all three fisheries to reduce risk to species in the region.

Condition 12

By 25 May 2026 the Australian Fisheries Management Authority must implement an enforceable 50cm minimum size limit for prickly redfish (*Thelenota ananas*) and amberfish (*Thelenota anax*) unless scientific evidence can be provided to substantiate a deviation from this limit.

Condition 13

By 25 May 2025 the Australian Fisheries Management Authority must provide evidence to demonstrate there are biologically appropriate, precautionary, and enforceable biomass limits in harvest strategies for prickly redfish (*Thelenota ananas*) and amberfish (*Thelenota anax*) in the Torres Strait Bêche-de-mer Fishery.

Condition 14

By 25 May 2026 the Australian Fisheries Management Authority must review existing spatial management arrangements to ensure these arrangements are sufficient to manage the risk of localised depletion of sea cucumbers in the Torres Strait Bêche-de-mer Fishery.

Condition 15

By 25 May 2025 the Australian Fisheries Management Authority must ensure prickly redfish (*Thelenota ananas*) is managed as a 'Middle Tier' species or above under the harvest strategy for the Torres Strait Bêche-de-mer Fishery.

Attachment C**Notification of Reviewable Decisions and Rights of Reviewⁱ**

There is a right of review to the Administrative Appeals Tribunal (AAT) in relation to certain decisions/declarations made by the Minister, the Minister's delegate or the Secretary under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Section 303GJ(1) of the EPBC Act provides that applications may be made to the AAT for the review of the following decisions:

- (a) to issue or refuse a permit; or
- (b) to specify, vary or revoke a condition of a permit; or
- (c) to impose a further condition of a permit; or
- (d) to transfer or refuse to transfer a permit; or
- (e) to suspend or cancel a permit; or
- (f) to issue or refuse a certificate under subsection 303CC(5); or
- (g) of the Secretary under a determination in force under section 303EU; or
- (h) to make or refuse a declaration under section 303FN, 303FO or 303FP; or
- (i) to vary or revoke a declaration under section 303FN, 303FO or 303FP.

If you are dissatisfied with a decision of a type listed above, you may:

1. by notice, provided in writing, request that the Minister or the Minister's delegate give you a statement in writing setting out the reasons for the decision as per section 28 of the *Administrative Appeals Tribunal Act 1975*. The Minister, or Minister's delegate may refuse to give you a statement of reasons if your application is made more than 28 days after the day on which you received this notice.
2. apply to the AAT for independent merits review of the decision. The AAT undertakes *de novo* merits review. This means they take a fresh look at the facts, law and policy relating to the decision and arrive at their own decision. They decide if the decision should stay the same or be changed.

Application for review of a decision must be made to the AAT within **28 days** after the day on which you have received the reviewable decision. However, an extension of time for lodging an application may be granted by the AAT under certain circumstances. Please visit the AAT's website at <http://www.aat.gov.au/> or telephone 1800 228 333 for further information. The role of the AAT is to provide a review mechanism that is fair, just, economical, informal and quick.

Applications & Costs

Applications to the AAT are made by lodging an Application Form (Form 1). This can be found on the AAT's website at <http://www.aat.gov.au/>.

There are no strict timelines in which the AAT must review the decision; however, the first conference between the parties will usually be held within 6 to 10 weeks of the application being lodged. The timeframe for review of certain decisions can be expedited in some circumstances.

¹ In accordance with the *Administrative Appeals Tribunal Act 1975* Code of Practice for Notification of Reviewable Decisions and Rights of Review

The cost of lodging an application for review is \$1082 (as of 8 April 2024) (GST inclusive). You may be eligible to pay a reduced fee of \$100.00 if:

1. legal aid has been granted for the review
2. you hold a health care card, pensioner concession card, Commonwealth seniors' health card or other card that certifies entitlement to Commonwealth health concessions
3. you are in prison, immigration detention or otherwise detained in a public institution
4. you are under 18 years of age
5. you receive Youth Allowance, Austudy or ABSTUDY Centrelink payments.

You may also be eligible for a reduced fee if you can demonstrate to the AAT that paying the full fee would cause you financial hardship. Further information can be found on the AAT's website.

Additionally, you can access information about legal assistance at:

<https://www.ag.gov.au/sites/default/files/2020-03/Legalfinancialassistanceinformationsheet.pdf>.

If you pay a standard application fee, most of it will be refunded if the case is resolved in your favour. The refund amount is the difference between the fee you paid and \$100. So, if you paid \$1082, you get back \$982. There is no refund if you paid the lower application fee for certain taxation decisions or the reduced fee of \$100.

Contact Details

Further information or enquiries relating to the decision should be directed to:

The Director
Sustainable Fisheries Section
Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601
Email: sustainablefisheries@dceew.gov.au

Alternatively, you may contact the AAT at their Principal Registry or the Deputy Registrar, Administrative Appeals Tribunal in your Capital City or Territory.

Administrative Appeals Tribunal
Street address: Level 6, 83 Clarence Street, Sydney
Mailing address: GPO Box 9955, Sydney, NSW 2001
T: 1800 228 333 and (02) 9276 5000
F: (02) 9276 5599
E: generalreviews@aat.gov.au
W: <http://www.aat.gov.au>

Freedom of Information Request

You may make an application under the *Freedom of Information Act 1982* (FOI Act) to access documents. Further information can be found at:

<https://www.dceew.gov.au/about/reporting/freedom-of-information>. Please contact the Freedom of Information Contact Officer at foi@environment.gov.au for more information.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
Research priorities for 2025/26	Agenda Item 6 For RECOMMENDATION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG):
 - a. **NOTE** the current status of funding for research projects relevant to Torres Strait hand collectables fisheries;
 - b. **DISCUSS** and **PROVIDE ADVICE** regarding research priorities for proposed funding in 2025/26 for inclusion in the draft rolling Five-Year Research Plan for Hand Collectables Fisheries for 2025/26 to 2029/30 (the Research Plan) (**Attachment 6a**). In doing so note the advice provided by the Hand Collectables Working Group (HCWG) at their meeting held from 18-19 October 2023;
 - c. **DISCUSS** and **PROVIDE ADVICE** regarding the three proposals received (**Attachments 6b-d**) in response to a special call for research released on 30 May 2024, for the following projects:
 - i. *Scientific stock survey of sea cucumber stocks in the eastern Torres Strait* – one proposal received;
 - ii. *Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef* – two proposals received.
 - d. **DISCUSS** and **PROVIDE ADVICE** regarding how to progress the scope for the project, *Collecting data on socio-economic indicators in the Torres Strait Beche-de-mer Fishery* (**Attachment 6e**). This scope was not included in the 2023 call for research, as further guidance is sought on what the social and economic data and information needs are for the Torres Strait Beche-de-mer (BDM) Fishery, including the purpose/objectives for collecting it, how it is to be used and the frequency of collection.

KEY ISSUES

Outcomes of the 2023 call for research

2. The Torres Strait Scientific Advisory Committee (TSSAC) met on 22-23 August 2023 to consider research priorities for Torres Strait fisheries for inclusion in their 2023 call for research. The Five-Year Research Plan for Hand Collectables Fisheries for 2024/25 to 2028/29, and associated scopes for three research priorities identified as essential were submitted for consideration. TSSAC included two of the three scopes in their call for research released on 8 September 2023:
 - a. *Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef*; and
 - b. *Management Strategy Evaluation of the BDM Fishery Harvest Strategy*.
3. At their meeting, TSSAC sought additional advice from the HCRAAG and HCWG regarding the following:
 - a. *Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef* – this scope was included in the call for research, however further advice was sought on the scale of survey required;

- b. *Collecting data on socio-economic indicators in the Torres Strait Beche-de-mer Fishery* – this scope was not included in the call for research, further guidance was sought on what the social and economic data and information needs are for the BDM Fishery, including the purpose/objectives for collecting it, how it is to be used and the frequency of collection.
4. Research proposals were due to the TSSAC secretariat by 30 October 2023 (after the HCRAAG and HCWG met). No proposals were received against the two scopes released in the 2023 call for research.

Currently funded research projects

5. There are currently three research projects that have been recently completed or are underway that are relevant to Torres Strait hand collectables fisheries:
 - a. *Research to support Beche-de-mer fisheries in Torres Strait* (AFMA project 2021-0815) – this project was completed in June 2023. Some outcomes from this project were considered at the HCRAAG and HCWG meetings held from 17-19 October 2023. The remaining outcomes concerning curryfish processing conversion factors, will be considered at the HCRAAG and HCWG meetings to be held in September 2024;
 - b. *Black teatfish size sampling and stock assessment update* (AFMA project 2023-0800) – this project was completed in June 2024. Outcomes from this project were considered at the HCRAAG and HCWG meetings held from 17-19 October 2023;
 - c. *Modelling climate change impacts on key fisheries resources in the Torres Strait to co-develop adaptation and mitigation strategies* – this project has been fully funded by the TSRA and commenced in November 2023. Relevant updates will be provided to the HCRAAG and HCWG as this project progresses.

TSSAC research budget for 2025/26

6. TSSAC is scheduled to meet on 28-29 August 2024 to discuss the next round of research funding for 2025/26. Assuming an available budget of \$420,000 in AFMA research funds and a minimum of \$225,000 from TSRA, it is expected there will be approximately \$645,000 available to fund ongoing and new research projects in 2025/26.
7. This baseline funding needs to cover all Torres Strait fisheries research, and TSSAC are responsible for considering competing priorities and making recommendations on how funding should be allocated across fisheries. It is also possible PZJA agencies will be able to source additional funding above this estimated base budget for critical projects, however this is considered against individual agency budget allocations each year. Having a complete list of essential and desirable research for each Torres Strait fishery is crucial in PZJA agency budget planning.
8. A detailed breakdown of committed TSSAC funds for multi-year projects from 2024/25 through to 2027/28 is provided at **Attachment 6f**.

Research priorities for 2025/26

9. HCRAAG advice is sought on research priorities for proposed funding in 2025/26 for inclusion in the Research Plan (**Attachment 6a**). Prompts indicating where particular HCRAAG advice is sought are highlighted in the Research Plan. Advice should include consideration of:
 - a. advice provided by the HCWG at their meeting held from 18-19 October 2023;
 - b. data, assessment and any other research needs identified under the BDM Fishery Harvest Strategy, including data, surveys and stock assessments to inform total allowable catch (TAC) setting;
 - c. data, assessment and any other research needs identified as a condition of Wildlife Trade Operation (WTO) approvals for Torres Strait hand collectables fisheries;

- d. the project objectives and component tasks, priority (essential/desirable), timing and indicative costing of each identified research priority to inform consideration of research priorities by TSSAC.

HCWG advice

10. The HCWG met on 18-19 October 2023 and recommended the inclusion of two research priorities in the Research Plan, pending HCRAAG consideration and advice:
 - a. targeted small-scale surveys for those species which are not surveyed effectively using the current methodology, including the survey of areas not currently covered (e.g. area south of seven reefs);
 - b. gonad staging for black teatfish.
11. The HCWG also referred the project, *Understanding biological parameters of BDM Fishery species, including growth, mortality, size and breeding seasonality*, to the HCRAAG for advice on whether it is essential rather than desirable.

Research priorities arising from WTO conditions

12. A further three research priorities have been identified through conditions of the WTO approval for the BDM Fishery (further details provided under **Agenda Item 5**), and have been included in the Research Plan:
 - a. a multi-species stock survey of sea cucumbers in the Torres Strait;
 - b. accurate ratios for converting between all processed and unprocessed forms of amberfish;
 - c. ecological risk assessment for the BDM Fishery.

Other research items

13. Since the last HCRAAG and HCWG meeting, AFMA have identified the need to seek advice on the frequency and indicative cost for analysing size data collected during black teatfish openings. At its last meeting, the HCRAAG also identified the need to review the minimum legal size (MLS) limits in the BDM Fishery. Both these items have been included as research priorities, for further discussion by the HCRAAG at this meeting.
14. HCRAAG advice is also sought on how to progress the project, *Collecting data on socio-economic indicators in the Torres Strait Beche de mer Fishery (Attachment 6e)*. This scope was not included in the 2023 call for research, as further guidance was sought by TSSAC on what the social and economic data and information needs are for the BDM Fishery, including the purpose/objectives for collecting it, how it is to be used and the frequency of collection. A smaller initial scoping project may assist to progress this priority, using the BDM Fishery as a case study.
15. To support HCRAAG deliberations, and for comment as needed, scopes for those projects currently listed as essential are provided at **Attachments 6e**. Scopes for any additional essential projects identified by the HCRAAG at this meeting will need to be developed and provided for comment out-of-session.

Special call for research

16. A condition of the WTO approval for the BDM Fishery is to commence the delivery of a multi-species stock survey of sea cucumbers in the Torres Strait by May 2026. This condition must be met in order to maintain the WTO approval for the fishery.
17. Noting the increased priority of this survey but also the significant funding involved to undertake such surveys, AFMA and TSRA have recently discussed possible funding sources outside of the limited (and largely committed) TSSAC research fund. On 30 May 2024, TSSAC made a special call for research, releasing two scopes. Three proposals were received:
 - a. *Scientific stock survey of sea cucumber stocks in the eastern Torres Strait* – one proposal received (**Attachment 6b**);

- b. *Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef* – two proposals received (**Attachment 6c and 6d**).
18. HCRAAG advice is sought regarding these proposals. Criteria used by the TSSAC to assess proposals is provided at **Attachment 6g**.

BACKGROUND

19. TSSAC operates under a Strategic Research Plan (SRP) which guides priority setting for research in Torres Strait fisheries over a five-year period. The SRP specifies the research priorities and strategies (summarised in **Attachment 6h**) that the PZJA intend to pursue in Torres Strait fisheries. The research priorities can be broad, covering all topics within the SRP, some of which may be funded by AFMA, and some of which may require funding from other funding bodies.
20. There are 3 research themes within the SRP, under which RAGs and WGs can identify research priorities. There are several strategies under each theme and suggested ideas to help RAGs and WGs to think about the sorts of projects which may fit within these themes and strategies. The TSSAC requires each fishery to develop a rolling five-year research plan, which fits into the themes identified in this SRP.
21. In August 2023, the TSSAC recommended that the SRP change form to be a higher level 1-2 page document. They recommended the SRP be much more visual, and simply include background, research priorities and some information on how research is enabled in Torres Strait. A draft of the new SRP 2024-2028 is provided at **Attachment 6i**. TSSAC welcome comments from the HCRAAG on the draft. The TSSAC hope to finalise the SRP at their August 2024 meeting. Rolling five-year research plans should be drafted using the existing SRP, noting the new one is not yet finalised.
22. The TSSAC has an annual research cycle, which fits with the AFMA budgeting cycle, details provided at **Attachment 6j**.



Five-year Research Plan 2025/26 – 2029/30

Torres Strait Hand Collectables Fisheries

Beche-de-mer
Pearl shell
Crab
Trochus



**COMPILED BASED ON ADVICE FROM THE HAND COLLECTABLES
RESOURCE ASSESSMENT GROUP (HCRAG) AND WORKING
GROUP (HCWG)**

29 July 2024

ABOUT THIS PLAN

The Torres Strait Scientific Advisory Committee (TSSAC) seeks input from each fishery advisory body (Resource Assessment Group (RAG), Management Advisory Committee (MAC) or Working Group (WG)) to identify research priorities over five year periods from 2025/26 to 2029/30. This template is to be used by the relevant advisory body to complete their five-year plan. The plans are to be developed in conjunction with the TSSAC Five-year Strategic Research Plan (SRP) with a focus on the three research themes and associated strategies within the SRP.

All fishery five-year plans will be assessed by the TSSAC using a set of criteria, and used to produce an Annual Research Statement for all Torres Strait fisheries.

The TSSAC then develop scopes for the highest ranking projects in order to publish its annual call for research proposals. There are likely to be more scopes that funding will provide for so TSSAC can consider a number of proposals before deciding where to commit funding.

The fishery five-year plans are to be reviewed and updated annually by the Torres Strait forums to add an additional year onto the end to ensure the plans maintain a five-year projection for priority research. Priorities may also change during the review if needed.

Table 1. Research priorities for Torres Strait Hand Collectable Fisheries for 2025/26 – 2029/30.

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
APPROVED RESEARCH (RECENTLY COMPLETED OR UNDERWAY)											
Research to support Beche-de-mer fisheries in Torres Strait (AFMA project 2021-0815)	<ol style="list-style-type: none"> Undertake new stock assessment modelling for white teatfish to allow species TAC to be reviewed under the Torres Strait Beche-de-mer Harvest Strategy. Develop processing conversion ratios for curryfish, with industry to undertake the sampling process. 	-	-	-	-	-	Completed June 2023	CSIRO in-kind	Essential		1
Black teatfish size sampling and stock assessment update (AFMA project 2023-0800)	<ol style="list-style-type: none"> Advise on size frequency sampling program for black teatfish during the 2023 fishery opening. Re-run black teatfish model using updated data: new data (size frequency), historical size frequency (survey) data and fishery catch data. 	-	-	-	-	-	Completed June 2024	CSIRO in-kind	Essential		1
Modelling climate change impacts on key fisheries resources in the Torres Strait to co-develop adaptation and mitigation strategies	<ol style="list-style-type: none"> Provide up-to-date evidence-based information to fishers and managers about current and future risks to fisheries associated with climate change. Investigate the impacts of climate change scenarios on fisheries/species in the short (2 year), medium (5 year) and long-term (20 years), also considering socio-economic and livelihood metrics. Scientific results will be used to inform stakeholders and co-develop adaptation strategies via workshops. 	\$178k	\$29k	-	-	-	Commenced November 2023	Funded by the TSRA	Essential		1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
Black teatfish size sampling program	1. Representative sampling to collect size and weight frequencies during the black teatfish openings.	\$30-40k	\$30-40k	\$30-40k	\$30-40k	\$30-40k	Annual sampling to be undertaken by the AFMA observer program, in partnership with communities	Funded via the AFMA fisheries budget	Essential		1
RESEARCH NEEDS FOR 2025/26											
Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef	<ol style="list-style-type: none"> Undertake a survey of sea cucumber stocks on Warrior Reef area with a focus on sandfish and other commercially important sea cucumber species (e.g., deepwater redfish and hairy blackfish). Observations on other commercially relevant hand collectable species known to occur on Warrior Reef (e.g., trochus, pearl shell) should also be collected where possible. Survey outputs are to be available in a form suitable for use under the BDM Fishery Harvest Strategy. Seek to collaborate with the PNG National Fisheries Authority to undertake a full-scale survey, to include the proportion of the sandfish stock found on Warrior Reef in the PNG Western Province Beche-de-mer Fishery. Produce stock size estimates and distribution data, and assess the fishery status for each sea cucumber stock on Warrior Reef. 						Subject to confirmation of support from lama and Tudu Island Traditional Owners, GBK, fishers and other relevant stakeholders. Initial engagement to be led by the TSRA regarding support for the project to be followed by subsequent consultation by AFMA on the draft project scope and potentially proposal following	Co-funding to be sought from the PNG NFA Researcher in-kind	Essential	1	1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
	<ol style="list-style-type: none"> 4. Use survey data and apply the BDM Fishery Harvest Strategy to make recommendations on total allowable catches and re-opening of closed species. 5. Map important habitat variables, especially those relevant to fishery production. 6. Seek to engage Torres Strait Islanders directly in the project, including providing for economic opportunities (e.g., employment). 						HCRAG review				
Collecting data on socio-economic indicators in the Torres Strait Beche-de-mer Fishery	<ol style="list-style-type: none"> 1. In consultation with the HCRAG and HCWG, determine the key social and economic data and information needs for the Torres Strait Beche-de-mer (BDM) Fishery, including the purpose/objectives for collecting it, how it is to be used and the frequency of collection. 2. Design a practical and cost-effective data collection method (e.g. interview-based survey of fishers and fishery workers), to collect the social and economic data and information needs identified for the BDM Fishery. 3. Collect the identified social and economic data and information using the designed method. 4. Provide a report on the outcomes of the data collection program, including: <ol style="list-style-type: none"> a. analyses of the collected data and information. For example, an analysis of differences in key socio-economic indicators (e.g. dependency, fishery income, target species and catch rates) among fisher types and 						Project may fall within the remit of ARC	Researcher in-kind	Essential	2	2

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
	<p>locations within the fishery. Analyses to be undertaken to be informed by advice from the HCRAAG and HCWVG;</p> <p>b. an assessment of how the data collection method met the objectives;</p> <p>c. how the social and economic data and information collected is to be used/applied;</p> <p>d. recommendations for further extension (e.g. incorporation into the management framework for the BDM Fishery);</p> <p>e. future data collection needs.</p>										
Management Strategy Evaluation of the Torres Strait Beche-de-mer Fishery Harvest Strategy	<ol style="list-style-type: none"> Collate all data and biological information. If sufficient information is available, define species-specific reference points for key species and determine the current status of stocks in relation to those species-specific reference points. Revise and update the spatial multi-species operating model developed for earlier projects (or construct a new model). Use Management Strategy Evaluation (MSE) to evaluate how well the Torres Strait Beche-de-mer (BDM) Fishery Harvest Strategy achieves the pre-specified objectives, including performance against the new species-specific reference points as appropriate. In consultation with stakeholders, use the MSE framework to investigate ways to improve the current BDM 						Requires 3-5 years of BDM Fishery Harvest Strategy implementation, Harvest Strategy implemented in 2020	Researcher in-kind	Essential	3	1, 2

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
	Fishery Harvest Strategy. For example, investigate options for BDM Fishery licence holders to make arrangements for a process that would allow the under-catch of the black teatfish TAC each year to be harvested in a way that disseminates benefits broadly, while safeguarding against an over-catch of the TAC.										
Scientific stock survey of sea cucumber stocks in the eastern Torres Strait	<p>1. Undertake a survey of sea cucumber stocks in the eastern region of the BDM Fishery. The survey is to focus on commercially important species, including but not limited to black teatfish, blackfish species, curryfish species, deepwater redfish, greenfish, prickly redfish, surf redfish and white teatfish. The survey is to include deep-water habitats (>20 metres). Survey outputs are to be available in a form suitable for use under the BDM Fishery Harvest Strategy. Given the BDM Fishery is a multi-species fishery, survey priority should be given to those target species which are actively fished (in particular those where annual catch is approaching the TAC), closed species and where there are concerns as to the uncertainty of a species stock status.</p> <p>Of important note, there are a number of species (deepwater blackfish, deepwater redfish, hairy blackfish and surf redfish) which are not effectively</p>						Condition of BDM Fishery WTO approval, to commence by May 2026	Researcher in-kind	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
	<p>surveyed under the existing protocols. Proponents should consider this in preparing a proposal.</p> <p>2. Produce stock size estimates and distribution data, and assess the fishery status for each sea cucumber stock in the eastern region of the BDM Fishery. Again, given the BDM Fishery is a multi-species fishery, priority for stock size estimates should be given to target species which are actively fished (in particular those where annual catch is approaching the TAC), closed species and where there are concerns as to the uncertainty of a species stock status.</p> <p>3. Use survey data and apply the BDM Fishery Harvest Strategy to make recommendations on total allowable catches and re-opening of closed species.</p> <p>4. Map important habitat variables, especially those relevant to fishery production.</p>										
Ecological Risk Assessment for the Torres Strait Beche-de-mer Fishery	<p>1. Conduct an Ecological Risk Assessment (ERA) for the Torres Strait Beche-de-mer Fishery.</p>						Condition of BDM Fishery WTO approval. Last ERA delivered December 2021	To be funded via the AFMA fisheries budget Researcher in-kind	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1
Processing conversion factors for amberfish	<p>1. Formulate processing conversion factors for amberfish.</p>						Condition of BDM Fishery WTO approval, to be	Researcher in-kind	Not assigned, to be discussed	Not assigned, to be discussed	1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
							implemented by May 2025		by HCRAG	by HCRAG	
Targeted scientific stock survey of sea cucumber stocks in the eastern Torres Strait	1. Undertake targeted small-scale surveys for those species which are not surveyed effectively using the current survey methodology.						Identified at HCWG20, to be discussed by HCRAG	Researcher in-kind	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1
Spawning period for black teatfish	1. Conduct gonad staging of black teatfish to determine the species' spawning period/s in the Torres Strait.						Identified at HCWG20, timing to be discussed by HCRAG	Researcher in-kind	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1
Black teatfish size sampling data analysis	1. Analysis of size data collected during black teatfish openings.						Identified by AFMA	May be funded via the AFMA fisheries budget	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1
Review of minimum legal size (MLS) limits in the BDM Fishery	1. Undertake a review of literature relevant to the setting of minimum legal size (MLS) limits in the BDM Fishery, and recommend changes as appropriate.						Identified at HCRAG03, timing to be discussed by HCRAG	Researcher in-kind	Not assigned, to be discussed by HCRAG	Not assigned, to be discussed by HCRAG	1
Understanding biological parameters of sea cucumber species, including growth,	1. Fill identified gaps in knowledge of biological parameters of sea cucumber species and investigate options for collaborative research. The MSE research project (listed above), if undertaken, will						To be addressed as the need arises. Conservative proxies currently in	Researcher in-kind	Desirable, HCWG20 requested this be discussed by HCRAG	3	1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
mortality, size and breeding seasonality	inform the parameters that are a priority.						use. Research need is best addressed through other avenues such as PhD projects and through QLDRAC given similar projects were recently funded by FRDC for finfish species in Queensland. Recent research undertaken on some parameters, to be considered further by HCRAG				
Supply chain	1. Better understanding of the value chains of sea cucumbers and sea cucumber products from Torres Strait and opportunities for improving economic returns to fishers.							Researcher in-kind	Desirable	Not assigned	2
Ecological Risk Assessment for the Torres Strait Pearl Shell Fishery	1. Conduct an Ecological Risk Assessment (ERA) for the Torres Strait Pearl Shell Fishery (TSPF).						Only needed when effort in the TSPF increases above negligible levels. There is some	To be funded via the AFMA fisheries budget	Desirable (once TSPF is active)	Not assigned	1

Project	Objectives and component tasks	Year project to be carried out and indicative cost					Notes on project timings	Other funding bodies	Evaluation		
		2025/26	2026/27	2027/28	2028/29	2029/30			Priority essential / desirable	Priority ranking (1-5)	Theme
							information on pearl shell stock estimates from tropical rock lobster surveys	Researcher in-kind			

Torres Strait Bêche-de-mer Fishery: Scientific stock survey of sea cucumber stocks in the eastern Torres Strait

Project need:

Scientific stock surveys of sea cucumber stocks in the Torres Strait Bêche-de-mer Fishery (BDM Fishery) have been undertaken since 1995. In the eastern Torres Strait, where sea cucumber stocks are concentrated, three full scale surveys were undertaken in 1995/96, 2002 and most recently 2019/20 with a further two abbreviated surveys in 2005 and 2009. Additionally, Warrior Reef sandfish population surveys have been carried out in 1995, 1998, 2000, 2002, 2004 and 2010.

The most recent survey undertaken in 2019/20 provided updated density and biomass estimates for sea cucumber stocks in the BDM Fishery. This survey in particular included, for the first time, examination of deep-water habitats (>20 m), focusing on species found at these depths (e.g. white teatfish). Data on environmental parameters was also collected to monitor important fishery biota and habitat. The survey data supported the development of a population model for black teatfish, status assessments for individual sea cucumber stocks and ongoing monitoring of trends in abundance.

There is a need under the [BDM Fishery Harvest Strategy](#) (November 2019) to monitor the status of sea cucumber stocks, including the recovery of overfished species. The Harvest Strategy details rules for the annual monitoring and adjustment of total allowable catch (TAC) limits, including for how to increase (or decrease) TACs if high quality fishery data are available (e.g. fishery dependent data and survey data). Survey data can be used to calculate density and biomass estimates to which the Harvest Strategy is applied to determine whether current TAC limits are appropriate. In considering whether to re-open fishing for a closed species (e.g. surf redfish), the Harvest Strategy requires the collection of the necessary data (e.g. through a stock survey) to first establish that the stock is above a limit reference point level and subsequently to inform the setting of an appropriately conservative TAC limit for a trial re-opening.

There are a number of existing protocols for survey design based on previous surveys and it is recommended that these be adhered to in designing future surveys for use as inputs to the BDM Fishery Harvest Strategy. This is also to ensure that any new data are consistent with and comparable to historical information and can therefore be used as an index of relative abundance. AFMA can provide further details and contacts, as needed, to interested proponents.

Desired outcomes:

Guided by requirements under the BDM Fishery Harvest Strategy, the project is required to:

1. Undertake a survey of sea cucumber stocks in the eastern region of the BDM Fishery. The survey is to focus on commercially important species, including but not limited to black teatfish, blackfish species, curryfish species, deepwater redfish, greenfish, prickly redfish, surf redfish and white teatfish. The survey is to include deep-water habitats (>20 metres). Survey outputs are to be available in a form suitable for use under the BDM Fishery Harvest Strategy. Given the BDM Fishery is a multi-species fishery, survey priority should be given to those target species which are actively fished (in particular those where annual catch is approaching the TAC), closed species and where there are concerns as to the uncertainty of a species stock status.

Of important note, there are a number of species (deepwater blackfish, deepwater redfish, hairy blackfish and surf redfish) which are not effectively surveyed under the existing protocols. Proponents should consider this in preparing a proposal.

2. Produce stock size estimates and distribution data, and assess the fishery status for each sea cucumber stock in the eastern region of the BDM Fishery. Again, given the BDM Fishery is a multi-species fishery, priority for stock size estimates should be given to target species which are actively fished (in particular those where annual catch is approaching the TAC), closed species and where there are concerns as to the uncertainty of a species stock status.
3. Use survey data and apply the BDM Fishery Harvest Strategy to make recommendations on total allowable catches and re-opening of closed species.
4. Map important habitat variables, especially those relevant to fishery production.

Information from the project is to be provided to AFMA and other Torres Strait stakeholders in the form of formal final reports and a plain English summary document. Special consideration is to be taken with Traditional Knowledge (TK).

Applicants wishing to submit a proposal can contact AFMA for further information.

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Torres Strait Bêche-de-mer Fishery: Management Strategy Evaluation of the Torres Strait Bêche-de-mer Fishery Harvest Strategy

Project need:

The Commonwealth Fisheries Harvest Strategy Policy (2018) (the Harvest Strategy Policy) requires that harvest strategies be formally tested to demonstrate that they are highly likely to meet the objectives of the Harvest Strategy Policy. Where appropriate, such testing should be conducted using methods such as Management Strategy Evaluation (MSE). MSE is a procedure whereby alternative management strategies are tested and compared using simulations of stock and fishery dynamics. MSE testing should be conducted as part of the development of new or updated harvest strategies to ensure that, before any such strategies are adopted, they have a high probability of achieving the objectives of the policy. Harvest strategy testing should identify conditions or circumstances under which the harvest strategy should be subject to review, revision, and re-evaluation, including when MSE testing should be redone. Whilst there is no Torres Strait Fisheries Harvest Strategy Policy, the Harvest Strategy Policy reflects best practice.

A harvest strategy for the Torres Strait Bêche-de-mer Fishery (BDM Fishery), was developed over a number of years, from 2017-2019, in close consultation with fishery stakeholders. The final harvest strategy (BDM Fishery Harvest Strategy) was adopted by the Protected Zone Joint Authority (PZJA) in November 2019 and implemented for the 2020 fishing season. In relation to Harvest Strategy Policy requirements, the development of the BDM Fishery Harvest Strategy was informed by an MSE used to evaluate management procedures for several other bêche de mer fisheries in Australia¹²³.

The Harvest Strategy Policy recommends an early review of a harvest strategy (i.e., earlier than the five year standard) if it is implemented without formal testing or evaluation using methods such as MSE. MSE should also be undertaken to test the effect of changing reference points on the performance of future harvest strategies. After three fishing seasons in operation, it is timely for the BDM Fishery Harvest Strategy to undergo formal MSE testing. The PZJA's Hand Collectables Resource Assessment Group and Hand Collectables Working group have also identified the development of species-specific reference points for key species as a priority, and which will require MSE testing.

Desired outcomes:

The project is required to:

1. Collate all data and biological information.
2. If sufficient information is available, define species-specific reference points for key species and determine the current status of stocks in relation to those species-specific reference points.

¹ Plagányi, É., Skewes, T., Dowling, N., and Haddon, M. 2011. Evaluating management strategies for data-poor bêche de mer species in Torres Strait. CSIRO/DAFF Report, Brisbane, Australia.

² Plagányi, E.E., Skewes, T.D., Dowling, N.A., and Haddon, M. 2013. Risk management tools for sustainable fisheries management under changing climate: a sea cucumber example. *Climatic Change* 119(1): 181-197. doi:DOI 10.1007/s10584-012-0596-0.

³ Plagányi, E.E., Skewes, T., Murphy, N., Pascual, R., and Fischer, M. 2015. Crop rotations in the sea: Increasing returns and reducing risk of collapse in sea cucumber fisheries. *P Natl Acad Sci USA* 112(21): 6760-6765. doi:10.1073/pnas.1406689112.

3. Revise and update the spatial multi-species operating model developed for earlier projects¹²³ (or construct a new model).
4. Use MSE to evaluate how well the BDM Fishery Harvest Strategy achieves the pre-specified objectives, including performance against the new species-specific reference points as appropriate.
5. In consultation with stakeholders, use the MSE framework to investigate ways to improve the current BDM Fishery Harvest Strategy. For example, investigate options for BDM Fishery licence holders to make arrangements for a process that would allow the under-catch of the black teatfish TAC each year to be harvested in a way that disseminates benefits broadly, while safeguarding against an over-catch of the TAC.

Applicants wishing to submit a proposal can contact AFMA for further information.

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Torres Strait Bêche-de-mer Fishery: Scientific stock survey of sandfish and other sea cucumber species on Warrior Reef

Project need:

Scientific stock surveys of sea cucumber stocks in the Torres Strait Bêche-de-mer Fishery (BDM Fishery) have been undertaken since 1995. There are strong spatial patterns in sea cucumber distribution in the BDM Fishery. Generally, sandfish (*Holothuria scabra*) is restricted to Warrior Reef (with some small extension to reefs south and east), and most other species are found east of Warrior Reef, in the eastern region of the Torres Strait. There are some species found in both areas (e.g. deepwater redfish, hairy blackfish, curryfish), but there is usually only minor overlap. The Papua New Guinea (PNG) sea cucumber fishery, which is primarily carried out on the northern Warrior Reef, is mostly sandfish.

Due to this spatial species pattern, for research purposes, the BDM Fishery has often been considered as two fishery areas – Warrior Reef (mostly based on sandfish); and the eastern Torres Strait that includes all reefs east of Warrior Reef and is based on a range of species.

Warrior Reef sandfish population surveys have been carried out in 1995, 1998, 2000, 2002, 2004 and 2010. In addition, to further assess the recovery of the sandfish population on Warrior Reef and investigate the feasibility of experimental fishing to monitor the fishery, a small experimental fishing exercise was undertaken in 2012.

Fishing for sandfish was closed in 1998 due to sustainability concerns following a considerable decline in abundance. The most recent full scale survey in 2019/20 did not cover the Warrior Reef complex so did not provide an update on the status of the sandfish stock. The last survey of sandfish in the Torres Strait was in 2010¹. From this survey, densities were estimated to be around 80% lower than in 1995, when the stock was already considered to be depleted. The mean density at 41 repeated sites (\pm standard error) in 2010 was 94 ± 50 sandfish per hectare, which was similar to the 2004 estimate (94 ± 25 sandfish per hectare), suggesting that there had been no recovery up to the time of the 2010 survey. A separate study estimated that a density of 1,600 sandfish per hectare would have been required to enable the 1,200 tonnes harvested in 1995². Densities reported from surveys in 2004 and 2010 were less than 6% of that level. This indicates that the stock was substantially reduced and likely below the limit reference point. Illegal fishing is thought to be a factor in this.

There is a need under the [BDM Fishery Harvest Strategy](#) (November 2019) to monitor the recovery of overfished species. In considering whether to re-open fishing for a closed species, the Harvest Strategy requires the collection of the necessary data (e.g., through a stock survey) to first establish that the stock is above a limit reference point level and subsequently to inform the setting of an appropriately conservative total allowable catch limit for a trial re-opening. Noting the sandfish stock

¹ Murphy, N.E., Skewes, T.D., Filewood, F., David, C., Seden, P., Jones, A. 2011. The Recovery of the *Holothuria scabra* (sandfish) population on Warrior Reef, Torres Strait. CSIRO Wealth from Oceans Flagship. Final Report, CMAR Cleveland. 44 pp.

² Skewes, T.D., Taylor, S., Dennis, D., Haywood, M., Donovan, D. 2006. Sustainability assessment of the Torres Strait Sea Cucumber Fishery, CRC-TS Project task number T1.4, CSIRO Marine and Atmospheric Research, Cleveland, Queensland.

has not been surveyed since 2010, a new survey is required to assess the status of the stock and to inform the consideration of a re-opening.

There are a number of existing protocols for survey design based on previous surveys and it is recommended that these be adhered to in designing future surveys for use as inputs to the BDM Fishery Harvest Strategy. This is also to ensure that new data are consistent with and comparable to historical information and can therefore be used as an index of relative abundance.

Desired outcomes:

Guided by requirements under the BDM Fishery Harvest Strategy, the project is required to:

1. Undertake a survey of sea cucumber stocks on Warrior Reef area with a focus on sandfish and other commercially important sea cucumber species (e.g., deepwater redfish and hairy blackfish). Observations on other commercially relevant hand collectable species known to occur on Warrior Reef (e.g., trochus, pearl shell) should also be collected where possible. Survey outputs are to be available in a form suitable for use under the BDM Fishery Harvest Strategy.
2. Seek to collaborate with the PNG National Fisheries Authority to undertake a full-scale survey, to include the proportion of the sandfish stock found on Warrior Reef in the PNG Western Province Beche-de-mer Fishery.
3. Produce stock size estimates and distribution data, and assess the fishery status for each sea cucumber stock on Warrior Reef.
4. Use survey data and apply the BDM Fishery Harvest Strategy to make recommendations on total allowable catches and re-opening of closed species.
5. Map important habitat variables, especially those relevant to fishery production.
6. Seek to engage Torres Strait Islanders directly in the project, including providing for economic opportunities (e.g., employment).

Information from the project is to be provided to AFMA and other Torres Strait stakeholders in the form of formal final reports and a plain English summary document. Special consideration is to be taken with Traditional Knowledge (TK).

The objectives above are with reference to a full scale survey. Pending advice, budget costings for both an abbreviated and full scale survey should be provided as part of proposals. Abbreviated surveys have been undertaken in the past and should be used as a guide when preparing a proposal. AFMA can provide further details and contacts, as needed, to interested proponents.

Applicants wishing to submit a proposal can contact AFMA for further information.

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Torres Strait Bêche-de-mer Fishery: Collecting data on socio-economic indicators in the Torres Strait Bêche-de-mer Fishery

Project need:

The Commonwealth Fisheries Harvest Strategy Policy (2018) (the Harvest Strategy Policy) provides a framework for the development of harvest strategies for Commonwealth managed fisheries. A harvest strategy sets out a decision framework necessary to achieve defined biological and economic objectives for commercial fish stocks in a given fishery. This includes processes for monitoring and assessing the biological and economic conditions of commercial fish species within a fishery against fishery-specific reference levels, as well as decision rules that control fishing activity according to the biological and economic conditions of the fishery. Whilst there is no Torres Strait Fisheries Harvest Strategy Policy, the Harvest Strategy Policy reflects best practice.

A harvest strategy for the Torres Strait Bêche-de-mer Fishery (BDM Fishery), was developed over a number of years, from 2017-2019, in close consultation with fishery stakeholders. The final harvest strategy (BDM Fishery Harvest Strategy) was adopted by the Protected Zone Joint Authority (PZJA) in November 2019 and implemented for the 2020 fishing season. The BDM Fishery Harvest recognises that data and information pertaining to the economic and social aspects of the fishery, complements that biological data currently used, to better understand the dynamics of the fishery and inform management decisions.

Social and economic data and information can be collected through a range of methods including, but not limited to, semi-structured interview-based surveys of fishers and fishery workers. Data and information that can be obtained are diverse and can include fishing effort, fishing activities, fishing income, motivations of fishers, economic importance and dependence, fishing costs, supply chain and value chain issues and opportunities, trade issues, cultural issues, perceptions of fishers (e.g. about stocks and management), changes in fishing strategies, and fishing gear use. In relation to data and information that would be useful to inform management of the BDM Fishery, these include:

- prices per species, which would both help understand demand drivers for the fishery, and support fishers planning their operations;
- mapping and analysis of value and supply chains, which would be useful to identify critical elements, strengthen the resilience of the supply chain and identify opportunities for value adding;
- characterisation of participants in the fishery;
- participants' vision for the fishery, to inform fishery management objectives;
- preferred management mechanisms, including incorporation of community-led management;
- perceptions of resource and habitat health.

Fishery dependent data currently collected by AFMA through the TBD02 catch disposal record (CDR) can provide an overview of the nature and extent of participation in the fishery by fishers across the region and should be used to inform the design of a project to collect economic and social data and information. The project will require close consultation with the HCRAG, HCWG and other relevant fishery stakeholders at each stage of the project.

Desired outcomes:

In close consultation with the HCRA, HCWG and other relevant fishery stakeholders at each stage of the project, the project is required to:

1. In consultation with the HCRA and HCWG, determine the key social and economic data and information needs for the BDM Fishery, including the purpose/objectives for collecting it, how it is to be used and the frequency of collection.
2. Design a practical and cost-effective data collection method (e.g. interview-based survey of fishers and fishery workers), to collect the social and economic data and information needs identified for the BDM Fishery.
3. Collect the identified social and economic data and information using the designed method.
4. Provide a report on the outcomes of the data collection program, including:
 - a. analyses of the collected data and information. For example, an analysis of differences in key socio-economic indicators (e.g. dependency, fishery income, target species and catch rates) among fisher types and locations within the fishery. Analyses to be undertaken to be informed by advice from the HCRA and HCWG;
 - b. an assessment of how the data collection method met the objectives;
 - c. how the social and economic data and information collected is to be used/applied;
 - d. recommendations for further extension (e.g. incorporation into the management framework for the BDM Fishery);
 - e. future data collection needs.

The report is to only include aggregated data that cannot be linked to individual fishers or businesses¹.

Please note, the scope of this project may change, pending final advice from the HCRA and HCWG at meetings in October 2023 on data and information needs and objectives. Depending on the outcomes of this discussion, any proposals submitted in response to this scope may need amendment. For details on the outcomes of these discussions, please contact AFMA on the contacts below.

Applicants wishing to submit a proposal can contact AFMA for further information.

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¹ Report must be compliant with requirements under AFMA's Information Disclosure policy.

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Committed Torres Strait Scientific Advisory Committee (TSSAC) funds for multi-year projects 2024/25 – 2027/28

Key

FUNDED

Project Title	Cost per year			
	2024/25	2025/26	2026/27	2027/28
FIS, stock assessment, Harvest Strategy and Recommended Biological Catch calculation for the Torres Strait TRL Fishery	\$338,429	(Estimate \$345,000)	(Estimate \$345,000)	(Estimate \$345,000)
Finfish Fishery: Coral Trout and Spanish Mackerel Biological Sampling 2021-2024	\$186,159	(Estimate \$190,000)	(Estimate \$190,000)	(Estimate \$190,000)
TS Spanish mackerel CKMR – contamination analysis (3 year project with stop/go after first year)	\$23,491	(\$240,000)	(\$240,000)	
Climate change project (Funded by TSRA)	\$881,755	\$177,980	\$29,202	
Total cost for all proposed projects (excluding Climate Change)	\$548,079	\$775,000	\$775,000	\$535,000
Predicted available research budget ¹ (excluding Climate Change)	\$548,079 \$420,000 AFMA \$128,079 TSRA ²	\$645,000 \$420,000 AFMA ³ \$225,000 TSRA ⁴	\$645,000 \$420,000 AFMA \$225,000 TSRA	\$645,000 \$420,000 AFMA \$225,000 TSRA
Available remaining funds or shortfall (factoring in TRL, Spanish Mackerel and CKMR projects ongoing and assuming available research budget moving forward)	\$0	-\$110,000	-\$110,000	~\$110,000

¹ This is an estimate of the minimum expected budget, noting sometimes PZJA agencies find additional funding for critical research above this amount. Further this amount is not guaranteed as a minimum.

² Includes \$90,000 rollover of underspent TSRA funds from 2023-24 FY and in principle support for remaining \$38,079

³ Assumed Government budget allocation

⁴ Estimate of an annual ongoing TSRA contribution

Torres Strait Scientific Advisory Committee (TSSAC) criteria for assessing research proposals

RANKINGS - does not meet (1), meets (2), exceeds (3), not applicable for this project (NA)

Attractiveness

Is there a priority need for the research (does it align with the Torres Strait Strategic Research Plan and Annual Research plan)?

Is/are the end-user/s identified?

Do the outcomes have relevance and are they appropriate to the end-users?

Should the outputs contribute towards outcomes and are they measurable?

Cost benefit analysis. Research projects are to be prioritised and funded in accordance with the need, risk, cost and expected benefits of the research to the fishery, ecosystem, industry and broader community.

Does the proposal actively engage Traditional Inhabitants and Torres Strait Islanders in the research?

Are there employment opportunities for Traditional Inhabitants and Torres Strait Islanders?

Does the research contribute to the knowledge that underpins ecosystem based fisheries management (EBFM) to improve the quality of decisions made?

Does the project involve capacity development for Communities? If so, TSSAC to discuss if there funding from other agencies such as the IRG or TSRA that could support this project.

Feasibility

Does the applicant and their team / resources have the capacity to produce the outputs?

Is the budget appropriate to meet the outputs and outcomes?

Does the proposal outline a coherent strategy surrounding data collection, analysis, and storage?

Does the proposal include appropriate plans (for example, adoption, communication and/or commercialisation plans) to ensure that the full potential of the research is realised through adoption of research outputs by end-users?

Are the methods scientifically sound, well described and consistent with the projects objectives?

Research will be most effective when there is effective engagement with fishery stakeholders, particularly Traditional Inhabitants of the Torres Strait, and where the research has widespread stakeholder support (refer to procedural framework for undertaking research in the Torres Strait and the TSSAC research application).

Does the project identify the key stakeholders and how they will be consulted regarding the project in a culturally appropriate way?

Consistent with the legislative responsibilities of the PZJA, the TSSAC will not deal with aquaculture research except for where there would be potential aquaculture/wild-stock interactions.

Torres Strait fisheries strategic research themes, strategies and research activities

Theme 1: Protecting the Torres Strait marine environment for the benefit of Traditional Inhabitants	
Aim: Effective management of fishery stocks based on understanding species and their biology and ecological dependencies so it can support Traditional Inhabitant social and economic needs.	
Strategy 1a - Fishery stocks, biology and marine environment	Possible research activities under this theme may include: <ol style="list-style-type: none"> a. Stock assessment and fishery harvest strategies for key commercial species. b. Ecological risk assessments and management strategies for fisheries. c. Minimising marine debris in the Torres Strait. d. Addressing the effects of climate change on Torres Strait fisheries through adaptation pathways for management, the fishing industry and communities. e. Incorporating Traditional Ecological Knowledge into fisheries management. f. Methods for estimating traditional and recreational catch to improve fisheries sustainability.
Strategy 1b – Catch sharing with Papua New Guinea	Possible research activities under this theme may include: <ol style="list-style-type: none"> a. Status of commercial stocks and catches by all sectors within PNG jurisdiction of the TSPZ. b. Good cross-jurisdictional fisheries management through better monitoring and use of technology.
Theme 2: Social and Economic Benefits	
Aim: Increase social and economic benefits to Traditional Inhabitants from Torres Strait Fisheries.	
Strategy 2a - Promoting social benefits and economic development in the Torres Strait, including employment opportunities for Traditional Inhabitants	Possible research activities under this theme may include: <ol style="list-style-type: none"> a. Models for managing/administering Traditional Inhabitant quota b. Understanding what influences participation in commercial fishing by Traditional Inhabitants. c. Understanding the role and contribution of women in fisheries. d. Capacity building for the governance of industry representative bodies e. Methods for valuing social outcomes for participation in Torres Strait fisheries. f. Identifying opportunities and take-up strategies to increase economic benefits from Torres Strait fisheries.
Theme 3: Technology and Innovation	
Aim: To have policies and technology that promote economic, environmental and social benefits from the fishing sector.	
Strategy 3a – Develop technology to support the management of Torres Strait fisheries.	Possible research activities under this theme may include: <ol style="list-style-type: none"> a. Electronic reporting and monitoring in the Torres Strait, including for small craft. b. Technologies or systems that support more efficient and effective fisheries management and fishing industry operations.

Torres Strait Scientific Advisory Committee Strategic Research Plan 2024–2028

For more information about TSSAC and our research in the Torres Strait, visit the PZJA website at pzja.gov.au or contact the AFMA Torres Strait Fisheries team on (07) 4069 1990 or torresstraitresearch@afma.gov.au.

Who we are

The Torres Strait Scientific Advisory Committee (TSSAC) is a Protected Zone Joint Authority (PZJA) advisory committee providing advice to the PZJA on use of research funds for Torres Strait fisheries research.

TSSAC includes members from the Australian Fisheries Management Authority (AFMA), the Torres Strait Regional Authority (TSRA), Fisheries Queensland, the Torres Strait Islander industry, and the scientific community.

What we do

TSSAC provides advice and recommendations in prioritising research across all Torres Strait fisheries.



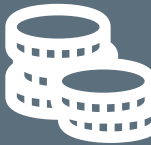





AFMA, as the secretariat of the committee, assesses milestone reports and advises on the use of funds to ensure research projects are achieving expected outcomes.

Our objectives

- **Develop research priorities** for Torres Strait fisheries in conjunction with resource assessment groups, management advisory committees and working groups, addressing the PZJA's management objectives.
- Review and **provide advice on individual fishery research plans** for Torres Strait fisheries.
- **Advise** the PZJA on allocating research funds.
- **Engage and inform** representatives of Torres Strait communities about proposed research and project outcomes.

Strategic research themes

Any research recommended by TSSAC for funding will help the PZJA achieve the objectives of the Act.

 <p>Undertake scientifically robust surveys, assessments and targeted scientific projects, which may include Traditional Ecological Knowledge, for risk-based management of fisheries resources, including the direct and indirect impacts of fishing on stocks and the broader ecosystem.</p>	 <p>Understand the relationship between fishing pressures and stock structures in the Torres Strait alongside other jurisdictions (such as Queensland and Papua New Guinea) and the implications for stock assessment and management.</p>	 <p>Identify and assist in developing resources and the optimal use of existing resources.</p>	 <p>Develop cost effective approaches for data capture, storage, and analysis to improve fisheries assessments.</p>	 <p>Address the effects of climate change on Torres Strait fisheries through adaptation pathways for management, for the fishing industry and communities.</p>	 <p>Understand what influences participation in commercial fishing by Traditional Inhabitants and explore ways to promote better engagement in under-utilised fisheries.</p>	 <p>Identify opportunities to increase economic, cultural, and social benefits arising from Torres Strait fisheries.</p>	 <p>Develop, review, and advance harvest strategies to streamline decision making processes, optimise economic return, and instil confidence in management practices.</p>
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Key enablers

AFMA provide secretariat support to TSSAC including organising meetings, managing research contracts and project milestones, linking research teams with Torres Strait community representatives, and publishing final project reports on the PZJA website.

The communication of research outcomes to non-scientific audiences include summary documents on project outcomes and implications for fisheries management, and these are published online and provided to relevant Torres Strait stakeholders.

PZJA continues to facilitate greater involvement of Torres Strait Islanders in fisheries research and management through capacity development and collaborative approaches in research projects.

Research objectives

This plan responds to the complex research needs for Torres Strait fisheries where the management environment pursues sustainability objectives alongside social, economic, and cultural objectives.

Research carries high costs. In an economic environment of competing funding pressures there is a reliance on PZJA advisory committees for strategic planning to deliver the best long-term return on research investment.

There are significant social objectives in managing Torres Strait fisheries and returns on investment may need to be assessed differently to a typical western economic value model. Assessing the value of research against broader objectives will assist the PZJA pursue the social objectives of the Act, alongside the more routinely measured economic and environmental objectives.

TSSAC research cycle timeline

TSSAC PROCESS	
July (START)	July - RAGs, WGs and MACs to update five year rolling research plan and specify their priority research needs for funding in the next financial year (12 months time). Provide to TSSAC EO by end July.
August	Start to mid-August, Annual Research Statement (ARS) and TSSAC papers sent for consideration before end August meeting. Late August - TSSAC meets (face to face or via teleconference) to finalise the PZJA ARS and agree on priorities/ scopes for the TSSACs call for research proposals.
September	Early sept - call for research opens (6-8 weeks given due to more complex proposal for Torres Strait research).
October	end October - proposals due.
November	AFMA draft budgets due.
December	Mid December - RAG comments due on proposals (6 weeks).
January	TSSAC papers sent ahead of meeting.
February	Early February- TSSAC meet face to face to recommend research proposals for funding (pending community pre-consultation). Mid-Feb – researchers notified of conditional support for project, which requires community pre-consultation before final support. Researchers to develop and provide pre-consultation package to TSSAC EO (2 weeks). TSSAC EO to send pre-consultation packages to relevant PBC, councillors and fishers associations (for relevant projects). PIs to follow up with phone calls (2 weeks). NOTE AFMA budgets finalised mid to late Feb, hence timings for this meeting.
March	Late March – researchers submit a summary of feedback from pre-consultation to TSSAC EO.
Early April	TSSAC meet via teleconference to discuss outcomes of pre-consultation. If no / minimal and supportive comments received only, then send out of session for consideration instead of teleconference. Mid-April – researchers notified of final endorsement of project and process for contracting. EO to work with research team to arrange drafting of contracts.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
Review of the BDM Fishery Harvest Strategy	Agenda Item 7 For RECOMMENDATION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG):
 - a. **RECALL** at HCRAAG 03, AFMA was tasked with developing TAC undercatch carryover provisions for black teatfish to allow for up to 10% of the current fishing season's TAC, if not caught, to be carried over from the current season to the subsequent season;
 - b. **RECOMMEND** public consultation be undertaken on the draft amendment to the Torres Strait Beche-de-mer Fishery Harvest Strategy (the BDM Fishery Harvest Strategy) (**Attachment 7a**);
 - c. **NOTE** the final amendment to the BDM Fishery Harvest Strategy, and any comments received through public consultation process, will be provided to the next meeting of the HCRAAG for further consideration.

KEY ISSUES

Black teatfish undercatch carryover

2. At HCWG19, held on 10 November 2022, the HCWG recommended the continuation of the 20 tonne TAC for black teatfish and sought advice from the HCRAAG on:
 - a. the anticipated duration of an annual 20 tonne catch limit, noting a few more years of data is required to increase certainty on what future annual TACs might be possible;
 - b. the scientific basis for the development and application of undercatch carryover provisions; and
 - c. options for the review of the BDM Fishery Harvest Strategy to include provisions to carry over undercatch and set provisional TACs.
3. At HCRAAG03, held on 17-18 October 2023, the HCRAAG considered the development of undercatch carryover provisions for black teatfish. HCRAAG scientific members advised that they had no concerns with the development of TAC undercatch carryover provisions for black teatfish. It was noted that the life history of the species was suited to the arrangement (longer lived). It was also noted that management strategy evaluation (MSE) testing showed that the arrangement did not raise sustainability risks for the species.
4. Taking into account the scientific advice, HCRAAG03 agreed with AFMA's recommendation for the development of TAC undercatch carryover provisions for black teatfish to allow for up to 10% of the current fishing season's TAC, if not caught, to be carried over from the current season to the subsequent season. As part of discussions, it was clarified that the undercatch carryover amount would not be able to be carried over for more than one season (i.e. if it is not caught in the subsequent season, it cannot be carried over again).
5. Given the nature of management arrangements for black teatfish openings, the TAC for the last four openings has been undercaught (12% in 2021, 14.5% in 2022, 10.5% in 2023 and 21.5% in 2024). Industry stakeholders have been supportive of the development of TAC undercatch

carryover provisions for black teatfish, in the HCRAg, HCWG and other forums (BDM Workshop held in March 2023).

6. In the intersessional period, AFMA have drafted the following amendment to the BDM Fishery Harvest Strategy (refer to page 22 of **Attachment 7a**):
 - a. *For black teatfish, if the current fishing season's TAC is not fully caught, then up to 10% of the current fishing season's TAC, if not caught, can be carried over from the current fishing season to the next fishing season. The undercatch amount cannot be carried over for more than one fishing season.*
7. HCRAg advice is sought on any changes to the draft amendment. If the draft amendment is supported, AFMA proposes to undertake public consultation prior to the next HCRAg and HCWG meetings in September 2024, with a view to implement the amendment for the 2025 fishing season. As this entails an amendment to the BDM Fishery Harvest Strategy, it will require approval by the PZJA prior to implementation.

Other amendments

8. Also at HCRAg03, the HCRAg recommended the BDM Fishery Harvest Strategy be reviewed to clarify the high tier decision rules, to provide for stock assessments that are undertaken out of cycle with fishery independent surveys, to be taken into account in setting TACs. This work has yet to be undertaken.

BACKGROUND

9. TAC overcatch is currently accounted for under the BDM Fishery Harvest Strategy. Under the Low Tier Catch-Based Decision Rule (decision rule 2.11.1.1) TACs are monitored and adjusted annually, with agreement that a fishery will be closed if no data are provided. Overcatch of the TAC may result in a corresponding reduction from the TAC the following year, a 1 year pause in fishing, or a closure of the species, depending on the severity of the overcatch. However, there is currently no provision in the BDM Fishery Harvest Strategy for the carryover of TAC undercatch.
10. AFMA have implemented overcatch and undercatch arrangements in some key Commonwealth fisheries, under [Fisheries Management Policy 10](#). While this policy does not apply to Torres Strait fisheries, it contains some key principles (some of which are not directly applicable to non-quota managed fisheries) that can be used to guide the implementation of such arrangements:
 - a. in quota managed fisheries, a correctly set and sufficiently precautionary TAC is the primary management tool for pursuing sustainability and economic efficiency.
 - b. the use of undercatch/overcatch arrangements can provide flexibility in the fishery, although it is recognised that such arrangements are likely to constrain the efficient operations of the quota market and may impact negatively on sustainability.
 - c. to minimise such distortions, the parameters for such arrangements should reflect the characteristics of the species/fishery in which they operate but generally percentage/quantity levels should be minimal (10 percent or below) or zero.
 - d. the level of undercatch/overcatch must be taken into account when setting a TAC. The level of undercatch is particularly important where TACs need to be reduced. If there is a high possibility that a TAC needs to be reduced or there is uncertainty in stock assessment advice, then it is preferable not to set a high undercatch/overcatch for that species.
 - e. undercatch/overcatch arrangements should be set in conjunction with TACs for a fishing year and not varied once in place.



Australian Government
Australian Fisheries Management Authority

Torres Strait Beche-de-mer Fishery Harvest Strategy

August 2024

CONSULTATION DRAFT

This harvest strategy is based on outcomes from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Oceans and Atmosphere Division project, *Harvest Strategies for the Torres Strait Beche-de-mer (sea cucumber) Fishery*. The project was funded by the Australian Fisheries Management Authority (AFMA).

AFMA Project No. 2016/0823.

Project Authors: Éva Plagányi (Principal Investigator), Nicole Murphy, Tim Skewes, Mibu Fischer, Leo Dutra, Natalie Dowling, Margaret Miller

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Glossary

Types of reference points:

Reference Point	Description
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
B_{TARG}	Biomass target reference point - the desired biomass of the stock

Other acronyms:

Acronym	Description
AFMA	Australian Fisheries Management Authority
BDM	Beche-de-mer
CPUE	Catch per unit effort
CSIRO	Commonwealth Scientific and Industrial Research Organisation
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

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).

Acronym	Description
HCWG	Hand Collectables Collectables Working Group
HS	Torres Strait Beche-de-mer Fishery Harvest Strategy
HSF	Harvest Strategy Framework
HSP	Commonwealth Harvest Strategy Policy and Guidelines 2018
MSE	Management Strategy Evaluation - a procedure whereby alternative management strategies are tested and compared using simulations of stock and fishery dynamics ¹
PZJA	Protected Zone Joint Authority
RBC	Recommended Biological Catch
RNTBC	Registered Native Title Body Corporate
TAC	Total Allowable Catch
Tiered approach	A framework that uses different control rules to cater for different levels of uncertainty about a stock
TSRA	Torres Strait Regional Authority
QDAF	Queensland Department of Fisheries and Agriculture

Overview

The Torres Strait Sea Cucumber or Beche-de-mer 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 a stock, the analytical procedures and the rules applied to determine the recommended biological catch each fishing season.

The need to formalise a harvest strategy for the Torres Strait Beche-de-mer fishery has been discussed at management forums (e.g. Hand Collectables Working Group HCWG) for some time. In consultation with the HCWG, AFMA, TSRA, QDAF, Malu Lamar (Torres Strait Islander) Corporation RNTBC and other stakeholders, CSIRO have led drafting a scientifically-sound harvest strategy.

The HS describes a clear and transparent protocol, agreed on by stakeholders, for monitoring, information gathering, assessment and management into the foreseeable future. It applies to all Torres Strait BDM species, with these classified into groups; closed species, target species, curryfish species and basket species.

The HS depends critically on fishery data provided through the Torres Strait Fish Receiver System that was implemented on 1 December 2017. The strategy specifies the data that are needed to effectively manage the fishery and how these data will be used to adjust catch limits and manage the fishery to meet the biological, social and economic objectives.

The HS framework is a tiered system which accounts for understanding that more data and more information reduces the risk to a resource and reduces the need for precautionary management. This means higher catch limits are possible if there are more, better quality data available.

The HS uses data from fishers and surveys (where available). Primary Indicators (in order of importance) from fisher data are:

- a) Catch per species per day (including discards) converted to gutted weight (using revised conversion ratios compiled as part of the HS)
- b) Catch Per Unit Effort (CPUE) – requires Effort (e.g. hours fished)
- c) Proportional composition of different species in catch if individual species mass is not recorded
- d) Size composition (per species) of a representative catch sample
- e) Area (and depth) of each species caught (preferably fine-scale information)

The HS includes different rules for the following cases:

1. Monitoring and adjusting TACs annually, with agreement that a fishery will be closed if no catch-reported data are provided.
2. Rules for managing mixed species/basket catch limits. Species specific monitoring is necessary to support future growth of the fishery. This requires as many target species as possible to be monitored as individual species. Species specific data collection will help support future development of selected species in response to growing market demands.
3. Rules for how to increase TACs if high quality fishery data are available and indicate an increase is possible

4. Rules for how to further increase TACs if high quality survey data become available.
5. Rules for how to re-open a fishery that has been closed. This includes fisheries that have been closed due to overfishing (e.g. sandfish), concerns about underreporting (e.g. black teatfish), or due to TACs being exceeded. There are guidelines for supporting species recovery and improved catch reporting as well as how surveys (either full scale scientific surveys or smaller experimental surveys with fisher participation) can be used to inform whether the fishery could be re-opened.

The strategy also includes some static controls such as minimum size limits and the option for spatial closures to complement fishery management measures and other traditional community management initiatives (e.g. a proposed 10 nautical mile voluntary spatial closure on fishing for prickly redfish around home reefs).

The HS meets the requirements of the *Commonwealth Fisheries Harvest Strategy Policy and Guidelines 2018* (HSP) by applying a precautionary approach as well as a tiered approach that applies different harvest control rules (HCR) 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 stock status. This intends to maintain the same level of risk across the different tiers.

Harvest Strategy development is an ongoing process, with the immediate requirement for some basic primary indicators which can be used in setting rules to inform first order decisions. Simultaneously the HS maps a pathway for ongoing improvements and refinements, through further data collection and a clear role for community-level data and local knowledge.

The HS has been developed in close consultation with stakeholders, incorporates local knowledge and has been designed to have regard to traditional knowledge and the ability for communities to manage fishery resources locally (e.g. voluntary spatial closures), through acknowledging and incorporating customary and traditional laws.

1 Background

This Harvest Strategy has been developed in accordance with the *Commonwealth Fisheries Harvest Strategy Policy and Guidelines 2018* (HSP) and is consistent with objectives of the *Torres Strait Fisheries Act 1984* (the Act).

The Protected Zone Joint Authority (PZJA) is responsible for management of commercial fishing in the Australian waters of the Torres Strait Protected Zone. The PZJA objectives adopted for the Torres Strait Beche-de-mer Fishery are:

- to provide for the sustainable use of all Beche-de-mer stocks in Torres Strait;
- to develop Beche-de-mer stocks for the benefit of Australian Traditional Inhabitants (as defined by the Torres Strait Treaty); and
- to develop an appropriate long term management strategy for sandfish.

The HS has been designed to have regard to traditional knowledge and the ability for communities to manage fishery resources locally (e.g. voluntary spatial closures), through

acknowledging and incorporating customary and traditional laws where relevant. It is recognised that there are differing cultural laws for individual nation groups which may be applied by communities to supplement fishery management measures. These include Malo ra GELAR (Malo's Law) of Kemer Kemer Meriam Nation, Saabi law of Maluialgal Nation, Saabi law of Gudamalulgal Nation and Kulkalgal Nation and Saabi law of Kaurareg Nation.

The HS uses a tiered approach to cater for different amounts of data available and different species groups and types of assessments (e.g. target species with species-specific Catch-Per-Unit-Effort (CPUE) and surveys). Underpinning a tiered HS is increased levels of precaution with increasing levels of uncertainty about the stock status. Each tier has its own HCR and associated rules that are used to determine an RBC.

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 fishing in the Torres Strait Protected Zone, 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.

1.2 Development of the BDM Harvest Strategy

The HS has been developed in close consultation with the HCWG (and as part of HS development workshops led by CSIRO) and involving a broader group of stakeholders (3 November 2016; 27-29 June 2017; 25-26 October 2017; 24-26 July 2018; 23-24 October 2018; 1-2 August 2019 and out of session 16-30 September 2019).

2 The Beche-de-mer Fishery Harvest Strategy

2.1 Scope

This HS applies to the whole Torres Strait Beche-de-mer Fishery comprised of 18 commercial species (Table 1).

The HS outlines the control rules used to develop advice on the recommended biological catch (RBC) and recommend Total Allowable Catches. The HS sets the criteria that pre-agreed management decisions will be based on in order to achieve the Fishery objectives.

Over time, the HS will be subject to periodic reviews and updates with ongoing opportunities to refine and improve the strategy in future. Summaries of local knowledge, observations, preferences, outcomes of local management practices including community-specific closures and spatial rotations as to where fishing takes place could be used in an iterative manner to continually improve the HS and ensure customary practices receive appropriate acknowledgement.

Table 1. Summary of key Beche-de-mer species in Torres Strait.

Common name	Scientific name	Common name	Scientific name
Sandfish	<i>Holothuria scabra</i>	Deepwater redfish	<i>Actinopyga echinites</i>
Surf redfish	<i>Actinopyga mauritiana</i>	Curryfish vastus	<i>Stichopus vastus</i>
Black teatfish	<i>Holothuria whitmaei</i>	Burrowing blackfish	<i>Actinopyga spinea</i>
White teatfish	<i>Holothuria fuscogilva</i>	Deepwater blackfish	<i>Actinopyga palauensis</i>
Prickly redfish	<i>Thelenota ananas</i>	Golden sandfish	<i>Holothuria lessoni</i>
Hairy blackfish	<i>Actinopyga miliaris</i>	Brown sandfish	<i>Bohadschia vitiensis</i>
Curryfish common	<i>Stichopus herrmanni</i>	Leopardfish	<i>Bohadschia argus</i>
Elephant trunkfish	<i>Holothuria fuscopunctata</i>	Greenfish	<i>Stichopus chloronotus</i>
Lollyfish	<i>Holothuria atra</i>	Stonefish	<i>Actinopyga lecanora</i>

2.2 Objectives

The objectives of this Harvest Strategy are:

- a) to provide for the sustainable use of all Beche-de-mer in Torres Strait to take account of long-term sustainability for future generations;
- b) to develop Beche-de-mer populations for the benefit of Australian Traditional Inhabitants (as defined by the Torres Strait Treaty) and accommodating commercial considerations;
- c) to acknowledge area-specific issues;
- d) where possible, to consider an ecosystem approach to management that reduces impacts on, or optimises interactions with, other harvested and dependent species and acknowledges the important ecological role of sea cucumbers and
- e) to develop long-term recovery strategies for species, where appropriate.

2.3 Recommending TACs From RBCs

The Recommended Biological Catch (RBC) is the recommended total catch of BDM (both retained and discarded) that can be taken from throughout the area by the Fishery in a fishing season. The HSP states that when setting the TAC for the next fishing season the HS should take into account all sources of fishing mortality.

2.4 Monitoring

The Fishery is monitored by a range of methods listed below. Currently there is no ongoing monitoring strategy in place to collect economic information. In addition, very limited historical fishery-dependent monitoring data are available as catch reporting was only made compulsory in December 2017. It is anticipated that there will be a time lag before reliable catch and effort data are available for analysis.

The HS therefore outlines a starting point in terms of data collection, analysis and use to inform decision making, however this may need to be revised as more data become available and as data needs arise. It is acknowledged that development of a harvest strategy is an ongoing process, with the immediate requirement for some basic primary indicators which can be used in setting rules to inform first order decisions. Simultaneously the strategy clearly maps a pathway for ongoing improvements and refinements, including further data collection as well as a clear role for community-level data and local knowledge.

2.4.1 Fishery independent surveys

There are a number of surveys and other biological studies (Long et al. 1996; Skewes et al. 2000; Skewes et al. 2002; Skewes et al. 2010) conducted in Torres Strait which have been used to inform aspects of harvest strategy development. Fishery-independent surveys are highly recommended where appropriate to inform decisions related to whether increases or decreases in TACs may be warranted. Considering the costs of surveys relative to the value of the fishery, its multispecies nature and spatial heterogeneity, there are a range of different survey types that could be used as inputs to the HS. These include:

- a) Small-scale experimental fishing surveys with local fisher participation and possible cost-recovery via fishers being permitted to sell animals surveyed;

- b) Species-specific dedicated surveys (which could be conducted by fishers and/or scientists) and are tailored to effectively survey stocks that are not otherwise easily included in more general surveys, e.g. white teatfish (due to depth), black teatfish (due to high value and sensitivity to overexploitation), deepwater redfish (restricted distribution)
- c) Full-scale scientific surveys conducted over a large representative area and surveying multiple species.

There are a number of existing protocols for survey design based on previous surveys and it is recommended that these be adhered to in designing future surveys for use as inputs to the HS. This is also to ensure that new data are consistent with and comparable to historical information and can therefore be used as an index of relative abundance. Most surveys will yield an index of relative stock abundance, however some of the above survey designs could also be used to estimate total standing stock biomass. To be useful for management, surveys need to demonstrate that they are conducted in an adequately representative manner and underpinned by scientific principles, and therefore all references to survey data in the HS assume that the survey design and execution have been approved by qualified scientific expertise.

2.4.2 Catch and effort information

Fishers are required to record catch information on Torres Strait Catch Disposal Records (TDB02) as part of the mandatory Fish Receiver System. This includes reporting the total mass of each species landed, as well as the processing method so that conversion ratios (see Table 4) can be used to convert all reported catch to a standard weight (wet gutted). It is important that these records also include an accurate estimate of the total discards (which includes product lost in the processing phase). Accurate total catch per species, including discards needs to be provided in a timely manner and is a critical data input to the low tier decision rules. While catch disposal records do not require reporting of discards, changes to reporting requirements may be needed to facilitate this.

It is important that total catches are separated by species and where there is uncertainty regarding accurate species identification, it is recommended that representative photos of the catch be taken for later identification (e.g. with the assistance of scientists or experienced industry persons). In this instance the catch record reference needs to be stored with the photos. For species such as curryfish with a mixed bag of similar species (and in instances where it isn't practical to separate the species due to handling and processing constraints), the proportion of each individual species (in particular *Stichopus herrmanni* and *S. vastus*) should be estimated (noting that several fishers have indicated they are able to distinguish these species in a variety of product forms – alternatively, representative photos of the catch should be provided). A Torres Strait Beche-de-mer species identification guide is available to assist in identifying individual species (Murphy et al. 2019).

Catch per day and per spatial location are needed to support scientific assessments of the fishery (lumped and stockpiled data are less useful). Other very useful data to support scientific assessment include fishing effort (e.g. hours fished) and size of animals caught. Information about the area where the sea cucumbers were caught is extremely valuable and needs to be recorded as accurately as possible. If high quality area-specific and depth information are recorded, these data could be used as inputs to the middle tier decision

rules. The provision of effort information under the TDB02 is voluntary, but is strongly encouraged to support scientific assessments of the fishery. Detailed logbook information including fishing effort, area fished and depth supplied on HC01 Daily Fishing Log can be completed and submitted now on a voluntary basis. This data is treated by AFMA as confidential.

Fishing effort is a key measure that is used to calculate Catch-Per-Unit-Effort (CPUE) which can serve as an index of abundance and inform on stock status and trends. The default unit of effort is assumed to be one day, but data quality can be improved by recording the total number of hours per trip (corresponding to the catch landed), and number of fishers in the vessel. High quality CPUE data are needed as inputs to decision rules that can be used to adjust TACs upwards or downwards. If no regular fishery-independent (survey) data are available, high quality CPUE data provide a valuable input that can be used to support decision making and progression to the middle tier.

For some high value target species or species with a restricted distribution, the CPUE data are expected to index a single species only, and this should be obvious from the data entries submitted. For catches comprised of mixed species, the total catch and effort information are still useful provided an accurate breakdown of the component species is provided. If a fishing trip involved targeting different species or areas, data would be most useful for analyses if an estimate is provided of the total time spent on different activities.

Note also that in some instances, (e.g. when re-opening a fishery) additional constraints may be imposed on the recording of catch and effort information.

2.4.3 Catch sub-sampling information

Estimates of the size distribution of individual species are additional data required as inputs to the middle tier decision rule for use in adjusting TACs. It isn't necessary to measure every animal caught, however accurate measures of the length and mass of a representative (by area and species) sub-sample is an important data input. Size frequency sub-sample information could be collected by volunteers, nominated fishers or trained fish receivers. These data could also be complemented by additional detailed information such as the proportion of each species comprising a mixed bag catch.

2.4.4 Environmental Indicators

Data on environmental indicators are not currently collected in the BDM fishery. However, as a longer term objective for the fishery, some fishers indicated as part of the HS workshops that they were eager to undertake local reporting and to take responsibility for local management. As such, a framework was developed to operationalise these indicators in a decision framework to provide a defensible basis on which to make recommendations for local management measures. The hierarchical decision tree framework considered two groups of local indicators: "primary" local indicators (those felt to be most reliable/important, and thus invoking the greatest change in management), and "secondary" local indicators (used to make further, more minor adjustments to management recommendations). Examples of indicators include condition of feeding grounds (algae abundance etc.), density estimated from diver camera surveys, surveys of dead individuals on the beach and perceived extent of illegal, unreported or unregulated (IUU) fishing. This framework is described in Plagányi et al. (2019) as no such data are currently available for evaluation,

but if these data are collected on a regular basis in future, then it might be possible to more formally incorporate them in the HS given that it is anticipated the HS will regularly be revised and updated in future years.

2.4.5 Information based on local knowledge

The stated objective of acknowledging and incorporating local knowledge and the ability to locally manage resources has been achieved to some extent as all elements of the HS, developed in close consultation with Traditional Owners, have been supported by local indigenous knowledge. For example:

- Species targeted, processing challenges, discard rates, areas fished, species distribution
- Local knowledge has informed which strategies are likely to be successful and implementable
- Local knowledge being used to propose additional management measures, such as voluntary spatial closures for sensitive species

In addition, customary practices are being acknowledged and included as “voluntary” (i.e. self-managed) components of the HS.

2.5 Static Management Controls

The Harvest Strategy framework (Figure 1) identifies a number of static controls that can be implemented to complement and strengthen other management actions. The key static controls used to strengthen the HS are as described below, with dynamic (i.e. changing over time) controls outlined in later sections of this document.

2.5.1 Size limits²

Recent research on Australia’s sea cucumber fisheries recommended that for data-poor species in regions where more sophisticated management controls are difficult to implement (Plagányi et al. 2015) a minimum legal size (MLS) limit enhances benefits. Where data are available to inform as to the choice of this, it should be selected to protect at least the first age-at-maturity. Table 5 summarises recommended HS size limits.

2.5.2 Spatial and temporal closures

Beche-de-mer temporal/seasonal closures are not currently implemented as a compulsory component of this HS but could be used as an additional management measure by local communities and may be more formally incorporated in future versions depending on level of support and need. An example of industry proposed spatial closures discussed during HS workshops can be found at Figure 7.

2.6 Species Classification

The HS recognises that the TS BDM fishery is a multispecies fishery comprising species with different life histories, economic value, distributions and fishing pressure. All species have therefore been assigned to one of four species categories as described in Table 2.

² This HS includes recommended changes in some current size limits to bring them in line with updated information on the age-at-first-maturity as well as to better align them with comparable size limits from other fisheries such as the East Coast Beche-de-mer Fishery.

Species may change categories over time depending on available information and the associated management decisions made.

Table 2. TS BDM species category definitions as at November 2019.

Category	Examples of species in category as at November 2019	Category definition
Closed	sandfish surf redfish black teatfish	Species closed to fishing due to concerns of overfishing or stock depletion, underreporting, or significant overcatch of the TAC
Target species	white teatfish prickly redfish hairy blackfish deepwater redfish greenfish	Target species with own individual TAC
Curryfish	3 curryfish species	Increasingly targeted curryfish species
Basket species	all other species	Remaining species basket with trigger to identify species of growing commercial interest

2.7 Total Allowable Catch (TAC)

Changes to the TACs (pre-Harvest Strategy implementation, see Table 3) are recommended to reflect the revised classification of the component fishery species into categories. Starting TACs and trigger limits are based on a series of stock surveys carried out between 1995 and 2011 (Skewes et al., 2010; Murphy et al., 2011), and estimates of fishery harvests up to 2018. Starting TACs under the HS have been set at less than 10% of population biomass and are designed to be sustainable medium-term annual limits that result in low risk to overexploitation. The trigger limits are even more conservative and include species with a high uncertainty in population estimates and/or biological parameters, allowing for potential increase if more information on species stock status is forthcoming. Changes in market value and demand mean that several additional species were identified as target species needing to have specific TACs or triggers (with associated actions). These include curryfish, greenfish, hairy blackfish and deepwater redfish (Table 3).

Table 3. Starting HS TAC Recommendations

Common name	Scientific name	Commercial value	Pre-HS TAC (t) ³	Recommended HS Starting TAC (t)	Basket triggers (t)	Notes	Max middle tier TAC increase (based on indicators) before needing survey	Max recorded historical catch and year (not necessarily sustainable catch)
Sandfish	<i>Holothuria scabra</i>	High	Closed	Closed			5	1200t (1995)
Surf redfish	<i>Actinopyga mauritiana</i>	Medium	Closed	Closed			5	60.2t (1998)*
Black teatfish	<i>Holothuria whitmaei</i>	High	Closed	Trial 15t			25	52.7t (1996)
White teatfish	<i>Holothuria fuscogilva</i>	High	15	15			20	16.3t (2014)
Prickly redfish	<i>Thelenota ananas</i>	High	15 (↓ from 20)	15			20	28.1t (2015)
Deepwater redfish	<i>Actinopyga echinites</i>	Medium	Part of 80t basket	5 [#]			40t based on surveys	5.5t (2015)*
Hairy blackfish	<i>Actinopyga miliaris</i>	Medium	Part of 80t basket	5			10 (lower CI survey as uncertain)	28.5t (2001)
Greenfish	<i>Stichopus chloronotus</i>	Medium	Part of 80t basket	40t			40	1.2t (2002)
Curryfish common	<i>Stichopus herrmanni</i>	Medium	Part of 80t basket	60t curryfish			60 (herrmanni)	6.1t (2015); 15t (mid-2018)
Curryfish vastus	<i>Stichopus vastus</i>	Medium	Part of 80t basket	60t curryfish	15	new trigger	20 (vastus)	see curryfish
Elephant trunkfish	<i>Holothuria fuscopunctata</i>	Low	Part of 80t basket	Part of 50t basket	15	existing trigger	15	0.4t (2004)
Lollyfish	<i>Holothuria atra</i>	Low	Part of 80t basket	Part of 50t basket	40	half existing	80	0
Burrowing blackfish	<i>Actinopyga spinea</i>	Medium	Part of 80t basket	Part of 50t basket	5	trial new species	10 (survey e.g. high around Warrior)	0
Deepwater blackfish	<i>Actinopyga palauensis</i>	Medium	Part of 80t basket	Part of 50t basket	0.5	previous catch	10	0.5t (2001)*
Golden sandfish	<i>Holothuria lessoni</i>	High	Part of 80t basket	Part of 50t basket	0.5	previous catch	5	0.35t (2014)
Brown sandfish	<i>Bohadschia vitiensis</i>	Medium	Part of 80t basket	Part of 50t basket	3	previous catch	5	3.4t (2002)
Leopardfish	<i>Bohadschia argus</i>	Medium	Part of 80t basket	Part of 50t basket	40	existing trigger	40	9.6t (2003)
Stonefish	<i>Actinopyga lecanora</i>	Medium	Part of 80t basket	Part of 50t basket	5	existing trigger	5	0.5t (2010)
TOTAL			110t	205t [§]			415t	

Notes: [§] including trial openings for black teatfish; # catches over 2013-15 approx 5.5t/yr; * possible misidentification

³ Prior to Harvest Strategy implementation, the TACs for most species were set based on a conservative estimate of biomass from historical surveys.

2.8 Reference Points

There were no existing adopted proxy reference points consistent with the HSP for the Torres Strait BDM fishery, and it isn't necessarily sensible to derive these because of the highly variable nature of the fishery as well as the cost-benefit relationship when considering the large spatial area that would need to be reliably assessed for relatively small catches of some species. Instead, starting TACs are set conservatively and in that respect reflect an intention to meet the HSP. Additionally, the HS proposes use of some reference point proxies that are fairly conservative and consistent with the HSP.

Where required, proxies for reference points were based on Plaganyi et al. (2015) as follows:

The unfished biomass B_0 – defined as the pristine or survey-based spawning biomass estimate, noting however that with large recruitment variability, it is possible for populations to exceed B_0 in some years, or conversely appear severely depleted in other years, even in the absence of fishing.

The limit biomass B_{LIM} – a more conservative value (than the default harvest strategy limit reference point) of $0.4 * K$ is used. Where available, survey data are used to select a lower limit reference level below which stock density is considered unacceptably low and the fishery should be closed – see example in Figure 5 and Figure 8. A threshold limit can also be specified as the level above which the fishery is allowed to re-open.

The target biomass B_{TARG} – it's difficult to define a proxy for the HSP target biomass because of the large natural variability (both in time and space) and insufficient data. For some species such as sandfish an estimate can be obtained based on historical survey data and/or comparison with densities in less fished areas (see Figure 8).

F_{TARG} , F_{LIM} and F_{MSY} – as above, it is difficult to derive sensible estimates of these quantities, and none currently exist. It is also difficult to estimate fishing mortality in practice because accurate catch records are needed, as well as regular assessments of resource status. Some of the TAC estimates are based on applying pre-existing conservative fishing mortalities to conservative biomass estimates.

The HS is tailored to the specific data available for this fishery, and a range of indicators are used to inform on the status of each species. The status of each stock depends on comparison with agreed Reference Points as specified. For example, if total catch exceeds a pre-specified limit or CPUE is below a pre-specified limit reference level then it may indicate that a species is being fished too heavily. An assessment process is therefore needed to assess the current status and trends in the biomass of each species. A decision rule is then used to describe what action is needed to adjust catch limits to achieve desired targets and satisfy the overall fishery objectives.

2.9 Stock Assessment Cycle

The Hand Collectables Working Group (HCWG) meets at least once annually to review all available catch data as well as primary indicators data, and advises on analyses needed as well as any future monitoring needs and revisions to the HS.

2.10 Data Summary

The annual data summary reviews the catch and catch per unit effort (CPUE) from the fishery as well as all other information, including the size-frequency information provided from sub-samples of commercially caught BDM. The data summary is used as an indicator to identify if catches correspond to the RBC, and to monitor CPUE.

2.11 Decision Rules

In order to manage the TS BDM stocks to meet the operational objectives of the HS and the BDM Fishery more broadly, the HS includes a mix of approaches as described above:

- a) Effort controls and temporal closures;
- b) Spatial management;
- c) Total Allowable Catches to limit total amount caught; and
- d) Complementary minimum size limits to allow animals a chance to breed before being caught.

A summary of the harvest strategy framework is provided below, and includes Decision Rules specified within each tier.

Low Tier:

- i. **Catch-based Decision Rule** – TACs are monitored and adjusted annually, with agreement that a fishery will be closed if no data are provided. Overcatch of the TAC may result in a corresponding reduction from the TAC the following year, a 1 year pause in fishing, or a closure of the species, depending on the severity of the overcatch.
- ii. **Joint TAC trigger-limit Decision Rule** – Basket species are managed under a joint TAC with species specific triggers. If the trigger limit of an individual basket species is exceeded by more than 10 per cent, all available information must be considered and changes to basket TACs or individual basket species trigger limits may be possible.

Middle Tier:

- i. **Multiple Indicator Decision Rule** – TACs may be increased or decreased if high quality fishery data are available from at least two primary indicators. The potential increase to TACs may be capped at a specified level depending on the proportional change (10% or more) in the multiple indicator adjustment factor. If the proportional change in the multiple indicator adjustment factor is less than 10%, the TAC stays the same.

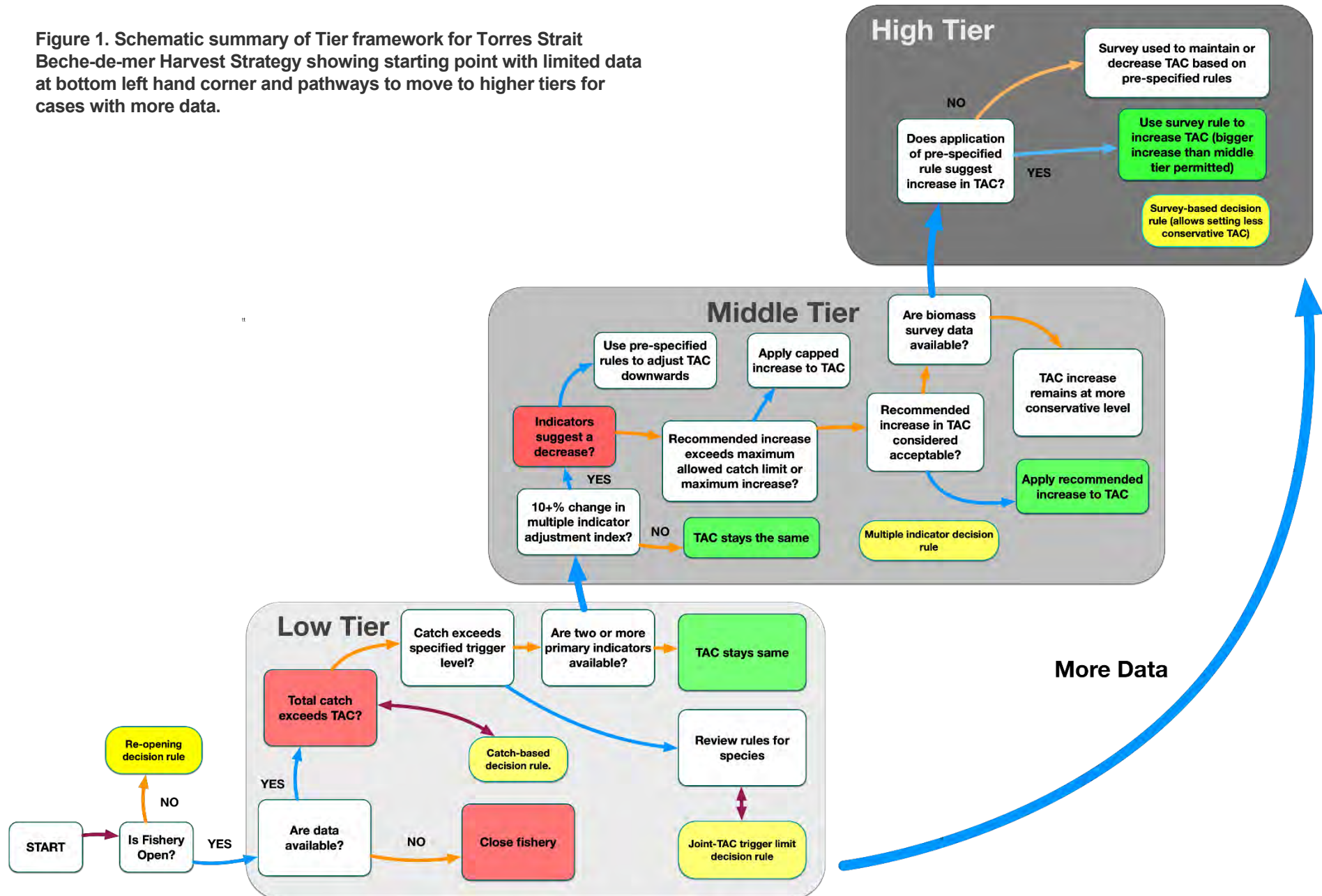
High Tier:

- i. **Survey-based Decision Rule** – TACs may be increased or decreased using high quality survey data based on trends or total biomass estimates.

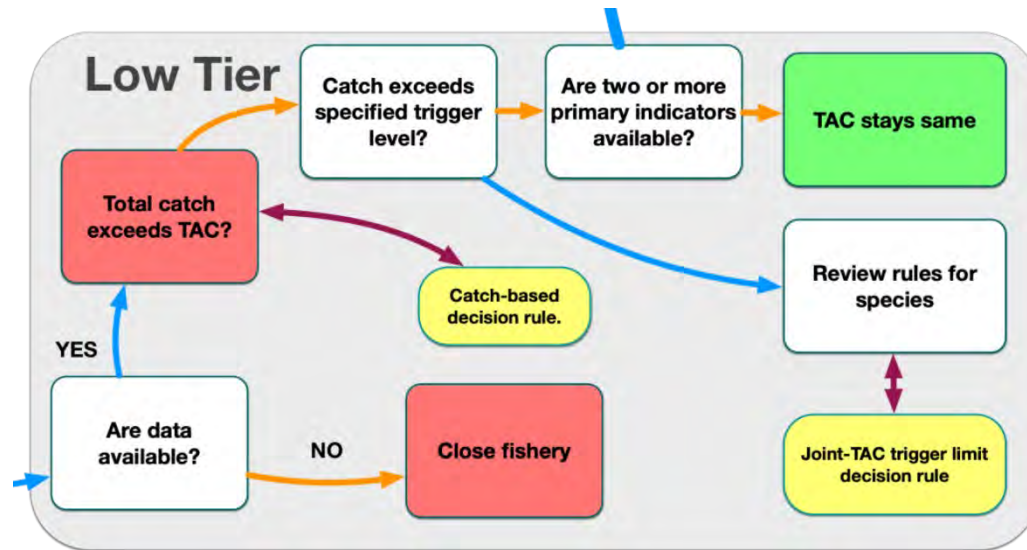
Closed Species:

An additional **Re-opening Decision Rule** applies for species that have been closed to fishing due to concerns of overfishing or stock depletion, significantly exceeding catches beyond the TAC, or in the absence of reported catches.

Figure 1. Schematic summary of Tier framework for Torres Strait Beche-de-mer Harvest Strategy showing starting point with limited data at bottom left hand corner and pathways to move to higher tiers for cases with more data.



2.11.1 Low Tier Decision Rules



When is the low tier applied?

In the absence of data other than the total amount of reported catch by species or combined basket.

What are the decision rules?

There are two decision rules that operate within the low tier:

- Catch-based decision rule
- Joint TAC trigger-limit decision rule

What do the decision rules allow?

For species with individual TACs, the low tier allows the TAC to either be maintained or reduced depending on the information available. A transition to the middle tier, and increased TACs is not possible unless two or more primary indicators are available.

For species with individual triggers, within a basket with a joint TAC, the low tier may allow changes to the joint TAC, or individual triggers, depending on the information available.

2.11.1.1 Low Tier Catch-Based Decision Rule

This is a low tier rule that is applied to all species in the absence of data other than total annual catch per species:

1. If no reliable catch-reported data, then TAC = 0;
2. If reported catches exceed the TAC by more than double, close the fishery;
3. If reported catches exceed the TAC by >20% and <100% (double), then pause fishing for one fishing season;
4. If the cumulative reported catches over a three year period exceed the TAC by >5% and <20%, then deduct the total overcatch from the TAC in the next full fishing season;
5. For black teatfish, if the current fishing season's TAC is not fully caught, then up to 10% of the current fishing season's TAC, if not caught, can be carried over from the current fishing season to the next fishing season. The undercatch amount cannot be carried over for more than one fishing season.

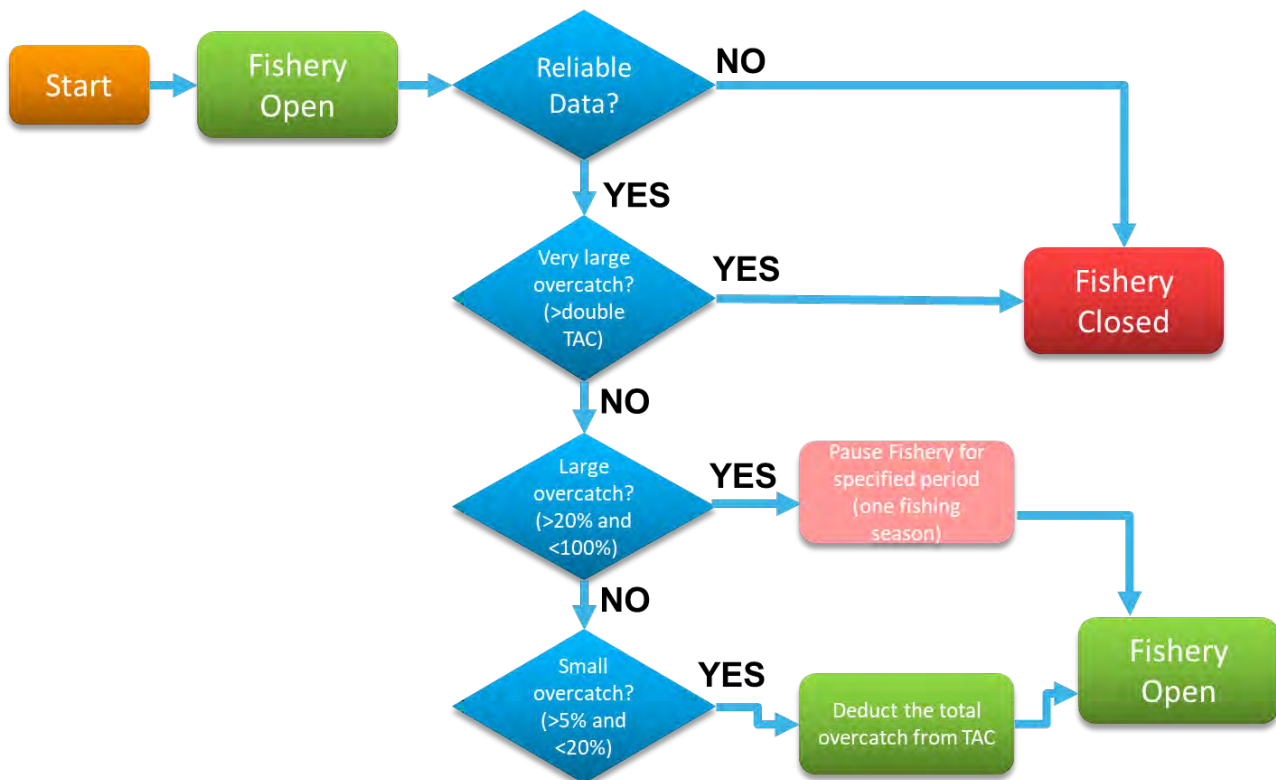


Figure 2. Flowchart summarising low tier catch-based decision rule.

2.11.1.2 Low Tier Joint TAC Trigger-Limit Decision Rule

This is a low tier rule that is applied to species with specific triggers within a basket:

1. Calculate the total catch (including discards) of all species in the species basket;
2. Calculate the estimated total catch of each species, either from direct species-specific catch data or from (representative) catch samples used to infer proportional abundance of different species;
3. If the catch of any species exceeds the species-specific trigger (Table 3) by more than 10%, then collect data and information to decide whether:
 - a) to make a change to the basket TAC, or individual species trigger, or
 - b) a species-specific TAC is justified, or
 - c) a closure is deemed necessary, or
 - d) recommend further data be collected (e.g. in the form of a survey, or indicator before any change to the joint TAC or trigger limit is allowed.

Such data and information may include but is not limited to, updated information on stock distribution, stock status or biomass estimates from nearby fisheries (e.g. Queensland East Coast BDM Fishery) of the same species, or new information on life history characteristics, biology, or market value.

The current TAC and trigger limit will remain in place unless the above (3a – d) suggests a change. For basket species groups, triggers are specified such that when the catch of a particular species reaches or exceeds a trigger, the reasons need to be established and appropriate management action implemented (Figure 3). This could include specifying the need for additional data to monitor the expansion of a fishery for a species, a good example being the recent growth in fishing effort on curryfish (*Stichopus hermanni* and *S. vastus*) due to improved processing methods and market opportunities (Purcell et al., 2014).

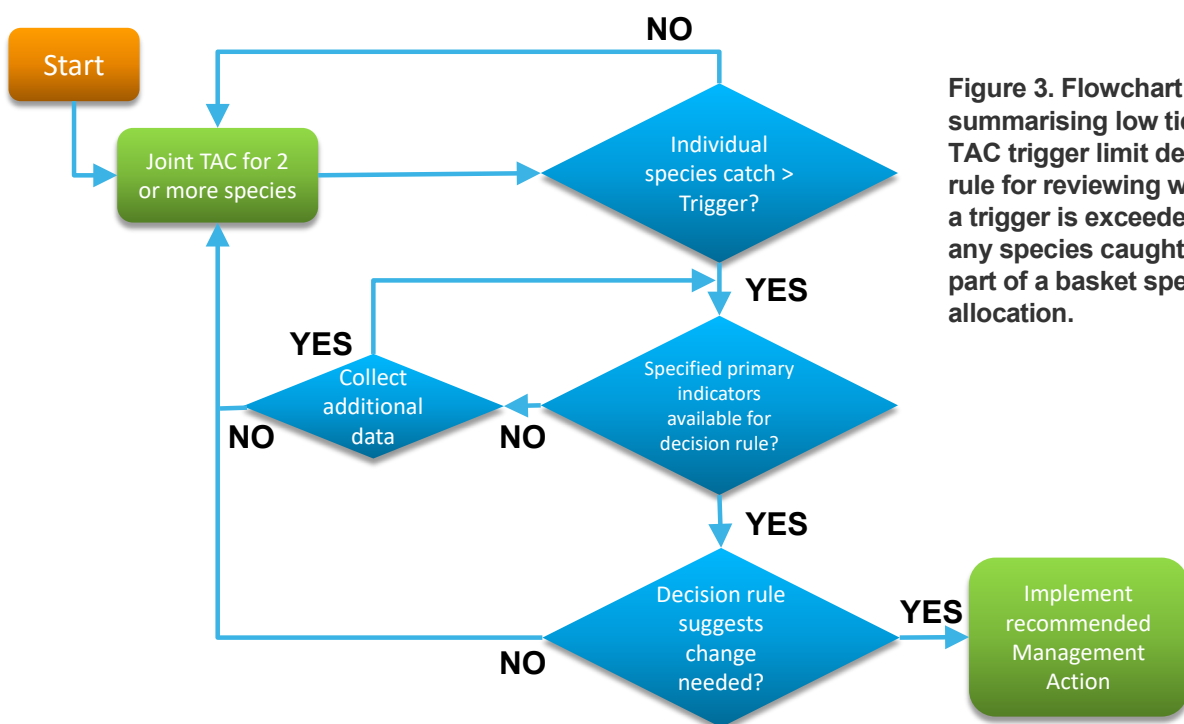
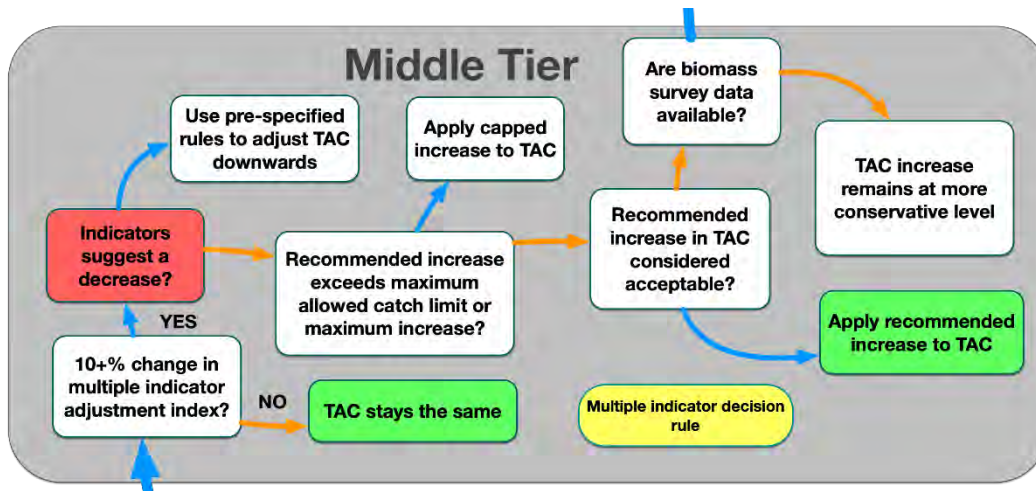


Figure 3. Flowchart summarising low tier Joint TAC trigger limit decision rule for reviewing whether a trigger is exceeded for any species caught as part of a basket species allocation.

2.11.2 Middle Tier Decision Rules



When is the Middle Tier applied?

The Middle tier applies when high quality data are available from several primary indicators in addition to total catch per species.

The Middle Tier is not applicable during the initial years of HS implementation as insufficient detailed historical fishery data are available, but it provides a pathway for improving and growing the fishery in line with the HS objectives.

What does the Middle Tier decision rule allow?

The Middle Tier Decision Rules specify how to increase TACs if good quality fishery data are available and indicate a capped increase is possible (see Table 3, maximum middle tier TAC increase).

The Middle Tier uses the Multiple Indicator Decision Rule, with the condition that high quality data are required from at least two of the additional primary indicators (Figure 4).

2.11.2.1 Middle Tier Multiple Indicator Rule

Catch-Per-Unit-Effort (CPUE) has not been demonstrated to be a reliable indicator on its own, but as more data are collected, the value of CPUE data as an index of abundance will increase, especially if used in combination with other indicators such as changes in average size of animals caught, catch composition and spatial footprint. Decision rules using a combination of these indicators could be used to increase or decrease the TAC based on a Recommended Biological Catch (RBC) calculated using two or more of the following primary indicators, where the weights assigned to each indicator are denoted w_1 , w_2 , w_3 , w_4 for respective indicators CPUE, average Size, spatial footprint (Area) and changes in catch composition (Figure 4):

$$A = w_1 \times \text{CPUE} + w_2 \times \text{Size} + w_3 \times \text{Area} + w_4 \times \text{Catch proportion}$$

The default weights are set at 0.25 (i.e. equal weighting), but renormalised if any of the indicators are missing and have associated zero weight.

The overall recommended adjustment in the RBC is computed by scaling the average of the adjustment factors by the average (3 yr) Catch, but with the constraints that the adjustment proportion not exceed the pre-specified cap A_{cap} and $A < \text{maximum increase permitted (MAX}_{sp})$:

$$\begin{aligned} RBC &= \min(A, A_{cap}) \times C_{CUR} & RBC &\leq MAX_{sp} \\ RBC &= TAC & \min(A, A_{cap}) \times C_{CUR} &> MAX_{sp} \end{aligned}$$

The **Multiple indicator rule** can be summarised as follows:

- a) Calculate 2 or more of the individual Indicator adjustment factors described below
- b) Work out the average A of these values or a weighted average if assigning different weights to different contributions
- c) Calculate the average recent catch (past 3 years)
- d) If the average A exceeds a pre-specified maximum increase proportion (default value 0.10) then use the maximum capped value rather than calculated value
- e) Multiply the average recent catch by the indicator average to obtain the new Recommended Biological Catch (RBC)
- f) Check that the RBC does not exceed a pre-specified maximum catch limit (Table 3).

The multiple indicator rule will typically be applied to species which are highly targeted and assume that available data and information are largely species-specific. Additional considerations are necessary if the target species is typically caught together with one or more other species. The middle tier also recognises that the use of CPUE is problematic as an index of abundance of sea cucumbers (noting potential for hyperstability in particular for highly aggregated species) as well as the limitations of the other primary indicators used here, and for this reason, increases based on these data are more conservative than possible if using survey data based on sound scientific methods. Individual indicator adjustment factors are calculated as described below, with a mathematical formulation first specified followed by plain English summary of the rule.

Multiple Indicator Decision Rule

- Use CPUE plus at least 1 other (out of possible 3) indicators
- Calculate average trend in these combined indicators
- If positive, then increase in TAC could be considered (& conversely if negative)
- Set upper catch limit allowed (need survey to increase beyond this)

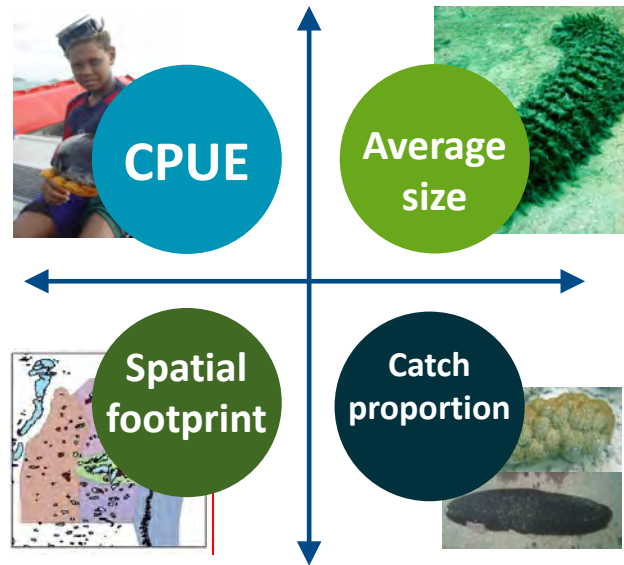


Figure 4. Schematic summary of the Middle Tier Multiple Indicator Decision Rule and its components

Calculating Middle Tier Individual Indicator Adjustment Factors

CPUE Indicator (based on recent trend in CPUE)

$$I_{CPUE} = 1 + c_1 \times slope_{CPUE}$$

- Where “slope” is the slope in the trend in (standardised if available) CPUE index over the past 3 years for which data are available
- Parameter c_1 accounts for how reliable data are, with guidance provided on default settings

Calculating the Middle Tier CPUE Indicator Adjustment Factor

- Use all available reliable data converted to consistent units (e.g. kg/hour fishing) to compute the annual average CPUE (preferably standardised to the extent possible) for a target species (and/or area)
- Use the past series of comparable CPUE data (at least 3 years’ data required) and compute the slope of a regression line fitted through the data (i.e. quantify the trend in the data to determine whether CPUE is increasing, decreasing or stable over time) (e.g. a population increasing at 10% per year would have an average slope value of 0.1).
- Select a value for the scaling parameter which downweights the empirical slope estimate to take into account that the CPUE data do not provide a very reliable index of stock abundance. The default setting is 0.5 (see also comparison with survey factor below). Hence for example this downweights a perceived stock increase of 0.1 to 0.05, as a basis for recommending a 5% increase in the TAC).
- The CPUE Index contribution to the multiple indicator rule is then 1 plus the slope factor.

Average Size Indicator (based on recent average size relative to historical average)

$$I_{size} = 1 + c_2 \left(\frac{\sum_{y-2}^y s_y / 3 - \bar{s}}{\bar{s}} \right)$$

- Where s is the average annual size of animals from a catch sample, with the average computed over the past 3 years and compared with the historical average size \bar{s} of previously sampled animals
- Parameter c_2 accounts for how reliable data are (e.g. is the size sample representative), with guidance provided on default settings

Calculating Middle Tier Average Size Indicator Adjustment Factor

- Use all available representative size data converted to consistent units (e.g. length of live animal in cm or average individual mass of boiled individual animal in kg) to compute the average size of the catch of a target species (and/or species in a particular area) over the past 3 years
- Use data from past observations (see Plagányi et al. (2019) and noting that these data should be reviewed and updated over time) to compute an average historical size of the fished population
- Calculate the ratio of the recent measured size compared with the base estimate to determine whether average size has been increasing or decreasing over time.
- Select a value for the scaling parameter which downweights the empirical size ratio to account for potential errors and biases in this measurement. The default setting is 0.5.
- The Size Indicator Index contribution to the multiple indicator rule is then 1 plus the scaled size ratio

Percentage of areas fished Indicator (based on recent average area fished relative to historic average)

$$I_{area} = 1 + c_3 \left(\frac{\bar{a}}{a} \right)$$

- Where a is the proportion of areas fished relative to the historical average proportion of area fished – note that an expansion of the area fished is assumed to indicate a decline in stock status (e.g. due to local depletion)
- Parameter c_3 accounts for how reliable data are (e.g. are there spatial references in the logbook used to compute the change in spatial footprint), with guidance provided on default settings

Calculating Middle Tier Area Fished Indicator Adjustment Factor

- Use all available data on the area fished for a target species, converted to consistent units (e.g. square kilometres of fished area; number of reefs fished; depth range fishing occurred), to compute the average recent fished area of a target species
- Use data from past observations to compute an average historical fishing area for the fished population
- Calculate the ratio of the recent fished area compared with the base estimate to determine whether average fished area has been increasing or decreasing over time.
- Select a value for the scaling parameter which down weights the empirical area fished ratio to account for potential errors and biases in this measurement. The default setting is 0.5.
- The Area Fished Indicator Index contribution to the multiple indicator rule is then 1 plus the scaled area ratio.

Catch proportion Indicator (based on recent average catch proportion of species being considered, relative to total catch of all TS BDM species)

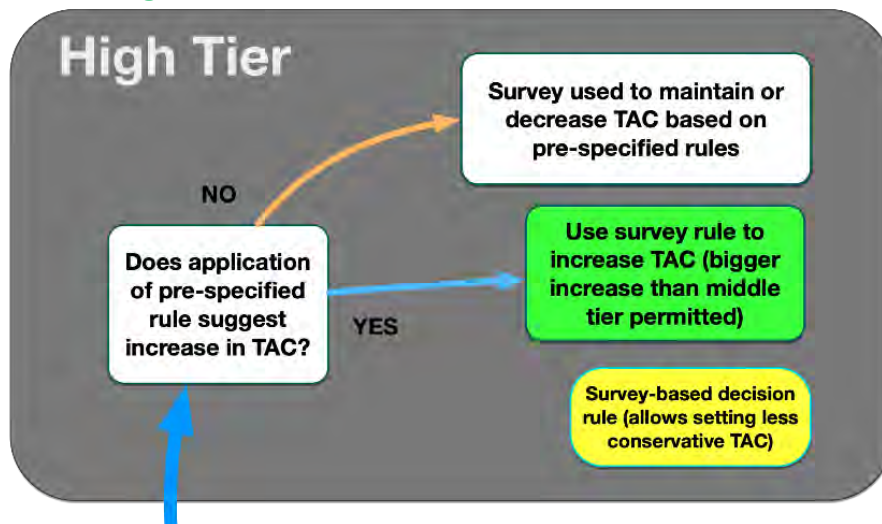
$$I_{prop} = 1 + c_4 \left(\frac{\sum_{y-2}^y P_y / 3 - \bar{p}}{\bar{p}} \right)$$

- Where p is the average annual catch proportion (of the species being considered) from a catch sample, with the average computed over the past 3 years and compared with the historical average catch proportion \bar{p}
- Parameter c_4 accounts for how reliable data are (e.g. were representative catch samples used, data from logbooks), with guidance provided on default settings

Calculating the Catch Proportion Indicator Adjustment Factor

- Use all available reliable data (but excluding data from highly targeted single-species catches such as for black teatfish) to compute the average (past 3 years) catch proportion for a target species
- Use data from past observations (including survey data) to compute the average expected catch proportion of the fished population
- Calculate the ratio of the recent measured catch proportion compared with the base estimate to determine whether the proportional representation of a species in a mixed basket catch has been increasing or decreasing over time.
- Select a value for the scaling parameter which down weights the empirical catch proportion ratio to account for potential errors and biases in this measurement. The default setting is 0.5.
- The Catch Proportion Indicator Index contribution to the multiple indicator rule is then 1 plus the scaled catch proportion ratio.
- Before using this index, information (such as from market prices and fisher local knowledge pertaining to drivers to target particular species) should be considered to determine whether the change in catch proportion is likely due to fisher targeting behaviours or reflects changes in the relative abundance of the target species relative to other species. This indicator therefore needs to be used with caution, but may be particularly useful for species such as curryfish where data on component species are required.

2.11.3 High Tier Decision Rules



When is the High Tier applied?

The high tier utilises high quality survey data (see earlier section outlining requirements for survey data to meet the criterion of being adequately high quality and representative).

What do the High Tier decision rules allow?

The high tier can be used to adjust TACs upwards (in cases where there is evidence of scope to increase TACs) or downwards (in cases where there are concerns about the status of a fished species). This is usually only necessary if total catch of a species is close to the current TAC.

2.11.3.1 Survey-based Decision Rule for adjusting TACs

This section describes the use of survey data as relative indices of abundance, as well as for estimating total standing stock biomass. There are a number of spatially-representative historical surveys which can be used as a baseline for comparison with future survey data to quantify trends in abundance of key species. Before comparing new and old survey data, it is critical that an evaluation is made of the extent to which the data are comparable (e.g. were they collected from comparable areas and habitats; how extensive was the survey) and where necessary, data should be reconfigured to ensure optimal comparability. In evaluating a trend based on survey data, the inter-survey interval also needs to be considered as long gaps between surveys mean that data may be less informative. As fishery-independent or dedicated surveys conducted by fishers are generally considered more reliable than CPUE data, survey trends can be used to adjust TACs upwards (in cases where there is evidence of scope to increase TACs) or downwards (in cases where there are concerns about the status of a fished species). This is usually only necessary if total catch of a species is close to the current TAC.

2.11.3.2 Survey-Based Decision Rule based on trends

- If Average (3 yr) Catch between 80% and total TAC, use index of abundance (survey) to adjust:
 - $TAC = (1+b*slope)*C_{CUR}$ and maximum increase pre-specified
- where C_{CUR} is average catch over the past three years, and includes landings plus discards;
- “slope” is the slope in the trend in standardised biomass survey index over the past 3 years for which data are available, noting that it isn’t necessary for past data to be available on an annual basis
- Parameter b differs based on how reliable data are (e.g. survey extent, intensity and standard error). Default settings are shown below.

Settings:

- If excellent survey data available, set $b = 1$
- If survey less comprehensive and lag since last survey, set $b = 0.8$
- Lower b adjusts for data being less reliable

Slope:

- If slope is positive it suggests resource is increasing and TAC can be increased
- Conversely, if slope is negative, it suggests resource is decreasing and TAC should be decreased
- If slope is large positive i.e. fast increase, a cap (limit) on the maximum permissible increase in TAC should be implemented. Default setting is 10% for fixed period of 2 years.

2.11.3.3 Survey-Based Decision Rule based on total biomass estimate

For most species the starting TAC is set based on a conservative estimate of historical biomass (Figure 5). The survey biomass estimates can be used to inform baseline target and limit densities. Density standardised by habitat type and reference sites is proposed as the reference measure because it is measurable locally rather than requiring a full survey across all spatial areas. However, challenges need to be recognised in obtaining comparable and representative estimates for different species with differing habitats or spatial distributions. Any density measure needs to be sufficiently representative of the broader area in which that species occurs.

Given that the BDM Fishery includes many species occupying different habitats, the HS recognises that the same survey design isn't appropriate for all species. For species concentrated in a specific area (e.g. sandfish on Warrior Reef), a dedicated survey design can be used to estimate the local density and this can then be compared with limit reference points (see Reference Points section) to determine whether or not the fishery can be re-opened (see Re-opening Decision Rules). Once open, future surveys can be pursued to obtain an estimate of relative abundance as described above.

In contrast, for species which occur mostly in deeper waters (e.g. white teatfish), a survey with representative sites could be used to estimate the total standing stock biomass occupying previously unsurveyed areas or depths (in this case, depths in excess of 20m). This new information can inform on total stock standing biomass and can be used to make adjustments to existing TACs using the same process that was used previously to estimate conservative initial TACs for species (Skewes et al., 2010).

Similarly, for species of concern, (e.g. prickly redfish), surveys could be used to either assess trends in abundance or to evaluate standing stock biomass for the purpose of comparing with estimates of sustainable catch.

The HS also recognises that technologies and survey techniques are developing and that innovative new survey methods may need to be included in future revisions of the HS.

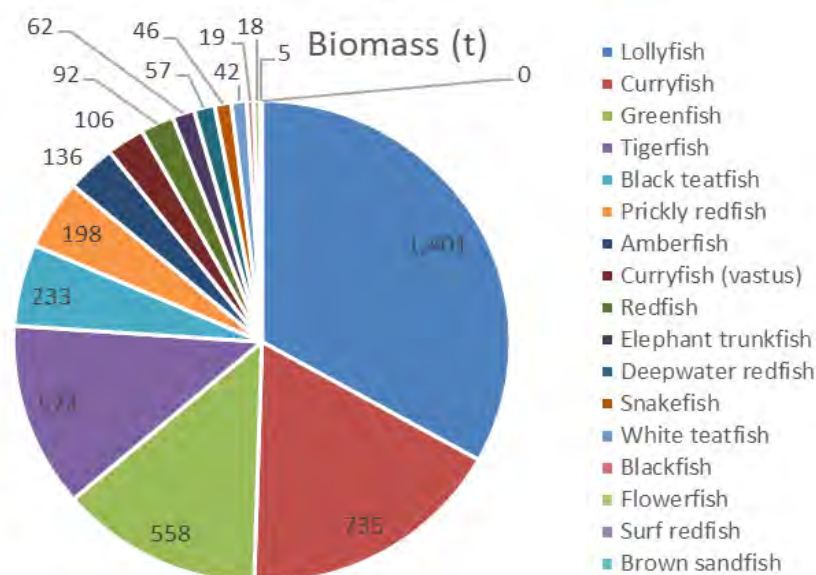
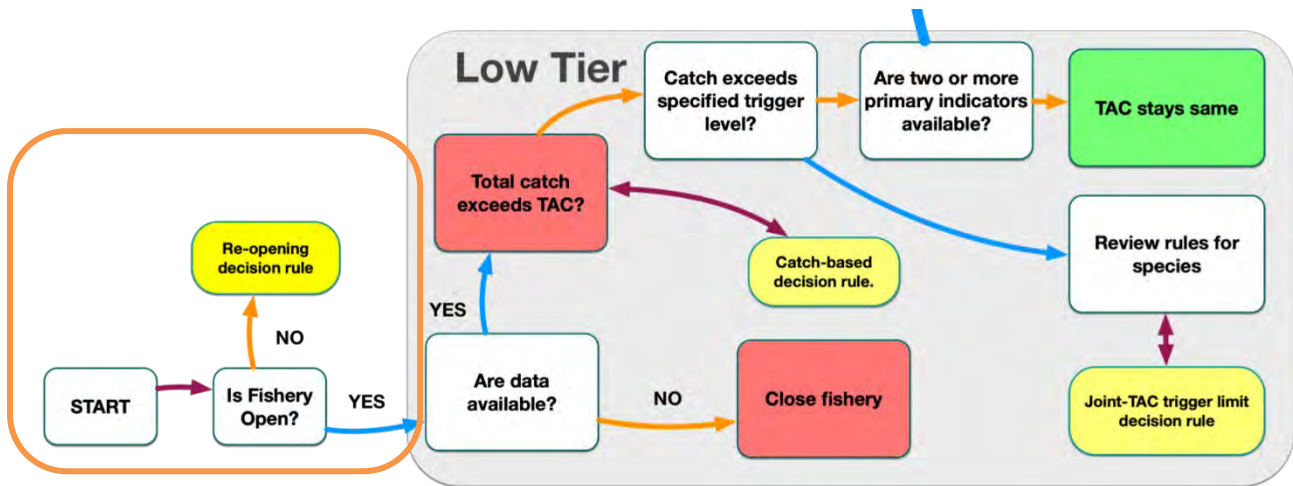


Figure 5. Schematic showing average survey-based Torres Strait biomass estimates (t) for species as shown for use in comparing with future survey-based biomass estimates.

2.11.4 Re-opening Decision Rule



This rule that is applied to re-open a fishery (where the term “fishery” here refers to a specific BDM species in Torres Strait) that has been closed due to concerns around stock status and depletion, or for reasons such as needing to first ensure adequately precautionary measures are in place so that overfishing does not occur or the stock does not become overfished.

A decision that the fishery may potentially be re-opened should also take into account previous survey information as well as recent catch history (both legal and illegal) and periods over which the fishery has been closed (e.g. black teatfish). Note this also takes into account findings from testing spatial rotation strategies for Beche-de-mer (Plaganyi et al. 2015) which suggest that larger annual catches need to be followed by rest periods (with no fishing for 2-3 years) to keep risks to the fishery the same as lower, but constant annual average catches. This notion is also consistent with, and underpins, the catch-based decision rule which prescribes a pause in fishing following instances of heavy fishing (see [Low Tier Catch-Based Decision Rule](#)).

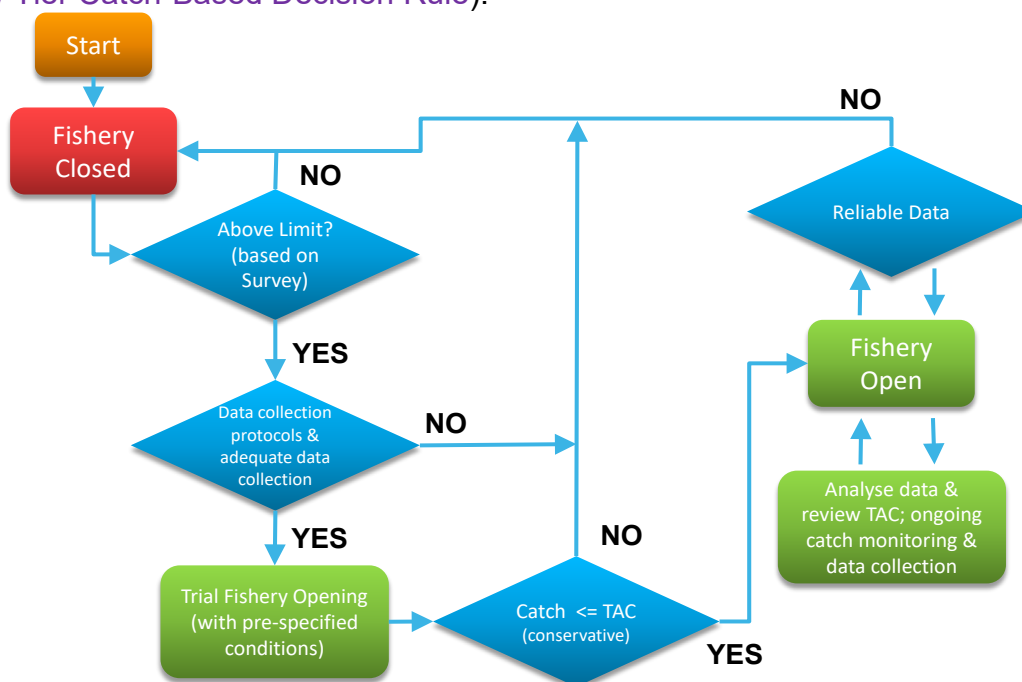


Figure 6. Flowchart summarising process for re-opening a closed fishery

If considering re-opening a closed fishery (Figure 6):

1. Using all available information, first establish that the stock is above a limit reference point level.
 - In the absence of reliable information, this may require conducting a new stock survey and comparing the biomass results with the limit reference point (see [High Tier Decision Rules](#)).
 - Only proceed to the next step in potential opening if the survey or available information suggests the stock is above a limit reference point.
2. Evaluate whether monitoring and management are adequate.
 - This involves ensuring data collection and monitoring are clearly specified and in place before proceeding to next step in potential opening.
3. If the above conditions are met, then a trial opening is possible with the following conditions attached:
 - Accurate daily catch and effort reporting is required
 - A precautionary trigger limit may be set to temporarily pause fishing while catch records are collated to ensure that overfishing does not inadvertently occur.
 - An effective warning system needs to be put in place to ensure everyone stops and waits while approaching the trial TAC to allow all catch reported data to be entered and processed.
 - Further conditions may also be considered, including limitations on which species can be harvested in conjunction with a re-opened species, or with a particular gear (e.g. hookah).
 - Trial opening dates should be considered in relation to seasonal fishing dates. For example, industry have advised that the opening of a high value species such as black teatfish should preferably occur during the same time that the TRL fishery is open to hookah fishing to reduce pressure on the BDM stocks This may also account for equity considerations for fishers dedicated to working in eastern areas where the BDM stocks are mostly located. Trial opening dates also need to take into account favourable weather and tides to ensure safe and efficient fishing can occur.
 - Consideration should also be given to cultural laws and community agreements with respect to who can fish where.
4. The Trial opening TAC needs to be set at a demonstrably conservative level with reference to values as shown in Table 3.
5. If the Trial TAC is exceeded by more than 5%, then the fishery is automatically paused (i.e. no fishing allowed) for the following year.
6. If data collection during the Trial opening was not conducted satisfactorily, then the fishery is closed again and the re-opening decision rule process can commence again.
7. If the TAC wasn't exceeded and reliable data were collected, these data need to be analysed to review the TAC and potential for the fishery to stay open in future, or be re-opened periodically after a pre-specified interval.
8. An ongoing condition of the fishery remaining open is that reliable data collection continues, and preferably includes additional data such as CPUE, spatial footprint and size composition (see Multiple Indicator Rule).

3 Governance

The status of the Fishery and how it is tracking against the HS is reported to the Working Group and the PZJA as part of the yearly management process.

4 Review

Under certain circumstances, it may be necessary to amend the harvest strategy. For example if:

- there is new information that substantially changes the status of a fishery, leading to improved estimates of indicators relative to reference points; or
- drivers external to management of the fishery increase the risk to BDM stock/s; or
- it is clear the strategy is not working effectively and the intent of the HSP is not being met; or
- alternative techniques are developed (or a more expensive but potentially more cost-effective harvest strategy that includes surveys and annual assessments is agreed) for assessing the Fishery. The HS may be amended to incorporate decision rules appropriate for those assessments.

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Appendix A.1 – Conversion Ratios

Table 4. Conversion ratios

Common name	Species	Live to Gutted	Live to Salted	Live to Dried	Gutted to Salted	Gutted to Dried	Salted to Dried	Salted to Gutted	Dried to Gutted
Sandfish	<i>Holothuria scabra</i>	0.496 ⁴	0.355 ⁴	AVE=0.049 ^{a14}	0.758 ⁴	0.094 ⁴	0.125 ⁴	1.319 ^d	10.638 ^{e4}
Surf Redfish	<i>Actinopyga mauritiana</i>	0.684 ^{2*}	-	AVE=0.084 ^{a12*}	0.873 ⁴	AVE=0.187 ^{2*4}	0.286 ⁴	1.145 ^d	AVE=5.930 ^{2*e4g}
Black Teatfish	<i>Holothuria whitmaei</i>	AVE=0.677 ^{2*34}	0.529 ³	AVE=0.108 ^{a12*3}	0.824 ^{f,4}	AVE=0.177 ^{2*f3}	0.220 ^f	1.213 ^{f,4}	AVE=5.663 ^{2*f3g}
White Teatfish	<i>Holothuria fuscogilva</i>	AVE=0.627 ^{2*c4}	0.593 ^c	AVE: 0.137 ^{1ab2*}	0.775 ¹	AVE=0.237 ^{12*}	0.309 ¹	1.290 ¹	AVE=4.219 ^{12*g}
Prickly Redfish	<i>Thelenota ananas</i>	AVE=0.667 ^{c4}	0.481 ^c	AVE=0.055 ^{1ab4}	AVE=0.736 ¹⁴	AVE=0.088 ¹⁴	AVE=0.118 ¹⁴	AVE=1.382 ^{1d4}	AVE=12.502 ^{1e4}
Hairy Blackfish	<i>Actinopyga miliaris</i>	0.480 ⁴	-	AVE=0.067 ^{a14}	0.964 ⁴	0.209 ⁴	0.217 ⁴	1.037 ^d	4.785 ^e
Curryfish (common)	<i>Stichopus herrmanni</i>	0.651 ²	-	AVE=0.036 ^{a1}	-	0.114 ²	-	-	8.772 ^{2g}
Elephants Trunkfish	<i>Holothuria fuscopunctata</i>	0.519 ⁴	-	AVE=0.133 ^{a1b4}	0.911 ⁴	0.242 ⁴	0.263 ⁴	1.097 ^{d4}	8.772 ^{e4}
Lollyfish	<i>Holothuria atra</i>	AVE=0.436 ^{c12*}	0.236 ^{c1}	AVE=0.063 ^{a1bc2*}	0.586 ¹	0.150 ^{12*}	0.256 ¹	1.706 ¹	5.917 ^{12*g}
Deepwater redfish	<i>Actinopyga echinites</i>	0.692	-	AVE=0.088 ^{a13}	-	0.152 ^{f3}	-	-	6.600 ^{f3}
Curryfish (vastus)	<i>Stichopus vastus</i>	-	-	-	-	-	-	-	-

Common name	Species	Live to Guttled	Live to Salted	Live to Dried	Guttled to Salted	Guttled to Dried	Salted to Dried	Salted to Guttled	Dried to Guttled
Burrowing blackfish	<i>Actinopyga spinea</i>	0.544 ³	0.375 ³	0.073 ^{1a}	0.689 ^{f3}	0.135 ^{f3}	0.195 ^{f3}	1.449 ^{f3}	7.424 ^{f3}
Deepwater blackfish	<i>Actinopyga palauensis</i>	AVE=0.818 ^{c13}	AVE=0.593 ^{c1} ₃	AVE=0.175 ^{a1b}	AVE=0.728 ^{1f3}	AVE=0.190 ^{1f3}	AVE=0.262 ^{1f3}	AVE=1.374 ^{1f3}	AVE=5.335 ^{1f3}
Golden sandfish	<i>Holothuria lessoni</i>	0.645 ³	0.526 ³	0.098 ^a	0.815 ^{f3}	0.152 ^{f3}	0.186 ^{f3}	1.226 ^{f3}	6.588 ^f
Brown sandfish	<i>Bohadschia vitiensis</i>	0.735 ^{c1}	0.612 ^{c1}	0.116 ^{c1}	0.834 ¹	0.157 ¹	0.189 ¹	1.199 ¹	6.337 ¹
Leopardfish	<i>Bohadschia argus</i>	AVE=0.665 ^{c12}	0.572 ^{c1}	AVE=0.115 ^{c12}	0.777 ¹	AVE=0.171 ¹²	0.233 ¹	1.286 ¹	AVE=5.841 ^{12g}
Greenfish	<i>Stichopus chloronotus</i>	-	-	-	-	-	-	-	-
Stonefish	<i>Actinopyga lecanora</i>	0.894 ^{c1}	0.652 ^{c1}	AVE=0.154 ^{c12*}	0.729 ¹	AVE=0.158 ¹² _*	0.253 ¹	1.372 ¹	5.418 ¹

References – Table 4

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- ^{2*}Calculations from raw data used in Prescott et al., 2015. (Data provided by Shijie Zhou).
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- ^aNgaluafe & Lee, 2013. Table 3; percent conversion ratios, total whole/fresh weight, from wet to dry product including values from other studies.

^bNgaluafe & Lee, 2013. Table 1; wet-to-dry conversion ratios.

^cWhole fresh weights noted in Purcell et al., 2009.

^dDerived: Inverse gutted to salted value Skewes et al. 2004.

^eDerived: Inverse dried to gutted value Skewes et al. 2004.

^eEmpirical: Values calculated from Purcell et al. 2009.

^gInverse: Values calculated from Prescott et al., 2015.

Footnote

^aNgaluafe & Lee, 2013. Table 3, percent conversion ratios, total whole/fresh weight, from wet to dry product including values from other studies.

^fEmpirical: Values calculated from Purcell et al. 2009.

Data

^hData from Ugar Island: Curryfish processing example (Provided by Rocky Stephens)

Curryfish x9

Boil & then weigh 8kg (800gr each, conversion ration boiled to dry = 0.375)

Wet to dry – 2.4kg (300gr each, 0.375 conversion ration dry to boiled = 2.66)

Appendix A.2 – Size limit information

Table 5. Size limits

Common name	Species	Maximum length cm (guide)	Size at maturity cm	Size limit TS	Proposed size limit TS*	Size limit East Coast	Age at maturity TS yrs (size, cm) (model)	TAC Torres Strait (t)
Sandfish	<i>Holothuria scabra</i>	32	13-25	18	Leave ⁴	20	2 (16.5)	No take
Surf Redfish	<i>Actinopyga mauritiana</i>	38	22-23	22	Leave	25	3 (13.8)	No take
Black Teatfish	<i>Holothuria whitmaei</i>	30	22-26	25	Leave	30	4 (24)	No take
White Teatfish	<i>Holothuria fuscogilva</i>	55	32	32	Leave	40	4 (30.4)	15
Prickly Redfish	<i>Thelenota ananas</i>	70	30-35	35	Leave	50	4 (30.4)	20
Hairy Blackfish	<i>Actinopyga miliaris</i>	35	12	22	Leave	20	3 (19.2)	Part of 80t limit
Curryfish (common)	<i>Stichopus herrmanni</i>	55	27-31	27	31 ²	35	-	Part of 80t limit
Elephants Trunkfish	<i>Holothuria fuscopunctata</i>	66	35	24	Leave ⁵	40	-	Part of 80t limit
Lollyfish	<i>Holothuria atra</i>	65	12-19	15	Leave ⁵	20	-	Part of 80t limit
Deepwater Redfish	<i>Actinopyga echinites</i>	35	9-12	12	20 ³	20	3 (19.5)	Part of 80t limit
Curryfish (<i>vastus</i>)	<i>Stichopus vastus</i>	35	-	nil	15 ¹ (5t trigger)	15	-	Part of 80t limit
Burrowing blackfish	<i>Actinopyga spinea</i>	40	-	22	Leave	20	-	Part of 80t limit
Deepwater blackfish	<i>Actinopyga palauensis</i>	35	-	22	Leave	20	-	Part of 80t limit
Golden sandfish	<i>Holothuria lessoni</i>	46	22	18	22 ²	15	-	Part of 80t limit
Brown sandfish	<i>Bohadschia vitiensis</i>	40	15-26	nil	25 ^{1,2}	25	-	Part of 80t limit
Leopardfish	<i>Bohadschia argus</i>	60	30	nil	30 ¹	35	3	Part of 80t limit
Greenfish	<i>Stichopus chloronotus</i>	38	14	nil	Leave	20	-	Part of 80t limit
Stonefish	<i>Actinopyga lecanora</i>	24	-	nil	Leave	15	-	Part of 80t limit

*Proposed size limit (Torres Strait):

1 = Better align with EC (East Coast BDM fishery)

2 = Too small relative to age at maturity

3 = Based on model simulation recommendation (TS BDM Milestone Report, Appendix/Summary)

4 = Species closed to fishing

5 = Low value species (medium and high value considered for new size limits)

References – Table 5

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Appendix A.3 – Sea cucumber Spawning Information

Table 6. Sea cucumber spawning information

Common name	Species	Spawning time	Country
Sandfish	<i>Holothuria scabra</i>	October to January*	Australia*
		March to May, November to December	India
		December, January, August, September	New Caledonia
		November to December	Papua New Guinea
Surf Redfish	<i>Actinopyga mauritiana</i>	June to April	Guam
		December, January	New Caledonia
Black Teatfish	<i>Holothuria whitmaei</i>	June, July	New Caledonia
		April	Aldabra, Seychelles
		December*	GBR, Australia*
White Teatfish	<i>Holothuria fuscogilva</i>	Part of November, December, January	New Caledonia
Prickly Redfish	<i>Thelenota ananas</i>	January, February, March	New Caledonia
		December*	John Brewer Reef, GBR, Australia*
Hairy Blackfish	<i>Actinopyga miliaris</i>	July (new moon)	Japan
		May, November to December	New Caledonia
		November*	Orpheus Island, Australia*
Curryfish (common)	<i>Stichopus herrmanni</i>	December, January	New Caledonia
		June to July	Straits of Malacca, Malaysia
		November, December, January*	Little Broadhurst Reef, GBR, Australia*
Elephants Trunkfish	<i>Holothuria fuscopunctata</i>	December, January, part of February	New Caledonia
		December*	Lizard Island, Australia*
		December*	John Brewer, GBR, Australia*

Common name	Species	Spawning time	Country
Lollyfish	<i>Holothuria atra</i>	November	Solomon Islands
		August	Peninsular Malaysia
		October*	Davies Reef, GBR, Australia*
Deepwater Redfish	<i>Actinopyga echinites</i>	January, February	New Caledonia
Curryfish (<i>vastus</i>)	<i>Stichopus vastus</i>	-	-
Burrowing blackfish	<i>Actinopyga spinea</i>	-	-
Deepwater blackfish	<i>Actinopyga palauensis</i>	-	-
Golden sandfish	<i>Holothuria lessoni</i>	November, December, January, part of February	New Caledonia
		November	New Caledonia
Brown sandfish	<i>Bohadschia vitiensis</i>	November, December	New Caledonia
Leopardfish	<i>Bohadschia argus</i>	October to January*	GBR, Australia*
		October, November, December, January*	GBR, Australia*
Greenfish	<i>Stichopus chloronotus</i>	April to June, December to February	Straits of Malacca, Malaysia
		November, January*	Myrmidon Reef, Davies Reef, GBR, Australia*
Stonefish	<i>Actinopyga lecanora</i>	July	Peninsular Malaysia
		December*	GBR, Australia*

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Appendix A.4 – Average density from surveys

Table 7. Average density (per ha) of sea cucumbers from surveys. Densities were sampled at 122 repeated sample sites in eastern Torres Strait during the 2002 and 2005 abundance surveys (from Skewes et al. 2010)

Species	Common name	Average density (per ha)		% change
		2002	2005	
All sea cucumber	-	150.94	153.28	1.6
High value	-	18.03	14.74	-18.3
Med value	-	55.99	53.93	-3.7
<i>H. whitmaei</i>	Black teatfish	4.00	3.08	-22.8
<i>H. fuscogilva</i>	White teatfish	5.43	3.57	-34.1
<i>T. ananas</i>	Prickly redfish	8.61	8.09	-6.0
<i>A. miliaris</i>	Blackfish	1.64	3.79	131.3
<i>A. lecanora</i>	Stonefish	0.10	0.00	-100.0
<i>A. mauritiana</i>	Surf redfish	1.02	0.00	-100.0
<i>A. echinites</i>	Deep water redfish	1.43	0.51	-64.3
<i>All Actinopyga</i>		4.20	4.30	2.4
<i>H. atra</i>	Lollyfish	25.60	33.91	32.5
<i>H. fuscopunctata</i>	Elephant trunkfish	15.30	15.43	0.9
<i>H. coluber</i>	Snakefish	0.61	4.41	616.7
<i>H. edulis</i>	Pinkfish	30.79	27.97	-9.2
<i>B. graeffei</i>	Flowerfish	3.59	3.72	3.8
<i>B. argus</i>	Leopardfish	12.91	11.32	-12.3
<i>S. chloronotus</i>	Greenfish	23.16	24.71	6.7
<i>T. anax</i>	Amberfish	2.56	2.59	1.3
<i>S. hermanni</i>	Curryfish	10.60	10.18	-4.0
<i>H. leucospilota</i>	Black tarzan	1.54	2.56	66.7

Appendix A.5 – Industry proposed closures

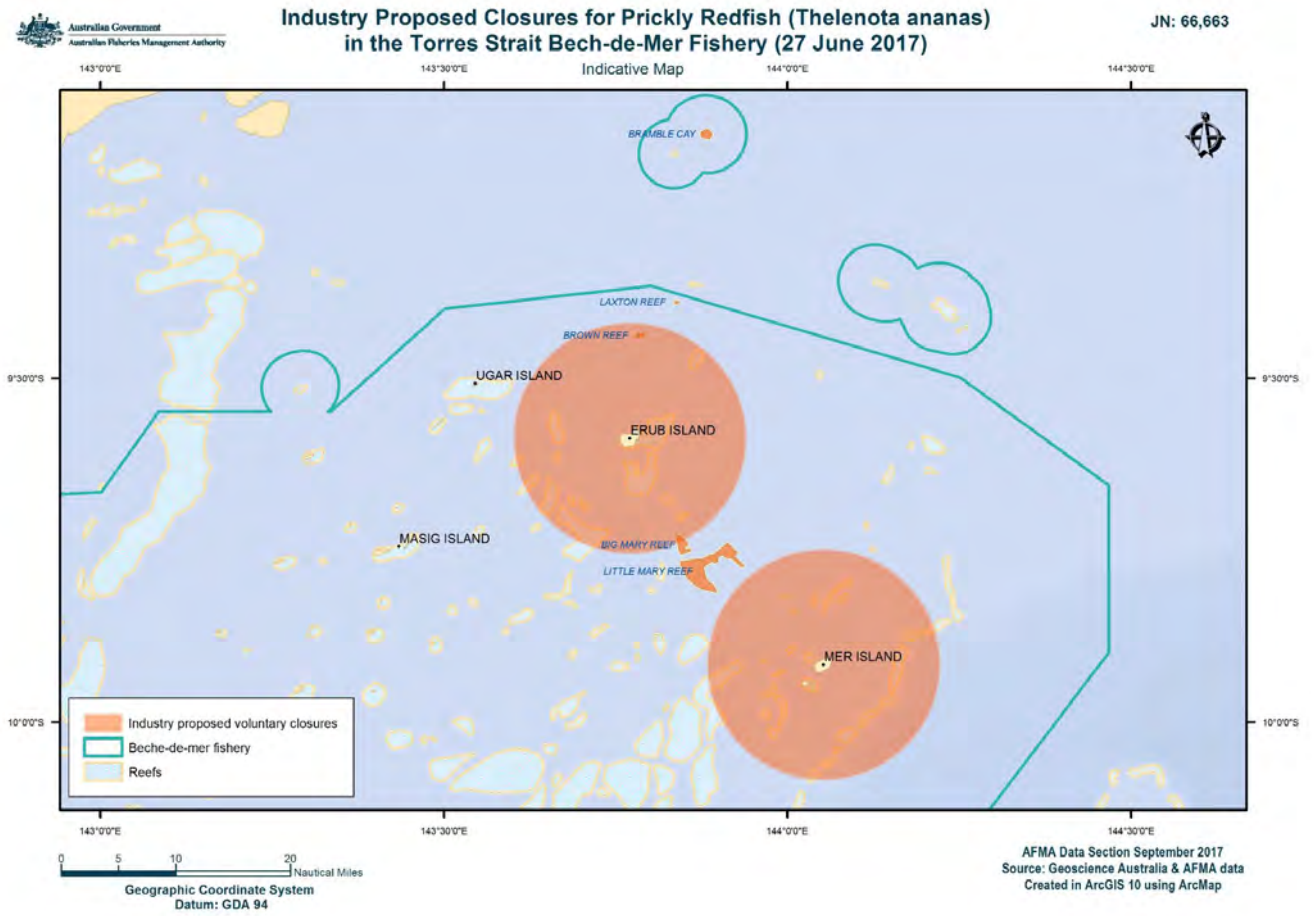


Figure 7. Industry proposed closures for Prickly Redfish (*Thelenota ananas*) in the Torres Strait Beche-de-mer Fishery (27 June 2017).

Appendix A.6 – Sandfish historical survey data

Warrior Reef sandfish example

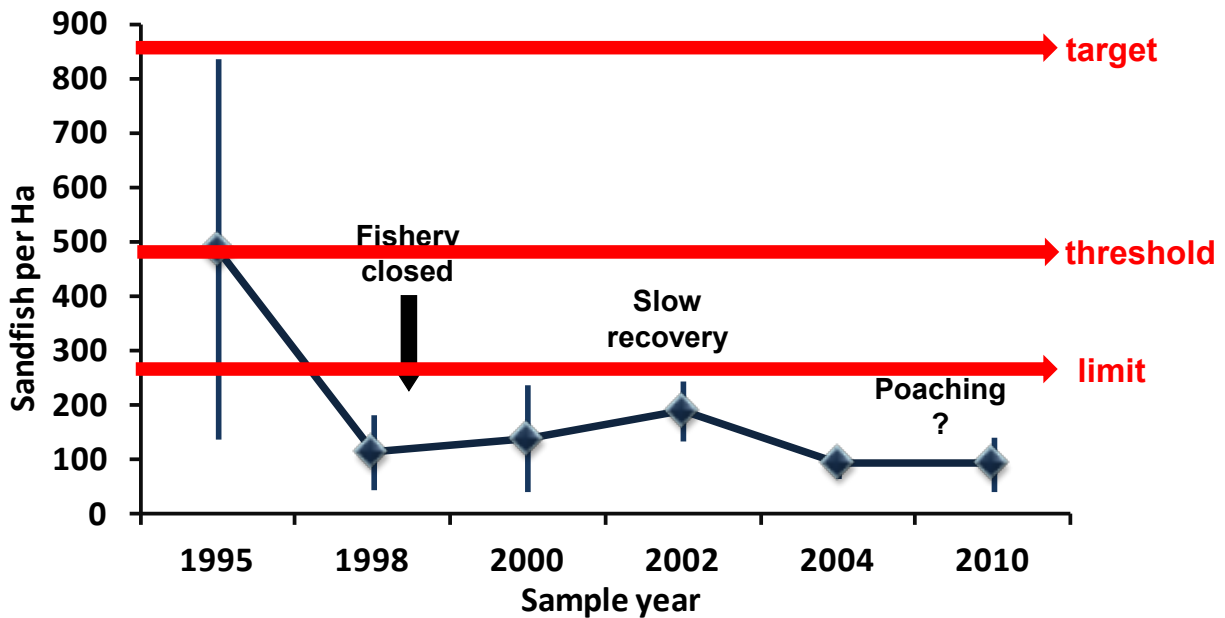


Figure 8. Example using Warrior Reef historical survey data for sandfish and comparison with sandfish density estimates from other locations, to inform choice of a limit reference point (below which the fishery should be closed), a threshold reference point (which is set higher than the limit reference point and serves as a trigger to re-open a fishery) and a target level that should ideally be aimed for.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
Ugar aquaculture project	Agenda Item 8 For DISCUSSION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG):
 - a. **NOTE** the update to be provided by Rocky Stephen and Leo Dutra concerning a project to assess the feasibility of establishing an Indigenous-led business to reproduce and grow sea cucumbers on Ugar (Stephen Island), which will include the collection of sexually mature sea cucumbers from the wild for aquaculture broodstock purposes;
 - b. **NOTE** that, as part of the project, CSIRO will undertake a scientific survey of sandfish (*Holothuria scabra*) and other sea cucumber species in the area of waters surrounding Ugar;
 - c. With reference to the Torres Strait Beche-de-mer (BDM) Fishery Harvest Strategy, **PROVIDE ADVICE** regarding the data and assessment needs necessary to support the project, including the potential collection of sexually mature sea cucumbers from the area of waters surrounding Ugar for aquaculture broodstock purposes.

KEY ISSUES

Ugar aquaculture project

2. CSIRO is working with Rocky Stephen as the representative for the Ugar community to assess the feasibility of establishing an Indigenous-led business to reproduce and grow sea cucumbers on Ugar. The project will focus on the high-value species, golden sandfish (*H. lessoni*) and sandfish. Further details regarding the project will be presented at the meeting.
3. As part of the project, CSIRO will undertake a scientific survey of sandfish and other sea cucumber species in the area of waters surrounding Ugar. The scientific survey will count and measure sea cucumbers. Observations of other commercially important species, marine plants (seaweed and seagrass) and habitat composition will be recorded. Water quality parameters will also be measured. CSIRO will work closely with Mr Rocky Stephen as a representative for the Ugar community, and business consultant Mr Ewan Colquhoun. CSIRO will also follow directions from the Ugar Ged Kem Le Zeuber Er Kep Le (Torres Strait Islanders) Corporation RNTBC (Ugar RNTBC) on cultural sites and any other cultural matters when undertaking the survey.
4. The aquaculture industry is managed by multiple agencies across local councils, State and Commonwealth governments. The approvals needed will depend on the type, scale and location of the aquaculture enterprise. In the Torres Strait region, the Queensland government has jurisdiction over the management of aquaculture, while the Protected Zone Joint Authority (PZJA) has jurisdiction over the management of commercial fishing for wild fish stocks, including their take for aquaculture purposes. This project plans to include the collection of sexually mature sea cucumbers from the area of waters surrounding Ugar for aquaculture broodstock purposes, in particular golden sandfish and sandfish.

Golden sandfish

5. The [BDM Fishery Harvest Strategy](#) provides clear and transparent guidance, agreed on by stakeholders, for monitoring, information gathering, assessment and management of all Torres Strait sea cucumber species.

6. Under the BDM Fishery Harvest Strategy, golden sandfish is subject to a 0.5 tonnes (wet weight of gutted fish) trigger. Under the Low Tier Joint TAC Trigger-Limit Decision Rule (refer to section 2.11.1.2 of the BDM Fishery Harvest Strategy), if the catch of any species exceeds the species-specific trigger by more than 10%, data and information need to be collected to decide whether:
 - a. to make a change to the basket TAC, or individual species trigger; or
 - b. a species-specific TAC is justified; or
 - c. a closure is deemed necessary; or
 - d. recommend further data be collected (e.g. in the form of a survey, or indicator before any change to the joint TAC or trigger limit is allowed).
7. There is a possibility, that with targeted collection of sexually mature golden sandfish under this project that the trigger for golden sandfish will be reached. HCRAAG is invited to note that this may require further consideration once the project progresses to this point.

Sandfish

8. Fishing for sandfish was closed in 1998 due to sustainability concerns following a considerable decline in abundance. There are strong spatial patterns in sea cucumber distribution in the BDM Fishery. Generally, sandfish is restricted to Warrior Reef (with some small extension to reefs south and east), and most other species are found east of Warrior Reef, in the eastern region of the Torres Strait. The last survey of sandfish on Warrior Reef was in 2010. From this survey, densities were estimated to be around 80% lower than in 1995, when the stock was already considered to be depleted. The mean density at 41 repeated sites (\pm standard error) in 2010 was 94 ± 50 sandfish per hectare, which was similar to the 2004 estimate (94 ± 25 sandfish per hectare), suggesting that there had been no recovery up to the time of the 2010 survey.
9. During the 2019/20 survey of the eastern region of the Torres Strait, separate intensive sampling of Ugar Island and Campbell reefs was also undertaken to investigate sea cucumber populations and their habitats, in order to identify suitable species and locations for re-seeding research. The survey identified the presence of a number of high value commercial sea cucumber species, including golden sandfish and sandfish, with a range of size classes measured. The survey did not include the formulation of biomass estimates or indices of relative abundance.
10. The BDM Fishery Harvest Strategy does not provide specific guidance for re-opening of a fishery with limited spatial scope (e.g. area of waters surrounding Ugar only). However, under the Re-opening Decision Rule (refer to section 2.11.4 of the BDM Fishery Harvest Strategy), the following guidance is provided when considering the re-opening of a closed fishery:
 - a. using all available information, first establish that the stock is above a limit reference point (LRP) level;
 - i. in the absence of reliable information, this may require conducting a new stock survey and comparing the biomass results with the LRP (see High Tier Decision Rules);
 - ii. only proceed to the next step in potential opening if the survey or available information suggests the stock is above a limit reference point;
 - b. evaluate whether monitoring and management are adequate;
 - i. this involves ensuring data collection and monitoring are clearly specified and in place before proceeding to next step in potential opening;
 - c. if the above conditions are met, then a trial opening is possible. Further guidance is provided in the BDM Fishery Harvest Strategy once this step is reached.
11. Under the Survey-Based Decision Rule (refer to section 2.11.3.3 of the BDM Fishery Harvest Strategy), for species concentrated in a specific area (e.g. sandfish on Warrior Reef), a dedicated survey design can be used to estimate the local density and this can then be compared with limit

reference points to determine whether or not the fishery can be re-opened. Once open, future surveys can be pursued to obtain an estimate of relative abundance. The BDM Fishery Harvest Strategy also states that a threshold limit (e.g. average density) can be specified as the level above which a fishery is allowed to re-open. Nothing has been specified in the case of sandfish.

12. There are historical survey data (1995/96, 2002, 2005, 2009 and 2019/20) for a number of sites in Ugar waters, though the same sites were not consistently sampled each survey. Sixty transects were undertaken as part of the 2019/20 survey around Ugar. Of the sites sampled, 38 were previously surveyed in one or more surveys carried out in 1995/96, 2002, 2005, 2009 (repeated measures), with 22 new sites that included reef top, reef top buffer and representative reef edge sites to inform on sea cucumber species, distribution and habitat.
13. Given this, there may be sufficient data needed (e.g. density) to formulate an estimate of relative abundance. However, guidance provided under the BDM Fishery Harvest Strategy indicates biomass estimates (as a % unfished) will still be needed to inform a re-opening of the fishery, upon which to base a conservative initial TAC.
14. Noting the above, HCRAAG advice is sought regarding the data and assessment needs necessary to support the potential future collection of sexually mature sandfish from the area of waters surrounding Ugar for aquaculture broodstock purposes.

BACKGROUND

15. This project has been presented on previously at the Black Teatfish Industry Workshop held on 8-10 February 2021. Details of the workshop outcomes can be found on the [PZJA website](#).
16. Outcomes of 2019/20 survey presented at HCRAAG meeting held from 6-8 October 2021.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
OTHER BUSINESS	Agenda Item 9 For DISCUSSION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAAG) **NOMINATE** any further business for discussion.

TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP	Meeting No. 4 14 August 2024
HCRAG PRIORITIES AND NEXT MEETING	Agenda Item 10 For DISCUSSION

RECOMMENDATIONS

1. That the Hand Collectables Resource Assessment Group (HCRAG) **NOMINATE** a date and a venue for the next meeting.

KEY ISSUES

2. AFMA proposes the next HCRAG meeting be held in late September.