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Australian Fisheries Management Authority

Torres Strait Hand Collectables Resource Assessment Group

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Final record

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

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Contents

1	Preliminaries	3
1.1	Acknowledgment of traditional owners, welcome and apologies	3
1.2	Adoption of agenda	3
1.3	Declarations of interest.....	3
1.4	Terms of reference (TOR) of the RAG.....	6
1.5	Out of session correspondence	6
2	HCRAg Updates.....	6
2.1	Industry members	6
2.2	Scientific members	8
2.3	Government Agencies	9
2.4	Native Title.....	9
2.5	PNG National Fisheries Authority	9
3	Final Results of the Beche de mer stock survey (CSIRO)	9
4	Black teatfish trial opening 30 April - 3 May 2021 and future openings.....	11
5	Harvest strategy implications of scientific survey results and catch data	16
6	Ecological Risk Assessment (CSIRO)	21
7	Climate change impacts on Torres Strait Fisheries (CSIRO)	22
8	Research priorities.....	22
9	Other business	22
10	HCRAg priorities and date for next meeting	22

1 Preliminaries

1.1 Acknowledgment of traditional owners, welcome and apologies

1. The meeting was opening in prayer by Sereako Stephen around 8:45am.
2. The Chair welcomed members and observers to inaugural meeting of the Torres Strait Hand Collectables Resource Assessment Group (the RAG). The Chair acknowledge the traditional owners of the lands in which members were participating in the meeting from and paid respect to Elders past, present and emerging.
3. The Chair provided an overview of the role of the RAG and obligations on members, including conduct and the treatment of confidential information as outlined in the *PZJA Fisheries management Paper No.1*. The Chair noted that whilst the RAG seeks to make consensus recommendations to the PZJA and Hand Collectable Working Group, from time to time members may have dissenting views. When consensus cannot be reached the views of each member will be recorded.
4. The Chair noted the following apologies:
 - Milton Savage, Kulkalgal Traditional Inhabitant Industry member (note Mr Savage joined the meeting on day two)
 - George Morseau, PZJA HCRA Traditional Inhabitant industry member from Maluialgal
 - Nicole Murphy, observer, CSIRO Principal Investigator for the Eastern Torres Strait Beche-de-mer stock survey.
 - Mark Anderson, TSRA member
 - Samantha Miller, QDAF member
5. The Chair and all scientific members and observers participated in the meeting via video conference whilst all other members and industry observers participated from the James Cook University conference room on Thursday Island.

1.2 Adoption of agenda

6. The RAG adopted the draft agenda with one change to defer consideration of *Agenda Item 7 – Climate Change Impacts on Torres Strait Fisheries* to the RAG's next meeting.

1.3 Declarations of interest

7. The Chair advised members and observers, that as provided in the PZJA Fisheries Management Paper No. 1 (FMP1), all members must declare all real and potential conflicts of interest in the Torres Strait Beche-de-mer Fishery 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 on that issue.
9. Declared interests 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 comment on the declared interests;

- b. Discuss if the interests preclude the members from participating in any discussions; and
 - c. Agree on any actions to manage declared conflicts of interest.
10. The scientific members removed themselves from the meeting (left their seats and camera view) while the remaining members discussed whether they should participate in the research priorities (Agenda item 8) discussion and recommendation process or just the discussion given they may be the potential recipients of research funding. The Chair and members recognised that although the scientific members may have a real or perceived conflict of interest, they have research expertise and knowledge relevant to the fishery that is valuable to the development of the RAG's advice. They agreed that the scientific members should participate in the research discussions but not in the recommendation making process.
 11. The industry members that hold a fishing licence, including the TSRA observer left the meeting 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 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. They agreed to review this approach if matters arise that are likely to directly benefit only some industry members.
 12. The Chair reiterated the obligation of all members to act in the best interest of the Fishery as specified in the terms of reference for the RAG.
 13. The RAG agreed to address any additional conflicts of interest should they arise throughout the discussion of agenda items.

Table 1. Declared interests from each attendee

Name	Position	Declaration of interest
Members		
Sian Breen	Chair	Employed by Department of Agriculture and Fisheries. No pecuniary interest in Torres Strait Fisheries but from time to time other staff members may work on fishery research projects in the Torres Strait (not occurring now).
Tim Skewes	Scientific Member	Independent Consultant. Previously employed by CSIRO. Scientific Member on the Hand Collectables Working Group. Previous principal scientist and co-investigator for Torres Strait Scientific Advisory Committee (TSSAC) and TSRA funded projects focused on the sea cucumber, tropical rock lobster, finfish and traditional fisheries in Torres Strait.
Steve Purcell	Scientific Member	Scientific Member on the Hand Collectables Working Group. 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. Specialist in sea cucumber ecology and fisheries.

Name	Position	Declaration of interest
		Will be involved in a sea cucumber population survey in New Caledonia to inform the CITES Appendix II listing of black and white teatfish.
Eva Plaganyi-Lloyd	Scientific Member	Employed by the CSIRO and from time to time receives funds to undertake research relating to Torres Strait Fisheries but not currently funded for BDM Fishery projects. Scientific member on the Tropical Rock Lobster Resource Assessment Group. Lead scientist for PZJA funded TRL research projects conducted by CSIRO.
Michael Passi	Traditional Inhabitant Member Kemer Kemer Meriam	Traditional inhabitant boat (TIB) licence holder and full time BDM operator. Hand Collectables Working Group Member.
Milton Savage	Traditional Inhabitant Member Kaiwalagal	Currently does not hold a TIB licence but has held one in the past.
Mark Pearson	Traditional Inhabitant Member Kulkagal	Traditional inhabitant boat (TIB) licence holder.
Thomas Mooka	Traditional Inhabitant Member Gudumalulgal	Traditional inhabitant boat (TIB) licence holder.
Selina Stoute	AFMA Member	Employed by AFMA, no pecuniary interests or otherwise
Executive officer		
Danait Ghebregabhier	Executive Officer AFMA	Employed by AFMA, no pecuniary interests or otherwise
Permanent Observers		
Maluwap Nona	Malu Lamar	TIB licence holder; Chairperson of Malu Lamar, Director of MDW Fisheries Association on Mer; Traditional Inhabitant Member on TSSAC and the HCWG.
Observers and invited industry participants		
Quinten Hirakawa	TSRA officer	Employed by TSRA and TIB licence holder with a BDM endorsement.
Monty Naawi	Invited industry participant (Moa Island, St Paul's)	holds a TIB licence
Joseph Billy	Invited industry participant (Poruma Island)	holds a TIB licence
Dennis Passi	Invited industry participant (Mer Island)	holds a TIB licence and own a private fishing business. Traditional Owner on Mer Island.
Sereako Stephen	PBC Chair Ugar Island	PBC Chair Ugar Island and currently does not hold a TIB licence but intending to re-engage full time in the industry. Has family members that old TIB licences
Simon Naawi	Invited industry participant (Masig Island)	holds a TIB licence

Name	Position	Declaration of interest
Sam Mye	Invited industry participant (Erub Island)	holds a TIB licence with BDM and reef line entries
Isaac Ghee	Invited industry participant (Erub Island)	holds a TIB licence with BDM, CRAY and reef line entries and President of the Erub Fisheries Management Association
Lala Gutchen	Invited industry participant (Erub Island)	fishes under father's TIB licence and assists uncle with fish receiver operations.
Leo Dutra	CSIRO Staff	Employed by the CSIRO and from time to time receives funds to undertake research relating to Torres Strait Fisheries.

1.4 Terms of reference (TOR) of the RAG

14. The RAG discussed and noted the role of a PZJA RAG and the terms of reference for the group as outlines in the PZJA Fisheries management Paper No.1 and detailed in the agenda paper.

1.5 Out of session correspondence

15. The RAG noted the correspondence circulated by AFMA to members out of session. Members noted this information is provided for members records and to ensure members have not missed any out-of-session business or notifications. The RAG noted that paper would be updated to clarify that agenda papers for the meeting were email on 16 September 2021.

2 HCRAG Updates

2.1 Industry members

16. The RAG noted the following updates from Industry members and observers:
- The weather has not been great this year for fishing and therefore fishers have not fished as much as usual. The reduced fishing effort however has given the reefs a chance to recover and there does seem to be more sea cucumber available on the reefs as a result.
 - In relation to the black teatfish opening, it was good that AFMA closed the fishery before the TAC was exceeded. Fishers were concerned that the TAC would be overcaught.
 - As a private owner of a fishing business, one observer was of the view that the communal approach to managing sea cucumber stocks is not working and local private fishing businesses need to be better engaged in consultative bodies such as the RAG. He has worked to establish his business over the last 5 years. Private business also helps the community.
 - Being in the fishing industry isn't a one-day thing and it doesn't come easy. It takes interest and commitment over years. In their experience they have worked for seven years to develop processing techniques and have trained youth coming into the industry. They have gone from firewood, gas to now having a drier and are able to maximise returns from buyers. Prices for

processed/value added, product is better than for wet. In general buyers are demanding more product and having multiple buyers is an advantage.

- e. The big picture for the fishery is that the TIB licencing process is long overdue for review. An economic evaluation of the system needs to be undertaken so that licencing arrangements benefits the industry. As a 100 percent owned fishery, we have the right to take control. When you are in the industry you have responsibility. Policy changes are required to ensure that the relatively small resource remains sustainable and fishers can be properly educated for the betterment of the community and the people that share those resources. If advice is taken from people that do not understand the industry, it can have consequences for those that heavily rely on it down the track.
- f. The economic potential is not maximised by individual operators and communities when so many of the BDM TACs are under caught. White teatfish is consistently under caught. This issue needs to be a priority for the Working Group.
- g. The Erub freezer has been out of operation so it has been hard for fishers. Focus has mostly been on finfish.
- h. During the black teatfish opening Erub fishers did not fish beyond 5 miles due to bad weather. Whilst fishing they noticed a lot of pollution on the reef (for example ghost nets) which is of concern. There has not been much fishing for Aber (sea cucumber) at Erub water restrictions on the island has impacted the fish receiver's operation and they have not been buying.
- i. In terms of Covid 19 impacts, industry advised of mixed impacts. In one case, where the fisher supplies a Tasmanian abalone company prices have dropped. Pre-Covid 19 the buyer directly supplied buyers visiting from China. Once the Chinese buyers could no longer travel to Tasmania the prices dropped. In response the Tasmanian company has opted to stock-pile product until conditions improve. In contrast prices from a buyer on the Sunshine Coast have not changed as the domestic demand for BDM seems to be increasing. The Torres Strait BDM Fishery was not impacted by freight disruptions as the fishery relies on the Seaswift barge service to move product out of the region.
- j. Many fishers have a preference to be able to dry the product in the Torres Strait and export it directly. Doing so would also reduce freight costs and the return is higher. A good drier however costs approximately 40k. TSRA should look to support private businesses to make these investments. Buyer's currently reluctant to buy processed product as they do not want to lose money.
- k. There is a lot of pressure on currently open high value species whilst there are plenty of species not being fished. Pricing drives targeting. Processing is largely the same across species. If TSRA could assist with funding, individual operators could get driers to value add to other species. Prices paid to fishers for dried curryfish is \$100kg.
- l. There is plenty of curryfish, stonefish and other species on reefs between St Paul's and the east. It is up to the divers to catch it.

- m. Currently medium to high value species are being fished. That is the current trend of the market from personal experience and from outside advice.
- n. Now that the crayfish season has finished so some of the fishers on Warraber have switched to fishing for curryfish.

2.2 Scientific members

17. The RAG noted the following updates from the Scientific member, Dr Eva Plaganyi:

- a. CSIRO has recently published articles on the development of the conversion ratios and the harvest strategy for the Torres Strait Beche de mer Fishery (articles were provided with the agenda papers).
- b. CSIRO convened a science capacity building workshop in May at CSIRO labs in Brisbane that several new HCRA traditional inhabitant industry members attended. The workshop was considered a success and received good feedback. The workshop was funded by AFMA and also involved visiting CSIRO's Bribie island aquaculture facility.
- c. As part of an FRDC funded project, CSIRO is continuing to seek opportunities to support traditional inhabitants' attendance and participation in fisheries conferences. Frank Loban recently co-presented the BDM Harvest Strategy with CSIRO at the World Fisheries Conference (WFC) held virtually. For the first time the WFC convened a specific indigenous fishing session which was very well received. If other members are interested to take up similar opportunities, please let CSIRO know. CSIRO has one placement available in the current funding year.

18. The RAG noted the following updates from the Scientific member, Dr Purcell:

- a. There are new proposals lodged with CITES to consider listing for *Thelenota* species (prickly redfish, amberfish, Candy canefish [*T. rubralineata*]) but there is not much data available to support the listing evaluation;
- b. Advice from the Sea Cucumber Assessment Group of New Caledonia reported that fishers have moved north to new grounds and are targeting leopard fish. Fishers in the north of the territory have been particularly active as stock in the southern grounds have been depleted;
- c. The species name for Surf redfish (*Actinopyga mauritiana*) is set to be changed to *A. varians*; and
- d. A private venture running a white teatfish stock enhancement project, in French Polynesia has had recent success, with successful spawning and survival of white teatfish for the first time. Generally, these types of projects are risky, in terms of being economically viable. White teatfish is long lived with slow growth rates and can take 5-10 years to reach the required size. Further risks to be carefully monitored and mitigated are environmental effects. This include the risk of spreading disease. It is the case however that animals can be screened in the laboratory for a range of diseases and the species (white teatfish) is generally not considered invasive.

19. The RAG noted the following updates from the Scientific member Tim Skewes:

- a. The Western Australia sea cucumber fishery has recently received Marine Stewardship Council (MSC) certification. The QLD east coast fishing industry is in the process of pursuing MSC certification.
- b. A three-year study to monitor sea cucumbers in the Great Barrier Reef Marine Park has been funded. The study will use aerial and underwater drones to survey areas.
- c. He is assisting the Seychelles Government with a white teatfish and prickly redfish stock assessments. Stocks in the Seychelles are mostly now found in deeper water as the shallow reefs have been fished out.

2.3 Government Agencies

- 20. The RAG noted the update provided by AFMA as detailed in the agenda paper. The RAG further noted the Communique from the Queensland Sea Cucumber Fishery Working Group's meeting on 23 August 2021. In addition to the Communique the Chair advised that the QLD east coast black and white teatfish stock assessments had recently been published (~ 30 September) to meet their WTO export approval conditions.
- 21. The RAG noted the following TSRA update provided by the TSRA Observer:
 - a. The TSRA's Fisheries Programme continues to focus on supporting traditional inhabitant members and fishers with questions; and
 - b. Although a separate fishery, some fishers in the TRL fishery had not fished due to ambiguity with China and having less buyers.

2.4 Native Title

- 22. The RAG noted an update on native title matters from the Chair of Malu Lamar (Torres Strait Islanders) Corporation RNTBC (Malu Lamar). The Chair provided an overview of role of Malu Lamar as outlined in the *Native Title Act 1993*. The Chair advised that relevant to the RAG, Malu Lamar seeks TRSA's assistance together with legal advice on how the Intellectual Property of Traditional Owners (TO) in research such as the BDM survey can be protected. Following discussions with TSRA, the Chair advised that Malu Lamar would then advise AFMA of the outcomes. The Chair confirmed his support for such research however noted that TOs only receive a 'thank you' for allowing researchers to come into their lands and waters. The Chair advised that TOs hold property rights over the marine environment. The TSRA observer undertook to notify relevant officers within TSRA of Malu Lamar's request.

2.5 PNG National Fisheries Authority

- 23. The RAG noted that although invited to the meeting, officials from the Papua New Guinea National Fisheries Authority were not in attendance to provide a further update to the background information on the PNG BDM fishery provided by AFMA in the agenda paper.

3 Final Results of the Beche de mer stock survey (CSIRO)

- 24. The RAG considered the final results of the CSIRO research project: '*Stock survey of Torres Strait Beche-de-mer species*' as presented by Scientific member, Tim Skewes (**Attachment A**). The RAG noted that the survey results had been considered by most members and observers at previous

meetings such as meetings of the HCWG, the Mer industry workshop held on 8-10 February and the CSIRO capacity building workshop held on 24-28 May for RAG members.

25. The RAG thanked the Project Team for delivering a high-quality survey and corresponding report and noted the outcomes would inform the RAGs advice on future black teatfish openings (agenda item 4) and application of the harvest strategy (agenda item 5).
26. Members and observers raised several broader matters including:
- a) *Spawning and larval transport*: Did the survey provide any further insight into when and where BDM species of the Torres Strait spawn and patterns of larval movement? The Scientific member advised that no further information was gained but it is generally understood that BDM species spawn in summer with black teatfish however spawning in the winter months. An Industry observer advised that he had observed curry fish spawning twice in Oct/Nov.

In terms of larval transport, the Scientific member advise that it is likely that BDM larvae do not travel far from the spawning location as they have a relative short larval phase (in the order of 2 weeks). This means it is unlikely that there is significant net transport of larval between areas. The Scientific Member advised that this was the finding from a water circulation model developed some years ago focused on sandfish at Warrior Reef.

The Scientific member did not consider having finer scale, region specific information on spawning as a critical knowledge gap currently. Instead the higher priority was to monitor the status of the stock and develop reliable fisheries dependent data. Another scientific member advised that management measures to protect spawning is generally only required if fishing puts at risk the spawning behaviour (aggregating) or the species is more vulnerable to overfishing.

- b) *East coast stock assessment*: The Chair advised that the recent QLD east coast sea cucumber stock assessment found that stocks were in good condition. The exploitable biomass of east coast black teatfish stock was found to be at 40-48% of virgin biomass. Fishing for black teatfish only resumed on the east coast a few years ago (2019) following a 20-year closure.
 - c) *Crown of thorns (COTS)*: Members sought advice on whether there were any regular COTS surveys in the Torres Strait similar to those conducted on the east coast. Scientific members were not aware of any regular COTS surveys (some COTS counting done during the TRL survey) but noted that fishers were often the first to observe any outbreaks.
27. In designing a future survey, the RAG **RECOMMENDED** that consideration be given to adding more sites in northern Great Barrier Reef (GBR) (from the Green Zone north to Mer Island) noting advice from a traditional inhabitant industry member that historical catches of black teatfish from this area were significant.
- The member reported that between 1994-1999 three large vessels worked the area from the northern most green zone of the Great Barrier Reef Marine Park to Mer averaged 5-10 tonnes per trip. The vessels worked to Sue Frazer's Factory at Rose Hill on Thursday Island.

ACTION - AFMA to circulate the QLD east coast black teatfish stock assessment to members.

4 Black teatfish trial opening 30 April - 3 May 2021 and future openings

28. RAG members noted and discussed:

- a. the AFMA update on the outcomes of the black teatfish trial opening that took place on 30 April – 3 May including catch and effort reporting by licenced fish receivers;
- b. a presentation by the Scientific member Dr Eva Plaganyi of the CSIRO analysis of data from the opening; and
- c. information from industry members and observers that participated at the opening.

Recommendation summary

29. Having regard for all available information and conditions 5-8 of the BDM Fishery Harvest strategy (HS) relating to reopening decision rule that need to be addressed, following a trial opening the RAG **RECOMMENDED** a black teatfish opening in 2022 with a 20t TAC on the basis that:

- a. the 2021 trial reopening TAC of 20t was not overcaught (condition 5 of the HS);
- b. data was collected satisfactorily during the opening (condition 6 of the HS);
- c. updated modelling analysis, inclusive of 2021 catch data, confirmed that a 20t TAC is sustainable (conservative estimate of MSY being 21t) and would not lead to a decrease in black teatfish biomass after the first year of fishing (condition 7 of the HS). In contrast, the modelling found that annual catches of 30t could lead to a gradual depletion of the stock.
- d. prior to a future black teatfish opening AFMA focus on communication and education on improving voluntary reporting of area and effort data by fishers and fish receivers, including preparing fact/information sheets and organising a teleconference with all fish receivers as a cost effective way to discuss ways of improving voluntary reporting.
- e. opportunities to undertake a sub-sampling program to collect size and weight frequency data during black teatfish openings at key landing locations be explored. Noting that the sampling program would need to be scientifically designed.

30. The RAG **RECOMMENDED** that the HCWG, noting the ongoing concern of the economic viability of so many licences being able to access the relatively small black teatfish TAC in a short period of time, consider the performance of licencing arrangements for the fishery in line with the *Torres Strait Fisheries Act 1984*.

CONDITION 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

31. The RAG noted that the total reported catch of black teatfish during the 2021 trial opening was 17.6t which did not exceed the 20t TAC. Accordingly, the harvest strategy recommendation that the fishery be automatically paused for the following year if the TAC is exceeded by more than 5 per cent does not apply.

CONDITION 6 - Was data collection during the trial conducted satisfactorily?

Catch reporting during the opening

32. The RAG noted AFMA's advice that it believes reported catches accurately reflect the total amount of black teatfish that was caught and landed during the opening due to the high level of industry compliance with the daily catch landing and reporting requirements that applied. AFMA however

sought industry members and observers' advice on whether they considered the catch landing data to be accurate. Industry members and observers unanimously agreed that the catch data was accurate.

33. AFMA advised that it deployed a significant compliance presence throughout the region during the opening, including land-based officers on some of the key islands which were able to support and assist industry to meet the licencing and reporting requirements. The AFMA member thanked the Queensland and Federal enforcement agencies that assisted the AFMA Thursday Island Compliance team during the operation.
34. Industry members and observers that fished during the opening reported that it was beneficial to have Compliance fisheries officers on ground on Mer Island. As well as enforcing the regulatory arrangements for the opening, the compliance officers also supported fishers and fish receivers with the reporting and licencing requirements to be able to participate in the opening.

CSIRO Analysis of catch and effort data

35. The Scientific member Dr Eva Plaganyi presented the results of the CSIRO analysis of data reported during the opening, starting with a brief overview of the (**Attachment B**):
 - a. harvest strategy framework that guided the reopening of black teatfish (conditions 1 – 4 of the reopening decision rule)
 - b. scientific surveys results that helped establish that the black teatfish stock was above the limit reference point to enable its opening in 2021; and
 - c. preliminary modelling considered by the HCWG which provided validation that the black teatfish stock had recovered and demonstrated that a 20t TAC, although higher than the default HS starting TAC of 15t, was still demonstrably conservative.
36. A summary of total catch per area and per day showed that most of the black teatfish was reported as being caught in the Cumberland, Darnley and Don Cay reporting areas. However, a significant amount of the catch did not include corresponding location data which limits its usefulness to support additional trend analyses in the future relating to the sustainability and productivity of the stock. CSIRO advised that the temporal pattern in the catch data shows that:
 - a. there was no evidence of stockpiling before the opening
 - b. there was no evidence of declining catch after a few days which would indicate depletion (low catch on the third day of the opening was due to significantly reduced fishing in observance of the Sabbath). The highest daily catch and fishing effort was recorded for the fourth day of the opening (also the last day).
 - c. cumulative catches were tracked and adhered to the 20t TAC.
 - d. the number of fishers participating was controlled due to good organisation and centralised catch landing points.
37. Based on the analysis CSIRO recommended:
 - a. Improved location catch data is required to increase the usefulness of the data. Communication of the importance of location information may lead to higher levels of location reporting. To demonstrate the importance of increased location reporting (which could be used in communication material to industry) Dr Plaganyi presented a plot of standardised daily catch rates for each reporting area based on a subset of the catch data. Over time, and given the

patchy distribution of sea cucumber species, this type of trend analyses can be used to monitor depletion and help support the fishery demonstrate its ongoing sustainability.

- b. More information be requested on the catch reported as being from the Warrior Reef reporting area to help scientific understanding of the information content of the data because it was unclear why fishing was only reported there for one of the days, and hence whether the absence of data for the other days was because no one fished there or the area fished wasn't recorded.

38. Industry participants confirmed that most of the fishing took place in the reporting areas Cumberland (17), Darnley (16) and Don Cay (19) consistent with the catch reporting and where high densities of black teatfish are found. With regards to the catch that is missing location information, they advised that most of it, would have been caught in Cumberland (17) which includes Mer Island where most of the catch was landed. They further commented that catches from Don Cay (19) may be underrepresented as an artefact of the boundaries of the CDR reporting areas. Industry queried the validity of the catch that was reported as being caught at Warrior (11) as they are not aware of any fishing occurring in that area during the opening.

ACTION - AFMA to work with relevant fishers and fish receivers to confirm or otherwise the validity of the catch reported to have been caught in the Warrior reef reporting zone to ascertain whether the absence of data for the other days was because no one fished there or the area fished wasn't recorded.

CONDITION 7 - Noting the TAC was not exceeded and reliable data were collected, the data needs to be analysed to review the TAC and potential for the fishery to stay open in the future, or be re-opened periodically after a pre-specified interval

- 39. The RAG noted a presentation from Dr Plaganyi explaining the black teatfish modelling used to support the 20 tonne TAC for the trial opening and updated modelling results inclusive of catch data from the 2021 black teatfish opening (**Attachment A**).
- 40. The RAG noted that the model is based on a time series of biomass estimates from scientific surveys (which provide an index of abundance), available catch data and key life history parameters for black teatfish. The model estimates the trajectory of the black teatfish biomass in response to catches since 1995 as well as a forward projection of the biomass to 2024 using annual TAC scenarios between 15t and 30t. The results of the recent survey were used to estimate a biomass recovery rate – this approach was validated by comparing with management strategy evaluation modelling done for the east coast black teatfish stock and published literature. The model indicated that a 15t – 20t annual TAC would be sustainable (MSY being 21t) while a 30t TAC might lead to a consistent decline in black teatfish biomass over the next few fishing years. The model was updated to include the 17.6t catch from the 2021 trial opening which confirmed that a 20t TAC continued to be sustainable.
- 41. The RAG discussed the need to balance the current uncertainty due to insufficient fishery data with a precautionary approach whilst also taking into account the importance of the resource to support Torres Strait Islander livelihoods. Setting a TAC higher than 20t to meet the high level of interest in the fishery in the short term risks depletion of the resource, resulting in the loss of the benefits to the industry in the long term and to future generations. Additional data, especially fishery data,

would go a long way towards addressing some of the existing uncertainties and supporting a potential increase to the TAC in the future.

42. The RAG **RECOMMENDED** reopening black teatfish with a 20t TAC on the basis that updated modelling analysis, inclusive of 2021 catch data, confirmed that a 20t TAC is sustainable (conservative estimate of MSY being 21t) and would not lead to a consistent decline in black teatfish biomass after the first year of fishing. In contrast, the modelling found that catches of 30t could lead to a gradual depletion of the stock.
43. In making its recommendation, the RAG noted that the fishery is going to need increasingly better area (location) and effort data reporting. This will inform the scientific assessment of the fishery.
44. The RAG noted advice from industry members and observers that in their view the black teatfish opening should be held on Monday 9 May next year. This timing coincides with favourable tides and is unlikely to overlap with Sunday (the sabbath).

CONDITION 8 - Additional data to be collected during future openings

Effort and catch location information

45. The RAG was particularly concerned by the level of black teatfish catch that was not attributed to a reporting area (as specified in the catch disposal record book) during the 2021 trial opening and agreed that this needs to improve substantially for future openings. Industry participants suggested that better voluntary reporting of area and effort data should be a priority focus of future industry consultation prior to a future black teatfish opening, especially for the so called 'weekend warriors' that may not be familiar with the current reporting requirements.
46. Given the importance of building a sufficient time series of key fishery dependent data (including catch, location and effort data) for management, industry participants called for compulsory location and effort reporting. The RAG noted the AFMA member's advice that there is a process underway to progress the legislative amendments required to mandate reporting for the TIB sector and stated their strong support for this to continue/be expedited.
47. AFMA advised that it would continue to work with RAG and Working Group industry members to find more cost-effective ways to better understand and resolve industry impediments to voluntary location and effort reporting. As a cost-effective option, the Malu Lamar Chairperson recommended AFMA convene a teleconference discussion with all the fish receivers from the black teatfish opening as a starting point.
48. The RAG noted that over time the fishery may be able to also consider a range of other potential options for collecting representative fishery information including, divers wearing data loggers to get detailed information of fishing behaviour, location and catch rates.
49. The RAG **RECOMMENDED** that prior to a future black teatfish opening AFMA focus on communication and education on better voluntary reporting of area and effort data by fishers and fish receivers, including preparing fact/information sheets and organising a teleconference with all fish receivers as a cost effective way to discuss ways of improving voluntary reporting.

Catch size and weight

50. The RAG **RECOMMENDED** that opportunities to undertake a sub-sampling program to collect size and weight frequency data during black teatfish openings at key landing locations be explored. Noting that the sampling program would need to be scientifically designed.
51. The RAG noted that such a program could be initially led by scientists and AFMA officers (or potentially Rangers) but ultimately transition to industry and fishing communities.
52. The RAG noted a suggestion from an industry member for the TSRA to consider training the TSRA Rangers to undertake sea cucumber sampling at key locations. The TSRA observer undertook to follow up with a suggestion with the Land and Sea Management Unit Team.

Socio-economic data

53. The RAG noted that there are some large socioeconomic knowledge gaps that could be addressed through semi-structured interview-based surveys of fishers and fishery workers. AFMA advised that the CDR data can provide an overview of the nature and extent of participation in the fishery by fishers across the region which could inform the design of such a survey.

Future research considerations

54. Industry members and observers advised that the 20t TAC will continue to come from a limited area close to communities while there are areas south of Mer Island that contain black teatfish that are not fished, partly due to the boat size restriction in the fishery.
55. The Scientific member Tim Skewes advised that black teatfish populations found in the small reef areas of the South east zone are not included in the biomass estimate as they have not been surveyed recently but surveying these is unlikely to offer more information than that which could be collected through additional fishery logbook data:
 - a. South east zone part of the Torres Strait region near Dugong Island – makes up less than 10% of the reef area in eastern Torres Strait (last surveyed in 1995/96).
 - b. Ashmore Reef
56. Industry members requested the TSRA consider funding additional scientific surveys of areas previously not included as a matter of priority to help provide additional information that may support increasing the black teatfish TAC. The TSRA observer undertook to notify relevant officers within TSRA of industry's request.

Economic viability and efficiency

57. The RAG noted some industry's suggestion for future reviews of the BDM HS to consider including carry over provisions for re-opening arrangements. This may address industry's current concerns regarding foregone catch and therefore income from high value species. The RAG noted that the HS did not currently provide for carry over arrangements for reopening species noting the need for a precautionary approach to rebuilding stocks that have been closed due to overfishing.
58. The Malu Lamar Chairperson advised that the black teatfish TAC and future openings need to be economically viable and contribute to economic growth and to the improvement of the livelihoods and quality of life of Torres Strait Islander peoples in line with the closing the gap campaign. He

commented that the current licencing arrangements encourage a race to fish and opportunistic fishing for black teatfish which does not benefit those operators that are investing in the industry. He called for licences or effort to be limited so that the full economic benefits of the openings can be realised.

59. The RAG **RECOMMENDED** that the HCWG, noting the ongoing concern of the economic viability of so many licences being able to access the relatively small black teatfish TAC in a short period of time, consider the performance of licencing arrangements for the fishery in line with the *Torres Strait Fisheries Act 1984*.

Access to sea cucumber fishing grounds outside of the Torres Strait Protected Zone

60. Industry questioned the possibility of Torres Strait fishers being able to access sea cucumber fishing grounds south of the Torres Strait BDM Fishery (i.e. outside but near zone down to Cape York) and at Ashmore Reef and asked that AFMA seek more information from Queensland Fisheries on access requirements.

ACTION – AFMA to invite Queensland Fisheries to provide information on access requirements to sea cucumber fishing grounds in the Queensland east coast sea cucumber fishery and at Ashmore reef.

5 Harvest strategy implications of scientific survey results and catch data

61. The RAG considered total allowable catches (TAC) for the 2022 fishing season commencing on 1 January in line with the BDM HS tiers and decision rules and taking into account new data and information available for the fishery since the HS was implemented.
62. Given the large number of species, the RAG agreed to prioritise the assessment of species where survey results have indicated a need for review, with the rest of the species to be reviewed at the RAG's next meeting. The species that were assessed included:
- White teatfish (target species)
 - Prickly redfish (target species)
 - Deepwater redfish (target species)
 - Hairy blackfish (target species)
 - Curryfish Herrmanni (common) and Curryfish vastus (curryfish basket species)
 - Elephant's trunkfish (basket species)
 - Lollyfish (basket species)
 - Deepwater blackfish (basket species)
 - Pinkfish (basket species)
63. The RAG noted that all species assessed remain in the low tier of the harvest strategy. This is because a transition to the middle tier requires at least two primary indicators and is not applicable during the initial years of HS implementation as insufficient detailed historical fishery data are available. For the high tier to apply a time series of high-quality species-specific surveys together with a reasonable level of catch is required.

64. The RAG agreed to discuss sandfish upon industry's request, noting that it remains closed until there is reliable information to establish that the stock is above a limit reference point level. A stock survey was planned for 2019/20 but did not proceed.

Recommendation summary

65. Having considered the latest information available and the BDM Harvest Strategy the RAG

RECOMMENDED:

- a. no changes to the current TACs for the 2022 BDM fishing season.
 - b. that the basket trigger limit for curryfish vastus be increased to 30t in light of the additional information available for the species and the survey results indicating a more even relative abundance.
 - c. that the HCWG continue to consider the review of the current hookah ban in relation to white teatfish and undertake further community consultation on management arrangements that would support sustainable harvesting of white teatfish using hookah.
66. The RAG **RECOMMENDED** the following short-medium term data, research and analysis needs:
- a. stock assessment modelling to assess the potential (and extent) for an increase to the white teatfish TAC.
 - b. consistent with the BDM harvest strategy and where there is sufficient information available, determine the current status of sea cucumber stocks in relation to the harvest strategy reference points.
 - c. ongoing data collection to better understand fishing practices for lollyfish on Poruma as there may be some evidence of home reef depletion.

67. Guided by the species assessment sheets provided as part of the meeting papers (also provided as **Attachment C**), the RAG provided the following advice for each species considered.

White teatfish

68. The RAG noted that the recent survey results, which include the deep water population for the first time, indicate that the stock is above the default BDM HS limit reference point of B40 (compared to the Commonwealth Harvest Strategy Policy default of B20). The RAG further noted advice from the scientific members that the results show there is potential to increase the TAC.
69. The TAC has not been achieved for a number of years, industry advised that this is due to the inaccessibility of deep water stock without hookah. While the 15t TAC is considered appropriate for the current fishery management arrangements an increase may be considered if there's any additional fishery dependent data to support this process. The RAG also noted the advice from scientific member Tim Skewes that there may be areas that were not included in the survey but are known to have white teatfish (namely south east Torres Strait and deep-water reefs), further supporting a defensible TAC increase.
70. Industry members and observers advised that, economically, this is a priority species for them in terms of considering a TAC increase and being able to use hookah to access deep water stocks similar to the arrangements that are currently in place for the Queensland Sea Cucumber fishery.

71. The RAG noted advice from scientific member that because Torres Strait reefs are about 1/10th of the GBR reef area, it is unlikely to support a similar white teatfish TAC. However, the 15t starting TAC is set at or less than 10% of the 2009 survey biomass estimate which did not account for the substantial deep water population. While a proportional increase to the starting TAC may be calculated given the new survey results it would need to be precautionary due to insufficient fishery dependent data and lack of comprehensive biological understanding of the species. The RAG **RECOMMENDED** stock assessment modelling to assess the potential (and extent) for an increase to the white teatfish TAC.
72. The Chair suggested that the white teatfish stock assessment for the Queensland sea cucumber fishery be circulated to RAG members to provide more information on the assessment that underpins catch limits for the fishery.
73. In terms of other considerations for the species, the Scientific member Steven Purcell advised that the species is listed as vulnerable on the International Union for Conservation of Nature (IUCN) Red list due to a decreasing population trend globally. There is less biological information known about them than black teatfish and a lot more data uncertainty. They may be vulnerable due to their life history traits (slower growing to a larger size and takes longer to reach sexual maturity).
74. The RAG **RECOMMENDED** that the HCWG continue to consider the review of the current hookah ban in relation to white teatfish and undertake further community consultation on management arrangements that would support sustainable harvesting of white teatfish using hookah.

ACTION – The Executive Officer to circulate the white teatfish stock assessment for the Queensland Sea Cucumber Fishery to RAG members.

Prickly redfish

75. Based on the results of the recent survey the RAG supported advice from the Scientific members that the stock is above the default BDM HS limit reference point of B40. A slight decline in trend was observed in the survey results but it is not considered indicative of the stock being at risk and the RAG agreed to monitor annual catches of this species closely.
76. The RAG noted that the 2020 TAC was overcaught by 4.36%. Whilst level of overcatch does not trigger the harvest strategy decision rule, repeated over catches should be avoided. Industry members advised that:
- catches have been slow this year due to inclement weather but may pick up towards the end of the year as the conditions improve but they are not anticipating exceeding the TAC this year (AFMA confirmed that 10t had been caught in the 2021 season to date).
 - Don Cay is a good fishing area for prickly redfish and white teatfish due to suitable habitat as well as the being a breeding area for white teatfish.
 - they currently adopt a rotational harvesting approach that was initially used by Mer fishers and has now been taken up more widely.
77. In terms of other considerations for the species, the scientific member Steven Purcell advised that the species is on the list for possible CITES listing consideration in the future and listed as endangered on the IUCN red list.

Deepwater redfish

78. The RAG noted that the survey trend indicates a slight increase in density and supported advice from the scientific members that there is no evidence to support an assessment that the species is below the limit reference point. However, the biomass estimate excludes areas known to have deepwater redfish as they were not surveyed (e.g. Warrior Reef) and is somewhat imprecise due to the patchy distribution of the species. The Scientific member, Tim Skewes advised that deepwater redfish is known to occur on Warrior reef.
79. There were no catches of this species in 2020 and are very low so far for 2021. It was taken out of the basket and assigned an individual TAC (based on its basket trigger limit) when the BDM HS was developed because it was historically caught in large volumes in the 1990s and likely misidentified as surf redfish. Industry advised that there is plenty of the species around, but it is not targeted much due to low beach price (\$3/kg).
80. The RAG noted that deepwater redfish is listed as vulnerable on the IUCN red list.

Hairy blackfish

81. The RAG noted that the survey found patchy distribution of this species possibly due to other known habitats not being surveyed (e.g. Warrior reef) and natural stock variability driven by other factors (e.g. climate change). The landed weight was low, high density patches of deepwater redfish and hairy blackfish observed in previous surveys were not encountered in the recent survey. The species' burrowing behaviour may have also made it difficult to spot. There is insufficient information to assess the status of the stock in relation to the limit reference point.
82. Industry members and observers advised that the species is normally caught in the afternoon on the incoming tide, mostly dry picked and can fetch about 80-100 dollars a kilo when dried. They are not currently targeting the species due to low beach price (\$3/kg).

Curryfish Basket

83. The RAG noted that the recent survey trend indicates a decline in the density of curryfish common (*Stichopus herrmanni*) but an increase in that of curryfish vastus (*S. vastus*). The decline in *S. Herrmanni* is concerning but can be plausibly explained by the recent commencement of fishing for the species, however data collection and close ongoing monitoring by the RAG is needed if the decline continues. Fishing for this species only commenced a few years ago so an initial decline or depletion can be expected. The Scientific members advised that both species are considered to be above the default limit reference point of B40.
84. The survey found an even split in the density of the two species, whereas historically *S. Vastus* made up 20% of the total curryfish biomass. Both species were taken out of the general basket due to increased fishing interest driven by market demand and a trigger limit put in place for *S. Vastus*, being the lesser known species as a precaution. The increased catches of curryfish in 2018 were accompanied by high levels of discard which industry advise have since reduced due to more appropriate processing methods for the species.

85. In terms of the catch data, the RAG noted that most of the reported curryfish catch is not differentiated by species which can make it challenging to monitor trigger limits. Industry members and observers advised that it is easy to distinguish the two species apart and it is a matter of ongoing education with industry to promote catch recording by species.
86. Industry members and observers advised that, consistent with the survey findings, the two species are generally evenly split but there are some regional variations (e.g. Masig fishers more commonly encounter *S. Vastus* and Mer fishers *S. Herrmanni*). They have also observed the increasing trend of *S. Vastus* and the decreasing trend of *S. Herrmanni* and members discussed whether this might be in response to changing environmental conditions that are impacting each species differently.
87. The RAG noted that curryfish common is listed as vulnerable on the IUCN red list, however curryfish *S. Vastus* is not listed as yet most likely due to lack of information.
88. The RAG agreed that it is a priority to improve the species identification in curryfish catch reporting to allow better monitoring of trigger limits in the future and, based on the survey results indicating a more even relative abundance. The RAG **RECOMMENDED** that the trigger limit for *S. Vastus* be increased from 15t to 30t. The RAG will consider the need for a trigger limit for curryfish common in the future.
89. The RAG agreed it would be beneficial to get an update on density/biomass trends of similar sea cucumber species in the Queensland sea cucumber fishery.

Status of stocks in relation to the BDM harvest strategy reference points

90. Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG **RECOMMENDED** a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points.

Basket species - general

Elephant's trunkfish

91. The RAG noted that the survey results show a declining trend in abundance in surveyed sites but it is not considered to be fishing induced given low to no catches recently.
92. Industry members and observers advised that they have seen the species roll with the tide and have seen plenty of them in Mer and Erub areas, co-occurring with curryfish in lagoons or off the reef edge. They further advised that there isn't a high market demand for the species and the beach price is low (\$2/kg).

Lollyfish

93. The RAG noted that the survey results show an overall linear trend for the species with a slight downward slope. CSIRO advised that there is no degree of concern that the stock is below the limit reference point (noted a standing stock biomass of 5,668t). The species has high fluctuations in density.
94. With regards to the relatively low catches, industry advised that it is most likely due to the depletion of the species from Poruma's home reef where it is mostly caught by dry picking. The

species is known to stay on top of the reef and can be easily collected leading up to Christmas for income when the TRL fishery is closed. It has a beach price of \$2-5\$/kilo.

95. The RAG **RECOMMENDED** that AFMA work with Poruma fishers to ongoing data collection to better understand fishing practices for lollyfish on Poruma as there may be some evidence of home reef depletion.

Deepwater blackfish

96. The RAG noted that the survey trend is not a concern however estimates are uncertain. The recent survey provides the first biomass estimate for the species, however it was assessed as being of limited adequacy and it may benefit from a dedicated survey in the future. The RAG may want to continuously monitor this species noting that it has a very conservative catch trigger limit.
97. The RAG discussed whether species identification between the blackfish species is an issue and industry commented that they can be differentiated by the thickness of their skin and water content. Industry confirmed that the species' distribution across the reefs is extremely patchy and highly variable, but it is not clear if this is due to habitat or climate related factors.

Pinkfish

98. The RAG noted that this is a very common species however the survey trend indicates a decline most likely as a function of the survey or due to natural variability as it is hardly fished. The population density can also be highly variable. Industry members and observers advised that it is a very low value species with low market demand, noting that it is increasingly becoming a key commercial species in New Caledonia.

6 Ecological Risk Assessment (CSIRO)

99. The RAG reviewed the draft results of the CSIRO Ecological Risk Assessment for the Effects of Fishing (ERA) on the Torres Strait BDM Fishery (ERA) as presented by Dr Leo Dutra and Miriana Sporcic of CSIRO (**Attachment D**).
100. The RAG noted that the draft ERA assessed all direct and indirect impacts to and of the BDM Fishery as having either minor or negligible scores and the overall risk for the ecological impacts for the effects of fishing and external activities is low. The assessment outcome was based on the scale and nature of the fishery as well as available survey data. Fishing for sea cucumbers is very selective as done by hand collection. There is no by-catch or byproduct. It followed also in the assessment that the direct ecological impact on the benthos from harvesting the species is low.
101. The RAG provided the following comments to the project team to consider when finalising the ERA noting the assessment outcomes are not expected to change as a result of addressing the RAGs comments:
- review finding in the ERA that catch rates of prickly redfish have declined over the assessment period given the catch per unit effort trends in the survey report indicate an increase.
 - 'dry picking' or 'walking the reef' occurs occasionally in the fishery with most of the catch being taken whilst diving. Prickly redfish, curry fish and white teatfish can only be taken by diving. The only species that may be taken by dry picking, include species that are infrequently targeted such as stone fish, black fish, deepwater redfish, lolly fish, leopard fish and green fish.

7 Climate change impacts on Torres Strait Fisheries (CSIRO)

102. The RAG agreed to defer consideration of this item until its next meeting.

8 Research priorities

103. The RAG considered the information provided on the status of identified research priorities and needs for the BDM Fishery, and on the TSSAC research funding process, including funding available for the 2022/23 financial year. The RAG also considered the additional analysis and sampling needs identified during the meeting to address some of the key data gaps that exist in the fishery. The RAG reviewed all identified research needs and prioritised as outlined in Table 1.
104. With regards to a future sandfish survey, the RAG considers it to be an important research requirement for the BDM fishery to be able to assess the status of the sandfish stock at Warrior reef and enable consideration of a future opening to benefit Torres Strait Islanders. The RAG agreed that AFMA would write to the Iama and Tudu island PBC and relevant stakeholders to gauge their level of interest in a survey being undertaken. The Scientific member Tim Skewes suggested that efforts be made to engage PNG in the research also given it is a shared stock.
105. The RAG revisited its earlier discussion under Agenda Item 4 on the large socioeconomic knowledge gaps in the fishery. The RAG discussed the data that can be obtained from socioeconomic surveys on fishing effort, fishing activities, 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. It was discussed that the data from many of these metrics can strongly inform the management of the fishery and members were supportive of undertaking such surveys and study. The RAG requested an update of the current wording of the socioeconomic research need identified for the fishery to reflect the RAG's discussion and agreed that the development of an appropriate research scope could benefit from further consideration by the RAG and social science expertise..

ACTION – RAG recommended that AFMA write to Iama island PBC, GBK, TOs and fishers seeking their feedback on the priority for assessing the status of the sandfish stock and inviting representatives to the RAG's next meeting.

ACTION – 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.

9 Other business

106. There was no other business nominated for discussion.

10 HCRAAG priorities and date for next meeting

107. The RAG agreed to defer the discussion on HCRAAG priorities to its next meeting. The RAG agreed to tentatively schedule its next meeting for June-July 2021.
108. The Chair thanked all members and observers for their contribution to a productive meeting. Mr Simon Naawi closed the meeting at 1805 in Prayer.

Table colour key	Completed	Scoped and/or costed	Not scoped/not costed
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Table 1. Overview and status update of research needs identified or discussed for Hand Collectable Fisheries at previous HCWG meetings and the rolling five-year research plan including HCRAg's recommendations and assigned priorities from its meeting on 6-7 October 2021.

	Research activity	Detail	Status	Comments/questions	HCRAg priority and comments
1	Status of BDM stocks in relation to harvest strategy reference points	Consistent with the BDM harvest strategy and where there is sufficient information available, a tactical research project is needed to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points.	Not scoped/not costed		High priority
2	White teatfish modelling	Additional analysis on white teatfish to develop a rationale on the status of the stock in relation to harvest strategy reference points and modelling analysis on a sustainable TAC increase.	Not scoped/not costed		High priority
3	Black teatfish sampling	Representative sampling to collect size and weight frequencies during the black teatfish openings.	Not scoped/not costed		High priority
4	Development of curryfish conversion ratios	Project to develop conversion ratios for curryfish with industry undertaking the sampling process.	Scoped and costed \$12,000	Full proposal developed and allocated funding in 2019/20 but did not proceed due to COVID-19.	High priority
5	Sandfish stock survey	Outstanding stock survey of Sandfish at Warrior Reef to better understand its status	Not scoped/not costed	Identified as a research need for the fishery by HCWG17 at its meeting 12 October 2020. Was part of the 2019-20 stock survey but did not proceed.	High priority subject to confirmation of support from Iama and Tudu Island PBC, GBK, Traditional Owners and fishers.

	Research activity	Detail	Status	Comments/questions	HCRA priority and comments
6	Black and white teatfish follow up surveys	Follow up black and white teatfish surveys focusing on specific areas and potentially including areas not surveyed previously such as south east TSPZ, barrier and deep-water strata.	Not scoped/not costed		Medium term priority. The RAG will initially need to determine what is required, other than an independent survey, to meet the WTO requirement to provide a revised population estimate.
7	Socio-economic	Collection and analysis of socioeconomic data from interview-based questionnaire surveys.	Not scoped/not costed	Identified as a research need for the fishery by HCWG members.	Medium term priority as there is preceding work and update the current wording to reflect RAG discussion. Research scope and survey design and development to be: <ul style="list-style-type: none"> • Informed by AFMA's review of CDR participation data to date • further considered by the HCRA and social science expertise to ensure it is appropriate.
8	Management Strategy Evaluation (MSE) of the Beche-de-mer Harvest Strategy	1. Collate all data and biological information; 2. Update and extend the spatial multispecies TS BDM operating model developed earlier (or construct a new model); 3. Use MSE to evaluate how well the HS achieves the pre-specified objectives; 4. In consultation with stakeholders, use the MSE framework to investigate ways to improve the current HS.	Not scoped Est cost – \$130k	Identified as an essential research priority by HCWG in the rolling five-year research plan for Hand Collectable Fisheries. Requires 3-5 years of BDM HS implementation.	Medium priority and to be held off until the harvest strategy has been in place for a few years.

	Research activity	Detail	Status	Comments/questions	HCRA priority and comments
9	Supply chain	Better understanding of the supply chains as per other fisheries to better understand vulnerabilities and help develop an industry that is resilient to fluctuating export market conditions.	Not scoped/not costed		Not prioritised
10	Exploring sea ranching/re-seeding opportunities		Not scoped/not costed	Identified as a key research need for the fishery by HCWG Traditional Inhabitant members. Industry initiated pilot project currently underway on Ugar.	To be removed from the research plan - Aquaculture falls outside the remit of the PZJA. PZJA can provide support through provision of information and permitting collection of broodstock. With regarding to Sandfish aquaculture, the PZJA will initially want to establish the status of the sandfish stock on Warrior reef.
11	Ecological Risk Assessment (ERA) – Torres Strait Pearl Shell Fishery	Conduct an ERA for the Torres Strait Pearl Shell (TSPF) Fishery	Not scoped Est cost - \$20,400	Identified as an essential research priority by HCWG in the rolling five-year research plan for Hand Collectable Fisheries	To be remove from the research plan as there is no fishing activity and therefore no immediate ecological risk.
12	Understanding biological parameters of BDM species, including growth, mortality, size and breeding seasonality	Identifying gaps in knowledge of biological parameters of BDM species and investigating options for collaborative research	Not scoped/not costed	Identified as an essential research priority by HCWG in the rolling five-year research plan for Hand Collectable Fisheries Requires further scientific advice.	Low priority and proposed that it be addressed as the need arises.
13	Stock Status Survey	To undertake a stock survey of all Torres Strait beche-de-mer species with a focus on deeper water species	Completed in 2019 - 2020	Final report identified research needs that the HCRA may want to consider further	N/A

	Research activity	Detail	Status	Comments/questions	HCRA priority and comments
14	Ecological Risk Assessment (ERA)	Conduct an ERA for the TSBDM Fishery	Draft completed on 30 June 2021.	Needs to be completed by January 2022 to meet WTO condition 5 for the fishery.	N/A
15	Climate Change impacts and vulnerability	Scoping study across all Torres Strait	Completed	Final report made recommendations for further research	N/A
16	Data analysis	Further analysis of catch data collected during the 2021 trial reopening of black teatfish to inform future openings and follow up work from the stock survey.	Completed	HCWG identified this as the highest research need for the BDM Fishery. CSIRO completed the black teatfish catch data analysis from the 2021 opening and updated the modelling to inform future opening and TAC.	Completed

Summary of actions arising from HCRAAG 1

Action Item	Responsibility
AFMA to circulate the QLD east coast black teatfish stock assessment to members.	AFMA
AFMA to work with relevant fishers and fish receivers to confirm or otherwise the validity of the catch reported to have been caught in the Warrior reef reporting zone to ascertain whether the absence of data for the other days was because no one fished there or the area fished wasn't recorded.	AFMA
AFMA to invite Queensland Fisheries to provide information on access requirements to sea cucumber fishing grounds in the Queensland east coast sea cucumber fishery and at Ashmore reef.	AFMA
The Executive Officer to circulate the white teatfish stock assessment for the Queensland Sea Cucumber Fishery to RAG members.	AFMA
RAG recommended that AFMA write to Iama Island PBC, GBK, TOs and fishers seeking their feedback on the priority for assessing the status of the sandfish stock and inviting representatives to the RAG's next meeting.	AFMA
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

Summary of HCRAAG 1 recommendations

Agenda Item #	Recommendations
3	In designing a future survey, the RAG RECOMMENDED that consideration be given to adding more sites in northern Great Barrier Reef (GBR) (from the Green Zone north to Mer Island) noting advice from a traditional inhabitant industry member that historical catches of black teatfish from this area were significant.
4	Having regard for all available information and conditions 5-8 of the BDM Fishery Harvest strategy (HS) relating to reopening decision rule that need to be addressed, following a trial opening the RAG RECOMMENDED a black teatfish opening in 2022 with a 20t TAC on the basis that: <ul style="list-style-type: none"> a. the 2021 trial reopening TAC of 20t was not overcaught (condition 5 of the HS); b. data was collected satisfactorily during the opening (condition 6 of the HS); c. updated modelling analysis, inclusive of 2021 catch data, confirmed that a 20t TAC is sustainable (conservative estimate of MSY being 21t) and would not lead to a decrease in black teatfish biomass after the first year of fishing (condition 7 of the HS). In contrast, the modelling found that annual catches of 30t could lead to a gradual depletion of the stock. d. prior to a future black teatfish opening AFMA focus on communication and education on improving voluntary reporting of area and effort data by fishers and fish receivers, including preparing fact/information sheets and

Agenda Item #	Recommendations
	<p>organising a teleconference with all fish receivers as a cost effective way to discuss ways of improving voluntary reporting.</p> <p>e. opportunities to undertake a sub-sampling program to collect size and weight frequency data during black teatfish openings at key landing locations be explored. Noting that the sampling program would need to be scientifically designed.</p>
4	<p>The RAG RECOMMENDED that the HCWG, noting the ongoing concern of the economic viability of so many licences being able to access the relatively small black teatfish TAC in a short period of time, consider the performance of licencing arrangements for the fishery in line with the <i>Torres Strait Fisheries Act 1984</i>.</p>
5	<p>Having considered the latest information available and the BDM Harvest Strategy the RAG RECOMMENDED:</p> <ul style="list-style-type: none"> a. no changes to the current TACs for the 2022 BDM fishing season. b. that the basket trigger limit for curryfish vastus be increased to 30t in light of the additional information available for the species and the survey results indicating a more even relative abundance. c. that the HCWG continue to consider the review of the current hookah ban in relation to white teatfish and undertake further community consultation on management arrangements that would support sustainable harvesting of white teatfish using hookah
5	<p>The RAG RECOMMENDED the following short-medium term data, research and analysis needs:</p> <ul style="list-style-type: none"> a. stock assessment modelling to assess the potential (and extent) for an increase to the white teatfish TAC. b. consistent with the BDM harvest strategy and where there is sufficient information available, a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible. c. ongoing data collection to better understand fishing practices for lollyfish on Poruma as there may be some evidence of home reef depletion.

List of attachments

Attachment A – Presentation on the outcomes of the CSIRO research project: ‘Stock survey of Torres Strait Beche-de-mer species’

Attachment B – Presentation on the results of the CSIRO analysis of data reported during the opening

Attachment C – Presentation on the draft results of the CSIRO Ecological Risk Assessment for the Torres Strait Beche-de-mer Fishery

Attachment D – Species Assessment Sheets

Attachment E – Meeting Agenda



Torres Strait sea cucumber (Beche-de-mer) survey 2019/20

Hand Collectables RAG

Nicole Murphy, Kinam Salee, Steve Edgar, Eva Plaganyi, Timothy Skewes,
October 2021

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Australian Government
Australian Fisheries Management Authority



Australian Government



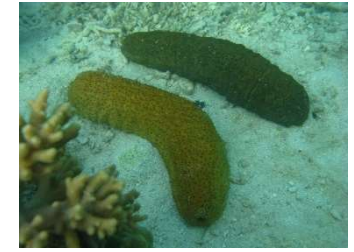
TSRA
www.tsra.gov.au



2019/20 Survey objectives

Determine stock size and density trends for:

- Current target species:
 - White teatfish (high priority)
 - Prickly redfish (high priority)
 - Curryfish (medium priority)
- Closed or reopening species:
 - Black teatfish (high priority)
 - Surf redfish (medium priority)
- Other species (low priority)
- Deeper water populations:
 - White teatfish (high priority)
 - Burrowing blackfish (low priority)
 - Other species (medium priority)



Other objectives and outcomes

- Habitat trends and mapping

- Seagrass, coral
- Crown of thorns starfish
- Clams, other species



- General reef mapping

- Reef mapping ground truthing (of new NERP reef map)
- Better understanding of reef area and structure in Torres Strait

Ugar survey

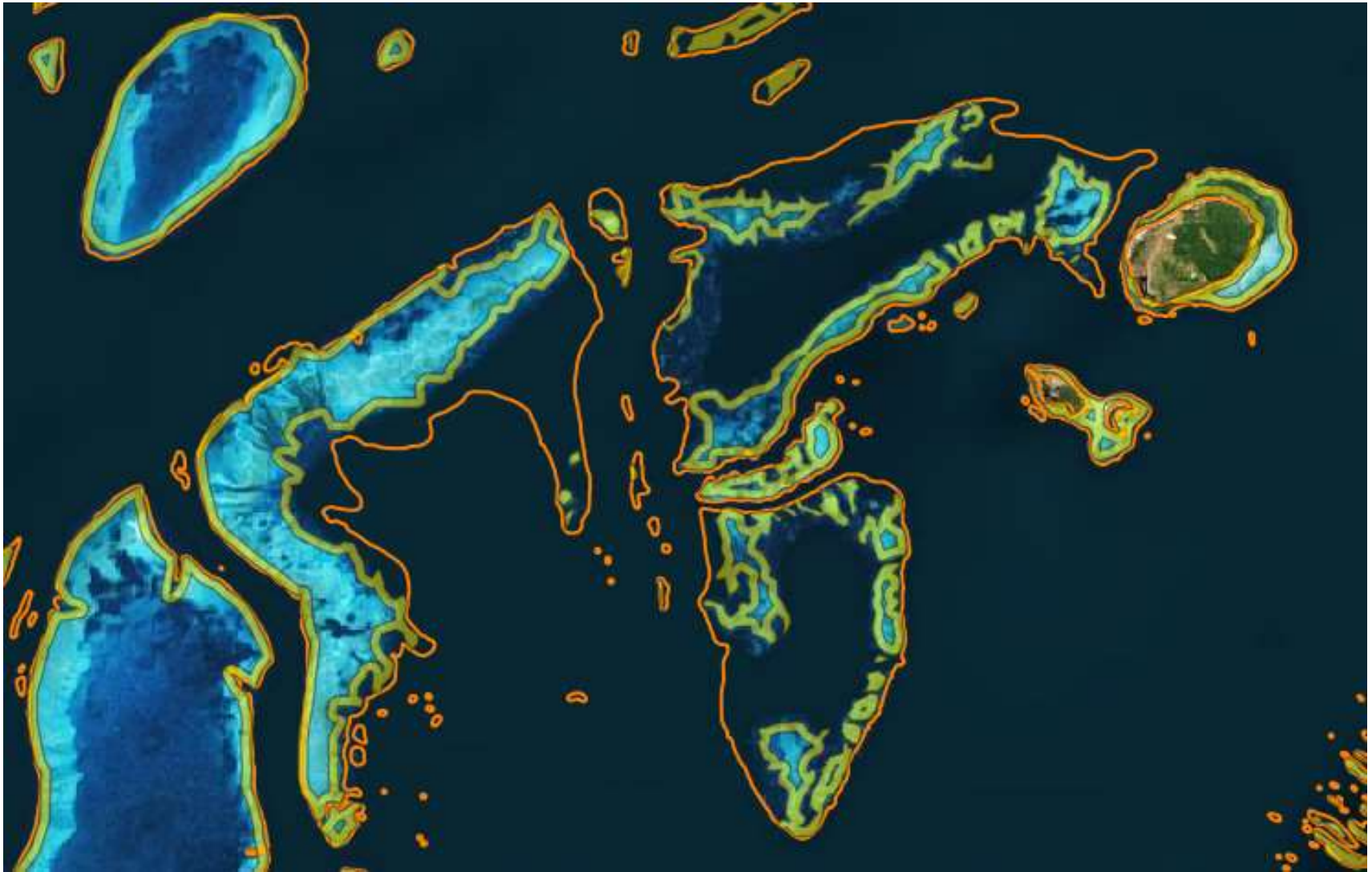
- Sea cucumber survey and reef mapping of Ugar and Campbell Reefs
- To support development of community sea cucumber aquaculture project
- Results provided to community



Study area - Zones

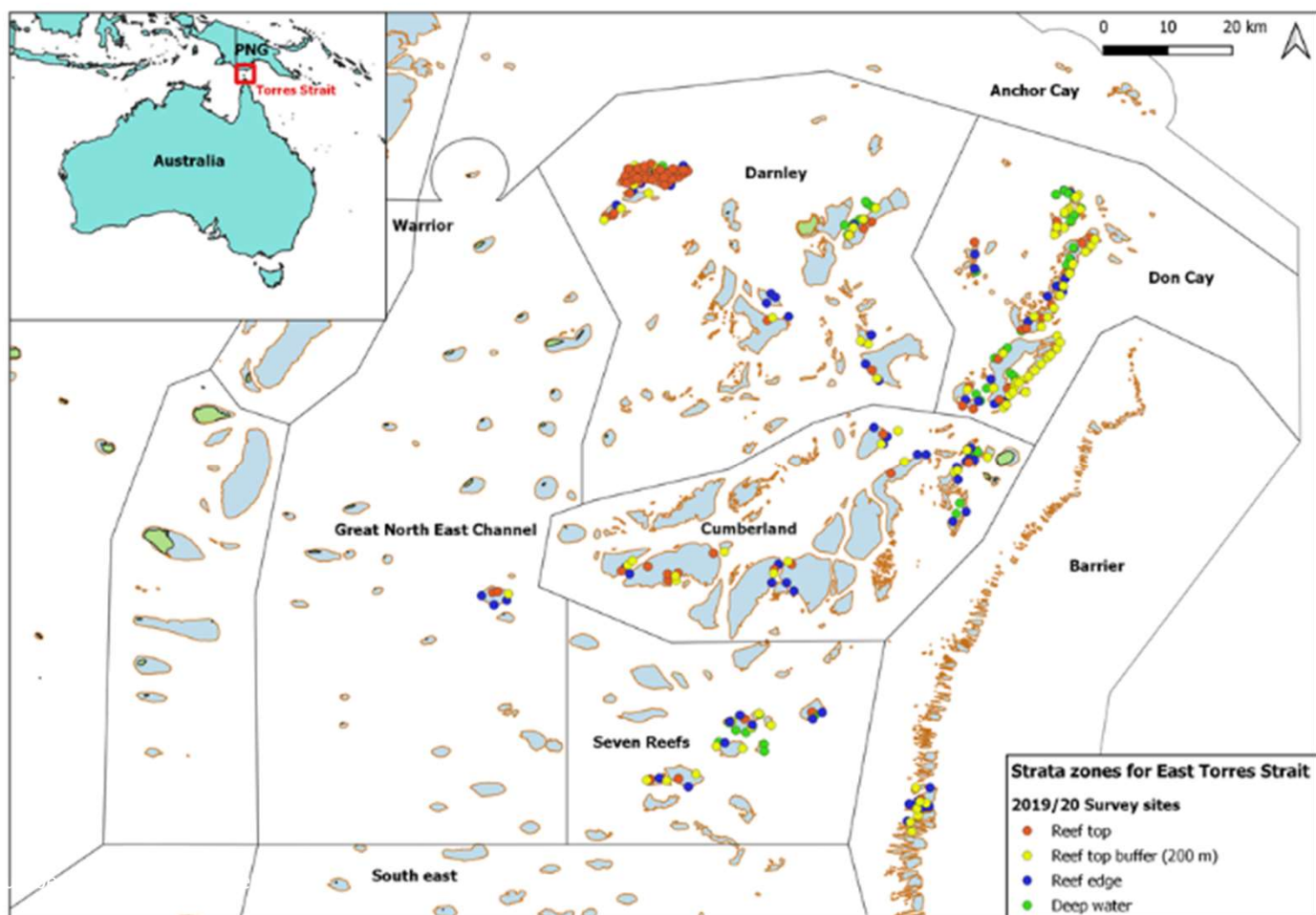


Study area - strata



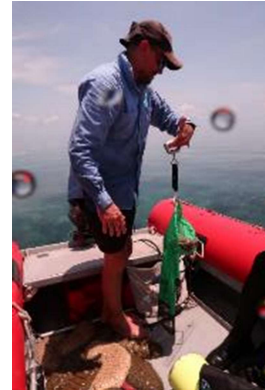
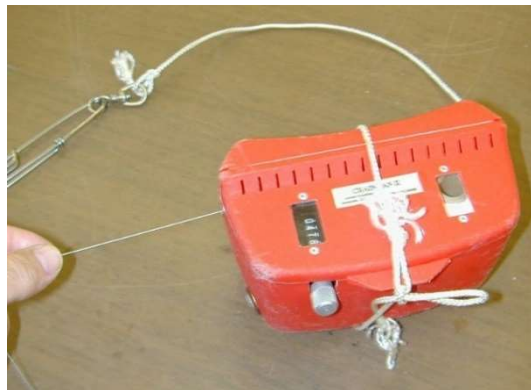
Survey sites

Year	Zones	Top	Buffer	Edge	Deep	Total
1995/96	14	1089	164	365	0	1618
2002	6	136	139	159	0	434
2005	5	35	52	40	0	127
2009	5	33	25	45	0	103
2019/20	6	88	86	70	53	297



Survey methods – shallow reef (<20 m)

- Same methods used in all previous surveys
- 40 m to 100 m transects – snorkel or scuba
- Use GPS and chainman distance device
- Counted and collected sea cucumbers
- Recorded habitat and other biota
- Measured length and weight
- All sea cucumber returned to sampled habitat

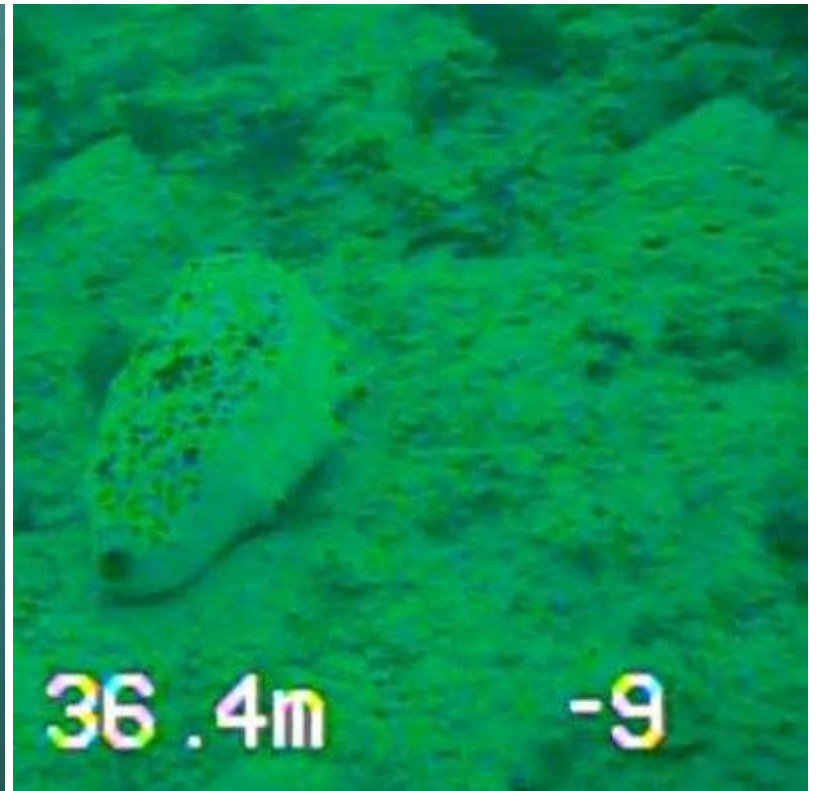


Deep reef survey

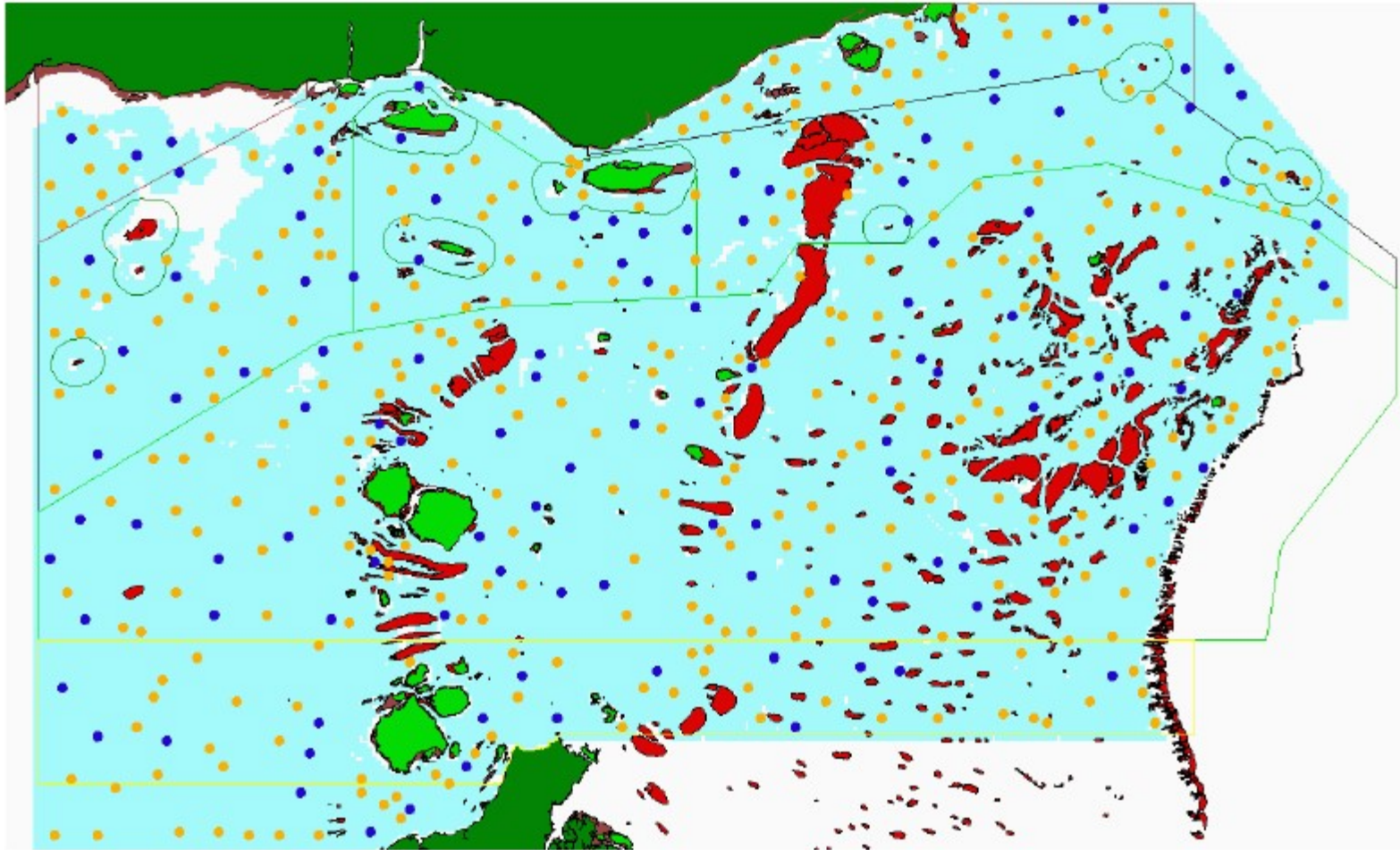
- 20 m - 50 m deep
- 10 min drifts, 40 – 600 m
- TSRA camera system – *Thanks!*
- Deepest White teatfish 37 m



Thank you Madeina! (David)



Inter-reef habitat

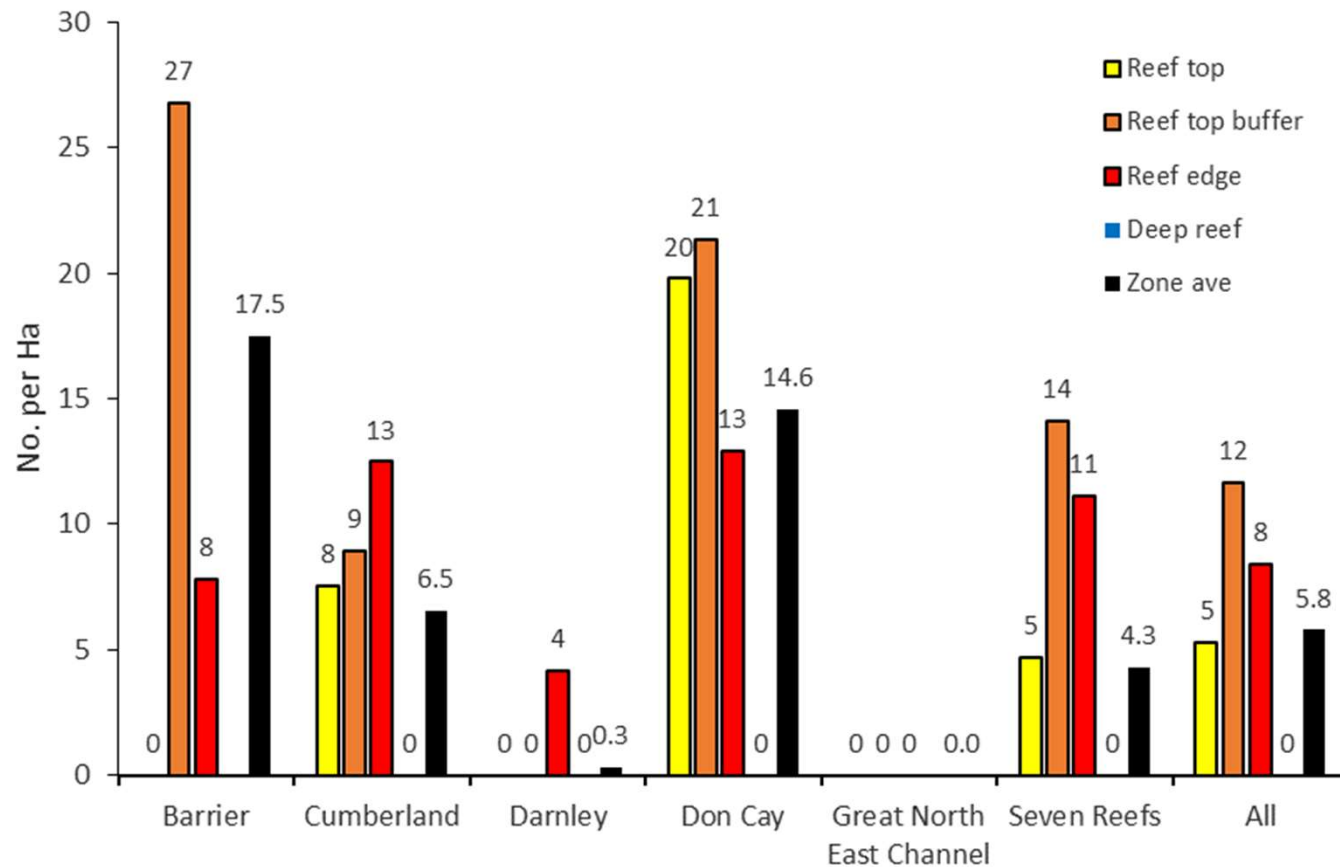


Inter-reef habitat

Species	Sites observed	Biomass (t)
<i>Actinopyga lecanora</i> **	1	-
<i>Cercodemas anceps</i>	37	19.3
<i>Cladolabes perspicillum</i>	2	-
<i>Cladolabes schmeltzi</i>	2	-
<i>Holothuria edulis</i> **	1	-
<i>Pentacta australis</i>	17	-
<i>Cladolabes perspicillum</i>	2	-
<i>Pseudocolochirus violaceus</i>	17	929.8
<i>Stichopus horrens</i> **	21	314.1
<i>Holothuria ocellata</i>	50	69.8
<i>Stichopus herrmanni</i> **	2	-
<i>Holothuria atra</i> **	1	-
<i>Holothuria lessoni</i> **	7	-
<i>Stichopus ocellatus</i>	1	-



Black teatfish 2019/20



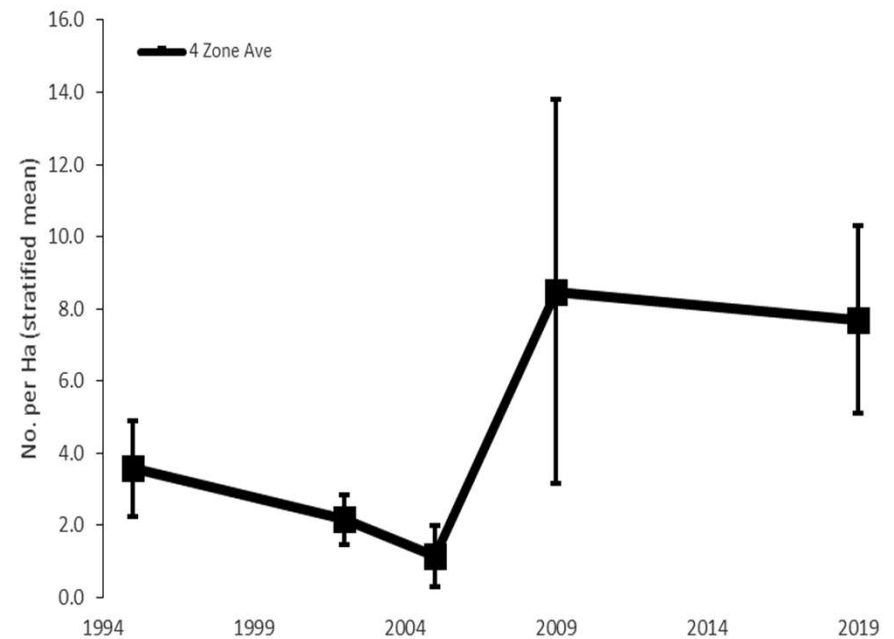
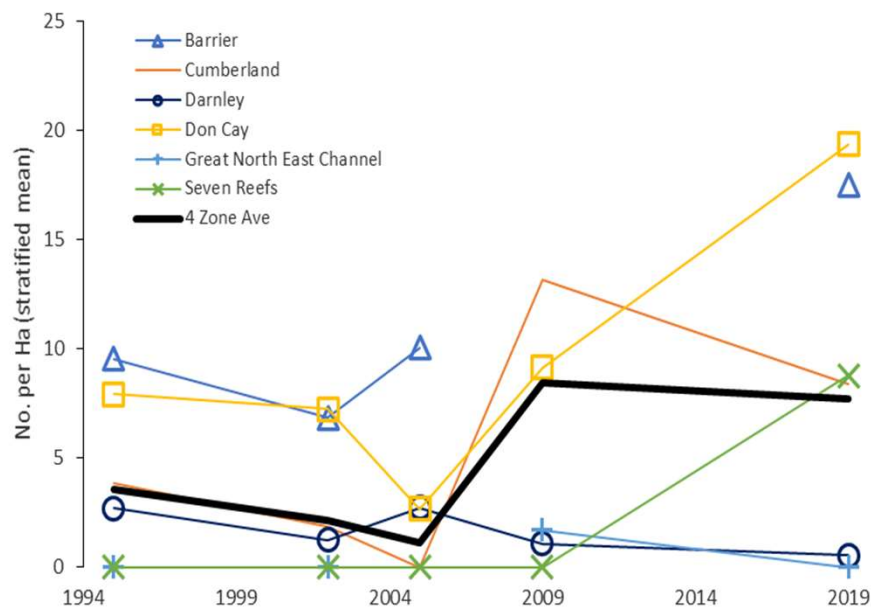
Fishery biomass estimate = 787 t
 >MLS = 172 t

Black teatfish – stock trends



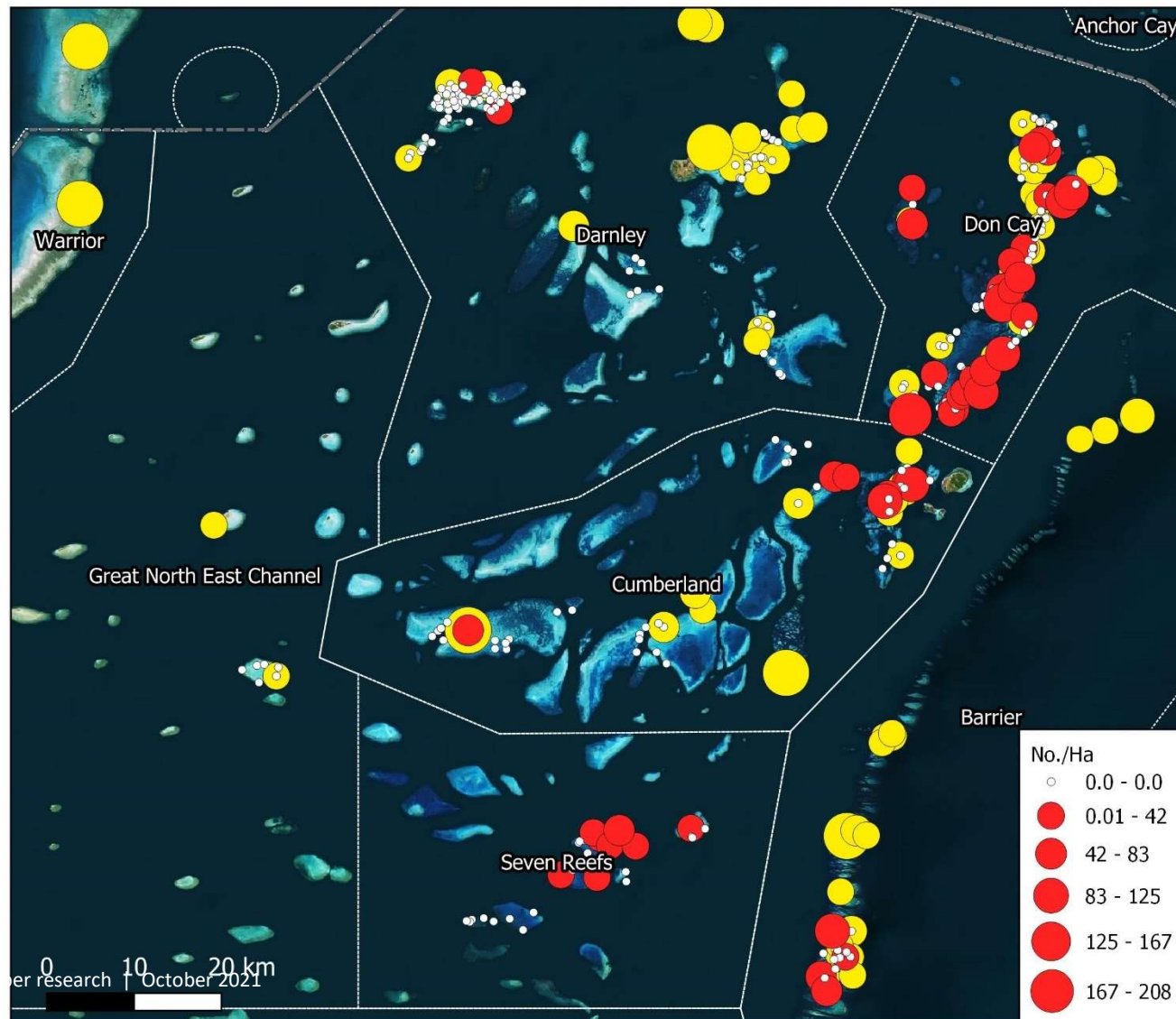
Density trends 1995 - 2019/20

- 4 zones consistently sampled (Cumberland, Darnley, Don Cay and Seven Reefs)



Black teatfish – stock trends

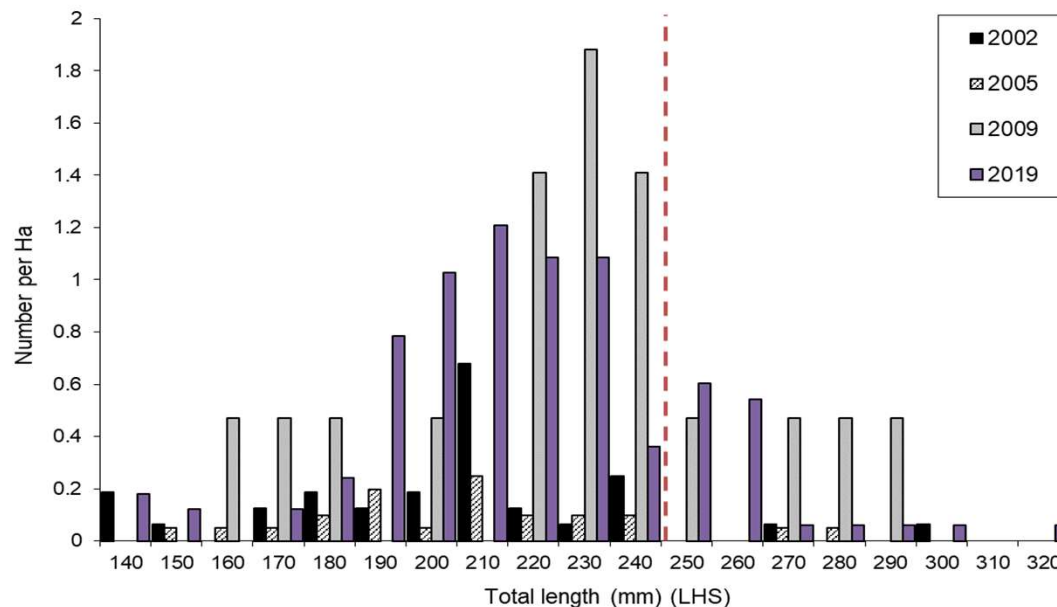
Site density 2019/20 v previous



Black teatfish - size



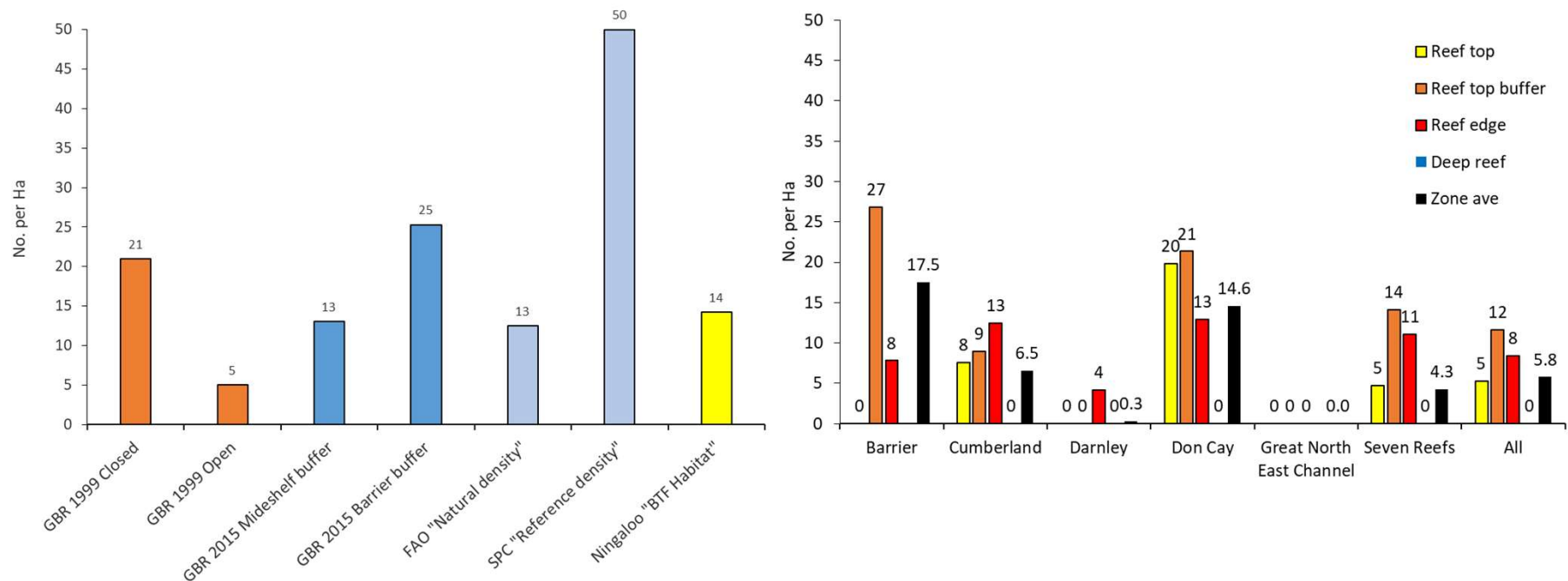
- Average size in 2019/20 was 219 mm (slightly smaller than 2009, but larger than other surveys)
- Slightly lower proportion of legal size animals compared to 2009
- Size at maturity: 220 - 260 mm
- Minimum legal size: 250 mm



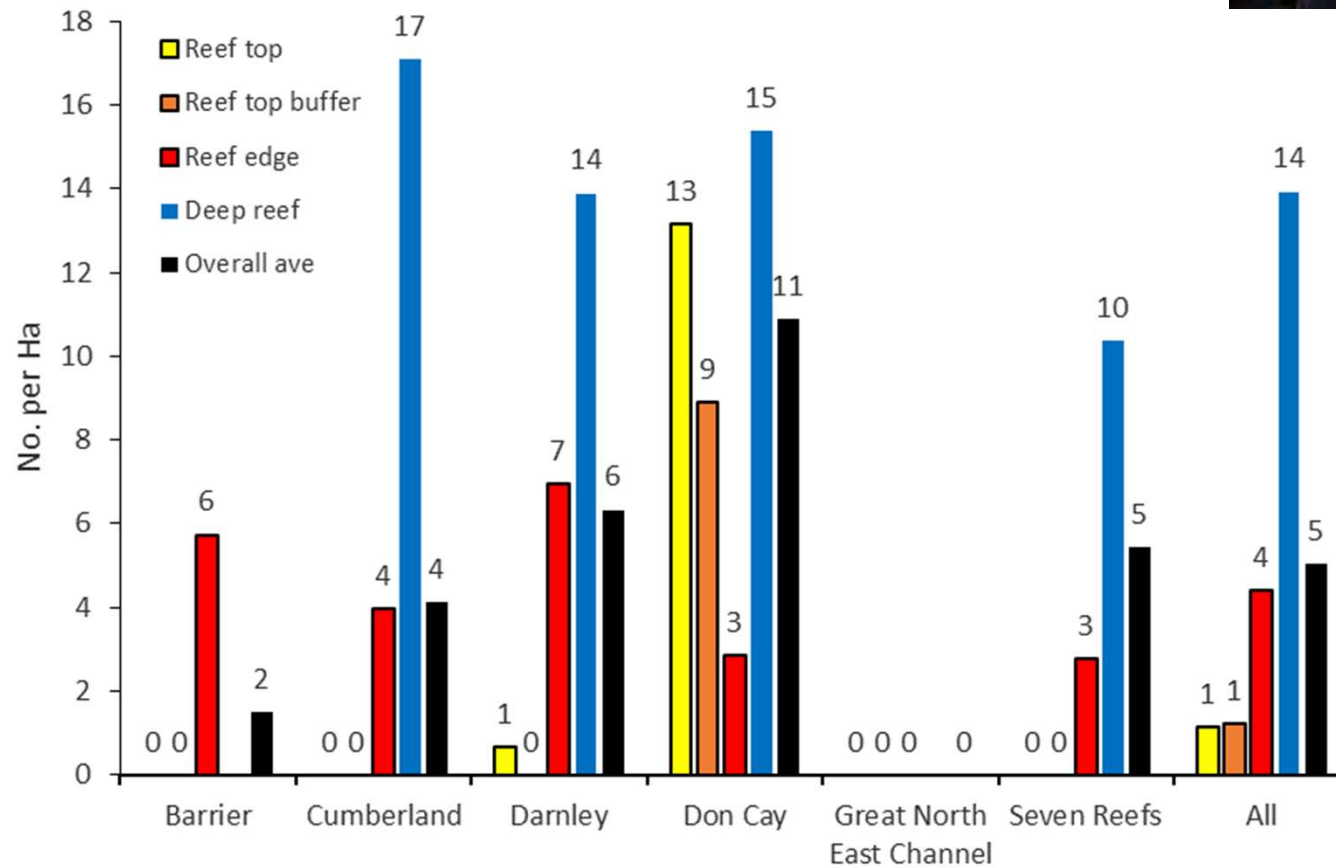
Black teatfish – stock status



Comparison to other studies

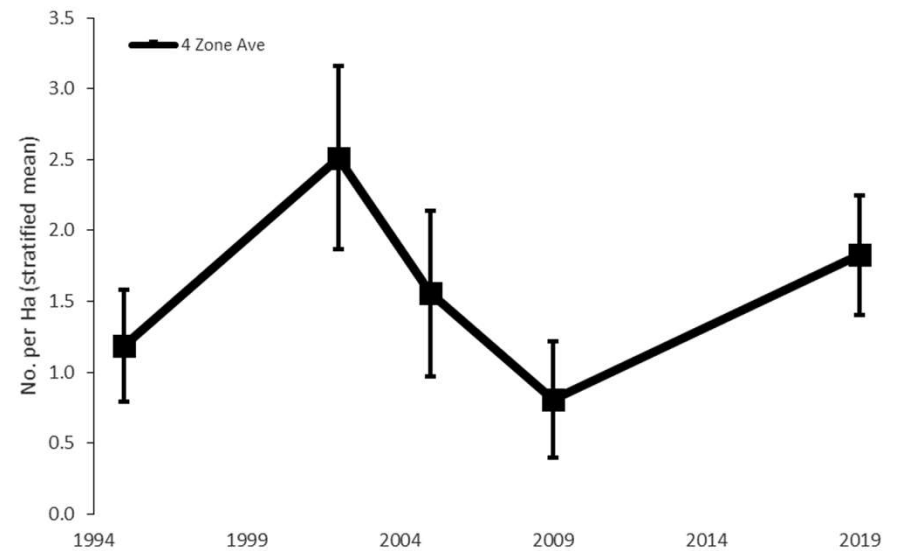
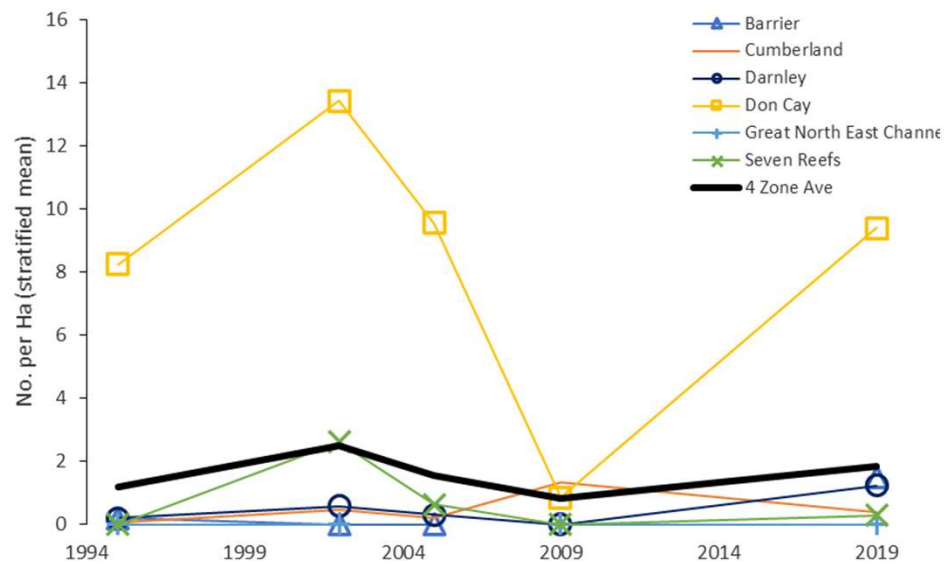


White teatfish



Fishery biomass estimate = 879 t
>MLS = 143 t

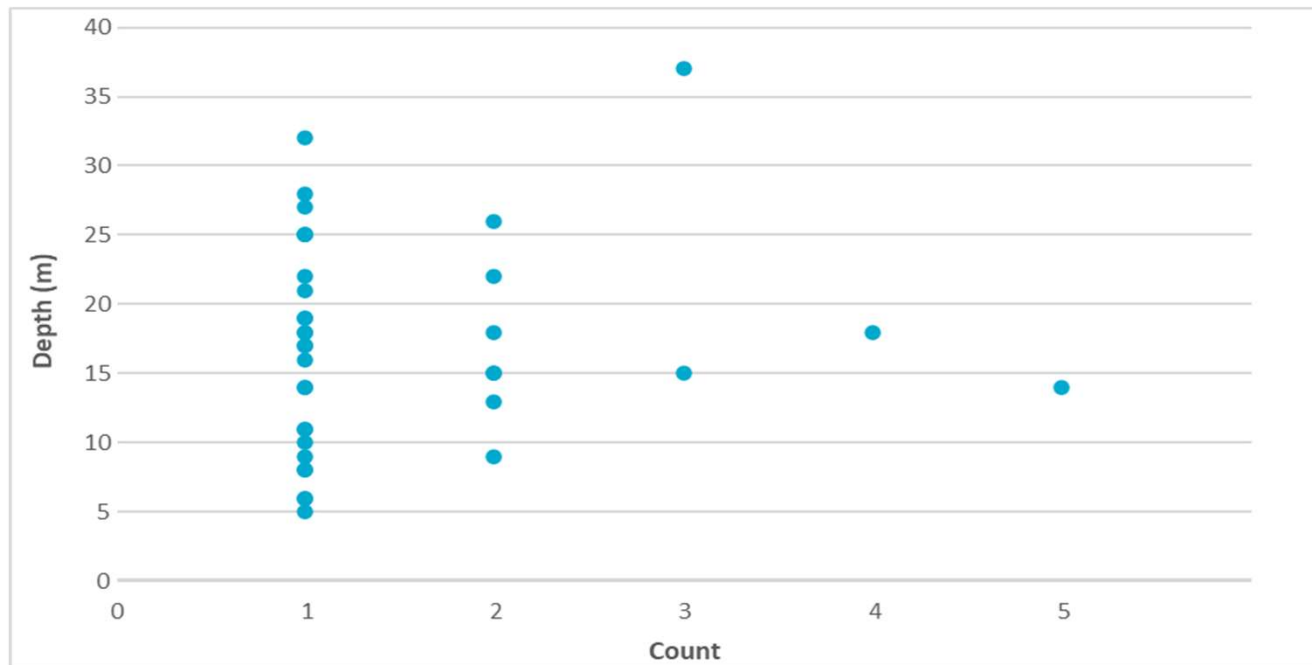
White teatfish



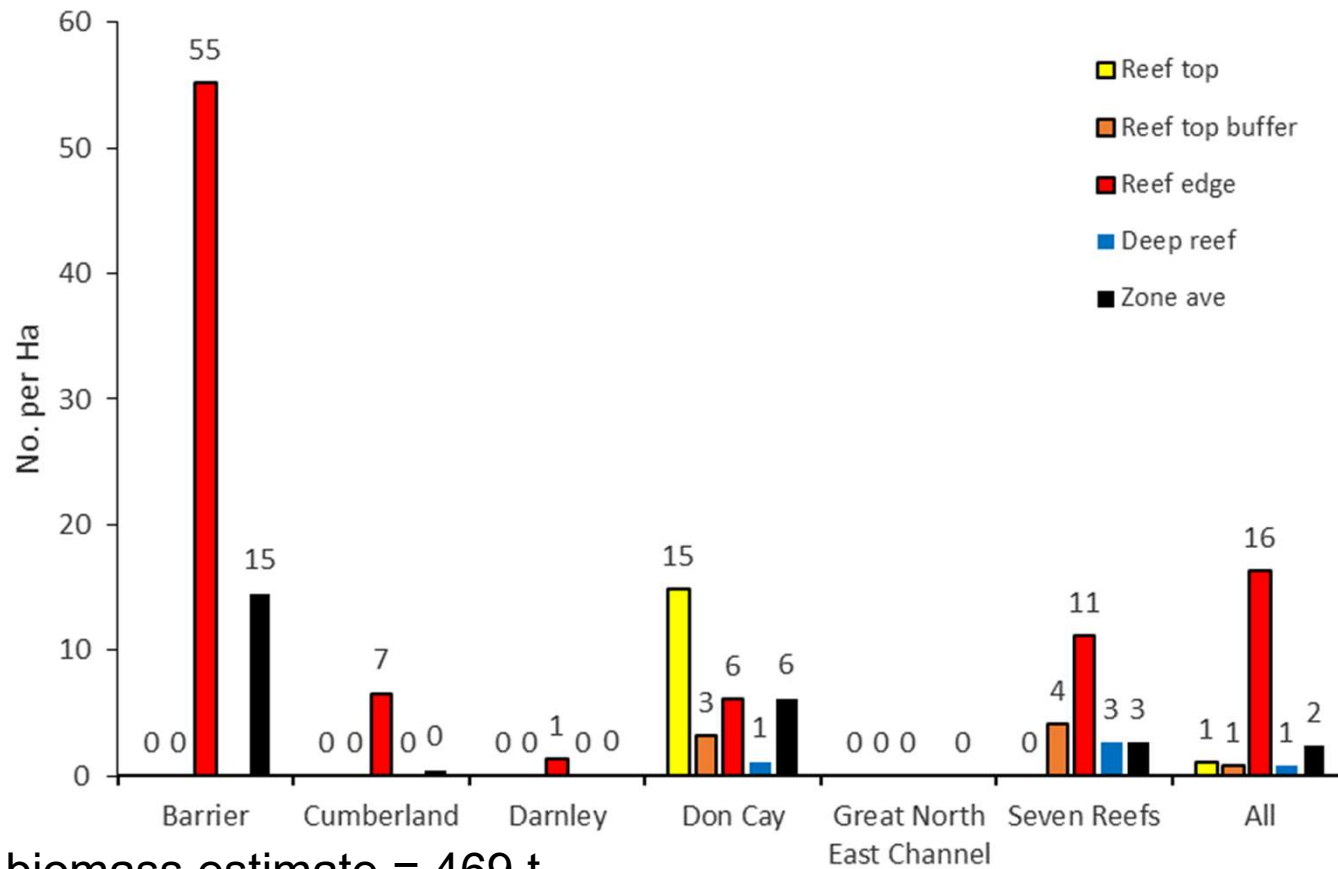
White teatfish

Depth profile

- Majority found between 5 m and 30 m depth
- Deepest was 37 m



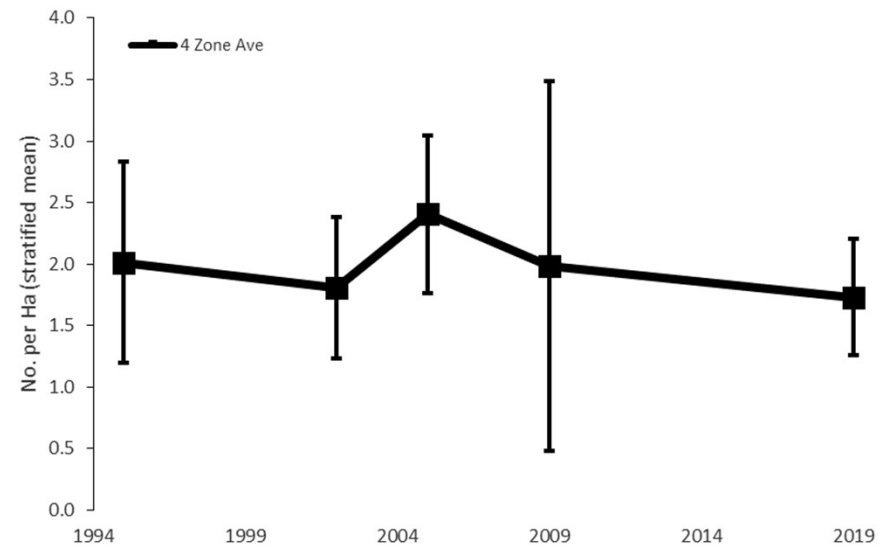
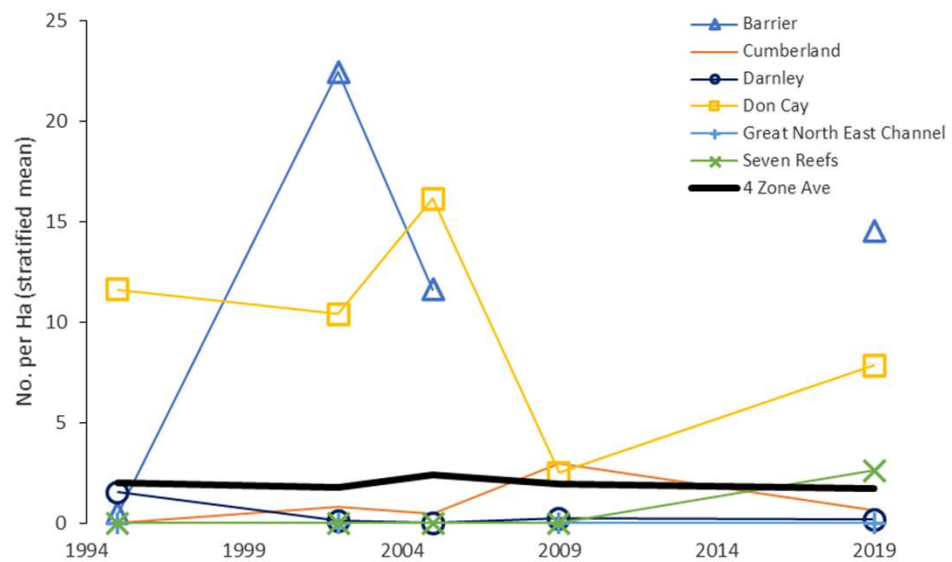
Prickly redfish



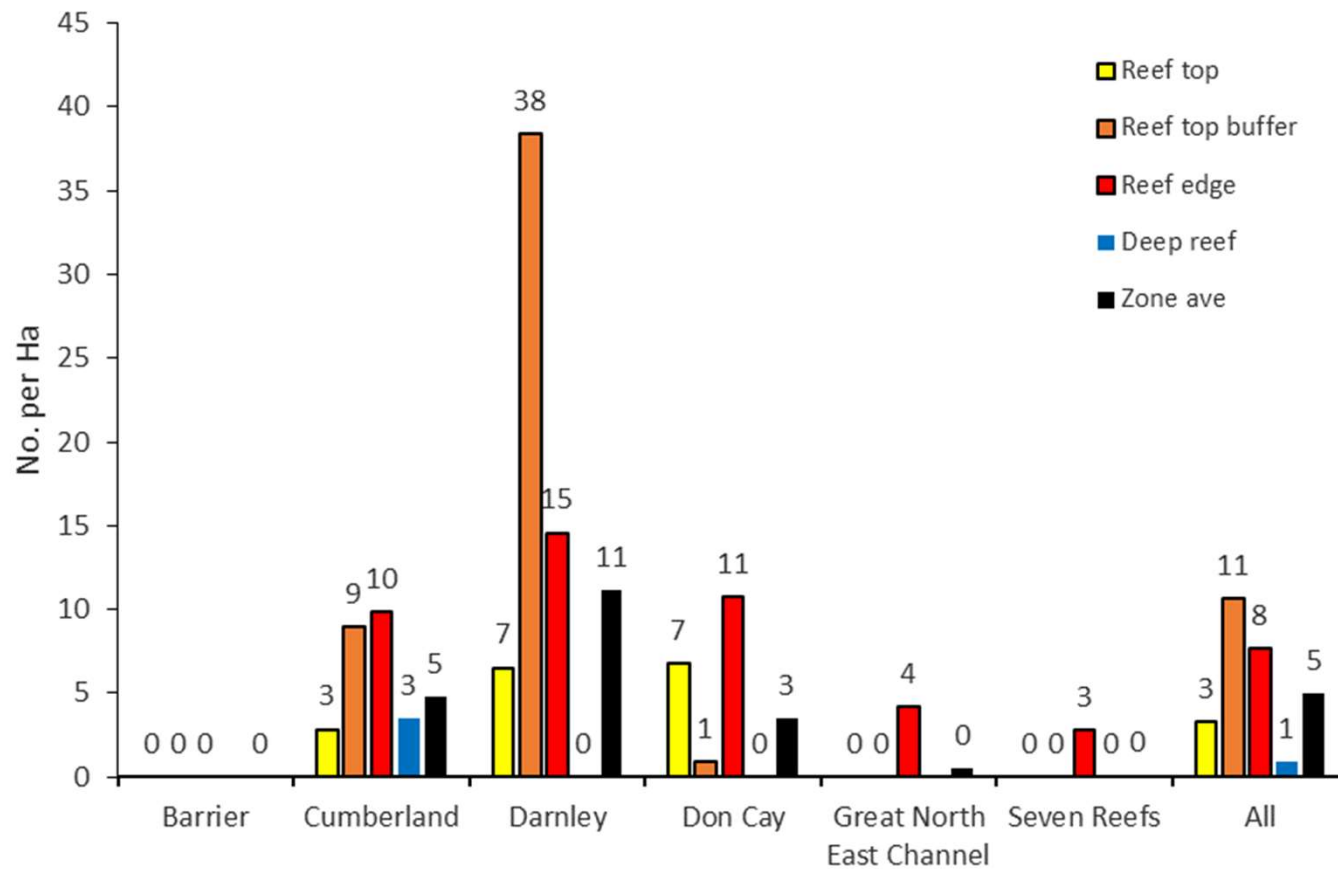
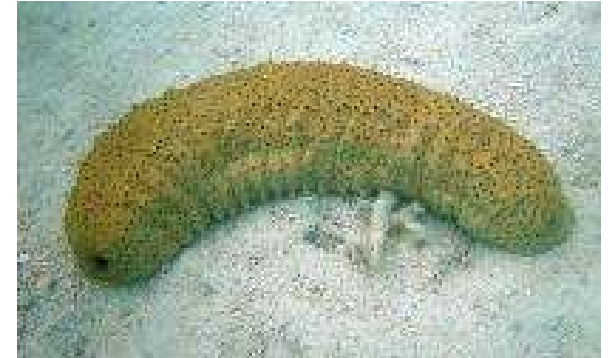
Fishery biomass estimate = 469 t

>MLS = 257 t

Prickly redfish

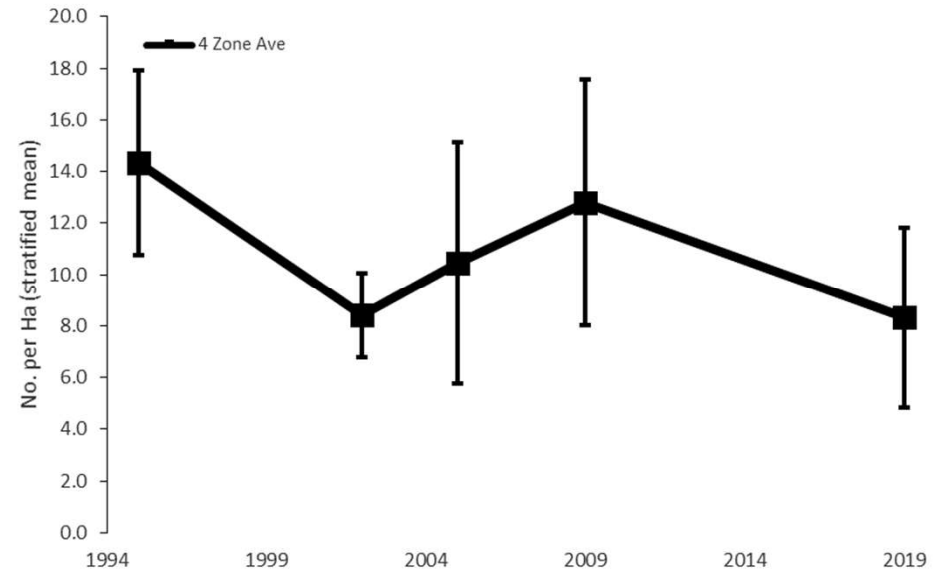
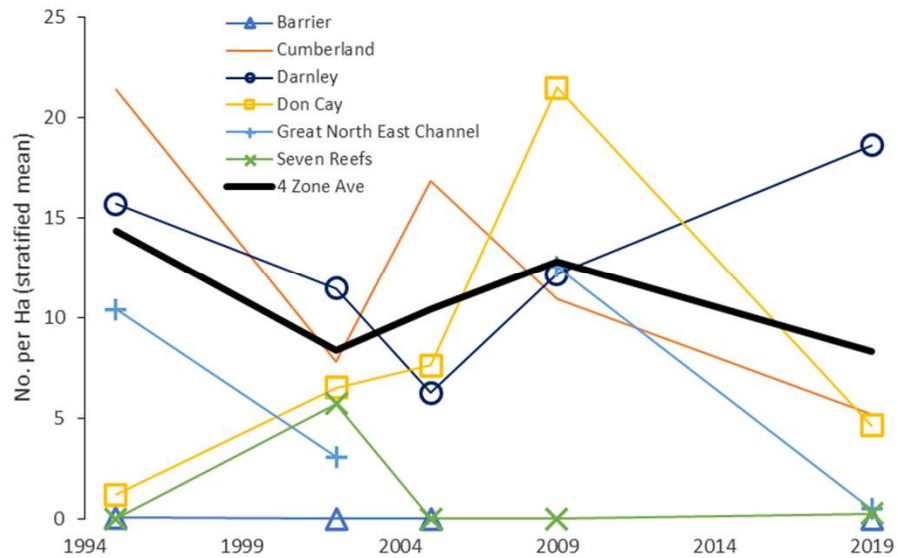
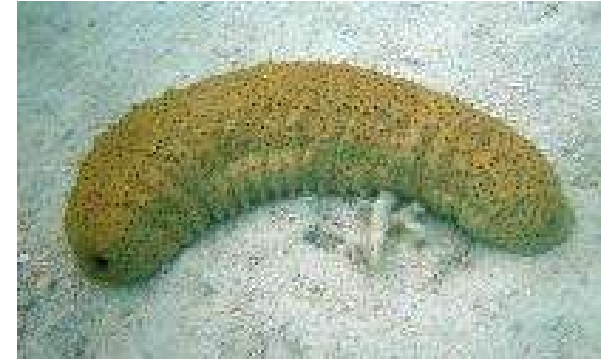


Curryfish (common)



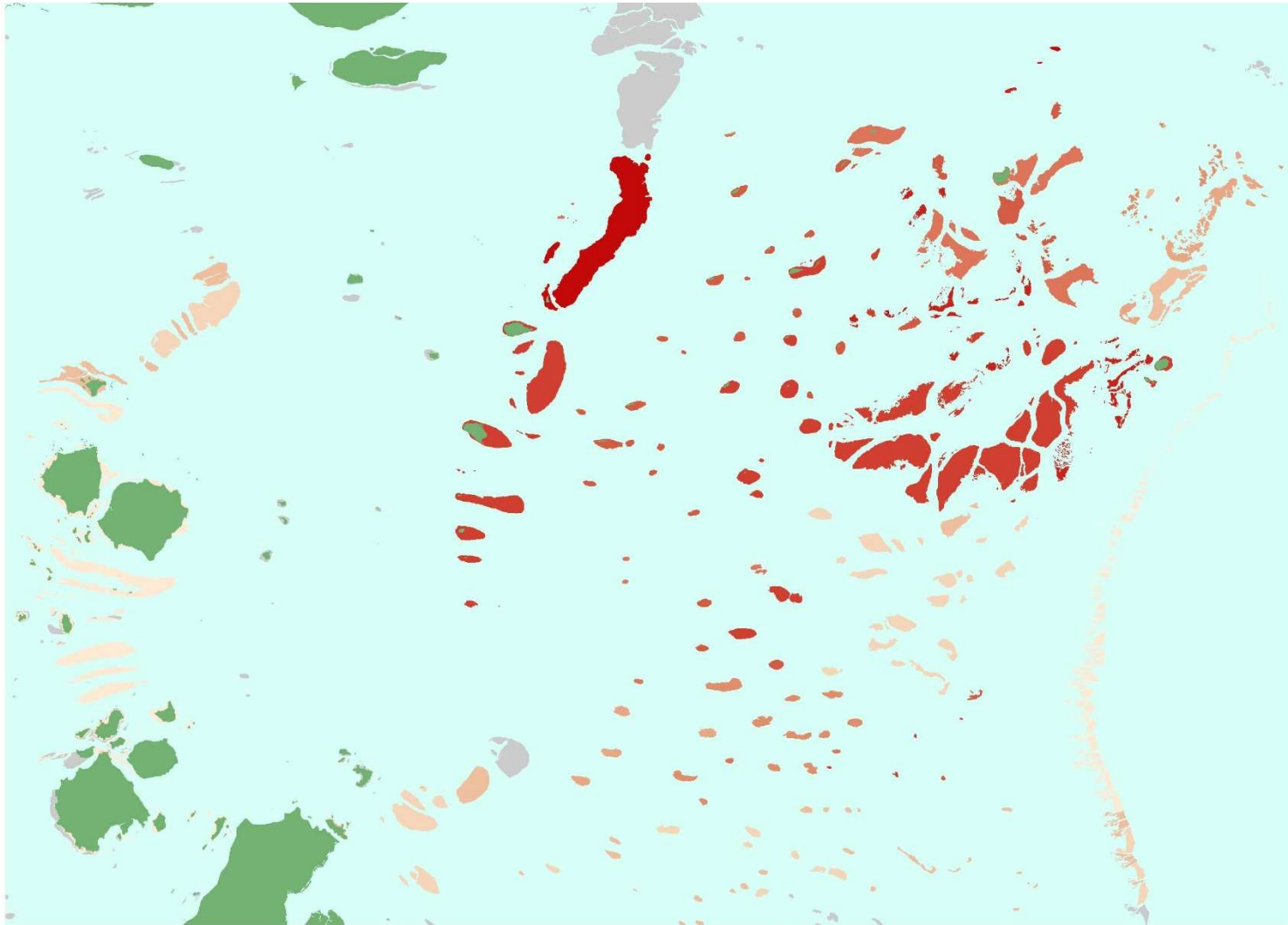
Fishery biomass estimate = 682 t
>MLS = 647 t

Curryfish (common)

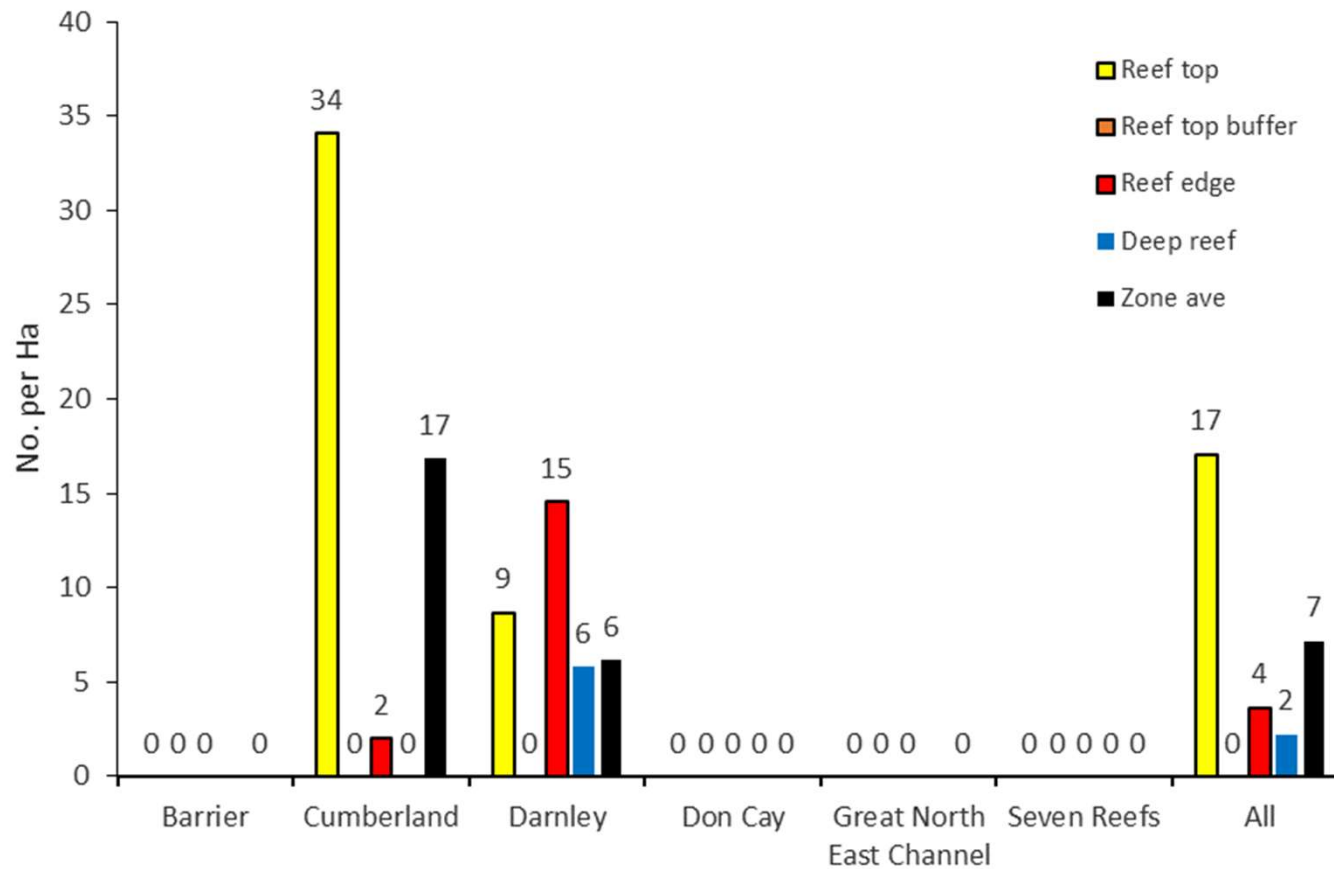


Curryfish (common) – distribution

- Modelled from survey data 1995-2009 and biophysical correlates



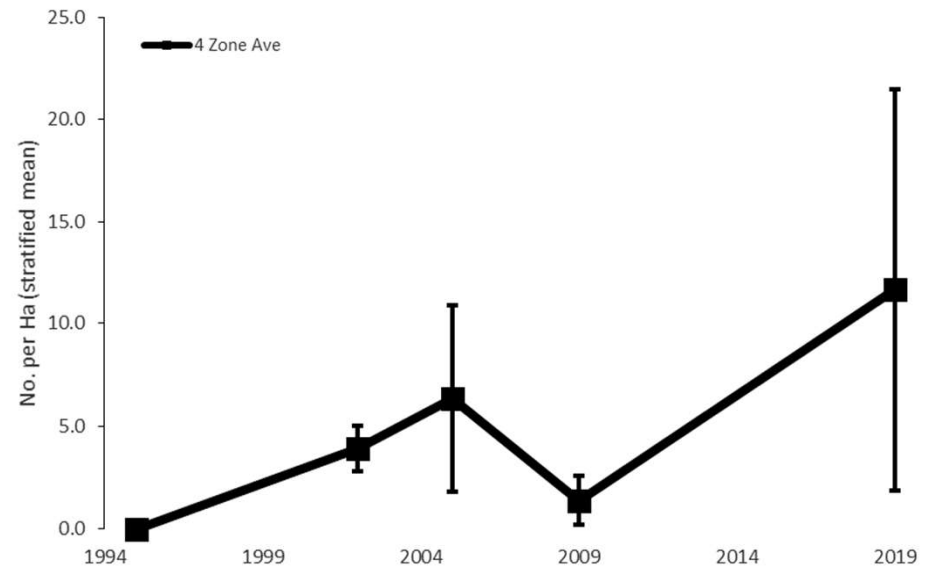
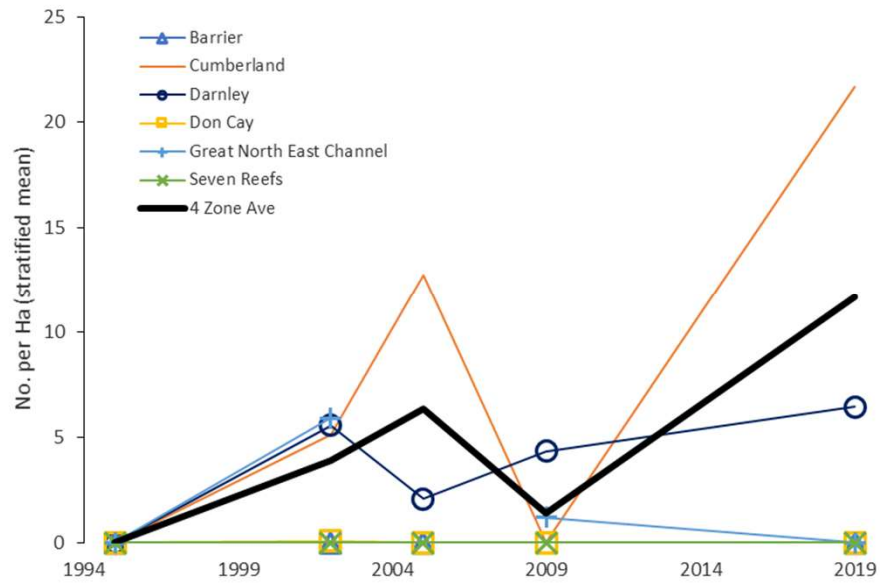
Curryfish (vastus)



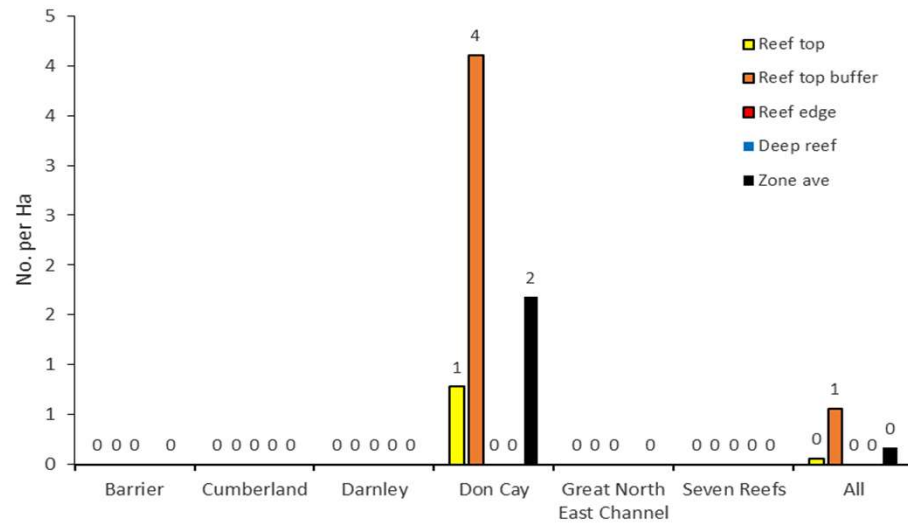
Fishery biomass estimate = 171 t

>MLS = 171 t

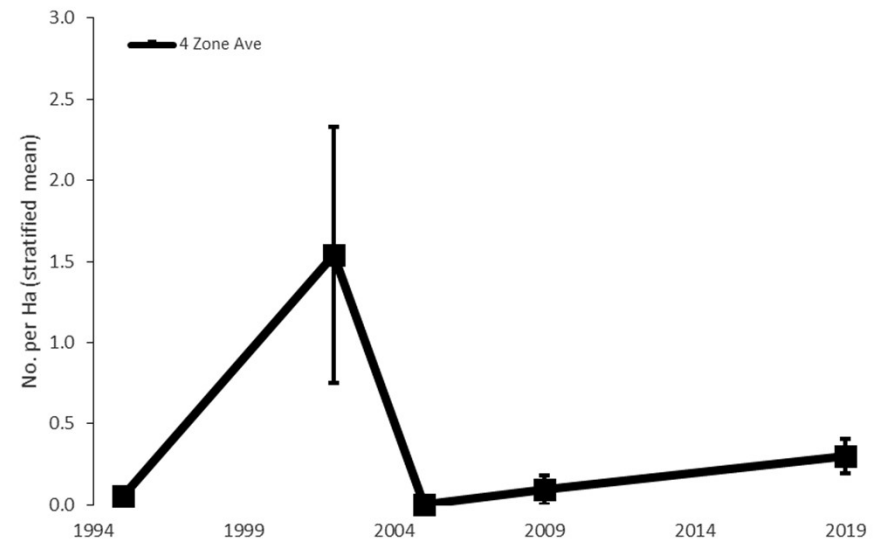
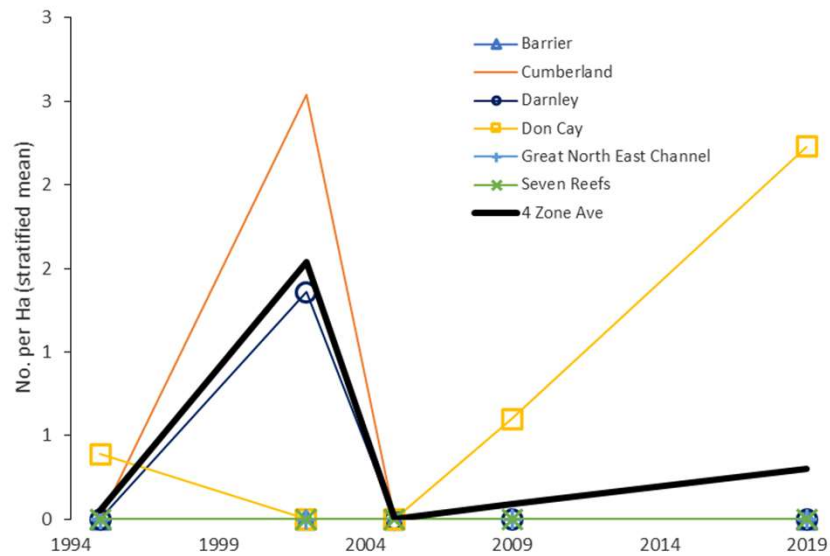
Curryfish (vastus)



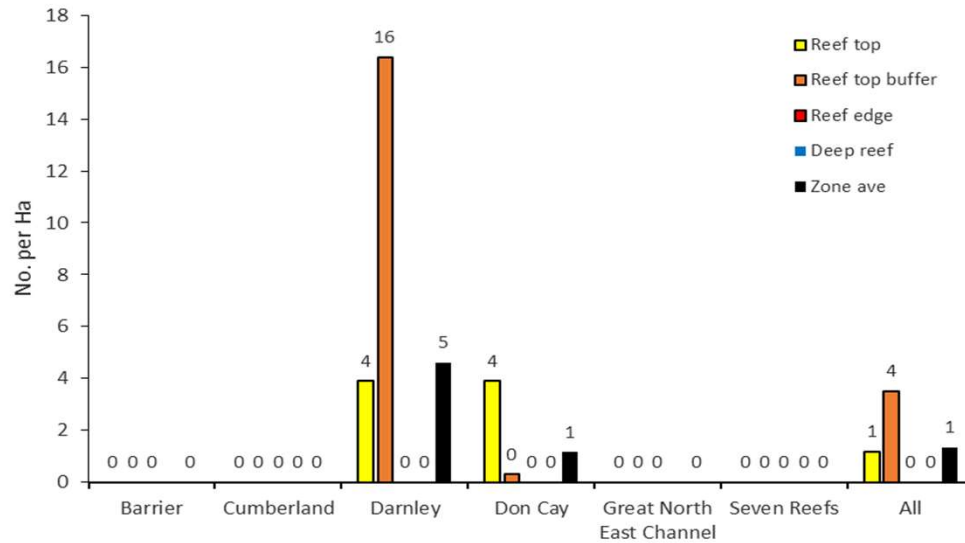
Surf redfish



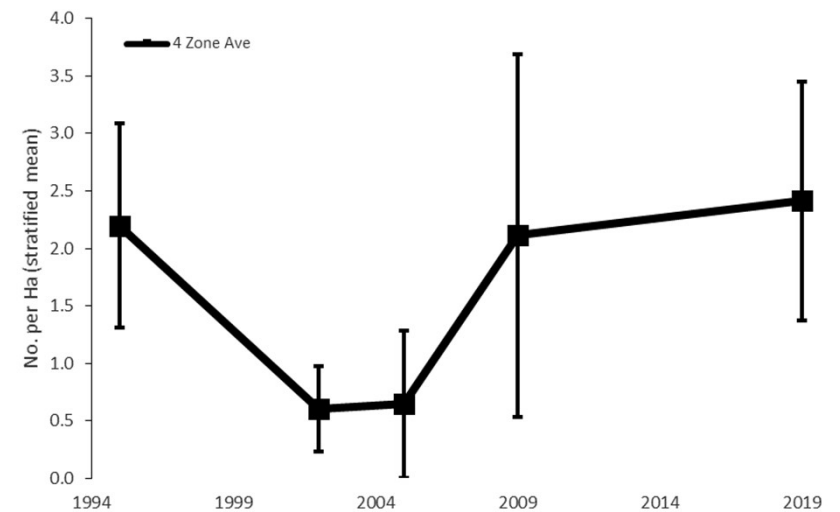
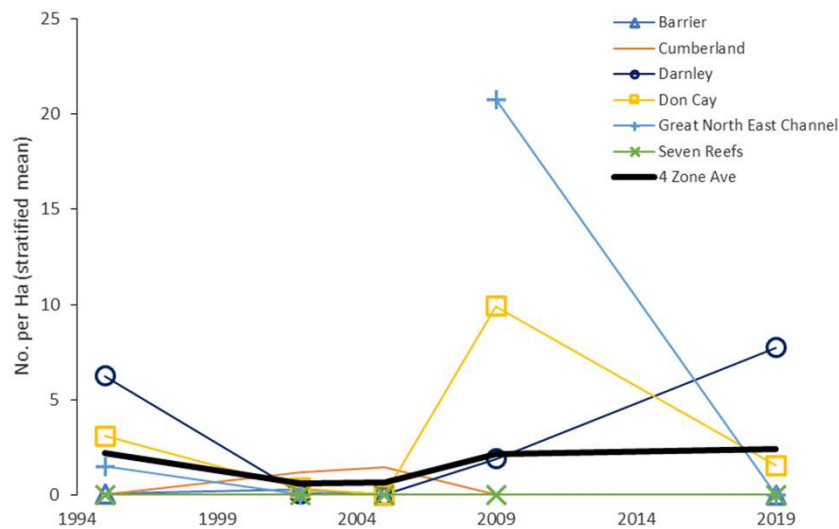
Fishery biomass estimate = 14 t
>MLS = 7 t



Deepwater redfish



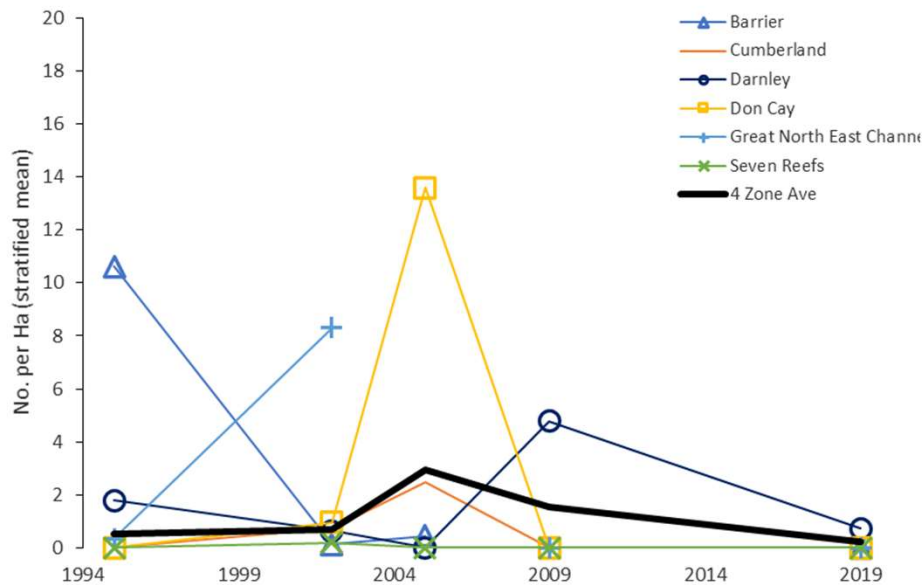
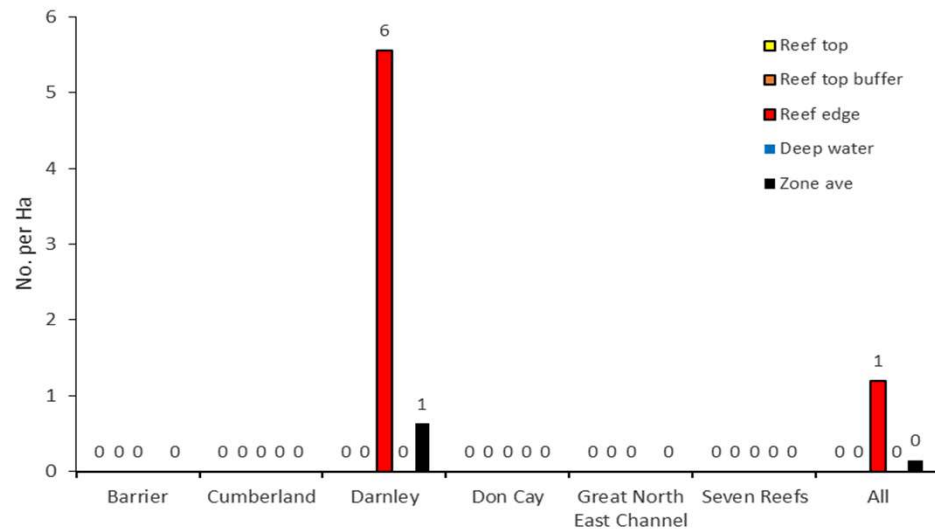
Fishery biomass estimate = 66 t
>MLS = 55 t



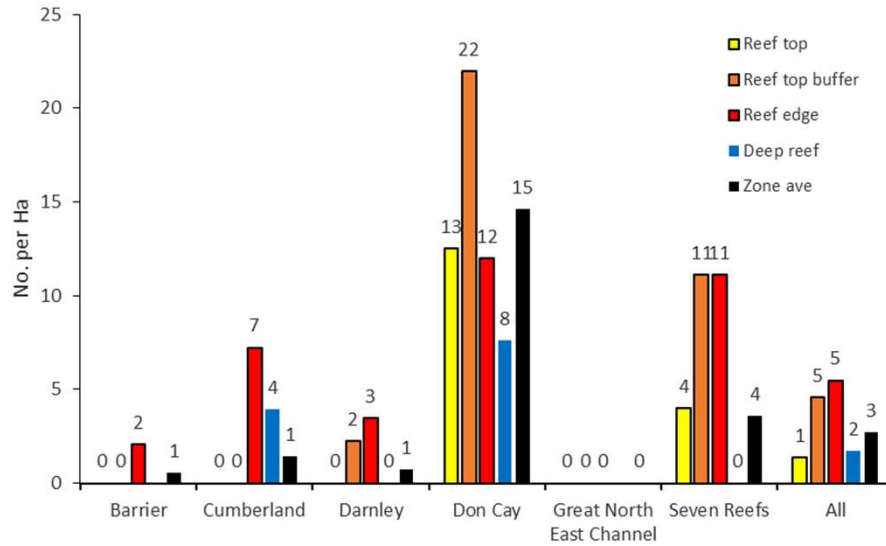
Hairy blackfish



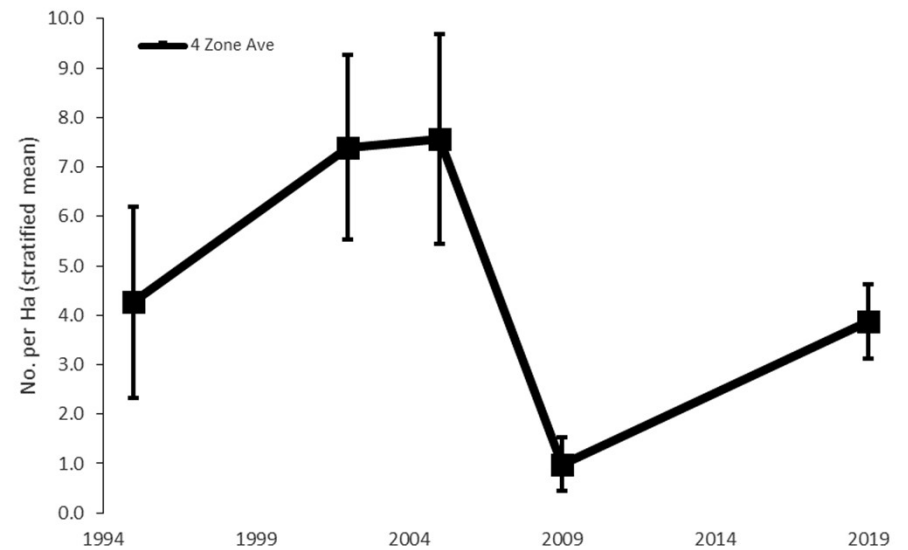
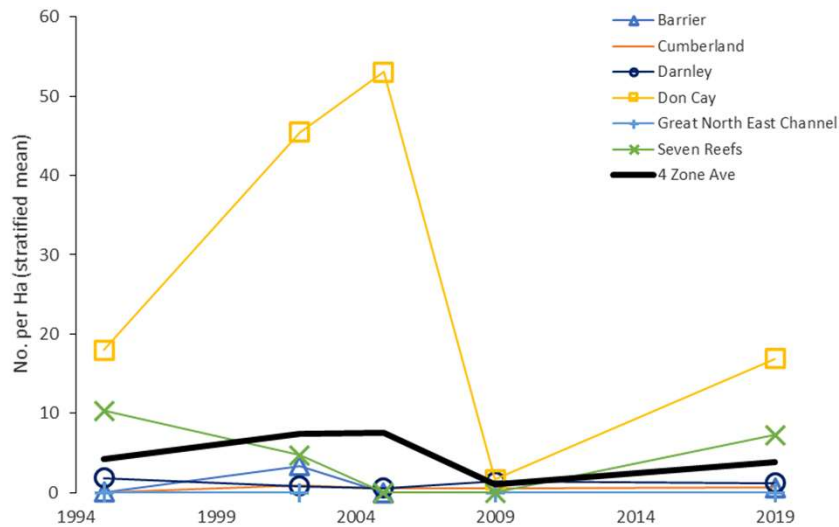
Fishery biomass estimate = 15 t
(gutted weight)



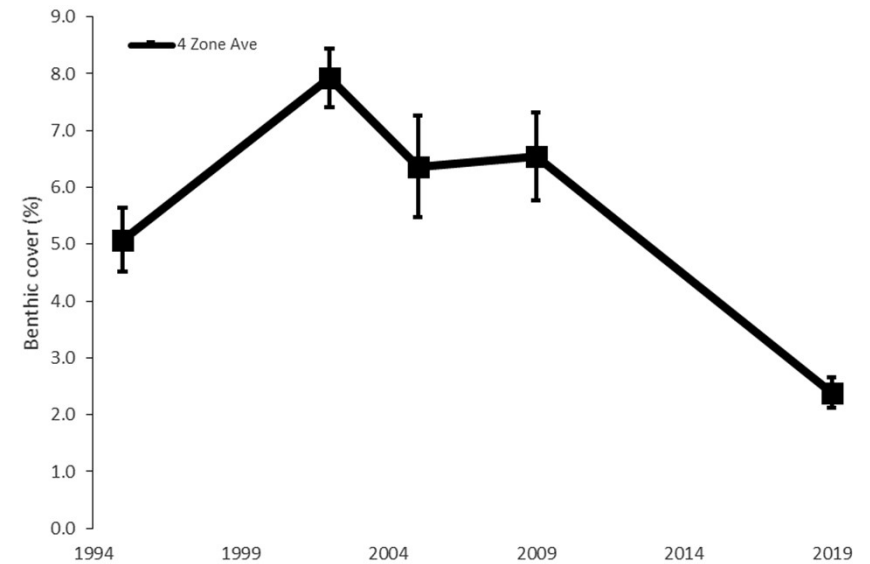
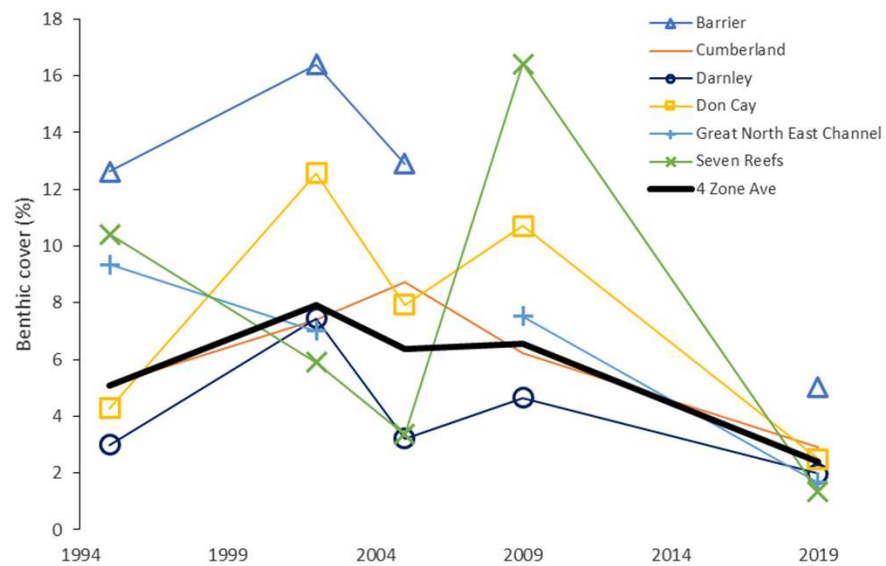
Elephant trunkfish



Fishery biomass estimate = 450 t

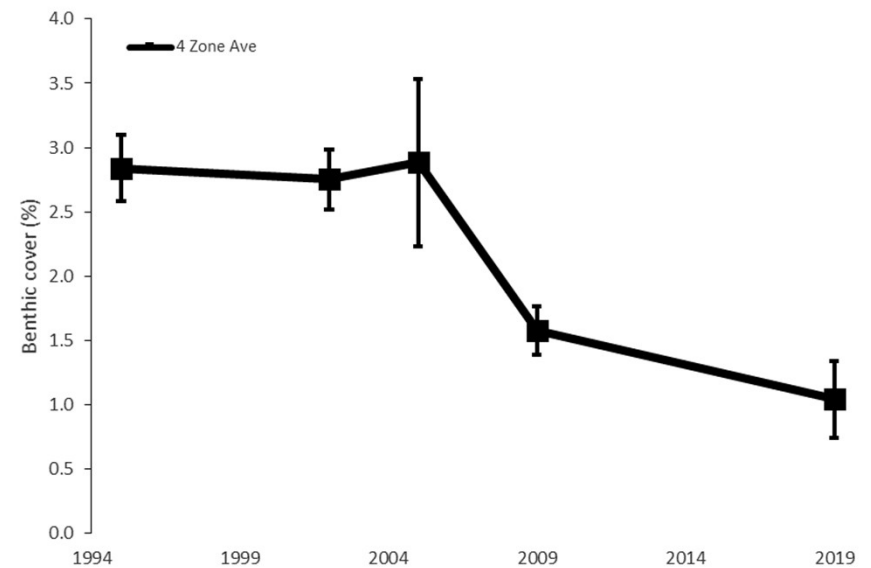
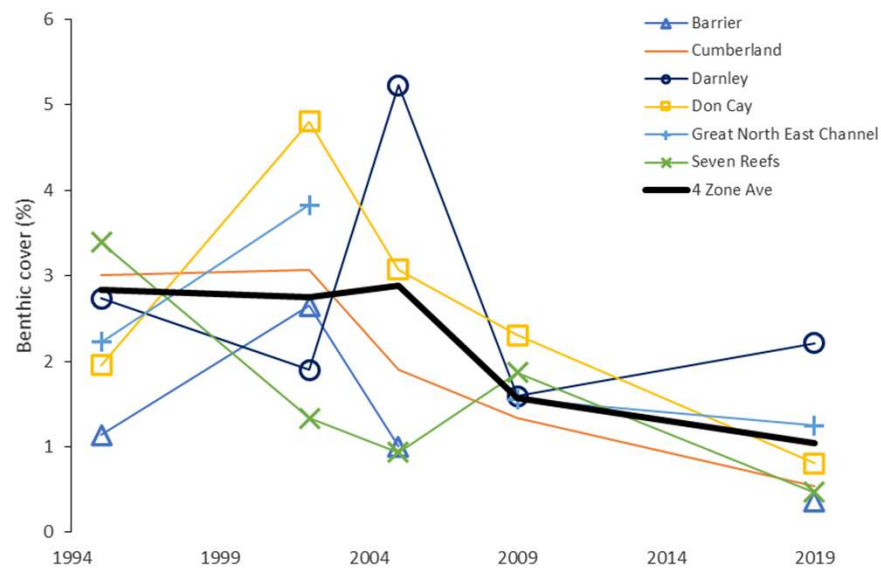


Environmental – Coral



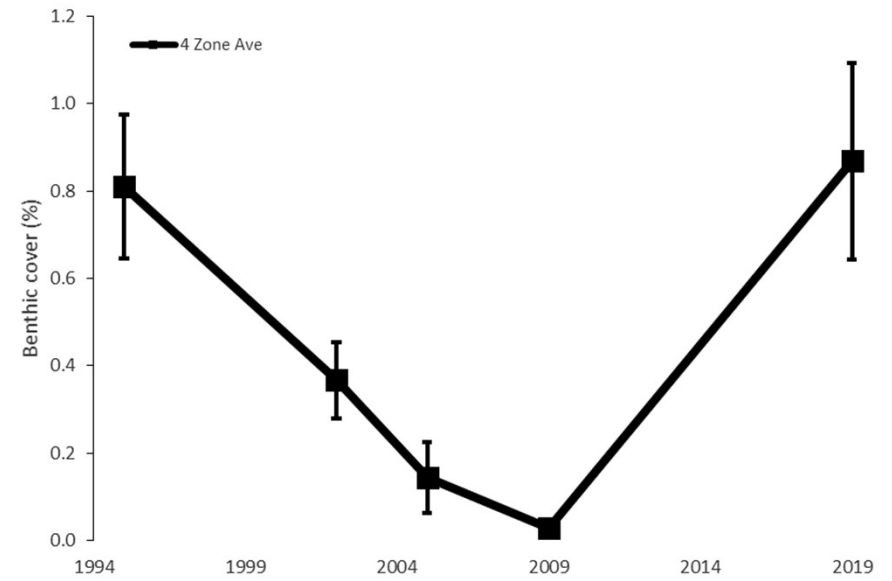
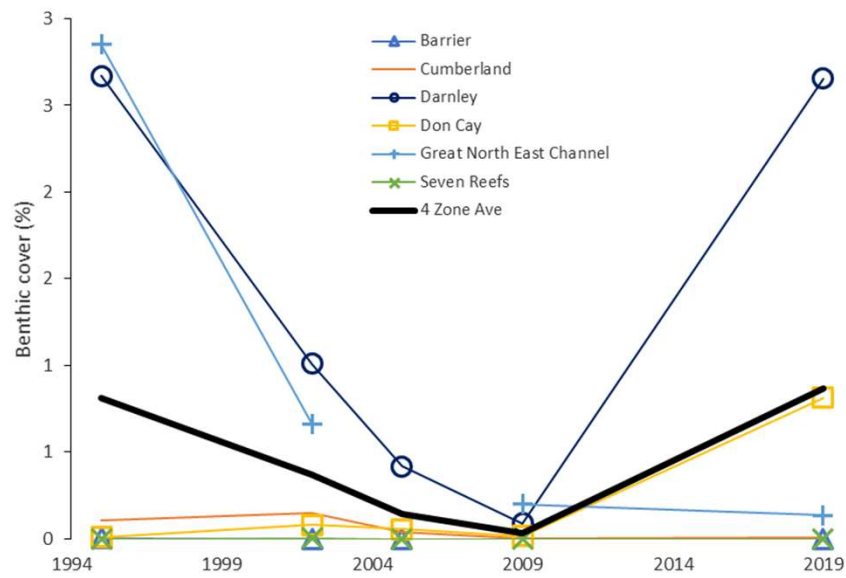
Total coral cover = 4005 Ha

Environmental – Soft Coral



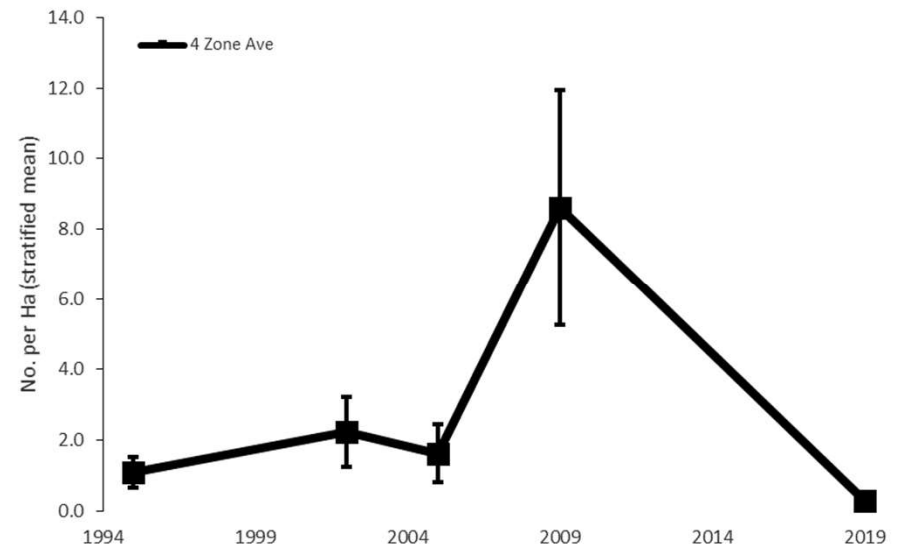
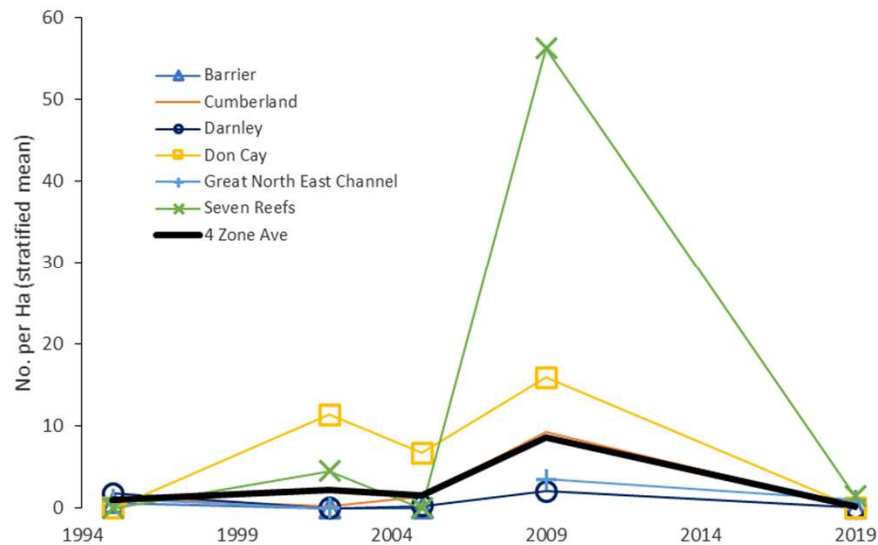
Total soft coral cover = 1558 Ha

Environmental – Seagrass



Total seagrass cover = 1119 Ha

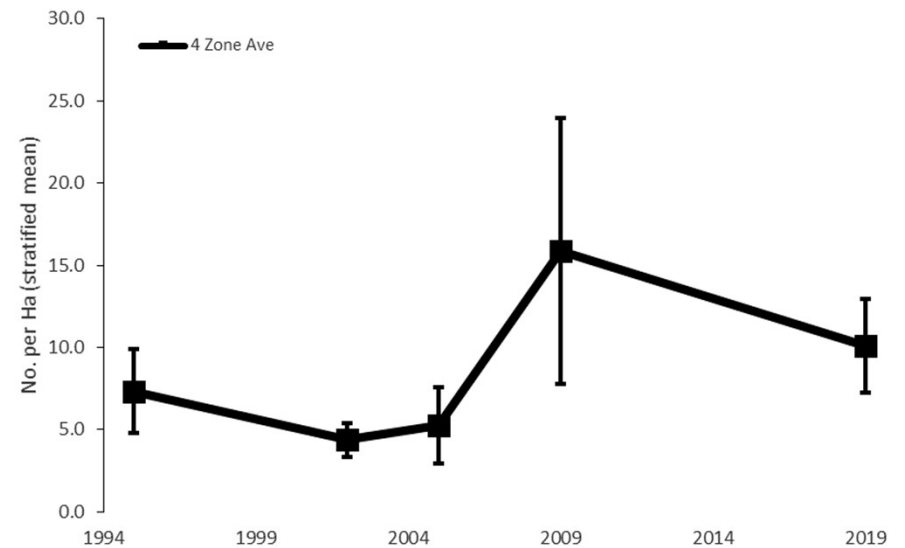
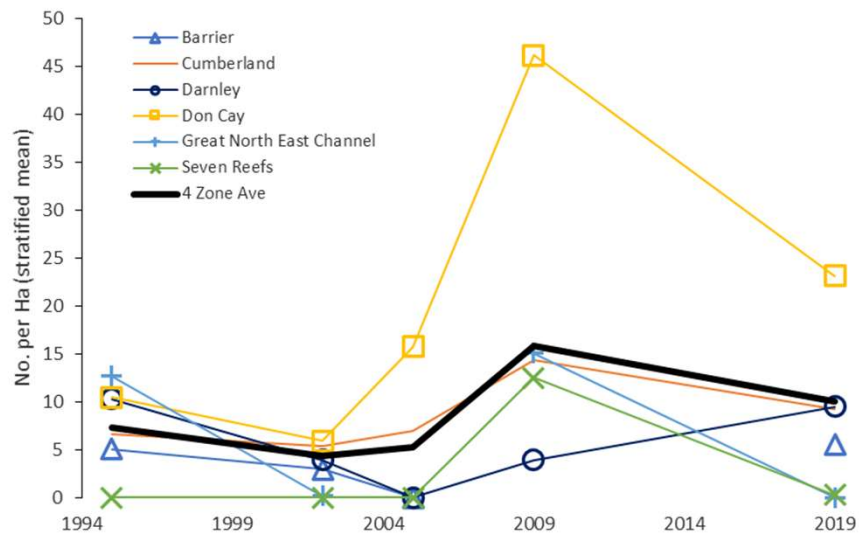
Crown of Thorns starfish



2009 Population estimate : 825,060

2019/20 Population estimate: 44,199

Giant clams (*T. gigas*)



2019/20 Population estimate: 1,180,489

Key survey outcomes

Black teatfish

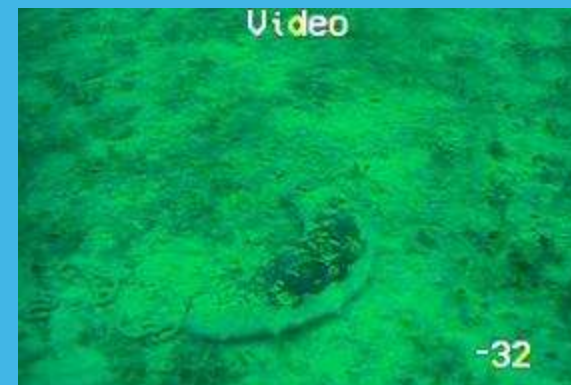
- Black teat fish stocks healthy
- Preliminary sustainable yield recommendation of 20 t per yr

White teatfish

- White teatfish stock healthy
- The density (14 per Ha) and population (72%) of White teatfish in the deep-reef habitat was the highest of any of the sampled strata
- Outcomes of the 2019/20 survey have supported the current CITES *Non-Detriment* Finding for the Torres Strait Beche-de-mer Fishery

Key survey outcomes

- Curryfish and Prickly redfish - small declines, however survey estimates suggest current catch limits are sustainable
- Surf redfish were found in higher numbers relative to previous surveys, which supports species recovery, but still not enough information available to reopen fishery
- Hairy blackfish and Deepwater redfish densities were lower than in previous surveys - may be due to their natural patchy distribution, or may indicate a possible decline



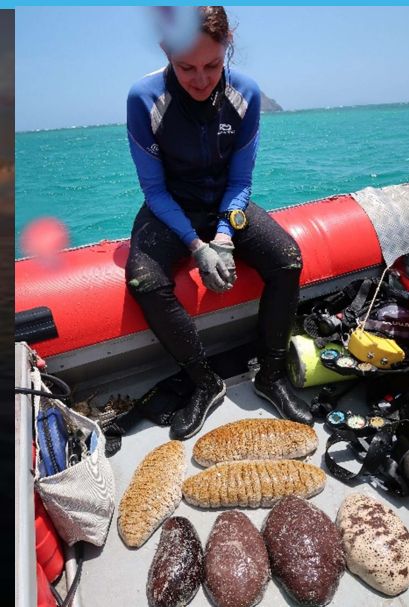
Thank you

CSIRO OCEANS & ATMOSPHERE

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CSIRO OCEANS & ATMOSPHERE
www.csiro.au





Torres Strait bêche de mer fishery: black teatfish trial re-opening

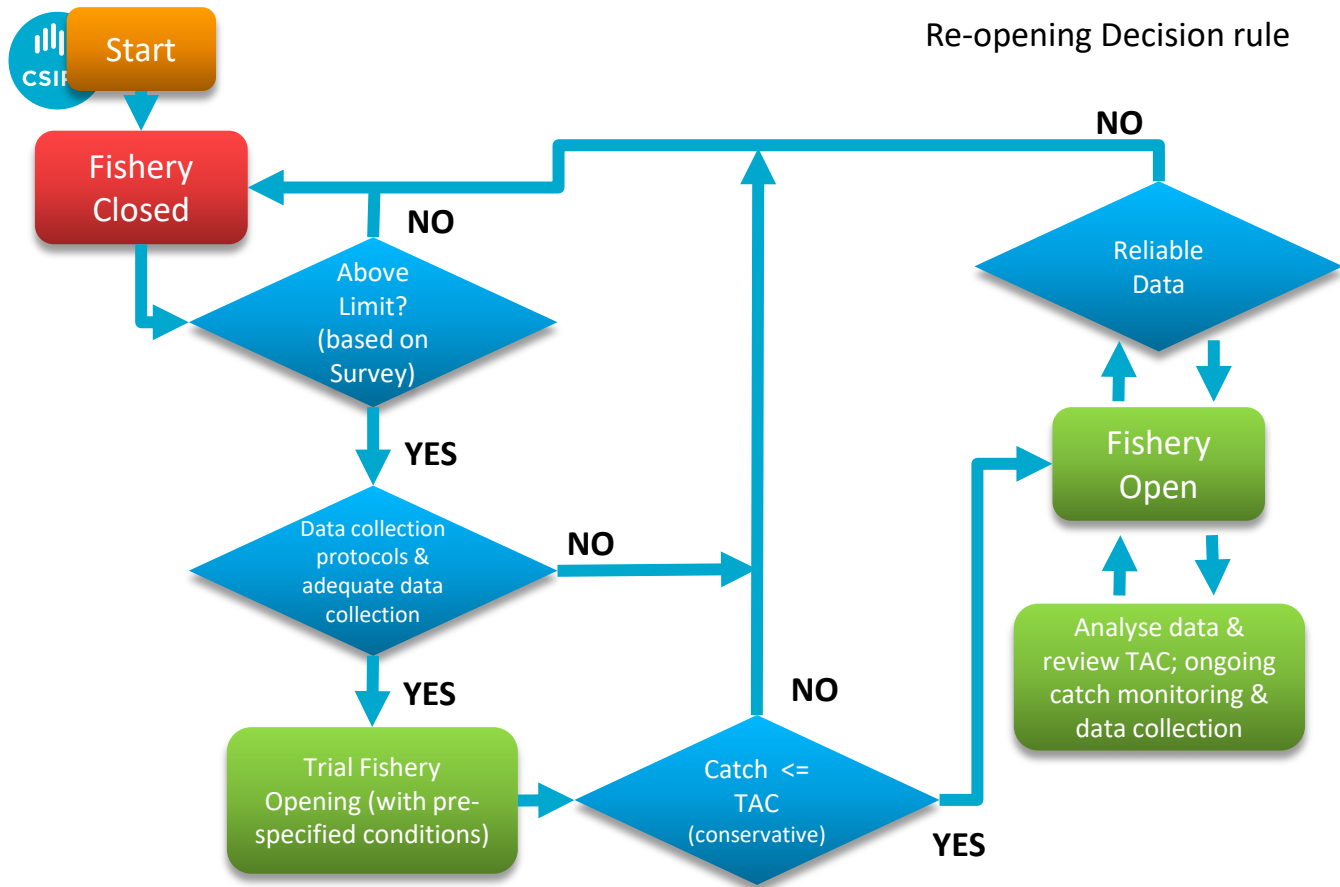
Éva Plagányi, Nicole Murphy and
Timothy Skewes

HCRAg | October 2021

Black teatfish 'Pauraber or
Goleh-Golher Pauraber'



*CSIRO acknowledges the Traditional Owners of the land, sea and
waters, of the area that we live and work on across Australia. We
acknowledge their continuing connection to their culture and we pay
our respects to their Elders past and present*





Re-opening

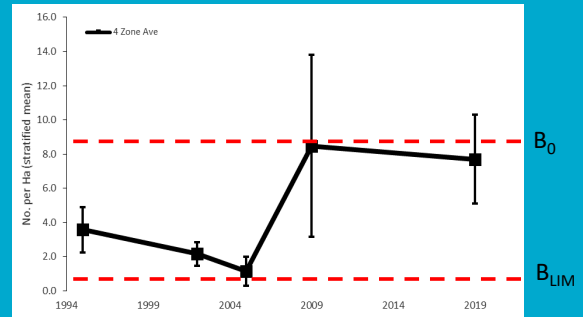
- New catch reporting measures in place
 - CDR catch reporting - compulsory since 2017
- Torres Strait Beche-de-mer Harvest Strategy

Re-opening Decision Rule applies for species that have been:

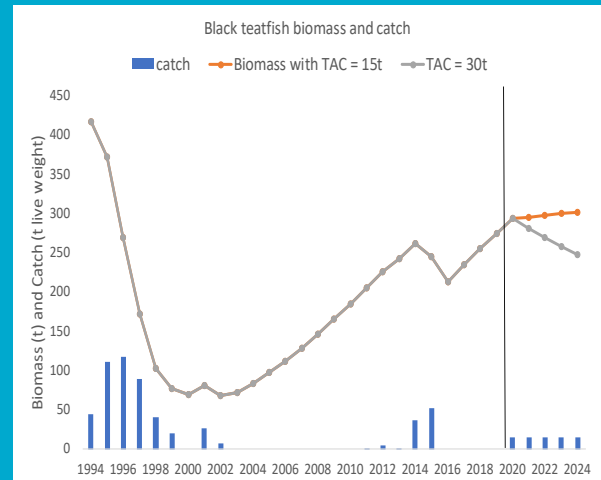
- *Closed to fishing due to concerns of overfishing or stock depletion, significantly exceeding catches beyond the TAC, or in the absence of reported catches*

- Stock above B_{LIM} from use of high quality survey data
 - Meets parameters of the Decision Rule - species to be opened with *Trial 15 t*
- Additional population modelling - 21 t can be removed
 - Allows for higher opening TAC (tier 3)
- Quota allowance: 20 t

SURVEY



POPULATION MODELLING





Re-opening

- Trial opening: 30th April 2021 for 20 t
 - Closed 3rd May 2021
 - 17.26 t caught as at 15:00 on 5th May 2021
- (<https://www.pzja.gov.au/2021-black-teatfish-trial-opening>)

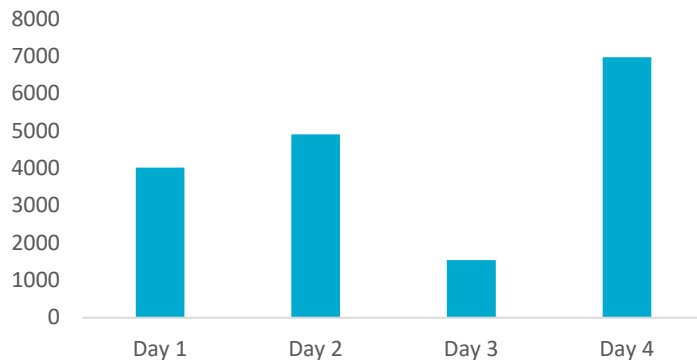
- Notes
 - Fishers organised among themselves, previous times described as ‘free for all’
 - Went further out and worked in across days
 - Came in early on fourth day in anticipation that nearing quota
 - Happy with how the fishing went



Traditional Owner & fisher, Mr Tristen Passi – Mer Island

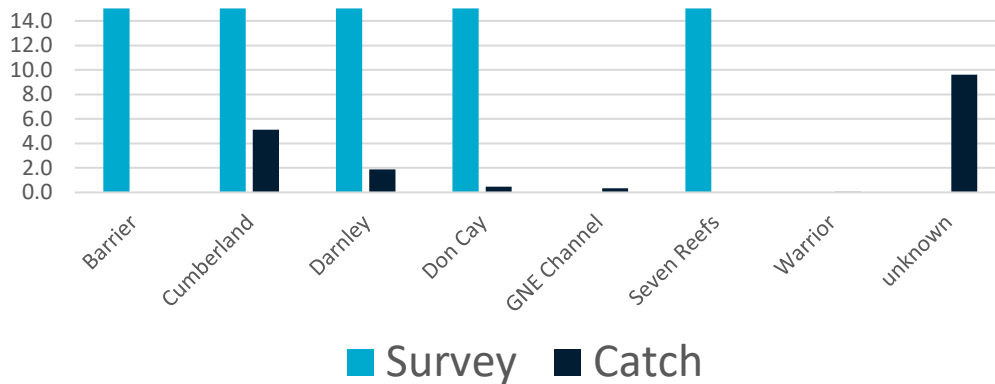
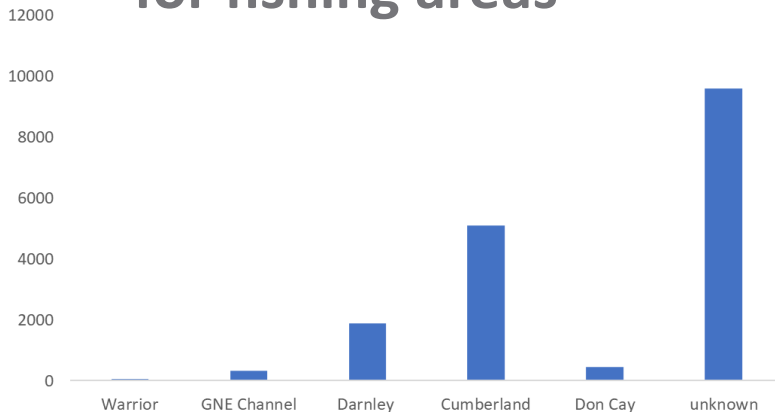


Sum of converted weight (kg) for catch taken for areas fished for each fishing day



Weight (kg)	Warrior	GNE Channel	Darnley	Cumberland	Don Cay	Blank*	Grand total
April total	-	119.78	41.24	468.95	311.13	3257.46	4198.57
30-Apr	-	119.78	41.24	468.95	311.13	3075.51	4016.62
May total	50.95	208.33	1837.69	4634.13	145.56	6358.28	13234.94
1-May	-	141.19	551.31	1392.45	-	2820.29	4905.24
2-May	-	67.15	276.20	1030.81	-	166.42	1540.57
3-May	50.95	-	1010.19	2210.87	145.56	3553.51	6971.08
Grand total	50.95	328.12	1878.94	5103.08	456.69	9615.74	17433.51

Total catch (converted weight - kg) for fishing areas





Missing Data to Inform assessments

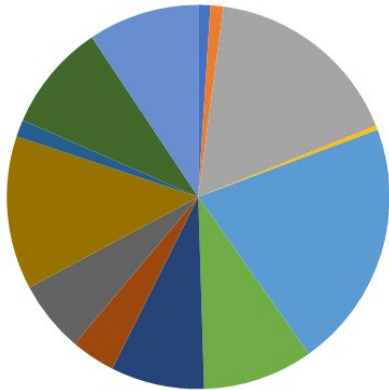
Day	Warrior	GNE Channel	Darnley	Cumberland	Don Cay	Unknown area
1	-	119.8	41.2	468.9	311.1	3075.5
2	-	141.2	551.3	1392.5	-	2820.3
3	-	67.1	276.2	1030.8	-	166.4
4	50.9	-	1010.2	2210.9	145.6	3553.5

Largest catch taken from 'unknown' area recorded in catch data

It is important to improve communication for future fishing around the need to record location, as this limits the usefulness of the data.

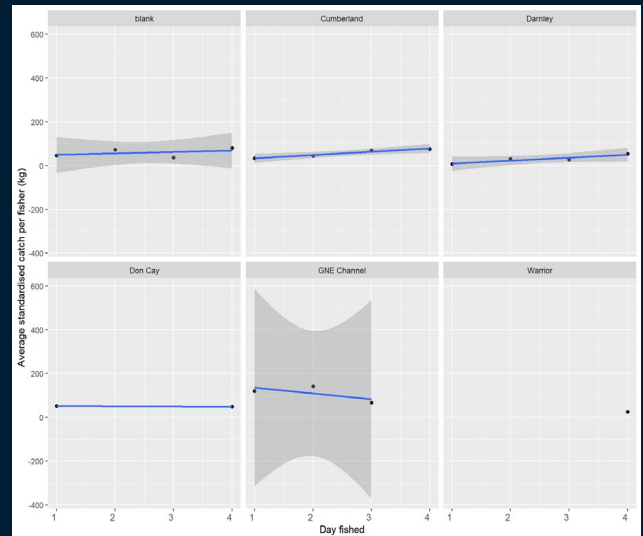
Information as to why Warrior Reef was only fished on day 4 – or whether this is the only day for which area was recorded – would also help scientific understanding of the information content of the data.

Catch landed at fish receivers

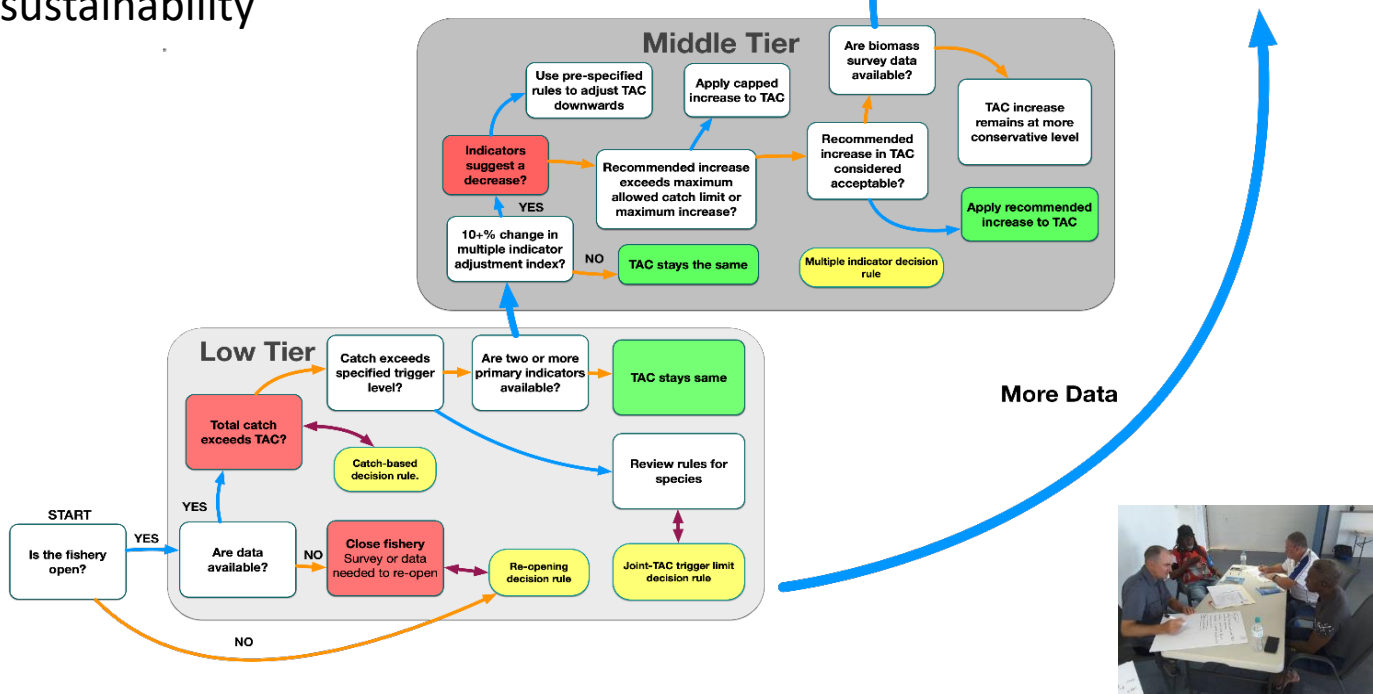


- Fairly good spread of the catch amongst fish receivers,
- 3 fish receivers landed ~half catch

- No trends or local depletion was seen for catch and areas fished. The high variance for the Great North East Channel results from the area not being fished on day 4



Pathway to economic growth without risking biological sustainability



Summary Framework Components

- **Management controls – static**
 - Size limits
 - Close areas or seasons eg during breeding season
- **Monitoring and data collection to determine indicators**
- **Management controls – dynamic - Decision Rules Needed:**

Low tier:

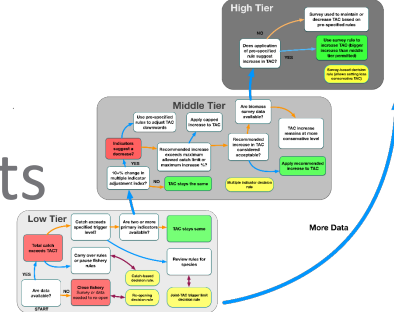
1. Catch-based Decision rule: for species-specific recommended biological catch
2. Joint TAC trigger-limit Decision rule: for lumped species category
3. Re-opening Decision rule: for re-opening a fishery or area

Middle tier:

4. Multiple Indicator Decision Rule: for adjusting species-specific TACs

High tier:

5. Survey-based Decision Rule



Primary Indicators

- **Catch per species**
- Effort
- CPUE (Catch Per Unit Effort)
- Size/mass
- Spatial footprint
- Species composition





Summary

- Total catch amounts were reliably and timeously reported
- Majority (55%) of the catch did not include details such as the area caught and no. fishers
- Missing data limits the usefulness of the data to support additional analyses related to the sustainability and productivity of the stock
- Harvest Strategy can't just rely on surveys – need additional indicators going forward especially for CITES-listed species

Part 13A conditions to the Torres Strait Protected Zone Joint Authority on the approved wildlife trade operation declaration for the Torres Strait Beche-de mer Fishery - December 2020

Condition 7:

By 1 November 2023 the Protected Zone Joint Authority must provide the department with a revised population estimate for Black Teatfish (*Holothuria whitmaei*) and White Teatfish (*Holothuria fuscogilva*) in the Torres Strait that is based on new information for the fishery, including catch data and fishery-independent data or scientific expert advice and an assessment of the impact of harvest on the stocks.

Thank you

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Nicole Murphy
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Funding: AFMA, CSIRO

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Pella-Tomlinson equation

$$N_{t+1} = N_t + r N_t \left(1 - \left(\frac{N_t}{K} \right)^\mu \right) - C_t$$

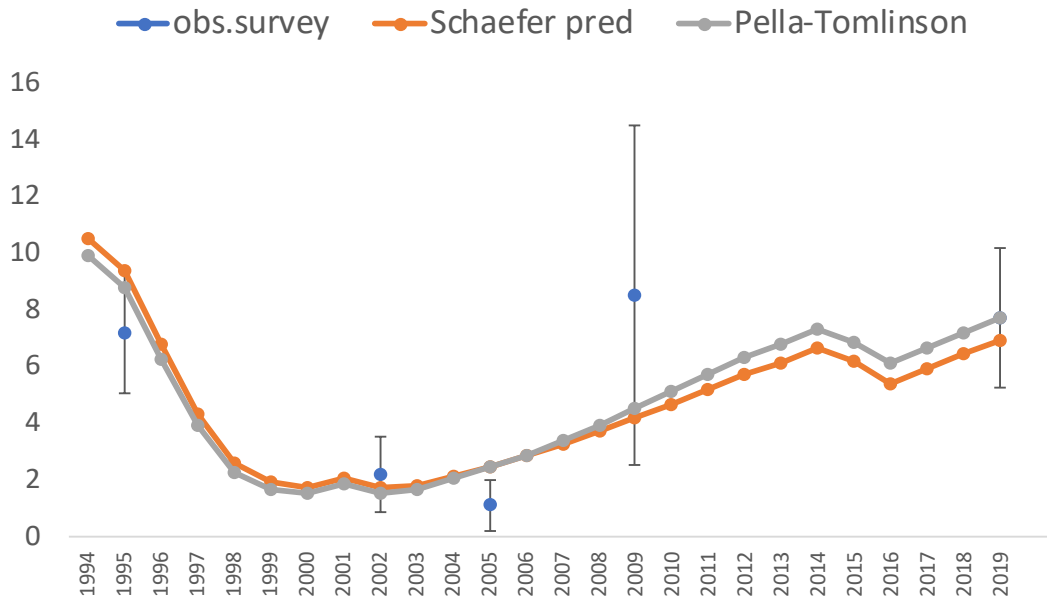
Diagram illustrating the Pella-Tomlinson equation with parameter annotations:

- N_{t+1} : Total biomass of BTF per year (indicated by a blue arrow pointing to N_{t+1})
- N_t : Total biomass of BTF per year (indicated by a blue arrow pointing to N_t)
- r : Intrinsic growth rate (indicated by a blue arrow pointing to r)
- K : Carrying capacity (pristine biomass) (indicated by a blue arrow pointing to K)
- μ : Shape parameter (indicated by a blue arrow pointing to μ)
- C_t : Total annual catch (indicated by a blue arrow pointing to C_t)

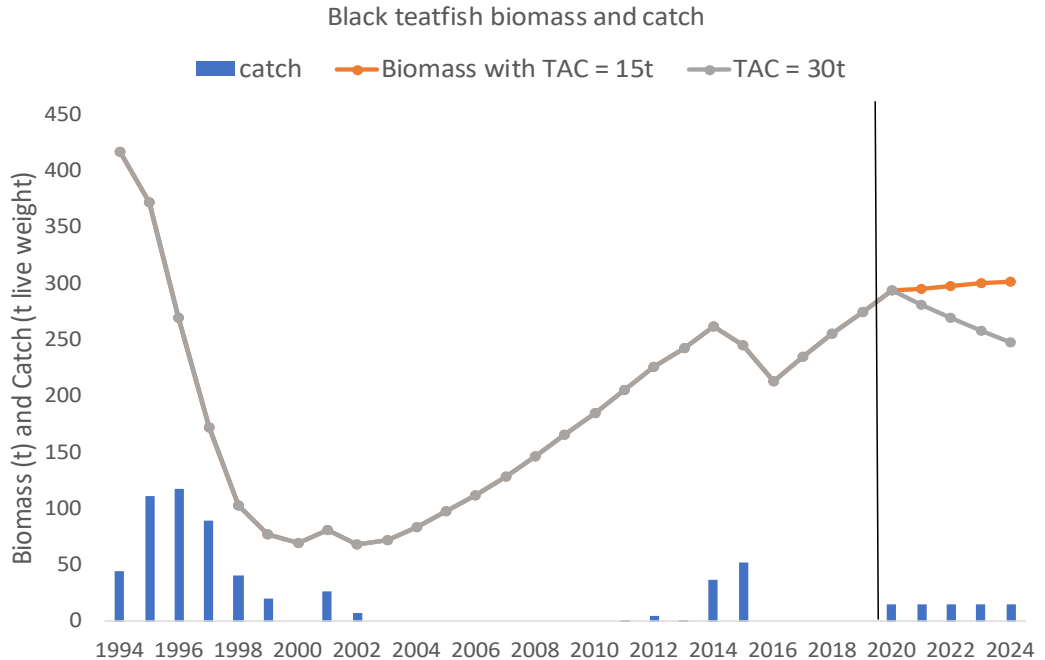
- Lumped biomass model
- Assumes growth is density-dependent
- The combination of r and K is more robust than these parameters on their own and informs on sustainable/replacement yield
- Implemented in ADMB

Model fit to survey data

Model fit to survey data : $r=0.2$; double surv(95)

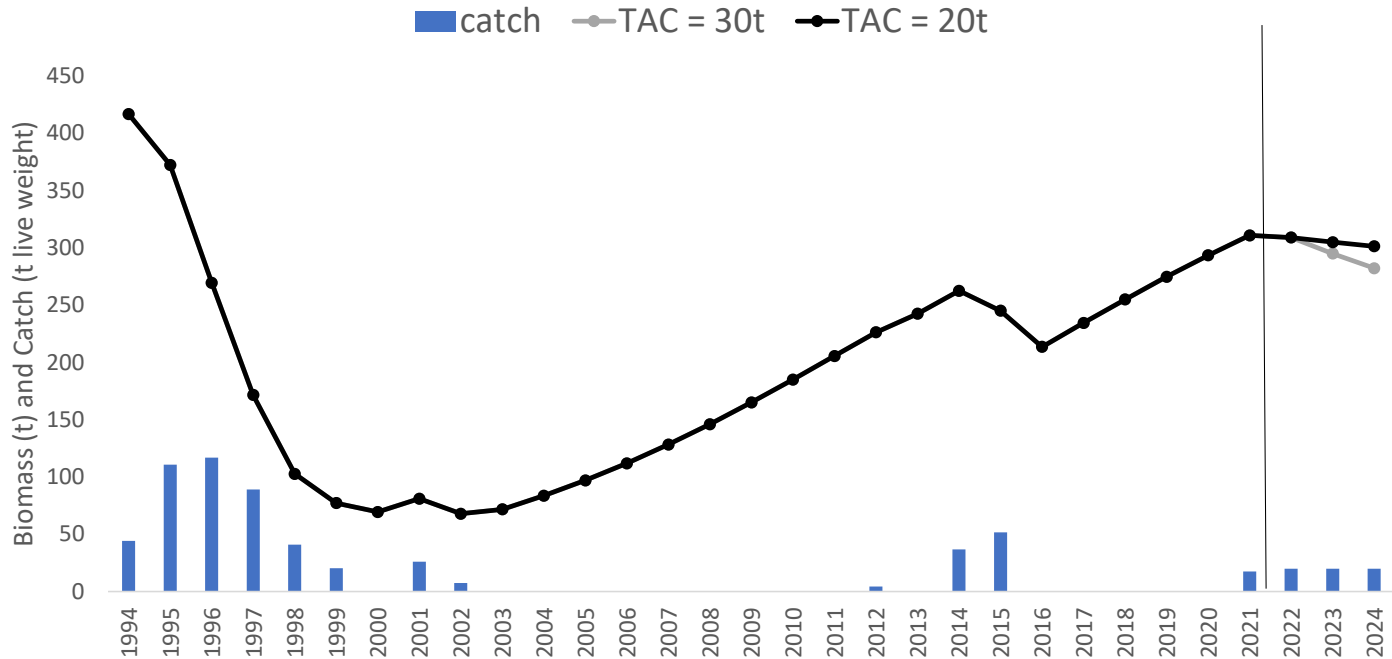


Base-case model estimated biomass trajectory and forward projection



Updated 2021 Modelling Results

Black teatfish biomass and catch (Model 4) - 2021 update with Catch(2021)=17.6t

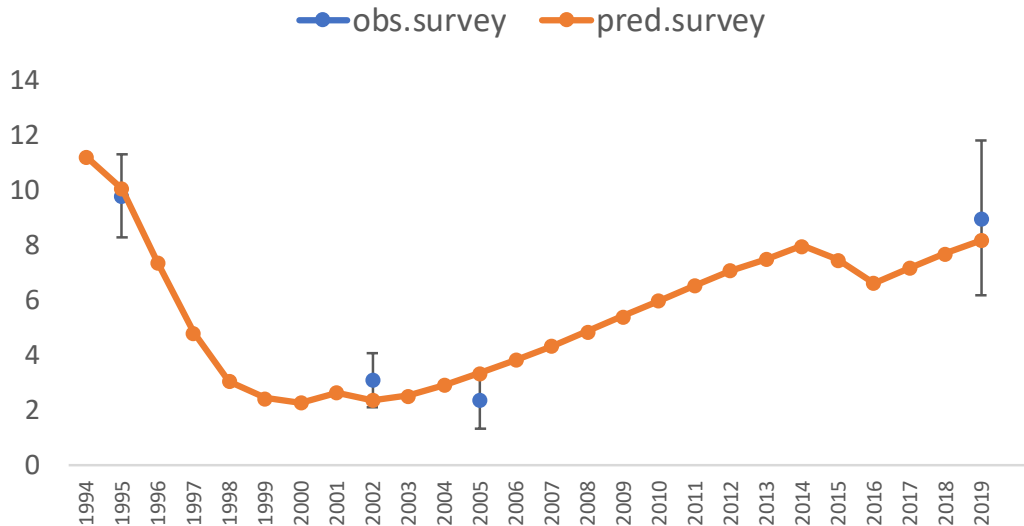


Model Results Summary: MSY

	Description	MSY (t)	BMSY (t)	B(2019) (t)	B2019/BMSY
Model 1	S; fix r	18.5	245.4	336.9	1.37
Model 2	double surv(95)	16.9	225	242.3	1.08
Model 3	S; fix r	15	300.5	385.7	1.28
Model 4	S; fix r; dbl	20.8	208.3	274.7	1.31
Model 5	S; est r,K	28.5	195.8	344.3	1.75
Model 6	S; est r,K; dbl	24.6	197.8	308.2	1.56
Model 7	P; est r,K,mu; dbl; mu=3.5	49.7	257.4	308.2	1.19
Model 8	Fix K, est r	19.9	410.2	647.8	1.57

Use survey series that includes outer barrier (less variable as less fishing there, but no data for 2009)

Model fit to "barrier "survey data : $r = \text{fix } 0.2$; $K = 430 \text{ t}$
 $[\text{STD } 87]$; $\text{MSY} = 21.5 \text{ t}$





Australian Government

Australian Fisheries Management Authority

Torres Strait Bêche-de-mer (BDM) Fishery Species Assessment Sheets - 2021

Hand Collectables Resource Assessment Group (HCRAG) Meeting No.1

6-7 October 2021

Thursday Island/Videoconference

Table of Contents

Purpose	3
Individual target species	4
White teatfish.....	4
Prickly redfish	6
Deepwater redfish.....	8
Hairy blackfish	10
Greenfish	12
Basket species – curryfish	14
Curryfish common.....	14
Curryfish vastus	16
Basket species	18
Elephant trunkfish.....	18
Lollyfish.....	20
Burrowing blackfish.....	22
Deepwater blackfish.....	24
Golden sandfish.....	26
Brown sandfish	28
Leopardfish.....	30
Pinkfish	32
Amberfish	34
Closed species	36
Surf redfish (closed)	36
Sandfish (closed)	37

Purpose

This document is intended to be used in conjunction with the *Torres Strait Beche-de-mer Harvest Strategy 2019* (the Harvest Strategy), applicable species stock assessments and annual catch and effort summaries.

The individual species assessment sheets (SAS) are aimed at guiding the Hand Collectables Resource Assessment Group's (HCRAAG) assessment of commercial sea cucumber species in the BDM fishery in line with the Harvest Strategy, and to determine the recommended biological and/or total allowable catches for the fishing season commencing on 1 January each year.

The SAS provide a stepped application of the harvest strategy decision rules to recommend RBCs and/or TACs for each species, taking into account the latest scientific and fishing information available. The SAS also provides a summary of the basic information on stock status and assessment details for each species.

This resource is also intended to be used by the HCRAAG to identify information gaps and research needs for each species that can feed into the TSSAC research need identification and prioritisation process for Torres Strait Fisheries.

Individual target species

White teatfish

HCRAg Species Assessment Sheet						
Common names	White teatfish – <i>Holothuria fuscogilva</i>					
Pre-HS TAC	15 tonnes					
Status open/closed	Open					
Current TAC	15 tonne	Based on harvest strategy starting TAC				
Basket trigger	N/A					
Minimum size limit	32cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	880	142.9	Yes		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	No	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Deepwater survey undertaken for the first time in 2019/20. Confident that white teatfish population for East Torres Strait has been quantified. Survey trend for shallow reef population fairly constant over time. Review TAC – potential to increase, however some population modelling and/or fishery dependent data required. .					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021).					
Price data (as advised by industry at HCRAg 1 meeting)	Beach price is \$30/kg (salted), \$40 - \$50/kg (gutted and salted)					
Any other changes in the fishery?	None identified					
Any other sources of mortality apart from fishing?	None identified					
Other information	Listed on Appendix II of CITES. Listed as vulnerable on the IUCN Red list due to a decreasing population trend globally.					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	1.77	15	11.8 %	TAC: No	N/A
					Basket: N/A	

	2021 ¹	1.31	15	8.7 %	TBA	TBA
Decision rules	No concerns from RAG and additional industry members regarding the total reported catch.					
Species specific data gaps and needs						
General need to improve area and effort reporting in catch disposal records.						
Species Specific Research and Priorities						
Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible. Modelling analysis to inform a sustainable TAC increase for white teatfish.						
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)	
	2022	15t	N/A	N/A	15t	
The RAG did not recommend any changes to the TAC.						

¹ Catches for the 2021 season to date – as of 18 August 2021.

HCRAG Species Assessment Sheet						
Common names	Prickly redfish – <i>Thelenota ananas</i>					
Pre-HS TAC	15 tonnes (changed from 20 tonnes to 15 tonnes in 2017)					
Status open/closed	Open					
Current TAC	15 tonnes	Based on harvest strategy starting TAC				
Basket trigger	N/A					
Minimum size limit	35cm					
New information						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	461	253.3	Yes		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Slight decline (in slope – density over time), suggesting some concern given reports of sustained high catches. Close monitoring recommended. Stock assessment needed.					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Beach price is \$61-\$85/kg (clarify product type)					
Any other changes in the fishery?	Industry use a voluntary rotational harvesting approach.					
Any other sources of mortality apart from fishing?	None identified.					
Other information	On the list for possible CITES listing consideration in the future and listed as endangered on the IUCN red list.					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	15.65	15	104.36 %	TAC: Yes	4.36%
					Basket: N/A	
2021 ²	8.79	15	58.6 %	TBA	TBA	
Decision rules	No concerns from RAG and additional industry members regarding the total reported catch.					

² Catches for the 2021 season to date – as of 18 August 2021.

	Reported overcatch does not trigger any of the overcatch decision rules (refer to section 2.11.1.1 of the harvest strategy).				
	RAG advised that a TAC reduction may need to be considered if the species continues to be overcaught in subsequent fishing seasons.				
Species specific data gaps and needs					
General need to improve area and effort reporting in catch disposal records.					
Species Specific Research and Priorities					
Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022	15t	N/A	N/A	15t
The RAG did not recommend any changes to the TAC.					

HCRA Species Assessment Sheet						
Common names	Deepwater redfish – <i>Actinopyga echinites</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	5 tonnes	Based on harvest strategy starting TAC				
Basket trigger	N/A (previously 5t basket trigger limit)					
Minimum size limit	20cm					
New information						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	66	55	No evidence to support that the species is below the default LRP		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	No	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Catches low <u>relative to biomass</u> . <u>Increasing overall trend in density</u> . No concern for TAC.					
Catch data	Available for 2020 and 2021 (to date).					
Price data (as advised by industry at HCRA 1 meeting)	Not targeted much due to low beach price of 3/kg (wet), \$7/kg (boiled) and \$80-\$100/kg (dried)					
Any other changes in the fishery?	None identified					
Any other sources of mortality apart from fishing?	None identified					
Other information	Assessed as Uncertain by ABARES in the 2020 Fishery Status Reports – given its low density it is unclear if catches of this species would impede effective recruitment and recovery of the species. The species is listed as vulnerable on the IUCN red list.					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0	5	0 %	TAC: No Basket: N/A	N/A
	2021 ³	0.017	5	0.11 %	TBA	TBA

³ Catches for the 2021 season to date – as of 18 August 2021.

Decision rules	No concerns from RAG and additional industry members regarding the total reported catch.				
Species specific data gaps and needs					
General need to improve area and effort reporting in catch disposal records.					
Species Specific Research and Priorities					
Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022	5t	N/A	N/A	5t
The RAG did not recommend any changes to the TAC.					

HCRAG Species Assessment Sheet						
Common names	Hairy blackfish – <i>Actinopyga miliaris</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	5 tonnes	Based on harvest strategy starting TAC				
Basket trigger	N/A (previously 5t basket trigger limit)					
Minimum size limit	22cm					
New information since the TAC was last considered (in this it was the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Landed (wet gutted) weight (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	15	-	Insufficient information to assess the status of the stock in relation to the LRP		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Limited	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Status still remains relatively unknown. Possible decline or natural variability. Stock assessment needed. Targeted survey sampling may need to be factored into future fishery surveys.					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Has a low beach price of \$3 – \$7.50/kg but dry product can fetch up to \$80-100/kg. \$15/kg (frozen whole? Seek clarification from industry)					
Any other changes in the fishery?	None identified					
Any other sources of mortality apart from fishing?	None identified					
Other information	Assessed as Uncertain by ABARES in the 2020 Fishery Status Reports – given its low density it is unclear if catches of this species would impede effective recruitment and recovery of the species. The species is listed as vulnerable on the IUCN red list.					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	1.4	5	28 %	TAC: No Basket: N/A	N/A
	2021 ⁴	0.5	5	10 %	TBA	N/A

⁴ Catches for the 2021 season to date – as of 18 August 2021.

Decision rules	No concerns from RAG and additional industry members regarding the total catch.				
Species specific data gaps and needs					
General need to improve area and effort reporting in catch disposal records. Potential for cryptic behaviour to impact on surveys.					
Species Specific Research and Priorities					
Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022	5t	N/A	N/A	5t
The RAG did not recommend any changes to the TAC.					

HCRAAG Species Assessment Sheet						
Common names	Greenfish – <i>Stichopus chloronotus</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	40 tonnes	Based on harvest strategy starting TAC				
Basket trigger	N/A					
Minimum size limit	nil					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	739	N/A	RAG to discuss		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	No	RAG to discuss		
Comments on scientific survey findings	CSIRO analysis: Catches low. Generally increasing density trend. No concern for TAC.					
Catch data	Available for 2020 and 2021 (to date).					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information	*RAG members to provide advice*					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0.015	40	0.04 %	TAC: No Basket: N/A	N/A
	2021 ⁵	0	40	0	N/A	N/A
Decision rules	Is the total catch reliable? *RAG members to provide advice*					
	Not overcaught so overcatch decision rules not triggered (refer to section 2.11.1.1 of the harvest strategy).					
	For species with an individual TAC, should the TAC be reduced or maintained (refer to section 2.11.1 of the harvest strategy)? *RAG members to provide advice*					

⁵ Catches for the 2021 season to date – as of 18 August 2021.

Middle Tier (not applicable during initial years of HS) (data for 2020 fishing season)					
Are two or more primary indicators available?	CPUE (at least 3 years required)	Average size (over 3 years)	Spatial footprint (% of areas fished)	Catch proportion (average over past 3 years)	
	1 record for 2020 – no reports of 'days fished' and 'number of fishers'	Not being collected.	Not reported for 2020	Average catch of species relative to total catch for all BDM spp 0.05% of total 2020 catch	
RAG advice	Based on harvest strategy data needs to develop reliable primary indicators the RAG should identify any gaps in the current data collection program and possible options to address those gaps. The information above is a summary of data held and not an analysis of primary indicators.				
High Tier					
Standardised biomass survey index	Are the surveys comparable	Are the inter-survey intervals acceptable	Has there been sufficient catch (average catch used in decision rule)		
	RAG to discuss	*RAG to discuss*	*RAG to discuss*		
RAG advice	Can the survey-based decision rule be applied to this species? If yes, is it a high assessment priority currently?				
Species specific data gaps and needs					
to be completed at the meeting					
Species Specific Research and Priorities					
to be completed at the meeting					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022				
General RAG comments					

Basket species – curryfish

Curryfish common

HCRAG Species Assessment Sheet						
Common names	Curryfish common – <i>Stichopus herrmanni</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	60 tonnes (Curryfish basket TAC)	Based on harvest strategy starting TAC				
Basket trigger	N/A					
Minimum size limit	31cm					
New information						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	667	632.4	Yes		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO paper: Possible decline (noting fairly negative trend fitted to survey data). Stock assessment needed. Close monitoring recommended – part of 'Curryfish mixed' (catch split 50:50 between Curryfish species when not identified). Appears that the <i>herrmanni:vastus</i> split is changing over time, with higher proportion of <i>vastus</i> . Could be an identification problem with <i>S. Vastus</i> during the 1995/96 survey.					
Catch data	Available for 2020 and 2021 (as at 18 August 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Beach price \$15-22/kg (boiled and salted), \$150/kg (dried)					
Any other changes in the fishery?	While common curryfish used to make up most of the catch in the past, industry reported noticing a generally even split between the two curryfish species with some regional differences.					
Any other sources of mortality apart from fishing?	None identified. Previously recorded high discard levels have reduced due to more appropriate species processing methods.					
Other information	Listed as vulnerable on the IUCN red list					
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0.6	60	1 % 17.5 % (mixed)	TAC: No	N/A
		10.5 (mixed)			Basket: N/A	

	2021 ⁶	3.96 (mixed)	60	TBA	TBA	TBA
Decision rules	No concerns from RAG and additional industry members regarding the total catch. The RAG agreed to consider the need for a trigger limit for the species.					
Species specific data gaps and needs						
RAG agreed it is a high priority to improve species differentiation in catch disposal records as well as general improvements to area and effort reporting.						
Species Specific Research and Priorities						
The RAG further noted the ongoing research need to develop conversion ratios for curryfish species. Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible						
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)	
	2022	60t	N/A	N/A	60t	
The RAG did not recommend any changes to the TAC.						

⁶ Catches for the 2021 season to date – as of 18 August 2021.

HCRAAG Species Assessment Sheet						
Common names	Curryfish vastus – <i>Stichopus vastus</i>					
Pre-HS TAC	Part of the 80t basket species TAC					
Status open/closed	Open					
Current TAC	60 tonnes (Curryfish basket TAC)		Based on harvest strategy starting TAC			
Basket trigger	15 tonnes species trigger limit					
Minimum size limit	15cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	168	168	Yes		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Higher ratio of curryfish vastus observed in 2019 survey. Close monitoring recommended – part of 'Curryfish mixed' (suggest splitting catch 50:50 between curryfish species when not identified).					
Catch data	Available for 2020 and 2021 (as at 18 August 2021).					
Price data (as advised by industry at HCRAAG 1 meeting)	Beach price \$15-22/kg (boiled and salted), \$150/kg (dried)					
Any other changes in the fishery?	Industry reported noticing a generally even split between the two curryfish species with some regional differences and increasingly more curryfish vastus.					
Any other sources of mortality apart from fishing?	None identified					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0.15 10.5 (mixed)	60 (15t trigger limit)	0.25 % 17.5 % (mixed)	TAC: No	N/A
					Basket: No	
2021 ⁷	- 3.96 (mixed)	60 (15t trigger limit)	TBA	TBA	TBA	
Decision rules	No concerns from RAG and additional industry members regarding the total catch. The RAG recommended increasing the trigger limit to 30t.					

⁷ Catches for the 2021 season to date – as of 18 August 2021.

Species specific data gaps and needs

RAG agreed it is a high priority to improve species differentiation in catch disposal records as well as general improvements to area and effort reporting.

Species Specific Research and Priorities

The RAG further noted the ongoing research need to develop conversion ratios for curryfish species. Consistent with the BDM harvest strategy and where there is sufficient information available, the RAG recommended a tactical research project to determine the current status of sea cucumber stocks in relation to the harvest strategy reference points, noting that the first step is to define the reference points for the species for which it may be possible

HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022	60t	N/A	N/A	60t

The RAG did not recommend any changes to the TAC. The RAG recommended increasing the trigger limit to 30t.

Basket species

Elephant's trunkfish

HCRAG Species Assessment Sheet						
Common names	Elephant trunkfish – <i>Holothuria fuscopunctata</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50t basket species TAC		Based on harvest strategy starting TAC			
Basket trigger	15 tonnes					
Minimum size limit	24cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	451t	-	Not assessed		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Catch rates low. Possible decline or natural variability. Stock assessment needed.					
Catch data	Available for 2020 and 2021 (as at 18 August 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Beach price \$2/kg (wet-gutted)					
Any other changes in the fishery?	None identified					
Any other sources of mortality apart from fishing?	None identified.					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	50	-	TAC: No Basket: No	N/A
	2021 ⁸	No catch reported	50	TBA	TBA	TBA

⁸ Catches for the 2021 season to date – as of 18 August 2021.

Decision rules	No concerns from RAG and additional industry members regarding the total catch.				
Species specific data gaps and needs					
General improvements to area and effort reporting.					
Species Specific Research and Priorities					
None identified					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022	50t (15t trigger limit)	N/A	N/A	50t (15t trigger limit)
The RAG did not recommend any changes to the basket TAC or the trigger limit for the species.					

HCRAG Species Assessment Sheet						
Common names	Lollyfish – <i>Holothuria atra</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50t basket species TAC		Based on harvest strategy starting TAC			
Basket trigger	40 tonnes					
Minimum size limit	15cm					
New information since the TAC was last considered (in this it was at the implementation of the Harves Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	5,668	-	Yes		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO analysis: Noted catch increase. Possible decline or natural variability. Stock assessment needed.					
Catch data	Available for 2020 and 2021 (as at 18 August 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Beach price \$2-\$5/kg (wet-gutted)					
Any other changes in the fishery?	Further information required from Poruma fishers on reduced catches to ascertain whether this is due to home reef depletion given its susceptibility to being caught.					
Any other sources of mortality apart from fishing?	None identified					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	1.3	50 (40t basket trigger limit)	2.6 %	TAC: No Basket: No	N/A
	2021 ⁹	0.021	50 (40t basket trigger limit)	TBA	TBA	TBA
Decision rules	No concerns from RAG and additional industry members regarding the total reported catch.					

⁹ Catches for the 2021 season are as of 18 August 2021.

Species specific data gaps and needs					
General improvements to area and effort reporting.					
Species Specific Research and Priorities					
None identified					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022	50t (40t trigger limit)	N/A	N/A	50t (40t trigger limit)
The RAG did not recommend any changes to the basket TAC or the trigger limit for the species.					

Burrowing blackfish (not assessed by HCRAg)

HCRAg Species Assessment Sheet						
Common names	Burrowing blackfish – <i>Actinopyga spinea</i>					
Pre-HS TAC	Part of the 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50 tonne basket species TAC			Based on harvest strategy starting TAC		
Basket trigger	5 tonnes					
Minimum size limit	22 cm					
New information since the TAC was last considered (in this it was the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	N/A	N/A	RAG to discuss		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	N/A	N/A	N/A	RAG to discuss		
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): N/A					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021). Refer to attachment A of Agenda Item 5 .					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	50 (5t trigger limit)	No catch reported	TAC: No Basket: No	N/A
	2021 ¹⁰	No catch reported	50 (5t trigger limit)	TBA	TBA	TBA
Decision rules	Is the total catch reliable? *RAG members to provide advice*					
	Not overcaught so overcatch decision rules not triggered (refer to section 2.11.1.1 of the harvest strategy).					

¹⁰ Catches for the 2021 season to date – as of 18 August 2021.

	For species with individual triggers within a basket with a joint TAC, should the joint TAC or individual triggers be changed (up or down) (refer to section 2.11.1.2 of the harvest strategy)? <i>*RAG members to provide advice*</i>				
Species specific data gaps and needs					
<i>*to be completed at the meeting*</i>					
Species Specific Research and Priorities					
<i>*to be completed at the meeting*</i>					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022				
<i>*General RAG comments*</i>					

HCRAg Species Assessment Sheet						
Common names	Deepwater blackfish – <i>Actinopyga palauensis</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50t basket species TAC		Based on harvest strategy starting TAC			
Basket trigger	0.5t					
Minimum size limit	22cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Landed weight (wet gutted) (t)	Standing stock biomass above min species size limit (t)		Is standing stock biomass above the default limit reference point?	
	2019/20	104	-		Not assessed	
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance		Need for management response	
	Limited	No	Yes		HCWG to discuss	
Comments on scientific survey findings	CSIRO analysis: Status still remains relatively unknow. Stock assessment needed. Targeted survey sampling may need to be factored into future fishery surveys.					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021).					
Price data (as advised by industry at HCRAg 1 meeting)	Beach price \$15/kg (wet-gutted)					
Any other changes in the fishery?	None advised					
Any other sources of mortality apart from fishing?	None identified					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0.17	50 (0.5t trigger limit)	0.34 %	TAC: No	N/A
					Basket: No	
2021 ¹¹	0.07	50 (0.5t trigger limit)	TBA	TBA	TBA	

¹¹ Catches for the 2021 season to date – as of 18 August 2021.

Decision rules	No concerns from RAG and additional industry members regarding the total reported catch.				
Species specific data gaps and needs					
General improvements to area and effort reporting.					
Species Specific Research and Priorities					
May benefit from a dedicated survey in the future.					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022	50t (0.5t trigger limit)	N/A	N/A	50t (0.5t trigger limit)
The RAG did not recommend any changes to the basket TAC or the trigger limit for the species.					

Golden sandfish (not assessed by HCRAAG)

HCRAAG Species Assessment Sheet						
Common names	Golden sandfish – <i>Holothuria lessoni</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50t basket species TAC		Based on harvest strategy starting TAC			
Basket trigger	0.5 tonnes					
Minimum size limit	22cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	Not included in 2019-20 survey	-	-	RAG to discuss		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	No	N/A	N/A	RAG to discuss		
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): N/A					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021). Refer to attachment A of Agenda Item 5 .					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	15	-	TAC: No Basket: No	N/A
	2021 ¹²	No catch reported	15	-	TBA	TBA
Decision rules	Is the total catch reliable? *RAG members to provide advice*					
	Not overcaught so overcatch decision rules not triggered (refer to section 2.11.1.1 of the harvest strategy).					

¹² Catches for the 2021 season to date – as of 18 August 2021.

	For species with individual triggers within a basket with a joint TAC, should the joint TAC or individual triggers be changed (up or down) (refer to section 2.11.1.2 of the harvest strategy)? <i>*RAG members to provide advice*</i>				
Species specific data gaps and needs					
<i>*to be completed at the meeting*</i>					
Species Specific Research and Priorities					
<i>*to be completed at the meeting*</i>					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC (t)
	2022				
<i>*General RAG comments*</i>					

HCRAAG Species Assessment Sheet						
Common names	Brown sandfish – <i>Bohadschia vitiensis</i>					
Pre-HS TAC	Part of the 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of the 50t basket species TAC			Based on harvest strategy starting TAC		
Basket trigger	3 tonnes					
Minimum size limit	25cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	Not included in 2019-20 survey	-	-	RAG to discuss		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	-	-	-	RAG to discuss		
Comments on scientific survey findings	N/A					
Catch data	Available for 2020 and 2021(as at 18 Aug 2021). Refer to attachment A of Agenda Item 5.					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	50 (3t trigger limit)	N/A	TAC: No Basket: No	N/A
	2021 ¹³	No catch reported	50 (3t trigger limit)	TBA	TBA	TBA
Decision rules	Is the total catch reliable? *RAG members to provide advice*					
	Not overcaught so overcatch decision rules not triggered (refer to section 2.11.1.1 of the harvest strategy).					

¹³ Catches for the 2021 season to date – as of 18 August 2021.

	For species with individual triggers within a basket with a joint TAC, should the joint TAC or individual triggers be changed (up or down) (refer to section 2.11.1.2 of the harvest strategy)? <i>*RAG members to provide advice*</i>				
Species specific data gaps and needs					
<i>*to be completed at the meeting*</i>					
Species Specific Research and Priorities					
<i>*to be completed at the meeting*</i>					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022				
<i>*General RAG comments*</i>					

HCRA Species Assessment Sheet						
Common names	Leopardfish – <i>Bohadschia argus</i>					
Pre-HS TAC	Part of the 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of the 50t basket species TAC			Based on harvest strategy starting TAC		
Basket trigger	40 tonnes					
Minimum size limit	30cm					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	508	-	RAG to discuss		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	No	RAG to discuss		
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): catches low. Generally increasing density trend. No concern for TAC.					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021). Refer to attachment A of agenda item 5 .					
Price data	\$15/kg (gutted-salted), \$120/kg (dried)					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	0.2	50 (40t basket trigger limit)	0.004 %	TAC: No Basket: No	N/A
	2021 ¹⁴	No catch reported	50 (40t basket trigger limit)	TBA	TBA	TBA
Decision rules	Is the total catch reliable? *RAG members to provide advice*					

¹⁴ Catches for the 2021 season to date – as of 18 August 2021.

	Reported overcatch does not trigger any of the overcatch decision rules (refer to section 2.11.1.1 of the harvest strategy).				
	For species with individual triggers within a basket with a joint TAC, should the joint TAC or individual triggers be changed (up or down) (refer to section 2.11.1.2 of the harvest strategy)? <i>*RAG members to provide advice*</i>				
Species specific data gaps and needs					
<i>*to be completed at the meeting*</i>					
Species Specific Research and Priorities					
<i>*to be completed at the meeting*</i>					
HCRA recommendations	Fishing season	RBC (t)	Overtcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022				
<i>*General RAG comments*</i>					

HCRAG Species Assessment Sheet						
Common names	Pinkfish – <i>Holothuria edulis</i>					
Pre-HS TAC	Part of 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of 50t basket species TAC		Based on harvest strategy starting TAC			
Basket trigger	N/A					
Minimum size limit	N/A					
New information						
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?		
	2019/20	85	-	Not assessed		
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response		
	Yes	No	Yes	HCWG to discuss		
Comments on scientific survey findings	CSIRO paper: Possible decline or natural variability. Stock assessment needed.					
Catch data	Available for 2020 and 2021 (as at 18 August 2021).					
Price data (as advised by industry at HCRAG 1 meeting)	Currently no market demand for the species					
Any other changes in the fishery?	None identified – this species is hardly fished					
Any other sources of mortality apart from fishing?	None identified					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	50	N/A	TAC: No Basket: N/A	N/A
	2021 ¹⁵	No catch reported	50	TBA	TBA	TBA
Decision rules	No concerns from RAG and additional industry members regarding the catch data.					
Species specific data gaps and needs						

¹⁵ Catches for the 2021 season to date – as of 18 August 2021.

N/A					
Species Specific Research and Priorities					
None identified					
HCRAG recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022	50t	N/A	N/A	50t
The RAG did not recommend any changes to the basket TAC or the trigger limit for the species.					

HCRAAG Species Assessment Sheet						
Common names	Amberfish – <i>Thelenota anax</i>					
Pre-HS TAC	Part of the 80t basket species TAC					
Status open/closed	Open					
Current TAC	Part of the 50t basket species TAC			Based on harvest strategy starting TAC		
Basket trigger	N/A					
Minimum size limit	N/A					
New information since the TAC was last considered (in this it was at the implementation of the Harvest Strategy)						
Latest scientific survey data	Year	Standing stock biomass (90th percentile) (t)	Standing stock biomass above min species size limit (t)		Is standing stock biomass above the default limit reference point?	
	2019/20	478	-		RAG to discuss	
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance		Need for management response	
	Yes	No	No		RAG to discuss	
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): Catches low. No concern for TAC.					
Catch data	Available for 2020 and 2021 (as at 18 Aug 2021). Refer to attachment A of Agenda Item 5 .					
Any other changes in the fishery?	*RAG members to provide advice. For example, fishing behaviour/market demand? *					
Any other sources of mortality apart from fishing?	*RAG members to provide advice*					
Other information						
Low Tier						
Total catch data	Fishing season	Catch (t)	TAC (t)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
	2020	No catch reported	50	-	TAC: No Basket: N/A	N/A
	2021 ¹⁶	No catch reported	50	TBA	TBA	TBA
Decision rules	Is the total catch reliable? *RAG members to provide advice*					
	Not overcaught so overcatch decision rules not triggered (refer to section 2.11.1.1 of the harvest strategy).					

¹⁶ Catches for the 2021 season to date – as of 18 August 2021.

	For species with individual triggers within a basket with a joint TAC, should the joint TAC or individual triggers be changed (up or down) (refer to section 2.11.1.2 of the harvest strategy). <i>*RAG members to provide advice*</i>				
Species specific data gaps and needs					
<i>*to be completed at the meeting*</i>					
Species Specific Research and Priorities					
<i>*to be completed at the meeting*</i>					
HCRA recommendations	Fishing season	RBC (t)	Overcatch to be discounted (t)	Other source(s) of mortality (t)	TAC/trigger limit (t)
	2022				
<i>*General RAG comments*</i>					

Closed species

Surf redfish (closed)

HCRAg Species Assessment Sheet				
Common names	Surf redfish – <i>Actinopyga mauritiana</i>			
Pre-HS TAC	0 tonnes			
Status open/closed	Closed since 2003 due to sustainability concerns			
Minimum size limit	22cm			
New information				
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?
	2019/20	20	6.7	RAG to discuss
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response
	Yes	No	No	RAG to discuss
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): Species remains closed – Harvest Strategy closed species rule applies.			
Catch data	This species is closed to fishing however 200kg of catch was reported by a fisher in 2020. This matter was followed up by AFMA Compliance.			
Other information				
Re-opening Decision Rule (2.11.4 section of the harvest strategy) – this rule can only be applied if, using all available and reliable information, it can be established that the stock is above a limit reference point level.				
Species specific data gaps and needs				
to be completed at the meeting				
Species Specific Research and Priorities				
to be completed at the meeting				
General RAG comments				

HCRAG Species Assessment Sheet				
Common names	Sandfish – <i>Holothuria scabra</i>			
Pre-HS TAC	0 tonnes			
Status open/closed	Closed since 1998 due to sustainability concerns			
Minimum size limit	18cm			
New information				
Latest scientific survey data	Year	Standing stock biomass (90 th percentile) (t)	Standing stock biomass above min species size limit (t)	Is standing stock biomass above the default limit reference point?
	Planned for but not included in 2019-20 survey	unknown	unknown	RAG to discuss
	Survey adequate for species	Any unexpected results	Any concerns with biomass trend or absolute abundance	Need for management response
	-	-	-	RAG to discuss
Comments on scientific survey findings	CSIRO paper (attachment B of agenda item 5): No survey undertaken. Harvest Strategy closed species rule applies.			
Catch data	This species is closed to fishing			
Other information	Assessed as 'Overfished' but 'Not subject to overfishing' by ABARES in the Annual Fishery Status Reports as no recovery in overall density was observed between 1998 and 2010, and there is no other robust information to inform stock status.			
Re-opening Decision Rule (2.11.4 section of the harvest strategy) – this rule can only be applied if, using all available and reliable information, it can be established that the stock is above a limit reference point level.				
Species specific data gaps and needs				
to be completed at the meeting				
Species Specific Research and Priorities				
to be completed at the meeting				
General RAG comments				



Australian Government

Australian Fisheries Management Authority

Protected Zone Joint Authority

Hand Collectables Resource Assessment Group Meeting No. 01

6-8 October 2021

Thursday Island





Agenda item 6 – Ecological Risk Assessment

- The ERA/ERM framework helps AFMA manage the impacts of commercial fisheries on commercial species, by-product species, bycatch species, protected species, and habitats and communities.
- A draft ERA for the Torres Strait BDM Fishery has been prepared by the CSIRO to address:
 - an assessment priority for the fishery,
 - an export approval condition for the fishery, which currently requires an ERA to be completed by 1 January 2022

Torres Strait Beche-de-mer Fishery WTO Condition 5: The Protected Zone Joint Authority must complete an ecological risk assessment of the Torres Strait Beche-de-mer Fishery by 1 January 2022 and develop an associated risk management strategy to address any risks identified in this assessment.

- Stakeholder consultation is an important feature of the ERA process to improve the assessment, increase the chance of uptake of results and to identify suitable management responses
- The HCRAAG is being asked to **DISCUSS** and **PROVIDE ADVICE** on the draft results of the BDM ERA, following a presentation of the assessment process and draft results by the CSIRO.



Australia's National Science Agency

Ecological Risk Assessment for the Effects of Fishing

Torres Strait Bêche-de-mer fishery (2016-2020)

Leo Dutra, Miriana Sporcic and Nicole Murphy

Hand Collectables RAG, 6-8 October 2021



What is an Ecological Risk Assessment for the effects of Fishing?

A tool to help managers and fishers understand how both the fishing activity and external activities impact the environment

Commercial species

Targeted species (key commercial) and commonly caught and retained species (secondary commercial)

By-product species

Species that are caught and retained (but not targeted)

Bycatch species

Species that are accidentally caught and not usually retained

Protected species

Species that are protected by law

Habitats

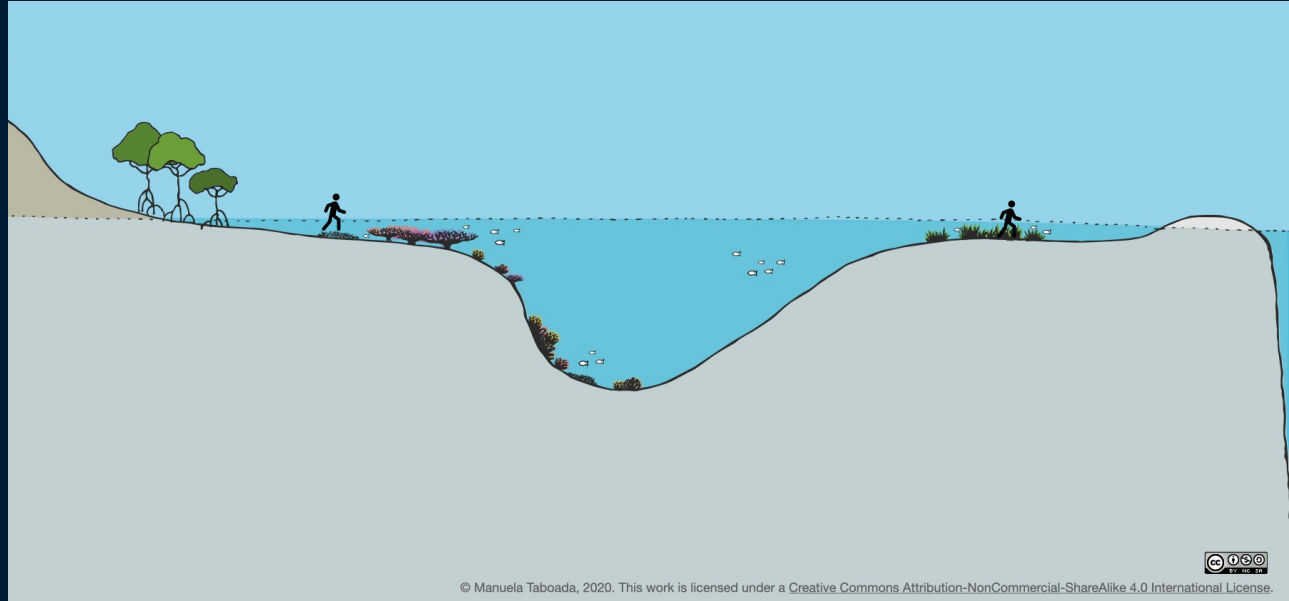
Seafloor, animals and plants attached to the bottom

Communities

Mobile animals - live above the seafloor in the water column



Source: Pakoa, K., R. Masu, J. Teri, J. Leqata, P. Tua, D. Fisk, and I. Bertram. 2014. Solomon Islands sea cucumber resource status and recommendations for management. Pacific Community, Noumea.





LUCINDA ROUSE

Source: <https://www.bbc.com/news/world-africa-56402550>

Abdoulaye Mansaray learnt about the business while processing sea cucumbers in Sierra Leone



Methods: Scoping

General description of the fishery

Identification of sub-fisheries and associated activities

- Checklist of activities – which ones actually occur?
- Include activities external to the fishery

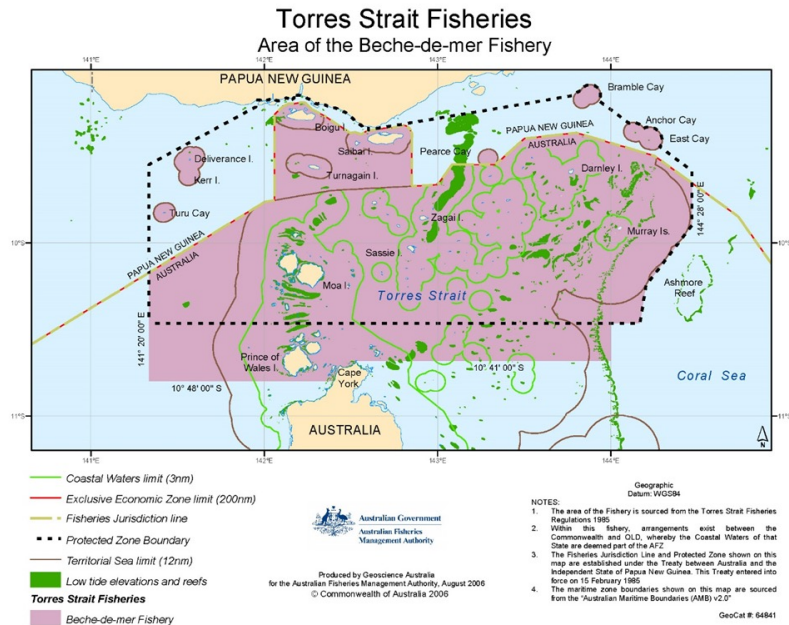
Identification of existing or agreed objectives for each component

Identification of units of analysis for each sub-fishery

- Lists of species (key/secondary commercial, bycatch, byproduct, Protected), habitats, and communities



Description of the fishing activity



since **2014**

Only accessed by
Traditional Inhabitant
fishers

16,844km²

Area

1,388 km²

Shallow reefs

Catches

Great North East Channel

Don Cay

Darnley Island

Cumberland Channel

Barrier regions

65%

of all reefs in Torres Strait



Photo: Mr Michael Passi, Traditional Owner

Fishing

Hand collection
Free diving (2 divers)
Walking along reef tops

Up to **10m**
Depth

80%
Fishing trips last 1-3 days
Camp

Gear restrictions

Hooka/SCUBA ban
7m boat length limit
Any method other than
collection by hand



Traditional Owner & Fisher, Mr Warren Ghee – Mer Island
Photo: Mr Michael Passi, Traditional Owner

last **3 years**

Fishery unlikely to have
unsustainable ecological
impact

Hand collection

No byproduct
No bycatch
No Protected species issues
reported
Low impact on habitats

BDM fishery

Fully commercial
No traditional fishing
Fishery is healthy
Decreased catch rates for Prickly
redfish and Curryfish
Black teatfish recovery

Habitats

Good condition
Coral decline since 2002
Concerns related to
walking on reefs



Photo: Mr. Michael Passi, Traditional Own

Discards

Minimal

Autotomy / falling apart

External hazards

Coastal development

Shipping



Species list

Key commercial species (>20% of the catches)



Photo: Tim Skewes/CSIRO

Prickly redfish *Thelenota ananas*



Photo: Tim Skewes/CSIRO

Curryfish (common) *Stichopus herrmanni*

Secondary species



White teatfish
Holothuria fuscogilva



Deepwater redfish
Actinopyga echinites



Elephant's trunkfish
Holothuria fuscopunctata



Stonefish
Actinopyga lecanora



Greenfish
Stichopus chloronotus



Hairy Blackfish
Actinopyga miliaris



Lollyfish
Holothuria atra



Burrowing blackfish
Actinopyga spinea



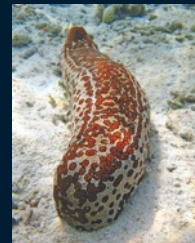
Brown sandfish
Bohadschia vitiensis



Golden sandfish
Holothuria lessoni



Curryfish vastus
Stichopus vastus



Leopardfish
Bohadschia argus



Deepwater Blackfish
Actinopyga palauensis

Previously key species closed to fishing in 2016-2020



Sandfish
Holothuria scabra

Potential Mis-ID



Black teatfish
Holothuria whitmaei

No interactions

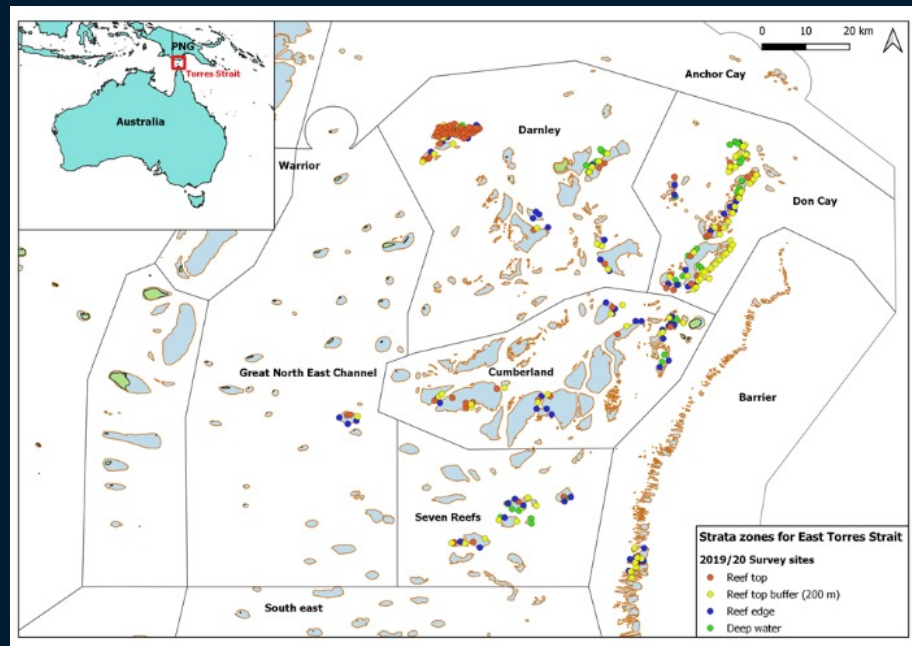


Surf redfish
Actinopyga mauritiana

Potential Mis-ID
Not listed in catch watch report

Identify habitats

Places where commercial species are usually found



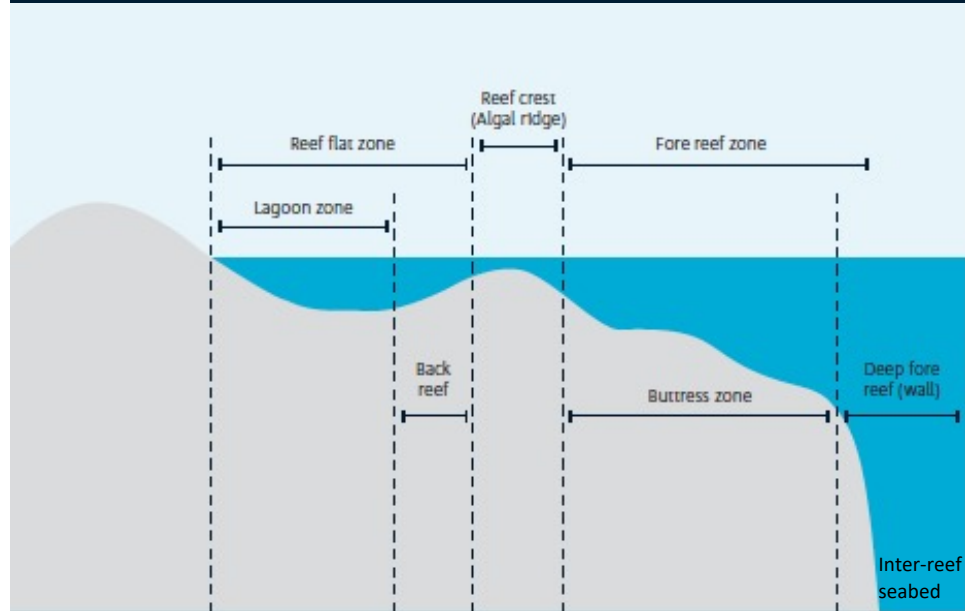






Habitats

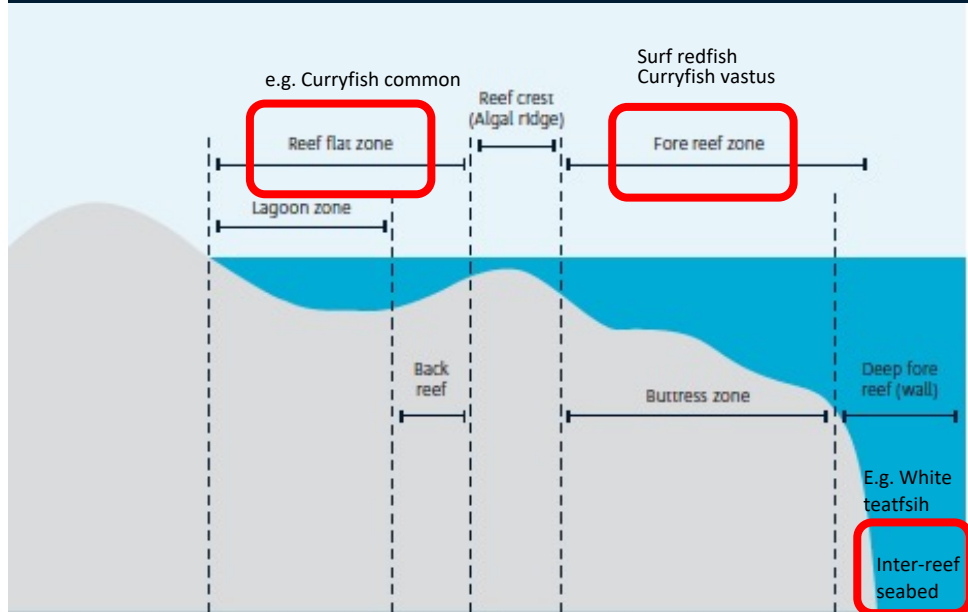
[...]commercial species in Torres Strait are harvested on coral reefs, mostly on reef tops and reef edges, with species having preferences to different reef habitats. (pg 48)



Murphy et al. 2019. Torres Strait Beche-de-mer (Sea cucumber) species ID guide

Habitats

[...]commercial species in Torres Strait are harvested on coral reefs, mostly on reef tops and reef edges, with species having preferences to different reef habitats. (pg 48)



Murphy et al. 2019. Torres Strait Beche-de-mer (Sea cucumber) species ID guide

SPECIES	BROAD HABITAT PREFERENCE
Deepwater redfish	Reef flat; Seagrass beds
Surf redfish	Forereef zone
Hairy blackfish	Reef flat
Deepwater blackfish	Forereef zone
Burrowing blackfish	Reef flats
Stonefish	Reef flats; Forereef zone
Leopardfish	Reef flats; Forereef zone; Inter-reef seabed
Brown sandfish	Reef flats
Lollyfish	Reef flats
White teatfish	Reef flats; Inter-reef seabed; Deep reef
Elephant trunkfish	Reef flats
Golden sandfish	Reef flats
Sandfish	Reef flats; Seagrass beds
Black teatfish	Reef flats; Forereef zone; Inter-reef seabed
Greenfish	Reef flat; Forereef zone
Curryfish (common)	Reef flat
Curryfish (vastus)	Forereef zone
Prickly redfish	Reef flat

Communities

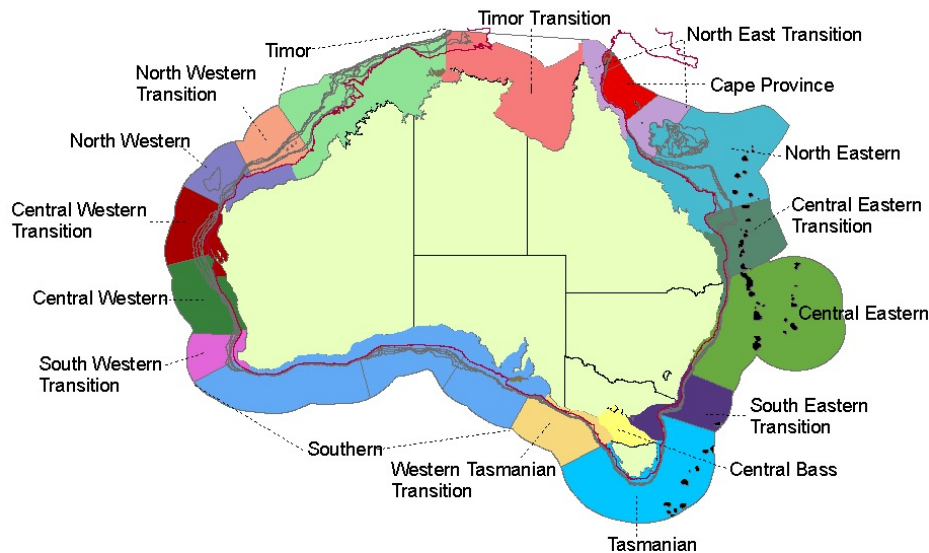
Groups of mobile animals (e.g. fish, seastars, crabs) that occupy large areas identified from national bioregionalisation studies

Excludes animals that are attached to the bottom (e.g. corals)

Demersal (animals living close to the bottom)

Reef (0-110m)

Inner shelf (0-110m)





DIRECT IMPACT OF FISHING	FISHING ACTIVITY
Capture	Bait collection
	Fishing
	Incidental behaviour
Direct impact without capture	Bait collection
	Fishing
	Incidental behaviour
	Gear loss
	Anchoring/ mooring
Addition/ movement of biological material	Navigation/ steaming
	Translocation of species
	On board processing
	Discarding catch
	Stock enhancement
	Provisioning
Addition of non-biological material	Organic waste disposal
	Debris
	Chemical pollution
	Exhaust
	Gear loss
	Navigation/ steaming
	Activity/ presence on water

DIRECT IMPACT OF FISHING	FISHING ACTIVITY
Disturb physical processes	Bait collection
	Fishing
	Boat launching
	Anchoring/ mooring
External Impacts	Navigation/ steaming
	Other fisheries (TS-Rock lobster; TS-finish)
	Aquaculture
	Coastal development
	Other extractive activities
	Other non extractive activities
	Other anthropogenic activities



DIRECT IMPACT OF FISHING	FISHING ACTIVITY
Capture	
	Fishing
	Incidental behaviour
Direct impact without capture	
	Fishing
	Incidental behaviour
	Anchoring/ mooring
	Navigation/ steaming
Addition/ movement of biological material	
	Discarding catch
	Organic waste disposal
Addition of non-biological material	
	Chemical pollution
	Exhaust
	Navigation/ steaming
	Activity/ presence on water

DIRECT IMPACT OF FISHING	FISHING ACTIVITY
Disturb physical processes	
	Fishing
	Boat launching
External Impacts	Navigation/ steaming
	Other fisheries (TS-Rock lobster; TS-finish)
	Coastal development
	Other non extractive activities
	Other anthropogenic activities

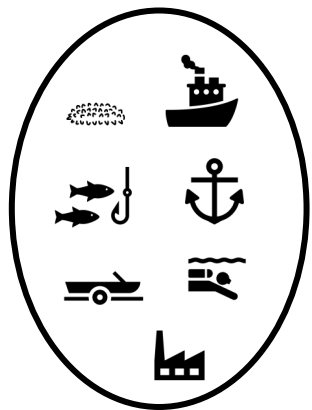
Consequence scores

LEVEL	SCORE	DESCRIPTION
Negligible	1	Impact unlikely to be detectable at the scale of the stock/habitat/community
Minor	2	Minimal impact on stock/habitat/community structure or dynamics
Moderate	3	Maximum impact that still meets an objective (e.g. sustainable level of impact such as full exploitation rate for a target species)
Major	4	Wider and longer term impacts (e.g. long-term decline in CPUE)
Severe	5	Very serious impacts now occurring, with relatively long time period likely to be needed to restore to an acceptable level (e.g. serious decline in spawning biomass limiting population increase)
Intolerable	6	Widespread and permanent/irreversible damage or loss will occur-unlikely to ever be fixed (e.g. extinction)

LEVEL 1 (SICA) RATIONALE

DEVELOP SCENARIOS:
AGREE ON THE WORST EFFECT
ON ANY OF THE SPECIES
IN THE COMPONENT

A SET OF ACTIVITIES



Fishing



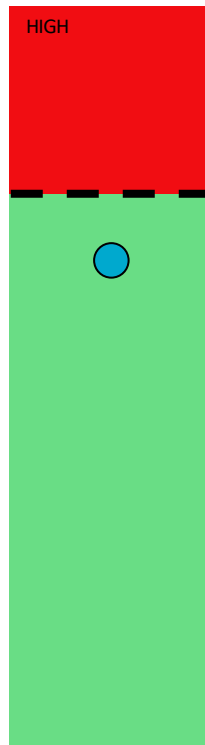
Most vulnerable species: Prickly redfish

Possible fishing decline in 2019
(compared with 2009)

Survey estimates (Murphy et al. 2019)
suggest that current catch limits are sustainable



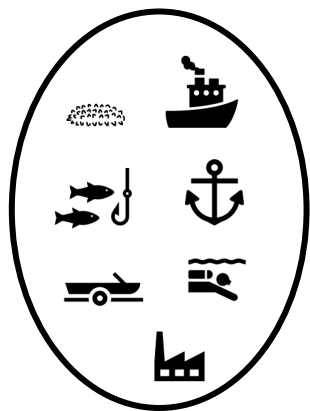
SCORE THE CONSEQUENCE OF
THAT WORST SCENARIO



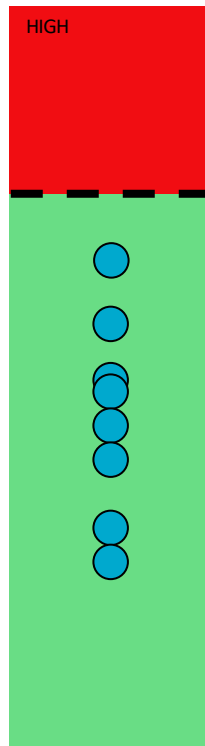
LEVEL 1 (SICA) RATIONALE

DEVELOP SCENARIOS:
AGREE ON THE WORST EFFECT
ON ANY OF THE SPECIES
IN THE COMPONENT

A SET OF ACTIVITIES



SCORE THE CONSEQUENCE OF
THAT WORST SCENARIO



COMPONENT
IS ELIMINATED

IF WORST IS
BELOW THE LINE SO WILL
BE ALL OTHERS

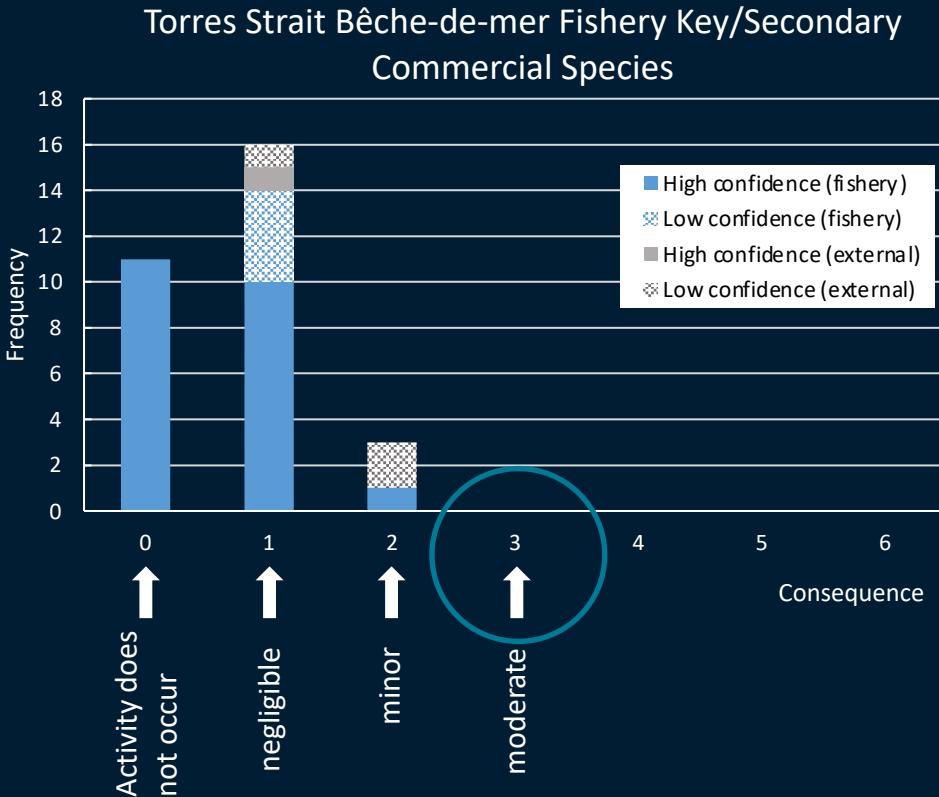


Commercial species

This is a highly selective hand collectable fishery

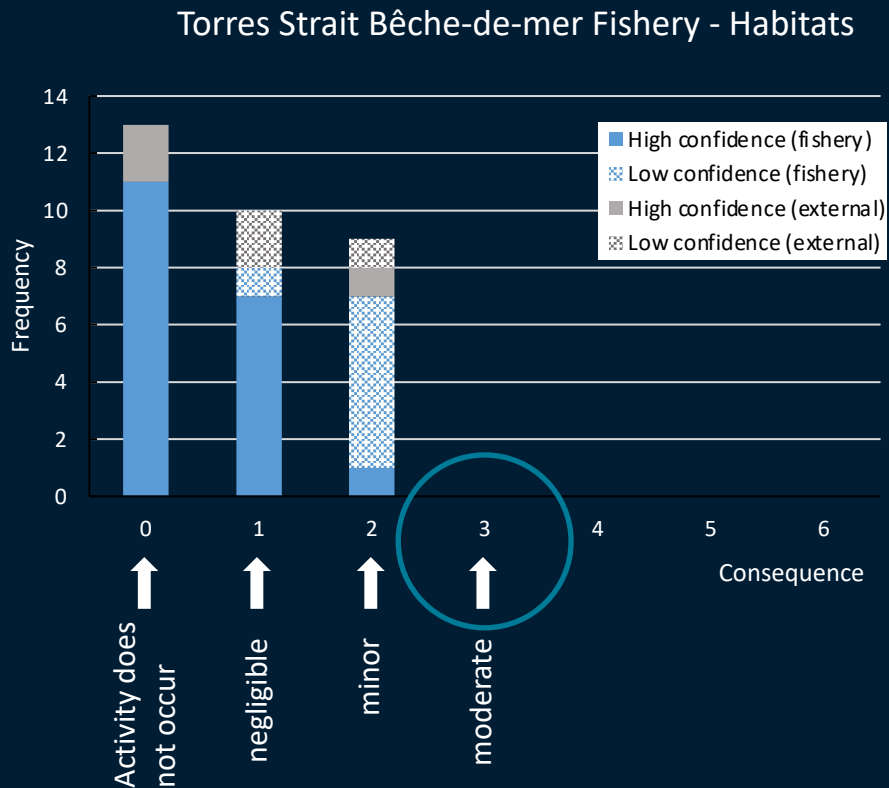
There are no byproduct, bycatch species and protected species

CONSEQUENCE (SCORE)	NUMBER OF ACTIVITIES
Activity does not occur (0)	11
Negligible (1)	16
Minor (2)	3



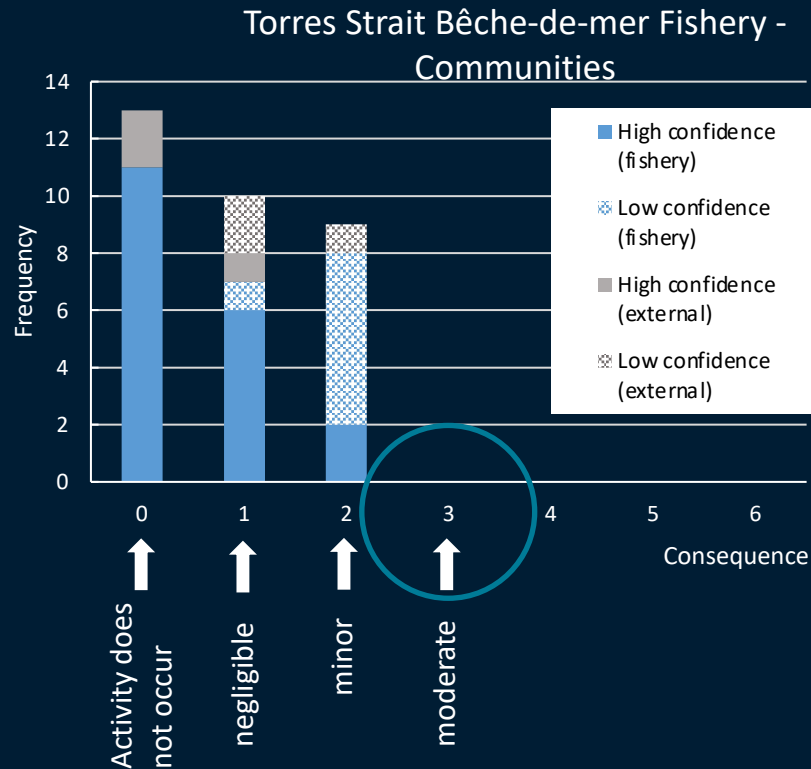
Habitats

CONSEQUENCE (SCORE)	NUMBER OF ACTIVITIES
Activity does not occur (0)	13
Negligible (1)	10
Minor (2)	9



Communities

CONSEQUENCE (SCORE)	NUMBER OF ACTIVITIES
Activity does not occur (0)	13
Negligible (1)	10
Minor (2)	9





Summary of analyses

All ecological components were eliminated at Level 1 (i.e. no components with risk scores of 3 – moderate – or above)

Fishing for sea cucumbers is very selective as collected by hand

- no by-catch or byproducts species recorded in the fishery
- no interactions with Protected species have been reported

‘Bycatch’, ‘byproduct’, and ‘Protected’ species were not assessed because they didn’t interact with the fishery



Summary of analyses

All hazards (fishing activities and external) were considered as low risk and eliminated at Level 1 (i.e. no components with risk scores of 3 – moderate – or above).

The highest risk scores (2; minor with high confidence level) were reported for as part of direct fishing activity on key/secondary species, habitats and communities.

Fishing for sea cucumbers involves walking/trampling and diving on coral reefs, which may affect species directly and also break or damage animals and plants living on seafloor and coral reef structures.



External hazards

Coastal development was the highest scored risk (risk score = 2 low risk) to key/secondary species, habitats and communities

localised pollution in some Islands and sediment runoff from coastal developments in the Fly river (PNG).

Confidence is low because impacts from Fly river likely restricted to Northern Islands in the Torres Strait Protected Zone and are still poorly understood

there is a lack of data on water quality issues and recovery times of species and habitats

A close-up photograph of two hands, palms facing each other, with thumbs pointing upwards in a 'thumbs up' gesture. The hands are light-skinned and appear to be from an adult. The background is a bright blue sky with scattered white clouds. The text 'Overall risk is low' is centered in the upper half of the image.

Overall risk is low



Thank you

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Thanks to Danait Ghebregabhier, Natalie Couchman, Selina Stoute (AFMA), Eva Plaganyi and Tim Skewes for valuable inputs, comments on early versions of report and for sharing their knowledge about the fishery.

1st MEETING OF THE PZJA TORRES STRAIT HAND COLLECTABLES RESOURCE ASSESSMENT GROUP (HCRAG) – 6-7 October 2021

James Cook University Conference Room/video conference, Thursday Island

AGENDA

The meeting will open at 8:30 am on Wednesday 6 October 2021.

AGENDA ITEM 1 PRELIMINARIES

1.1 Acknowledgement of Traditional Owners, welcome and apologies

The Chair will welcome HCRAG members and observers to the 1st meeting of the Torres Strait Hand Collectables Resource Assessment Group (HCRAG).

1.2 Adoption of agenda

The RAG is invited to consider and adopt the draft agenda.

1.3 Declarations of interest

HCRAG members and observers are invited to declare any real or potential conflicts of interests and determine whether a member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict.

1.4 Terms of reference (TOR) of the RAG

The HCRAG is invited to review the general RAG TOR outlined in PZJA FMP 1.

1.5 Out of session correspondence

The HCRAG is invited to note any out of session correspondence to the HCRAG in the lead up to the first meeting.

AGENDA ITEM 2 HCRAG UPDATES

2.1 Industry members

Industry members are invited to introduce themselves and provide an update on matters concerning the Torres Strait Hand Collectable fisheries, in particular, providing comment on fishing patterns, behaviours, prices, and market trends.

2.2 Scientific members

Scientific members are invited to provide an update on relevant research matters relevant to Torres Strait Hand Collectable fisheries.

2.3 Government Agencies

The HCRAG is invited to note updates from AFMA, TSRA and Fisheries Queensland on matters relevant to Torres Strait Hand Collectable fisheries.

2.4 Native Title

The HCRAAG will note a verbal update from the Malu Lamar (Torres Strait Islander) Corporation RNTBC representative if available to attend.

2.5 PNG National Fisheries Authority

The HCRAAG will note an update from the PNG National Fisheries Authority if available to attend.

AGENDA ITEM 3 FINAL RESULTS OF THE BECHE-DE-MER STOCK SURVEY (CSIRO)

The HCRAAG is invited to consider the final results of the eastern Torres Strait stock survey of Beche-de-mer species that took place in December 2019 - January 2020.

The HCWG considered the preliminary survey results at its August 2020 meeting and agreed to consider the finalised survey results and their implications for future management arrangements across all species in the BDM Fishery at their meeting in early 2021.

AGENDA ITEM 4 BLACK TEATFISH TRIAL OPENING 30 APRIL – 3 MAY 2021 AND FUTURE OPENINGS

Considering the outcomes of the 2021 black teatfish trial reopening and in accordance with conditions 5, 6 and 7 of the Re-opening Decision Rule in the BDM Harvest Strategy, the HCRAAG is invited to:

- review whether data collection during the trial opening was conducted satisfactorily;
- consider the analysis of the data collected and its suitability to inform a future TAC and potential to stay open; and
- provide advice to the Hand Collectables Working Group and the PZJA:
 - on the potential for future fishery openings including an appropriate TAC, interval between openings and reporting and data collection requirements and any other conditions that should apply.
 - identify additional data that should be collected during future openings (e.g. length sampling).

Industry observers will be invited to participate during this discussion to inform the RAG's consideration.

AGENDA ITEM 5 HARVEST STRATEGY IMPLICATIONS OF SCIENTIFIC SURVEY RESULTS AND CATCH DATA

The HCRAAG is invited to consider the implications of the final scientific survey results and annual catch data on the implementation of the BDM Harvest Strategy, including current classifications and triggers for surveyed species, data requirements and remaining gaps.

Considering the final results of the scientific stock survey and under the guidance of the Beche-de-mer Harvest Strategy, the HCRAAG is invited to recommend to the HCWG and the PZJA TACs for the 2022 fishing season in line with the BDM Harvest Strategy.

AGENDA ITEM 6 ECOLOGICAL RISK ASSESSMENT (CSIRO)

The HCRAAG is invited to note an update from CSIRO on the Ecological Risk Assessment (ERA) process and provide comment on the draft ERA for the Torres Strait Beche-de-mer Fishery (if available).

AGENDA ITEM 7 CLIMATE CHANGE IMPACTS ON TORRES STRAIT FISHERIES (subject to CSIRO's availability)

The HCRAAG is invited to note a presentation from CSIRO on the outcomes of the project *Scoping a future project to address impacts from climate variability and change on key Torres Strait Fisheries*.

AGENDA ITEM 8 RESEARCH PRIORITIES

The HCRAAG is invited to consider the annual and five-year research plans for Hand Collectable Fisheries and recommend research priorities to the HCWG and the Torres Strait Scientific Advisory Committee research priorities for funding in 2022-23.

AGENDA ITEM 9 OTHER BUSINESS

The HCRAAG is invited to nominate any other business for discussion.

AGENDA ITEM 10 RAG PRIORITIES AND DATE FOR NEXT MEETING

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