Australian Government
Australian Fisheries Management Authority

Torres Strait Hand Collectables Resource Assessment Group

Meeting No. 3

17–18 October 2023

Meeting Record

Note all meeting papers and minutes are available on the PZJA webpage: www.pzja.gov.au

Box 7051, Canberra Business Centre, ACT 2610 / Ph (02) 6225 5555 / Fax (02) 6225 5500 / AFMA Direct 1300 723 621 afma.gov.au

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1 Acknowledgment of traditional owners, welcome and apologies

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

2 Adoption of agenda

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

3 Declarations of interest

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

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

Table 1. Declared conflicts of interest from each attendee.

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

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

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

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

4 Action items from other meetings

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

5 Out of session correspondence

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

6 HCRAG Updates

6.1 Traditional Inhabitant members

20. The RAG noted the following updates from Traditional Inhabitant members:

    a. The Traditional Inhabitant member for Gudumalulgal noted that a sea country claim is still in progress. The member also noted that fishers had noticed damage to seagrasses around Boigu due to sand and mud incursions. The Scientific member commented that these observations are extremely important particularly given that climate change will make El Nino more extreme affecting water levels and leading to increased sand incursions.

    b. The Traditional Inhabitant member for Kulkalgal noted that it was a good black teatfish season although it was slow on the first day. The member noted that the community is looking to fish a greater range of sea cucumber species, noting they currently target black teatfish and curryfish.

    c. The Traditional Inhabitant member for Kemer Kemer Meriam noted that only one fisher is opportunistically diving for BDM on Ugar, there are two full time BDM businesses on Erub who are targeting mainly curryfish and three businesses on Mer which have been fishing on and off this year. The member noted that there was a slow start to the black teatfish season with animals being smaller this season and not found in the same spots as last season. The member noted that the vessel MV *Iron Joy* had conducted a coral survey on Ashmore and Boot Reefs. The survey was undertaken by the Great Barrier Reef Marine Park Authority, Parks Australia and James Cook University. A community representative was on the trip and looked at BDM and clamshells.

    d. The Traditional Inhabitant member for Maluialgal noted that there is interest in moving the opening of the black teatfish to October and increasing the TAC to 22 tonnes with a closure at 20 tonnes. The member noted the high cost of fuel ($3.70/litre) is having a significant impact on the community. AFMA welcomed the suggestion to employ local people when undertaking research and noted that there is increasing interest to get communities involved particularly through ZK Fisheries.

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

6.2 Scientific members

21. The RAG noted the following update from the Scientific member, Dr Eva Plaganyi:

    a. There is a CSIRO strategic research project underway on improving supply chain resilience to climate change with the TRL Fishery being used as a case study.

    b. TSRA are funding a new project starting soon that will look at climate change impacts and adaptation options. Laura Blamey will be the lead investigator on this project.

    c. There will be a science communication day on Thursday island on 16 November 2023 where the 35th annual lobster survey will be celebrated. Members noted that the climate change project will also be discussed.

    d. Nicholas McClean, University of Technology Sydney, is undertaking a project looking at indigenous engagement in Commonwealth fisheries. The Scientific member noted that they are involved to provide technical expertise with a national workshop being held in Canberra in November 2023. Members noted that Sereako Stephen has provided advice for this project.

    e. There is a crown-of-thorns starfish outbreak in the Torres Strait (particularly in the East). Members noted this is a concerning problem and the only way to kill them is to inject them with a bile salt solution or vinegar. Fishers should not spear them as they can split and regenerate. CSIRO have historical data from previous outbreaks that could be used to inform the current outbreak, that they are happy to share.

22. Scientific observer, Nicole Murphy, noted that she will be conducting the TRL survey from 1-15 November 2023.

23. Scientific member, Tim Skewes, noted that he is currently working for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) providing information for the non-detriment finding (NDF) for *Convention on the International Trade of Endangered Species of Wild Fauna and Flora* (CITES) listed *Thelenota* species in the BDM Fishery.

24. The RAG noted the following updates from the Scientific member, Assoc Prof Steven Purcell:

    a. The team he was collaborating with completed assessments of the sea cucumber fishery in New Caledonia. There are four reports which include the results of two stock surveys, a comparison of historical export and catch data, and a comparison of the density of sea cucumbers in the 2021/22 survey to the 2003-2007 survey.

    b. He is currently finalising a report with New Caledonian collaborators on a survey of sea cucumbers in French Polynesia. He was part of the team that surveyed stocks of white teatfish and several other commercially-important sea cucumbers on an atoll in the Tuamotu archipelago to assess whether fishing could re-open and to inform a non-detriment finding for harvests of white teatfish.

c. In New Caledonia, he has commenced two mark-recapture studies for golden sandfish and white teatfish that will reveal their growth rates and age-at-size curves. Those two studies will be completed in 2024.

d. New Caledonian marine scientists with ADECAL, commissioned a study to determine conversion ratios from fresh, gutted, salted and dried for numerous commercially important species. ADECAL also recently finished a research study to determine the size at sexual maturity for various species. Both studies will be highly useful for the Torres Strait fishery.

e. He has recently finished a market survey on dried sea cucumber in Hong Kong. The project looked at changes over 10 years, comparing changes in prices to the consumer price index (CPI) in Hong Kong. Some species have declined in value compared to CPI, however, black teatfish, white teatfish and curryfish have increased.

25. The RAG noted the following updates from the acting Chair of the HCWG, David Brewer, who noted that he is working on a community consultation project about collecting traditional and recreational catch data. The project includes giving feedback to communities on catches and changes over time.

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

26. The RAG noted the update provided by AFMA as detailed in the agenda paper, in particular:

a. The CITES listing of sea cucumber species may have an impact on fishers being able to export product.

b. At the last RAG meeting in September 2022, there was discussion concerning three transferable vessel holder (TVH) fishing licence packages that did not have fishery entries. The holder of one of these licence packages was seeking to fish for species groups for the ornamental aquarium trade. At their meeting in October 2022, a decision was made by the PZJA that the three licence packages were inconsistent with the objectives of the Torres Strait Fisheries Act 1984 (the Act), and the policies of the PZJA, and should not be renewed upon their next expiry dates. At the meeting in July 2023, the PZJA agreed to write to the affected parties with a statement of reasons.

c. AFMA has been delivering domestic compliance functions in the Torres Strait in accordance with the National Compliance and Enforcement Program. In 2022/23, there were three compliance officers based in the Thursday Island office delivering both domestic and foreign compliance programs. All targets for this period have been met.

d. On 13 February 2023, the Assistant Minister to the Prime Minister gave policy approval to amend the Act. At its meeting in July 2023, the PZJA agreed to consider a decision on progressing legislative amendments at its next meeting. This meeting has yet to happen.

e. Community consultation meetings will be held early next year. The RAG agreed compliance officers should be in attendance where possible, so that concerns regarding illegal fishing can be discussed.

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

f. The RAG notes that a sandfish survey has been identified as a priority by the TSSAC and there has been a call for proposals which closes at the end of the month. Members noted that all proposals received will go out-of-session to the RAG for comment. It was noted that for the sandfish survey project, the researcher will need to work closely with communities. A key part of the survey is to include community employment.

27. The RAG noted the update from the ABARES observer that the latest ABARES Fishery Status Reports (FSR) will be released next week. The FSR includes evaluations of 102 fish stocks including Torres Strait fisheries. The AFMA member agreed to circulate a copy of the report once it is released.

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

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

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

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

6.4 Native Title

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

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

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

6.5 PNG NFA

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

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

c. The meeting noted that the PNG BDM Fishery is currently closed. The PNG NFA advised they have recently completed a sea cucumber stock survey, including the Western Province, with a view to re-opening the fishery. NFA advised the survey will be finalised by the end of 2023 and the results will be shared with Australia.

d. PNG identified the listing of Thelenota species under the CITES is an area for collaboration.

e. As sea cucumber and trochus are not Article 22 fisheries, catch sharing arrangements were not entered into.

7 Status of Wildlife Trade Operation approval and CITES listings

32. Members noted that the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), administered by the DCCEEW, requires the Australian Government to assess the environmental performance of all commercial fisheries, including those in the Torres Strait, and promote ecologically sustainable fisheries management. Wildlife Trade Operation (WTO) approval under the EPBC Act is necessary for Australian commercial fisheries to be able to legally export commercially wild caught seafood from Australia. Members noted that such approvals may be subject to conditions applicable to the responsible management authority and fishers. The AFMA member stated that the BDM Fishery was last assessed in 2020 and was declared as an approved WTO under the EPBC Act until 30 November 2023 subject to several conditions being addressed during the period of the approval. Members noted that the current WTO approval includes additional requirements that need to be met by the PZJA to manage the harvest of black teatfish and white teatfish. One of these conditions places a seasonal total allowable catch (TAC) limit of 20 tonnes and 15 tonnes for black and white teatfish, respectively. Members noted that the fishery is on track to meet all the conditions of the current WTO.

33. The RAG noted that in June 2023, AFMA made an application to DCCEEW for the re-assessment of the BDM Fishery under the EPBC Act. Members noted that AFMA is yet to receive information on the outcome of the new assessment, including any proposed conditions that may be imposed should the fishery be approved as a WTO. As discussed at the BDM Workshop held on 21-22 March 2023, AFMA has sought flexibility in the conditions placed on any future WTO approval, to recognise the science-based TAC setting process in the fishery and remove fixed caps on TACs and recognise current arrangements for undercatch and overcatch.

34. Members further noted that three species currently commercially harvested in the fishery have been listed under Appendix II of CITES:

    a. The listing for black teatfish (*Holothuria whitmaei*) and white teatfish (*H. fuscogilva*) came into effect on 28 August 2020.

    b. The listing for prickly redfish (*Thelenota ananas*) and amberfish (*T. anax*) comes into effect on 25 May 2024. The Scientific member noted that it is likely there will be a high priority to complete a stock assessment for prickly redfish and take management action on amberfish.

35. Members noted that species listed under Appendix II of CITES are not necessarily threatened with extinction but may become so unless trade is closely controlled. Listed species may still be traded internationally provided the trade, or a specified level of trade, has been determined to be non-detrimental to the survival of the species in the wild. NDFs for the *Holothuria* and *Thelenota* species, will be considered as part of the process to re-assess the fishery under the EPBC Act.

36. The RAG noted that the Queensland Sea Cucumber Fishery has invested millions in updated science to ensure they are meeting WTO conditions so that the fishery can continue to export sea cucumbers.

8 Climate and ecosystem update

37. The AFMA member stated that the effects of climate change are an ongoing concern in all fisheries globally. Members noted that a program of work is being undertaken in Commonwealth fisheries to ensure that climate impacts are more strategically incorporated into the management of these fisheries to ensure that AFMA continues to meet legislative objectives relating to ecological sustainability. This work is a follow up action from the Adaption of Commonwealth fisheries management framework to climate change project (the climate adaptation project) that looked at the readiness of Commonwealth fisheries management arrangements to the potential impacts of climate change and provided a range of resources to assist with adaptation. The RAG noted that the outcomes of this project have not yet been applied to Torres Strait fisheries.

38. Members noted that over the next few years under an El Nino climate pattern, it is likely that water temperatures will increase which may impact on ecosystems. The AFMA member stated that industry insight is critical to monitor changes.

39. Members noted that El Nino conditions are expected to continue through the 2023/24 summer. Members noted that modelling and predictions show that most fisheries will not perform well with climate change and management needs to be precautionary and conservative. The Scientific member noted that Torres Strait species should cope well with warmer waters, however, they will get closer to their thermal optimum and therefore need to be monitored closely. It was further noted that sea cucumbers should be fairly resilient to climate change effects, however, a climate risk assessment completed by James Cook University highlighted that the black teatfish was at the highest risk due to winter spawning.

40. Members agreed that AFMA would provide the adaptation to climate change guidebook to the next RAG meeting and discuss the tools used by other fisheries to manage the impacts of climate change.

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

9 BDM Workshop outcomes

41. Members noted that in recent years the RAG and HCWG have requested a workshop be held to seek broader industry views from active fishers on future management arrangements for the Torres Strait, in particular to:

    a. identify optimal timing for annual black teatfish openings;

    b. identify potential options for the better utilisation of the under caught black teatfish TAC;

    c. understand the benefits and impacts of different options for the better utilisation of the under caught white teatfish TAC, including the use of hookah gear.

42. The BDM Workshop was held on 21-22 March 2023 on Ngurupai (Horn Island). Members noted that TSRA provided logistical support and funding. AFMA thanked TSRA for their support and industry for their attendance and participation. Members noted that workshop participants made a number of recommendations, including:

    a. An opening date for the 2023 black teatfish fishery opening.

    b. That a further independent stock survey be undertaken with the design to be informed by input from Traditional Owners and fishers. Members noted that the last survey cost approximately $400,000.

    c. The WTO conditions for the BDM Fishery be updated to remove fixed caps on black teatfish and white teatfish TACs to reflect latest science.

    d. An increase the black teatfish TAC to 22 tonnes. With regards to any remaining under caught TAC in 2023, it was discussed that the fishery be re-opened for the required period later in the year (e.g. one day in November). The remaining TAC will be held in trust by ZK Fisheries, who

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

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

10 2023 black teatfish opening and future openings

10.1 Outcomes of 2023 opening

43. The RAG noted that the black teatfish fishery opened on 15 May 2023 for three and a half days, resulting in 17.9 tonnes of the 20 tonnes TAC being caught. A total of 36 TIB licence holders participated in the opening and AFMA estimates that the total landed value of the catch was approximately $0.6 million.

44. The RAG noted a presentation provided by the Scientific observer, Ms Nicole Murphy, regarding the analysis of black teatfish data collected during the 2023 opening (**Attachment B**). Ms Murphy noted that a size-frequency sampling program was undertaken by scientific observers for the second consecutive year during the 2023 opening. Analysis of this and other data collected from the 2021-2023 seasons were undertaken as part of TSRA funded project 2023-0800.

45. Members noted that comparing whole (live) black teatfish length measurements between 2022 and 2023, for whole (live) animals, the average length, maximum length and median length (middle value) decreased in 2023. There was, however, an increase in the average weight measured. There were similar trends for gutted and salted animals, though there was a decrease in the average weight in this group. The RAG discussed the variability in the data for length and weight between years. Ms Murphy explained that this could be due to animals being out of the water for differing and unknown periods of time (e.g. the variation could be due to water loss, evisceration and differences in handling (whether water is drained from animals prior to weighing or how animals are packed into tubs).

46. Ms Murphy stated that the minimum legal size (MLS) for black teatfish is 250 mm, which is measured as the length of the animal in the water in its 'undisturbed state'. Observer data for whole (live) animals show that the percentage of animals below the MLS was 23.6% in 2022 and 34.7% in 2023. Members noted, however, that observer measurements of animals at catch landing points are being recorded at a different time to when MLS should be measured (i.e. in the water). Black teatfish are known to shrink when they are taken out of the water and there are delays before they are landed and able to be measured. During this time, they lose water and eviscerate. To take into account the 'shrinkage' of animals between collection and when they are measured, 10% was applies to length measurements, resulting in 11.4% (in 2022) and 18.4% (in 2023) of black teatfish measuring below the MLS. The RAG noted that black teatfish under the MLS need to remain in the water so that they have the opportunity to spawn. Comparing the length of whole (live) animals measured between years showed that in 2023, there were fewer very large animals measured for the population.

47. The RAG noted that additional size-frequency data from future black teatfish fishery openings will help to improve estimates of stock productivity, as well as provide information on population recruitment (breeding), which is important given sea cucumber recruitment may be sporadic (not regular).

48. The RAG noted that many fishers are leaving the voluntary Part B section of the catch disposal record (CDR) blank, which includes fishing effort, area and method information. The RAG agreed that catch per unit effort (CPUE) analyses should be included in the analysis of next season's data. AFMA also agreed to undertake further education with fishers on the importance of the voluntary Part B section of the CDR as well as MLS requirements.

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

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

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

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

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

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

10.2 Updates to black teatfish stock assessment modelling

50. The RAG noted a presentation provided by the Scientific member, Dr Eva Plaganyi, regarding the results on updates to the black teatfish surplus production model (used to set the TAC for the 2021 and 2022 trial openings) and the age-structured production model based on historical catches, survey data, and size-frequency data collected during surveys and openings (**Attachment C**). Results from both models were consistent with previous modelling results that, based on the data currently available for the BDM Fishery, an annual 20 tonnes TAC for black teatfish continues to be sustainable, whereas an annual TAC of 30 tonnes was projected to lead to a significant decline towards the limit.

51. The RAG noted that as more data become available, it will be possible to refine and substantially improve modelling results and reduce uncertainty. However, members noted that other factors will need to be taken into consideration in the future when setting TACs including the ecosystem impacts of climate change and possibly the COTS outbreak.

52. The RAG discussed uncertainties around some of the parameters used in the modelling, including natural mortality and age at maturity. It is understood that age at maturity for black teatfish is between 4-8 years, and likely 6 years on average. The age-structured production model groups lengths into different age classes. The data suggests that there are not a lot of animals that are in the older age cohort (10+ years). A range of sensitivities were tested, including different growth, selectivity, mortality assumptions.

53. Members noted that black teatfish are understood to have their main spawning period in June and July with a smaller spawning period in December. Traditional Inhabitant members queried whether fishing after the spawning period would be more beneficial to the stock. The Scientific member noted that that the TAC is only a small percentage of the total spawning biomass and fishing animals above the MLS and at sustainable levels is more important than avoiding the spawning period. Also, animals will also be in poorer condition following spawning.

54. The RAG discussed the MLS for black teatfish (250 mm), noting other jurisdictions have higher MLS.

55. The Chair thanked the Scientific member and observer for their presentations. The RAG noted that under the current WTO conditions the take of black teatfish is restricted to a 20 tonnes TAC.

56. **Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for black teatfish should remain at**

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

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

10.3 Future openings

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

Carryover of TAC undercatch

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

c. options for the review of the BDM Fishery Harvest Strategy to include provisions to carry over undercatch and set provisional TACs.

63. The RAG noted that the BDM Fishery is currently undergoing re-assessment under the EPBC Act. If the BDM Fishery is approved as a WTO, this approval will be subject to conditions. AFMA have met with DCCEEW and sought the removal of fixed caps on TACs to enable the carryover of TAC undercatch amounts between fishing seasons and allow for the full implementation of the BDM Fishery Harvest Strategy with respect to TAC overcatch.

64. The AFMA member noted that AFMA has implemented overcatch and undercatch arrangements in a number of Commonwealth fisheries, under AFMA's *Fisheries Management Policy 10*. The general approach is to carryover up to 10% of an undercaught TAC from one season to the following season. It was clarified that the undercatch amount would not be able to be carried over for more than one season (i.e. if it is not caught in the subsequent season, it cannot be carried over again).

65. Scientific members advised that they had no concerns with the development of TAC undercatch carryover provisions for black teatfish. It was noted that the life history of the species was suited to the arrangement (longer lived). It was also noted that management strategy evaluation (MSE) testing showed that the arrangement did not raise sustainability risks for the species.

66. **Taking into account the scientific advice, the RAG agreed with AFMA's recommendation for the development of TAC undercatch carryover provisions for black teatfish to allow for up to 10% of the current fishing season's TAC, if not caught, to be carried over from the current season to the subsequent season.**

67. The AFMA member noted the draft arrangements would be developed for further consideration at HCRAG and HCWG meetings in 2024. The arrangements will require amendment to the BDM Fishery Harvest Strategy, which will require approval by the PZJA prior to implementation.

11 Outcomes of white teatfish and curryfish research project

68. The RAG noted a presentation provided by the Scientific member, Dr Eva Plaganyi, regarding the results of AFMA funded project 2021-0815, concerning new stock assessment modelling undertaken for white teatfish (**Attachment D**). The RAG noted that the results of the project concerning new processing conversion ratios for curryfish species will be provided for consideration at the next HCRAG meeting in 2024.

69. The RAG noted that white teatfish is a slow-growing species that has been listed under Appendix II of CITES. In addition, the white teatfish population structure is not well understood. The 2019/20 survey showed 72% of the stock was in deeper waters (>20 m) which is not accessible to free diving. It is also unknown as to the extent of mixing between the shallow and deep water components of the stock.

70. Dr Plaganyi advised that an integrated age-structured production model for white teatfish was developed using historical catch data (available for the period 1995-2022) and fitted to a time-series comprising four survey indices of abundance (2002, 2005, 2009 and 2019, noting that the 1995 survey is not considered adequately representative for white teatfish), the 2019 survey absolute abundance estimate, the survey length frequency data (after converting to age) for three years (2002, 2005 and 2019 - sample size too low in 2009), as well as two measures of the average biomass of the commercial catch.

71. The RAG noted that despite considerable uncertainty, the age-structured model results suggests that the current white teatfish TAC of 15 tonnes is conservative and that an annual catch of 15 tonnes will have a very small effect on the white teatfish population. Members noted that although the results indicated the TAC could be increased, it was recommended a precautionary approach be taken with any increase to be undertaken in a step-wise manner and accompanied by the collection of better data.

72. The industry observer noted that Traditional Inhabitant fishers have put forward a proposal to be able to fish for white teatfish using hookah gear. The Scientific member noted that if white teatfish was allowed to be taken by hookah gear, then the catches from the different methods (e.g. free dive, hookah) would need to be separated in the model. The Chair noted that the industry proposal will be discussed at the HCWG meeting.

73. The QDAF member noted that some white teatfish research was being finalised for the Queensland Sea Cucumber Fishery and agreed to circulate the report once it is published. The Scientific member, Assoc Prof Steven Purcell, also noted research which showed growth rates and age at maturity for white teatfish, different to that used in the modelling. The Scientific member agreed to provide CSIRO with the research reports for their consideration.

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

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

74. Members noted that the TAC for white teatfish is currently limited to 15 tonnes under a condition of the BDM Fishery's WTO approval which expires on 30 November 2023.

75. The RAG noted that the BDM Fishery Harvest Strategy states that is fishing effort is low then the TAC should not be increased. Members further noted that if a hookah trial was to be approved the Harvest Strategy would need to be amended as well as the PZJA management arrangements which would involve a consultation period and the HCRAG would need to consider the proposal again. The Traditional inhabitant observer noted that this issue has been discussed for the last 5 years with very little progress.

76. Members noted that should the industry proposal proceed to a trial, the following data would be needed to support ongoing assessment:

    a. total catch;

    b. CPUE;

    c. length frequency of a (adequate) sub-sample of the catch;

    d. average mass of a sub-sample of the catch;

    e. spatial footprint/location of the catch;

    f. if necessary and possible, a survey 3 to 5 years after the start of more intensive fishing would continue the survey series and update the estimate of standing stock;

    g. other monitoring methods such as divers carrying data loggers could also be used and these data could potentially be compared with those available for the 2012-2013 fishing period.

77. **Taking into account the updated modelling results and low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for white teatfish should remain at 15 tonnes for the 2024 fishing season.** It was noted there is a scientific basis to consider an increase to the TAC should the industry proposal proceed to a trial.

78. As for black teatfish, noting that the high tier decision rules could not be applied to recommend a TAC for the 2024 fishing season, the RAG reiterated their recommendation that the BDM Fishery Harvest Strategy be reviewed to clarify the high tier decision rules, to provide for stock assessments that are undertaken out of cycle with fishery independent surveys, to be taken into account in setting TACs.

12 Total allowable catches for the 2024 fishing season

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

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

Prickly redfish (Thelenota ananas)

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

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

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

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

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

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

Hairy blackfish* (*Actinopyga miliaris)

90. Members noted that hairy blackfish stock status was discussed at the last RAG meeting and acknowledged that the stock survey needs to be adapted to better target hairy blackfish to get sufficient information to assess its status. ABARES currently list the fishing mortality and biomass as uncertain. The ABARES observer noted the 5 tonnes TAC is concerning given the current low estimated biomass of hairy blackfish measured in the latest survey, but also acknowledged the views of survey scientists that hairy blackfish are difficult to count.

91. Members noted that AFMA will continue to work with industry to improve the quality of catch reporting, particularly with regards to spatial reporting and species identification.

92. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for hairy blackfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.**

Deepwater redfish (Actinopyga echinites)

93. Members noted that under the BDM Fishery Harvest Strategy the current TAC for deepwater redfish is 5 tonnes. Members noted that catches are low compared to estimates of biomass from the last population survey but with an increasing overall trend in average density.

94. The Scientific member noted that recent surveys estimated densities at around 2.5 individuals per hectare, which is far below the regional reference densities recommended for healthy populations by the Pacific Community. The RAG noted that deepwater redfish are not targeted due to low market price, but would be taken opportunistically by fishers. The Scientific member recommended that that a 0 tonne TAC should be set for species assessed at risk on the IUCN Red List (https://www.iucnredlist.org), noting deepwater redfish was assessed as Vulnerable. The member further noted that, according to the last CSIRO survey report, the species looks to have declined or disappeared from the Great North East Channel and other areas of the Torres Strait. Another Scientific member advised that a closer scrutiny of the survey and other data is needed see if there has been a decline in density in specific areas of the Torres Strait, noting however that the results of the 2019/20 survey showed an increasing overall trend in density.

95. The AFMA member explained that the IUCN Red List is advisory only and assessments for most species are at a global scale. However, the IUCN listings are used as an important signal to pay closer attention to the management of species of concern. The member also noted that harvest strategy decision rules do not stipulate to set a 0 tonne TAC in this instance.

96. ABARES lists the biomass as uncertain, but not subject to overfishing. Members noted that industry need to improve the quality of catch reporting, particularly with regards to spatial reporting and species identification. The RAG stated that more targeted survey and/or sampling of deepwater redfish is required to get sufficient information to assess its status.

97. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for deepwater redfish should remain at 5 tonnes for the 2024 fishing season, with education needed on the importance of species identification and the voluntary Part B section of the CDR.**

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

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

Greenfish (Stichopus chloronotus)

99. Members noted that under the BDM Fishery Harvest Strategy the current TAC for greenfish is 40 tonnes with zero catch taken in the last few years. Under the ABARES status report the greenfish is listed as not subject to overfishing or overfished.

100. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the TAC for greenfish should remain at 40 tonnes for the 2024 fishing season.**

Curryfish basket species

Curryfish (common) (Stichopus herrmanni)

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

102. The AFMA member agreed to provide additional data on changes to how many fishers are targeting curryfish each fishing season, to inform discussions at the next meeting on what is causing the decline in catches (**action arising 15**).

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

Curryfish (vastus) (Stichopus vastus)

103. The AFMA member explained that curryfish vastus has a 15 tonnes species specific trigger. With reference to the low tier decision rules under the BDM Fishery Harvest Strategy, members noted annual reported catches in the last two fishing seasons have not exceeded the TAC or trigger, and therefore no additional actions apply under decision rules.

104. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for curryfish species should remain at 60 tonnes for the 2024 fishing season, with education needed on the importance of species level identification and the voluntary Part B section of the CDR.**

Other basket species

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

Deepwater blackfish (Actinopyga palauensis)

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

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

107. The AFMA member noted that the 500 kg species trigger limit for deepwater blackfish was exceeded in 2022 by more than 10% and the low tier joint TAC trigger-limit decision rules apply. These rules state: if the catch of any species exceeds the species-specific trigger by more than 10%, then collect data and information to decide whether: a) to make a change to the basket TAC, or individual species trigger, or b) a species-specific TAC is justified, or c) a closure is deemed necessary, or d) recommend further data be collected (e.g. in the form of a survey, or indicator before any change to the joint TAC or trigger limit is allowed.

108. The ABARES observer noted the ABARES FSR assesses this species as uncertain and expressed their concern that, like several of the other *Actinopyga* species in this fishery, the deepwater blackfish stock may be depleted.

109. The RAG discussed historical species identification and survey issues concerning deepwater blackfish, deepwater redfish, burrowing blackfish and hairy blackfish. The RAG requested that further analysis on *Actinopyga* species, including trigger limits, be provided at the next meeting for further consideration.

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

Elephant trunkfish (Holothuria fuscopunctata)

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

Lollyfish (Holothuria atra)

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

Burrowing blackfish (Actinopyga spinea)

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

Golden sandfish (Holothuria lessoni)

113. The AFMA member noted that there is a 500 kg species trigger limit. The RAG noted that golden sandfish were not observed during the 2019/20 stock survey or annual TRL surveys. There were no annual reported catches in the last two fishing seasons. The Scientific member noted that golden sandfish has been listed as Endangered by the IUCN Red List (https://www.iucnredlist.org).

114. The Scientific member proposed for the TAC for golden sandfish to be reduced to 0 tonnes because densities in the current fishing zones were extremely low and any further opportunistic harvests would put the populations at risk. As it is considered endangered throughout its distribution, caution should be applied. The AFMA member noted that the IUCN Red List is not binding and is advisory in nature.

115. The AFMA member noted that a change to the TAC for golden sandfish, and other species such as *Actinopyga*, based on low catches is not currently part of the BDM Fishery Harvest Strategy decision rules.

Brown sandfish (Bohadschia vitiensis)

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

Leopardfish (Bohadschia argus)

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

Stonefish (Actinopyga lecanora)

118. Members noted that stonefish are not recorded in the stock survey and there has been no annual reported catches in the last two fishing seasons.

119. **Taking into account the low tier decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that the basket TAC for other species should remain at 50 tonnes for the 2024 fishing season, noting the next meeting of the HCRAG should discuss further as to why those basket species with low or no catches are not being caught.**

120. **In making this recommendation, the RAG noted concerns raised by the Scientific Member concerning the TAC for golden sandfish.**

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

Closed species

Sandfish (Holothuria scabra) and surf redfish (Actinopyga mauritiana)

121. The AFMA member stated that the biomass of sandfish is listed as overfished and surf redfish as uncertain and both remain closed to fishing in the Torres Strait. The RAG and HCWG have previously recommended a research project to undertake a survey of sea cucumber stocks on Warrior Reef area with a focus on sandfish and other commercially important sea cucumber species.

122. **Taking into account the re-opening decision rules under the BDM Fishery Harvest Strategy, the RAG recommended that fishing for sandfish and surf redfish remain closed for the 2024 fishing season.**

Other species

123. Members noted that amberfish have recently been listed under CITES, however there have been no catches of amberfish since 2001. Members noted that both amberfish (*Thelenota anax*) and pinkfish (*Holothuria edulis*) are included in the survey and there are no current concerns.

124. The RAG discussed at various points current MLS for species in the BDM Fishery compared to other jurisdictions and the latest research. **The RAG recommended a review of MLS in the BDM Fishery be undertaken and provided for consideration at the next HCRAG meeting in 2024.**

13 Research priorities for 2025/26

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

14 Updates on other hand collectable fisheries

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

15 Other business

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

16 HCRAG priorities and next meeting

128. Members noted that there would be a teleconference in early December 2023 to discuss WTO conditions and also to discuss the outcomes of the call for research proposals. Members noted that proposed dates will be sent to members via email.

129. The Chair thanked members and observers for attending and closed the meeting at 12:15pm on Wednesday 18 October 2023.

List of attachments

Attachment A – Agenda

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

Attachment C – Presentation regarding stock assessment modelling for black teatfish

Attachment D – Presentation regarding stock assessment modelling for white teatfish

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

Summary of actions arising from HCRAG 3

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

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

Summary of HCRAG 3 recommendations

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

Attachment A

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

17-18 October 2023

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

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

Draft Agenda

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

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

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

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

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

Attachment B

HCRAG/WG

Black teatfish Fishery Opening - 2023

Black teatfish (*Holothuria whitmaei*) (source: CSIRO)

Nicole Murphy | October 2023
Éva Pláganyi and Timothy Skewes

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

Fishery data

Torres Strait Black teatfish Fishery

Data from:

- Trial openings 2021 and 2022
- Opening 2023
  - Catch data
  - Size frequency

Traditional Owner & Fisher, Mr Warren Ghee – Mer Island
(Photo courtesy of Mr Mike Passi)

Size frequency sampling program

Undertaken during 2022 and 2023 Black teatfish openings

Collect population size frequency data and morphometrics

- Four AFMA *Observers* stationed at Mer and Erub Island
- Minimum of 1000 length and width measurements (mm) distributed across logbook zones (fishing areas)
- Record product form e.g. Whole (Live), Gutted & Salted
- Collect weights (kg)

Outcomes:

- Update estimates for population modelling
- Support analyses of recruitment rates and help identify indicators of effects of fishing

Photo courtesy of AFMA

Size frequency sampling program

Results

- 2022: total of 1886 length, width and weight
- 2023: total of 1382 measurements
- Opportunistic measuring for other species

Common name	Scientific name	2022	2023
Black teatfish	*Holothuria whitmaei*	1886	1382
White teatfish	*Holothuria fuscogilva*	29	10
Curryfish common	*Stichopus herrmanni*	44	13
Curryfish vastus	*Stichopus vastus*	33	-
Prickly redfish	*Thelenota ananas*	24	21
Burrowing blackfish	*Actinopyga spinea*	2	-

- Measured product: Whole (Live), Gutted and Salted (2022 & 2023), Gutted (2022)

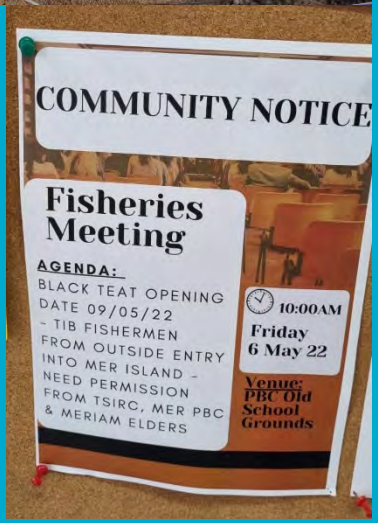


Photo courtesy of AFMA

Size frequency sampling program

Results – Whole (Live)

- 2023 versus 2022
- Decreases for the average length
- Decreases for the maximum length
- The median length (middle value) was less
- There was an increase in average weight measured

Zone: All	2022 (n=551)	2023 (n=876)
Average length (mm)	284.87	266.56
Median length (mm)	280	270
Minimum length (mm)	160	140
Maximum length (mm)	448	415
Average width (mm)	117.62	136.11
Average weight (g)	1317.24	1664.55

Photo courtesy of AFMA

Size frequency sampling program

Results – Gutted and Salted

- 2023 versus 2022
- Slight decrease for average length
- Slight decrease for median length
- Decrease in the average weight

Zone: All	2022 (n=1148)	2023 (n=506)
Average length (mm)	235.18	231.71
Median length (mm)	232	230
Minimum length (mm)	156	100
Maximum length (mm)	450	360
Average width (mm)	139.76	134.19
Average weight (g)	1282.79	1083.44

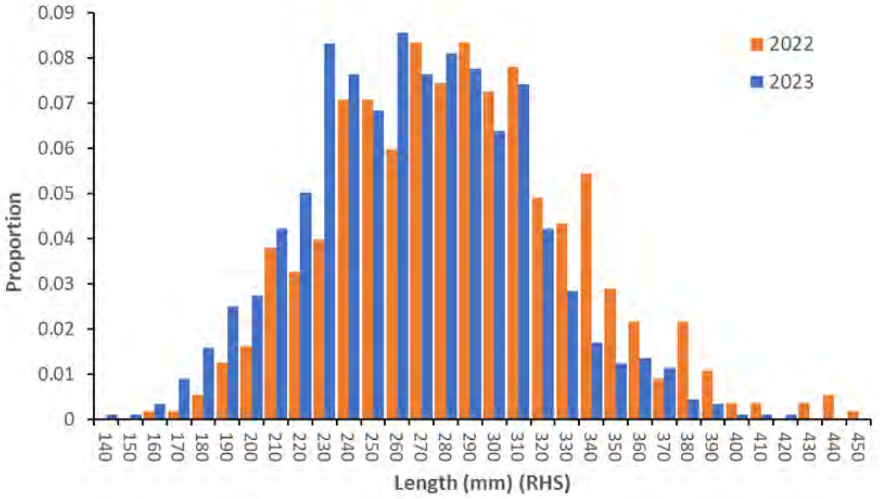
Photo courtesy of AFMA

Relative Size frequency

- Relative frequency used to show the proportion of animals in different size classes
- Takes into account different number of measurements between 2022 and 2023

Whole (Live) – 2023 versus 2022

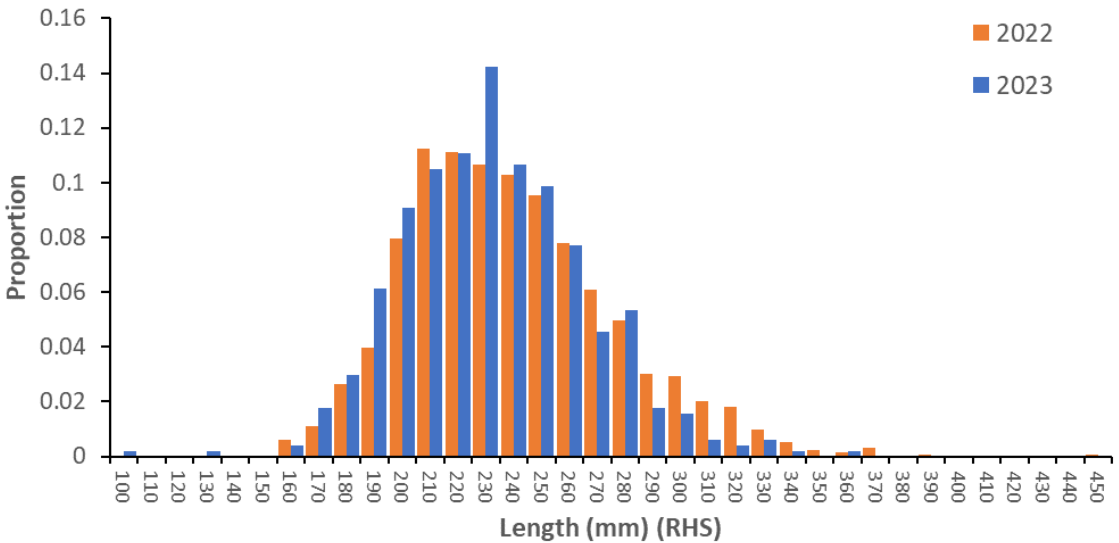
- 2023 - Fewer very large animals measured for the population
- Largest in 2023 was 420mm, compared to 450mm in 2022



Relative Size frequency

Gutted and Salted - 2023 versus 2022

- 2023 - fewer larger animals measured for the population
- Largest at 450mm in 2022, compared to 360mm in 2023
- 2023 - smaller animals measured for the population



Size frequency sampling program

Minimum Legal Size (MLS)

Black teatfish: 250mm

- Observer measurements: Percentage of animals below MLS in the catch (Whole (Live))
  - 23.6% in 2022
  - 34.7% in 2023
- Definition under the instrument:

Measurement in water/undisturbed state

- Survey – sea cucumber collected, taken to boat and measured
- Observer – sea cucumber collected, transported, then measured
- Need to determine the correction for 'shrinkage' for sea cucumbers

Photo courtesy of AFMA

Size frequency sampling program

Minimum Legal Size (MLS)

Black teatfish: 250mm

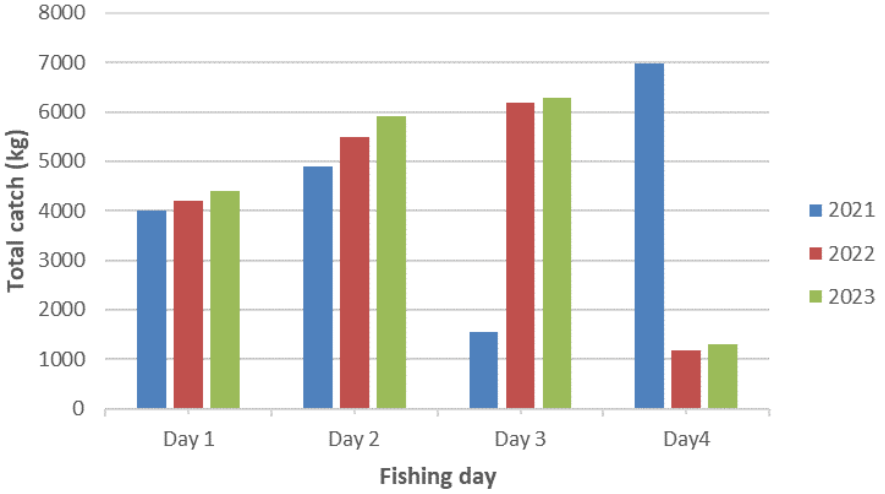
- Shrinkage - only way to determine is measuring same animal in water, on boat, then when landed (and compare data)
- We used an estimate – applied 10% to size measurements
    - 11.4% in 2022
    - 18.4% in 2023
- **Important reminder to be aware of size limits**
- Especially important as Black teatfish were previously overfished
- Not fishing animals until they are big enough to breed at least once - what the MLS is based upon
- One of the ways to keep fishing sustainable

Photo courtesy of AFMA

Catch data

Catch across days

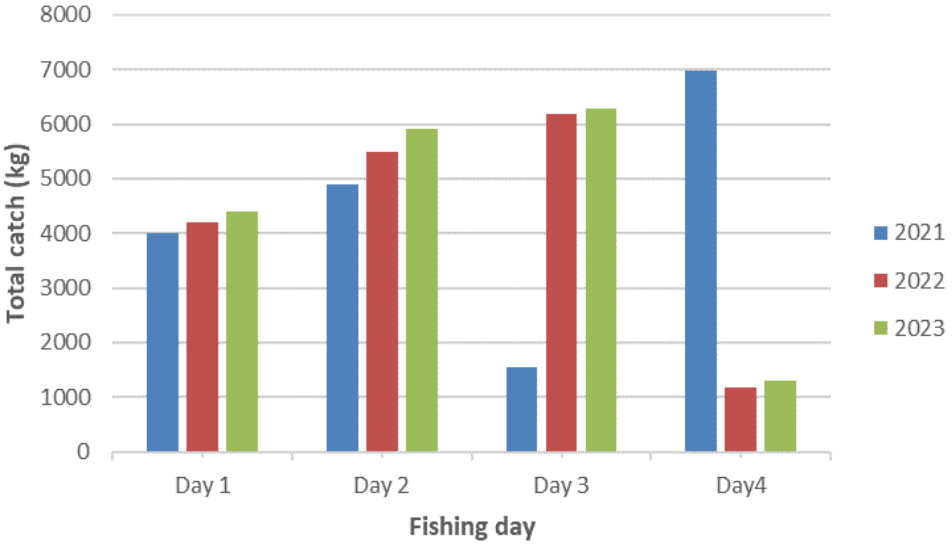
- 2021 - largest catch was taken on day 4 and the least was taken on day 3
- 2021 - catch was low on day 3 as this was the Sabbath
- 2022 and 2023 - largest catch was taken on day 3 and the least was taken on day 4
- 2022 and 2023 - catch was low on day 4, as the fishery was opened for only half a day and some fishers did not go out fishing



Catch data

Catch across days

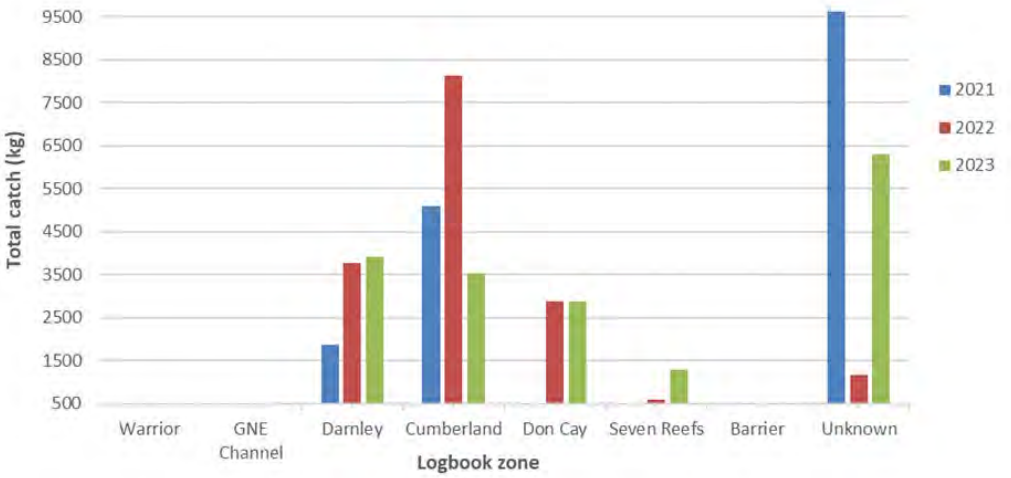
- All years - there was no evidence of stockpiling
- All years - there was no sign of declining catch after a few days
- All years - the number of fishers participating in the fishery was only a portion of the available fishing effort (out of all TIB licence holders for Torres Strait)



Catch data

Catch for area fished

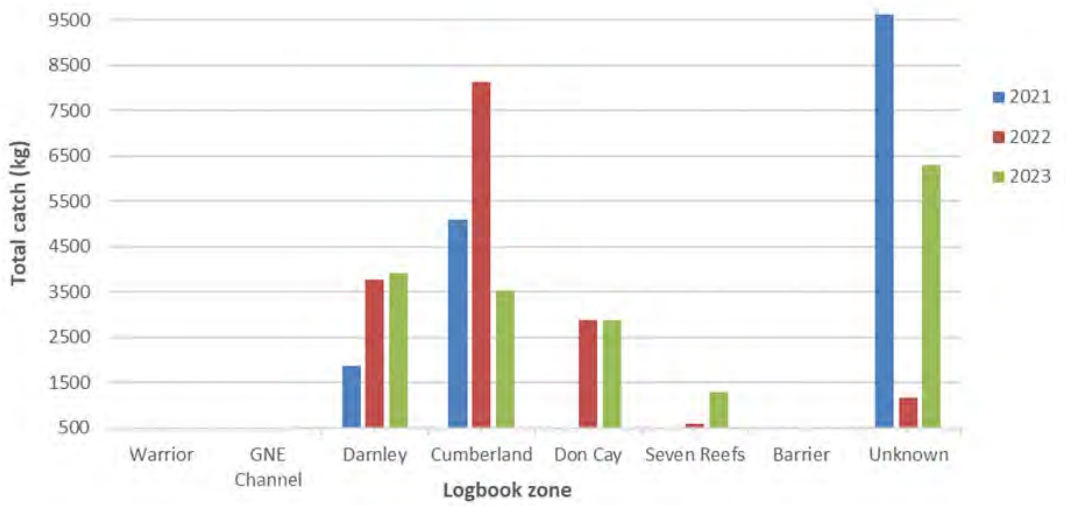
- 2021 - largest catch was taken from ‘Unknown’ area recorded in the catch data
- After 2021 opening - fishery meetings stressed the importance of recording the catch area (logbook zone) location for the area fished
- In 2022 - improvement in recording the location for the area fished
- 2023 - largest catch was again taken from ‘Unknown’ area recorded in the catch data



Catch data

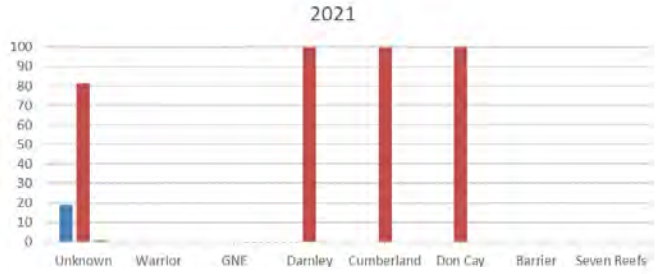
Catch for area fished

- All years – Darnley, Cumberland (and Don Cay) received more effort and likely contribute to 'Unknown' records
- Recording the area (logbook zone) fished is important data to record
- Lets fishers, managers and scientists better assess stock status



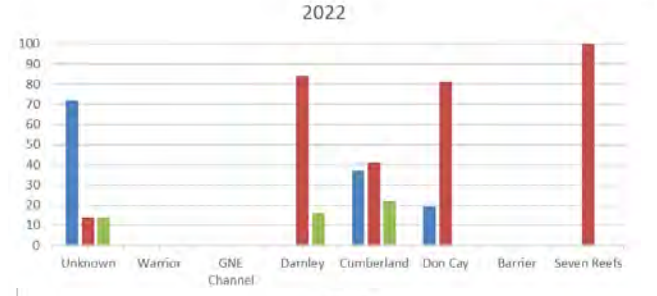
Product state

Photo courtesy of AFMA



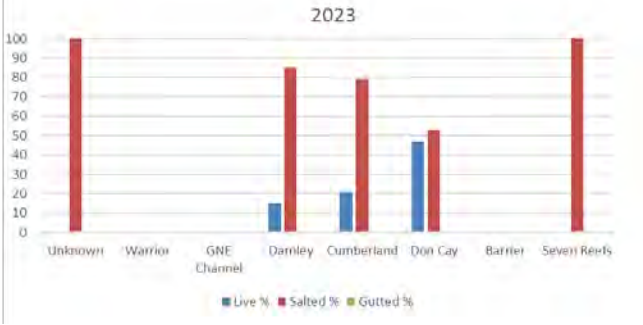
2021

- Majority of product landed – Gutted & Salted



2022

- More product types landed – Whole (Live), Gutted, Gutted & Salted



2023

- Majority of product landed Gutted & Salted, some Whole (Live)

Catch data and product data

Outcomes

- **Catch:**
  - Cumulative catches tracked and adhered to management TAC
- **Size frequency:**
  - Less large individuals in 2023
  - Variation for Whole (Live) data - animals out of the water
  - Less variation for Gutted and Salted data
  - Gutted and Salted measurements supported trends seen for Whole (Live)
  - Further size measurements from future fishery openings will allow a signal to show in the data
  - Allow for more detailed comparisons e.g. trends in growth

Catch data and product data

Issue:

- ‘Unknown’ area fished:
  - Restricts seeing signals for effects of fishing for logbook zones
  - In future a zone could be ‘rested’ to fishing
- Undersize in catch:
  - Consequence to ongoing sustainability
  - Fishery has now been fished for three years
  - Need to demonstrate fishery is being fished sustainably
  - Important reminder to leave smaller size animals in the water to reach maturity

East Torres Strait BDM survey 2019/2020

Teatfish species

White teatfish

East Torres Strait BDM survey 2019/2020

Black teatfish

East Torres Strait BDM survey 2019/2020

- Check species of Teatfish
- White teatfish can be very dark coloured
- Juvenile White teatfish found shallow
- Mixed catch?

Catch data and product data

Future:

- ➢ Importance of ongoing length frequency, time series data:
  - Surveys are expensive
- ➢ Length frequency data will inform on:
  - Size structure for Black teatfish population
  - Update modelling
  - Indicate effects of fishing
  - Management for sustainable fishing
- ➢ Importance of anecdotal information from fishers and Observers
- ➢ Loggers on boats or fishers – Catch per Unit Effort

Black teatfish - Breeding season

Study - Shiell & Uticke (2006)

- Northern GBR – Black teatfish observed to spawn in summer
- These were males – highly likely females also spawning
- **Winter – main spawning period**
- Science looked at gonad staging for Black teatfish

Results

- Immature - April
- Maturing – May
- Fully mature/Partial spawning - June
- Spawning – July
- Worse condition after spawning - August

Thank you and appreciation to:

Torres Strait Bêche-de-mer fishers for providing their fishery data

AFMA Observers - Tamre Sarhan, Ben Lidell, David Schubert, Henry Oak and Stephen Hall

Funding: AFMA, CSIRO

CSIRO OCEANS & ATMOSPHERE

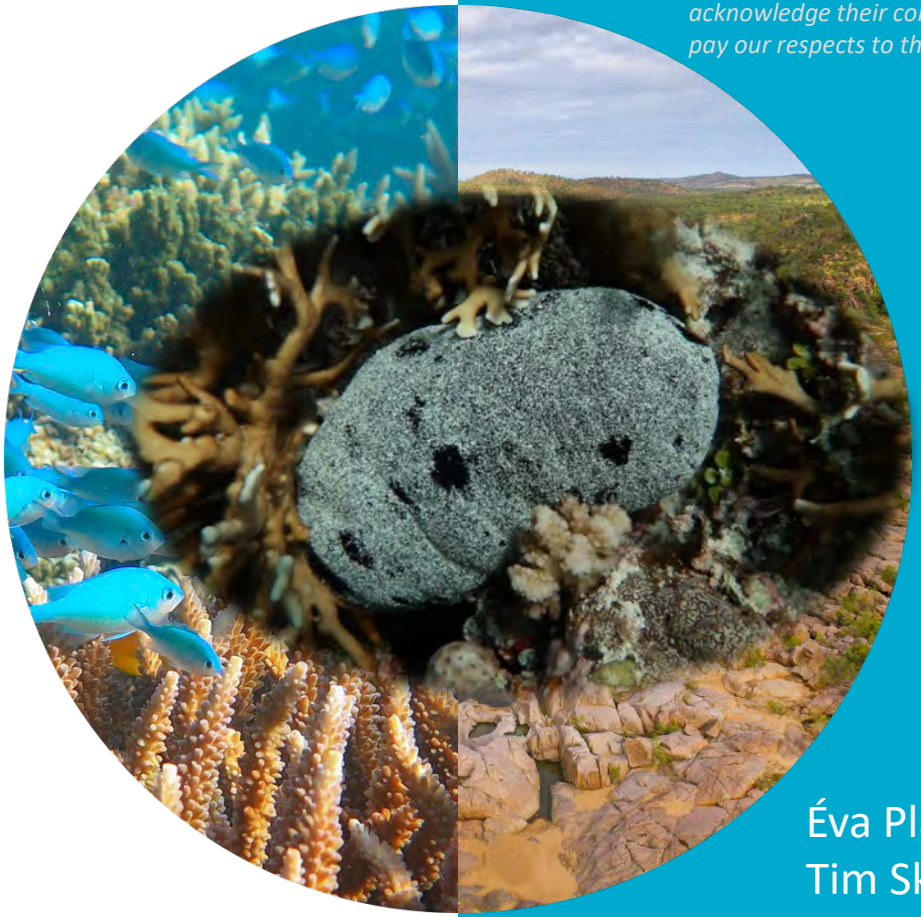
Nicole Murphy (P.I.)
Brisbane, Australia

t +61 7 3833 5948
e nicole.murphy@csiro.au
w www.csiro.au

Photo courtesy of AFMA

Attachment C

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.



Torres Strait Black teatfish stock assessment modelling

Éva Plagányi, Nicole Murphy, Tim Skewes

|October 2023

HCRAG

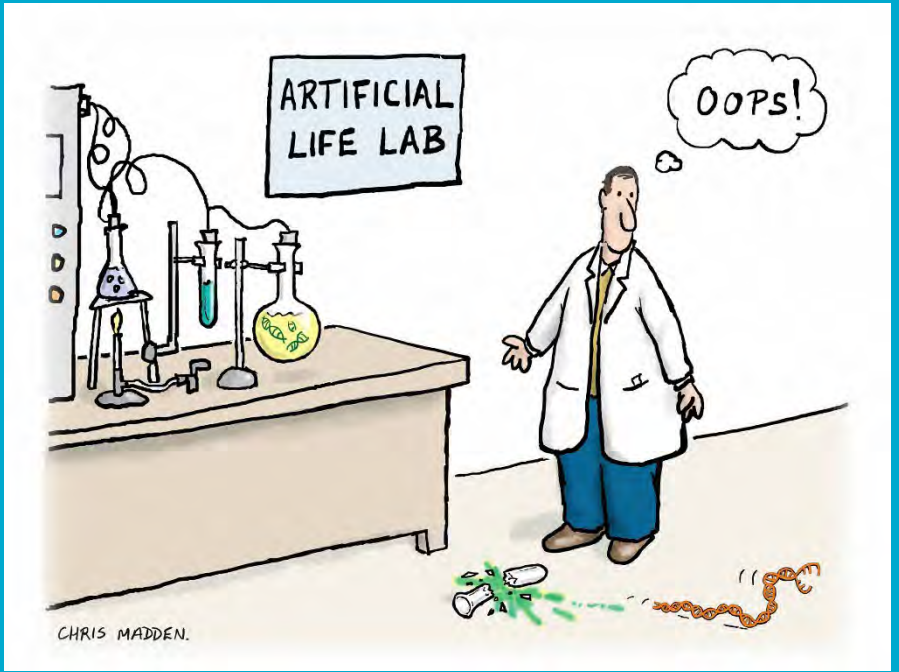
Australia's National Science Agency

Black Teatfish Modelling

1. Simpler “lumped” biomass dynamics model (Schaefer model)
2. Age-structured model – allows fitting to length measurement data after converting to age

Models create “artificial” populations based on the data and information we have about the actual population:

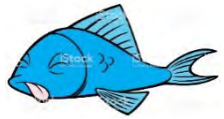
- we can then do management experiments with the artificial population



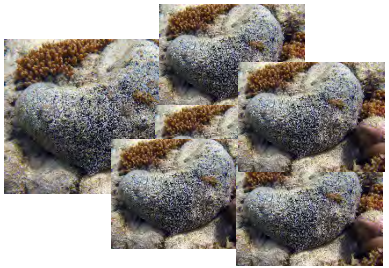
Modelling Basics

How many animals this year and hence how many can be caught sustainably?

Subtract those that die due to natural causes (natural mortality M) and fishing (fished proportion F)



How many are left to breed : calculate recruitment and add to population numbers, allowing time to grow



Update model population estimates

Check how model estimates compare with actual observations – adjust population parameters (e.g. M) to improve explanation of data

Conversion Ratios

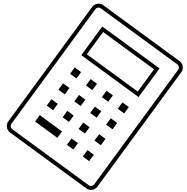
SPC Beche-de-mer Information Bulletin #41 – March 2021 5

Updated conversion ratios for beche-de-mer species in Torres Strait, Australia

Nicole E. Murphy,[1,*] Timothy D. Skewes[1] and Éva E. Plagányi[1]

Abstract

As part of the newly endorsed Torres Strait Beche-de-mer Harvest Strategy, conversion ratios for commercial beche-de-mer species were reviewed. Accurate conversion ratios are required to determine total catches in a standard unit (e.g. wet gutted or landed weight) from data that records catch weight in several different processing stages. These values are useful for stock assessment, management and monitoring of the beche-de-mer fishery in Torres Strait, and elsewhere in Australia.



Black teatfish: Live to gutted 0.677

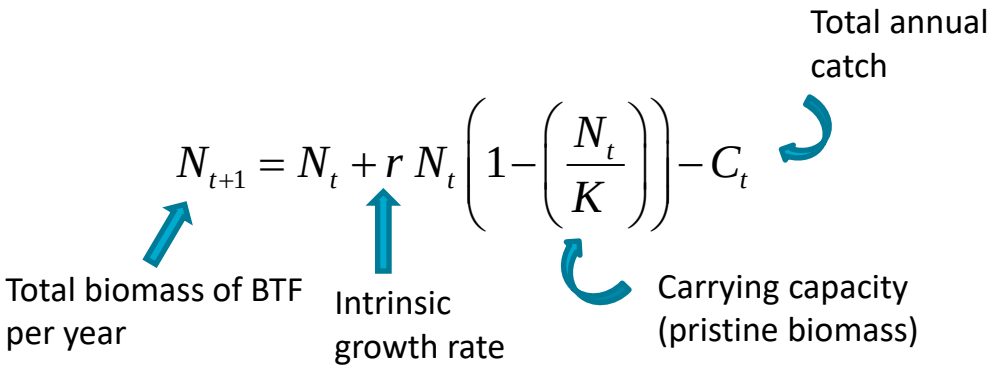
Total Allowable Catch (TAC) is in wet gutted / landed weight

Hence e.g. TAC = 20 t converts to LIVE biomass 20/0.677 = 29.5 t

TAC = 30 t converts to LIVE biomass 30/0.677 = 44.3 t

Model works in units of LIVE biomass and converts to landed weight

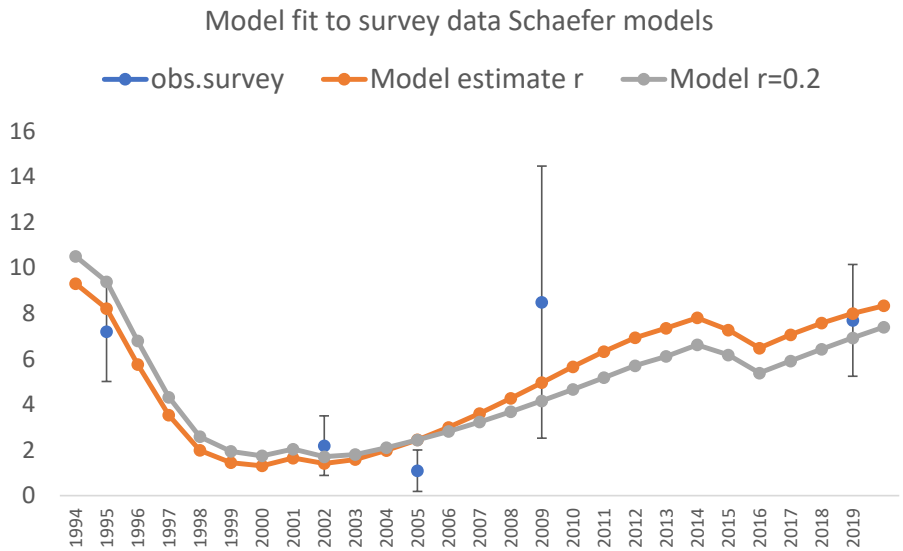
Surplus Production Model: Schaefer form



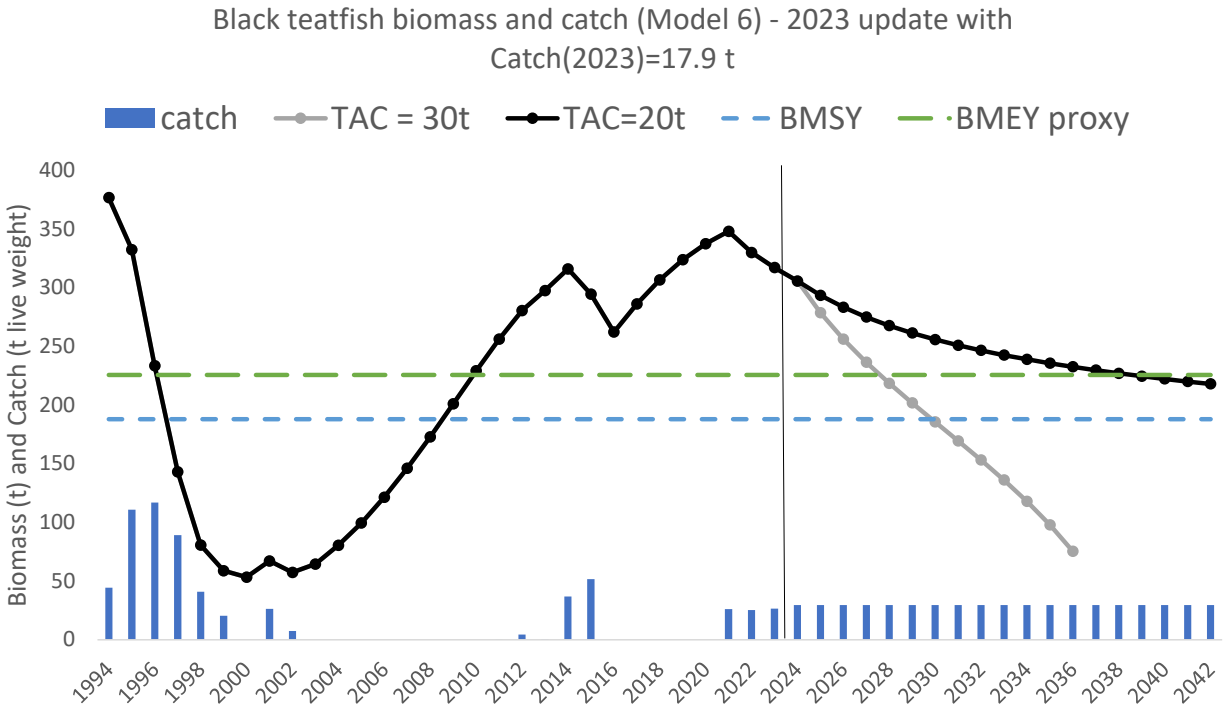
- Lumped biomass model
- Assumes growth is density-dependent
- The combination of *r* and *K* is more robust than these parameters on their own and informs on sustainable/replacement yield
- Implemented in ADMB

Schaefer base model fit to survey data

	Model 6 (estimate r,K)	Model 4 (fix r; estimate K)
K	396 [stdev 36]	417 [stdev 150]
r	0.248 [stdev 0.084]	*0.2*
q	0.02496 [stdev 0.0057]	0.0252 [stdev 0.0068]
TAC (landed wt)	16.4	14.1
-lnL	-4.665	-4.442
AIC	-5.33	-6.885



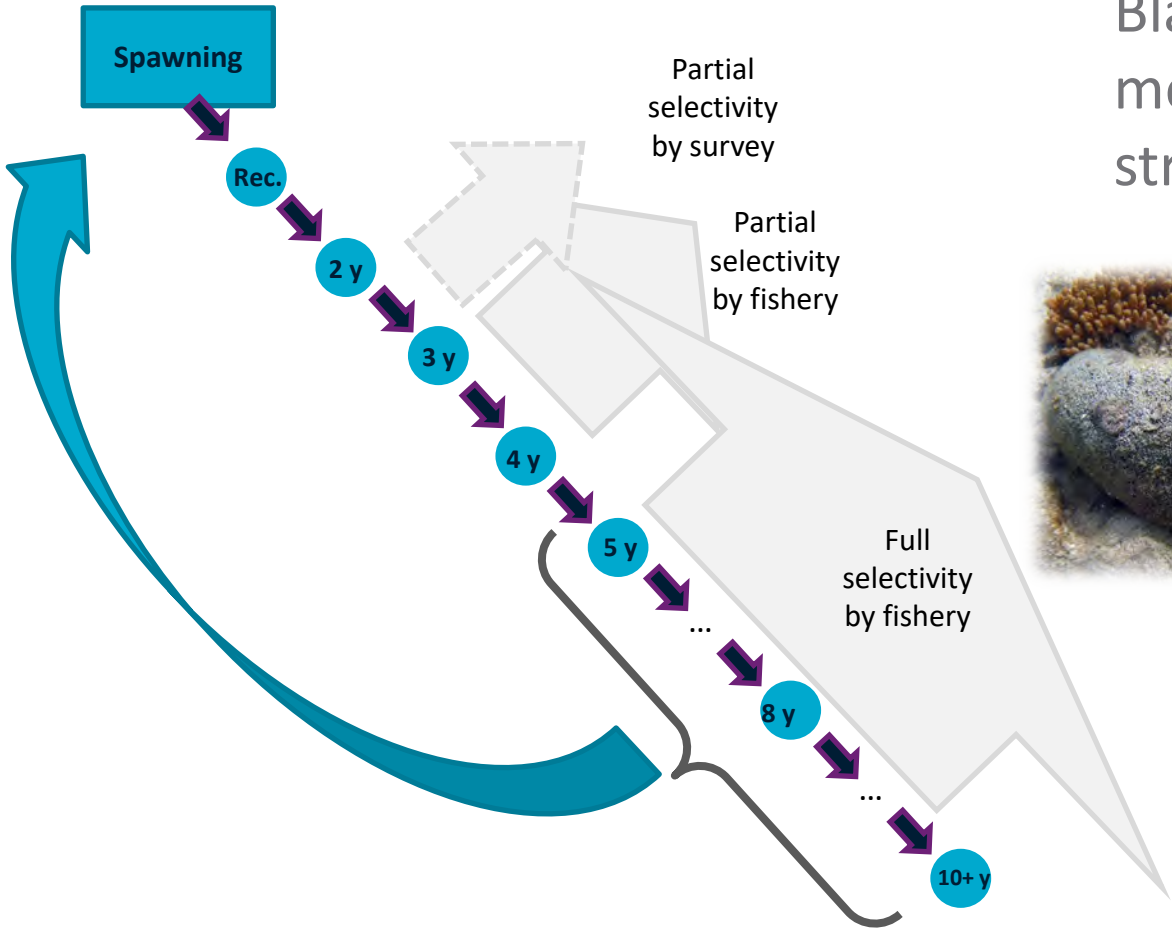
Alternative: fix K: MSY = 22.8t but AIC = 0.82


Black teatfish biomass and catch (Model 6) - 2023 update with Catch(2023)=17.9 t
catch
TAC = 30t
TAC=20t
BMSY
BMEY proxy
Biomass (t) and Catch (t live weight)
400
350
300
250
200
150
100
50
0
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
2042

Age-Structured Production Model

- Age Structured model is similar to that used in previous Management Strategy Evaluation (MSE) models (Plaganyi et al. 2013, 2015)
- Integrated assessment with everything included in the same DYNAMIC framework
- Widely used approach for providing TAC advice with associated uncertainties
- Can fit to all data including Survey, Age-length frequency and (eventually) standardised CPUE data
- Converting lengths to ages helps inform on the lags and time needed for animals to mature and grow above MLS (minimum Legal Size)

Black teatfish model structure



Natural mortality estimates

Table S5. Mortality rates for species used in the MSE operating model (Plagányi et al. 2015)

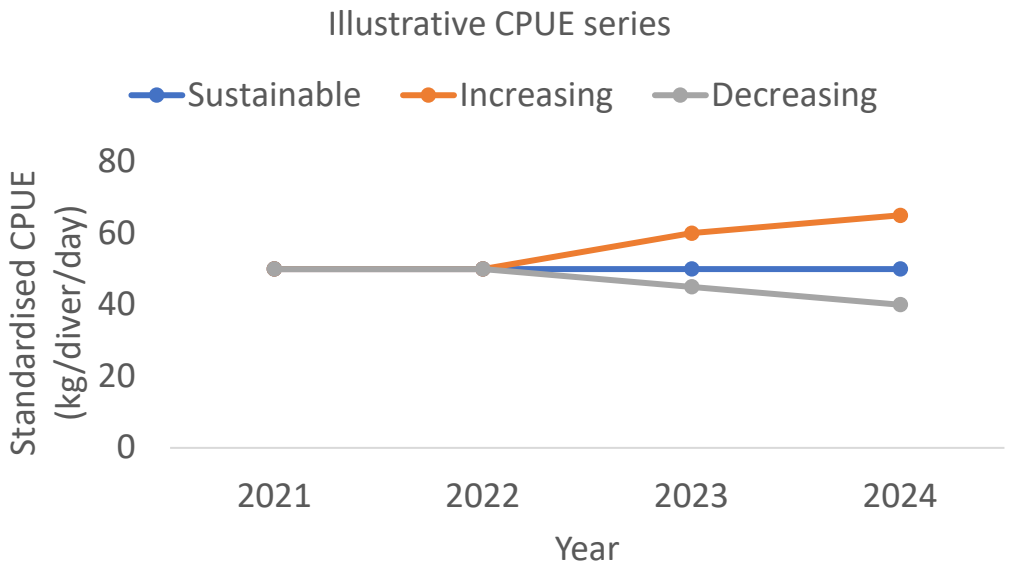
Species	Natural mortality Hoenigs	Natural mortality MSE (min)	Natural mortality MSE (max)
Black teatfish	**0.44**	**0.3**	**0.6**
Brown sandfish	0.73	0.4	0.8
White teatfish	0.44	0.3	0.6
Prickly redfish	0.44	0.3	0.6
Golden sandfish	0.73	0.4	0.8
Curryfish herrmanni	0.62	0.4	0.8
Curryfish vastus	0.73	0.4	0.8
Blackfish	0.73	0.4	0.8
Burrowing blackfish	0.73	0.4	0.8

Data used in model

- Historical catches – up to 2023
- Survey index (1995,2002,2005,2009,2019)
- Survey length frequency measurements (2002,2005,2019)
- Observer length frequency measurements (2022 & 2023)

surveys	2002	2005	2009	2019
Number length samples	26	20	18	127

Building a CPUE index of abundance

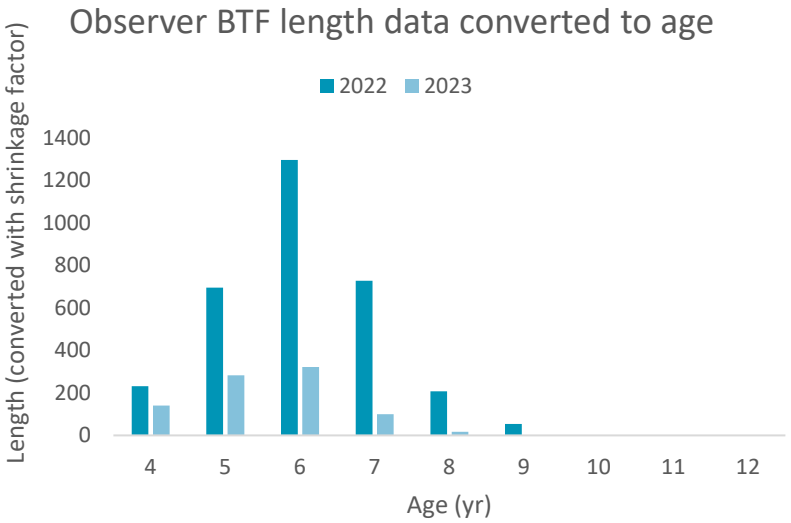


- Effort measured in days, need to adjust for part-day fishing (bottom time per diver would be ideal)
- Given more data, can use statistical approaches to standardise using diver and area etc
- Will also analyse CPUE per area

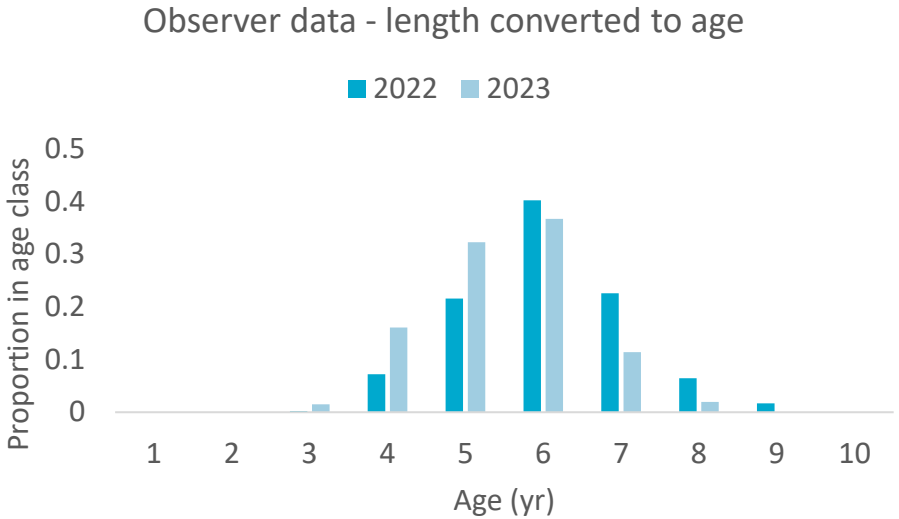
Model assumptions

- 2002 Length frequency adjusted using shrinkage conversion of 10%
- Historical catches (pre 2019) assumed 1.5 larger than available records (due to catch reporting being voluntary/discarding)
- 1995 survey estimate doubled and additional variance (2.5) applied

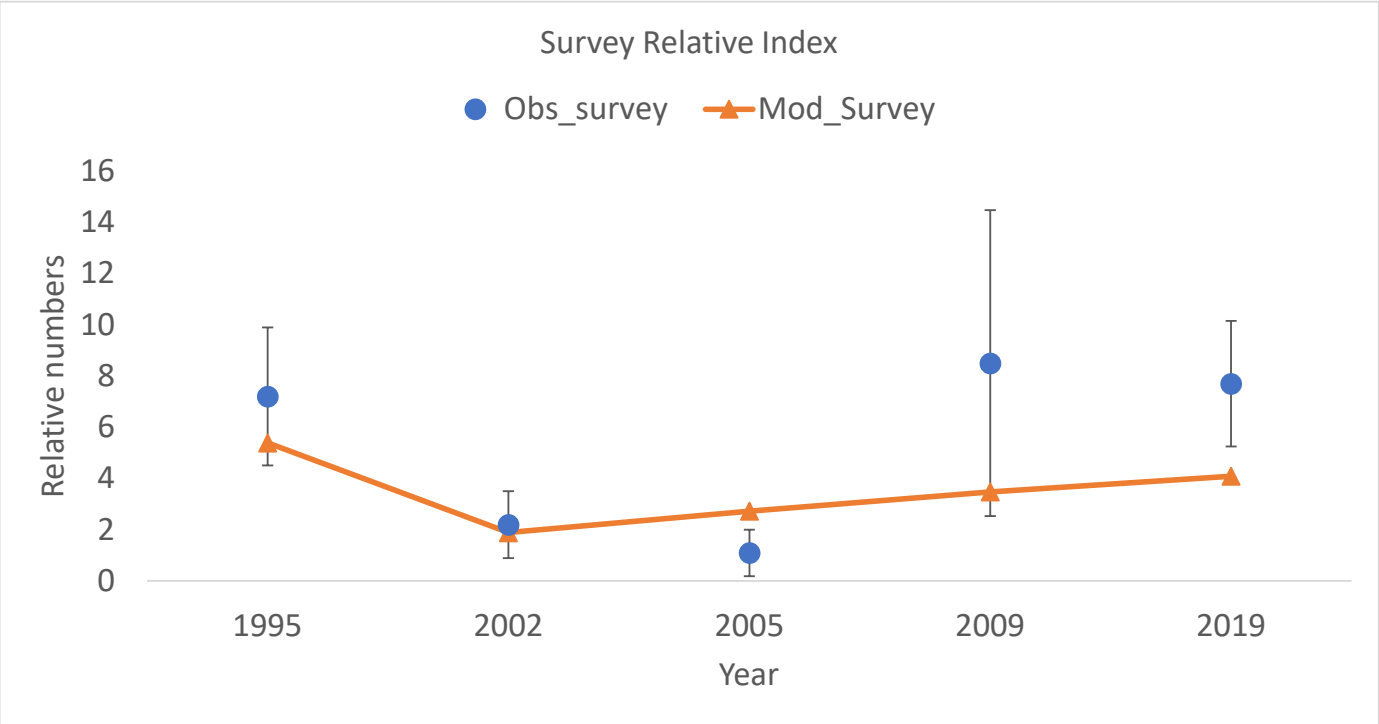
Base Model – length converted to age



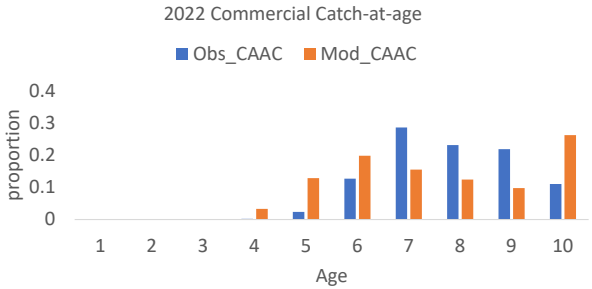
2022: n=551
2023: n=876

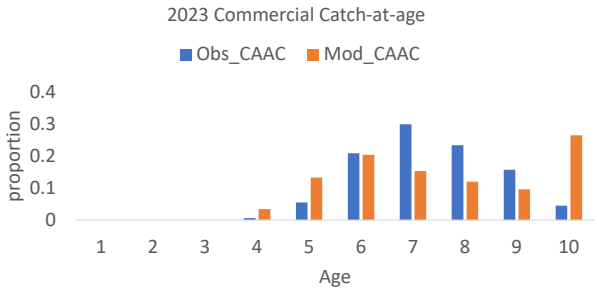


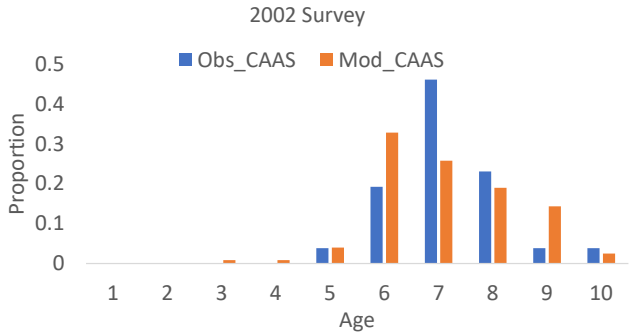
Fit to survey index of abundance

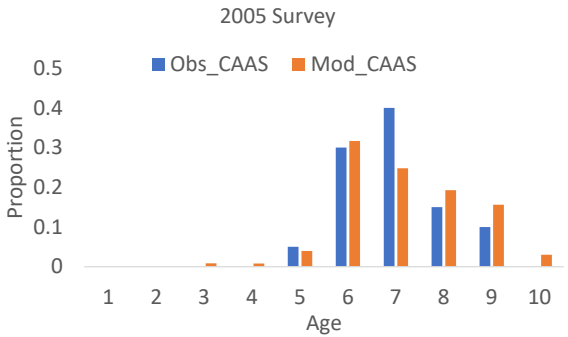


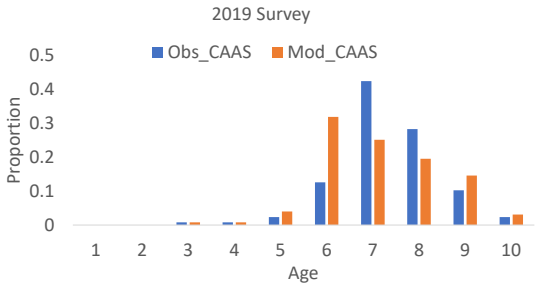
Example Model conflict in fitting to data



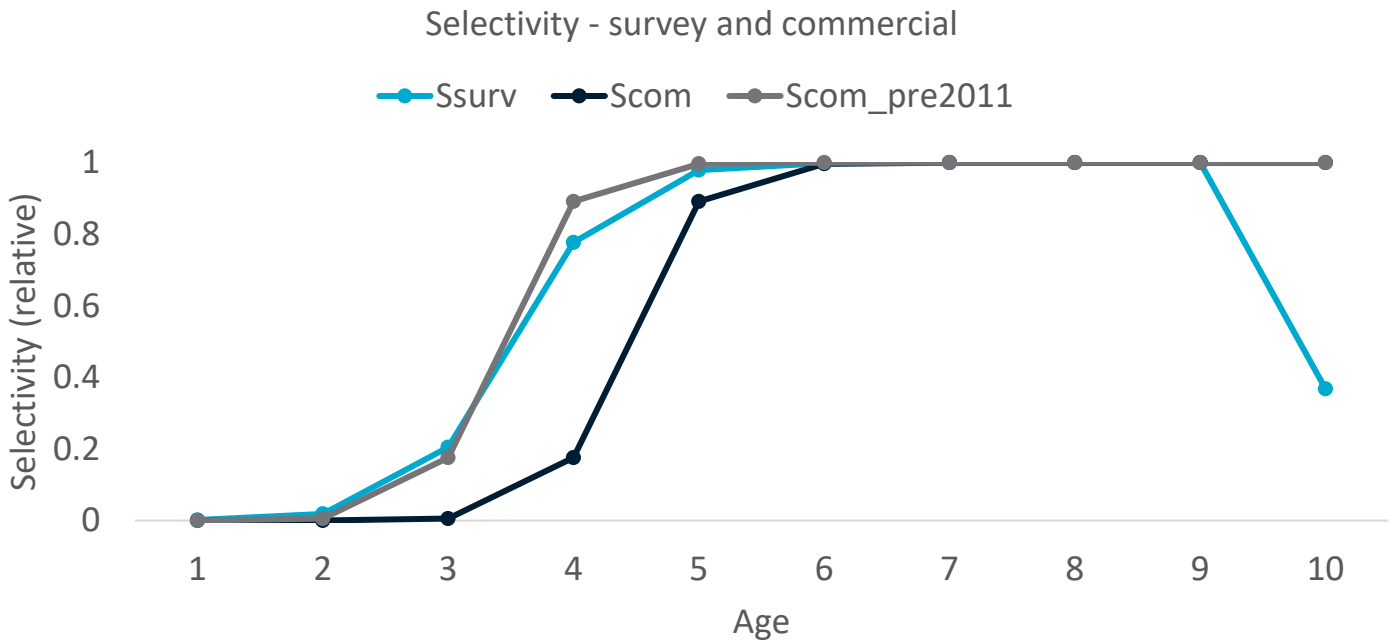




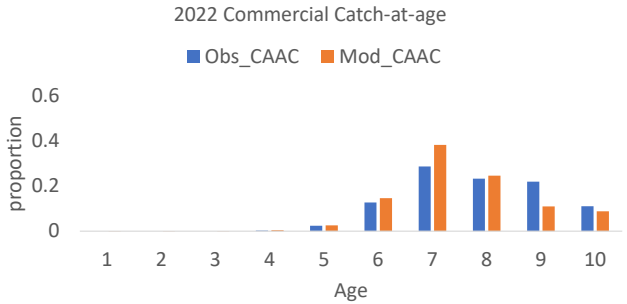


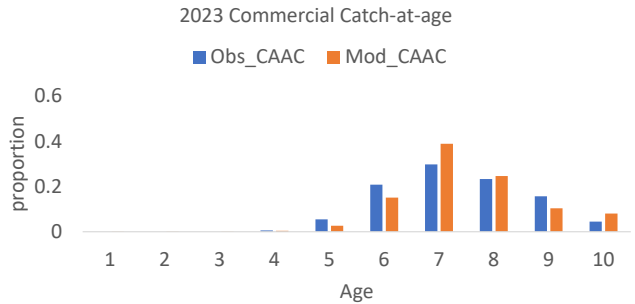


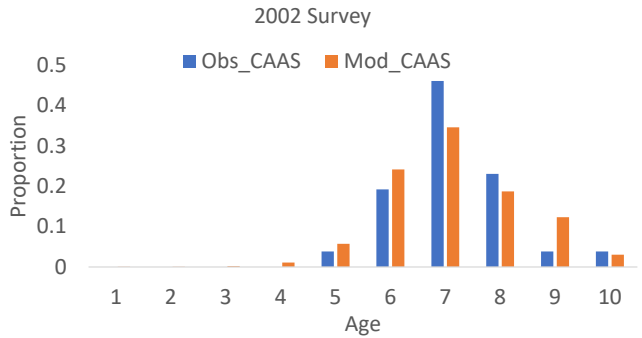
Estimate logistic selectivity curves

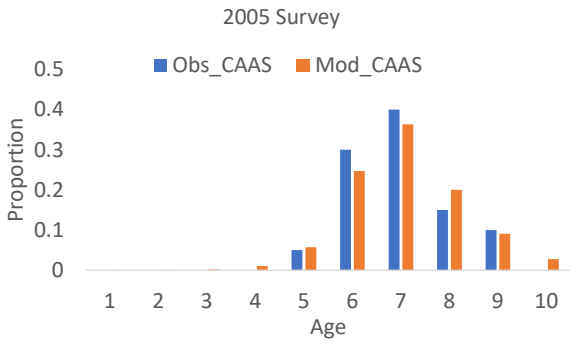


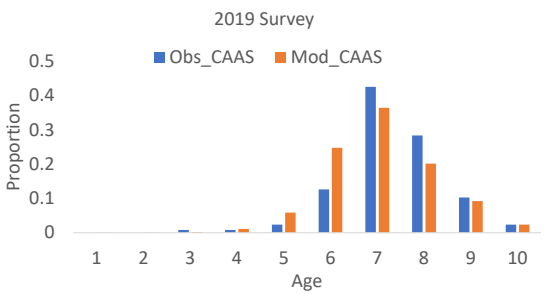
Fitting survey and commercial catch-at-age



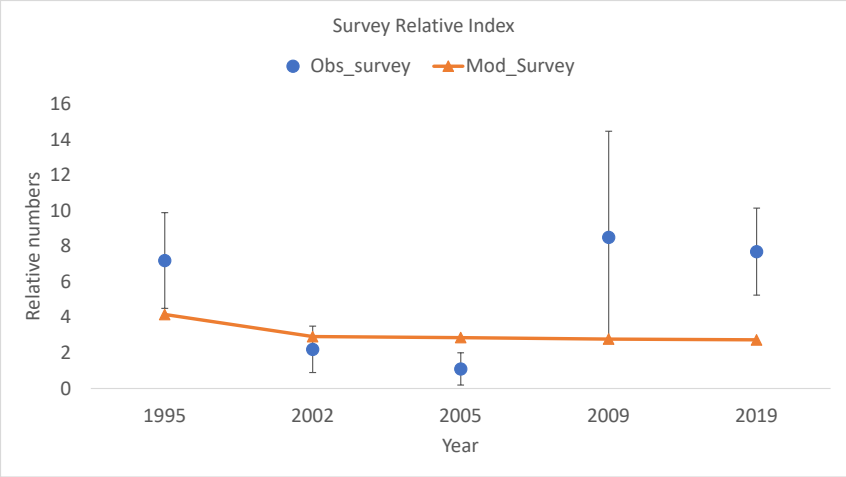


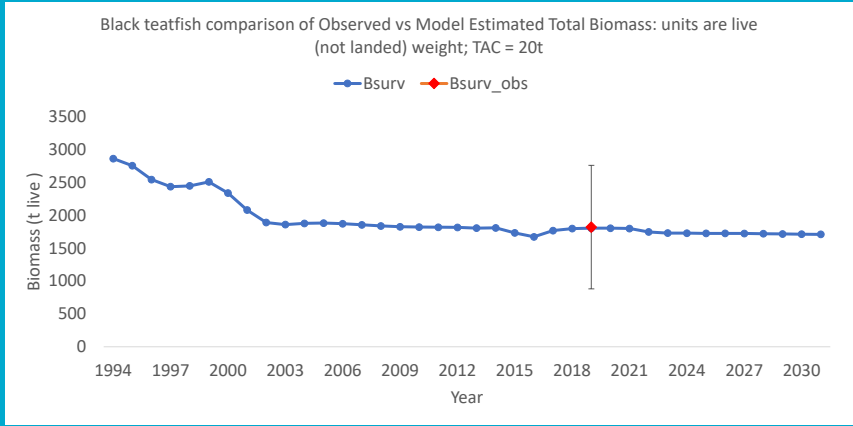






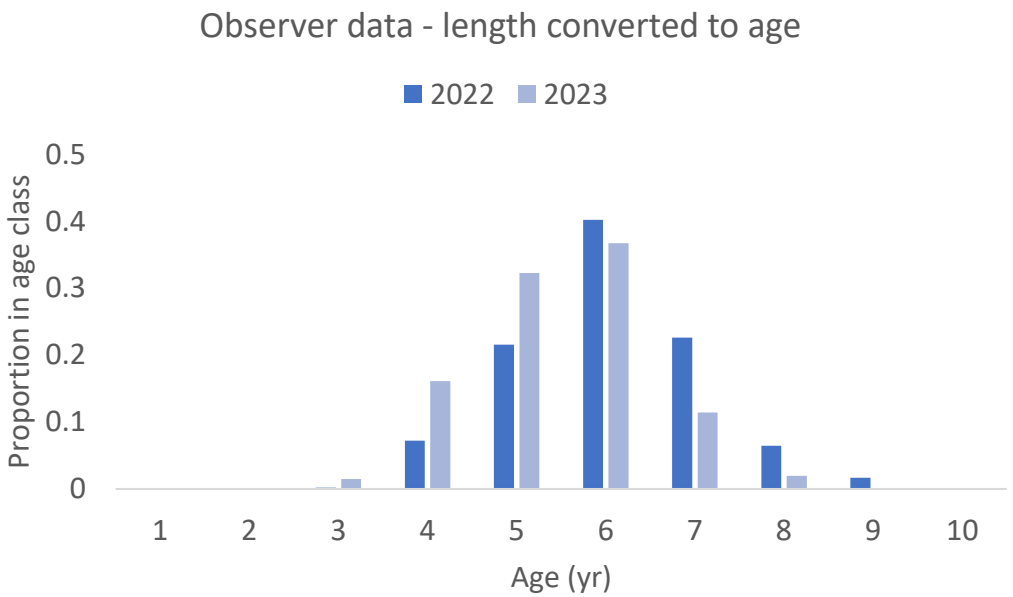
Survey fit: relative and absolute for 2019



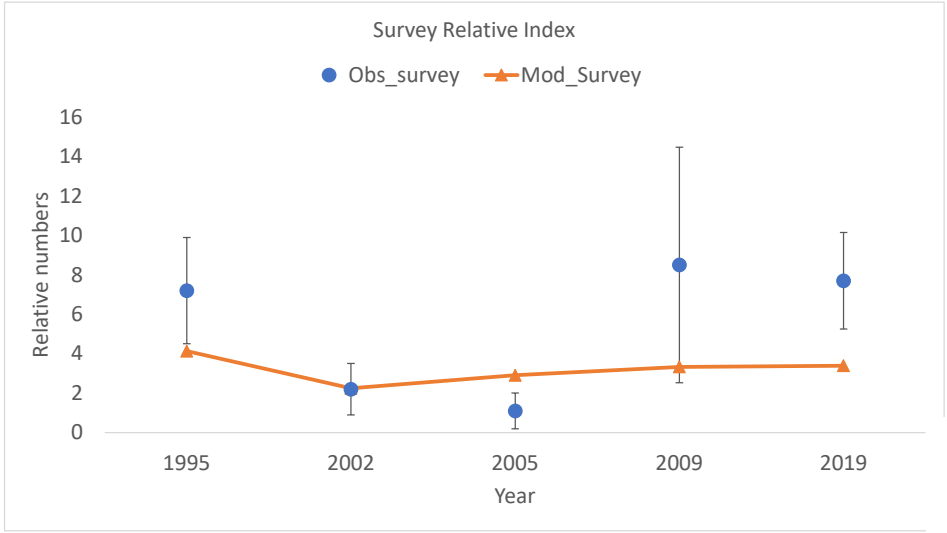


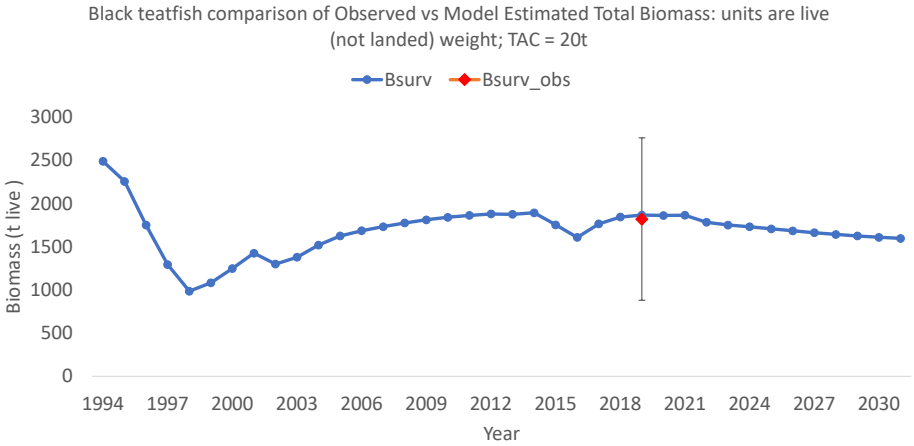
	(A) Est selectivity			(B) Fix M=0.2		
Parameter	Value	90% CI		Value	90% CI	
B(1973)^{sp}(tons)	776	177	1374	616	172	1059
M	0.80	0.80	0.80	0.20		
h	fixed 0.7			fixed 0.7		
S_age50(surv)	6.46	6.17	6.74			
del(surv)	0.40	0.33	0.47			
S_age50(com)	6.79	6.43	7.16			
sel(com)	0.38	0.33	0.43			
Catch_multiplier	1.2			1.2		
"Missing" catch (t/yr)	0			0		
Additional var (1995)	2.5			2.5		
Start depletion	1			1		
Model estimates and depletion statistics						
Bsurv(live) (2019) (tons)	1805			1251		
Bcomm(2023)(tons)	195			377		
Bsp(2023) (tons)	466			457		
Bsp(2022)/Bsp0	0.60			0.74		
F(2022)	0.14			0.07		
RY(2023) model (t landed)	20			18		
Likelihood contributions		Sigma	q		Sigma	q
-lnL:Survey Index	2.42	from data	9.162E-06	2.12	from data	1.461E-05
-lnL:Survey Absolute abund	-0.71			-0.42		
-lnL:CAA(2022-23)	13.18	0.43		27.49	1.20	
'-lnL:CAAsurv	17.11	1.34		18.77	1.34	
No. parameters estimated	6			2		
'-lnL:overall	31.99			47.96		
AIC	75.98			99.92		

Alternative growth model

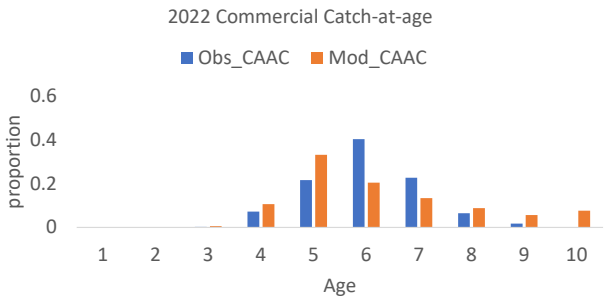


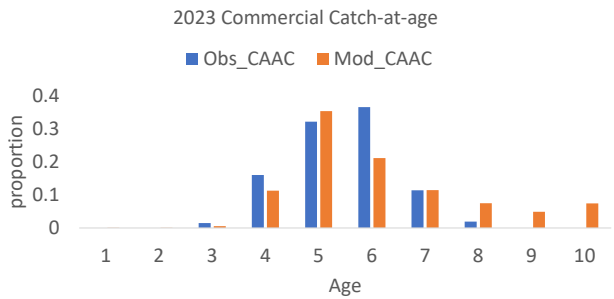
Faster growth; M=0.44; estimate selectivity

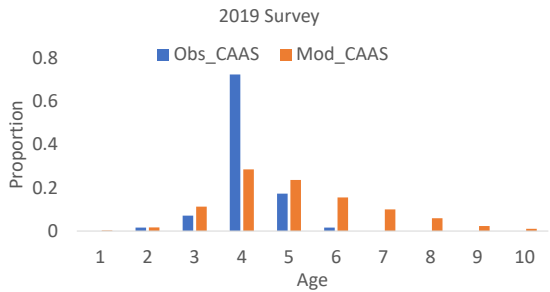


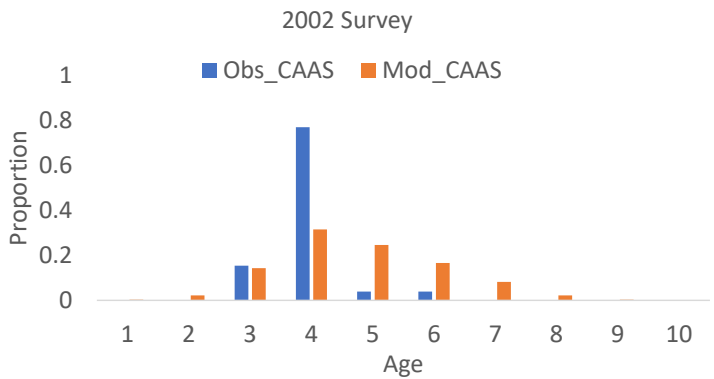


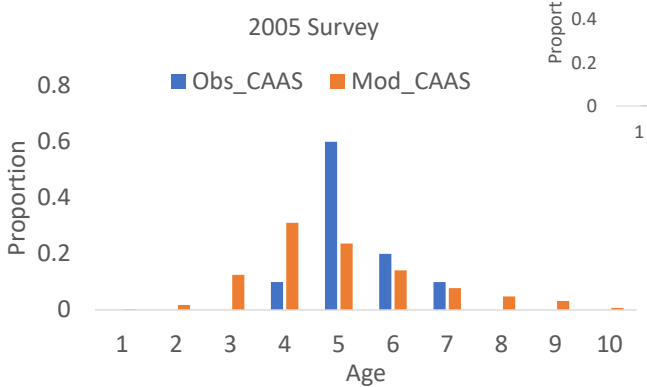
Faster growth; M=0.44; estimate selectivity



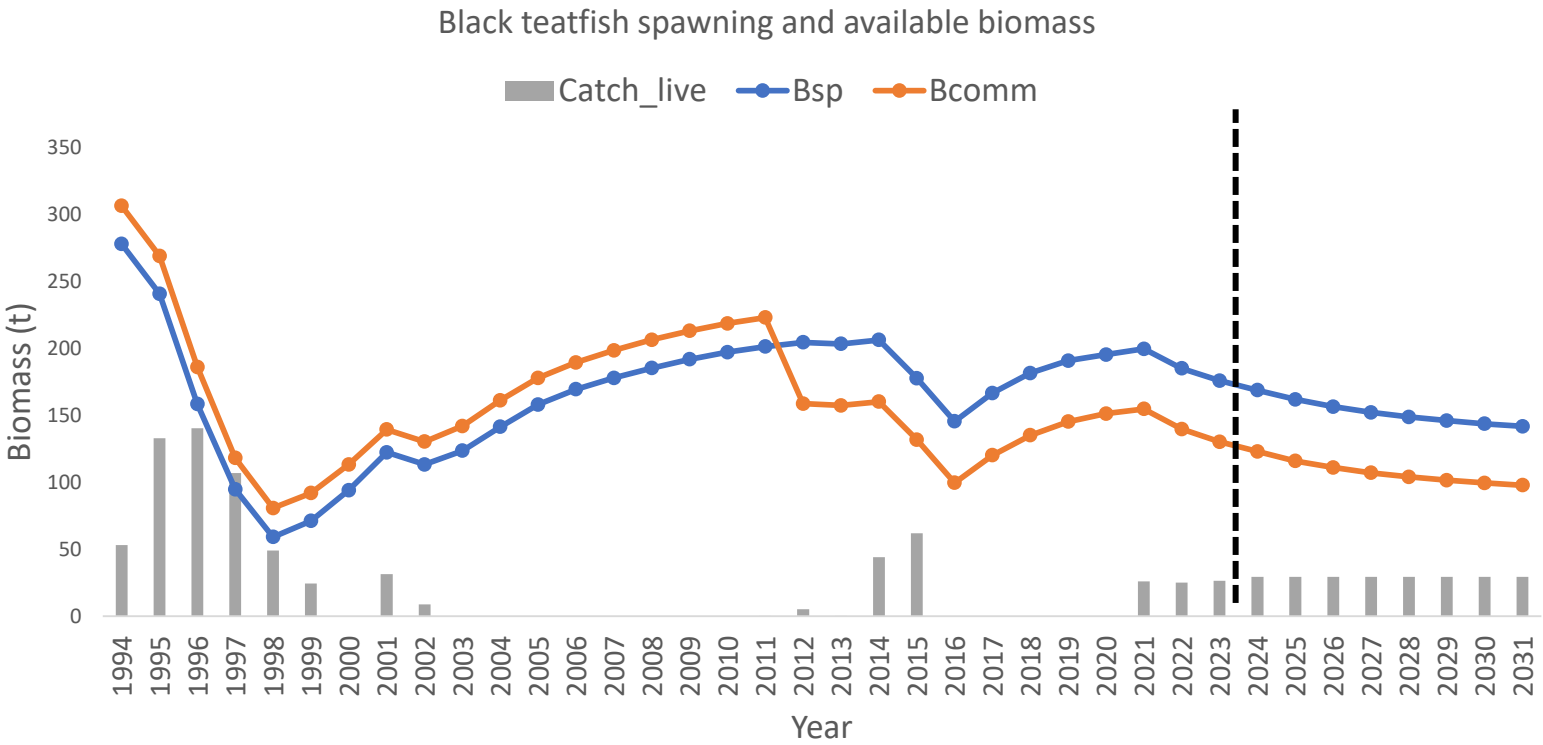


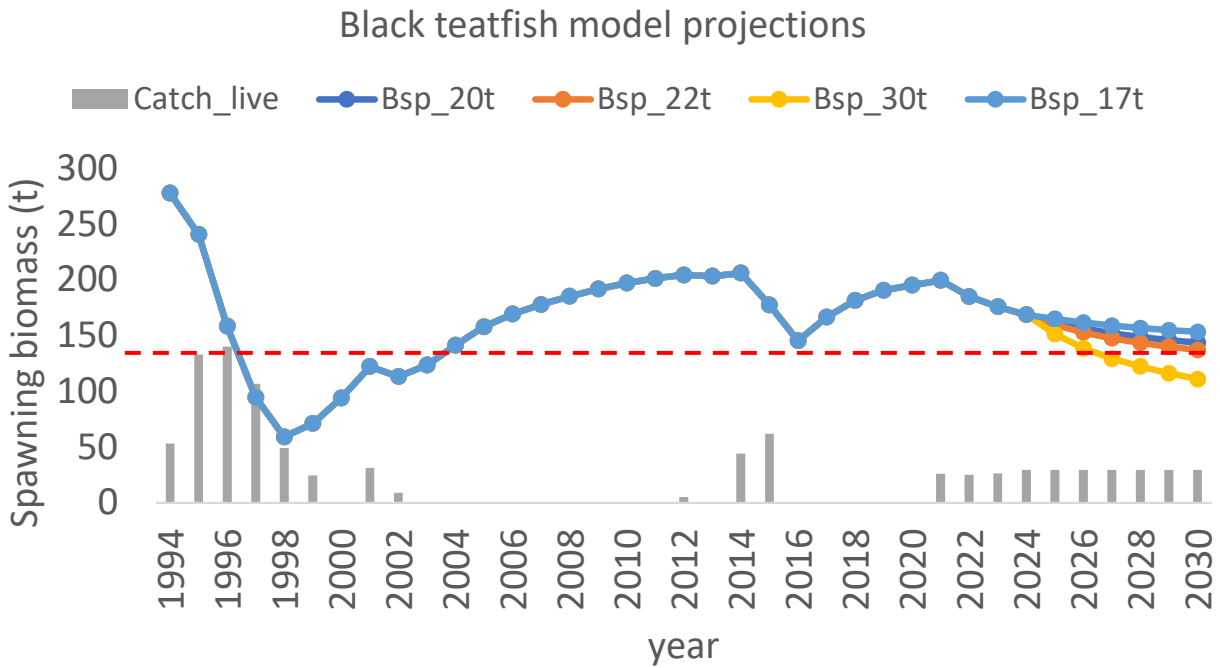






Projection with TAC = 20t





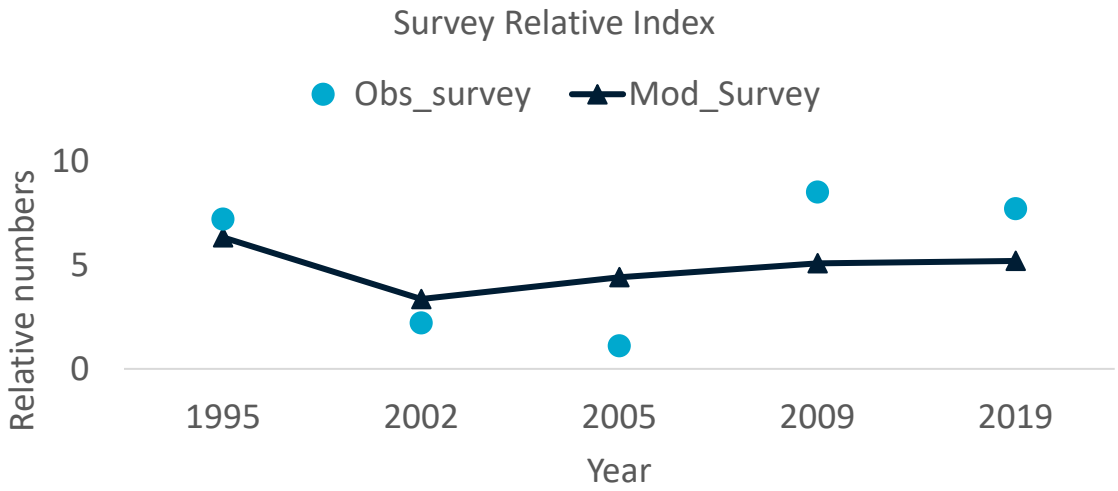
TAC = 20t:
B(2029)/B(2019) = 0.78

Other sensitivities tested

- Different steepness *h* of stock-recruit relationship
- Different scaling of 1995 survey estimate
- Different growth, selectivity, mortality assumptions
- Different assumptions re starting depletion level (1975) (0.8 vs 1.0)
- Multiplier to historical catches

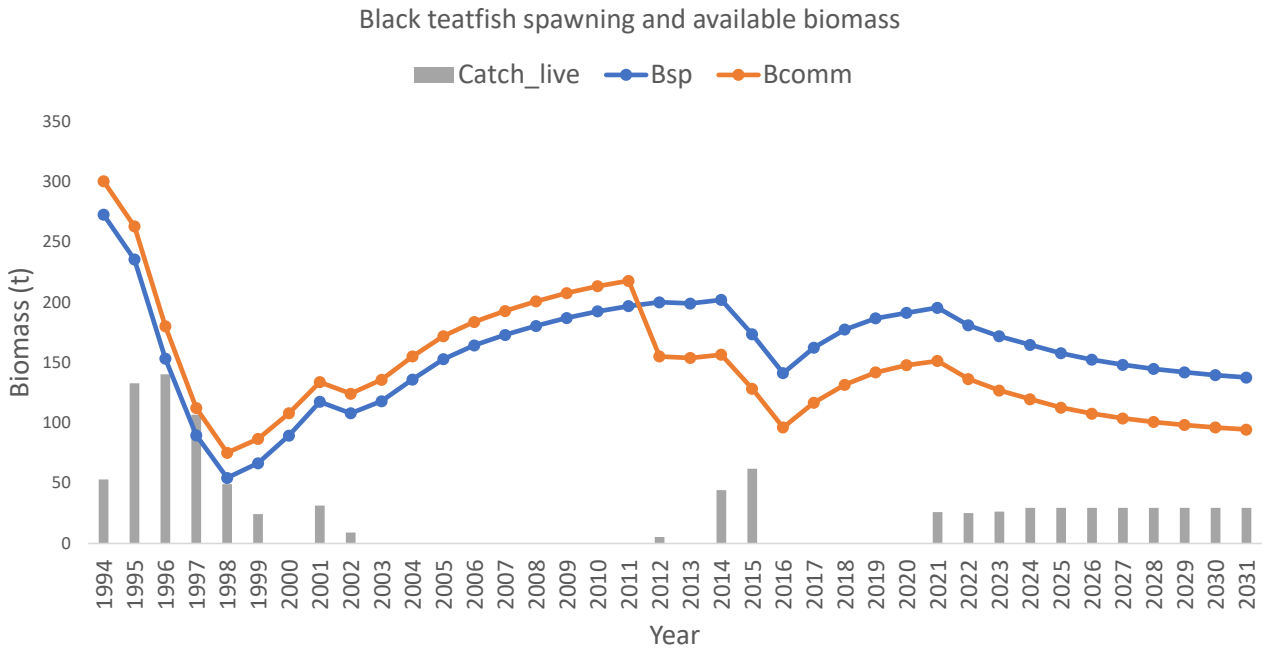
- Not done: estimate sporadic recruitment, variable growth rates, climate change impacts

Additional variance applied for 2005 and 2009 surveys



Parameter	Value	90% CI	
B(1973) ^{sp} (tons)	273	244	301
M	*0.44*		
h	fixed 0.7		
S_age50(surv)	3.50	2.24	4.76
del(surv)	0.38	0.00	0.75
S_age50(com)	4.43	3.98	4.87
sel(com)	0.27	0.18	0.37
Catch_multiplier	1.2		
"Missing" catch (t/yr)	1		
Additional var (1995)	2.5		
Start depletion	1		
Model estimates and depletion statistics			
Bsurv(live) (2019) (tons)	1850		
Bcomm(2023)(tons)	127		
Bsp(2023) (tons)	172		
Bsp(2022)/Bsp0	0.63		
F(2022)	0.21		
RY(2023) model (t landed)	20		
Likelihood contributions		**Sigma**	**q**
-lnL:Survey Index	0.57	from data	2.592E-05
-lnL:Survey Absolute abund	-0.71		
-lnL:CAA(2022-23)	19.36	0.73	
'-lnL:CAAsurv	21.21	1.34	
No. parameters estimated	5		
'-lnL:overall	40.43		
AIC	90.86		

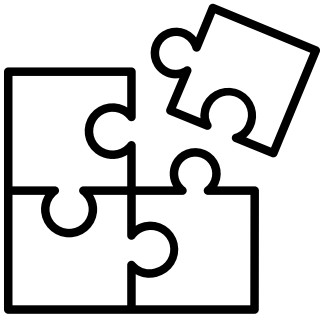
Model sensitivity: TAC = 20t; M=0.44; survey additional variance



Summary

- Across most model versions, projections suggested that a constant annual TAC of 30t may not be sustainable, whereas a TAC of 20 t was sustainable across all model versions run.
- As more data become available, it will be possible to refine and substantially improve modelling results.
- Ongoing Observer length frequency measurements are helpful to improve estimates of the stock productivity and e.g. to estimate recruitment residuals – especially important given recruitment can be sporadic and can try account for this in future modelling
- CPUE data (standardised) could also be used in the model once a time series becomes available
- Accurate spatial recording of spatial location of catch could be used in future spatial analyses
- Given the large number of uncertainties, a MSE modelling approach is preferred
- Related: white teatfish modelling and climate change impacts

Putting the pieces together for black teatfish



- ✓ Harvest Strategy
- ✓ Catch data
- ✓ Conversion ratios
- ✓ Survey
- ✓ TRIAL OPENING
- ✓ Fishery data from openings
- ✓ Length frequency
- ✓ Stock assessment
- ✓ CITES Export Permit
- ✓ Ongoing sustainable fishing

Thank you

Éva Plagányi

Senior Principal Research Scientist

Eva.plaganyi-lloyd@csiro.au
csiro.au

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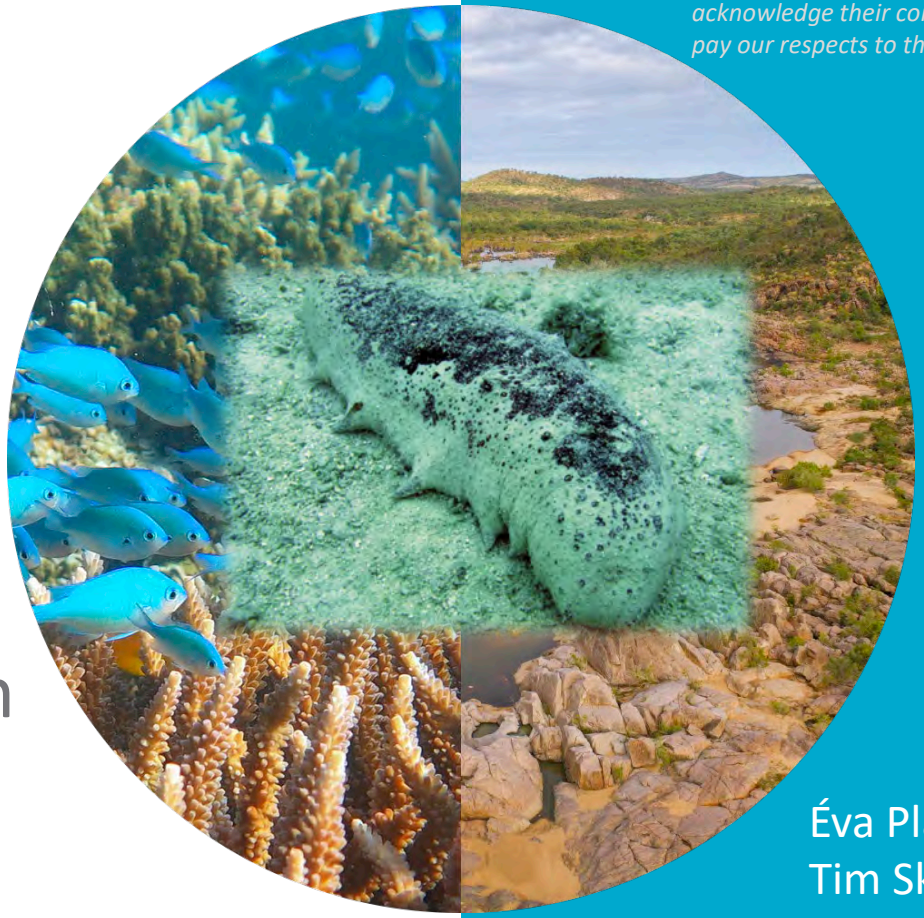
Nicole Murphy
Tim Skewes

Funding
CSIRO
AFMA
TSRA

Attachment D

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.



Torres Strait White teatfish modelling

Éva Plagányi, Nicole Murphy, Tim Skewes

|October 2023

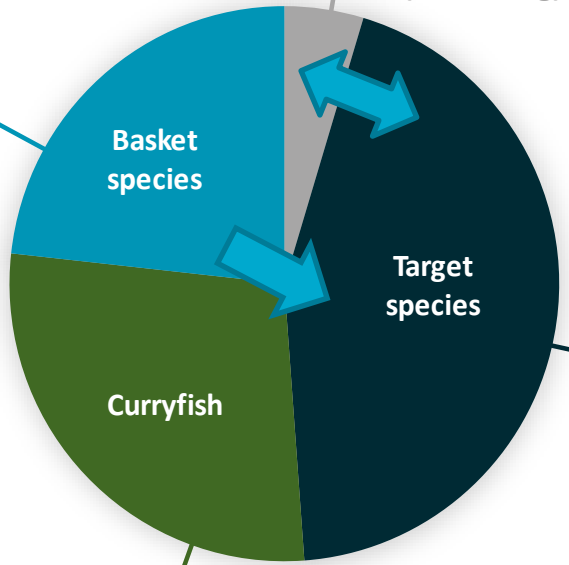
HCRAG

Australia's National Science Agency

Species Categories

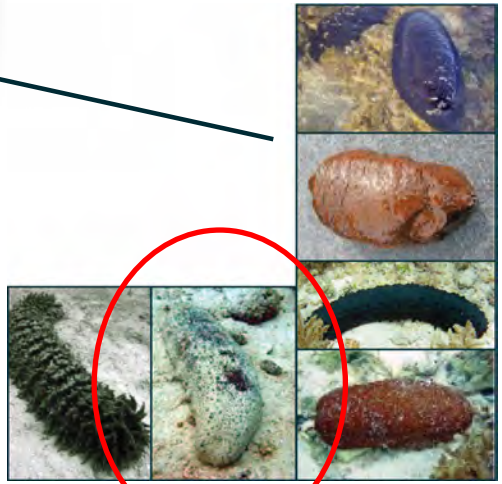
Lowest risk

Increasing risk

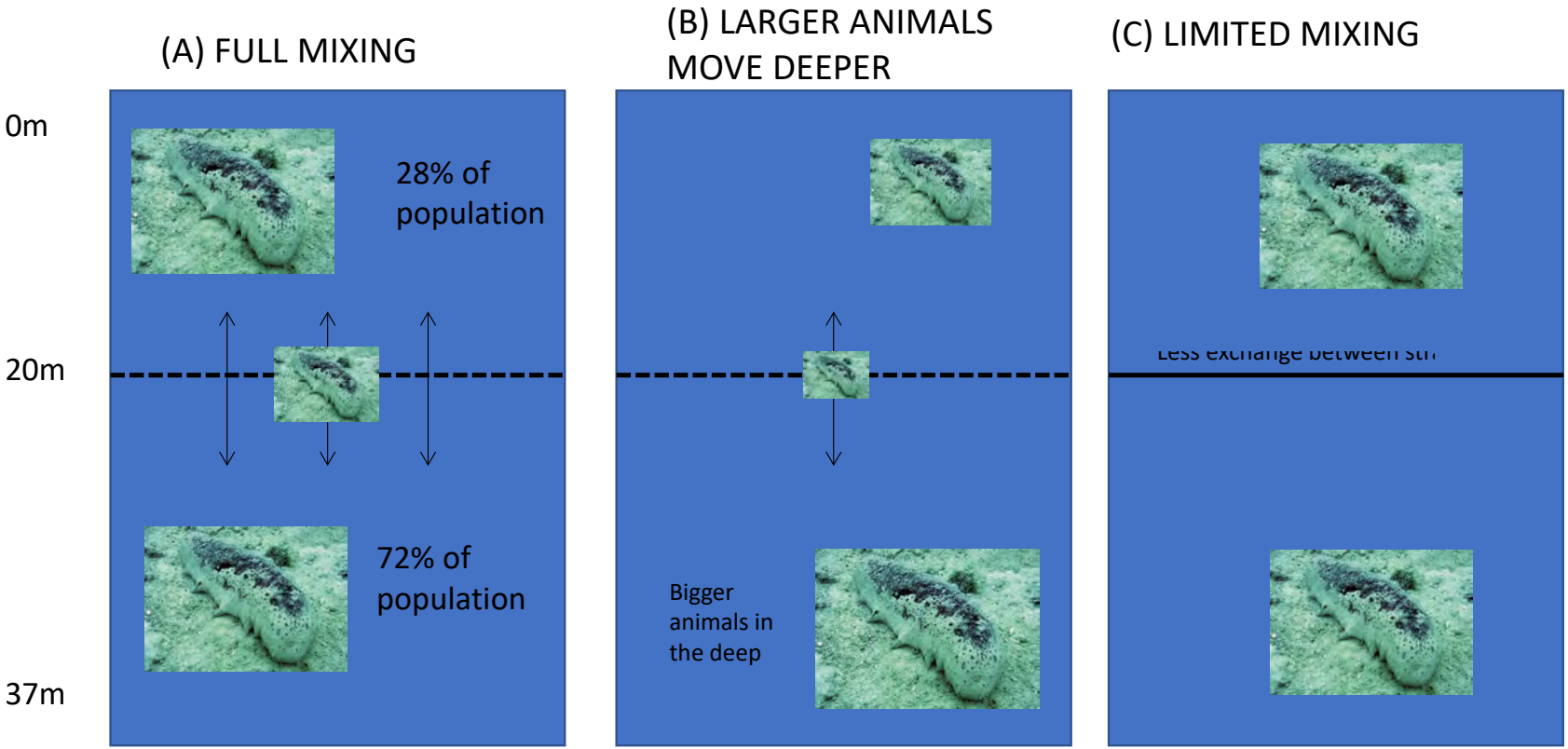


Highest risk

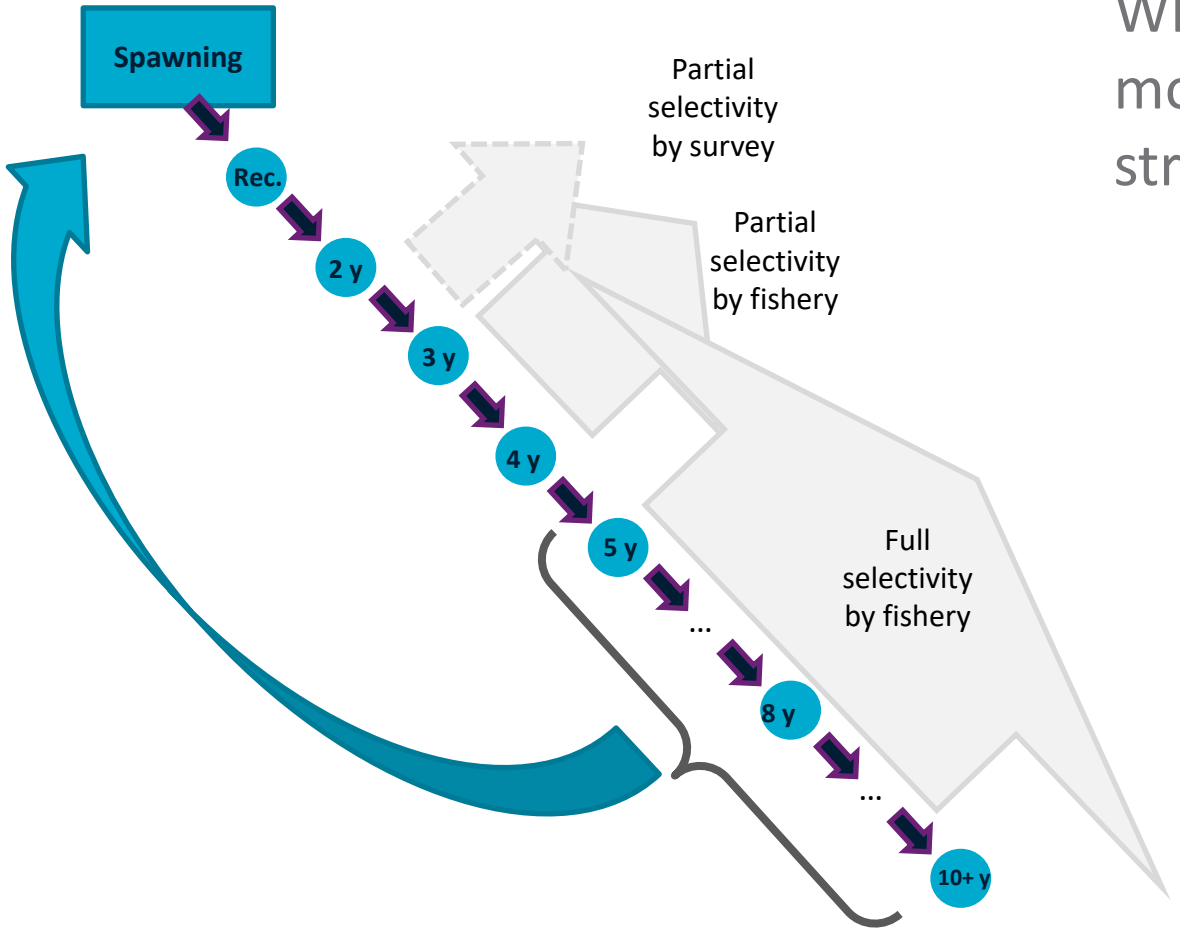
High risk



WTF Population Structure



White teatfish model structure



Data used in White teatfish model

- Historical catches – 1995-2022
- Survey index (2002,2005,2009,2019)
- 2019 survey absolute abundance
- Survey length frequency measurements (2002,2005,2019)
- Average individual mass of commercial catch

Conversion Ratios

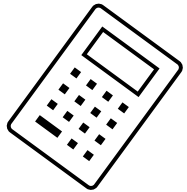
SPC Beche-de-mer Information Bulletin #41 – March 2021 5

Updated conversion ratios for beche-de-mer species in Torres Strait, Australia

Nicole E. Murphy,[1,*] Timothy D. Skewes[1] and Éva E. Plagányi[1]

Abstract

As part of the newly endorsed Torres Strait Beche-de-mer Harvest Strategy, conversion ratios for commercial beche-de-mer species were reviewed. Accurate conversion ratios are required to determine total catches in a standard unit (e.g. wet gutted or landed weight) from data that records catch weight in several different processing stages. These values are useful for stock assessment, management and monitoring of the beche-de-mer fishery in Torres Strait, and elsewhere in Australia.



White teatfish: Live to gutted 0.627

Total Allowable Catch (TAC) is in wet gutted / landed weight

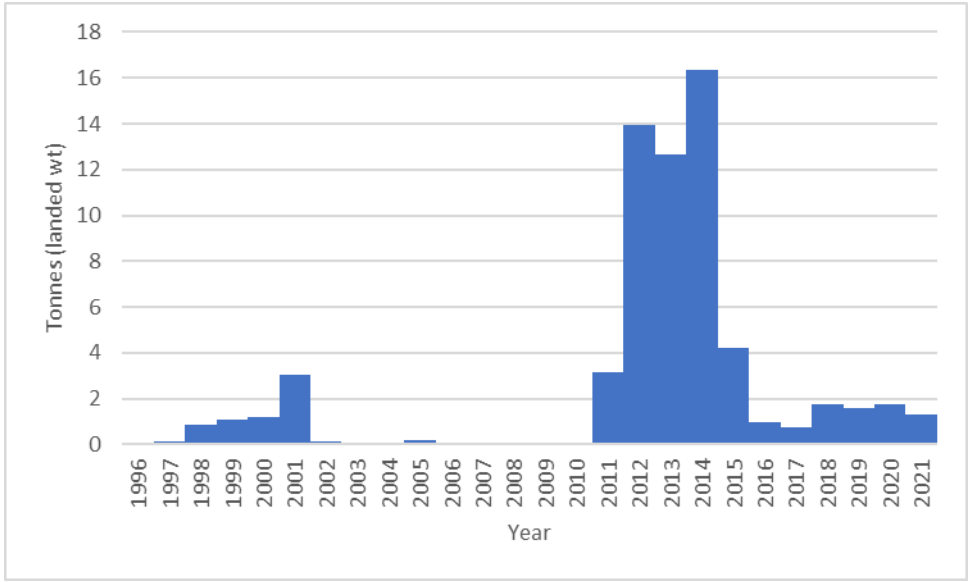
Hence e.g. TAC = 20 t converts to LIVE biomass 20/0.627 = 31.9 t;

TAC of 15 t = 23.9 t live

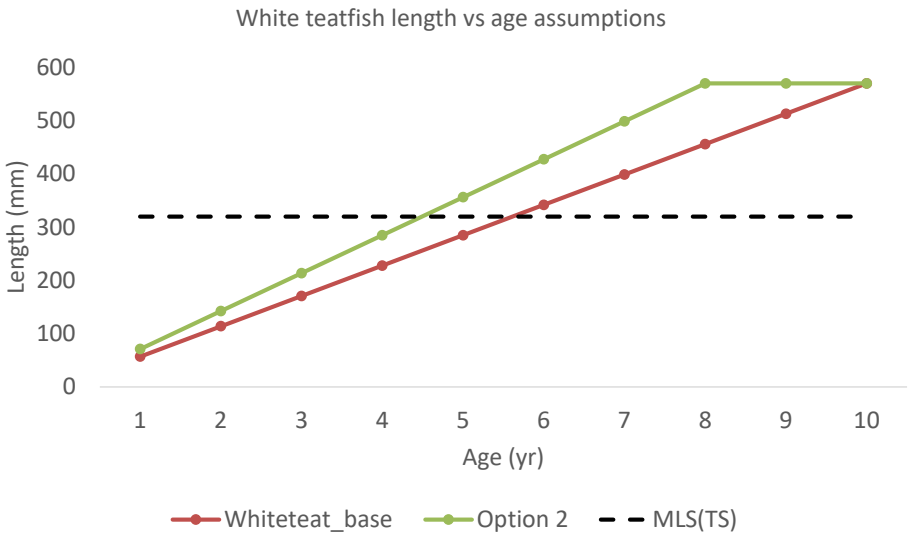
TAC = 30 t converts to LIVE biomass 30/0.627 = 47.8 t

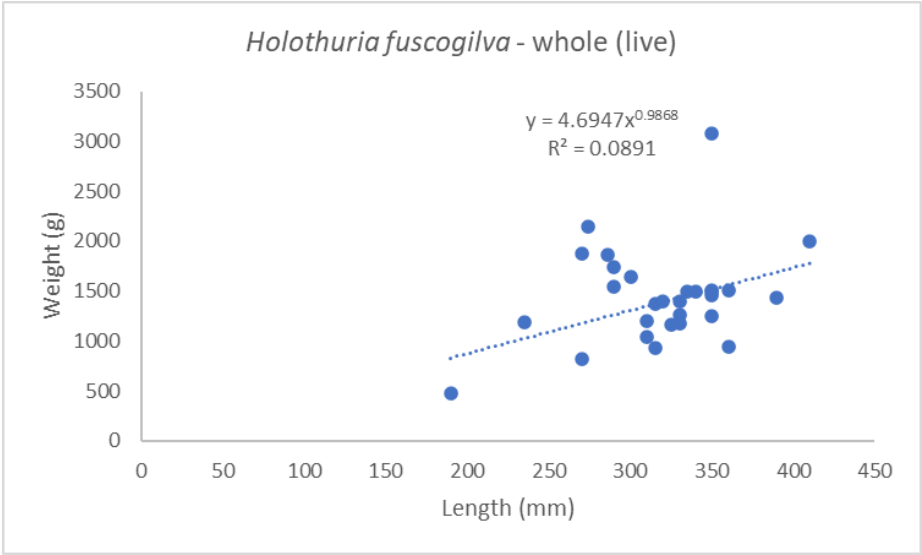
Model works in units of LIVE biomass and converts to landed weight

White teatfish catch data

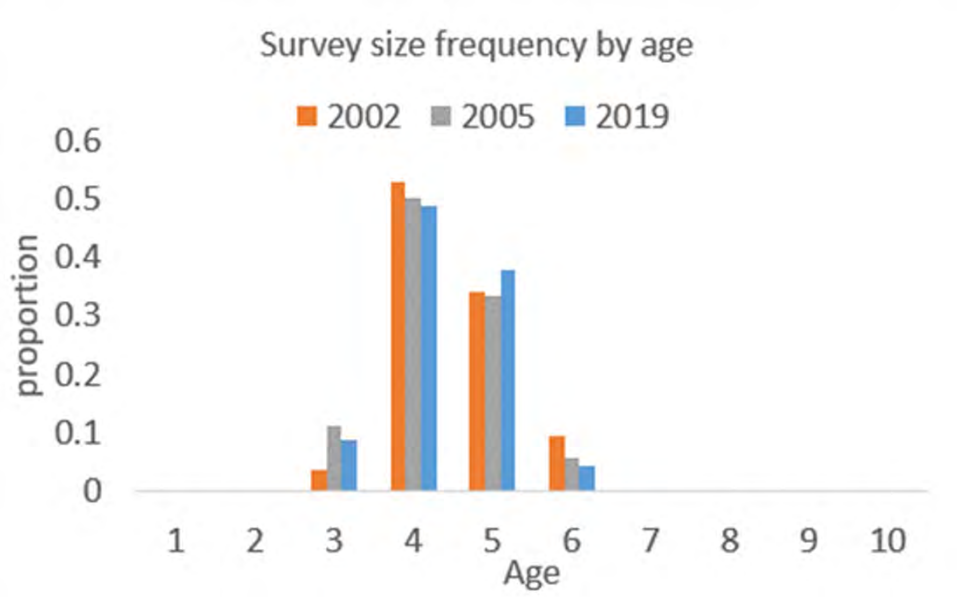


Length-weight-age relationship

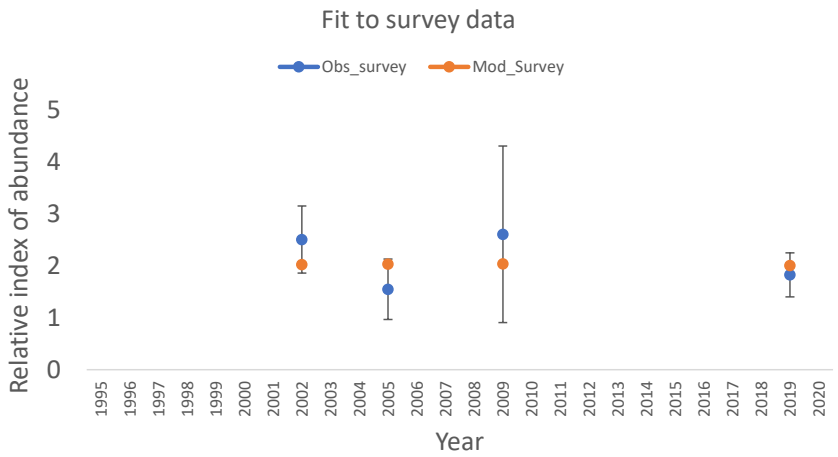


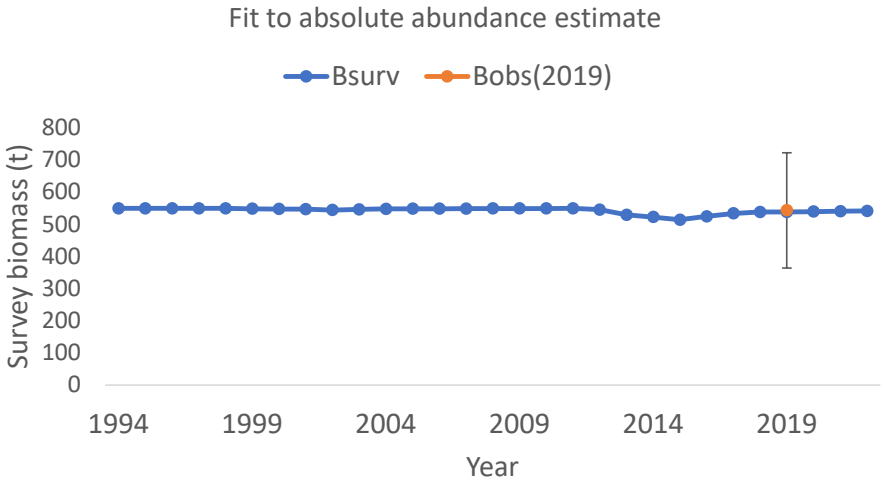


Survey size frequency data

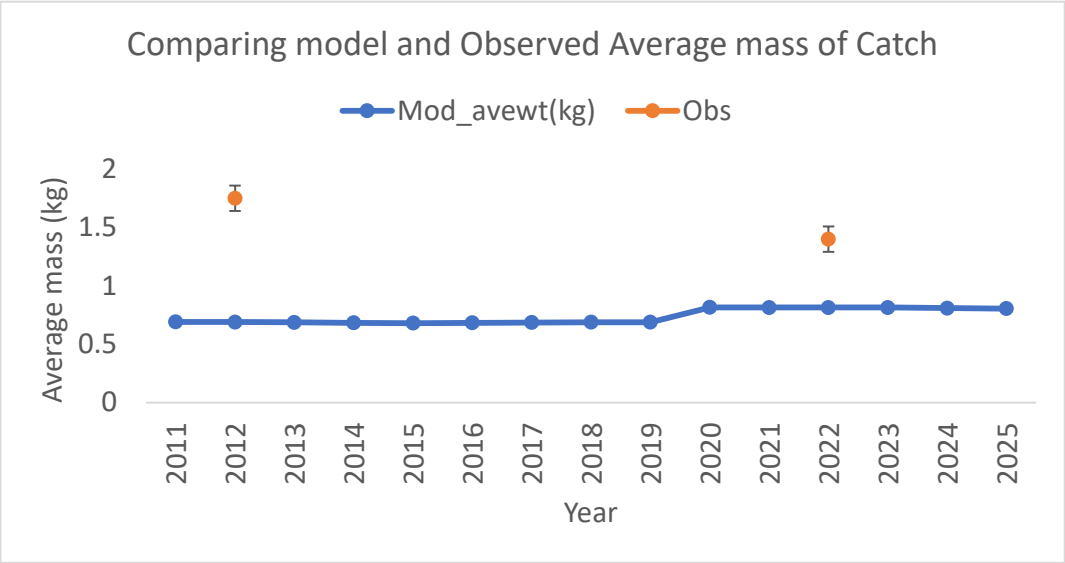


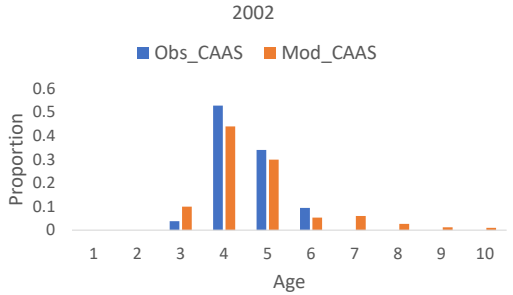
Shallow stratum model

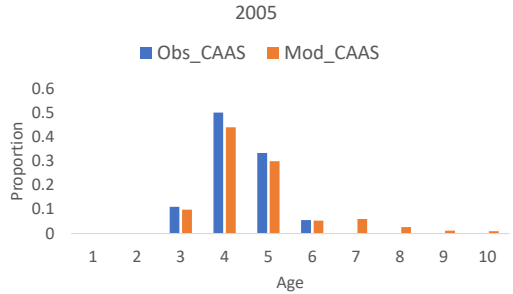


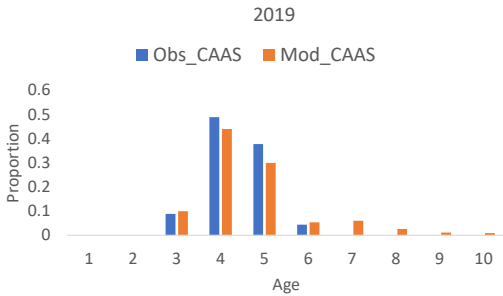


Model fits to data

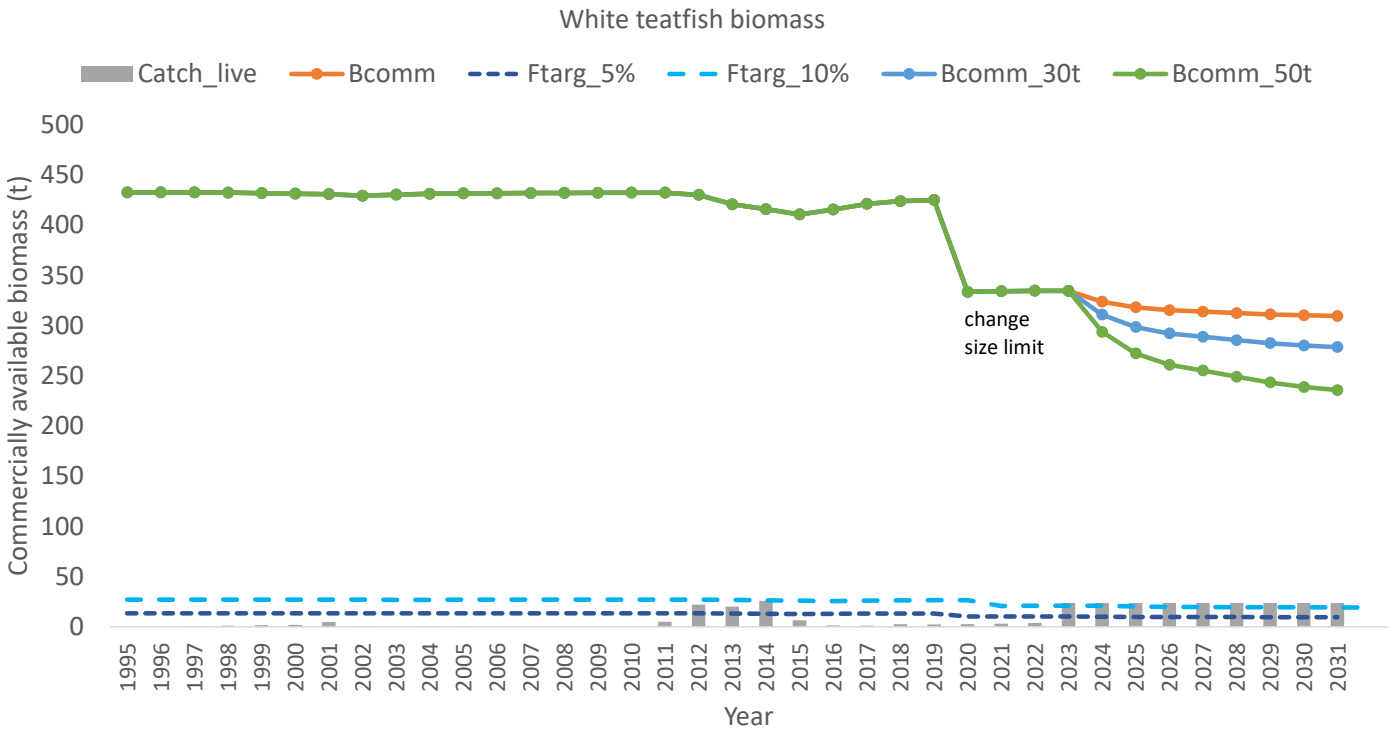




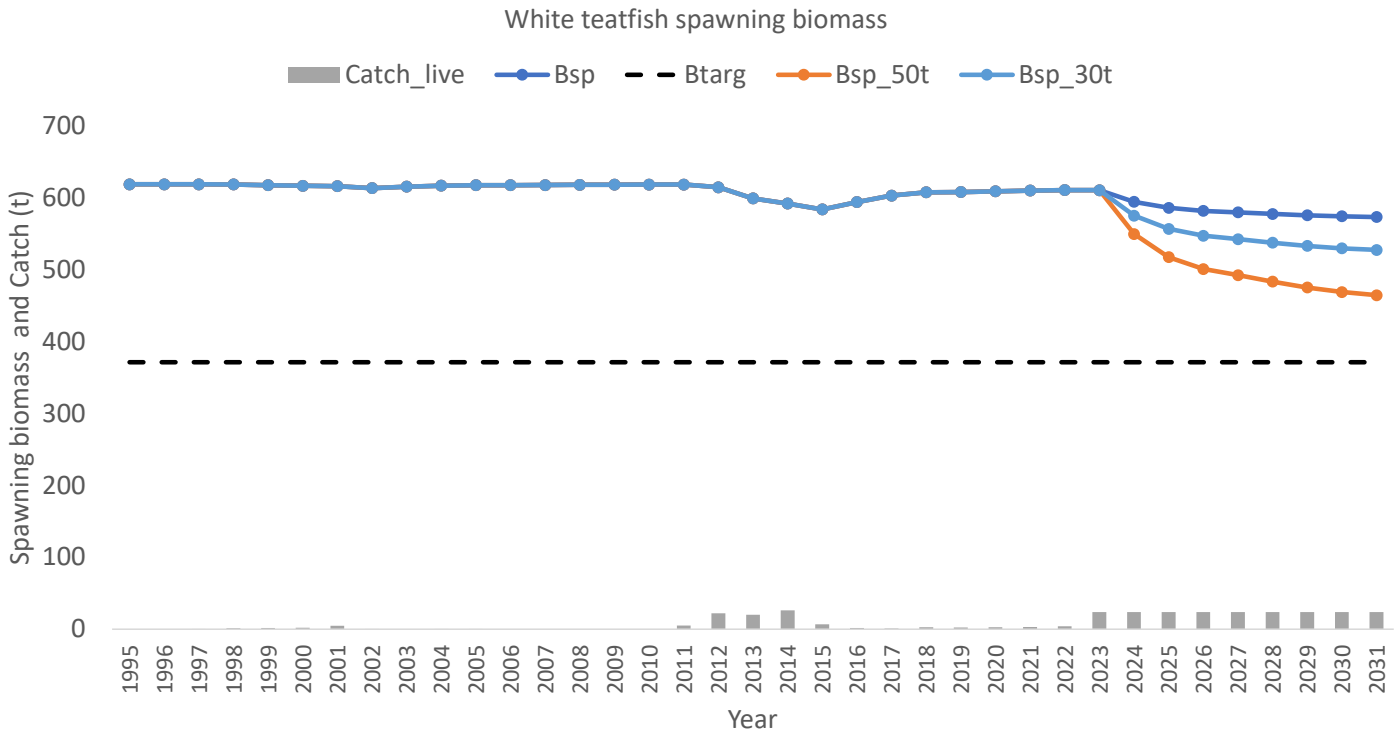




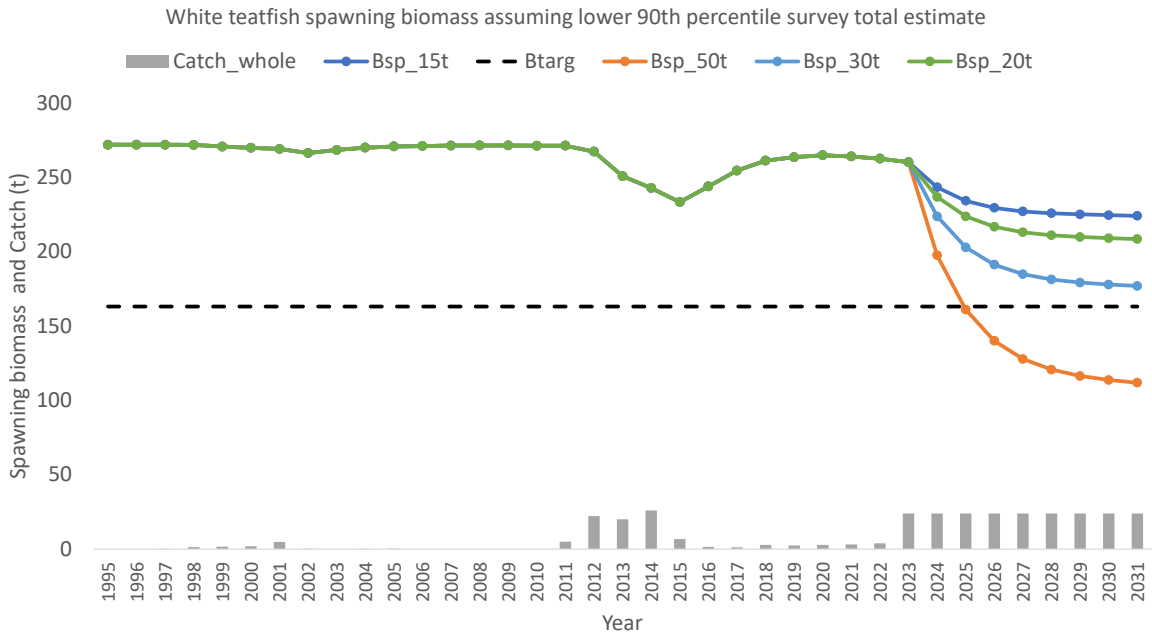
Shallow model illustrative projections



Shallow model illustrative projections



Precautionary model illustrative projections



Modelling summary

- Tried models with different structures
- Integrated model – tried estimating growth relationships directly in model
- Not enough contrast in the data to reliably discriminate between alternative plausible parameter combinations
- Modelling supports that current TAC is likely highly conservative

Monitoring data that will help

- Total catch,
- Catch-per-unit-effort (CPUE),
- Length frequency of a (adequate) sub-sample of the catch,
- Average mass of a sub-sample of the catch and
- Spatial footprint/location of the catch.
- If necessary and possible, a survey 3 to 5 years after the start of more intensive fishing would be particularly helpful, to continue the survey series and update the estimate of standing stock.
- Other monitoring methods such as divers carrying data loggers could also be used and these data could potentially be compared with those available for the 2012-2013 fishing period.

Summary of findings

- Despite the considerable uncertainty, the age-structured model suggests TAC of 15t is very conservative and that an annual catch of 15t will have a very small effect on the White teatfish population.
- Modelling suggests scope to increase the TAC but in cautious step-wise manner to first obtain more information on the White teatfish productivity rate, to be able to improve the reliability of model estimates. E.g. it may be feasible to set a higher TAC of 30t for 3 to 5 years so that the stock tends towards the target biomass level, but it would be essential that the stock be monitored to inform on stock abundance and productivity.
- After this initial fishing period, the new data could then be used to inform an updated sustainable TAC going forward.

Thank you

Éva Plagányi

Senior Principal Research Scientist

Eva.plaganyi-lloyd@csiro.au
csiro.au

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Attachment E

HCRAG

17-18 October 2023

Agenda Item 12 – TACs for the 2024 fishing season

Australian Government
Australian Fisheries Management Authority

What are you being asked to consider?

- Consider the information in the species summaries
- Provide advice on TACs for the 2024 fishing season, taking account of decision rules detailed in the BDM Fishery Harvest Strategy
- Provide advice on short to medium term data, assessment and research needs
- Note IUCN Red List ratings

Current (2023) TACs

Species	TAC (t, wet gutted weight)	Catch monitoring trigger (t, wet gutted weight)
Black teatfish (*Holothuria whitmaei*)	20	-
Curryfish (common) (*Stichopus herrmanni)*	60 (curryfish basket)	-
Curryfish vastus (*Stichopus vastus*)		15
Deepwater redfish (*Actinopyga echinites)*	5	-
Greenfish (*Stichopus chloronotus*)	40	-
Hairy blackfish (*Actinopyga miliaris*)	5	-
Prickly redfish (*Thelenota ananas*)	15	-
Sandfish (*Holothuria scabra*)	0 (closed)	-
Surf redfish (*Actinopyga mauritiana*)	0 (closed)	-
White teatfish (*Holothuria fuscogilva*)	15	-
Elephant trunkfish (*Holothuria fuscopunctata*)	50 (all other species basket)	15
Lollyfish (*Holothuria atra*)		40
Burrowing blackfish (*Actinopyga spinea*)		5
Deepwater blackfish (*Actinopyga palauensis*)		0.5
Golden sandfish (*Holothuria lessoni*)		0.5
Brown sandfish (*Bohadschia vitiensis*)		3
Leopardfish (*Bohadschia argus*)		40
Stonefish (*Actinopyga lecanora*)		5

Species summaries

Assist the RAG to:

- compile and characterise all relevant information (for example adequacy of survey and catch data for a particular species)
- confirm the appropriate decision rule tier for each species
- apply the Harvest Strategy decision rules OR recommend further analysis to be undertaken
- identify any short to medium term data and research needs

Preliminary assessment

- Most species will fall under the low tier of the Harvest Strategy
- Six species identified as a priority for HCRAG consideration: black teatfish, white teatfish, prickly redfish, curryfish common, curryfish vastus and deepwater blackfish
- Black teatfish and white teatfish already considered
- Will go through remaining 16 species, in priority order
- *Some confidential information provided*

Harvest Strategy – low tier

For species with an individual TAC and where there is only annual catch data available:

- if no reliable catch-reported data, then TAC = 0
- if reported catches exceed the TAC by more than double, close the fishery
- if reported catches exceed the TAC by >20% and <100% (double), then pause fishing for one fishing season
- if the cumulative reported catches over a three year period exceed the TAC by >5%and <20%, then deduct the total overcatch from the TAC in the next full fishing season

Harvest Strategy – low tier

For species managed under a basket TAC:

- calculate the total catch (including discards) of all species in the species basket
- calculate the estimated total catch of each species, either from direct species-specific catch data or from (representative) catch samples used to infer proportional abundance of different species

Harvest Strategy – low tier

For species managed under a basket TAC:

- if the catch of any species exceeds the species-specific trigger by more than 10%, then collect data and information to decide whether
  - to make a change to the basket TAC, or individual species trigger, or
  - a species-specific TAC is justified, or
  - a closure is deemed necessary, or
  - recommend further data be collected (e.g. in the form of a survey, or indicator before any change to the joint TAC or trigger limit is allowed

231 Prickly redfish (*Thelenota ananas)*

- Current TAC - 15 tonnes, reduced from 20 tonnes in 2017
- Harvest Strategy tier – Low Tier Catch-Based Decision Rule applies
- Catch trend - stable, catches > TAC in 2021
- 2019/20 survey - slight decline (in slope - density over time), suggesting some concern given reports of sustained high catches
- Other – CITES listed (25 May 2024)
- Previous recommendations – HCRAG (2022) recommended close monitoring of the species

231 Prickly redfish (*Thelenota ananas)*

- Annual reported catches in the last two fishing seasons have not exceeded the TAC by >20%. Cumulative reported catches for the last three fishing seasons (2020-2022) have not exceeded the TAC by >5% (44.204 tonnes), no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	15.036	15	100.2	Yes, TAC exceeded	0.2
2022	13.514	15	90.1	No	N/A
2023 (partial)	6.108	15	40.7	No	N/A

Total catch – curryfish species basket

- Catches did not exceed basket TACs

Basket	2023 TAC (kg)	2018 (kg)	2019 (kg)	2020 (kg)	2021 (kg)	2022 (kg)	2023 (kg)
CURRYFISH SPECIES BASKET TOTAL	60,000*			11,295	12,604	2,358	-**
OTHER SPECIES BASKET TOTAL	50,000*	48,181	25,557	1,644	812	648	244

*New curryfish species basket TAC as of 1 January 2020, previously part of the 80t basket species TAC. Prior to 1 January 2020, the TAC for basket species was 80t.

**Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

236 Curryfish (common) (*Stichopus herrmanni*)

- Current TAC - 60 tonnes curryfish basket TAC (no trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - total curryfish catches decreasing, catches < basket TAC
- 2019/20 survey - possible decline (noting fairly negative trend fitted to survey data)
- Other – N/A
- Previous recommendations – HCRAG (2022) recommended close monitoring of the species and implementation of a species trigger

236 Curryfish (common) (*Stichopus herrmanni*)

- Annual reported catches in the last two fishing seasons have not exceeded the TAC (no trigger), no additional actions apply under decision rule. Implementation of species trigger to be discussed

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	4.054 6.690 (mixed)	60	6.8 11.2 (mixed)	No	N/A
2022	0.400 1.558 (mixed)	60	0.7 2.6 (mixed)	No	N/A
2023 (partial)	0 - (mixed)*	60	0 - (mixed)*	No	N/A

*Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

238 Curryfish vastus (*Stichopus vastus*)

- Current TAC - 60 tonnes curryfish basket TAC (15 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - total curryfish catches decreasing, catches < basket TAC
- 2019/20 survey - higher ratio of S. vastus observed in 2019/20 survey
- Other – N/A
- Previous recommendations – HCRAG (2022) recommended close monitoring of the species

238 Curryfish vastus (*Stichopus vastus*)

- Annual reported catches in the last two fishing seasons have not exceeded the TAC or trigger, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	1.860 6.690 (mixed)	60 (15 t trigger limit)	3.1 11.2 (mixed)	No	N/A
2022	0.400 1.558 (mixed)	60 (15 t trigger limit)	0.7 2.6 (mixed)	No	N/A
2023 (partial)	0 - (mixed)*	60 (15 t trigger limit)	0 - (mixed)*	No	N/A

*Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

Total catch – other species basket

- Catches did not exceed basket TACs

Basket	2023 TAC (kg)	2018 (kg)	2019 (kg)	2020 (kg)	2021 (kg)	2022 (kg)	2023 (kg)
CURRYFISH SPECIES BASKET TOTAL	60,000*			11,295	12,604	2,358	-**
OTHER SPECIES BASKET TOTAL	50,000*	48,181	25,557	1,644	812	648	244

*New curryfish species basket TAC as of 1 January 2020, previously part of the 80t basket species TAC. Prior to 1 January 2020, the TAC for basket species was 80t.

**Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

246 Deepwater blackfish (*Actinopyga palauensis*)

- Current TAC - 80 tonnes other species basket TAC (0.5 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - increasing, catches < basket TAC but > species trigger in 2022
- 2019/20 survey - only properly identified in surveys and catch in 2019, after concerted review of taxonomy and working with Torres Strait Islander fishers. Status remains relatively unknown. Targeted survey sampling to be factored into future fishery surveys
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment
- Previous recommendations – no concerns, noting data needs

246 Deepwater blackfish (*Actinopyga palauensis*)

- Annual reported catches in 2022 have exceeded the species trigger by >10%.

  Decision rule considerations to be discussed

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0.184	50 (0.5 t trigger limit)	0.4	No	N/A
2022	0.648	50 (0.5 t trigger limit)	1.3	TAC - no Trigger - yes	TAC – N/A Trigger – 29.6
2023 (partial)	0.244	50 (0.5 t trigger limit)	0.5	No	N/A

223 Deepwater redfish (*Actinopyga echinites*)

- Current TAC - 5 tonnes (no trigger)
- Harvest Strategy tier – Low Tier Catch-Based Decision Rule applies
- Catch trend - decreasing, catches < TAC
- 2019/20 survey - catches low relative to biomass, increasing overall trend in density, no concern for TAC
- Other – uncertain status (biomass) in ABARES assessment
- Previous recommendations – HCRAG (2022) noted catches low (market driven), survey not optimised to species distribution, catches low relative to biomass, overall increasing trend in density, spatial reporting and species ID

223 Deepwater redfish (*Actinopyga echinites*)

- Annual reported catches in the last two fishing seasons have not exceeded the TAC (no trigger), no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0.031	5	0.6	No	N/A
2022	0.049	5	1	No	N/A
2023 (partial)	0	5	0	No	N/A

228 Hairy blackfish (*Actinopyga miliaris*)

- Current TAC - 5 tonnes (no trigger)
- Harvest Strategy tier – Low Tier Catch-Based Decision Rule applies
- Catch trend - decreasing, catches < TAC
- 2019/20 survey - status remains relatively unknown. Possible decline or natural variability. Targeted survey sampling may need to be factored into future fishery surveys
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment
- Previous recommendations – HCRAG (2022) noted catches low (market driven), survey not optimised to species distribution, targeted survey/ sampling when resources allow, spatial reporting and species ID

228 Hairy blackfish (*Actinopyga miliaris*)

- Annual reported catches in the last two fishing seasons have not exceeded the TAC (no trigger), no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0.519	5	10.4	No	N/A
2022	0.696	5	13.9	No	N/A
2023 (partial)	-*	5	-*	No	N/A

*Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

226 Greenfish (*Stichopus chloronotus*)

- Current TAC - 40 tonnes (no trigger)
- Harvest Strategy tier – Low Tier Catch-Based Decision Rule applies
- Catch trend - decreasing, catches < TAC
- 2019/20 survey - catches low, generally increasing density trend, no concern for TAC
- Other – N/A
- Previous recommendations – no concerns

226 Greenfish (*Stichopus chloronotus*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	40	0	No	N/A
2022	0	40	0	No	N/A
2023 (partial)	0	40	0	No	N/A

240 Elephant trunkfish (*Holothuria fuscopunctata*)

- Current TAC - 50 tonnes basket species TAC (15 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey - catch rates low, overall average zone density was higher in 2019/20 than the 2009 survey, but less than previous survey years, possible decline or natural variability
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – no concerns

240 Elephant trunkfish (*Holothuria fuscopunctata*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	50 (15 t trigger limit)	0	No	N/A
2022	0	50 (15 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (15 t trigger limit)	0	No	N/A

242 Lollyfish (*Holothuria atra*)

- Current TAC - 50 tonnes basket species TAC (40 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey - noted catch increase, overall 4 zone average density was lower in 2019/20 compared to the 2009 survey and similar to previous survey years, possible decline or natural variability
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – no concerns

242 Lollyfish (*Holothuria atra*)

- Annual reported catches in the last two fishing seasons have not exceeded the TAC or trigger, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0.422	50 (40 t trigger limit)	0.8	No	N/A
2022	0	50 (40 t trigger limit)	0	No	N/A
2023 (partial)	-*	50 (40 t trigger limit)	-*	No	N/A

*Confidential, unable to be released due to information disclosure requirements, information does not represent data from five or more vessels.

244 Burrowing blackfish (*Actinopyga spinea*)

- Current TAC - 50 tonnes basket species TAC (5 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey - precautionary approach is needed as status remains relatively unknown
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – no concerns

244 Burrowing blackfish (*Actinopyga spinea*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	50 (5 t trigger limit)	0	No	N/A
2022	0	50 (5 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (5 t trigger limit)	0	No	N/A

248 Golden sandfish (*Holothuria lessoni*)

- Current TAC - 50 tonnes basket species TAC (0.5 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey – not recorded during survey, some found present at Ugar Island
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – HCRAG (2022) noted golden sandfish were not observed during the 2019/20 survey or annual TRL surveys due to minimal overlap with their habitat

248 Golden sandfish (*Holothuria lessoni*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	50 (0.5 t trigger limit)	0	No	N/A
2022	0	50 (0.5 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (0.5 t trigger limit)	0	No	N/A

250 Brown sandfish (*Bohadschia vitiensis*)

- Current TAC - 50 tonnes basket species TAC (3 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey – not recorded during survey, some found present at Ugar Island and Campbell Reefs
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – no concerns

250 Brown sandfish (*Bohadschia vitiensis*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	50 (3 t trigger limit)	0	No	N/A
2022	0	50 (3 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (3 t trigger limit)	0	No	N/A

252 Leopardfish (*Bohadschia argus*)

- Current TAC - 50 tonnes basket species TAC (40 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend - decreasing, catches < basket TAC and species trigger
- 2019/20 survey – catches low, generally increasing density trend, no concern for TAC
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – no concerns

252 Leopardfish (*Bohadschia argus*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0.207	50 (40 t trigger limit)	0.4	No	N/A
2022	0	50 (40 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (40 t trigger limit)	0	No	N/A

254 Stonefish (*Actinopyga lecanora*)

- Current TAC - 50 tonnes basket species TAC (5 tonnes trigger)
- Harvest Strategy tier – Low Tier Joint TAC Trigger-Limit Decision Rule applies
- Catch trend – nil catches
- 2019/20 survey – not recorded during survey
- Other – uncertain status (fishing mortality and biomass) in ABARES assessment, not specific to this species
- Previous recommendations – not previously assessed

254 Stonefish (*Actinopyga lecanora*)

- No annual reported catches in the last two fishing seasons, no additional actions apply under decision rule

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	50 (5 t trigger limit)	0	No	N/A
2022	0	50 (5 t trigger limit)	0	No	N/A
2023 (partial)	0	50 (5 t trigger limit)	0	No	N/A

256 Sandfish (*Holothuria scabra*)

- Current TAC – CLOSED (since 1998)
- Harvest Strategy tier – Re-opening Decision Rule applies
- Catch trend – nil catches
- Surveys – 2010 survey densities were found to be at similar levels to 2004, and again were ~80% less than observed in 1995/96, at which time the population was considered to be overexploited
- Other – overfished status (biomass) in ABARES assessment
- Previous recommendations – remain closed

256 Sandfish (*Holothuria scabra*)

- No recent survey data available to assess species, species to remain closed

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	0	0	No	N/A
2022	0	0	0	No	N/A
2023 (partial)	0	0	0	No	N/A

258 Surf redfish (*Actinopyga mauritiana*)

- Current TAC – CLOSED (since 2003)
- Harvest Strategy tier – Re-opening Decision Rule applies
- Catch trend – nil catches
- 2019/20 survey – found in higher numbers relative to previous surveys, which supports species recovery. While the species is showing signs of recovery, biomass is low at 24 tonnes and current densities of 0.3 per Ha are low in comparison to 1.54 per Ha recorded in 2002
- Other – uncertain status (biomass) in ABARES assessment
- Previous recommendations – remain closed

258 Surf redfish (*Actinopyga mauritiana*)

- No new survey data available to re-assess species, species to remain closed

Fishing season	Catch (t, wet gutted weight)	TAC (t, wet gutted weight)	% TAC caught	TAC or basket trigger exceeded?	% of TAC overcatch
2021	0	0	0	No	N/A
2022	0	0	0	No	N/A
2023 (partial)	0	0	0	No	N/A

Other species

- Two other species of interest, not actively managed under Harvest Strategy (other species basket if commercial fishing commenced)
- Pinkfish (*Holothuria edulis*)
  - no history of commercial catches, no additional actions apply under Harvest Strategy
  - 2019/20 survey - possible decline or natural variability
- Amberfish (*Thelenota anax*)
  - commercial catches in 2001 only, no additional actions apply under Harvest Strategy
  - 2019/20 survey – no concerns

Esso