



**Australian Government**

**Australian Fisheries Management Authority**

## **Northern Prawn Fishery Resource Assessment Group (NPRAG)**

### **Meeting minutes**

**24-25 May 2023**

**View Hotel – Brisbane**

**Meeting held on Turrbal and Jagera Country**

## Meeting participants

Position	Participant
Chair	Ian Knuckey, Fishwell Consulting
NPRAG members	Ian Boot, Industry member David Brewer, Scientific member Rik Buckworth, Scientific member Tom Kompas, Economic member (via teams – items 17 & 18)) Éva Plagányi, CSIRO <sup>1</sup> , Scientific member Phil Robson, Industry member Bryan van Wyk, Industry member Darci Wallis, AFMA <sup>2</sup>
AFMA Employees	Cate Coddington (Executive Officer) Sarah Kirkcaldie Brett McCallum (via teams – Item 4) Brodie Macdonald (via teams – Item 16b) Alice McDonald (via teams)
Invited participant	Annie Jarrett, NPFI <sup>3</sup>
Observers / Presenters	Laura Blamey, CSIRO (Day 1) Ian Butler, ABARES <sup>4</sup> (via teams) Robert Curtotti, ABARES (via teams) Roy Deng, CSIRO Michael Dylewski, ABARES (via teams) Gary Fry, CSIRO (Day 1, morning of Day 2) Trevor Hutton, CSIRO Rob Kenyon, CSIRO Yeming Lei, CSIRO Rich Little, CSIRO (via teams) Brandon Meteyard, NPFI Denham Parker, CSIRO Sean Pascoe, CSIRO Toby Patterson, CSIRO (via teams) Richard Pillans, CSIRO (Day 1) André Punt, CSIRO (via teams – Item 15a)
<b>Apologies</b>	
	Shijie Zhou, CSIRO

<sup>1</sup> Commonwealth Scientific and Industrial Research Organisation

<sup>2</sup> Australian Fisheries Management Authority

<sup>3</sup> Northern Prawn Fishery Industry

<sup>4</sup> Australian Bureau of Agricultural and Resource Economics and Sciences

## Agenda item 1. Preliminaries

### a. Welcome and apologies

Ian Knuckey, the Chair, opened the meeting with an Acknowledgement of Country at 0830 AEST<sup>5</sup>.

The RAG noted that there was a quorum for the meeting as per *Fisheries Administration Paper 12* ([FAP12](#)).

### b. Declarations of interest

The RAG discussed potential conflicts of interest and participation under specific agenda items as outlined in FAP12, noting:

- The register of interest is at [Attachment A](#).
- Attendees with research interests were deemed to have a potential conflict of interest with [Agenda Item 19](#): *NPF Research*. Research attendees left the meeting so the remaining attendees could discuss participation in the item. It was agreed that these attendees should be present for the discussion but will be asked to leave if making priority decisions. Additionally, if it is recognised that there is a conflict for researchers during the meeting they will be asked to leave.
- Annie Jarret declared that industry attendees have potential conflicts of interest with **agenda items 6** (Is there a role for electronic monitoring in the Northern Prawn Fishery (NPF)), [11](#) (broodstock catch limits), [16](#) (tiger prawn assessment data update and consideration of Total Allowable Effort (TAE) setting), and [19](#) (2024-25 Annual research statement and research scopes). Industry attendees left the meeting so the remaining attendees could discuss industry participation in the items. It was agreed that industry should be present for the discussions and recommendations unless there any recommendations being unduly influenced.

### c. Adoption of agenda

The RAG adopted the agenda, outlined at [Attachment B](#). During the meeting, the order of agenda items was adjusted to suit individual needs of the participants, the order of discussion is also outlined at [Attachment B](#).

### d. Minutes from previous meetings

Previously accepted out-of-session, the 7 December 2022 NPRAG minutes were endorsed as a true and accurate record of the meeting. The RAG noted that they have been published on the AFMA website on the [NPRAG past meetings](#) webpage.

### e. Correspondence

The RAG noted the correspondence provided since the May 2022 meeting related to the: 2023-24 call for research proposals; the MAC and RAG consultative review; and building climate change information into AFMA decision making processes.

## Agenda item 2. Actions arising from previous meetings

The RAG noted the status of the action items from previous meetings and an update provided by the Executive Officer at [Attachment C](#). In particular:

- *Action Item 5 (May 2021) – AFMA/NPFI to provide NPRAG with an analysis of the champagne lobster data, including grading data – Complete*: a basic analysis was undertaken of the data:

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<sup>5</sup> Australian Eastern Standard Time

- Total champagne lobster catch in the scampi sub-fishery was highly variable and unrelated to effort.
- The relative proportion of catch across grades (from limited data) has remained constant over the period. However, there may be market impacts on the retention of catch; anecdotally discarding is relatively low at between zero and five per cent of the catch.
- Industry informed the RAG champagne lobster is generally landed in the shallower water on the eastern side of where the scampi is landed.
- Action item 12 (May 2022) – *AFMA to provide an update to the RAG on the status of the automation of ERA, and an evaluation of the costs for undertaking an ERA triggers checklist* – **Redundant:** AFMA Management is currently undertaking a review of Fishery Management Paper 14 – *AFMA’s Approach to Ecological Risk Management* and its supporting Guide to AFMA’s Ecological Risk Management Framework.
  - Among other things the revised policy explores the concept of a stepped risk assessment utilising triggers and benefits of automated ERA to determine when an ERA is to be updated rather than the default five years in the current policy.
  - At this early stage, there are no explicit savings of the automated approach, but it is expected this will be explored further through the review.
  - The policy and guidelines will shortly be released for broader comment (including through the RAGs and MACs).

A list of action items established at this meeting are listed in [Attachment D](#).

**Action Item 1: AFMA**

AFMA to distribute the champagne lobster analysis to the RAG members, noting the requirements under the *Fisheries Management Paper 12 – information disclosure policy*.

**Action Item 2: AFMA**

AFMA to provide an update to the NPRAG when the ERA review is completed, noting that one of the main drivers for moving to an automated system was the potential cost savings.

## Agenda item 3. Update reports

### a. Industry update report

The RAG noted the update provided by industry members and NPFI:

- on the 2023 banana prawn season:
  - At over 6 000 t, 2023 catches of banana prawns (*Penaeus merguensis*) have been exceptional. The southern end of the Gulf of Carpentaria (GOC) was more productive than in 2011. However, aside from the area around Weipa, there very few signs of prawns along the eastern coastline of the Gulf.
  - The ability of spotters to detect prawns was affected by the level of freshwater flowing from rivers.
  - While fuel prices are approximately 30 per cent lower than the prices considered at the NPRAG meeting in May 2022, they are still 47 per cent higher than they were in 2021.
  - Banana prawn prices are likely to be significantly lower compared to the previous year due to the high catches in the NPF and other global and domestic prawn fishery production, including aquaculture.
  - Anecdotal reports suggest the upcoming tiger prawn season will be promising.

- The catch rates of banana prawns recorded during the 2023 banana season – at 2.7 tonnes per boat per fishing day in the first reporting period, and 1.2 tonnes during the second – were the highest since the reporting process was instigated in 2014.
- It is first time since the banana prawn MEY trigger process started that the trigger has fallen within the 15 per cent buffer at 535kg/boat/day.
- Demand for wild broodstock (black tiger prawns: *P. monodon* –) out of the NPF remains low (compared to 2019).
- The transfer of data from AFMA to NPFI remains problematic, but the issues are being rectified.
- Crew monitoring observer (CMO) program met the key performance indicators for the 2022 fishing seasons. The first CMO workshop since the COVID-19 pandemic will be held in Cairns in July.

#### Action Item 3: NPFI

Annie Jarrett to provide the table containing catch report details of the banana prawn reporting periods to the EO for distribution to the NPRAG.

### b. AFMA management update

The RAG noted the update provided by AFMA about key issues relevant to the NPF:

- The draft amendments to the NPF Management Plan were released for public comment on 17 April 2023 with comments due by 31 May 2023.
- There were challenges meeting observer targets during 2021 and 2022, but targets are being met in the 2023 banana prawn season.
- The draft ecological risk assessment (ERA) report for the redleg banana prawn (*P. indicus*) sub-fishery is expected during the second half of the year.
- Reassessment of the NPF as a Wildlife Trade Operation under the EPBC Act is due in January 2024.
- The Indigenous engagement project is nearly finished, the NPF has been proposed for a trial engagement with First Nations communities.
- A review of AFMA's Management Advisory Committee and Resource Assessment Group consultative framework is almost complete, the report is due to the AFMA Commission in June 2023.
- The next phase of the data transformation (DT) and Electronic Monitoring Program is to focus on modernising AFMA's data storage and exchange mechanisms.
- AFMA has been working with the former Department of Agriculture and Environment, Parks Australia and Maritime Border Command on a ghost net GPS tracking trial. There is potential for AFMA to provide in-kind support for the expansion of the trial into the NPF.

### c. CSIRO update

The RAG noted the update provided by CSIRO on:

- progress made validating Models of Intermediate Complexity for Ecosystem (MICE) modelling of mangroves.
- a project CSIRO are undertaking is focussing on seafood supply chains in Australia through its valuing sustainability future science platform<sup>6</sup>.
- mangroves that continue to recover from dieback and have attained about half the original canopy height. The cause of the mangrove dieback was due to water stress, there were high temperatures with a lack of fresh water during the period in November/December 2015.

<sup>6</sup> further information available here: [research.csiro.au/vsfp/resilience-plus](https://research.csiro.au/vsfp/resilience-plus)

#### **d. Northern rivers update**

The RAG noted the update provided by Rob Kenyon on the catch/flow research assisting the understanding of irrigated agriculture initiatives around the northern development area including the:

- Roper River Water Resource Assessment (currently the focus of the project)
- Southern Gulf Rivers Water Resource Assessment
- Victoria River Water Resource Assessment
- MICE technique<sup>7</sup> will be spatially expanded and flow data from rivers such as the Walker River, Roper River and McArthur River in the GoC as well as the Victoria River will be included in the MICE to attempt to determine the influence of flow on catch of commercial species.

### **Agenda item 4. Climate and ecosystem status reports**

#### **a. Update on AFMA's Climate Adaptation Program – Climate and ecosystem status report for the tiger prawn sub-fishery**

The RAG noted and discussed the update by Alice McDonald on AFMA's Climate Adaptation Program:

- The AFMA Commission has endorsed the introduction of standing climate change agenda items for RAG and MAC meetings; to enable the discussion of key climate and ecosystem indicators and research when catch or effort limits are being considered.
- A number of projects are underway at AFMA that refine the preliminary projections and improve understanding of the influence of environmental variables.
- The NPF already has adaptive mechanisms in place, providing the potential for adapting to the impacts of climate change.
- AFMA is working with CSIRO to develop climate and ecosystem status reports for all AFMA fisheries.

The RAG agreed that it would be beneficial to receive feedback from the AFMA Commission about how climate change and environmental condition information is considered both qualitatively and quantitatively in determining catch and effort limits.

The RAG noted the information on key climate and ecosystem indicators, contained in the climate and ecosystem report, for the NPF tiger prawn sub-fishery in the GOC:

- Sea surface temperatures have been generally trending upwards over the past 30 years.
- Water temperatures are currently average or below average in the southern Gulf regions.
- Significant rainfall has been received across northern Australia over the past 6 months.
- The Southern Oscillation Index (SOI) has returned to neutral.
- Over the next few months, the Bureau of Meteorology (BOM) has projected the return of El Niño conditions, with rainfall predicted to be the median or slightly below the median and water temperatures are warming over coming months, with an anomaly of 0.2-0.6°C.
- Expectation is that the SOI may become more variable in the future, resulting in more frequent extreme weather events.

The RAG discussed:

- The draft climate and ecosystem status report for the NPF tiger prawn sub-fishery in the GOC:
  - The report was developed by AFMA to both enable feedback as a starting point on the contents of the report and to inform the RAG of climatic conditions for consideration during TAE considerations. Caution should be applied in relying on such information given the limited data

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<sup>7</sup> MICE report available at: [Ecological modelling of the impacts of water development in the Gulf of Carpentaria with particular reference to impacts on the Northern Prawn Fishery | FRDC](#)

about climatic conditions in the GOC and their associated effects on harvested species. CSIRO plans to develop a report card for the area when the linkages between environmental condition effects on tiger prawn populations is better understood; similar to the report developed for the Joseph Bonaparte Gulf (JBG) ([Agenda item 4b](#)).

- Under a FRDC project lead by Ian Knuckey, the Integrated Marine Observing System (IMOS) Ships of Opportunity program is placing calibrated temperature-depth loggers on fishing vessels, including two in the NPF, from which measurements will go directly to the Australian Ocean Data Network (AODN) portal.
- The placement of calibrated data loggers in areas that are important to the fishery and could bridge the gap of reliable information on sea surface temperature. In particular, areas of juvenile prawn habitat are a priority for environmental data collection, as extreme water temperatures in the nearshore (inter-tidal) zone is likely to influence juvenile and larvae prawn mortality.
- Improvements to the report could include the provision of:
  1. guidance on the reliability of the climatic information provided
  2. a monthly catch by species as a stacked monthly bar chart rather than an annual catch
  3. information about climate in shallow water nursery habitat areas (for example blue mud bay), particularly if there are marine heat waves during the latter half of the dry season which is a crucial time for juvenile prawns.
- the importance of understanding the long-term impacts of climate change in the NPF, particularly since:
  - it is likely that there is linkage between the SOI and the catch of prawns in the fishery
  - Threatened, Endangered and Protected (TEP) species are likely to be impacted differently, currently these are consolidated in the summary of projections for key species<sup>8</sup>.
  - Additionally, it will be important to be able to disentangle the impacts of climate change versus the impacts of fishing on these species.

#### Recommendations

The RAG recommended that further consideration of the information to be contained in the climate and ecosystem status report is postponed until after the tiger prawn MICE work is completed.

#### Action Item 4: Alice McDonald

Alice McDonald to provide the *AFMA's Climate Adaptation Program – Climate and ecosystem status report for the tiger prawn sub-fishery* presentation to the EO for dissemination to NPRAG.

#### Action Item 5: Ian Knuckey / Annie Jarrett

Ian Knuckey and Annie Jarrett to discuss the potential for additional calibrated data loggers in the fishery, potentially on more NPF vessels as part of the IMOS Ships of Opportunity program.

## b. Climate and ecosystem status report for the Redleg Banana Prawn Sub-fishery

The RAG noted the information provided by Laura Blamey, in particular the climate and ecosystem status report for the JBG and the following environmental conditions:

- The climate conditions suggest that there will be a very good CPUE in the JBG for the upcoming season:
  - the end of 2022 and early 2023 saw a continuation of La Niña conditions

<sup>8</sup> [CSIRO Regional Projection for Northern Australia](#)

- a combined January-February rainfall total of 694 mm recorded at Lake Argyle weather station
- the Indian Ocean Dipole (IOD) was negative in late 2022
- mean sea level has been slightly above average
- both maximum sea surface and air temperature conditions were below average.
- The SOI index has shifted to neutral (slightly positive) towards mid-2023 and an El Niño watch has been issued by the BOM for the rest of the year.

The RAG discussed the impacts of the environmental conditions on redleg banana prawn stocks and the fishery for the upcoming season:

- There is cautious optimism in the linkages between the environmental conditions and impacts on the redleg banana prawn population, the increasing level of data is providing a greater understanding; particularly in the effects of the ENSO and the IOD.
- The massive level of rainfall flooded most waterways in the region.
- The closure of the first season in the JBG has been very favourable for redleg banana prawn catch during the second season. It is also expected that the good conditions for redleg banana prawns will again take fishing pressure away from the tiger prawn fishery.

The RAG discussed information that should be incorporated for the report card:

- There have been no changes made to the report card since the tiger prawn workshop aside from the updating the data, noting that cyclone data has not yet been collated for the JBG.
- There may be a better method to demonstrate average information on climate variables, currently these are averages based on recent data and do not enable the trend in averages to be illustrated properly.
- Industry's experience is that rainfall and the ensuing effect on river flow can be inconsistent, as not all rainfall events result in river flow, and any assumed relationship between the two should be treated with a degree of caution.
- Incorporating a graph of catches from previous years was suggested to emphasise the relationship between catches and environmental factors.

## Agenda item 5. Marine Stewardship Council (MSC) certification

The RAG noted the information provided by NPFI on the progress of the NPF MSC reassessment process<sup>9</sup>, in the final draft report and determination stage:

- The current fishery certificate expires on 18 July 2023, subject to next steps and whether there are any objections lodged, the fishery is expected to be recertified by that date.
- the proposed Client Action Plan contains:
  - Two rollover actions related to updating the harvest strategy for red endeavour prawns (*Metapenaeus ensis*) (due by September 2023) – these are being addressed by the *red endeavour prawn assessment – further potential improvements* project ([Agenda item 15b](#))
  - A new action in relation to sawfish in the banana and tiger prawn fisheries, that the direct effects of these fisheries are highly likely (with 80 per cent probability) to not hinder the recovery of sawfish species<sup>10</sup>.

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<sup>9</sup> information relating to the MSC reassessment of the Northern Prawn Fishery can be accessed at:

[fisheries.msc.org/en/fisheries/australia-northern-prawn/@assessments](https://fisheries.msc.org/en/fisheries/australia-northern-prawn/@assessments)

<sup>10</sup>Under the requirements of the new MSC Fisheries Standard (version 3.0), MSC assessors must now consider whether a fishery is impacting a species' ability to recover to a minimum of '50% of unimpacted levels within three generations or 100 years, whichever is shorter': [msc.org/standards-and-certification/developing-our-standards/the-fisheries-standard-review/projects/best-practice-reducing-impacts-on-endangered-species](https://msc.org/standards-and-certification/developing-our-standards/the-fisheries-standard-review/projects/best-practice-reducing-impacts-on-endangered-species)

The RAG discussed the proposed condition relating to sawfish species:

- There are research projects proceeding that will assist to meet the proposed condition (refer to [Agenda item 10](#))
- While the MSC milestone requirement relating to sawfish species in the NPF is somewhat ambiguous, details on the actions required to achieve this milestone are provided in the Client Action Plan.
- Given the quantitative implication of the proposed condition, how this applies directly to the NPF will need to be considered; noting that other fisheries operating in the area also contribute to sawfish mortality.

#### Recommendations

The RAG recommended that a working group be established to consider the implications of, and how to meet, the new milestone requirement with relation to sawfish.

#### Action Item 6: MSC condition working group

Members of the MSC condition working group to consider the implications of, and how to meet, the MSC milestone requirement:

*By September 2027, demonstrate that systems are in place that allow >80% certainty that the tiger prawn and the white banana prawn sub-fisheries do not hinder recovery of the sawfish species*

Membership: Toby Patterson, Rich Pillans, Darci Wallis, Dave Brewer, Bryan van Wyk, Brandon Meteyard

## Agenda item 6. Is there a role for electronic monitoring in NPF data collection?

The RAG noted:

- Electronic monitoring (EM) is the use of independent electronic systems (i.e., video cameras, sensors etc.) to validate and enhance information provided by fishers in daily fishing logs and/or to collect in-situ environmental information pertinent to the fishery.
- The objective of AFMA's EM expansion project is to provide opportunities for fisheries not using EM technology to trial and potentially implement fishery-specific EM programs. This will enable those fisheries to independently validate catch and effort data and/or begin collecting environmental information around the fishery.

The RAG discussed whether a trial of EM in the NPF is warranted:

- Due to the financial impost on operators, there is a need to ensure that EM implementation represents value for money. There has been a reticence by industry to adopt EM, primarily due to cost and privacy issues, for example whether operators will be required back to port if EM systems breakdown.
- As the NPF is managed through effort controls, target species are not discarded or under-reported the benefit of EM would be limited for these species. As such, it is likely that the focus would be for logbook reporting validation of TEP species and potentially black tiger prawn broodstock collection. Some validation is already provided by both Crew Member Observer (CMO) and AFMA observers programs.
- It is unclear whether EM will achieve MSC needs.
- Concerns were raised about the potential loss of:
  - biological data currently collected by observers, noting most of this data cannot be collected through EM
  - observer engagement and knowledge, for example, the ability for people to identify species and the loss of the collection of biological samples.

- As the main TEP species of concern, sawfish bycatch is a critical issue for the fishery. It is unclear whether the collection of EM footage will lead to improvement in management responses for this and other TEP species.
- Other opportunities/mechanisms for the collection of environmental data, such as temperature loggers, should be considered as part of discussions on EM in the NPF.
- A comprehensive cost benefit analyses, considered from both industry and management perspectives, would enable the issues to be captured.

#### Recommendations

The RAG recommended that a cost/benefit analysis be undertaken from both AFMA and Industry perspectives, and that this should be done prior to any EM trial. Additionally, a working group should be established to consider opportunities for EM that are not directly fisheries data collection but are environmental data related.

#### Action Item 7: EM working group

Members of the Electronic Monitoring Working Group to consider opportunities of EM unrelated to direct fisheries data collection – but environmental data relating to climate change and other non-camera options of value to NPF including the use of inshore temperature and salinity loggers.

Membership: Rob Kenyon, Ian Knuckey, Bryan van Wyk, Éva Plagányi, Brandon Meteyard

#### Action Item 8: AFMA / Industry

AFMA and NPFI to develop cost benefit analyses from management and industry perspectives recognising the different drivers for these stakeholders in the fishery.

#### Action Item 9: CSIRO

Éva Plagányi to provide the publication that has a cost benefit analysis of EM programs (and includes information on the potential loss of observer knowledge) to the EO for dissemination to the RAG.

## Agenda item 7. Wildlife Trade Operations (WTO) reassessment – sea snake conditions

The RAG noted the information provided by Gary Fry:

- The [accreditation](#) of the NPF management plan and export approval under parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) expires in January 2024. AFMA will be applying for reassessment in July 2023.
- A review of current and past research (since 1998) has been undertaken with further research directions in trawl impacts on sea snakes developed:
  - The CMO, AFMA SO and CSIRO prawn monitoring programs currently provide adequate monitoring of long-term catch trends for most TEP species in the NPF
  - Long-term catch trend analysis is undertaken every three years as part of the Bycatch Sustainability Assessment that evaluates the nature and level of impacts of fishing on the EPBC Act protected species. Sea snake interaction analysis has not shown any long-term decline of these species.
  - Research data on direct impacts of trawling on TEP species; fishing mortality and escapement rates, is potentially outdated with the introduction of new bycatch reduction devices (BRDs) that have significantly reduced the total bycatch volumes by up to 40 per cent, possibly increasing survival rates (around 50 per cent in 1990s) of sea snakes caught in trawls.
  - Current sawfish trawl mitigation projects collecting underwater video data on behaviour when interacting with TEDs have provided some data on sea snake escapement rates through TED openings but not through BRDs. According to the data, sea snakes were only able to escape from upward facing TEDs.

- To demonstrate the effects of new BRDs on sea snake interactions either a dedicated at-sea study comparing trawl catches from nets with no BRD and nets with the new BRDs or the use of currently available catch data is needed.

The RAG discussed the progress in implementing the sea snake conditions under the EPBC Act accreditation and agreed that there are ample initiatives to meet the requirements.

The RAG discussed the analysis of sea snake interactions and agreed that it is likely that the reported increase in sea snake interactions is a result of improved reporting by operators rather than increased interactions. While the reduction of the CMO program daily sea snake interaction rate during 2021 was potentially concerning, further analysis of the data found that the vessels carrying CMOs in 2021 were different to other years, including different regions during the seasons fished.

**Action Item 10: AFMA**

AFMA to ensure that the daily interaction rates for AFMA SOs and CMOs are accurate in the 'Average Daily Sea Snake Interaction Rate' graph.

## Agenda item 8. Update of species to be included in the CMO monitoring list

The RAG noted and discussed the information provided by Gary Fry regarding updating the CMO species monitoring list, and information relating to brown mantis shrimp (*Dictyosquilla tuberculata*) and porcupine ray (*Urogymnus asperrimus*) that are proposed for removal from the list:

- It is important that an iterative process is undertaken to consider species being monitored by the CMO program to ensure that the program is efficiently meeting fishery, MSC certification and fishery assessment under the EPBC Act needs.
- The new MSC fisheries standard (version 3.0) provides guidance about whether fishery impacts on species are considered negligible:
  - While the NPF has not yet moved to the new MSC requirements (it is certified under v2.01), considering requirements under version 3.0 would ensure that MSC requirements continue to be met.
  - The risks for in-scope species<sup>11</sup> comprising less than 2 per cent of catch that are resilient would be considered negligible. Both brown mantis shrimp and porcupine ray would be considered in-scope minor bycatch species.
- Bycatch monitoring is considered as part of the fishery assessment under the EPBC Act, administered by DCCEEW. As such, the fishery needs to demonstrate that monitoring is a part of their sustainable bycatch strategy. To justify removing a bycatch species from monitoring lists, the fishery is required to demonstrate that the species has steady or increasing catch trends over time and show that it is not associated with a spatial change in fishing effort.
- Bycatch species are monitored by AFMA scientific observers in the breakdown of bycatch, regardless of whether they are on CMO or independent monitoring program (IMP) monitoring lists or not.

The RAG considered the information regarding the removal of both brown mantis shrimp and porcupine rays ([Attachment E](#)) from the CMO 'at-risk' bycatch monitoring list:

- Neither species have been recognised as high-risk species in the most recent ERAs for either the tiger prawn or banana prawn sub-fisheries.
- Under the MSC fisheries standard the risk for both species is considered negligible.

<sup>11</sup> Under the [MSC Fisheries Standard \(version 3.0\)](#), in-scope species are fish and invertebrates, which are not target species nor endangered, threatened or protected species.

- Brown mantis shrimp are consistently caught in the NPF, have widespread distribution across northern Australia and low within-trawl mortality rates. Populations are not adversely susceptible to impacts from NPF trawling.
- Porcupine rays are rarely recorded in the NPF and only in try-gear, are effectively removed through TEDs, have a widespread distribution across northern Australia and very low within-trawl mortality rates. Populations in the NPF area would not be adversely susceptible to impacts from trawling.

#### Recommendations

The RAG recommended that both the brown mantis shrimp and porcupine ray could be removed from the CMO monitoring list noting that:

- Neither species are considered at risk from the fishery as both the catch trends for the species and the area fished remain steady.
- Catch composition is sampled by the AFMA ISMP observer program and operators are required to report TEPs via their logbooks.

## Agenda item 9. Research project updates

### a. Bycatch sustainability

The RAG noted the update provided by Gary Fry on the long-term bycatch sustainability assessment project, which is progressing well according to the milestones. CMO coverage was 21 per cent of the total boat-day effort during the 2022 tiger season. The CMOs also captured good quality photos of the TEP bycatch.

### b. Integrated monitoring program

The RAG noted the update by Rob Kenyon on the recruitment survey undertaken in February 2023.

- The gulf-wide indices from the survey for:
  - Banana prawns – following a strong wet season, the index was the second highest of the series ( $16.9 \pm 4.8$  prawns per hectare (series range: 1 to 18 prawns  $\text{ha}^{-1}$ )). The Weipa regional index was the highest of the series ( $111.5 \pm 46.0$  prawns  $\text{ha}^{-1}$  (series range: 2 to 111 prawns  $\text{ha}^{-1}$ )).
  - Brown tiger prawns – there has been a significant increase in the index to just above the long-term average of the series ( $8.42$  prawns  $\text{ha}^{-1}$  (series range: 3 to 15 prawns  $\text{ha}^{-1}$ )), it was similar to the decade before 2021. The Mornington regional index for brown tiger prawn doubled from 2022 to 2023.
  - Grooved tiger prawns – while the index ( $4.4 \pm 0.3$  prawns  $\text{ha}^{-1}$ ) was about 30 per cent higher than in 2022, the index has remained stable for the last 5 years with a slight increase that was still well below the long-term average ( $4.4$  prawns  $\text{ha}^{-1}$  (series range: 3 to 11 prawns  $\text{ha}^{-1}$ )). Additionally, the low abundance of grooved tiger prawns in the northern GoC, including a Weipa regional index that was lowest of the series ( $7.1 \pm 1.3$  prawns  $\text{ha}^{-1}$  (series range: 7 to 55 prawns  $\text{ha}^{-1}$ )), which together with the series second-highest Mornington regional index, may indicate a south-ward distribution shift for grooved tiger prawns.
  - Blue endeavour prawns (*M. endeavouri*) – was about ‘average of the series’ at ( $2.6 \pm 0.2$  prawns  $\text{ha}^{-1}$  (series range: 1 to 4 prawns  $\text{ha}^{-1}$ )).
- There was high rainfall throughout the river catchments adjacent to offshore banana prawn habitats in the GOC, which indicated the potential for a high commercial catch in during the 2023 banana prawn season. High catches were taken in the same regions as high survey catches: primarily, Weipa and Bold Point. Following the survey, a significant level of rainfall in March 2023 caused high-level flooding in the catchments of the Leichardt, Albert, Gregory and Nicholson rivers. This also indicated that the indices would be higher than the survey outcomes.

- The Groote regional index was the lowest of the series for both brown tiger prawns ( $3.4 \pm 0.7$  prawns  $\text{ha}^{-1}$  (series range: 3 to 11 prawns  $\text{ha}^{-1}$ )) and grooved tiger prawns ( $3.2 \pm 0.3$  prawns  $\text{ha}^{-1}$  (series range: 3 to 26 prawns  $\text{ha}^{-1}$ )).
  - In conjunction with highest or near highest abundances for grooved tiger prawns in southern GOC regions, a potential southward distribution shift may be indicated.
  - As the abundance of brown tiger prawns north of Groote Eylandt was also low, it is possible a limiting environmental factor, such as temperature, may be influencing tiger prawn abundance in the northern GOC.
  - The RAG also noted the endeavour prawn assessment found that the biomass of blue endeavour prawns in the Groote Eylandt region is depleted (**Agenda Item 15b**).

### c. Productivity analysis in fisheries management – NPF case study

The RAG noted the information on the FRDC project ([FRDC project 2019/026](#)) *measuring, interpreting and monitoring economic productivity in commercial fisheries* and that the NPF was used as a case study for the project.

## Agenda item 10. Sawfish research projects update

### a. NPFI Sawfish projects

The RAG noted the update provided by NPFI:

- Reporting by skippers of TEP species interactions in 2022 was slightly lower than 2021 but still higher than in 2019. Sawfish identification to species level has significantly improved since 2020.
- During the banana season that reporting of TEPs can be problematic as there are many activities occurring. However, trawls during this season are generally very short and, as such, survival could potentially be higher than during the tiger prawn season.
- NPFI continues to work with several research providers to improve management and mitigation of sawfish interactions. Of note, two new projects that have been approved for funding:
  - *Investigating potential for fishing gear, technology and management measures to reduce sawfish and sea snake interactions in Australia's Northern Prawn Fishery*<sup>12</sup> being funded by the MSC, with the overarching objectives of:
    1. Analyse observer data and catch data to identify differences in bycatch between individual vessels, gear type and net mesh size, fishing grounds, and fishing times and seasons
    2. Support the development and design of sawfish bycatch mitigation trials; and
    3. Evaluate whether the implementation of Tom's Fisheye BRD to trawl nets has reduced sea snake bycatch.
  - *Mitigating Sawfish Interactions in the Northern Prawn Fishery*<sup>13</sup> being funded by the DCCEEW's Threatened and Migratory Species Fisheries Bycatch Mitigation Program with the following overarching objectives:
    1. Collect and analyse data to determine the potential efficiency of TED flap mesh material to enable the egress of sawfish; and
    2. Undertake trials of a modified TED (STED) which has been designed with a view to reducing sawfish interactions/improving escapement.

<sup>12</sup> [msc.org/what-we-are-doing/our-collective-impact/ocean-stewardship-fund/impact-projects/reducing-sawfish-interactions-australia-northern-prawn-fishery-2023](https://www.msc.org/what-we-are-doing/our-collective-impact/ocean-stewardship-fund/impact-projects/reducing-sawfish-interactions-australia-northern-prawn-fishery-2023)

<sup>13</sup> [grants.gov.au/Ga/Show/28e293a8-7bfd-4a71-8179-626d61ddc34f](https://grants.gov.au/Ga/Show/28e293a8-7bfd-4a71-8179-626d61ddc34f)

## b. Sawfish Close Kin Mark Recapture (CKMR) Project

The RAG noted the update by Toby Patterson on sawfish tissue sample collection for the *Estimating Narrow Sawfish (Anoxypristis cuspidata) abundance using close-kin mark recapture* ([FRDC project 2021/015](#)) project:

- The number of samples collected during 2022 was low, with a total of 41 samples received. There will be a low precision population estimate if the population of sawfish is above 10,000-20,000. It is important to increase the sampling rate for the next season; this is possible as there has been only a 5-10 per cent rate of return of tissue samples to reported interactions.
- Currently, there is no concern about the spatial distribution of samples received.
- It is expected that it will be possible to gain information about population structures.
- As part of the NESP Sawfish project, sawfish tissue sampling has been extended to NT and QLD (GoC only) gillnet fisheries.

The RAG discussed the potential to increase the level of sawfish sampling noting that skippers have been highly engaged on sawfish issues and connections between the project and industry has been strong. It is important that sawfish fatigue does not happen.

### Action Item 11: Industry / CSIRO

NPF operators to be encouraged to collect sawfish tissue samples for the sawfish CKMR project:

- fleet managers to emphasise the importance of the collection of sawfish tissue samples to skippers
- Brandon Meteyard and Gary Fry to promote the collection of tissue samples at the Cairns CMO workshop and fishery pre-season briefings before the beginning of the 2023 tiger season.

## c. Sawfish – satellite tagging

The RAG noted and discussed the update from Richard Pillans on the sawfish satellite tagging project *Multi-fishery collaboration to assess population abundances and post release survival of threatened sawfish in northern Australia* ([FRDC project 2022/068](#)) and the plans for deployment of satellite tags in the NPF:

- Of the 120 tags to be deployed on sawfish across the fisheries, it is planned that 60 tags will be deployed in the NPF. Tags must be deployed on animals larger than 1.6 metres as the tag size could hinder the survival of smaller sawfish.
- While tags will be deployed across sawfish species to provide information on depth, light and location of the animal for 60 days, the focus of the project will be on both narrow sawfish (*A. cuspidata*) and largetooth sawfish (*Pristis pristis*). Tags will be distributed to CMOs, AFMA observers and any skippers/crew willing to participate, noting it will be important to effectively incentivise both skippers/crew and CMOs to maximise their involvement.
- To avoid a skewed result of survivability, it is important that live sawfish in a variety of conditions are tagged (not just those that are vigorous).

## Agenda item 11. Broodstock catch limits

The RAG noted the information provided by Darci Wallis for setting broodstock catch limits:

- The annual 9 000 individual supply limit of *P. monodon* has been in place since 2017 and, when last considered in 2021, it was recommended that the harvest limit be maintained until an updated stock assessment (scheduled for 2024) allowing a continuation (and improvement where possible) of current *P. monodon* data collection and monitoring across the fishery.
- While the AFMA Commission agreed to maintain management arrangements until the next assessment is undertaken in 2024, the 9 000 individual supply limit for broodstock permits operators was agreed for the 2021 fishing season only.

- There are also Class B SFR operators that fish for broodstock.
- As outlined in the industry update the demand for broodstock is low ([Agenda item 3a](#)).

#### Recommendations

The RAG recommended that the individual supply limit for *P. monodon* be maintained at 9 000 in the NPF for both 2023 and 2024; noting that this is unlikely present a risk to stock sustainability and the demand for live *P. monodon* broodstock supply remains low.

## Agenda item 12. Banana prawn MEY in season trigger annual review

The RAG noted the information presented by Sean Pascoe on the banana prawn MEY catch trigger calculations for 2022 and the implications for the breakeven catch rate and the MEY catch trigger (**Table 1**):

- The breakeven CPUE is sensitive to both prawn prices and fuel costs
- Industry predictions of prawn prices were very good, but costs were overestimated. The resultant estimate of the breakeven CPUE was about 10 per cent different to that using the surveyed prawn prices and fuel costs. These differences had no impact on the resultant MEY trigger catch rate as this was constrained by the lower end of the buffer (at 15 per cent). Additionally, while repairs and maintenance costs increased 136 per cent from 2021 to 2022, there was also no impact on the trigger due to the 15 per cent buffer.

The RAG reviewed the industry estimated fuel and prawn prices compared with the actual prices and costs data input:

- Despite the volatility in prawn prices and fuel costs, the group considered these estimates to be predicted fairly well.
- While the costs for repair and maintenance on boats increased substantially, these costs do not change predictably during either profitable or nonprofitable periods of catch.
- Prawns prices remain volatile as such, the 2023 banana prawn prices predictions may be somewhat different to where prices end up.

**Table 1: Comparison of the industry predicted prices and the actual prices estimated from the industry survey for the 2022 banana prawn season and the impacts of these on the triggers calculated for the fishery.**

	Item	Industry estimate – predicted	Survey estimate – actual	Percentage difference
<b>Inputs</b>	Fuel price (\$/litre)	\$1.40	\$1.21	15.7%
	Banana prawn price (\$/kg)	\$15.50	\$14.93	3.9%
<b>Implications</b>	Breakeven catch rate (kg/boat/day)	227	290	-10.3%
	MEY Trigger (kg/boat/day)	425	425	0%

#### Recommendations

The RAG agreed that the MEY trigger process remains effective and that the process should continue.

## Agenda item 13. Redleg stock assessment

The RAG noted the information presented by Éva Plagányi on the 2023 redleg banana prawn stock assessment, in particular:

- During 2022, the observed effort at 511 days was much higher than the TAE recommendation at 364 days and the observed catch was 622 tonnes which was much higher than the forecasted catch at 459 tonnes.

- The number of boat-days in the JBG for 2022 (511) was well above the data-sufficient number (70) under the redleg banana prawn sub-fishery harvest strategy for undertaking an assessment.
- Fishing power was estimated to have increased 1 per cent in 2022 relative to 2021.
- The estimate of mortality (at 0.05 per week) used for the assessment is an average based on tagging data from 2002 and is uncertain. These data are being revisited; preliminary outcomes of this process indicate that a better model fit is achieved when a lower mortality estimate is used.
- The stock is currently estimated at 110 per cent of the  $B_{MSY}$  level and 92 per cent of the target  $B_{MEY}$  level.
- The recommended TAE for 2023, with no fishing in first season, is 689 boat-days (90 per cent confidence interval [502;876]), with a corresponding catch prediction of 952 tonnes [585;1318]. This is a predicted 35 per cent increase in effort from the previous year (and a 53 per cent increase in catch).
- The optimistic forecast for 2023 is because the model estimates that the stock will fully recover to the target level in 2023; under a deterministic recruitment assumption (i.e.,  $B_{sp(2023)}/B_{MEY} = 98$  per cent).
- The environmental indicators suggest that 2023 may be a good year for redleg banana prawns, although there is currently an El Niño watch which could mean that 2024 may once again be a less favourable year.

The RAG discussed the results of the stock assessment:

- While the effort in the fishery during 2022 was greater than the expected TAE, it was evident that the TAE could have been set higher:
  - There was a large confidence interval associated with the TAE recommendation.
  - The data were retrospectively analysed with a higher-than-average recruitment given last year's favourable environmental conditions on recruitment and outputs from the model suggest that the TAE could have been set higher. Moving forward, environmental impacts on recruitment rates could be incorporated into the stock assessment model if these are considered sufficiently reliable.
- While not guaranteed, there is enough capacity in the fishery for a TAE of 689 boat-days to be achieved, although this would also depend on the level of tiger prawns available in the GOC.

#### Recommendations

In line with the assessment results, and noting the first season JBG fishery closure, the RAG recommended the TAE of 689 boat-days for the redleg banana prawn sub-fishery during 2023 with a corresponding catch prediction of 952 tonnes.

## Agenda item 14. NPF Tiger prawn fishery adaptation strategy workshop

The RAG noted the summary provided by the Chair on the tiger prawn fishery adaptation strategy workshop held in February 2023:

- A workshop report is in development and will be provided for comment when ready.
- The key outcomes of the workshop were the development of potential priority research areas for NPRAG consideration that could improve the tiger prawn fishery, stock assessment and harvest strategy:

#### *Fishing power and catchability*

- Integrate influence analysis of the different inputs into the fishing power model and review the Prawn Trawl Performance Model (PTPM) input data.

#### *Environmental drivers / climate change impacts*

- Examine and prioritise the environmental parameters influencing tiger prawn populations.
- Consider how environmental factors/climate change can be incorporated into the model.
- Consider ways to implement cost-effective monitoring of environmental factors where there is confidence in the relationship between environmental parameters and stock dynamics.
- Consider the capacity/feasibility of looking at environmental data and stocks levels retrospectively to identify relationships between tiger prawn stocks and environmental drivers.

#### *Economics and minimum effort threshold*

- Economic components of the stock assessment should be re-examined including relevance to the current model as well as whether economic assessment is the best approach for the fishery.
- Review the *minimum effort threshold*, including the potential for a dynamic threshold that accounts for changes in the fishery and the economics driving operations.
- Review the need for/relevance of ‘forecasting’ approach in MEY model.

#### *Stock assessment inputs and biological data*

- Finalise the species-split project as a high priority; incorporate the results into the assessment.
- Review biological inputs to the model according to the age of and confidence in the data, the cost of updating, likelihood of parameter changes and influence on the stock assessment outputs.

The RAG noted that some of the potential priority research areas already have relevant projects underway or project proposals being developed, with some for consideration at this meeting.

The RAG discussed the outcomes and agreed that they need to be considered in the context of:

- The development of the next five-year NPF strategic research plan, which should incorporate the medium and long-term priorities.
- The 2024-25 annual research statement, which should incorporate the more immediate priorities.

## **Agenda item 15. Tiger prawn sub-fishery research project updates**

### **a. Species distribution**

The RAG noted the update from André Punt on the progress of the *updated NPF species distribution data, models and sampling schemes – towards regular ongoing monitoring project* (AFMA project 2019/0805):

- Preliminary updates to the species-split models were presented at the NPF Tiger Prawn Strategic Planning Workshop in February 2023. The estimates from the stock assessment are broadly robust to updating the species-split models. However, the reference points from the stock assessment are impacted to a non-trivial degree (for example, 5 to 20 per cent increases in  $E_{MSY}$  and  $E_{MEY}$  for grooved tiger prawns and 6 to 20 per cent reductions for brown tiger prawns).
- A full evaluation of model diagnostics for the assessments based on the alternative species-split models needs to occur before final conclusions are drawn.
- The preliminary analysis involved adding a new predictor variable, related to the species proportions by location changing over time, in an attempt to identify non-stationarity. There is still no evidence for non-stationarity in species-split proportions for endeavour prawns, but this is not the case for tiger prawns. The non-stationary in tiger prawn manifests in some removals previously attributed to brown tiger prawns being attributed to grooved tiger prawns.
- Since the workshop, the following work has been conducted:
  - Species-split data have been updated to 2022 and appended to the data used for the analyses.
  - 2023 survey data have been updated and appended to the data used for the analyses.
  - Scientific observer data querying is ongoing.

- The species size distribution analyses have been updated to include 2022.
- Benthic habitat variables across the NPF region used have been updated for use in the sensitivity analyses.

The RAG was advised that, to enable a dynamic species distribution consideration to be incorporated into the tiger prawn stock assessment model, the AFMA observer program will need to undertake a relevant sampling regime that provides adequate and consistent coverage of the fishery.

## **b. Red endeavour prawn assessment**

The RAG noted the information presented by Yeming Lei on the outcome of the assessments from the “*red endeavour prawn assessment – further potential improvements*” project (AFMA project 2020/0806) using the updated growth, CPUE and fishing power parameters:

- Blue endeavour prawns are more abundant than red endeavour prawns;  $B_{msy}$  and MSY are nearly twice as large for blue endeavour prawns than for red endeavour prawns.
- Productivity, gauged by population growth rate and  $F_{msy}$ , are largely comparable between the two species, although red endeavour prawns tend to have a slightly higher productivity.
- Assessment outcomes for the two species, by the different stock distributions, were:

### *Red endeavour prawns*

- As a single stock: The median  $B_{2020}/B_{msy}$  was 1.20 (95 per cent CI 0.77—1.76) and median  $F_{2020}/F_{msy}$  0.21 (95 per cent CI 0.14—0.35), suggesting the red endeavour prawn stock was unlikely to be overfished and overfishing was not occurring in 2020.
- As four substocks: Estimated  $F_{msy}$  values were similar among the four stocks. Median  $B_{2020}/B_{msy}$  ratio varied from 1.08 in Region 2 to 1.88 in Region 1, and biomass in all regions were above the  $B_{msy}$  reference point. Median  $F_{2020}/F_{msy}$  ratio ranged from 0.13 in Region 4 to 0.21 in Region 3; all stocks were well below their  $F_{msy}$  benchmarks.

### *Blue endeavour prawns*

- As a single stock: The median  $B_{2020}/B_{msy}$  was 1.12 (95 per cent CI 0.79—1.54) and median  $F_{2020}/F_{msy}$  0.22 (95 per cent CI 0.14—0.35), suggesting the blue endeavour prawn stock was unlikely to be overfished and overfishing was not occurring in 2020.
- As four substocks: Median  $B_{2020}/B_{msy}$  ratio was estimated as: 1.70, 0.35, 1.47, and 1.89 for stocks 1 to 4, respectively, suggesting that although stocks 1, 3, and 4 were above the reference point in 2020, stock 2 is depleted (approx. 35 per cent of unfished abundance). Despite this, the median  $F_{2020}/F_{msy}$  ratio ranged from 0.05 in Region 4 to 0.47 in Region 2, all below their  $F_{msy}$  benchmarks.

The RAG noted the requirement under the MSC certification that the NPF harvest strategy is updated by September 2023 to include red endeavour prawns (refer to [Agenda item 5](#)).

The RAG thanked Shijie Zhou and the team for their work on the improvements to the stock assessment and discussed the potential incorporation of the outcomes of the project into the tiger prawn bioeconomic stock assessment model:

- Revenue from endeavour prawns affects the revenues during the tiger prawn season and incorporating the outputs of the red endeavour prawn project may lessen the uncertainty in the output of the tiger prawn bioeconomic model.
- The base case for the tiger prawn stock assessment model outputs does not currently incorporate red endeavour prawns. Because there will be repercussions to incorporating this species, it would be prudent to continue to incorporate it as a sensitivity run.

- The benefits of using adjusted catch data rather than raw catch data requires the conversion of catch in the months other than August to equivalent August weight. This introduces additional uncertainties and requires more effort. While directly using raw catch and ignoring life stage of harvested prawns may be biased toward precaution, the analysis is straightforward and does not change the overall conclusion about stock status.
- Undertaking the red endeavour prawn assessment as a single stock is consistent with current Tiger Prawn assessment, will satisfy external needs such as MSC certification, and provide an overall NPF stock status. On the other hand, spatial assessments would assist in determining potential localised depletions in the fishery.

#### **Recommendation**

The RAG accepted the endeavour prawn assessment results and recommended the following that:

- raw catch data rather than adjusted catch data is used as an input into the tiger prawn stock assessment model
- the model is run as a single stock rather than in four stock regions
- the red endeavour prawns are incorporated as a sensitivity in the tiger prawn stock assessment rather than as part of the base-case, until further review by NPRAG in November.

### **c. Fishing power**

The RAG noted the information presented by Denham Parker on the finalised project “*revision of the Northern Prawn Fishery fishing power data series and model*” (AFMA project 2017/0836):

- Only the impact of variables on model outputs was analysed, not the validity of the effect of each variable.
- The offsets in the model drive the increasing trend, whilst fitted variables generally account for the inter-annual variability around the underlying trend.
- The combined influence of the swept area index (which accounts for about 50 per cent of the increase) and other offset variables account for approximately 70 per cent of the increase in fishing power. The remaining increase can be attributed to changes in other modelled parameters.
- The shift of the fleet from the double to quad net rigs, in conjunction with a fleet wide increase in rated engine power and increased deployment of the thinnest netting ply, are the major factors contributing to the observed increase of the swept area index since 2008.
- The introduction of TEDs and BRDs decreased the catching efficiency slightly due to prawn escapement
- The influences of some constant offsets (for example, black and white echosounder) are outdated and require review.

The RAG thanked Denham Parker for undertaking the review and discussed influencing variables.

Discussions with industry representatives suggested that the observed increase in rated engine power and the transition to thinner netting ply may not have translated directly to increases in swept area, as the PTPM results indicate. Rather, the primary purpose for these gear changes is likely to be for improved fuel efficiency. Furthermore, fishing gear behaviour (for example, to maintain an effective spread of the net mouth) is a determinant of trawling speed, thus limiting swept area.

The RAG agreed that the impact of modelled fishing power is a high-level issue for the fishery; changes in the estimates can affect stock assessment outcomes. Given the dominant influence of the swept area index (derived from the PTPM) on estimating fishing power, a review of the mechanistic PTPM by a suitably qualified person is required.

## d. MICE – tiger prawn

The RAG noted the information provided by Éva Plagányi on:

- The NPRAG developed project, *methods to account for climate impacts in fishery models and management: Case study example of environmental contributors that affect tiger prawn population dynamics*, will commence in August 2023.
  - The project will now to be co-funded by FRDC. Consequently, the project scope has been expanded to achieve broader benefits outside of the NPF (regarding the utility of MICE models, particularly accounting for climate variability) and has an additional phase (outreach and extension activities, with guidelines developed, for other fisheries).
  - The first two phases (data analysis and ecosystem modelling) and the fourth phase (outreach and extension) will be undertaken in any case, and the third phase (field-based study to obtain data on juvenile abundance and associated habitat) will proceed if deemed necessary. The agency responsible for approving phase three is still being determined.
- The banana prawn MICE<sup>14</sup>.
  - The model explains 50-83 per cent of variation in banana prawn catch. However, as the river flow component of the model is complex, and to update it is an involved process, it has not been run since the project.
  - CSIRO is undertaking further work to investigate a potential river flow or rainfall proxy that can be used in the model.

The RAG discussed the banana prawn MICE and nuances in developing a rainfall proxy for river flow, it may be problematic as it would depend on several factors including the timing, location and intensity of rainfall.

## Agenda item 16. Tiger prawn stock assessment

### a. 2022 fishery catch, effort and survey index update

The RAG noted:

- That whilst the RAG initially recommended in May 2022 that a stock assessment be undertaken in 2023, in July 2022 the NPRAG recommended that the additional tiger prawn assessment not be undertaken due to: unprecedented economic issues; the estimated stock size being above limit reference points; the tiger prawn TAE implemented was more precautionary than the assessment recommended; and, that areas of concern in the assessment needed to be resolved.
- The presentation by Roy Deng on the data from 2022 tiger prawn season. There was a 21.4 per cent decrease in fishing effort during the tiger prawn season, from 4 665 boat-days in 2021 to 3 667 in 2022. The resultant catch of prawns also decreased:
  - Tiger prawn catches decreased by 8.9 per cent, from 1014 tonnes in 2021 to 924 tonnes in 2022. Tiger prawn catches peaked in 2015 (3 168 tonnes) and have generally declined since, with 2022 being the second lowest recorded catch in the NPF history; the lowest recorded catch was 814 tonnes taken in 2011.
    1. Grooved tiger prawn landings in 2022 was 621 tonnes, which is the second lowest value in the NPF history and a 7.7 per cent decrease from 2021. Correspondingly, the 2022 Grooved Tiger Prawn directed fishing effort of 2 660 days was a 20 per cent decrease from the year prior.

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<sup>14</sup> Developed during the Ecological modelling of the impacts of water development in the Gulf of Carpentaria with particular reference to impacts on the Northern Prawn Fishery project [FRDC project 2018/079](#).

2. Brown tiger prawns catch landings decreased to 303 tonnes in 2022 (about 11 per cent) with a corresponding 25 per cent decrease in fishing effort (1007 days).
  - Blue endeavour prawn landings in 2022 were 217 tonnes, an 18 per cent decrease from 2021 (266 tonnes).
  - Red endeavour prawn landings in 2022 were 155 tonnes, a 9 per cent decreased from 2021 (170 tonnes).

The RAG discussed:

- The recruitment survey in February occurred prior to the significant rainfall in March. This rainfall would likely have positively affected the survey index ([Agenda Item 9b](#)).
- The early season closure of the tiger prawn fishery in 2022 by one month, and the transfer of effort in the JBG, lessened the number of fishing days and lowered catches of tiger and endeavour prawns.
- The linkage between events, such as low catch levels and the early closure of the season, is important to interpret data presented. As such, a fishery management history would be an important tool to understand linkages between data outcomes and impacts on stock assessments.

The early tiger prawn fishery closure on 1 November 2022 was expected to result in a 16 per cent effort reduction. The RAG noted that actual fishing effort in the tiger prawn fishery GOC was reduced by 30.8 per cent; partly resulting from the early closure, but also due to the transfer of effort to the JBG to target redleg banana prawns. The RAG commended industry on this achievement.

**Action Item 12: NPFI / AFMA**

Annie Jarrett to provide AFMA her fishery history document. AFMA to consider collating the history.

## **b. Consideration of 2023 TAE setting**

Given the process for setting the 2022 TAE, the Commission will need to consider a TAE for the 2023 tiger prawn season.

The RAG noted:

- The process by which the TAE for the 2022 tiger prawn season was derived (at the May 2022 meeting) as issues with the minimum effort threshold used for the bioeconomic model caused concerns in applying the TAE derived from the model in line with the harvest strategy.
  - Ultimately, the RAG recommended implementing a 10 - 20 per cent effort cut (based on the 5-year average (2017-22) of 5303 days), with NPFI to decide how this would be operationalised.
  - The extremely high fuel prices at the time, together with poor recent recruitment indices would unlikely warrant a TAE increase (as predicted by the assessment given the minimum effort threshold) if effort was aiming for an MEY goal for the fishery.
  - NPFI subsequently recommended the 10-20 per cent cut in effort be achieved by closing the 2022 tiger prawn season on 1<sup>st</sup> November, one month earlier than currently outlined under the NPF Harvest Strategy. This proposal was subsequently agreed to by both NORMAC and the AFMA Commission.
- The key outputs of the 2022 stock assessment presented to the RAG in May 2022<sup>15</sup>. The estimated spawning stock size in 2021 was 61 per cent of  $S_{MEY}$  and 75 per cent of  $S_{MSY}$  for grooved tiger prawns and 66 per cent of  $S_{MEY}$  and 90 per cent of  $S_{MSY}$  for brown tiger prawns (although all estimated stock size were above the limit reference points<sup>16</sup>).

<sup>15</sup> 17-18 May 2022 NPRAG meeting minutes – available at: [Northern Prawn Fishery Resource Assessment Group past meetings | Australian Fisheries Management Authority \(afma.gov.au\)](#)

<sup>16</sup> The five-year moving average spawning stock size over 50%  $S_{MSY}$

- The improving indicators for the fishery compared to the same time last year:
  - The results of the 2023 pre-season survey; the recruitment indices for both tiger prawn species had improved; particularly for brown tiger prawns, although the grooved tiger prawn index remained below the long-term average and the brown tiger prawn index is just above the long-term average ([Agenda item 9b](#)).
  - The reduction in fuel prices since May 2022 of approximately 30 per cent ([Agenda Item 3a](#)).
  - The summary the 2022 NPF tiger prawn fishery catch, effort and survey index, including the effort reduction achieved during the 2022 tiger prawn season of 30.8 per cent ([Agenda item 16a](#)).
  - Other tiger prawn fishery assessment related topics, including the species distribution, red endeavour prawn assessment, fishing power projects ([Agenda items 15a-c](#)).

For all the reasons highlighted in the previous year, the RAG reconfirmed its decision from May 2022 and that it was still not appropriate to use the 2022 stock assessment base case to derive a 2023 TAE. Members also reiterated their concern in having to again move outside of the harvest strategy approach to set the 2023 TAE. Whilst noting the recent improvements in the 2023 independent recruitment survey indices, the significant effort reductions in the 2022 tiger prawn season and the lower fuel prices, the RAG was aware of the previous assessment outcomes that estimated spawning stock size of both tiger prawn species was below maximum sustainable yield ( $B_{MSY}$ ) and maximum economic yield ( $B_{MEY}$ ) targets. As such, the RAG agreed that it was appropriate to take a precautionary approach and that there wasn't sufficient justification to deviate from the 2022 TAE recommendation.

#### Recommendations

The RAG recommended maintaining a 10-20 per cent cut in effort (as nominal days) relative to the recent five-year average for the 2017-21 years (of 5 303 effort days), as per the 2022 TAE recommendation, noting that:

- while the recruitment indices for both tiger prawn species have increased based on the results of the 2023 pre-season survey, these remain below the long-term average and marginally above the long-term average for grooved tiger prawn and brown tiger prawn, respectively.
- the effort reduction achieved in the Gulf of Carpentaria during 2022 through the early closure of the tiger prawn season and the transfer of effort into the Joseph Bonaparte Gulf for redleg banana prawns was 30.8 per cent (this is twice the predicted 16 per cent reduction).
- importantly for an MEY target, the impact of fuel costs has been lessened as the fuel price decreased by approximately one third since the RAG considered the TAE for 2022.

The RAG recommended that NPMI consider the tiger prawn stock assessment results, and the RAG advice and recommendations, and provide advice to NORMAC on the preferred option/s to achieve a 10-20 per cent effort reduction on tiger prawns during 2023.

The RAG noted that although the recommended cut in effort in 2022 and 2023 is ad hoc, it is based on first principles in that it is a precautionary approach to declining stock trends and substantial increases in costs. It is also aligned with general approach taken in other Commonwealth fisheries under anomalous conditions and acknowledging that reductions in effort levels can be staged or constrained within reasonable bounds to not overly impact the viability of fishing operations and still result in stock recovery.

#### Action Item 13: NPMI

NPMI to consider the RAG recommendation and provide advice to NORMAC on the preferred option that will achieve a 10-20 per cent effort cut on tiger prawns effort during the 2023 tiger prawn season.

## Agenda item 17. Tiger prawn stock assessment – MEY data consideration

The RAG noted the information provided by Sean Pascoe and discussed the analysis of approaches to incorporate estimates of prawn and fuel price changes over time into future bioeconomic analyses when setting TAEs for the tiger prawn fishery:

- Currently, projected prawn and fuel prices are used in the tiger prawn bioeconomic model.
- The model is currently based on the fuel costs of the previous year, derived from the economic survey. These lagged costs may be an over- or underestimate of the current costs, and hence may result in model projection being overly optimistic or pessimistic.
- Actual prices varied considerably more than the estimated prawn prices even when forecasts were applied. As the data used in the model was lagged one year (i.e., the prices received in the previous year), the forecast series differed from the actual prices even in the first year of the model analysis.
- Modelled TAE is substantially more sensitive to the assumption around the current fuel prices than the projections of future prawn and fuel prices. Results from the analysis show that there is little benefit in including price forecasts in the model as the trends in actual prices varied substantially from the forecasts.
- Long-term MEY estimates are less sensitive to the current assumptions:
  - The difference between the current model MEY estimate and the fully modified model (with updated fuel prices and not price projections) was only 6 per cent. However, the trajectory is sensitive – the higher fuel prices in the current year resulted in a substantially lower recommended TAE.
  - The high variability in prawn and fuel prices provides an additional rationale for setting a minimum threshold effort level, with the short-term TAE estimate being sensitive to the highly variable values.
- The current estimates are not used to track MEY year-to-year but to find a pathway ahead to achieve MEY over the longer term (7 years). It may be possible to predict fuel forecasts if there are better forecasting rules.

The RAG agreed to defer the decision about the use of prawn and fuel price assumptions until the NPRAG meeting in November, when a number of projects and decisions will be needed about several inputs into the 2024 tiger prawn stock assessment.

### Action Item 14: Tom Kompas

Tom Kompas to consider approaches that might enable the forecast prawn and fuel price estimates to be improved for use in the bioeconomic model.

## Agenda item 18. Preparation for the 2024 tiger prawn stock assessment

The RAG noted the information provided by Sean Pascoe on the key areas requiring further consideration prior to undertaking the 2024 tiger prawn stock assessment:

- Determining an appropriate effort threshold; the threshold value constrained the output of the bioeconomic model in 2022 and, as such, an ad hoc TAE was determined ([Agenda Item 16b](#)).
- The application of the outcomes of the red endeavour stock assessment project into the bioeconomic stock assessment model, particularly whether to incorporate in the bioeconomic model base case or as a sensitivity for both the red endeavour prawn assessment model and the updated blue endeavour assessment model (discussed at [Agenda item 15b](#)).
- Consideration needs to be given to revising the fishing power model (discussed at [Agenda Item 15c](#)).

- The revised species-split estimates will change the time-series of information used in the 2024 assessment, such as catch, effort time-series and fishing power series – additional work will be required to re-calculate the appropriate time-series of data for use in future stock assessments.
- Determining the appropriate prices and costs to use in the bioeconomic model (discussed at [Agenda Item 17](#)).

The RAG discussed:

- Possible alternative minimum effort thresholds that could be applied to the stock assessment. But as per the RAG discussions in May 2022, the RAG either did not support the assumptions required for this or were concerned there was not sufficient information to propose an appropriate quantitative alternative. The RAG agreed that dealing with the minimum effort threshold was a very high priority to be addressed before the next (2024) assessment.
- While the minimum effort threshold has been split across the two tiger prawn species, it was originally intended to be on the one species.
- While there is the potential to include the red endeavour model in the NPF bioeconomic assessment model, this will impact the TAE estimate, as such it might be prudent to only include the red endeavour model as a sensitivity until the impact on the broader tiger prawn assessment is understood. However, there is less risk incorporating the updated blue endeavour assessment model into the bioeconomic model base case.
- There is still further work to be undertaken on the other items to be considered, including improving the estimation of projected fuel costs in the model ([Agenda Item 17](#)), as such these decisions could be deferred to the NPRAG meeting in November 2023.

#### Recommendations

The RAG recommended that:

- the minimum effort threshold should be set for total effort, rather than half applied to each tiger prawn species.
- to assist with considering the appropriate effort threshold a small review project should be undertaken immediately with the results presented at the November 2023 NPRAG meeting (along with other project results that will influence the assessment approach).
- the new blue endeavour assessment model is included in the bioeconomic model base case for 2024, and that the updated assessment model for red endeavours is maintained in the model as a sensitivity.

#### Action Item 15: AFMA / Ian Knuckey

AFMA to work with Ian Knuckey on the options for the five key areas that need addressing for the 2024 tiger prawn stock assessment to inform the NPRAG meeting in November 2023.

#### Action Item 16: AFMA / CSIRO

CSIRO to undertake a minimum effort threshold analysis project for the NPRAG meeting in November to inform consideration on options for the 2024 tiger prawn fishery assessment. AFMA to confer with CSIRO about the project including funding.

## Agenda item 19. 2024-25 Annual research statement and research scopes

The RAG agreed that this item would be considered out of session.

## Agenda item 20. Next meeting

The RAG agreed that the next meeting will be a two-day meeting in Brisbane in November 2023.

## Agenda item 21. Other Business

The RAG noted the concern raised by Éva Plagányi about the well drilling activity planned for Joseph Bonaparte Gulf<sup>17</sup> and whether there could be implications for the redleg banana prawn stock assessment.

**Close of meeting: 1530 AEST**

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<sup>17</sup> Further information about the Beehive Prospect activity: [eogresources.com/company/areas-of-operation/australia](https://eogresources.com/company/areas-of-operation/australia)

## Attachment A – Register of interest

Participants	Declared Interest
<b>Chair</b>	
Ian Knuckey	<p><b>Positions:</b>            Director –Fishwell Consulting Pty Ltd            Director –Olrac Australia (Electronic logbooks)            Chair –Northern Prawn Fishery Resource Assessment Group            Chair –Tropical Rock Lobster Resource Assessment Group            Chair –Victorian Rock Lobster and Giant Crab Assessment Group            Chair –Victorian Central Zone Abalone Fisheries Resource Advisory Group            Chair –Gulf of St Vincent’s Prawn Fishery MAC Research Scientific Committee            Scientific Member –Northern Prawn Management Advisory Committee            Scientific Member –Gulf of St Vincent’s Prawn Fishery Management Advisory Committee            Scientific Member –Tropical Tuna Resource Assessment Group            Scientific Member – SESSF Resource Assessment Group            Councillor –Victorian Marine and Coastal Council Member –The Geelong Agri Collective</p> <p><b>Fishwell current/recent projects:</b>            DAWE Project: Multi-sector fisheries capacity building            AFMA 2022: Annual monitoring, reporting and assessment of SPF marine mammal interactions, including effectiveness of mitigation measures            AFMA 2020-0807: Bass Strait Scallop Fishery Survey – 2020-22            AFMA project: Design sea cucumber fishery-independent survey for Coral Sea            FRDC 2019-027: Improving and promoting fish-trawl selectivity in the SESSF and GABTS            FRDC 2018-021: Development and evaluation of SESSF multi-species harvest strategies            Traffic Project: Shark Product Traceability            Sea Cucumber Assn: Design and implementation of various sea cucumber dive surveys. Australia Bay: Queensland Gulf of Carpentaria Developmental Fin Fish Trawl Fishery            Beach Energy: BACI study of Prion Marine Seismic Survey impacts relative biomass of scallops on beds in the immediate vicinity.            Expert Witness: Gladstone Harbour development impacts</p>
<b>Members</b>	
Ian Boot	Industry member – NPRAG & NORMAC Managing Director of Austfish, a company that operates NPF vessels. Has a commercial interest in the fishery. NPF broodstock permit holder. Participates in scampi fishing.
David Brewer	Scientific member – NPRAG Director – Upwelling P/L (David Brewer Consulting) Scientific member – Torres Strait Fin Fish Working Group Chair – Torres Strait Fin Fish RAG Current consultancy work with the Quandamooka Yoolooburrabee Aboriginal Corporation/FRDC (Moreton Bay), Newcrest mining (Lihir I gold mine PNG) and MRAG (MSC certification assessment). Research provider. Has in the past and may in future seek and receive funding for research in the fishery.

Rik Buckworth	<p>Scientific Member – NPRAG  Director -Sea Sense Australia Pty Ltd  Adjunct Professor – Charles Darwin University  CSIRO Honorary Fellow  Chair of the NT Aquarium Fishery Management Advisory Committee  Consultancy contract with NPFI to review Red Endeavour Prawns  Current and pending projects with government agencies, CDU and fishing industry for projects in the NT, Torres Strait and Qld  Researcher involved particularly in stock assessment research in NPF. Has in the past and may in future seek and receive funding for research in the fishery.  Member – Data Working Group for the GABTF</p>
Tom Kompas	<p>Economic member – NPRAG  Employed by University of Melbourne. Research provider. Has in the past and may in future seek and receive funding for research in the fishery.</p>
Éva Plagányi	<p>Scientific member – NPRAG  Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery.  Research provider involved particularly in stock assessment research in NPF.  Also currently receiving FRDC funding related to development of a GoC ecosystem model.  Scientific member of TRLRAG and TS HCRAG.</p>
Phil Robson	<p>Industry member – NPRAG  Employee of A Raptis and Sons, responsible for managing NPF vessels &amp; an NT demersal fish trawler. Has provided charter for scientific surveys in NPF in the past and may in future.</p>
Bryan van Wyk	<p>Industry member – NPRAG  Employed by Austral Fisheries, a company with SFR holdings in the fishery.</p>
Darci Wallis	<p>AFMA member – NPRAG  Employed by AFMA, Manager of Northern Prawn Fishery.  No interest, pecuniary or otherwise.</p>
<b>Invited participants</b>	
Annie Jarrett	<p>CEO – NPFI  Commonwealth Fisheries Association Director  Chair – Australian Council of Prawn Fisheries (ACPF)  Member of the FRDC selection panel.  Invited participant - NORMAC  No pecuniary interests  Represents the interests of industry.</p>
<b>AFMA</b>	
Cate Coddington (EO)	<p>Employed by AFMA  No interest, pecuniary or otherwise.</p>
Sarah Kirkcaldie	<p>Employed by AFMA  No interest, pecuniary or otherwise.</p>
Brodie Macdonald	<p>Employed by AFMA, Senior Manager – Northern Fisheries  No interest, pecuniary or otherwise.</p>
Brett McCallum	<p>AFMA Commissioner  Chair – Offshore Snapper Fishery Management Advisory Committee (NT)  Safety &amp; Training consultant - WA Fishing Industry Council  Director – Bresal Consulting  Chair – FRDC Research Advisory Committee (WA)  Chair – FRDC Research Advisory Committee (SA)  Chair – PIRSA Cost Recovery Review Panel  Facilitator – NSW Peak Industry Body Review</p>
Alice McDonald	<p>Employed by AFMA, Climate Adaptation Senior Program Manager, No interest pecuniary or otherwise</p>

Observers / Presenters	
Laura Blamey	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery
Ian Butler	Employed by ABARES and compiles information for the ABARES Fishery Status and Status of Australian Fish Stocks reporting. No current pecuniary interest in fishery.
Robert Curtotti	Employed by ABARES. Research interests for ABARES projects, in particular the economic survey of operators in the NPF. No pecuniary interests, personal or otherwise in the fishery
Roy Deng	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery
Michael Dylewski	Employed by ABARES and. No current pecuniary interest in fishery. Note: in 2021, undertook (and plan to undertake this year) an economic survey of the NPF, which had a similar obligation to protect NPF operators' confidentiality and privacy.
Gary Fry	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery
Trevor Hutton	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery
Rob Kenyon	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery
Yeming Lei	PhD student supervised by a CSIRO employee. Through CSIRO, he has in the past, and may in the future, receive funding for research related to the fishery.
Rich Little	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery. Assessment scientist. Project leader CSIRO Marine Visual Technologies project team on automated catch detection and species identification. Project leader Southeast Australian Marine Ecosystem Survey (SEA-MES) Principle Investigator for the Species Distribution project
Brandon Meteyard	Employed by NPFI. No pecuniary interests. Represents the interests of industry
Denham Parker	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery.
Sean Pascoe	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery.
Toby Patterson	Employed by the CSIRO and (on behalf of the organisation) has in the past, and may in the future, receive funding for research related to the fishery.
Richard Pillans	Employed by the CSIRO and through the organisation has in the past, and may in the future, receive funding for research related to the fishery.
André Punt	Employed by the CSIRO and the University of Washington. Research provider. Member of an organization that provides advisory services for fisheries management. The CSIRO has in the past, and may in the future, receive funding for research related to the fishery. Member of a Pop Model LLC, an LLC located in the USA that provides consultancy services, including related to the MSC certification (the fishery is currently MSC certified). Editor-in-chief of a peer-reviewed scientific journal ( <i>Fisheries Research</i> ) that publishes scientific papers related to the fishery.

## Attachment B – Final meeting agenda

Agenda Items were discussed in the following order during the meeting:

- **Day 1:** 1, 2, 3, 21, 4a&b, 5, 8, 10b,c&a, 6, 7, 11, 12, 13
- **Day 2:** 14, 15c,a,b&d, 9b, 16a,b, 17, 18, 19, 20

Item	Purpose	Presenter
<b>1. Preliminaries</b> a. Welcome and apologies b. Declarations of interest c. Adoption of Agenda d. Minutes from previous meeting e. Correspondence	a. for information b. for action c. for adoption d. for information	Chair
<b>2. Actions arising from previous meetings</b>	For information	AFMA
<b>3. Update reports</b> a. Industry update b. AFMA management update c. CSIRO update d. Northern rivers	For information	a. Industry members / NPFI b. AFMA c. CSIRO d. CSIRO
<b>4. Climate and ecosystem status reports</b> a. Update on AFMA's Climate Adaptation Program - Climate and ecosystem status report for Tiger prawn sub-fishery b. Climate and ecosystem status report for Redleg banana prawn sub-fishery	a. for discussion  b. for advice	a. AFMA  b. CSIRO
<b>5. MSC certification</b>	For information	NPFI
<b>6. Is there a role for EM in the NPF</b>	For discussion	AFMA
<b>7. WTO reassessment - Sea snake conditions</b>	For advice	CSIRO
<b>8. Update of species to be included in the CMO monitoring list</b>	For decision	CSIRO
<b>9. Research project updates</b> a. Bycatch sustainability b. Integrated monitoring program c. Productivity analysis in fisheries management – NPF case study	For information	CSIRO
<b>10. Sawfish research projects update</b> a. Sawfish projects b. Sawfish CKMR update c. Sawfish – satellite tagging	For information	a. NPFI b. CSIRO c. CSIRO
<b>11. Broodstock catch limits</b>	For recommendation	AFMA
<b>12. Banana prawn MEY in-season trigger annual review</b>	For review	CSIRO
<b>13. Redleg banana prawn stock assessment</b>	For advice	CSIRO
<b>14. NPF Tiger Prawn Fishery Adaptation Strategy Workshop</b>	For advice	Chair
<b>15. Tiger prawn fishery research updates</b> a. Species distribution b. Red endeavour prawn assessment c. Fishing power d. MICE – tiger prawn	a. for information b. for recommendation c. for advice d. for information	CSIRO
<b>16. Tiger prawn stock assessment</b> a. 2022 fishery catch, effort and survey index update b. consideration of 2023 TAE setting	a. for information b. for recommendation	a. CSIRO b. AFMA
<b>17. Tiger prawn stock assessment – MEY data consideration</b>	For advice	CSIRO / Tom Kompas

Item	Purpose	Presenter
18. Preparation for the 2024 tiger prawn stock assessment	For advice	CSIRO
19. 2024-25 Annual research statement and research scopes	For advice	AFMA
20. Next meeting	For information	AFMA
21. Other business		

## Attachment C – NPRAG action items

		Complete	Redundant	Underway	Need NPRAG advice	Not yet started
No.	Mtg Date	Action Item	Agency / Person	Timeframe	Progress	
5	12-13 May 2021	AFMA/NPFI to provide NPRAG with an analysis of the champagne lobster data, including grading data.	AFMA / NPFI		<p><b>Complete</b> – an analysis was undertaken on champagne lobster catch data between 2008 and 2022, including available grade data:</p> <ul style="list-style-type: none"> <li>The total catch of champagne lobsters has been highly variable (between 5.4 tonnes and 0.1 tonnes) with no correlation between effort, represented as total number of shots in the scampi fishery (unlike the target species – scampi).</li> <li>It is difficult to determine whether champagne lobster size has changed between 2008 and 2021 as the catches are highly variable. Relative distribution of catch in each grade was analysed. The percentage of the catch across grades have remained relatively constant over time – this relative distribution of catch is the most important variable in detecting size class change, rather than the tonnage in each grade.</li> </ul> <p>Items of note:</p> <ul style="list-style-type: none"> <li>There are a limited number of operators that land champagne lobsters, and only one company grades catch (Grade 1: 400+gms / Grade 2: 300-400gms / Grade 3: 200-300gms / Grade 4: 100-200gms).</li> <li>Market effects may impact discarding. Anecdotally, discarding is relatively low at between zero and five per cent of the catch. There is very little formal reporting of discarding.</li> <li>In the final banana prawn ERA, champagne lobsters were listed as a medium risk and not high risk as in the draft.</li> </ul>	
2	23 November 21	Éva Plagányi to check if red endeavour prawns part of previous data focusing on JBG stocks of redleg banana prawns.	CSIRO	November 2022	<p><b>Complete</b> – the data has been checked and all available data are included.</p>	

1	8-9 February 2022	NPFI and AFMA to consult with industry regarding the trigger and catch limit proposed for scampi to provide back to the RAG. A paper to be provide to NPRAG in May 2022 that includes industry feedback and any other relevant information.	AFMA and NPFI	May 2022	<b>Complete</b> – Harvest strategy with trigger and catch limits for scampi incorporated into the draft and attached to the 15 July 2022 NPRAG meeting minutes.
3	8-9 February 2022	AFMA, CSIRO and NPFI to develop a proposal to review the information on squid to support updating the NPF harvest strategy. Need to ensure that the protection of spawning aggregations and the experience from other squid fisheries (including pre-season surveys) are considered. An update to be provided to the NPRAG in May 2022, with further consideration to occur at the October/November 2022 if required.	AFMA, CSIRO and NPFI	November 2022	<b>Pending</b> – when resources are available to direct to this task, likely to be during next update of the Harvest Strategy for tiger prawns.
4	8-9 February 2022	Industry to provide feedback to CSIRO on the approach of using a voluntary trigger rate to help operators decide when to stop fishing for redleg banana prawns; currently proposed as 0.5 tonnes (500kg) per day.	Industry	As soon as practicable	<b>Complete</b> – NPFI provided feedback to CSIRO – the 0.5 tonne voluntary trigger has been maintained.
7	8-9 February 2022	As a 2023/24 research priority for the fishery, workshops will be held to ensure that the approach to the tiger prawn assessment remains appropriate and is future-proofed by considering the latest information and initiatives. These workshops will inform the new 5-year strategic research plan.	AFMA, CSIRO, NPFI and Ian Knuckey	Feb 2023	<b>Complete</b> – workshop held in Brisbane on 24-24 February 2023.
8	8-9 February 2022	NPFI (Josh Cahill) and CSIRO (Gary Fry) to consider readjusting priorities for the CMO program to ensure that the program it is targeting fishery needs, particularly given the recent ERA results.	NPFI and CSIRO	August 2022	<b>Complete</b> – changes to data collection commenced for the tiger season in August 2022.
1	17-18 May 2022	AFMA to continue development of a data and monitoring plan for the fishery in consultation with the RAG. The following items to be considered: <ul style="list-style-type: none"> <li>Refining the objectives of the data and monitoring plan including updating the drivers of data needs by considering habitat and communities, social licence / values and acceptability, market access, animal welfare and indigenous interests;</li> <li>Determining the temporal and spatial observer needs of the fishery, taking into consideration the scientific report that originally established the program;</li> </ul>	AFMA	During development of the data plan	<b>Underway</b> – preliminary work has been undertaken to develop the data plan. Progress has stalled until there are appropriate resources available to undertake the work.

		<ul style="list-style-type: none"> <li>• Consider setting and monitoring of observer program targets on an annual basis;</li> <li>• Determining the worth of continuing to collect species abundance counts and, if retained, whether the current protocols are suitable;</li> <li>• Exploring options for validating the CMO and Scientific Observer eyeball estimates of total bycatch;</li> <li>• Automating data quality checks and the rectification of data errors;</li> <li>• Consider if there are any required changes to byproduct species data collection and monitoring; and</li> <li>• Consider the feasibility (including costs) and options of introducing finer scale reporting (shot level) for tiger prawn fishing and, potentially, banana prawn fishing.</li> </ul>			
2	17-18 May 2022	AFMA to inform the RAG of the outcome of the strategic research proposal process	AFMA	As soon as practicable	<b>Complete</b> – The RAG informed via email on 7 July 2022. The ARC considered this proposal at their Feb 2022 meeting where they suggested that the proposal required more development and that a focused workshop may be an appropriate approach to do that. Subsequently the priority was also provided to COMRAC for consideration. COMRAC requested some further work on the priority for reconsideration.
3	17-18 May 2022	AFMA to inform the RAG on how funding is allocated under the Data Transformation and Electronic Monitoring Program.	AFMA	As soon as practicable	<b>Complete</b> – AFMA was provided \$20.1 million dollars over the forward estimates in the 2021 Budget for the delivery of the Data Transformation and Electronic Monitoring Program. This was comprised of \$9.95 million for Data Transformation initiatives and \$10.1 million for the e-monitoring program.
4	17-18 May 2022	NPFI to consider the importance and cost/benefit of maintaining MSC certification for red endeavour prawns.	NPFI	As soon as practicable	<b>Pending</b> – the costs/implications of including red endeavours under MSC certification cannot be considered until the red endeavour project is completed.
5	17-18 May 2022	A Harvest Strategy Drafting Working Group to be established and convened in early to mid-July to ensure that the draft Harvest Strategy incorporates all items as discussed at the meeting. The updated Harvest Strategy to be provided to NPRAG at the end of July, NORMAC to consider it in mid-August, in	Harvest Strategy Drafting Working Group	mid-July	<b>Complete</b> – the updated harvest strategy provided to NPRAG at the 15 July 2022 meeting.

		time for the Commission meeting in mid-September. Membership: NPFI, AFMA, Rik Buckworth, Ian Knuckey, Tom Kompas and Éva Plagányi			
6	17-18 May 2022	MEY tiger prawn stock assessment be performed again next year to obtain improved model output with updated 2022 data, rather than waiting for the usual two-year cycle for this assessment.	CSIRO	May 2023	<b>Redundant</b> – NPRAG recommended at the 15 July 2022 meeting that an additional tiger prawn stock assessment not be undertaken due to unprecedented economic issues, that there are no sustainability concerns for the 4 species and that the TAE that was implemented was more precautionary than the assessment recommended.
7	17-18 May 2022	NPFI to consider the 2021 stock assessment results and the RAG recommendations/ advice and provide advice to NORMAC on the preferred option/s to achieve a 10 – 20% effort cut on tiger prawns in 2022. Required updates to the MEY model be discussed/ considered as part of the tiger prawn fishery assessment improvements workshop	NPFI	May 2022	<b>Complete</b> – NPFI met on 19 May 2022 and recommended a fixed season closure be implemented to take effect on 1 November 2022, rather than closing on the season as normal on the 30 November 2022 (resulting in a reduction of effort from recent levels by 9.78%. In addition, it is expected that (as with the 2021 season) operators will expend effort in the JBG which would reduce the effort applied in the tiger prawn fishery. Including this expected effort reduction would present a reduction of 16.6% on the five-year average
8	17-18 May 2022	AFMA to undertake an analysis of sea snake interactions, like that done for sawfish, to determine whether these interaction rates are consistent between logbook information and that from the CMO and AFMA scientific observer programs.	AFMA	November 2022 meeting	<b>Complete</b> – a basic analysis was undertaken; it was found that the increase in logbook reported interactions (in both total numbers across the fishery and average number of sea snakes per vessel) is likely the result of improved reporting by operators rather than increased interactions.
9	17-18 May 2022	Develop an appropriate project using available information that can analyse sea snake behaviour in fishing gear and understanding escapement through the current bycatch reduction devices, noting that footage and information regarding size structure and species that interact with the gear is available from research undertaken on sawfish.	AFMA, Gary Fry and Annie Jarrett	As soon as practicable	<b>Complete</b> – project funded by <a href="#">MSC</a> : <i>Investigating potential for fishing gear, technology and management measures to reduce sawfish and sea snake interactions in Australia's Northern Prawn Fishery</i>
10	17-18 May 2022	AFMA and NPFI to conduct a scoping workshop in July 2022 that will prepare and 'scope' for a more targeted workshop in late 2022 to enable a strategic review of the tiger prawn stock assessment that will consider the latest information and initiatives. Membership: NPFI, AFMA, Ian Knuckey, key industry members (Annie Jarrett to confirm), CSIRO, ABARES, Tom Kompas and Rik Buckworth	Tiger prawn assessment working group	July 2022	<b>Complete</b> – scoping workshop held on 18 July 2022.

11	17-18 May 2022	AFMA to update the 2023/24 Annual Research Statement based on the discussion at the meeting.	AFMA	August 2022	<b>Complete</b> – provided to NPRAG at their July 2022 meeting for information
12	17-18 May 2022	AFMA to provide an update to the RAG on the status of the automation of ERA, and an evaluation of the costs for undertaking an ERA triggers checklist.	AFMA	November 2022 meeting	<b>Redundant</b> –AFMA Management is currently undertaking a review of <i>Fishery Management Paper Number 14 – AFMA’s Approach to Ecological Risk Management</i> and its supporting Guide to AFMA’s Ecological Risk Management Framework. Among other things the revised policy explores the concept of a stepped risk assessment utilising triggers and benefits of automated ERA to determine when an ERA is to be updated rather than the default five years in the current policy. At this early stage there are no explicit savings of the automated approach, but we expect to explore this further through the review of the policy and guidelines. The policy and guidelines will shortly be released for broader comment (including through the RAGs and MACs) and we encourage the RAG to contribute to that process.
13	17-18 May 2022	Gary Fry to investigate a list of steps and develop a reasonably reliable basis to document the process for considering removing the collection of species from the CMO program.	Gary Fry	August 2022	<b>Complete</b> – discussed at <b>Agenda Item 8</b>
14	17-18 May 2022	Annie Jarrett and Toby Patterson to discuss the development of processes that will enable appropriate management responses to occur in parallel with research, rather than needing to wait until the completion of research projects.	NPFI / CSIRO	November 2022 meeting	<b>Not yet started</b> – Pending due to lack of available resources.
15	17-18 May 2022	Toby Patterson to provide an update of the sawfish CKMR project at the November 2022 NPRAG meeting.	CSIRO	November 2022 meeting	<b>Complete</b> – presented at <b>Agenda Item 10b.</b>
1	15 July 2022	AFMA to update the revised NPF Harvest Strategy as per the NPRAG discussion (in consultation with CSIRO and NPFI as relevant).	AFMA (with CSIRO & NPFI)	August 2022	<b>Complete</b> – attached to the 15 July 2022 NPRAG meeting minutes.
2	15 July 2022	AFMA to find the original Figure [3] – <i>sources of data for the NPF, and some routine processing pathways</i> – so that it may be updated with the latest information.	AFMA	As soon as practicable	<b>Complete</b> – The original could not be found. However, the figure has been converted from pdf to word and is available by contacting the NPRAG EO.
3	15 July 2022	Shijie Zhou to provide the research paper ‘ <i>Estimating growth from length frequency distribution: comparison of ELEFAN and Bayesian approaches for red endeavour prawns (Metapenaeus ensis)</i> ’ to the EO for dissemination to NPRAG once published.	CSIRO	As soon as practicable	<b>Complete</b> – the research paper was emailed to meeting participants on 22 July 2022

4	15 July 2022	Annie Jarrett to check with MSC if there are any implications from stepping outside the process [for tiger prawn TAE setting] described in the harvest strategy, noting that the decision on effort landed on by the RAG, NORMAC and the AFMA Commission was more precautionary than the assessment recommended.	NPFI	As soon as practicable	<b>Redundant</b> –the MSC reassessment is in process and the MSC Announcement Comment Draft Report (ACDR) reflects the very precautionary nature of NPRAG/ NORMAC decision/approach
1	7 December 2022	CSIRO to update the <i>detailed analysis of environmental contributors that could affect tiger prawn population dynamics</i> research proposal to have more of a strategic focus; the research is ground-breaking and could have broader implications with benefit flowing to other fisheries.	CSIRO	January 2023	<b>Complete</b> – provided to the 79 <sup>th</sup> meeting of the ARC, which considered and endorsed the proposal for funding
2	7 December 2022	AFMA to distribute the completed assessment form [for the tiger prawn population dynamics research proposal] to NPRAG for comment.	AFMA	January 2023	<b>Complete</b> – research proposal assessment form provided to NPRAG for comment and provided to the ARC for consideration at the 79 <sup>th</sup> meeting.
3	7 December 2022	Tom Kompas to work with Sean Pascoe to develop a factsheet relating to the low effort threshold for the tiger prawn assessment. Éva Plagányi to provide further information about the needs of the factsheet to Tom Kompas.	Tom Kompas / CSIRO	January 2023	<b>Complete</b> – factsheet provided to participants of the tiger prawn strategic planning workshop

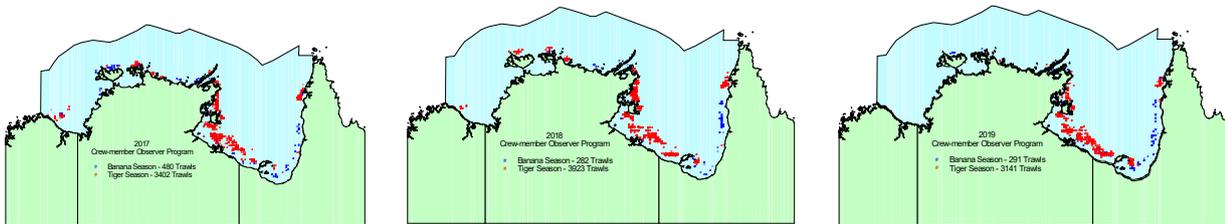
## Attachment D – Action items arising from the meeting

No.	Meeting Date	Action Item	Agency / Person	Timeframe
1	24-25 May 2023	AFMA to distribute the champagne lobster analysis to the RAG members, noting the requirements under the <i>Fisheries Management Paper 12 – information disclosure</i> policy.	AFMA	As soon as practicable
2	24-25 May 2023	AFMA to provide an update to the NPRAG when the ERA review is completed, noting that one of the main drivers for moving to an automated system was the potential cost savings.	AFMA	As soon as practicable
3	24-25 May 2023	Annie Jarrett to provide the table containing catch report details of the banana prawn reporting periods to the EO for distribution to the NPRAG.	NPFI	As soon as practicable
4	24-25 May 2023	Alice McDonald to provide the <i>AFMA's Climate Adaptation Program – Climate and ecosystem status report for the tiger prawn sub-fishery</i> presentation to the EO for dissemination to NPRAG.	Alice McDonald	As soon as practicable
5	24-25 May 2023	Ian Knuckey and Annie Jarrett to discuss the potential for additional calibrated data loggers in the fishery, potentially on more NPF vessels as part of the IMOS Ships of Opportunity program.	Ian Knuckey / Annie Jarrett	As soon as practicable
6	24-25 May 2023	Members of the MSC condition working group to consider the implications of, and how to meet, the MSC milestone requirement: <i>By September 2027, demonstrate that systems are in place that allow &gt;80% certainty that the tiger prawn and the white banana prawn sub-fisheries do not hinder recovery of the sawfish species</i> Membership: Toby Patterson, Rich Pillans, Darci Wallis, Dave Brewer, Bryan van Wyk, Brandon Meteyard	MSC condition working group	As soon as practicable
7	24-25 May 2023	Members of the Electronic Monitoring Working Group to consider opportunities of EM unrelated to direct fisheries data collection – but environmental data relating to climate change and other non-camera options of value to NPF including the use of inshore temperature and salinity loggers.  Membership: Rob Kenyon, Ian Knuckey, Bryan van Wyk, Éva Plagányi, Brandon Meteyard	EM working group	As soon as practicable
8	24-25 May 2023	AFMA and NPFI to develop cost benefit analyses from management and industry perspectives recognising the different drivers for these stakeholders in the fishery.	AFMA / Industry	As soon as practicable
9	24-25 May 2023	Éva Plagányi to provide the publication that has a cost benefit analysis of EM programs (and includes information on the potential loss of observer knowledge) to the EO for dissemination to the RAG.	CSIRO	As soon as practicable
10	24-25 May 2023	AFMA to ensure that the daily interaction rates for AFMA SOs and CMOs are accurate in the 'Average Daily Sea Snake Interaction Rate' graph.	AFMA	As soon as practicable
11	24-25 May 2023	NPF operators to be encouraged to collect sawfish tissue samples for the sawfish CKMR project: <ul style="list-style-type: none"> <li>Fleet managers to emphasise the importance of the collection of sawfish tissue samples to skippers</li> </ul>	Industry / CSIRO	During the tiger prawn season

No.	Meeting Date	Action Item	Agency / Person	Timeframe
		<ul style="list-style-type: none"> <li>Brandon Meteyard and Gary Fry to promote the collection of tissue samples at the Cairns CMO workshop and fishery pre-season briefings before the beginning of the 2023 tiger season.</li> </ul>		
12	24-25 May 2023	Annie Jarrett to provide AFMA her fishery history document. AFMA to consider collating the history.	NPFI / AFMA	As soon as practicable
13	24-25 May 2023	NPFI to consider the RAG recommendation and provide advice to NORMAC on the preferred option that will achieve a 10-20% effort cut on tiger prawns effort during the 2023 tiger prawn season.	NPFI	NORMAC meeting in June 2023
14	24-25 May 2023	Tom Kompas to consider approaches that might enable the forecast prawn and fuel price estimates to be improved for use in the bioeconomic model.	Tom Kompas	NPRAG meeting in November 2023
15	24-25 May 2023	AFMA to work with Ian Knuckey on the options for the five key areas that need addressing for the 2024 tiger prawn stock assessment to inform the NPRAG meeting in November 2023.	AFMA / Ian Knuckey	NPRAG meeting in November 2023
16	24-25 May 2023	CSIRO to undertake a minimum effort threshold analysis project for the NPRAG meeting in November to inform consideration on options for the 2024 tiger prawn fishery assessment. AFMA to confer with CSIRO about the project including funding.	AFMA / CSIRO	NPRAG meeting in November 2023

## Attachment E – Information relating to the removal of brown mantis shrimp and porcupine ray from the CMO list of monitored species

Trawl sites recorded for the crew-member observer program from 2017 to 2019 in the NPF.



### Brown Striped Mantis Shrimp (*Dictyosquilla tuberculata*)

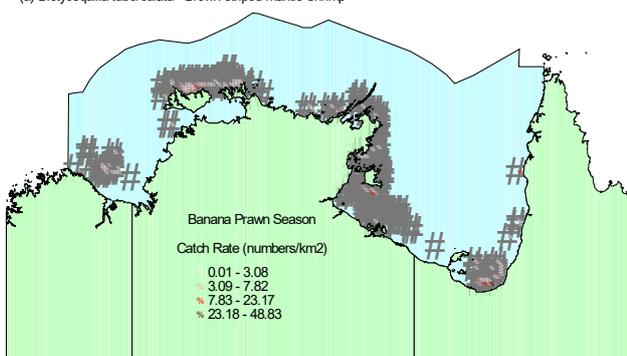
Source: 'Monitoring interactions with bycatch species using crew-member observer data collected in the Northern prawn Fishery: 2017-2019' [Report June 2021](#)

- Catch data collected since 2009
- Long term catch trends were assessed in 2021 for data period 2009-19
- Steady increase in catch trend from 2010 to 2019
- Widely distributed throughout the NPF region and outside
- Within-trawl mortality rates low (around 20%)
- Bycatch proportion (MSC 2022 Report 2016-2021):
  - o Red Leg – 0.077%
  - o Banana – 0.009%
  - o Tiger – 0.072%
- MSC v.3.0 Categorisation: Principle 2 In-Scope Species
- AFMA continues to monitor all bycatch species through subsampling total catches

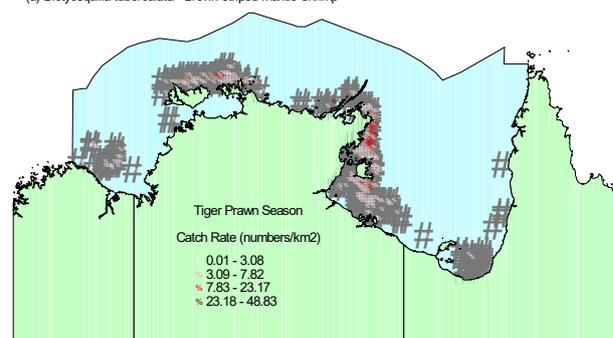
This species is consistently caught in the NPF, widespread distribution across northern Australia, low within-trawl mortality rates therefore populations are not adversely susceptible to impacts from NPF trawling and, as such, was removed from the CMO species monitoring list.

### Distribution and catch rates of Brown-Striped Mantis Shrimp interactions within the NPF

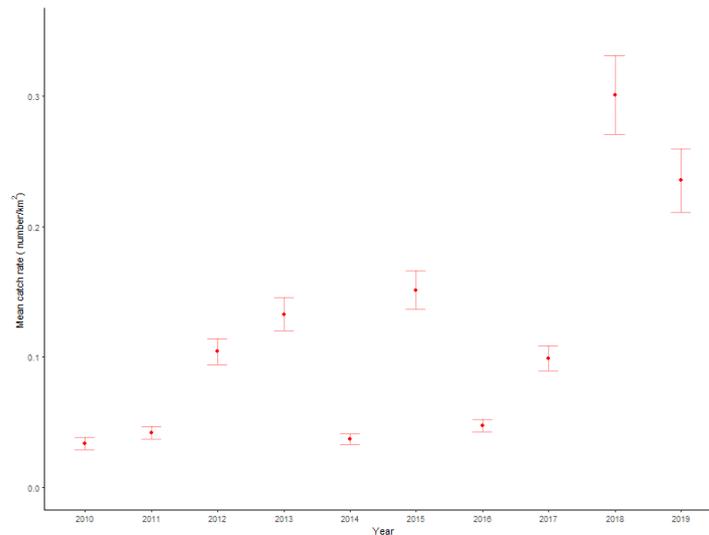
(a) *Dictyosquilla tuberculata* - Brown-striped Mantis Shrimp



(a) *Dictyosquilla tuberculata* - Brown-striped Mantis Shrimp



**Trends in mean catch rate (numbers per km<sup>2</sup>) with 95% confidence intervals for the Brown-striped Mantis Shrimp (*Dictyosquilla tuberculata*) from the crew-member observer program from 2010 to 2019.**



**Native distribution of Brown-striped Mantis Shrimp (source: sealifebase 2023)**



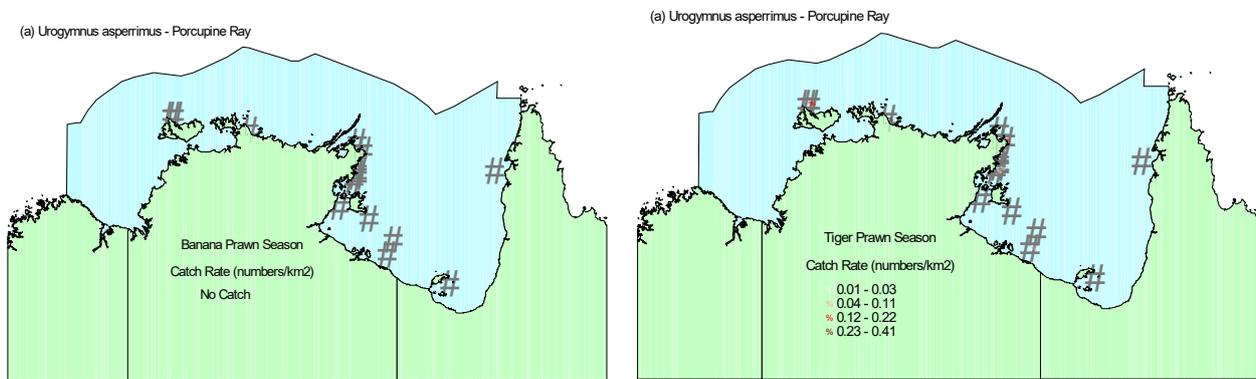
**Porcupine Ray (*Urogymnus asperrimus*)**

Source: 'Monitoring interactions with bycatch species using crew-member observer data collected in the Northern prawn Fishery: 2017-2019' [Report June 2021](#)

- Catch data collected since 2006
- Recorded seven times during the CMO program, all records from try-gear interactions
- Within-trawl mortality rates very low (0%)
- Long term catch trends not assessed in 2021 for data period 2006-19 due to limited interaction data
- Likely to be effectively excluded from main gear through TED interaction
- Widely distributed outside of NPF area (Last and Stevens 2009; Fishbase 2014)
- Mostly reef-associated species (Fishbase 2014)
- AFMA continues to monitor all bycatch species through subsampling total catches
- Bycatch proportion (MSC 2015 Report 2007-2015):
  - o Red Leg – <0.001%
  - o Banana – <0.001%
  - o Tiger – <0.001%
- MSC v.3.0 Categorisation: Principle 2 In-Scope Species

This species is rarely recorded in the NPF and only in try-gear, effectively removed through TEDs, widespread distribution across northern Australia, very low within-trawl mortality rates therefore populations are not adversely susceptible to impacts from NPF trawling and, as such, was removed from the CMO species monitoring list.

### Distribution and catch rates of Porcupine Ray interactions within the NPF



### Native distribution of Porcupine Ray (source: Fishbase 2023)

