Australian Government
Australian Fisheries Management Authority

# Northern Prawn Fishery Resource Assessment Group (NPRAG) Meeting

## Meeting Minutes

## Date: 7-8 November 2019

## Venue: Brisbane Riverview Hotel

# Attendees

| **Thursday 7 November 2019** | |
|---|---|
| **Name** | **Member type** |
| *Ian Knuckey* | *Chair* |
| *Phil Robson* | *Industry Member* |
| *Ian Boot* | *Industry Member* |
| *David Brewer* | *Scientific Member* |
| *Rik Buckworth* | *Scientific Member* |
| *David Power* | *AFMA Member* |
| *Stephen Eves* | *Executive Officer - AFMA* |
| *Annie Jarrett* | *Invited Participant – NPFI* |
| *Adrianne Laird* | *Observer – NPFI* |
| *Trevor Hutton* | *Observer – CSIRO* |
| *Mahdi Parsa* | *Observer – ABARES* |
| *Gary Fry* | *Observer – CSIRO* |
| *Rob Kenyon* | *Observer – CSIRO* |
| *Judy Upston* | *Observer – CSIRO* |
| *Roy Deng* | *Observer – CSIRO* |
| *Eva Plaganyi* | *Observer – CSIRO* |
| *Laura Blamey* | *Observer – CSIRO* |
| *Sean Pascoe* | *Observer – CSIRO* |
| *Toby Patterson* | *Observer – CSIRO* |
| *Miriana Sporcic* | *Observer – CSIRO* |
| *Tamre Sarhan* | *Observer – AFMA* |
| *Steve Hall* | *Observer – AFMA* |
| **Friday 8 November 2019** | |
| *Ian Knuckey* | *Chair* |
| *Phil Robson* | *Industry Member* |
| *Ian Boot* | *Industry Member* |
| *David Brewer* | *Scientific Member* |
| *Rik Buckworth* | *Scientific Member* |
| *David Power* | *AFMA Member* |
| *Stephen Eves* | *Executive Officer - AFMA* |
| *Annie Jarrett* | *Invited Participant – NPFI* |
| *Adrianne Laird* | *Observer – NPFI* |
| *Trevor Hutton* | *Observer – CSIRO* |
| *Mahdi Parsa* | *Observer – ABARES* |
| *Gary Fry* | *Observer – CSIRO* |
| *Rob Kenyon* | *Observer – CSIRO* |
| *Judy Upston* | *Observer – CSIRO* |

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|---|---|
| *Roy Deng* | *Observer – CSIRO* |
| *Eva Plaganyi* | *Observer – CSIRO* |
| *Laura Blamey* | *Observer – CSIRO* |
| *Tonya van der Velde* | *Observer – CSIRO* |
| *Toby Patterson* | *Observer – CSIRO* |
| *Miriana Sporcic* | *Observer – CSIRO* |

# 1 Preliminaries

## 1.1 Welcome and apologies

The Northern Prawn Fishery Resource Assessment Group (NPRAG) Chair, Ian Knuckey, opened the meeting at 9:00 am (EST) at the Riverview Hotel in Brisbane on 7 November 2019 with an Acknowledgement of Country. The Chair noted apologies from Economic Member Tom Kompas.

## 1.2 Adoption of Agenda

The Chair requested that the NPRAG consider the draft agenda (Attachment 1), identify any required amendments, and adopt the draft agenda for the meeting. Due to the availability of some participants, the agenda items were reordered to accommodate availability.

## 1.3 Declaration of interests

The Chair requested that NPRAG members consider the standing table of declared interests (Attachment 2) and individually declare whether the stated interests remain accurate, and if not, provide an update on those.

NPFI participants declared they have a potential conflict with any item that involves research funding and would step out of the room if funding priorities were to be discussed. It was also noted that during the research agenda item the CSIRO/research representatives have a potential conflict and would be asked to leave if recommendations on research priorities were to be made.

Ian Boot declared his participation in scampi fishing and there may be a potential conflict if scampi was to be discussed during the meeting.

No other apparent conflicts of interest were identified that would prevent individuals participating in discussions but it was confirmed that if a particular conflict arose for any agenda item, the relevant party would be asked to leave the meeting at the appropriate time.

## 1.4 Minutes from previous meetings

It was noted that the minutes from the 29 August 2019 teleconference were accepted out-of-session via email as a true and accurate record of the meeting.

# 2 Action items

The Executive Officer addressed the action items listed in Attachment 3 and updated the NPRAG on their progress.

The AFMA Scientific Observer advised that during 2019, data had been collected on bird/warp strikes. Zero interactions were reported and AFMA will consider what the wildlife data collection protocols will be for future observer trips.

Rob Kenyon provided an update on the preliminary outcomes of Andrew Broadley's[1] work on northern waters streamflow/catch modelling. Key results indicate that maintenance of low-level flows is a crucial requirement for sustained fishery yields. Interpretation of the modelling emphasises the importance of protecting low-level flows as well as high-level flows. The prohibition of water harvest during low-flow years may be a management option required to sustain fishery production. The outcomes of this research suggest that protecting low-level flows has the capacity to meet the requirements of agricultural development of river catchments while also maintaining terrestrial-marine streamflow linkages for adjacent marine fisheries.

# 3 Update reports

## 3.1 Industry update

NPRAG noted an update from Industry on the 2019 tiger prawn season. It was advised that catches of tiger prawns and endeavour prawns in the Gulf of Carpentaria (GoC) and across the Top End have been good. Prawn catches near the Tully Inlet and west of Mornington Island were some of the best in a long time. Chinese markets are becoming more receptive to endeavour prawns. Fuel prices have been steady throughout the season at 82 cents in port and $1.02 from the mothership.

The RAG noted a further update from NPFI on: the NPF Bycatch Strategy; sawfish mitigation; and, the CMO program.

The majority of operators have opted to use the Tom's Fisheye BRD with a couple also using the Kon's Covered Fisheyes BRD. Several skippers have installed the new Tom's Fisheye BRD in all their nets. Full implementation of the new BRDs in all tiger prawn fishing nets will be mandatory for the tiger prawn season from 2020. The RAG also noted that the Tom's Fisheye BRD may reduce sea snake interactions, but further data collection and analysis is required to confirm this observation.

To date, testing and implementation of new BRDs that achieve the 30 per cent reduction has only been in the tiger prawn season. Implementation in the banana prawn season has not yet occurred as the tiger prawn fishery has significantly more bycatch and implementation of the new devices in the banana prawn season could result in substantial prawn loss. The use of other approved BRDs remains mandatory in the banana prawn season.

The RAG noted that the NPF Industry discussed and agreed to the implementation of BRDs which reduce bycatch by 30 per cent or more being mandatory in all nets in the tiger prawn season from 2020. It was also noted that mandatory use of the new BRDs for vessels targeting tiger prawns in the first season is problematic and NPFI has thus requested that analysis of the quantity of tiger prawns caught in the first half (as a proportion of the yearly tiger prawn catch) be undertaken to determine a trigger value for review of BRD use in the first season. In addition, NPFI is in the process of developing a Code of Conduct for operators targeting tiger prawns in the first season. The results of the analysis

[1] Australian Rivers Institute, Griffith University, Nathan, Queensland, Australia

will be reported to NPRAG and NORMAC in early 2020 with a view to seeking support for an appropriate trigger value to determine when a review of BRDs for use in the banana prawn season would occur. The use of other approved BRDs would continue to be mandatory in the banana prawn season until a review occurred. The RAG suggested that although there may be problems with the implementation of the new BRDs for vessels targeting tiger prawns in the first season, best practice should still be pursued. The RAG recommended reviewing the trigger value data to determine how to proceed in implementing 100 per cent use of the new BRDs for vessels targeting tiger prawns.

The RAG noted an update on the current sawfish mitigation projects underway including: the testing of electric fields; underwater footage of sawfish interactions with trawl nets; population structure and connectivity of sawfish across northern Australia; and, improving logbook reporting of sawfish species.

A summary of the 2019 CMO program was provided. Two CMOs collected data during the banana prawn season and 10 are collecting data during the tiger prawn season. The 2019 CMO Workshop was held in July with eight CMOs attending (5 returning CMOs, 3 new recruits). One other returning CMO and two new recruits who were unable to attend the workshop were briefed on their boats and provided with their data collection kits.

**Action:**

- NPFI to provide the RAG with results of the analysis of the quantity of tiger prawns caught in the first half (as a proportion of the yearly tiger prawn catch) to determine a trigger value for review of BRD use in the first season.

## 3.2 AFMA management update

NPRAG noted an update provided by AFMA management including:

- Ecological Risk Assessment (ERA) – the first draft has been completed and will be presented later in the meeting.
- Fisheries Management Strategy (FMS) – AFMA and NPFI are progressing with development of the NPF FMS. A full draft of the FMS has been provided to the RAG to illustrate the full layout of the document and how all the sections fit together.
- A proposal to list Narrow Sawfish as endangered was submitted to the Threatened Species Scientific Committee for consideration in June 2019. AFMA provided the Department of the Environment and Energy with an overview of management actions already in place in the NPF to protect sawfish as well as the outcomes of past ERAs. On 29 September 2019 the Minister for the Environment confirmed that narrow sawfish had been prioritised for assessment under the EPBC Act.
- Following a review by NPRAG and NORMAC, AFMA has amended the NPF harvest strategy to change the commencement of the 12-month review period for scampi from 1 January to 1 December each year. Both NPRAG and NORMAC were in full support of the proposed change and it will take effect on 1 December 2019.
- Following advice and support from NPRAG, AFMA management is engaging CSIRO to conduct an assessment of Black Tiger Prawns (*Penaeus monodon*). The assessment will consider the following components as outlined in the CSIRO proposal:
    - CPUE standardisation using two potential methods
        - Generalised Additive Modelling (GAM)
        - Geostatistical modelling

- Bayesian biomass dynamic assessment (provides B and F estimates)
- Catch-only assessment using CPUE (provides B and F estimates)

The RAG discussed the timing of the *P. monodon* stock assessment as collection usually starts in March/April each year and it is unlikely results will be available until June 2020. The RAG suggested that the fishing mortality assessment could be undertaken as a priority and the results will hopefully inform whether the current harvest level is sustainable. Following this, the rest of the assessment can be undertaken to provide biomass results in mid-2020. CSIRO advised it will explore options to provide results before March 2020 and a preliminary report for the RAG to consider in May 2020.

**Action:**

- CSIRO to explore options to provide an update on *P. monodon* stock assessment results before March 2020 and the preliminary report by May 2020.

### 3.3 AFMA Scientific Observer update

The RAG noted a summary of the 2019 AFMA Scientific Observer program. The RAG discussed the observer coverage and it was questioned whether the coverage was adequately distributed spatially and across seasons. It was suggested that the RAG was not in a position to make ad hoc decisions about observer coverage and a rigorous process would be a better approach based on a review of the data needs. The RAG recommended that Dave Brewer and Gary Fry review the observer report and suggest a process for determining the temporal and spatial observer needs of the fishery, taking into consideration the scientific report that originally established the program. It was also suggested that the observer report should contain the programs targets and a summary of how the program is tracking in relation to the targets.

**Actions:**

- Dave Brewer and Gary Fry to review the AFMA Scientific Observer report and suggest a process for determining the temporal and spatial observer needs of the fishery, taking into consideration the scientific report that originally established the program
- AFMA to consider including the observer program targets in the annual observer report and a summary of how the program is tracking in relation to the targets.

# 4 NPF data/monitoring plan

The RAG noted a summary of the NPF data workshop that was held the previous day and progress in developing the NPF data/monitoring plan. The purpose of the data and monitoring plan is to provide a review and plan for ongoing data collection needed to support evidence-based fishery management decisions in the NPF. In particular as it relates to the management of commercial species, bycatch species, threatened, endangered and protected (TEP) species, habitats and communities and the pursuit of broader management objectives. The RAG had a brief discussion regarding the data needs for each species group identified at the data workshop.

It was suggested that a lot of the fishery's data needs are determined by the objectives the fishery wants to pursue. The RAG recommended that NPFI should consider the NPF byproduct species

and determine its aspirations for each species to inform what level of assessment is required, which will also help identify what the data gaps are.

It was also suggested that, with the development of the FMS, the accessibility to the various components of the FMS should be maintained. Hyperlinks on the AFMA website to the various FMS components was suggested as a good approach to maintain usability.

**Actions:**

- NPFI to consider the NPF byproduct species and determine its aspirations for each species to inform what level of assessment is required and what the data gaps are
- AFMA to explore options to maintain accessibility and usability of the various components of the FMS.

# 5 Tiger prawn assessment – planning for 2020 assessment

The RAG noted a summary of the CSIRO NPF assessment team annual meeting, the proposed sensitivity tests for the 2020 tiger prawn stock assessment, an update on the fishing power analysis and a progress report on the species split project.

**Tiger prawn assessment**

The RAG reviewed the proposed sensitivity tests to be run with the 2020 tiger prawn stock assessment including the delay-difference model, mid-high fishing power, fixed effort pattern, estimate season, constraining effort change (year-on-year), low effort threshold and the base-case plus Red Endeavour Prawn scenarios. CSIRO proposed an additional sensitivity test, a no-effort threshold scenario, because the current base case has a lower effort threshold that was set when there was limited data. This lower effort threshold may lead to an overestimation of future catch and effort of Brown Tiger Prawns. It is predicted that by removing the lower effort threshold, the model will better fit to the optimal path. The RAG suggested that originally the model had to be constrained to converge, but now that there is over ten years of additional data, the model may converge without the constraint and it can be removed. The RAG supported the proposed sensitivity test to be run in 2020.

An Industry member suggested that improvements can be made in the fishery, especially to the assessment of Brown Tiger Prawns. The current assessment and management approach is not on a fine enough spatial scale to pick of some of the complexities in the fishery. Considerable improvements could be made if the fishery were to explore some of these spatial complexities. It was noted that the current CSIRO project, models of intermediate complexity for ecosystem assessment (MICE), may be able to provide some insight into the spatial complexities in the fishery and may indicate where further research would be valuable.

**Fishing power**

Judy Upston (CSIRO) presented an update on the fishing power analysis and a summary of the recent industry fishing power surveys. The project objective is to update the fishing power historical data series that feeds into the tiger prawn stock assessment based on changes in fishing efficiency since 2010. Twenty one skippers in three ports were surveyed during the 2019 tiger prawn pre-season briefings and data was collected on gear changes that increased fishing efficiency. The tiger prawn stock assessment model will be updated with the fishing power data to accurately reflect the change in effort to better estimate catch per unit effort (CPUE). A comment was made that the survey wasn't picking up that fishing power may be increased through an increase in the power of winches. Some members suggested that the power of winches has little impact on fishing

efficiency. It was noted that the shot data collected at a daily basis isn't of a fine enough scale to be able to pick up small scale changes in trawl time. This raised the question of whether the NPF daily logbook was able to collect the data required. The RAG suggested that there may be a large amount of data that is being missed and in an effort controlled fishery, shot-by-shot data should be reported. The RAG supported AFMA to explore the feasibility of changing the logbook reporting requirement to a shot-by-shot report.

**Species split**

Judy Upston (CSIRO) provided an update on the NPF species split project. Tiger prawn and endeavour prawn species are not recorded in logbooks to species level, i.e. Brown and Grooved Tiger Prawns or Blue and Red Endeavour Prawns. For this reason, a periodic survey is undertaken to determine the species composition (species split) of the commercial catch to feed into the tiger prawn stock assessment model. The objectives of the current project are to calibrate the species split model used to estimate catch proportion of species for stock assessments and to explore whether a Scientific Observer sampling regime can be developed that will allow observer data to be used to monitor the species split ratio long term. The sampling during the 2019 tiger prawn season is progressing well, with 18 skippers providing boxes of prawns throughout the season to be analysed.

**Actions:**

- CSIRO to provide a spatial analysis of the annual tiger prawn catch time series as part of the MICE project
- AFMA to explore the feasibility of changing the NPF logbook reporting requirement to a shot-by-shot report.

# 6 JBG Redleg Banana Prawn sub-fishery

CSIRO presented a progress update on the management strategy evaluation (MSE) project for Redleg Banana Prawns. The RAG noted the performance metrics will include:

- total average annual catch and median evaluated over a 20-year projection period;
- catch variability, including the risk of cumulative catch (e.g. over 3-5-year period) dropping below a minimum viable level;
- risk statistics, including resource status relative to $B_{MSY}$, $B_{MEY}$ and $B_{LIM}$ noting that $B_{MSY}$ is required as the target reference point for MSC;
- frequency of closing first season or stopping fishing.

The RAG suggested that a valuable addition would be to include price data in the model. Including price data in addition to biomass will provide useful information under an MEY harvest strategy. An understanding of how the size of prawns increases throughout the year, and consequently the increased price value of bigger prawns, will enable industry to make informed decisions about how to maximise economic yield.

The RAG discussed the timing of results of the project, noting that a revised Redleg Banana Prawn harvest strategy is needed by April to meet the conditions of the fishery's Marine Stewardship Council (MSC) accreditation. The RAG recommended that preliminary results be made available for industry to consider at its February 2020 meeting. Following this, the industry-preferred harvest strategy option could be considered by the NPRAG at its March 2020 teleconference and a revised harvest strategy be prepared ahead of the April MSC audit.

**Actions:**

- CSIRO to include price data in the Redleg Banana Prawn MSE project model and use projected value of catch landed ($AUD) as an additional performance metric
- CSIRO to provide preliminary results of the Redleg Banana Prawn MSE project to NPFI for consideration at its February 2020 meeting.

# 7 Sawfish bycatch and bycatch strategy

The RAG noted the latest data on sawfish interaction trends in the NPF. It was noted that the number of sawfish interactions during broodstock trips in 2019 was far less than in 2018 and it was suggested that the management measures put in place may have been effective in changing fishing behaviour. It was also noted that sawfish logbook reporting has been improving in terms of number of boats reporting interactions and operators reporting to species level. However, it was pointed out that the number of unidentified sawfish being reported was still high and the difficulty in reporting sawfish interactions accurately during the banana prawn season was highlighted. The RAG suggested that mitigating sawfish interactions is the fishery's highest priority and operators need to balance sawfish reporting with processing duties, even if it involves just taking a photo. The RAG needs reliable data to inform its recommendations and it proposed that NPFI work with individual skippers where improvements are necessary.

**Action:**

- NPFI to work with individual skippers to improve sawfish data reported in the NPF logbooks.

# 8 ERA

Miriana Sporcic (CSIRO) presented to the RAG on the draft results of the banana prawn and tiger prawn sub-fishery ERAs. The RAG noted the process that was undertaken to develop the draft report and how the risk rating for each species was generated. It was advised that the risk ratings for each species was generated based on a generic approach analysing the available information and there may be some species that are rated either too high or too low risk because of a lack of data. For example, the four sawfish species interacted with in the NPF were rated as low risk when a bSAFE assessment was undertaken, which raised questions–although it was explained that it was due to bSAFE assessing at a family level, not at a species specific level. CSIRO then assessed sawfish using the productivity susceptibility analysis (PSA) methodology and two sawfish (Dwarf and Freshwater/Largetooth) were rated high risk and the other two (Narrow and Green) medium risk. The RAG discussed this result noting that the susceptibility scores implied that Green and Narrow sawfish were less likely to get caught. The RAG questioned these scores and suggested that they be considered further with expert input. RAG members also questioned if there were other species that may need to be assessed using the PSA methodology. It was advised that expert opinion could identify such species and if further information could be provided on any species, the risk assessment accuracy could be improved. The RAG suggested that there were a few species for which it appeared that the risk rating wasn't accurate and recommended that the NPF ERA sub-group identify the species that need further enquiry and liaise with experts to try and fill any data gaps. The RAG emphasised the importance of documenting any changes, or expert overrides, made to species' risk rating.

**Actions:**

- The NPF ERA sub-group to review the draft ERA and identify species that need further enquiry and liaise with experts to try and fill any data gaps.

# 9 Harvest strategy approach for byproduct species

The RAG noted that following the release of the updated Commonwealth Harvest Strategy Policy in November 2018, the management arrangements for some NPF species may need to be updated to ensure they are managed in accordance with the Policy. The RAG considered the results of the draft ERA and discussed potential updates that may be required and whether external review of the current harvest strategy is required. It was noted that the Harvest Strategy Policy objectives are that all byproduct species are maintained above a limit reference point but no target reference point is necessarily required. Consequently, the ERA can be used as a proxy to determine whether the current harvest level for each byproduct species is above the limit reference point. Any significant increase in the harvest level for any byproduct species may require further assessment.

The RAG discussed the management approach for squid and cuttlefish, which are both considered byproduct in the draft ERA. The NPF Harvest Strategy currently has a trigger limit for squid but sets no limit for cuttlefish. It was noted that reference to a report by Milton et al. 2010 (*Biology, dynamics and management strategy evaluation for byproduct species in the NPF*) could inform the setting of a limit for cuttlefish and other byproduct species. In regards to squid, the RAG suggested clarifying the wording in the NPF Harvest Strategy as it currently reads as two review points, one at 300t of catch and one at 500t. The RAG recommended revising the strategy so that an annual review point is set at 300t and an annual catch limit at 500t. The RAG also recommended reviewing data for other byproduct species, such as bugs and scallops, to inform an appropriate sustainable catch trigger.

The RAG considered how scampi should be considered in the ERA. Scampi is caught in deep-water along the outer boundaries of the fishery and is usually targeted by a small number of vessels for two months between the tiger prawn and banana prawn seasons. Because of the relatively small volume caught (about 30t per year) and the minor economic contribution to the fishery, the RAG proposed that it was unnecessary to classify scampi as a separate sub-fishery, but commentary should be provided in the ERA to clarify the different nature of scampi fishing (including the associated catch of red champagne lobster). It was questioned why scampi was even included in the banana prawn and tiger prawn sub-fishery ERAs as the depth limit in both sub-fisheries should exclude the scampi catch. The ERA sub-group were nominated to investigate this further, but it was suggested that there may be some scampi catch that was recorded in shallower parts of the fishery. The RAG also confirmed that the depth limit of the banana prawn sub-fishery should not be increased to cover the scampi fishing grounds as this would distort the results of the banana prawn ERA.

**Actions:**

- AFMA to revise the NPF Harvest Strategy for squid to clarify that there is a review point at an annual catch of 300t and an annual limit of 500t
- AFMA/CSIRO to review data for all byproduct species (i.e. mudbugs and scallops) to inform the development of sustainable catch triggers in the NPF Harvest Strategy

- ERA sub-group/CSIRO to include commentary in the ERA to clarify the different nature of scampi fishing (including the associated catch of red champagne lobster).

# 10 Research

**MICE project progress update**

Eva Plaganyi (CSIRO) provided an update on the models of intermediate complexity for ecosystem assessment (MICE) project. The MICE will focus on the prawns, barramundi and other species for which there are sufficient data, as well as exploring sawfish. It has the capability of incorporating flow information in population models, at fine scales (such as monthly). The MICE will use as inputs flow scenarios developed by the NAWRA project's river end-of-system flow modelling. For species such as banana and tiger prawns, the model will be statistically fitted to available data such as survey and CPUE data, using methods similar to that used in stock assessments and implemented in AD Model Builder. Although the model will not be a detailed mechanistic model, it will incorporate some mechanistic representation of processes where necessary, and be based on the latest available scientific research and data. As there are important differences in system structure and functioning in different parts of the Gulf of Carpentaria (GoC), the model will have a spatial structure, with the final choice of spatial structure to be decided with input from stakeholders at the first workshop. This is similarly the case for key species and relevant data to be included in the model. This project will focus on the GoC but could be extended to other regions as part of a future project.

The MICE modelling project will quantify the relationship between flow and the estuarine populations of key fishery species, and hence catch. Collaboration between NAWRA river system modellers, NESP ecologists, CSIRO modellers and GoC regional stakeholders will bring together the latest data and knowledge to support the analyses. It will provide a matrix whereby the population dynamics of estuarine fish and crustaceans, estuarine productivity, together with river flow projections under water resource development scenarios can be modelled to elucidate water resource management policy that can sustain the ecosystem services in estuarine and nearshore habitats for downstream fisheries, while enabling the harvest of useful quanta of water for extractive use.

**Research priorities for stock assessment improvements**

The RAG noted the list of research priorities for stock assessment improvements which included, in order of priority, the revised Redleg Banana Prawn assessment, the Red Endeavour Prawn stock assessment and evaluating a spatial assessment for the NPF tiger prawns. No changes were made to the assessment research priorities but it was recommended that these priorities were well below the significant other NPF research currently either underway or proposed to address MSC requirements, the Monodon assessment and work on bycatch and sawfish mitigation.

**MSC client action plan**

The RAG noted that the MSC second audit of the fishery is about to begin and is due to be completed by 19 April 2020. Three conditions need to be met by the completion of the second audit, including two conditions for Red Endeavour Prawn and one for Redleg Banana Prawn. For the Red Endeavour Prawns, the conditions require them to be included in the tiger prawn stock assessment model or independently empirically based harvest control rules developed. It was advised that Western Australia Fisheries faced similar conditions for some of its MSC certified

stocks and the approach taken was to determine MSY through an assessment and relate harvest control rules to the MSY.

It was advised that the problem for the NPF is that re-including Red Endeavour Prawns in the tiger prawn stock assessment bio-economic model may create 'noise' that will influence the calculation of optimum effort levels of other stocks. The reason for the 'noise' is that there is limited biological information (growth, annual life cycle) on Red Endeavour Prawns and catches of the species are very variable from year to year, reflecting similarly variable recruitment and/or catchability. CSIRO has produced a production model for Blue Endeavour Prawns that is applied to Red Endeavour Prawns, but with less species specific life history information given there is less available for Red Endeavour Prawns.

The MSC requirement is for stocks to fluctuate around MSY and applying a production model to Red Endeavour Prawns will only assess their stock status but will not ensure they fluctuate around MSY (which would be the result of management activity, to be facilitated by the Harvest Strategy). The tiger prawn fishery bio-economic model is designed to maximise the economic yield of the 'species basket', which means that if the model is adjusted to include Red Endeavour Prawns the other, more valuable, tiger prawn species may be under caught and the economic yield from the fishery as a whole may be significantly reduced.

One concern is that a production model for Red Endeavour Prawns, with an annual time step, might not capture the effects of management changes that have been implemented over the fishery's history. A modelling approach could be to add parameters to the Red Endeavour Prawn stock assessment that would account for the changes to fishing throughout the history of the fishery. Effort has been reduced through spatial and temporal closures progressively throughout the history of the fishery, to maintain the spawning biomass of NPF commercial species. These changes were implemented to ensure that the fishery catches relatively large and valuable prawns and that spawning biomass is correspondingly large, and so supporting sustainability. This effort reduction, as well as changes to the timing of the fishery, is not currently accounted for in any assessment of Red Endeavour Prawns and, consequently, the modelled stock biomass may be lower than the actual stock biomass. CPUE as an index of abundance in the model does not take this into account. Accounting for the historical reduction in effort and changes in effort patterns may indicate the biomass is higher than currently modelled and is actually above MSY, thus meeting the MSC criteria. It was pointed out that the problem with the Red Endeavour Prawn assessment equally applies to Blue Endeavour Prawns. It was also pointed out that developing harvest control rules before April will not prove that the stock is fluctuating around MSY.

The RAG concluded that the problem with the stock assessment is that a single, annual CPUE time series is used in the model when the series should be standardised to reflect the different levels of effort that have been applied to the stock over time. It was also noted that the catchability input into the model is constant over the CPUE time series when it could be amended to reflect the different catchability trends in the fishery following the implementation of temporal and spatial closures. The RAG recommended that NPFI draft an options paper to provide to CSIRO, which includes updating the CPUE time series and/or catchability to reflect the temporal and spatial changes in the fishery. CSIRO can then assess whether it has the capacity to complete the work. The RAG also recommended that NPFI update the MSC auditors on the progress toward completing work that meets the Red Endeavour Prawn condition.

The RAG noted its actions required under the NPF Client Action Plan to meet the Redleg Banana Prawn condition involves making recommendations to NORMAC and AFMA on the additional harvest control rules to address the current uncertainties for the Redleg Banana Prawn assessment. It was advised that the Redleg Banana Prawn MSE project currently underway, will

provide results in February for NPFI and NORMAC to consider. Following NORMAC consideration, the harvest strategy will be revised to incorporate the updated harvest control rules.

**NPF five-year research plan**

The RAG reviewed the NPF 5-year Research Plan and provided comment on the research priorities identified. It was noted the plan will incorporate the RAGs final comments and then provided to NORMAC for endorsement before being finalised.

**Sawfish close-kin mark recapture project proposal**

Toby Patterson (CSIRO) presented on the close-kin mark recapture research that could enable an absolute abundance estimate of breeding adult sawfish within the fishery area to be determined. With enough data, the close-kin method may also provide estimates of adult survival rates, connectivity within mature individuals of a population and population trend. The RAG noted that sawfish tissue samples are required to be collected for the project and the most effective approach is simply to collect as many samples as possible by bolstering sampling efforts, and then begin the analyses and attempt to find kin-matches. It was advised that the current sawfish samples collected for another NPF project should be able to be used for a close-kin project. The RAG noted that recording the size of individuals, through either measuring or taking a photo, to allow an age estimate to be calculated, or alternatively getting the age directly through a vertebrate sample, is important.

The Chair asked CSIRO to leave the room while the RAG discussed the research proposal. It was suggested that the required number of sawfish samples could be collected by the end of 2019 through the NESP A2 project under CDU, which could enable the first part of the project to begin, with the full sample requirements able to be collected in 2020. The RAG was supportive of the project and recommended CSIRO develop a full project proposal with each component costed, which the RAG would review prior to being submitted to FRDC. It was also recommended that AFMA liaise with Queensland and Northern Territory Fisheries to coordinate collaborative support for the project and sample collection.

**Actions:**

- NPFI to draft an options paper for CSIRO to consider for the assessment of Red and Blue Endeavour Prawns, which includes updating the CPUE time series and/or catchability to reflect the temporal and spatial changes in the fishery
- CSIRO to develop a full project proposal for the close-kin mark recapture research, with each component costed, for RAG review before being submitted to FRDC
- AFMA to liaise with Queensland and Northern Territory Fisheries to coordinate collaborative support for the project and sample collection.

# 11 Other business

**FRDC report – Market integration and demand for prawns in Australia**

Sean Pascoe (CSIRO) presented on the results of a recent FRDC project regarding market integration and demand for prawns in Australia. The results show that a one per cent increase in imports has a moderate but less than proportional impact on domestic prawn prices in the short term, and this decreases in the longer term. However, there has been a big increase in imports, and this total volume effect has seen a big decline in domestic prawn prices (even though a less than proportional decline).

Aquaculture also has a less than proportional impact on prawn prices, but having seen the impact of imports, a big increase in aquaculture will lead to a (not quite as big) reduction in the domestic wild-caught prawn price.

The biggest driver of wild caught prawn prices is the quantity of wild caught prawns, with an almost one-for-one impact in the longer term (i.e. a 1% increase in wild caught prawn quantity results in a 1% reduction in price). Changes in banana prawn landings, therefore, may have an impact on the average price for all Australian wild caught prawns sold in the domestic market

**Australian fisheries bycatch report**

The RAG discussed a draft report by Professor Steve Kennelly on Australian fisheries bycatch, which included a summary of the NPF. Concern was raised that the NPF data used in the report may not be the most representative data available as it was a small subset of all possible. Previous work has demonstrated that determining the total volume of bycatch in the NPF is difficult due to the substantially differing volumes both spatially and temporally across the fishery. It was noted that through the implementation of BRDs, reductions in the fleet size, restrictions on daylight tiger prawn fishing and increased area closures, there has been a significant reduction in bycatch over the years and the single bycatch ratio figure in the report does not capture any of this bycatch reduction. It was also suggested that there should be reference to the recent implementation of new BRDs that significantly reduce bycatch in the NPF as the total bycatch volume has been reduced considerably. NPRAG recommended that AFMA, NPFI and CSIRO coordinate a response to inform of the additional information available that will enable a more accurate NPF bycatch figure to be determined.

**NT data analysis of commercially important species**

The RAG noted that Northern Territory Fisheries has requested AFMA Scientific Observer data on NPF bycatch species for use in its stock assessments. Specifically, NT Fisheries is interested in determining the volume of Black Jewfish and lutjanid species taken as bycatch in the NPF.

Before the discussion continued, the Chair declared a potential conflict of interest, stating that he is working with NT Fisheries to design a survey for tropical snapper species. Rik Buckworth also declared that he works with NT Fisheries as a consultant on various projects.

The RAG discussed the methodology to determine the total catch of the species of interest and suggested that the current methodology may not capture some of the detail that is needed to ensure an accurate estimate of total bycatch. Some of the considerations that should be taken into account include time, depth and strata. Gary Fry (CSIRO) advised that he has used the data set for other projects and understands some of the complications with the data that need to be accounted for and suggested that he can look at results from previous MSC and ERA projects to determine the quantities of bycatch NT Fisheries in which is interested.

**Sawfish mortality research proposal**

Gary Fry (CSIRO) presented a research proposal to the RAG on estimating the mortality of sawfishes impacted by commercial trawl gear in the NPF using survival experiments and satellite tags. The project will use at-sea survival experiments to estimate mortality rates of the small individuals. The CSIRO Prawn Population Monitoring surveys and AFMA Scientific Observer program will carry out short-term experiments by holding trawl-caught small sawfish in flow-through tanks and monitor the health of each individual over several days. The CSIRO Prawn Population Monitoring surveys and AFMA Scientific Observer program will also deploy mini-PAT tags on a number of trawl-caught large sawfish individuals where these would have a reasonable chance of post-release survival. The tag data collected will be used to determine the mortality rates of these larger individuals and additional movement information of individuals that survive from being caught in trawls.

It was suggested that a blood sample could be taken of the sawfish that are to be kept in tanks. The blood sample would allow the stress hormones of sawfish to be sampled which can give additional information when analysing which sawfish survive in the holding tanks. If a relationship is established between stress hormone levels and survivability then only blood samples may need to be collected for future survivability research.

The CSIRO representatives were asked to leave the room while the RAG discussed the proposal. The RAG were supportive of the proposal but noted the range of sawfish project proposals currently being put forward that have benefits well beyond just the NPF. It recommended that it would be valuable for FRDC to facilitate a national workshop to coordinate all the sawfish research being proposed and prioritise the research. The RAG was informed that the Department of the Environment and Energy is planning to facilitate a national sawfish workshop at the beginning of 2020 to assist in the development of the next national sawfish recovery plan. This would be a good opportunity to review and prioritise all the sawfish research.

The RAG suggested that there was a low likelihood the tagging aspect of the project would enable sawfish mortality rates to be determined. As an immediate priority, the RAG recommended the flow-through tanks proposal was valuable and could begin within existing programs immediately.

**NPF independent monitoring survey vessel charter**

The RAG noted that NPFI will now be directly procuring vessels for the NPF independent monitoring project. The rest of the survey will continue to be coordinated by CSIRO.

**Supply chain traceability**

The RAG noted a joint project by the Australian Council of Prawn Fisheries (ACPF) and the Australian Prawn Farmers Association (APFA) has enabled the origin of prawns to be determined based on trace metals linked to an environmental footprint. The results allow NPF prawns to be clearly distinguished from other Australian prawns and wild caught prawns to be distinguished from aquaculture prawns. Further work is currently underway to verify the technology in markets and so far the results show 98 per cent reliability. This technology will help combat the problem of substitution of some non-NPF caught prawns being labelled as NPF caught prawns.

**Scampi data needs**

The RAG was asked to consider the need for a Scientific Observer trip at the end of the year. The RAG recommended the data needs be established first and then the current industry data be reviewed to determine if any data gaps exist. This information can be used to inform the proposed

scampi review. It was also noted that the observer trip undertaken at the beginning of 2019 revealed there is a species identification problem. The RAG recommended this also be considered during the scampi review.

**Actions:**

- AFMA, NPFI and CSIRO to coordinate a response to Steve Kennelly to inform of the additional information available that will enable a more accurate NPF bycatch figure to be determined
- Gary Fry (CSIRO) to look at results from previous MSC and ERA projects to determine the volume of bycatch NT Fisheries is interested in
- Review of scampi to include 'species identification problem'.

The Chair closed the meeting at 4:00 pm (EST) on 8 November 2019.

**Signed (Chairperson):**

**Date:** 14/01/2020

# Attachment 1

## Draft Annotated Agenda

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

### 7-8 November 2019 9.00 am (Eastern Standard Time)

| Item | Responsibility | Paper |
|---|---|---|
| 1. Introduction / Meeting Management<br>• Welcome<br>• Adoption of agenda<br>• Declaration of interests<br>• Minutes from previous meetings | Chair | Yes<br>20 min |
| 2. Action Items<br><br>*Outcomes: RAG to note progress on action items from previous meetings and provide feedback and comments where appropriate.* | AFMA | Yes<br>10 min |
| 3. Update Reports<br>• Industry<br>  ○ Tiger prawn season/BRD update<br>  ○ Sawfish mitigation<br>• AFMA<br>  ○ Fisheries Management Strategy (FMS)<br>  ○ Proposed listing of narrow sawfish?<br><br>*Outcomes: The RAG notes the various update reports.* | NPFI/AFMA | Yes<br>30 min |
| 4. NPF data/monitoring plan<br>• Outcomes of the data workshop held the day before the RAG<br>  ○ Drivers of data and information needs for the NPF – and acceptable data standards<br>  ○ Objectives for the NPF data and monitoring plan<br>• Updates to e-reporting and logbook data collected<br><br>*Outcomes: The RAG to advise on drivers of data and information needs, and acceptable standards for the NPF and objectives for the NPF data and monitoring plan.* | AFMA | Yes<br>1 hour |

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| 5. Tiger Prawn Assessment – planning for 2020 assessment<br>• Proposed sensitivity tests for 2020 assessment (including revision to bio-economic model settings)<br>• Feedback on outcomes of 2019 CSIRO stock assessment team meeting<br>• Update of fishing power and species split projects<br><br>*Outcomes: That the RAG endorse the standard sensitivity tests normally run for each assessment.* | CSIRO | Yes<br>30 min<br>(species split to be Friday morning) |
| 6. JBG Redleg Banana Prawn sub-fishery<br>• Update on the review of the Redleg Banana Prawn MSE<br><br>*Outcomes: The RAG note progress on the Redleg Banana Prawn MSE project.* | AFMA/CSIRO | Yes<br>30 min |
| 7. Sawfish bycatch and bycatch strategy<br>• Update on interactions trends (sawfish and other TEPS)<br>• Management and mitigation<br>○ NPFI update on bycatch strategy priorities<br>○ Developing priority actions for bycatch including sawfish and any high risk and priority species identified through ERA<br><br>*Outcomes: RAG to review trends in bycatch and provide recommendations on further management and research priorities.* | AFMA | Yes<br>2.5 hours<br>(including close-kin from item 10) |
| 8. ERA<br>• CSIRO presentation on results of the updated ERA for tiger and banana prawn sectors<br>• RAG advice on species classification<br>• RAG feedback on ERA results and implications for bycatch strategy<br>• RAG advice on any further ERA needs e.g. Redleg Banana Prawn sub fishery and trips targeting scampi and broodstock.<br><br>*Outcomes: RAG to review the draft ERA results, species classification and resulting priorities for bycatch strategy and provide recommendations to finalise the ERA.* | CSIRO/AFMA | Yes<br>2.5 hours |
| 9. Harvest strategy approach for byproduct species<br>• Reviewing harvest strategy requirements of byproduct species following finalisation of species list | AFMA | Yes<br>30 min |

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| ○ scampi trigger review<br>○ AFMA progress in engaging an independent scientific review<br><br>*Outcomes: RAG to advise how to assess byproduct species to meet the requirements of the Commonwealth Harvest Strategy Policy.* | | |
| 10. Research<br>• Update on MICE project (impact of water development) and progress made<br>• Research priorities for stock assessment improvements<br>• MSC client action plan<br>• Annual research plan/5 year plan<br>• Close-kin project on Sawfish<br>• Northern waters developments (+ mangrove dieback update)<br><br>*Outcomes: The RAG reviews progress made with FRDC project on impact of water development, the assessment related research projects and their priority; the RAG review the MSC client action plan and assess if the NPF is on track; the RAG develop the NPF annual research plan and comment on the five year plan; the RAG note an update on the northern waters developments.* | CSIRO/AFMA/NPFI | Yes<br><br>1 hour |
| 11. Other business<br>• FRDC report – Market integration and demand for prawns in Australia<br>• Australian fisheries bycatch report<br>• NT data analysis of commercially important species<br>• Sawfish mortality research proposal<br>• NPF independent monitoring survey vessel charter<br>• Supply chain traceability<br>• Scampi data needs | RAG | 30 min |

**Attachment 2**

# NPRAG Declared Conflicts of Interest

| Participant | Membership | Interest Declared |
|---|---|---|
| *Ian Knuckey* | *Chair* | *Director - Fishwell Consulting Pty Ltd*<br>*Director - Olrac Australia – a company associated with electronic logbooks.*<br>*Scientific member – NORMAC*<br>*Member – North Marine Parks Advisory Committee*<br>*Chair - Tropical Rock Lobster RAG*<br>*Chair - Victorian Rock Lobster RAG*<br>*Scientific member - SESSF shark RAG*<br>*Scientific member – GABRAG*<br>*Works with Indigenous communities in capacity building activities*<br>*Chair - South Australia's Gulf of St Vincent prawn fishery's research committee*<br>*Scientific member - South Australia's Gulf of St Vincent prawn fishery's management advisory committee*<br>*Current consultancy with NT Fisheries designing a snapper species survey*<br>*Various research interests in other Commonwealth and State fisheries.* |
| *Rik Buckworth* | *Scientific Member* | *Scientific Member - Torres Strait Finfish RAG*<br>*Chair - NT Research Advisory Committee (FRDC)*<br>*Director - Aquatic Remote Biopsy Pty Ltd*<br>*Director - Sea Sense Australia Pty Ltd*<br>*University Professional Fellow – Charles Darwin University*<br>*Current consultancy contract with NPFI to review Red Endeavour Prawns*<br>*Various consultancy work with NT Fisheries*<br>*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.* |

| Participant | Membership | Interest Declared |
|---|---|---|
| *David Brewer* | *Scientific Member* | *Director – Upwelling P/L (David Brewer Consulting)*<br>*Honorary Fellow – CSIRO*<br>*Scientific member – NPRAG*<br>*Scientific member – Torres Strait Fin Fish Working Group*<br>*Chair - Torres Strait Fin Fish RAG*<br>*Current consultancy work with AFMA.* |
| *Phil Robson* | *Industry Member* | *Employee of A Raptis and Sons, responsible for managing NPF vessels & an NT demersal fish trawler. Has provided charter for scientific surveys in NPF (none of which are in JBG) in the past and may in future.* |
| *Ian Boot* | *Industry Member* | *Managing Director of Austfish, a company which operates NPF vessels. Has a commercial interest in the fishery. NPF broodstock permit holder. Participates in scampi fishing.* |
| *David Power* | *AFMA Member* | *AFMA employee, no pecuniary interest in the fishery.* |
| *Stephen Eves* | *Executive Officer (AFMA)* | *AFMA employee, no pecuniary interest in the fishery.* |
| *Annie Jarrett* | *Observer - NPFI* | *CEO- NPFI*<br>*Member of the MSC Stakeholder Council*<br>*Chair - Australian Council of Prawn Fisheries (ACPF).*<br>*Some research items are of relevance to NPFI.* |
| *Adrianne Laird* | *Observer - NPFI* | *Employed as a contractor by NPFI.*<br>*Some research items are of relevance to NPFI.* |
| *Gary Fry* | *Observer - CSIRO* | *Research provider involved particularly in the NPF bycatch monitoring program. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Rob Kenyon* | *Observer - CSIRO* | *Research provider. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Trevor Hutton* | *Observer - CSIRO* | *Research provider 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.* |
| *Eva Plaganyi* | *Observer - CSIRO* | *Research provider 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.* |

| Participant | Membership | Interest Declared |
|---|---|---|
| *Roy Deng* | *Observer - CSIRO* | *Research provider 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.* |
| *Judy Upston* | *Observer - CSIRO* | *Research provider. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Mahdi Parsa* | *Observer - ABARES* | *Economics research provider. No current pecuniary interest in fishery. Potential to seek and receive funding for research in the fishery in future.* |
| *Laura Blamey* | *Observer - CSIRO* | *Research provider. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Sean Pascoe* | *Observer - CSIRO* | *Research provider 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.* |
| *Toby Patterson* | *Observer - CSIRO* | *Research provider. May seek and receive funding for research in the fishery.* |
| *Miriana Sporcic* | *Observer - CSIRO* | *Research provider. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Tonya van der Velde* | *Observer - CSIRO* | *Research provider. Has in the past and may in future seek and receive funding for research in the fishery.* |
| *Tamre Sarhan* | *Observer - AFMA* | *AFMA employee, no pecuniary interest in the fishery.* |
| *Steve Hall* | *Observer - AFMA* | *AFMA employee, no pecuniary interest in the fishery.* |

**Attachment 3**

# NPRAG Action items

| Item | Person responsible | Description of action item | Progress |
|---|---|---|---|
| | **18 May 2016 Meeting** | | |
| 1. | Rik Buckworth/CSIRO | Upload research reports relevant to the NPF to the GovTEAMS site. | **Ongoing** – CSIRO has a student compiling a bibliography that will be available to NPF stakeholders |
| | **17-18 November 2016 Meeting** | | |
| 2. | CSIRO | Review/update the assessment inputs to consider the influence of price elasticity. | **Ongoing** – Tom Kompas to follow up and investigate whether this can be done and coordinate with the AFMA working group to ensure resources looking into price elasticity are not being doubled up. Tom to discuss at the July 2018 working group meeting |
| 3. | NPRAG Chair | Send a thank you letter to the crews involved in the operational testing of the BRD. | **Ongoing** – letters with Chair for signing, to be sent by the end of the tiger prawn season, Adrianne Laird to advise who to send the letters to |
| | **23-24 May 2018 Meeting** | | |
| 4. | AFMA/NPFI | AFMA and NPFI to investigate the objective for collecting species abundance counts and whether this data should continue to be collected. | **Ongoing** – data on warp strikes was collected during 2019 |
| 5. | David Brewer, David Power, Steve Eves, Adrianne Laird | David Brewer, David Power, Steve Eves, Adrianne Laird and a representative from the CSIRO ERA team to | **Ongoing** |

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| | | form a working group to engage in the ERA process and report key results back to the RAG. | |
| | **1 November 2018 Meeting** | | |
| 6. | Rob Kenyon | Rob Kenyon to consult with NAWRA researchers to seek to provide the RAG with a summary of key results of the NAWRA side project report that details the impact of loss of late dry season flows (and other low-level flows) on banana prawn catch. Rob Kenyon to provide a copy of the report to the NPRAG when it is released | **Ongoing** – Rob Kenyon to keep RAG informed on the progress of the report. Report not available yet and unlikely to be finalised any time soon. |
| 7. | AFMA | AFMA to look into New Zealand's protocols for counting bird abundance | **Ongoing** |
| 8. | AFMA | AFMA to check the observer protocols to ensure the collection of the 10 kg subsample is in accordance with the method outlined by *Heales* et al. | **Ongoing** |
| 9. | AFMA | AFMA to re-check the data within the 2017 annual observer report | **Complete** – observer report redrafted in new format and presented under agenda item 3 |
| 10. | AFMA | AFMA to consider dividing up annual observer report by season and including the target number of days per season and target lengths | **Complete** |
| 11. | David Brewer/Gary Fry | David Brewer and Gary Fry to provide comments/feedback to AFMA on the current observer manual and annual observer report | **Ongoing** – new report to be reviewed and comments provided |
| | **30-31 May 2019 Meeting** | | |

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| 12. | Rob Kenyon | Circulate the Andrew Broadley NESP report when it becomes available | **Ongoing** – update provided during meeting |
| 13. | AFMA/CSIRO | Provide NPRAG Chair with a map showing the locations of the NPF spawning and recruitment survey sites in reference to the marine park zones that he can take to the North marine park committee meeting in June 2019 | **Redundant** – Chair raised the survey at the meeting |
| 14. | CSIRO | Advise what impact the removal of the survey sites within the marine park zones would have on the survey outcomes | **Complete** – CSIRO ran the model with the four sites within the marine park removed. The removal has little impact on the overall survey but there is a higher impact on the regional indices. There is also valuable data that can be collected that can be used to inform the effectiveness of the marine parks |
| 15. | NPFI | Provide historical information about the NPF benthic survey sites to the Chair for consideration at the North marine parks committee meeting in June 2019 | **Redundant** |
| 16. | AFMA/CSIRO | Collaborate with Parks Australia to identify if there are any areas of mutual benefit from the NPF survey data collection and if there are opportunities for co-funding | **Ongoing** – CSIRO and AFMA in discussions with Parks Australia regarding the mutual benefits of the NPF surveys. |
| 17. | NPRAG Chair | Write to the CMOs acknowledging their efforts and contribution to the fishery | **Ongoing** – letters to be sent by the end of the tiger prawn season, Adrianne Laird to advise who to send the letters to |
| 18. | AFMA | Investigate if data quality checks and rectifying data errors can be automated | **Ongoing** |

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| 19. | AFMA | Consider including updating drivers of data needs to ensure they include habitat and communities, social licence/values and acceptability, market access, animal welfare and indigenous interests | **Ongoing** |
| 20. | AFMA | Circulate a copy of the ETBF data and monitoring plan to the NPRAG | **Complete** – emailed on 6/11/19 |
| 21. | AFMA/NPFI | Refine objectives and continue development of the data and monitoring plan in consultation with the RAG | **Ongoing** |
| 22. | CSIRO/NPFI | Review the adaptation project survey (economic and social data) and finalise language to ensure it is clear and tailored to industry | **Complete** – CSIRO sent draft survey to NPFI for review in September. |
| | **ERA species list review** | | |
| 23. | AFMA/CSIRO | Split the ERA species lists by logbook data and all other data sources (e.g. observers) to help clarify the species splits | Discussed under agenda item 8 |
| 24. | CSIRO/AFMA | Consider splitting the logbook recorded squid species group in the ERA by the percentages recorded by CSIRO survey data | Discussed under agenda item 8 |
| 25. | CSIRO/AFMA | Use the species split model to split the tiger prawns recorded in the banana prawn sub-fishery | Discussed under agenda item 8 |
| 26. | CSIRO/AFMA | Double check the catch of Redleg Banana Prawns in the banana prawn sub-fishery | Discussed under agenda item 8 |
| 27. | CSIRO/AFMA/ABARES | Review the ERA species value table and split the species using the species split model so that each species only appears once in the table | Discussed under agenda item 8 |

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| 28. | CSIRO/AFMA | Categorise all king prawns as a byproduct species group | Discussed under agenda item 8 |
| | **Harvest Strategy review** | | |
| 29. | AFMA | Compile all available data on each byproduct species to enable the RAG to assess what level of assessment is feasible and review if current harvest strategy triggers are appropriate | **Ongoing** |
| | **Bycatch strategy review** | | |
| 30. | AFMA/NPFI | Prepare a draft of the NPF bycatch strategy by the November 2019 RAG meeting | **Ongoing** – strategy to be presented at next NPRAG meeting |
| 31. | AFMA/NPFI | Split general bycatch and TEPs into sub-sections under the NPF bycatch strategy | **Ongoing** – strategy to be presented at next NPRAG meeting |
| 32. | AFMA/NPFI | Include an overview of historical initiatives and bycatch reductions in the new bycatch strategy | **Ongoing** – strategy to be presented at next NPRAG meeting |
| 33. | AFMA | Explore options for validating the CMO and Scientific Observer eyeball estimates of total bycatch | **Ongoing** |
| 34. | AFMA | Update bycatch strategy template to align with the policy by including the words 'reasonable and practical' when the objective is to minimise bycatch or maximise post-release survival | **Ongoing** – NPF bycatch strategy wording to align with the wording of the Commonwealth policies |
| | ***P. monodon assessment*** | | |
| 35. | CSIRO | Prepare a report reviewing the feasibility and anticipated costs for assessing the *P. monodon* sock using a Tier 4 assessment (CPUE analysis), length converted catch-curve analysis and e-SAFE. In preparing the report, the following points will be considered: | **Complete** |

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| | | ○ Analyse data from the additional sources identified to assess whether any data on *P. monodon* can be used in an assessment; and<br><br>Conduct CPUE standardising for *P. monodon* accounting for spatial effects | |
| 36. | CSIRO | Include prawn discards in the next tiger prawn stock assessment as a sensitivity test | **Complete** – agenda item 7 |
| 37. | APFA | Provide weight data on individual prawns to determine the average weight of each *P. monodon* collected for broodstock purposes | **Ongoing** – AFMA to also ask if length data is available. |
| 38. | AFMA | Explore whether the Scientific Observers can measure the length of all *P. monodon* caught during targeted broodstock trips | **Ongoing** – not possible due to practicalities of handling live prawns. Additional data requirements may arise from undertaking the *P. monodon* stock assessment. Scientific observers may be able to collect biological data on the *P. monodon* discards. |
| 39. | NPFI/Tassal | Explore whether the crews on board broodstock trips can record the length of all *P. monodon* caught | **Ongoing** – not possible due to practicalities of handling live prawns. Additional data requirements may arise from undertaking the *P. monodon* stock assessment. |
| | **Sawfish** | | |
| 40. | AFMA | Compare sawfish interactions with number of broodstock caught and provide analysis to APFA. AFMA to coordinate with | **Ongoing** |

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| | | other jurisdictions and fisheries to expand the sawfish genetic sampling regime | |
| 41. | CSIRO/NPFI | Collaborate with Charles Darwin University to ensure the sampling protocols are managed to allow samples to be used for both the population analysis and close-kin genetic projects | **Complete** – sampling protocols should allow samples to be used for both projects. |
| 42. | CSIRO | Prepare a project proposal with costings for the close-kin genetic work | **Complete** – agenda item 10 |
| 43. | AFMA/CSIRO | Coordinate the development of a project proposal to undertake a sawfish post-release survival project | **Complete** – CSIRO presented proposal under agenda item 11 |
| 44. | AFMA | Organise a NPRAG teleconference in July/August 2019 to discuss the sawfish project proposals | **Complete** |
| 45. | AFMA/CSIRO | Develop a Scientific Observer data collection method that can be used to test if the current prawn sampling method is sufficiently comparable to the established method used in the species split research project, the results of which are used for estimating species proportions in the commercial tiger or endeavour catches | **Complete** – CSIRO and AFMA have established a protocol for the Scientific Observers |
| 46. | CSIRO | Include MSY as a target reference point in the Redleg Banana Prawn MSE project | **Complete** |
| | **29 August 2019 Teleconference** | | |
| 47. | CSIRO | Cost each component of the *P. monodon* stock assessment options separately and provide this to AFMA and the RAG | **Complete** |

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| 48. | AFMA/CSIRO | Develop an assessment proposal package including CPUE analysis, Bayesian biomass dynamics and the catch-only method with a milestone review point after the CPUE analysis is available that prompts further review by the RAG | **Complete** |
| 49. | NPRAG | After CPUE analysis results are available, NPRAG to recommend which combination of *P. monodon* stock assessment options would be most suitable to provide a sustainable catch limit | **Complete** |
| 50. | AFMA/NPFI | Update the harvest strategy reference period for Scampi from the calendar year to a 12 month period beginning 1 December each year and present this to NORMAC for consideration | **Complete** |
| 51. | AFMA/NPFI | Develop terms of reference for the NPF harvest strategy review for scampi and other byproduct species in light of the revised HSP | **Ongoing** |