



Australian Government

Australian Fisheries Management Authority

Northern Prawn Fishery Resource Assessment Group (NPRAG) Meeting

Meeting Minutes

Date: 1 Nov 2018

Venue: Brisbane Riverview Hotel

Attendees

Thursday 1 November 2018	
Name	Member type e.g. industry member
<i>Ian Knuckey</i>	<i>Chair</i>
<i>Phil Robson</i>	<i>Industry Member</i>
<i>Ian Boot</i>	<i>Industry Member</i>
<i>David Brewer</i>	<i>Scientific Member</i>
<i>Rik Buckworth</i>	<i>Scientific Member</i>
<i>Ian Butler</i>	<i>A/g AFMA Member</i>
<i>Adam Camilleri</i>	<i>AFMA Observer</i>
<i>Stephen Eves</i>	<i>Executive Officer - AFMA</i>
<i>David Mobsby</i>	<i>Observer – ABARES</i>
<i>Annie Jarrett</i>	<i>Observer – NPFI</i>
<i>Adrienne Laird</i>	<i>Observer – NPFI</i>
<i>Eva Plaganyi</i>	<i>Observer – CSIRO</i>
<i>Trevor Hutton</i>	<i>Observer – CSIRO</i>
<i>Roy Deng</i>	<i>Observer – CSIRO</i>
<i>Gary Fry</i>	<i>Observer – CSIRO</i>
<i>Rob Kenyon</i>	<i>Observer – CSIRO</i>
<i>Tonya van der Velde</i>	<i>Observer – CSIRO</i>
<i>John Glaister</i>	<i>Observer – NORMAC Chair</i>

1 Preliminaries

1.1 Welcome and apologies

The Northern Prawn Fishery Resource Assessment Group (NPRAG) Chair, Ian Knuckey, opened the meeting at 8:00 am (EST) at the Riverview Hotel in Brisbane on 1 November 2018 with an Acknowledgement of Country. Ian Knuckey extended his condolences to the family of Harry Evans (an NPF crew member who recently passed away) and David Carter (whose Dad recently passed away). The Chair noted apologies from Economic Member Tom Kompas, who was unable to attend the day, and mentioned Eva Plaganyi will be running late but will be present for the Redleg Banana prawn discussion. The Chair welcomed John Glaister (NORMAC Chair), Tonya van der Velde (CSIRO Observer) and Adam Camilleri who has joined the AFMA Northern team as a graduate.

1.2 Adoption of Agenda

The Chair requested that the NPRAG consider the draft agenda (Attachment 1), identify any required amendments, and then adopt the draft agenda for the meeting. It was noted there were a couple of additional items to discuss including the Northern Australia mangrove dieback, Spotted Tilapia in Queensland catchments, changing of the Kimberley Prawn Fishery (KPF) season dates, results from the NPF survey indices, and the draft CSIRO sawfish report.

1.3 Declaration of interests

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

The Chair went on to ask each individual/group to leave the room while their potential conflict as it related to the meeting's agenda items was discussed. It was noted that CSIRO representatives had potential conflicts specifically regarding potential funding, and would be asked to leave the room if any recommendations were to be made. It was also noted that during Agenda Item 6 – Water use in Northern waters, CSIRO representatives and Rik Buckworth, as co-authors to the research report, may be asked to step out if the RAG identified a potential conflict or a need to discuss the item without the co-authors present.

No other apparent conflicts of interest were identified that would prevent individuals participating in discussions but 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 23-24 May 2018 meeting were accepted out-of-session via email as a true and accurate record of the meeting.

2 Action items

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

Clarification was sought regarding the outcome of the proposed profit versus profit-at-MEY autonomous adjustment indicator (action item 30)(computed from tiger prawn bioeconomic model). It was advised that currently banana prawn profit cannot reliably be factored into an MEY calculation and therefore, this estimate of profit is not a fair representation of MEY across the entire fishery. Considering this, industry decided not to use this indicator at this point in time.

3 Update reports

3.1 Industry update

NPRAG noted an update provided by NPF Industry Pty Ltd including:

- Progress of industry's bycatch strategy, performance of new bycatch reduction device designs, and the results from recent bycatch trials
- Progress of various research projects including sawfish electric pulse testing, Turtle Excluder Device (TED) orientation and trawl net configuration, and a Narrow Sawfish population analysis

A Scientific Member suggested that the relationship between bycatch reduction device (BRD) position and volume of catch could be further explored in order to ensure continuous improvement in bycatch reduction. One Austral vessel got a permit to change the position of the BRD and results would be available at the end of the season. Ian Boot advised that feedback from his fleet indicated significant losses of catch from using the FishEX70 and the idea of full implementation in 2019 is concerning. It was noted by the RAG that BRDs are the future but more time is needed for them to

develop. This notion was supported by Phil Robson who raised similar concerns from his fleet that industry isn't ready to move to full implementation at this stage. Industry advised that scientific trials need to be representative of actual trawl conditions. The RAG was informed that there is an opportunity to test some of the BRDs in a flume tank in Norway during 2019. The testing may help with the full implementation of BRDs that achieve greater than 30 per cent bycatch reduction in 2019.

It was questioned whether a more flexible approach to BRD positioning would cater for individual fleet needs, provided continuous improvements are achieved. Industry agreed that a flexible approach is needed heading in to the 2019 tiger prawn season given the problems that have been experienced so far. The Chair acknowledged the concerns of industry trying to balance prawn loss, compliance capability and bycatch reduction. As a result, the Chair asked if it is worth recording gross catch, bycatch and discards in logbooks for spatial and temporal information that would aid in understanding bycatch reduction achievement across the fleet. There were mixed views in regards to the reliability of estimating gross volume of each net. For example, some RAG members mentioned that skippers are very good at ensuring the total catch is recorded reliably, but some members disagreed. It was pointed out that that credible and reliable bycatch data is becoming increasingly important, particularly if the NPF aims to meet Marine Stewardship Council (MSC) certification.

The RAG was provided with a season update on fuel price, prawn volume and prawn size. The current net fuel price out of Darwin is \$0.98, \$1.78 gross in the Gulf of Carpentaria (GoC) and the net price for the mothership is \$1.20. Catch in the Joseph Bonaparte Gulf (JBG) for Redleg Banana prawns was okay with the low amount of effort expended. The tiger prawn season was generally poor although prawn size was okay.

One Industry Member suggested that the tiger prawn season reporting period may be negatively affected by having to report by date and should instead be reported during a certain moon phase. As prawn catches are related to the moon phase, during a full moon catches tend to be smaller. Starting the reporting period at a certain point in the moon phase will provide more data to inform the in-season trigger rule. However, it was stated that the reason for converting from a one week to a two week reporting period was to account for periods during the moon phase when fishing effort is limited.

Industry was asked if they had noticed any changes within the fishery that may be attributed to climate change, as there has been noticeable changes in other fisheries. Ian Boot informed that data from his fleet suggests a change in tiger prawn sizes during his involvement in the fishery. Eva Plaganyi agreed and suggested the NPF should take note of gradual shifts in weather patterns; despite being slower and decadal, the potential impacts on the fishery could be catastrophic. This has been noticed in other fisheries where weatherly spikes have caused certain species to reach their tipping point. The Bureau of Meteorology (BoM) prediction for El Nino in 2019 is at 70 per cent, which may be of concern for the Redleg Banana prawns as the stock didn't fare so well during the last El Nino event. Ian Butler added that scientists have predicted that in 2019 the GoC will be warmer than usual. The RAG was advised to combine its knowledge of the NPF with climatic predictions as a way of developing ongoing adaptive strategies. It was acknowledged by the RAG that these climatic events are of concern.

The RAG discussed some potential options to improve the economic health and sustainability of the fishery in light of changing environmental conditions. It was suggested that the most important option could be to protect small prawns by closing the first season to tiger prawn fishing and possibly moving the tiger prawn season back a month to increase the size of the prawns caught. It is something for the industry to think about while the fishery is in a good position. The Chair agreed

that there are some options to consider to further improve the performance of the NPF including continually monitoring the management arrangements and encouraged the industry to continue to consider progressive options such as changing the season dates and targeting species at different times moving forward.

3.2 AFMA update

NPRAG noted an update provided by AFMA management including:

- TED inspections were conducted in July 2018 by the US National Oceanic and Atmospheric Administration (NOAA) agency for the NPF, Torres Strait Prawn Fishery and QLD East Coast Trawl Fishery.
- Autonomous Adjustment - the Commission accepted the relevance of the key indicators and what they capture in terms of the biological and economic health of the fishery. The Commission decided to seek advice on the proposed indicators and response strategies from AFMA's Economic Working Group (EWG) and suggested that NPF industry attend the EWG.
- Commonwealth Bycatch and Harvest Strategy Policies are complete and in press. The Department of Agriculture and Water Resources (DAWR) expects to release them by the end of the month. The intention by DAWR is to release them alongside the Bycatch and Harvest Strategy Policy Guidelines which are in final form, but not quite ready for publication.
- Compliance report - during the 2018 tiger prawn season, AFMA fisheries officers conducted at-sea inspections of the NPF fleet. Ten vessels were inspected with no compliance issues detected.
- Ecological Risk Assessment (ERA) - three sub-fisheries have been identified as needing ERA: White Banana prawn, tiger prawn and Redleg Banana prawn. Despite the delays we still expect results this financial year.
- Govdex/GovTEAMS - now up and running. GovTEAMS will be the central location for storing and accessing research papers for NPF stakeholders. AFMA will create a GovTEAMS community for the NPF and invite NPRAG and NORMAC members to join.
- The new Fisheries Management Strategy (FMS) for the NPF will be inclusive of management plans, strategies, ERAs, ecological risk management (ERM), bycatch strategies, and research papers. This came about from a review by the Australian Continuous Improvement Group (ACIG) who recommended there be a formal Fisheries Management framework. There will also be additional documents included such as the Data Strategy that was presented at the last NPRAG meeting.

Ian Butler informed the RAG that this would be his last NPRAG meeting as the selection process for the permanent AFMA NPF manager position had been finalised. The Chair commended Ian Butler on his performance while in the position and thanked him for his highly capable contribution to the fishery.

4 JBG Redleg Banana prawn sub-fishery

4.1 Assessment

The Chair provided a background to the Redleg Banana prawn discussion and advised the RAG to consider options to ensure the stock is managed to a maximum economic yield (MEY) target. Eva Plaganyi presented a summary of information on Redleg Banana prawn status and suggested options to revise the harvest strategy. It was noted that the current harvest strategy requirement of a minimum of 100 boat days in a fishing year to reliably analyse catch per unit effort (CPUE) could potentially be revised. In the May 2018 meeting the RAG recommended that in-season triggers could be explored as a way to manage the stock to the MEY target. NPF Industry Pty Ltd (NPF)

considered in-season triggers at its July 2018 meeting but concluded in-season triggers were not feasible due to a number of reporting issues. Instead, NPFI suggested slightly modifying the current decision rules to use a more conservative trigger value.

Eva Plaganyi presented a table that retrospectively applied NPFI's proposed control rule. The rule would close the fishery if the Redleg Banana prawn stock drops below the LRP and the fishery would remain closed until the stock rises above the LRP. It was noted that as no survey is undertaken in the sub-fishery there aren't any data to reopen the fishery. NPFI suggested running the assessment with catch mortality at zero and using average recruitment to determine the status of the fishery in relation to the LRP. A suggested improvement could be to use a deterministic estimate from the stock recruitment equation. The estimate from the stock recruit equation accounts for less recruitment at lower stock levels, which is a more valid prediction. However, without running the harvest strategy through a management strategy evaluation (MSE) it is difficult to know if the rule is sufficiently conservative.

The RAG discussed additional rules to reopen the sub-fishery after a closure but it was noted the rules don't indicate the reason for the decline, whether it is environmental, ecological or economic reasons. The rule is also not proactive. Previous work has shown that January to February rainfall, together with the southern oscillation index (SOI) can be used to predict if it's going to be a bad year and the fishery can be closed accordingly. The proposed rule isn't responsive to forward predictions and doesn't allow the stock to be managed within a year. The Chair advised that the current rules are focussed on the LRP but under the MSC assessment criteria, stocks should be managed to fluctuate around the target reference point (TRP). Any changes to the harvest control rules should be MSE tested, including the harvest strategy's ability to maintain stocks around the TRP.

It was noted that the potential remains for the Redleg Banana prawn sub-fishery to be fished too heavily if the right conditions allow, for example high prawn prices, low fuel costs and low tiger prawn stocks in the GoC. Effort within the JBG could increase with no current mechanism to limit effort. It was suggested that an in-season trigger that limits effort could be valuable as both an economic and sustainability trigger. The Chair added that a further concern is that the current NPFI proposal only considers closing the second quarter when significant fishing effort often occurs in the third quarter. The current rules may limit fishing in quarter two but there can still be high fishing pressure in quarter three. Another concern is that the stock recruitment relationship doesn't account for low stock levels that are due to environmental reasons such as lack of rainfall. There may be a number of possible options but their effectiveness won't be known until each option is MSE tested. An Industry Member agreed that there is concern with the stock and is open to options such as closing the first season permanently and implementing triggers in the third quarter.

Eva Plaganyi presented a table with historic CPUE and explained how a trigger rule with a trigger value of 0.6 (600kg per day average catch) could work. RAG members were confused with the table as the confidential data had been removed. As the RAG has Terms of Reference ensuring confidentiality, the AFMA member advised it would be okay to show the data in the meeting without further distribution.

The RAG discussed when the optimal time to fish for Redleg Banana prawns would be given consideration of the biology of the species. It was suggested that, similar to tiger prawns, the idea is to protect the stock before they spawn, which is in the first and second quarter. The Chair reminded the RAG that the reason industry gave as to the difficulties with in-season reporting is the ability for skippers to report on time. With e-logs this should be an automated, easy process. A daily report wouldn't be necessary, instead a report at the end of each trip/neap tide would suffice.

Industry agreed this may be an option as the boats pass Fog Bay at the end of each trip where they would get reception to submit their trip report.

Concerns had been raised previously with in-season triggers regarding the potential that only one or two boats fish in the JBG during the reporting period, which may not provide a representative CPUE of the fleet. It was suggested there would still need to be a rule regarding the number of boats/amount of effort that is considered representative, which is similar to the current 100 boat day rule.

Ultimately, the RAG considered four options to be tested using a MSE: the industry proposal which is to shut the first season using a higher LRP; shut the first season permanently; close the first season based on rainfall/SOI indices; an in-season trigger rule with limits on the number of boats/effort.

The Chair asked CSIRO participants to step out of the room while the RAG considered funding for the proposed scope of work. The RAG considered directly engaging CSIRO is the preferred option as it is already across the Redleg Banana prawn assessment model, has expertise in MSE, and has an in depth understanding of the fishery's complexities. The Chair welcomed CSIRO participants back in to the meeting and informed them of the RAG's preferred approach noting that AFMA has a procurement process it needs to follow. The RAG recommended CSIRO to scope out the four options, including cost, by the end of the month and circulate to the RAG and NPFI out of session. Eva Plaganyi advised that two options, a streamlined version and a more comprehensive version, could be costed. The RAG agreed to convene for a teleconference at the beginning of December to consider the proposal and the procurement requirements. In addition, the CPUE table CSIRO presented should be sent to NPFI with the confidential information removed.

Actions:

- CSIRO to provide a project scope for MSE testing the four Redleg Banana prawn harvest strategy options and circulate to NPFI and the RAG out of session by the first week in December 2018
- AFMA to confirm the procurement process for undertaking the Redleg Banana prawn MSE project
- AFMA to organise a teleconference to discuss the Redleg Banana prawn MSE project scope and procurement requirements at the beginning of December 2018

5 Tiger Prawn assessment

The RAG was provided with an update on the work CSIRO was conducting on tiger prawn stock assessment and noted that the indices from the 2018 surveys were still trending negatively, except for the Grooved Tiger prawn recruitment indices which was slightly positive. Despite the negative overall trend, there were good catches in some regions.

5.1 Blue Endeavour prawn sensitivity

The action item "Trevor Hutton (with Andre Punt) to investigate why the Blue Endeavour Prawn sensitivity test five-year average is higher than the base case five-year average" was explored and the reason ultimately comes down to timing and the effort regime. The estimate of MSY (computed across all the species) was higher in the sensitivity test due to a different effort regime being modelled. The effect is seen for Grooved Tiger prawns even though a different model (weekly

length-based model) is used. Shifting effort to a different time of the year when there is a different growth rate does not correspond to an equal change in catchability which leads to a change in the model outcomes across all the species. Modifying the effort and timing inputs to the model and assuming a constant effort regime in the future changes the estimate of MSY (as the yield which is 'used' to compute the maximum computes over all the species).

5.2 Blue Endeavour prawn MEY

The RAG noted a response to the action item "Trevor Hutton to clarify with Andre Punt why the assessment model predicts Blue Endeavour prawns to trend back up to MEY". Part of the MEY target in the tiger prawn bioeconomic model numerically specifies Blue Endeavour prawns to reach 1 (i.e. approach their biomass at MEY for the tiger prawn fishery) over a set time period (up to year 2050 in this case). During the explanation it was realised that some members had mistakenly thought this was convergence of Blue Endeavour prawns to individual B_{MEY} rather than MEY for the fishery. Once this was understood, all members agreed that this convergence to 1 was correct.

The action item "CSIRO to investigate what changes to the model or changes in effort for tiger prawn/Blue Endeavour prawns will allow the Blue Endeavour prawn stock to fluctuate around MSY" was addressed. By changing the rule above, CSIRO generated hypothetical scenarios to determine whether the MSC requirement that the stock fluctuates around B_{MSY} could be achieved. Scenarios were modelled where effort on tiger prawns was reduced to allow the Blue Endeavour prawn stock to increase to above its individual B_{MSY} . This occurred with a reduction in the normal effort on either species of tiger prawns and consequently, the overall fishery profit is significantly reduced. Basically, by modelling the Blue Endeavour prawn stock to fluctuate around B_{MEY} one of the tiger prawns stocks would be economically underfished. Thus, the MSC requirement to ensure all stocks fluctuate around B_{MSY} is problematic in this multispecies fishery (given also the optimality conditions set, the model specifications and data assumptions, and the treatment of species which are not targeted to the same extent as the tiger prawn stocks). The CSIRO modelled scenarios of Blue Endeavour prawns agreed with what the RAG understands about the interplay between fishing effort and stock status of each species. With the fishery at MEY, it is quite possible that Blue Endeavour prawns within the species basket could be on occasion less than B_{MSY} . The RAG considered whether it was more important to maximise profits on tiger prawns or have Blue Endeavour prawns MSC certified, because the model indicates both outcomes can't be achieved simultaneously in every instance. The species are currently managed according to the Commonwealth Harvest Strategy policy, but this won't achieve MSC certification for byproduct species such as Blue and Red Endeavour prawns.

The RAG discussed options for dealing with MSC requirements for endeavour prawns. It noted that over 40 years of management the fishery has established a system of spatial and temporal closures to maintain a large volume of spawning stock. This has involved closing a lot of areas and periods when people used to fish, including where there have been historically high catches of endeavour prawns. It was considered unlikely that the production model used to assess endeavour prawns, with the yearly time step, is capturing all these changes. It was suggested that the endeavour prawns could be modelled as byproduct, with some effort standardisations applied, so the assessment accounts for all the fishery changes. This approach may be difficult because the model standardises fishing power and there isn't a Blue Endeavour prawn specific fishing power. A different assessment approach that accounted for the amount of the population that's in closures and unavailable to the fishery might be possible if there were enough data. While a range of options was possible there was a high degree of uncertainty about whether different approaches would be viable, and even if they were, it is not certain the endeavour prawn stocks would all achieve the B_{MSY} target (i.e. over this level 50% of the time) required by MSC. The Chair summarised the discussion suggesting that three options were available: 1) change the species

that are MSC certified, that is, not include endeavour prawns in the certification; 2) discuss the issues with a multispecies fishery with MSC and try to resolve the NPF issue (the RAG noted that the MSC put out a draft paper in 2016 on multispecies fishery criteria requirements for assessment which might be worth looking into as the NPF may be able to be assessed under the multispecies criteria in the future) or; 3) re-configure the model to account for changes in the fishery which may indicate a large part of the stock exists outside the fishery that isn't accounted for in the model which then may possibly show that endeavour prawns are in fact above MSY (again only possibly some of the time – as postulated only at this stage). The Chair suggested that NPFI needs to consider the three options before moving forward.

5.3 Red Endeavour prawn assessment

The RAG noted a response from CSIRO regarding the action item “Trevor Hutton to investigate how the current Red Endeavour prawn model compares to the previous model before Red Endeavour prawns were taken out (in terms of assumptions) and present the findings at the next RAG meeting”. A publication by Dichmont et al. explains the development of the current assessment model which suggests the reason Red Endeavour prawns weren't included was due to a high level of uncertainty and lack of data regarding the stock. All the uncertainty and lack of data associated with Blue Endeavour prawns discussed earlier applies to Red Endeavour prawns to an even larger degree. It was advised that in 2008 a delay difference model (constructed by Yimin Ye and co-authors) was used with a weekly time step which required a lot of information. The information used was borrowed from other sources (e.g. growth parameters for Blue Endeavour prawns were used), which was suboptimal and the model was described as limited and preliminary. The model was then updated to a length/frequency based model and the existing problems with the data were magnified to the point where it was decided to remove Red Endeavour prawns from the model. Including Red Endeavour prawns in the bioeconomic component of the model would have added unnecessary noise. If Red Endeavour prawns weren't included in the bioeconomic model then there was little need to do an assessment on them at all and it was agreed at the time to exclude the species from inclusion in the full bioeconomic model.

The Chair suggested this may be a fourth option for NPFI to explore moving forward with future MSC assessments and certifying all current species including endeavour prawns (by undertaking a separate assessment). The RAG agreed that NPFI should discuss with the MSC Conformity Assessment Body (CAB) the issues and proposed options for the fishery in order to receive some guidance on where the fishery should focus its research.

Action:

- NPFI to discuss with the MSC Conformity Assessment Body (CAB) the issues and proposed options for the fishery in order to receive some guidance on where the fishery should focus its research.

6 Northern waters

The RAG discussed water developments in Northern Australia, noting that both NORMAC and the NPRAG have previously emphasised this issue is a critical external threat to the fishery. A presentation was delivered by Rob Kenyon (paper provided) which summarised the outcomes from the recent Northern Australia Water Resource Assessment (NAWRA) project.

The RAG noted that one of the NAWRA technical reports, an economic report by Chris Stokes, suggests that proposed Northern Development water infrastructure projects would be “challenged to find opportunities for new irrigated agriculture in the Assessment area that met regulatory

requirements and gained stakeholder support while also providing a financial rate of return to investors commensurate with the level of risk involved". The report also suggests that one scenario to improve the economic feasibility the developments could include a large dam that generates hydroelectric power. Such a proposal would lead to constant downstream flows and a perpetually freshwater estuary. It would then be impossible to manage the rivers to mimic natural flows and the impact on prawns would be significant.

The RAG discussed the challenges posed to the fishery by the Northern waters developments. It was noted the political agenda is strongly supportive of developments in the North and the NPF has very little influence on water harvesting decisions. NPF advised that it continues to engage in Northern Waters discussions to try to inform decision makers as to the importance of Northern river flows for the NPF. There is currently a lack of stakeholder support for the developments and, possibly due to the unfavourable economic outlook, progress has slowed. NPF will continue to engage with water resource planners and increase its efforts if there is any further progress on the developments.

It was advised that missing from the NAWRA report is an estimate of economic losses to the NPF with error bars included. It was suggested that a quick desktop study could produce the economic data but the NPF MICE model proposal that's been put forward to the FRDC will include an aspect that quantifies the impacts on NPF species as well as other ecosystem components.

The Chair advised the RAG that the Commission is seeking its advice on the NAWRA report. It was pointed out that there are some uncertainties with regards to the estimated impact on prawns and the stated figures need to be put into context. There is also a political consideration as exemplified by recent drought events where politicians overrode water allocation rules to release environmental water to irrigators. It was suggested that this should be considered when designing water harvesting rules in the North. The RAG noted that as part of the NPF MICE model project there is a liaison component with Queensland and Northern Territory water resource planners. There is a real attempt to try and synthesise all sources of information and initial meetings indicate that the planners are looking for some good guidance, supported by quantitative data. The planners are open to making modifications if it can be shown when and how flows should be managed. It was noted in the NAWRA report that calculating the average prawn loss is different to understanding that there may be good catches three out of four years but every fourth year there will be minimal catch. Understanding that the catch in some years may be really low is important and that gets masked by averages. It was further emphasised that there is also an interaction with tiger prawns that hasn't been considered. If the catches of banana prawns are low for a few years then it puts increased pressure on tiger prawns. The actual economic impact on the fishery could be a lot greater when considering the added pressure on tiger prawn stocks and the lost opportunity costs. There are flow on effects from different water harvest scenarios that impact every aspect of the fishery and ultimately impact the overall economic landscape.

The Chair summarised the discussion which included the RAG noting reports from CSIRO and that, depending on the water harvesting scenarios, there can be significant impacts on different prawn life history stages which can ultimately impact the fishery. There is also an aspect of uncertainty regarding prawn life history and its connection to various water flow metrics and seasonality. Furthermore, the real impacts on the fishery may be masked by analysing averages and there are uncertainties with the reported estimates and how large the variation around these estimates may be. The NPF MICE model project in conjunction with State water resource managers will address some of these uncertainties. However, the Northern Waters Developments remain a major risk to the fishery. Damming of rivers remains one of the highest risks and there may also be impacts on threatened, endangered and protected species (TEPS) that aren't yet considered.

It was advised that NPF data had been analysed as a side project to the NAWRA which modelled the impact from low flows. The draft report indicates that some of the low flows have quite a high impact factor on the catch. Rob Kenyon advised he would follow up with the researcher to see if the report had been finalised.

Actions:

- RAG to provide advice to the Commission on the outcomes from the NAWRA reports and the impact on the NPF target species
- Ian Knuckey to draft a Chairs report for NORMAC and the Commission with assistance from Rob Kenyon and Eva Plaganyi to capture the detail of the Northern waters developments
- 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.

7 Scientific Observers

The RAG considered the revised Scientific Observer protocols.

7.1 Bird counts

Feedback from the Scientific Observers was that conducting the bird count at night was pointless due to poor visibility. The AFMA member asked for the RAGs advice on carrying out the bird observation protocol and whether the Scientific Observers should count species abundance at the same time as watching the warp line, count them separately or conduct an observation of just the warp. The RAG noted that the bird observation data quality across all AFMA fisheries has been poor as the observations have not been conducted consistently between observers or between years. The point of conducting the observations at all was questioned but it was suggested that the data is used during the ecological risk assessment (ERA) process.

A Scientific Member advised that there are issues globally regarding impacts on birds from trawling and discards. There are also studies in the GoC on the potential impacts of bycatch and discards on birds and other species. It could be beneficial for the fishery to collect some data on bird abundance and any potential warp strikes. It is still valuable information to record these data even if there aren't any bird interactions with the warp line. The RAG noted the potential for Scientific Observers to miss seeing warp strikes if they were distracted by counting bird abundance. Experience from fisheries in Southern Australia indicated that the issue of warp strikes wasn't known until observers specifically spent dedicated time watching the warp lines. It was also noted that the warp lines should be watched as the discards are being returned to the water. An Industry Member advised that the warps on a prawn trawler are a lot further off the boat than a fish trawler and the likelihood of any interactions is low. The RAG agreed that the likelihood of warp strikes occurring in the fishery was low but recommended that observers should dedicate time to watching the warp lines every trip for a year to collect data. It was suggested that a photo of the boom should be taken just before the warp line observations are undertaken and the warp line on the same side as the discard chute should be observed. It was further suggested that New Zealand has protocols for monitoring birds that may help guide the NPF data collection protocols. The Chair advised that AFMA would talk to the Scientific Observers to decide on what is feasible, liaise with New Zealand regarding its protocols, and then have Dave Brewer and Gary Fry review the final protocols.

7.2 Bycatch subsampling

The question of why the 10 kg subsample is collected by the Scientific Observers was raised. A Scientific Member informed that the data is useful to meet the MSC requirement to monitor bycatch species that contribute greater than two per cent to the bycatch volume. The data also contributes to the fisheries bycatch sustainability work that CSIRO undertakes. The number of samples required per night was raised and it was suggested that a sample from one shot per night was adequate as long as the shot the sample is taken from is rotated each night. It was suggested that the 10 kg data collection protocol should be reviewed in line with the protocol described by Heales *et al.* (2003). The Chair advised that an important piece of data that is missing from the current protocols is an estimate of the total catch. The AFMA member clarified that the Scientific Observers obtain an eyeball estimate of the total catch from the skipper. It was agreed the protocols need to make it clear this process is undertaken.

The AFMA Member asked whether data was needed on just the retained bugs or all bug catch as the Scientific Observers have indicated that measuring the entire bug catch from a shot is too time consuming. It was advised that a representative subsample is adequate as long as the entire bug catch is sampled. A suggested number of 30 individuals was recommended to be randomly sampled from each shot. It was clarified that the 30 individuals is separate to the 10 kg subsample and can be collected in a manner similar to the prawn subsample.

7.3 Length measurements

It was advised that the Scientific Observer length data for prawns needs to be reviewed as the carapace length is measured in different units across the data (mm, cm and 'unknown'). A bit of work is needed to clean up the data. The AFMA Member advised that there is an issue with the data sheets and it will be rectified.

7.4 Observer manual

The RAG was asked to provide comments on the observer manual and the annual observer report. It was agreed that Gary Fry and Dave Brewer would provide feedback to AFMA on the final observer protocols/manual. There was a question regarding the amount of data that was included in the observer report as the current data indicates that only 35 prawns were measured each day which is significantly less than the required amount. AFMA advised it will review the data to ensure its accuracy. Further suggestions from the RAG included dividing the data up by season, including the target number of days per season and including target lengths.

Actions:

- AFMA to update the observer protocol for counting birds to include the monitoring of potential warp strikes
- AFMA to look into New Zealand's protocols for counting bird abundance
- AFMA to update the observer protocol for collecting bugs to include the collection of a 30 individual subsample of bugs of all sizes
- AFMA to check the observer protocols to ensure the collection of the 10 kg subsample is in accordance with the method outlines by Heals et al.
- AFMA to include the method for collecting the eyeball estimate of the total catch in the observer protocols
- On page 99 of the meeting documents, dot point 4, remove the word 'group' – Identify species 'group' should be 'identify species'

- AFMA to ensure the observer data is collected in the correct unit of measurement
- AFMA to re-check the data within the 2017 annual observer report
- AFMA to consider dividing up annual observer report by season and including the target number of days per season and target lengths
- David Brewer and Gary Fry to provide comments/feedback to AFMA on the current observer manual and annual observer report.

8 Banana prawn fishery update

The Chair advised that each year the RAG review the industry projected economic inputs used for the banana prawn fishery in-season triggers and compare them to the actual price data. It was advised that the actual price data was not available yet and that the RAG normally reviews the data via teleconference at the beginning of each year. The RAG agreed to discuss the price data during the Redleg Banana prawn assessment results teleconference.

Actions:

- Tom Kompas to provide the economic data used for the 2018 in-season banana prawn catch triggers
- RAG to compare the industry provided price data with the actual 2018 price data (surveyed in mid to late 2018 and collated at the beginning of 2019)

9 Research

9.1 CSIRO projects

CSIRO provided an overview of the items discussed at its 2018 assessment team workshop. Items discussed included plans for data weighting, automating data, a summary of fishing power, an update on the Redleg Banana prawn harvest strategy, the potential for a full bio-economic model, a report on prawn larvae and recruitment, prawn life-history considerations and implications with Northern developments, and a report on trawl footprints.

The RAG discussed the species split project and provided guidance for developing the final proposal before submitting for funding. At its previous meeting, the RAG suggested the method for conducting the species split project last time should be revisited to see if the same method can be applied in the current project. CSIRO advised that the previous method was reviewed as well as considering how to incorporate the data that will be available from the Scientific Observers. It was advised that boxes of prawns will be required to be collected for two years to account for any large deviations in the stock in any one year. The RAG noted that the Scientific Observer data alone would not provide the statistical veracity required and there would also be problems with coverage. It was questioned whether there was a component of the project that could determine if Scientific Observer data could be used in the long term to avoid having to repeat the species split project periodically. The timing of the project was also questioned as boxes will need to be collected from operators targeting tiger prawns during the end of the banana prawn season. The RAG suggested that the project scope needs to be clarified including a clear sampling regime and CSIRO should liaise with NPFI regarding costs. It was recommended that boxes start to be collected in 2019 and CSIRO should prepare the revised proposal ahead of the NPFI meeting in February 2019.

9.2 MSC Client Action Plan

The RAG reviewed the MSC client action plan noting a draft Red Endeavour prawn review had been circulated which was the first action of the first quarter. The second action to include a higher level sensitivity test for Red Endeavour prawns has also been completed as Red Endeavour prawns were included in the 2018 assessment as a sensitivity test. The third action will need further discussion with the assessors about whether Red Endeavour prawns can be included as part of the multi-species MSC assessment criteria. However, the RAG has discussed and considered the issue as part of the current meeting. It was confirmed the actions for the first audit, which is likely to take place in March 2019, have been completed and plans for the second audit have begun to be formulated.

The RAG considered research priorities for the five-year strategic plan ahead of the planning workshop in February 2019. It was suggested that a bottom-up approach where the industry identify all the research priorities for the fishery is the preferred approach, but it would be useful at the start of the workshop to inform what the RAG identified as the top research priorities. The RAG agreed research priorities didn't need to be identified at its current meeting.

An update on the ARC research proposals was provided by AFMA.

Action:

- CSIRO/Trevor Hutton to revise the species split project scope to include a clear sampling regime and liaise with NPF regarding costings before the February 2019 industry meeting.

10 Other business / next meeting

10.1 Mangrove dieback

Rik Buckworth presented the latest information regarding the mangrove dieback in Northern Australia. The RAG was asked if it was interested in having Norm Duke attend the next meeting to give a presentation on the project. The RAG agreed it would be useful to wait until the end of summer to see if any new information became available, and if so Norm could be invited to the next meeting.

10.2 Spotted Tilapia

The RAG discussed the discovery of Spotted Tilapia in GoC catchments and considered the impact on the NPF. It was noted that AFMA was contacted by Biosecurity Queensland seeking support to investigate the incursion. The RAG expressed its concern and agreed that it was committed to support any work undertaken to mitigate the impact but suggested the primary responsibility was with the State government. NPF informed that it was in contact with the team coordinating the biosecurity response and has encouraged them to do all the research they can to better understand the incursion. The RAG discussed the potential impact on prawns suggesting that an understanding of the Spotted Tilapia diet and the ecological impact were areas to target research. The RAG agreed that it is supportive of staying involved in the biosecurity response, it is interested in plans to mitigate the impact, it has concerns of the impact on the NPF and is interested in supporting/assisting as required.

10.3 Kimberley Prawn Fishery

The RAG discussed the potential for the Kimberley Prawn Fishery (KPF) to change its season dates. The KPF is considering changing from having the same season dates as the NPF to a single extended season. There is concern that the change will allow dual licence holders to fish in the KPF during the NPF mid-season closure leading to a significant increase in effort in the KPF.

An Industry Member suggested that the effort limit would be reached before the proposed end date of 15 November but the season change could always be reverted back if it wasn't effective. The RAG agreed that there is likely to be an increase in effort but it was also noted that the KPF is a specialised fishery where skippers need to be familiar with the challenges of operating in that region. NPF skippers also need a break during the mid-season closure before the second season starts so there may be only a small increase in effort in the KPF for a week or so. The use of twin gear in the KPF is also likely to slow down increased effort from NPF fishers.

10.4 Survey indices

An Industry Member raised concern regarding the NPF survey indices and asked if the RAG should be taking action. The Chair advised that the RAG won't see the data until February 2019 but the concern was noted and the RAG agreed to critically analyse the data when it became available. NPF informed the RAG that at its July 2018 meeting it was agreed the NPF closures would be reviewed to determine if more protection could be afforded to Brown Tiger prawns. The Industry is to provide recommendations at its February 2019 meeting. It was noted that the NPF tiger prawn fishery in Queensland waters gets disproportionately targeted as the closure regime provides limited alternative options. With the potential for the JBG Redleg Banana Prawn fishery to be closed in the first season, even more pressure will be put on tiger prawn stocks.

10.5 Sawfish projects

The RAG discussed the draft CSIRO sawfish report by Dr Richard Pillans and co-authors. It was noted that an issue with the data was identified as the data didn't match what was reported in the NPF sustainability report. The issue was related to how the data was analysed as it wasn't separated by season. Gary Fry advised that he will inform Dr Pillans the data could be analysed by season (all strictly dependent on data availability). It was also noted that the report suggests commercial fishing effort should be reduced by 40 per cent within two years but no other impacts or mitigation measures are suggested. A Scientific Member questioned the assumption in the report that all sawfish stocks are between MSY and crash levels and suggested this may not be the case. There was consensus from the RAG Members that some of the wording in the draft report as it stands could do with editing. The Chair summarised the discussion and confirmed that NPF and AFMA were to respond to the draft (as is due process with external reports), Gary Fry and Trevor Hutton would correspond with the author(s) regarding the presentation of the data, AFMA were to speak to CSIRO/DoEE regarding the status of the report and request re-wording to content, and the RAG would request to see the re-revised draft again before it was finalised. A Scientific Member advised that the report does provide some useful information for the NPF including the current challenge in telling whether Green and Freshwater stocks are going up or down. It is well known sawfish distributions have shrunk globally and Northern Australia is a remaining stronghold for some species. The NPF has interactions with sawfish and may be the best source of information to identify sawfish stock status. It is likely the next step is to do a population analysis to work out population sizes of the sawfish species in Northern Australia and together with catch data from the NPF (and other fisheries) an understanding of changes in population sizes may be possible. The RAG agreed that there is useful information in the report and that the NPF can use this information to manage its operations.

Actions:

- The RAG to inform Biosecurity Qld that it is supportive of staying involved in the biosecurity response, it is interested in plans to mitigate the impact, it has concerns of the impact on the NPF and is interested in supporting/assisting as required.

- The RAG to critically analyse the NPF survey indices data at the beginning of 2019 when made available
- Gary Fry to inform Dr Pillans the sawfish data within his report could be analysed by season (depending on data availability).
- Gary Fry and Trevor Hutton to correspond with Dr Pillans with regard to the presentation of the data in the sawfish report
- AFMA to contact CSIRO/DoEE to discuss the content of the sawfish report
- AFMA to ask that the re-vised draft sawfish report (i.e. any new revisions) be made available to the RAG before it is finalised

The Chair closed the meeting at 6:20 pm (EST).

Signed (Chairperson):



Ian A Knuckey

Date: 25/01/2019

Draft Annotated Agenda

Northern Prawn Fishery Resource Assessment Group (NPRAG) meeting

1 November 2018 8.00 am (Eastern Standard Time)

Item	Responsibility	Paper
1. Introduction / Meeting Management <ul style="list-style-type: none"> • Welcome • Adoption of agenda • Declaration of interests • Minutes from previous meetings 	Chair	Yes
2. Action Items <i>Outcomes: RAG to note progress on action items from previous meetings and provide feedback and comments where appropriate.</i>	AFMA	Yes
3. Update Reports <ul style="list-style-type: none"> • Industry <ul style="list-style-type: none"> ○ Bycatch strategy/industry BRD trials ○ Tiger Prawn season • AFMA <ul style="list-style-type: none"> ○ US TED inspections ○ Commission outcomes on Autonomous Adjustment ○ Commonwealth Harvest Strategy and Bycatch Policies ○ Compliance report ○ ERA ○ Govdex/GovTEAMS <i>Outcomes: The RAG notes the various update reports.</i>	NPFI/AFMA	Yes
4. JBG Redleg Banana Prawn sub-fishery <ul style="list-style-type: none"> • Reminder of results from 2018 assessment • Update on the review of the Redleg Banana Prawn harvest control rule • Industry plan to manage Redleg Banana Prawns <i>Outcomes: The RAG note the results from the 2018 assessment and discuss Industry's proposed change to the harvest strategy rule.</i>	CSIRO/NPFI	Yes
5. Tiger Prawn assessment <ul style="list-style-type: none"> • Update on assessment/improvements • Blue Endeavour Prawn sensitivity test • Red Endeavour Prawn sensitivity test 	CSIRO/NPFI	Yes

<p><i>Outcomes: That the RAG notes that 2019 is a non-assessment year and considers the success of the 2018 season in relation to the model estimates; the RAG considers the Blue and Red Endeavour Prawn sensitivity test and discusses their assessment in terms of MSC accreditation.</i></p>		
<p>6. Water use in Northern waters</p> <ul style="list-style-type: none"> • CSIRO NAWRA report • Provide advice to the AFMA Commission on the analysis/outcomes regarding impact of water use in Northern Australia on the NPF <p><i>Outcomes: The RAG discusses the CSIRO NAWRA report in the context of the NPF and provides advice to the AFMA Commission on the analysis/outcomes regarding the impact of water use in Northern Australia on NPF primary species.</i></p>	CSIRO/AFMA	Yes
<p>7. Scientific observers</p> <ul style="list-style-type: none"> • Discuss the data collected by scientific observers • Discuss the collection of commercial catch-at-length data and if the AFMA Scientific Observer data can be used • Review the Scientific Observer report and comment on whether it meets expected objectives • Review the NPF Scientific Observer manual <p><i>Outcomes: The RAG discusses the data collected by scientific observers and if it meets the fishery's needs; the RAG discusses whether the Scientific Observer length-frequency data can be used in the assessment; the RAG reviews and comments on the Scientific Observer report; the RAG reviews the Scientific Observer manual.</i></p>	AFMA/CSIRO	Yes
<p>8. Banana Prawn fishery update</p> <ul style="list-style-type: none"> • Retrospective partial check on this year's in-season trigger given current economic situation (e.g. price) <p><i>Outcomes: The RAG reviews the economic inputs used for the 2018 in-season triggers.</i></p>	CSIRO	Yes
<p>9. Research</p> <ul style="list-style-type: none"> • Summary of CSIRO assessment team workshop • Species split project proposal • MSC client action plan • 5 year plan update and proposals • ARC update <p><i>Outcomes: The RAG notes the outcomes from the CSIRO assessment team workshop and the species split project proposal; the RAG reviews the MSC client action plan; the RAG notes the timing of the 5 year</i></p>	CSIRO/AFMA/NPFI	Yes

<i>strategic plan workshop and discusses potential research proposals to include in the plan; the RAG notes an update on the ARC research submissions.</i>		
10. Other business <ul style="list-style-type: none"> • Tilapia 	RAG	

NPRAG Declared Conflicts of Interest

Participant	Membership	Interest Declared
<i>Ian Knuckey</i>	<i>Chair</i>	<i>Director - Fishwell Consulting Pty Ltd Director - Olrac Australia – a company associated with electronic logbooks. Scientific member - NORMAC Chair - Tropical Rock Lobster RAG Chair - Victorian Rock Lobster RAG Scientific member - SESSF shark RAG Scientific member - GABRAG Various research interests in other Commonwealth and State fisheries.</i>
<i>Rik Buckworth</i>	<i>Scientific Member</i>	<i>Scientific Member - South East RAG Scientific Member - Torres Strait Finfish RAG Chair - NT Research Advisory Committee (FRDC) Director - Aquatic Remote Biopsy Pty Ltd Director - Sea Sense Australia Pty Ltd Current consultancy contract with NPFI to review Red Endeavour prawns 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.</i>
<i>David Brewer</i>	<i>Scientific Member</i>	<i>Researcher/consultant. Has in the past and may in future seek and receive funding for research in the fishery.</i>
<i>Ian Boot</i>	<i>Industry Member</i>	<i>Managing Director of Austfish, a company which operates NPF vessels. Has a commercial interest in the fishery.</i>
<i>Phil Robson</i>	<i>Industry Member</i>	<i>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.</i>
<i>Ian Butler</i>	<i>AFMA Member</i>	<i>AFMA employee, no pecuniary interest in the fishery.</i>
<i>Stephen Eves</i>	<i>Executive Officer (AFMA)</i>	<i>AFMA employee, no pecuniary interest in the fishery.</i>
<i>Adam Camilleri</i>	<i>Observer - AFMA</i>	<i>AFMA employee, no pecuniary interest in the fishery.</i>

Participant	Membership	Interest Declared
<i>Annie Jarrett</i>	<i>Observer - NPFI</i>	<i>CEO- NPFI Member of the MSC Stakeholder Council Chair - Australian Council of Prawn Fisheries (ACPF). Some research items are of relevance to NPFI.</i>
<i>Adrienne Laird</i>	<i>Observer - NPFI</i>	<i>Employed as a contractor by NPFI. Some research items are of relevance to NPFI.</i>
<i>John Glaister</i>	<i>Observer - NORMAC Chair</i>	<i>NORMAC Chair, ex-AFMA Commissioner, no pecuniary interest in the fishery.</i>
<i>Trevor Hutton</i>	<i>Observer - CSIRO</i>	<i>Research provider. Has in the past and may in future seek and receive funding for research in the fishery.</i>
<i>Eva Plaganyi</i>	<i>Observer - CSIRO</i>	<i>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.</i>
<i>Roy Deng</i>	<i>Observer - CSIRO</i>	<i>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.</i>
<i>Tonya van der Velde</i>	<i>Observer - CSIRO</i>	<i>Research provider in the CSIRO monitoring team 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.</i>
<i>Gary Fry</i>	<i>Observer - CSIRO</i>	<i>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.</i>
<i>Rob Kenyon</i>	<i>Observer - CSIRO</i>	<i>CSIRO employee. Participates in projects related to the NPF that currently receives funding and will seek to receive funding in the future.</i>
<i>David Mobsby</i>	<i>Observer - ABARES</i>	<i>Economics research provider. No current pecuniary interest in fishery. Potential to seek and receive funding for research in the fishery in future.</i>

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 – Rik Buckworth/CSIRO to identify the top 50 papers that are fundamental to the RAG's work and upload to GovTEAMS
2	AFMA	Provide a written annual summary of observer monitoring that provides methods, results and spatial distribution (use SESSF report as a template).	Complete – presented to RAG at November 2018 meeting
3	AFMA	Update observer manual to include most up-to-date handling and data collection techniques and send updated list of items recorded to NPRAG.	Complete – Observer manual complete (agenda item 7). AFMA to provide the updated species of interest list to the AFMA scientific observers after the ERA/ERM has been completed
4	NPRAG	Reassess the research priorities at the next face-to-face meeting to establish a schedule of improvements to be made to the stock assessment.	Ongoing – to be discussed at May RAG each year
5	CSIRO	Update on the mangrove die-off.	Ongoing – to be discussed at each meeting
17-18 November 2016 Meeting			
6	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
7	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 kept on file until mid-2018
11 May 2017 Meeting			
8	CSIRO	Present economic spreadsheet with the inputs into the MEY trigger at annual November RAG meeting.	Ongoing – present at November meeting each year (agenda item 8)
9	CSIRO/Tom Kompas	Present data on how the industry price estimates compare with the survey results at the November NPRAG meeting each year.	Ongoing – present at November meeting each year (agenda item 8)
4-5 December 2017 Meeting			
10	NPFI/AFMA	NPFI/AFMA to finalise the new compliance method for measuring TEDs before the February 2018 NORMAC meeting and ensure the testing protocols are recorded for transparency.	Complete – industry and AFMA agreed the current protocol which involves pulling the stretched mesh taut will continue as is
23-24 May 2018 Meeting			
11	CSIRO/Eva Plaganyi	Eva Plaganyi to review the CPUE for Redleg Banana Prawns in August 2017 to confirm the assessment model output is accurate.	Complete – agenda item 4
12	AFMA	AFMA to formally advise NPFI of the results from the Redleg Banana Prawn assessment each year (if there was enough data to run the assessment) and the results against the harvest control rules. Industry will consider the results and may use feedback from environmental and economic indicators to decide whether the fishery is open or closed.	Complete – industry to be advised of the assessment results ahead of the season opening each year
13	CSIRO/Eva Plaganyi	Eva Plaganyi to provide Industry with a table of historical CPUE	Complete – sent to NPFI on 5 July 2018

		data on Redleg Banana Prawns for it to consider potential in-season trigger limits.	
14	NPFI	NPFI to discuss the Redleg Banana Prawn assessment and the proposed changes to the harvest control rules at their next industry meeting in July 2018 and advise the RAG of the industry's preferred response for managing Redleg Banana Prawns at the next RAG meeting.	Complete – agenda item 4
15	CSIRO/Trevor Hutton	Trevor Hutton (with Andre Punt) to investigate why the Blue Endeavour Prawn sensitivity test five-year average is higher than the base case five-year average.	Complete – agenda item 5
16	CSIRO/Trevor Hutton	Trevor Hutton to investigate how the current Red Endeavour Prawn model compares to the previous model before Red Endeavour Prawns were taken out (in terms of assumptions) and present the findings at the next RAG meeting.	Complete – agenda item 5
17	CSIRO/Trevor Hutton	Trevor Hutton to clarify with Andre Punt why the assessment model predicts Blue Endeavour Prawns to trend back up to MEY.	Complete – agenda item 5
18	CSIRO	CSIRO to investigate what changes to the model or changes in effort for Tiger Prawn/Blue Endeavour Prawns will allow the Blue Endeavour Prawn stock to fluctuate around MSY.	Complete – agenda item 5
19	AFMA	AFMA to ensure the Scientific Observer photos of TEPs and at-risk species are being sent to Gary Fry for analysis.	Ongoing – in discussions with Scientific Observers and Gary Fry about how to share large amounts of data
20	AFMA	AFMA to review each species on the SOI list to determine if	Complete – no longer any SOI data collected

		further data collection is needed and whether the species should be removed from the list.	
21	AFMA/CSIRO	AFMA to work with CSIRO and Scientific Observers to update the scientific data collection protocols.	Ongoing – to be discussed at May RAG meeting each year
22	AFMA/NPFI	AFMA and NPFI to investigate the objective for collecting species abundance counts and whether this data should continue to be collected.	Ongoing – agenda item 7
23	AFMA	AFMA to review the bug collection data to determine if it still needs to be collected.	Ongoing – agenda item 7
24	CSIRO	CSIRO to develop a full species split project proposal with costings, based on the original method of data collection (Bill Venables' project).	Complete – agenda item 9
25	CSIRO/Eva Plaganyi	Eva Plaganyi to include some funding in the MICE model project proposal for an industry advocate to be part of the project as a co-investigator.	Complete – industry representative included in project proposal as a co-investigator
26	NPFI	NPFI discuss allocating funds for a student to conduct a literature review on Red Endeavour Prawns.	Complete – Rik Buckworth has been contracted by NPFI to conduct review
27	David Brewer, Ian Butler, Steve Eves, Adrienne Laird	David Brewer, Ian Butler, Steve Eves, Adrienne Laird and a representative from the CSIRO ERA team to form a working group to engage in the ERA process and report key results back to the RAG.	Ongoing – agenda item 3
28	AFMA	AFMA to clarify the purpose, audience and cost of the FMS and report back to the RAG.	Complete -
29	AFMA/NPFI	AFMA and NPFI to collaborate to finalise the indicators report to provide more descriptive information on each indicator.	Complete – agenda item 3

30	Tom Kompas/Trevor Hutton	Tom Kompas and Trevor Hutton to develop a model of profit vs. profit at MEY based on historical data to provide industry with an example of what the indicator would look like.	Complete – presented at NPFI Pty Ltd meeting in Brisbane on 6 July 2018
31	AFMA	AFMA to investigate whether it would be possible for Tom Kompas and Annie Jarrett to meet with the Commission to discuss the Autonomous Adjustment issue.	Complete – Annie Jarrett attended the September 2018 Commission meeting