Australian Government
Australian Fisheries Management Authority

Northern Prawn Fishery Resource Assessment Group (NPRAG) Meeting

Meeting Minutes

Date: 23-24 May 2018

Venue: Brisbane Riverview Hotel

Attendees

Wednesday 23 May 2018	
Name	**Member type e.g. industry member**
Ian Knuckey	*Chair*
Phil Robson	*Industry Member*
Ian Boot	*Industry Member*
Tom Kompas	*Economic Member – University of Melbourne*
David Brewer	*Scientific Member*
Ian Butler	*A/g AFMA Member*
Stephen Eves	*Executive Officer - AFMA*
Annie Jarrett	*Observer - NPFI*
Adrianne Laird	*Observer - NPFI*
Eva Plaganyi	*Observer - CSIRO*
Trevor Hutton	*Observer - CSIRO*
Roy Deng	*Observer - CSIRO*
Gary Fry	*Observer - CSIRO*
Steve Hall	*Observer - AFMA*
Thursday 24 May 2018	
Ian Knuckey	*Chair*
Phil Robson	*Industry Member*
Rik Buckworth	*Scientific Member*
David Brewer	*Scientific Member*
Ian Butler	*A/g AFMA Member*
Stephen Eves	*Executive Officer - AFMA*
Annie Jarrett	*Observer - NPFI*
Adrianne Laird	*Observer - NPFI*
Eva Plaganyi	*Observer - CSIRO*
Trevor Hutton	*Observer - CSIRO*
Roy Deng	*Observer - CSIRO*
Gary Fry	*Observer - CSIRO*

1 Preliminaries

1.1 Welcome and apologies

The Northern Prawn Fishery Resource Assessment Group (NPRAG) Chair, Ian Knuckey, opened the meeting at 8.30 am (EST) at the Riverview Hotel in Brisbane on 23 May 2018 with an Acknowledgement of Country. The Chair noted apologies from Scientific Member Rik Buckworth, who was only able to attend the second day and Industry Member Ian Boot, who was only attending the first day. Apologies were also noted from Robert Curtotti, David Mobsby and Sean Pascoe. The Chair welcomed AFMA Scientific Observer Steve Hall and CSIRO observer Gary Fry. As all RAG members had been recently appointed for a three year term, the Chair provided a

presentation on the role and expectations of members and observers during RAG meetings based on Fisheries Administration Paper No. 12 (FAP12).

1.2 Adoption of Agenda

The Chair advised that the agenda (Attachment 1) would be modified to account for various individual availability throughout the two day meeting.

1.3 Declaration of interests

The RAG followed the conflict of interest declarations as outlined in the revised FAP12.

The Chair called for declarations of interest to be made by the group in relation to any pecuniary or other interests relevant to discussions outlined on the agenda (see Attachment 2). The Chair asked each individual/group to leave the room while their continued involvement in the meeting was discussed. It was noted that CSIRO representatives had a potential conflict regarding agenda item 8 – research, specifically in relation to the strategic research plan and the annual research plan and would be asked to leave the room if any recommendations were to be made.

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 meeting

It was noted that the minutes from the December 2017 meeting were approved out-of-session as a true and accurate record of the meeting and had been published on the AFMA website.

2 Actions items

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

3 Update reports

3.1 Industry update

The RAG noted an update from Adrianne Laird on the progress of industry's bycatch strategy (paper provided).

Adrianne Laird advised that the project proposal 'Can sawfish bycatch within the NPF be mitigated through a novel electric device?' has been funded by FRDC under Program 1. A start date for the project is yet to be determined.

NPFI have been working on improving the quality of logbook data on sawfish species interactions within the fishery. The 2017 sawfish interaction data from logbooks shows a great improvement in species identification and recording of the interactions by skippers. Crew Member Observers (CMOs) have also collected tissue samples throughout 2016 and 2017 to provide to Dr Richard Pillans (CSIRO) for population genetics of the sawfish species. Collection is continuing during 2018.

Industry member Ian Boot provided an update on the current banana prawn season. The current fuel price out of Darwin, net to the vessel, is 87.48 cents. The fuel price has been steadily increasing from 82.68 cents a fortnight ago to 85.10 cents the previous week and increasing again

to the current price. The catches around Fog Bay have been average, with boats catching approximately 40 tonne per boat per week in the first two weeks. The banana prawns have been small at around the 23 count. A lot of smaller product, around the 30+ count, has been caught around Lorna Shoal. There have been no substantial catches in the Joseph Bonaparte Gulf (JBG). At the start of the season there was a lot of 'green water' due to the high rainfall, which meant the spotter planes weren't able to spot boils on the surface. Some skippers have suggested that although there was a lot of rainfall, there wasn't much flooding, which may help explain the low banana prawn catches around the top end. The standard beach price of banana prawns for 10/20 sized prawns is approximately $14 per kilogram for a 5 kilogram box, which is slightly higher than last year.

Industry member Phil Robson provided further information on the 2018 banana prawn season. The above average rainfall across the Top End does not appear to have produced any results, with catches being well below expectations. The eastern part of the Gulf of Carpentaria (GoC) has been the best area for fishing, with large catches and exceptional quality of product. Weipa and the Edward River areas received some late rain that appears to have helped flush the prawns out. There was strong wind in late April/early May which resulted in tough operating conditions and may have effected prawn catches.

3.2 AFMA update

NPRAG noted an update provided by AFMA management including:

- In July 2018 the US National Oceanic and Atmospheric Administration (NOAA) agency will visit Australia to conduct inspections of TEDs in the NPF, Torres Strait Prawn Fishery and QLD East Coast Trawl Fishery.
- Changes have been made by the United States to export regulations. By January 1, 2022, a harvesting nation must apply for and receive a comparability finding for each of its export and exempt fisheries that are specified on a list to continue to export fish and fish products from certain fisheries to the United States.
- There is a project underway to replace Govdex with a more modern and robust digital collaboration service, called GovTEAMS. It is expected GovTEAMS will launch in August 2018.
- Bycatch and Harvest Strategy Policies are complete and in press. The intention by the Department of Agriculture and Water Resources is to release them alongside the Bycatch and Harvest Strategy Policy Guidelines which are in final form, but not quite ready for publication.

4 JBG red-legged banana prawn sub-fishery

4.1 Assessment

The RAG noted a presentation from Eva Plaganyi on the results of the 2017 red-legged banana prawn assessment (paper provided). Effort in 2017 was 548 boat days, similar to the 2014 effort level, and hence much higher than the relatively low effort of 79 and 76 boat days for 2015 and 2016 respectively. There was substantial effort throughout the three quarters of fishing, and particularly in the third quarter (Jul-Sept). Despite having a similar effort level to 2014, the CPUE was substantially less and hence the total catch of 365 tonnes was only 44 per cent of the 2014 catch. The Reference Case Model fits the latest CPUE data well but suggests a concerning declining trend in spawning biomass. The preliminary assessment indicates that the stock is currently substantially reduced (likely due to the combined impact of fishing and the major environmental anomalies as discussed previously). The 2018 model-estimated spawning biomass

(1400t) is currently estimated to be below the target level but above the limit reference point, although there is a fair amount of uncertainty associated with this prediction. The Reference Case recommended total allowable effort (TAE) for 2018 is 334 boat days (based on an average of the pattern of the last three years), with a corresponding catch prediction of 152.7 tonnes.

An industry member questioned the catch rate figure in the assessment for the month of August as it was quite low compared to what the boats experienced on the water. The member advised that August was a good month for red-legged banana prawns and the JBG was more profitable than the GoC for his fleet. Eva Plaganyi advised she will review the assessment model rules to clarify how effort is or isn't included to confirm the CPUE figure for August is correct. However, the CPUE figure is half of that in 2014 and it is unlikely there is an error in the observed trend.

The RAG noted that none of the trigger points were exceeded and the CPUE was above the limit reference point of 390 kg/boat/day. The Chair advised that the outcome of the assessment needs to be clearly communicated to NPF stakeholders, specifically industry, as soon as the assessment has been completed. With a harvest strategy that has control rules, the industry should be informed every year of the results against the 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 (as some years there may be insufficient data to conduct an assessment).

4.2 Harvest Strategy

The RAG discussed the red-legged banana prawn stock status under the current harvest strategy and how to rebuild the stock to the target reference point. The Chair was concerned that currently there is no management response to set a harvest level that ensures the stock trends toward the target reference point. The only management options available under the harvest strategy are to assess the stock status at the end of each year and decide whether to close one or both seasons the following year. Eva Plaganyi suggested one option could be to monitor the catch rates throughout the year and if a certain target is not met then fishing effort is reduced to give the stock more time to recover. The RAG discussed replacing the current season closure rules with in-season trigger rules, similar to the banana prawn sub-fishery.

The RAG noted that although there was not enough data in 2015 and 2016 to reliably run the red-legged banana prawn assessment model, these two years may still provide valuable information. Including 2015 and 2016 data in the assessment model as a sensitivity indicates these years were both consistent with a declining stock status trend. The Chair suggested that the current requirement for a minimum of 100 days data may need to be revised as the results from 2015 and 2016, although not included in the assessment, were consistent with the trend observed in the fishery.

The RAG reviewed the draft table of red-legged banana prawn scenarios and proposed decision rules (paper provided). It was suggested that the RAG was developing a really complex set of harvest control rules to make up for a lack of information in the fishery. One of the fundamental requirements of the Commonwealth's Harvest Strategy Policy is that harvest strategies are meant to be precautionary and simple. An industry member suggested that one way to simplify the harvest control rules is to revert back to one season where the fishery is closed the first season and only opened the second season. In addition, the catch rate could be monitored during the second season to ensure not too much pressure is placed on the stock. The Chair agreed that catch rate could be an important mid-season indicator and suggested that for a simple fishery the control rules should be simple and a good starting point is to monitor catch rates. A minimum catch rate could be determined, similar to the banana prawn sub-fishery, and if the catch rates aren't reached then the season is closed. Eva Plaganyi advised that, as a starting point, the data could be interrogated to determine some appropriate catch rate triggers and also explore the application

of these triggers to historical data. An industry member suggested that the fishing effort could be reduced to a couple of months in the second season until the stock shows signs of trending positively and interim in-season triggers, such as 700 or 800 kg/boat/day, could be established which would close the fishery if not achieved. Another suggestion was to raise the 390 kg/boat/day LRP, but it was pointed out that this would still rely on full season closures and isn't necessarily a way to monitor the stock in-season to ensure it trends positively. Industry agreed to discuss the red-legged banana prawn assessment and the proposed changes to the harvest control rules at the next NPFI meeting in July. Consideration will be given by industry to using in-season trigger limits as a management alternative. NPFI will provide in-season trigger limits which are acceptable to Industry at the next RAG meeting and advise the RAG of the industry's preferred response for managing red-legged banana prawns.

Actions:

- Eva Plaganyi to review the CPUE for red-legged banana prawns in August 2017 to confirm the assessment model output is accurate

- AFMA to formally advise NPFI of the results from the red-legged 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

- Eva Plaganyi to provide Industry with a table of historical CPUE data on red-legged banana prawns for it to consider potential in-season trigger limits

- NPFI to discuss the red-legged banana prawn assessment and the proposed changes to the harvest control rules at their next industry meeting in July and advise the RAG of the industry's preferred response for managing red-legged banana prawns at the next RAG meeting.

5 White banana prawn MEY catch trigger

The RAG noted that the second MEY catch reporting period had just been completed with catch rates above the trigger limit at 833 kg/boat/day, meaning that the banana prawn season would go full term. It was also noted the industry estimated cost estimates used to calculate the MEY trigger were comparable to actual costs at the December 2017 RAG meeting.

6 Tiger prawn assessment

Trevor Hutton provided a presentation on the 2017 tiger prawn assessment (paper provided). It was noted that red endeavour prawns were re-included in the model as a sensitivity test but the preliminary results were to be read with caution. It was questioned how the current approach of including red endeavour prawns in the assessment model compares to the previous approach before red endeavour prawns were removed from the model. Trevor Hutton advised that CSIRO will look into the two models (in terms of assumptions) and report back to the RAG the differences.

The Chair questioned why the assessment model predicts blue endeavour prawns to trend positively to MEY in the future when blue endeavour prawns (as a byproduct species) are expected to stabilise at a sustainable level below MEY. Trevor Hutton advised that he will raise the question with Andre Punt when he visits in August 2018. The Chair advised that for MSC certification, a P1 stock is expected to fluctuate around MSY. Currently, the blue endeavour prawn stock is not

expected to fluctuate around MSY because it is managed as part of a species 'basket'. The RAG discussed why the model predicts blue endeavour prawns to trend positively to MEY. One suggestion for the model predicted blue endeavour prawn stock status may be due to temporal and spatial changes in the fishery over the years, which has reduced the good blue endeavour prawn grounds over time. This has the effect of the model assuming the stock is much smaller than it is in reality as large parts of the stock are closed off to fishing. Another possible reason the model shows blue endeavour prawns positively trending toward MEY is that the recruitment is based on the average recruitment curve and the model assumes there has been poor recruitment the last two years but future years will return to average recruitment. The Chair advised that if you have an MEY target for the fishery (rather than for individual species) then some species may be sustainably fished at a level below MSY. He explained that this is not unexpected, but it seems surprising that the model always shows all key species, including the blue endeavour prawn stock, returning to MEY. The RAG discussed this concern with the current model.Trevor Hutton explained that a trajectory to MEY is what the model is constrained to achieve as part of the agreed optimality condition. It was noted that the MEY stock size for each species is that at which economic performance is optimised for the basket of species. Thus, the MEY stock size for blue endeavour prawns might be below MSY for that species, as it conforms with a level of effort that provides high profit from tiger prawn fishing. The economic member suggested to investigate the differences in the cost of fishing by species, because if the stocks are low the cost of fishing is higher, so when you're converging to MEY there will be changes in those differential costs across species. It was also questioned why fixed costs were initially included in the model as it is variable costs that influence target outcomes. Including fixed costs only influences the profit value and is something that should be further considered. It was also suggested that the sensitivity of the blue endeavour prawn stock value to changes in tiger prawn target effort levels should be investigated.

The RAG considered the red endeavour prawn sensitivity and agreed to keep them in the assessment model, at least until further work to understand the dynamics of the model is completed. Trevor Hutton advised that it is possible that the problems associated with blue endeavour prawns and keeping the stock fluctuating around MSY also apply to red endeavour prawns. For this reason, it is probably sensible to leave the red endeavour prawns as a sensitivity test until the dynamics of the blue endeavour prawns model simulations are better understood.

Trevor Hutton presented the results from Rob Kenyon's 2018 monitoring survey.

Actions:

- 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

- 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

- Trevor Hutton to clarify with Andre Punt why the assessment model predicts blue endeavour prawns to trend back up to MEY

- 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.

7 Scientific Observer data collection

The AFMA member, Ian Butler, advised that it is timely for the RAG to review the data collection protocols for the AFMA Scientific Observer Program and whether the current protocols reflect the data needs of the NPF. The RAG discussed the purpose of the program and what data is currently collected. David Brewer advised that the program was initially established to validate the data collected by Crew Member Observers (CMOs). The data collected by CMOs and the AFMA Scientific Observers is used in the bycatch sustainability assessment conducted by Gary Fry. The data collected is primarily targeted toward Threatened, Endangered and Protected (TEP) species and at-risk species. The AFMA Scientific Observer data has improved over time with the last six years of data being of high enough quality to sufficiently validate CMO data. The key difference in the data collection is that the CMOs only collect data on TEPs and at-risk species whereas the AFMA Scientific Observers collect additional bycatch and target species data.

Gary Fry advised the AFMA Scientific Observer data is generally of good quality but needs to be validated by photos. The AFMA Scientific Observer, Steve Hall, informed that photos are taken of all TEP and at-risk species and it was agreed Ian Butler would ensure the photos are being passed on to Gary Fry for analysis.

The RAG discussed the third category of data collection, species of interest (SOI), and how and why the list is established/updated. Steve Hall advised that the last SOI list was established because of Northern Territory state fishers raising concerns over some of the species being caught in the NPF such as jewfish. The length, weight and status of each SOI is recorded by the Scientific Observers. The need to collect this data was questioned and it was suggested that the weight of each SOI could be determined from the catch composition sample, which should provide enough information to determine the relative catch of each species. The Chair advised that each species on the SOI list needs to be reviewed to determine if continued data collection is needed or whether the species should be removed from the list.

The Chair asked whether the data collected by CMOs and AFMA Scientific Observers is used to track abundance of TEPs and at-risk species over time. Gary Fry clarified that the data collected on TEPs and at-risk species is used to assess the catch rate trend over time. If the trend analysis indicates a species is increasing then the species may be removed from the at-risk list when the ERA is revised. Conversely, if the trend analysis indicates a species is decreasing over time then there will be a need for collecting more information on that species.

Trevor Hutton asked how the target species are sampled to determine if the data would be useful for the species-split model. Steve Hall advised the current protocol is for Scientific Observers to collect length-frequency data on 30 individual prawns of one species based on what the boat is targeting at the time. Based on this methodology, it was determined the target species data could not be used to update the species-split model as the sample collected only recorded one species. Ian Butler asked how the length-frequency data for the target species is being used. The Chair advised this data is used in the assessment model. Trevor Hutton clarified that the length-frequency data used in the assessment is actually taken from the pre-season and mid-year monitoring surveys where the data is split at the species level. Roy Deng added that the length-frequency data used in the assessment model comes from the pre-season and mid-year surveys and a pre-determined two or three year period of collection of commercial catch data which was part of the original species split project design. It was suggested that the 10 kilogram sub-sample did not necessarily need to be collected for every shot. Instead a sub-sample of target species should be collected to obtain the length, weight and sex of each individual. It needs to record directly the proportion of each species in a sample. If Tiger prawns are the main target for a haul, then grooved tiger prawns and brown tiger prawns need to be recorded on separate sheets. This

data would then be able to be used in the assessment model and/or be used to verify/up-date the species-split model.

The RAG discussed the value (or otherwise) of the species abundance counts, such as counting the number of birds from the deck of a vessel. The Chair suggested that the information collected through this survey has been generally of poor quality over time, because AFMA protocols have changed and each Observer counts abundance differently. The interest of each Observer in this data also contributes to the data quality. It was also questioned whether any of this data is actually used. AFMA and NPFI agreed to investigate the objective for collecting this data and whether it should continue. It was suggested that a better alternative may be for the Observers to watch the warp lines and record any wildlife interactions because bird interactions with trawl warps are generally cryptic but have been high in some fisheries.

Ian Butler asked what the data collected on bugs is being used for and whether it still needs to be collected. The Chair advised that the data has been collected ever since the size limit on bugs was reduced and the data was to be used to assess the influence of the change in size limit on the sustainability of the stock. AFMA agreed to review the data to determine if it still needs to be collected.

Actions:

- AFMA to ensure the Scientific Observer photos of TEPs and at-risk species are being sent to Gary Fry for analysis

- AFMA to review each species on the SOI list to determine if further data collection is needed and whether the species should be removed from the list

- AFMA to work with CSIRO and Observers to update the scientific data collection protocols.

- AFMA and NPFI to investigate the objective for collecting species abundance counts and whether this data should continue to be collected

- AFMA to review the bug collection data to determine if it still needs to be collected.

8 Research

8.1 Strategic Plan

The RAG discussed the development of the NPF five-year research plan and agreed to hold a workshop in the second half of 2018 with industry to develop the plan.

8.2 Annual Plan

The Chair asked if CSIRO had provided the results of the desktop study into the species split model. The so-called ‘desk-top’ study, which was not funded, was to consider the validity of the Scientific Observer data to check against the species split model. The suggestion to use the non-commercial monitoring survey data was an additional, secondary suggestion. Trevor Hutton advised that the non-commercial monitoring survey data should not strictly be used as the surveys are conducted outside of the season, which is not the preferred approach. A better approach is to collect in-season species-split data as the in-season commercial catch data is ‘split’ each year and the time periods need to match. CSIRO discussed the project with the developer of the original species split model, Bill Venables, who suggested that the survey data should not be used as the data was from a different time of year compared to the original data. Some data was included in the model from the monitoring survey but it is not advisable to use this data as the main source as

it is out of season. The survey data is not representative of the actual species split that occurs in-season. The Chair asked what data was needed. The RAG suggested in-season data was needed, which would be available from the AFMA Scientific Observers from this point on after discussions earlier in the meeting. A scientific member suggested that the Scientific Observer data could also be used to compare to the survey data to determine if there is a difference between pre and in-season species split data. It was pointed out that the current method of sampling prawn species was not suitable for this as the species breakdown is not currently being recorded. It needs to record directly the proportion of each species in a sample. If tiger prawns are the main target for a haul, then grooved tiger prawns and brown tiger prawns need to be recorded on separate sheets and the proportions either recorded or reflected by the sample size. Similarly, if endeavour prawns are being recorded then blue and red endeavour prawns need to be recorded on a separate sheet. Industry queried what data was used in the original species split model. Trevor Hutton advised that industry provided boxes of prawns in-season to determine the species split. The RAG agreed that the proposed species-split desktop study may not be appropriate and asked CSIRO to develop a full project proposal with costings, based on the original species split model method. An industry member suggested that another option would be to compare the monitoring survey data with the pre-season survey data to determine if there was a large difference in the species split.

The RAG discussed and prioritised the assessment related research projects as per the below table:

Attachment	Title	Priority
A	Banana MEY trigger	Not prioritised
B	Species split	Priority for funding in the 2019/20 annual research plan
C	Revised red-legged assessment	On hold until other work (harvest control rules etc.) has been completed as it may inform how the model is updated
D	Banana/tiger economics	Useful in the future but considered a low priority
E	Data Weighting in the Tiger Prawn Assessment	A small percentage of Andre Punt's time has been costed into the three year assessment project to undertake an initial look at data weighting
F	Including new Scientific Observer Data in NPF assessments	Past scientific observer data can't be used but the collection protocols are being updated so future data can be included
G	Evaluating a Spatial Assessment for the NFP tiger prawns	Will be informed by the species split project, so species split project needs to be completed first

8.3 Proposed Research Projects

Based on an industry question, the RAG discussed whether it is more economical to close the first season to tiger prawn fishing and only fish for tiger prawns in the second season when the prawns are bigger and more valuable. The Chair advised that this is the type of proposal that should be discussed during the five-year plan workshop and if there is enough industry support then a full project proposal will be developed. Trevor Hutton suggested this scenario could potentially be run as a sensitivity test in the assessment model. Annie Jarrett informed that during the historic stock rebuilding strategy, the first season was closed to tiger prawn fishing. A scientific paper was written

(perhaps by Cathy Dichmont) on the effect of closing the first season to tiger prawn fishing. Consequently, there may be a paper that can enlighten the RAG as to whether it is more economical to only fish for tiger prawns in the second season. The Chair added that when the fishery was considering the transition to TACs the impact of changes in the season length was investigated.

Gary Fry provided an overview of the sawfish mitigation research proposal (paper provided). The Chair asked how this project interacts with the current sawfish mitigation project by Charlie Huveneers investigating electric device repellents. A scientific observer advised that Charlie's project is similar to a project that was done previously where shark repellent devices worked in a tank but were not strong enough when placed in fishing nets. The project is a good idea but unless the electric devices have considerably increased in power then it's prudent to be cautious about the results from the proposal.

In Rob Kenyon's absence, Trevor Hutton presented the results of the Northern Waters development project (paper provided). The RAG discussed the results and how these feed into Eva's MICE model project proposal. The Chair asked if funding had been included in the project proposal for Industry, as a co-investigator, to employ a representative to engage in northern development discussions. Eva Plaganyi advised that there wasn't funding allocated for this purpose at this stage but it's something that could be added. NPFI advised that the amount to employ a professional would be in the order of $50 000 to $60 000 range. Eva Plaganyi advised that she will include some funding for an industry advocate to be part of the project as a co-investigator.

The Chair asked CSIRO to step out of the room while the RAG discussed the MICE model project proposal and the sawfish mitigation research proposal and whether they were priorities for FRDC funding. The RAG agreed the northern waters developments are a huge issue for the NPF and supported the MICE model project proposal as its highest priority. The Chair suggested that a full project proposal should be put to the FRDC as a priority without going through the pre-proposal stage accompanied by a letter from NPFI indicating this is a critical issue for the fishery. The proposal should also incorporate an aspect that indicates how the project will benefit state fisheries.

The RAG discussed Gary Fry's sawfish mitigation project proposal. A scientific member suggested that sawfish are a high external risk to the fishery and sawfish mitigation is an area of high priority. It was noted that Charlie Huveneers' project only proposed the initial testing of electric devices and if any devices showed positive results in the tank then a further project would be proposed to test the devices in the field. Therefore, it could be a number of years before the research produces any tangible results. Conversely, Gary Fry's research proposal could have more immediate results and could also provide a further benefit of collecting baseline data on sawfish interactions (as well as other species) that could be compared to Charlie Huveneers' research if it is field tested in the future. An industry member added that Gary's work could allow industry to test certain devices or configurations in situ to generate ideas and innovations that would mitigate sawfish interactions. The Chair suggested that when putting the proposal to FRDC to be specific about how it ties in to Charlie Huveneers' project and provide an indication of timing and risk. The RAG supported Gary's project and agreed it should be put forward for FRDC funding.

The RAG reviewed the MSC conditions to ensure the fishery was on track to meeting the conditions in the NPF client action plan. It was noted that earlier in the meeting the RAG had agreed to re-include red endeavour prawns in the assessment model, noting that the results from 2017 were preliminary and further work needs to done to improve confidence in the model. The Chair questioned whether the red endeavour prawn data was being compiled and reviewed by

someone. The RAG suggested that a literature review should be done on red endeavour prawns to collate all the information about the species. It was also suggested that the work discussed earlier in the meeting regarding blue endeavour prawns is equally applicable to red endeavour prawns. NPFI and CSIRO agreed they will discuss how to approach the assessment of blue and red endeavour prawns.

Actions:

- CSIRO to develop a full species split project proposal with costings, based on the original method of data collection (Bill Venables' project)

- 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.

- NPFI discuss allocating funds for a student to conduct a literature review on red endeavour prawns.

9 Broodstock collection

Adrianne Laird provided a summary of the 2017 NPF broodstock collection (paper provided). The RAG noted the catch data from the operation including the number of broodstock individuals retained and discarded, the number of discarded target species, and the number of TEP interactions.

10 ERA

The RAG noted the NPF ecological risk assessment (ERA) is underway with the preliminary species list near completion. The Chair suggested that forming a small working group made up of RAG members/observers with bycatch expertise would be an efficient way to engage in the ERA process with the group reporting key results back to the RAG. The RAG agreed that members/observers on the working group should include David Brewer, Ian Butler, Steve Eves, Adrianne Laird and a representative from the CSIRO ERA team.

Actions:

- David Brewer, Ian Butler, Steve Eves, Adrianne 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.

11 Fisheries Management Strategies (FMS) and NPF data strategy

Ian Butler provided a presentation on AFMA's proposed FMS and what it entails. The RAG noted that as part of the FMS an NPF data strategy will be developed. The RAG discussed the FMS proposal and raised the following points:

- The FMS scope may be too narrow and overly ecologically focused and doesn't appear to account for external risks such as environment, other parties, economics, access, allocation, and social licence to operate. For a fisheries strategy, the FMS focusses too heavily on the biological risks (bycatch, TEPS) and doesn't account for other risks.

- How the development of the FMS is being funded is a concern to industry under a cost-recovery model.
- The purpose of the FMS was questioned and who the audience is. If the audience is an external party then the industry find it hard to justify why their money is being spent to make it easier for external stakeholders to access documents they could find themselves.
- The proposed format appears to be more of a collation of current documents than a fisheries strategy.

Actions:

- AFMA to clarify the purpose, audience and cost of the FMS and report back to the RAG.

12 Autonomous adjustment

Annie Jarrett provided an update on the status of industry's indicators report (paper provided). A question was posed to the RAG of whether it was possible for the fishery to reach the proposed minimum time and gear thresholds and still be profitable. The Chair suggested that the harvest strategy would prevent the fishery getting to those minimums, but only if internal factors are considered. Potentially there are external factors that could drive the fishery to the minimum time and gear thresholds at no fault of the industry. A scientific member suggested that a scenario where this may be possible is if there was a recruitment failure but high tiger prawns prices, which is possible, if for example, the Australian dollar drops in value resulting in a drop in fuel prices. In addition, it was suggested that the potential for ecological and economic fluctuations over the next 20 to 30 years is very real meaning the extreme scenarios discussed may become increasingly probable.

The RAG discussed some of the proposed indicators. The economic member suggested that while profit can be a good indicator, an even more important indicator is profit compared to profit at MEY because that indicates if you're reaching the target. If profit declined much lower than profit at MEY it would indicate a need for a management response. Annie Jarrett advised that NPFI directors could not agree to support profit versus profit at MEY as an indicator at this time as this indicator has not been modelled to show the impacts or what 'boundaries' around such an indicator need to be considered. The economic member advised that in the assessment model, profit is worked out over a horizon and then discounted to the present, which isn't directly comparable to current profit. A calculation of profit can be obtained from the data, as long as fixed costs are included appropriately, and then the ex-post profit at the hypothetical MEY can be calculated for comparison to profit. The stock value, catch, prices and costs are known, therefore an ex-post calculation could be used instead of a model outcome discounted to the present. The other option is to calculate profits based on a different trajectory to a different kind of outcome. Annie Jarrett advised that it sounds good in theory but industry want to see it modelled to understand it better. The Chair suggested that Tom Kompas and Trevor Hutton collaborate to develop a model of profit vs. profit at MEY based on historical data to provide industry with examples to consider. Tom Kompas advised that the model can estimate stock at MEY, hence catch, and if the prices and costs are known then profit can be calculated ex-post. But profit alone is not optimal because that will go up and down depending on prices, costs and all the external factors. What's important is the current profit relative to a constructed measure of MEY profit. The aim is to keep them more or less the same in principle, because that's when the fishery is achieving maximum profitability. The Chair added that the tolerance around profit vs. profit at MEY would need to be determined because the Commission will monitor the indicator and want to know at what point the industry would make adjustments.

Ian Butler presented an example of an indicator with an explanation of what it measures, why, what, when a response is needed, and how it is monitored. The RAG agreed the example provided the necessary information the Commission was seeking. Ian Butler advised that AFMA could help review industry's draft indicators report and provide assistance in expanding each indicator to contain more descriptive information. Annie Jarrett agreed the help would be useful to finalise the report. Ian Butler further added that the first part of the Commission's request, to develop a suite of indicators, has almost been fulfilled. The indicators just need to be tidied up a little and that part's done. The next part is for industry to determine what the critical thresholds are for the key indicators. The third part is for industry to decide how industry would respond once an indicator moves beyond that threshold. Annie Jarrett advised that industry has previously completed part 2 which involved determining a threshold and if the fishery reached that threshold the adjustment options at the time would be considered, followed by a feasibility study and implementation. This was communicated to the Commission in a separate report. NPFI don't want to incorporate that approach into the indicator's report because it views autonomous adjustment as a different issue to a paper on indicators that show trends in the fishery. The economic member agreed, advising that autonomous adjustment is about the instrument that initiates restructure. Annie Jarrett further advised that NPFI came up with a minimum threshold on gear and time, and anything that happens between now and the minimum threshold point is just business as usual under the harvest strategy. The industry would adjust at the point the fishery got to the minimum threshold.

Annie Jarrett asked the RAG for feedback on whether a fixed value (i.e. in dollar terms) could be used as a minimum threshold indicator rather than a percentage value. The economic member advised that this would be a little confusing as the fishery could be in a bad state but still be at MEY because prices are low and costs are high. The government doesn't normally do anything in this situation as it doesn't buy out companies when they're having trouble with prices and costs. It was questioned what the Commission's real concern was. The economic member advised that a paper has been written that indicates that autonomous adjustment is happening in the fishery. He further questioned what the Commission was trying to protect and suggested that perhaps it was trying to prevent the fishery from being in a bad state while also sitting at MEY. The RAG questioned why the Commission would want to protect the fishery in this way when it's not government's role to bail out companies that are failing. It was noted that the previous buyout in the NPF was entirely different because the cause was overfishing due to too many boats in the fishery. But that isn't the case in the fishery now. The RAG commented that it's a little confusing as to what the Commission are really trying to achieve. With this issue now having dragged out over two years, the Chair suggested that Tom Kompas and Annie Jarrett should visit the Commission to determine what it actually wants.

Actions:

- AFMA and NPFI to collaborate to finalise the indicators report to provide more descriptive information on each indicator.

- 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.

- 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.

13 Other business / next meeting

No other business was raised and the RAG noted the next meeting will be held around October 2018.

The Chair closed the meeting at 2.00 pm (EST).

Signed (Chairperson):

Date: 31/07/2018

Attachments

1) NPRAG 23-24 May 2018 Annotated Agenda
2) NPRAG 23-24 May 2018 Declared conflicts of Interest
3) NPRAG 23-24 May 2018 Updated action items

Attachment 1

Draft Annotated Agenda

Northern Prawn Fishery Resource Assessment Group (NPRAG) meeting

23-24 May 2018 8.30 am (Eastern Standard Time)

Item	Responsibility	Paper
1. Introduction/ Meeting Management • Welcome – RAG member roles and responsibilities • Adoption of agenda • Declaration of interests • Minutes from previous meetings	Chair	Yes
2. Action Items *Outcomes: RAG to note progress on action items from previous meetings and provide feedback and comments where appropriate.*	AFMA	Yes
3. Update Reports • Industry o Bycatch strategy o Tilapia in Northern waters o Ecosystem services/valuation o Banana prawn season • AFMA o US TED inspections o US export regulations o GovDex o Commonwealth Harvest Strategy and Bycatch policies *Outcomes: The RAG notes the various update reports.*	NPFI/AFMA	Yes
4. JBG Red-legged banana prawn sub-fishery • Results from 2017 assessment • Update on the review of the red-legged banana prawn harvest control rule *Outcomes: The RAG discuss the proposed change to the red-legged banana prawn harvest strategy rule.*	AFMA/CSIRO	Yes

5. White banana prawn MEY catch trigger • In-season trigger review *Outcomes: RAG to assess the in-season banana prawn trigger and advise on updated data that feeds into the trigger calculation.*	CSIRO	Yes
6. Tiger prawn assessment • Catch and effort data • Survey data • Fishing power series • Stock assessment *Outcomes: The RAG to note the information provided on the 2017 tiger prawn stock assessment including catch and effort, the fishing power analysis, status of target species and estimates of optimal effort levels.*	CSIRO	Yes
7. Scientific observers • 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 *Outcomes: The RAG discusses the data collected by scientific observers and if it meets the fishery's needs.*	AFMA/CSIRO	Yes
8. Research • Research priorities for stock assessment improvements including the data weighting proposal • MSC client action plan • Spatial project proposal (dis-aggregating the model) • MICE model project proposal • Sawfish mitigation proposal • Review efforts to increase tiger prawn MEY • Annual research plan/5 year plan • Northern waters developments (+ mangrove dieback update) *Outcomes: The RAG reviews 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 review the research proposals and provide recommendations; the RAG discuss the question of increasing tiger prawn MEY; the RAG develop the NPF annual research plan and five year plan.*	CSIRO/AFMA/NPFI	Yes

9. Broodstock collection • Brief on 2017 collection • Sawfish catch component • TEPS catch component *Outcomes: The RAG note the NPFI brief on 2017 broodstock collection.*	NPFI	Yes
10. ERA *Outcomes: The RAG note the progress toward completing the NPF ERA.*	AFMA	Yes
11. Fisheries Management Strategies (FMS) and NPF data strategy • Presentation on FMS • Purpose of the data strategy • Proposed data strategy format *Outcomes: The RAG note AFMAs proposal to implement FMS and the proposal to update the NPF data strategy.*	AFMA	Yes
12. Autonomous adjustment *Outcomes: The RAG note industry's indicators report.*	NPFI	Yes
13. Other business •	RAG	

Attachment 2

NPRAG Declared Conflicts of Interest

Participant	Membership	Interest Declared
Ian Knuckey	*Chair*	*Director - Fishwell Consulting Pty Ltd* *Director - Olrac Australia – a company associated with electronic logbooks.* *NORMAC Scientific member* *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.*
Rik Buckworth	*Scientific Member*	*South East RAG Scientific Member* *Torres Strait Finfish RAG Scientific Member* *NT Research Advisory Committee (FRDC), Chair* *Aquatic Remote Biopsy Pty Ltd, Director* *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.*
David Brewer	*Scientific Member*	*Researcher. Has in the past and may in future seek and receive funding for research in the fishery.*
Ian Boot	*Industry Member*	*Managing Director of Austfish, a company which operates NPF vessels. Has a commercial interest in the fishery.*
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.*
Tom Kompas	*Economic Member – University of Melbourne*	*Research provider. Has in the past and may in future seek and receive funding for research in the fishery.*
Ian Butler	*AFMA Member*	*AFMA employee, no pecuniary interest in the fishery*
Stephen Eves	*Executive Officer (AFMA)*	*AFMA employee, no pecuniary interest in the fishery*

Participant	Membership	Interest Declared
Annie Jarrett	*Observer - NPFI*	*CEO- NPFI* *Member of the MSC Stakeholder Council* *Chair - Australian Council of Prawn Fisheries (ACPF).* *Some research items are of relevance to NPFI.*
Adrianne Laird	*Observer - NPFI*	*Employed as a contractor by NPFI.* *Some research items are of relevance to NPFI.*
Trevor Hutton	*Observer - CSIRO*	*Research provider. 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.*
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.*
Steve Hall	*Observer - AFMA*	*AFMA employee as a Scientific Observer. Participates in scientific monitoring trips on-board commercial vessels, no pecuniary interest in the fishery.*
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.*

Attachment 3

NPRAG Action items

Item	Person responsible	Description of action item	Progress
	3-4 March 2015 Meeting		
1	CSIRO	Sean Pascoe to explore the potential to run the MEY calculation without including fixed costs.	**Complete** – Trevor Hutton presented the results during agenda item 6. Trevor advised that when they were running the model, it wasn't converging because it was calculating negative profits, and so the fixed costs were left out. However, leaving fixed costs out doesn't change any of the biological parameters, it only changes the estimate of profit, and the profit estimate is only higher by 6 per cent over 32 years. It affects the 2017 assessment where instead of it being a $1.5 million profit estimate, it's $3.3 million because the fixed costs are being subtracted.
	18 May 2016 Meeting		
2	Rik Buckworth/CSIRO	Upload research reports relevant to the NPF to the Govdex site.	**Ongoing** – Rik Buckworth/CSIRO to identify the top 50 papers that are fundamental to the RAG's work and upload to GovDex.
3	AFMA	Provide a written annual summary of observer monitoring that provides methods, results and spatial distribution (use SESSF report as a template).	**Ongoing** – will be presented at end of 2018.

4	AFMA	Update observer manual to include most up-to-date handling and data collection techniques and send updated list of items recorded to NPRAG.	**Ongoing** – AFMA to provide the updated species of interest list to the AFMA scientific observers after the ERA/ERM has been completed. AFMA to create some NPF guidelines for AFMA scientific observer data collection that clearly justifies and defines the data being collected.
5	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.
6	CSIRO	Update on the mangrove die-off.	**Ongoing** – to be discussed at each meeting.
7	CSIRO (David Brewer)/NPFI	Identify the top 3 bycatch reduction devices to be further tested for effectiveness. NPFI to lead this project and Austfish to test 1 or 2 of these devices. CSIRO to send results from the PNG bycatch trials when finalised.	**Complete** – the final report will be distributed when publicly available. Dave Brewer to provide a summary of the key points from the PNG bycatch reduction trials to the NPRAG out-of-session – sent via email on 20/03/2018.
	17-18 November 2016 Meeting		
8	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.
9	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.

10	AFMA	Circulate the draft CSIRO boat level MEY analysis paper to the NPRAG.	**Complete** – Trevor Hutton provided a hardcopy of the paper at the meeting.
11	CSIRO	Conduct an initial investigation into species split by analysing the survey data.	**Complete** – initial investigation was unable to be undertaken due to unreliable data. Next steps discussed during agenda item 8.
	11 May 2017 Meeting		
12	CSIRO	Present economic spreadsheet with the inputs into the MEY trigger at annual May RAG meeting.	**Ongoing** – present at November meeting each year.
13	CSIRO/Tom Kompas	Present data on how the industry price estimates compare with the survey results at the May NPRAG meeting each year	**Ongoing** – present at November meeting each year.
	4-5 December 2017 Meeting		
14	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.	**Ongoing** – industry and AFMA to coordinate an agreed protocol.
15	AFMA/CSIRO	AFMA/CSIRO to re-draft the red-legged banana prawn decision rule flow chart.	**Complete** – Attachment 4B.
16	All	NPRAG to review and revise the red-legged banana prawn decision rule flow chart ahead of the February 2018 NORMAC meeting.	**Complete** – RAG to explore in-season triggers.
17	AFMA	AFMA to review previous RAG minutes to determine why some of the sensitivity tests were kept in the assessment.	**Complete** – No recorded reason to keep fixed pattern sensitivity. Base case was updated in 2015 to include the average of last two years data plus Andre Punt's addition. No recorded discussion on

			the other sensitivities. CSIRO present the base case and proposed sensitivities every second year for RAG comment but there is no record of the RAG recommending the proposed sensitivities to be included or removed, they were just noted.
18	CSIRO	CSIRO, within six months, to present a spatial project proposal to the RAG including outline and cost.	**Complete** – agenda item 8.