



8950 Martin Luther King Jr. St. N.,
Suite 202, St. Petersburg, FL 33702, USA
Tel: (727) 563-9070
Fax: (727) 563-0207
Email: mrag.americas@mragamericas.com

President: Andrew A. Rosenberg, Ph.D.

Australia Northern Prawn Fishery

MSC Surveillance Report #1
Prepared for NPF Industry Pty Ltd

Certificate No: **MRAG-F-0009**

Prepared by
MRAG Americas, Inc.
April 2019

MSC reference standards:
MSC Certification Requirements Version 1.3
MSC Process Certification Requirements Version 2.0

Authors: Richard Banks, Kevin McLoughlin and Mihaela Zaharia

Table of Contents

| | | |
|-------|--|----|
| 1 | General Information | 3 |
| 2 | Background..... | 3 |
| 2.1 | Changes in the management system and relevant regulations | 6 |
| 2.2 | Changes to personnel involved in science, management or industry..... | 7 |
| 2.3 | Changes to scientific base of information including stock assessments | 7 |
| 2.3.1 | Stock status | 7 |
| 2.3.2 | Harvest strategy | 11 |
| 2.3.3 | Byproduct and bycatch information, status and management | 13 |
| 2.3.4 | Endangered, Threatened and Protected (ETP) species information, status and management..... | 18 |
| 2.3.5 | Benthic habitats and ecosystem | 19 |
| 2.3.6 | Governance and fisheries specific management issues | 20 |
| 3 | Assessment Process | 21 |
| 4 | Results | 23 |
| 5 | Conclusion..... | 28 |
| 6 | References | 28 |
| | Appendices..... | 31 |
| | Appendix 1. Re-scoring evaluation tables (if necessary)..... | 31 |
| | Appendix 2. Stakeholder submissions | 32 |
| | Appendix 3. Surveillance audit information | 36 |
| | Appendix 4. Additional detail on conditions/ actions/ results | 37 |
| | Appendix 5. Revised Surveillance Program (if necessary)..... | 39 |

1 General Information

| | | | |
|-------------------------------|--|---|-----------------|
| Fishery name | Australia Northern Prawn Fishery | | |
| Unit(s) of assessment | Brown tiger prawn (<i>Penaeus esculentus</i>), grooved tiger prawn (<i>P. semisulcatus</i>), blue endeavour prawn (<i>Metapenaeus endeavouri</i>), red endeavour prawn (<i>M. ensis</i>), white banana prawn (<i>Fenneropenaeus merguensis</i>), red-legged banana prawn (<i>F. indicus</i>) | | |
| Date certified | 19 January 2018 | Date of expiry | 18 January 2023 |
| Surveillance level and type | Surveillance level 1, on-site surveillance | | |
| Date of surveillance audit | 20 February 2019 | | |
| Surveillance stage (tick one) | 1st Surveillance | X | |
| | 2nd Surveillance | | |
| | 3rd Surveillance | | |
| | 4th Surveillance | | |
| | Other (expedited etc) | | |
| Surveillance team | Lead assessor: Richard Banks Assessor(s): Kevin McLoughlin, Mihaela Zaharia | | |
| CAB name | MRAG Americas | | |
| CAB contact details | Address | 1631 15th Ave W, Suite 215 Seattle, WA 98119 | |
| | Phone/Fax | +1 (206) 430 5286 | |
| | Email | certification@mragamericas.com | |
| | Contact name(s) | Amanda Stern-Pirlot | |
| Client contact details | Address | PO Box 756, Caloundra, Queensland 4551 Australia | |
| | Phone/Fax | +61 (0)7 54370513 / +61 (0)7 54372226 | |
| | Email | annie.jarrett@bigpond.com | |
| | Contact name(s) | Annie Jarrett | |

2 Background

This report outlines the process and outcome of the 1st annual surveillance audit for the MSC certified Australian Northern Prawn Fishery (NPF) (following re-certification in January 2018). The NPF is located in the Australian EEZ, but also inside the boundaries of the States of Northern Territory, Queensland and Western Australia. The fishery uses twin, triple and quad otter trawl to target brown tiger prawns (*Penaeus esculentus*), grooved tiger prawns (*P. semisulcatus*), blue endeavour prawns (*Metapenaeus endeavouri*), red endeavour prawns (*M. ensis*), white banana prawns (*Fenneropenaeus merguensis*) and red-legged banana prawns (*F. indicus*).

The fishery is managed by the Australian Fisheries Management Authority (AFMA) in accordance with the *Fisheries Management Act 1991* (FMA), *Fisheries Management*

Regulations 1992, Fisheries Administration Act 1991 and *Fisheries (Administration) Regulations 1992*. Commonwealth-managed fisheries are also subject to aspects of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Environment Protection and Biodiversity Conservation Regulations 2000*. In particular, fisheries are periodically assessed for compliance with the Guidelines for the Ecologically Sustainable Management of Fisheries. The NPF was re-accredited for under this legislation for 5 years from January 2019.

Vessels in the NPF may tow a range of nets in a variety of configurations. These are regulated by the *Northern Prawn Fishery Management Plan 1995* (the Management Plan) and relevant determinations. In addition to the main nets, a small “try-net” is used to test the potential catches for a given area. All trawl nets (other than try-nets) in the NPF are required to be fitted with approved Turtle Excluder Devices (TEDs) and Bycatch Reduction Devices (BRDs).

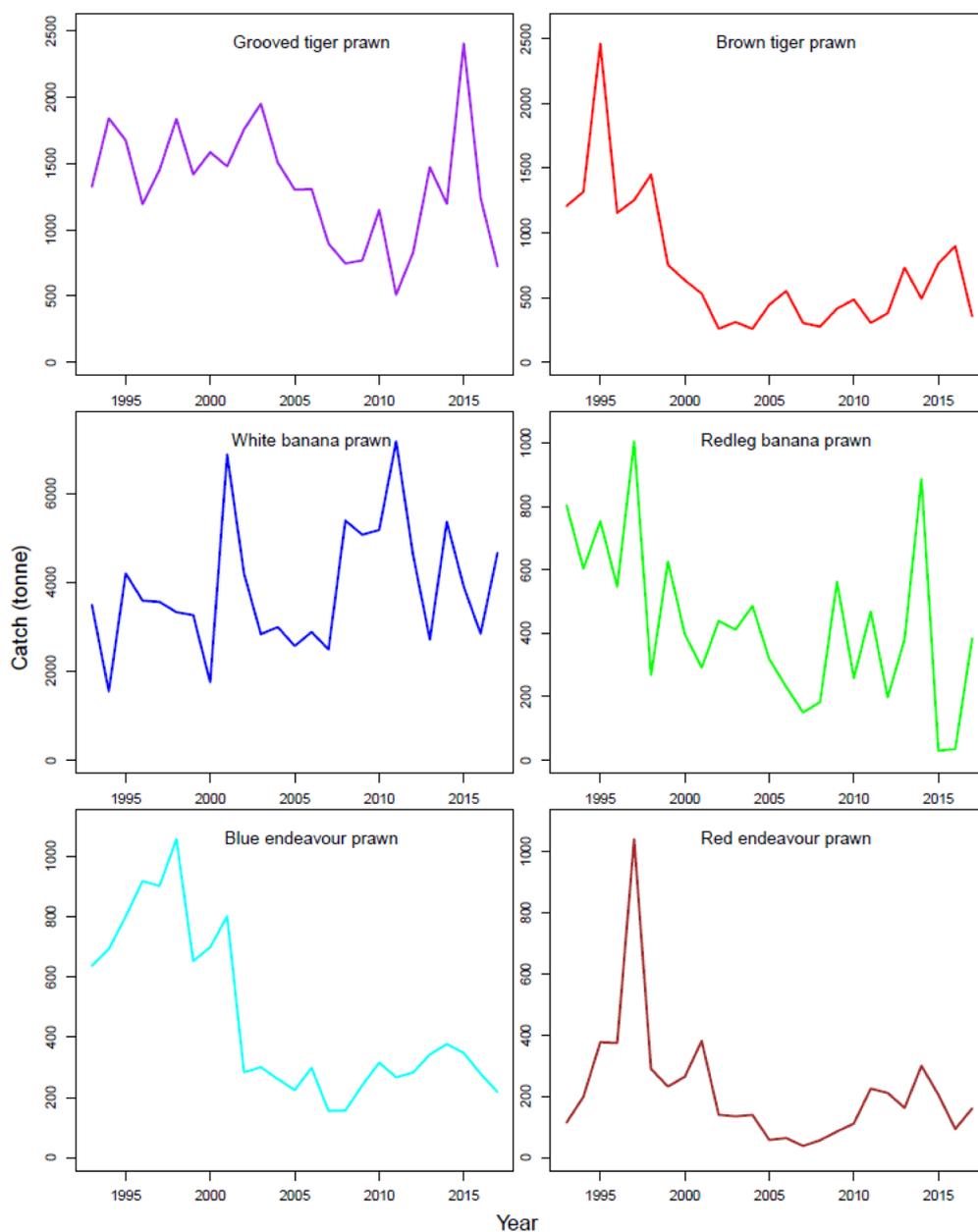


Figure 1. Estimated annual catches (tonnes) by species for the NPF Tiger Prawn Fishery, 1993-2017 (NPRAG, 2018a).

The fishery is conducted by members of the Northern Prawn Fishery Industry Pty Ltd (NPF). There are 52 vessels in the fishery. Most of the vessels are purpose built steel boats and range in length from 17 to 28 m. The NPF comprises three distinct sub-fisheries: the banana prawn trawl sub-fishery, operating from 1 April to mid-June; the tiger prawn multispecies sub-fishery (targeting brown tiger prawn, grooved tiger prawn, blue endeavour prawn, and red endeavour prawn), operating from 1 August until late November (with closure depending on catch rates); and the Joseph Bonaparte Gulf (JBG) red-legged banana prawn sub-fishery operating during the banana prawn and tiger prawn sub-fishery open seasons. There is no fishing throughout the area during the two closed seasons each year (1st December to 1st April, and 15th June to 1st August).

Landings of banana prawn (white and red-legged) totalled 5069 t in 2017, compared with 2904 t in 2016. The two tiger prawns (brown and grooved) totalled 1087 t in 2017 compared with 2158 t in 2016, and endeavour prawns (blue and red) totalled 382 t in 2017 compared with 374 t in 2016. Catches by species are shown in Figure 1.

Other retained catches in 2017 included 7 t of king prawns, 28 t of scampi, 33 t of bugs, 11 t of squid, 6 t of cuttlefish, 3 t of scallops, and smaller quantities of other species. The banana prawn season operated from 1 April until 15 June. The tiger prawn season operated from 1 August to 20 November, closing earlier than previous years due to lower catches and the early closure decision rule being triggered. There were 76 fishing days available during the first season in and 112 days available during the second season (a total of 188 for the year).

Catch data for 2018 is preliminary: 5055 t of banana prawns, 1472 t of tiger prawns and 492 t of endeavour prawns. Other retained catches in 2018 included 11 t of king prawns, 38 t of scampi, 38 t of bugs, 21 t of squid and 2 t of scallops. The season lengths in 2018 were the same as for 2017.

Table 1a. TAC and Catch Data (TACs not in place for the fishery) – Brown Tiger Prawn

| | | | | |
|--|----------------------------------|-------------|---------------|--------------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 366 t |
| | Year (second most recent) | 2017 | Amount | 356 t |

Table 1b. TAC and Catch Data (TACs not in place for the fishery) – Grooved Tiger Prawn

| | | | | |
|--|----------------------------------|-------------|---------------|---------------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 1097 t |
| | Year (second most recent) | 2017 | Amount | 724 t |

Table 1c. TAC and Catch Data (TACs not in place for the fishery) – Blue Endeavour Prawn

| | | | | |
|-------------------------|-------------|------------|---------------|------------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |

| | | | | |
|---|---------------------------|------|--------|-------|
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 283 t |
| | Year (second most recent) | 2017 | Amount | 219 t |

Table 1d. TAC and Catch Data (TACs not in place for the fishery) – Red Endeavour Prawn

| | | | | |
|---|---------------------------|------|--------|-------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 209 t |
| | Year (second most recent) | 2017 | Amount | 161 t |

Table 1e. TAC and Catch Data (TACs not in place for the fishery) – White Banana Prawn

| | | | | |
|---|---------------------------|------|--------|--------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 5063 t |
| | Year (second most recent) | 2017 | Amount | 2842 t |

Table 1f. TAC and Catch Data (TACs not in place for the fishery) – Red-legged Banana Prawn

| | | | | |
|---|---------------------------|------|--------|-------|
| TAC | Year | n/a | Amount | n/a |
| UoA share of TAC | Year | n/a | Amount | n/a |
| UoC share of TAC | Year | n/a | Amount | n/a |
| Total green weight catch by UoC (all operators in the fishery are within the UoC) | Year (most recent) | 2018 | Amount | 269 t |
| | Year (second most recent) | 2017 | Amount | 383 t |

Table 2. Summary of Assessment Conditions

| Condition number | Performance indicator (PI) | Status | PI original score | PI revised score |
|------------------|---------------------------------|-----------|-------------------|------------------|
| 1 | 1.2.1 – Red endeavour prawn | On target | 70 | Not revised |
| 2 | 1.2.2 – Red endeavour prawn | On target | 75 | Not revised |
| 3 | 1.2.2 – Red-legged banana prawn | On target | 65 | Not revised |

2.1 Changes in the management system and relevant regulations

There have been no important changes to the management of the fishery or regulation since re-certification. Important information for operators in the NPF is published annually in a

directions and closures report (AFMA, 2017). That said, the Fisheries Legislation Amendment (Representation) Act, 2017 was introduced, so as to ensure effective representation of indigenous and recreational fishing interests onto MACs. Discussions are presently ongoing with the MAC, which may allow for permanent representation of both recreational and indigenous representative as full members on each MAC, if considered appropriate.

2.2 Changes to personnel involved in science, management or industry

A new Chair has been appointed to the Northern Prawn Management Advisory Committee (Dr John Glaister) and there is a new AFMA manager of the fishery (David Power).

2.3 Changes to scientific base of information including stock assessments

2.3.1 Stock status

Since re-certification of the fishery updates to the stock assessment for the target species have been presented at meetings of the Northern Prawn Fishery Resource Assessment Group (NPRAG) and the Northern Prawn Management Advisory Committee (NORMAC).

White banana prawn sub-fishery

White banana prawn

As discussed in the PCR for the fishery, annual yields of white banana prawn are largely dependent on annual recruitment and recruitment is closely associated with seasonal rainfall, it has not been possible to develop a stock assessment for white banana prawn. The stock is managed through permitting sufficient prawns to escape to ensure an adequate spawning biomass for subsequent recruitment. There has been no change to this approach in recent years. See discussion of harvest strategy below.

Red-legged banana prawn sub-fishery

Red-legged banana prawn

In May 2017, NPRAG examined the anomalously low Joseph Bonaparte Gulf catches of red-legged banana prawn in 2015 and 2016 (NPRAG, 2017). Preliminary work by Plagányi et al. (2017) found an association between catch rates and different combinations of El Niño conditions (Southern Oscillation Index) and seasonal rainfall. The qualitative model developed predicted low catch rates in both 2015 and 2016 as a result of El Niño conditions and below-median rainfall. Low catch rates in years of poor environmental conditions and better fishing opportunities elsewhere at these times are likely to lead to low catches and effort in Joseph Bonaparte Gulf.

Plagányi et al. (2018) provides an updated assessment for red-legged banana prawn. The assessment uses a stock production model; quarterly time steps are used to represent the dynamics and the model is fitted to available catch and effort data (to 2017). The assessment model was not applied in the two previous years because low effort in 2015 and 2016 in Joseph Bonaparte Gulf meant that the data was considered unreliable.

Effort in 2017 was 548 boat days, similar to the 2014 effort level, and 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 open quarters, particularly in the third quarter (Jul-

Sept). The reference case model fits the latest catch per unit effort (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) (Plagányi et al., 2018). The 2018 model-estimated spawning biomass (1400 t) is currently estimated to be below the target level but above the limit reference point. The model predictions are considered more uncertain than in previous years because of the two-year gap in CPUE data due to the low fishing effort in 2015 and 2016. Results are considered preliminary at this stage.

Tiger prawn sub-fishery

An updated assessment of the target species taken in the tiger prawn sub-fishery was presented to the NPRAG held in May 2018 (NPRAG, 2018a). The assessment approaches undertaken are described in the public certification report (PCR) for the fishery (MRAG, 2018), with the 2018 updates being described in papers provided to the NPRAG (NPRAG, 2018a). Conclusions from the assessment are summarized below.

| Name | Grooved | Brown | Blue Endeavour |
|---|----------------|--------------|-----------------------|
| Steepness | 0.392 | 0.336 | NA |
| Catch ₂₀₁₈ | 1142 | 713 | 321 |
| Observed C ₂₀₁₇ | 724 | 356 | 219 |
| MSY | 1654 | 1083 | 752 |
| MEY | 1486 | 1138 | 701 |
| S _{MEY} /S _{MSY} | 1.17 | 1.03 | 0.94 |
| S ₂₀₁₇ /S ₀ (%) | 41 | 39 | 23 |
| S ₂₀₁₇ /S _{MSY} (%) | 74 | 78 | 41 |
| S ₂₀₁₇ /S _{MEY} (%) | 63 | 75 | 44 |
| 5-year mav(S ₂₀₁₃₋₂₀₁₇ /S _{MSY}) (%) | 135 | 131 | 67 |
| S ₂₀₂₄ /S _{MEY} (%) | 98 | 98 | 84 |
| Observed nominal E ₂₀₁₇ | 3494 | 1397 | NA |
| Estimated nominal E ₂₀₁₈ | 4283 | 2777 | NA |
| E _{MSY} | 7130 | 2698 | NA |
| E _{MEY} | 4954 | 3284 | NA |
| E _{MEY} /E _{MSY} (%) | 69 | 122 | NA |
| E ₂₀₁₇ /E _{MSY} (%) | 49 | 52 | NA |
| E ₂₀₁₇ /E _{MEY} (%) | 70 | 42 | NA |
| Standardised E ₂₀₁₇ /E _{MSY} (%) | 49 | 52 | NA |
| Standardised E ₂₀₁₇ /E _{MEY} (%) | 71 | 43 | NA |

Table 1. Results of relevant management measures and parameter estimates for all three species for the “Base case” assessment. E_{MSY} is the effort level (expressed in terms of 2017 boat days) at which MSY is achieved and S_{MSY} is the spawner stock index at which the (deterministic) MSY is achieved.

Brown tiger prawn

The brown tiger prawn stock in 2017 ranged from 69% to 79% of S_{MSY} in all scenarios tested. The five year average abundances were all above 100% of S_{MSY}, and thus well above the reference point, 0.5 S_{MSY}. Therefore, the resource is considered not overfished. Effort in 2017 was well below that at E_{MSY}. Overfishing is therefore not occurring.

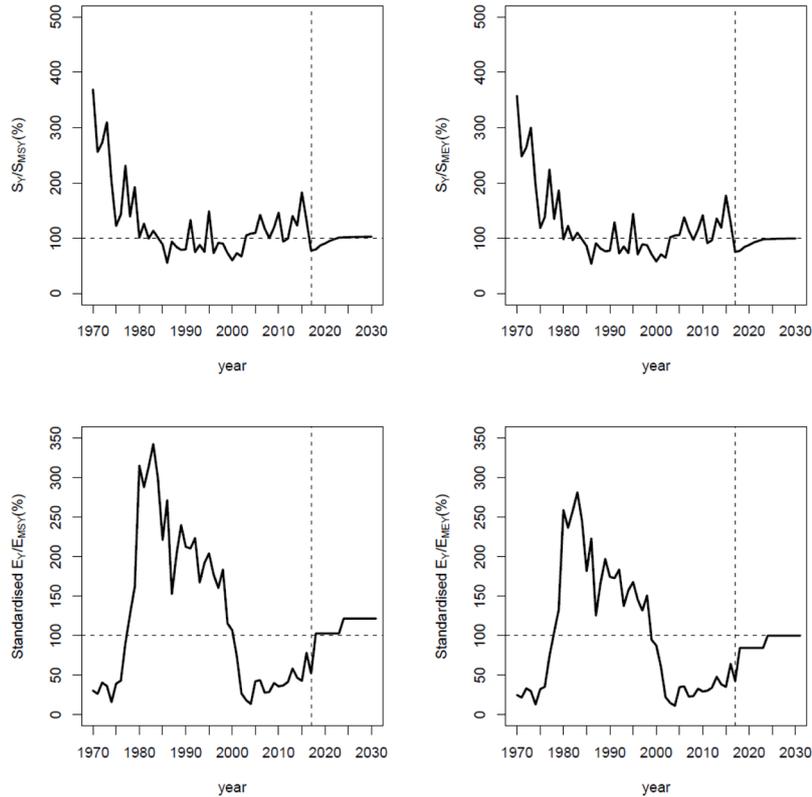


Figure 2. Status of the stock and effort relative to reference points for brown tiger prawns (“Base case”).

Grooved tiger prawn

In all scenarios tested, the grooved tiger prawn stock abundance was under S_{MSY} , ranging from 69% to 84%, at the end of 2017. Furthermore, effort in 2017 was below that at E_{MSY} . The five year average abundances were all above 100% of S_{MSY} , and thus well above the reference point, $0.5 S_{MSY}$. Grooved tiger prawns are therefore considered not overfished, and overfishing is not occurring.

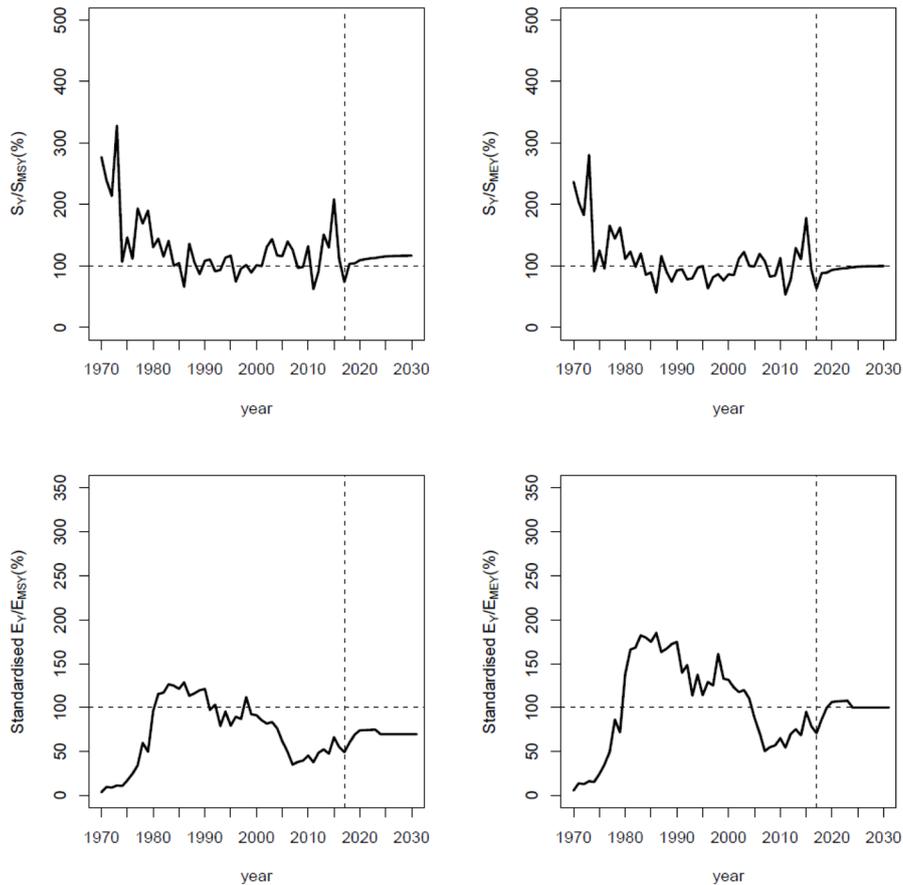


Figure 3. Status of the stock and effort relative to reference points for grooved tiger prawns (“Base case”).

Blue endeavour prawn

Blue endeavour prawns are considered a by-catch in the tiger prawn sub-fishery. In all the sensitivity tests tested, the stock abundance was under S_{MSY} at the end of 2017 (41% to 62%). There has been a decreasing trend in S/S_{MSY} , but this is predicted to increase under predicted recruitment levels. The five-year average abundance estimate ranged from 67% to 94% of S_{MSY} , hence the species is not considered to be overfished relative to the target reference point of $0.5 S_{MSY}$.

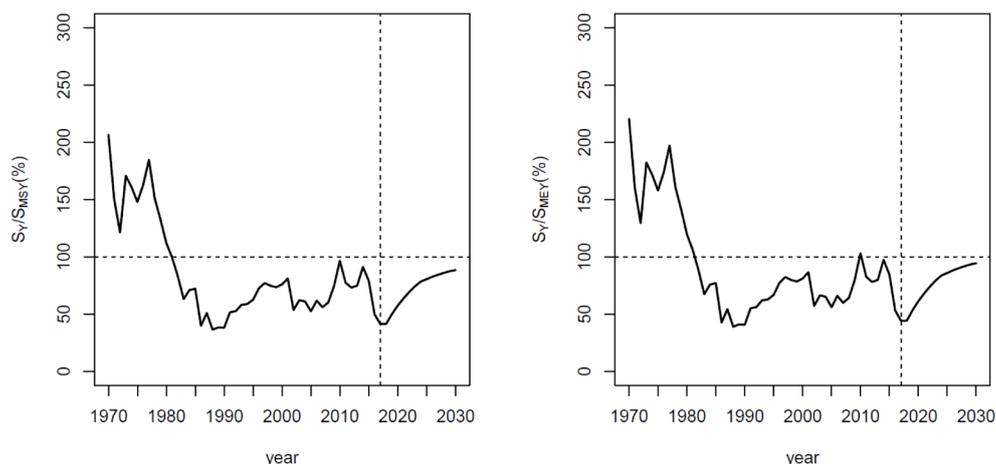


Figure 4. Status of the stock and effort relative to reference points for blue endeavour prawns (“Base case”).

Red endeavour prawn

Red endeavour prawns are considered a by-catch. The species was not included in the previous tiger prawn sub-fishery assessment described in the PCR for the fishery (MRAG, 2018). As a first step in improving the information available to address the two certification conditions, a review of literature and data sets for the species has been undertaken (Buckworth et al., in prep.). The report reviews available information on life history, habitat, diet, predation, catchability and growth. The report also provides information on previous assessment and available data sets.

Red endeavour prawn was included in the 2017 tiger prawn sub-fishery assessment as a sensitivity test. The 4-species test included in this assessment is to explore the capability of the model to provide information on red endeavour prawn status. The spawning stock size of red endeavour prawns in 2017 was estimated to be greater than that at maximum economic yield (S_{MEY})(105%) and close to spawning stock size at maximum sustainable yield (S_{MSY})(84%). The five year average abundance is estimated to be 101% of S_{MSY} and is not considered to be overfished relative to the target reference point of 0.5 S_{MSY} (based on a 5-year moving average). Available results for red endeavour prawn are preliminary.

2.3.2 Harvest strategy

Detailed descriptions of the harvest strategy are provided in the PCR for the fishery (MRAG, 2018).

White banana prawn sub-fishery

The harvest strategy for white banana prawns includes, inter alia, an objective to allow sufficient escapement to ensure an adequate spawning biomass and to allow subsequent recruitment. This is achieved by closing the season when catch rates fall below a trigger level, associated with permitting sufficient prawns to escape to ensure an adequate spawning biomass for subsequent recruitment (based on an analysis of historical data. The trigger is also designed to achieve an economic outcome by closing fishing when catch rates fall to an uneconomical level.

In 2017, the average catch rate of banana prawns was 460 kg, above the minimum 425 kg per boat fishing day trigger level. As all decision rules were met, including the requirement for catch reports from > 95% of NORMAC members and advisers, the fishery remained open to both banana and tiger prawn fishing until 15th June. Reported catch of tiger prawns in this period was 264 kg.

In 2018, the average catch of banana prawns per boat per fishing day was 602 kg, again in excess of the 425 kg per boat per fishing day restricted trigger limit. All decision rules were met, including the requirement for catch reports from > 95% of NORMAC members and advisers. Hence, the fishery remained open to both banana and tiger prawn fishing until the closing date of 15th June.

Red-legged banana prawn sub-fishery

The red-legged banana prawn harvest strategy uses a proxy LRP based on $0.5B_{MSY}$, which correlates with a catch of 390 kg per vessel per day. The LRP is deemed to have been breached if catch rates fall below 390 kg per vessel per day in August, September and October, and there has been at least 100 days fishing over the full fishing year.

In 2017, none of the trigger points were exceeded and the CPUE was above the LRP. Under the current harvest strategy there is no management response to set a harvest level that ensures the stock trends toward the target reference point.

There is a condition for the harvest strategy for this species and the strategy is under review. NPRAG has been actively considering harvest strategy options for red-legged banana prawns (NPRAG, 2018b). Several options are being considered and a project is being developed to undertake management strategy evaluation of the various options, in particular the various harvest control rules for opening and closing the fishery (NPRAG, 2018b).

Tiger prawn sub-fishery

The NPF bioeconomic analysis provides estimates of optimal effort levels for the tiger prawn sub-fishery separately for brown and grooved tiger prawns based on effort patterns over the previous two years (optimising the effort over a seven year moving window to maximise profits), The target effort level is E_{MEY} (effort at maximum economic yield) (i.e. $E_y/E_{MEY} = 1$).

Estimated total allowable effort to achieve MEY in the tiger prawn sub-fishery in 2017 was 9928 boat days, comprising 7130 boat days directed at grooved tiger prawns and 2698 boat days directed at brown tiger prawns. Standardised effort for grooved tiger prawns in 2017 was under to the E_{MEY} level (70%). Standardised effort for brown tiger prawns was just 42% of the E_{MEY} level (“Base case”).

Estimated total allowable effort to achieve MEY in the tiger prawn sub-fishery in 2018 was 7060 boat days. This comprises 4283 boat days directed at grooved tiger prawns and 2777 boat days directed at brown tiger prawns. This equates to an increase in total effort of 44.3% over 2017 effort.

At the end of the designated catch reporting period for the tiger prawn sub-fishery in 2017, the average catch per boat per fishing day was 242 kg, below the 350 kg per boat/per fishing day trigger limit. As a result, the season closed on 20 November.

At the end of the designated catch reporting period for the tiger prawn sub-fishery in 2018, the average catch per boat per fishing day was 322 kg, below the 350 kg per boat/per fishing day trigger limit. The season again closed on 20 November.

There are two conditions in place for **red endeavour prawns** in relation to the harvest strategy and harvest control rules (PI 1.2.1 and PI 1.2.2). The client action plan seeks to establish a stock assessment approach for red endeavour prawns and develop the harvest strategy and harvest control rules over the current period of certification. The difficulties in progressing the harvest strategy have been discussed in recent meetings of the NPRAG. Appendix 4 presents considerations in relation to this.

2.3.3 Byproduct and bycatch information, status and management

No conditions or recommendations on P2 components were proposed at the NPF MSC re-certification in January 2018 and there is no evidence of any increase in risk from the fishery on these components. Nevertheless, there have been some significant developments in the fishery since the re-certification. These developments relate to improved monitoring and reporting through Crew Member Observer Program and Scientific Observer Program information from new BRD trials becoming available and the move to a ‘phase-in’ in the implementation of the NPF Bycatch Strategy (industry voluntary strategy). In addition, the Australian Government has released a revised bycatch strategy. These changes will be presented and discussed below.

Crew Member Observer Program

The Crew Member Observer (CMO) program began in 2003 as part of the long-term bycatch monitoring project (FRDC Project No. 2002/035) (see Brewer et al., 2007). Each year crew members from NPF vessels volunteer to participate in annual training workshops. The 2018 CMO Workshop was delivered in July. The training was provided over a one day workshop. The workshop was organised and facilitated by the Project Officer in conjunction with CSIRO. Eight CMOs attended the workshop in 2018 (7 returning CMOs, 1 new recruit). Three other returning CMOs and one new recruit who were unable to attend the workshop were briefed on their boats and provided with their data collection kits. The workshop was delivered in a format to allow for training sessions followed by group discussion. This also gave the CMOs time to discuss any practical issues that may have arisen last year and solutions. Two AFMA scientific observers also attended the workshop (NPF, 2019).

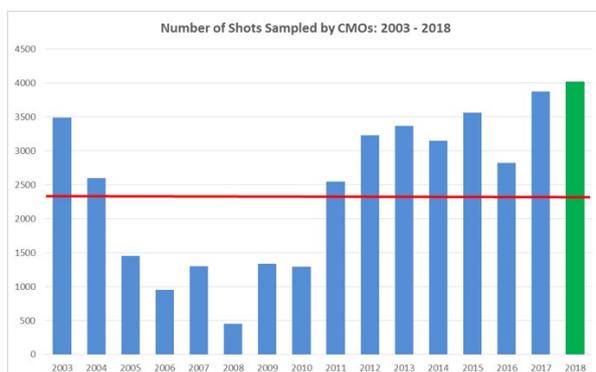


Figure 5. Total number of shots monitored by CMOs, 2003-2018, Source: NPFI, 2019

Since the start of the program, 2018 has been the most successful year of CMO coverage, with 15% of the fishing activity having been observed (NPFI, 2019). A total of 4020 shots were monitored for interactions with ETP and at-risk species, well exceeding the target of 2350 shots per year that is required to detect changes in the species being monitored. The level CMO coverage necessary to detect change was estimated in Brewer et al. (2007).

The NPFI projects manager concluded, in the NPF Co-Management Projects Manager Activity Report, that CMOs are very successful in finding the right species, and participants are reliably recording observations and interactions on field data sheets, complimented with photographs to enable validation of species identifications (NPFI, 2019).

Scientific Observer Program

AFMA Scientific Observers collect similar information to CMOs in order to compare and validate catch data and add taxonomic detail (better species identification) (Fry et al., 2015).

Scientific observers sampling protocols for non-target species (retained and discarded) have been discussed at the NPRAG's November meeting and it was suggested that AFMA should revise these protocols in line with those described by Heales et al (2003). It was clarified the importance of sampling the catch for catch composition to meet the MSC requirement to monitor "main" bycatch species and also separate sampling to estimate total catch of the retained species (i.e. bugs) (NPRAG, 2018b). To be noted that at the MSC reassessment bugs represented less than 1% of the catch in any of the three fisheries, while squid, less than 0.01%, and no retained species were assessed as 'main'.

Following the November 2018 NPRAG meeting, among the agreed actions to be undertaken by AFMA, actions related to scientific observer bycatch sampling and observer manual were:

Actions:

- 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 outlined by Heales et al. 2013
- AFMA to include the method for collecting the eyeball estimate of the total catch in the observer protocols

BRD Scientific Trials

The Northern Prawn Fishery conducted trials of two new Bycatch Reduction Devices (BRDs) in May-June 2018 and a third new BRD in November 2018 against the currently approved BRD; the Square Mesh Panel BRD. The three new devices were modifications of the approved Kon's Covered Fisheye device and both were tested as single 'fisheyes' positioned at 60 or 65 meshes from the codend drawstrings while the control Square Mesh Panel BRD was positioned at 120 meshes from the codend drawstring. The trials were done in accordance with the objectives of the NPF Bycatch Strategy 2015-18 to reduce the capture of small bycatch by 30% in 3 years. The Single Kon's Covered Fisheye BRD and the FishEX70 BRD were trialled on the vessel Newfish II, in May-June 2018 with the new devices positioned at 65 meshes from the codend drawstrings. The third new BRD, the Tom's Fisheye BRD was trialled on the vessel Eylandt Pearl, in November 2018 and was positioned at 60 meshes from the codend drawstrings. The data was collected by AFMA scientific observers and given to CSIRO for analysis (Lawrence & Fry, 2018).

After processing and analyzing the BRD trials data, the authors concluded that there was significantly less bycatch caught in the nets with all of the trialled BRDs; the Single Kon's Covered Fisheye, FishEX70 and Tom's Fisheye BRDs installed compared to the nets with the standard Square Mesh Panel BRD installed. In terms of bycatch reduction, the FishEX70 BRD and Tom's Fisheye BRD were noticeably better than the Single Kon's Covered Fisheye BRD, achieving a mean reduction in bycatch of 41% and 44% compared to the 23% of the Single Kon's Covered Fisheye BRD. There was no significant difference in mean commercial prawn catches between the nets fitted with either of the three trialed BRDs compared to nets with the standard Square Mesh Panel BRD. The confidence intervals around the estimates are very wide so it was not possible to state that there was no difference with any statistical confidence. To improve the estimates of the difference between prawn catches more trials would need to be conducted (Lawrence & Fry, 2018).

BRD Review

All currently approved BRDs were to be reviewed in the latter part of 2018 with the view to disallow ineffective devices (i.e. devices which do not reduce small bycatch by at least 30%) when tiger prawn fishing (AFMA, 2017). This review was completed and it was agreed that the following BRDs would be removed from the approved BRDs list in due course: Fisheye (but **not** the KCF or Tom's Fisheye which will remain on the list), Square mesh codend, and Radial escape (Annie Jarrett, pers. comm. March, 2019). NPF and AFMA have agreed to not to remove those devices that do not remove small bycatch until 2020. This will provide operators an additional opportunity for voluntarily modification and testing of those devices in 2019 before full phase-in (see below).

NPF Bycatch Strategy Implementation

The NPF Bycatch Strategy 2015 – 2018 is a voluntary industry strategy to reduce small bycatch by 30% in 3 years. It was implemented in 2015 and since then 15 industry-developed devices have been tested with four (Kon's Covered Fisheyes, Single Kon's Covered Fisheye, FishEX70, and Tom's Fisheye) undergoing scientific trial. The scientific trial demonstrated that the KCF reduces small bycatch by 36.7% with no prawn loss and was subsequently approved for use in the fishery in 2017. Also, FishEX70 and Tom's Fisheye reduced bycatch by 41% and 44%, as presented above. In accordance with the objectives of the Industry Bycatch Strategy, any device that undergoes scientific testing and achieves 30% bycatch reduction with minimal prawn loss will be approved for use in the fishery. In July 2018 the FishEX 70 was approved by NPF and legislated by AFMA for the start of the tiger prawn season. Tom's Fisheye is to be approved at the February 2019 NPRAG meeting (Annie Jarrett, pers. comm. December 2018).

A phase-in approach to implementing new approved BRDs into the fishery started in 2018 and will continue in 2019. From 1 August 2018, it was mandatory for all NPF vessels to install an approved BRD that has been shown to reduce bycatch by at least 30% in half of their nets. The majority of vessels are using the FishEX 70, though several skippers have changed to the KCF during the season (NPRAG, 2018b).

Some skippers have found variation in performance of these new BRDs this season compared to the results of the trials. In response to these concerns, a scientific member of NPRAG 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, with one vessel having received a permit to change the position of the BRD and results were expected at the end of the season (NPRAG, 2018b).

Revised Commonwealth Bycatch Policy

Australian Government is committed to delivering ecosystem based fisheries management practices and the Bycatch Policy provides a strategic approach to address bycatch in Commonwealth fisheries. A revised Bycatch Policy was released in December 2018 to provide:

- improved guidance on species classification and policy coverage for all species
- inclusion of a risk-based approach to monitoring, assessing and managing bycatch
- consideration of cumulative impacts on bycatch species
- inclusion of a performance monitoring and reporting framework (DWAR, 2018a).

The revised policy defines bycatch as a species that is incidentally either:

- taken in a fishery and returned to the sea
- killed or injured as a result of interacting with fishing equipment in the fishery but not taken

Bycatch is further classified in:

- **General bycatch** describes all bycatch species in a fishery that are not listed under the EPBC Act. The large variation of species in this category calls for various assessment and management approaches.
- **EPBC Act-listed species** are managed separately to other bycatch species due to their special status under Australia's national environmental legislation. EPBC Act-listed species comprise those species protected under Part 13 of the EPBC Act, including whales and other cetaceans and listed threatened, marine and migratory species (except for conservation-dependent species managed through rebuilding strategies under the Harvest Strategy Policy in line with the requirements of the EPBC Act) (DWAR, 2018a).

Bycatch does not include the non-target retained species (byproduct) which are managed under the Commonwealth Harvest Strategy Policy (DWAR, 2018a)

Commonwealth Bycatch Policy 2018 requires that unobserved mortality (cryptic) to be taken into account when managing bycatch and specifies that the adaptive nature of the Australian Government's fisheries management framework allows the incorporation of emerging information and technical advancements, including monitoring to detect suspected cryptic mortality (DWAR, 2018a).

The Bycatch Policy aims to minimise fishing-related impacts on general bycatch species in a manner consistent with the principles of ecologically sustainable development and with regard to the structure, productivity, function and biological diversity of the ecosystem (DWAR, 2018a). To pursue this objective the Australian Government will implement bycatch mitigation strategies for general bycatch species that:

- draw on best-practice approaches to avoid or minimise all bycatch, and minimise the mortality of bycatch that cannot be avoided
- manage fishing-related impacts on general bycatch species to ensure that populations (that is, discrete biological stocks) are not depleted below a level where the risk of recruitment impairment is regarded as unacceptably high
- in instances where fishing-related impacts have caused a bycatch population to fall below a level where the risk of recruitment impairment is regarded as unacceptably

high, implement management arrangements to support those populations rebuilding to biomass levels above that level.

No general bycatch species should be exposed to any greater risk than that faced by a commercial species managed under the Harvest Strategy Policy. Both the Bycatch and Harvest Strategy policies apply the same test that species should not be exposed to an unacceptable risk of recruitment impairment. Where fishing interactions with bycatch species precipitates an unacceptable risk to the functioning of the marine ecosystem, that risk should be mitigated (DWAR, 2018a).

The implementation of the Commonwealth Bycatch Policy 2018 in AFMA managed fisheries will be administered through individual Fishery Management Strategy (FMS). The FMS is a single documented process that integrates management tools, such as the ERA/M, Harvest and Bycatch strategies and data management plans. The Bycatch chapter will have explicit objectives for general bycatch that replicate or are equivalent to those of the Bycatch Policy (DWAR, 2018b).

Guidelines to the Bycatch Policy explain how the equivalency of the retained species management (Harvest Strategy Policy) and general bycatch management can be achieved. Although the Bycatch Policy does not set target reference points for bycatch species (because they are not commercial species and their catch needs to be minimised), it sets similar limit reference points as in the Harvest Strategy. However, it is recognised that due to limited data on rare species, estimates of the level of depletion are unlikely to be reliable. The Australian Government currently advocates the use of fishing mortality and ecological risk-based reference points to pursue policy objectives (DWAR, 2018b).

The ecological risk assessment for the effects of fishing (ERAEF) is the primary methodology underpinning the Australian Government's approach to ecological risk management (ERM). The ERAEF was developed to assess and monitor the risk posed by Commonwealth fisheries to the ongoing sustainability of ecosystem components that interact with Commonwealth fisheries. AFMA has developed guidelines (AFMA, 2017) for implementing ERM in Commonwealth fisheries, which include enhancement of methods for assessing and quantifying risks from fishing to ensure they remain best practice (DWAR, 2018b).

The ERAEF involves a hierarchical process of risk assessment, with a qualitative analysis at Level 1, an indicator-based analysis at Level 2, and a model-based analysis at Level 3. The hierarchical approach allows AFMA to balance the need to quantify risks with the financial costs of doing so, and the costs of managing the risk. The assessment at level 1 and 2 are more precautionary due to limited quantitative information, thus lower level of ERAEF are unlikely to underestimate the risk.

In the NPF the principle of 'avoiding and minimising' bycatch is already implemented through ongoing innovation and development of BRDs (NPF Bycatch Strategy; NPF, 2015).

An Ecological Risk Management framework is already implemented in the NPF and species on a priority list (resulted from ERAs) are monitored through AFMA Scientific Observer and Crew Member Observer Programs. Data from these programs is held and periodically analysed for trends by CSIRO (i.e. Fry et al., 2015). The results from a new ERA for each of the three subfisheries (tiger, white banana, red-leg banana) are currently underway and expected to be published within the current financial year (NPRAG, 2018b).

Based on the new information and evidence provided by the client and AFMA, there is no justification in rescoring the PIs 2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2 and 2.2.3.

2.3.4 Endangered, Threatened and Protected (ETP) species information, status and management

Sawfish Interactions

In 2017, 506 sawfish were reported as caught, 69% of which were released alive (Laird, 2018). Preliminary reports suggest that 596 individuals were caught in 2018, 69% being released alive (Quarter 4 report not yet available) (<https://www.afma.gov.au/sustainability-environment/protected-species-management/protected-species-interaction-reports>).

Considering the improvement in CMOs training and coverage, it is possible that the increased number of interactions compared to previous years might be due to better reporting rather than reflecting an increase in risk. Even though there is a trade-off between precise species identification and prompt release unharmed of the sawfish, there has been an improvement of the percentage of animals identified to species level over recent years (unidentified down from 92% in 2016 to 64% in 2017, NPFI, 2019). In 2018, for the reported interactions, the rate of unidentified sawfish is 54% (<https://www.afma.gov.au/sustainability-environment/protected-species-management/protected-species-interaction-reports>).

NPFI have been working with CSIRO and operators to improve the identification of sawfish. Sawfish identification guides were developed by NPFI and handed out at the 2017 tiger prawn pre-season briefings. Skippers were also instructed on how to identify the four species using the guides. As a result, the proportion of unidentified sawfish being reported has declined.

In addition, CSIRO provided 10 cameras to skippers so that sawfish ID can be validated. Improving the quality of logbook sawfish data will allow CSIRO to use logbook data in sustainability assessments. This is particularly important for the rare species, such as the freshwater sawfish, that may not be seen by the CMOs or AFMA Scientific observers. The program was successful and, at the time of NORMAC meeting (February 2018) CSIRO were provided with photographs of 37 sawfish. All individuals were able to be identified to the species levels, including 12 that were recorded in the logbooks as unidentified (AFMA, 2018).

Sawfish Information

NPFI is working with several research providers to improve management and mitigation of sawfish interactions in the NPF:

- 1) Can sawfish bycatch within the NPF be mitigated using an electric field? Flinders University, Charles Darwin University

Tank trials will begin in April 2019 at JCU in Cairns to assess whether sawfish behaviourally respond to electric fields. The animals will be caught in early March from north of Cairns under permit from the Qld Fisheries (was scheduled for early February but postponed due to the heavy rain).

- 2) How does trawl gear configuration affect sawfish catches: mitigating interactions with sawfish in the NPF. CSIRO

This project proposes to investigate the effect of TED orientation and trawl net configuration on escapement and entanglement of sawfish to identify potential mitigation measures. The project was recommended at the May NPRAG meeting as a high priority for the NPF and was submitted to the October ComRAC meeting. In addition, a pilot study (funded by CSIRO) has been undertaken in 2018 tiger prawn season to test the most appropriate camera

and light configurations for filming sawfish behaviour when entering the net and when encountering the TED.

- 3) Is the Northern Prawn Fishery interacting with a single population, or multiple populations of the Narrow Sawfish *Anoxypristis cuspidata*? Charles Darwin University

Details on the Narrow Sawfish are poorly-known with little information available on its habitat, movements, ecology, or population connectivity. This research aims to fill a critical data gap for this species (population structure and connectivity across northern Australia). The work is part of a larger research project at Charles Darwin University “A12 Australia’s Northern Seascape: assessing status of threatened and migratory marine species.” being delivered by the NESP Marine Biodiversity Hub. NPMI is working with the lead investigator, Dr Peter Kyne, to facilitate the collection of tissue samples over the next two years of Narrow Sawfish incidentally caught in the NPF. The tissue samples will be provided to CSIRO geneticists to sequence complete mitogenomes with the aim of determining the provenance of individuals caught (Laird, 2019).

Sea Snake Interactions

A total of 9,051 sea snake interactions were recorded during 2017. The majority of sea snakes (6,825 individuals, representing 75.4% of the total) were released alive. 2,179 (24%) perished, 2 (0.02%) were released injured, and 45 (0.5%) were released with unknown condition (Laird, 2018). Partial data for 2018 (Quarter 4 not yet available), show 6,702 interactions, with 5,510 (82%) being released alive. Sea snakes cannot be reported by species in electronic logbooks due to the high number of species (up to 20) occurring in the NPF and difficulty for the crew to determine the species. However, species identification is done through the bycatch sustainability program using CMO, CSIRO and AFMA Scientific Observer data, and photographs taken for all observed interactions (NPMI, pers comm., February 2019).

Other ETP Interactions

A total of 64 turtle interactions were reported in the NPF during 2017, compared to 55 interactions in 2016. Turtles of undetermined species were the most numerous (40 interactions) followed by Green turtles (9 interactions). Six interactions occurred with Pacific (Olive) Ridley turtles, four with flatback turtles, two loggerhead turtles and one each of leatherback and hawksbill turtles. Of these, 61 turtles were released alive, one perished and the life status of two Flatback turtles was unknown (Laird, 2018). Partial data for 2018 show 46 turtle interactions (7 green, 2 loggerhead, 3 flatback, 34 unidentified turtles). Out of these, 43 turtles were released alive and three unidentified turtles were reported as dead.

A total of 49 syngnathid (seahorses and pipefish) interactions were recorded during 2017. Of these, 25 (51%) were released alive and 23 (47%) perished and for one (2%) the condition was unknown. In 2018, partial data show 135 interactions with 104 (77%) released alive.

Based on the new information and evidence provided by the client and AFMA, there is no justification in rescoring the PIs 2.3.1, 2.3.2 and 2.3.3.

2.3.5 Benthic habitats and ecosystem

Under a recent project (Pitcher et al., 2016, 2018), the impact of AFMA trawl fisheries on demersal habitats was assessed with consideration of existing spatial management. The project aimed to quantify the overlap of mapped seabed assemblages with trawl footprints,

and with areas of spatial management that exclude trawling, by building on previously collated data and assemblage mapping as well as data for Commonwealth demersal trawling effort (not mid-water trawl), fishery closures and marine reserves. These trawl exposure and protection estimates provide information that AFMA can use to focus on priorities or gaps, regarding the needs for future for habitat ERAs. This report showed that the majority of habitats that overlap with AFMA trawl fisheries are minimally exposed to trawl effort or adequately protected by existing spatial closures. Pitcher et al (2018) have estimated the Relative Benthic Status (RBS) of the predicted assemblages as a measure of the habitat status. RBS provides an estimate of the long-term equilibrium status of the benthos with current trawling effort, relative to that with no trawling. This measure allows an assessment of habitat status against sustainability standards such as EU MSFD, which aims to achieve good environmental status (GES) by 2020; for “Sea-floor Integrity” implementation, this could mean that >80% of each habitat should be in >80% status (Pitcher et al, 2018).

The MSC standard requires, at SG80, that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats (main) to a point where there would be serious or irreversible harm. For the habitat component, this is the reduction in habitat structure, biological diversity, abundance and function such that the habitat would be unable to recover to at least 80% of its unimpacted structure, biological diversity and function within 5-20 years, if fishing were to cease entirely (MSC, 2018). An average RBS estimate of >.80 might be compatible with the MSC requirement, although MSC has not yet adopted this measure. In any case, no predicted assemblages and respective habitats mapped within the NPF areas had an RBS estimate lower than .95 (Pitcher et al., 2018), which suggest that NPF sub-fisheries have a very low impact on habitats.

Based on the new information and evidence provided by the client and AFMA, there is no justification in rescoreing the PIs 2.4.1, 2.4.2 and 2.4.3.

No new information for ecosystem overall impact. There is no justification in rescoreing the PIs 2.5.1, 2.5.2 and 2.5.3.

2.3.6 Governance and fisheries specific management issues

Two specific issues are worth noting in the context of Governance issues.

Following a [review of the Harvest Strategy Policy and Guidelines](#), the revised *Commonwealth Fisheries Harvest Strategy Policy and Guidelines for the Implementation of the Commonwealth Fisheries Harvest Strategy Policy* were released on 21 November 2018. In the light of the revised guidelines the NPF Resource Assessment Group is in the process of reviewing the NPF Harvest Strategy. It is expected that the outcome of this review will be complete and available by the 2020 annual surveillance review.

The Fisheries Legislation Amendment (Representation) Act was implemented in 2017 with a view to strengthening representation of indigenous and recreational interests on the MAC. Discussions are now taking place between NORMAC and AFMA on options for involving indigenous representatives in the MAC.

Engagement by NPF and AFMA with indigenous interests are considered to provide opportunity and encouragement for all interested and affected parties to be involved, and facilitate their effective engagement. It is noteworthy that NPF and AFMA regularly consult with the Aboriginal Land Corporation and the indigenous ranger groups from the Dhimurru,

Anindilyakwa, Laynhapuy, Djelk and Crocodile Islands Indigenous Protected Areas (IPAs) through face to face meetings and teleconferences. IPAs are areas of land and sea country owned or managed by Indigenous groups, which are voluntarily managed as a protected area for biodiversity conservation through an agreement with the Australian Government (A. Jarrett, pers. comm. February, 2019). NPMI attended the Dhimurru and Yirralka IPA Advisory Group meeting in Gove on 26-27 June 2018, to update the groups on the NPF. NPMI also provided an update via telephone to the Anindilyakwa IPA Advisory group meeting on 15th June 2018. Sea Rangers have expressed interest in attending an NPF pre-season briefing and spending time with skippers on boats in Darwin to better understand about how the fishery operates. NPMI is also consulted by indigenous groups on topical issues such as potential Native Title claims. Indigenous groups also have a long-standing invitation to attend NORMAC meetings to raise/discuss any issues of concern (A. Jarrett, pers. comm. February, 2019).

Non-compliance events reported in the fishery accounted for 8 identified infringements in the three years from 2016 to 2018, from 268 inspections (Stephen Eves, AFMA, pers. comm. February 2019). This represents a non-compliance rate of 3% overall. Failure to fit, carry or use Bycatch Reduction Devices, largely in 2017, was identified as the most significant infringement. The unusually high number offences in this year was the result of new requirements regarding turtle excluder devices (TEDs). Specifically, there was a new specification which limited the amount of overlap for 'double flap' designed TEDs to 38 cm when stretched taut. This led to a lack of understanding of the new requirements among some operators and education was needed to clarify the specifications. These offences were not repeated in 2018. Upon review, the assessors still support the view that there is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.

3 Assessment Process

The Northern Prawn fishery was certified for the second time in January 2018 using MSC FCR v1.3. This 1st annual audit covers the period from re-certification on 19 January 2018 to 20 February 2019. The on-site audit took place on 20 February 2019 at the Brisbane Riverview Hotel during a meeting of the Northern Prawn Fishery Management Advisory Committee. Participants at the meeting are listed at Appendix 3. Additional information was gathered via email correspondence with Annie Jarrett, CEO of the NPF Industry Pty Ltd and Dr Trevor Hutton, CSIRO.

A wide range of stakeholders were contacted including Government organisations, NGOs, and indigenous groups, and invited to submit comments. WWF provided a written submission (see Appendix 2). WWF's comments were submitted in respect to all PIs, but specific issues were raised in respect to P2 and P3 issues. The report text above provides details which address the points raised. There is no new information that would warrant any changes to the scoring.

Surveillance discussions have covered all issues as laid out in Annex CG of the MSC Certification Requirements, including the principal changes occurring to the fishery within the 1st year of certification and outcomes as outlined in the Client Action Plan against conditions set.

4 Results

Table 3:

Condition 1: Red Endeavour Prawn

| Performance Indicator(s) & Score(s) | Insert relevant PI number(s) | Insert relevant scoring issue/ scoring guidepost text | Score |
|-------------------------------------|--|--|-------|
| | 1.2.1 | The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points. | 70 |
| Condition | SI a) By the fourth surveillance audit, demonstrate that the harvest strategy for red endeavour prawn is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80. | | |
| Milestones | <p><u>Years 1, 2 and 3:</u> The client will need to provide evidence that it is actively working to ensure that the harvest strategy for red endeavour prawns is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving the management objectives. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome. Resulting PI score 70 or more.</p> <p><u>Year 4:</u> The client will need to provide evidence that the harvest strategy is responsive to the state of the stock and that the elements of the harvest strategy work together towards achieving management objectives reflected in PI 1.1.1. Resulting PI score ≥ 80.</p> | | |
| Client action plan | <p><u>By 1st Audit:</u> (Nov 2018) The NPRAG, in consultation with AFMA and NPFI, will: initiate a review of all available data (eg catch and effort, species split, survey data) on red endeavours; discuss and consider the option of running a single ‘higher level sensitivity test’ for the next full Tiger Prawn assessment in 2018 which includes red endeavours as incidental catch using either a Deriso or Bayesian production model; and discuss and consider alternative approaches (eg ‘data poor’ harvest strategy approaches) for managing red endeavours.</p> <p>CSIRO, on advice from the NPRAG, will: Run a single ‘higher level sensitivity test’ for the next full 2018 Tiger Prawn assessment which includes red endeavours as incidental catch using either a Deriso or Bayesian production model Present the findings to the NPRAG for consideration</p> <p><u>By 2nd Audit:</u> (Nov 2019) The NPRAG will: Subject to the results of the sensitivity test and a cost/benefit (risk-catch-cost) analysis, determine whether to: re-include red endeavour prawns in the tiger prawn assessment; or, to develop independent empirically -based harvest control rules for red endeavour prawns. If the latter, develop an independent empirical-based set of harvest control rules for red endeavours for testing.</p> <p><u>By 3rd Audit:</u> (Nov 2020) AFMA will: Apply either the multi-species model to management of red endeavour prawns or</p> | | |

| | <p>Apply independent empirical-based harvest control rules to red endeavours as a trial to determine the effectiveness of the management approach (tiger seasons 2018/2019).</p> <p><u>By 4th Audit:</u> (Nov 2021) The NPRAG will: Review the success of the management approach using either the stock assessment outputs or other appropriate methodologies (eg a Management Strategy Evaluation (MSE) of independent empirically-based harvest control rules). recommend to NORMAC and AFMA the preferred management option for red endeavour prawns.</p> <p>AFMA, in consultation with NORMAC and NPFI, will: amend the NPF Harvest Strategy such that it demonstrates responsiveness to the state of the red endeavour prawn stock and includes well-defined harvest control rules, meeting the requirements of Condition 1.</p> | | | | | | | | | | | | |
|--|--|-------------|----------|---|--|--|---|---|---|--|----------------------------|---|-------------------------------|
| Progress on Condition [Year 1] | <p>Progress against the Year 1 Client Action Plan items is summarised below:</p> <table border="1"> <thead> <tr> <th>Action item</th> <th>Progress</th> </tr> </thead> <tbody> <tr> <td>a) Initiate a review of all available data on red endeavours.</td> <td>NPFI commissioned a review. The report is in 'final draft' stage and has been provided to the auditors (Buckworth et al., in prep.).</td> </tr> <tr> <td>b) Discuss and consider the option of running a single 'higher level sensitivity test etc.</td> <td>Red endeavours were included as a higher level sensitivity test in the 2018 tiger prawn assessment. This stock assessment report was provided to the auditors (NPRAG, 2018c).</td> </tr> <tr> <td>c) Discuss and consider alternative approaches for managing red endeavours.</td> <td>NPRAG is actively considering alternative strategies for managing red endeavours, as evidenced by minutes of November 2018 NPRAG meeting (NPRAG, 2018b)</td> </tr> <tr> <td>d) Run a single 'higher level sensitivity test' for the next full 2018 Tiger Prawn assessment which includes red endeavours as incidental catch etc.</td> <td>Completed as at (b) above.</td> </tr> <tr> <td>e) Present the findings to the NPRAG for consideration.</td> <td>Completed as indicated above.</td> </tr> </tbody> </table> <p>Further detail on the research undertaken is provided in Section 2.3 of this report. Discussions on development of the assessment of red endeavour prawns and its implications for the harvest strategy are ongoing. In consideration of efforts relative to the client action plan, the assessment team concludes the condition is on target.</p> <p>Appendix 4 presents discussion of potential considerations in addressing the PI 1.2.1 and PI 1.2.2 conditions for red endeavour prawns.</p> | Action item | Progress | a) Initiate a review of all available data on red endeavours. | NPFI commissioned a review. The report is in 'final draft' stage and has been provided to the auditors (Buckworth et al., in prep.). | b) Discuss and consider the option of running a single 'higher level sensitivity test etc. | Red endeavours were included as a higher level sensitivity test in the 2018 tiger prawn assessment. This stock assessment report was provided to the auditors (NPRAG, 2018c). | c) Discuss and consider alternative approaches for managing red endeavours. | NPRAG is actively considering alternative strategies for managing red endeavours, as evidenced by minutes of November 2018 NPRAG meeting (NPRAG, 2018b) | d) Run a single 'higher level sensitivity test' for the next full 2018 Tiger Prawn assessment which includes red endeavours as incidental catch etc. | Completed as at (b) above. | e) Present the findings to the NPRAG for consideration. | Completed as indicated above. |
| | Action item | Progress | | | | | | | | | | | |
| a) Initiate a review of all available data on red endeavours. | NPFI commissioned a review. The report is in 'final draft' stage and has been provided to the auditors (Buckworth et al., in prep.). | | | | | | | | | | | | |
| b) Discuss and consider the option of running a single 'higher level sensitivity test etc. | Red endeavours were included as a higher level sensitivity test in the 2018 tiger prawn assessment. This stock assessment report was provided to the auditors (NPRAG, 2018c). | | | | | | | | | | | | |
| c) Discuss and consider alternative approaches for managing red endeavours. | NPRAG is actively considering alternative strategies for managing red endeavours, as evidenced by minutes of November 2018 NPRAG meeting (NPRAG, 2018b) | | | | | | | | | | | | |
| d) Run a single 'higher level sensitivity test' for the next full 2018 Tiger Prawn assessment which includes red endeavours as incidental catch etc. | Completed as at (b) above. | | | | | | | | | | | | |
| e) Present the findings to the NPRAG for consideration. | Completed as indicated above. | | | | | | | | | | | | |
| Status of condition | On target | | | | | | | | | | | | |

Condition 2: Red Endeavour Prawn

| Performance Indicator(s) & Score(s) | Insert relevant PI number(s) | Insert relevant scoring issue/ scoring guidepost text | Score |
|-------------------------------------|------------------------------|--|-------|
| | 1.2.2 | Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. | 75 |

| | |
|---------------------------|--|
| Condition | SI a) By the fourth surveillance audit, demonstrate that well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. |
| Milestones | <p><u>Years 1, 2 and 3:</u> The client will need to provide evidence that it is actively working to ensure that well defined harvest control rules taking into account the main uncertainties are in place for red endeavour prawns that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome. Resulting PI score 75 or more.</p> <p><u>Year 4:</u> The client will need to provide evidence that well defined harvest control rules taking into account the main uncertainties are in place for red endeavour prawns that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Resulting PI score ≥ 80.</p> |
| Client action plan | <p><u>By 1st Audit: (Nov 2018)</u> The NPRAG, in consultation with AFMA and NPFI, will: initiate a review of all available data (e.g. catch and effort, species split, survey data) on red endeavours; discuss and consider the option of running a single ‘higher level sensitivity test’ for the next full Tiger Prawn assessment in 2018 which includes red endeavours as incidental catch using either a Deriso or Bayesian production model; and discuss and consider alternative approaches (eg ‘data poor’ harvest strategy approaches) for managing red endeavours.</p> <p>CSIRO, on advice from the NPRAG, will: Run a single ‘higher level sensitivity test’ for the next full 2018 Tiger Prawn assessment which includes red endeavours as incidental catch using either a Deriso or Bayesian production model Present the findings to the NPRAG for consideration.</p> <p><u>By 2nd Audit: (Nov 2019)</u> The NPRAG will: Subject to the results of the sensitivity test and a cost/benefit (risk-catch-cost) analysis, determine whether to: re-include red endeavour prawns in the tiger prawn assessment; or, to develop independent empirically -based harvest control rules for red endeavour prawns. If the latter, develop an independent empirical-based set of harvest control rules for red endeavours for testing.</p> <p><u>By 3rd Audit: (Nov 2020)</u> AFMA will: Apply either the multi-species model to management of red endeavour prawns or Apply independent empirical-based harvest control rules to red endeavours as a trial to determine the effectiveness of the management approach (tiger seasons 2018/2019)</p> <p><u>By 4th Audit: (Nov 2021)</u> The NPRAG will: Review the success of the management approach using either the stock assessment outputs or other appropriate methodologies (eg a Management Strategy Evaluation (MSE) of independent empirically-based harvest control rules). recommend to NORMAC and AFMA the preferred management option for red endeavour prawns.</p> <p>AFMA, in consultation with NORMAC and NPFI, will: amend the NPF Harvest Strategy as required to include well defined harvest control rules to manage red endeavour prawns to meet the requirements of Condition 2.</p> |

| | |
|---------------------------------------|--|
| | |
| Progress on Condition [Year 1] | <p>Progress In consideration of efforts relative to the client action plan is as described for Condition 1. The assessment team concludes the condition is on target.</p> <p>Appendix 4 presents discussion of potential considerations in addressing the PI 1.2.1 and PI 1.2.2 conditions for red endeavour prawns.</p> |
| Status of condition | On target |

Condition 3: Red-legged Banana Prawn

| | Insert relevant PI number(s) | Insert relevant scoring issue/ scoring guidepost text | Score |
|--|--|--|-------|
| Performance Indicator(s) & Score(s) | 1.2.2 | <p>SI (b) The selection of the harvest control rules takes into account the main uncertainties.</p> <p>SI(c) Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> | 65 |
| Condition | <p>SI b) By the fourth surveillance audit, provide evidence that the HCRs take into account the main uncertainties.</p> <p>SI c) By the fourth surveillance audit, demonstrate that available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.</p> | | |
| Milestones | <p>Years 1, 2 and 3: The client will need to provide evidence that it is actively working to ensure that well defined harvest control rules taking into account the main uncertainties are in place for red-legged banana prawns that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. This evidence will include a summary of the actions taken by the client and other relevant parties to achieve this outcome. Resulting PI score 65 or more.</p> <p>Year 4: The client will need to provide evidence that well-defined harvest control rules taking into account the main uncertainties are in place for red-legged banana prawns that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Resulting PI score ≥ 80</p> | | |
| Client action plan | <p><u>By 1st Audit:</u> (Nov 2018) CSIRO will: Present a report to the NPRAG on investigations into the impacts of the Southern Oscillation Index (SOI) and economic impacts of fishing effort in other areas of the NPF (e.g. the Gulf of Carpentaria) on the red legged banana prawn assessment Propose additional harvest control rules for inclusion in the NPF red legged banana prawn Harvest Strategy to address the current uncertainties Subject to data availability, run and present the Red-legged Banana Prawn Assessment.</p> <p>The NPRAG will: Consider and discuss the proposed additional harvest control rules to address the uncertainties for the Red-legged Banana Prawn assessment; Consider mechanisms for testing the proposed HCRs if required (e.g. a management strategy evaluation).</p> | | |

| | <p><u>By 3rd Audit:</u> (Nov 2020)¹ The NPRAG will: Initiate mechanisms for testing the proposed HCRs if required Review HCR tests; Make recommendations to NORMAC and AFMA on the additional HCRs to address the current uncertainties for the Red-legged Banana Prawn assessment</p> <p>AFMA, in consultation with NPFI and NORMAC, will: revise and incorporate the new Harvest Control rules into the NPF Stock Assessment (by Nov 2020) to meet Condition 3.</p> | | | | | | | | | | | | |
|--|---|---|-----------------|---|---|--|--|---|---|--|-------------------------------|--|--------------------------------|
| <p>Progress on Condition [Year 1]</p> | <p>Progress against the Year 1 Client Action Plan items is summarised below:</p> | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th data-bbox="440 651 815 685">Action item</th> <th data-bbox="815 651 1350 685">Progress</th> </tr> </thead> <tbody> <tr> <td data-bbox="440 685 815 1115"> <p>a) Present a report to the NPRAG on investigations into the impacts of the Southern Oscillation Index etc.</p> </td> <td data-bbox="815 685 1350 1115"> <p>Progress on this is discussed in NPRAG (2018a) and NPRAG (2018b). Plagányi et al. (2017) found an association between catch rates and different combinations of El Niño conditions (Southern Oscillation Index) and seasonal rainfall. The qualitative model developed predicted low catch rates in both 2015 and 2016 as a result of El Niño conditions and below-median rainfall. Low catch rates in years of poor environmental conditions and better fishing opportunities elsewhere at these times are likely to lead to low catches and effort in Joseph Bonaparte Gulf.</p> </td> </tr> <tr> <td data-bbox="440 1115 815 1480"> <p>b) Propose additional harvest control rules for inclusion in the NPF red legged banana prawn Harvest Strategy to address the current uncertainties.</p> </td> <td data-bbox="815 1115 1350 1480"> <p>NPRAG (NPRAG, 2018b) has actively considered additional harvest strategy control rules options [including permanent closure of the first season (quarter 2); in-season trigger limits with threshold limits on the number of boat/effort; closing the first season using a higher (above LRP) trigger point; and closing the first season based on rainfall/SOI indices. NPRAG has agreed to commission a management strategy evaluation to test these options. This work will be planned to be undertaken in early 2019.</p> </td> </tr> <tr> <td data-bbox="440 1480 815 1608"> <p>c) Subject to data availability, run and present the red-legged banana prawn assessment.</p> </td> <td data-bbox="815 1480 1350 1608"> <p>CSIRO undertook the 2017 red-leg banana prawn assessment and presented the assessment to the May 2018 meeting (NPRAG, 2018a, Plagányi et al., 2018).</p> </td> </tr> <tr> <td data-bbox="440 1608 815 1760"> <p>d Consider and discuss the proposed additional harvest control rules to address the uncertainties for the red-legged banana prawn assessment.</p> </td> <td data-bbox="815 1608 1350 1760"> <p>Completed - see above.</p> </td> </tr> <tr> <td data-bbox="440 1760 815 1888"> <p>e) Consider mechanisms for testing the proposed HCRs if required (e.g. a management strategy evaluation).</p> </td> <td data-bbox="815 1760 1350 1888"> <p>Continuing - see above.</p> </td> </tr> </tbody> </table> | Action item | Progress | <p>a) Present a report to the NPRAG on investigations into the impacts of the Southern Oscillation Index etc.</p> | <p>Progress on this is discussed in NPRAG (2018a) and NPRAG (2018b). Plagányi et al. (2017) found an association between catch rates and different combinations of El Niño conditions (Southern Oscillation Index) and seasonal rainfall. The qualitative model developed predicted low catch rates in both 2015 and 2016 as a result of El Niño conditions and below-median rainfall. Low catch rates in years of poor environmental conditions and better fishing opportunities elsewhere at these times are likely to lead to low catches and effort in Joseph Bonaparte Gulf.</p> | <p>b) Propose additional harvest control rules for inclusion in the NPF red legged banana prawn Harvest Strategy to address the current uncertainties.</p> | <p>NPRAG (NPRAG, 2018b) has actively considered additional harvest strategy control rules options [including permanent closure of the first season (quarter 2); in-season trigger limits with threshold limits on the number of boat/effort; closing the first season using a higher (above LRP) trigger point; and closing the first season based on rainfall/SOI indices. NPRAG has agreed to commission a management strategy evaluation to test these options. This work will be planned to be undertaken in early 2019.</p> | <p>c) Subject to data availability, run and present the red-legged banana prawn assessment.</p> | <p>CSIRO undertook the 2017 red-leg banana prawn assessment and presented the assessment to the May 2018 meeting (NPRAG, 2018a, Plagányi et al., 2018).</p> | <p>d Consider and discuss the proposed additional harvest control rules to address the uncertainties for the red-legged banana prawn assessment.</p> | <p>Completed - see above.</p> | <p>e) Consider mechanisms for testing the proposed HCRs if required (e.g. a management strategy evaluation).</p> | <p>Continuing - see above.</p> |
| | Action item | Progress | | | | | | | | | | | |
| | <p>a) Present a report to the NPRAG on investigations into the impacts of the Southern Oscillation Index etc.</p> | <p>Progress on this is discussed in NPRAG (2018a) and NPRAG (2018b). Plagányi et al. (2017) found an association between catch rates and different combinations of El Niño conditions (Southern Oscillation Index) and seasonal rainfall. The qualitative model developed predicted low catch rates in both 2015 and 2016 as a result of El Niño conditions and below-median rainfall. Low catch rates in years of poor environmental conditions and better fishing opportunities elsewhere at these times are likely to lead to low catches and effort in Joseph Bonaparte Gulf.</p> | | | | | | | | | | | |
| | <p>b) Propose additional harvest control rules for inclusion in the NPF red legged banana prawn Harvest Strategy to address the current uncertainties.</p> | <p>NPRAG (NPRAG, 2018b) has actively considered additional harvest strategy control rules options [including permanent closure of the first season (quarter 2); in-season trigger limits with threshold limits on the number of boat/effort; closing the first season using a higher (above LRP) trigger point; and closing the first season based on rainfall/SOI indices. NPRAG has agreed to commission a management strategy evaluation to test these options. This work will be planned to be undertaken in early 2019.</p> | | | | | | | | | | | |
| | <p>c) Subject to data availability, run and present the red-legged banana prawn assessment.</p> | <p>CSIRO undertook the 2017 red-leg banana prawn assessment and presented the assessment to the May 2018 meeting (NPRAG, 2018a, Plagányi et al., 2018).</p> | | | | | | | | | | | |
| <p>d Consider and discuss the proposed additional harvest control rules to address the uncertainties for the red-legged banana prawn assessment.</p> | <p>Completed - see above.</p> | | | | | | | | | | | | |
| <p>e) Consider mechanisms for testing the proposed HCRs if required (e.g. a management strategy evaluation).</p> | <p>Continuing - see above.</p> | | | | | | | | | | | | |

¹ Note that the CAP dates require adjustment to November 2020 to reflect consistency with the third surveillance audit.

| | |
|---------------------|-----------|
| Status of condition | On target |
|---------------------|-----------|

5 Conclusion

The assessors found that progress is on target for the three conditions. The MRAG Americas, Inc. concurs that the certification of the Northern Prawn Fishery against the MSC Principles and Criteria for Sustainable Fishing be continued for a further year.

6 References

AFMA (2017). *Northern Prawn Fishery Directions and Closures*, Australian Fisheries Management Authority. Canberra, Australia. Retrieved from: <https://www.afma.gov.au/sites/default/files/uploads/2018/03/FINAL-NPF-Directions-book-2018.pdf>.

AFMA (2018). Northern Prawn Fishery Management Advisory Committee (NORMAC) 81 Minutes, 22 February 2018. Retrieved from: https://www.afma.gov.au/sites/default/files/final_normac_81_minutes_22_february_2018.pdf

Brewer D.T., Griffiths S., Heales D.S., Zhou S., Tonks M., Dell Q., Taylor B.T., Miller M., Kuhnert P., Keys S., Whitelaw W., Burke A. and Raudzens E. (2007). Design, trial and implementation of an integrated long-term bycatch monitoring program road tested in the Northern Prawn Fishery. Final Report FRDC Project 2002/035. CSIRO Cleveland. http://frdc.com.au/research/Documents/Final_reports/2002-035-DLD.PDF.

Buckworth, R.C., McLean, C.S. and Keller, K. (in prep.). A Review of literature and available Australian data sets for Red Endeavour Prawn (*Metapenaeus ensis*), with emphasis on relevance to the Northern Prawn Fishery.

Department of Agriculture and Water Resources (2018a). Commonwealth Fisheries Bycatch Policy: Framework for managing the risk of fishing-related impacts on bycatch species in Commonwealth fisheries. Available at <http://www.agriculture.gov.au/fisheries/environment/bycatch/review>

Department of Agriculture and Water Resources (2018b). Guidelines for the Implementation of the Commonwealth Fisheries Bycatch Policy. Available at <http://www.agriculture.gov.au/fisheries/environment/bycatch/review>

Fry, G., Barwick, M., Lawrence, E. and Tonks, M. (2015). Monitoring interactions with bycatch species using crew-member observer data collected in the Northern Prawn Fishery: 2013 – 2014. Final Report to AFMA; R2013/0806. CSIRO, Australia. Pp. 218.

Heales D.S., Brewer D.T., Wang Y.G. and Jones P.N. (2003). Does the size of subsamples taken from multispecies trawl catches affect estimates of catch composition and abundance? *Fishery Bulletin* 101: 790–799.

Laird, A. (2018). Northern Prawn Fishery Data Summary 2017. NPF Industry Pty Ltd, Australia. Retrieved from: <https://www.afma.gov.au/sites/default/files/uploads/2018/04/NPF-Data-Summary-2017-FINAL.pdf>

Laird, A. (2019). Item 3.1 NPF Co-Management Projects Manager Activity Report: July 2018 – February 2019.

Lawrence, E. and Fry, G. (2018). Analysis of NPMI BRD Trial Data 2018. www.csiro.au.

MRAG (2018). Northern Prawn Fishery. First Re-Assessment. Public Certification Report. January 2018. <https://fisheries.msc.org/en/fisheries/australia-northern-prawn/@@assessments>.

MSC (2018). MSC fisheries standard, v.2.1, 31 August 2018. Marine Stewardship Council, London, 133 pp.

NPMI (2015). Northern Prawn Fishery Bycatch Strategy 2015-2018. 11pp. Retrieved from: <http://www.afma.gov.au/wp-content/uploads/2014/02/NPF-Bycatch-Strategy-2015-18-FINAL-VERSION.pdf>.

NPMI (2019). Item 3.1. NPF Co-Management Projects Manager Activity Report: July 2018 – February 2019.

NPRAG (2017). Northern Prawn Fishery Resource Assessment Group Meeting Minutes. 11 May 2017, Brisbane. <https://www.afma.gov.au/fisheries/committees/northern-prawn-resource-assessment-group/northern-prawn-fishery-resource-assessment-group-past-meetings>.

NPRAG (2018a). Northern Prawn Fishery Resource Assessment Group Meeting Minutes. 23-24 May 2018, Brisbane. <https://www.afma.gov.au/fisheries/committees/northern-prawn-resource-assessment-group/northern-prawn-fishery-resource-assessment-group-past-meetings>.

NPRAG (2018b). Northern Prawn Fishery Resource Assessment Group Meeting Minutes. 1-2 November 2018, Brisbane. <https://www.afma.gov.au/fisheries/committees/northern-prawn-resource-assessment-group>.

NPRAG (2018c). Northern Prawn Fishery Resource Assessment Group. 23-24 May 2018, Brisbane. Agenda item 6 – Tiger prawn assessment.

NPRAG (2018d). NPRAG combined 2018 papers.

Pitcher, C.R., Ellis, N., Althaus, F., Williams, A., McLeod, I., Bustamante, R., Kenyon, R., Fuller, M. (2016) *Implications of current spatial management measures for AFMA ERAs for habitats — FRDC Project No 2014/204*. CSIRO Oceans & Atmosphere, Published Brisbane, November 2015, 50 pages

Pitcher, C.R., Rochester, W., Dunning, M., Courtney, T., Broadhurst, M., Noell, C., Tanner, J., Kangas, M., Newman, S., Semmens, J., Rigby, C., Saunders T., Martin, J., Lussier, W. (2018) *Putting potential environmental risk of Australia's trawl fisheries in landscape perspective: exposure of seabed assemblages to trawling, and inclusion in closures and reserves* — FRDC Project No 2016-039. CSIRO Oceans & Atmosphere, Brisbane, 71 pages.

Plagányi, É., Deng, R., Upston, J., Miller, M., Hutton, T., and Moeseneder, C. (2018). Assessment of the Joseph Bonaparte Gulf Red-legged Banana Prawn (*Penaeus indicus*) Fishery to 2017, with TAE Recommendations for 2018. Report to the Australian Fisheries Management Authority, July 2018. CSIRO. Brisbane. 28 p.

Plagányi, É., Hutton, T., Kenyon, R., Moeseneder, C., Deng, R., Miller, M., Pascoe, S. & Upston, J. (2017). Environmental drivers of variability in Joseph Bonaparte Gulf red-legged banana prawn (*Penaeus indicus*) fishery, preliminary progress report for the Northern Prawn Fishery Resource Assessment Group, March 2017, AFMA Canberra.

Stevens J.D., McAuley R.B., Simpfendorfer C.A. and Pillans R.D. 2008. Spatial distribution and habitat utilisation of sawfish (*Pristis* spp) in relation to fishing in northern Australia. A report to the Department of the Environment, Water, Heritage and the Arts. CSIRO and Western Australia.

Zhou, S., Griffiths, S.P. and Miller, M. 2009. Sustainability assessment for fishing effects (SAFE) on highly diverse and datalimited fish bycatch in a tropical prawn trawl fishery. *Marine and Freshwater Research* 60: 563-570.

Zhou, S. (2011). Sustainability assessment of fish species potentially impacted in the Northern Prawn Fishery: 2007-2009. Report to the Australia Fisheries Management Authority, Canberra, Australia. February 2011.

Zhou, S., Buckworth, R.C., Miller, M., and Jarrett, A. 2015. A SAFE analysis of bycatch in the Joseph Bonaparte Gulf fishery for Red-legged Banana Prawns. CSIRO Oceans and Atmosphere Flagship, Brisbane, Australia.

Appendices

Appendix 1. Re-scoring evaluation tables (if necessary)

Re-scoring not required.

Appendix 2. Stakeholder submissions



WWF Comments on the MRAG Surveillance report Australian Northern Prawn Fishery

WWF-Australia (WWF) welcomes the opportunity to participate in the first Surveillance Audit of the Northern Prawn Fishery (NPF) Marine Stewardship Council (MSC) certification to be conducted by MRAG America on 20 February 2019.

Through our corporate partnerships with major Australian seafood producers and buyers including Woolworths, John West and (previously) Coles, WWF has supported MSC certified products and has been involved in numerous Fisheries Improvement Projects to help fisheries achieve MSC standards.

WWF appreciates that the Australian Northern Prawn Fishery has made progress over the last decade to address the sustainability challenges facing this fishery. While significant steps have been made in regard to marine turtles, some challenges are ongoing, particularly in terms of interactions with other threatened, endangered and protected species (TEPs) and reducing the amount of bycatch.

WWF believes TEP species interactions and reducing the amount of bycatch should be a focus for ongoing improvement and investment. In order to achieve this WWF suggests consideration of strengthening reporting requirements and providing more regular updates on progress to address these issues. This will help improve stakeholder and consumer confidence in MSC certified fisheries. Specific comments regarding the Australian Northern Prawn Fishery Public Certification Report (CR) requirements are provided in detail below.

2.3.1 - ETP species outcome: Sawfish

The CR reports that *Anoxypristis cuspidata* was the most common sawfish species recorded in the NPF and also states that this species is not listed as vulnerable under the Environmental Protection and Biodiversity Conservation Act 1999. However, the species is listed as endangered on the IUCN Redlist with populations noted as declining (see: <https://www.iucnredlist.org/species/39389/18620409>) and listed in Appendix I by CITES. WWF recommends that the surveillance report be updated to reflect the IUCN and CITES listing. In addition, it should be noted that all species of sawfish are listed as Totally Protected under the Western Australian Fish Resources Management Act (FRMA) and protected by Queensland Legislation in coastal waters.

The CR report also states:

Although sawfish species are endangered globally, the Australian sawfish populations are probably the healthiest in the world (Stevens et al., 2008).

This reference does not reflect the intent of the statements of the authors which states:

Australia, in particular areas of the Kimberley and Pilbara regions of north western Australia, probably represent some of the last relatively healthy populations of sawfish in the world. However, even in this region sawfish numbers might have been reduced by commercial and recreational fishing.

WWF recommends that the CR report be amended to more accurately reflect the reference used.

While current Ecological Risk Assessments (ERA) have found that sawfish species were not at high risk, these reports are either related to only a subsection of the fishery (e.g. Zhou *et. al* 2015) or have not been updated since updated since 2011 (e.g. Zhou *et. al* 2009 and Zhou *et. al* 2011). WWF is aware the ERAs for the fishery are due for publication in early 2019 and WWF requests that the unpublished results be made available to stakeholders of the surveillance audit so that they can have the benefit of this latest assessment information.

It is also recommended that the preliminary results of the FRDC report stated in the CR, *Can sawfish bycatch within the NPF* be shared with stakeholders during the surveillance audit.

2.3.3 Relevant information is collected to support the management of fishery impacts on ETP species.

WWF recommends that the Surveillance Report includes updates regarding the reporting of ETP species in log books. Current logbook requirements do not require species reporting for sawfishes or other high risk species identified by ERA reports. WWF recommends that Bycatch Action Plans are updated with improved species identification guides and the plans are updated to reflect the high risk species identified in the most recent reports.

Current log book requirements are that log books must be completed daily. WWF recommends that fishing data be recorded after each trawl is retrieved to enable more accurate data in regard to fishing effort and of TEP species interactions and identification allowing for improved spatial management of the fishery.

In addition, WWF recommends that current observer rates be made available for the audit, including reporting separately for each of the program of independent fishery observers, Crew Member Observers and Fisheries Independent Surveys.

2.2.3 Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch

While the surveillance report lists literature on the nature of species composition bycatch of the fishery, there has been a paucity of scientific reports assessing the amounts of bycatch in the fishery. It is recommended that baseline studies on the volume of bycatch be incorporated in the assessment process to ensure confidence in achieving results and making progress on bycatch mitigation initiatives. In addition WWF recommends that the number/proportion of vessels utilising Bycatch Reduction Devices by type be reported as means of recording improvements in the fishery.

Finally, WWF urges the fishery to improve its monitoring of bycatch levels. Recognising that reporting is challenged by the fast pace of a prawn trawl operation as well as difficulties with species identification, WWF encourages the fishery to consider the introduction of electronic

observation tools which can be linked to smart analytics software. Given the increasing availability of such technologies, we believe this would provide the fishery with an opportunity to independently verify vessel-specific reductions to bycatch through digital means.

1.2.1 Harvest strategy

WWF supports the conditions and recommendations listed in the Northern Prawn Fishery Public Certification Report:

Condition 1: (Red endeavour prawn, PI 1.2.1, scoring issue a).

- By the fourth surveillance audit, demonstrate that the harvest strategy for red endeavour prawn is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.

Condition 2: (Red endeavour prawn, PI 1.2.2, scoring issue a).

- By the fourth surveillance audit, demonstrate that well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.

Condition 3: (Red-legged banana prawn, PI 1.2.2, scoring issues b and c).

- By the fourth surveillance audit, provide evidence that the HCRs take into account the main uncertainties.
- By the fourth surveillance audit, demonstrate that available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.

WWF requests that the surveillance report provide a detailed update of progress against these criteria.

3.2.3 Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.

WWF appreciates that the management of fishery by the Australian Fisheries Management Authority utilises a credible and comprehensive risk based approach to compliance. WWF hopes that the details of the 'approach' can be augmented with information about 'impact' through the provision of data regarding rates of non-compliance and examples of management measures implemented.

3.1.2 The management system has effective consultation processes that are open to interested and affected parties.

The CR notes the FRDC project: *Developing a model for enhanced consultation and collaboration between indigenous communities and the fishing industry: A case study between the NPF Industry and Carpentaria Land Council*. The recommendations of this project stated:

The Aboriginal Corporation and Wellesley Island elders agreed that knowledge exchange between NPF staff and representatives of Wellesley Island Indigenous Communities would be optimised through presenting at industry/community meetings. Appropriate approval gained when entering lands owned and managed by Indigenous Australian peoples.

WWF suggests that the Surveillance Report would benefit from an update on industry initiatives. WWF also hopes that the Aboriginal Corporation and Wellesley Island elders are consulted and the outcomes of these discussion are reported in order to appropriately gauge progress.

We would be happy to discuss the points outlined above regarding strengthening the management of the NPF. Please do not hesitate to contact me directly should you require any further information.

Yours sincerely,

Erik Raudzens
Seafood Policy
Officer WWF
Australia

Erraudzens@wwf.org.au

Appendix 3. Surveillance audit information

NORMAC Meeting Attendees (members and observers) 20 February 2019

| Name | Affiliation |
|---------------------|--|
| John Glaister | NORMAC Chair |
| David Carter | NPFI Industry member (Austral Fisheries) |
| Greg Albert | NPFI Industry member (Madang Contractors) |
| Arthur Raptis | NPFI Industry member (Raptis) |
| Ian Knuckey | NORMAC Research member (Fishwell Consulting) |
| Ian Boot | NPFI (Austfish P/L) |
| Steve Bolton | AFMA member |
| David Power | AFMA NPF Manager |
| Clair van der Geest | Environment/Conservation member |
| Annie Jarrett | NPFI |
| Trevor Hutton | CSIRO |
| Roy Deng | CSIRO |
| Rob Kenyon | CSIRO |
| Eva Plagányi | CSIRO |
| Rik Buckworth | Sea Sense P/L |
| John Palmer | WA Seafoods |
| Robert Curtotti | ABARES |
| Phil Robson | NPFI (Raptis) |
| Andy Prendergast | NPFI (Austral Fisheries) |
| Adrienne Laird | NPFI |
| Brian van Wick | NPFI (Austral Fisheries) |
| Steve Eves | AFMA, NORMAC Executive Officer |
| Kevin McLoughlin | MSC Assessor, MRAG |

Appendix 4. Additional detail on conditions/ actions/ results

Considerations in addressing PI 1.2.1 and 1.2.2 conditions for red endeavour prawns

The management of the tiger-prawn sub-fishery places a heavy emphasis on economic factors and aims to manage to maximum economic yield. Although blue endeavour prawn and red endeavour prawn can be targeted at times, they are predominantly taken as a by-product of tiger prawn fishing. Red endeavour prawns, in particular, have been poorly considered in recent stock assessments and the current harvest strategy for the fishery, hence have conditions for PI 1.2.1 and 1.2.2. Red endeavour prawns were assessed using the RBF in the re-certification of the NPF.

The client action plan seeks to establish a stock assessment approach for red endeavour prawns and develop the harvest strategy and harvest control rules over the current period of certification. The difficulties in progressing the assessment of endeavour prawns, in particular red endeavour prawns, and development of the red endeavour prawn harvest strategy have been discussed in recent meetings of the Northern Prawn Fishery Resource Assessment Group (NPRAG).

An example of this discussion from the November 2018 NPRAG (NPRAG 2018b) is shown below:

“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.”

“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 NPF needs to consider the three options before moving forward.”

Further, “ The RAG agreed that NPF 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.”

Guidance in the MSC Fisheries Certification requirements (FCR) documents is relevant. The MSC FCR v2.0 guidelines provide the following paragraph (MSC FCR v2.0, Box GSA3: MSC intent on the achievement of MSY in P1, p385) (https://www.msc.org/docs/default-source/default-document-library/for-business/program-documents/fisheries-program-documents/msc_fisheries_certification_requirements_and_guidance_v2-0.pdf?sfvrsn=bfa6e7c1_26):

“• Multi-stock fisheries and mixed-stock fisheries. The existence of biological and/or technical interactions means that fishing on one stock has an effect on others. So it is not possible to simultaneously obtain the maximum sustainable yield from each of the individual component stocks. A compromise is required to obtain what is considered the best yield from the combination of stocks. At two extremes, for example, it could be considered that the least productive stock will be harvested up to its MSY so that all other stocks are harvested at less than their individual MSYs or it could be considered that the most productive stock will be harvested up to its MSY so that all other species will be harvested beyond their individual MSYs (i.e., fishing mortality higher and biomass lower than the MSY levels). MSC recognises this as a management choice for the target reference point for each species (e.g. UNFSA Annex II para 2), but also currently requires that the single species (or single stock) limit reference points be maintained (cf the US approach that requires no species be reduced such that it triggers the threatened species listing).”

In discussion of this guidance at the recent Northern Prawn Management Advisory Committee (February 2019), the participants indicated that the ideas represented in this paragraph strongly reflect the situation with the NPF, in particular the tiger prawn sub-fishery, whereby management cannot obtain MSY simultaneously for brown tiger prawn, grooved tiger prawn, blue endeavour prawn and red endeavour prawn. The guidance is important in determining the potential direction of research to address the conditions for red endeavour prawn.

In addition, MSC guidance on short-lived stocks is potentially relevant to the fishery (<https://mscportal.force.com/interpret/s/article/TRP-in-annual-or-nearly-annual-fisheries-PI-1-1-1-1527262011107>)

Section GSA 2.2.3 of the FCR v2.0 discusses the determination of status with respect to the point of recruitment impairment (PRI) and B_{MSY} . The following subsection, 2.2.3.1, on the use of surrogate or proxy indicators and reference points, includes the following text:

Where proxies are used that are not expressed as percentages of B_0 , teams should generally ensure that:

- Any reference point used as a proxy for scoring the PRI is set above the point where there is an appreciable risk of recruitment failure; and
- Any reference point used as a proxy for the MSY level maintains the stock well above the PRI and at levels of production and stock sizes consistent with B_{MSY} or a similar highly productive level.

The use of proxies and the choice of targets different to MSY levels for some species in a multi-species fishery (whilst maintaining limit reference points) are potentially relevant in addressing the current conditions for red endeavour prawns. There is flexibility in the current client action plan to consider such an approach.

Appendix 5. Revised Surveillance Program (if necessary)

There have been no revisions to the surveillance program.

Table 5.1: Fishery Surveillance Program

| Surveillance Level | Year 1 | Year 2 | Year 3 | Year 4 |
|--------------------|---|----------------------------|----------------------------|--|
| Level 6 | On-site surveillance audit | On-site surveillance audit | On-site surveillance audit | On-site surveillance audit & re-certification site visit |
| | In the second and subsequent certification periods a reduced team of 1 auditor may be used if the fishery has conditions associated with Principle 1, or no conditions. | | | |