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**Surveillance Audit Report for
The Australian Northern Prawn (Twin, triple and quad otter
trawl) Fishery:**

**Brown tiger prawn (*Penaeus esculentus*)
Grooved tiger prawn (*P. semisulcatus*)
Blue endeavour prawn (*Metapenaeus endeavouri*)
Red endeavour prawn (*M. ensis*)
White banana prawn (*Fenneropenaeus merguensis*);
Red-legged banana prawn (*F. indicus*)
Twin, triple and quad otter trawl**

4th Surveillance Report
Prepared for NPF Industry Pty Ltd

Certificate No: MRAG-MF-1492

MRAG Americas, Inc.
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1 General Information

Fishery name	Australian Northern Prawn Trawl (Twin, triple and quad otter trawl) 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	6 November 2012	Date of expiry	6 November 2012
Surveillance level and type	Surveillance level 1, on-site surveillance		
Date of surveillance audit	13-14 February 2017		
Surveillance stage (tick one)	1st Surveillance		
	2nd Surveillance		
	3rd Surveillance		
	4th Surveillance	X	
	Other (expedited etc)		
Surveillance team	Lead assessor: Richard Banks Assessor(s): Kevin McLoughlin, Mihaela Zaharia		
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2 Background

This report outlines the process and outcome of the fourth annual surveillance audit for the MSC certified Australian Northern Prawn Fishery (NPF). 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 (*Fenneropenaeus 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 fishery is conducted by members of the Northern Prawn Fishery Industry (Pty) Ltd (NPFIL). There are 52 vessels in the fishery.

The NPF comprises three distinct sub-fisheries: the Tiger prawn multispecies sub-fishery (targeting brown tiger prawn (*Penaeus esculentus*), grooved tiger prawn (*P. semisulcatus*), blue endeavour prawn (*Metapenaeus endeavouri*), and red endeavour prawn (*M. ensis*); the Banana prawn (*Fenneropenaeus merguensis*) trawl sub-fishery; and the Joseph Bonaparte Gulf (JBG) red-legged banana prawn (*Fenneropenaeus indicus*) sub-fishery. All sub-fisheries are able to target prawns using twin, triple and quad otter trawls.

Prawn trawling is an active fishing method which involves towing a conical-shaped net spread open by two or four steel or timber otter boards over the seabed, commonly called otter trawling. Ground chains are also used on the nets to stimulate prawns into the trawl mouth. 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).

Most of the vessels in the NPF are purpose built steel boats and range in length from 17 to 28 m. All NPF boats have modern, sophisticated catch handling, packing and freezing capabilities as well as wet (brine) holding facilities. All vessels use electronic aids such as colour echo sounders and Global Positioning Systems (GPS) and plotters. Satellite phones and fax equipment is used by most vessels and many have introduced on-board computing facilities, as well as electronic log books. All vessels are required by legislation to have an operational Vessel Monitoring System (VMS). Prawns account for >95% of the landed catch in the three fisheries combined. Landings of banana prawn (white *Fenneropenaeus merguensis* and red-legged *F. indicus*) totaled 3,957 in 2015, compared with 6,330 tonnes in 2014. The two tiger prawns (brown (*Penaeus esculentus*) and grooved (*P. semisulcatus*)) totaled 3,186 tonnes in 2015 compared with 1,708 tonnes in 2014, and endeavour prawns (blue (*Metapenaeus endeavouri*) and red (*M. ensis*)) totalled 554 tonnes in 2015 compared with 675 tonnes in 2014. The catch of red legged banana prawn from the JBG over the same period totalled 56 tonnes in 2015 compared to 380 tonnes in 2014 (1.4% of the total banana prawn catch). In addition, non-target retained prawn species in 2015 amounted to 36t of king prawns, and 15t of mixed prawn species. In 2015, the fishery also landed 76 t of bugs, 24 t of squid, 6 t of cuttlefish, 1t of scallops, and smaller quantities of other retained species (AFMA, unpublished data).

White banana prawns are caught mainly during the day in the Gulf of Carpentaria east of Arnhem Land and on isolated grounds along the Arnhem Land coast in < 20 m depth. The white banana prawns form dense aggregations (‘boils’) that may be located by spotters in planes, who direct the trawlers to them. The highest catches are taken in areas offshore from the nursery areas based around the mangrove forests.

Tiger prawns are taken mainly at night in the southern and western Gulf of Carpentaria and along the Arnhem Land coast. The tiger prawn fishing grounds are often close to those of banana prawns, but the highest catches are in areas near the nursery coastal seagrass beds. A daylight trawl ban is in place during the second (tiger prawn) season.

Blue and red endeavour prawns are caught as additional target species within the tiger prawn sub-fishery.

Red-legged banana prawns are caught in deeper waters of the JBG (45m – 85m). The sub-fishery takes place during neap tides, with fishing occurring for up to 14 days a month (on average). The sub-fishery was closed during the first fishing season (the white banana prawn season) from 2007 to 2010 inclusive. Catches are usually higher from August to November, but 2015 and 2016 have experienced significant declines in catch. The reasons for this are not clear at this stage. It is possible that there was reduced availability due to anomalous environmental conditions (including low rainfall). However, there is significant travel time (more than 20 hours from Darwin) and little incentive for vessels to make this journey in the second half of the year when catch rates in JBG in the first season have been low and tiger prawn catches in the Gulf in the second season are good, as was the case in 2015.

There are two closed seasons each year at which time there is no fishing throughout the area. These are: 1st December to 1st April, and 15th June to 1st August.

Principal support organisations include the Northern Prawn Fishing Industry Pty Ltd (NPFIL) and AFMA. The principal research organization is the Commonwealth Scientific and Industrial Research Organisation (CSIRO). Other stakeholders identified in the assessment included the NGOs the World Wildlife Fund (WWF) and the Australian Marine Conservation Society (AMCS).

In preparation for this surveillance audit, stakeholders were contacted by email on 20 December, 2016 and by notice on the MSC website, and invited to submit comments. The notification of the surveillance audit was also published on the MSC website on the 20 December, 2016. The surveillance assessors, Richard Banks, Mihaela Zaharia and Kevin McLoughlin commenced the audit on 13 February 2017, in association with the Re-certification assessment site visit. No formal submissions have been made but the document was circulated to NPF, AFMA, WWF and CSIRO for comment.

2.1 Major changes notified by the client since the full assessment

There were no major changes highlighted for the fishery, but it is pertinent to summarise the key points.

2.1.1 Stock status

Assessment of the tiger prawn sub-fishery was undertaken in 2016 with data to the end of 2015. For this fishery, population models are combined with an economic model, and used to assess the status of the fishery relative to both biological sustainability (Maximum Sustainable Yield, MSY) and maximal economic performance (Maximum Economic Yield, MEY). The two tiger prawns and blue endeavor prawns were found to be not overfished and not subject to overfishing and the fishery is operating as required under the harvest strategy. The control rules for these species have been updated and strengthened in the 2014 harvest strategy (Dichmont et al., 2014). There is no stock assessment model for red endeavour prawns, however, catch information and fishery independent survey information do not raise concerns over current stock status of the species.

At the time of the 2012 MSC certification of the NPF, information on red endeavour prawns was incorporated into the bioeconomic model. The model has subsequently been changed and red endeavour prawns are not included due to the lack of a stock assessment for the species. This has implications in the revised harvest strategy adopted for the fishery (Dichmont et al., 2014) which will require consideration at the time of re-certification of the fishery.

Assessment of red-legged banana prawns in Joseph Bonaparte Gulf (JBG) incorporating 2014 data concluded that the stock was well above the limit and target reference points. However, low catches and catch rates in 2015 (and 2016) have resulted in the most recent assessment not being used to provide assessment advice. Further investigation of the reasons for these low catches is required.

The status of white banana prawns is not assessed with a formal stock assessment model, as the wide variation in annual recruitment in this fishery has so far hindered the development of an appropriate model. This is achieved by closing the season when catch rates fall below a trigger level. It is considered that annual escapement is sufficient to provide adequate levels of spawning biomass for subsequent recruitment. As well as fishery wide input controls, management of the white banana prawn fishery has from 2014 included an MEY-based catch rate trigger system that ensures that fishing continues only while catch rates are at profitable levels.

2.1.2 Bycatch information, status and management

Through the application of the NPF Crew Member Observer (CMO) programme and Scientific Observers, AFMA assesses the impact of the NPF on bycatch and ETP species. A 2015 report (Fry et al) provides a summary of the current status of bycatch. AFMA regularly identifies a number of

vulnerable species through the application of the Ecological Risk Assessment for the Effects of Fishing (ERAEF) framework (Griffiths et al, 2006).

The current priority list includes the Porcupine ray (*Urogymnus aspererrimus*), two teleost species (*Lepidotrigla spinosa* and *Lepidotrigla sp*) and two stomatopod species, *Dictyosquilla tuberculata* and *Harpiosquilla stephensoni*. Fry et al. (2015) conclude that the porcupine ray is likely to be effectively removed from trawl nets with TEDs and is widely distributed outside of the NPF high effort areas. The CMO programme is unlikely to effectively sample *Lepidotrigla spinosa* and *Lepidotrigla sp* as there is little distribution data and insufficient suitable descriptive information available to assist in species identification onboard vessels. It was recommended that these continue to be monitored during annual fishery independent surveys. The two ‘at risk’ stomatopod species, *Dictyosquilla tuberculata* and *Harpiosquilla stephensoni*, have widespread distributions across the NPF, and both species have shown steady increases between 2009-2012. However, *Harpiosquilla stephensoni* catches dropped in 2013 and it continues to be closely monitored (Fry et al., 2015).

Following the recommendation from the 2014 audit, AFMA collected data on all incidental catch species to allow the assessment team to determine main and minor species, which would assist in the 2017 re-assessment. Data were collected by AFMA Scientific Observers, subsampling each observed trawl. Data on catch quantity of each species were made available for retained (byproduct) species. Due to using subsamples and not whole catch as reference, catch percentages but not catch quantities, were made available for bycatch species. For some species of small teleosts (e.g. Leiognathidae, Mullidae, Sciaenidae) data were only available for families as opposed to specific species (Fry & Miller, 2016).

2.1.3 ETP information, status and management

In 2015, the Department of Environment (DoE) published the Sawfish and River Sharks, Multispecies Recovery Plan, (DoE, 2015). Three species, the dwarf (*Pristis clavata*), largetooth (*P. pristis*) and green (*P. zijsron*) sawfishes, are included in the Recovery Plan by virtue of their listing as Vulnerable species under the Environment Protection and Biodiversity Conservation (EPBC) Act. The full ranges of dwarf and largetooth sawfishes are currently uncertain; these species may occasionally venture into waters of the fishery. Listing advice from the Threatened Species Scientific Committee (TSSC), recommended that “there should be a Recovery Plan for the species, preferably as part of a multispecies Recovery Plan”. The EPBC status of largetooth, green and dwarf sawfish has not been reviewed or revised since their original listings (2000, 2008 and 2009, respectively) and, the original reasons for their listing remain current. Both dwarf and green sawfishes were judged by the TSSC to be eligible for listing as vulnerable under the EPBC Act under Criterion 1; i.e. that they had undergone, (were) suspected to have undergone or (were) likely to undergo in the immediate future a very severe, severe or substantial reduction in numbers. Largetooth sawfish were listed as Vulnerable under the EPBC Act by virtue of their prior listing as vulnerable under Schedule 1 of the Endangered Species Protection Act 1992.

At the 2012 MSC assessment, the assessors judged direct effects from the NPF subfisheries as highly unlikely to create unacceptable impacts to sawfish. This was based on the NPF ERAEF findings.

In the NPF, catches of sawfish remain constant, underlined by high level reporting from CMOs (Bowling, pers. comm, November, 2015). Some species are caught in such low numbers that catch trend analysis requires more scrutiny, as there are insufficient trend analysis data available (Fry et al., 2015). CSIRO’s latest report on monitoring interactions with bycatch using the CMO, AFMA scientific observer and CSIRO prawn survey data looks at the catch rate of all of the sawfish species. Narrow sawfish makes up approximately 97% of sawfish caught in the NPF and catch trend analysis of this species shows no clear trend over time (catch rate remains mostly constant across the 3 monitoring programs – any slight increase or decrease has not been statistically significant). The mean catch rates indicate the catches for other species are remaining constant across the years including for *P. pristis* (Fry et al., 2015, p.151). The NPMI proposed new research application that is currently being

considered by FRDC. Project will investigate a novel sawfish mitigation device using electric pulse to deter the animals from entering the trawl net (Jarrett, pers. comm, February 2017).

Since 2011 there has been an improvement in crew-member observer participation and data collection quality coinciding with the implementation of a payment scheme for crew-member observers. All ETP interactions continue to be recorded in logbooks and all ETP species continue to be monitored within the CMO and AFMA SO programs, as well as within CSIRO's bi-annual fishery independent surveys (NPF Prawn Monitoring Program).

2.1.4 Benthic habitats

AFMA has identified a need to extend the ERAs covering habitats and communities, taking into account the new information, methods and management and the need to focus on the small number of highly exposed assemblages and Vulnerable Marine Ecosystems (VMEs). This is an important initiative since MSC's Fishery Certification Requirements v2.0, which will be applicable from 2017 onwards, has added scoring criteria to assess the impact on VMEs.

AFMA has specified a priority requirement for a gap analysis to determine the extent to which individual fishery ERAs, and the ecological risk management (ERM), need to address habitats considering other fishery management measures now in place — including effort reductions & closures — and following the finalisation of the CMRS network. The objectives for this project (FRDC Project No 2014/204) were:

- quantification of the overlap of fishing effort and intensity with each mapped assemblage,
- quantification of the overlap of each mapped assemblage with areas of spatial management that exclude fishing, such as closures and reserves,
- a gap analysis and prioritization of which mapped assemblages, and in which fisheries, may require future focus for AFMA's fishery ERAs.
- a qualitative assessment of the potential risk implications for any habitat forming biota (if/where data available) in mapped assemblages with high exposure to fisheries, given current spatial management.

This study was finalised and a report is available in draft at Pitcher et al., 2015. The study has provided — for all Commonwealth continental demersal trawl fisheries — a consistent spatial-mapping approach to assessment of exposure & protection of the demersal environment. The results demonstrate that the great majority of demersal environments within the NPF have little or no exposure to trawling, independent of whether they have high or no protection. The authors concluded that it is highly probable that this majority is subject to no substantive risk from demersal trawling. The results also demonstrate that relatively few demersal environments within Commonwealth fishery jurisdictions, including regions of Gulf of Carpentaria have high exposure to trawling and therefore potential for risk to sensitive habitats if they occur in these areas. The implications are that limited resources for future habitat ERAs can be focussed on the small number of more highly exposed assemblages, particularly those with lower levels of protection, to assess whether sensitive habitats are present and whether they are at substantive risk from trawling (Pitcher et al., 2015). However, the main habitats affected by each subfishery are clearly identifiable from the habitat mapping resulted from the project and the outcome of these habitats can be assessed based on adequate and sufficient information about each subfishery and the respective habitats. The new information relevant to the NPF can be summarised as follows: "About 19.6% of the NPF area (0-150 m) is closed in CMRs, ~0.2% in MPAs and ~0.7% under fishery regulation — the total closed is 20.5%. The annual footprint of the NPF trawl fishery is 1.6% overall, with most trawling around the perimeter of the Gulf of Carpentaria in assemblages '9' (main habitat for the tiger prawn subfishery) & '2' (main habitat for the white banana prawn subfishery), with footprints of 13% & 5.7% trawled annually about 1.9 & 1.4 times on average, hence total swept ratios are 24.7% & 7.9% respectively. These footprints are indicative of the relative potential for habitat risk and priority for future AFMA habitat ERAs" (Pitcher et al., 2015). The main habitat affected by the red-leg banana subfishery extends over a large

area with 25.7% in closed areas and only 1.4% trawled and 2.3% swept (Pitcher et al., 2015). Note that trawling occurs on mud/sand habitats with high recoverability rate (Haywood et al., 2005). It can be concluded that none of the affected habitats are at risk of serious or irreversible harm.

2.1.5 Governance and fisheries specific management issues

The Australian Government, under the auspices of the then Department of Agriculture, Fisheries and Forestry (DAFF), undertook extensive formal consultation on and review of the Fisheries Management Act 1991, the Commonwealth Harvest Strategy Policy and the Bycatch Policy. Similarly the Department of Environment undertook a formal review of the EPBC Act. The Review of Commonwealth fisheries legislation, policy and management (Borthwick 2012) provided recommendations. These have since been acted upon with AFMA's review of its national harvest and bycatch management strategies.

The NPFI has also initiated its Bycatch Management Strategy (NPFI, 2015), with a commitment to reduce bycatch by 30% by July 2018. This is based on AFMA's Bycatch and Discarding Workplans, which have replaced Bycatch Action Plans since 2008. Early indications are that the NPFI has responded positively in implementing the strategy with the development of Kon's Covered Fisheyes BRD, where initial trials have led to the reduction in bycatch by 36.7% in the tiger prawn fishery (NPFI, 2017). The current approved BRDs will remain in legislation until 30 June 2018, then a review of BRDs will be undertaken and less effective devices will be removed from the "approved" list.

3 Assessment Process

The fourth annual surveillance audit was carried out at the same time as the re-assessment site visit. No requests were received from stakeholders for verbal consultation. The surveillance team met with the client, and CSIRO separately.

Discussions covered all issues as laid out in Annex CG of the MSC Certification Requirements, including the principal changes occurring to the fishery within the fourth year of certification. One change had been identified in respect to a probable removal of red endeavours from the design of the harvest strategy, and this is being investigated as part of the recertification assessment.

The Northern Prawn fishery was certified in November 2012 using MSC v1.3. The annual audit covers the first Certification period, from 21 October, 2016 to 6 November, 2017.

A wide range of stakeholders were contacted including Government organisations, NGOs, and indigenous groups. The full list of stakeholders contacted is shown in Appendix 3.

4 Results

There was no requirement to review the outcomes from the Client Action Plan (CAP), as all the conditions had been met, and there were no changes to the application of these conditions.

4.1 MSC Certification validation requirements

4.1.1 Public claims made by the client

The client uses the MSC logo on its website (<http://npfindustry.com.au/>), and reference to MSC certified prawns has been used in specific product promotions and cooking programmes. The only claim by the client is that the fishery is MSC certified and is a sustainable fishery. No unsupportable claims are made.

4.1.2 Review of any personnel changes in science, management or industry

There have been no changes to the organisations managing the fishery. Personnel associated with NPF Industry Pty Ltd, and AFMA remain unchanged. The principal scientist is Trevor Hutton, and marine ecologist, Gary Fry. CSIRO, NORMAC and the NPF Resource Assessment Group remain unchanged.

4.1.3 Review of any changes to the scientific base of information, including stock assessments

The extensive monitoring systems in place for the fishery have not been substantially changed in recent years. The stock assessment models continue to be developed and improved. There has been a change to the bioeconomic model for the tiger prawn sub-fishery in that the model evaluated at the 2012 certification included consideration of both species of tiger prawns and both species of endeavour prawns. The bioeconomic model has since been revised such that red endeavour prawns are no longer included due to the lack of a stock assessment for the species (Dichmont *et al.*, 2014). This has implication for the reference points and control rules that will require further consideration at re-certification.

4.1.4 Progress in implementing the client action plan

All conditions were closed out prior to or at the third surveillance audit. Details on the achievement of the milestones is set out in the third surveillance audit report carried out on 9-12 November 2015. The report is available at <https://fisheries.msc.org/en/fisheries/australia-northern-prawn/@assessments>.

5 Conclusion

5.1 Progress relative to milestones

All the milestones for four Conditions had been met by 2014.

5.2 Closed-out conditions

With the four closed out conditions, the annual audit confirms that there was no evidence to suggest that the implementation of the actions in support of the Client Action Plan had changed. Four of P1 scores for the six UoCs are ≥ 85 . However, two of the UoCs - red endeavours and white banana prawns prawns, achieve Principle scores of < 85 . All P2 and P 3 scores are now ≥ 85 .

SUMMARY Overall scores for Principle 1 species are as follows:

Brown tiger prawn (<i>Penaeus esculentus</i>)	100
Grooved tiger prawn (<i>P. semisulcatus</i>)	100
Blue endeavour prawn (<i>Metapenaeus endeavouri</i>)	96.3
Red endeavour prawn (<i>M. ensis</i>)	80.6
White banana prawns (<i>Fenneropenaeus merguensis</i>);	81.9
Red-legged banana prawns (<i>Fenneropenaeus indicus</i>)	85

SUMMARY Overall scores for Principle 2 species were as follows:

Brown tiger prawn (<i>Penaeus esculentus</i>)	89
Grooved tiger prawn (<i>P. semisulcatus</i>)	89
Blue endeavour prawn (<i>Metapenaeus endeavouri</i>)	89
Red endeavour prawn (<i>M. ensis</i>)	89
White banana prawns (<i>Fenneropenaeus merguensis</i>);	88.3
Red-legged banana prawns (<i>Fenneropenaeus indicus</i>)	85

SUMMARY Overall scores for Principle 3 species were as follows:

Brown tiger prawn (<i>Penaeus esculentus</i>)	100
Grooved tiger prawn (<i>P. semisulcatus</i>)	100
Blue endeavour prawn (<i>Metapenaeus endeavouri</i>)	100
Red endeavour prawn (<i>M. ensis</i>)	100
White banana prawns (<i>Fenneropenaeus merguensis</i>);	100
Red-legged banana prawns (<i>Fenneropenaeus indicus</i>)	100

The P3 score for all five UoCs is at 100 with the completion of Condition 4

5.3 Surveillance

Based on the guidelines as set out in Annex CG 27.22 (Table C3), the Surveillance score is now zero.

5.4 Certification Decision

The MRAG Americas Certification Decision-making Process concurs that the certification of the Northern Prawn Trawl fishery against the MSC Principles and Criteria for Sustainable Fishing be continued for a further year.

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Appendices

Appendix 1. Re-scoring evaluation tables

2.2 Bycatch Species				
2.2.3	Information / Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
	Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	<u>Qualitative information</u> is available on the amount of main bycatch species affected by the fishery.	<u>Qualitative information and some quantitative information are</u> available on the amount of main bycatch species affected by the fishery	<u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.
	<i>(Note: Scoring issues in brackets need not be scored when the RBF is used to score PI 2.1.1.)</i>	Information is <u>adequate</u> to <u>broadly understand</u> outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u> .
		Information is adequate to support <u>measures</u> to manage bycatch.	Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.	Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.
			Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
Score: 95				
Justification				
<p>Scientific and CMO surveys were undertaken between 2010 and 2013 to assess bycatch in the red-legged prawn sub-fishery. 611 trawl hauls were observed, in 2013, including 215 trawls by scientific observers and 396 by Crew Member Observers over 551 fishing days.</p> <p>A SAFE report assessing the impacts on bycatch in the Red-legged Banana Prawn fishery in the JBG Box for 2010 to 2013 fishing seasons used three separate approaches – one linked to biological regionalisation database for species distribution range (http://www.marine.csiro.au/marq/edd_search.Browse_Citation?txtSession=1121), one using data from CSIRO scientific surveys conducted since the 1970s and the final assessment using fishery specific information from recent information collected by SO and CMOs between 2010-2013. The three alternative approaches fail to detect any species that is potentially at risk of overfishing. We conclude that the impacts of fishing on the species examined, expressed as instantaneous fishing mortality rates, are less than the maximum rates that would be sustainable. Clearly, a key explanation of these findings is that a low proportion of the species’ distribution ranges is being trawled as a result of low fishing effort.</p>				
Conclusion				
SG 60 and SG 80 are met. SG 100 scoring elements are met for ‘Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations’ and ‘Monitoring of bycatch data is				

2.2 Bycatch Species				
2.2.3	Information / Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
conducted in sufficient detail to assess ongoing mortalities to all bycatch species.'				
References				
<p>Tonks, M.L., Griffiths, S.P., Heales, D.S., Brewer, D.T. and Dell, Q. 2008. Species composition and temporal variation of prawn trawl bycatch in the Joseph Bonaparte Gulf, northwestern Australia. <i>Fisheries Research</i> 89: 276–293.</p> <p>Jarrett, A., Dennis, D.M., Buckworth, R.C., Bustamante, R., Haywood, M.D.E, Tonks, M., Venables, W., and Barwick, M. (2013) A synthesis of existing information, analysis and prioritisation of future monitoring activities to confirm sustainability of the red legged banana prawn sub fishery in the Joseph Bonaparte Gulf: Draft. FRDC 2013/047. October, 2013. 61pp</p> <p>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 on FRDC Project 2002/035. CSIRO, 393 pp.</p> <p>Fry, G., Brewer, D., Dell, Q., Tonks, M., Lawrence, E., Venables, W., Darnell, R. 2009. Assessing the sustainability of the Northern Prawn Fishery bycatch from annual monitoring data. AFMA Project 2008/826, CSIRO Marine and Atmospheric Research.</p> <p>Griffiths, S., Kenyon, R., Bulman, C., Dowdney, J., Williams, A., Sporcic, M. and Fuller, M. 2007. Ecological Risk Assessment for Effects of Fishing: Report for the Northern Prawn Fishery. Report for the Australian Fisheries Management Authority, Canberra, 319pp.</p> <p>Zhou, S. Buckworth, R. C. Miller, M and Jarrett, A, A SAFE analysis of bycatch in the Joseph Bonaparte Gulf fishery for Red- legged Banana Prawns , Australian Fisheries Management</p> <p>Zhou, S. and Griffiths, S.P. 2008. Sustainability Assessment for Fishing Effects (SAFE): A new quantitative ecological risk assessment method and its application to elasmobranch bycatch in an Australian trawl fishery. <i>Fisheries Research</i> 91: 56–68.</p> <p>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.</p> <p>Zhou, S., Griffiths, S.P. and Miller, M. 2009. Sustainability assessment for fishing effects (SAFE) on highly diverse and data-limited fish bycatch in a tropical prawn trawl fishery. <i>Marine and Freshwater Research</i> 60: 563–570.</p> <p>AFMA. 2009a. Northern Prawn Fishery: Bycatch and Discarding Workplan 1 July 2009 to 30 June 2011. Accessed online at: http://www.afma.gov.au/information/publications/fishery/baps/default.htm</p> <p>AFMA. 2011. Northern Prawn Fishery Operational Information 2011. Australian Fisheries Management Authority. Canberra, Australia. 123pp. Accessed online at http://www.afma.gov.au/wp-content/uploads/2010/06/NPF-Info-book-2011-FINAL-280311.pdf</p> <p>AFMA. 2009b. Ecological Risk Management: Report for the Northern Prawn Fishery – Tiger and Banana Prawn Sub-fisheries</p>				

2.4 Habitat				
2.4.3	Information/ Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	There is a basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
		Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	Changes in habitat distributions over time are measured.
			Sufficient data continue to	The physical impacts of

2.4 Habitat				
2.4.3	Information/ Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
			be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	the gear on the habitat types have been quantified fully
Score: 80				
Justification				
<p>Jarrett <i>et al.</i> (2013) indicated that while there has been no comprehensive mapping of the seabed habitats in the area of the JBG sub-fishery, coarse scale descriptions of benthic habitats of JBG were provided in the Interim Marine and Coastal Regionalisation for Australia (IMCRA, 1998) report and updated to IMCRA version 4.0 in June 2006. Moreover, a generalized habitat map for the JBG showing potential distribution of habitats and biological communities is provided in Przeslawski <i>et al</i> (2011), based on biological data from scientific and mining related surveys. This report, combined with VMS spatial coverage information, suggests the broad habitats would be impacted by prawn trawling and their likely vulnerability. All trawling within the JBG occurs within a single bioregion – the ‘infaunal plain, i.e. <i>flat soft substrate with occasional rocky outcrops scattered epifauna, biota dominated by infauna</i>. The infaunal plain is the largest of the JBG habitats covering around 64% of the JBG area, and is characterized by extremely rare (<0.01%) occurrence of large vulnerable growth forms (Przeslawski <i>et al</i>, 2011). The VMS also provided evidence of low footprint, which had also been declining over the years. Around 8% of grids in the JBG area were fished in 1999, declining to ~1.5% of grids in 2012. Amongst grids with >10 hours.nm² fishing effort, coverage declined from ~3% to ~0.5% over the same period. No new areas have been fished post-2005.</p>				
Conclusion				
<p>Evidence provided from ongoing research suggests that the nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery; and that sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location. SG 60 and SG 80 are met but not SG 100.</p>				
References				
<p>Jarrett, A., Dennis, D.M., Buckworth, R.C., Bustamante, R., Haywood, M.D.E, Tonks, M., Venables, W., and Barwick, M. (2013) A synthesis of existing information, analysis and prioritisation of future monitoring activities to confirm sustainability of the red legged banana prawn sub fishery in the Joseph Bonaparte Gulf: FRDC 2013/047. October, 2013. 61pp</p> <p>Griffiths, S., Kenyon, R., Bulman, C., Dowdney, J., Williams, A., Sporcic, M. and Fuller, M. 2007. Ecological Risk Assessment for Effects of Fishing: Report for the Northern Prawn Fishery. Report for the Australian Fisheries Management Authority, Canberra, 319pp.</p> <p>Haywood M, Hill B, Donovan A, Rochester W, Ellis N, Welna A, Gordon S, Cheers S, Forcey K, Mcleod I, Moeseneder C, Smith G, Manson F, Wassenberg T, Thomas S, Kuhnert P, Laslett G, Burrridge C and Thomas S. 2005. Quantifying the effects of trawling on seabed fauna in the Northern Prawn Fishery. Final Report on FRDC Project 2002/102. CSIRO, Cleveland. 462 pp.</p> <p>Bustamante, R.H., Dichmont, C.M., Ellis, N., Griffiths, S., Rochester, W.A., Burford, M.A., Rothlisberg, P.C., Dell, Q., Tonks, M., Lozano-Montes, H., Deng, R., Wassenberg, T., Okey, T.A., Revill, A., van der Velde, T., Moeseneder, C., Cheers, S., Donovan, A., Taranto, T., Salini, G., Fry, G., Tickell, S., Pascual, R., Smith, F., and Morello, E. 2010. Effects of trawling on the benthos and biodiversity: Development and delivery of a Spatially-explicit Management Framework for the Northern Prawn Fishery. Final report to the project FRDC 2005/050. CSIRO Marine and Atmospheric Research, Cleveland, P382.</p> <p>AFMA. 2011. Northern Prawn Fishery Operational Information 2011. Australian Fisheries Management Authority. Canberra, Australia. 123pp. Accessed online at http://www.afma.gov.au/wp-content/uploads/2010/06/NPF-Info-book-2011-FINAL-280311.pdf</p>				

2.5 Ecosystem				
2.5.3	Information/ Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
	There is adequate knowledge of the impacts of the fishery on the ecosystem.	Information is adequate to <u>identify</u> the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to <u>broadly understand the key</u> elements of the ecosystem.	
		Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>have not been investigated in detail</u> .	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>may not have been investigated in detail</u> .	Main <u>interactions</u> between the fishery and these ecosystem elements can be inferred from existing information, and <u>have been investigated</u> .
			The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are <u>known</u> .	The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are <u>understood</u>
			Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components <u>and elements</u> to allow the main consequences for the ecosystem to be inferred.
			Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
Score: 80				
Justification				
<p>The main information available for future modeling of the JBG ecosystem comes from the 30+ years of fisheries research conducted by the NT Fisheries department and NPF management, as well as through the process to support the National Marine Bioregionalisation of Australia and associated biodiversity conservation initiatives. Most of the field-based data and information comes from the scientific surveys by the Australian government research agencies such as Geoscience Australia, CSIRO and the Australian Institute of Marine Science (AIMS). These included a study of species composition of prawn trawl bycatch in the JBG fishery, based on 53 trawls over two years (Tonks <i>et al</i>, 2007). The information available has been sufficient to allow a number of authors to develop conceptual or schematic models of ecosystem structure and biophysical process in the JBG (e.g. Brewer <i>et al</i>, 2007; Przeslawski <i>et al</i>, 2011). Jarrett <i>et al</i> (2013) qualitatively assessed the levels of data and information available for each component of the marine ecosystem of the JBG. Abiotic and environmental components of the JBG ecosystem are the most information-rich, while interactions between components and ecosystem processes are less well-known. Information to detect potential changes in the risk level to the JBG ecosystem from the fishery continues to be collected through catch and effort logbook information, VMS data on spatial effort patterns, gear type</p>				
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2.5 Ecosystem				
2.5.3	Information/ Monitoring	60 Guideposts	80 Guideposts	100 Guideposts
information, CMO and SO data on ‘at risk’ and ETP species (albeit coverage has been low in recent years) and SO data on catch composition. Given the substantial decline in catch and effort since the mid-1990s, coupled with the introduction and refinement of BRDs and TEDs and the contraction of the area trawled, CSIRO concluded that the impact of the fishery on the ecosystem has reduced proportionally.				
Conclusion				
The assessment of information available was assessed as adequate, following the first surveillance audit, to broadly understand the key elements of the ecosystem. Additional information compiled by Jarrett <i>et al.</i> (2013) since the original certification, suggested that the main function of the components (i.e. target, bycatch, retained, ETP species and habitats) in the ecosystem are known, albeit significant gaps still exist in our understanding of interactions between ecosystem components. Sufficient data continue to be collected through catch and effort information, VMS data on spatial extent of the fishery, catch composition through scientific observers, and gear type, to detect any increase in risk level. Evidence provided that this Condition had been met and that the fishery was rescored at SG 80.				
References				
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 on FRDC Project 2002/035. CSIRO, 393 pp.				
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Bustamante, R.H., Dichmont, C.M., Ellis, N., Griffiths, S., Rochester, W.A., Burford, M.A., Rothlisberg, P.C., Dell, Q., Tonks, M., Lozano-Montes, H., Deng, R., Wassenberg, T., Okey, T.A., Revill, A., van der Velde, T., Moeseneder, C., Cheers, S., Donovan, A., Taranto, T., Salini, G., Fry, G., Tickell, S., Pascual, R., Smith, F., and Morello, E. 2010. Effects of trawling on the benthos and biodiversity: Development and delivery of a Spatially-explicit Management Framework for the Northern Prawn Fishery. Final report to the project FRDC 2005/050. CSIRO Marine and Atmospheric Research, Cleveland, P382.				

3.2 Fishery-Specific Management System				
3.2.4	Research Plan	60 Guideposts	80 Guideposts	100 Guideposts
	The fishery has a research plan that addresses the information needs of management.	<u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC’s Principles 1 and 2.	A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.	A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC’s Principles 1 and 2.
		Research results are <u>available</u> to interested parties.	Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion	Research <u>plan</u> and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are

3.2 Fishery-Specific Management System				
3.2.4	Research Plan	60 Guideposts	80 Guideposts	100 Guideposts
				<u>widely and publicly available.</u>
Score: 100				
Justification				
<p>A five year Research Plan (2014-2018) has been published (NPFIP, 2014) and was implemented from the start of 2014. Key research priorities include:</p> <ul style="list-style-type: none">• Collect information to inform annual RAG assessment to set the Total Allowable Effort (TAE) for tiger, common and red-legged banana prawns in accordance with NPF harvest strategies• Provide key data used to set TAE through at-sea monitoring projects (ie recruitment and spawning surveys)• Undertake annual analysis of CMO and Scientific Observer data to confirm it meets criteria for use in monitoring populations of Endangered, Threatened, and Protected (ETP) and at-risk species• Undertake a Sustainability Assessment of Fishing Effects (SAFE) assessment for the Joseph Bonaparte Gulf sub-fishery. <p>The research priorities for the NPF are reviewed annually by the Research Advisory Group (NPRAG) and the Management Advisory Committee (NORMAC) and included in an Annual Research Statement. These priorities are then pursued by research providers, often in partnership with industry and/or fisheries managers with the help of the below research advisory bodies: The AFMA Research Committee (ARC), which considers essential stock assessment type research for funding by AFMA in the following financial year; and the Commonwealth Fisheries Research Advisory Body (ComFRAB) which considers Commonwealth fisheries research priorities for potential Fisheries Research and Development Corporation (FRDC) funding two years hence) - the FRDC research cycle is an 18 months' cycle compared to the ARC which is a 12 months' cycle. The Plan is available on the website and disseminated to interested parties.</p>				
Conclusion: – Score: 100				
The scoring elements of SG60, SG 80 and SG 100 are met				
References				
<p>AFMA (2005), Researching for Fisheries, Industry and Community: AFMA's Strategic Research Plan, 2005–2010. Available at http://www.afma.gov.au/wp-content/uploads/2010/07/strategic_research_plan.pdf</p> <p>NPF Annual Research Plan, 2014-2018, http://www.afma.gov.au/wp-content/uploads/2010/06/NPF_Five_Year_Strategic_Research_Plan_FINAL1.pdf</p> <p>NORMAC (2011b) Northern Prawn Fishery, Research Project Summary, 2000-2011</p>				

Appendix 2. Surveillance audit information

Stakeholder	Name	e-mail contact
NPF Industry Pty Ltd	Annie Jarrett Adrianne Laird	annie.jarrett@bigpond.com adrianne@npfindustry.com.au
Fishing Companies	Arthur Raptis (A Raptis & Sons) Phillip Robson (A Raptis & Sons) Jamie Ball (Tropic Ocean Prawns) Tony Murray (MTC) Greg Albert (Madang Contractors) Neal Harris (Austfish) Ron Earle (Tropic Ocean Prawns) Bryan Van Wyk (Austral) Andy Prendergast (Austral) David Carter (Austral)	
AFMA	Steve Bolton	
RAG	Ian Knuckey	ian@fishwell.com.au
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NORMAC	Claire Van der Geest	

No stakeholders responded to the opportunity to submit written comments.

Appendix 4. Additional detail on conditions/ actions/ results (if necessary)

No changes were made to the Conditions set, or the required CAP milestones.

Appendix 5. Revised Surveillance Program (if necessary)

No adjustment is needed to the surveillance programme.