Australian Government
Australian Fisheries Management Authority

Northern Prawn Fishery

ANNUAL RESEARCH STATEMENT

2017-18

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NPF Annual Research Statement for 2017/18

AFMA funding in 2017/18 (AFMA Research Committee - ARC)

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	**Priority/rank**	**Feasibility**
1. NPF Stock Assessment: - to set the Total Allowable Effort (TAE) for the tiger prawn fishery (including endeavour prawns) - to set the TAE for red-legged banana prawns in accordance with the NPF Harvest Strategy - determine the MEY target trigger catch rate for white banana prawns for the 2017 banana prawn season	Update the fishing power surveys incorporating data from gear surveys. Estimate MEY-based catch levels for the tiger prawn fishery for the 2017 and 2018 fishing years. Assess and provide a TAE for red-legged banana prawns in 2017 and 2018. Determine MEY trigger value for white banana prawns Continual improvement to model performance.	2017/18 allocation under project RR2015/0811 ~ $195,611 (ARC) ~ $59,614 (Researcher)	Essential	Ongoing assessments help to meet fishery economic and sustainability objectives. This research has a prior record of feasibility and completion.
2. Recruitment survey: - Undertake a fishery independent survey in January/February 2018.	To obtain two adequate vessels for the recruitment survey (for a 15-20 day period in January/ February). The outcomes will be the delivery of a vessel charter which enables the collection of adequate fishery independent data for the NPF bioeconomic	~ 285K (ARC) allocated for 2017/18 to conduct a Summer survey only.	Essential	Annual fishery independent surveys help to meet fishery economic and sustainability objectives. This research has a prior

	model. The resulting benefit to AFMA will be an understanding of the stock dynamics for tiger prawns which supports the management of the entire fishery.			record of feasibility and completion.
3. Integrated monitoring program NPF 2015-18	Undertake analysis of data collected during the recruitment surveys to determine and evaluate: • fishery independent parameters on the state and status of the population and recruitment indices for commercial prawn species; • the spatial extent, variability and abundance of prawn populations; and • the spatial extent and abundance of byproduct and bycatch species at risk.	2017/18 allocation under project RR2015/0810 ~ $351,710 (ARC) ~ $75,278 (Researcher)		
4. Annual analysis of Crew Member Observer (CMO) and Scientific Observer data to confirm it meets criteria for use in monitoring populations of TEP and at-risk species, with sustainability assessment every third year.	2017 CMO data analysed and collated with existing data.	2017/18 allocation under project RR2015/0812 $62,418 (ARC)	Essential	Ongoing bycatch data analysis work with a prior record of feasibility and completion

FRDC funding in 2017/18 (Commonwealth Research Advisory Committee - ComRAC)

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	**Priority/rank**	**Feasibility**
1. Addressing knowledge gaps for studies of the effect of water resource development on the future of the NPF	The primary objective for this project is to ensure that decisions about development of water resources in the southern GoC are based on as good information as possible. This includes an understanding of the importance of individual rivers to support juvenile banana prawns and other fisheries species. River flow is crucial in the life cycle of prawns that support the Northern Prawn Fishery (NPF), as well as for a suite of other species important to commercial, recreational and Indigenous fisheries, or with high conservation and cultural value. Specific objectives include: a) Synthesize historical data available on surveys of the fishery and recruitment of prawns. b) Contribute to the sampling design for field trips to the southern Gulf of Carpentaria to estimate juvenile prawn densities across estuarine nursery habitats. c) Undertake field sampling across estuaries in the southern Gulf of Carpentaria to	Already allocation under project 2016 - 047 ~ $150,000 (FRDC) ~ $60,000 (AFMA) ~ $75,000 (CSIRO)	Essential	

	estimate prawn densities and explore linkages to primary production in rivers with different characteristics and catchment features to the Norman River, expanding knowledge to other GOC rivers. d) Contribute to data analysis from field sampling effort (Objective 2) and provide advice on sample sorting and analysis			
2. Proposed northern Australia water developments pertinent to the Northern Prawn Fishery: collation and review.	The project will collate, review and compile publicly-accessible summaries of available information, to identify what is known in terms of development plans, to inform research planning for the NPF and in particular will focus upon collation of material that will inform the operational aspects of government policy in relation to potential northern development. It will link map and knowledge summaries to key baseline legislation, proposals, assessment reports and consultation outputs to facilitate research and management planning. The review will provide a knowledge base to better understand biological and ecological responses to proposed development. The project would address the following questions: a) What are the proposed water developments in northern Australia and how will they impact natural flow? b) What species and critical habitats are within catchment and footprint of	Already allocation under project 2016 - 015 ~ $27,000 (CSIRO) ~ 50,000 (FRDC)	Essential	CSIRO Oceans and Atmosphere has a large number of staff who has capability in undertaking the review work. Additionally the agency has a large number of capable data professionals who could address the data management and information access tasks of this project.

	proposed development? c) What and where are the potential impacts on the biology and ecology of NPF and other fisheries species d) threats, potential benefits and other considerations e) What cumulative impacts (i.e. in relation to other development) should be accounted for? f) Are there potential ecological interactions due these impacts? g) Might biological and ecological impacts of proposed developments affect non-fishery stakeholders?			
3. Ecological modelling of the impacts of water development in the Gulf of Carpentaria with particular reference to impacts on the NPF	The primary objective will be to investigate the ecological and economic impacts of proposed and potential water resource developments in Northern Australia upon commercial fisheries, in particular the Northern Prawn Fishery. Key tasks are envisaged to include a) Review, collate and summarise information pertaining to proposed and potential water developments in northern Australia to identify the range of likely water capture and altered flow regime scenarios that may have the potential to impact on commercially important	$480 K	Essential	Required modelling research is feasible, given the prior development of a preliminary MICE model focussed on prawns in the Gulf of Carpentaria, which would serve as the basis for an expanded whole of ecosystem approach. Similarly, Ecopath models relevant to GoC have also been

	fisheries species and the ecosystems that support those. b) Evaluate and quantify the likely cumulative biological and economic impacts of northern waters developments upon commercially important fisheries species (in particular those targeted by the NPF) and the ecosystems that support these, through the development of modelling approaches that account for whole of ecosystem processes in relevant waters off Northern Australia Research is needed to build upon previous preliminary investigations which were quite spatially limited in scope, did not take into account interacting biophysical and ecological processes, and only quantified potential impacts on two commercial species (only one targeted by NPF). Research should focus on both the reduction in, and cessation of, low-to-moderate flood-flow due to extraction or impoundment. The benefits from such research would not only be specific to the Northern Prawn fishery. The conclusions could help inform government decisions regarding a host of water allocation options/regimes for multiple user groups across Northern Australia. This in turn would make this research need			developed previously and can be adapted and built upon. There will be a need to investigate and communicate with other stakeholders potentially impacted by water resource development in Northern Australia.

	applicable to other research funding organisations such as the GrowNorth CRC (yet to be formally established).			
4. Extend historical monitoring series to track food-web, seagrass health/extent and other indicators of ecological health and stability in response to coastal and catchment development in the Gulf of Carpentaria.	The principal objective for this work is provide relevant targeted monitoring of key indicators of the status of the ecological processes that underpin the NPF's prawn species. Building upon historical research, the work should also address the knowledge gaps about the key ecological processes, dynamics and nursery habitats for commercial prawn species of the Northern Prawn Fishery. This would provide the basis for evaluating ecological change as well as identifying the drivers of change. Changes (e.g. in sea grass extent or species composition) could arise from environmental variation climate change or other causes (e.g. water extraction, port development, mining). The work would serve to inform the ecological modelling of Objective 1 above. Tasks would include field studies, employing new techniques to measure productivity, nutrient flux, lipid markers and stable isotope diagnostics, to indicate organic sources, microbial drivers, sediment health and trophic status of key habitats. For example, the work would address the role and importance of the nutrient plumes produced by wet season floods at river mouths, in the growth and survival of banana prawns inshore, and of nearshore seagrass communities and juvenile		Essential	

	tiger prawns. This would be an important input in predicting impacts of activities that alter flow regimes. Extensive mapping and characterisation of key seagrass communities (tiger and endeavour prawn nursery habitats) in a 1983-1990s survey series provides a historical baseline. Re-surveying these communities would provide the data to estimate changes in status in the intervening decades, and evaluate drivers. Thus the impacts of extreme weather (e.g. cyclones), environmental change (e.g. temperature) or port development and industrial activities can be evaluated (e.g. MacArthur River mouth sites (near transhipment port) vs western Gulf vs Groote).			
5. Advance co-management including through investigation of a 'standards' approach to auditing management functions undertaken by NPFI.	NPFI and AFMA are interested in ways to expand the co-management functions undertaken by NPFI. The NPF has been identified as a case study in the FRDC project looking at the establishment of standards for Commonwealth fisheries.	Already funded via FRDC	Essential	Potential for inclusion in broader FRDC project. No NPF specific funding may be required.
6. Research to support MSC Certification.	Research needs associated with the MSC certification process will be identified following the completion of an associated audit later in 2015.	Uncertain	Essential	Scope to be determined
7. Can sawfish bycatch within the NPF be	The primary objective of this project is to reduce sawfish interactions in the NPF by developing	$120k	Essential	Dr Charlie Huveneers (Flinders University) is the research leader

mitigated through a novel electric device?	and testing a novel bycatch mitigation device using electric pulse to reduce sawfish bycatch, which has been identified as a risk to Marine Stewardship Council recertification in the fishery, while improving the safety of the industry. Key tasks will include: a) Development of a device that will produce an underwater electric field which can be tested on captive species; and b) Use this device to test various electric field strength and frequencies on the behaviour of captive freshwater sawfish (*Pristis pristis*).			of the Southern Shark Ecology Group which delivers high quality research on the biology, ecology and population status of sharks and rays, as well as assessments of their vulnerability to fishing pressure, and bycatch mitigation measures. Dr Huveneers has over 55 peer-reviewed publications and has extensive experience managing large research projects and budgets. Dr Peter Kyne (Charles Darwin University) has a background in fish biology, fisheries bycatch and fish conservation, particularly in relation to the chondrichthyan fishes.