

## Queensland mud crab research project: FRDC 2019/062

Researchers from the Department of Agriculture and Fisheries (DAF) Queensland, CQUniversity (CQU) and the Department of Primary Industries (DPI) NSW Fisheries are collaborating on a Fisheries Research and Development (FRDC) co-funded research project on mud crab populations in Queensland. The project aims to provide a better information base to assess and sustainably manage Queensland mud crab fisheries.

### Background

The management of mud crabs in Queensland (i.e., minimum legal size of 150 mm carapace width for males, and prohibited harvest of females) is generally assumed to ensure their sustainability. However, mud crabs are subject to heavy commercial and recreational fishing pressure in some regions, as well as black market harvesting. Recent evidence from the Western Gulf of Carpentaria suggests that mud crab populations can be vulnerable to environmental events – in this case, prolonged drought combined with high temperatures and a drop in sea level led to a major failure of catch in 2016 in Northern Territory waters. Additionally, for most areas in Queensland, there is no index of female abundance, nor male to female ratios which are needed in stock assessments. Currently in Queensland, the main data used to assess mud crab biomass (against target levels) is commercial catch rates, which may not represent changes in population abundance for a number of reasons.

### Objectives

1. *Examine the extent of genetic mixing of mud crabs between South East Queensland and New South Wales.* This work will occur during 2020/2021 and is led by Dr Sam Williams (DAF), Professor Matt Taylor and Daniel Johnson (NSW DPI-Fisheries). Due to limited information about the spawning movements of female mud crabs, there remains uncertainty about the amount of larval connection between regions due to drifting in regional currents. A genetic approach using ‘Single nucleotide polymorphisms’ (SNPs) will be used to assess the genetic connectivity of mud crabs between regions in Queensland and New South Wales. This will inform regional stock structure and suggest options for a possible regional management approach in the future.

2. *Tag and recapture mud crabs to provide regional estimates of growth, natural mortality and movement.* This work will occur in late 2021 and 2022 and is led by Dr Julie Robins (DAF) and Dr Nicole Flint (CQU). Crabs between 80 and 100 mm carapace width will be tagged and released at their catch locations. Researchers will be seeking assistance from crab fishers to report the tag-recaptures, as this information can be used to estimate movement, natural mortality, and growth (if the crab has moulted). These values are important in stock assessments and are likely to vary regionally throughout Queensland. Focus regions will be south-east Queensland (greater Moreton Bay), central



Recreational catch (K. McLennan)



Tagged mud crab (M. Grubert)

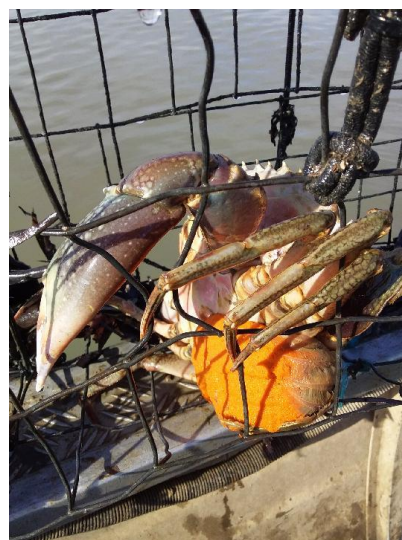
Queensland (Gladstone/ Rockhampton), north Queensland (Hinchinbrook), and the south-eastern Gulf of Carpentaria (Karumba).

3. *Develop a cost-effective method to monitor key biological information of regional Qld mud crab populations.* This work will collaborate with interested fishers and is led by Dr Julie Robins (DAF) and Dr Nicole Flint (CQU). It will examine what a pragmatic and cost-effective monitoring program might look like that can provide key ongoing biological information, such as the abundance of sub-legal sized crabs, male to female ratios and size-frequencies over time (to infer growth rates). Survey pots are one means by which data on sub-legal crabs could be collected, but the project will consider a range of ideas. One option is to photograph non-retained catch and use image recognition technology to estimate the number, size and sex of sub-legal crabs. Researchers will be consulting with interested crab fishers in each focus region (Moreton Bay, central Queensland, north Queensland and the south eastern Gulf) to identify and assess workable solutions to this objective.

4. *Better understand the spawning migration of female mud crabs.* This objective will examine whether tagging technologies (acoustic or satellite tags) can track the migration of egg-bearing female mud crabs, to identify where the eggs are released, and what proportion of these females return to estuaries after spawning.

The project is asking recreational and commercial fishers in Queensland and New South Wales to assist by reporting current sightings of egg-bearing females.

Sighting information should include date, location (e.g., lat/long), whether the crab was at the surface or caught in gear (i.e., pot or trawl-caught). Photos of the egg-bearing crab are best (top and underneath, to confirm species identification). The colour of the egg mass will indicate how old the eggs are (i.e., when did the female lay the eggs), as well as how long before the eggs hatch (i.e., where will the eggs be released and using oceanographic information determine where the larvae might end up). Researchers will map the sightings to better quantify when and where mud crab spawning occurs. **Fishers are reminded that it is prohibited under the Fisheries Act 1994 to possess female mud crabs in Queensland.**



*Egg-bearing female mud crab  
(Port Alma fisher)*

An ongoing research and monitoring program on mud crabs brings this species into line with other target fishery species regularly monitored by the Queensland Government. Better data will support informed decision-making, such as the Total Allowable Catch, that is necessary for the Queensland Mud Crab Fishery Harvest Strategy: 2021 – 2026 (see <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/harvest-strategy> for more information).

## How can you help?

Report sightings of egg-bearing females via email to [info@daf.qld.gov.au](mailto:info@daf.qld.gov.au) or by phoning 13 25 23.

For further information or if you are interested in providing information or assistance to the project contact Dr Julie Robins at [Julie.Robins@daf.qld.gov.au](mailto:Julie.Robins@daf.qld.gov.au).



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