

A collaborative recruitment forecasting programme for the Northern Territory Mud Crab Fishery

Update 2 - January 2010

A collaborative research project involving the Northern Territory Seafood Council, the Fisheries Group of the Department of Resources, the NT Mud Crab Licence Committee (formerly the NT Crab Fishermen's Association), the Wanga Djakamirr and Li-Anthawirriyarra Sea Ranger Groups is now into its second year.

The aim of the study (funded by a Landcare Sustainable Practices grant under the Australian Government's Caring for our Country) is to collect information on when and where juvenile mud crabs are found and describe potential links between juvenile abundance and the subsequent commercial harvest of mud crabs. The areas being monitored include Castlereagh Bay and surrounds as well as the Limmen Bight, McArthur, Roper, and Wearyan Rivers in the Gulf of Carpentaria.

Since the project began in August 2008 NT Fisheries staff in conjunction with Chris Calogeras (C-AID Consultants) have conducted a number of training/review workshops with each of the project partners. Where necessary, these workshops covered how best to set and retrieve crab pots, mud crab handling techniques as well as data recording and reporting protocols.



Figure 1. Wanga Djakamirr ranger Solomon O'Ryan checking research pot

Each participant (or group) has been issued with a number of purpose-built research pots (Figure 1) and a scientific permit to use non-standard pots. The research pots are based on commercial crab pots but are wrapped in a smaller, finer mesh. The use of shade cloth to line the funnels and a narrow funnel entrance provides purchase for the small legs of

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juvenile crabs (allowing them to enter the pot) and blocks the entry of large crabs, respectively.

Three to five pots have been grouped in several locations within each monitoring area (e.g. near salt pans, mangroves and mud flats) and are checked at least two to three times per week. Crabs captured are emptied into a plastic tray which has a checkerboard pattern applied to the inner surface for calibration purposes (Figure 2).

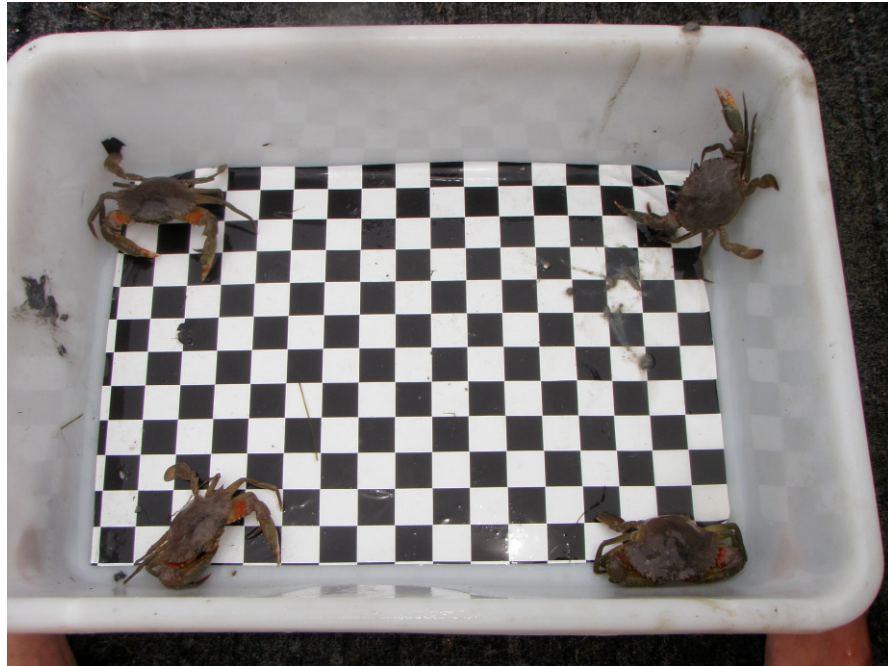


Figure 2. Calibrated plastic tray

Once photographs of the catch have been taken (using water-proof digital cameras), the crabs are released. Images are returned to Darwin each month for crab size estimation using image analysis software (Figure 3).

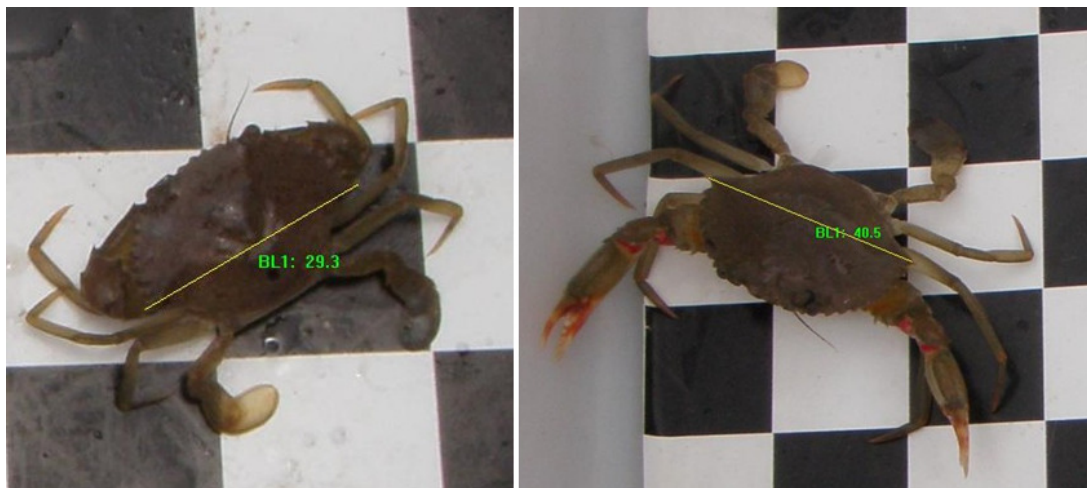


Figure 3. Juvenile mud crabs measured using image analysis

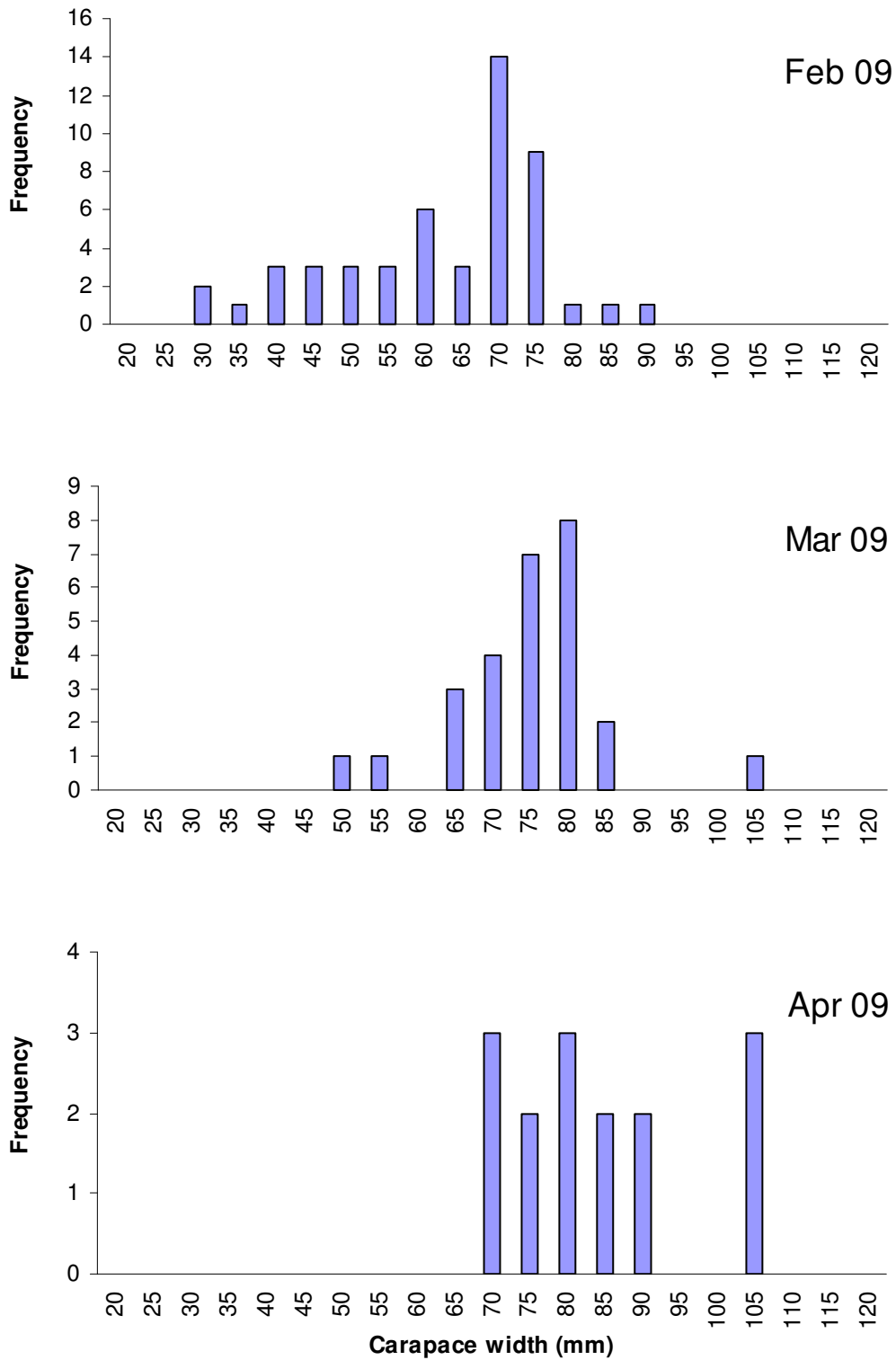


Figure 4. Change in monthly size frequency of juvenile mud crabs caught in the Wearyan River from February to April 2009

Figure 4 provides an example of the change in size frequency of juvenile crabs (which can be interpreted as growth from left to right down the page) caught (and released) in the Wearyan River from February to April 2009. Similar trends were observed in the data from other study areas. Whilst it appears that fewer crabs were caught in April compared to February, this data has not been standardised for effort (i.e. the pots may have been set and/or checked more frequently in February than in April).

In an attempt solve this problem (i.e. quantify effort) we are individually labelling every pot (Figure 5) and asking participants to take a photo of each pot as it checked, irrespective of whether or not it contains a crab/s. In many cases, participants are also recording the exact position of the pots by taking photos of their GPS units (either hand-held or hard-wired) at the point of retrieval (as shown below).



Figure 5. Digital image showing individual pot number and GPS readout

Our immediate success in capturing good numbers of small mud crabs has generated interest in the project among crab biologists in both Queensland and Western Australia. The project methodology and results have also been presented through meetings, workshops and conferences held locally (Darwin, NT), nationally (Bribie Island, QLD and Fremantle, WA) and internationally (Anchorage, Alaska, USA and Vancouver, British Columbia, Canada).

At the completion of the project, the data collected will be used to identify patterns in juvenile crab abundance in each area. This information will then be compared with the commercial harvest. If trends in juvenile and adult (i.e. commercial) catches are similar, then the survey method may enable fishers to predict the relative size of their catch 6 to 9 months in advance. Such a forecasting tool may also allow crabbers to scale their operations to the predicted catch.