

# monitoring the effects of traditional harvesting

## ON INTERTIDAL GASTROPODS AT ARRAWARRA HEADLAND

MID-NORTH COAST, NSW

### Background and scope

The Garby Elders group of the Gumbaynggirr Nation are coastal people with a strong cultural tradition of harvesting marine and estuarine molluscs within the Arrawarra region. In 1991, Arrawarra Headland (Fig. 1), an important harvesting site in the past, became a Sanctuary Zone within the Solitary Islands Marine Reserve (now the Solitary Islands Marine Park) and harvesting ceased. By working closely with the managing agency (NSW Marine Parks Authority), the Garby Elders and Yarrawarra Aboriginal Corporation negotiated the re-introduction of traditional harvesting (commencing in April 2006) with activities to be guided by a Conservation Plan. As part of this process, harvesting will be monitored in a collaborative programme involving managers, biologists and traditional users.

This programme aims to:

- identify the main resources to be harvested;
- determine the most appropriate methods to quantify harvesting impact on key target species;
- provide traditional users with training in scientific monitoring methods;
- collaboratively collect long-term data on the effects of harvesting on target populations; and
- collate information on traditional harvesting practices for a wide range of education activities.



Fig. 1. The northern aspect of Arrawarra Headland showing the extensive rock-platform and stone fish traps, which are the primary sites for mollusc harvesting.

Photo: Roger Dwyer



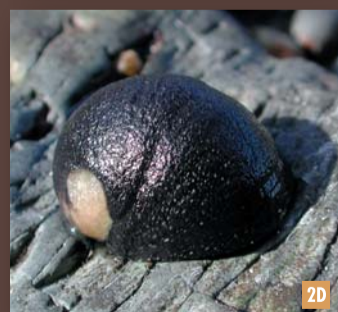
2A



2B



2C



2D

Fig. 2. Species of gastropod mollusc targeted by harvesting (in order of importance).

A) *Turbo militaris* Reeve, 1848 (googoombull); B) *Turbo torquatus* Gmelin, 1791 (googoombull); C) *Austrocochlea porcata* (Adams, 1851) (joontis); D) *Nerita atramentosa* Reeve, 1855 (joontis).

Photos: A,C,D - Steve Smith; B - David Elkins

### The resources to be harvested

Apart from a range of fish species, which are captured using the stone fish traps (Fig. 1), a number of gastropods are the primary target of harvesting activities (Fig. 2). From field excursions with Garby Elders, supported by data from an adjacent midden, it is clear that turbinid molluscs, and especially *T. militaris* which is numerically dominant, receive the greatest harvesting pressure.

### Sampling methods and study design

*T. militaris* occurs at the lowest tidal levels where it is mainly associated with complex topographical features such as crevices, overhangs and aggregations of the tube-building polychaete worm *Idanthyrsus pennatus* (Fig. 3). Pilot studies, using stratified random sampling and contiguous 1 m<sup>2</sup> quadrats, indicated that the most cost-effective sample unit size was 4 m<sup>2</sup> with 9 replicates required per study site. One impact site (Arrawarra Headland) and 3 reference sites (Flat Top Point, Diggers Camp and Mullaway Headland — the former 2 are 'no-take' zones in the Solitary Islands Marine Park, the latter has negligible harvesting pressure) are being monitored (abundance and size distributions — Fig. 4).



3

Fig. 3. *T. militaris* amongst aggregations of *Idanthyrsus pennatus* at Arrawarra Headland.

Photo: Steve Smith

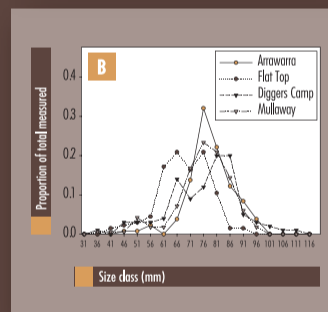
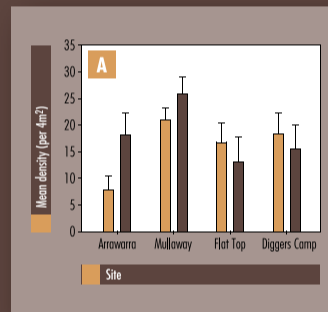


Fig. 4. Summaries of data from pre-harvesting surveys at the four study locations showing A) densities (two sample times) and B) size distributions (shell height, mm).

### Training

Training is being provided to allow teams comprising scientists and traditional users to monitor the effects of harvesting on googoombull populations. The first step was to train the trainers (Fig. 5). Follow-up, field-based workshops are scheduled to provide wider training.

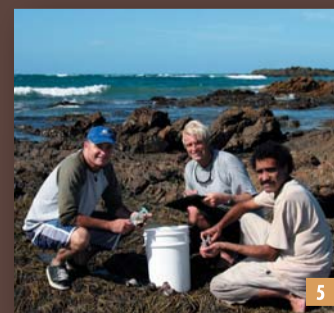


Fig. 5. The authors (Steve, Adam and Ricky, left to right) measuring specimens of *T. militaris* as part of the 'train the trainer' programme.

Photo: Margje Mohring

### Education activities

A key outcome of the project is to facilitate education about traditional harvesting across a wide spectrum of sectors, and in particular to local Indigenous kids. Although the project is in its infancy, different aspects have been successfully articulated into: a 3rd year university unit (survey design and field methods — Fig. 6A); informal activities with Indigenous kids (Fig. 6B); general public awareness campaigns.



6B

Fig. 6. Examples of education activities associated with the project. A) 3rd year university students at the National Marine Science Centre conducting assessments of density and size distribution (large photo at top of poster); B) Ty Cowan displaying some of the first googoombull harvested following the re-introduction of harvesting at Arrawarra Headland in April 2006.

Photos: A - Adam Davey, B - Steve Smith

### Acknowledgements

We would like to acknowledge the project management team: Milton Duroux (Garby Elders, Yarrawarra Aboriginal Corporation), Dee Murphy (Yarrawarra Aboriginal Corporation), Nicola Johnstone (NSW Marine Parks Authority), Libby Sterling (Department of Environment and Conservation), Darren Murray (Northern Rivers Catchment Management Authority) and Russell Glover (Department of the Environment).

The programme is funded through an Environmental Trust — Environmental Education Program grant and by a small grant from the Northern Rivers Catchment Management Authority.

The poster was designed by Kathryn James.

