

Australian Aquatic Biological Pty Limited

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Surveying Ongoing

Gosford City Council Ecological Research Grant received and Gosford LGA currently being surveyed intensively.

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Project: 100031

Research Brief

Baseline mapping of rare and endemic crayfish species and habitat in the Central, Hunter, Mid North & North Coast regions of NSW.

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Introduction

The Central Coast, Hunter and North Coast local government areas (LGAs) are experiencing rapid growth and development. This high population coastal area represents a significant environmental asset which is fundamentally important to our lifestyle and economy. Implementing the infrastructure needed to support the increased population, agriculture and tourism must be undertaken so as to minimize or avoid ecological impacts on coastal vegetation, wetlands and threatened species. It is essential that management agencies have the information on hand to wisely plan the development and future of these fragile coastal regions. Additionally, these LGAs are areas that will be increasingly affected by global warming and climate change. Any decisions made today could have lasting effects on the biodiversity of these coastal areas. Currently, however, management agencies do not have access to appropriate information to enable the protection of our coastal crustacean species and their fragile aquatic habitats.

Over the last few years the Australian Crayfish Project (ACP) has been surveying eastern Australia for freshwater crayfish. Without any government assistance to date, the survey has expended over \$250,000 in private funding and made numerous important discoveries. In addition to recording and describing several new species of crayfish in the region, the survey has also revealed that an alarming proportion of the region's endemic species appear to be facing serious threats.

For example, Wyong LGA has an un-named and currently undescribed species of *Gramastacus* crayfish. Prior to the ACP survey late last year, *Gramastacus* crayfish were only known from the Grampians area in Victoria. Because it has not previously been recorded in coastal New South Wales, this species has not been included in any local government or catchment management plans and as a consequence the majority of its habitat areas have been developed.

Another undescribed species of *Gramastacus* crayfish also occurs in the Ramsar wetland of the Myall Lakes, yet none of the management agencies have previously known of its distribution or existence. Crustaceans have been neglected from routine wetland surveys in the past, and although a considerable number of biological surveys have been conducted in the past freshwater crayfish were never recorded from the area. Specific crustacean surveys by the ACP found populations of an undescribed *Gramastacus* crayfish throughout the area. A lack of historical sampling for crayfish in the region, such as in this case, has ultimately resulted in a lack of information for the LGAs responsible for managing such wetland areas. In addition to their own importance to coastal biodiversity, freshwater crayfish likely provide an important food base for a

wide range of wildlife, including migratory birds, yet nothing is known as to the distribution and populations of this crayfish within the Ramsar and surrounding wetlands.

Gramastacus crayfish have also been found in Newcastle and Lake Macquarie LGA this year, yet management agencies are unaware of their existence or lack baseline data to factor into planning considerations.

In the Manning LGA, an apparently new species of *Cherax* crayfish has been discovered. It has only been found in a small area within 100 m of the Pacific Highway. The new express-way goes directly through its small habitat area, fragmenting it and consuming half of the currently known extent of occurrence for this species. Such a situation could not have been avoided due to the historical neglect of crayfish in wetland surveys, but the new knowledge of the species and its potentially precarious status warrants that biological surveys be undertaken in order to provide management agencies with baseline data on its distribution and habitat. There are also two further species of *Cherax* in the region, and 2 species of *Euastacus* crayfish, some of which are recognized as threatened.

Just above Coffs Harbour is a coastal wallum swamp that supports an undescribed species of *Tenuibranchiurus* crayfish. This one swamp, behind one beach, supports the only known population of this species. This coastal swamp may constitute critical habitat for this species, and protection measures may be required to ensure the species and its habitat is adequately conserved. The identification of such high conservation value aquatic ecosystems is critical but at the moment the tools to identify them are not available.

These are just a few examples of the need for a biological survey targeting crustaceans in the Central to Northern Coast region. Baseline data on distribution and habitat is required to generate GIS layered maps, to facilitate all management agencies to better manage their native habitat and ensure the protection of these crustaceans in future planning and development considerations.

Aim

The aim of this project is to provide baseline data on the distribution and habitat of all species of freshwater crayfish in the Central, Hunter and North Coast regions of New South Wales. We propose to conduct targeted surveys of the whole region between Gosford and Tweed Heads. The surveys will cover 17 local government regions in all. In co-ordination with each LGA region, the relevant dataset will be developed into GIS layers to facilitate management considerations. Each LGA will have their entire LGA surveyed for crustaceans and the distributions and habitat areas of all species will be mapped. Data will also be made available to state and federal management agencies.

This survey and mapping will target crayfish but other aquatic species will also be recorded, as the proponents have a good knowledge of other invertebrates and fishes. This will provide additional valuable information to management agencies on the health and distribution of both native and exotic species within each ecosystem. Invasive fish and crayfish species are also a concern and the distribution of invasive species will also be mapped for each LGA.

The privately funded ACP has contributed a wealth of information to the knowledge base on Australian crustaceans, but it only involved biological surveys of approximately 15 -

30 sites per LGA. This proposed project involves the biological surveying of 100 to 150 sites per LGA. The information gathered will provide a comprehensive foundation on which to establish the successful management of these unique species, maintaining the valuable biodiversity of the Central to Northern coastal region of New South Wales.

Method

Approximately 100 - 150 sites per local government area will be surveyed. The surveys will be site specific but targeted towards freshwater crustaceans. At each site a record will be kept of the following.

1. Time and Date.
2. Location details. Road or street access, and/or creek and/or crossing name, if known. A location description will also be included (e.g. Track at end Morton Rd, 200 m down track then left 500 m to creek crossing).
3. GPS location recorded in Decimal to 5 places.
4. Altitude (m above sea level) taken at each location.
5. Habitat details. Basic water quality measurements (DO, pH, conductivity, temperature, flow) will be recorded, as will the size and nature of the watercourse. A basic habitat descriptor will also be included (e.g. open paddock with damp depressions, wallum swamp or swamp oak floodplain forest, etc.).
6. Crayfish species. All specimens will be identified and recorded, and voucher material will be retained for subsequent clarification of any uncertain records. Other signs of crayfish presence (e.g. burrows, remains) will also be noted.
7. Other species. Each site will be surveyed specifically for freshwater crayfish but a variety of other species will likely also be captured depending on the site and method used.

Collection methods include:

1. *Visual observation*. Each site will be visually inspected prior to sampling, enabling identification of potential habitat areas and the methods needed to sample those areas. Quite often preliminary visual observation also results in direct crayfish capture. Targeted visual surveys may also be used at suitable sites (e.g. spotlight surveys).
2. *Scoop netting*. This involves using hand held scoop nets to scoop along the bottom sediments, weed beds and under ledges etc. in aquatic habitats. This is a very effective method if crayfish are out and about and its success can be determined by the species and time of day. Other species like native fish, (galaxiids, gudgeons etc) and exotic fish like carp, gambusia and swordtails are also captured with this method.
3. *Trapping*. Baited yabby traps are very effective at capturing some species of crayfish.
4. *Baiting*. Baiting with stringlines is the most effective method of capturing some species. A piece of meat attached to a string is placed at the front of a burrow to lure the crayfish out.
5. *Turning rocks*. Rock turning is an effective method for capturing crayfish, particularly for elusive species that do not respond to baits.
6. *Excavation*. Freshwater crustaceans are not restricted to creeks and swamps. Many species colonize damp areas and paddocks away from the water body. These species create a burrow below the dry surface into the wet clays below. These will need to be physically dug from their burrows to identify the species.

Records will be taken of all species captured and all information recorded on a project database. In collaboration with management agencies, the information will then be used to generate GIS layers of each LGA. These maps will cover every creek, stream, swamp and all sub catchments of each LGA. All the information generated will be disseminated between all stakeholders.

Outcomes

The biological data gathered will enable GIS maps to be generated for each LGA and the entire coastal region. The benefits will be immense.

- The maps generated from this project will be used by all management agencies to help protect and conserve our endemic crayfish and fragile aquatic ecosystems along this highly populated coastal strip.
- These maps will allow the sustainable management of native habitat and vegetation which is essential for Australia to meet its international and national environmental objectives.
- Identify the areas of conservation importance and allow conservation of threatened species..
- Allow long-term planning to identify priority areas within landscapes leading to the increase in native habitat. This may include construction of habitat corridors rejoining fragmented native habitat areas.
- Readily available maps will allow better management of native habitat and vegetation which will contribute to the National Framework for the Management and Monitoring of Australia's Native Vegetation.
- Potentially provide further information on the role these crayfish might play in the wider coastal ecosystems – e.g. their role as a food source for migratory birds.
- Help all management agencies to reduce the threats to important habitat areas indicated on the maps generated. Potential threats include: physical modification or encroachment, catchment modification, disturbance of acid sulphate soils, loss of biodiversity, pollution and increased nutrient input, changes to water regimes, utilisation of resources, recreational fishing or poaching and the introduction of invasive species both plant and animal.
- Identify current introduced/pest plant or animals species threatening the aquatic ecosystems, and provide data regarding the distribution and habitat of exotic aquatic fauna

For Further Information
Refer Project No.:100031
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