

NSW DEPARTMENT OF PRIMARY INDUSTRIES

JOHN HOLLIDAY STUDENT CONSERVATION AWARD

– 2003 –

2003 WINNER

Katie O'Donnell



Grant Holliday, brother of the late John Holliday who the Student Conservation Award is named in memory of, congratulates Katie O'Donnell on winning the Award for 2003.

OTHER ENTRIES RECEIVED FOR 2003

Leanne Faulks
Jason Coughran

**** 2003 WINNING ENTRY ****

**Biology and ecology of the temperate loliginid squid
(*Photololigo etheridgei*) in the Hawkesbury River, NSW:
Implications for the management of its fishery**

By Katie O'Donnell

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Summary

Katie's study aimed to investigate the abundance, distribution, reproduction, age and growth of commercially fished squid in the Hawkesbury River. The Hawkesbury River Estuary Prawn Trawl Fishery has targeted squid using otter trawlers for more than 35 years. The species of commercial interest in this river was identified genetically as *Photololigo etheridgei*.

The study was done using squid that were trawled adjacent to Flint and Steel within the Hawkesbury River, with data collected for two years, at two times within each season. Flint and Steel is one of the two main locations that are persistently trawled for squid commercially. Katie found the following results: growth of the *P. etheridgei* was fast and the life-span completed in less than six months; the total number of squid and the number of mature squid was greatest in summer; each individual spawns more eggs in spring but fewer individuals' spawn then; maturity occurs at about 100mm mantle-lengths and 120 days of age; and, multiple batches of eggs appear to be spawned throughout their adult life. Differences in these results were investigated between sexes and among seasons. The implications of these results were discussed in terms of strategies for the management of fisheries, including closures during times of spawning and size-limits.

Phylogeography of the Southern Purple Spotted Gudgeon (*Mogurnda adspersa*)

By Leanne Faulks

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Summary

Leanne's study investigated the genetic differentiation and evolutionary relationship among populations of the Purple Spotted Gudgeon (*Mogurnda adspersa*) in Southern Queensland and the Murray-Darling Basin. The Murray-Darling Basin populations were classified as endangered under the *Fisheries Management Act 1994*. The Murray-Darling Basin populations are genetically distinct from Queensland populations and can be considered as an Evolutionary Significant Unit (ESU).

The study concludes that the Purple Spotted Gudgeon (*Mogurnda adspersa*) may have originated in northern Queensland and undergone a range expansion along the coast to the south, and inland. Drainage rearrangements and extreme flooding may have facilitated this colonisation and the following dispersal throughout the Murray-Darling Basin. The Murray-Darling Basin populations are an ESU, and display low genetic diversity and gene flow. It has been found that these populations are classified as endangered and their future conservation may involve translocations among populations within the Murray-Darling Basin.

The Conservation Status of the Freshwater Crayfishes of Northeastern New South Wales: Update

By Jason Coughran

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Summary

This report is an update of Jason's study that aims to determine the species distributions and identify any factors restricting distribution and to assess the conservation status of crayfish of northeastern NSW. Currently these species are recognised as threatened and face various threats, including: introduction of alien species; loss of genetic diversity; overfishing and localised depletion; and illegal poaching from habitats in protected areas.

The sampling methods primarily include baited traps, spotlighting, kick sampling and hand collection. Crayfish are measured (occipital carapace length, abdomen width and propodal length), inspected (e.g., for injuries, moult stage, sex, reproduction activity and presence of ectosymbionts) and released at the site of capture. The results identified that conservation measures will need to be on-going, and some immediate measures are mentioned that can be taken to minimise threats; developing educational material programs; enforcement of penalties for illegal fishing activities; reduction in the current bag limit for *E. valentulus*; and initiation of research into the population genetics and a stock assessment of the species.

Contrary to general observations for *Euastacus* species, the highland species found in northern New South Wales are not dependent on high quality water. They all occur in at least some areas characterised by a distinct lack of water. Their distributions may be influenced by water temperature, but traditional, generalised theories about restriction of highland *Euastacus* are not valid for these species.