The Geocrinia Gazette

Official Newsletter of the Geocrinia Recovery Team

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Welcome to the first issue of the "Gazette", and to what is intended to become a regular update on the activities and progress of the Geocrinia Recovery Team and the people in the local community who are taking an active part in the conservation of the White-bellied Frog and Orange-bellied Frog.

A special feature in this issue is a discussion on managing fire to achieve a balance between the conservation of white and orange-bellied frogs and achieving adequate fire protection for the surrounding lands. What time of year and how frequently should sites be burnt ? What are implications of more frequent fires ? A complex issue , which requires the cooperation and understanding from many organisations and individuals if the balance is to be found.

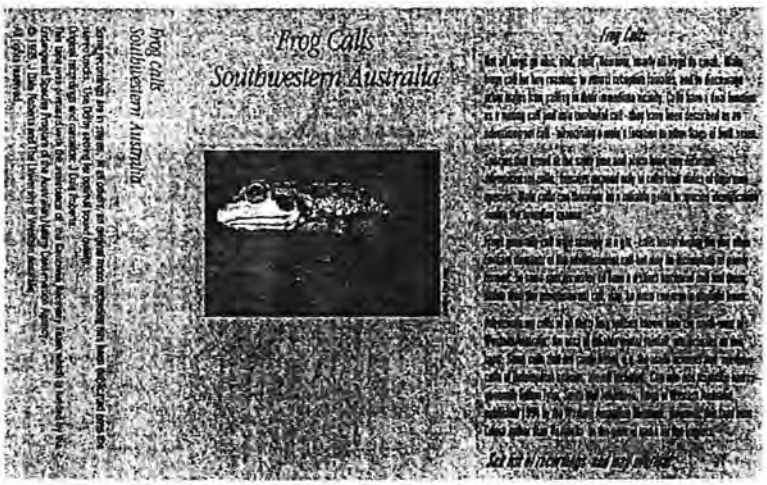
Kim Williams,
Chair, Geocrinia Recovery Team

Who are We?

The Geocrinia Recovery Team was formed in November 1992 to implement actions needed to prevent both orange and white-bellied frogs from becoming extinct. Membership is voluntary and is comprised of ecologists, conservation managers and community representatives with an interest in conserving these species. The current membership of the team is;

Andrew Burbidge	Director Threatened Species Unit - CALM
Kim Williams	Rgnl.Conservation Officer - CALM Bunbury
Dale Roberts	Zoologist UWA - Zoology Dept.
Sally Stephens	Threatened Species & Communities Section Environment Australia - Canberra
Greg Voigt	Dist.Conservation Officer - CALM - SW Capes
Simon Conroy	PhD Student UWA - Zoology Dept.
Ian Wheeler	Technical Officer CALM - Manjimup
Ian Noakes	Landholder Lower Blackwood LCDC
Jack Stannard	Shire Ranger Augusta/Marg River Shire
Lyn Serventy	Community Rep Leeuwin Conservation Group

The team meets formally, twice per year in June/July and November/December in Margaret River. Subcommittees, comprising current team members and others, explore various actions and options such as fencing, pig control and research and report back to the full team.



Newsflash... Frog Calls Cassette now available

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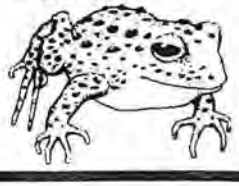

Research Activity

Research into the population biology of both G. alba and G. vitellina has been the main focus of contributions from Zoology at the University of Western Australia.

This work was initiated by Dale Roberts with Grant Wardell-Johnson from CALM and has been followed up since 1992 by the extensive field operations of Don Driscoll.

Don's work has been directed at understanding the populations structure of both species: are they sedentary with every site isolated from every other, or, are sites connected meaning animals frequently migrate to and breed at sites other than where they were born? Don's work has shown that these two frogs have one of the most sub-divided populations structures known for any vertebrate meaning that there is almost no migration between even adjacent populations.

Work on the karri and Walpole frogs (G. rosea and G. lutea) indicate this is a natural phenomenon, not a pattern generated by clearing and fragmentation of habitat. This level of subdivision is found in some other amphibians which also have direct developing eggs, such as terrestrial salamanders, but is not common to all frogs - many others, e.g. Litoria moorei, the motorbike frog, disperse over very large distances.

Don's work has been directed to obtaining a degree of Doctor of Philosophy and is currently being written up for submission early in 1996.

Simon Conroy has just embarked on his research program also directed at a degree of Doctor of Philosophy. Simon's work will build on Don's population studies looking at survival rates of adult frogs as well as focussing on survival of eggs and newly metamorphosed frogs.

In many frogs, egg survival, or more generally the lack of it, controls population size with less than 1% of eggs making it through to juvenile frogs in most species. Simon's work will focus on trying to model population structure and persistence using Population Viability Analysis (PVA) - a tool for simulating long term population growth. PVA might also allow us to investigate the impacts of fire, drought or excessive run-off on egg survival and then the flow on to the number of adults. Many of the populations of G. alba are very small and chance fluctuations in population size might be expected to cause their extinction. However, it may be that these populations have always been small and have evolved mechanisms to cope with environmental fluctuations caused by drought or fire: e.g. careful selection of sites for egg deposition or larger egg yolks to give a larger froglet coming out of the egg mass.

The Geocrinia Recovery Team has supported research work by both Don and Simon. This represents a very successful co-operation marrying the need for applied outcomes in population management with sophisticated, in many cases esoteric, techniques for analysis of population structure and persistence. It has made all of us acutely aware of the problems of day to day management and the need to translate science into management objectives.

J. Dale Roberts,
Department of Zoology,
University of Western Australia

Frog Call Cassette Released

One of the aims of the Recovery Team is to raise awareness, understanding and an appreciation of the need to conserve not only orange and white bellied frogs, but also creekline vegetation. These creeks are home to many species of fauna, particularly frogs but how do you identify one species from the next ?

Recognising this problem, the Geocrinia team has produced: "***Frog Calls of South Western Australia***", a cassette containing calls of the 38 species of frogs commonly found the south west of Australia - Geraldton to Esperance. In addition to recordings, the inside cover provides information on where different species call from and at what time of year.

The best way to use the tape is to take it and a portable tape player down to your local swamp at night, listen to the frogs calling and play back the tape to identify them.

Copies of the tape are available from Dale Roberts - University of WA Zoology Dept Ph:(08) 93802224 . Cost $15.00ea + postage.

Fire Management for Orange- and White-bellied Frogs

The Impacts of Fire on Frogs

The impacts of fire on white- and orange-bellied frogs are unclear. A hot, autumn wildfire significantly reduced a population of the white-bellied frog in 1991 but after five years this population is showing signs of recovery. Many other sites have been through several fuel reduction burn cycles but retain populations of both species.

Because of this uncertainty the Recovery Team has taken two approaches to dealing with this issue:

i) fire exclusion and prescribed burning as immediate management options, and

ii) a continuing analysis of fire impacts, which may alter management actions in the future

Current Management: Fire Exclusion and Prescribed Burning

Fire exclusion.
Around Spearwood Creek (orange-bellied frog habitat),where there were existing roads or fire breaks, we have adopted a policy of fire exclusion. This area is protected by breaks on three sides and by the Blackwood River on the fourth.

For the white-bellied frog this is not feasible on CALM-managed lands as there are no existing roads or other features near the frog populations that could be used as fire breaks. We chose not to construct new roads in areas where these might encourage visitation, particularly in summer. Increased roading would also raise the risk of introduction of disease such as dieback.

Prescribed burning.
Most of the sites on CALM-managed lands have been through several fuel reduction burn cycles and some still retain reasonably large populations of both white-bellied and orange-bellied frogs, though others have only small populations. Sites on private land also have a varying history of fire exposure.

Young frogs come into the population after prescribed fires, indicating that some adults must survive, as studies of marked frogs and genetic analyses indicate very limited migration in both species. This suggests fuel reduction burns are not necessarily bad.

Sites where fire exclusion is not possible have been retained in the fuel reduction program but with two restrictions.

i) Fires are to be confined to early Spring to generate cool, low intensity fires that minimise probable impacts on swamp systems. This policy aims to reduce the risk of hot, wildfires occurring over summer and autumn.

ii) There is to be a minimum of eight years, roughly two frog generations, between prescribed fires, to allow some population recovery if fire does have an impact.

There is no certainty that fire exclusion is the best management option as the absence of fire in swamps may also have impacts on long term population survival. We are as ignorant of these impacts as we are of the effects of fires.

Analysis of Fire Impacts

An experimental study of the effects of spring fires on population density of a closely related species, *Geocrinia lutea*, the karri frog from Walpole, has shown a significant reduction in population size two years after fire compared with adjacent unburnt sites. There was considerable variation in fire impact amongst the six study sites with all burnt populations declining in size after fire but with some unburnt sites also having a reduced population size.

These experimental populations of *Geocrinia lutea* will be monitored over the next few years for signs of recovery. The data so far suggest that small frog populations are at greater risk than larger ones. We also note that some populations of the white-bellied frog have gone extinct without recent fire impacts or other discernible disturbance indicating that many factors may cause local extinctions of small populations in this species.

We are starting a retrospective analysis of fire history of areas occupied by populations of both species. This study will collate data from CALM and private land holders on fire history of sites. We hope to be able to relate fire history to population size and swamp area. This is part of an ongoing analysis of fire effects that may lead to altered policies in the future.

Using Fire on your Property

The team encourages landholders with frog swamps on their property to adopt the following recommendations:

1. For small areas, no deliberate fires.

2. For larger areas, e.g. swamps with a forested upland adjacent, no deliberate fires, or cool spring fires with a minimum eight year gap between fires, but try to keep fire out of swamp areas.

3. If areas are deliberately burnt, stagger the burn to produce a mosaic of burn ages over several years and aim for cool, spring fires.

Further Information

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