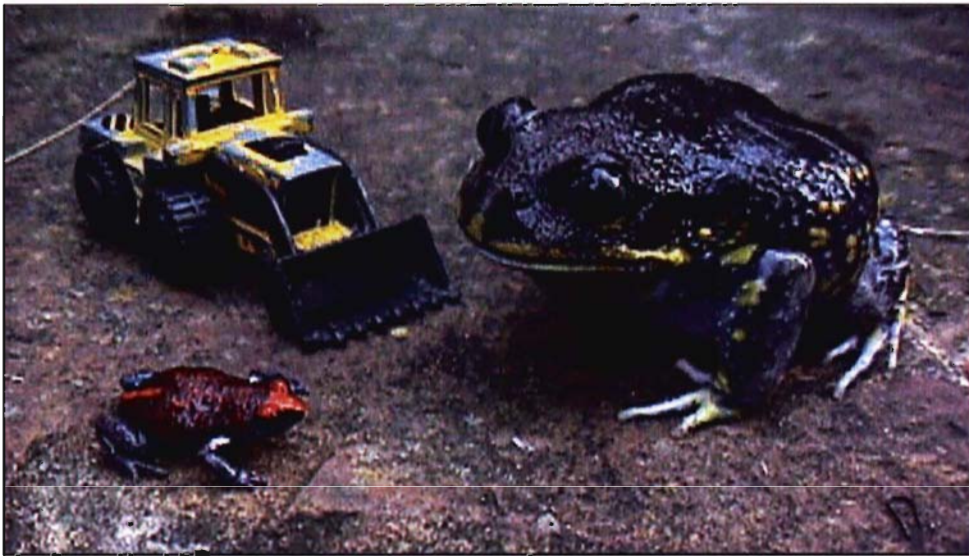


HABITAT REQUIREMENTS AND HABITAT USE OF THE
RED-CROWNED TOADLET *PSEUDOPHRYNE AUSTRALIS*
AND THE GIANT BURROWING FROG *HELEIOPORUS*
AUSTRALIACUS IN THE SYDNEY BASIN



Andrew G. Stauber BSc (Hons)

Thesis submitted for the degree of Doctor of Philosophy

Department of Environmental Sciences
University of Technology, Sydney

2006

CERTIFICATE OF AUTHORSHIP / ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Andrew Stauber

June 2006

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Some personal comments

This research program provided me with a unique opportunity to learn more about some of the animals I feel passionate about. Working on these threatened frogs, I learned that it is often difficult to reach conclusions due to low sample sizes. Nevertheless, it is my belief that conservation efforts for any threatened species can only be maximised if they are based on information of that particular species.

The threatened status of both frogs was more than once the catalyst for restrictions on experimental procedures and sample sizes imposed by the Animal Care and Ethics Committee. The numbers of animals encountered in the field were generally low because of both species' rarity, and the ongoing drought may also have interfered with sample sizes. I am strongly convinced however, that the numbers of animals identified and measured for this report are the highest ever recorded for both species.

Occasionally things do not work out the way they were planned. I had manufactured and installed 192 buckets and fencing in three replicated sandstone areas in a layout that would have allowed me to test for differences in abundance based on relative distance from a road, relative distance from a water course, and vegetation structure. Over six months, 1824 bucket nights yielded 10 individual *H. australiacus*. Shortly after trapping had started, an arson attack to a trapping site meant that 16 buckets had to be relocated to a new, unburnt site. After six months, 75% of all traps had become inoperable as a result of four different fires. Those fires spelt the end of that exercise.

It was not all doom and gloom. I acquired many new and useful skills and saw many wonderful things during all those days and nights in the bush. I also got the opportunity to learn the developmental stage at which *H. australiacus* tadpoles hatch from their eggs, a fact previously unknown (Anstis, 2002). My work also led to the first record of a snake parasite *Sphaerocephalus rotundicapilatus* in an amphibian (many thanks to Prof. Lesley Warner for identifying the organism).

I hope the work I put into this program will eventually be used to benefit both the “lively perky little frog” as well as the large one whose “rarity must apologise for its deformity” (a statement I disagree with; see Chapter 1, Sections 4 and 5).

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LIST OF ABBREVIATIONS

ACEC	Animal Care and Ethics Committee
AM	Australian Museum, Sydney
AMG	Australian Map Grid (always Zone 56 in this text)
Culvert	pipe or similar structure used to direct water under the track
E	Easting (AMG Reference)
GIS	Geographic Information System
IUCN	International Union for Conservation of Nature and Natural Resources
LMF	Digital Location Map of animals where they were F irst encountered
m	metre (unit of length)
Mitre drain	drain to conduct runoff from the shoulders of a trackto a disposal area away from the road alignment
M-W	Mann-Whitney statistical test
N	Northing (AMG Reference)
n	Numbers, sample size
NPWS	NSW National Parks and Wildlife Service
NP	National Park
NR	Nature Reserve
NSW	New South Wales
Reserve System	protected lands including NP, NR, as well as SF
SE	Standard Error
SF	State Forest land
SF NSW	State Forests of New South Wales
Table drain	side drain of a track running adjacent to and parallel withthe shoulders and forming part of the track formation
WA	Atlas of NSW Wildlife