

# Herps in forests: developing educational courses for frog and reptile management and conservation

Francis L. Lemckert<sup>1</sup> and Cameron Slatyer<sup>2,3</sup>

<sup>1</sup>Research & Development Division, State Forests of New South Wales. P.O. Box 100, Beecroft. New South Wales 2119. Australia. E-mail frankl@sf.nsw.gov.au

<sup>2</sup>Bulahdelah District, State Forests of New South Wales.

<sup>3</sup>Present Address. Environment and Heritage Commission. GPO Box 787, Canberra. Australian Capital Territory. 2601. Australia. E-mail Cameron.Slatyer@deh.gov.au

## ABSTRACT

The knowledge of land managers is generally poor in regards to frogs and reptiles. To address this we provide information to forestry workers through two courses: a) General Wildlife Schools concentrating on basic surveys and identification of threatened species, and b) an advanced Frog and Reptile School providing detailed information on the biology, identification and survey methods. Ethics and licensing are components of both courses. The varied educational level of attendees provides a significant challenge to course teachers. Direct contact with live animals is very important and the interaction of forestry workers and regulators is valuable in developing an understanding of differing points of view. Wildlife Schools play a continuing role in the management and conservation of forest dependent herpetofauna in forestry areas of NSW and provide an educational avenue for a broad range of people interested in forest-dwelling reptiles and frogs.

**Key words:** training, frog, reptile, survey, protection, conservation.

## Introduction

The New South Wales *Forestry Act 1916* requires that all flora and fauna be conserved within the state timber production forests of New South Wales. State Forests of New South Wales (SFNSW) is the government body responsible for timber production within these Crown areas and is the agency required to ensure this conservation outcome. General habitat prescriptions (e.g. streamside buffers and protection of habitat trees) are applied across the forest landscape to provide general protection to all wildlife within the forest (Lemckert and Morse 1999). SFNSW is required to undertake extensive pre-logging wildlife surveys under the Integrated Forest Operations Agreement (IFOA). The IFOA has been developed in consultation with the New South Wales National Parks and Wildlife Service (NPWS 1997) (now the Department of Environment and Conservation) and sets rules for pre-logging surveys to determine the presence or absence of species considered to be “sensitive” to forestry activities. Populations of sensitive species are protected using species-specific prescriptions (e.g. retained specific feed trees or nesting trees) also set down in the IFOA. The correct application of species-specific prescriptions depends on detecting individuals present within the area of forest to be harvested.

In the early 1990s, discussions with land managers did, however, strongly indicate that many had a poor understanding of how to search for frogs or reptiles, limited ability to recognise the rarer species or limited to no knowledge of the habitats that were important to them. Hence, finding species of interest and applying required protective prescriptions was not always a straightforward process.

To address this situation, since 1994 SFNSW has implemented training courses to provide staff with information on forest fauna and flora, including frogs and reptiles. These “Wildlife Schools” provide basic, as well as more advanced information and skills in wildlife survey, species identification and habitat requirements. Over time, these courses have attracted an increasing number and range of non-SFNSW people who want to learn about wildlife, which has expanded the scope of these courses. We report here on the content of these Wildlife Schools, what we have tried to achieve in them, the problems encountered and the changes made through time. We present this information to assist anyone developing courses covering these two groups.

## General training courses

The General Wildlife School runs over three days and consists of lectures, round-table discussions and field visits. The frog and reptile component emphasises the survey and quick identification of species of specific conservation interest. For both groups, we present an initial brief (about 30 minutes) talk covering specific points of their biology (e.g. ectothermy, permeable skin of frogs) that are important when undertaking surveys. We also discuss general habitat use patterns and requirements and cover any known or likely adverse effect the loss of or changes to forest attributes can have on both groups (e.g. loss/reduction of hollows or exfoliating bark).

We present specific information for each species of conservation significance found in the region covered by the course. This includes both species listed under

the NSW *Threatened Species Conservation Act 1995* (TSC Act) and species likely to be of future concern. Each is discussed, starting with pictures of the animal and, wherever possible, preserved specimens to provide a better indication of how living specimens look. Pictures and specimens of similar looking common species are also presented along with methods to distinguish them from rare species. We present information on the habitat requirements of each species of significance and how they may be impacted by habitat changes.

We also lecture on the basic herpetofauna survey techniques, covering habitat searches (e.g. turning logs and rocks, looking under bark), call playbacks (for frogs), visual searches (particularly using eyeshine), road transects and pitfall trapping. Theory is followed by field sessions where each technique is demonstrated along with safe methods to handle and house captured animals. Attendees undertake surveys under general supervision and can ask questions as these are carried out.

Information on licensing requirements is presented to ensure workers perform activities with the appropriate research authorities and licences. We emphasise the ethical requirements of fauna surveys and the need to avoid situations where the health of animals and people might be put at risk. The potential problems of disease transfer between captive animals are addressed, along with the methods to minimise this risk. This is particularly important with frogs due to the recent recognition of a pathogenic fungus in most parts of Australia that has caused serious declines in many frog populations (Berger *et al.* 1999).

### Specialised training courses

A more specialised frog and reptile (and bat) Wildlife School is also available for people who wish to obtain more extensive knowledge and experience with these vertebrates. Over four days and three nights we present detailed information on all aspects of the biology of frogs and reptiles, not just that of specific importance for survey work (e.g. diet and reproduction). We consider how species have evolved different strategies to live in the forest environment. Biogeography and population genetics are covered to address the issue of managing genetically distinct populations. As in the General School, each regionally significant species is covered in turn, but more detailed information is provided, particularly regarding the “knowns” and “unknowns” of each species and recent research findings. Profiles are provided that present information unavailable in texts and to correct errors or confusion present in field guides, particularly erroneous distribution maps.

Frog and reptile schools are held in areas of known high species and habitat diversity, preferably where there are also concentrations of TSC Act listed species. Hence these schools are usually held in more remote locations, which requires more travelling time, and usually in spring (when most frog species call). This approach maximises the diversity of the herpetofauna encountered and enables us to visit specific sites inhabited by many

different target species. A good example is the course run in the Dorrigo area of northern NSW. This is held at a field station adjacent to forest that has six species of TSC Act listed frogs (*Adelotus brevis*, *Assa darlingtoni*, *Litoria subglandulosa*, *Mixophyes balbus*, *M. iteratus* and *Philoria sphagnicolus*) within 10 minutes drive of the field station. Courses here are preferably held in September or October, when all of the frogs are actively calling and breeding and when reptiles are also moving around.

We have found that observing live specimens is very important in the education process. Live animals provide much greater detail to use in their identification and people obtain a clearer understanding of the size and colour of live individuals. Features listed in guides are often not as obvious on a live animal as a picture suggests it should be (e.g. the blue upper eye of *Mixophyes balbus*) and the presentation of live animals demonstrates more clearly the reliable identification features. To further capitalise on this point, we collect live specimens prior to the course, which are presented at appropriate times. This maximises the opportunity for attendees to see regionally important species and see a great diversity of species and individual variation.

Experienced field workers present talks on currently-used protective prescriptions and provide field demonstrations on their implementation. This provides attendees with a better understanding of their correct use and, as an exercise, attendees are asked to mark out protective prescriptions around a stream or pond. We have found that this best demonstrates how much forest a 30-metre or 50-metre buffer actually encompasses and then how much habitat is left unaffected by disturbance, as specified in the IFOA.

Surveys for reptiles and frogs are undertaken on each day and night to provide intensive experience with survey techniques under expert supervision. Talks are held at field sites to identify the species likely to be present, how each species would use the area and so, where to search for them. The attendees then undertake surveys with the aim of seeing, hearing and locating any species present at the site. Providing intensive hands-on training in surveys is considered to be a high priority and is the main reason that a specialist school runs over four nights.

Another new area of learning in the specialist school is specimen identification using field guides. These books are the typical means of identifying frogs and reptiles outside of course times and so form an integral part of survey work. We identify the points in the keys where mistakes are often made and how to overcome these problems (e.g. reading all the choices in the key and not just one). We find it better to start the learning process with preserved specimens. These do not move and so allow easy viewing of most of the salient key features used in any guide. Practise with the preserved animals is followed by an introduction to holding live animals for best viewing. The attendees are then allowed to key out the available live animals with some knowledge of exactly what features they need to look for. This whole process takes about two hours. On the following two mornings all newly-collected animals are keyed out to refresh their identification skills.

We also review the available guides and their strengths and weaknesses to make recommendations as to the best identification guides for a given area or species group (e.g. Robinson 1993, provides the easiest key to use whereas Barker *et al.* 1995 provides better general information).

In specialist courses, every effort is made to include several recognised experts in reptiles and amphibian biology and conservation. We do this to present a broad range of perspectives on fauna management and a still greater range of experience with and knowledge of frogs and reptiles. These experts also possess knowledge of the most recent information on the biology and conservation strategies for any given species that might not otherwise be available through publications.

An area receiving increasing attention is the importance of accurate record keeping and data management. We believe that detailed record taking procedures are poorly presented at all levels of education and we emphasise the need to record accurate data in standardised forms, using specific examples to demonstrate why each recording is important. An example is the need to record temperatures and cloud cover when searching for reptiles because cloud cover often directly determines the extent of success of a survey. We also discuss the value of proforma data sheets and databases in providing a consistent method of collecting and storing data, which has the long-term value of repeatability and comparability of surveys through time and over different geographical ranges.

### Other target audiences

Forestry workers were the initial target group for Wildlife Schools. Increasingly however, people from the government agencies involved in wildlife conservation have attended a course to increase their knowledge in this area. From a SFNSW perspective, the most important people in this category are those from the Department of Environment and Conservation (formerly NPWS) who develop and approve protective prescriptions used in forestry operations. On a course, fauna managers can gain first hand experience of the habits and habitat requirements of frogs and reptiles and see exactly how different protective measures can or cannot work.

Incidentally, as the people attending courses has diversified, so too has the coverage of the course diversified, covering a wider range of threatening processes, such as introduced predators (eg. foxes and trout) and diseases (e.g. chytrid fungus) and the actions required to ameliorate these and other threats.

### Important points learnt from schools

“Hands on” work with live animals is the most effective means of conveying information as most course participants rarely see frogs or reptiles close up, if at all. The workers handle the animals, which usually gives them an appreciation that both frogs and reptiles are intrinsically interesting, are generally not dangerous and that each species has specific adaptations to suit its environment.

Species identification is an issue that requires particular attention. What experts perceive to be easily separated species are not what school attendees can easily distinguish. An example is the confusion between *Pseudophryne coriacea* and *P. australis*. These species have proven to be more difficult for attendees to distinguish than would have seemed likely. The use of slides to compare easily-mistaken species has been a valuable tool in this regard.

Travelling to sites inhabited by threatened species is important as attendees can see the habitat requirements of an animal (e.g. what sort of tree *Hoplocephalus stephensi* might prefer to use, or the soaks preferred by *Philoria* spp.). They can see how a disturbance will impact on the environment of a specific animal (e.g. will logging or burning occur in a wet gully used by *Assa darlingtoni*) and we can demonstrate how a protective prescription should be best applied. Attendees can familiarise themselves with the types of environments used and relate it to the area they regularly work in.

As an indication of the value of this approach, SFNSW employees were able to identify the nest sites for *Mixophyes balbus* in their local streams based on seeing suitable habitat in a specialist frog school. Additional records of *Litoria brevipalmata* were obtained near Wauchope after the relatively specific breeding habitats were shown to SFNSW personnel in a wildlife school. The most valuable record of all was obtained in the highlands of southern NSW where the only known extant population of *Litoria aurea* was located by people who had recently attended a Wildlife School. They sent an email after they found the population to note that they recognised the frog and the importance of the population because they had attended the School.

We have learnt that, in general, textbooks do not provide enough specific information to be used to develop surveys or protective prescriptions. These texts provide generalised descriptions of habitat relations and often present only broad or vague ideas on breeding habitats and seasons of breeding when animals, especially frogs, can be most easily located. In some cases, the information is not correct in light of new (and even old) information, which will lead to poor survey success (e.g. the suggestion that *Mixophyes balbus* is a river frog whereas it really prefers small streams). Protective prescriptions could also be placed in incorrect habitats or incorrect areas within correct broad habitat types. To each person attending the course we provide information sheets that cover each regionally significant species. These detail the important points on the biology of each species, the best survey techniques for them and how these surveys can be best performed (e.g. suitable times).

We stress that attending a course provides a person with a sound starting point on which they can build their knowledge and experience on herpetofauna surveys and management. The teachers need to be responsive to the education levels of the course attendees. Field workers possess education levels varying from mid-year high school to university graduates. Some find the schools daunting and the information too extensive if it is not presented

carefully, but they can and do have local knowledge of the environment of the animals and provide insights that researchers do not have. Using a verbal, rather than written, approach is more successful for many attendees when communicating information. The hands-on aspect of seeing animals and looking at habitats is very helpful in this regard. Tests are stressful to people who have not undertaken them for many years and assessments now are kept relatively simple. Furthermore, any final assessment is based on the work through the course and not solely on a test at the end and we acknowledge attendance and completion of the course rather than passing the course.

### What has been achieved?

This program has developed a core group of people trained in herpetofauna surveys. Since 1993, we have conducted 26 General Wildlife Schools and nine specialist Frog and Reptile Schools, covering more than 250 and 100 SFNSW staff respectively. SFNSW is now self sufficient in undertaking faunal surveys required to meet its legal obligations and it has greatly increased its knowledge of forest fauna. Between 1991 and 1995 SFNSW placed 257 frog and 32 reptile records onto its database. Between 1996 and 2000, 3222 frog and 598 reptile records were placed on the database, demonstrating the great increase

in fauna survey effort being undertaken with newly-trained staff. This program has resulted in greater interaction with managers from different agencies and more than 50 managers have attended schools since 1999.

The controversy and occasional confrontation between forestry workers and conservation agencies and groups is often simply a result of a lack of practical knowledge and understanding of wildlife and its conservation. Many people do not know practically how large a 50 metre radius area covers or that a minimum 50% of all forest areas are left undisturbed through a logging operation. These courses allow interactions that assist both sides in understanding each other's perspective.

### Conclusion

There are no similar wildlife training courses available within New South Wales and growing numbers of people from other government agencies and educational institutions are attending to gain first-hand experience in these two little recognised group of vertebrates. These courses provide an increasing pool of people with both the knowledge and skills to manage frogs and reptiles in forests and provide a stronger basis for their conservation.

### Acknowledgements

We would like to thank Jim Shields for his efforts in getting these courses up and running and to SFNSW for the continued encouragement in

developing and running them. We thank Traecec Brassil and two anonymous people for reviews of the document.

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