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Above Swamp Wallaby photograph taken with a infrared camera (see page 19). *Photo courtesy of Deryk Engel and Paul Burcher.*



Above: A comparison of cage traps. (see page 28). *Photo courtesy of Jason Berrigan*



Above: Myrtle Rust outbreak (see page 36). *Photo courtesy of A. Carnegie.*

Editor: Jason Berrigan newsletter@ecansw.org.au

Front Cover Photo: Rose-crowned Fruit-dove - This dove is one of Steven's favourite native pigeons and is also listed as Vulnerable under the TSC Act. *Photo Courtesy and Copyright of Steven Sass.*

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PHOTO COMPETITION

Congratulations! to Steven Sass of Envirokey for winning the last photo competition with his photograph of the Rose-crowned Fruit-dove, featured on the front cover.

Thank you to everyone who entered our photo competition. All entries have been included in the ECA Photo Gallery on the back cover.

Email your favourite flora or fauna photo to admin@ecansw.org.au to enter a competition and have your photo on the cover of the next ECA newsletter. Win your choice of one year free membership or free entry into the next ECA annual conference. The winner will be selected by the ECA council. Runners up will be printed in the photo gallery

What Am I? Competition

I was found on a highway south of Sydney, this road being surrounded by woodland that is typical of those found on the underlying Hawkesbury Sandstone. The pen is 14cm long. What Am I or should it be what was I?

To Enter: Email your entry to admin@ecansw.org.au by the 12p.m. 5th September 2010. First correct answer will receive a \$25 gift voucher for books on sale at the **ECA annual conference 2010 book stall**. If you are unable to make the conference we can provide you with a list



Photo Courtesy of Deryk Engel

of titles to choose from and have your prize posted to you.

ECA Tree Hollow Workshop: 12-14th February 2010.

*Amy Rowles^a, Ray Williams^b and Adam Greenhalgh
Ecotone Ecological Consultants
ECA Administrative Assistant^a; ECA Council^b*

In February, the ECA held a tree hollow workshop at the ANU Kioloa Coast Campus on the south coast. The workshop was well attended with 32 delegates, including a mix of consultants, council staff, DECCW and SOPA. Expert presenters included Brad Law and Rod Kavanagh from Forest and Rangeland Ecosystem: Industry and Investment NSW (formerly DPI). Brad Law has many years experience studying tree roosting microbats and Eastern Pygmy Possums. Rod Kavanagh is an expert in the ecology of Australian owls and arboreal mammals. Stephen Ambrose (President of the ECA), presented as an expert on hollow dependant diurnal birds.

The weather however, was not in our favour. As we approached the destination a light sprinkle of rain began and by the time we arrived at the campus the deluge had begun and continued for much of the weekend. Locals were however pleased as they needed a good rain. The rain significantly reduced the potential for field work, which was limited to a drive through the forest and a discussion on estimating the height and DBH (diameter at breast height) of trees. There was also some discussion on estimating the dimensions, etc, of a hollow from ground level as well as whether a hollow is actually present. A brief discussion on methods of hollow sampling (e.g. transects or quadrats; how many per hectare, etc) also took place. It was hoped to conduct transects and quadrats as a field exercise however the rain put paid to that idea.

We heard a series of very informative lectures presented in the lecture room on Saturday (as the rain fell outside).

Rod started the proceedings and discussed hollow usage by mammals and determined that 46% of all mammals use tree hollows (30% of non-flying mammals and 69% of microbat species). All of the large forest owls are largely dependant on the larger trunk hollows as nest sites as well as roost sites for some species (Masked Owl). Rod discussed the characteristics preferred by each owl species and used his study on Barking Owls in the Pilliga forests as example of habitat assessment including tree hollow density assessment. The hollow requirements of seven species of arboreal mammals were discussed. Greater Gliders have a small home range (1-2 ha) and require a high density of hollows in large old growth trees. In contrast the Yellow-bellied Glider has a large home range (30-60 ha) and therefore can survive in habitat with less hollows per ha. Tree retention prescriptions for forestry activity were discussed which included: standard exclusion buffers and habitat tree retention (10 hollow bearing and 10 recruitment trees per 2 ha.); and additional prescriptions added if a threatened species was detected or predicted to occur. Rod noted that the use of nest boxes was successful for most arboreal mammal species. In general, Rod concluded that owls prefer the largest hollows whereas arboreal mammals prefer the smallest hollow entrance that they can squeeze into.

Brad concentrated on hollow usage by microbat species and discussed the characteristics of tree hollows used by microbats, with reference to Goldingay 2009 who concluded that bats: choose any tree species; favour dead trees; do not have a preference for height of hollow from the ground; choose a hollow diameter relative to body size. Additionally, temperature within the roost may influence seasonal usage and large mature trees are generally used as maternity sites. Methods of detecting roost sites were discussed, with stag watching identified as being labour intensive whereas radio-tracking is a more productive

method of finding roosts, sometimes in unexpected locations. Brad used his studies on the eastern forest bat as an example. Forty bats were radio-tracked and it was found that old growth forest and gullies were preferred for roosting. A study on paddock trees found that such trees were used by Greater Broad-nosed Bats and that down facing hollows were used. Roost selection is based on microclimate and water availability and may be seasonally chosen to coincide with life cycle requirements such as the breeding season and bouts of winter torpor. Studies have shown that many species change roosts regularly, even during the breeding season, probably as a measure of avoiding predators.

Stephen concentrated on diurnal birds and found that 114 or 15% of land birds are dependant on tree hollows to some degree. Of these, 16 species are listed as threatened. A variety of hollow types are used by birds in dead and live trees, including dead spouts, live and dead branch hollows, trunk hollows as well as basal scars and logs on the ground.

Narawan Williams presented a slide show of reptiles and frogs known to use tree hollows and shared knowledge of habitat use by these species. Narawan's observations show that a large number of reptiles and amphibians use tree hollows for shelter at least part of the time.

The rain eased on Saturday night allowing a trip-lining demonstration, some bat call detection, nocturnal call playback and spotlighting. One group was lucky enough to see a Sooty Owl and there was also a possible sighting of a Masked Owl. A Southern Boobook, Sugar Glider, Common Brushtail Possum, Grey Kangaroos and Perons Tree Frogs were also recorded. A Large-footed Myotis colony was also inspected under a near by concrete road bridge.

A presentation on nest boxes was given by Ray Williams on the Sunday morning. Examples of a

variety of styles of box to suit groups or individual species were shown and methods of attachment to trees were discussed. Despite the rain, limited tree climbing techniques were demonstrated by Narawan and arborist Paul D'Hondt by attaching ropes to the frame of the building verandah – a bit low but served a purpose.

Food is always considered an important component of such events, and the caterers did a great job and there were no complaints.

Despite the weather, all appeared to enjoy the workshop and gain some valuable information.

ECA Eucalyptus Identification Workshop.

Paul Burcher
Aquila Ecological Surveys
ECA Treasurer

Twenty-five people, including eight ECA members, attended our "*Eucalypt Identification in the Sydney Basin Workshop*" at Sydney Olympic Park on the weekend of 17th and 18th of July. The workshop was run by Van Klaphake, who used his recently revised field key for the demonstration. The new key covers almost 150 species of this ecologically and economically vital plant group that occur within the area bounded by Newcastle, Nowra and Orange.

The group had a wide range of experience with eucalypts, varying from those with advanced knowledge of the genus, to those who prior to the course wouldn't have known a pedicel from a peduncle let alone a Transversaria from an Exsertaria. Van guided his charges through his user-friendly key, using a vast array of specimens [that he somehow managed to transport to the venue by motorcycle], as well as his amazing in-depth field knowledge, warm personality and quirky humour. Feedback from the group also

identified some improvements that could be made to the key and Van was more than happy to take these on board for inclusion in future editions.



Above: Van extracts some foliage from a Forest Red Gum (*Eucalyptus tereticornis*) as participants look on while simultaneously avoiding cyclists.

Below: Heads down in the classroom as Van (far right) tackles a curly question.



After lunch on the second day, the group had a field trip to woodland adjacent to the venue where many eucalypt species were identified, with Van's enthusiasm taking us well past the proposed 4pm finish time. Apart from Van, thanks must go to Andrew Jack from the Sydney Olympic Park Authority who organised the venue

as well as free parking in the Park for participants; and Robert Spillane of Red Pepper catering for the food.

EUROKY

Euroky: ability of an organism to adapt to changes in the environment

If you have any interesting observations or useful hints and information that you would like to share in the euroky column, please forward them to the newsletter editor or administration assistant to be included in the next edition.

Recent Research on Tree Dwelling Bats in plantation forests: A Review from the 14th Australasian Bat Society Conference, July 2010.

Amy Rowles

ECA Administrative Assistant

Ecotone Ecological Consultants

Kerry Borkin from the University of Auckland gave a presentation on the effect of clear fell harvesting of plantation radiate pine forests in NZ on the Long-tailed Bat *Chalinolobus tuberculatus*. Colony size and roosting ranges decreased significantly as a result of the harvesting. This species uses exfoliating bark on the pines for roosting.

Brad Law presented a paper on his work within eucalypt plantations. Total activity and species richness was positively correlated with the number of remnant old growth trees available. Young eucalypt plantations received no greater activity than treeless paddocks, with remnants receiving greater activity. Radio-tracking illustrated that most bat roosts were in tree hollows, with only one species *Nyctophilus*

geoffroyi, located under bark. The plantations were devoid of hollows and although decorticating bark was present, no bats were observed using this resource. The results of this study highlighted the importance of retaining remnant old growth trees in the landscape and within plantings.

Reference: Program and Abstracts of the 14th Australasian Bat Society Conference: Darwin 12-14th July, 2010.



GEOFF WINNING 1955-2010

It is with sadness that we announce the death of a former ECA Executive Councillor and member Geoff Winning. Geoff died on 21st of July 2010 aged 55 years from cancer. Geoff was initially diagnosed several years ago, but it returned very aggressively in early 2010. A profile of Geoff was published in the 2nd Newsletter of the ECA in September 1999. Snippets of Geoff's life were lifted from this Newsletter and his obituary held on 26th July in Newcastle.

Geoff was a Newcastle lad who had a variety of jobs after leaving school, including the thought of joining a commune on the North Coast of NSW. However, Geoff put his head down and completed the first of his studies in 1988. Part of his Graduate Diploma in Environmental Management included a synopsis of the vegetation of Blackbutt Reserve, a 170 hectare remnant in the City of Newcastle LGA. Coincidentally, it was at this time that he met Anne-Maree whilst pulling lantana. Initially they became friends, and eventually married in 1996.

Geoff happened to be in the right place at the right time, as the Shortland Wetlands Centre was in it's infancy and Geoff became the first employee. Whilst there were many chief's / visionaries associated with the early days of the Shortland Wetlands Centre, Geoff was the man to get the job done. The advent of SEPP14 Coastal Wetlands policy kick started environmental consultancy and wetlands management, which again was great timing for Geoff. Also, in 1991 the introduction of the Endangered Fauna (Interim Protection) Act 1991 further increased the workload in environmental consultancy, and Geoff established a consultancy arm of the Shortland Wetlands Centre. Geoff furthered his academic cap by gaining a Master's degree in wetland ecology, and was well on his way through a Ph.D. until ill health slowed down his activity. Geoff was employed as a lecturer with the NSW TAFE, teaching environmental management and also ran his own consultancy business, Hunter Wetlands Research.

Geoff was a tireless worker, often burning the mid-night oil to get things done, but would always be there at 8:00am the next morning to take on another day. He took on married life with the same energy as his work, building an impressive rainforest, creek, pond and vegetable garden for his two boys, Heath and Cedar, to grow and explore. Geoff was immensely proud of Anne-Maree's artwork, herself a highly regarded artist in Newcastle and beyond.

Geoff was a quiet sort of a bloke, not loud or boastful, but always willing to provide advice when asked. He had a regular slot on the local ABC radio talking about all things ecological. Geoff was one of the initial founders who kick started the ECA of NSW Inc, taking on the role of Treasurer and Public Officer in the initial years. He was one of those rare people you encounter and come away thinking to yourself, how could one person achieve so much in one week? My lasting impression's of Geoff Winning was of him

scaling a wall of lantana barefoot, and another time spent walking all day in head high *Phragmites australis*, again with no shoes. I don't reckon you could drive a nail in the soles of his feet, they were almost bulletproof.



Geoff is survived by Anne-Maree, Heath and Cedar.

Upcoming Events in 2010

ECA Events

- **2010 ECA CONFERENCE and AGM**

Title: Assessing Indirect Impacts of Developments and Activities.

Date: Monday 6th September 2010

Venue: Mount Annan Botanic Gardens

Cost: \$70 Member; \$100 Non-member

Contact: admin@ecansw.org.au or ph. Amy on (02) 4995 6190 or 0418 451 488. (see page 7)

- **FROG and TADPOLE IDENTIFICATION WORKSHOP**

Date: Friday 29th- Sunday 31st of October 2010

Venue: Smiths Lake Research Centre

Cost: \$250 Member; \$350 Non-member

Contact: admin@ecansw.org.au or ph. Amy on (02) 4995 6190 or 0418 451 488.

(see page 8)

- **PROPOSED ECA WORKSHOP 2010/2011**

- **Rainforest Plant ID**

The date and venue for these workshops are yet to be determined. You may register your interest in any of these workshops by emailing admin@ecansw.org.au.

Non - ECA Events

- **Skills For Environmental Assessment: Plant Identification**

Date: 2nd - 5th November 2010.

Venue: Janet Cosh Herbarium, University of Wollongong

Cost: \$1045

Details: www.uow.edu.au/science/biol/herbarium

- **BASNA Twitchathon 2010**

Date: 30-31st October 2010.

Details: <http://www.birdsaustralia.com.au/the-organisation/southern-nsw-act.html>

Contact: basna@birdsaustralia.com.au

- **BASNA 'Real birds eat squid' – an introduction to working with seabirds**

Date: 26th September 2010 (7am - 4pm).

Location: Wollongong Boat Harbour

Cost: \$80

Contact: basna@birdsaustralia.com.au

02 9647 1033

- **BASNA 'An Introduction to bird banding – Country'**

Date: 8th-10th October 2010

Location: Munghorn Gap (near Mudgee)

Cost: \$30

Contact: basna@birdsaustralia.com.au; 02 96471033

- **Royal Zoological Society Annual Forum**

Theme: **Wildlife and Climate Change: toward robust conservation strategies for Australian fauna.**

Date: 23rd October 2010

Location: ANZ Conservation Theatre, Taronga Zoo

Details: www.rzsns.org.au

- **Australian Systematic Botany Society Conference**

Date: December 2010.

Location: Lincoln, New Zealand

- **XVIII International Botanical Congress**

Date: 23-30 July 2011.

Details: <http://www.austplants-nsw.org.au/index.htm>

- **Ecological Society of Australia: 2010 Annual Conference. 50th Anniversary Conference.**

Theme: *Sustaining Biodiversity: the next 50 years.*

Date: 6th-10th December 2010

Location: Manning Clark Centre, ANU, Canberra

Cost: \$295 - \$825

Details: <http://esa2010.org.au>

‘Assessing Indirect Impacts of Developments and Activities’

Monday, 6 September 2010
Mount Annan Botanic Gardens
(The Bowden Centre)

Cost: \$70 (ECA Member) \$100 (non-member)
(Cost includes morning tea, lunch and afternoon tea)

Commences: Registration 8:30am – 8:50 am.

Closes: 5:00pm

Conference Drink and Dinner: from 5:30pm

Conference enquiries should be directed to Amy, ECA Administration Assistant at admin@ecansw.org.au or Phone 0418 451 488

The Mount Annan Botanic Garden is about 60km south-west of Sydney, between Campbelltown and Narellan. Mount Annan is the native plant garden of the Botanic Gardens Trust. It covers 416 hectares, making it the largest botanic garden in Australia. More information on Mount Annan Gardens may be found on their website <http://www.rbgsyd.nsw.gov.au/annan>.

A post-conference dinner will be held in the evening at a nearby location and is a great opportunity to exchange experiences, talk shop or just catch up with long lost colleagues over a glass of wine or beer and dinner. The conference dinners in the past have been well attended and are an entertaining night out.

ECA Frog and Tadpole Workshop

Fri 29th – Sun 31st October 2010

Presenter: Dr Arthur White

The NSW ECA is pleased to present a Frog and Tadpole Workshop to be held at the UNSW Research Centre at Smiths Lake, located in the Great Lakes Area. The workshop will begin Friday afternoon to prepare for an evening survey and conclude after lunch on Sunday.

The workshop will focus on the identification of NSW species, particularly those that make up the rich amphibian diversity in the vicinity of the research centre.

Cost: *ECA member \$250 non-member \$350*

[includes food (afternoon tea Fri, through to lunch on Sunday) and accommodation (bunk style or camping)]

Registration:

(please register early, as there are only 40 places available)

Contact: The ECA Administration Assistant
 Amy Rowles

Email admin@ecansw.org.au

Ph: (02) 4995 6190 0418 451 488

Recent Literature and New Publications

Book Reviews

Effective Ecological Monitoring

Written by David Lindenmayer and Gene E. Likens

Published by CSIRO, 2010.

As soon as I found out that this book was to be published by CSIRO Publishing, I placed an advance order. Would this be the book needed by myself and fellow consultants to establish good monitoring strategies for developments. etc? I hoped so, as there is a lot of talk about how to monitor, but not much in the way of practical advice.

David Lindenmayer is a Research Professor from The Australian National University with 25 years of experience in biodiversity conservation issues. Gene Likens is currently Distinguished Senior Scientist at the Cary Institute of Ecosystems Studies in the USA. Together they have published 44 books and 1050 scientific articles – wow, more than the entire ECA membership, I am sure.

The authors state that they have produced this relatively small book “*to demonstrate the importance of long-term ecological monitoring programs and present a diagnosis of the features of good and successful ones and the problems that beset poor or failed monitoring programs*”. The authors also feel that there is need for this book to foster a renewed interest in ecological monitoring, and to make sense of the monitoring literature. Although the authors say that the book is not intended to be an exhaustive treatment of the vast amount of literature on monitoring, they do draw on many thousands of papers to develop their ideas and list hundreds of these at the end of each chapter.

There are five chapters. Chapter 1 defines three types of monitoring: curiosity -driven or passive

monitoring; mandated monitoring (this is where consultants come in); and question-driven monitoring. Chapter 2 provides reasons why monitoring programs fail, and Chapter 3 describes the features of good monitoring programs. Chapter 4 presents case studies that the authors believe to be good or problematic. Finally, Chapter 5 summarises the main points of the book and offers thoughts on how monitoring programs could be improved. The authors recommend the use of a strategy that they call *Adaptive Monitoring*.

There are many figures and boxes describing examples of monitoring, both good and bad, and these give a hands-on feel to the book. It is obvious that both authors are familiar with the many monitoring programs being undertaken throughout the world.

Curiosity-driven monitoring is mainly done out of inquisitiveness and is mainly of little or no purpose. However, the authors do state cases where such monitoring by individuals can serve a purpose e.g. long-term observations of animals in a small area. There are many cases in the avian world where curiosity-driven monitoring has been of great benefit (look at the data provided by Ernie Hoskins and Keith Hindwood, etc, for birds of Sydney, or for the long-term data about birds at Botany Bay).

Mandated monitoring is monitoring for which environmental data must be gathered as a stipulated requirement of government legislation or a political directive. The authors state that “*Mandated monitoring does not attempt to identify or understand the mechanism influencing a change or an entity. Rather, the focus is usually to identify trends in a given entity (e.g. whether environmental conditions are getting ‘better or worse’)*”. , I would disagree with this observation. Monitoring mandated by regulations is attempting to understand why changes are occurring (are any changes due to the effects from the development or are they from overall climatic etc changes?).

Whether monitoring programs are successful in their attempts is another matter, but the basic aim of mandated monitoring is to identify and understand the mechanism influencing a change.

Finally, question-driven monitoring is guided by a conceptual model of an ecosystem or some other entity, and is guided by a rigorous experimental design. Thus this approach results in *a priori* predictions that can be tested. In question-driven monitoring, mechanisms can be discovered whereby prospective scenarios of trends can be calculated and modeled. Such learning is informed by strongly contrasting management interventions and is sometimes called “*longitudinal studies with interventions*”. This can lead to robust predictive capacity and enable the investigator to pose new questions i.e. an adaptive monitoring approach.

There is much discussion and description of the use and misuse of long-term data sets, simulation modeling, indicator species, data management and engagement with the public and policy makers. Because of the authors’ international qualifications, examples come from around the world and tend to draw on large monitoring programs that use biotic and abiotic factors. The following are put forward as characteristics of ineffective monitoring: passive, mindless and lacking questions; poor experimental design; monitoring too many things; failure to agree on what entities to monitor; assumption that all monitoring programs can be the same; scientific disengagement from monitoring programs; poor data management; and loss of funding and key personnel.

Chapter 3 provides information on those characteristics that make effective long-term monitoring and here we have some good advice for those undertaking such programs. Characteristics include the posing of good questions i.e. defining the problem); using a conceptual model; selection of appropriate entities

to measure; good design; well-developed partnerships between scientists, statisticians, policy-makers, resource managers etc, strong leadership, ongoing funding, use of data and scientific productivity (i.e. publications, something all of us can probably be embarrassed about). There is a short list of “Tricks of the Trade” and this covers field transport, field staff, site access and time in the field. I think that most ecological consultants are more familiar with these factors than academics or government personnel due to the problems of costing a project (this can sometimes be the most challenging part of consulting).

There is a box in Chapter 3 that sets out in point form some critical components for maintaining effective monitoring programs. These points are of great use as a form on manifesto for ecological consultants and some points could be used in a revised Code of Conduct for ECA. The list refers to a paper by Likens as its source but this paper is not listed in the references for the chapter (lazy editing?).

Chapter 3 also provides a number of those complex network diagrams that remind me of the puzzles where one had to go through a maze to get from A to B. There is a conceptual model diagram for guiding research, another for guiding studies at Warra Long-term Ecological Research in Tasmania, and one for the Adaptive Monitoring framework. It is the Adaptive Monitoring framework that Lindenmayer and Likens are recommending. The Adaptive Monitoring framework comprises of question setting, experimental design, data collection, data analysis and data interpretation as iterative steps. A monitoring program can then evolve and develop in response to new information or new questions e.g. altering the frequency of data collection when key entities are changing at rates different from those initially anticipated. If you think that this sounds similar to the often-used phrase adaptive management, then you are

correct, and the authors admit that it is a similar approach.

I won't detail Chapter 4 as it is a series of descriptions of monitoring programs from around the world (including Australia) that are classed by the authors as problematic, effective and ugly. They make interesting reading and give an insight into the process of monitoring programs. Most are relatively large compared to that in which we would be involved. However, it is interesting to see how large institutions are capable of making messes.

The final chapter is a summary of the previous four and calls for a change in the culture to facilitate monitoring. The authors also state that the next big challenge is to integrate different kinds of monitoring and they feel that the diversity of approaches is fundamental to their Adaptive Monitoring framework. After a description of the many mandated monitoring programs known around the world (e.g. State of Environment reports) they still insist that these programs will often produce "*coarse-level summaries of temporal changes in resource condition (e.g. status reports), but provide limited understanding about the site-specific mechanisms that have given rise to those changes*". They point out that there is a tension between mandated monitoring programs, and site and region-based monitoring programs, and that this is reminiscent of tensions between top-down and bottom-up approaches in ecological thinking and researches approaches.

Lindenmayer and Likens believe that the fundamental characteristics of some of the best examples of question-driven monitoring programs (well-defined questions, well-articulated conceptual models, rigorous experimental designs) are features that should be much more widely embraced as part of efforts to improve mandated monitoring programs. I firmly endorse such a strategy, but am mindful that there are already mandated monitoring programs

that have the characteristics of question-driven programs, often within the constraints of a client-driven budget.

So, did this relatively small book (I read it in three hours) provide the answers to the problems of ecological monitoring? Well, it certainly gives lots of information on monitoring programs around the world and produces many thought-provoking ideas. It also gives a helpful summaries of the 'state of play' regarding how monitoring is undertaken.

However:

The book is certainly written by academics that have been involved with relatively large-scale monitoring projects – this comes through with the examples provided and the type of practical advice given. One can see how this book would be useful in a university undergraduate course and would provide ideas for policy-makers. Whether there is any good practical advice on how to undertake a monitoring program I am not as sure. Personally, I would like to know how many replicates are necessary, should I undertake quadrat or transect sampling, how long is long-term, how many treatment and control sites are needed, and is temporal sampling as important as spatial sampling? OK, I can turn to Tony Underwood or Graeme Caughley or more modern analytical books and software to get some answers, but what is needed is a book that gives these practical guidelines. Perhaps I am an old grump, but this book just didn't satisfy my desire to undertake the 'perfect monitoring survey'.

As may be apparent, I am a little bit cheesed off with the constant downgrading of mandated monitoring. There are many mandated monitoring programs that have been undertaken for many years. I am in my 15th year monitoring terrestrial and aquatic fauna at Ulan Coal Mines. I know of similar programs being undertaken for water release and/or extraction, mining,

roadways, etc, that have been going longer than some of the projects cited in the book. Most of these monitoring programs have a carefully defined question to answer: "Does the development have any effect upon biodiversity?". A simple but well-defined question.

Most mandated monitoring has some form of control (also called analogue) sites – this is usually the hardest to convince the client to finance but some agencies are already driving this aspect. Lindenmayer and Likens state that the questions associated with mandated monitoring are 'almost always' posed as *post-hoc* of some environmental problem and are not derived from a conceptual model. Perhaps this can be true, but with the planned monitoring of mine impacts upon biodiversity, regulations require at least two years pre-impact data. In this time conceptual models are developed (e.g. locating survey sites in relation to future mining plans). The major problem with such monitoring is extracting changes due to natural fluctuation in plant and animal populations, weather, etc, from that caused by the mining activities. This is a challenge that can be difficult to satisfy no matter how many conceptual models are developed.

There is no doubt that this book will provide an informative and interesting read to anyone involved in monitoring, and I am glad that I purchased a copy. However, don't expect miracles from the two gurus of biodiversity conservation, just some gems of wisdom.

Martin Denny
Biodiversity Monitoring Services
ECA 2nd Vice President

Wild Plants of Greater Brisbane

Edited by M. Ryan

Published by Queensland Museum, South Brisbane, 2003.

This is not a new publication, but was recently shown to me by a new employee who completed her degree in Queensland, and purchased it at the University book shop. I immediately bought my own from the on-line Queensland Museum shop, as this book is simply one of those "must have" botanical field guides, like Robertson (1991) *A Field Guide to the Plants of Sydney*, and in fact, is very similar in style to that handy guide. It is very much a 'cheats and hints' book for those who hate laboriously checking off botanical features, are a bit out of practice, just want cost-effective ID, or want an educated guess to that sometimes ambiguous question: "*what genus am I?*" (damn those sedges and grasses!).

This book is perfect for all these purposes for one reason: photos! That's right: photos, not dubious line drawings which are someone's interpretation of a plants structure and appearance; or dead, brown, flat things pasted on paper. Photos of the real, living thing. Genius. Someone buy Gwen a digital camera to update *Flora of NSW*!

The book is 372 pages, and covers many plants found in the coastal North Coast bioregion which in NSW generally extends from Newcastle to the Queensland border, hence its usefulness to NSW. To make the tedious job of plant ID for pseudo-botanists like myself just too easy, the guide is divided into habitat-based chapters (i.e. wetlands (subdivided into tidal and freshwater), wallum heath, eucalypt forests, rainforests, mountain heath, weeds, and even urban landscapes). Each page is dedicated to one or two species, with very representative photos (i.e. flower, fruits, close ups, and even in-situ habitat shots). A simple and logical taxonomical description, notes on habitat and range, and also "other things it may look

like” section compliment the photos – but with the quality of the photos, you’ll usually ignore these.

Overall, this book is ideal for a recent graduate getting the hang of the local flora, the casual botanist/bush regenerator, and the “*God, I’ve been in the office too long*” consultant. Put it on your bookshelf now.

Jason Berrigan

Darkheart Eco-Consultancy

ECA Member and Consulting Ecology Editor

Weeds of the South-East: An Identification Guide for Australia.

Written by F.J. Richardson, R.G. Richardson and R.C.H. Shepherd.

Published by R.G. and F.J. Richardson, Meredith, Victoria, 2007.

Weed’s don’t usually rate high for priority in plant identification in my opinion, unless they are Weeds of National Significance, declared noxious, or the job is about restoration not development.

When time is precious (i.e. a fixed budget which most consultants are often onerously bound to), that weed with no flowers, no fruits, and that I have no idea what genus it is: doesn’t go into the envelope with the natives to the Botanical Gardens. It goes into the folder labelled “*identify in spare time*”. It’s a big folder, as spare time is like budget surpluses, “*spare no expense*” clients, and the Cumberland Plain Woodland.

This wonderful book is that spare time saver. It is not a new book. Originally published in 2006 by two of its authors, and slightly revised in 2007, to me it was one of those “*I wonder if that’s better than the one’s I’ve already got*” books you see on the CSIRO publishing website. I have two other weed books, which appear to have every weed but what

I find up here on the mid-north coast. I was wary of another bookshelf stuffer, but with instruction from the accountant to get some last minute tax write-offs, I popped it in the cart and checked out. And I’m glad I did. This is THE book for weed identification. It is about 438 pages, with about 430 of those pages devoted to weed identification. And by identification, I mean photos. Glorious photos. Over 1600 of them according to the back cover, with over 2000 plants identified. Each page has about 3 species with accompanying photos and the expected text to reassure you it’s that plant. The term ‘weed’ of course includes some natives that match that classic definition (i.e. a plant growing in the wrong place. The book also includes a lot of garden escapees (even those lovely purple grasses now plaguing a forest remnant near you).

Perusing this book within 5 minutes of the postie nearly giving himself a hernia hefting \$500 worth of new books from CSIRO into my hands, I experienced the rare euphoria of buyer’s satisfaction from buying a good book that I’ve not physically been able to browse. Consequently, I whittled my “spare time” folder of weeds from an encyclopaedia collection to a manila folder that very evening, and now no longer dread the “*what the #*%*#%* hell is this?*” experience with that weed which covers the site, but apparently appears unknown to science. This book is another must have for your reference library.

Jason Berrigan

Darkheart Eco-Consultancy

ECA Member and Consulting Ecology Editor

Recent Journal Articles / Literature

Tokushima H. and Jarman P. (2010). Ecology of the rare but irruptive Pilliga mouse, *pseudomys pilligaensis*. III. Dietary ecology. *Australian Journal of Zoology* **58** (2): 85-93

Crane M, Lindenmayer D. and Cunningham R. (2010) The use of den trees by the squirrel glider (*Petaurus norfolcensis*) in temperate Australian woodlands. *Australian Journal of Zoology* **58** (1): 39-49.

Asari et al. (2010). Gap-crossing in fragmented habitats by mahogany gliders (*Petaurus gracilis*). Do they cross roads and powerline corridors? *Australian Mammalogy* **32**(1): 10-15.

Glen A. (2010) Hybridisation between dingoes and domestic dogs: a comment on Jones (2009). *Australian Mammalogy* **32**(1): 76-77

Harris R. and Nicol S. (2010) The effectiveness of hair traps for surveying mammals: results of a study in sandstone caves in the Tasmanian southern midlands. *Australian Mammalogy* **32**(1): 62-66

Claridge A., Mills D. and Barry S. (2010) Prevalence of threatened native species in canid scats from coastal and near-coastal landscapes in south-eastern Australia. *Australian Mammalogy* **32**(2): 117-126

Hobday A. (2010). Nighttime driver detection distances for Tasmanian fauna : informing speed limits to reduce roadkill. *Wildlife Research* **37** (4): 265-272.

Taylor B. and Goldingay R. (2010). Roads and wildlife: impacts, mitigation and implications for wildlife management in Australia. *Wildlife Research* **37** (4): 320-331.

Kelly et al., (2010). The short-term responses of small mammals to wildfire in semiarid mallee shrubland, Australia. *Wildlife Research* **37** (4): 293-300.

Sharpe D. and Goldingay R. (2010). Population ecology of the nectar-feeding squirrel glider (*petaurus norfolcensis*) in remnant forest in subtropical Australia. *Wildlife Research* **37** (2): 77-88

Spence-Bailey L. et al., (2010) Maximising trapping efficiency in reptile surveys: the role of seasonality, weather conditions and moon phase on capture success. *Wildlife Research* **37** (2): 104-115

Lee T. et al., (2010) Defining spatial genetic structure and management units for vulnerable koala (*Phascolarctos cinereus*) populations in the Sydney region, Australia. *Wildlife Research* **37** (2): 156-165.

Ruibal M. et al., (2010) Advancement to hair-sampling surveys of a medium-sized mammal: DNA-based individual identification and population estimation of a rare Australian marsupial, the spotted-tailed quoll (*Dasyurus maculatus*) . *Wildlife Research* **37** (1): 27-38.

Metsers E. et al., (2010) Cat-exclusion zones in rural and urban-fringe landscapes: how large would they have to be? *Wildlife Research* **37** (1): 47-56.

Lindenmayer D. et al., (2010) Comparing bird species richness and assemblage composition between montane ash eucalypt forest and cool temperate rainforests – an empirical study from Victoria, south-eastern Australia . *Emu* **110**(2): 109-117

Priday S. (2010) Beyond the 'woody remnant' paradigm in conservation of woodland birds: habitat requirements of the Hooded Robin (*Melanodryas cucullata cucullata*) . *Emu* **110**(2): 118-124

Hogan F. and Cooke R. (2010) Insights into the breeding behavior and dispersal of the Powerful Owl (*Ninox strenua*) through the collection of shed feathers. *Emu* **110**(2): 178-184.

Recent Book Releases

Information Source: CSIRO Publishing Website
<http://www.publish.csiro.au>

Title: The Australian Bustard

Author: Mark Ziembecki

RRP: \$39.95

No. Pages: 120

Publisher: CSIRO Publishing

Date: February 2010

Title: Australasian Nature Photography

Author: South Australian Museum

RRP: \$39.95

No. Pages: 104

Publisher: CSIRO Publishing

Date: October 2010

Title: Desert Channels: The Impulse to Conserve

Editors: Libby Robin, Chris

Dickman and Mandy Martin

RRP: \$59.95

No. Pages: 352

Publisher: CSIRO Publishing

Date: September 2010



Title: Kangaroo: A Portrait of an Extraordinary Marsupial

Author: Stephen Jackson and Karl Vernes

RRP: \$24.99

No. Pages: 280

Publisher: Allen and Unwin

Date: December 2009

Title: Platypus: The Extraordinary Story of How a Curious Creature Baffled the World

Author: Ann Moyal

RRP: \$24.99

No. Pages: 264

Publisher: Allen & Unwin

Date: June 2010

Title: Temperate Woodland Conservation and Management

Author: David Lindenmayer, Andrew Bennet and Richard Hobbs

RRP: \$89.95

No. Pages: 400

Publisher: CSIRO Publishing

Date: October 2010



Title: Peter Cullen's Legacy: Integrating Science, Policy and Management of Rivers

Author: Ed. Darren Ryder et al.

RRP: \$75.00

No. Pages: 96

Publisher: CSIRO Publishing

Date: August 2010

Title: Algae of Australia: Phytoplankton of Temperate Coastal Waters

Author: Gustaaf Hallegraeff et al.

RRP: \$140.00

No. Pages: 432

Publisher: CSIRO Publishing

Date: July 2010

Title: Successfully Growing Australian Native Plants

Author: Geoff Rigby and Bev Rigby

RRP: \$29.95

No. Pages: 228

Publisher:

Date: September 2010

Title: Forest Phoenix: How a Great Forest Recovers After Fire

Author: David Lindenmayer, David Blair, Lachlan McBurney and Sam Banks.

RRP: \$39.95

No. Pages: 128

Publisher: SCIRO Publishing

Date: September 2010

Title: Native Plants of the Sydney Region: from Newcastle to Nowra and West to the Dividing Range.

Author: Alan Fairley and Phillip Moore.

RRP: \$59.99

No. Pages: 640

Publisher: Allen and Unwin

Date: September 2010

Title: The Flowering of Australia's Rainforests: A Plant and Pollination Miscellany.

Author: Geoff Williams and Paul Adam

RRP: \$99.95

No. Pages: 216

Publisher: CSIRO Publishing

Date: March 2010

Title: Flora of Australia: Volume 44A: Poaceae 2

Author: Australian Biological Resources Study

RRP: \$110 paperback; \$130 hardback

No. Pages: 432

Publisher: CSIRO Publishing / Australian Biological Resources Study

Date: 2009

Title: Trees and Forests: A Colour Guide: Biology, Pathology, Propagation, Silviculture, Surgery, Biomes, Ecology, Conservation

Author: Bryan Bowes

RRP: \$160

No. Pages: 288

Publisher: Manson Publishing, UK

Date: March 2010

Title: Field Guide to Australian Fungi.

Author: Bruce Fuhrer

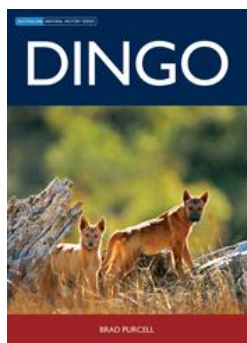
RRP: \$49.95

No. Pages: 548

Publisher: Bloomings Books

Date: June 2010

Title: Dingo
Author: Brad Purcell
RRP: \$39.95
No. Pages: 176
Publisher: CSIRO Publishing
Date: September 2010



2010 ECA Membership Report

Amy Rowles
ECA administrative assistant

In total we have 122 members. There are currently four applicants. We have five new members since the last edition of the newsletter. The new members are introduced below:

Name: Tim Mouton
Membership Status: Associate
Qualifications: B. Env. Sc; M. Env. Sc.
Company: On-Site Environmental Management
Location: Valentine

Name: Daniela Binder
Membership Status: Associate
Qualifications: B Sc. (Hons)
Company: SMEC
Location: North Sydney

Name: Peter Richards
Membership Status: Practising
Qualifications: B. Sc. (Botany & Zoology)
Company: Self employed
Location: Thirroul

Name: Rob Gration
Membership Status: Practising (regional)
Qualifications: M Sc (Wild. Mgt-habitat); Post Grad. Cert. (App. Sc.)
Company: SMEC Australia Pty Ltd
Position: Principal Ecologist; Team Manager
Location: Melbourne

Name: Kim Stephan
Membership Status: Practising (regional)
Qualifications: B. Sc. (Hons) Ecology
Company: Pitta Ecological Services
Position: Principal Ecologist
Location: Murwillumbah

The ECA Forum

Compiled by Amy Rowles

The ECA Forum on the ECA's website is one of the many privileges of membership, and is intended:

- To encourage discourse within the membership.*
- To enable a forum for members to raise issues that affect members, the industry and the ecologist.*
- To provide a venue for depositing information eg anecdotal sightings, interpretation of legislation, etc.*
- To inform members of changes to legislation, upcoming events, draft reports, etc on public exhibition.*
- To reduce some of the email generated by in-house chat within the membership.*
- To provide a means of archiving information shared within the membership for future reference.*

The Forum features a range of issues from legal to anecdotal, comments and questions by some members seeking some clarity on some issues or assistance in a work-related matter or some hotly debated issues.

If you haven't had time to log on and catch up, here's a summary of some of the recent and most commented on topics up to the 19th July 2009:

A Reviewers Comments

Deryk Engel: Deryk commented that his client (a government department) on review of his report by an ecologist doubted his positive identification of both the Eastern Bentwing Bat (*Miniopterus schreibersii*) and Cumberland Plain Land Snail

(*Meridolum corneovirens*), despite the habitat being highly suitable with records of both species known within a 10km radius. In contrast, he was also given comments stating that he was not precautionary enough. The case is discussed in more detail on the forum.

2010 Twitchathon

Deryk Engel: Paul Burcher and Deryk, two ECA members and current council members, are entering this years twitchathon in October. They are looking for sponsors, so if you are interested in helping them to raise money, please contact them at admin@lesryk.com.au or pburcher@ozemail.com.au to make a donation.

Coastal Ecology

Belinda Cooke: Belinda is a PhD student studying Coastal Ecology. Belinda is requesting copies of reports written on beach nourishment projects in Australia. If you think you may be able to assist Belinda, please contact her at belinda.cooke@students.mq.edu.au.

Correct Spelling of Common Names of Bird Species.

Stephen Ambrose began this discussion in January this year, concerned that many consultants appear to be unclear about the correct spelling of bird species common names, particularly with the use of hyphens. Stephen suggests using the spelling rules used by the International Ornithological Congress (IOC). These rules are listed on the forum. Elizabeth Ashby responded that she elects to use the common names of a threatened species as it is currently spelt in the threatened species listing. Although notes that in the case of threatened flora, it is even more difficult to find standardized common names. Edward Cannella pointed out that according to the Australian Style Guide common names do not need to be capitalised

unless they include a proper name. Edward states that he is ignoring much of the style guide as he feels that it reflects a dumbing down of the English language and grammar in writing. Stephen Ambrose agreed that there are inconsistencies between the Australian Style Guide and International guides. Stephens opinion is that any written report should be regarded as international literature, particularly now with the internet, therefore Stephen elects to use international standards. Edward Cannella further responded with the fact that he had two reports returned from government departments asking him to comply with the Australian Style Guide, mainly concerning the use of capital letters for common names. Edward would rather see documents comply to the standards that apply for the preparation of international journal articles.

Essential References for Professional Ecologists

Jason Berrigan has started a list of useful references for our industry. Stephen Ambrose has added to this list. Please add references that you consider may be useful to other consultants and ecologists to this list.

Kath Chesnut has enquired as to whether anyone knows how to get a copy of Flora of NSW Volume 4. If you can assist Kath, please respond on the forum or contact her directly at kathryn_chesnut@urscorp.com.

Equipment

Kath Chesnut has asked for recommendations of a supplier for a nice mobile, fairly light weight plant press. If you can assist Kath, please respond on the forum or contact her directly at kathryn_chesnut@urscorp.com.

General – Blue Mountains Herp Species

Danny Wotherspoon has requested species lists for both common and threatened frogs and

reptiles for the lower Blue Mountains area. He only requires a general location to avoid any confidentiality issues. If you can assist Danny please contact him directly on info@abeleecology.com.au or via the forum.

Glider Poles

Kath Chesnut has asked for whether anyone has any experience with glider pole as a mitigation measure or can recommend any literature, projects or experts in their installation. If you can assist Kath, please respond on the forum or contact her directly at kathryn.chesnut@urscorp.com.

Stephen Ambrose responded with examples of glider poles along the Hume Highway between Tarcutta and Albury, with contact details for Dr Rodney van der Ree as a contact.

Grey-headed Flying-fox

Stephen Ambrose notified forum readers of a new Grey-headed Flying-fox colony, of approximately 100 individuals, which has established at Tarban Creek Reserve, Hunters Hill in June. Deryk Engel responded with his recent observations of a new flying-fox colony of approximately 10 individuals at Cabbage Tree Creek in Wollongong in May. Nick Skelton added a new colony at Therry St, Avalon.

In The Spotlight.

In April Paul Burcher began a discussion on spotlights. Paul now prefers to use his Zweibruder P7 LED lenser torch for spotlighting. Paul discusses these torches in more detail on the forum. Deryk Engel has also switched to using this same torch and states that although it chews through the AAA batteries, the benefits of using a small torch over the heavy conventional spotlight outweighs this expense. Nick Skelton has been using the P14 model for most spotlighting,

however does have some concerns about the amount of eyeshine.

Owls and Nest Boxes

Stephen Ambrose began this discussion with concerns over the number of consultants reports that recommend the use of owl roosting/nesting boxes as a mitigation measure, when there is little evidence that owl species in Australia will use the boxes. Correspondence with Rod Kavanagh (owl expert) agrees with this concern and although he believes that the method should be explored, it is too early to rely on boxes as a mitigation measure. In correspondence with Stephen Debus (owl expert), he also agreed with the above comments, including the need for some proper, scientifically based tests of nest-box use. Further details are discussed on the forum.

Deryk Engel commented on whether it would be better to relocate hollows themselves rather than make artificial ones. Stephen Ambrose considered that other habitat factors such as increased disturbances may still impact on the use of the translocated hollows, and commented that there is still limited evidence that owls will effectively use translocated hollows.

Liz Ashby stated that perhaps it is the design of the boxes that is the problem and not the willingness of Powerful Owls to use them. Stephen responded with examples of overseas owl species that readily use nest boxes, and others that despite extensive research will not use artificial nest boxes. Due to the lack of experimentation with Australian species, we do not know in which category they belong.

Nick Skelton has concerns with the health of a tree used to hold a translocated hollow, due to their heaviness and required attachments. He suggests using a pole. Stephen Ambrose responded that although he can understand the concerns, doubts that a hollow-dependent bird

species, particularly an owl, would use an artificial nest on a pole, as many other habitat variables outside of the hollow characteristics, appear to be important in the selection of a useable hollow.

Pressures Exerted by Some Consent Authorities to Change Reports

Judith Rawling began this discussion, asking whether others 'have had the experience of having a council or departmental officer order you to change your survey results or report recommendations even though you know this is either the wrong thing to do, or is actually in contradiction of what you found on site?'.

Judith stated that her company UBM has had this happen on numerous occasions recently, particularly in relation to VMPs. UBM's policy is to refuse to accede to all unreasonable or unethical requests. Being put in this position has put UBM under great pressure from both Council requesting these changes to pass the document, and the client as they want the document passed.

Edward Cannella responded with the fact that he has been put under this pressure from clients who attempt to change the report to favour their desired outcomes. He notes that this has resulted in him pulling out of projects or had unauthorized summaries of his reports used in other reports.

Safety Clothing vs Survey Efficacy

Edward Cannella began a discussion on the effect of bright coloured PPE on the efficacy of bird surveys. Work Safety Standards at mine sites has resulted in the requirements to wear such PPE in the field, and Edward believes that it has reduced his bird counts. Edward enquired as to whether anyone knows of any published data on the subject.

Stephen Ambrose responded that he did not know of any studies on the subject. Stephen also felt that brightly coloured PPE may impact on bird surveys, with some species hiding and becoming quiet, and others giving alarm calls and being easier to detect. Stephen has found some companies to be extremely strict with PPE and others more reasonable once the situation is explained.

Edward Cannella later found some papers discussing the topic and has listed them on the forum. Stephen Ambrose has also posted a reference and abstract for a relevant paper on the forum.

Who's Report?

Deryk Engel is discouraged by clients requesting layout and formatting changes to draft reports. Deryk argues that although these changes do not alter the content of the report, they can take a lot of time, and alters the appearance of the report considerably so as to not resemble a report written by his company. He has discussed the topic in more detail on the forum and has asked for others views on the subject.

Infrared Cameras: One Alternative to Trapping

Deryk Engel^a and Paul Burcher^b

^aLesryk Environmental Consultants

ECA Secretary

^bAquila Ecological Surveys

ECA Treasurer

When undertaking fauna surveys, the welfare of the animals being targeted is paramount. Fauna ecologists are always looking for methods to maximise their survey effort without compromising either the overall objective of their study, or the health of those species being sought. Live trapping is one of those techniques that is both labour intensive and has the potential to

injure and/or stress those captured individuals. Live trapping will be necessary to target some species, but as a broad brush approach to general fauna surveys, there may be more suitable, less invasive techniques available. One of these may be the use of infrared cameras. This technique has been around for a while, but initial set ups were cumbersome and expensive.

Relatively recently, products such as the Reconyx RapidFire™, Reconyx RapidFire Professional™ and Scout Guard Scouting and Trail Cameras™ have come on to the market. These cameras range in price from \$300 to \$700 and are available from a variety of sources. The cameras all employ an active infrared (AIR) system which results in a picture being taken when an animal breaks an invisible beam. The cameras are compact, waterproof, around 30 centimetres by 20 centimetres in size, and operate both diurnally and nocturnally. The RapidFire Professional™ PC85 model can take up to one frame per second and its trigger speed is 1/5th of a second. Shots that are taken are saved to a compact flash card, which is an additional cost. Photographs are in colour for daytime shots and black and white for night (refer to plates provided). Capacity for a 4GB card is 10,000 to 15,000 images for a 3.1MP model.

When purchasing one of these cameras, it is worth bearing in mind its method of operation at night. Some of the cameras use an inbuilt flash, whilst others rely on infrared illuminators. In purchasing our cameras, we opted for units that employed an infrared illuminator as this is expected to result in less disturbance to those animals being photographed compared to a camera that continually flashed. A camera that utilises an infrared illuminator is also expected to result in more shots being taken of the animals present as a flash may scare individuals away from the camera site. In publically accessible localities, a unit that flashes would also be unacceptable as it would

become visible and therefore vulnerable to theft or disturbance.

As this is a relatively new technique available to ecological consultants, little or no information on its use is provided in any of the standard survey method guidelines. A search of the internet identified several scientific papers and articles in which infrared cameras are used, though these mainly deal with specific investigation such as the monitoring of latrine (*toilet*) sites, game trails or nesting sites. There do not appear to be any papers, websites or articles that promote the use of this technique for broad-scale fauna surveys. Whilst this is the case, interestingly, on two projects we have recently been involved with, the Department of Environment, Climate Change and Water (DECCW) has recommended/requested the use of infrared cameras to target ground dwelling threatened species. The wording in one situation provided by DECCW was *“recent work undertaken by DECCW in the....area has determined the presence of the Southern Brown Bandicoot (Isodon obesulus) and Long-nosed Potoroo (Potorous tridactylus). These animals have been detected using infrared cameras which is the DECCW preferred method for detecting these species. Further surveys using infrared cameras should be undertaken.”* Whilst this comment was made, no further information on an appropriate setup, bait, duration (i.e. length of time the camera was left out on site) and so forth was provided. Similarly, reference to the DECC (2004) *“Threatened biodiversity survey and assessment: Guidelines for developments and activities (Working Draft)”* did not provide any direction on the appropriate use of infrared cameras.

In conducting surveys where this technique has been employed, the authors have utilised the following techniques:

- 1) Securing of the camera to a tree at a height of around 1.5 metres, and angling it slightly downwards. To entice animals into the camera's field of view, lures scented with truffle oil were employed.

These were placed at a distance of around 5m in front of the camera and secured to the ground by a large steel peg. This distance was selected as it is within the unit's motion detector coverage range (as per the directions provided in the unit's instruction manual); and,

- 2) Securing the camera to a tree at a height of around 2 metres and facing it towards a wooden bracket onto which was attached a honey pot.

Using these methods, the authors have photographed the following species:

- Eastern Grey Kangaroo (*Macropus giganteus*);
- Swamp Wallaby (*Wallabia bicolor*);
- Common Brushtail Possum (*Trichosurus vulpecular*);
- Common Ringtail Possum (*Pseudocheirus peregrinus*);
- Common Wombat (*Vombatus ursinus*);
- Fox (*Vulpes vulpes*); and
- Black Rat (*Rattus rattus*).

Verbal discussions held with other researchers indicate that the methods they employ when using this technique include providing bait balls (composed of rolled oats, peanut butter, honey and walnuts) or bird seed bells (such as those commercially available from pet shops) (M. Schulz pers comm). Use of these attractants has resulted in several ground birds being photographed (e.g. Pittas).

When establishing our cameras, we have tended to leave these out for around 10 nights. Being waterproof, the effectiveness of the cameras is only limited by the size of the flash card and the bait being used. Ten nights has been selected as this corresponds to the recommended length of time when using hairtube traps (DECC 2004). From a time management perspective, it would seem logical to establish and collect both the cameras and hairtube traps on the same day.

When writing our reports, ecologists use jargon such as trap night or person hours. With infrared cameras, this terminology has yet to be developed. Camera nights would be one term (when targeting nocturnal species), though as these units are also used during the day, camera hours maybe more reflective of the "survey effort" (i.e. the length of time it is continually on and therefore able to record the presence of any fauna species). One trick we have adopted when collecting our cameras is to ensure that a photograph of a researcher is taken. This technique is used to ensure that the camera is still operating at the completion of the study, and hasn't ceased operating half-way through a study due to a flat battery or full memory card.

A researcher who has recently employed infrared cameras in a fauna survey managed to record species such as *Antechinus* by using a video option within the settings of his particular camera (M. Schulz pers comm). The cameras we use do not have this option.



Plate 1: Day shot – Eastern Grey Kangaroos. Portion of lure visible between both animals.

It is acknowledged that, when endeavouring to determine the presence of some species, reliance upon infrared cameras would not be effective. The species unlikely to be recorded through use of the infrared cameras are the rodents and small dasyurids (e.g. planigales). Whilst these animals are likely to be too small and quick for the infrared cameras to capture, detection of these

species may be possible by incorporating the use of hairtubes into the study. When considering the welfare of those species being targeted (is it really important to capture another *Antechinus* or Black Rat?!!), and the overall objective of an ecological study, an ecologist may consider it more appropriate to forgo live trapping preferring to rely upon a combination of infrared cameras and other non-invasive survey methods such as hairtube traps, echolocation detectors and spotlighting.



Plate 2: Day shot – Swamp Wallaby. Lure present on ground in front of wallaby.



Plate 3: Night shot – Common Ringtail Possum. Camera set up on known movement trail.



Plate 4: Night shot – Common Wombat smelling lure.



Plate 5: Night shot – Fox smelling lure.

Hollow / Den Inspection Cameras on a Budget

Jason Berrigan

Darkheart Eco-Consultancy

ECA Member and Consulting Ecology Editor

Clearing monitoring and especially retrieving hollow-obligate fauna from fallen hollow-bearing trees is a task that consulting ecologists are increasingly being asked to perform. Some consultants may already routinely undertake or circumstances may dictate the need for inspecting hollows as a part of a threatened species assessment (eg when justifying the retention of a specific tree due to its hollows). Inspection

cameras may also be used to inspect nest boxes for usage to avoid the disturbance of lifting the lid, to seeing if snakes are in dens or rock crevices. Inspection cameras are thus quickly becoming another essential survey tool like the mandatory Elliot traps in an ecological consultant's repertoire.

Some of our brethren are well advanced in the use of inspection cameras with home-made designs manufactured from components sourced from Dick Smith and Ebay over the last decade (Paul Burcher. pers. comm.). Some have also long been using inspection cameras designed for plumbers to inspect sewers. The latter inspection cameras generally have very long cables and some can produce high quality images (video and photos), but their bulk limits portability (eg carrying up a ladder), and their cost is an obstacle to affordability. These plumber-style cameras are however now available on Ebay at reasonable prices (about \$800 with 30m of cable) if that style meets your needs better. You can even buy remote submersible cameras there too, to enhance your fishing success.

With increasing demand of course comes greater supply and innovation, and now there are a number of very affordable options from commercial suppliers such as Faunatech, as well as dedicated industrial tool manufacturers. You should do your own research to find what product will meet your needs, but I found the main influence on price and quality is the camera technology: LED light assisted or Infra-Red; and resolution output. Infra-red and higher resolution cameras appear to be more expensive, while the LED low resolution cameras are available in a range of designs intended to suit the automotive, building and plumbing industry. The option of recording video and/or photos also appears to influence price, as does the length of video cable.

After some extensive Googling and comparing of specifications (generally resolution, wireless

receiver, ability to record images, and cost of extensions), and consideration of how often I would use the tool, I decided to invest in two of the pistol-grip style inspection cameras using a LED camera. These units have the advantage of a removable wireless receiver which is reportedly good for 10m away. There are some cheaper alternatives to the models I chose, but these either have a fixed receiver (a severe limitation) and no options to extend the camera tube length; or simply consist of a camera on a wand that only connects to a laptop/PDA via USB to use the latter as a monitor. The USB wand styles are useless on a construction site or at the top of a 6m ladder.

While you can buy the name brand for >\$300 from tool suppliers (generally the same specifications but lacking wireless monitors), a number of pistol grip designs sell under various names and packaging for about \$150+ on Ebay for the non-recordable unit (which was my first purchase), and about \$210+ for the recordable unit (my second purchase). These generally come from Hong Kong. You can also buy hard carrying cases (about \$50) and extensions (\$30-\$50/m). These units, which all seem to come from the same factory, have the following specifications:

Below: Photo 1. The budget recordable inspection camera.



Camera

Imaging Sensor	CMOS
Total Pixels	704 x 576 (PAL) ; 712 x 486 (NTSC)
Horizontal View Angle	50 degree
Transmission Frequency	2468 MHz
Minimum Illumination	0 Lux
Modulation Type	FM (Frequency Modulation)
Bandwidth	18 MHz
Power Supply	4 x AA Alkaline Batteries
Camera Diameter	16 mm
Dimensions	approx. 186 (W) x 41 (D) x 145 (H) mm (Flexible Tube excluded)
Weight	approx. 173 g

Receiver

LCD Screen Type	5.9 cm TFT-LCD
Effective Pixels	480 x 240
Video System	PAL / NTSC
Transmission Frequency	2468 MHz
Exterior Supply Voltage	8 ~ 36 V DC
Consumption Current (Maximum)	450 mA
Video Output Level	0.9 ~ 1.3 V at 75 ohm
Dimensions	99 (L) x 69 (W) x 29 (D) mm
Weight	approx. 137.5 g

The camera (but not the handle or wireless receiver) is also waterproof, with a maximum submersed depth of 25cm, which is handy as some hollows may contain water (as I found out after inspecting a tree felled after 25mm of rain the preceding day). This is also handy in the event of the accidental wedding ring drop into the toilet situation, or finding what children's toy is blocking the drain.

The pistol grip is nothing but a glorified case to hold the batteries that control the LEDs, with the 'trigger' being a wheel you roll with your index finger to control brightness. I wouldn't want to drop the wireless receiver from any height as it doesn't feel too robust. The receiver housing readily scratches, and I wouldn't take chances with scratching the screen either – I have left the protective plastic cover they came with, on. The camera tube is extremely flexible - you can bend it into a necktie and wear it while pulling an animal out of a hollow, so no-one steps on it (eg the guy with the chainsaw standing next to you waiting to see your arm emerge with something's teeth embedded in it), but heavy. I have the standard 1m length on it, and could see having 2m or 3m being cumbersome (and you really won't need it in most cases).

You will also find any direct sun on the receiver face obscures all vision – but this is where the wireless receiver is a boon. Simply pull it off and place it in your shadow, or better still, get someone else to hold it as you watch it and manoeuvre the camera like a colorectal surgeon through the hollow. You will soon discover that there is a physical limit to how much you can bend and twist the camera to see around corners. This is why >1m is probably a waste of time, unless you buy a camera with a remotely rotatable head (currently appear to be limited to high quality inspection camera used to survey pipes, or surgical tools).

The receiver has a built in battery which appears to last hours, however I am not sure how the battery would be replaced when it expires. The non-recordable unit has a video out plug which may allow you to connect to something (eg a PDA perhaps) to record video. The recordable unit lets you record digital photos or video (30fps), and has a USB port and video out plug. The ability to record pictures is ideal for reporting, or in the event you need to prove something. The ability to record video also provides potentially useful

material for education and research. My personal observation was that recorded video quality was higher than still photos.

On that note, if you're expecting to film David Attenborough documentaries with this unit, then you will be disappointed. Image clarity ranges from good (see Photo 2) to poor (see Photo 3), and is usually grainy due to the amount of light (as hollows can be very dark even with the LEDs), and the low resolution (note *effective* pixels is different from what the total is). Signal strength/graininess also varies a little with how thick the wood is, and/or how far the receiver is away from the camera. Bottom line – it's not a great picture and it takes time and practise to be able to "read" the image. Using LED cameras also has the disadvantage of making the image very white when it comes close to objects in the foreground.

You will also find yourself wishing it had a zoom lens, so you could just sit the camera very still and zoom in and out to inspect the depths of the hollows for fauna, rather than pulling and pushing the tube to get a clearer view. If you want a high quality image and features like zoom, you will have to pay for them.

Below: Photo 2. Example photo A. This is a shot inside a baited Elliot A in a completely darkened room.



Below: Photo 2. Example photo B. This is a shot inside a nest box of a recently constructed Sugar Glider nest, over a failed Eastern Rosella nest (those white things are broken egg shells on the left and right). The real life image was not this grainy and I was able to clearly work out what I was looking at. However, hand shaking affects photo quality and this was the best out of 9 photos.



One glitch that jumps out is that for some inexplicable reason, the image is upside down on the monitor, as shown by the date stamp above in Photo 2. I haven't worked out if this setting can be changed yet, or a design flaw. However, this can be overcome by simply detaching the monitor and turning it upside down. You will have to do this otherwise you will be wondering why the camera is moving opposite to the way you are turning it.

It takes some practice to work out how to both manoeuvre the camera with a steady hand (gives one the impression of navigating the microscopic ship in *The Fantastic Journey*), and manipulate the brightness so that you can make out if that knob on the side is a bat, or just wood. However, while Photo 3 suggests otherwise, with some practise, it is easy to spot a Sugar Glider's nest, birds eggs, or the beady eyes of a Brushtail Possum. If you are primarily trying to ascertain if the hollow is vacant or not, and where to direct the chainsaw cut: these units are sufficient for the job.

Despite these limitations, you will find your knowledge and understanding of the structure of hollows, and how fauna use them, exponentially increase. The exercise in examining even a fallen tree in the forest or a burrow is very educational, and gives a resounding verification of the fact that aperture size is certainly no indication of a hollow's habitability. In that regard, I have often found myself disheartened with the fact that the number of hollows that may be actually structurally suitable for habitation, is disturbingly disproportionate to the perceived number of hollows indicated by external apertures. On the other hand, it is always a relief to see that a hollow in a tree that has just crashed to the earth in a cloud of dust, is vacant.

One more limitation of the LED style inspection camera is that any fauna in the hole may find it disturbing due to the bright light which illuminates the whole cavity. This probably applies to the IR camera as well (ie anything that comes into your hole and blocks the escape route I'm sure would have some threat status). This begs the question of course, is this an animal ethics issue? For use as a tool to monitor nesting birds, I would say yes and not recommend this kind of inspection camera, and very careful use of any inspection camera. For use to inspect a tree hollow that is likely to be, about to be, or has been felled, its justifiably less (if any) of an issue as the purpose is to reduce the likelihood of the animal/s being killed/injured during tree felling. Regardless, due consideration is warranted in use of any hollow-inspection camera system.

Overall, I recommend investing in this kind of inspection camera if: your use is basic; your budget and usage frequency are limited; and you have 20/20 eyesight. For more technical and featured cameras, best contact the experts and have a flexible budget.

Quo vadis: funnels or buckets?

Gerry Swan

Cygnets Surveys & Consultancy

The Feb/May 2005 edition of the ECA newsletter (Volume 11/12) included an article by Martin Denny on the road testing of reptile funnel traps. As five years have passed I thought it might be useful to members if some more information on results from using these traps was provided. In this article I detail the results of two surveys where a combination of funnel and pit traps was used in conjunction with drift fences. The first survey was at a site on the Cumberland Plain in Sydney and the second was in central western NSW between Nyngan and Cobar.

At the Sydney site the trap lines were set up with a 20 litre bucket at each end and three funnel traps in between, with the fence joining the funnels at each end. A total of 73 animals were caught in the traps; 59 (81%) in funnels and 14 (19%) in buckets.

Fifty-one reptiles comprising 4 species were caught; 49 in funnels and 2 in buckets. One species, the Grass Skink (*Lampropholis guichenoti*), was caught in both funnels and buckets. The other three species, the Elegant Snake-eyed Skink (*Cryptoblepharus pulcher*), the Garden Skink (*Lampropholis delicata*) and the Lace Monitor (*Varanus varius*) were only caught in funnel traps. Yes, big goannas do get in and stay in these traps: this one was 1.2 metres long. Admittedly there was nothing else in that trap, so who knows what it had eaten, but at least it couldn't move on to clean out the rest of the traps.

There was heavy rain the evening after we set up the traps, so frogs were plentiful for a few days. Twenty-two frogs comprising 7 species were caught; 10 in funnels and 12 in buckets. Two

species, the Green Tree Frog (*Litoria caerulea*) and the Bleating Tree Frog (*Litoria dentata*), were only caught in funnels. Three species, the Eastern banjo Frog (*Limnodynastes dumerilii*), the Striped Marsh Frog (*Limnodynastes peronii*) and the Spotted Grass Frog (*Limnodynastes tasmaniensis*), were only caught in buckets; while two species, the Common Eastern Froglet (*Crinia signifera*) and the Smooth Toadlet (*Uperoleia laevisgata*) were caught in both funnels and buckets.

Apart from trapping, systematic searching was undertaken and this resulted in an additional 14 species of reptile and 4 species of frog being found.

At the central western NSW site, the trap lines consisted of two 20 litre buckets, two 15cm diameter PVC tubes, and four funnel traps placed in pairs on either side of the fence. A total of 40 animals were caught in the traps; 29 (72.5%) in funnels, 5 (12.5%) in buckets and 6 (15%) in tubes.

Twenty reptiles comprising 13 species were caught. Fifteen in funnels, 3 in buckets and 2 in tubes. Three Blind Snake species were caught; *Ramphotyphlops wiedii* in a bucket, *R. proximius* in a funnel, and *R. bicolor* in a tube. The Box-patterned Gecko (*Lucasium steindachneri*) was only caught in a tube, while the Beaked Gecko (*Rhynchoedura ornata*) was caught in both buckets and funnels. The other 8 species were all caught in funnels.

Again there was heavy rain during the survey, resulting in numerous frogs. Twenty captures of one species of frog, the Desert Tree Frog (*Litoria rubella*), resulted from 15 caught in funnels, 3 in tubes and 2 in buckets. One mammal, the Common Dunnart (*Sminthopsis murina*), was caught in a tube. Apart from trapping, systematic searches located an additional 11 species of reptile and 8 species of frog.

So what does this tell us? Obviously don't put all your eggs in one basket or all your reptiles in one

trap. For reptiles, funnels definitely catch more animals and more species than buckets. Certainly I have caught in funnels, all the lizard families in NSW plus blind snakes and elapids. As yet, I have not caught any pythons or colubrids, but I see no reason why they would not enter the funnels. For frogs, the tree frogs (*Litoria*) were more frequently caught in funnels – they can of course easily climb out of buckets. The other interesting aspect of these two surveys was the species that were not caught in any traps and only located by systematic searching by experienced herpetologists. These results point out one obvious fact: if you want to find out what reptiles are in an area, then spread the risk and utilise as many methodologies as possible.

Apart from the fact that funnels catch many more animals, they are far easier to carry, install and remove, and don't fill up with water. They have less impact on the site (no holes to dig or fill in), and certainly catch species that can get out of buckets like large snakes and lizards that can be a real nuisance by cleaning up anything trapped in a bucket then moving to the next bucket. At least in a funnel trap, they can't move on but can be relocated a distance away.

I have found funnel traps to be an extremely effective tool, but I must admit to having an each way bet by putting a couple of buckets along a trap-line if practical. The unanswered question is whether or not the animals just happened to hit the fence next to a funnel and that was the first trap they came to. Do some species deliberately avoid buckets for whatever reason? It would be a neat project to set up cameras along a trap-line to see what different species actually do when they come to the fence. Maybe next year.

Denny M. (2005). Reptile Funnel Traps – a road test. *Newsletter of the Ecological Consultants Association of NSW* 11/12:6-7

Review of Four Wire Cage Designs: Which to buy?

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Darkheart Eco-Consultancy

ECA Member and Consulting Ecology Editor

It's been nearly 10 years since I bought any quantity of wire cages, but gradual attrition due to theft has necessitated some replacements. Remembering that Google is your friend, I trawled the internet for purchase options.

One of the interesting things I immediately found was that I could buy all manner of wire cage traps on Ebay, of all places. I also found a number of websites (generally selling agricultural goods) which sold traps including the Shermans, and some which would not be legal in NSW (ie snares).

The range of wire cage traps is in no small part due to that mega-exporter and manufacturer of all things, China, supplying a range of trap designs and manufacturing materials. Review of the various designs though left me with the following observations:

- Most were of flimsy/thin material (ie unsuitable for a Quoll).
- Some had what I perceived as dangerous closing mechanisms or other design defects which begged animal ethics questions (see Photo 3 and 4).
- A lot are designed to catch mice and rats, surprisingly.
- Most were based on a hook-trigger, when treadle designs are better for animal safety and effectiveness, in my opinion.

Despite this, I found two Australian manufacturers on Ebay: Wiretainers and P&L Wire Products. Both made treadle style traps which appeared to be of similar dimensions similar to the Mascot Wire Works traps that are generally the stock and trade of NSW consultants.

I thus purchased a trap from each manufacturer (see photos below), plus an imported folding trap for a price that seemed too good to be true, to compare.

Below: Photo 1. The four traps

From left to right: Imported collapsible, P&L, Wiretainers and Mascot. Elliot A for reference.



Below: Photo 2. Front gate on imported collapsible cage. Spring in mid-ground is the trigger.



Below: Photo 3. View of back gate of collapsible trap. Note flimsy gate lock (either chain or bar equally ineffective) and gap which also occurs at front. The gap is on either side.



Below: Photo 5. P&L Rear gate and lock. Unlock by pushing down. Spring maintains lock in position, and does not need manual setting once gate is closed.



Below: Photo 4. P&L trap trigger mechanism. Note spring to close front door faster. This reduces the risk of the sliding lock being stuck halfway down.



Below: Photo 6. Front trigger on Wiretainers. Essentially the same as Mascots.



Below: Photo 7. Rear door on Wiretainers. Note no gate lock, and flange on inside of cage that may allow an animal to lift the gate.



Below: Photo 8. Trigger on Mascot



Table 1 summarises the comparison in price and physical attributes.

Table 2 provides an assessment of the design features based on an arbitrary score of 1-3 (poor to excellent).

Below: Photo 9. Rear gate lock on a Mascot
Note ready access by trapped animal than can allow unlocking, but also the reliance on the user to set the lock



Table 1: Cost and physical characteristics of the traps

	MASCOT WIREWORKS	WIRETAINERS	P&L Products	Wire	IMPORTED COLLAPSIBLE
COST (incl. delivery to postcode 2443).	\$165	\$140	\$120		\$65
LENGTH (mm)	600	82	900		820
WIDTH (mm)	310	31	30		290
HEIGHT (mm)	315	30	28		320
WEIGHT (kg)	4.5	5.5	6.5		5

Table 2: Comparison and evaluation of trap features

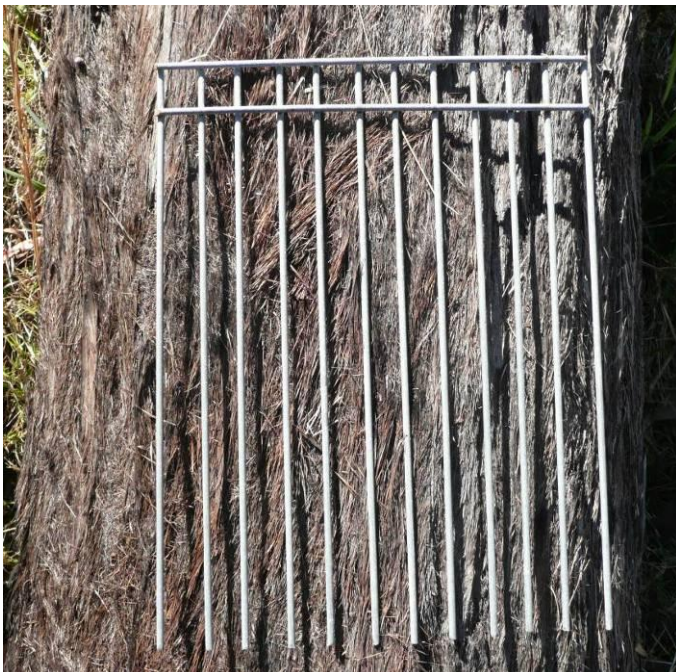
	MASCOT WIREWORKS	WIRETAINERS	P&L Wire Products	IMPORTED COLLAPSIBLE
Build quality and Durability	2: Reasonably thick wire but design prone to wire bending and breaking at welds by animal teeth. Rear door cannot be pulled out of trap.	2/3: Cross-hatch design makes it bite resistant, but rear door is flimsy thin metal sheeting. Frame bending excess weight rendering rear door unclosable. Door can be pulled right out of trap.	3: Solid, thick wire. Rear door attached to frame. Tough trap	0: Light gauge wire, not galvanised. Weak crimps holding joins. Large gaps between flimsy/flexible walls and gates. Quoll would rip through it.
Front Gate and Lock Design	2: Sliding lock may get stuck if runway is bent during packing.	3: Sliding lock has a bit of friction on runway, but otherwise very durable.	3: Sliding lock design similar to Mascot, but more durable. Spring loaded door.	1: Dangerous mechanism risks animal injury. Very noisy. 25mm gap either side of gate encourages attempted escape and hence risk of entrapment against gate, with associated stress and injury risk.
Rear Gate Design	2: Good gate though sheet design.	1: Light material and top flange poses risk of predator lift. Flange on inside base poses high risk of lift by trapped animal. Flimsy sheet steel prone to bending when inserted.	3: Same as front gate with small gap.	0: Weak and falls open when lock undone. About 25mm gap either side encourages animal to try to escape – very high risk of injury.
Front Trigger Design	3: Simple (wire end on bar) and easy to use. Easy to set very sensitive.	3: Good – single wire end design, but a bit thick.	2: Uses whole wire. Can be set sensitive but prone to wear reducing friction necessary to maintain grip.	1: Limited sensitivity. Feels like setting a rat trap.
Rear Door Lock Design	2: Latch requires manual locking and prone to unlocking by animal	0: Absent.	3: Self-locking. Spring loaded.	0: Consists of long pin on a chain best described as useless.
Stackability	2/3: Short design allows more traps to stack into a ute, but rigid handles need some puzzle-fitting. This is abated by the lack of cross-hatch wiring.	2: Rigid handles and cross-hatch wiring make stacking complicated.	3: Handles not fixed, hence only gate handle sticks up.	3: Folds very flat but doors stick out.
Animal Safety	2: No pointy wire ends (until wires break). No major gaps.	3: No pointy wire ends. No major gaps.	3: No pointy wire ends. No major gaps.	0: One could argue this is not a trap but a medieval torture device.
Treadle Design	2: Only one support wire. Treadle can be moved out of alignment.	2/3: Single wire support, but larger plate.	3: Huge plate and dual wire support. Very robust.	1: Flimsy.
TOTAL:	17/18	16/18	23	6

P&L also make and sell what is best described as a crush tool (see Photo 10). Like a cattle crush, this can be used to herd an animal to one end of the trap to allow inspection (eg sexing, checking for young, hair samples, etc). You simply insert the tool (which is essentially a fork) vertically into the cage to restrict the animal to one end of the trap. Due care would of course have to be taken to ensure the animal is not panicked and injured (eg by taking an eye out on one of the wires), and the length of time spent confined would have to be minimised. However, this useful tool could minimise the inherent “finger loss” risk of handling Spotted-Tail Quolls.

Table 3 summarises the Pro’s and Cons of each type of trap.

Overall, no trap was perfect. I ended up buying 5 more of the P&L traps based on durability and price, but I will buy more Mascot traps (next time I am Sydney to save freight costs) due to their light weight, shorter length and hence greater suitability for hiring out due to freight costs. Hence I will have a mix of both types to suit the situations I may face.

Below: Photo 10. P&L crush tool



All of these manufacturers have other designs to offer. Wiretainers and Mascott both sell collapsible designs, as well as smaller and larger (including double-entry traps). P&L Wire Products have fewer designs and no collapsible traps, but are the only ones who offer the crush tool.

Below: Photo 11. The crush tool in action holding a dangerous animal at bay.



Their websites are:

- P&L Wire Products: www.plwireproducts.com.au
- Wiretainers: www.wiretainers.com.au
- Mascot Wire Works: www.mascotwireworks.com.au

Table 3: Final evaluation of traps

MAKE	PRO'S	CON'S
Mascot Wire Works	<ul style="list-style-type: none"> • Light weight. • Short length can be an advantage in packing. • Proven design • Good trigger. • Relatively easy to stack. 	<ul style="list-style-type: none"> • Wires break when chewed and become injury risk. • Rear door lock can allow escapes and relies on manual setting each time. • Trap price and over-charged freight.
Wiretainers	<ul style="list-style-type: none"> • Price. • Build quality (cross hatch) • Cheap freight. • Good trigger. 	<ul style="list-style-type: none"> • Rear door design is a <u>major</u> defect. • Absence of rear door lock requires user to add one. • Vulnerability to frame bending. • Can't be readily stacked.
P&L Wire Products	<ul style="list-style-type: none"> • Price • Build quality. • Stackability. • Spring-closed front gate. • Excellent rear door lock. • Excellent treadle • Cheap freight. • Easy to stack trap on trap. • Crush tool • Best value for money. 	<ul style="list-style-type: none"> • Weight – hard to lug around the bush! • Weak trigger design – may be prone to setting with low sensitivity. • Long trap makes packing a bit harder, but can sit upright. • Tall gate handle can make packing and carrying a bit tricky.
Imported Collapsible.	<ul style="list-style-type: none"> • Collapsible • Light weight • Price 	<ul style="list-style-type: none"> • Dangerous design. • Poor build quality. • Suitable only for very quiet moggies or perhaps mud crabs.

Advertising Opportunities with the ECA

Website:

1. \$200 for a banner
2. \$300 for company name with some detail and a link
3. \$500 for company name within box, logo, details and web link

All website packages run for one financial year and include a small ad in any newsletter produced during the financial year.

Newsletter:

1. \$100 for a third of a page
2. \$250 for a half page
3. \$500 for a full page
4. \$1 / insert / pamphlet

Advertising is available to service providers of the Ecological Consulting industry. The ECA will not advertise a consultant or their consulting business.

If you wish to advertise, please contact the ECA administrative assistant on admin@ecansw.org.au.

Recent Bat Research Relevant to Ecological Consulting in NSW: A review from the 14th Australasian Bat Society Conference, 12-14th July 2010.

Amy Rowles

ECA Administrative Assistant

Ecotone Ecological Consultants

The 14th Australasian Bat Society conference was held during July in Darwin. The event was held over three days at the Art Gallery and Museum. The first day included four sessions of Student Papers. Day two contained sessions on: Captive Care and Development; Survey Methods and Results; and Translocation, Roosting and Foraging. Day three began with a session on Echolocation and Activity Patterns, followed by Conservation and Education, with a final session discussing the Christmas Island Pipistrelle extinction. Thirteen poster papers were also presented.

In this article I would like to summarise some of the information presented that would be relevant to consultants working in NSW.

East Coast Freetail Bat

As part of Anna McConnville's PhD work on the East Coast Freetail Bat *Mormopterus norfolkensis*, she investigated landscape scale habitat use by the species. Cleared and semi-cleared landscapes were found to have higher activity levels than urban or forested landscapes. Riparian sites were found to have greater activity levels.

Grey-headed Flying-fox

Heather Baldwin presented her preliminary research on the population genetics of Grey-headed Flying-fox. Preliminary results show a high level of dispersal and some natal philopatry[#] in permanent colonies. The final results of this

study will provide valuable information for the management of the species throughout its range.

Habitat Use by Microbats

A poster presented by Caragh Threlfall *et al* discussed urbanization and its effects on the distribution and activity of insectivorous bats in Sydney. The authors found that the 'average nightly activity was significantly higher in bushland sites compared to open space sites'. Variation in geology was linked to variation in activity and richness, hence the authors suggest that 'productivity in shale areas is higher thus affecting insect density and bat response'. The question of productivity was discussed by a number of speakers throughout the conference. Some reference to historical productivity (pre-European clearing) was also used to potentially explain why some species show a high preference for cleared areas, riparian zones etc. Generally high productivity areas have been cleared for agriculture and may still hold some significance/benefit to the bat populations.

Bat Survey Techniques

A workshop on the recent advances in techniques for bat surveys provided some insight into the future direction of bat surveys, as well as some cheaper alternatives.

Kyle Armstrong has been experimenting with automated bat call analysis of WAVE signals based on Linear Coding and Geometric Distance. Terry Reardon demonstrated how he repaired his old Anabat microphones for \$30. Tim Pearson presented some cut-price alternatives to the Anabat Detector (however, they did not have the same functionality, but would be suitable for less scientific purposes).

Greg Richards discussed the use of the Binary Acoustic Technology bat detector and Sonobat software. Greg looked into this technology for a

project that required a large number of detectors, as they are a cheaper alternative.

Pascal Hirsch introduced recent advances in microcontrollers, MEMS microphones (smaller than a match head) and how this will evolve future bat detectors.

Roger Coles presented the prototype of his Nanobat detector. This detector will be about the size of a mobile phone and will allow the user to both view and store the calls. Roger hopes that his new detector will be available at a cheaper price than the current detectors that offer similar features.

Clare Hourigan discussed the benefits of using a CF GPS with the Anabat SD2 for field surveys. These GPS systems are available from Titley Electronics.

Terry Reardon demonstrated the use of an exorbitantly priced thermal imaging camera and missile tracking software to count bats. Terry has been using this system to count bent-wing bats at Naracoorte Caves in South Australia and has found it to be very accurate when set up correctly. Michael Pennay also presented a paper about a project he was involved with, that used this same technology to count Eastern Bent-wing Bats using two maternity caves. By comparing manual counts of the footage with the missile tracking software, it was demonstrated that the software is very accurate with errors within 1.5%. The software is able to calculate the data in minutes as opposed to the hours required for manual counting.

Weather protection for Anabats

Deciding on how best to weatherproof your Anabat Detector is a difficult part of bat surveys. There is that compromise between the safety of your equipment and the reduced performance of the detector. Those of you that read the last

newsletter would recall an article on the use of condoms to protect detector microphones. The authors found that although condoms reduced the effectiveness of the detector to some degree, results were adequate to warrant the use of this method to protect the microphone when needed (Engel *et al* 2010).

At the conference, Michael Pennay presented a paper on weather protection devices for anabat detectors and their impacts on detector performance. Michael used sound reflection devices, tubing over the microphone (with a 90 degree bend) and weatherproof membranes (e.g. condom and umbrella), as well as a control with no weather protection. Michael found that all weather protection devices reduced the central range of the detector (i.e. distance calls could be detected from). The tubing however resulted in a broader range than the control (i.e. detection from wider angles). All weather protection devices, except the plastic tubing resulted in a significant loss of identifiable calls and number of species recorded. A few more of these experiments on this topic would be very useful for those of us regularly setting detectors.

Hendra Virus

The general public tend to associate bats with disease. Flying-foxes have been linked to the Hendra Virus and this leads to concerns for the health of people and livestock in areas where these bats occur. Hume Field from the Australian Biosecurity Cooperative Research Centre for Emerging Infectious Diseases gave a very informative presentation on how bats appear to be involved with the life cycle of this disease. The disease has low infectivity, but there is a high chance of fatality for both horses (75%) and humans (50%) once infected. Flying-foxes are the natural hosts of the virus and do not appear to have symptoms when infected. Horses become infected most likely from contact with flying-fox urine and fruit spats. Human cases have resulted

from direct contact with an infected horse. There is no evidence of bat to human transmission. There is no curative treatment or vaccine currently available.

The risk of horses contracting the disease can be reduced by fencing off areas that contain popular feed trees for local flying-foxes and keeping horses outside roost sites. It is currently believed that the virus has been present in flying-foxes in Australia for some time and is not a new disease. It is likely that the modifications that have been made to their habitat have increased the interactions between bats and horses, allowing the disease to emerge in horses and humans.

References:

Program and Abstracts of the 14th Australasian Bat Society Conference: Darwin 12-14th July, 2010.

Engel D., Bloomfield S. and Edwards J. (2010) A Waterproofing Option for Anabat Detectors – Protecting Your Tool. *Consulting Ecology* **24**: 51-58.

Glossary:

natal philopatry is exhibited in a species when an individual returns to their birthplace in order to breed.

Myrtle Rust (*Uredo rangelii*) Outbreak

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We (I&I NSW) are currently working to contain an outbreak of Myrtle Rust, an exotic fungus that could impact on native vegetation throughout Australia.

It is crucial that we spread awareness of this pest through as many professional channels as possible.

The following website contains some important source of information on the Myrtle Rust outbreak, including quarantine areas.

<http://www.industry.nsw.gov.au/info/myrtlerust>

If you see anything similar to Myrtle Rust, please report it to the Exotic Plant Pest Hotline on 1800 084 881.

Plates 1 and 2. Newly formed bright yellow pustules of Myrtle Rust on *Agonis flexuosa* c.v. Afterdark (Photos courtesy of A. Carnegie)



Plate 3. Older lesions of Myrtle Rust on *Agonis flexuosa* c.v. Afterdark (Photos courtesy of A. Carnegie)



Plate 4. Newly formed bright yellow pustules of Myrtle Rust on Turpentine (Photos A. Carnegie)



Regional Reports

This column of Consulting Ecology, encourages those regional members to let the rest of us know what issues they are facing in their area. If you are a regional member and have something you would like to share with the membership, please consider contributing to this column.

No contributions this edition.

Environmental consultant convicted of causing damage to koala habitat at Taylors Beach, Port Stephens

Orogen Pty Ltd and its director Anthony Fish have been convicted in the Land and Environment Court of causing damage to habitat of threatened species, namely the Koala, knowing that the land concerned was habitat of that kind. Orogen and Mr Fish provided a developer with advice on what vegetation could be lawfully cleared on the property but failed to advise that damaging the habitat of the Koala was unlawful under the National Parks and Wildlife Act. Both Orogen and Mr Fish were aware that the property contained habitat of the koala and koala movement corridors. Vegetation containing Koala habitat was subsequently cleared. The offences occurred at a proposed development site at 60 Port Stephens Drive, Taylors Beach, at the intersection with Sky Close.

Orogen and Mr Fish both pleaded guilty. Orogen and Mr Fish were fined a total of \$15, 000. The company was also ordered to pay the prosecutor's costs and investigation expenses.



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Consultant Prosecuted because of Clearing Advice

Tony Fish

Business Manager, Orogen Pty Ltd

Orogen Pty Ltd, an environmental consultancy company on the mid-north coast of NSW, and its Director Tony Fish, have pleaded guilty and been convicted of an offence under the National Parks and Wildlife Act 1974 of Causing Damage to Threatened Species Habitat (clearing of Koala habitat) knowing that the land contained habitat of that kind.

This is the first time an environmental consultancy rather than the contractor, developer or landholder has been prosecuted for the unlawful clearing of vegetation/Threatened Species habitat.

The offences occurred when Orogen provided advice to a developer in relation to the vegetation it sought to clear on industrial zoned land at Taylors Beach, NSW. The offences occurred as a result of an oversight. Orogen failed to identify that a licence was required under the *National Parks and Wildlife Act 1974* to clear vegetation on the industrial zoned land unless development consent had been gained for the industrial subdivision or development of the land.

The clearing advice was provided to the client following a review of available on-line DECCW information relating to vegetation/habitat clearing and consultation with the local CMA and Port Stephens Council. Despite this review and consultation, the specific requirement of the NPW Act was not flagged and hence the consultancy advice was provided in error.

The clearing works were undertaken by a contractor under supervision of the developer's project manager.

The key lessons learnt from the case that are relevant to the industry are summarised as follows:

- Project briefings need to include a thorough legislative review process;
- Consultants need to understand their role in relation to third party briefing of site contractors;
- Scope of works for provision of advice needs to clearly articulate roles and responsibilities of clients, consultants and contractors in carrying out any site works;
- Outcomes of site meetings should be recorded and confirmed with all stakeholders; and
- Consultants should consider undertaking a legal review of advice provided to clients in circumstances where site works are proposed in the absence of development consent for such works.

Orogen General Manager Des Wheeler said that Orogen sincerely regrets the destruction of koala habitat and recognises that erroneous advice was given in relation to the permissibility of clearing of vegetation at Taylors Beach.

"Orogen made a serious mistake in this matter and we are very sorry for that". Mr Wheeler said. "We have learnt from this incident and have undertaken internal system improvements to ensure that it does not occur again".

After recognising its mistake and pleading guilty to the offence, Orogen offered to carry out an Environmental Project in Port Stephens as a contribution to environmental sustainability in that area. The Court accepted this offer and issued an Environmental Service Order to conduct detailed mapping of koala habitat. This environmental project will result in improved knowledge, and hence protection, of Koala habitat

which will significantly contribute to environmental sustainability in Port Stephens.

Orogen will undertake this project in consultation with Port Stephens Council and the Department of Environment Climate Change and Water (DECCW), and will also utilise the expertise of the Australian Koala Foundation.

“Orogen is looking forward to working closely with Council, DECCW and the community to provide valuable and thorough mapping of Koala habitat in the Port Stephens Local Government Area,” Mr Wheeler said.

[Notice: The performance by Orogen Pty Ltd of part of this project is part of a penalty imposed by the Land and Environment Court following conviction for the offence of causing damage to the habitat of the Koala, knowing it was habitat of that kind.]

Contributions to the Newsletter, Volume 26

Contributions to the next newsletter should be forwarded to the editor, Jason Berrigan editor@ecansw.org.au or the administration assistant Amy Rowles admin@ecansw.org.au by the **1st of January 2011.**

- Articles may be emailed in WORD, with photos included or referenced in an attached file as a jpg.
- Please keep file size to a minimum, however there is no limit on article size (within reason)
- Ensure all photos are owned by you, or you have permission from the owner
- Ensure that any data presented is yours and you have permission from your client to refer to a specific site (if not please generalize the location).
- All articles will be reviewed by the editorial committee, and we reserve the right to request amendments to submitted articles or not to publish.
- Please avoid inflammatory comments about specific persons or entity

The following contributions are welcome and encouraged:

Relevant articles
Anecdotal ecological observations
Hints and information
Upcoming events
Recent literature
New publications (including reviews)
Member profiles
Photographs

Are you required to offset your development?

Biodiversity Lands specialises in the sale of biodiversity offset ready sites with each site strategically located adjacent to State or National Parks and within proximity to expanding development areas within NSW.

For further information, contact Grace Strachan or Jamie Boswell on (02) 9233 2588 to arrange portfolio documents or email grace@hardieholdings.com.



BIO Lands

10,360ha – 10 diverse locations
Ecological assessments completed



"Non-ECA promotional material presented in the ECA Newsletter does not necessarily represent the views of the ECA or its members."

ECA Photo Gallery

(Photo Competition Entries)



Above left: Red-bellied Black Snake (*Pseudechis porphyriacus*). Photo courtesy of Narawan Williams.



Above Right: This Southern Rainbow Skink *Carlia tetradactyla* was trapped during recent fauna surveys near Wagga Wagga in southern NSW. A small skink (about 50mm snout to vent length), the males develop these beautiful colours in breeding season, presumably to attract females. Photo courtesy and copyright of Steve Sass, EnviroKey.



Above: Eastern Water Dragon (*Physignathus lesueurii*). Photo courtesy of Deborah Gleeson.



Left: red triangle slug, (*Triboniophorus graeffei*). Suspected of feeding on the algae on the porch. Photo courtesy of Adam Greenhalgh

ECA Photo Gallery

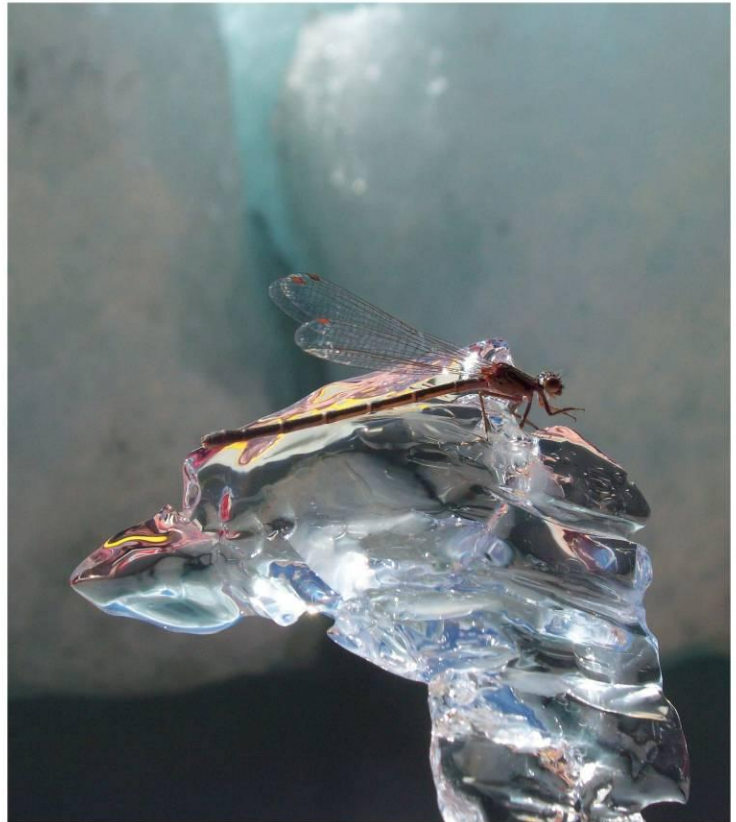
(Photo Competition Entries)



Left: A Holy Cross Toad *Notaden bennettii* emerges near Cobar after heavy rain which brought hundreds of individuals to the surface ready to breed. Photo courtesy and copyright of Steve Sass, EnviroKey.



Above Left: Sawfly Larvae . Photo courtesy of Narawan Williams.



Above Right: Dragonfly on ice in New Zealand. Photo courtesy of Emma Rawling.