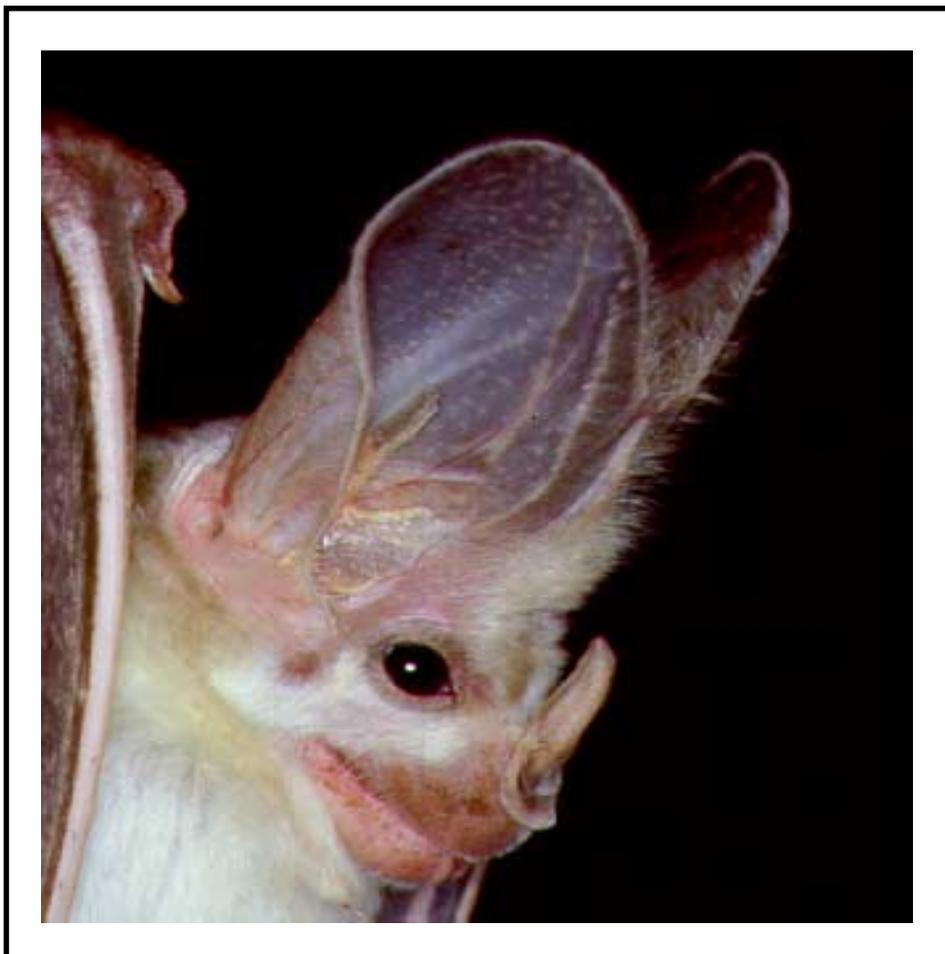

The Australasian Bat Society Newsletter

Number 13

September 1999



Ghost Bat *Macroderma gigas*

Photo: Lindy Lumsden

INSTRUCTIONS TO CONTRIBUTORS

The *Australasian Bat Society Newsletter* will accept contributions for one of two broad sections of the Newsletter. There are two deadlines each year: 21 February for the March issue, and 21 August for the September issue. The Editor reserves the right to hold over contributions for subsequent issues of the *Newsletter*, and meeting the deadline is not a guarantee of immediate publication.

Opinions expressed in contributions to the newsletter are the responsibility of the author, and do not necessarily reflect the views of the Australasian Bat Society, its Executive or members.

For consistency the following guidelines should be followed:

For Scientific Articles:

- Hard copy manuscripts should be posted to the Newsletter Editor at the address below.
- Electronic copy manuscripts should be submitted in plain text (ASCII) form on an IBM format 3½" floppy disk to the above address, or as an e-mail attachment, to the Newsletter Editor.
- Manuscripts should be submitted in clear, concise English and free from typographical and spelling errors.
- Papers should ideally include: Title; Names and addresses of authors; Abstract (approx. 200 words); Introduction; Materials and methods; Results; Discussion and References. References should conform to the Harvard System (author-date).
- All pages, figures and tables should be consecutively numbered and correct orientation must be used throughout. Metric units and SI units should be used wherever possible.
- Some black and white photographs can be reproduced in the Newsletter after scanning and digital editing (consult the Editor for advice). Diagrams and figures should be submitted as "Camera ready" copy, sized to fit on an A4 page, or electronically as TIFF or BMP image files. Tables should be in a format suitable for reproduction on a single page.
- Manuscripts are not being refereed routinely at this stage, although major editorial amendments may be suggested and specialist opinion may be sought in some cases. Articles will generally undergo some minor editing to conform to the *Newsletter*.

For News, Notes, Notices, Art etc.:

Hard copy should be posted to the Newsletter Editor at the address below. Electronic copy should be submitted in plain text (ASCII) form on an IBM format 3½" floppy disk to the address below, or as an e-mail attachment to the Newsletter Editor. Manuscripts should be submitted in clear, concise English, and free from typographical and spelling errors. Art in the form of line drawings and other monochromatic media may also be submitted. Some black and white photographs can be reproduced in the *Newsletter* after scanning and digital editing (consult the Editor for advice).

Special notes for electronic submission:

Although electronic submission is strongly encouraged, there are a few ground rules. Plain text (ASCII) is by far the best format to eliminate system/software compatibility problems, and can easily be sent as part of the body of an e-mail message. This is the most *convenient* way for the Editor to receive text generated on an Amiga or Macintosh. If attaching formatted DOS/Windows files to e-mail, please remember to say what word processing package has generated the file. The Editor's system can decode UU, MIME and BinHex attachments.

If none of this makes sense, please ask for advice from your local computer guru, system administrator or Internet service provider (ISP).

President

Bruce Thomson
QNPWS
Dept. of Environment
Toowoomba Qld 4350
ph 07 4639 8324
fax 07 4639 4524
bruce.thomson@env.qld.gov.au

Secretary

Peggy Eby
PO Box 3229
Tamarama NSW 2026
ph/fax 02 9387 6134
p.eby@ozemail.au

Newsletter Editor

Nicola Markus
Veterinary Anatomy and
Pathology
University of Queensland
St Lucia Qld 4072
ph 07 3365 2544
fax 07 3365 1355
n.markus@mailbox.uq.edu.au

Editorial

Fieldwork – if it doesn't kill you, it's got to make you tougher!

Over the past two years of studying flying-foxes in suburban Brisbane, I thought I had seen it all – winos, hobos, street-kids, curious residents, 2 million possums and the odd bat. And, while suspicious stares from alarmed residents are par for the course (“Yes, I know it’s past midnight, but my bat is in your yard – anything flowering or fruiting?”), some have gone to great lengths to guard their families against obvious fruit-loops like myself. Thus, I have met a few nice security guards, a couple of not-so-nice-ones and some ever-so-helpful police officers (“OF COURSE you are radio-tracking a flying-fox – what else would you be doing at 3.00am on a remote industrial estate?”). Oh, yes, - gun-shots, guard dogs, RBT’s and flat tyres – I have weathered them all.

It was with reasonable confidence, therefore, that I recently embarked on a three-week trip to Madagascar, to help catch and track *Pteropus rufus*, the Madagascan flying-fox. As a former French colony, the majority of Madagascar’s land is in private ownership and still administered in an almost feudal system. So, it was on a moonlit night, while my colleagues from Aberdeen University and I were excitedly tracking the first of our collared animals through the sisal fields, that we found ourselves suddenly surrounded by a group of scantily-clad men wielding large spears and very sombre expressions, indeed. These, we knew, were ‘guardiens’, the protectors of the land.

Did any of us speak Malagasy? Not much, no. Did the guards look like they meant business? You betcha! And were we in fact trespassing on private land? Hmm, well, there weren’t any signs, but... Thankfully, some smooth talking by a bilingual, friendly Malagasy saved the day and we lived to tell the tale. But if anyone would like to nominate me for a ‘Bravery in the Service of Flying-fox Research’ award, I may be willing to accept the nomination ...

Thank you once again to all those people who have contributed to yet another substantial issue of this newsletter. Features include everything from handy hints (‘Monitor mode: a new Anabat software feature ...’, p. 16; ‘The Simple Bat Detector’, p. 20) to some food for thought (‘Commercial harvesting of flying-foxes’, p. 29), conference up-dates and some great scientific contributions. In the past six months, I have had requests for reprints of articles from the newsletter from as far afield as Norway, Poland and the U.S., showing how widely read even an informal publication such as this one may be.

Don’t forget to register for the up-coming 9th ABS conference in the Hunter Valley – detailed info and registration forms are included in this issue. The info is situated in the centre of the newsletter in case you want to lift it out, and the registration form is loose for ease of sending off.

‘Til next time, keep up the good work!

Nicki Markus
Editor

President's Report

The Society's first Financial General Meeting was held in Brisbane on the 7th May 1999 and proved to be a most interesting and informative event. Those of you who perused the notice for the meeting would have seen that we had made tentative arrangements to have Dr Don Henry from the ACF talk to us about advocacy. In fact, as it turned out, he was unable to attend but we did manage to organise Jan Oliver at very short notice, to talk to us about this issue. Jan is Director of the Wildlife Preservation Society of Queensland and I extend our very special thanks to her for the wonderful presentation she made at the meeting.

Jan's position with the WPSQ is a full-time one and, like the directors of other large conservation groups, she works long hours to research and present the Society's position. She provided a very interesting insight into the WPSQ's advocacy work and, in particular, the adversarial role that the Society adopted on various issues.

So what did we learn about advocacy and what did we decide about advocacy for the ABS?

From our discussions with Jan it became quite apparent that, with our part-time executive and limited resources, we would not be able to engage in the intensive type of advocacy that larger conservation groups are able to sustain. We thus need to consider targeting those activities which we feel most comfortable with and those which are going to give us the best returns for the efforts that we invest.

We have also been fortunate in obtaining some information on advocacy from WWF Australia, and their guidelines have provided us with some additional insights.

The points that I have listed below outline a suggested advocacy policy for the ABS which will still require further refinement. We are very keen to canvas the views of members before any definite policy is adopted. Hopefully these points will provide a starting point. Before I present them, however, there is one more point of clarification: as you know, we have been working slowly towards the development of ABS conservation position statements on a number of subject areas. How do these relate to our advocacy policy? Well essentially, our advocacy policy will define how we use our position statements, how we present our position and how we negotiate and conduct ourselves in the pursuit of our conservation goals.

Our advocacy policy will aim specifically to:

- Translate the results of field work, research and experience into specific decisions and policies which benefit the conservation of bats.
- Adopt a positive approach to environmental issues and seek to build cooperative and productive relationships with decision-makers by providing scientifically accurate, expert advice and factual information.
- Take an active role in providing information to all parties involved in bat conservation issues.
- Build strong ties with larger conservation organisations and provide them with expert advice and factual information on key bat conservation issues so that they may adopt a more informed, adversarial approach to these issues if required (backed by a much larger membership and with greater lobbying power).

It will also adopt the following points from the WWF guidelines (not all, since some are embodied in the philosophies of the above points):

- To be politically non-partisan.
- To be non-ideological. By that we mean that we recognise that there is a range of stakeholders involved in conservation issues and so we do not rule out working with any of them through 'anti' ideologies, ie. refusing to work with corporations, mining companies, etc.
- To be scientifically accurate and to do our homework on conservation issues well before we engage in any actions.
- To stay within our area of expertise.
- To follow due processes internally. Advocacy needs to be approved by the ABS executive.
- To stick to our conservation principles and not engage in personal or institutional attacks (but to address the subject matter of the debate only).

I would ask all members to read this carefully and to think about the issues involved. We are all well aware that our membership demands that the ABS be actively involved in advocacy. It is vitally important that we set up an appropriate basis for this to occur. I would be very pleased to receive suggestions and comments, criticisms and praise on this subject! Please take the time to give positive, as well as negative feedback. The Executive wants to know the views of all members.

Bruce Thomson
President

E-mail: Bruce.Thomson@env.qld.gov.au Phone: 07 4639 8324 Fax: 07 4696 8852

Or post your comments to:
The Secretary
ABS Inc.
PO Box 3229
Tamarama NSW 2026

- Research Articles and Reviews -

Centralian bats come to cyberspace

Alexander Herr
Environmental Studies Unit, Charles Sturt University

Two weeks of bat work in central Australia was a warm change from the cold weather in Bathurst, NSW. I visited Phil Wise who works with the Parks and Wildlife Commission Northern Territory (PWCNT) to undertake fauna surveys. The PWCNT recently increased the intensity of formal fauna surveys concurrently with the development of their GIS database. Only recently have bats been included into these surveys (Wise 1999).

The task was to undertake fauna surveys at Trepina Gorge Nature Park (80 km east of Alice Springs) and Ruby Gap Nature Park (200 km north-east of Alice Springs). At the time of the first survey, I was the only person inoculated against lyssavirus, thus it was my task to capture and identify the bats and to record reference calls. Luckily, towards the end of the week, when long nights took their toll, Dennis Matthews joined in. At Trepina Gorge, with combined efforts using triplines set at a permanent water hole, and mist nets, we managed to catch seven species of bats (Table 1) and record their reference calls. During reference call recordings, Garry (another ranger from Arltunga) and myself fell victim to angry bats that sunk in their teeth to draw blood. So post rabies exposure needles were required. Consequently, we drained the supply of rabies post-exposure vaccine in the NT in the short term. In the second week surveys were undertaken at Ruby Gap. Traps and mist nets were set at a triplined waterhole. This effort yielded six bat species (Table 1). *Taphozous hilli* was not caught during these surveys, but was formerly identified from these areas on many occasions (D. Matthews and P. Wise pers. comm.).

One of the aims of the bat surveys was to establish a bat reference call library for Central Australia. This ANABAT bat call library will be available on the internet in the near future. The calls in this reference bat call library can be used to identify the bat species in Centralia. The intention of the effort is to replace trapping and handling of bats with non-intrusive ultrasound identification, thus reducing stress for the bats and needles for rabies post-exposure shots.

The fauna surveys undertaken by the PWCNT rely mainly on volunteers. As a result, expertise in bat call identification is unlikely to be on-site. Thus, Dennis Matthews is in the process of developing a system for bat surveys that requires minimal experience in bat call identification. The system will rely on ANABAT recordings, which will be processed with 'Analyse' (Jolly 1996). Using reference calls in combination with the methods suggested in Jolly (1996), it will be possible to identify the species occurring in Central Australia by their calls (D. Matthews pers. comm.). However, this requires that many more reference calls are collected for each species. The advantages of this proposed system are the minimisation of the handling of bats and the enabling of bat call identification by non-experts. This system has the potential to advance bat surveys over a large area in Central Australia.

Table 1: Bats detected using mist nets, harp traps and trip lines in Central Australia in May 1999.

Trephina Gorge	
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
<i>Mormopterus planiceps</i> (long penis form)	Southern Freetail Bat (long penis form)
<i>Mormopterus planiceps</i> (short penis form)	Inland Freetail Bat (small penis form)
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat
<i>Tadarida australis</i>	White-striped Freetail Bat
<i>Vespadelus finlaysoni</i>	Inland Cave Bat
<i>Vespadelus baverstocki</i>	Inland Forest Bat

Ruby Gap	
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
<i>Mormopterus planiceps</i> (long penis form)	Southern Freetail Bat (long penis form)
<i>Mormopterus planiceps</i> (short penis form)	Inland Freetail Bat (small penis form)
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat
<i>Tadarida australis</i>	White-striped Freetail Bat
<i>Vespadelus finlaysoni</i>	Inland Cave Bat

References

Jolly, S. 1996. Analysis of ANABAT files: bat echolocation call recognition. *Australasian Bat Society Newsletter* 7: 22-28.

Wise, P. 1999. A Report on an Insectivorous Bat Survey conducted in Arltunga Historical Reserve and Trephina Gorge Nature Park. Draft Report (unpublished), PWCNT Arltunga Historical Reserve.

^V^ ^V^ ^V^

Activity levels of insectivorous bats in urban and surrounding woodland areas in the Blue Mountains, New South Wales: preliminary findings

Alison L. Towerton
Forest Research and Development Division
State Forests of NSW
PO Box 100, Beecroft NSW 2119
alisont@sf.nsw.gov.au

Introduction

This study was an undergraduate project (B.Sc., UNE) which aimed to compare the presence of insectivorous bat species and foraging activity levels between the small urban areas and the surrounding woodland in the Blue Mountains, NSW. It is expected that greater levels of bat activity, higher species-richness and higher levels of foraging activity would occur in woodland, as this forest environment is likely to offer more roost sites, a greater diversity and abundance of foraging resources and a structure that provides many niches and opportunities for flight. However, observations of unidentified insectivorous bats flying overhead in our backyards and roosting in the shed or the roof of the house (A. Towerton, pers. obs.) indicates some species use urban areas.

The survey area was located in the mid-Blue Mountains within the townships of Woodford and Hazelbrook. The extent of urbanisation in this area is quite different to that of the typical Sydney region. Many housing blocks are larger than 0.1 ha ($\frac{1}{4}$ acre), spare blocks with native vegetation are scattered locally, backyards are generally well vegetated (often exotic), and the built up areas are usually found upon ridges surrounded by forested gullies.

Methods

Field Sampling

Three paired sites were chosen, one of each pair in an urban area and the other in the surrounding woodland, in order to measure bat activity (total number of bat passes) and feeding activity (total number of feeding buzzes). Paired sites were surveyed simultaneously for bats using two ultrasonic detectors (Anabat II - Titley Electronics). An attempt was made to make the general size of the urban areas comparable when choosing the three locations, with the sampling site located towards the centre of the area. The forest sampling sites were positioned at least one kilometre from the boundary with the urban area to minimise edge effects. The woodland sites were located on ridges with similar topographic position and altitude to paired urban areas. In the urban area the detector was directed down the length of a backyard and mounted up off the ground above fencelines, while in the forest they were placed on the ground and directed down the track. Each site was sampled for two non-consecutive nights, 12 sample nights in total. Bats were sampled in March and early April 1998 and avoided periods of full moon.. Sampling took place for 45 minutes within the first 1½ hours after sunset. Harp traps were used to capture bats so that reference bat sonar calls could be obtained.

Analysis

For each site the data were averaged over the two nights of sampling. Parametric tests (paired t-tests) were used (transformed $\log(1+x)$ data) after testing for significant difference in variances (F-test). Means are presented with standard errors.

The total number of bat-passes (to give an indication of total bat activity), the number of passes for each species and species richness were compared between the urban and woodland areas. An index of foraging activity was also calculated by summing the number of feeding buzzes (increase in pulse rate during attack phase on insect) at each site and dividing by the number of passes to account for the different levels of activity.

Results

Sonar

The total number of species recorded in the study was six, with only two, *Chalinolobus gouldii* and *Vespadelus regulus*, occurring in both woodland and urban areas. In urban areas *C. gouldii*, *V. regulus* and *V. darlingtoni* were recorded. In woodland areas *Tadarida australis*, *C. gouldii*, *V. regulus*, *V. vulturinus* and *C. morio* were recorded.

There were no statistically significant differences in mean species richness or mean total activity levels (both flight and foraging) between urban and woodland areas. However, total activity (again both flight and foraging) was higher generally in the woodland area (Figure 1). A total of 62 passes were used in the analysis with 70% recorded in the woodland area (Figure 1). The average number of passes within the urban area was 6.3 while the woodland average was 14.3 passes for the 45 minute period.

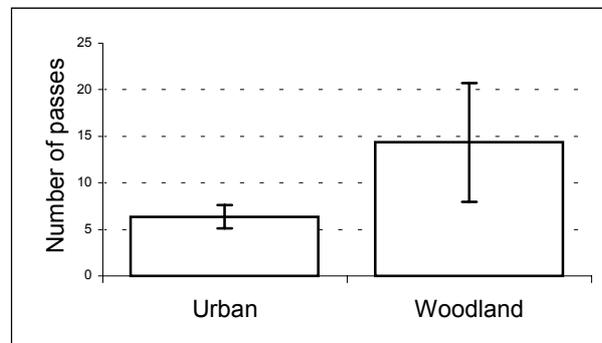


Figure 1. Mean number of passes (and standard error) within the 45 minute period in three woodland and three urban sampling areas.

About 32% of passes were placed in a category of unidentified passes which were sonar sequences that could not be identified or those only identified to a possible species. Because sonar calls of *Vespadelus vulturinus* and *Chalinolobus morio* were difficult to distinguish, I present only the results for *V. regulus* and *C. gouldii*. These two species differed in their activity levels in each area (Figure 2) with *C. gouldii* present at all three urban sites and only one woodland site while *V. regulus* was recorded at two woodland sites with high levels of activity and one urban site. However, the difference in mean activity for each species was not significant ($p = 0.3$). Temperature and wind records for the period of study showed that there was little variation observed in sample night conditions.

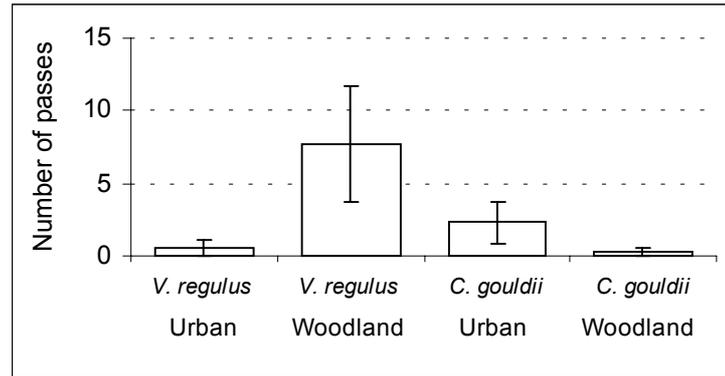


Figure 2. Mean number (with standard error) of passes for *Chalinolobus gouldii* and *Vespadelus regulus* in the urban and woodland areas.

Discussion

This pilot survey indicated that there was no statistically significant differences between species richness and bat activity in the urban and woodland sites. As an undergraduate project the study was limited by resources and therefore the number of sites sampled. Greater replication would have increased the confidence of these results. There was a trend for flight activity of the bats to be greater in the woodland than in the urban area (Figure 1). This is also evident in the bats foraging activity with two species, *Vespadelus regulus* and *V. vulturinus*, recorded foraging in the woodland and only one, *V. regulus*, in the urban area. Of the number of passes recorded for *Chalinolobus gouldii*, 86% were in the urban area while 94% of the passes for *V. regulus* were in the woodland. Kristen and Klomp (1998) also found that bat activity was greatest in the forest when comparing between rural and urban areas in southern NSW. They attribute this high activity level to the presence of the *Vespadelus* species, *C. morio* and *Tadarida australis*.

This trend may be related to the different manoeuvrability of these species. The flight pattern of *Chalinolobus gouldii* has been described as direct and rapid (O'Neill and Taylor 1986), and limited in manoeuvrability, preferring to forage in open habitats and as fast aerial feeders foraging close to and above the canopy or in gaps beside the canopy (Kutt 1995). Radio-tracking has demonstrated that *C. gouldii* successfully forages in rural towns (Kirsten and Klomp 1998) where they are able to fly among the many gaps and above the discontinuous structure provided by housing. Their study found that all the radio-tracked *C. gouldii* (13 females) visited urban areas to forage at illuminated sites and were found to roost in the forest, urban and rural areas. Of the eight roost sites six were located in dead sections of mature eucalypts, one in a dead sapling and one within a building. Mooy (1998) found that *C. gouldii* was one of the more frequently recorded species in the open areas of Cumberland State Forest in Sydney.

The trend for lower activity of *V. regulus* in urban areas could reflect small home ranges around roosts located in hollows found in woodland. An alternative is the species may avoid foraging in the more open and simple habitats found in urban areas. *V. regulus* is described as flying with great aerial agility, frequently spiralling and gliding as it changes direction (O'Neill and Taylor 1986). It is placed in the foraging guild described as medium to fast aerial feeders foraging below, inside and beside the canopy and sub-canopy with medium to high speed and manoeuvrability (Kutt 1995). *V. regulus* was found to be sensitive to extreme levels of forest fragmentation on the south-west slopes of NSW (Law *et al.* 1999).

To conclude, a number of bat species were recorded in urban areas of the Blue Mountains, but low replication probably accounts for the inability to distinguish differences in the activity of individual species from surrounding woodland.

Acknowledgements

Dr Brad Law is gratefully thanked for his help in all areas of the project. Chris Towerton and Graham and Joan Brooks are thanked for their assistance with field work.

References

- Kirsten, I. and Klomp, N. 1998 Microchiroptera in urban, rural and forest areas of southern NSW. *Australasian Bat Society Newsletter* **11**: 28-30.
- Kutt, A.S. 1995 Activity and stratification of Microchiropteran bat communities in thinned, unthinned and old lowland regrowth forest, East Gippsland. *Victorian Naturalist* **112**: 86-93.
- Law, B., Anderson, J. and Chidel, M. 1999 Bat communities in a fragmented forest landscape on the south-west slopes of New South Wales, Australia. *Biological Conservation* **88**: 333-346.
- Mooy, R. 1998 Undergraduate Project: The effect of the lunar cycle on the activity of bats within open and forested areas in Cumberland State Forest.
- O'Neill, M.G. and Taylor, R.J. 1989 Feeding ecology of Tasmanian bat assemblages. *Australian Journal of Ecology* **14**: 19-31.

^V^ ^V^ ^V^

Daytime retention of viable seeds in the gut of *Cynopterus sphinx* (Megachiroptera, Pteropodidae): implications for long-distance seed dispersal

Louise A. Shilton
School of Biology, The University of Leeds, UK &
Department of Forestry, Australian National University, ACT
Louise.Shilton@anu.edu.au

Abstract

Generally rapid food transit times (< 30 min) in fruit-eating bats has restrained consideration of their potential to transport small seeds long-distance. Regular daytime (>12 h) retention of food and viable fig (*Ficus*, Moraceae) seeds in the gut of *Cynopterus sphinx* necessitates a re-appraisal of their potential importance in transporting seeds to remote areas and facilitating gene flow between isolated populations of plants, both within mainland areas and across substantial ocean barriers.

Introduction

Van der Pijl (1957) reported a “peculiar disregard of bats” by early workers interested in seed dispersal, a sentiment echoed elsewhere (Docters van Leeuwen 1936; Whittaker and Jones 1994), and the colonization of remote islands by animal-dispersed plants has often been attributed almost entirely to birds (Ridley 1930; Docters van Leeuwen 1936; Carlquist 1967). Some birds retain viable seeds in their gut for ‘maximum’ periods sufficient to potentially transport them several thousand kilometres (Proctor 1968). Similar studies of fruit-eating bats have tended to report mean or mean minimum food transit times (*e.g.* Tedman and Hall 1985; Boon and Corlett 1989; Laska 1990; Utzurrum and Heideman 1991; Eby 1996). Such food transit generally occurs within 30 minutes, and these studies have inadvertently lent weight to the assumption that bats are unable to transport seeds long-distance (*e.g.* Whittaker and Jones 1994; Thornton 1996). A striking example of this is the recolonization of post-eruption Krakatau (see Shilton 1997). Although only about 40 km from mainland Java and Sumatra, the role of bats in transporting seeds to Krakatau has repeatedly been underrated, despite the early arrival of bat-dispersed figs (Docters van Leeuwen 1936; Thornton 1996).

Here I report the regular daytime (>12 h) retention of food and viable fig seeds in the gut of *Cynopterus sphinx* (see also Shilton *et al.* 1999). Field observations indicate that this behaviour may be widespread in the Megachiroptera.

When studying pteropodid bats in Indonesia (Bogor, Krakatau and Sebesi Island; Shilton 1997), *Rousettus* and *Cynopterus* bats captured around dusk were often observed to defecate dark, viscous faeces, that occasionally contained seeds, but uncharacteristically lacked the colour and texture of the fruits eaten (Thomas 1988).

During preliminary captive feeding trials, each of seven wild-caught *Cynopterus sphinx* were observed to produce faeces, sometimes voiding up to five or six separate faeces before feeding that evening. These faeces were dark and viscous, resembling those observed in the field, and easily distinguished from the usual faeces of rapidly processed food. When fig seeds were supplied with food on any one evening, small numbers (one to seven) of seeds of a species that had been provided

the previous evening were recovered from gut-retained faeces. Seeds of the figs used (*Ficus heterophylla*, *F. ribes*, *F. septica* and *F. variegata*) can be distinguished on seed coat texture and seed morphology (unpublished data), and seeds of a single *Ficus* species only were used in any one feeding trial (ie. on any one evening).

These observations of wild and captive pteropodid bats prompted me to hypothesize that they retain food in their gut through the day, most probably their last feed of the previous night, and that this retained food may include seeds. I conducted a series of experiments to test this hypothesis.

Methods and Results

Seven *Cynopterus sphinx* were housed individually in cages (450 by 600 by 800 mm) sufficient to enable limited flight (the wingspan of *C. sphinx* is about 400 mm; unpublished data). In the first experiment I conducted seven trials without seeds to test for daytime food retention. Food was withheld from the bats until either all the bats had defecated retained food or until at least midnight, whichever event came first. I checked for faeces produced from gut-retained food each hour. Uneaten food was removed at dawn (06:00), and the duration of food retention was estimated using 06:00 as the latest possible time for food ingestion. I thus report the period of food retention over and above the approximately 12 h daytime resting phase. Bats became active shortly before dusk (18:00) and made frequent short flights within their cage. This activity did not induce the production of faeces, which occurred between dusk and 22:00 (>12 to >15 h retention of food in the gut). Furthermore, defecation was not triggered by the use of an odorous bait (fresh cut paw paw suspended in a mesh bag outside each cage) on three of the seven nights. Gut-retained food was voided 1-3 h after dark (>13 to >15 h of retention) by at least five of the seven bats on each of these three evenings, and each of the seven bats produced retained faeces in the seven trials. I thus concluded that these bats regularly, perhaps routinely, retain ingested food in the gut during the daytime resting phase, from one night to the following evening. I then wanted to know if seeds could also be retained in this way, and if so, whether ingestion of seeds affected food retention.

I used seeds of two *Ficus* species, *Ficus septica* and *F. variegata*, that are each commonly consumed by *C. sphinx* in the wild (unpublished data) to test whether small seeds could be retained in the gut >12 h. Nine trials were conducted using seeds of *Ficus septica* on five evenings and *F. variegata* on four evenings. Figs were selected for use in trials on the basis of ripeness and the stage of seed development. The small seeds (1-2 mm diameter) were removed from figs and mixed with chopped paw paw. Seeds were present in nearly 80 percent of gut-retained food faeces produced by the bats in these trials, and each of the seven bats deposited some seeds in these faeces. In several instances, food and seeds were retained >18 h.

Seeds must be able to germinate in order for plants to colonize areas after intestinal transport. I therefore attempted to germinate seeds collected from the gut-retained food faeces described in the previous paragraph. Seeds were from three treatments: Control (non-ingested), Ingested (generally defecated within 1 h) and Retained (held in the gut >12 h). Seeds from each Ingested and Retained treatment were identified under a binocular microscope before sowing; all Retained seeds were of the *Ficus* species provided the previous evening. Each Retained seed was sown, as numbers were small (1 to 118 seeds), whereas a random sub-sample of approximately 200 seeds was sown from Control and Ingested treatments. Results are shown in (Figure 1). Seeds retained in the gut of *Cynopterus sphinx* >12 h germinated at least as well as control seeds in both *Ficus* species.

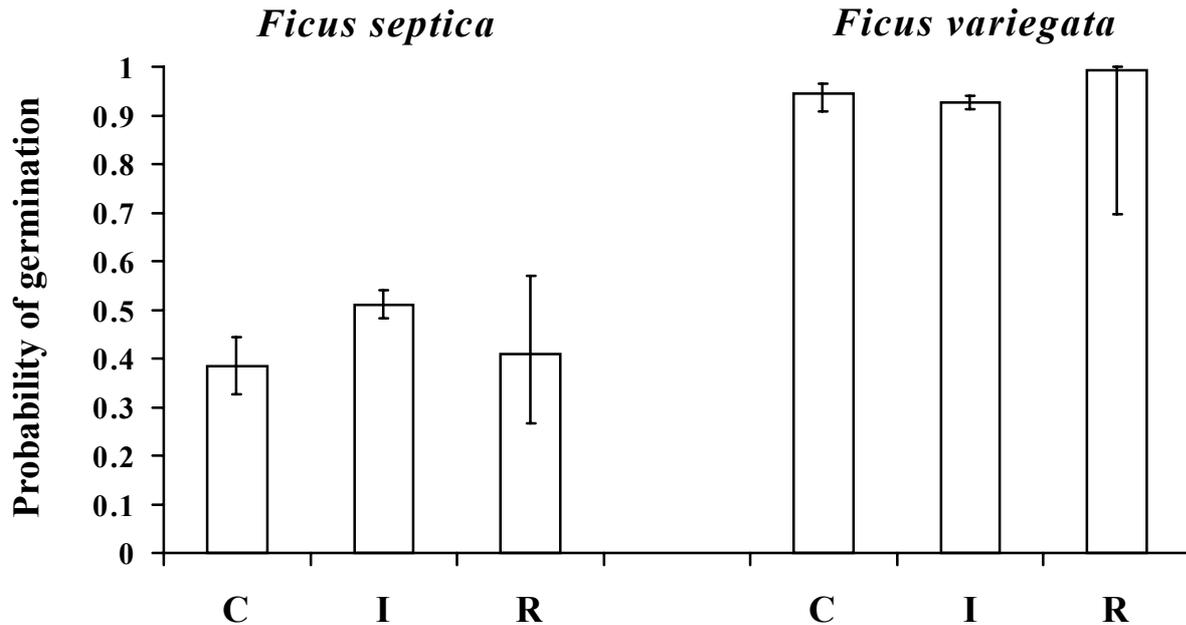


Figure 1. Probabilities of germination of *Ficus septica* and *F. variegata* seeds: C = control, I = Ingested, R = Retained.

Discussion

I suggest that seeds retained in the gut of *Cynopterus sphinx* (which commute at 25 km/h; unpublished data) could potentially colonize areas over 300 km from the parent plant. Since colonization events do not need to be frequent to be effective (Carlquist 1967), seeds dispersed in this way may be sufficient to establish populations of plants in remote areas. Pteropodid bats are highly mobile, and many species are known to undertake seasonal migrations in a number of regions (e.g. Marshall 1983; Thomas 1983; Eby 1996). Large *Pteropus* species may commute distances up to 50 km (van der Pijl 1957) during their nightly searches for food patches at speeds of 40 km/h (Richards 1990). Daytime retention of food and viable seeds in the gut indicates a greater role for pteropodid bats in long-distance seed dispersal than has been thought possible. This highlights both the importance of further research on pteropodid bats and the value of conserving them in a world where forest habitats are becoming increasingly fragmented.

Acknowledgements

My sincere thanks go to everyone who has helped me in some way during the course of my PhD studies. I am extremely grateful to my Indonesian sponsors, LIPI, Jakarta and PPPB, Bogor for the opportunity to carry out this research in Indonesia, and also to Bat Conservation International, The Royal Society's South-east Asia Rainforest Research Project and the University of Leeds Philosophical and Literary Society for providing financial assistance. I was funded by a University of Leeds (Boothman, Reynolds & Smithells) Scholarship.

References

- Boon, P. P. and Corlett, R. T. 1989. Seed dispersal by the Lesser Short-nosed Fruit Bat (*Cynopterus brachyotis*, Pteropodidae, Megachiroptera). *Malayan Nature Journal* **42**: 251-256.
- Carlquist, S. 1967. The biota of long-distance dispersal. V. Plant dispersal to Pacific Islands. *Bull. Torr. Bot. Club* **94**: 129-162.

- Docters van Leeuwen, W. M. 1936. Krakatau, 1883 to 1933. *Ann. Jardin Bot. Buitenzorg* **46-47**: 1-506.
- Eby, P. 1996. *Interactions between the Grey-headed flying fox Pteropus poliocephalus (Chiroptera: Pteropodidae) and its diet plants - seasonal movements and seed dispersal*. (PhD. thesis, University of New England, Australia).
- Laska, M. 1990. Food transit times and carbohydrate use in three Phyllostomid bat species. *Z. Saugetierkunde* **55**: 49-54.
- Marshall, A. G. 1983. Bats, flowers and fruit: evolutionary relationships in the Old World. *Biol. J. Linn. Soc.* **20**: 115-135.
- Pijl, L. van der. 1957. The dispersal of plants by bats (Chiropterochory). *Acta Bot. Neerl.* **6**: 291-315.
- Proctor, V. W. 1968. Long-distance dispersal of seeds by retention in digestive tract of birds. *Science* **160**: 321-322.
- Richards, G. C. 1990. The Spectacled Flying-fox, *Pteropus conspicillatus* (Chiroptera: Pteropodidae), in North Queensland 2. Diet, seed dispersal and feeding ecology. *Aust. Mammal.* **13**: 25-31.
- Ridley, H. N. 1930. *The dispersal of plants throughout the world*. L. Reeve & Co., Ltd: Ashford.
- Shilton, L. A. 1997. Seed dispersal by fruit bats on the Krakatau Islands, Indonesia. *Australasian Bat Society Newsletter* **8**: 8-15.
- Shilton, L. A., Altringham, J. D., Compton, S. G. and Whittaker, R. J. 1999. Old World fruit bats can be long-distance seed dispersers through extended retention of viable seeds in the gut. *Proc. R. Soc., Lond. B* **266**: 219-223.
- Tedman, R. A. and Hall, L. S. 1985. The morphology of the gastrointestinal tract and food transit time in the fruit bats *Pteropus alecto* and *P. poliocephalus* (Megachiroptera). *Aust. J. Zool.* **33**: 625-640.
- Thomas, D. W. 1983. The annual migrations of three species of West African fruit bats (Chiroptera: Pteropodidae). *Can. J. Zool.* **61**: 2266-2272.
- Thomas, D. W. 1988. Analysis of the diets of plant-visiting bats. In *Ecological and Behavioral Methods for the Study of Bats* (ed. T. H. Kunz), pp. 211-220. Smithsonian Institution Press: Washington.
- Thornton, I. W. B. 1996. *Krakatau. The Destruction and Reassembly of an Island Ecosystem*. Harvard University Press: Cambridge, Massachusetts.
- Utzurum, R. C. B. and Heideman, P. D. 1991. Differential ingestion of viable vs nonviable *Ficus* seeds by fruit bats. *Biotropica* **23**: 311-312.
- Whittaker, R. J. and Jones, S. H. 1994. The role of frugivorous bats and birds in the rebuilding of a tropical forest ecosystem, Krakatau, Indonesia. *J. Biogeogr.* **21**: 245-258.

^V^ ^V^ ^V^

Monitor mode: a new Anabat software feature that automatically saves bat calls to computer

Ryan R. Chick and Lindy Lumsden
Arthur Rylah Institute, Dept. of Natural Resources and Environment
123 Brown St., Heidelberg, VIC 3084

Monitor mode and its benefits

The Anabat system of ultrasonic detection is widely used in Australia and overseas, and most researchers working on insectivorous bats will be familiar with the available software and hardware (Chris Corben, California, USA, and Titley Electronics, Ballina, NSW). However, judging by the number of questions we have been asked recently about 'monitor mode', it appears that not everyone is aware of this new automatic file saving feature. In this mode, Anabat will automatically recognise bat calls (as distinct from other high frequency sound) and save them as computer files without a human operator needing to be in attendance. Monitor mode has allowed us to develop an improved method of detector sampling, which has proved particularly useful in broad scale bat surveys.

Monitor mode has been around for a while – since Anabat version 5.5 – and information on it has been included in the notes accompanying recent versions. However, it is not described in the Anabat instruction manual (Anabat5.asc), nor in the 'Anabat System Practical Guide' (de Oliveira 1998), as both were based on earlier versions. O'Farrell (1998) outlines a computer system based on monitor mode but doesn't describe the mode in detail.

It has long been recognised that calls saved directly to computer are of a much higher quality, and thus easier to analyse, than those saved initially to an audio tape. While most people already save their reference calls directly to a laptop computer and may use a laptop in surveys, prior to the availability of monitor mode this required an operator to be present to save the calls manually (either by pressing 'S' or pushing the 'cal' tone on the detector when the 'save on cal' function is activated).

Automatic saving and storage of bat calls ('set and forget' units) were previously possible only with a delay switch linked to an audio tape recorder. The tape calls then had to be downloaded in a separate operation to a computer using a ZCAIM. Using monitor mode, the delay switch and tape recorder are now redundant, and this intermediate and time-consuming step of downloading is eliminated. The calls are saved at the correct frequency, and the date and time are provided by the file name, thus the calibration tone and the talking clock provided by the delay switch are unnecessary.

The major benefits of a detection system based on a computer using monitor mode are:

- 1) the call quality is significantly better than that from tape recorders, and therefore a higher proportion of calls can be reliably identified;
- 2) there is considerable time saved by no longer having to download calls manually from tapes;
- 3) as the program has been written to recognise ultrasonic sounds that resemble bat calls, little in the way of non-target sounds are saved;

- 4) the duration of recording is not determined by the length of a tape: a full night of recording can be guaranteed provided the computer has sufficient battery life; and
- 5) the time of the call is saved directly in the file name and you don't have to try and work out what the talking clock is saying any more!

Basic operation

Monitor mode is very simple to use. It differs from record mode only in that the software now has the ability to recognise bat calls and save them automatically. The following notes are based on our experience with Anabat 5.7i.

To start a recording session in monitor mode you proceed as you would in record mode, with the detector connected to the ZCAIM, and the ZCAIM to the computer. In DOS check that the computer's date and time are correct, and then create the directory that you wish to save to. Run Anabat version 5.5 or later, load the new directory, and save the site details in the text buffer (using 'Ctrl F10'), and return to the graphics mode. Hit 'Ctrl n' to enter monitor mode (as opposed to 'Shift n' for record mode). The recording screen should now appear with the words "MONITOR MODE" in the top left-hand corner and the current time on the right. The computer will now automatically save ultrasonic sounds that resemble bat calls. The name of the last file saved appears below the current time as in record mode. Other commands of record mode still function in monitor mode, e.g. spacebar to stop recording; 'tab' to toggle between a scrolling and non-scrolling cursor. The "No ZCAIM found" message will still appear if your ZCAIM isn't properly connected.

Unlike record mode which can also be reached from the "MAIN MENU" (by typing 'n' for "New data") monitor mode can only be reached from the graphics mode, by typing 'Ctrl n'. Also, in our experience, computers that previously required a boot-up disk to correctly run earlier versions of Anabat still do so for the more recent versions featuring monitor mode.

Explanation of parameters

Upon entering Anabat you will notice that the "MAIN MENU" now carries a new "Autosave menu" option. This new option is where you tell Anabat what a bat call 'looks' like and when to save it. By altering the settings contained under this new menu you alter the instructions to the computer of what type of sound input to save. The software defines patterns of frequency change over time in terms of four parameters. Limits can be set for three parameters ("slack", "max. slope" and "minimum line length") which determine if a line of data points is defined as a bat call (discrete echolocation pulse). There must be at least two of these lines (ie. two pulses) in order for a file to be saved. Single pulses will not be saved. The saved file will contain all the data points present on the screen or in the buffer at the time of saving, not just those data lines that meet the criteria, ie. the usual background ultrasonics or poorer quality calls will also be saved providing that they occur amongst 'good' calls as defined by the parameters.

The file will be saved when the setting of the fourth parameter, the "between calls max." time, is exceeded. Alternatively, if a long sequence is being recorded, a file will be saved when 15 seconds has elapsed since the first pulse was detected. This is the time it takes the vertical scroll bar to cross the screen in real time ('F1') mode. In this regard it differs to the delay switch, and this needs to be recognised if comparing the level of activity based on the number of calls recorded using the two systems. A long sequence will be recorded in its entirety by the delay switch, whereas monitor mode will save the same sequence as a number of separate files at 15 second intervals. This will only be an issue at sites with very high bat activity. A file will also be saved when the buffer is

filled, but since it holds over 16,000 data points this is unlikely to occur except in instances of intense ultrasonic activity.

Detailed information on the four parameters, and the effect of altering them, is provided in Chris Corben's notes on new features of the recent versions of Anabat. Below is a summary of these, including the settings that we have used.

SLACK - For Anabat to recognise ultrasonic sound as a bat call, the data points must lie in a straight line. This means that for any three points, the middle one must be at a frequency which is the average of the ones either side of it. Altering the 'slack' allows this to be modified, but for most situations a value of '1' is appropriate.

MAX. SLOPE - The slope of the line of data points must not be too steep. According to Chris the default setting of 260 octaves per second is appropriate for most situations.

MINIMUM LINE LENGTH - There must be more than a certain number of points in a straight line. If this is set to '10', it means that at least ten points in a straight line must be found before the "Autosave" routine accepts that a bat call has been detected. Chris says that '10' is appropriate for most purposes, but low frequency calls of short duration may fail to meet this criterion. We found that at a setting of '10' some *Tadarida australis* calls were not saved. This problem was solved by reducing the setting to '5'. However, at this setting there is an increased risk of recording unwanted insect noise.

BETWEEN CALLS MAX. - The default setting is 5000 ms (5 sec). This means that a file will be saved once five seconds has elapsed since the last call was detected. It also means that there must be at least two pulses within a period of five seconds before a file will be saved. You can change this value, although there is no real disadvantage to leaving it at the default.

Hardware requirements

To use monitor mode for remote sampling we have developed units consisting of a laptop computer connected to a ZCAIM, detector and power supply, all housed in an inexpensive aluminium camera case (Fig. 1). A minimum of a 386SX computer is required to run Anabat, and we have used 386 and 486 laptops which were purchased from secondhand dealers for \$300-400 each. As the computer's internal batteries usually last only a couple of hours we have connected them to external 6V or 12V batteries as appropriate through a circuit breaker. Different computers have various power requirements and so it is necessary to determine this for each individual machine when setting up an external power supply. Our 12V laptop systems operate for over 15 hours on two 12V, 7Ah sealed lead-acid batteries, even on nights of high bat activity. As the system only saves sounds that resemble bat calls, the units can be set during the afternoon without the requirement for a night sensor as found on the delay switches. Hard disk size is not a critical consideration as each file saved is usually small; our laptops can store several thousand calls before space becomes limited. However, we recommend that files be backed up to external storage as soon as possible to guard against data loss from possible computer malfunction in the field. We have found direct transfer of files to a separate laptop, via a data cable using 'laplink' software, to be a quick and efficient system.

These units end up costing a little more than the standard tape recording systems, with a computer and ZCAIM required in place of the delay switch and tape recorder. However, the benefits gained by the lack of downloading time and the higher quality calls greatly outweigh this extra cost. We

have found this system to be a considerable improvement over the audio tape method and recommend it to anyone undertaking detector surveys.

Figure 1. One of our 'set and forget' computer detector units used for surveys of insectivorous bats.



Photo: Lindy Lumsden

Acknowledgements

We would like to thank Chris Corben for incorporating this improvement into Anabat. The automatic computer detector units we currently use were constructed by John Silins at ARI. Consultation with Ross Meggs of Faunatech and David Titley of Titley Electronics in the developmental stage of these units was useful. Graeme Newell commented on an earlier draft of this note.

References

- de Oliveira, M. 1998 *Anabat System Practical Guide*. Dept. of Natural Resources, Queensland.
- O'Farrell, M. J. 1998 A passive monitoring system for Anabat II using a laptop computer. *Bat Research News* **39**: 147-150.

_____ ^v^ ^v^ ^v^ _____

- Reports -

The Simple Bat Detector

This story starts with my recently found addiction to all things batty. This addiction is a result of my supervising of three students undertaking their practical project subject (Diploma of Applied Science) during 1998. Their project consisted of a bat survey of Plenty Gorge Parklands under the direct supervision of Brendan Sullivan from Parks Victoria. Although I have been an active member of the fauna survey group of the Field Naturalists Club of Victoria, my interest had always been with other mammals. This was soon to change.

Like most educational institutions, resources can be a problem, particularly when we are looking at such specialised equipment for surveys. Harp traps were not a problem thanks to the FNCV, but getting access to a bat detector was. We were fortunate enough to have Lindy Lumsden share a night of her expertise with us demonstrating the Anabat system. I thought if I could access a cheap bat detector, it could then be used for providing evidence of bats for the positioning of the harp traps.

After spending many hours on the Internet (what a great resource this is) I found it: Tony Messina's Simple Bat Detector site (<http://pw1.netcom/~t-rex/BatDetector.html>). I down-loaded the schematics and had the college's electronics department build the first one. Since then, I have built about a dozen bat detectors. They have their limitations in that the frequency range is limited to 30-60 kHz (which is fine for us down in the south) and, although you can record with them, they are not really suitable for the Anabat software. There is, however, a site where a spectrum analyser can be down-loaded as freeware, which is good for practice purposes (<http://www.monumental.com/rshorne/gram/html>). Such bat detectors serve the purpose of providing evidence of bat activity and act as an educational tool to allow others to experience the world of bats.

I suggest that it is worth taking a look at Tony Messina's site as he has some interesting projects on the go in the development of bat detectors at present. Tony's philosophy is that he wants as many people as possible to have access to affordable bat-detecting equipment - hence his posting of the schematics on the internet. I also have kits of Tony's simple bat detectors for those of you like me who like tinkering around. These are extremely simple to put together. In keeping with his philosophy, the kits can be purchased at cost of \$43.00. If anyone is interested, just contact me on the above email or by phone.

In my thirst for knowledge about bats I have been reading as many texts as possible. For those only able to afford one book on bats, here is my suggestion: Professor John Altringham's (Leeds University) "Bats, Biology and Behaviour" is now available in paperback. It is published by Oxford University Press and is by far the most comprehensive and readable text I have come across for those newly addicted to all things batty.

Rob Gratton

Northern Melbourne Institute of Tafe, (03) 9269-1067/1060, rgratton@yahoo.com.au

9th Australasian Bat Conference, 2000 Including the Australasian Bat Society's Biennial General Meeting The Hunter Valley, NSW, 25th-28th April 2000

CALL FOR REGISTRATION AND PAPERS

Papers are invited on any topic of bat biology for the 9th Australian Bat Conference, to be held at Tocal Agricultural College, Paterson, NSW. Papers may be SPOKEN or POSTER. The language of the Conference will be English and the prices quoted for registration are in Australian Dollars (AUD). We hope that people from a wide range of backgrounds will attend this conference. Anyone with an interest in bats is welcome to attend. If you know of anyone else that may wish to attend the conference, please give them a copy of these papers.

Dates

Note: Easter is late this year with Easter Monday being on the 24th April 2000.

Registration and Welcome BBQ on Tuesday 25th April; the conference activities will be from Wednesday 26th to Friday 28th April and a field trip has been organised for the weekend, Saturday 29th to Monday 1st May 2000.

Venue

Tocal Agricultural College is set in beautiful undulating countryside within the Hunter Valley of NSW, 5km from the small township of Paterson and 15km from the city of Maitland, at latitude 32° 36' S. The Hunter Region is famous for its unique blend of scenery, historical towns and award winning wineries. It is a major tourist destination with tourists tasting wine at more than 70 regional wineries and in their more sober moments succumbing to the excitement of sky diving, hot air ballooning and whale watching (to name just a few activities). It is a rich area for bats. Ratcliffe (1931) identified nine flying-fox colony sites in the Hunter and certainly we know of a similar number in existence today... probably the same sites! And there is a considerable microbat fauna with some spectacular colonies of some species in the area.

Climate

The Weather Bureau gives the following statistics for the Hunter in April:

Mean Relative Humidity	75%-52% (depending on the time of day)
Mean Daily Maximum Temperature	24°C
Mean Daily Minimum Temperature	12°C
Mean Rainfall for the Month	53 mm
Mean Number of Rain Days	8

However there is considerable fluctuation from year to year. Delegates should be warned that the week-end field trip will be held at a considerably colder, high country, location.

SCIENTIFIC PROGRAMME

As this is the first Bat Conference in the new millennium, we would particularly like to encourage papers on the present state of bat biology and of the priorities for research that we should be setting for the future. It is likely that there will be a special session entitled "Ecology and Systematics of the Bats of Tropical Australia and Papua New Guinea" and these will form an interesting contrast with the more commonly researched animals in Australia's Temperate and Sub-Tropical areas.

SPOKEN papers will be allotted a maximum of 12 minutes, with an additional 3 minutes for discussion, 35mm slide and overhead projection facilities will be available at all times.

POSTER papers of any size or shape can be accommodated. There will be a session time-tabled when authors are expected to attend their posters and be available for discussion.

ABSTRACTS will be required for all papers, spoken and poster. The abstracts must be received by David and April Gee by the 25th February 2000 otherwise titles submitted for papers on the Registration Form will not be included in the program.

Abstracts (including the title etc.) are to fit into half a page, which allows for approximately 200 words of text. It will be presented in single line spacing in 10pt Times New Roman or similar font. The first line contains the title in capitals; the second line left blank; the third contains the author/s; the fourth the address/s; and then the fifth line is blank before the start of the text. Abstracts should be as informative as possible giving a summary of results to be presented. Please indicate on the registration form if the paper is to be presented as a spoken or poster paper.

If possible, abstracts should be electronically submitted, either via e-mail to dgee@mildura.net.au or on a 3.5" floppy disk. Please ensure that you include in the body of the email, or with the disk, if the paper is spoken or a poster. The preferred format is as a MSWord for Windows file (IBM). A submitted disk should include the name of the author, and the name of the computer program and system. People that do not have access to e-mail or computers are welcome to submit a typed copy. If you submit a printed abstract, be sure that the letters are clear and dark, as it will be scanned. Abstracts must be in English. A hard copy of the abstract should be included with the registration form regardless of how else it is sent.

Abstracts will be included in the book of abstracts, which will be available at the Conference. We will compile a list of conference delegates, which will be included in the registration pack. If anyone would prefer that their address/phone number/fax number/email address is not included, please indicate this on the registration form.

Enquiries about Abstracts and the Abstract Book should be directed to:

David and April Gee

PO Box 189

Gol Gol, NSW 2738

ph 03 50 248 708, fax 03 50 213 328

International Code for Australia is "61" plus the above numbers without the 0 prefix.

email dgee@mildura.net.au

SOCIAL PROGRAMME

A **Welcome BBQ** will be held on **Tuesday 25th April** at Tocal during registration. A **Wine Tasting and Informal Dinner** will be held on **Wednesday 26th April** at Tocal, at a cost of \$15 a head. There will be the opportunity to purchase boutique wines for dinner or whenever. Bat trapping on the Tocal site will occur after dinner. The **9th ABC Dinner** will be held on **Thursday 27th April** at Wyndham Estate Wineries. The cost will be \$40 a head. This will include food and wine and transport to and from Tocal College. A bar will be open for the purchase of additional drinks. There will also be a **Farewell Bash** on **Friday 28th April 2000** at Tocal College. The cost will be \$15 a head, which will include music, food and wine.

POST-CONFERENCE EXCURSION

The post-conference excursion will depart Paterson on Saturday, 29th April for two nights of bat surveying in the Barrington Tops National Park. This has been arranged in conjunction with The Hunter District National Parks and Wildlife Service who will arrange facilities (tents, toilets and showers) within the National Park for us. Delegates should bring personal camping equipment, warm clothes and any bat survey gear they may have. Food will be supplied from dinner on Saturday 29th April to breakfast on Monday 1st May. The cost will be \$40 a head.

Inexpensive transport to the field site will be arranged by car-pooling and/or the hire of a bus. If you have your own transport and intend to go on the field trip, please indicate on your registration form the number of extra people, if any, you could transport.

Conference Shirts

Stringybark, a Hunter based company, has agreed to produce the Conference Tee-Shirt. This will have the Conference Logo on it. Shirts should be ordered and paid for with registration and will be handed to delegates with their registration package.

Accompanying Persons and Tourist Activities

Non-registrants who are accompanying delegates are welcome at the night social functions and the field trip for the same price as delegates. The only exception to this is the Tuesday's Welcome BBQ which is free to delegates but will cost

non-delegates \$10. There is not an official day programme for accompanying people. However, information on Tourist activities within the Hunter Region can be obtained from:

Maitland Visitors Centre,
New England Highway and High Streets, Maitland, NSW 2320
ph 02 49 332611, email: maitland.tourism@hunterlink.net.au

Visitor Information Centre,
Aberdare Rd Cessnock, NSW 2325.
ph 02 49 904 477 Fax: 02 49 914 518
email info@winecountry.com.au

web address www.winecountry.com.au

ACCOMMODATION

At Tocal College

There are limited rooms available at Tocal College and these must be booked when you register. They will be assigned in the order in which PAYMENT is received. Colleges have all the usual disadvantages of student accommodation, but they are at the venue and are cheap.

- ▶ Single student rooms (share bathrooms) B&B (\$A32/night),
- ▶ Single student rooms (with ensuite) B&B (\$42/night)
- ▶ Group rooms (3 single beds/room with ensuite) B&B (\$42/person/night)

There are facilities for the disabled.

Bookings and payment must be made to the Australasian Bat Society (Tocal College will not take direct bookings or payment) and must be in advance.

Alternative Accommodation Guide

The following is a list of hotels, motels and camping grounds near Tocal College. Prices quoted are 1999 prices and are subject to change.

Paterson (5km N)

Court House Hotel, 23 King Street, next door to the PO. ph 02 49 385122 fax 02 49 385309

- ▶ single \$40, double \$50 to \$80, extra person \$10

Maitland (15km S)

Country Comfort Monte Pio, Dwyer St, 2km NW of PO. ph 02 49 325288; tollfree 1800-065064, fax 02 49 326788

- ▶ single \$94 to \$124, double \$94 to \$124, extra person \$15

Sundowner Chain Motor Inn, 279 New England Hwy., 500m S Rutherford PO. ph 02 49 325255, fax 02 49 328348

- ▶ single \$65, double \$75 to \$95, extra person \$10 to \$15

Endeavour Motel, New England Hwy., East Maitland, 500m S East Maitland PO. ph 02 49 335488; tollfree 1800-812087 fax 02 49 342080

- ▶ single \$57 to \$67, double \$69 to \$79, extra person \$6 to \$12

Maitland City Motel, 258 New England Hwy., Rutherford, 4km W of PO. ph 02 49 328322 fax 02 49 328343

- ▶ single \$52 to \$68, double \$62 to \$78, triple \$72 to \$88, extra person \$10

Molly Morgan Motor Inn, New England Hwy., East Maitland, 2km E of East Maitland PO. ph 02 49 335422 fax 02 49 332762

- ▶ single \$58 to \$65, double \$61 to \$69, triple \$71 to 79, extra person \$10 to \$15

The Imperial Hotel, 458 High St, 1 km N of Station. ph 02 49 336566 fax 02 49 335855

- ▶ single \$35, double \$50, extra person \$15

Coachstop Caravan Pk, New England Hwy., op. High St Station, 2 km E of PO. ph 02 49 332950 fax 02 49 332950

- ▶ unpowered site, double \$9; powered site, double \$12; Park Cabin Section double \$55, extra person \$5.

Remember the Conference starts the Tuesday directly after Easter Monday and is during the Easter School Holidays - book now!!!

TRANSPORT

Qantas has been selected as the Official Airline for our conference. As a special conference fare has been negotiated for our delegates, we suggest you contact Qantas Association Sales (Toll Free: 1800 684 880) to avail yourself of this offer. A discount of up to 45% off the full economy airfare excluding taxes at the time of booking has been negotiated (subject to seat availability in group class). Please quote our Association Profile Number which is "1194760" and destination and date of conference when making your reservation. Unlike other discounted tickets, these tickets can be purchased up to the day of departure; can have their dates changed, are fully refundable up to 3 days prior to departure and can be used up to 7 days either side of the conference date. Please note that the applicable discount is available for domestic travel within Australia only and is subject to payment & ticketing conditions. International delegates are advised to contact their local Qantas office.

Sydney is the nearest capital city. Tocal College is 174 km N of Sydney.

Access by:

Road: Tocal College is approximately a 3 hours drive from Sydney. Road maps to Tocal will be issued on request.

Train: The closest train station is Maitland, which is 15km from Tocal.

Air: Newcastle's Williamtown Airport (50 km E of Tocal) is serviced by Eastern Australia Airlines (which is associated with Qantas) among other carriers and there are incoming flights from Brisbane, Coolangatta, Lismore, Coffs Harbour, Port Macquarie, Tamworth, Sydney, Wollongong, Canberra, Cooma and Melbourne.

Please mark on the registration form if and when you wish to be picked up and transported to Tocal from Maitland, Williamtown or any other local location and we will be able to organise it for a small fee.

COMMUNICATION

Check Our Website For Updates: <http://batcall.csu.edu.au/batcall/abs/abc/conf2000>

General Enquiries should be directed to:

Kerryn Parry-Jones
Biological Sciences
University of Sydney,
Sydney 2006, NSW, Australia.
email: kpjones@bio.usyd.edu.au
Ph/fax 02 43 653 232

Lynda Stevenson,
57 Richardson Rd,
Raymond Terrace,
NSW 2324, Australia.
email: koalahos@tpgi.com.au
Ph/fax 02 49 874 196

DEADLINES

Early Registration (to the 31st December 1999)	\$A60	(Student/Senior \$A50)
Registration (1st January-25th February 2000)	\$A80	(Student/Senior \$A60)
Late Registration (26th February 2000 onwards)	\$A100	(Student/Senior \$A80)

The absolute deadline for receipt of abstracts is 5.00 pm 25th February 2000. Papers will not be time-tabled without abstracts. Remember, college accommodation is limited and is on a "first in, first served" basis. Payment must be in advance.

Range extension of the Gould's Long-eared Bat *Nyctophilus gouldi*

During surveys of bat species within citrus orchards in the far south-west corner of New South Wales, conducted over the summer of 1998, one specimen of *Nyctophilus gouldi* was captured. This capture indicates that the distribution of *N. gouldi* in New South Wales is much further west than previous records indicate. The closest record to this capture was near Deniliquin, approximately 350 km to the east (Figure 1).

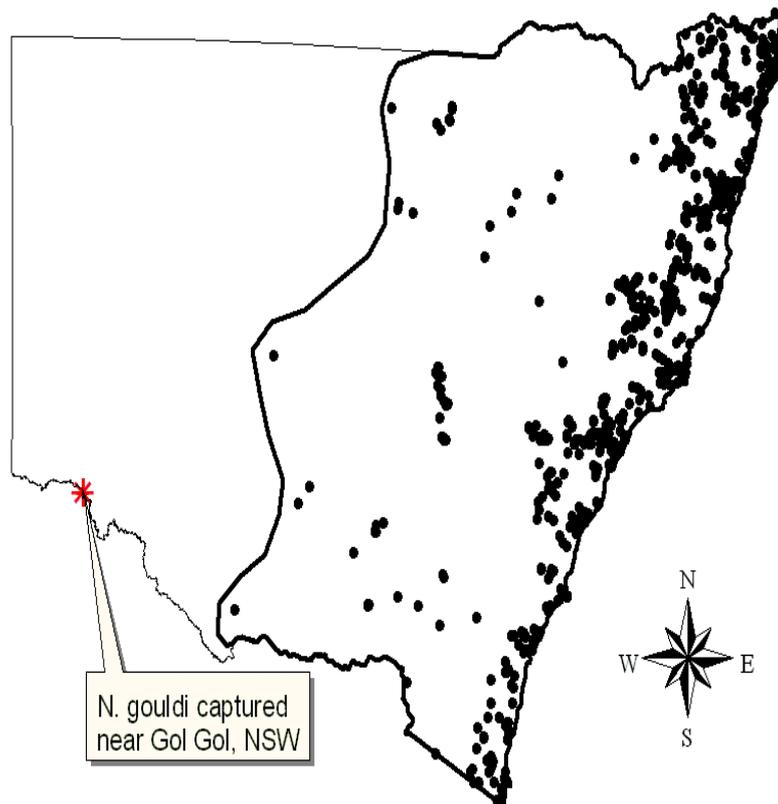


Figure 1. Distribution of *N. gouldi* in New South Wales

This specimen was forwarded to the Australian Museum where the species identification was confirmed by Harry Parnaby (Museum record number M 34151). The animal captured was an adult male, with a weight of 7.5 grams, a forearm length of 37.8 mm, hindleg length of 17.1 mm, teeth width of 4.2 mm and ear length of 21.7 mm. As stated in Parnaby (1992), the most recognisable feature of this species differentiating it from *N. geoffroyi* is the nose leaf. In the specimen caught, the nose leaf was not as elongated as *N. geoffroyi*, but it was not as marginal as *N. timoriensis* (Figures 2 & 3).



Photo: L. Lumsden

Figure 2. An inland *N. gouldi*: this individual, which is very similar to the Gol Gol specimen, is from Echuca, Victoria.

Out of 160 bats caught over an unbroken period of eight weeks of trapping with four harp traps at 12 locations in the citrus orchards near Gol Gol NSW, there was only one capture of *Nyctophilus gouldi*.

The size of the captured specimen was similar to *Nyctophilus geoffroyi* that I have caught in the Western Division of New South Wales. The specimen was smaller than *N. gouldi* recorded in the eastern parts of NSW (Parnaby, 1992). Churchill (1998) gives a mean forearm measurement of 38.5 mm with a minimum of 36.3 mm. The specimen met the size ranges stated in Churchill (1998). This specimen's size also falls within the size range recorded in Churchill (1998) for *N. geoffroyi*, (forearm 30.6 - 38.6 mm, ear length 17.6 - 25.3 mm and weight 3.9 - 8.5 g), making the nose leaf a critical identifying feature for this species in the Western Division of NSW. The size of this bat was very similar to those recorded by Ellis *et al.* (1989) for *N. gouldi* captured in the Macquarie Marches NSW, where forearm measurements of 35.2 mm and 36.8 mm were recorded.

This trapping program will continue during 1999 and it is hoped that more records of this species from this area will be obtained.

References

- Churchill, S. 1998. Australian Bats. Reed New Holland Publishers (Australia) Pty. Ltd: Sydney.
- Ellis, M.V., Williams, C.R. and Wilson P. 1989. Extension to the known range of Gould's Long-eared bat *Nyctophilus gouldi* Tomes, 1858 (Chiroptera: Vespertilionidae) in New South Wales. *Australian Zoologist* **25**: 79-82.
- Parnaby, H. 1992. An Interim Guide to Identification of Insectivorous Bats of South-eastern Australia. *Technical Reports of the Australian Museum* No. 8.

David Gee

dgee@mildura.net.au

Tick paralysis in flying-foxes on the Atherton Tablelands

In 1990, it was realised that the Spectacled Flying-foxes (*Pteropus conspicillatus*) on the Atherton Tablelands in far north Queensland were dying in large numbers from tick paralysis. There are about six colonies of Spectacleds, mostly at higher altitude in the wetter parts of the Tablelands, but also one in the relatively drier country of Tolga. There are bat hospitals for three of these colonies, coordinated by Pam Tully at Millaa Millaa, Ann Johnson at Ravenshoe and Jenny Maclean at Tolga.

It is still a mystery as to how the tick and flying-foxes are coming into contact. Little Red Flying-foxes (*Pteropus scapulatus*) also camp at two of the colonies during tick season but are rarely affected, despite roosting lower in the trees where a threat of ticks would seem more likely. It would seem that the ticks are being picked up at feeding sites rather than roosting sites. The Spectacleds occur throughout the Wet Tropics to north of Hinchinbrook Island, but it is only on the high altitude Tablelands, above 700 metres, that the ticks are a major problem. Atherton and Lismore appear to be 'hotspots' for paralysis ticks but the flying-fox species around Lismore have so far not been affected. (There was one report last year of ticks on a Grey-headed Flying-fox at Lismore). It is estimated that during 1990-95 about 1300 bats were treated by the hospitals annually. These numbers were roughly halved 1995-97, and this year the Tolga colony was the only one seriously affected. The early wet season around Millaa seems to have inhibited the ticks in that area. From Tolga, we treated 212 adult bats, and found 77 already dead. These figures do not account for bats that drop during fly-out at night.

Tick season, September to December coincides with birthing season. Last year at Tolga, we had 85 orphans, 35 of whom were born with severely cleft palates. Although the other hospitals had only a small number of orphans, each reported about 9 babies with cleft palate deformities. All the cleft palate babies were euthanased and sent to the DPI at Yeerongpilly and to Dr. Les Hall at the University of Queensland. Georgia Livesay and Janine Barratt did most of the post-mortems on them. Most of the cleft palate babies were born 1-15 October. There were also 2 babies with pin hole cleft palate deformities, one of whom is alive and well.

To put the above figures into perspective, the latest census figures for the three colonies indicate that there are approximately 2000 (Millaa), 9000 (Ravenshoe) and 4000 (Tolga) bats at the monitored colonies. This means that about 10% of the Tolga population were affected by tick paralysis last year. Between March and November 1998, census figures showed a drop of almost 50% in the three colonies on the Atherton Tablelands. Census data from March 1999 was unreliable because of the heavy wet weather on the nights of the count.

Spectacled Flying-foxes have the most restricted distribution of all the Australian flying-foxes. They are under threat from :

- loss of habitat
- shooting by orchardists and others
- tick paralysis
- birth abnormalities

Volunteers are needed for the bat hospitals, particularly Tolga. A veterinarian would be a real bonus if only for a week. We have a very smart, air-conditioned 'hospital' with 20 individual hanging cages and 16 lying cages, as well as an 8 metre outdoor cage. Work at the hospital is varied - twice daily searches, treatments, orphan care, food preparation and, of course, cleaning. Most

importantly, you have a unique opportunity to work with Spectacled Flying-foxes and a great team of bat enthusiasts. Volunteers are most appreciated if they can stay a minimum of one week. We are on 5 acres of wet sclerophyll / rainforest with easy access to Atherton, which is only 6 kms away.

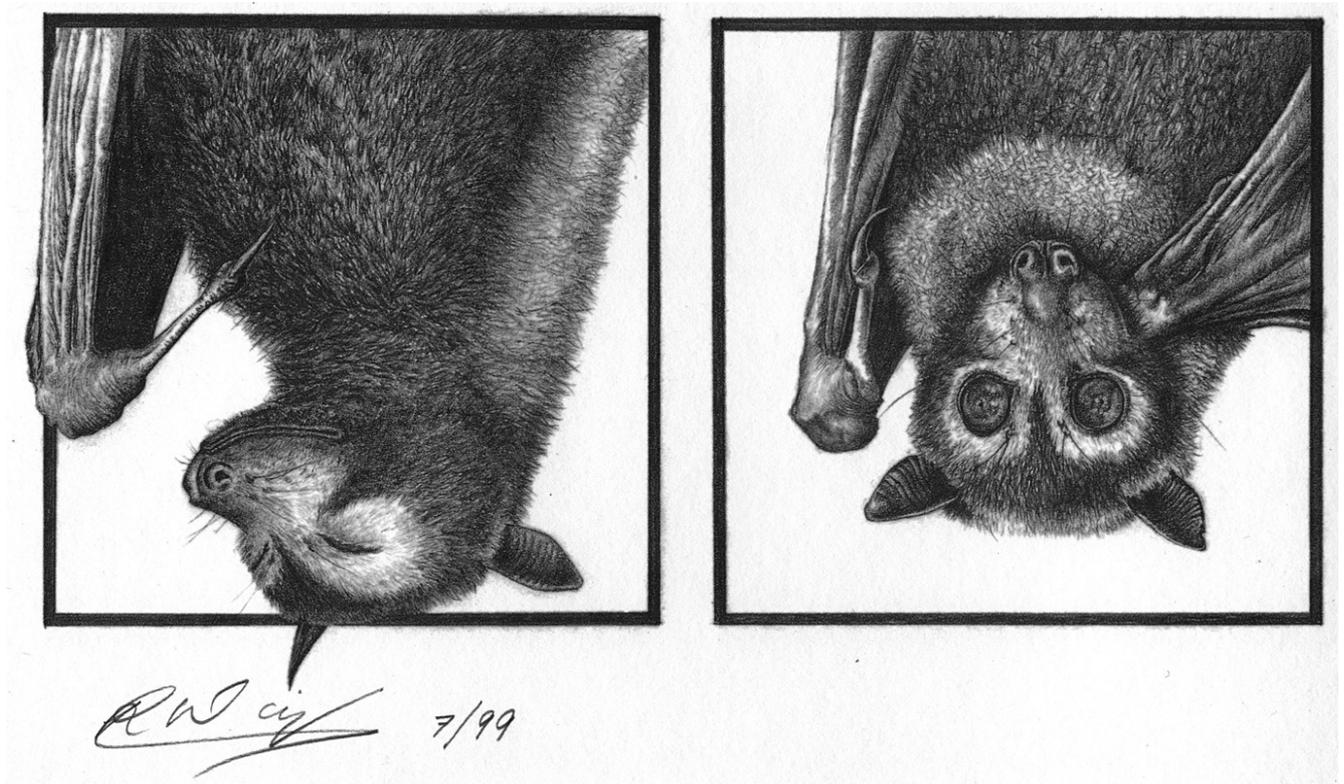
Pteropus Guesthouse is also on-site, offering very private self-contained accommodation throughout the year. Next time you're up this way, put your accommodation money into bats. All proceeds go to support the Tolga Bat Hospital now with a website at <http://www.athertontablelands.com/bats>

Jenny Maclean

Tolga Bat Hospital, PO Box 685, Atherton Qld 4883, tel / fax 07 4091 2683

jj@bushnet.qld.edu.au

^V^ ^V^ ^V^



Spectacled Flying-fox 1&2 - Artwork by Robin Wingrave

Commercial harvesting of flying-foxes

A recent article in *The Age* (27/7/99) claimed that a report from the Rural Industries Research and Development Corporation found that there was a market in South East Asia for Australian flying-foxes, and that it had an enormous export potential. The article goes on to say that harvesting flying-foxes in Australia could help reduce the impact of commercial hunting of Pacific Island species and also claimed that it was pressure from conservation groups which prevented Australia from tapping into the potential flying-fox market.

I find it disappointing that this sort of thinking could still come out of such an important commonwealth advisory and funding body. Although harvesting of flying-foxes has been mooted for quite a few years, there has been no hard data presented by its proponents to support that a sustainable harvest is possible. The current resurgence of the issue is now being partly camouflaged by additional claims which also appear to have no substance. Conveniently left out of the argument for harvesting is the problem now caused by the viruses which are found in flying-foxes.

The harvesting of flying-foxes has been thought about, investigated and rejected in the past. In a symposium on Pacific Island flying-foxes, Pierson and Rainey (1992) presented information which showed that only a 10% harvest rate on a flying-fox population will almost halve it in 5 years and could reduce it to one fifth in 20 years. The study was based on data from all flying-foxes, not just Pacific Island species. Using Pierson and Rainey's model and data from legal and illegal culling of *Pteropus poliocephalus* provided by Wahl (1994) and Richards and Hall (1998) showed that this culling rate (averaged at 10%) would reduce the population to 5% in 30 years. Given the recent population counts of *P. poliocephalus* in NSW and Queensland this prediction, unfortunately, appears to be accurate. In flying-foxes, the low reproductive rate, (most females do not breed until they are 3 years old, and males not before they are 2 years old), high natural mortality, man-induced mortality and in many species, declining populations, are clear indicators that additional harvesting of most populations could not be sustained. Although flying-foxes have been recorded living to over 20 years in captivity, in the wild their expected lifespan is likely to be much shorter, perhaps well under 10 years. This brings up the subject of life history tables. These tables are constructed by ecologists and wildlife management authorities and are based on information on survival and mortality rates of different age groups of the species involved. From these life tables, predictions for culling or harvesting rates can be made to ensure sustainability of the population. They are **an absolute basic minimum** requirement before sensible statements regarding harvesting can be made, particularly for animals which in some areas are already regarded as threatened. Unfortunately no such tables exist for flying-foxes and basic data is badly needed for their construction. There was an enormous amount of extremely valuable information lost when large-scale shoot-ups of flying-fox camps, organised by irate orchardists, excluded any scientific monitoring. I spent several unsuccessful years trying to convince people (orchardists, police and fauna authorities) of the value of examining the dead bats following a shoot, not so much as to count the number of dead animals, but to look at sex ratios and age groups and to get some idea of the flying-fox camp structure. This has all been lost to the past. Until long-term studies are conducted on Australian flying-fox populations which result in the construction of life history tables, the notion of sustainable harvesting of flying foxes should not be entertained as it will be based on guesses, not facts. There is ample evidence that in many cases harvesting of flying-foxes is not sustainable, as shown by the number of flying-fox species becoming extinct, mainly due directly to harvesting. This happened on Guam where Graham (1992) reported that subsistence hunting of flying-foxes led to a substantial

population decline which was then followed by commercial hunting which caused the extirpation of *P. tokudae*.

The supplying of Australian flying-foxes to the South East Asian markets will only increase the illegal and black market harvesting of their own species of flying-foxes. In a number of South East Asian countries (eg. Malaysia) flying-foxes are now protected. In addition, Australia has to honour its signature on the CITES agreement which prohibits the international trafficking of any flying-fox material. Given the human death toll and decimation of the Malaysian pig industry from Nypah virus, and the relationship between Nypah virus and Malaysian flying-foxes and fruit bats, it is unlikely that any South East Asian country would import Australian flying-foxes knowing that they can carry at least 3 viruses, one of which (Hendra) is exceptionally close to Nypah virus.

The idea of supplying Australian flying-fox carcasses to the Pacific Islands in order to lessen the impact of commercial hunting on these islands can only be regarded a backward step in flying-fox conservation. Why should Australia harvest its flying-foxes, some of which are already threatened, and supply them to another country which has virtually exterminated their own species of flying-fox? To further endanger our flying-foxes while perpetuating another country's eating habit which has already resulted in the extinction or near extinction of their own flying-foxes, seems ironic at best, and absurd at the worst. The end result will be the continued consumption of flying-foxes in these Pacific Islands and further illegal hunting by people who cannot afford the imported Australian flying-fox carcasses. The only benefits from the activity will be the small number of business people who will line their pockets. I am sure there is a better way to conserve Pacific Island flying-foxes. For a start, the Australian beef, lamb and pork industries badly need additional markets.

Current research is showing that there is an intimate bond between Australian flying-foxes and eucalypts, particularly important commercial hardwood species. Both appear to be dependent on each other and the presence of flying-foxes is necessary for the continued health of our forests and the timber industry. The maintenance of a sufficient density of flying-foxes is necessary for the raiders and residents model to operate and ensure the effective dispersal of seeds and pollen. The alarming drop in the numbers of *P. poliocephalus* in eastern Australia is of national concern. In north Queensland *P. conspicillatus* is suffering a similar decrease in numbers. The large camps of *P. alecto*, *P. poliocephalus* and *P. scapulatus* recorded by Francis Ratcliffe around 1930 in eastern Australia are just memories of the past and have been replaced by very much smaller and scattered camps. The effect on the behaviour and genetics of flying-foxes caused by the loss of these large aggregations may never be known. It has a disturbing similarity to the Passenger Pigeon extinction in North America.

The only flying-fox populations in Australia that could be considered in any way suitable for harvesting are those in the Gulf country of Queensland, Top End of the Northern Territory, and Kimberly region of Western Australia (ie reasonable numbers - as far as we can guess, and with no obvious threats). If the figures for the number of flying-foxes harvested by Aborigines in northern Australia quoted in *The Age* as between 180,000 and 220,000 per year are correct, then there is a real worry that if this continues, flying-foxes will or may have already started to decline. Hard data showing what effect this harvesting is doing to the numbers of Black Flying-foxes in the Northern Territory is lacking. There have been no long-term studies on flying-foxes in these areas to establish if flying-fox numbers vary or move due to seasonal conditions or what mortality factors might be involved.

Information from excavations of Aboriginal sites in Arnhem Land (eg. Foley, 1985) have shown that flying-foxes only compose a small percentage of the food types utilized by Aboriginies in the past. Research involving several Aboriginal communities in northern Queensland where their food and hunting has been studied, revealed that flying-foxes are only occasionally harvested and are considered more important as a medicinal food and to be protected, rather than a general food source. Archaeological digs at these sites have revealed very little use of flying-foxes in the past (David, 1998). The Aboriginal harvesting of such large numbers of flying-foxes in the Northern Territory seems to be a recent phenomenon, possibly associated with firearms, and should be closely monitored. If Aboriginies are to continue harvesting at this rate, and additional harvesting for export occurred, it would be very bad news for flying-foxes in northern Australia.

In these northern Australian areas most flying-fox camp sites are in remote locations and in only a few places are flying-foxes considered a serious orchard pest. Female Black Flying-foxes in northern Australia have a long breeding season with young born in almost all months of the year. It would be difficult to select a harvesting time which would not cause the killing of pregnant females or females with dependent young. Do we know enough about the social structure in flying-fox camps to calculate what damage would be done by harvesting? Would the shooting or catching be supervised and the population numbers monitored afterwards? How would they be virus tested? Would it comply with the IUCN wildlife harvesting specifications?

Comparisons between the possible harvesting of Australian flying-foxes with the situation in South Africa where commercial wildlife utilization and marketing of products is seen as a sensible economic enterprise and an effective means of promoting conservation (Cumming, 1990), are difficult. There are many differences between the two situations. In Australia we do not have the knowledge to set harvest limits, flying-foxes do not have the appeal to hunters as does large game, shooters cannot distinguish between sexes and age classes and it is unlikely that profits from Australian harvesting (if any) will benefit more than a few individuals. Then there is the problem of just who owns or is entitled to harvest flying-foxes in Australia.

The notion that flying-foxes could be harvested in a sustainable way, used to decrease hunting pressures on Pacific Island species and provide an export market to South East Asia was an interesting idea and deserved airing. The IUCN has adopted resolutions recognising that wildlife utilization and sale of their products could be beneficial for a species' conservation. However, they also specify that it is necessary to provide guidelines and criteria to ensure sustainability of use. This has not been done for flying-foxes and only a simplistic model lacking hard data has been presented (Vardon and Tidemann, 1995). Ludwig, Hilborn and Waters (1993) challenged any simplistic notions of sustainable use of wildlife and claimed that wild resources are inevitably overexploited and that management principles are essential to deal with the uncertainties involved in wildlife utilization. The argument presented for the harvesting of Australian flying-foxes was floored from the beginning as it was based on the assumption that a market existed for their carcasses and this was then used as a reason to consider commercial harvesting. If there is no other reason to harvest flying-foxes than to supply their carcasses to a market (which I have shown does not really exist), then we should let them continue their important role in our environment unmolested.

The claim that harvesting of flying-foxes has been restricted by Government regulations which are being sustained by pressure from conservationists is only partly true. The main reason is simply that the proponants have never provided hard evidence that the sustainable harvesting of Australian flying-foxes is possible or that a profitable market for carcasses really existed here or in other countries. The US Wildlife authorities on Guam have indicated that the importation of Australian

flying-foxes for human consumption would not be permitted, and the European Commission has banned the import of Australian flying-foxes.

The idea of harvesting Australian flying-foxes should now be replaced by constructive thinking on issues concerning the pressing need to conserve flying-foxes in Australia.

I would welcome a response from any person who still supports the idea of flying-fox harvesting.

Leslie S Hall

Veterinary Pathology and Anatomy, University of Queensland, St Lucia, Qld.

References

Cumming, D.H.M. 1990. Wildlife products and the market place: a view from South Africa. Project Paper Number 12, WWF Multispecies Project, Harare, Zimbabwe. (25 pages)

David, B. (ed) 1998. Ngarrabullgan: Geographical Investigations in Djungan Country, Cape York Peninsula. Monash Publications in Geography and Environmental Science. Monash University, Clayton.

Foley, D. 1985. Faunal analysis of Anbangbang and Djuwarr 1. In R. Jones (ed), *Archaeological Research in Kakadu National Park*, pp 97-102. Australian National Parks and Wildlife Service, Canberra.

Graham, G.L. 1992. Conservation and subsistence harvesting of Pacific Island flying-foxes. Pp. 46-49. In *Pacific Island Flying-foxes: Proceedings of an International Conservation Conference*, eds D.E. Wilson and G.L. Graham. Biological Report 90(23), Fish and Wildlife Service, United States Department of the Interior, Washington.

Ludwig, D., Hillborn, R., and Waters, C. 1993. Uncertainty, resource exploitation and conservation: lessons from history. *Science* **260**: 17-27.

Pierson, E.D., and Rainey, W.E. 1992. The biology of flying-foxes of the genus *Pteropus*: a review. Pp. 1-17. In *Pacific Island Flying-foxes: Proceedings of an International Conservation Conference*, eds D.E. Wilson and G.L. Graham. Biological Report 90(23), Fish and Wildlife Service, United States Department of the Interior, Washington.

Richards, G.C., and Hall, L.S. 1998. The conservation biology of Australian bats: are recent advances solving our problems? Pp. 271-281 in *Bat Biology and Conservation*. Eds. T.H. Kunz and P.A. Racey. Smithsonian Institution Press, Washington.

Vardon, M.J. and Tidemann, C.R. 1995. Harvesting of flying foxes (*Pteropus* spp.) in Australia: could it promote the conservation of endangered Pacific Island species? In *Conservation through sustainable use of wildlife*, eds G. Grigg, P. Hale and D. Lunney, Centre for Conservation Biology, University of Queensland.

Wahl, D.E. 1994. The management of flying-foxes (*Pteropus* spp.) in New South Wales. Masters thesis University of Canberra, Australia.



MINUTES OF THE 1st FINANCIAL GENERAL MEETING OF THE AUSTRALASIAN BAT SOCIETY, INC.

Friday, 7th May, 1999, commencing 1:40 PM
University of Queensland, St. Lucia, Qld.

Chairperson Bruce Thomson
Minutes Peggy Eby

Open and Welcome: B. Thomson

Apologies: G. Bennett, P. Birt, M. Cullen, G. Ford, N. Markus, N. Schedvin, I. Temby

Minutes of the 4th Biennial AGM, Rockhampton

motion to accept minutes as read:
moved N. Pallin; seconded L. Lumsden
accepted unanimously by show of hands

Minutes of the Special General Meeting, Rockhampton

motion to accept minutes as read:
moved K. Parry-Jones; seconded M. Turton
accepted unanimously by show of hands

Business arising

There was no business arising from the minutes.

Reports of Members of the Executive

Secretary – Peggy Eby

Correspondence for the year was tabled.

The ABS became an incorporated society under the NSW Department of Fair Trading on 18th May 1998, and the ABS Inc. took over the books of the former ABS on 6th April 1998.

A two-day meeting of the Executive of the ABS was held on 22nd & 23rd Sept 1998. The primary aims of the meeting were to discuss changes to the operations of the society as set out in the Rules, to formulate procedures for running the society and to set priorities. Agenda topics included: clarifications of divisions of responsibilities within the Executive, financial management, insurance, listing on the Register of Environmental Organisations, the 2000 conference, membership issues, sub-committees, the website, relations with international organisations, and the ABS Newsletter.

Archival material for the ABS is being collected. The archives currently include newsletters, conference proceedings, abstracts and lists of delegates, and newsletters from organisations with which the ABS has exchange arrangements. Further archival material such as photographs and conference t-shirts would be welcomed.

Treasurer – Natasha Schedvin

An audited statement of accounts for the 1998 financial year was tabled. The financial year of the ABS Inc. runs from 1st Jan to 31st Dec, and the first set of audited books covers the period from 6th April to 31st Dec. The Statement of Income and Expenditure is attached.

Income for this period was \$10,651.26. Income was primarily derived from membership subscriptions and surplus from the Rockhampton conference. Expenditure for that period was \$2516.28. The largest item of expenditure was production and postage of the newsletter (\$1765.96). Taking into account the surplus at 6th April 1998, the account balance at 31st Dec was \$9992.31.

Membership Officer – Lindy Lumsden

Membership levels have increased markedly over the 1998 financial year. Currently, the ABS has 199 members. At the Executive meeting in Sept 1998 it was decided that the ABS would continue to send newsletters to members until their membership fees were more than two years in arrears. Two renewal/reminder notices were sent out resulting in the numbers of financial members rising significantly. In addition, 42 new members joined the society in 1998, taking the number of financial members from 11 in March 1998 to 150 in May 1999.

Editor – Nicki Markus

The past year has been very fruitful for the *Australasian Bat Society Newsletter*. Contributions from members have been good and plentiful and indicate that the newsletter is taken seriously as a means of communication amongst battoes. Both of the last two issues have been substantial in size and diverse in content.

A few points are put forward for discussion: 1) It has been suggested that the format of the newsletter be changed to become more like a journal. How do other members feel about this? 2) At present, submissions to the newsletter, which have been edited for grammar or style, do not go back to authors for review prior to publication. Would members prefer more consultation on edits of their submissions? 3) Thus far there has been little response to the idea of providing a discussion topic for each issue and encouraging members to respond to this topic. Is this idea too ambitious?

Thanks go to Lindy Lumsden for proof-reading, constructive input and for turning the master copy into hundreds of hard copies for distribution.

General business

2000 conference – Kerry Parry-Jones and Lynda Stevenson

The venue for the 2000 conference is the Tocal Agricultural College in the Hunter Valley of NSW. The dates of the conference are 25th to 28th April 2000. The organisers have negotiated free use of conference rooms and facilities at the college if delegates use the college accommodation. Tariffs are reasonably priced. The venue for the conference dinner is the Wyndham Estate vineyard. Information on the conference and calls for abstracts will be posted on the ABS website as well as in the next newsletter.

Sub-committees

Four ABS sub-committees have been formed to produce position statements and information on bat-related issues, and 23 members have volunteered to participate in the process. As the new 1st Vice President, Marg Turton will coordinate the sub-committees.

Special resolution to establish the ABS Gift Fund

It was resolved that the rules of the ABS Inc be amended to include the following: “The Society may set up a gift fund to be known as the Australasian Bat Society Gift Fund, for the specific purpose of furthering the aims and objectives of the Society. The Australasian Bat Society Gift Fund must comply with subdivision 30-E of the *“Income Assessment Act 1997”*.”

moved L. Lumsden; seconded L. Martin
passed unanimously by show of hands

Resolution to adopt rules for ABS Gift Fund

It was resolved that the set of rules for the ABS Gift Fund published in the October 1998 newsletter be adopted.

Moved N. Pallin; seconded K. Parry-Jones
passed unanimously by show of hands

Other Business

The points raised in the Editor's report were discussed. There was general agreement that the current format of the newsletter should be retained as it is the only publication available for informal exchange of information about Australian bats. It was also agreed that as the newsletter was attracting considerable interest there was no need to pursue special topic issues. Finally, it was resolved that the Editor should retain the prerogative to make editorial changes to material prior to publication without review by contributors.

moved L. Hall; seconded P. Eby
passed unanimously

General appreciation was shown for the "Living with bats" brochure produced by B. Thomson. Methods of distributing the brochure were discussed.

Lindy pointed out that the funds in the ABS cheque account were not attracting reasonable rates of interest. It was resolved that surplus funds be transferred into an interest-bearing account with L. Lumsden and N. Schedvin as signatories.

moved L. Lumsden; seconded K. Parry-Jones
passed unanimously

It was agreed that members of the Executive should be reimbursed for the costs of phone calls, postage, etc. incurred while conducting the business of the Society by presenting to the Treasurer suitable documentation such as itemised accounts and receipts. It was resolved that \$500 be made available to the Executive as working funds for the 1999 financial year.

moved P. Eby; seconded L. Lumsden
passed unanimously

The ABS has been approached by the organiser of the 12th International Bat Research Conference in Malaysia for a list of members and their e-mail addresses. It was agreed that membership information should not be given out without the permission of individual members. Lindy will forward the request from the 12th IBRC to members who will then be able to choose whether to provide their contact details or not.

In keeping with the rules of incorporation in NSW, it was resolved that the Secretary and Public Officer should be authorised to sign Form 12, the Annual Statement, for lodgement with the NSW Department of Fair Trading.

moved K. Parry-Jones; seconded B. Thomson
passed unanimously

Jan Oliver, the Director of the Wildlife Preservation Society of Queensland, presented an insight into the issues involved for a society such as ours in undertaking the role of advocacy. This facilitated extensive discussion and debate.

Les Hall was thanked for his efforts in organising the venue for the meeting and in inviting Jan Oliver to speak.

Close

There being no further business, the meeting was declared closed at 6:50 PM.

AUSTRALASIAN BAT SOCIETY INC.
Income and Expenditure Statement
FOR THE FINANCIAL YEAR ENDING 31 DECEMBER 1998

	\$
Income	6 April 98 to 31 Dec 98
Membership subscription	5,664.00
Conference profit	4,962.00
Donations	23.00
Interest	2.26
<hr/>	
TOTAL INCOME	\$10,651.26
<hr/>	
Expenditure	
Audit and accounting fees	-
Bank fees	15.39
Incorporation fee	110.00
Insurance (public liability)	368.93
Newsletter (production & postage)	1,765.96
Stationery & postage	65.00
Executive committee (including travel expenses)	151.00
Sub-committees	
General sub-committee costs	40.00
<hr/>	
TOTAL EXPENDITURE	\$2,516.28
<hr/>	
OPERATING SURPLUS	3,172.98
ACCUMULATED SURPLUS AT 6 APRIL 1998	1,857.33
ACCUMULATED SURPLUS AT THE END OF THE FINANCIAL YEAR, 31 DECEMBER 1998	5,030.31
<hr/>	
ACCOUNT BALANCE AT 31 DECEMBER 1998	\$9,992.31
<hr/>	

^V^ ^V^ ^V^

Sub-committee Update

The need for accurate information on various bat-related issues has become increasingly apparent in recent years. To achieve this, the ABS is working towards producing 1) briefing notes for relevant Government Ministers, and 2) material for distribution as educational leaflets. To this end, four sub-committees have been set up to pool and collate information. The four sub-committees are :

Bats in Mines, Caves and Other Structures

Bats and Viruses

Flying Fox Camps

Education

In the longer term, the sub-committees will work towards the production of media packages.

The sub-committees are now all up and running, primarily through email. Thank you to the people that responded to the flyer that was sent out in mid-1998 with the newsletter. You should all have been contacted by now re your preferred sub-committee. If you did not or would still like to contribute to a sub-committee, contact **Marg Turton** on **ph/fax (02) 4757-3149** or **email : turtonm@acay.com.au**

_____ ^v^ ^v^ ^v^ _____

Why having a big dick is not always such a good thing!

I recently had handed into care a *Mormopterus* 'big dick' that had come to grief in a woodpile. The poor fellow had sustained a scraping injury to his abdomen and penis. The entire top of the sheath covering his penis had been spilt and scraped away. It made you wince just to look at it! To add insult to injury I decided that the only way to clean this up was to bathe the area in a warm solution of salt water. At one stage, the poor bat spasmed as I wiped a particularly sensitive spot. It did start me thinking that perhaps having a large dick is not always the good thing that we are led to believe. A small dick might not be subject to injury as often as it would not get in the way as much as a large dick. So the moral of the story is big is not always better, smaller can be safer!

David Gee

dgee@mildura.net.au

- *Contacts / NetWork / News* -

News from the University of WA

Bat research is still alive and well in Western Australia. This year, Graeme Zosky has begun an Honours project on cardiac function in hibernating bats under Dr Jamie O'Shea. Graeme will "examine the role of the autonomic nervous system in maintaining coordinated and sustained cardiac output at the low temperatures associated with hibernation. Bats possess a novel nervous innervation of the ventricle that may be responsible for preventing fibrillation at low temperature and, as a result, are of particular interest for studies involving hibernation." Graeme is working on *Chalinolobus gouldii* and *Nyctophilus* spp.

In my own research, I have recently converted my Masters into a PhD and am furthering my interest in the relationships between spatial distribution patterns and patterns of genetic subdivision in the Pilbara populations of *Rhinonycteris aurantius*, *Macroderma gigas* and *Taphozous georgianus*. With Stuart Anstee from Hamersley Iron Pty Ltd, I have been studying cave use by these three species plus *Taphozous hilli* and have an ongoing tagging program at one location. Together we are developing a modest library of bat calls for the region. Between 1997 and 1999, Hamersley Iron has contributed significantly to surveys for *R. aurantius* and may provide further support for other bat research in the future.

Finally, I am attempting to write a management plan for *R. aurantius* and *M. gigas* in the Pilbara since there seems to be inadequate protection for their roosts which have been, and will be, subjected to further disturbance, mainly by mining activity. So far, I have had positive responses from CALM and the mining companies. The plan involves a reserve system and I am keen to develop the idea, proposed by Hall and Richards (1997: Proceedings of the Workshop on Fauna Habitat Reconstruction after Mining pp. 125-137), of a national register of mines and natural roosts which are important for maintaining populations of various species. I hope to be able to attend the next ABS conference!

Kyle Armstrong

Department of Zoology, The University of Western Australia
Nedlands WA 6907

_____ ^V^ ^V^ ^V^ _____

Marking small bats

Are there any successful, ethical methods to uniquely mark bats in the 4-15 g range? (I do not want to use bands). If you know of a method, please contact Patrick Prevett at the University of Ballarat at the address below.

Pat Prevett, Senior Lecturer
School of Science, University of Ballarat
ph 0353 279 217 fax 0353 279 240 email p.prevett@ballarat.edu.au

Australian Museum Bat Exhibition 1999-2000

The Australian Museum's bat exhibition is about to open, after extensive planning and development. The exhibition will run from 25th September 1999 to 13th February 2000. This is a great opportunity to increase the profile of bats, in a really positive way. It is designed with kids under the age of 12 in mind, however Sue Hand has managed to incorporate as much basic biology and conservation themes as possible. It should be fantastic, so check it out if you have a chance. The Australian Museum is located in College St, Sydney.

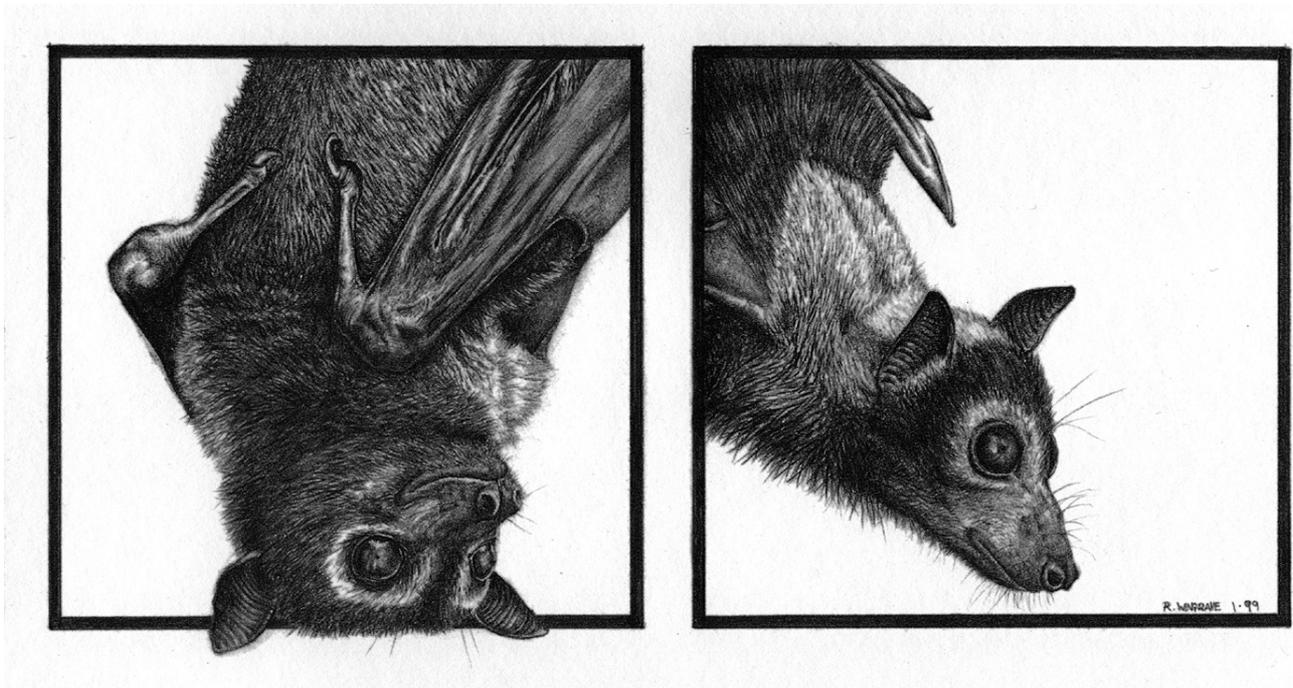
^v^ ^v^ ^v^

Volunteers wanted ...

... for working with Spectacled Flying-foxes on the Atherton Tablelands October to December 1999. Tick paralysis and orphan care. Prefer minimum stay of 1 week. Full board \$10 day. Veterinarians especially welcome!

For more information, please contact Jenny Maclean at -

Jenny Maclean, PO Box 685, Atherton Qld 4883, tel / fax 07 4091 2683
jj@bushnet.qld.edu.au



Spectacled Flying-fox 3&4 - Artwork by Robyn Wingrave

12th IBRC – Malaysia 2001: Update

The organizers of the 12th International Bat Research Conference have set up a website from which details of the conference can be obtained. For more specific information, please contact Dr. Zubaid Akbar at the address below or go directly to the site, also listed below.

Dr. Zubaid Akbar
Dept. of Zoology, FSH,
University Kebangsaan Malaysia
43600 UKM Bangi,
MALAYSIA.
Tel/Fax: 603-8293827

E-mail: zubaid@ukm.my or zubaid@pop.jaring.my

Website: www.fsh.ukm.my/fsh/dept/bz/zubaid.htm

12th International Bat Research Conference
<http://www.ukm.my/ukm/seminar/bat/index.html>

_____ ^v^ ^v^ ^v^ _____

New Journal - ACTA CHIROPTEROLOGICA

A new journal for the publication of bat research has just come into being. The first issue was recently presented during the 8th European Bat Research Symposium in Cracow, Poland. It will be published in two issues per year in a format similar to that of the Journal of Mammalogy. Annual subscription will cost US\$60.00 per institution or US\$40.00 for personal subscriptions.

For further information, please contact Wieslaw Bogdanowicz from the Museum and Institute of Zoology in Warsaw at email wieslawb@robal.miiz.waw.pl

Recent Literature

Compiled by N. Markus n.markus@mailbox.uq.edu.au

- Arkins, A.M., Winnington, A.P., Anderson, S. and Clout, M.N. 1999. Diet and nectarivorous foraging behaviour of the short-tailed bat (*Mystacina tuberculata*). *Journal of Zoology, London* 247: 183-187.
- de Oliveira, M.C. 1998. Towards standardized descriptions of the echolocation calls of microchiropteran bats: pulse design terminology for seventeen species from Queensland. *Australian Zoologist*, 3 (4): 405-411
- Ford, G.I. and Young, R.A. 1998. A note on possible camouflaging behaviour by a Little Red flying-fox *Pteropus scapulatus* (Chiroptera: Pteropodidae). *Australian Mammalogy*, 20: 433-435
- Geiser, F. and Coburn, D.K. 1999. Field metabolic rates and water uptake in the blossom bat *Syconycteris australis* (Megachiroptera). *Journal of Comparative Physiology*, 169 (2): 133-138
- Hamilton-Smith, E. 1998. Much ado about very little: bat (*Miniopterus schreibersii*) guano mining at Naracoorte, South Australia. *Australian Zoologist*, 3 (4): 387-391
- Hosken, D.J. and Withers, P.C. 1999. Metabolic physiology of euthermic and torpid lesser long-eared bats, *Nyctophilus geoffroyi* (Chiroptera: Vespertilionidae). *Journal of Mammalogy*, 80: 42-52.
- Lloyd, S., Hall, L.S. and Bradley, A.J. 1999. Reproductive strategies of a warm temperate vespertilionid, the large-footed myotis, *Myotis moluccarum*, (Microchiroptera: Vespertilionidae). *Australian Journal of Zoology*, 47: 261-274
- Martin, L. 1998. Posture and pauses during parturition in flying-foxes (Genus *Pteropus*, suborder Megachiroptera). *Australian Zoologist*, 3 (4): 437-442
- Martin, L. 1998. Posture and anatomical adaptations in neonatal flying-foxes (Genus *Pteropus*, suborder Megachiroptera): cautionary tales for carers. *Australian Zoologist*, 3 (4): 443-448
- Murphy, M. 1998. Mammal survey of Seven Mile Beach National Park and Comerong Island Nature Reserve on the south coast of New South Wales. *Australian Zoologist*, 3 (4): 419-425
- O'Donnell, C.F.J., Christie, J., Corben, C., Sedgeley, J. and Simpson, W. 1999. Rediscovery of short-tailed bats (*Mystacina* sp.) in Fiordland, New Zealand: preliminary observations of taxonomy, echolocation calls, population size, home range and habitat use. *New Zealand Journal of Ecology*, 23 (1): 21-30
- Pavey, C.R. 1998. Habitat use by the Eastern Horseshoe bat, *Rhinolophus megaphyllus*, in a fragmented woodland mosaic. *Wildlife Research*, 25 (5): 489-498

- Tidemann, C.R., Vardon, M.S., Loughland, R.A. and Brocklehurst, P.J. 1999. Dry season camps of flying-foxes in Kakadu World Heritage Area, north Australia. *Journal of Zoology*, 247 (2): 155-163
- Vardon, M.S. and Tidemann, C.R. 1998. Reproduction, growth and maturity in the black flying-fox, *Pteropus alecto* (Megachiroptera: Pteropodidae). *Australian Journal of Zoology*, 46 (4): 329-344
- Young, R.A. and Ford, G.I. 1998. Range extension of the little forest bat, *Vespadelus vulturnus*, (Chiroptera: Vespertilionidae) into a semi-arid area of central Queensland, Australia. *Australian Zoologist*, 30 (4): 392-397

_____ ^V^ ^V^ ^V^ _____



AUSTRALASIAN BAT SOCIETY

MEMBERSHIP APPLICATION/RENEWAL FORM

The Australasian Bat Society was conceived at the 4th Australian Bat Research Conference (Brisbane 1991) and became an incorporated society in 1998. The ABS unites people with a common interest in this unique fauna. Whether they be researchers, naturalists, foster-carers or fruitgrowers, everyone benefits from our unification. By presenting a united front to assist the resolution of conservation problems, or to lobby politicians, or simply spread the good word to the public, the goals of the ABS are conveyed more efficiently than through individual effort. Every second year the ABS arranges the Australasian Bat Conference. Communication is promoted through a bi-annual newsletter, which contains research news and notes, and our web page on the Internet - <http://batcall.csu.edu.au/batcall/abs/welcome.htm>

Further information on membership can be obtained from the Membership Secretary:

Lindy Lumsden, PO Box 137, Heidelberg, Victoria 3084, Australia.

Phone No. (03) 9450 8694 Fax (03) 9450 8799 E-mail <Lindy.Lumsden@nre.vic.gov.au>

MEMBERSHIP FORM FOR THE AUSTRALASIAN BAT SOCIETY

I wish to become a member/renew membership of the Australasian Bat Society. I declare that I subscribe to the Aim and Objectives of the Society and agree to be bound by the Rules of the Society.

Name:

Address

State Postcode Country

Phone: () Fax: ()

Email address:

I qualify for membership at the following annual rate (circle):

Standard (\$A30) *Student, Unemployed or Retired (\$A20)* *Institutions (\$A50)*

Outside the Australasian Region (\$A40) *Institutions Outside the Australasian Region (\$A60)*

Signed:

My payment by cheque/bank draft for Aust\$..... is attached, **OR**

Please debit my Bankcard / Mastercard / Visacard the amount of Aust\$

My card number is _____ Expiry date

Cardholder's Name

Signature

Please forward payment to the ABS Membership Secretary (address above).

Table of Contents

Instructions to Contributors	2
Editorial	3
President's Report	4
Research Articles and Reviews	
Centralian bats come to cyberspace A. Herr	6
Activity levels of insectivorous bats in urban and surrounding woodland areas in the Blue Mountains, New South Wales: preliminary findings A.L. Towerton	8
Daytime retention of viable seeds in the gut of <i>Cynopterus sphinx</i> (Megachiroptera: Pteropodidae): implications for long-distance seed dispersal L.A. Shilton	12
Monitor mode: a new Anabat software feature that automatically saves bat calls to computer R.R. Chick and L. Lumsden	16
Reports	
• The Simple Bat Detector	20
• 9 th Australasian Bat Conference 2000 – Call for Registration and Papers	21
• Range extension of the Gould's Long-eared Bat <i>Nyctophilus gouldi</i>	25
• Tick paralysis in flying-foxes on the Atherton Tablelands	27
• Commercial harvesting of flying-foxes	29
• Minutes of the 1st Financial General Meeting of the Australasian Bat Society, Inc.	33
• Sub-committee update	37
• Why having a big dick is not always a good thing!	37
Contacts/Network/News	
# News from the University of WA	38
# Marking small bats	38
# Australian Museum Bat Exhibition 1999-2000	39
# Volunteers wanted for Spectacled Flying-fox fieldwork	39
# 12 th IBRC – Malaysia 2001: Update	40
# New Journal - ACTA CHIROPTEROLOGICA	40
Recent Literature	41
ABS Membership Application/Renewal Form	43
Table of Contents	44