



# Newsletter *of the* Australasian Wildlife Management Society

Volume 22 Issue 1

March 2008

ISSN No. 1322-9028

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This newsletter reflects the opinions of the author(s) but not necessarily those of the AWMS Committee or membership. AWMS makes no claim as to the accuracy of stated claims and any party using this information does so at their own risk.

## From the President...

The most important AWMS event since the last newsletter is the 2007 conference, which was held in Canberra on 2–5 December. The conference, an Australian Academy of Science Fenner Conference on the Environment was special for several reasons. First, the theme of the conference, Wildlife Population Dynamics and Management, celebrated the career of the late Dr Graeme Caughley, a founding member of AWMS and a fellow of the Australian Academy of Science. In 1977, Dr Caughley published the book *Analysis of Vertebrate Populations*. That book has had a profound and long-lasting impact on wildlife science and management around the world. Although some techniques have changed greatly since Dr Caughley's untimely death in 1994, his works still provide an important conceptual background underpinning wildlife research and its application to environmental and conservation problems in Australasia and elsewhere. The general aims of the conference were to review general and specific topics in Dr Caughley's research, to describe developments in the many fields of wildlife population dynamics and management since 1977, and postulate on future research needs and directions in environmental and conservation problems in Australia and elsewhere. To meet these aims the conference organiser - Jim Hone - and the AWMS committee decided that it was appropriate to invite international experts to provide an overview of selected fields and indicate directions for further work. Although the format differed from previous years, it was the most exciting conference that I have attended in my association with AWMS. It was a wonderful four days and the invited papers that will be published in a special issue of *Wildlife Research* will be a fitting permanent record of the conference.

The second feature of the conference was the support of the Australian Academy of Science. Largely through the efforts of Jim Hone, AWMS was successful in its application to host the conference as an Australian Academy of Science Fenner Conference on the Environment. On behalf of AWMS I wish to thank the Australian Academy of Science and Professor Fenner for their generous support of the conference. Part of that support included the use of the Shine Dome, a Canberra landmark since its construction in 1959.

In addition to a National Heritage Listing, the Shine Dome has been nominated to the World Register of Significant Twentieth Century Architecture. It was a wonderful venue for the conference.

The third and final key feature of the conference was that it celebrated the 20th anniversary of the Australasian Wildlife Management Society. I particularly enjoyed hearing anecdotes about previous AWMS events and members.

On behalf of the Society I wish to thank Jim Hone for his organisation of the conference. I would also like to thank the Invasive Animals Co-operative Research Centre, Landcare Research and the Institute for Applied Ecology (University of Canberra) for their sponsorship of the conference.

*Dave Forsyth*

**VIEW THE 2007  
ANNUAL GENERAL MEETING  
MINUTES BY CLICKING HERE**

## Upcoming conferences:

### Australasian Vertebrate Pests Conference

10-13 June 2008

VENUE: Sky City, Darwin

WEBSITE: <http://www.abcon.biz/vertebrate.htm>

EMAIL: [vertebrate@onqconferences.com.au](mailto:vertebrate@onqconferences.com.au)

### AWMS Conference

24-28 November 2008

VENUE: Esplanade Hotel, Fremantle

WEBSITE: <http://www.awms.org.nz>

EMAIL: [awms@onqconferences.com.au](mailto:awms@onqconferences.com.au)

### 29th Symposium on Sea Turtle Biology & Conservation

17-19 February 2009

VENUE: Brisbane Convention & Exhibition Ctr

WEBSITE: <http://www.turtlesbrisbane2009.org/>

EMAIL: [brisbane2009@seaturtle.org](mailto:brisbane2009@seaturtle.org)

### International Invasive Bird Conference

1-4 December 2008

VENUE: Maritime Museum

WEBSITE: <http://www.abcon.biz/iibc.htm>

EMAIL: [iibc@onqconferences.com.au](mailto:iibc@onqconferences.com.au)

## 2008 AWMS Conference

The 2008 AWMS Conference will be held in the heart of the historical port city of Fremantle in Western Australia at the Esplanade Hotel, Fremantle.

The attractions of Fremantle offer the ideal setting for wildlife managers and researchers to come together and discuss the latest issues.

AWMS 2008 will be held in the last week of November (24-28), so mark those dates in your diary. Support for the conference is from the Western Australian Departments of Agriculture & Food and Environment and Conservation, with organisation services provided by long-time AWMS supporter Doreen Culliver and her team from On Q Conferences.

VENUE: Esplanade Hotel, Fremantle  
 WEBSITE: <http://www.awms.org.nz>  
 EMAIL: [awms@onqconferences.com.au](mailto:awms@onqconferences.com.au)

## 29th Symposium on Sea Turtle Biology & Conservation

17-19 February 2009 - Brisbane, Australia

Creating – Community – Collaboration: The symposium will explore themes such as building communication and networking at local, regional, and global scales. It aims to create linkages between communities and to connect policy-makers and managers at all levels with the latest information coming out of sea turtle research and conservation programs.

This is the International Sea Turtle Society's annual symposium.

VENUE: Brisbane Convention & Exhibition Centre  
 WEBSITE: <http://www.turtlesbrisbane2009.org/>  
 EMAIL: [brisbane2009@seaturtle.org](mailto:brisbane2009@seaturtle.org)

## International Invasive Bird Conference

To complement AWMS 2008, the inaugural International Invasive Bird Conference will also be held at the Maritime Museum in Fremantle from the 1st to 4th December. This conference aims to bring together researchers and managers from around the world to share their experiences relevant to the control of invasive birds and discuss future management options. The conference will focus specifically on species such as the common starling, the Indian myna, the house crow and the Indian ringneck parakeet.

This conference is supported by the Western Australian Department of Agriculture and Food, with organisation support from Doreen Culliver and On-Q Conferences. Enter the website and add your name into the Expression of Interest form so you are kept up-to-date with information.

VENUE: Maritime Museum  
 WEBSITE: <http://www.abcon.biz/iibc.htm>  
 EMAIL: [iibc@onqconferences.com.au](mailto:iibc@onqconferences.com.au)

## Student Award – Best spoken Paper awarded to Siobhan De Little



**Maximizing efficacy and minimizing effort: statistical stratagems for mosquito management.**

Mosquitoes cause more human suffering than any other organism; it has been estimated that over three million people die from mosquito-borne diseases globally every year. Mosquito population control currently

constitutes one of the largest recurrent land management programs in the Northern Territory; however, the effectiveness of this control program depends on our ability to identify and target the areas of high mosquito productivity. My PhD research centers on the development of stage-structured population models that will integrate both spatial and temporal data that defines the intrinsic and extrinsic factors governing the distribution of mosquito abundance. These models will not only be used for the assessment of current management regimes, but also to predict changes in mosquito abundance and range due to environmental and anthropogenic landscape and climate change.



I presented the preliminary results from an experiment designed to examine the effectiveness of the current spray program and estimate mosquito vital rates for model

development at the AWMS conference in Canberra last year. The experiment showed that current mosquito larvae sampling practice is incorrectly assessing mosquito density – this procedure is used world-wide, and could play a huge part in the effectiveness of control measures; the spraying control measures already performed in the NT are effective at reducing mosquito numbers; and while other control measures such as burning may affect mosquito density, the effects were minimal.

Data from the experiment that will be used to parameterized stage-classified matrix models of the mosquitoes includes: life history data for transition between stages, larval mortality due to insecticide, environmental conditions, predator/prey interactions, one of the possible mechanisms for density-dependence, adult survival, adult fertility, and adult dispersal capacity.

The next step in my PhD will be to construct and use fully parameterised models to identify the ideal control regimes for the mosquito populations (i.e. which life stages to target, environmental conditions and landscape as indicators for control), and also to examine and predict changes in mosquito population abundance and range in the face of climate change, which predicts higher rainfalls and changes in vegetation dynamics.

## 2007 AWMS Graeme Caughley Award



In 2003 the AWMS committee recommended that it was appropriate and desirable for a mechanism to be established through which its membership can occasionally recognise outstanding contributions to the field of wildlife management in Australia and New Zealand.

It was subsequently agreed

that AWMS establishes a 'Graeme Caughley Medal for Contributions to Australasian Wildlife Management'. Congratulations Dr Glen Saunders for receiving the 2007 Award.

### Extract from the Award nomination:

*Glen has made an outstanding contribution to many aspects wildlife management in Australia, primarily in the field of pest animal management. His contribution to wildlife management spans high level research, supervision of Masters and PhD students, policy development, advocacy and promoting best practice management of pest animal damage. He has also been very active within AWMS serving as President, Immediate Past President as well as organising annual conferences.*

### Statement in support of the nomination

Glen completed a Masters Degree on the biology and management of feral pigs in the High Country at Macquarie University and a PhD from Bristol University on urban foxes and their role in the control of rabies. Throughout his career, Glen has maintained a high output of scientific information and scientifically-based wildlife management policy. He has been highly influential in setting national and state policy for best practice management of pest animals in general with a major emphasis on feral pigs and foxes. He is Australia's foremost expert on foxes and their management and has published numerous papers and reviews on foxes including being the senior author of the Bureau of Rural Sciences Managing Vertebrate Pests: Foxes, a key resource document on the history, biology, damage and management of foxes. Recently he was a member of the team that reviewed fox management in Tasmania. Glen also has extensive input into Australia's preparedness for managing exotic animal diseases and into setting policy and practice for the humane treatment of pests.

Glen has not confined himself to research and policy but has actively encouraged the transfer and adoption of best practice at the operational level. He has worked closely with the pest animal extension arm of NSW DPI as well as with the state Rural Lands Protection Boards. Whenever practicable, he has given presentations to and on-ground advice to RLPB rangers and others involved in developing and implementing pest animal programs. Glen has prepared extension material, innovations such as the organisation of stakeholder involvement in the development and implementation of research programs, national training packages and the development of interactive CD-ROM technology for use in pest management training. A clear demonstration of his commitment to this has been the production of PESTPLAN, a practical guide and tool to assist managers set their pest animal priorities and to develop their locally owned and implemented pest animal strategies.

Dr Saunders' permanent position is Principle Research Scientist, Vertebrate Pest Research Unit, NSW Department of Primary Industries where he is the leader of the Vertebrate Pest Research Unit, the most highly regarded pest animal research unit in Australia.

The Unit has produced some of the most outstanding research in pest animal management including ground-breaking studies into the biology and management of feral pigs and foxes. Other research conducted by the Unit under the direction of Glen includes extensive research into feral goats, rabbits (including the impact of Rabbit Haemorrhagic Disease), feral goats, wild dogs and most recently, pest birds. Dr Saunders has also written key documents on managing wildlife for exotic disease preparedness and recently developed standard operating procedures and codes of practice for the humane treatment of pest animals destroyed during pest management programs.

Dr Saunders was a key member of the team that was successful in establishing and obtaining financial support for the Australasian Invasive Animals CRC. He is now the Program Leader, Terrestrial Products and Strategies for the CRC. Issues that his program is investigating include:

- Feral cat - development of suitable bait & baiting strategies.
- Development and testing of new feral pigs management solutions.
- Improving effectiveness of Rabbit Haemorrhagic Disease Virus (RHDV).
- Enhancing fox control methods and strategies.
- Improving the Management of Australia's Pest Birds – including maintenance of a national database and information exchange service.
- Investigation of solutions to cane toad control.
- Determining the role of commercial use in invasive animal control.

Throughout his career, Dr Saunders has reviewed numerous national and international research papers and is now Chief Editor of the Australian Journal of Wildlife Research. Other roles and activities that Glen has undertaken include:

- Assisted in the establishment of the National Wildlife Health Network.
- Organiser, Australasian Vertebrate Pest Control Conference, Dubbo and Australasian Wildlife Management Society Conferences, Camden and Kangaroo Is.
- Member of Grains Research and Development Corporation committee which reviewed national mouse plague control activities.
- Convenor of Ministerial Review Committee on wild dog control in NSW.
- National leadership in wildlife and exotic disease preparedness issues.
- Convenor and editor of the AUSVETPLAN Writing Group (Wild Animal Control).
- Member of a Commonwealth Government Wildlife and Exotic Disease Preparedness Program review panel which assessed relevance of funded research and recommended future directions.

*Continued Page 4*

## 2007 AWMS Graeme Caughley Award continued

- National leadership in establishing humane standard operating procedures and codes of practice for pest animal control.
- An enthusiastic champion of education and training for the next generation of wildlife managers through encouragement and engagement in postgraduate education for employees of his department and prospective employees of the industry more broadly, through Universities nationally and internationally.

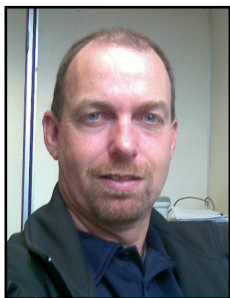
The relevance of Dr Saunders' research has been recognised by continued and substantial support from various Rural Industry and National Funding Bodies, a major coup for Glen given the ever decreasing funds available for wildlife (pest animal) research. Dr Saunders has been invited to present papers at national and international symposia; to participate in many science review panels including from United Kingdom Primary Industry Research agencies; and authorship of numerous policy review documents.

Dr Saunders is highly respected by his research peers and has developed a number of valuable associations with scientists and research organisations in similar areas of research throughout Australia and overseas. This has resulted in his recent appointment as Program Leader, Terrestrial Products and Strategies, Invasive Animals CRC. The extensive list of scientific papers, book articles, conference papers and other publications attest the breadth and extent and influence that Dr Saunders has had in wildlife management.

### The Award:

Apart from the medal itself, the award includes registration, an airfare and accommodation at the subsequent AWMS conference and the opportunity to address the Annual Conference on a subject of their choosing.

## New Committee member 2008



Dave Ramsey started his research career in Queensland working on the population dynamics of rodents in agricultural systems. After completing his PhD in ecology in 1995 at the Queensland University of Technology he left Australia for New Zealand joining Landcare Research as an ecologist. While there, he worked mainly on the population dynamics of vertebrate pests, in particular brushtail possums. Dave and a colleague also research the ability of

the human palette to discriminate between different types of cheap scotch whisky. However, after a few replicates the project had to be abandoned due to illness. Instead he became interested in the epidemiology of bovine Tb in wildlife and has researched the potential of different strategies for eradicating disease. He has also looked at issues around disease surveillance particularly around the issue of the power of monitoring to detect low numbers of diseased individuals. He has also applied the same thinking to determine the appropriate amount of monitoring required to estimate the success or failure of eradication programs for vertebrate pests. Dave's interests are in population dynamics, modelling and biometrics and he has been a member of AWMS since 1991. Dave moved back to Australia in 2007 and is currently employed as a biometrician at the Arthur Rylah Environmental Research Institute in Melbourne.

## Student Award – Best poster awarded to Jackie Chan (last page of Newsletter)



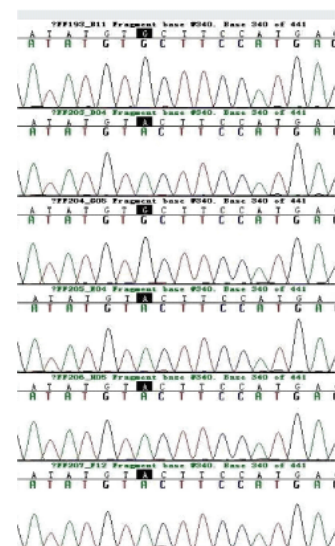
### Genetic Estimates of Dispersal and the Implications for Conservation Management of Grey-headed Flying Fox

The grey-headed flying fox (GHFF) is an endemic Australian species, belongs to the family Pteropodidae (also known as fruit or blossom bats). The GHFF primarily occupies the south-eastern region of Australia. The total population of GHFF has experienced continued decline and has been listed as

vulnerable since 2001. However, culling is still tolerated in some areas due to crop damage caused by the animal.

The GHFF exhibits regular seasonal movements according to the flowering patterns of their food source. Thus understanding dispersal pattern of GHFF could assist conservation management of this species. Using DNA, we estimated the dispersal rate between GHFF from four widely spaced locations along the east coast of Australia. The dispersal estimates inferred from this study are well within the values to be considered as high dispersal, and therefore GHFF from different locations should be considered as a single intermixing population. Consequently, it is possible that culling in any one of the locations could reduce the total population of the GHFF due to the large exchange of GHFF individuals between different localities.

**Figure 1** - This figure shows an example (of the chromatograms) of the DNA sequences obtained in this study. The sequences were aligned and compared, and then variable sites can be identified. In this figure, the highlighted position is one of the variable sites identified in this study.



This work was done as part of my honours study at UNSW. More details of this study can be found in the attached poster, or you can contact me on jackie.t.chan@gmail.com. The result of this work was presented at AWMS conference 2007 in Canberra.

## 2007 Conference photos



Well done to the student award winners



Were they discussing the probability of a two nil one-day cricket series loss to India?



Cathy Herbert (new AWMS Membership Secretary) with friends



Roger Pech and Dave Choquenot (had the venue run out of wine?)



Enjoying the lovely conference venue.



Pip Masters and her daughter with the incorrigible Braysheer

## AWMS. A brief history – by Jim Hone

The concept for the Australasian Wildlife Management Society (AWMS) developed one night during discussions between a group of researchers at Trangie in western New South Wales in 1987. The group in alphabetical order was Jim Hone, Terry Korn, John McIlroy, Peter O'Brien, Glen Saunders, Clem Tisdell and George Wilson. The concept was developed and the waters tested at the Australian Vertebrate Pest Control Conference in 1987 to determine if there was wider interest. The establishment was assisted by a steering committee comprising Graeme Caughley, John Parkes, Sue Briggs, George Wilson, Tony Oliver, Peter O'Brien and Jim Hone.

The aims of the Society were to provide a forum for discussion of scientific wildlife management and to support and advance the scientific basis of wildlife management. The aims have changed slightly over the years, to now promote the study and application of scientific wildlife management, and to provide opportunities for discussion and the dissemination of information among members by appropriate means such as meetings, workshops and publications.

The first members joined in 1988 and the first conference was held in early December 1988 in Canberra. Conferences have since been held each year about that time (Table 1). The conferences have been a particular focus for AWMS, as they constitute a major activity of the Society. In 2007 the Society held its 20th conference.

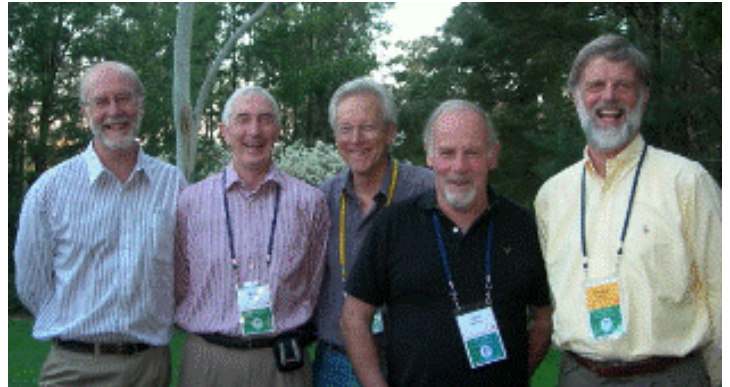
The Society has always had an interest in the science of wildlife management, and the application of science in wildlife management. Over the years, conferences have had a creative tension between addressing the science versus addressing the application of science.

The Society has published a newsletter several times a year in each year the Society has existed. The Society is 20 years old and there are 21 volumes of the newsletter, a peculiarity that deserves attention.

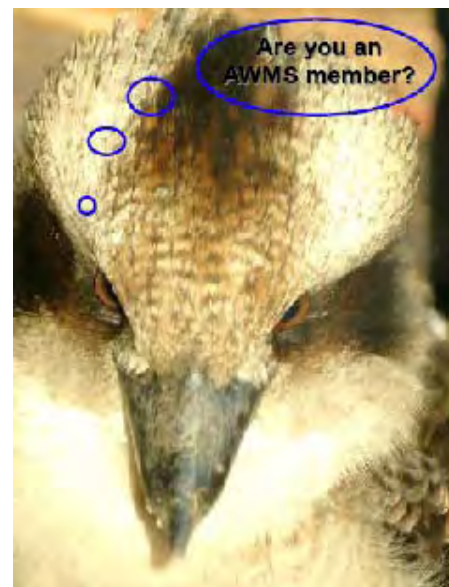
**Table 1.** The year of, and location of, AWMS conferences

Year	Location	Talks	Posters	Registrants
1988	Canberra	32	2	-
1989	Melbourne	51	9	155
1990	Lincoln	51	7	-
1991	Dubbo	42	4	-
1992	Brisbane	48	8	-
1993	Melbourne	57	9	146
1994	Alice Springs	61	6	-
1995	Christchurch	62	15	-
1996	Canberra	83	16	152
1997	Armidale	60	18	122
1998	Gatton	62	7	105
1999	Darwin	65	22	131
2000	Queenstown	67	8	102
2001	Dubbo	86	23	162
2002	Camden	65	9	110
2003	Christchurch	400	197	889
2004	Kingscote	116	17	220
2005	Hobart	96	12	143
2006	Auckland	100	10	148
2007	Canberra	52	21	141

The 2003 conference was incorporated into the International Wildlife Management Congress. The 2007 conference was incorporated into a Fenner conference. Numbers for talks, posters and registrants have not been corrected for non-shows and late registrations. A dash indicates no data.



Five of the original seven who kicked off AWMS. Peter O'Brien was in hospital with appendicitis, and the seventh was Clem Tisdell.



## Join up now and get the benefits

Join a group of people with similar interests ...

- Cheaper registration at conferences
- Newsletters
- Email news-group
- Access web page
- Electronic web payment now available

<http://www.awms.org.nz>

## NSW Wildlife Council Reaches Out

The state of New South Wales alone has well over 4,500 voluntary wildlife rehabilitators who are trained to rescue, rehabilitate and release native fauna. All but a handful are members of some 27 organizations licensed under the National Parks and Wildlife Act 1974.

The organizations themselves are surprisingly diverse, ranging from entities dealing with a single species across a particular region, e.g. Friends of the Koala [Northern Rivers] to the multi-branched New South Wales Wildlife Information and Rescue Service (WIRES). The Department of Environment and Climate Change's policy is to license groups wherever possible, however licences are still issued to individuals in certain circumstances.

In 2005 the peak body, the NSW Wildlife Council (NWC), was established to represent all voluntary, licensed, wildlife 'rehabbers'. The initiative came from the second national wildlife rehabilitation conference held in Penrith during 2004. The conferences have become an annual event, strengthening cohesion in Australia's wildlife rehabilitation sector and progressing the development of representative state/territory bodies. Councils have been formed in Queensland and New South Wales; Victoria is getting close.

### NWC's Operational Framework

**Mission:** Achieving optimal outcomes for Australian wildlife

**Objectives:** The Council will:

- Act as the peak representative body for licensed wildlife rehabilitators in New South Wales.
- Foster the sharing of available resources among rehabilitators and will collect, assemble and disseminate accurate and up to date information on all aspects of wildlife care, rescue, rehabilitation and release.
- Develop State/National standards and codes of practice for both captive wildlife management and the training of rehabilitators and through education and training maximize the welfare outcomes for native animals.
- Act as an independent advisory Council to all levels of Government, business and the community on wildlife rehabilitation and habitat conservation.
- Work with equivalent councils from other states and territories towards the creation of a national wildlife rehabilitation council.
- Work for the interests and needs of wildlife rehabilitators
- Undertake such other representations, programs and activities as may, at the discretion of the Council, be considered necessary and proper.



**Functions:** The Council may pursue its objectives by engagement in the following:

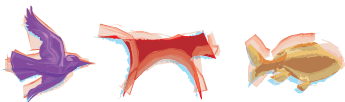
- Establish and maintain (within the legislative and regulatory framework) codes of practice and State/National standards for wildlife care.
- Promote the registration of education and training standards for licensed wildlife rehabilitators.
- Provide considered advice on any wildlife care/rehabilitation matters where applicable.
- Promote networking and dialogue between all those involved in wildlife health and welfare.
- Represent and provide a collective voice for its constituents.
- Liaise with relevant government ministers and departments regarding the work and outcomes of the Council.
- Establish working groups or seek wider consultation to assist in carrying out its functions as deemed necessary
- Advance and promote community awareness, interest and support for native wildlife welfare and conservation.
- Seek funding for pursuing the Council's objectives.
- Liaise with other State Councils in the creation of a National Council.

The licensed groups, (the individual licence holders are considered to be one group), constitute the Council's voting membership.

Entering its third year of operation the Council is ready to communicate its role and activities to all its stakeholders through a quarterly newsletter, *Wildlife Watch*. To find out more about the Council and to download *Wildlife Watch* visit [www.nwc.org.au](http://www.nwc.org.au)

Lorraine Vass  
Media Officer





# Cane toad control research forum

**Sky City Casino, Darwin 13 June 2008**

## ***Call for contributions and registration***

Objectives of the open forum:

- to bring together researchers and others with an interest in cane toad control
- to hear and discuss the latest information on cane toad control research
- to develop an understanding of future research priorities for the control of cane toads.

## **Draft program**

### **8.30am Welcome and overview of cane toad issues**

Prof. Tony Peacock, CEO of the Invasive Animals CRC and member of the Cane Toad Advisory Committee (CTAG).

### **8.45am Prospects for control**

Brief presentations are invited on current or proposed research on the control of cane toads. Maximum of 15 minutes per speaker.

*Intending speakers should submit a one page (maximum) abstract to Chris Lane via email ([chris.lane@dpi.nsw.gov.au](mailto:chris.lane@dpi.nsw.gov.au)) by 18 April 2008.*

### **10.30am Break**

### **11.00am Prioritising research**

Facilitated discussion on short, medium and long-term control issues for cane toads and consequent research priorities.

### **1.00pm Wrap up and final recommendations**

### **1.15pm Light lunch.**

**Note:** *forum presenters, speakers and participants must be familiar with the Proceedings of the 2006 Brisbane Cane Toad Workshop (download at: <http://www.invasiveanimals.com/downloads/2006-Cane-toad-workshop-proceedings.pdf>).*

*This forum will not cover old ground, but consider current control research and then look to the future. You must [click here](#) to register your attendance and participation at this forum - cost \$40. Attendees are also advised that a session on cane toads will be held as part of the main 2008 Australasian Vertebrate Pests Conference on Thursday 12th June at the same venue. Click [here](#) to view the full conference program.*

## 14th Australasian Vertebrate Pests Conference

10-13 June 2008, Sky City Darwin

The Australasian Vertebrate Pest Conference, to be held in Darwin 10-13 June 2008, is the 14th in a series recommended by the Vertebrate Pests Committee (VPC). The conference is held triennially, with the last conference convened in Wellington, New Zealand in May 2005. The 2008 AVPC will be organised in conjunction with the Invasive Animals Cooperative Research Centre and the Northern Territory's Dept. of Natural Resources, Environment and the Arts.

The role of VPC is to provide coordination in policy, planning and overall strategies which address pest animal problems. The upcoming conference is timely given that VPC has just released its' Australian Pest Animal Strategy (APAS) which will provide a national framework for the management of pest animals for the next five years. Through these triennial conferences, VPC aims to increase the exchange of ideas, knowledge and innovations of all those involved in pest animal management in Australia and New Zealand as well as internationally.

Organisation of the Australasian Vertebrate Pest Control Conference in Darwin is progressing well. The program is looking varied and interesting with 137 papers and 21 posters registered for presentation including a number of international speakers. This is 60 spoken papers more than the previous AVPC in Wellington, 2005.

A highlight of the opening plenary session will be a presentation by Jim Thompson outlining progress on the establishment of an Australian Pest Animal Strategy.

The program will cover the following topics:

- Pest Animal Outlook
- Managing Incursions
- Prioritising and Planning Pest Control
- Island Refuges and Control Programs
- Commercial use of Pest species
- Welfare, Urban Pests and Human Conflict
- The Future of Conservation Pest Management
- Pest Fish Control
- Pest Control in Production Settings
- Rabbit Control
- International Pest Control Issues
- New tools and methods
- Monitoring Pest Animals
- Cane toads impact and control



**IF YOU WOULD LIKE TO  
CONTRIBUTE AN ITEM TO THIS  
NEWSLETTER, CONTACT THE  
EDITOR**

**[ben.reddiex@maf.govt.nz](mailto:ben.reddiex@maf.govt.nz)**

# Genetic Estimates of Dispersal & Implications for Conservation Management of Grey-headed Flying Fox (*Pteropus Poliocephalus*)



Chan, J. T., Eby, P., Wan, S. and Sherwin, W. B.

University of New South Wales

Correspondent: Jackie, T Chan

Email: jackie.t.chan@gmail.com



## Introduction

This endemic Australian species is listed as vulnerable and is protected in some areas, **but** culled in some areas due to crop damage etc. Effective conservation management requires understanding of the dispersal between subpopulations because the mixed management strategy is unworkable unless there is a very limited dispersal between the subpopulations. Estimates of dispersal can be obtained by genetic methods.



## Aim

- Genetic estimates of dispersal across the geographic range of the species.
- Provide data for demographic modelling to predict the effect of the mixed management strategy.

## Method

- Samples were collected during winter to maximise the chance of capturing resident flying fox.
- Four subpopulations were sampled (Figure 1).
- Mitochondrial *cytochrome b* DNA sequence of 365 basepairs.
- $F_{st}$ ,  $\Phi_{st}$ , and  $\bar{p}(1)$  were used to estimate dispersal as number of dispersers per generation ( $N_e m$ ).
- Population structure inferred using Phylogeny.

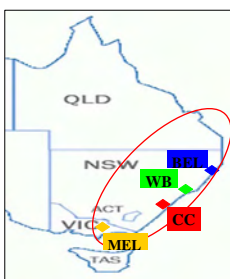


Figure 1. Sampling sites. Bellingen (BEL),  $n=17$ ; Wingham Bush (WB),  $n=27$ ; Sydney (CC),  $n=31$ ; and Melbourne Botanic Garden (MEL),  $n=30$ . The red circle shows the geographic range of the species.

## Results

- A huge amount of DNA sequence polymorphism was observed.
- Low divergence and high dispersal between the subpopulations (Table 1).
- No significant sequence divergences (Figure 2).
- No obvious correlation between the genotype and the geographic origin of individuals (Figure 2).

## Conclusion

The data collected in this study showed that there is high dispersal between the GHFF subpopulations and the species behave as a single large-interbreeding population. Therefore culling in one area is very likely to affect the whole population. Consequently, conservation management of the species should be considered at a species level.

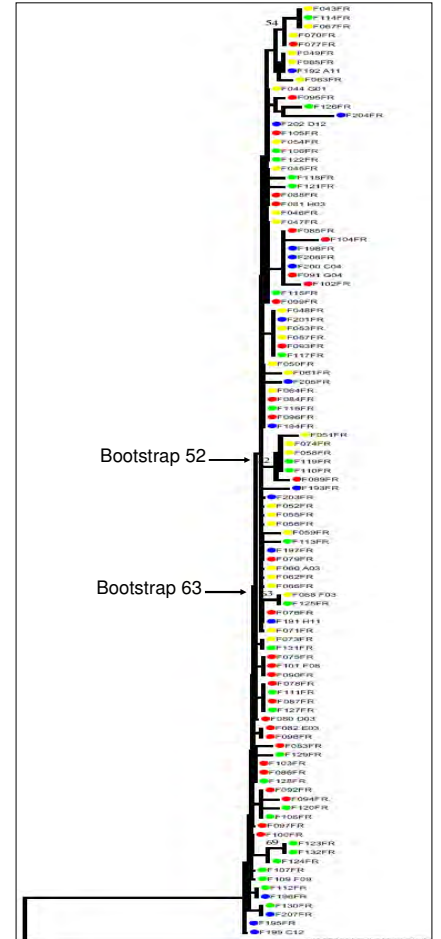


Figure 2. Evolutionary relationship of 106 grey-headed flying fox individual based on the cytochrome *b* sequence.

## Acknowledgements

We would like to thank the Ku-ring-gai Bat Conservation and the Linnean Society for the funding and support for the project.

Table 1. Subdivision measurements and inferred dispersal ( $N_e m$ ).

Population 1	Population 2	Freq-based	$N_e m$	Distance-based	$N_e m$	$\bar{p}(1)$	$N_e m$
MEL	CC	0.004	122	0.047	10	0.041	5
MEL	WB	0.016	30	0.013	38	0.040	6
MEL	BEL	0	$\infty$	0.029	17	0.056	3
CC	WB	0.003	153	0.006	80	0.039	6
CC	BEL	0	$\infty$	0	$\infty$	0.040	7
WB	BEL	0.010	49	0.011	46	0.053	4
OVERALL		0.004	122	0.018	27	0.039	7