# QUEENSLAND GLIDER NETWORK NEWS

Newsletter 18 | May 2012

Image: courtesy Shane Dineen—Squirrel Glider, Witta Nature Refuge owned by the Wildlife Land Fund Limited, founded, fostered and promoted by Wildlife Queensland

## What's news?



# Gliders in the Flinders Karawatha Corridor

On 9 November 2011 the Queensland Government announced its plan to secure long term protection of the Flinders Karawatha Corridor, which then on 24 January this year received formal legal protection. In addition, on 17 February 2012 it was announced that Queensland Rail had signed off on the transfer of 126 hectares of bushland to the then Department of Environment and Resource Management (DERM), in order for it to become part of the Flinders Karawatha Corridor. So what does this mean in terms of conservation? What actions will be taken in order to protect and manage this corridor?

DERM has formed a partnership with local councils, the commonwealth Department of Defence and various other community and catchment groups.

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# Gliders in the Flinders Karawatha Corridor *continued...*

This partnership has been formed so that the protection and management of the corridor can be a co-ordinated effort. The Queensland Government's five year vision for the corridor includes three phases:

1. 'Providing planning protection for the corridor to ensure the area is protected for its environmental, economic, social and cultural values.'
2. 'To determine a plan for the corridor including a strategy for future investment and management of the corridor. This will be carried out, working in partnership especially with local councils.'
3. 'Finally the provision of community green space. This will include walking tracks, rehabilitation of degraded habitats and maintaining and improving connectivity through the corridor.'

To date there have been no recent statements from the partnership or from any of the individual members of the partnership regarding actions to be taken. The Queensland Government was due to complete a management plan by Easter 2012, and it appears most partners are awaiting this. However, with the recent change to the Queensland Government, the protection and management of the corridor may not be at the forefront of the new Queensland Government's priorities. This means we may be forced to wait and see if the management plan materialises, and then if funding for the corridor becomes available.

The present situation within the corridor, though legally protected, is not one continuous connected wildlife corridor. At the moment the said corridor comprises of various fragmented habitats, and for it to be a true corridor in terms of conservation, these fragmented areas need to be connected somehow so that wildlife can migrate freely between habitats. Fragmentation of habitats is a huge conservation issue in today's modern world. One of the major problems with fragmentation is that species are unable to disperse, and gene flow is impossible, sometimes leading to the local extinction of a species. This in itself may not be a huge problem if the species is widespread, but if the area includes an endangered species then it can be catastrophic. As well as the connectivity of the corridor, there are other issues to be addressed such as the replanting of food trees, clearing of litter, management of introduced predators, clearing invasive and non-endemic plant species, monitoring biodiversity, and the installation and ongoing monitoring of nest boxes in the absence of natural hollows.

The Flinders Karawatha Corridor is home to at least 20 rare or threatened species [Flinders to Greenbank-Karawatha Conservation Partnership], and it is particularly important for gliders. At least three species of glider have been recorded within the corridor, though it is quite possible that five of Queensland's glider species reside within this corridor. The protection of this corridor is great news for gliders, and improving connectivity will do much to enhance current populations. For example the yellow bellied glider, which has been recorded within the corridor, can have home ranges as large as 120 hectares - these home ranges rarely overlap with other family groups. Connectivity will also help to improve gene flow and allow for wider dispersal. One of the main problems facing all species of glider is the severe lack of trees with hollows, and some glider species will use a number of different nest sites within their home range. Another issue facing squirrel gliders particularly, is that they are usually very committed to their home range, meaning that they will not leave their home range even if most of it has been cleared. Therefore the protection of this vast area of bushland, and improving its connectivity will do much to ensure the survival of gliders within south-east Queensland.

The Queensland Glider Network will have an important role within the corridor. There is a huge need for current glider populations to be mapped, for nest boxes to be installed where tree hollows are lacking, as well as the ongoing monitoring and maintenance of existing nest boxes. This information is imperative in order to help manage and conserve this vast area of native bushland successfully. If you would like to join the Queensland Glider Network and help with our activities within the corridor then please contact us on glider@wildlife.org.au or alternatively phone us on 07 3221 0194.

Image: Paradise Road wildlife crossing, Larapinta courtesy Maki Sumitani

For further information on the corridor including maps, please refer to the following websites:

- www.derm.qld.gov.au/land/planning/flinders-karawatha-corridor
- Flinders Karawatha corridor interactive map www.derm.qld.gov.au/land/planning/flinders-interactive-map
- Flinders to Greenbank-Karawatha Conservation Partnership www.sorb.org.au/fpk/pdf
- SEQ Catchments www.seqcatchments.com.au/news
- Wildlife Preservation Society of Queensland www.wildlife.org.au/news/2012/flinderskarawathacorridor

References:


- Department of Environment and Resource Management www.derm.gov.au/land/planning
- Flinders Karawatha Corridor Consultation Report 2012 http://www.derm.qld.gov.au/land/planning/pdf/flinders-karawatha-consultation-report.pdf
- Wildlife Preservation Society of Queensland species profiles www.wildlife.org.au/wildlife/speciesprofiles


Article written by Natalie McHugh

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# Hollows
## into the future

A paper by Ross Goldingay titled 'Characteristics of tree hollows used by Australian arboreal and scansorial mammals' has just been published in the Australian Journal of Zoology. It is an incredibly comprehensive assessment of the knowledge to date regarding the use of hollows by non-flying Australian mammals and associated management implications.

Goldingay states that with 62 percent of Australia's arboreal and scansorial mammals being dependent on hollows (a large number of which are classified as threatened by state or federal governments), understanding their hollow use and preferences is vital for their effective management and survival.

The paper examines existing data on the use of tree hollows; tree preferences; tree size and age; hollow height; entrance size and hollow type; hollow depth; temperature; multiple den use and den swapping; artificial hollow use; and the management implications and future research priorities.

Findings include (but are not limited to):

- Some species, for example the agile antechinus, supplement hollows with other den sites such as fallen logs
- Some species, for example the western pygmy-possum, may use hollows in some locations but not others
- The greater, squirrel and yellow-bellied gliders were among the five species most frequently studied with regard to hollow use
- The way different species use trees varies, so understanding this can assist in successful management of a species
- Stag trees (standing dead trees) were utilised by all species for which there were data, however, the proportion of stag trees versus living trees utilised varied both among species, and among locations, probably reflecting variation in stag availability
- Hollow abundance appears to be the main influence on tree preferences. This accounts for the frequent use of stags by most species because stags have a high probability of containing hollows
- The preference for a tree species appears to reflect hollow availability or perhaps quality within that tree species rather than a preference for the tree species itself
- Tree species differ in their patterns of hollow development, therefore, understanding this may assist in management and prediction of hollow abundance
- There is a positive correlation between the size of a tree and the number and size of hollows
- Animal preferences were for larger den trees although all tree sizes were utilised where available
- Tree age is the more critical factor in tree preferences, and tree size is a good indicator of tree age
- The height of entrances to used hollows appears to be influenced by the height of available hollows. Species such as the squirrel glider and mahogany glider have been documented using hollows <5 m above the ground
- Animal species display a preference for the smallest hollow entry size available, and a more specific understanding of this will allow for better species management
- While hollow depth and cavity width preferences would assist in species' management, not enough data currently exists to assess this
- Few data on the influence of temperature in hollow choice exist for Australian arboreal and scansorial mammals
- Multiple dens are used by all mammals reported on, but generally a subset of dens was used more frequently than others
- The number of dens required to satisfy animal requirements is basically not known. While many species are documented to use many trees per individual the number documented is influenced by local availability (e.g. two studies of the squirrel glider documented 2.7 and 6.9 per individual)
- Frequency of den changes may relate to one or more of: predation risk; foraging costs; home-range defence; thermal buffering; and parasite load. Data are accumulating to support the idea that den changes helps to reduce parasite load

A common brushtail possum uses a large trunk hollow (entrance diameter >10 cm) in a scribbly gum (*Eucalyptus haemastoma*) with a DBH of >60 cm. Image courtesy Ross Goldingay

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# Hollows into the future *continued...*

- Artificial hollows, or nest boxes, can be used to help understand factors that influence den tree choices
- Management of hollow-using species is required for a variety of reasons. Goldingay's paper finds that for this purpose:
  - There are few data on hollow characteristic preferences of many species
  - The primary factor in hollow choice appears to be availability
  - There is a lack of understanding whether the ongoing supply of hollows for species is provided for
  - Determining the number of hollows required to satisfy a species may assist in management of the species.

The paper emphasises how critical it is to understand the tree hollow requirements of Australian mammals, as well as the provision of hollow bearing trees, in order to manage and conserve these species in the long-term. Additionally, enhancing this understanding for Australian mammals will contribute to the management of arboreal and scansorial mammals worldwide.

Article written by Karen Brock, edited by Ross Goldingay

Goldingay, R. L. (2012). Characteristics of tree hollows used by Australian arboreal and scansorial mammals. Australian Journal of Zoology (59: 277-294). http://dx.doi.org/10.1071/ZO11081

# Mahogany Glider

## Recovery post Cyclone Yasi

Habitat of the endangered mahogany glider was hard-hit by category 5 Tropical Cyclone Yasi on 3 February 2011.

The public responded immediately and generously to help the glider by donating funds, supplementary food and nest boxes. But were these actions effective in helping the glider to recover?

The Foundation for Australia's Most Endangered Species (FAME) contributed funding to Wildlife Queensland to help answer this question. I was appointed to undertake an assessment of the recovery actions following Active Adaptive Management principles.

Studies were undertaken by three tertiary students, assisted by Queensland Parks and Wildlife Service, Girringun rangers Wildlife Queensland members, volunteers and the public. The studies focussed on supplementary feeding, nest boxes and survival of gliders in known habitat and confirmed that mahogany gliders were capable of surviving the impact of a major cyclone unaided providing they have sufficient unfragmented natural habitat. They also demonstrated that the cyclone had some beneficial effects for the glider - it created new den hollows where branches snapped off and reduced the density of the understorey thereby improving the glider habitat. The program raised community awareness and increased the knowledge pool of the glider suitable for future management which is the main aim of Active Adaptive Management.

Highlighted was the need for *proactive recovery actions* – strategic tree plantings to expand and reconnect habitat (paddock trees and glide-poles), regular monitoring of glider presence at localities to build a knowledge base for future recovery actions, and identification of critical glider populations. *Reactive recovery actions* using a scatter-gun approach to provide supplementary food and nest boxes were of minimal benefit to the gliders.

The program report made 11 recommendations to enable WPSQ to build on the work achieved in the past 12 months – including ongoing glider monitoring by Girringun Rangers, habitat improvement, a study into better design and placement of nest boxes for tropical conditions, and continuing assessment of future actions.

Mark Rantucci (WPSQ volunteer), Christine Zelenka (JCU) and Larry Leedie (Girringun Ranger) checking a nest box with the pole camera, courtesy John Winter

Dr John Winter, Wildlife Ecologist

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# The Feathertailed future

Image courtesy Natalie Waller

The feathertail glider used to be an iconic Australian animal featured on the one cent coin[1], yet in the present day it is not one of our better known species.

This glider is an extraordinary native animal which faces various anthropocentric threats. It is rarely seen which is mostly due to its diminutive size and its habitat requirements.

The feathertail glider (*Acrobates pygmaeus)* is found throughout eucalypt forests. It requires a high diversity of trees and shrubs to provide it with a constant supply of nectar. Its noticeable feature is its tail, which when straight looks like a feather, and is about the same length as its body. The tail is very agile in that it can grip onto small branches. Furthermore, this glider enters deep and prolonged torpor (hibernation) for several days at low temperatures[2]. It may initially be mistaken for a mouse, however the difference becomes clear when this magnificent animal is seen gliding up to 20 metres[2].

There are a number of criteria which are necessary for the success of feathertail gliders in the wild. They need plenty of climbing surfaces, food and shelter. Another requirement of the feathertail glider is that it needs tree species that together provide an abundance of loose bark throughout the year[3]. For example, the three species, *E. radiata,* makes up 43% of its dietary intake[3]. Also, they need to remain in a large social group of more than 12; not in pairs.

Currently, they are threatened by habitat loss and restrictive habitat requirements which makes them difficult to both study and conserve. Paul Davies from Sydney Zoo's Australian Fauna Unit says, 'There's simply not enough places for these little guys to live'[4]. This has been caused by a decrease in hollows due to various land clearing activities such as for housing developments. This problem is amplified as gliders also have significant seasonal preferences in their habitat use. This is important to take into consideration in the management of timber production forests in NSW where the gliders sometimes appear[3].

All the stated difficulties constrain possible solutions. Two possible solutions to increase their population numbers are: firstly captive breeding for release to amplify natural populations, and secondly habitat conservation.

Taronga Zoo in Sydney has a breeding program which has led to the birth of 23 feathertail glider joeys. It is the only zoo able to consistently breed them[5]. They believe that it comes down to group dynamics, which makes sense, as in order to breed successfully they need a huge number of females. This is because feathertail gliders experience what is called multiple paternity and communal maternal care. A recent study, yielded results that indicated that mothers care for young which are not their own[2]. Regardless, they seem to do well and reproduce when kept in captivity. Females usually produce two litters between July and January[6].

This all sounds very promising, however, this should not be the only conservation method as there are various drawbacks to breeding the feathertail glider in captivity.

Firstly, torpor in wild populations varies from individuals bred in captivity. Torpor is more frequent, deeper and longer in natural populations than in captive bred gliders. Daily activity patterns differ also. Captive bred gliders remain active for longer and wake earlier than those in natural populations.

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# The Feathertailed Future *continued...*

Due to the regularity of the captive gliders' diet, they do not need to use torpor as a form of energy conservation. In addition, captive bred gliders show that they are unable to warm themselves using endogenous heat production—which is truly remarkable. This physiological dysnfunction is likely a reflection of low torpor use, and increases the chances of captive gliders getting hypothermia. This has significant implications for captive animal breeding programs, as this physiological dysfunction in individuals released in the wild may not allow them to survive.

Breeding in captivity will help increase population numbers; however it is necessary to also focus on habitat protection. Due to the above drawbacks, such as behavioural and physiological changes in the captive feathertail gliders, species survival needs to focus on habitat conservation rather than simple population numbers. Therefore, breeding programs may not provide a useful reservoir for endangered populations of small endotherms in the wild[2]. Further research needs to be undertaken.

It is important to remember that pronounced changes may occur in morphology and behaviour of animals when kept in captivity. The feathertail glider demonstrates this phenomenon which calls for novel types of conservation and management.

**References**

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2 Parrot, Marisa et al. (2006). Multiple paternity and communal maternal care in the feathertail glider (Acrobates pygmaeus) . Australian Zoology . 53 (2), 79-85.
3 Geiser, Fritz and Körtner, Gerhard. (2010). Hibernation and daily torpor in Australian mammals. Zoologist. 32 (1), 205-213.
4 Christensen, Nic. (2010). Feathertail glider is in danger after overdevelopment and reckless pet owners in Sydney . Available: http://www.news.com.au/feathertail-glider. Last accessed 04/02/2012.
5 Aust. Gov. (2010). Taronga celebrates Feather-tail Glider births. Available: http://govnews.com.au/index.php?option=com_content&view=article&id=5913:taronga-celebrates-feather-tail-glider-births&catid=38:new-south-wales-government-news&Itemid=82 Last accessed 04/04/2012.
6 Marsupial Society of Victoria Inc. (2012). Feathertail Glider Marsupial Society of Victoria. (1) 1-4.

Article written by
Alana Valero

Image courtesy Natalie Waller

# QGN in action

A lot has been happening in QGN - here is a summary, for the full version, see wildlife.org.au/projects/gliders/qgninaction0412.html

In the south east, Queensland Glider Network is continuing and expanding nest box monitoring within the Flinders to Greenbank Karawatha Conservation Corridor.

We are also proud to be involved in the Pullen Pullen Catchment Group's habitat enhancement workshop and program, showcasing the biodiversity of our local bushland and creeks.

Recent events have included a spotlight at Wamuran near the Glass House Mountains on the Sunshine Coast hinterland, a great evening of hollow identification and spotlighting at the Greater Glider Reserve in the Redlands south of Brisbane and attendance at the White's Hill State College Fete displaying information on gliders and wildlife corridors.

Check out our updated glider species profiles wildlife.org.au/wildlife/speciesprofile/mammals/gliders/ and stay in touch with our evolving events program on facebook wildlife.org.au/qgnfacebook

Image: squirrel glider, Witta Conservation Reserve near Maleny, courtesy John Birbeck

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Wildlife Preservation Society of Queensland (*Wildlife Queensland* or WPSQ) has many programs and projects— the Queensland Glider Network (QGN) is one of them.

We are a community conservation organisation with a diverse membership drawn together by a common interest in wildlife.

*Wildlife Queensland* has been working to protect Australia's precious and vanishing natural environment since 1962.

If you would like to become a wildlife protector, a subscriber or a volunteer, please contact us:

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**www.wildlife.org.au**

Whether you are a conservationist, researcher, carer, or simply interested in gliders, you will find QGN has something to offer you, and in turn, you may have information to share with all of us.

Email us your glider news to glider@wildlife.org.au

To join QGN (it's free) - download the membership form from www.wildlife.org.au/qgn/join

**Do you have a story to share about spotting a glider?**

Send it to *Glider Tales* along with a picture if you have one and we may publish it on our website. See

www.wildlife.org.au/projects/gliders/tales

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www.wildlife-australia.org

# About our contributors

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**Karen Brock** is a Senior Projects Office for Wildlife Queensland and contracts as a Tourism Analyst and Event Director for Tony Charters and Associates. She holds a Bachelor of Science in the fields of Ecology and Zoology with a background in fieldwork and research in Australian Ecology, as well as Interpretation and Education Programs.