Hidden Vale Tails
HIDDEN VALE WILDLIFE CENTRE NEWSLETTER
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Saving THE MAHOGANY GLIDER

The mahogany glider is one of Australia's most threatened mammals and Queensland's only listed endangered glider species.

A mahogany glider, *Petaurus gracilis*, venturing out at the Hidden Vale Wildlife Centre.

Named for its mahogany-brown belly, this graceful glider has two folds of skin, called a patagium, which stretch between the front and rear legs. These act as a 'parachute' enabling the animal to glide distances of 30 metres in open woodland habitat. Their long tail is used for mid-air stabilisation.

They look similar to sugar or squirrel gliders, however mahogany gliders are much larger. They are nocturnal, elusive and silent, making research on free-ranging animals very difficult.

Mahogany gliders appear to be monogamous and will actively mark and defend their territory. They use hollows in large eucalypt trees, lined with a thick mat of leaves, as dens.

There are around 25 mahogany gliders in captivity Australia-wide, and the Hidden Vale Wildlife Centre is one of just a few locations authorised for breeding. Breeding is undertaken as an insurance against extinction. The Centre regularly exchanges gliders with other authorised locations to ensure genetic diversity in captive populations.

We encourage our mahogany gliders to develop and display their normal range of behaviours. That is why we have set up one half of their enclosure with climbing structures in the form of 'stable' branches, while the right half is left relatively 'blank'. This encourages them to glide, build up their core strength and learn how to manipulate their patagium in order to land safely.

The Centre recently received funding to purchase additional structures including climbing ropes and nets, ladders and 'unstable' branches to simulate the movement of small trees.

We are also planning to introduce a range of glider-suitable feeding enrichment, such as whole fruits, puzzle-feeders, or feed in a hanging log. We hope that our gliders will not only breed well, but will also become fit and healthy contributors to the total captive population.

– *Andrew Tribe and Dalene Adam*

Species SNAPSHOT

RUFOUS BETTONG

Scientific Name
Aepyprymnus rufescens

Distribution
Eastern Australia, North Queensland to northern New South Wales. Distribution and abundance severely reduced and extinct through some of its former range.

Habitat
Open grassy woodland and forest (with tall native grasses)

Conservation Status
Qld – Least Concern
NSW – Vulnerable
Victoria – Extinct

Rat-kangaroos, potoroos and bettongs belong to the Potoroidae family, collectively known as potoroids. All modern potoroids are small, compact, densely furred animals with short ("T-rex") forearms and well-developed muscular hind limbs with large hind feet. They also have well-developed claws on their forelimbs to dig for roots and hypogean (underground) fungi.

All of this digging plays an important role in cycling nutrients and moving fungal spores. For example, research has shown that seedlings grow better in soil dug up by a potoroid. Potoroids have also been shown to move mycorrhizal fungi onto new host trees. The mycorrhizal fungi spores join with the tree (e.g. Eucalypts), increasing root surface area and mineral uptake, in a mutualistic relationship that benefits both fungi and tree.

Loss of potoroids across a landscape may thus have wide reaching implications for ecosystem health.

Unfortunately, the importance of potoroids was not always understood. In the late 1800s and early 1900s, potoroids were considered an agricultural pest, being in 'plague' proportions in parts of eastern Australia, and bounties were offered for their scalps. Tamworth Pasture Protection Board alone paid bounties on 78,938 rufous bettong scalps in just 1897. Across New South Wales, over three million potoroids were killed between 1883 and 1920. With a severe decline in numbers, most bounties were discontinued by the 1920s, coinciding with the species falling prey to foxes.

Red foxes were introduced to Australia in the late 1800s and their spread has resulted in the decline of multiple mammal species – small potoroids are no match for this active predator. Even when potoroids can avoid foxes, the rapid development of remaining woodland habitat has served as a hurdle to their recovery.

The most recent threat is land use intensity, especially housing development. Our researchers have shown that out of 12 mammal species in a study in south-east Queensland, rufous bettongs were the first to disappear in fragmented landscapes, as farms were subdivided and landscapes were developed for housing.

Nearly all species in the family Potoroidae are now either threatened or extinct across some or all of their range. This predicament increases their intrinsic scientific importance, and conservation of all remaining forms is a prime consideration in all states and territories where they occur. Special reserves have been established for some of the threatened species. The rufous bettong is still considered "common" in Queensland, although considering historical numbers, this may be an argument in semantics.

So what is to become of the rufous bettong as landscapes continue to be fragmented and urban sprawl continues to encroach on habitat? Could it be heading for the threatened species list in Queensland? Where is the point of no return? What does it take to keep a declining species off the threatened species list?

This is not the end of the story for the rufous bettong and other potoroids. The Hidden Vale Project team has started a proactive research and monitoring program aiming to answer these questions and more.

We are undertaking surveys across Spicers Peak Station, Hidden Vale and Thornton View nature refuges to determine distribution and abundance of rufous bettong and other species, as well as habitat associations and condition. Recurrent predator scat surveys and content analysis is giving us an understanding of predation pressures. A PhD student is investigating predator avoidance training. Further research projects are planned, including investigating potoroid roles as ecosystem engineers, and keeping species off threatened species lists, with rufous bettongs as a case study. With the aim to conserve and improve the status of potoroids, we also need to answer some basic ecological questions, where information is lacking.

Research projects and volunteering opportunities are available with these and other projects, as well as other species, and other habitats. Please contact us if you would like to get involved!

– Megan Brady

Image above by Ben Nottidge.
Image to the left by Mellisa Mayhew.

Timing OF TOAD RESEARCH IS IMPORTANT!

Tetsu Masaki counting tadpoles as part of the scoop-count technique.

RESEARCH SPOTLIGHT

When it comes to testing the best methods to reduce cane toad populations, timing and rainfall is everything.

Earlier this year, all four waterbodies in the Hidden Vale billabong were drying out and there was no water in the creek.

The dry conditions impacted some animals. It also presented an opportunity to capture adult toads coming to those four waterbodies and minimise their breeding.

In this study, mostly undertaken by University of Queensland master's student Tetsu Masaki, we used three types of traps: an aquatic funnel trap for tadpoles, and pitfall and light traps for adult toads.

The funnel traps (illustrated bottom right) had an attractant inside, called a BufoTab. Tadpoles enter through the funnel and are captured inside.

A grid of 100 pitfall traps, consisting of 150 millimetre pipes buried 40 centimetres deep, were used to trap toads.

We also used light traps. These involved positioning a UV light to attract insects, in turn attracting toads. These toads were captured after entering a one-way 'gate' into a container below the UV light.

The aim of this project was to determine the effectiveness of combining different types of traps for controlling an established population of cane toad (Bufo marinus or Rhinella marinus).

A scoop-count tadpole technique was used to estimate tadpole numbers before and after trapping. Tadpole population estimates indicated that the number of tadpoles had decreased as a result of trapping in the four waterbodies. Great news!

The traps caught 6,585 tadpoles and 179 adult cane toads. On average, 11 cane toads were caught each day, with indications that there are still toads around the billabong and in the nearby creek.

The light traps were not successful and the funnel traps were only marginally better.

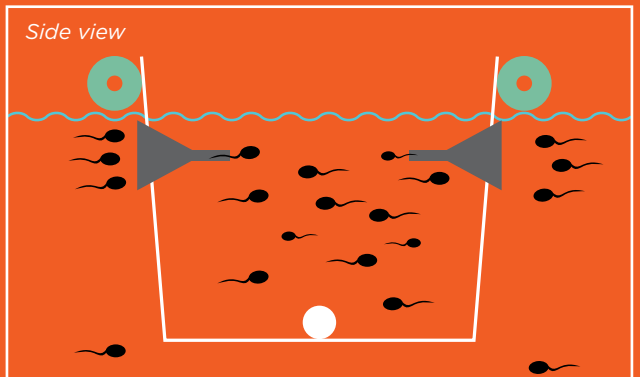
Improvements to the design of the funnel and light traps, and more suitable installation locations would maximise capture.

Results from this study indicate that using different types of traps targeting different life stages of the cane toad can reduce their local abundance, **but timing is everything.**

– Peter Murray

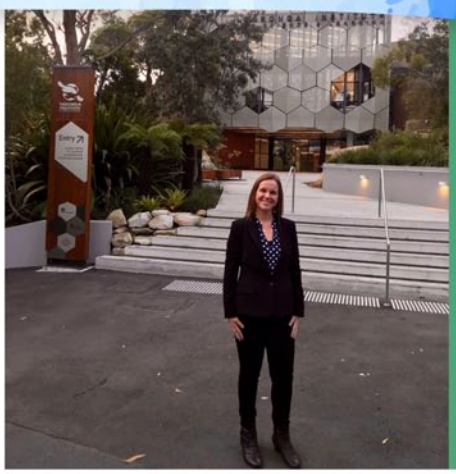
Photograph of the density of tadpoles in some locations.

Diagram illustrates the workings of the tadpole funnel trap.



Tadpoles swim through the large openings at the top of the trap, attracted by a bait. They find it difficult to swim back out the narrow funnel and become trapped.

Out & About



Hidden Vale Wildlife Centre's Chief Veterinarian Andrew Tribe, and Research Manager Julia Hoy attended the Zoo and Aquarium Association's Learning & Development Workshops, held at Sydney's Taronga Zoo, in early May. They met colleagues from zoos throughout Australia and New Zealand and provided an update on the research projects currently underway and planned for the future at the Centre. This was an important opportunity to establish closer links with similar organisations and facilities.

The Rosewood Fine Arts Society visited the Centre on 12 May with 21 of their artists. The Society will be featuring an Endangered Australian Wildlife class at this year's Rosewood Show (28-29 June). Spicers Hidden Vale Retreat is sponsoring prizes in the Fine Arts Classes 2 & 4. The winning entries will be exhibited in the Wildlife Centre after the Show.

Congratulations to Luis Buchan who received the Centre's first award for Volunteering Excellence. Luis has done an amazing job establishing the Hidden Vale Herbarium. He has a Certificate III in Conservation and Land Management and aims to become a botanist.

SIGN UP To subscribe to *Hidden Vale Tails* or to find out more about the Hidden Vale Wildlife Centre, visit **www.hiddenvalewildlife.uq.edu.au**

Supporting Australian Wildlife Preservation

The Turner Family Foundation is a not-for-profit environmental organisation established by Jude and Skroo Turner, founders of the Flight Centre Group, and their children Matt and Jo. The Turners have a passion for preserving Australia's flora and fauna, and the Turner Family Foundation is their vehicle to promote positive environmental outcomes. *Hidden Vale Tails* is a quarterly newsletter that shares the work of the Turner Family Foundation and the Hidden Vale Wildlife Centre.

TECHNO-RESEARCH UPDATE

Despite the onset of cooler weather, research within the Hidden Vale Wildlife Centre is really heating up!

Most industries around the world are adopting new technologies to improve outcomes, and we believe conservation science should as well.

This is why many of our research projects include a central theme based around the use of technology to develop innovative solutions to environmental issues.

Current projects are leading the way in the use of microchip-automated technology to control access of individual animals to resources such as food and refuge from predators. This research aims to improve the success of wildlife reintroductions, while allowing us to monitor wildlife in a more time-effective and cost-effective manner.

Our research students are also developing innovative technologies to record the activity of wildlife both within the Centre, and out on the surrounding properties. With technology advancing exponentially and costs decreasing, there has never been a better time to think outside the box.

With state-of-the-art facilities, and access to a wide range of technology, Hidden Vale's research students are uniquely equipped to make impactful contributions to conservation challenges. Watch this space!

– *Julia Hoy*

To find out more and to show your support, visit The Turner Family Foundation website at: **www.turnerfamilyfoundation.com.au**