



LAND FOR WILDLIFE

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Common Garden Frogs

Many of us are lucky enough to have garden ponds or dams close to our houses and regularly hear a chorus of frog calls on those warm humid nights.

Two common frog species that are found around our homes and gardens in SEQ are the Green Tree Frog and the Striped Marsh Frog. Most people have probably heard the Striped Marsh frog but not actually known what it is. How many of us have laid awake at night or just on dusk and heard this repetitive “tok” “tok” or “whuck” “whuck” and thought to ourselves who on earth is hammering a plank of wood or hitting a tennis ball at this time of night? Let me introduce you to *Limnodynastes peronii* or more commonly known as the Striped Marsh Frog.

My first introduction to this frog was on a walk one evening. As I approached a small wetland beside a local park it sounded like an auditorium full of people clapping. As I got closer to the wetland, I realized the noise was actually a chorus of Striped Marsh Frogs.

The Striped Marsh Frog is a ground dwelling frog that traditionally inhabited marshlands and swamps. However with increased urban development in low lying areas these little guys have adapted to readily take up residence in backyard ponds. Striped Marsh Frogs can reproduce rapidly laying up to 1000 eggs in a white foamy mass. While this helps to maintain their common status, when they all start calling and don't shut up, many property owners may think they are a little too common.

Litoria cerulean or the Green Tree Frog is one of our most recognised and well known frogs in urban areas. The Green Tree Frog can be found in most habitats across Australia. This common frog with



Green Tree Frog (photo by Melinda Barlow) and Striped Marsh Frog (photo by Steve Wilson).

its characteristic cheeky grin is well adapted to urban environments, often being found in toilets, down pipes, water tanks, plant pots and hanging off windows and glass doors at night chasing insects. These large frogs are adored by many. Their familiar deep “honk honk” call from down pipes has people everywhere making the statement ‘the frogs are calling - it must be going to rain’. However, like the Striped Marsh Frogs these guys can have the most seasoned frog lover cursing them at 2 am when they sit on the bedroom window sill and call all night.

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Article by Melinda Barlow.

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editorial

Welcome to the Land for Wildlife SEQ newsletter for 2008.

You may have noticed the new ISSN number on the front page of this edition. This means that these Land for Wildlife newsletters for South East Queensland will be catalogued by the National Library of Australia. We aim to have all back copies of this newsletter (all 27 of them since 1998) available electronically and in print in time for the 10th anniversary events in mid-2008. This will enable Land for Wildlife members and the general public to search and access all articles. I believe that this will be a useful resource for landholders interested in nature conservation in SEQ.

Planning for the 10th anniversary events is well underway. The key event will be an Open Property Scheme during September 2008 to coincide with Biodiversity Month and National Threatened Species Week. It is proposed that about 20 properties across SEQ will host half-day walk-and-talks to showcase not only the achievements of the individual property, but how the diverse range of Land for Wildlife properties contribute collectively to nature conservation across SEQ.

The key product that is being proposed for the 10th anniversary is a 'prospectus' that will showcase Land for Wildlife Case Studies and how the Land for Wildlife program complements Voluntary Conservation Agreements and Nature Refuges. Some of the Case Studies may also be Open Properties, so there will be many opportunities to learn about nature conservation issues in South East Queensland.

Case Studies will focus on practical, effective actions undertaken by Land for Wildlife landholders to manage a range of NRM issues such as riparian restoration, integrating conservation with grazing, threatened species management, weed control, pest animal control, erosion mitigation and providing wildlife corridors.

I hope you find this edition an interesting read. There are lots of great articles including information about the spectacular Caper White migration which occurred in late 2007. There are practical articles on how to raise tadpoles and how to catch and release pesky native mice from your home. Recent research into predator-prey interactions, habitat structure and rainforest restoration are also discussed. Lace Monitors and flower pollination systems are described. So, it is a diverse and hopefully useful read for all Land for Wildlife members.

This is now our third edition in full colour. I hope you like the new look and find colour images helpful in identification of plants, animals, habitats and other ecological features.

As always, I welcome any comments or contributions that you may have.

Happy reading.

*Deborah Metters
Land for Wildlife Regional Coordinator
SEQ Catchments
Phone: 07 3211 4404
dmetters@seqcatchments.com.au*

Envirofund Round 11.

Usually at this time of year, landholders are encouraged to think about Envirofund projects. The new federal government is still determining program details and dates. Eligible projects in the past have included native vegetation plantings, fencing to protect habitats and controlling stock access to riparian areas. Visit www.nht.gov.au/envirofund for more information or phone Col Freeman, Regional NRM Facilitator on 3503 1428 for program updates.

Correction

Apologies to Jennifer Sanders, Land for Wildlife landholder in Beaudesert for the misspelling of her name on page 4 of the October 2007 newsletter.

Land for Wildlife Extension Officers in SEQ

Beaudesert Shire Council

Keith McCosh, 5540 5436

Brisbane City Council

Susan Finlay, 3403 6575
Fflur Collier, 3403 6530
Lexie Webster, 3403 6075

Caboolture Shire Council

Samantha Jansen, 5420 0264

Caloundra City Council

Nick Clancy, 5439 6433
Alan Wynn, 5439 6477

Crows Nest Shire Council

Kym Campbell, 4698 1155

Esk Shire Council

Martin Bennett, 0428 198 353

Gatton Shire Council

Martin Bennett, 0428 198 353

Gold Coast City Council

Darryl Larsen, 5582 8896
Michael Banks, 5582 8047

Ipswich City Council

Stuart Mutzig, 3810 6618

Kilcoy Shire Council

Michelle Ledwith, 5422 0516

Logan City Council

Penny de Vine, 3412 5321

Maroochy Shire Council

Josh Birse, 5441 8002
Amanda Ozolins, 5441 8414

Noosa Shire Council

Dave Burrows, 5449 5202

Pine Rivers Shire Council

Lyndall Rosevear, 3480 6529

Redland Shire Council

Gavin Hammermeister, 3820 1102

Toowoomba City Council

Veronica Newbury, 4688 6572

For all other SEQ Local Government regions please contact the Regional Coordinator, Deborah Metters, on (07) 3211 4404.

Forward all letters to:

*The Editor
Land for Wildlife Newsletter
SEQ Catchments
PO Box 13204
George Street QLD 4003*

Landholder Registrations, Land for Wildlife SEQ - 01/01/2008

Registered Properties	Working Towards Registration	Total Area Retained	Total Area under Restoration
2119	435	41,298 ha	2,819 ha

fauna profile

The Caper White Migration

Compiled from three articles written by Peter Hendry and Dennis Bell in the *Butterflies and Other Invertebrates Club (BOIC) December 2007 newsletter*. Article modified by Deborah Metters with permission.

The Caper White butterfly (*Belenois java*) has made another impressive migration this year. The Caper White is a medium sized butterfly with a wingspan of 55 mm. The larvae feed on species in the plant family Capparaceae, mostly in the genus *Capparis*, hence the name Caper White.

No one really understands the reason for the migration. One theory is that the larvae build up in such large numbers that they devoid the area of available host plants and the adults migrate to find more. However in many cases they fly into areas where no host plants exist or fly straight out to sea, to a certain death. It is reported that the migration takes place every year and in some years goes unnoticed due to the lack of numbers.

The direction of the migration varies. Braby notes that Caper Whites undertake a mainly southeasterly migration. Apparently, the migrations proceeded southerly to South Australia and southwest Victoria, then turned west to the Fleurieu and Yorke Peninsulas, and then turn back north, presumably from where they started.

During October-November 2007, Land for Wildlife Officers noted the migration occurring in a northerly and north-westerly direction in southern Beaudesert Shire, around Brisbane and along the coast in Caloundra and Noosa. At times during the 2007 migration, the sheer numbers of Caper Whites was so great, that you could not drive without hitting them.

During the migration, Caper Whites are commonly seen taking nectar from flowering native and introduced plants such as Leptospermums, Callistemons, lantana and roadside herbs and thistles.

Sites containing larval host plants can attract frenzied mating and egg-laying displays. Female Caper Whites lay huge numbers of eggs at one time on host plants. The yellow-orange eggs are laid in clusters with one female reportedly laying 114 eggs in 30 minutes! The late Dr Waterhouse estimated that 250,000



Caper Whites find a resting site in Acacia shrubs on dusk at Mt Greville, Boonah Shire during November 2007. Photo by Deborah Metters.



Caper White eggs on *Capparis canescens*. Photo by Peter Hendry.



Caper Whites take nectar from a wide range of native plants and weeds.

eggs were laid on one large caper tree. Eggs have also been reported to be laid on non-host plants and, as expected, the resulting larvae have not survived.

In SEQ, Caper White larval host plants include *Capparis arborea*, *C. sarmentosa* and *C. velutina* with Scrub Caperberry or Caper Bush (*C. arborea*) being the main larval host. *C. arborea* is a small, thorny tree to 8 metres and is found in subtropical rainforest and dry vine scrubs. The white flowers are rather spectacular with large fluffy stamens. Propagation is best from fresh seed although the trees are slow growing and retain their immature leaves and thorns for many years. If planting to attract butterflies, it is best to plant in full sun.

There are three other species of butterflies listed as using *C. arborea* as a host plant: Chalky Pearl-white (*Elodina parthia*), Southern Pearl-white (*Elodina angulipennis*) and Australian or Caper Gull (*Cepora perimale*).

Some urban landholders wishing to attract butterflies to their garden choose to plant *Capparis lucida*. It is a North Queensland caper shrub that grows rapidly, is thornless and produces soft leaves preferred by larvae. In comparison, *Capparis arborea* is slow growing and thorny. As with all plantings of non-local native plant species, do not plant them in

bushland settings and keep a close eye to see if the plant shows signs of weediness, such as prolific seeding, seed dispersal by birds or dominance over native plants.

Caper White larvae usually eat all the leaves on the host plant. Competition between larvae is intense and late hatchings starve to death as the leaves run out. At this stage, parasitic flies and wasps move in, which is a disadvantage of having Caper Whites breeding in the garden, as they leave behind a large population of predators which then attack the more permanent butterfly species in the garden.

Anyone who has a *Capparis* on their property will know the defoliation that occurs when thousands of caterpillars start chewing at the leaves. Entire plants are defoliated, but seem to recover in time for the following season's Caper White migration.

While we may not fully understand the Caper White migrations, they are great ambassadors for the insect world as they do stir up the media and have the general public talking on a subject that many would not normally bother with.

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fauna research

A Bad Smell for Wildlife

Article by Amanda Ozolins
Land for Wildlife Extension Officer
Maroochy Shire Council

Do domestic dogs reduce the number of birds on a property? Do predators smell bad to native wildlife? A couple of recent studies have found some answers, and raised more questions, about these topics.

Scent marking by carnivores is usually done with a combination of urine, faeces or glandular secretions. The scent marks are typically left and re-marked on objects along a predator's regular pathway. These scents provide information to wildlife about identity, territorial boundaries, reproductive state and social status.

International research has shown that co-evolution has led to many small mammal species avoiding the scent marks of their main predators. One would therefore assume that Australia's native mammals have little ability to detect and avoid introduced mammalian predators such as foxes and cats because these prey and predators have not co-evolved together. Our small mammals have not yet evolved behavioural adaptations to avoid these introduced predators.

In line with international research, past Australian studies have shown that native rodents do not avoid odours of introduced predators such as foxes, cats and dogs. However, it was unknown if native small mammals would have a similar lack of reaction to native predators such as quolls.

In a recent study, the Tiger Quoll was the native predator of focus and small native mammals were the native prey. Traps were treated with either Tiger Quoll faeces or were left untreated. Native rodent species included Bush Rat (*Rattus fuscipes*), Swamp Rat (*Rattus lutreolus*) and Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*). The results showed that these 3 rodent species did avoid Tiger Quoll odours. Co-evolution theory would support this finding.

To complicate matters, this recent study also treated some traps with fox faeces. The results were surprising. Contrary to previous findings, this study showed that the three native rodent species did avoid fox odours. What does this mean? Are



Recent research indicates that small native ground-dwelling rodents, such as the Bush Rat, avoid fox odours. Unfortunately, this photo of a fox with a native rat in its mouth shows that native ground-dwelling mammals have a long-way to go before they outsmart, or successfully avoid, such introduced predators.

Photo taken with an infra-red triggered camera on Wal Mayr's Land for Wildlife property in the Gold Coast Hinterland as part of a fox monitoring and control program. See Land for Wildlife newsletter October 2007 for further information on this project.

native rodents learning to avoid foxes? Is this a recent evolutionary response? Is there a common scent component in both fox and quoll odours? Are the reasons for wildlife behaviours simply too complex to distill through research? Basically, a final position on if, and how, native rodents detect and avoid foxes is still debatable.

The research also studied the behaviour of the marsupial Brown Antechinus (*Antechinus stuartii*) by treating traps with both Tiger Quoll and fox faeces. In contrast to the native rodents, the antechinus showed no response to either predator odour. Thus, the study concluded that predator odour avoidance might not have evolved in marsupials.

Another study, north of Sydney, identified that walking dogs in bushland, significantly reduces bird diversity and abundance. Walking a dog in bushland can cause a 35% reduction in the number of bird species, and a 41% reduction in the number of individual birds in the area. This affect occurred in both areas where dog walking is common and where it was not, indicating birds do not become accustomed to disturbance by dogs. The



*A recent study showed that some marsupials, such as this Yellow-footed Antechinus (*Antechinus flavipes*) do not avoid predator odours. Photo by Queensland Museum.*

research did not identify if this is due to their physical presence or if it too is scent related.

The above results indicate that the presence of dogs may reduce bird diversity and abundance, but does not answer why this is so. Further research is definitely still required to provide dog-owners, land managers and pest animal controllers with more accurate information about predator and prey interactions in Australia.

Future research into predator-prey interactions may be able to provide us with new opportunities to manage and conserve our native species. One such opportunity may be the potential to spray road surfaces with artificial predator scents to deter native wildlife and reduce road-kill incidences.

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fauna profile

Lace Monitors

Article by Nick Clancy
Land for Wildlife Extension Officer
Caloundra City Council

For many landholders the Lace Monitor (*Varanus varius*) is the most frequently encountered large reptile. Usually referred to as 'Goannas', there are 26 Australian species represented in the *Varanus* genus, three of which occur in SEQ. The other two being the Sand Goanna (*Varanus gouldii*) and the Yellow-spotted Goanna (*V. panoptes*).

Lace Monitors can exceed 2 metres in length however are more commonly 1.5 metres. They have a wide distribution in eastern Australia and are found in a broad range of habitats. However for such a regularly encountered species there seems to be relatively little known about this swaggering dinosaur-like creature.

I have often heard it stated that a bite from a Lace Monitor results in a serious infection due to the amount of bacteria that inhabits their mouths. Given their sometimes unhygienic dietary preferences this certainly seems plausible. However recent research published in the scientific journal *Nature* (*Nature 439, 584-588*) reported that Monitors possess toxin-secreting venom glands in their mouth. Analyses of the venom from the Lace Monitor revealed some potent effects on its prey. It impacts blood pressure and clotting ability, as well as causing rapid loss of consciousness and extensive bleeding.

Bites to humans are rare. When disturbed or encountered Lace Monitors use their well developed claws to scamper up the closest tree, usually moving to the side opposite the observer. Encounters are common around places where humans leave food scraps, such as camping and picnic grounds. In the bush they can cover up to 3 km a day looking for a feed; constantly flicking out their forked tongue as they smell for their next meal.

The carnivorous Lace Monitor forages up trees and on the ground. The diet of the Lace Monitor consists of dead animals (carrion), small lizards, insects and small mammals. They are a predator of eggs from bird and turtle nests as well as chook pens. It is not uncommon to see them being noisily harassed by nesting birds or protective chook owners for that matter!



Male Lace Monitors engage in combat at the beginning of the mating season. The markings on these two Lace Monitors differ greatly. The male on the left displays a distinctive 'Bell's form' appearance with the individual on the right displaying the common form. Photograph by Steve Wilson.



A sleepy Lace Monitor sunning itself on a bush track, perhaps after a tasty meal in the nearby picnic area? Photograph by Darryl Larsen.

Lace Monitors are a top predator and are really only susceptible to predation when young. Like all native species they are threatened by habitat clearing. Other threats include being poisoned if they consume Cane Toads or ingesting rubbish such as plastic food wrappers in picnic grounds.

Like many reptiles Lace Monitors are inactive during winter, resting in a tree hollow, burrow or similar. In spring, mature males engage in upright, chest to chest combat which signals the start of the mating season.

The female breaks into a termite mound (either up a tree or on the ground) where she lays 6-12 eggs. The mound is then sealed over by the termites and the earthen home provides protection and a constant temperature perfect for incubation. While the hatchlings can break out of the nest, there is growing evidence that the mother returns to the termite nest to break the young out.

Little is known about the life of young Lace Monitors as they are rarely encountered. It's possible that they spend a substantial amount of their time above ground. If you have termite mounds on the ground or in trees on your property they are worth monitoring as they provide crucial nesting habitat for a surprising array of species including the ever familiar Lace Monitor.

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floral ecology

The Flowers and the Birds and the Bees

Article by Keith McCosh
Land for Wildlife Extension Officer
Beauesert Shire Council

So what about flowers, birds and bees? In the human world, flowers have been used for a long time by males to attract females. But flowers were designed for a different sort of attraction, even though the same outcome is intended. Here is an introduction to the science of flowers and pollination.

Evolution

The flowering plants (Angiosperms) have evolved over the last 100 million years to dominate the Earth, compared to the other main group in the Plant Kingdom, the ancient Gymnosperms or Pine Trees. Angiosperms have specialised devices called flowers to attract other living organisms to provide a pollination service for them. This has obviously been a huge benefit in the slow march of evolution.

Pollination

A flowering plant needs to get genetic material (pollen) to meet up with another piece of genetic material (an ovule). Fertilised ovules then form seeds and the surrounding ova forms the fruit. More specifically, a pollen grain from a suitable donor (from the stamen of a non-related flower) needs to be transferred onto a receptive style (on the end of a stigma) where the pollen can be captured and fused with an ovule to form a seed.

Most flowering species have evolved to use visitors to transfer the pollen. Some species such as grasses use the wind. Some water plants can use water currents.

Many plants can be fertilised by their own pollen. However, most plants try to avoid self-pollination due to a phenomenon called "inbreeding depression" where offspring are fewer in number, have reduced vigour and lower fertility.

There are many means by which plants can prevent self-pollination including physical means within the structure of a flower; separation of male and female functions on different plants; different release times for pollen; and chemical incompatibility where a pollen grain will not be accepted by a stigma.

Yet some species permit self-pollination ("geitonogamy"). Perhaps this tides them

over during adverse times until better circumstances for cross-breeding occur. Many annuals do this. In some plant species, seeds are produced without any pollen transfer at all ("agamospermy").

To have successful cross-pollination there needs to be success in two distinct aspects:

1. Male success. Pollen is deposited onto the right visitor and taken to flowers on another receptive plant (and not taken to flowers on the same plant and not lost on other species).
2. Female success. Capturing pollen to fertilise available ovules to trigger the formation of seeds.

Pollination success for a plant can be thought of as a balance between the energy put into creating pollen and that put into creating seeds. There is no point in creating abundant pollen if it doesn't lead to more pollination.

Flowers

Flowers are usually bi-sexual having both pollen and ovules. But some plant species may produce unisexual flowers – either "male" for producing pollen, or "female" for producing ovules. These different flowers may be borne on the same plant or on separate plants. In addition, some plants have both unisexual and bi-sexual flowers. Flowering categories include:

- Hermaphroditic – only bi-sexual flowers.



Delicate Native Iris (Patersonia sericea) showing the structure of a stamen - yellow anthers (where the pollen is kept) on top of purple filaments. This plant probably depends on insects for pollination. Photo by Glenn Leiper.



Tallowood (Eucalyptus microcorys) flowers attract many types of pollinators such as birds, gliders, possums and invertebrates. Photo by Keith McCosh.

- Monoecious – both male and female flowers on the one plant.
- Dioecious – plant carries only male or female flowers not both.
- Andromonoecious – mainly male and some bi-sexual flowers.
- Gynomonoecious – mainly female and some bi-sexual flowers.
- Polygamomonoecious – plant carries male and female and bi-sexual flowers.

Visitors

Flowers are designed to attract visitors. Attraction covers colour, ultra-violet markings, perfume, and special structures to assist certain visitors. This attraction is usually associated with a reward, so that a visitor may benefit as well as the plant. This is a delicate balance. Plants manipulate their visitors in order to maximise pollen transfer, but without wasting their own limited resources (flower production is a significant outlay).

Too much reward is usually counter-productive as very little pollen transfer may occur. Visitors will just hang around the one flower and self-pollination occurs. But too little reward brings no visitors. All this in a competitive jostling environment, with many plants wanting the services of available visitors. Evolution has thrown up vast numbers of different flower-visitor interactions leading to special inter-dependencies of numerous plant species with specific animal pollinators.



A male Scarlet Honeyeater - a nectar specialist and an effective pollinator of many flowering trees such as Eucalypts and Melaleucas. Photo courtesy of BRISBOCA.



Spear Lily (*Doryanthes palmeri*) showing flower structure with large stamens. Large red flowers possibly attract honeyeaters. Photo by Glenn Leiper.



Birdwing Vine (*Pararistolochia praevenosa*) flowers designed to trap pollinating male midges. Photo by Glenn Leiper.

Nectar (sugar and water) is the most common reward. Nectar provides sugars for energy, but also contains trace elements. Pollen is also a valuable resource rich in protein that may be used by visitors.

Visitors can be birds (honeyeaters, lorikeets), mammals (possums, gliders, blossom bats, flying foxes), insects (flies, butterflies, moths, wasps, beetles, bugs), and arthropods (spiders, mites). Some are there for the nectar and pollen, some are there as predators, some are there to eat the flowers, and some are there to find mates or lay eggs.

Visitors can come during daylight and others can be active during the night. Flowers geared to insects (“entomophily”) generally have perfume. Flowers geared to birds (“zoophily”) are often red and have no perfume (as most birds can’t smell).

The “Right” Visitor

Whilst specialization is evident, where attraction is geared towards a limited number of special visitors, there is also pollination success from attracting a wider array of different visitors. Twenty four hours in the life of a newly opened flower can reveal a constant procession of insects and other visitors, with a change-over at night. However, not all visitors will be good pollinators and plants try to attract the “right” visitors and dissuade the wrong visitors.

Cross-pollination depends on a visitor being able to collect pollen from a flower

and then move to a flower on another plant of the same species to deposit this pollen (called fidelity). The “wrong” visitors will wander between different species and lose their pollen loads.

Of course, there are short cuts and banditry, just to add to the complexity of Nature, where nectar and pollen are stolen from plants without any intention of providing a pollination service.

I find the most intriguing system is where some flowers emit pheromones to attract male insects searching for a female. The Birdwing Vine (*Pararistolochia praevenosa*) emits a pheromone that attracts a small non-biting midge. The males are lured into a pollen trap and receive no actual reward at all (apart from a scrub to remove any pollen they have and a dusting of new pollen). I note that this can’t affect the mating success of the insect species in question or otherwise they would have become extinct, and obviously depends on there being an excess of males that keep getting fooled (sounds human doesn’t it).

Leopard Ash (*Flindersia collina*) flowered in early Spring with masses of tiny white flowers with a slight peppery perfume. There does not seem to be much activity around the flowers until you get real close. Then you see all sorts of tiny flies, small black beetles and other assorted small insects. This plant is obviously aimed at small insects for pollination.

Compare to the Red Kamala (*Mallotus phillippensis*) also in flower at the same

time. This species has male and female flowers on separate plants (as has all in Euphorbiaceae family) – an example of “dioecious” plants. Male flowers are small and greenish with slight perfume and are visited by large Hover Flies with striped abdomens, in their hundreds, as well as green beetles and an assortment of other gnats. This plant obviously targets a cohort of larger insects.

Native stingless bees are key pollinators for certain plant species. Being small, native bees can crawl into the smaller Australian bush flowers. They collect and store nectar and pollen in a communal hive, rather than just consuming it like most insects, and thus tend to visit more flowers, losing a grain or two of pollen at each step.

So watching the flowers grow may be more complicated than you ever thought possible. How flowers attract pollinators in a competitive world is a fascinating story. How the resultant seed grows, matures, disperses, and germinates is another fascinating story.

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property profile

Osprey House and Mangrove Ecosystems

Article by Bernadette May
Environment Officer
Pine Rivers Shire Council

Osprey House Environmental Centre has been a member of the Land for Wildlife program since April 2005. The centre is owned by Pine Rivers Shire Council and staffed by volunteers who provide interpretive information to visitors and support Council officers in delivering environmental talks to schools and community groups.

The Vegetation

Located on the banks of the Pine River estuary, Osprey House is surrounded by mangrove shrubland, Swamp She-oak and Blue Gum forests. Patches of marine couch and saltmarsh plants grow on the flats above the high-tide mark. Osprey House is the only Land for Wildlife member in Pine Rivers Shire to have a mangrove ecosystem (Regional Ecosystem 12.1.3). There are only six other Land for Wildlife properties in South East Queensland that also contain mangroves. These properties are situated along the Pumicestone Passage, adjoining the estuaries of Caboolture River, bordering Deception Bay, at Victoria Point and on Lamb Island.

The mangrove forest at Osprey House is dominated by Grey Mangroves (*Avicennia marina*) with a young understorey of Stilted Mangroves (*Rhizophora stylosa*). River Mangroves (*Aegiceras corniculatum*) grow in the upper intertidal reaches with their sweet smelling flowers attracting many insects.

Other notable plant species include Cotton Trees (*Hibiscus tiliaceus*), Warrigal Greens (*Tetragonia tetragonioides*) and Prostrate Boobiala (*Myoporum boninense* ssp *australe*) – all of which provide good material for interpretive education and ‘bush tucker’ presentations.

Coastal Mistletoe (*Lysiana maritima*) has colonised many Swamp She-oaks (*Casuarina glauca*) in the natural bushland area. Mistletoe leaves are rich in phosphorus and nitrogen and are eagerly eaten by gliders and possums. Nutrient rich litter from Mistletoe encourages a great diversity of understorey plant-life as well as ground dwelling mammals such as bandicoots, antechinuses, and dunnarts where they occur.



View over mudflats and mangroves on the Osprey House interpretive boardwalk. Photo by Gerhard Poed.

Images of the Raptor Pole: A pair of Ospreys perching on their nest (top right); and, the Raptor Pole installation (below right). Photos by Ron Byrne.

The Wildlife

A boardwalk meanders alongside the mangrove forest at Osprey House, allowing visitors a closer look into the canopy and a glimpse of mangrove forest dwelling bird species such as the Grey Shrike-thrush and Collared Kingfisher which hunt crabs and insects in the mangrove forest.

This season, an old stag provided a hollow nest for a pair of Scaly-breasted Lorikeets, and an Australian Brush Turkey scraped together a Sherman tank-sized mound of leaf litter and forest debris in the western bushland area.

Raptor Pole

In September 2006, a 24 metre tall pole with nesting platform was installed to provide a safe and secure nesting site for raptors. The raptor pole also encourages research and education about raptors in Pine Rivers Shire. In May 2007, two Ospreys began throwing sticks at the platform and constructing a nest. The birds could be seen copulating frequently throughout June and July and hopes were high that the pair would follow through to raise young. Unfortunately the breeding cycle was aborted - possibly due to very cold weather in mid-July and perhaps also due to less than ideal environmental conditions resulting from the drought.

Nest Boxes

Nest boxes were installed in late 2005 and have been used by a number of species including Pale-headed Rosellas



and Rainbow Lorikeets. A nest box audit in February 2007 revealed three families of Squirrel Gliders. An Australian Night-jar has also been seen sunning itself at the entrance of the ‘possum box’.

Local and Migratory Wader Birds

During the warm months migratory wader birds arrive from the northern hemisphere to feed on mudflat organisms in the Pine River estuary. Visitors can watch these magnificent ‘flying machines’ from a purpose built bird hide, and are welcome to borrow binoculars for a closer look.

Osprey House is located on Dohles Rocks Road, Griffin, and is open most days from 10am to 4pm (closed Monday). Phone 3886 4463 or www.ospreyhouse@asn.au

flora profile

Habitat Trees and Their Ecological Services

Article extracted from Habitat Trees booklet produced by Pine Rivers Shire Council Edited by Bernadette May Environment Officer Pine Rivers Shire Council

Habitat trees are mature to old aged trees which provide numerous living places for native animals, plants and fungi. These trees have lots of hollows, cracks and crevices of various sizes, where animals may live, breed or shelter. Australia has a greater percentage of hollow-nesting animals than does any other continent. In Pine Rivers Shire, more than 31 native mammals, 14 reptiles, 6 amphibians and 60 bird species use these resources. *Cymbidium* orchids are now becoming less common, as they also depend on old trees for the cracks and hollows in which they grow.

Rainforests

Many kinds of big old native trees are habitat trees. For example, old rainforest trees provide innumerable living places for their native animal, plant and fungi tenants. Their canopies create large areas of shade and shelter. Beneath large old rainforest trees soil temperatures and moisture levels are more stable – providing better habitat for soil organisms. Litter from large areas of canopy protects and enriches the soil and provides habitat and food for microorganisms, worms, snails and slugs, insects, arachnids, frogs and lizards. Large surface areas of trunks and branches of habitat trees provide extensive hunting sites for animals which feed on organisms that live on the bark.

Mangroves

Old mangrove trees, though usually not as tall, also provide ecological niches and hollows for wildlife residents. Hollow tree trunks and limbs are breeding sites for owls, hawks and other birds. Owllet Nightjars favour areas with old trees, and, like gliders, will often utilise several hollows in an area. Old mangrove forests with their many hollows provide a good selection of nesting spots.

Eucalypts

Every old gum tree becomes a more valuable habitat tree as it ages. Gum trees occur in almost every terrestrial ecosystem in Australia, usually as the



Possums are regular residents in habitat trees. Photo by Alan and Stacey Franks, Hollow Log Homes.



Wood Ducks nest in high hollows. Once hatched, chicks leap to the ground and follow their parents to water. Photo by David Cook, Canberra Ornithologists Group, <http://photogallery.canberrabirds.org.au/Index.htm>

dominant vegetation. An old gum tree, even when left on its own after clearing, still supports infinitely more wildlife than a hundred similar-sized imported trees. Old native trees surrounded by other parts of the natural forest – understory shrubs, climbers, groundcovers and grasses – support even more wildlife.

Most gum trees produce an abundance of nectar or pollen, or both. This is why Australia is the centre of the world's honeyeaters (nectar-feeders) and lorikeets (nectar-pollen-feeders). Gum trees provide food for large numbers of megabats (flying foxes and blossom bats). In fact, many eucalypts produce a high nectar flow between 10pm and 2am - as evidence of Eucalypts co-evolution with flying foxes and blossom bats.



A mighty Tallowood habitat tree that has provided 300 years of service to our native wildlife.



An Owllet Nightjar enjoys sunlight in the hollow of an old mangrove tree hollow.

Habitat trees are an important part of our natural heritage and are among our most valuable environmental assets. These seasoned trees are the most important within their ecosystems for maintaining biodiversity. They are virtually irreplaceable and should be retained whenever possible.

As part of the *Living With the Environment* series of booklets and brochures, Pine Rivers Shire Council has recently produced a comprehensive information booklet about Habitat Trees, and also an accompanying Habitat Trees poster. The Habitat Trees booklets and posters are available from Council's administration building at Strathpine (phone 3480 6666) and Osprey House Environmental Centre on Dohles Rocks Road, Griffin.

practicalities

A Guide to Raising Tadpoles

*Article and photographs by Melinda Barlow
Land for Wildlife Extension Officer
Caboolture Shire Council*

Have you ever wanted to raise your own tadpoles and watch them metamorphose into frogs? Well for all you budding tadpole parents who were never quite to sure on what was required to raise tadpoles this article provides some key points that should be taken into consideration before you head out side and begin enthusiastically collecting frogs eggs or tadpoles.

Firstly it is always recommended to check the laws and permit requirements for taking and raising tadpoles and native frogs. The Environmental Protection Agency is responsible for issuing permits for the handling, taking and keeping of native frogs in Queensland. This permit system is coordinated under the *Nature Conservation (Wildlife Management) Regulation 2006*.

The Regulation states that no permit is required if you are catching or keeping a 'least concern' (common) amphibian from your own property. However, you must keep the amphibian on your own property and it must be for your own private enjoyment. The Regulation states that you must not keep more than 8 common amphibians or more than 2 amphibians of the same species. Tadpoles are not counted in these regulations. If the amphibian produces offspring, you must, within 7 days after the offspring's metamorphosis, release the offspring into the wild in the way stated in the reptile and amphibian code.

Secondly it is important to be able to identify the difference between native frog eggs and Cane Toad eggs. You don't want to be putting all your effort into raising Cane Toads. Cane Toads lay their eggs in long strands. They appear as a single line of small black eggs in a clear jelly. No native frogs lay their eggs in strings. If you find long strands of Cane Toad eggs they can easily be removed and placed on the ground out in the sun. This will dry out and kill the eggs.

Thirdly, be clear as to why you want to collect and raise frog eggs or tadpoles. If it simply to watch the transformation then only take a few eggs or tadpoles



Creating a pond to raise tadpoles can be a rewarding project to learn more about your local wildlife. This small pond habitat was created in a child's plastic shell pool complete with logs, planted and floating grass, large rocks and a raised beach area.



Striped Marsh Frog tadpoles resting on plants and floating sticks.

and leave the others in their natural environment. If it is to rescue the eggs or tadpoles from an evaporating pond or puddle then be sure that you have the time and resources to house all the tadpoles and are able to provide appropriate release sites.

Aquarium Size

The size of your pond or aquarium will depend on how many tadpoles you want to raise. A guide is to have a maximum of 20 tadpoles per 20 litres of water. Tadpoles are very sensitive to chemicals and contaminants. Metallic containers should never be used and all containers should be free from any chemicals.

Aquarium Water

Young tadpoles cannot survive in high concentrations of chlorine. Therefore, best type of water to use in containers

is rain water or fresh water from creeks or ponds. If this is not available then chlorinated tap water should be left out in full sunlight for 5-7 days allowing the sun's UV to break down the chlorine. The best way to do this is to have a larger container left sitting permanently in the sun and top it up each time you take some out.

It is important to regularly change the water in your aquarium or tub. If your tadpoles begin to gobble air at the surface then there is insufficient oxygen in their water and the water must be changed as soon as possible. In my pond, I cleaned the water weekly, sometimes doing a half change and leaving half of the old water with the algae and just topping up with fresh water.

Water temperature also plays a vital role in determining the rate of

metamorphosis. Cooler water slows down the rate of metamorphosis; however, if the water is too hot, tadpoles will die. So if you have a glass aquarium, do not expose it to any sunlight, especially the afternoon sun, to ensure that the water temperature is kept stable.

Storms and rain can also trigger metamorphosis. Recent storms in late 2007 triggered many of my Striped Marsh Frog tadpoles to start metamorphosis.

Plants & Rocks for Aquariums

I put my young tadpoles in to a glass fish tank and a clean plastic tub. I lined the base of the aquariums with some soil and small rocks from the original pond and added some clumps of nut grass complete with their roots and soil. The grass and vegetation provided shelter and somewhere for the tadpoles to hide. Plants also help maintain water quality.

I soon noticed that the tadpoles used the grass, floating bark and sticks to rest on. They would wiggle their bodies onto the sticks and just sit there for hours or until another tadpole knocked them off. There were often up to fifteen tadpoles lined up on one floating stick.

As tadpoles begin to morph they will need opportunities to climb out of the water to breath for longer periods. It is important to provide a rock, log or grass for young frogs to climb out of the water and sit on.

Feeding Tadpoles

Tadpoles feed on decomposing material and algae. However in captivity they can be feed a supplementary diet of boiled lettuce leaves and fish food flakes. The lettuce leaves need to be boiled to break down the cell structure to allow the tadpoles to digest the material. Boiled lettuce leaves can be frozen in ice cube trays for easy storage and a lettuce ice block dropped into the aquarium/tub every second day. If you over feed the tadpoles their water will become polluted very quickly with excess food. The little tadpoles in my aquariums seemed quite happy in their new nurseries and readily came to the surface to feed on the boiled lettuce leaves and fish food flakes I fed them to supplemented the algae.

Once your tadpoles have started metamorphosing, it is recommended that you place a garden light near your aquarium or pond. A light will attract insects to your pond for the frogs to catch.



Images from top to bottom: Striped Marsh Frog tadpoles at various stages of metamorphosis. A small frog climbing out of the water using plants for support. Resting on a log is a juvenile Striped Marsh Frog.

If you are considering collecting different species of tadpoles, be aware that different species have different breeding seasons and varying rates of metamorphosis. Some species can metamorphosis in 3-4 weeks whereas others, like the Green Tree Frog, can take

up to 4 months or longer. The Green Tree Frog tadpoles that I have been looking after still have not developed legs after 4 months. They just keep getting fatter!

Releasing Frogs into the Wild

When you are ready to release your young frogs it is recommended to do it at dusk and in an area with plenty of cover. This will give your new frogs the best chance to avoid predators. It is also a good idea to moisten the release site with some water. If you have your containers on or low to the ground you may find that your young frogs begin to jump out of the container themselves and you don't need to physically release them.

Learning more about frogs in your local area, or on your property can be a great activity. Purchasing a frog field guide, looking at some of the online references mentioned below, or joining the Queensland Frog Society are all good starting points. You will soon learn that over the summer months different species of frogs will come and go from your area. The changing patterns of frog life-cycles and breeding seasons means that frog watching is a constantly changing activity.

As of December 2007, I have nearly one hundred tadpoles at varying stages of metamorphosis and am still waiting for my first Green Tree Frog to completely morph. It has been a fantastic experience watching the tadpoles metamorphose into frogs and even more satisfying to be able to successfully release young frogs back into the environment.

Happy froggy parenting!

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practicalities

The Live-Catch Mouse Trap

Article and photographs by Alan Wynn
Land for Wildlife Extension Officer
Caloundra City Council

There are quite a few different live-catch mouse traps on the market but the one I have is an ingenious design. It relies on the animal entering the trap and in trying to reach the bait at the far end upsets the balance of the cantilevered design. This style of trap is too small for adult rats (native and introduced) but will catch mice and Yellow-footed Antechinus. The best bait I have found to use is a mix of peanut butter, honey and quick oats. Mix it up and stick a small amount to the removable lid on the opposite end of the trap to the hinged lid. Don't use too much or the trap will not set properly.

Speaking from personal experience I enjoy the antics of the antechinus that occasionally share our living space. Though sometimes opening the cutlery draw and finding that the little !@#%^^ has used the soup spoons as a dunny can be trying, to say the least. At certain times of year we also get a few House Mice (*Mus musculus*). Now this can lead to a dilemma on how best to get rid of the unwanted pests humanely and without harming the native wildlife. Wildlife can be harmed either directly, through ingesting poison baits or being snared in back-breaker traps, or indirectly, by consuming poisoned mice or rats. The live-catch mouse trap and other live-catch traps such as the Elliot trap can be a useful tool for the safe capture of small mammals.

An important caveat here is that while rescue trapping of house intruders is considered permissible, QPWS legislation specifies that a permit is required for the trapping of native fauna. For more information on using, purchasing and permit considerations for live-capture traps, please refer to the Land for Wildlife newsletter October 2005. If you don't have a copy, you can download it at http://www.seqcatchments.com.au/LFW_pop.htm or ask your local Land for Wildlife Extension Officer for a copy.

Be sure to check the trap first thing in the morning as it is not very kind to leave any animal stuck in a trap. If you have caught something the safest way to identify your catch is to tip it carefully into a clear



A live-capture mouse trap using a counter lever design. The top image shows the bait mixture of peanut butter, honey and oats which is place at one end of the trap.



Another simple, home-made live-capture mouse trap design is effective in capturing the animal when it falls off a bench, or table, into a bucket below. Make sure the bucket has some material for the animal to hide in.

plastic bag with small air holes in it. This way the animal can be viewed, easily identified and, if native, released back into the closest patch of bush. If the animal is found to be an introduced animal it should be disposed of in a humane fashion. Don't forget to thoroughly wash the trap and your hands after handling captured animals.

To assist identification of small ground-dwelling mammals in SEQ, check your Land for Wildlife folder for the information sheet "I think I smell a rat".

Several brands of live-catch mouse traps are available from most rural stores, hardware stores and on-line. They should retail for under \$10.

dvd review

Battling Lantana: Learning from the experiences of others.

A new DVD provides advice from land managers for land managers about lantana control methods.

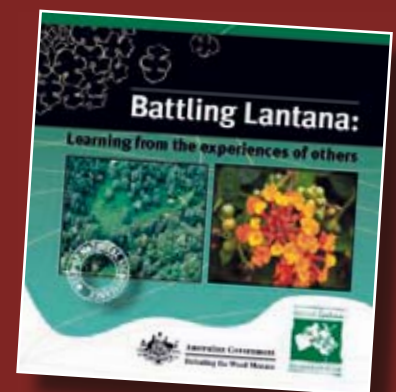
As Land for Wildlife members would know, lantana is one of the main environmental weeds in eastern Australia. Lantana competes with native plant species and reduces biodiversity. Lantana is listed as a Weed of National Significance as it currently infests about 4 million hectares of land in Australia.

This DVD provides perspectives from both conservation land managers and primary producers. It promotes some interesting comparisons and similarities between the two chains of thought.

For Land for Wildlife members, this DVD provides useful descriptions of an integrated approach to the management of lantana such as regeneration, resistance, fire management, mechanical removal, herbicide application (both broad scale and small property scale), biological control and the importance of vigorous follow up and maintenance. Of particular interest is for more inaccessible areas with the use of the splatter gun.

The DVD presents information about lantana's latest biological control agent, the Leaf Mining Fly. This fly is one of 17 other biological control agents established for lantana in Australia.

This DVD was funded by the federal Defeating the Weeds Menace program. To receive a free copy of the DVD, please phone Kym Johnson, National Lantana Coordinator, on 3405 5360 or email LantanaWoNS@dpi.qld.gov.au



book reviews

Rainforest Climbing Plants: A Field Guide to Their Identification.

by Gwen Harden, Bill McDonald and John Williams

Following on from their update of the Rainforest Trees and Shrubs (reviewed in Land for Wildlife January 2007 newsletter), this is another comprehensive production from the knowledgeable trio. It replaces the 'Green Book', which together with the 'Red Book', as they were affectionately referred to, formed the core rainforest plant references for plant nerds and amateur naturalists in sub-tropical eastern Australia for over 20 years.

The first difference you'll notice is the cover with the superb plant images from the camera of Hugh Nicholson. The other difference is that it is obviously a more substantial guide compared to its predecessor. The new 'Green Book' has been broadened in scope to include all rainforests of mainland eastern Australia from southern Victoria to Rockhampton. 265 species are described, which is nearly double that of the previous book.

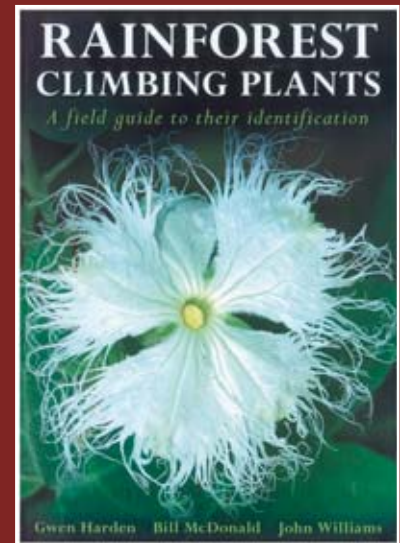
The main feature of this book is the key based on the distinctive features of the

leaves, stems and branchlets. It is much easier (usually) to obtain a representative leaf sample, as compared to flowers, and therefore this book has the advantage over more traditional botanical keys which rely on floral characteristics to identify plants. It is also much easier for the 'botanically challenged' to learn and distinguish differences in leaf morphology than the often complex anatomy of flowers.

In a separate section of the book to the key, each species is described in terms of its distinguishing characteristics and distribution along with a clear line drawing of the features used for identification.

This book also contains good explanations of rainforest types, climbing plant features, various leaf and stem characteristics and has an excellent glossary.

There is enough information for anybody to pick up this book and, with a little practice and persistence, identify the rainforest climbing plants in their patch.



Gwen Harden Publishing, 2007.
Soft cover, 190 pages, black & white.
ISBN: 9 780977 555314
RRP: \$40.00

"It's bloody good, buy it." – Spencer Shaw, Brush Turkey Enterprises.

Review by Alan Wynn.

Platypus.

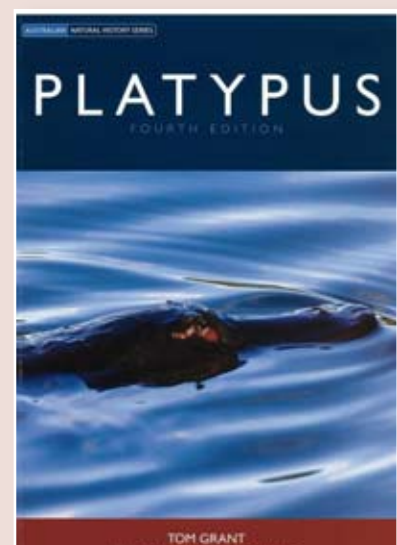
by Tom Grant

When first discovered by Europeans, the Platypus was thought to be a fake. Biologists of the time had never seen anything like it. A mammal that lays eggs? How could it be? Unable to find proof that their pickled specimens had been stitched together by imaginative taxidermists, the European biologists eventually gave in and accepted that a unique mammal had indeed been discovered in the colonies.

The Platypus continues to be the subject of controversy, interest and absolute wonder. The species is considered an Australian icon and yet very few Australians have had the great pleasure of seeing one in the wild. These plucky Aussie battlers have endured the impact of sharing space with humans including hunting, water pollution, changes to stream flow, and the introduction of new animals, plants and diseases. They are listed by the International Union for the Conservation of Nature and Natural

Resources (IUCN) as a species of 'least concern' since they have managed to continue occupying aquatic ecosystems throughout most of its historical range. However the future conservation of the species hinges on reversing human impacts and on mitigating the affects of climate change.

This book presents established factual information about the Platypus and examines the most recent research findings, along with some of the colourful history of the investigations of its biology. Completely updated, this fourth edition covers the anatomy, distribution and abundance, breeding, production of venom, unique senses, ecology, ancestry and conservation of this iconic mammal. It also includes a 'Frequently Asked Questions' section. A fascinating, informative and delightful read for anyone that has ever wondered which came first... the platypus or the egg?!



CSIRO Publishing, 2007
Soft cover, 168 pages, colour photographs
ISBN: 9 780643 093706
RRP: \$39.95

Review by Susan Finlay.

bush regeneration

Converting Stands of Camphor Laurel to Rainforest

Article by Dave Burrows
Land for Wildlife Extension Officer
Noosa Shire Council

Camphor Laurel (*Cinnamomum camphora*) is an invasive tree from Asia which was introduced into Australia in 1822. It was widely planted as a garden landscape species, however has now spread to such an extent that it is classified in Queensland as a Class 3 pest under the *Land Protection (Pest and Stock Route Management) Act 2002*.

Camphor is particularly common along watercourses and on soil types which once supported rainforest. Although stands of Camphor Laurel have greater biodiversity values than fully cleared pastureland, if the land is being managed for conservation it is desirable to replace Camphor Laurel with native rainforest species. However broad scale removal of Camphor Laurel from an area over a short period of time could have adverse impacts on biodiversity values. For example, the fruit of Camphor Laurel is utilised as a food resource by numerous species of birds such as rainforest pigeons.

This fact sheet reports on the results of practical research on techniques that bush regenerators (called restoration practitioners in the fact sheet) could use to replace Camphor Laurel with rainforest vegetation. It is specific to Northern NSW in an area known as the Big Scrub, where following broad scale clearing for agriculture in the early 1900's, Camphor Laurel has now become the dominant tree species in the landscape, particularly on those volcanic soils that once supported rainforest. The authors have found that stands of Camphor Laurel in the Big Scrub district often have native rainforest species recruiting in the understorey. The broad range of techniques are:

- Fully clear or poison stands of Camphor Laurel and revegetate with native species. This is a proven method but expensive and has a major impact on the landscape. Mechanical clearing is unsuitable for certain sites such as steep land, riparian land, and where there is regeneration of native species in the understorey;



Patch removal of Camphor Laurel, three years after treatment, near Fernleigh, northern NSW. This method involves killing all camphor trees in patches at one time, along with all understorey weeds, to promote the growth of rainforest plants. In this example, the treated patch is around 0.5 ha in size.

- Do nothing and wait for Camphor Laurel to be replaced by native plants. A cheap method but one that may take a long time for native species to become part of the canopy structure as a dense Camphor Laurel stand may suppress growth of native species.
- Camphor conversion. Strategically kill Camphor Laurel trees to promote growth and regeneration of native species that are present in the understorey or in the soil seed bank.

The camphor conversion technique is the focus of this fact sheet and 4 case studies are presented that describe how workers in this field have used two methods of camphor conversion in the Big Scrub district. These two methods are:

- Staged removal of Camphor Laurel where a proportion of mature camphor laurel trees in a stand are progressively killed,
- Patch removal, where patches of camphor laurel trees (0.5 to 1 ha) within a stand are killed.

The Camphor Laurel trees are killed by stem injection with a registered herbicide. The case studies that are presented show that costs of treatment are similar for both treatment methods, with the majority of costs being associated with primary treatment of camphor and understorey weeds. Follow up weed control is also essential and can be up to 40% of the overall cost. It is shown that after 4 to 6 years both staged and patch removal methods produced similar outcomes in terms of vegetation structure and the diversity of rainforest tree species regenerating at both sites.

Both methods have their proponents. Those who endorse staged removal of Camphor Laurel say it maintains a shaded habitat with intact strata during treatment. The shading reduces the risk that weeds will dominate the site if the work is interrupted, and reduces erosion risk on steep sites. The patch removal method is said to promote vigorous regeneration of rainforest pioneer species from the soil seed bank, and stimulates the growth of existing native plants by eliminating competition from Camphor Laurel trees.

The main factors that appear to influence the success of either method are having an existing soil seed bank of native species, the distance from the Camphor Laurel stand to remnant rainforest, the age of the Camphor Laurel stand, wallaby browsing, and enough resources to do the follow up work required.

This is an excellent fact sheet that advances our understanding of woody weed removal techniques and looking at weeds with a strategic focus.

Copies of the 16 page fact sheet can be downloaded from the Centre for Innovative Conservation Strategies website at www.griffith.edu.au/centre/cics/ or is available from your local Land for Wildlife Extension Officer.



Reference

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Converting stands of camphor laurel: What are the costs and outcomes of different control methods? Griffith University, Nathan.

habitat research

Habitat Structure is More Important than Vegetation Composition

Article by Lexie Webster
Land for Wildlife Officer
Brisbane City Council

As urban areas continue to expand, so does the threat of habitat loss and fragmentation on SEQ's biodiversity. Therefore, it is crucial that appropriate conservation and management techniques are implemented to mitigate the impacts of urbanisation on native wildlife within urban environments. To do this, an understanding of what local factors are important for maintaining diverse assemblages of native fauna must first be established.

A recent study set out to determine whether the occurrence of native reptile and small mammal species were more influenced by habitat structure or vegetation composition. Native reptiles and small mammals were targeted because they are considered to be fauna groups most sensitive to urbanisation and its associated disturbances.

The study focused on lowland remnant habitat fragments with the selected 59 sites all located in the two Brisbane suburbs of Karawatha and Burbank. These suburbs are located within a Regional Ecosystem (RE) type dominated by Scribbly Gum (*Eucalyptus racemosa*) woodland on sedimentary rocks and sandy soils. This RE has been extensively cleared and fragmented in Brisbane City.

Native reptile and small mammal species were identified at each site using a combination of live-trapping, direct observation and trace survey methods. This combination of methods maximised the probability of detecting target species. Twenty-three habitat attributes such as total number of termite mounds, approximate weed cover, total number of flora species, relative volume of fallen woody material and the presence or absence of fire and human disturbances, were measured at each site.

The study found that reptile abundance depends on four main habitat variables:

- Presence of termite mounds.
- Presence of fallen woody materials.
- Presence of weed cover .
- Absence of soil compaction.



Forest Grass Trees (*Xanthorrhoea johnsonii*) provide important nesting habitats for a range of ground-dwelling mammals such as antechinus and dunnarts.
Photograph by Keith McCosh.

These findings make sense given that many reptile species depend on leaf litter, fallen timber and low-lying vegetation for protection against predators, suitable nesting sites and habitat for prey species. Many reptiles feed on termites and other invertebrates which live in decomposing leaf litter and fallen timber. Termite mounds and fallen timber also provide basking and resting sites for reptiles. Sun-loving reptiles that depend on termite mounds and fallen timber that were assessed during this Brisbane study include the Lively Skink (*Carlia vivax*), Copper-tailed Skink (*Ctenotus taeniolatus*) and Tommy Roundhead Dragon (*Diporiphora australis*).

Soil compaction obviously reduces opportunities for reptiles and mammals to dig holes and burrows for feeding, nesting and refuge. Compacted soils are often dry and lack soil invertebrates, fungi and offer few opportunities for plants to grow. In the Brisbane study, no native reptiles were found in the habitats with the hardest (most compacted) soil. Likewise, ground-dwelling mammals avoided habitats with soil compaction due to the inability to dig nesting burrows and the lack of prey.

The study found that Grass-trees (*Xanthorrhoea* species) positively contribute towards the abundance of ground-dwelling mammals. Grass-trees provide important nesting habitats for Dasyurids such as the Yellow-footed Antechinus (*Antechinus flavipes*) and Common Dunnart (*Sminthopsis murina*).

These results initially indicated that both floral composition (i.e. weed cover and grass trees) and habitat structure (i.e. termite mounds, wood volume and soil compaction) are important for small mammal and native reptile species. However, when the researchers examined previous studies about the behaviours and life history traits of the species involved, it seemed more likely that the species were responding to the structural role provided by the weed cover and grass trees, rather than the floristic role.

This study concluded that at a local-level, habitat with more structural complexity is more important than vegetation composition for the occurrence of native terrestrial reptile and small mammal species in Brisbane's lowland remnant habitat fragments.

So what are the management implications of these results? It is important not to manage areas based on the requirements of a single species. This is difficult to do due to the variety of species-specific responses. It is therefore recommended that ecological profiles are developed to categorise species based on similarities in their habitat requirements and disturbance responses. These profiles may then guide habitat and conservation management decisions.

Reference

Garden, J., McAlpine, C., Possingham, H. & Jones, D. (2007) Habitat structure is more important than vegetation composition for local-level management of native terrestrial reptile and small mammal species living in urban remnants: A case study from Brisbane, Australia. *Austral Ecology* (2007) 32, 669-685.



A carefully disguised Carpet Python tries to blend in with a garden hose. Wet and warm summers are the best time to keep an eye out for snakes and other reptiles on your property. Photograph by Bernadette May.

Esk and Crows Nest Shires Join Land for Wildlife SEQ

Congratulations to Esk Shire Council and Crows Nest Shire Council who have both recently joined the SEQ Land for Wildlife program.

Funded by the recently introduced Environmental Levy and supported by the Esk Shire NRM Plan, Land for Wildlife is being re-invigorated in Esk Shire. A local landholder, Martin Bennett, has been engaged to do Land for Wildlife property assessments and revisits in Esk Shire. Martin is also the Land for Wildlife Extension Officer for Gatton Shire.

Esk Shire Council supported Land for Wildlife from 1999 to 2002 and during that time over 45 properties were registered with the program. These members will now have access to local Land for Wildlife services and support.

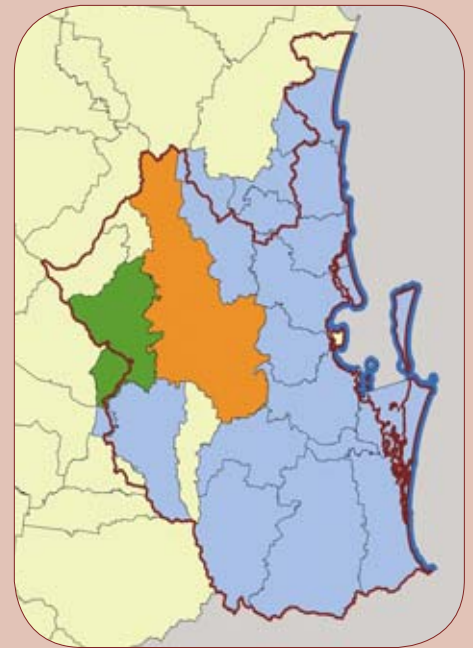
Esk is the largest shire in SEQ containing a mix of remnant vegetation and open grazing land. The Brisbane River and Wivenhoe Dam run through the middle of the Shire. The Brisbane River valley used to support extensive Blue Gum forests and floodplain ecological communities. Most of these have been modified for agriculture and grazing.

To the west, Esk Shire includes Ravensbourne National Park, several State Forests and many headwaters of creeks that flow into the Brisbane River. To the east, Esk Shire includes the D'Aguilar Range and numerous State Forests and reserves.

Esk Shire contains some significant biodiversity values such as endangered Brigalow woodlands, numerous threatened species and high conservation value riparian sites such as Emu and Cressbrook Creeks.

Crows Nest Shire Council, with support from the Qld Murray-Darling Committee (QMDC), has been delivering Land for Wildlife services to local landholders for many years. Staff and administrative changes have prompted Crows Nest Shire Council to join with the SEQ regional program. Land for Wildlife members in Crows Nest will receive information from both the QMDC and SEQ regional Land for Wildlife programs.

Kym Campbell at Crows Nest Shire Council can be contacted on 4698 1155. Martin Bennett can be contacted via Esk or Gatton Shire Councils or on 0428 198 353.



A map of the SEQ Catchments region outlined in red with Esk Shire highlighted in orange and Crows Nest Shire in green. All Local Government areas shaded in blue are also members of the SEQ regional Land for Wildlife program.

Land for Wildlife Southeast Queensland is proudly managed by SEQ Catchments (the accredited regional body for Natural Resource Management in South East Queensland) and proudly delivered by the following 17 Local Governments:



Australian Government

Land for Wildlife South East Queensland Regional Coordination is supported by the Australian Government.

*Opinions expressed by contributors to the Land for Wildlife newsletter are not necessarily those of the Land for Wildlife program nor any of the supporting agencies.
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