



LAND FOR WILDLIFE

SOUTH EAST QUEENSLAND

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Land for wildlife SOUTH EAST QUEENSLAND SNAPSHOT

 **5,267**
TOTAL
PROPERTIES

 **4,212**
REGISTERED
PROPERTIES

 **1,055**
PROPERTIES
working towards
RESTORATION

 **74,181** ha
RETAINED HABITAT

8,197 ha
Habitat Under
RESTORATION

 **9,168**
Facebook
Page Likes

18,477
iNaturalist
OBSERVATIONS


[www.inaturalist.org/
projects/lfwseq](http://www.inaturalist.org/projects/lfwseq)

To join contact your local LfW Officer

*These above statistics reflect LfWSEQ membership across 13 Local Governments (Toowoomba data pending).

Land for Wildlife is a voluntary conservation program that encourages and assists landholders to provide habitat for wildlife on their properties.

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Front Cover: Bandy-Bandys come out on warm wet nights to feed. Photo by Greg Tasney.

Front Cover Inset Photos: A Cottonwood (*Hibiscus tiliaceus*) flower, photo by Danielle Outram; a tunnelling dung beetle species, photo by Jessa Thurman.

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Land for Wildlife South East Queensland Team, December 2021

I've been in this role for many years now and I always try to keep the majority of stories in this newsletter positive for several reasons. Many of us already receive enough doom and gloom news about the environment and personally I find too much negativity disengages me from the issue. Nature is truly amazing and offers endless tales to share of wonder, variety and grit. Most importantly though, so many Land for Wildlife members are doing incredible work on their properties to restore ecosystems and wildlife habitats, I just want to spruik it.

This selective lens I choose to wear doesn't preclude the reality that we are living with a rapidly changing climate and within one of the major extinction events on Earth. These awful realities are hard to digest and have been brought close to home with extreme weather over the past few years. We call them floods and bushfires but could equally call them climate change. Many Land for Wildlife members and properties are reeling from these heartbreaking experiences. If your property was affected by the floods/storms earlier this year, please reach out to your Land for Wildlife Officer if you think the program can offer recovery support.

When browsing the latest IPCC report (essential reading but not fun), I was fascinated by the statement that the Earth's atmosphere is warmer and wetter and therefore more energetic. Anyone who saw the rivers raging recently saw this energy. The ferocity of bushfires is energy. We are turning up the dial and it is not very comfortable.

Let's get back to positivity. The back-to-back La Niña years with good rains have triggered major growth, flowering and fruiting of many native plants. Likewise, wildlife has taken advantage of the good seasons to breed, and invertebrates of all kinds have emerged from long periods of dormancy. It has been heartening to see wildlife look so healthy.

This edition has a wonderful story about native hibiscus and how it was, and still is, used by Jhdungah Murulla women for food, fire, shelter and fibre. Remembering that First Nations People across Australia lived through the last ice age over 20,000 years ago shows the depth of connection and understanding that First Nations People have about country and the ability of people to adapt when necessary.

Finally, I would like to congratulate Toowoomba Regional Council (TRC) for joining the LfWSEQ program and for re-instating Land for Wildlife for Toowoomba landholders. It's been many years since the program was last delivered in Toowoomba and it is great to see it back. TRC will be rolling out a four-year trial to gauge the community response and to see how the program fits within the broader council direction. There will be some rebuilding initially to reconnect with existing members and to process applications, but I am confident that the program will find its footings quickly given the capable hands at TRC. Please see more information on pg 13 if you are a Toowoomba LfW member or wish to join.

Stay safe and enjoy the incoming autumn.

Deborah Metters
Land for Wildlife Regional Coordinator

We welcome all contributions.

Please send them to:

The Editor

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Climate & Weather REGIONAL OUTLOOK Apr-Jun 2022



Daytime and Night-time Temperatures. It is likely that parts of the east coast will experience below median daytime temperatures with night-time temperatures warmer than average across the country.



Rainfall. Above median rainfall conditions are likely for eastern Australia.



Streamflow. Near median to high streamflows are likely in South East Queensland.

Influences

- La Niña event weakens, with predicted return to neutral El Niño–Southern Oscillation (ENSO) levels by late autumn. Higher than median rainfall still likely.
- Southern Annular Mode (SAM) has recently been positive but is forecast to stay neutral. A neutral SAM has little impact on Australian climate.
- Indian Ocean Dipole (IOD) remains neutral, having little influence on Australia's climate at this time of year.
- Australia's climate has warmed by ~1.47°C since 1910.
- In recent decades there has been a trend towards rainfall from high intensity but short duration rainfall events.

Sources

www.bom.gov.au/climate/ahead/

www.bom.gov.au/water/ssf

Weeds to Watch Apr-Jun 2022

Creeping Inch Plant forms dense mats of purple-green succulent vegetation that spreads easily by seed or vegetatively. Control with herbicide spray or thorough manual removal or dense smothering.



Water Hyacinth - highly invasive water weed. High seed production and vegetative spread rapidly colonises wetlands. Showy mauve to purple flowers. Early detection crucial and control using mechanical, biological and herbicide methods.



Salvinia, a free floating aquatic fern, rapidly forms mats across the water's surface. Likely a sterile hybrid, this weed only spreads vegetatively. A combination of biological, mechanical and herbicide control is most effective.



Photos by Kim Starr

Fassifern Blind Snake

THE MYTH, THE MEME, THE MYSTERY

My curiosity about blind snakes was first aroused on a walk around the Toowoomba escarpment, when my partner pointed out a perfect, but very dead specimen, lying just by the path. A sleek, scaled, worm-like corpse. Vestigial eyes staring blankly out from a tiny head. No visible wounds or abrasions, no evident clues to where it had come from. My curiosity was piqued, and down the rabbit hole I went.

Often mistaken for earthworms, blind snakes have a thin, uniform body and tiny sightless eyes, dark spots barely visible under opaque scales. Evolved for life in darkness, these snakes long ago lost the ability to see. Their worm-like body and smooth scales make short work of sliding through insect tunnels, burrowing through the ground, forked tongues flicking out to taste for ants and termites. Unable to bite and nonvenomous, these snakes are completely harmless. A nice change of pace for Australian wildlife!

Funnily enough my seemingly random encounter with this cryptic reptile mirrors how most data on these snakes has been gathered. They are quite hard to study, because, well, they live underground. Rarely emerging other than following weather a frog would love, specimens are rarely discovered by scientists. Your pet cat or swimming pool are far more likely to catch one!

There are 46 species of blind snake in Australia, 18 of which reside in Queensland. One of which is at risk of vanishing forever.

Recently a massive team of scientists joined forces to discover which Australian reptiles were most at risk of extinction. They ranked the 20 reptiles most likely to be extinct by 2040. Of these 20 species, 55% reside in Queensland. Six of these species have less than a 50% chance of survival. Their future on the toss of a coin.

South East Queensland has the dubious distinction of owning number two of the top six. The critically endangered Fassifern Blind Snake (*Anilius insoeratus*) is a rare and cryptic critter, even by blind snake standards. So much so that it was first recorded in only 1992. Found in a paddock under a rock, it sat unclassified in a jar for the next thirteen years, until a small group of scientists described it as a new species. And neither hide nor smooth, shiny scale has been seen of them since.

Fassifern Valley lies nestled comfortably within the picturesque surrounds of the Scenic Rim. Not far from Boonah and the Kalbar Sunflower Festival, Fassifern Valley produced the only specimen of this species known to science.

Sadly, the Fassifern Blind Snake might fade from existence before we ever find out more about the species. Scientists estimate there is a 75% chance that it will be extinct within the next 20 years.

Scientists have been searching for almost three decades for another Fassifern Blind Snake. Finding more specimens would allow researchers to model the potential distribution of the species.

So, if you live in the Scenic Rim and heavy rain breaks the heat of a hot summer's day, take your torch on an evening wander and keep your eyes trained near your feet. You might just happen upon a Fassifern Blind Snake and help save this rare and enigmatic species.

Amelia Carlson
Land for Wildlife Supporter
Toowoomba Region



A deceased blind snake, species unknown. Photo by Don Carlson.



Bandy-Bandys (*Vermicella annulata*) prey primarily on blind snakes. When threatened, Bandy-Bandys perform a defence display by looping their bodies in the air. Photo by De-Anne Attard.



This 'yawning' blind snake charmed the internet, and became a meme sensation. Photo by Kristian Bell.

If you live in the Scenic Rim and come across a blind snake, please don't touch, but note the location, take lots of photos and get in touch with the Queensland Museum and your local Land for Wildlife Officer.


References

Geyle HM, et al. (2020) Reptiles on the brink: identifying the Australian terrestrial snake and lizard species most at risk of extinction. *Pacific Conservation Biology*, 27, 3-12.

Venchi A, et al. (2015) A new blind snake (Serpentes: Typhlopidae) from an endangered habitat in south-eastern Queensland, Australia. *Zootaxa*, 3990 (2), 272-278.

<https://www.fassifernguardian.com/nature/scenic-rim-snake-second-most-likely-to-go-extinct-in-australia>

<https://reptilesmagazine.com/the-20-most-imperiled-australian-reptiles-predicted-to-disappear-by-2040/>



'NOTCHY' THE Donovan's Day Moth

The autumn of 2021 found us in the now-familiar humdrum of social isolation. During this time I was fortunate to have some special visitors grace our property. We had up to five Donovan's Day Moths (*Cruria donowani*) patrolling our bitumen driveway for over a fortnight. As the name suggests, most species of day moth fly during the day rather than at night. Adult moths are distinctively marked and brightly coloured, usually in orange, black and white.

I decided to observe, photograph, and document the behaviour of our colourful visitors. They flew and patrolled constantly just like some butterflies do, but regularly returned to rest on the tree trunks, favouring the trunk of a large Spotted Gum. They appear to prefer to perch between chest and eye height, making for perfect viewing!

One moth in particular caught my interest, a specimen with a small piece (notch) missing from its right hindwing. Dubbing this individual 'Notchy', I observed it aggressively chasing off any other day moths (probably males of the same species) and butterflies much larger than itself. After Notchy's passing, its territory and favourite gum trees were shared by two other Donovan's Day Moths. When I say shared, there was a constant battle between the two to see who dominated the territory. These moths certainly seem to be highly territorial!

The Donovan's Day Moth is said to mimic appearance of the Common Crow butterfly (*Euploea corinna*), commonly called the Crow Moth. The Common Crow is toxic and distasteful to predators, and mimicking its pattern and colouration is a nifty adaptation to protect against predation.

According to Dr Don Sands, retired CSIRO entomologist, adult day flying moths in the *Cruria* genus can live up to one month. Just imagine the number of kilometres a Donovan's Day Moth would clock up during its lifetime.

As winter drew on I was unable to enjoy the presence of Donovan's Day Moth any longer. However, I will certainly be on the lookout for this engaging little moth next season and hopefully will be able to discover further information about its behaviour and life history.

References and further reading

Common, IFB (1990) *Moths of Australia*, Melbourne University Press.

Kendall, R (2009) *Metamorphosis Australia*, 52.

Moss, JT (2010) Life history notes on the day-flying moth *Cruria synopla* Turner, 1903 and its distinction from *C. donowani* (Lepidoptera, Noctuidae), *Metamorphosis Australia*, 59, 4-8.

Nielsen, E, et al. (1996) *Monographs on Australian Lepidoptera Volume 4*, Checklist of the Australian Lepidoptera, CSIRO Publishing.

<https://lepidoptera.butterflyhouse.com.au/moths.html>

Article and photos by Paul Grimshaw
Land for Wildlife member
Mt Crosby, Brisbane

It is only when a Donovan's Day Moth settles in a downward position on a tree trunk, with its tail and wing tip resting on the tree and head and thorax raised, that you are able to see the pattern and the colours of the body from side on.



The first time I photographed 'Notchy' was the 19th March 2021. 'Notchy' landed on its favoured tree trunk facing upwards, but quickly rotated to face downward in its resting position, as I have observed all day moths do. This individual often flew up to me and landed on my shoulder or chest, and occasionally on my back. It even tried to land on my face!



The author observing 'Notchy' on its favoured Spotted Gum tree trunk. March of 2022 saw the return of later generations of Donovan's Day Moth to Paul's property, all favouring the same Spotted Gum.



Blooms of Cottonwood or *Gh-gung* (*Hibiscus tiliaceus*) flowers attract nectar-feeding birds, whilst the heavy insect load attract insect-eating birds. Birds such as lorikeets enjoy a feast on the seed capsules.



Native Hibiscus

ITS CULTURAL CONNECTIONS AND INSECT ASSOCIATIONS

What do you think of when you hear the word 'hibiscus'? Perhaps it's Nanna's garden, a Balinese sarong or a bright Hawaiian shirt? Despite its exotic, tropical associations, Australia has over 100 species of native hibiscus that occupy just about every ecosystem, from rainforest to desert.

Probably the two most common species of hibiscus in SEQ are Native Rosella (*Hibiscus heterophyllus*) and Cottonwood (*Hibiscus tiliaceus*). Native Rosella is a shrub with variable leaves ranging from simple to lobed with prickly stems. Its flowers are white with pink markings (although can be yellow). This species can often be found along rainforest margins and waterways. The Cottonwood is a spreading tree along mangroves, estuaries and dunes. It has yellow flowers and heart shaped leaves.

Bridgette Chilli Davis is a proud Murulla woman of Jhdungah Country, within the Kabi Kabi Nation and language group, Sunshine Coast. Bridgette was born on country and raised by her grandmother Pauline Chilli Davis, who was the matriarch of her family and the Murulla women of her community. Pauline taught Bridgette the traditional uses and significance of the *Gh-gung* (Cottonwood) and *Bhd-idi* (Native Rosella).

Gh-gung (Cottonwood) is a mother tree for Jhdungah Murulla women as it is highly resourceful and provider of shelter. *Bhd-idi* (Native Rosella or White Rosella) is a short-lived pioneer. Both species were harvested extensively by Jhdungah Murulla women for weaving fibre to make fishing nets, baskets, ceremonial dress and mats. The women harvested smaller branches, stripped the bark, soaked them in water until they were fibrous, then dried them out before adding different dyes (berries and ochre) to colour them, and finally weaving the fibres.

Gh-gung was also used to make fire. The (female) *Gh-gung* base was placed at the bottom, while the (male) Xanthorrhoea or grass tree flower stalk was used as the fire stick. Bridgette explains "You place male on female and rub to make fire. It's all in balance, everything in our culture is in balance."

Bridgette fondly remembers her grandmother taking her down to Cotton Tree near Maroochydore and feeding her the young buds and flowers of the *Gh-gung*. She notes that the larvae of the Hibiscus Harlequin Bug were also eaten traditionally but confesses that she hasn't tried them personally yet.

Jhdungah Murulla women were exceptional at catching seafood and could be recognised by one shortened pinky finger. At a young age, their smallest finger was bound by web of the Golden Orb Spider. When the tip of the finger fell off the girl was ready for womanhood and marriage. The shortened finger was useful for making the nets, baskets and ceremonial dress from the native hibiscus species as it wouldn't get caught in the fibres.



Insect activity on Native Rosella or Bhd-idi (*Hibiscus heterophyllus*) flowers.

When the *Gh-gung* is flowering in spring and early summer, the Jhdungah Murulla people would know that it was a good time to catch River Whiting, which have yellow on the fins the same as the *Gh-gung* flowers. The fish was cooked and served in the *Gh-gung* flowers and leaves and eaten together.

Modern culinary uses for Native Rosella are widely varied. Native Rosella buds can be cooked and made into jam. Petals and buds can be eaten raw, however the flavour is very mild and best used as a colourful ornament in salads. Flowers can be stuffed, made into fritters or brewed as a tea. Leaves are recorded to taste like sorrel and the roots like woody parsnips – an incredibly versatile vegetable. Likewise, the young leafy shoots of Cottonwood can be eaten as vegetables.

Native Rosella was one of the earliest native hibiscus to be grown in Europe from seed collected in Australia. Cottonwood was used like cork to seal cracks in boats. Medicinally, Cottonwood has been used to treat fevers and menstrual issues by making a tea from bark and roots. Caution should be taken when handling Native Rosella as there are irritant hairs on the seed capsule.

Now, if I've lost you with too many entomological references allow me to inject some scandal into the article. The Native Rosella has been used in film and television as a visual substitute for cannabis bushes, as the deeply lobed leaves resemble the illicit plant.

You'll probably notice a lot of insect activity on native hibiscus species on your property. These insects can cause flower buds to drop prematurely, but it's important to remember they are a natural part of the ecosystem. Insects are considered the main hibiscus pollinators, including bees that emerge from the flowers with obvious pollen attached.

The Hibiscus genus has been under taxonomic review in recent years through the work of botanist Dr Todd McLay. Dr McLay has been using modern DNA sequencing techniques that have only been developed in the last 5-10 years. Traditional DNA sequencing takes the same part of a genome for all different species and analyses the difference. With this new technique, botanists are now able to sample 100s of genes instead of just one. Where traditional morphology is very complex, such as in the genus Hibiscus, DNA sequencing can help complement taxonomy.

Dr McLay has discovered 40 new species of hibiscus through his research.

Whilst field work was vital, 90% of specimens came from herbarium collections. This was challenging and involved a lot of detective work including looking at scraps of leaves sent around the world and handwritten labels over 150 years old. Dr McLay even examined specimens from the Bourke and Wills expedition.

Hibiscus taxonomy is a work in progress and Dr McLay isn't convinced that our local hibiscus, *H. heterophyllus* is just one species. Differences include the colour of the flower, spiny hairs



Bridgette Chilli Davis, a proud Murulla woman of Jhdungah Country, within the Kabi Kabi Nation and language group, Sunshine Coast.

on stems and leaf size. He plans to do DNA sequencing and look at herbarium specimens to solve this conundrum. He believes the matter is complicated by a large number of cultivars that have been planted in bushland settings. A great reminder to always plant local provenance seedlings that are consistent with the regional ecosystem/s on your property.

References and Further Reading

Aluri J, et al. (2020) Pollination ecology of *Hibiscus tiliaceus*, an evergreen tree species valuable in coastal and inland eco-restoration. *Transylvanian Review of Systematical and Ecological Research*, 22:2, 47-56.

Low, T (1991) *Wild Food Plants of Australia*. Harper Collins.

Williams G (2020) *The Invertebrate World of Australia's Subtropical Rainforests*. CSIRO Publishing.

www.sown.com.au (Save our Waterways Now)

**Article and photos by Danielle Outram
Land for Wildlife Officer
Sunshine Coast Council**

A photograph of two men, Rod and Stuart, standing in a flooded creek. The water is murky brown and flows around them. The background is a lush green forest with many trees. The men are wearing light-colored shirts and shorts. The text 'The Floods' is written in a large, white, cursive font, and 'SUMMER '22' is written in a smaller, white, sans-serif font below it.

The Floods

SUMMER '22

Land for Wildlife members Rod and Stuart stand near their flooded creek on their property at Sheldon in the Redlands showing how flood waters fill usually dry gullies and can create new ponds or billabongs.

The deluge of February-March brought significant flooding and tragedy for many Land for Wildlife properties and members. Impacts of storms and floods will be felt for many years to come as people work to rebuild their homes, health and livelihoods. We wish you all a speedy recovery and if the program or your local council can assist, please reach out to your Land for Wildlife Officer.

Floods are the most expensive type of natural disaster in Australia. The cost of these recent floods is estimated to exceed the nation's previously most expensive flood - the 2011 flood in SEQ.

Not negating the loss and devastation for so many, floods are part of nature and can play an important ecological role in the boom-and-bust cycle of Australian ecosystems. Floods recharge groundwater, fill wetlands and deposit sediment on fertile floodplains. They trigger major breeding events such as the migration of hundreds of thousands of birds from coastal Australia

to breed on flooded inland lakes. In SEQ, we have seen the surge in all kinds of wildlife over the past few months with masses of invertebrates and many birds successfully rearing several clutches in one season.

Unfortunately, floods hit degraded and heavily modified ecosystems harder than healthy country. The loss of vegetation from our landscapes and built infrastructure increases the amount of sediment, nutrients, rubbish and weeds entering our waterways. Land for Wildlife is just one of many programs trying to make our environment healthier and more resilient to natural disasters. We thank all our members who have ever planted a tree or removed weeds as each action would have played a role, however small, in reducing erosion and keeping soils in place during this heavy rainfall event.

Here are a just a handful of stories from Land for Wildlife properties.



The construction of 'log jams' occurred on several Land for Wildlife properties in Tarome along Warrill Creek. This was done to control erosion during major flooding events and successfully stayed in place during the 2022 floods. Plantings on the upper creekbank have also contributed to reducing flood-related erosion. A log jam intertwines layers of fallen timber between pylons rammed into the creekbed to take the brunt of the water hitting the creek bend, and therefore minimise bank slumping and erosion. Photo by Catherine Madden.



These Meat Ants evacuated their flooded nest and held on to each other for dear life as water washed through the forest. Photo by Chris Wiley, Land for Wildlife member, Pine Mountain.



Unfortunately, wildlife can be hard hit by floods. Underground invertebrates such as spiders, ants, scorpions and native crayfish (as shown here) often succumb to floods. Photo by Rohan Porter, Land for Wildlife member, Booroobin.



For some parts of SEQ, the recent floods were accompanied by terrible storms. High winds stripped trees bare and twisted mature gumtrees like toothpicks. It was a terrifying experience for Land for Wildlife members on the Sunshine Coast when a large tree fell on their house in the middle of the night. Thankfully they were unhurt. Recovery from these events can take time for people, wildlife and ecosystems.

Resources to help manage soil erosion

The recent floods have had a devastating effect on SEQ, but they have also brought out the best in the community. The loss of life, property and vegetation has spurred a wave of public assistance that has become an icon of Queensland communities in the past decade. One offer of assistance has come from an unusual source, and I would like to let everyone know about it.

As Land for Wildlife Officers, we have seen a sharp rise in cases of severe erosion and bank slump, and the impact this soil loss has on our rivers and on Moreton Bay. Erosion is a widespread problem and yet often misunderstood. We do our best to assist, but in most situations there is a need for a professional engineering approach.

Enter Grant Witheridge, a respected and now retired hydrological engineer and waterway rehabilitation expert. In the past, Grant's company, Catchments and Creeks, has provided excellent advice for several Land for Wildlife properties across SEQ. Grant approached me recently to inform that although he has now retired, he intends to keep his erosion and waterway rehabilitation resources available on his website for public use, see;

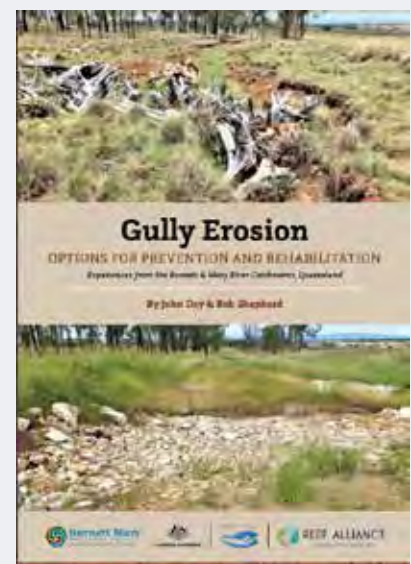
www.catchmentsandcreeks.com.au

This was fantastic to hear because many of us regularly refer to the resources and

refer our members to them. The Field Guides are particularly useful. They cover a range of erosion types, and importantly, they explain why erosion happens and how this drives the type of rehabilitation required. The natural process of erosion, I think, is often misunderstood and results in failure of many rehabilitation projects.

If you have an erosion problem, then it is important to get your solution right the first time. I strongly encourage you to take the time to go through the resources on the Catchments and Creeks website, and if you gain some benefit from the experience, why not send Grant a quick message of thanks.

Peter Copping
Land for Wildlife Officer
Logan City Council



Gully Erosion Options for Prevention and Rehabilitation
by John Day and Bob Shepherd

Available on Burnett Mary Regional Group (BMRG) website: <https://bmrq.org.au>

This is an excellent manual on understanding catchment water flow, causes of gully erosion, how to build fences and tracks to prevent gully erosion, and how to rehabilitate gully erosion.



Towering Tallowwoods with their distinctive reddish bark. Photos by Deborah Metters.

Climate Change

RESILIENCE FOR REVEGETATION IN BRISBANE

Manudi Periyapperuma, an Environmental Management student from UQ, recently took part in a project with Brisbane City Council as part of her industry placement. Over three months she was fortunate to interact with Land for Wildlife, Creek Catchment and Habitat Brisbane Officers, as well as some Land for Wildlife members.

Increasingly frequent events of climate extremes have brought into focus the negative impacts of climate change. These changes affect all types of life, including those of our native plants. A project was proposed to investigate the resilience of native plant species that are used by Brisbane City Council for community conservation projects across Brisbane. The resilience of our native plant species not only affects the landscape but also wildlife.

Manudi first identified and mapped the current distribution of 53 chosen native plant species. All of the species are used in revegetation projects around Brisbane. The climatic range was then calculated for each species and compared against predicted future tolerances.

Having gathered this information, the final step was to define a classification system to determine the resilience of each species. Therefore, a traffic light system was established showing the species' current natural distribution and predicted temperature and rainfall tolerances for 2030.

In analysing these results, it was identified that the majority of the 53 species will be resilient into the future. Thirty-three species were categorised as 'green', meaning they are naturally occurring within Brisbane and the predicted changes

to temperature and rainfall will not limit their natural distribution range into the future.

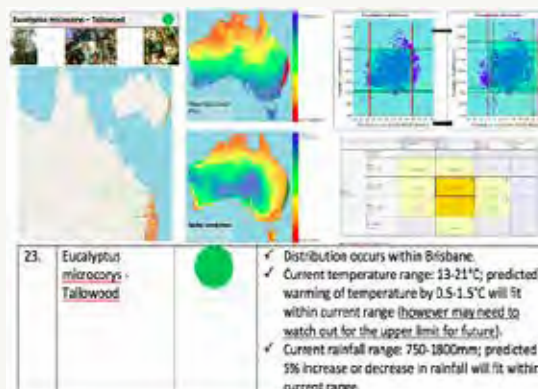
Nineteen species were categorised as 'yellow', meaning they occur naturally within the Brisbane Region but their range may be limited due to predicted future changes to temperature and rainfall. Though these species were categorised as 'keep watch', they should not be excluded from revegetation projects. Furthermore, these species provide more opportunities for research and to learn more about the interrelationships between the climate and revegetation species.

Only one revegetation species (*Myoporum parvifolium*) was found to be 'red', meaning it is not naturally distributed within Brisbane and the species' range may also be limited into the future with predicted changes to temperature and rainfall. It is being phased out of revegetation projects.

The species that had the Brisbane City Council Land for Wildlife Team abuzz was Tallowwood (*Eucalyptus microcorys*). They expected it to be classified 'yellow' but it turned out to be 'green'. The declining health of Tallowwoods as noticed in the field over the past few years by officers is probably due to drought, which of course, is influenced by climate change.

The results of this project have helped identify resilient native plant species for revegetation in Brisbane, but hopefully have also opened a door for more research in this area.

Manudi Periyapperuma
Industrial Placement Student, UQ
Brisbane City Council



Tallowwood (*Eucalyptus microcorys*) distribution maps showing temperature and rainfall tolerances.



'Red' Species
Creeping Boobialla (*Myoporum parvifolium*)



Kenmore State High School Saves the World

ONE TREE AT A TIME

Kenmore State High School students from years 7 to 12 planted 1000 native plants on the outskirts of the oval next to Moggill Creek to celebrate Schools Tree Day in 2021. This event was proudly supported by Planet Ark, Sci-Fleet Toyota and Dr Christian Rowan MP. Sci-Fleet Toyota has been a major sponsor of National Tree Day and the Tree Day plantings at Kenmore State High School for over 20 years.

The current climate change is the variation in weather and temperature patterns due to societies' carbon emissions. These variations are resulting in damaged ecosystems and rises in temperature. It is for these reason that many keen minds around the world are striving to solve this dilemma and the students of Kenmore State High School are no exception.

On 30th of July 2021, students volunteered to participate in the school's annual tree planting day. Since the beginning of this tradition in 2002, with teacher Mike Walker, students of Kenmore State High School have planted over 25,000 native plants in the school grounds.

Last year, 56 students participated in the event. The students of Kenmore State High School have expressed an interest in the local catchment.

"If we were the problem, we should also be the solution and do everything we can to help." - Amelia, Grade 10 student

Many who joined the event shared similar ideologies, helping the best they could in restoring their section of Moggill Creek. Tree planting day is an important part of the Kenmore State High School community and proves to be meaningful for many of the students.

"I really hate how humans have destroyed the planet and I think it is a really good thing to try and help it." - Emily, Grade 10 Student

Since 2002, Bruce Dymock, convenor of the Kenmore State High School P&C Environmental Group, has been a regular and integral participant in the event. Through his efforts, he has witnessed many unique sightings of the catchment's greatest features. These include bandicoots, gliders, possums, micro-bats and many more. The fauna are incredibly important to the creek. They play an important role in the biodiversity of the environment.

By planting trees and attempting to restore the creek banks, this will provide a better home for the diverse animals living in our community.

"Every small step each one of us takes can have an effect on those issues such as global warming." - Mr Dymock

It is for these reasons that Kenmore State High School joined the Land for Wildlife program, because they believe in a better, greener future.

The students had a great experience and felt closer to their community and their environment. Hopefully, many others will join as well to help repair the damage we, as a society, have caused our ecosystems.

Alex Dimitrijevic and Pia Strodl
Kenmore State High School Students
Kenmore, Brisbane



After the Floods

CREEK AND RIVERBED EROSION

Bank scour occurs when material (soil and rocks) are detached and dragged from the bank by flood waters or high flow events. This is often visible by horizontal scour marks along creek banks and can leave roots bare.

Erosion is a common problem for landholders with watercourses running through their properties. Understanding the processes that cause erosion is key to finding short and long-term solutions. If done well, erosion control can not only fix the immediate problem but build resilience and create habitats for wildlife. This article explores a common type of erosion caused by flooding.

Bank scour often occurs during flood events. The level and severity of bank scour erosion depends on flow velocity, the soil profile, vegetation type and whether there are blockages in the creek such as large fallen trees and other debris.

The general rule is the smaller the waterway, the greater the influence of vegetation in stabilising the creekbank. Large root balls, buttressing roots and entangled root mats all play a part in stabilising banks and assisting in soil retention and accumulation.

However, you may notice a peculiar trend while looking at creeks and riverbanks on your property. Is there more erosion occurring on the northern bank? In creeks and rivers that run east-west in the southern hemisphere, the northern banks are shaded. Typically, this results in a different type of plant assemblage and plant density growing on the northern banks. Erosion can occur along both banks however the northern bank is likely to experience more significant soil loss due to reduced vegetation strength and stability over time.

Most waterways experience sediment movement during floods. The quantity of sediment usually increases with the size of the catchment and is also influenced by surrounding land use. Sediment appears as murky, muddy water flowing through our creeks and rivers during floods.

When sediment moves downstream, it can increase erosion of the north bank and can settle on the lower banks of the creek. As sediment is typically high in nutrients, this can result in rapid weed growth, which in turn stabilises the sediment and changes the shape of the creek bed. This can create a narrower flow channel that can lead to bank undercutting and potential slumping. If slumping occurs, this can result in the northern bank being washed away creating a near vertical wall, which can further increase the effects of shading and make it difficult for vegetation to establish.

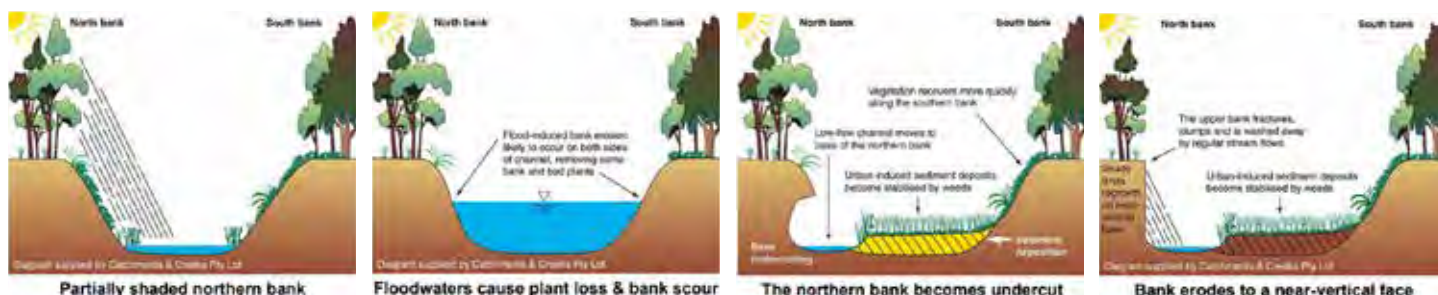
As landholders throughout SEQ begin to repair and rehabilitate areas that have experienced significant erosion and soil loss, it is essential to understand the basic principles of erosion before attempting management solutions. There are several cost-effective bank stabilisation options using soft engineering methods including battering and revegetation, benching, brushing, erosion control blankets and geo/coir logs. More details can be found in *Creek Erosion Field Guides* by Grant Witheridge, Catchments & Creeks (reviewed on page 9).

References

Witheridge G (2021) *Creek Erosion Field Guide Part 1 – Introduction*. Catchments & Creeks Pty Ltd.

Witheridge G (2021) *Creek Erosion Field Guide Part 3 – Bank Stabilisation*. Catchments & Creeks Pty Ltd.

**Article and photo by De-Anne Attard
Land for Wildlife Officer
Sunshine Coast Council**



Diagrams courtesy of Catchments & Creeks Pty. Ltd.

TOOWOOMBA REJOINS *Land for Wildlife*

Great news for Toowoomba landholders! Land for Wildlife is up and running in Toowoomba and all applications are welcomed.

After many years of the program being on hold, Toowoomba Regional Council (TRC) has taken up the reigns and will be delivering Land for Wildlife. The TRC Technical Officer for Conservation and Pest Management, Fiona Gray, will maintain strategic oversight while the operational delivery has been outsourced to Sandy Robertson from Fauna Bytes Ecological Services. Sandy previously worked as a LfW Officer for the Queensland Murray Darling Committee so brings with her a wealth of skills and local knowledge. She also owns a large LfW property on the eastern Darling Downs, so she walks the talk.

If you are an existing Toowoomba LfW member or wish to apply, please contact TRC on 13 18 72 or jump on the TRC website at www.tr.qld.gov.au and search for Land for Wildlife.

We are delighted that LfW Toowoomba is now part of the broader LfWSEQ program and we congratulate TRC on revitalising the scheme for their landholders. This renewal of the program in Toowoomba was in part thanks to the dedicated efforts of the Friends of Land for Wildlife Toowoomba Region (FoLFWTR) community group. Made up of LfW members and supporters, FoLFWTR has been actively working with LfW members to run workshops, plant feed trees for Glossy Black-Cockatoos and raise awareness of local conservation issues and the program. Going forward, TRC and FoLFWTR will continue to collaborate to hopefully deliver a wider suite of services and conservation projects for LfW members in Toowoomba.



The Friends of Land for Wildlife Toowoomba Region (FoLFWTR) recently held a bird walk on Ben and Jean Gundry's LfW property at Gowrie Junction. They are shown in the middle with Peter Hayes (left) from FoLFWTR (and a Toowoomba LfW member) and Martin Bennett (right), a LfW member from Somerset and LfW Officer with Lockyer Valley Regional Council.

Entangled Life

How Fungi make our worlds, change our minds and shape our futures

By Merlin Sheldrake

"From deep sediments on the ocean floor, to the surface of deserts, to frozen valleys in Antarctica, to our guts and orifices, there are few pockets of the globe where fungi can't be found."

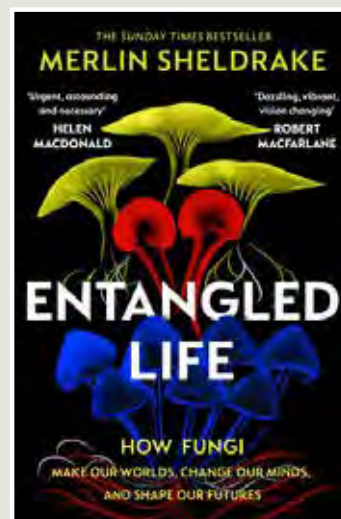
Amongst the estimated 2.2-3.8 million different species of fungus are the largest, oldest and most long-lived organisms on the planet. They can survive in space and in the radiation-blasted remains of Chernobyl. They can 'eat' rock, lignin, crude oil, plastic and TNT. They can transform fruit into wine, honey into mead, grain into bread and beer. They can make us ill and cure disease. They can give us visions and manipulate animal behaviour. They form mycorrhizal networks which support more than 90 percent of all plants as part of the 'Wood Wide Web'. And yet, for many people, fungi are no more than a pizza topping or the bland white button mushrooms found in almost every supermarket fresh food display along with the requisite rack of brown paper bags.

Entangled Life is an examination of how fungi intertwine, penetrate, co-opt, change and support life on earth. With almost a child-like wonder coupled with a deep profound knowledge of the subject Merlin Sheldrake uses metaphor and analogy to weave stories, scientific facts and philosophy in a way that engages and informs the reader not just about the different aspects of fungi but more broadly about the tangled web of life.

Even if you are the more observant type, like Land for Wildlife landholders, that notice the myriad of mushrooms that grow out of the ground and rotting stumps – Sheldrake's book will open your eyes and your mind.

**Review by Alan Wynn
Land for Wildlife Officer
Sunshine Coast Council**

BOOK REVIEW



Paperback | 2021
368 pages | \$23 in-store and online
Random House Publishing



Dung Beetles...

SOMEBODY'S GOT TO DO IT

Dung beetle, photo by Julie Burgher

Mention dung beetles and most people will conjure up the image of industrious beetles rolling massive balls of dung away from a steaming pile of elephant excrement to the dulcet tones of Sir David Attenborough. Some people may be aware that Australia has a long and successful history of introducing non-native dung beetles to combat the mountains of dung produced by agricultural animals, particularly cattle. These beetles were introduced because most of Australia's native dung beetles don't cope well with the large moist pads produced by cattle.

Over 40 foreign dung beetle species have been released across mainland Australia, 23 of which have established permanently. Unfortunately, information about Australia's suit of fascinating and unique dung beetles is overshadowed by the emphasis placed on these imported beetles due to their role in agriculture. There are estimated to be over 500 native species of dung beetle, almost 20% of which are found in South East Queensland.

Dung beetles belong to the family Scarabaeidae (the scarab beetles) and are found on all continents except Antarctica. Most dung beetles are winged, but there are a few wingless species, mainly found in rainforests. All have a keen sense of smell and characteristically branched, flat-tipped antennae.

Aptly named, the life of dung beetles revolves around animal dung. Interestingly, the beetles don't eat the dung itself as their mandibles aren't adapted for eating solid material. Instead, they greedily suck up the dungs' bacteria-rich moisture for sustenance.

Dung beetles are separated into three main groups based on their lifestyle: tunnellers (paracoprids), rollers (telecoprids) and dwellers (endocoprids). Australia's native dung beetles only belong to the tunneller and roller groups.

Tunnellers disperse dung by digging tunnels directly underneath the dung pile. After digging their tunnels using specially adapted forelegs, the beetles break off pieces of dung and drag them into their tunnels. They then compact the dung into a brood mass into which the female lays a single egg. The brood mass is then sealed in the tunnel with a plug of soil before a new brood mass is created, which is again sealed with soil, and so the process is repeated until the tunnel is filled. As well as digging straight down, some tunnellers also dig branching side tunnels which get filled with alternating layers of brood mass and soil. Different species dig burrows of different depths, affected by soil type and moisture.

Rollers, as their name suggests, create dung balls which they roll away from the site of dung deposition using their characteristically long, usually curved, back legs. These balls are created by working and moulding broken-off dung segments, and can weigh many times the beetle's weight. After depositing a ball into a pre-dug hole, the female dung beetle excavates a small hole into the ball, inside which she lays a single egg. She then seals the egg inside and scrapes soil over the top of her creation, known as a brood ball.



Dung Beetles are ecosystem engineers. Shown here are the introduced *Bubas bison* beetles that help to break down cattle dung and sequester carbon. Photo by The Dung Beetle Ecosystem Engineers project.

After an egg hatches, the larva spends the next period of its life systematically chomping away on the dung that surrounds it. In this way the brood mass is hollowed from the centre out, filled by the rapidly growing larva. The larva then pupates inside the brood mass and emerges as a young beetle. Depending on the species and environmental conditions this whole process can take up to a year.

Competition for a limited resource is a very common evolutionary driver between species (interspecific competition) and amongst members of the same species (intraspecific competition). Competition amongst dung beetles is believed to have driven the 'lifestyle' evolution of dung beetles into the different functional groups we see today.

In tunneller species this same competition has resulted in physiological evolution. Many sport spectacular horns along their bodies, which are used to defend their burrows and dung stockpiles from other beetles.

To further reduce competition, Australia's suite of dung beetles show highly diverse traits. Different species are active at different times of the day and year, are adapted to rainforest or open forest, prefer different soil types, range in size from 3.5cm down to the size of a pin head, and show a preference for different dung mediums. There are also dung beetle cuckoos, which lay their eggs in other beetles hard won and crafted dung.

In Australia we have dry dung, which is often deposited into a hot, dry environment. Some of our dung beetles, such as *Onthophagus parvus* (found in SEQ), have a unique adaptation to ensure they have ready access to fresh moist macropod pellets. These beetles literally hang around the anus of macropods with their claws, which are specially adapted to cling onto animal fur. They then drop off as their unsuspecting ride deposits a fresh load of pellets.

Another fascinating dung beetle found in SEQ rainforests is the wingless *Cephalodesmus quadridens*. Instead of using dung or fungi these dung beetles make their own pseudo 'dung'. The male beetle collects pieces of vegetation and fruit which he transports to a pre-dug nesting chamber. Here the female essentially creates a compost mound by chewing up the provided vegetative material and mixing it with her own faeces. This concoction composts for about a month after which the female breaks pieces off the mound and forms them into small balls. She then lays a single egg into each of these brood balls. Due to the small size of the initial ball, the female continues to add more layers of decomposing material to the brood mass to feed the ever-growing larvae inside. The larvae signals the mother to add more material by scraping its tail across its throat. The last act of these devoted parents is to spread a protective coating of faeces, excreted by the larvae itself, across the surface of the brood ball. This allows the larva to safely finish the process of pupation before it breaks out of the ball and makes its way to the surface as a fully formed beetle, ready to start the whole process over again.

There are doubtless more fascinating stories to be discovered about the lifestyles of our Australian dung beetles. In all their various forms they are amazingly efficient at what they do and are just one more of the unsung heroes that go quietly, and often unnoticed, about the business of nutrient recycling and improving soil health.

References and Further reading

<https://www.nationalgeographic.co.uk/>

<http://toowoombafielddnaturalists.blogspot.com/>

Edwards, P (2001-2002) The Queensland Dung Beetle Project.

Montieth, G. *Australian Native Dung Beetles*, Entomological Society of Queensland, Queensland Museum

Monteith, G & Kenyon, T (2011) *A Survey of Dung Beetles from the Moggill Creek Catchment, Brisbane*, A Consultancy Report to the Moggill Creek Catchment Group.

Ridsdill-Smith, J & Simmons LW (2009) *Encyclopedia of Insects 2nd Edn*.

Article by Tony Mlynarik
Land for Wildlife Officer
Brisbane City Council



Rolling dung beetle. Photo by Andi Gentsch

The rolling behaviour is thought to be an evolutionary response to intense competition amongst dung beetles over dung pads. This evolutionary adaption hasn't entirely eliminated this problem as competition amongst rollers for already formed dung balls frequently occurs. This can be the source of fierce battles between the ball creator and interlopers (kleptocoprids) who try and steal the already formed dung ball.



Tunnelling *Onthophagus* species. Photo by Jessa Thurman

So, when are dung beetles not *dung* beetles? Feeding on carrion, fungi or decomposing leaf litter, *Onthophagus dandalu* appears less of a fussy eater than other species. It's even been known to use dog faeces! Fungi feeders use fungi in the same way that 'traditional' dung beetles use dung. They hollow out mushroom stalks and collect gill material which they then carry down into their burrows excavated below the mushroom. Here they produce mushroom brood balls for their larvae.



Rolling *Aulocopris* species. Photo by Andrew Maynard

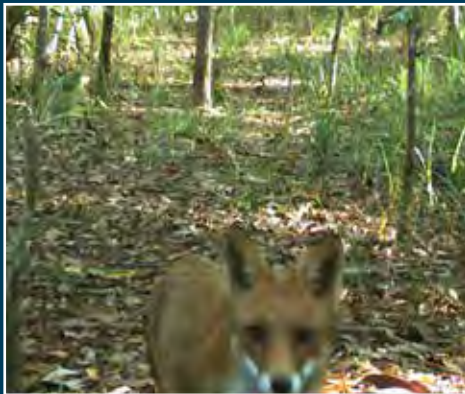
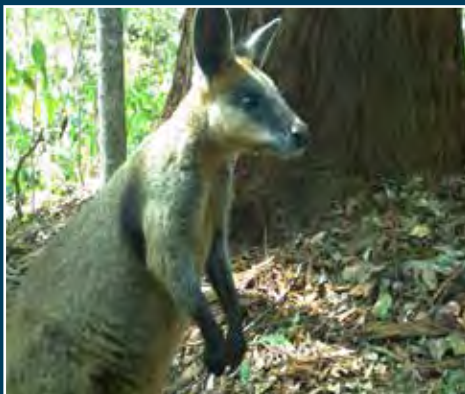
One of Australia's largest dung beetles, aptly named *Aulacopris maximus*, has a mixed feeding strategy. The beetles form brood balls by compacting together the small, dry droppings of bats for their larvae. The beetles themselves feed on fungi, presumably because bat droppings don't contain enough moisture and nutrients to sustain the adult beetles.

Land for Wildlife
South East Queensland
proudly delivered by:



Spotted!

How many mammals can you identify in these fauna monitoring camera images taken from Land for Wildlife properties in SEQ?



Answers from top, L to R: Koala with joey, Short-eared Possum, Swamp Wallaby, Feral Pig, Feral Red Deer, Northern Brown Bandicoot, Black-striped Wallaby, Red-necked Pademelon, European Red Fox, Long-nosed Potoroo