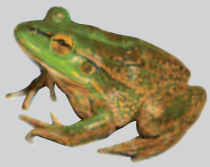
SUMMER 2018
Newsletter No.52

Newham & District Landcare Group



Working towards a healthier environment

Production of this newsletter is funded through Melbourne Water's Community Grants Scheme

Address – PO Box 314, WOODEND, 3442

Mistletoe friend or foe?

DIARY OF EVENTS

APRIL

Friday 20

Where are we going? – Newham Landcare takes a good look at itself

Presentation by Jim Sansom. Newham Hall 6.45pm.

We will review, with some sense of satisfaction, our past achievements. But more importantly we will look to the future.

Several young members of our community – pupils from Newham Primary School – will be helping us to set the challenge: WHAT GREAT THINGS CAN WE ACHIEVE TOMORROW?

MAY

Sunday 6

A Raptor Experience: Leigh Valley Hawk & Owl Sanctuary

'An informative and inspiring display with an elite team of trained birds of prey.'

11am – 2pm. 159 Dons Rd., Newham. Bird program starts promptly at 11.30.

Lunch to follow. RSVP essential: penroberts@bigpond.com

Sunday 13

Hands-on session at Hanging Rock Reserve

More planting and maintenance around the lagoon and on 'the island'.

9.30am – 12 with BBQ lunch to follow.

BYO gloves. RSVP: Penny penroberts@bigpond.com

Group contacts

President: Nick Massie. **Vice President:** Karl Kny. **Treasurer:** Hilary Roberts.

Committee members: Doug Dalgleish, Penny Roberts, Jim Sansom and Howard Stirling.
Please consider nominating for the committee as there are spaces vacant.

Secretary, Website: Helen Scott.

New members, general queries: Penny Roberts; 5427 0795.

Roadsides: Sue Massie; 5427 0065.

Newham Primary: Jenny Waugh; 5427 0408.

Animal pests: Replacement to be confirmed. *Thanks to John Luckock for his contribution to the rabbit eradication and Indian Myna programs. We wish him all the best for his move to Barwon Heads*.

Wesley Park: Fran Spain; 5427 0661.

Flora, library, small tools, grants: Penny Roberts; 5427 0795.

Spray trailer: Currently held by the Roberts family. Contact Penny on 0418396837.

Website: http://www.newhamlandcare.info/

The committee meets on the first Monday of the month (February to December) between 7.30 – 9pm in Newham. All members are welcome to attend the Committee meetings to become more involved or raise specific matters. Please advise a committee member if you wish to attend. Meetings start and finish on time... and we enjoy them!

On 26 October the Roadside Management Group submitted an application to the MRSC for a Community Weed Partnership Program Grant of $1,490. This would fund the purchase of herbicides, protective equipment, and the up-skilling of a group member for a Agricultural Chemicals Users Permit.

The group had nominated several roads in the district where they would like to undertake poisoning and removal of gorse, broom, blackberry and other weeds. On 29 November, Council advised the application had been approved. Herbicide and new spray backpacks were purchased and following a meeting on where and when to start our activities, the group met on 14 March to commence spraying in Shelton's Road from Bolger's Lane to Henneberg's Lane junction. Six members took part and sprayed or removed several patches of broom, gorse, blackberry, briar rose and hawthorn along the length of the road. Shelton's Road is recognised for the significant, beautiful wildflower and grass species which appear in profusion during springtime and so removal of weed outbreaks is vital to preserve this precious roadside environment. Carrying 15 kilos of poison in our backpacks certainly prepared us for a nice lunch afterwards and a refreshing glass of wine was enjoyed by all.

Whilst it is getting too late in the season for effective poisoning, later in the year the group will continue this work on the roadsides of Henneberg's Lane, between Whitebridge and Shelton's Roads and then Colwells Road.

Clean Up Australia Day

Ten volunteers attended the Newham Landcare sponsored Clean Up Australia Day on 4 March 2018. Thanks are given to Fran Spain, Neil McMaster, Howard and Janine Stirling, Jenny Waugh, Jim Sansom, Jean Dunn, Hilary Roberts and Sue and Nick Massie.

Roadsides cleaned included Colwells Road, Straws Lane, South Rock Road, Coach Road, Rochford Road to Bryce's Lane and Bryce's Lane (between Rochford and Colwells Roads.

The picture (left) shows some of the 14 bags of rubbish that was collected. I note that within 2 to 3 hours some roads had fresh rubbish (drink containers) thrown out of cars.

PEOPLE THIS IS NOT NECESSARY!

An insight into propagating natives

Robyn Nelson

Beautiful landscapes are the ideal of every Landcare member but achieving this goal is tough. Despite best efforts, hours of labour and good intentions, results are not always quick, and they are often tempered by no rainfall, kangaroos, rabbits and weed infestations. The only way through is to persevere, gain new skills and try new methods.

So, with patchy plantings in my rear sight, over the past couple of years I have sought the council of experienced members, undertaken a Property Management Plan Course, joined a farmer's discussion group, gained an ACUP license and taken advantage of some of the many educational sessions that come our way, the latest of which was a Plant Propagation Workshop.

On the last Saturday in February, the Upper Marbyrnong Catchment Group, in conjunction with the Darraweit Guim Landcare, hosted a Native Plant Propagation Workshop focused on growing plants from seeds and cuttings.

Following a detailed review of natives and propagation methods by Jim Robinson, Greening Australia, the group spent the best part of three hours on this hot and sweaty Saturday picking, trimming and seeding starter pots.

Many of you will be aware that propagation by cuttings is limited to only a handful of natives, the most, hardy of which is the Carpobrotus, or native pigface. While this is prominent in the sandy coastal areas, I have taken a few cuttings to try my luck in the Newham landscape. I figured that this was a fail-safe winner.

Next up was the picking of tiny seedlings to re-pot into the familiar planting pots provided by Landcare. This is a tricky process as many of the seedlings, particularly the Viola hederacea, or native violet, is clustered into many tiny heads in the seedling tray. This required patience, care and a chop-stick to separate the seedlings.

It was interesting to note that this process seemed to mirror our own personalities. I watched as some around me carefully curated their pots so that at the end of the process, their trays were orderly, labelled and simply, a piece of art. Many participants began with a set plan of the types of trees, shrubs and grasses they wanted to grow. I, on the other hand, didn't start with a plan, but was mesmerised by the tiny Acacia melanoxylon, or Blackwoods, that I know to grow well along Five Mile Creek. With an unlabelled tray, I set myself the task of later trying to identify my collection, was more random in my picking and ended with a slightly messier tray. Three weeks later I have the identification of some of the trees nailed, but the grasses remain elusive.

The propagation workshop could best be described as the end-point of the process before you wait to see the seedlings mature prior to planting out into the pastures. My takeaway message was that in order to have this whole process 'down pat', there was more work to be done. First up, immerse myself in literature on identifying local plant and grass species, secondly, develop a planting plan, thirdly to undertake a seed collection workshop and finally to set up a dedicated area for propagation and nurturing the new seedlings.

Not only was the workshop thoroughly enjoyable, but every day I am getting pleasure from watching my tray of seedlings flourish and grow as I wait for the right day in autumn to commit them to the paddock.

Pic: Caleb Bonsall-Pearson

We are always looking for photos for our newsletters, displays, and most particularly the website which will be revamped. Please contact Penny or Helen.

WHY LANDCARE?

WHAT HAS LANDCARE DONE?

WHAT CAN LANDCARE DO?

LANDCARE IN NEWHAM IS FOR THE FUTURE

FRIDAY APRIL 20TH
NEWHAM MECHANICS INSTITUTE
6.45PM

OUR SCHOOL PUPILS SET THE CHALLENGE

COME ALONG SET THE AGENDA FOR THE FUTURE

Landcare

Newham & District Landcare

Climate Change–
How Forestry can help save society

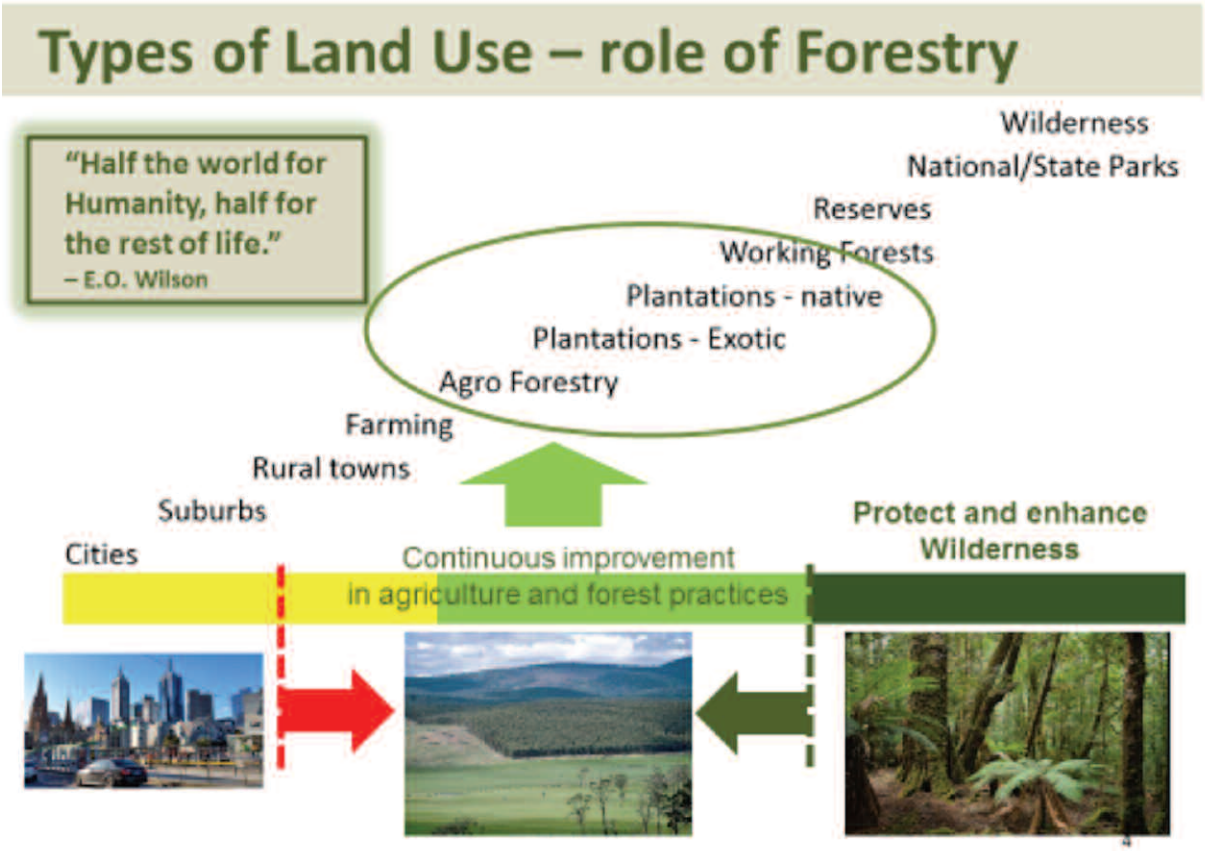
Recently, Karl Kny (retired CEO of HVP Plantations) gave a presentation at Newham Hall on Climate Change and how forestry can help. The presentation covered:

- *What is Forestry*
- *Climate Change and the role of forestry*
- *Global Trends in the use of wood*
- *Plantations – trends, examples, issues*
- *Forest succession, fire risk and mitigation*
- *What can we do in the Macedon Ranges*

Given the presentation's relevance with respect to global trends in the use of wood, plantations and working forests and the implications and opportunities for us in the Macedon Ranges, we asked Karl to write a summary. The key points from the first part of Karl's presentation are provided below.

NDLG Committee.

1) What is Forestry?



- To understand forestry one first needs to understand that Wilderness is critically important – for both its spiritual values for humans and as a bank of genetic diversity.

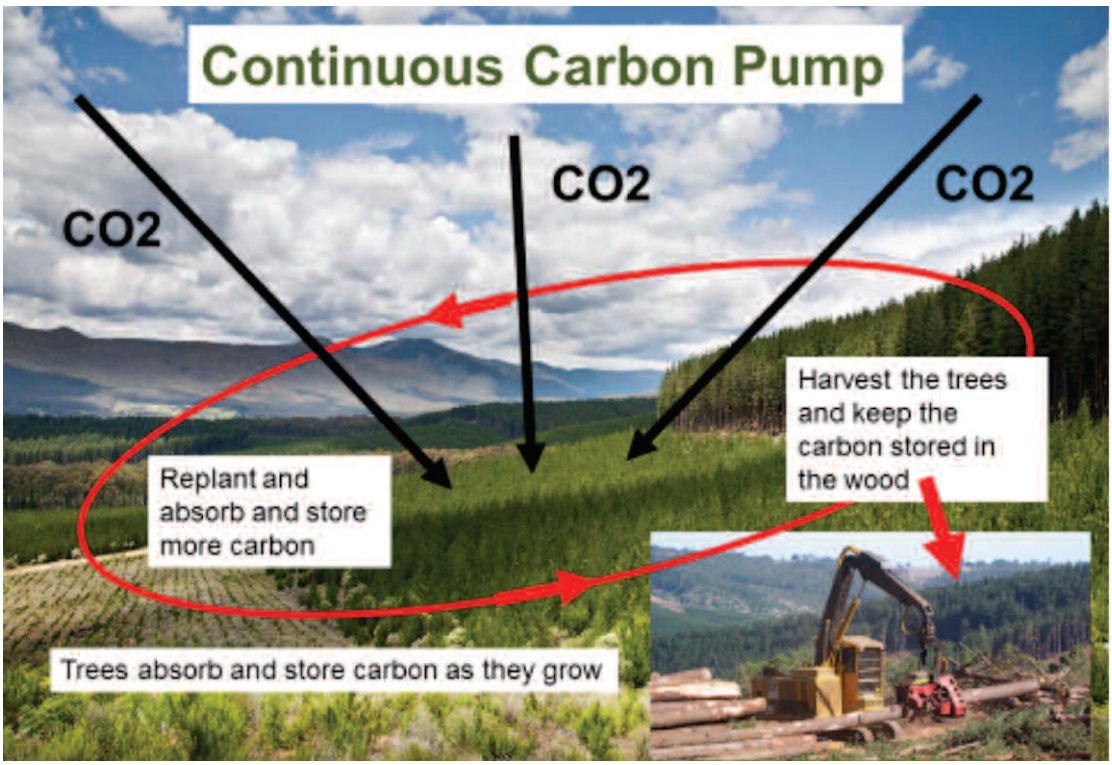
- So where does Forestry sit? In the spectrum of land uses Forestry sits between agriculture and conservation. There are a range of different types of forestry with increasing levels of environmental management ranging from: agroforestry, exotic (e.g. pine) plantations, native (e.g. blue gum) plantations to working forests (planted forests that look like native forests).

- A key part of Forestry is to protect and enhance Wilderness by continuous improvement in forestry practices so that more wood can be supplied from plantations rather than from native forests.

- Forestry is defined as the science and craft of sustainable forest management – originally to sustain forests to continue to provide timber and fuel. The oldest forestry school in Australia at Creswick near Ballarat was set up in 1910 in response to the unsustainable logging of the forests in the goldfields.

- Overtime Forestry is evolving into multiple use management of forests to supply timber, fuel, fibre as well as carbon absorption, biodiversity, water quality, recreation, social needs and employment. The continuous challenge is to balance the needs of the various stakeholders, as each forest and set of stakeholders is different.

2) Climate Change and Forestry



- At the Newham Landcare Annual General Meeting in 2016 climate scientist Professor David Karoly summarized the key mitigation measures that the world could undertake to reduce Climate Change. One of the four key measures was improving carbon sinks with reduced deforestation, improved forest management, planting new forests and bioenergy with carbon capture and storage. This was based on the advice of the Intergovernmental Panel on Climate Change (IPCC), which is an international grouping of scientists set up by the United Nations to advise Governments on Climate Change.

- A key point of the IPCC's recommendation was that in the long term sustainable forest management producing a sustained yield of timber, fibre or energy from the forest will generate the largest sustained mitigation benefit. Effectively sustainable forestry can be considered as a "Continuous Carbon Pump" in that as forests grow they absorb carbon; then when they are harvested carbon remains stored in the wood; and when replanted they continue to absorb more carbon – effectively an ongoing cycle removing carbon from the atmosphere.

- There is now political consensus on sustainable forest management (focused on plantations) to reduce Climate Change. Politicians from the Greens, Labour and Liberal are members of the Parliamentary Friends of Forestry and Forest Products.

Given the recommendations of the climate scientists on the importance of sustainable forest production to absorb and store carbon, there is a major global trend to the use of wood to replace concrete, steel, aluminium, plastics and to replace fossil fuels. In addition there are major efforts occurring in Australia to develop more plantations. This will be elaborated on in a future newsletter – stay tuned for stunning architecture with new ways of using wood, revised ideas about fire management, what could happen locally . . . .

Mistletoe in healthy Peppermint gum dominated woodland.

Mistletoe – friend or foe?

Mistletoes have many benefits, apart from their beautiful flowers: fruit, flowers, nectar and leaves are all highly nutritious and a wide range of wildlife depends on them – koalas, sugargliders, possums, birds and insects. It also provides shelter and produces incredibly nutrient-rich leaf litter.

More than two-thirds of all birds that nest in the foliage of Australian plants have been seen nesting in mistletoe. And why would a little bird want to build its nest anywhere else? It's evergreen and densely branched – all you have to do is add some twigs and you're done.

Research has been done on woodland bird populations and Mistletoe (Professor Watson et al., 2003 – 2008). Mistletoe was removed from some farms north of Albury and not from others, and woodland bird populations were compared. Within 3 years of removing Mistletoe (and doing nothing else) there was a 33% reduction in the number of woodland bird species.

Their bad rap is probably because Mistletoes are *semi-parasitic*. They do have chlorophyll in their leaves and can therefore manufacture their own food, but they need a host to provide water and support – they use the host as a root system.

Eucalypts have evolved strategies to minimise water loss in times of drought. The 'breathing holes' or stomates on the eucalypt leaf surface close up when under water stress to reduce moisture loss. The mistletoes parasitising the tree have no such water saving strategies, leaving their stomates wide open like a tap draining the tree's valuable moisture by evaporation. When trees have only minor mistletoe infestations they can probably cope with this water loss, but a heavily infested tree is under far more stress than its neighbours in times of severe drought and the mistletoe is likely to be the tipping point in causing its death. If a tree is heavily infested and you wish to reduce the stress on it, remove ***some*** of the Mistletoe by cutting the branch off behind the point of attachment – a costly exercise with a cherry picker, but worth it if the tree has particular significance.

Fire can be a great 'cleansing agent' for trees infested with mistletoes. Most eucalypts have developed strategies for regeneration after fire, especially from epicormic shoots that re-sprout from beneath the bark. A few years after a fire most eucalypts have re-gained their canopy of foliage. The mistletoes that infested them have no such fire resistance and are usually killed.

Mistletoe is usually kept in check by possums or birds. It does not often kill trees, because doing so causes its own death.

This species grows in a wide range of trees but can be difficult to spot, unless flowering, as they often mimic the foliage of their host tree.

The fruits are generally brightly coloured and the flesh is sweet and tasty. Each fruit has one large seed and is covered with a sticky coat. Birds enjoy the fruit but have to wipe the seed, either off their beaks or bottoms, onto a branch after feeding. The seed then rapidly germinates, sending a root into the host plant plumbing itself into the sap flow for life.

The Mistletoe bird (right), along with honey-eaters, spread this plant in Australia

Mistletoes deserve a rethink – they're valuable for biodiversity and beautiful as well.

The main reason some trees host a lot of mistletoe is because natural controlling factors are no longer operating (like caterpillars, possums and the occasional bushfire).

Rather than seeing mistletoe as a problem in and of itself, it's far better to consider it as an indicator of broader-scale ecosystem health and aim to improve the health of the system as a whole.

Pollination of plants

In December, Newham Primary school's years 4-6 had a Kitchen Garden Specialist lesson about pollination and reproduction of plants.

We found out that pollination could be through bats, bees, birds, flies, wind, and water and by itself.

A BIG surprise for us all was when we found out that there were female and male reproduction plant parts and that after the plant has been fertilised we often eat them!

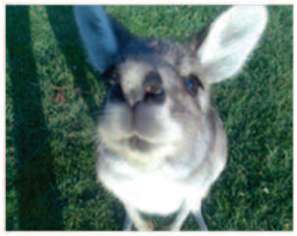
We dissected flowers, and looked at them under microscopes and identified the female and male parts of the flowers.

We finished our lesson with a game that Mr Harrison made, called Pollination Pandemonium. We had to act out how different plants were pollinated and raced the other teams to come up with the correct answers.

We would like to thank Carol Tillyer for helping and the Newham & District Landcare for funding our session.

By Max and Phoenix.

Brigitte's Wildlife Blog



Prickles the Echidna

It is autumn now, the soil has dried out and there is not much else to do for us treeplanters than to check worriedly our plantings and cart water to the most stressed ones. But it is also the time when we all seem to be a bit more aware of echidna daytime activity.

No – breeding season hasn't started yet – but somehow the echidnas seem to enjoy the cooler days and seem to do their stuff not only in the early mornings and late evenings but all day long. And yes – they also get injured by dogs, foxes and cars and have to come into human care.

Prickles the echidna got hit by a car and had his snozzle broken. When I picked him up from the vet clinic the vet explained to me that it depends on what angle and direction the break is to determine whether the echidna can survive. A "favourable" injury/break is basically the difference between life and euthanasia. Well – the x-rays showed that Prickles was very lucky. With proper care this break would heal eventually so he could poke his long snout again into the soil and lap up those yummy ants.

Ok. The echidna came home with me. De-fleed and de-ticked. Now what ???? How would I house him ??? For 6 weeks or so ??!! Escape-proof and yet big enough for a lengthy time without any sharp edges that would damage a delicate and slow healing echidna beak. I also knew that echidnas are notorious escape artists. Once they get even ONE-claw-only onto a rim of where-ever-they-are-in – YEAH – they do a Houdini and are gone.

When Karl and I built our house decades ago we stupidly had a rather fancy deep bathtub/spa installed. As we are on tank water in a fire prone area, I am rather stingy with water and that tub was never really used. It just now sits prettily in the corner of our bathroom – and of course was ideal for Prickles.

I lined the tub slip-proof with cardboard, newspaper and old rags and Prickles had a cardboard box to hide in. Clever me had cut it up so even if he climbed on top, the box would slowly collapse and Prickles the Houdini would not be able to reach the rim. His dietary requirements were well researched and we happily sat down knowing that Prickles would eventually heal and be released.

However we totally forgot that the tub he was in was right next to our bedroom …..

For the first week Prickles was a rather noisy patient. His breathing through his broken beak was this puffing sound mixed with the gurgling and popping of saliva bubbles. They do also normally huff and puff when they are out in the wild – but obviously his breathing was pretty hard for him and more laboured due to his injury.

And of course he was scared and bewildered and had no idea why he was is this whitish canyon with sheer slippery walls and could not get out. He woke us up quite often in this first week and Karl and I listened miserably to these heart-breaking sounds and the desperate attempts to dig through the layer of rags and bits of forest litter that lined the bottom of the tub. But eventually Prickles resigned to the fact that he was trapped and calmed down.

He just LOVED his echidna glug (a Healesville Sanctuary recipe) and licked every morsel out of the dish. And to our delight we found out that he slept on his side, his front paws tucked under his chin. It looked extremely adorable and quite often we tip-toed into the bathroom just to watch him sleep. We had absolutely no idea that echidnas sleep on their side.

And after 6 weeks in the bathtub the vet declared Prickles to be fit to go into the outside enclosure for 2 weeks or so. A few days before the Big Day Out I had prepared the enclosure with bits of old meat and drops of honey to attract ants. We needed to know if he still could poke his snozz into the ground to find food.

And did he what !!! He not only could poke – no, Prickles also actually FROLICKED. Yes the echidna ran up and down this enclosure, moved boulders and logs, rolled onto his side, moved the log again, moved the boulder again – it was pretty much a WOW experience for us to watch him play. And when Prickles was eventually released out of this enclosure the first thing he did was come briefly to the house as if to say 'thank you'.

NDLG Committee note: if you are interested in helping with conservation and tracking of echidnas there is a great app "EchidnaCSI" (Echidna Conservation Science Initiative) with the aim to gather as much data as possible on echidnas to aid in their conservation. If you see an echidna you can use the app to take a photo and record and send the information.

Threatened species in the Macedon Ranges –

we need to show State government departments that we are not a black hole!

Official records of threatened species in the Newham district are few and far between. We know they are here, but we need to confirm their presence and record the data in the State biodiversity atlas. Otherwise we risk being given a lower priority for funding than other areas that have been more diligent in their record-keeping.

We now have an opportunity to remedy this situation courtesy of the Upper Campaspe Landcare Network who obtained $46,485 funding from the State Government to undertake a citizen science project. This funding has been supplemented by Macedon Ranges Shire Council, to bring the total funding to $70,000.

Target species are the threatened Greater Glider, Powerful Owl and Brush-tailed Phascogale

Motion sensor cameras will be used to record the presence of native species (and pest animals). Already brush-tailed Phascogales have been confirmed at three sites on the property of one of our members and at Metcalfe there has been the unexpected finding of threatened Squirrel gliders. A series of spotlight walks will be undertaken to search for Greater Gliders, Powerful and Barking Owls, co-ordinated by Brad Blake, the project officer. This is a two-year project with several aims: to give landowners an opportunity to engage with their local environment, and to help measure the population health of these threatened species.

Your involvement in this project will help determine whether these species still exist in various locations and if so, how many still occur and whether the populations are secure.

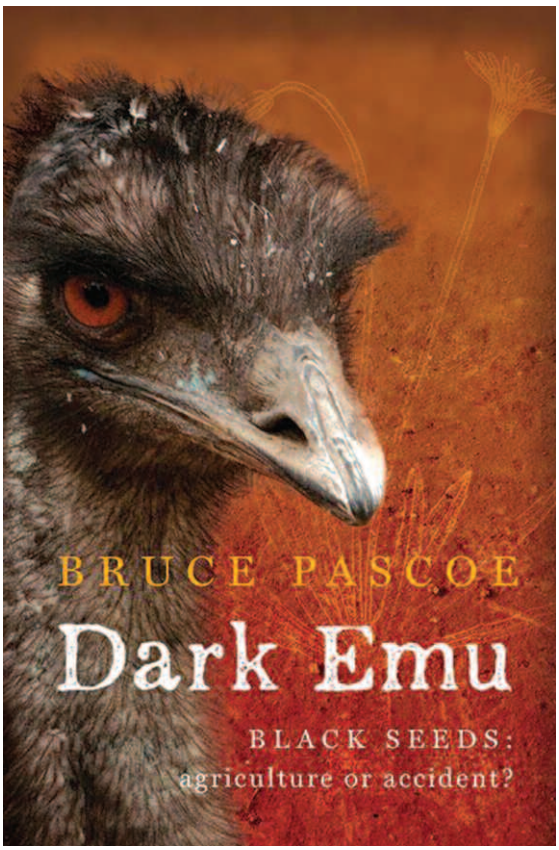
The Threatened Species Project Officer, Brad Blake, will work with private land owners and the Landcare group – contact him <brad@proconpest.com> if you think you might have any of these species on your property.

"It's extremely important that we continue to collect data on the threatened species of our region so that Government and the community can better manage our public and private land. This will ensure that species at risk of extinction survive and persist into the future for generations to come."

Brad Blake, Threatened Species Project Officer.

BOOK REVIEW

Dark emu, BLACK SEEDS: agriculture or accident?



Broome, Magabala Books, 2014

Bruce Pascoe.

175pp. ISBN: 9781922142436

Reviewed by Helen Scott.

This book dispels the myth perpetrated over the last 250 years that pre-colonial Aboriginal Australians were uncivilized, itinerant hunter-gatherers. Bruce Pascoe presents compelling evidence that they managed the land, "manipulating the landscape" to produce crops for harvesting, corral animals for hunting, and trap fish for capturing and spearing. They irrigated, they built wells and dams, they stored food for future use. They built dwellings and lived in village groups.

The evidence, with illustrations, is drawn from journals, diaries, and log books of the early European explorers (eg Charles Sturt and Thomas Mitchell) and settlers, all thoroughly referenced in the book. Since 1788 official historians generally ignored the references of the early European explorers and settlers as to the sophistication achieved by the indigenous people, which justified 'terra nullius' and thus the usurpation of indigenous lands. Pascoe also draws on the work of current historians (e.g. Bill Gammage, reviewed in NDLG newsletter no.43, 2015), anthropologists and archaeologists as well as his own research to argue that we reconsider our understanding of the way Aboriginal people lived.

Revise your image of bark humpies – Pascoe talks about explorers who saw Aboriginal buildings so big they could fit 30–40 people inside. He discusses houses so waterproof they could keep residents dry in a Top End wet season. One explorer wrote that he saw a 'humpy' that was twelve feet high. Aboriginal buildings around Australia were made of materials such as stone, grasses and wood from trees. They were sealed with clay. Pascoe cites the explorers coming across villages of houses with paths and communal areas in areas all over Australia. Major Mitchell came across grass "piled in hayricks… extending for miles".

"The book has eight chapters. In the first, 'Agriculture', he focuses on the yam and grain harvesting, irrigation, and the harvesting of emu and kangaroo. Chapter 2, 'Aquaculture' examines fishing operations, particularly in Brewarrina and Lake Condah, and watercraft on the rivers and seaboard. Chapter 3 is titled 'Population and Housing', where he argues that villages marked the movement towards agricultural reliance, most particularly where there were stone constructions. Chapter 4 'Storage and Preservation' explores the use of pottery and stockpiling , while Chapter 5 examines 'Fire' in the creation of grasslands. Chapter 6 is a divergence into 'The Heavens, Language and the Law' where he explores the theories that posit a qualitative shift in the 'intensification' of food production and technology about 4000–5000 years ago. Chapter. 7 'Australian agricultural revolution' is only four pages in length and suggests several Aboriginal crops that could be farmed commercially in the future. Examples are Kangaroo grass (Themeda triandra) and Yam daisy (Microseris lanceolata): the focus of two of our past Landcare events (one on grasslands this year, see next issue, and Dr Beth Gott back in 2013 – see issue no.36).

The final chapter 'Accepting History and Creating the Future' is a plea for an acceptance and re-visioning of Aboriginal agricultural and spiritual achievement, and allowing this to inform the future. (courtesy https://residentjudge.wordpress.com/2014/07/13/dark-emu-by-bruce-pascoe/).

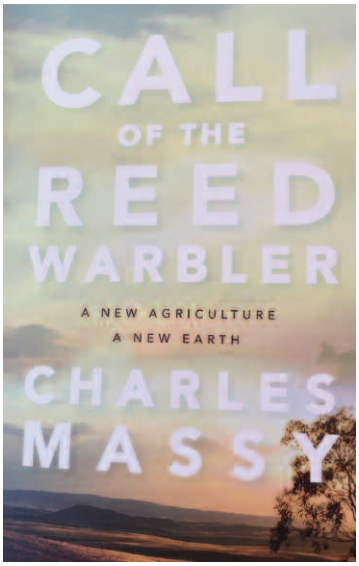
Bruce Pascoe is a Bunurong, Yuin and Tasmanian man born in the Melbourne suburb of Richmond. He is a

member of the Wathaurong Aboriginal Co-operative of southern Victoria and has been the director of the Australian Studies Project for the Commonwealth Schools Commission. Bruce has had a varied career as a teacher, farmer, fisherman, barman, fencing contractor, lecturer, Aboriginal language researcher, archaeological site worker, editor and writer of several books. Some of you may remember him talking in Kyneton during NAIDOC week in July last year.

This book won a 2016 NSW Premier's Literary Award for Book of the year, and at 156 pages of text is not a big read – I heartily recommend it.

CALL OF THE REED WARBLER

A new Agriculture a New Earth



Charles Massy

University of Queensland

Reviewed by Clare McKenna Aesop's Attic Bookshop Kyneton.

"Sun, soil, water, fire, carbon; this book addresses the future of life – plant, animal, and human." states Bill Gammage, author of 'The Biggest Estate on Earth'.

Charles Massy completed a Bachelor of Science in 1976 before farming for 35 years.

Concern about ongoing land degradation and the challenge of humanity's sustainability, he returned to study and completed a PhD in Human Ecology in 2009.

As I read through Charles Massy's book it was as if I was working my way through the collection of books that have accumulated around our house – Yeoman, Savory, Andrews, Pascoe to name just a few.

After a short walk through the history of this land and how it has been managed, there is a substantial section that addresses regeneration of five landscape functions: solar energy, the water cycle, the soil-mineral cycle, dynamic ecosystems and the human-social.

The final section of this book is titled 'Transforming Ourselves – Transforming Earth.'

Charles Massy's book is part biography part information storage house.

This book can be read in so many ways – it allows you to read a chapter here and there as you require particular information or to start and just keep on reading.

It is a rich source of information about Australia and its landscape.

Part 1: Into the Anthropocene
Chapter 1 Gondwanan Ark
Chapter 2 Emergence of the Mechanical Mind

Part 2: Regenerating the Five Landscape Functions
Chapter 3 An Indivisible Dynamic Whole

Regenerating the Solar Energy Function
Chapter 4 Upside Down World
Chapter 5 Out of Africia
Chapter 6 Make Mistakes but Don't Do Nothing

Regenerating the Water Cycle
Chapter 7 Water water everywhere
Chapter 8 Call of the Reed Warbler

Regenerating the Soil Mineral Cycle
Chapter 9 From Stardust to Stardust
Chapter 10 Farming without Farming
Chapter 11 Dancing under the Moon

Regenerating Dynamic Ecosystems
Chapter 12 Keep a Green Bough in your heart
Chapter 13 Blessed are the meek
Chapter 14 Listen to the Land

Landscape regeneration Role of Human – Social
Chapter 15 Mysterious dialogue
Chapter 16 Design with Nature
Chapter 17 Agri-Culture: sources of a Healthy Culture, society and Mother Earth

Part 3: Transforming Ourselves – Transforming Earth
Chapter 18 Big Picture Co-creating with Landscapes
Chapter 19 Transforming ourselves
Chapter 20 Healing Earth
Chapter 21 Healing Ourselves
Chapter 22 Towards an Emergent Future

Newham rainfall report

Nick Massie

2017 finished with a total rainfall of 712.2mm, which was slightly below the average of 756mm for the last eight years. Rainfall this calendar year to 28 February totals 85mm, only 8mm falling in February, and none up to 19 March. I note that February 2009 and 2016 recorded totals less than 8 mm while 2011 and 2012 recorded around 142mm.

The table below lists the monthly totals since 2008.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2008	25.5	12.5	30.5	18.0	35.0	103.0	53.5	50.5	14.0	6.0	60.5	84.0	493.0
2009	0	7.0	46.5	28.0	52.0	48.5	50.5	101.0	82.5	31.0	86.0	87.0	620.0
2010	23.5	56.0	85.0	47.5	25.0	93.0	85.0	162.5	63.0	163.9	178.4	92.0	1074.8
2011	243.4	142.4	21.6	65.6	64.5	58.3	82.2	50.2	102.6	66.6	77.4	96.2	1071.0
2012	47.6	141.8	77.6	30.6	43.8	115.0	104.4	90.4	42.6	21.4	21.0	25.2	761.4
2013	3.6	122.4	43.2	15.4	85.0	71.0	120.2	116.4	90.2	68.0	41.4	39.6	816.4
2014	18.2	11.2	43.6	70.2	50.6	105.6	33.8	15.6	49.8	34.8	14.6	21.0	469.0
2015	55.2	46.4	16.2	35.8	66.4	32.0	88.6	37.4	39.4	22.4	42.8	34.2	516.8
2016	37.6	5.2	38.8	41.4	106.6	105.6	170.0	92.2	186.0	97.4	54.2	94.6	1029.6
2017	27.0	21.0	28.2	173.2	35.6	7.0	59.6	110.0	55.0	47.0	78.0	70.6	712.2
2018	76.8	8.2											

The cumulative monthly totals are below.