Upper Shoalhaven & Upper Deua Landcare Network

SUMMER 2014 edition

The Landcare Perspective

The Quarterly Newsletter of the Upper Shoalhaven and Upper Deua Catchments

SUMMER 2014

Inside this issue:

CLIMATE CHANGE: AN IMPORTANT DISCUSSION

By Kristy Moyle

"It's time to face up to real and growing climate change risks and impacts, such as the growing severity and frequency of our bushfires", the Climate Institute said this month.

"Our national, state and individual interests depend on better preparation for growing climate change risks and impacts, which threaten personal health and safety as well as economic stability and our fragile environment," said The Climate Institute CEO John Connor.

The number of severe storms and cyclones is anticipated to increase.

"The evidence and analysis is clear: climate change is impacting Australia now and will only drive more risks, unless we engage in global efforts to avoid global warming of 2°C above the pre-industrial average."

"With just 2°C warming, south-east Australia can expect up to five times the number of days of very extreme fire danger by mid-century, according to work The Climate Institute facilitated through the CSIRO, Bureau of Meteorology, and Bushfire CRC. And that is just a taste of what is in store."

"Our thoughts are with the firefighters, emergency personnel and families at the front line

Looking towards the State Mine bushfire from the Blue Mountains in October, 2013.

today. But we treat them and countless others in future with reckless disregard if we don't face up to the reality and costs of climate change."

Since 2007, The Climate Institute has published research on the climate risks of bushfires, the human and economic consequences of them and other climate impacts, and the need for better planning for current and future warming.

We can no longer postpone discussion about the real and growing risks as well as the need for a credible plan for how Australia can help work with other countries to limit those risks," said Connor.

"In the last few years there has been a string of days of record breaking fire weather danger around Australia and yesterday around Sydney was yet another. Fires are not uncommon at

Continued on page 3...../

So long, farewell…

Hello Landcarers,

It feels odd to think that this will be my last editorial. Admittedly, it's probably the least-read section of the newsletter (a combination of clever positioning and frustratingly long and bumbling paragraphs on my part) but nonetheless, I hope that some of you read it, if only for me to convey to you the gratitude I feel, having worked with Landcare in this role for the last 3.5-odd years.

Through all the hustle and bustle of the CMA amalgamation process I received an offer for the position of 'Senior Strategic Land Services Officer'. I will be spending my time developing strategic plans to help our region adapt to extreme events in the face of a changing climate. As this is the area where my passion and skills really are, I took the job - although, it was a sad feeling, realising what I would be stepping away from.

I would just like to express my thanks and warm wishes to all the wonderful, down-to-earth (quite literally!) people that I have had the opportunity to meet. I have made some wonderful, lasting connections in this job and my life is all the richer for having discovered the vibrant, passionate and incredibly diverse community of Landcarers in this region.

I will still be working in the Braidwood office a fair bit of the time. I look forward to welcoming a new, fresh (as yet undetermined) person to the Local Land Services position in the new year. Stay in touch, I look forward to working with you on some really interesting new projects in the future.

All the best, Kristy Moyle (and Charlie Brown, the chocolate dog).

Don't give up! Keeping a Landcare group afloat

By Kristy Moyle

Considering that Landcare groups are full to the brim with hard-working, dedicated people, it is no surprise that these same good folk tend to feel anxious (maybe even a little guilty!) if their Landcare group hasn't been particularly active lately. I have had an enquiry or two this year from members of long-standing, successful groups who find themselves in this very situation. I would like to offer the following advice, based on my recent conversations with NSW Fair Trading.

Peaks and troughs are a part of the natural cycle of all things, volunteering included!

First of all, **Breathe easy!** Don't feel bad - NSW Fair Trading assured me that this is certainly not uncommon for volunteer groups across the state (regardless of what they do!). The reality is, all organisations go through periods of activity and inactivity. Peaks and troughs are a part of the natural cycle of all things, volunteering included!

Secondly, is your group incorporated? Incorporated Associations do have more legal responsibility than their non-registered counterparts. The upside of this is that you can apply for your own grant funding and enter into contracts with protection for individuals. The downside to this is, that with these abilities there are responsibilities. These include the following:

- Incorporated associations must have a minimum of five members at all times.
- Members of incorporated associations must conduct an annual general meeting (AGM) each year. This must take place within 6 months of the close of the association's finance year unless an extension is sought.
- Incorporated Associations need to submit their financial statements for the previous financial year to the annual general meeting. The nature of the financial statements submitted to the AGM must be in accordance with the category of association, either Tier 1 or Tier 2.
- An annual Summary of Financial Affairs must then be sent to the NSW Office of Fair Trading.
- Incorporated Associations must have a public officer at all times.
- The details of the current public officer for each association must be kept with NSW Office of Fair Trading.

If your group happens to be in a position where there are fewer than five members, if nobody wants to be part of the executive committee and AGMs and financial statements are getting the better of the group, there is always the option to 'Voluntarily Cancel'. To do this, the group must pass a special resolution that agrees to cancel, and any monies would be dispersed to another landcare group or USLC. As one very helpful woman from NSW Office of Fair Trading put it "It doesn't matter if a group has been inactive. As long as they have an AGM and fulfil the basic duties each year everything is fine." If you are thinking of cancelling the group, please call NSW Office of Fair Trading on (02) 6333 1400.If you would like some support, don't hesitate to get hold of Upper Shoalhaven Landcare Council. Call (02) 4842 2594 or email upper.shoalhaven@gmail.com

From front page…. this time but not at this scale."

Fire weather danger has already risen in many parts of the country since the 1970s, particularly in the southeast. The majority of New South Wales' most intense fires seasons in have happened since the 1990s.

The fire seasons in the continent's south-east are getting longer: the largest increase in the index of fire danger—the Forest Fire Danger Index (FFDI)—has occurred during spring and autumn.

"Reducing emissions is not a free lunch, but neither is climate change. Global action can limit climate change risks, Australia needs to do its fair share by limiting emissions to around a quarter of current levels by 2020."

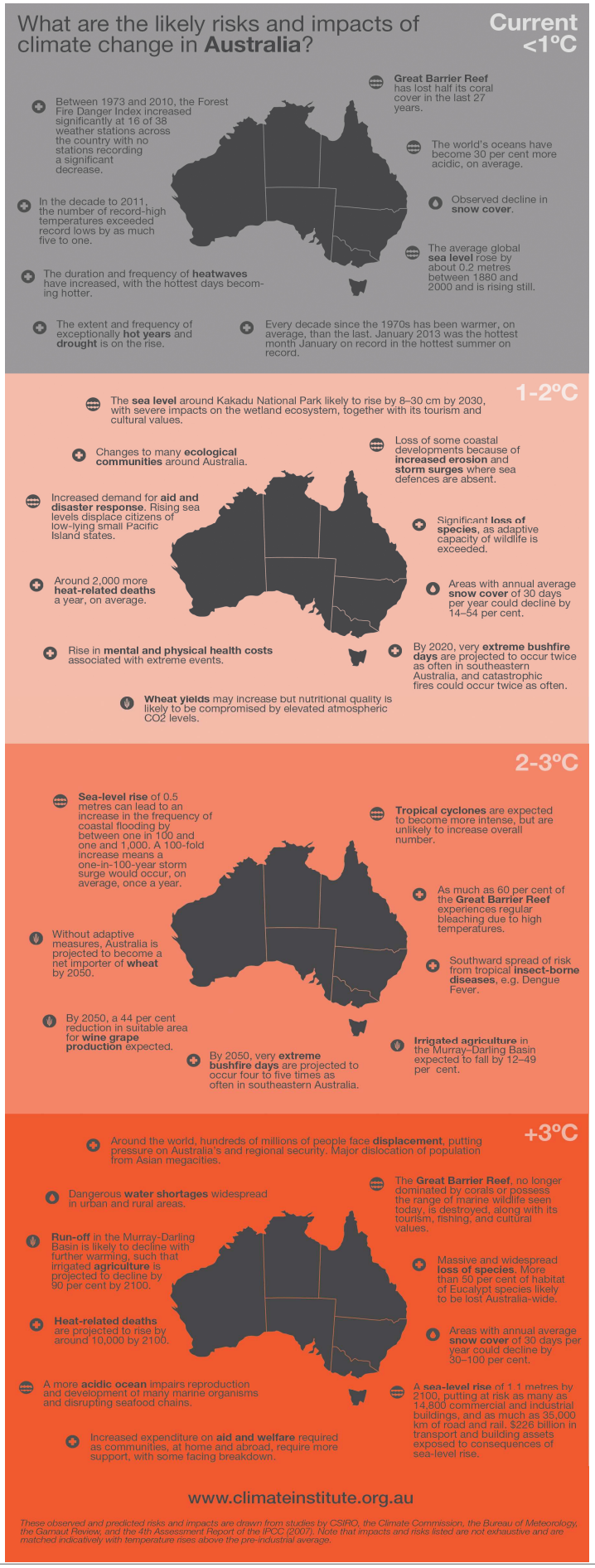
"We must also prepare for the climate change that is already on our door steps, instead of walking backwards into this century of climate change pretending nothing has changed."

"All relevant state and national agencies now need plans, approval processes and resources in readiness for a world that may see warming by as much as 4°C this century."

The Climate Institute recently released a media brief outlining expected climate impacts for Australia under various degrees of warming. It has also kept track of the Government's commitment to potentially up the target from 5 per cent to 25 per cent.

This image (right) shows expected impacts, relative to different changes in temperature. CSIRO predicts that temperatures will increase by an average of 1-1.5°C by 2030, which would result in twice as many extreme and catastrophic bushfire events occurring in the south east region. In addition to reducing our emissions, it is clear that we need to prepare for the changes, by improving our resilience as communities and finding ways to reverse the effects of this changing climate.

For more information from the Climate Change institute, visit their website: http://www.climateinstitute.org.au



UPPER SHOALHAVEN LANDCARE COUNCIL **AGM REPORT**

By Ben Gleeson, Secretary USLC

The USLC held its AGM on Thursday the 6th of February at which the new Committee was elected: Colin McLean (President.), Phil Shoemark (Vice-President.), Ben Gleeson (Secretary), Martin Royds (Treasurer) and Richard Stone (Ordinary member). Among numerous other highlights the meeting discussed and accepted the new constitution and heard from Felicity Sturgiss (regarding the ongoing Biodiversity for Carbon and Corridors project) and Peter Hazell (regarding the next stage of rehabilitation work in the Mulloon Creek catchment). President Colin McLean gave thanks to the executive and to Felicity for their efforts to date. He also reflected upon the recent loss of our Community Support Officer, Kristy Moyle, and expressed the committee's and the broader Landcare network's gratitude to her for her hard work and enthusiasm whilst in the role, wishing her well in her new position with Local Land Services.

It was noted during the meeting that the new USLC constitution will now formally recognise our existing membership arrangements (whereby all members of any other Landcare group in the Upper-Shoalhaven district is automatically an 'indirect' member of the USLC at no extra cost), whilst also allowing for individual landcarers throughout the district to become 'direct' members of the association on payment of a yearly membership of $5.

There was also some discussion of existing insurance arrangements to the effect that the USLC will continue to provide its blanket insurance for all groups in the Upper-Shoalhaven district, at no charge to the groups, but that the present pricing arrangements with our insurance broker will be renegotiated. It was stressed that any change to existing arrangements will not lessen the level of cover provided to the Landcare network through the USLC policy.

On the whole, an enjoyable and productive meeting for the USLC with many indications of exciting initiatives and activities to come. Among these is the new 'Farm Community Project' and our support for and involvement in the Braidwood Farmer's Market. Colin McLean expressed the committee's gratitude to all members in attendance at the AGM for their interest and engagement. The committee looks forward to continuing its work on behalf of all members to promote and support Landcare in the Upper-Shoalhaven in future.

WetlandCare Australia

Working with communities to protect, promote and restore wetlands since 1991

WetlandCare Australia is a not-for-profit company dedicated to achieving healthy wetlands in healthy catchments.

RSVP now for a Wetlands, Dams and Waterways Field Day on Friday the 7th of March.

Pete Hazell on geomorphology, erosion control techniques and natural ponds

Wetland Care Australia on integrating sustainable healthy wetlands and dams into your ordinary farm management. Bring your A3 property map along.

Landcare & Local Land Services staff will be on-site to talk about birds, grasses, frogs, wetland plants and wetland ecosystems & what to expect and how to apply for public funding that will assist with rehabilitating a wetland, dam or waterway on your property.

University of Canberra and DPI - Hydro-geological landscapes and wetlands in a changing climate

Where: Jembaicumbene Creek via Braidwood. Call Felicity on 0427 111 101 for more details.

'THE PATCH' JUNIOR LANDCARE

Australia's flies

By Sarah Jebara

Do you sometimes lay awake in bed and think of the weirdest things? Well, last night I wondered how many different types of flies there were and what I have learnt is that in Australia there are more than 6000 different species of flies. This includes blow flies, fruit flies, house flies and mosquitoes (which are apparently considered a form of fly). My first thought was, 'wow, how can there be so many different species of one insect?'. My second thought was, 'why would somebody want to find and sort out all these different types of flies?' It was this second thought that drove me to do a little more research on the subject (using Google). I discovered an animal health website which had detailed information on different species of flies (not all 6000, just some of the more common species).

Blow fly

House fly

With Spring already here and Summer just around the corner, our main priorities (gardening wise) would have to be our fruits and veggies. The fly that attacks our precious goods would have to be the fruit fly.

Fruit fly larvae (maggots) can cause your fruit and vegetables to turn into a soft, mushy mess.

DOT-TO-DOT! For young landcarers concerned about rising sea levels…

Sarah Jebara is a year-nine student at Braidwood Central School. Sarah did work experience with CMA / Landcare for a week during September.

http://www.grida.no/publications/other/geo2000/pacha/

Australia's flies

Adult female fruit flies lay eggs in the flesh of ripening and ripe fruits and vegetables. Once the eggs hatch, the larvae begin to feed within the fruit, causing it to ripen prematurely, rot and drop to the ground. This damage can make your fruit inedible.

Fruit fly larvae (maggots) inside of mandarin

How do fruit flies impact on the home gardener?

- Growing crops prone to fruit fly attack requires that you control the pest on an ongoing basis, costing you in terms of time, money and effort.
- Trying out different ways to control fruit flies can be frustrating and cause inconvenience, particularly if the result is not satisfactory.
- Suffering heavy losses to fruit fly damage can be very disappointing for you when it occurs.
- The presence of fruit flies in your area limits the range of crops that you can grow in your garden without using fruit fly control methods.
- Crop damage caused by fruit flies can limit the quantity and quality of fruit and vegetables that you would like to share with family and friends.

How do fruit flies impact on fruit production industries? They can:

- cause hundreds of millions of dollars a year in lost income and eradication costs and management to the fruit production industries.
- exclude fresh produce from valuable interstate and overseas markets, leading to fewer jobs and less income for affected regions.
- cause an increase in plant produce prices and even limit produce availability.

Oriental Latrine Fly

Aside from the information on some of the more common species of flies, the interwebz informs me that there are more effective methods for exterminating each species, depending on their habits and which sites they choose to breed.

I guess since we are always looking for more effective ways to kill these annoying pests, that would explain why so much research has been undertaken and why someone has recorded that there are 6000 species of flies (unless they're just a fly obsessed weirdo..). I guess my only real concern now is that since there are so many different species of flies and we're always looking for better ways to exterminate them, perhaps this might be seen as insect cruelty! People might create Fly Rights activist groups. The next step is that these groups might lobby the government, first to create an endangered species list of insects, and then try and get different species of flies added to the list. Then it is just small step until I am being arrested in my own home for swatting a fly! Okay, maybe this scenario is a long shot, but if the day comes when you get arrested for swatting a fly, don't tell me I didn't warn you!.

'Biodiversity for Carbon & Corridors' (B4CC) Program Update

To date, the B4CC program has been busily researching, writing, running events and working with a range of local agencies and stakeholders information sharing and developing suitable habitat assessment techniques and looking at the impacts of climate change on biodiversity in the upper Shoalhaven and upper Deua area.

In the second half on 2013, expressions of interest were sought from landholders wishing to undertake revegetation and/or restoration projects that would be primarily managed for habitat and carbon storage. As usual with these kinds of projects - the additional benefits are many and include increasing water quality for stock and other biodiversity (through riparian plantings and excluding stock from water) as well as creating shade and shelter for livestock through planting of patches of new vegetation. For this program, these patches are placed so as to be useful to local fauna, particularly small birds, as a 'stepping stones' across the landscape

Powerful Owl - *Ninox strenua.* Artwork: John Gould, 'The Birds of Australia', 1848

Invasive species and vertebrate pest management are a part of planning vegetation management in a corridor or 'connected' way leading us to also work with landholders managing foxes, blackberry and broom. 2 of our new fox traps are at work in Reidsdale - with a further two available for use at other project sites.

In this first stage EOI (expression of interest) process we have developed agreements with a number of landholders. We have been able to create a 27ha zone in Kain to be managed primarily for habitat and carbon storage, a series of patches and well sized windbreaks in Harolds Cross connecting two previously isolated areas, 2ha of riparian planting and weed management on the Shoalhaven river near Farringdon and a fox control program as part of vegetation restoration works in Reidsdale. A number of other EOI's for the re-establishment of vegetation patches are in development. A second round of funding for similar projects will be advertised in late March and in August.

Upcoming workshops

On Saturday the 22nd of February a habitat restoration workshop introducing small scale bush regeneration techniques, project planning and how to reintroduce habitat such as nest boxes will be held on flood creek in Braidwood.

Wetlands Care Australia will join Landcare in delivering a workshop for wetland management for conservation and production on March 7.

Future field days on revegetation techniques and fencing options, and further habitat restoration days are also in the pipeline. If you would like to express an interest in attending or hosting a field day or put in an expression of interest for revegetation or restoration works on your property please get in touch. The B4CC program will assess your proposal with an aim to contributing expertise and financial support. Fencing, tubestock and seeds, guards and watering expenses and project management are some of the support we are able to offer, should your proposal offer

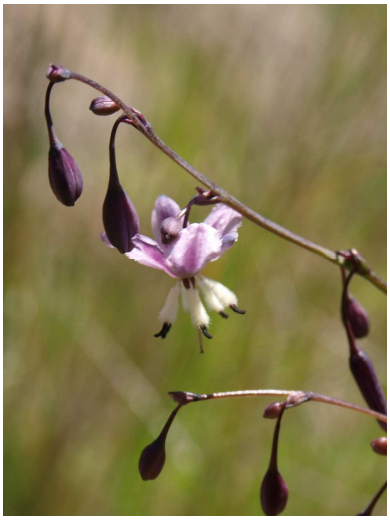
'Biodiversity for Carbon & Corridors' (B4CC) Program Update

good habitat and carbon management outcomes. Project proposals are assessed according to their size, distance from existing good habitat (within 100m) and distance from the existing NRS - the National Reserve System (within 15km). This includes state forests, national parks and flora reserves. The habitat value of any existing vegetation is also taken into consideration.

The monitoring we undertake on private property as a part of the project is a great benefit to landholders. Detailed vegetation assessments as well as the opportunity to undertake fauna assessments using remote cameras and expertise from visiting ecologists is a great part of being involved in the project.

This summer has seen a flourish of native flowers. Top right: Bulbine Lily (*Bulbine bulbosa*). Middle: Vanilla Lily, (*Arthropodium milleflorum*). Bottom right - Viola (*Viola betonicifolia*) Bottom and centre: Trigger Plant (*Stylidium grandiflorum*), Bottom left: Native geranium, (*Geranium solanderi*).

We've encountered a range of marsupial and rodent scats, evidence of water rats, observed a couple of large red-bellied black snakes and found threatened species habitat such as large hollows and glossy-black cockatoo feed trees (*Allocasuarina* stands) .



Nest boxes have just arrived by post at the Landcare office. Come along this Saturday to hear Rainer Rehwinkel and Sky Kidd discuss how to use them. 10.30am at Flood Creek in Braidwood. Call 48422594 for details.

The Corridor links and Carbon Sinks: Biodiversity for Carbon and Corridors project is supported through funding from the Australian Government's Clean Energy Future Biodiversity Fund.

Australian Government

B4CC Biodiversity in focus

Crayfish in Australia

Felicity Sturgiss & Rob McCormack

Crayfish are Arthropods. Yabbies are crayfish. Arthropods are 85% of all species on earth. To be considered part of the Arthropoda phylum you need to have an exoskeleton (preferably made of Chitin) a segmented body and jointed limbs (Knox et al, 1996).

Australia has one of the most diverse ranges of freshwater crayfish on the planet (McCormack 2014). Australian freshwater crays all belong to the Parastacidae family.

To Shoalhaven river people, yabbies are as familiar as eels and mussels, but there is a lot more than just *Cherax destructor…*

There are 10 different genus with 143 species (McCormack 2008) of crayfish in Australia. In NSW there are 5 different genera (genus) and 41 species. New species are still being discovered such a Gramastacus sp found along the central and mid-north coast. The genus *Euastacus* is the largest in NSW with 32 separate species. *Euastacus* (pronounced you-stay-shus) are often referred to as 'Spinies' as they are covered in spikes and spines.

The ten genus of crayfish in Australia are:

- TENUIBRANCHIURUS (1 species, NSW)
- GRAMASTACUS (1 species, NSW)
- EUASTACUS (52 species, NSW)
- ENGAEUS (35 species, NSW)
- CHERAX (28 species, NSW)
- ASTACOPSIS (3 species)
- SPINASTACOIDES (3 sp.)
- OMBRASTACOIDES (11)
- GEOCHARAX (2)
- ENGAEWA (5)

We inhabit the only continent on Earth that does not have 'crayfish plague', a fungus that has devastated populations elsewhere in the world. McCormack (2008) also reports that yabbies, or *Cherax destructor,* occur naturally west of the Great Divide, and are a more recent resident of eastern drainage units. Whilst investigating the possibility of spiny crayfish existing in the upper Shoalhaven, I discovered those who walk among us, yet spend their lives camped by mountain streams checking midnight traps for these and other kinds of lurking beauties. Rob McCormack from Australian Aquatic biological was just completing an aquatic biodiversity survey and baseline mapping freshwater crayfish and aquatic species of the upper Clyde river. He & scientists Hugh Jones

One of the catch at Currowan Creek 'in berry' (with eggs)

and David Crass invited me on a research trip to Currowan Creek to do some surveying. I had my swag, spotlights and sav blanc sorted in a second.

After hours-long discussions of sedimentology, riverine processes, nutrient pathways and 120 million years of bivalve genetic history it was time to check our carefully laid

Rob checking the traps in Currowan Creek

traps. Being the only one with a torch bright enough to illuminate the entire valley, I soon discovered some massive eels in the water stealing the bait from some equally incredible freshwater crays!

I asked Rob to send me a few words describing the Spinies and his work surveying in the Clyde. His response is below.

There are a number of freshwater crayfish species in south eastern NSW, the two most common species are the giant spiny crayfish *Euastacus spinifer* and the southern lobster *Euastacus yanga*. Both are very slow growing, taking 7-10 years to reach sexual maturity, but they are also very long lived so can live for another 20 or more years.

These species look similar when small but the position of spines on their body distinguishes them.
Euastacus spinifer grows to a huge size and can weight 1 kg, locally known as spinies or spinbacks they have an array of sharp, long spines along their abdomen.
Euastacus yanga is a smaller less spiny species that only grows to 150 grams in weight.

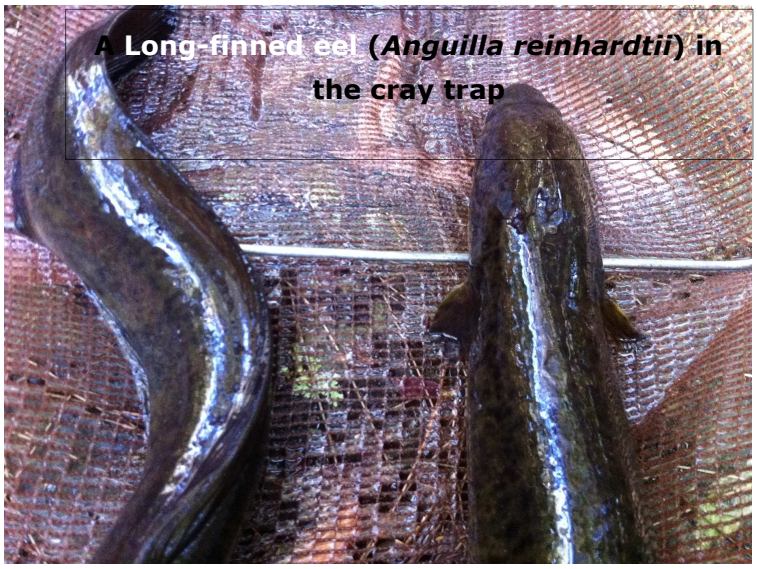
Adult female giant spiny *Euastacus spinifer* are the engines that drive the whole river system with the yearly bounty from the release of juveniles providing a critical food source for a mass of other species; macro-invertebrates, fish, eels, turtles, lizards, snakes, water rats, platypus and birds, to name just a few.

Freshwater crayfish are keystone species with a disproportionately large effect on the whole catchment relative to their abundance.

They play a critical role in maintaining the structure of the whole ecological community, their prosperity and abundance affecting many other organisms in the ecosystem and helping to determine the types and numbers of these other species in the catchment.

For every 10,000 juvenile crayfish released each year perhaps only one will survive the 7-10 years to become a new recruit into the adult breeding population. The other 9,999 have nourished all the other species within the ecosystem and without this major food source all these other catchment species suffer and reduce.

Adult giant spiny crayfish have thick unbreakable shells and armoured bodies that are invulnerable to predation. They are at the top of the food chain, which is why you can see them wandering the streams in the middle of the day. They would normally live for 20 or so years in the streams, releasing their young each year. Unfortunately, within the catchment *Euastacus* crayfish numbers are reducing and that can only have negative repercussions for all the other species in the permanent water sections of the catchment.


A Long-finned eel (*Anguilla reinhardtii*) in the cray trap

The threats facing freshwater crayfish are numerous; habitat alteration climate change, invasive plants and animals, and illegal fishing. Across NSW we have observed illegal fishing for freshwater crayfish as having occurred and this is the main threat to these river giants.

Whilst surveying we have had the pleasure of talking to many of the local landholders and members of the general public. As one conducting a crayfish survey I would chat to those I encountered about crayfish and what they knew of what's around and where to find them. Invariably I was told of how the river (The lower Clyde in this case) used to be full of "*Giant Spinyback Crayfish*" and how they used to go down and easily fill a couple of 20-litre buckets, but these days they are lucky to get one or two individuals.

Typically, stories of how many giant spinyback crayfish used to be around and how few and rare they are today was all the talk. Interestingly when I started telling people that the giant spinies are very slow growing and the large ones they used to catch were 20-30 years old and it's going to take that long to replace them. They had no idea.


E. spinifer with juveniles attached
©RB McCormack

NSW Fisheries regulations allow the capture of large spiny crayfish, a minimum recreational size limit of 90mm OCL is in place for any spiny (Euastacus) crayfish. All small crayfish do not attain the minimum size requirement and so are indirectly protected by the Fisheries ACT.

All small spinies are protected so you cannot catch them as pets for your aquarium.

The use of any sort of trap or net in eastern drainages is also prohibited under the NSW Fisheries Management Act.

Discarded illegal crab traps and nets were observed at many sites indicating that illegal trap fishing is occurring. These traps and nets not only pose a threat to the crayfish and fish species but rare and protected animals such a platypus and water rats also are easily entangled and killed in these illegal traps. The problem is that these traps are relatively cheap to purchase so many irresponsible illegal fishers put them out but are too lazy or useless to actually pull them back in. Many of these abandoned traps can "ghost fish" where they catch a fish or crayfish which eventually dies in the trap which then attracts another fish or crayfish to eat the dead critter.
These traps can ghost fish for years constantly killing heaps of our native species.

Euastacus Yanga female with eggs.

Rob with freshwater ecologist and bivalve enthusiast Hugh Jones recording survey data

Please protect our native crayfish and help them to survive and provide food for all our native animals. If you see illegal fishing occurring REPORT the activity to your local fisheries office or via the Fishers Watch Phone line on 1800 043 536. If you find abandoned nets or traps, please remove them and dispose of them." Rob McCormack

Rob has some great publications out, some of which are also references for this article.

References:

McCormack, R 2008. **The Freshwater Crayfish of NSW Australia**. Australian Aquatic Biological Pty Ltd Press.

Knox, Ladigies and Evans, 1996. **Biology**.

McCormack, R 2013. **A Guide to Australia's Spiny Freshwater Crayfish** Australian Aquatic Biological Pty Ltd Press.

Mulloon Watershed Community Rehydration Project

Ben Gleeson introducing a report by Peter Hazell

The Upper-Shoalhaven Landcare Council is pleased to have been invited to partner with The Mulloon Institute, South East Local Land Services and The Sydney Catchment Authority to provide community oversight on a proposed new restoration project in the Mulloon catchment. Research partners in the project will include the NSW Department of Primary Industries and The Australian National University.

Here, Project Coordinator, Pete Hazell, provides an outline of the proposed project for the benefit of Upper-Shoalhaven Landcare network members.

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Introduction

This community-based project aims to reconstruct and rejuvenate the main valley-floor, tributary valley-floors, and slopes of the Lower Mulloon watershed. It is based on the idea that landscape function, fertility and resilience is influenced by the relationship between hydrology and biological diversity. Restoring pre-existing watershed-scale hydro-ecological relationships is the most effective means of moderating potentially destructive solar energy fluxes and related climate extremes, i.e. floods or droughts (Kravcik *et al,* 2007). Harnessing hydro-ecological relationships will also lead to aggradation of the landscape, rather than continuing erosion and degradation.

Forecast benefits of the project include:

- Improved agricultural productivity.
- Improved water quality and availability (in-situ and downstream).
- Enhanced biological diversity and ecological resilience.
- Moderation of extreme events - such as droughts and floods.

Landscape history and management

Johnson & Brierley (2006) describe Lower Mulloon Creek floodplain pocket as a mostly discontinuous watercourse prior to European settlement – i.e. it once had no distinct stream channel. Instead it was comprised of a complex of wetlands, swampy meadows, grasslands, chains of ponds and floodplain terraces. Shortly after European settlement (c.1820s), incision of the Lower Mulloon floodplain began to occur. This process of erosive degradation was mirrored across much of southeast Australia (Eyles 1977).

From the late 20th century, State and Federal Government programs invested considerable resources in attempts to arrest the continued erosion of Mulloon Creek and its tributaries. The most visible of these attempts is the extensive willow revetment work that lines the banks of Lower Mulloon Creek. This previous work, however, failed to address one of the underlying issues, that of streambed lowering, consequently many of these revetments continue to be undermined.

More recently, (c. 2000–2007) several log and rock-sill structures have been placed within the channel along the length of the Creek in an attempt to arrest this process of streambed lowering. Several kilometres of Mulloon Creek have also been fenced to control livestock access.

Mulloon Watershed Community Rehydration Project

Mulloon Creek Natural Sequence Farming (NSF) Demonstration

In 2006, a demonstration of Peter Andrews' Natural Sequence Farming approach to landscape rehabilitation began at Mulloon Creek Natural Farms (Dobes et al. 2013). This demonstration extends upon the idea of arresting stream*bed* erosion and seeks to reconnect the eroded channel with its adjacent floodplain. This would allow flood pulses to dissipate across the floodplain, depositing silt and filtering floodwaters as a result (Norris and Andrews 2010). A greater volume of the flood pulse would be stored within in the floodplain and released slowly back into the stream as conditions dry out. This phenomenon is evident in nearby floodplain pockets that remain intact today (Healthy Rivers Commission of NSW 1999).

For the time-being regulatory issues preclude this project from demonstrating a fully reconnected stream-floodplain system. However, with the stabilization of the streambed and the slowing of flood pulses, substantial vegetation regeneration has occurred in and adjacent to the creek. Also, flows have been moderated to the extent that, as of February 2014, after record low January rainfall, the lower end of this floodplain continues to discharge surface flow while most of the rest of the Mulloon catchment has ceased to flow.

Peters Pond, March '06

Next steps

Given the broad community interest in Peter Andrews' methods and results, the next stage of the project is intended to include all interested landholders of Mulloon watershed, downstream of Mulloon Creek Natural Farms. With associated tributaries, this encompasses an area of close to 10,000ha. Taking the next stage of the original demonstration beyond the current single property site provides opportunities for wider community participation and to demonstrate the effects of the approach at a broader landscape scale. Existing regulatory issues are less likely to impede the nature of the works required to achieve the outcome of stream-floodplain reconnection within these downstream areas.

There will be a lead-time of about 12 months before any major on-ground interventions can occur. This will to allow time to:

- Engage all stakeholders
- Develop and organise required skills.
- Establish scientific benchmarks
- Plan specific on-ground works.
- Access financial resources.

Mulloon Watershed Community Rehydration Project

While the understandings that underpin this project show great promise, they also raise many biophysical, social and economic questions. We know that Lower Mulloon was once a discontinuous watershed system that, after nearly 200 years of modern agriculture, is now continuously channelised and continues to degrade. Given this, the biggest question to answer could be the Humpty-Dumpty question: can we put it back together again?

The biggest question to answer could be the Humpty-Dumpty question

Can we put it back together again?

Peters Pond, 2013

For further information about the project contact:

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Consultant Project Coordinator

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Mulloon Watershed Community Rehydration Project

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Habitat Rehabilitation

Tree hollow-dependent animals

By Sky Kidd writing for the USLC Biodiversity program

*The USLC's **Biodiversity for Carbon & Corridors'** program will be hosting a Habitat Rehabilitation workshop on February 22nd 2014. Part of the workshop will be looking at hollows, along with other important habitat features.*

There has been an increase in tree planting for increasing biodiversity in recent years, and a move away from traditional closely spaced and 50/50 euc/acacia mix. These workshops will assist landholders in increasing habitat diversity and also help some of our most threatened fauna species.

Hollows are an important part of Australian ecology. They are critical for many bird, mammal and reptile species for nesting and roosting habitat. Also fallen hollow logs in streams and ponds are equally as important to many aquatic species such as fish and crayfish.

Hollow size	Species utilisation	Years to form
Small (2-5 cm)	Brush-tailed phascogale, eastern pygmy possum, micro bats, small gliders antechinus large variety of birds frogs geckos, lizards and snakes	100 years
Medium (6-10 cm)	parrots some ducks kookaburra ringtail and brushtail possums	200 years
Large (>10cm+)	Large forest Owls Glossy black cockatoo Gang gang cockatoo Other cockatoos	200 years +

Table 1: Hollow size and potential species utilisation

It is established that the older the tree, and the larger the diameter at breast height (DBH), the greater the number and size of hollows. For many tree species hollow formation can take more than 200 years. Key factors for hollow formation include: physical damage, fire, fungi, invertebrates (eg termites and beetles) and time. The average age of a eucalypt is somewhat unknown, however there are papers suggesting that gum trees can live to around 400-450 years old.

Recruiting and retaining large old trees is important for the ongoing survival of hollow- dependent animals and birds. In south-east NSW, eucalypt forest and woodlands have been extensively cleared of large old trees, which has resulted in a decrease of hollow-dependent animals and bird populations; at least a quarter of all hollow dependent fauna are listed as threatened species.

Loss of hollow-bearing trees is listed as a key threatening process under the *Threatened Species Conservation Act 1997*.

Hollow sizes and species:

Species utilise hollows in different ways, and there is more to it than the size of the entrance. The hollow depth, aspect on the tree, its location on the trunk, its shape, the quality of the surrounding vegetation, whether the tree is alive or dead, proximity to food resources and the density of the forest all play a part in whether the hollow is suitable for a particular species. However an approximate guideline relating to hollow entrance size is listed on page 18, as this is the simplest method adopted for species surveys and judging potential habitat.

How to protect existing hollow bearing trees:

- Provide buffer planting around isolated trees (use hollow-bearing recruitment trees – see species for this area below).
- Avoid fertilising areas in the vicinity of trees.
- Avoid excess accumulation of nutrients close to retained trees by managing stock movements (such as fencing off patches around larger and older trees).
- Avoid herbicide drift near trees .
- Avoid burning around hollow bearing trees, including low-intensity burns.
- Provide suitable conditions for populations of insect-eating animals such as birds and bats.

The last point is an important one. Suitable conditions include proximity to water sources and foraging habitat. A list of foraging requirements for some threatened hollow-dependent fauna from the south east region on NSW is listed on pager 18.

How many hollows?

There need to be enough hollow-bearing trees per hectare to meet the requirements of existing wildlife, as well as sufficient maturing trees to provide replacement hollows in the future. As a general guide, 3—10 hollow bearing trees, with as many as 30 hollows, may be needed per hectare to support a rich mix of species. This figure will vary depending on the number of wildlife species, habitat type and so on. Note that many hollow

entrances are small and difficult to see from the ground.

Introduced species

The following introduced animal species are known to use hollows:

- European honeybee
- Mallard
- Common myna
- Common starling
- House sparrow
- Tree sparrow
- Cat
- Ferret
- Five-striped palm squirrel
- Grey squirrel
- Black rat
- Polynesian rat

These introduced species are a potential threat to native hollow-dependent fauna, either through direct competition or as predators.

You can assist by:

- Reporting all bee swarms to your nearest apiarist or local council. Many apiarists will come and collect the swarm.

- Noting any hollow use by the above species. If there are these species present, then you can assist the native fauna by supplying artificial hollows (known as nest boxes – see the table on page 14 for more information).

Table 2: Animals from South East NSW that are listed as Threatened under the Threatened Species Act and their known food and water requirements. The information compiled in this table comes from a variety of sources whose references can be found at the end of this article. While accurate at the time of writing It is not a fully comprehensive list.

Hollow-dependent species under threat of becoming endangered	Foraging requirements	Proximity to water
Brown Treecreeper	Insectivorous – forages on tree trucks, leaf litter and fallen logs for ants, beetles and larvae.	?
Eastern False Pipistrelle	Insectivorous - hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	Proximity to water can increase insect activity. Water metabolised through food, however wildlife rescue organisations report bats drinking regular amounts of water in captivity.
Eastern Freetail Bat	Insectivorous - bugs, ants and beetles.	Proximity to water can increase insect activity. Water metabolised through food, however wildlife rescue organisations report bats drinking regular amounts of water in captivity.
Eastern Pygmy Possum	Nectar and pollen from eucalypts, banksias, and bottlebrushes, supplemented by insects and fruit.	Low mobility, may derive water requirements from nectar Intake, dew drop etc.
Gang Gang Cockatoo	Green acacia pods.	High mobility. Will drink on edge of open water bodies
Glossy Black Cockatoo	Allocasuarina or casuarina pods	High mobility. Will drink on edge of open water bodies.
Masked Owl	The typical diet consists of tree-dwelling and ground mammals, especially rats. Also rabbits and bandicoots. Other prey animals include possums, reptiles, birds and insects.	High mobility – and water metabolised through food.
Powerful Owl	The Powerful Owl is a carnivore, eating mainly medium to large tree-dwelling mammals, particularly the Common Ringtail Possum and the Greater Glider. It will also take roosting birds and sometimes small ground-dwelling mammals such as rabbits or small marsupials.	Water metabolised through food.

Threatened hollow-dependent species	Foraging requirements	Proximity to water
Sooty Owl	Feeds on small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum or Sugar Glider.	Water metabolised through food
Spotted-tailed Quoll	Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl.	Surveys suggest that quoll populations are more likely to survive closer to permanent water
White-footed Dunnart	Opportunistic carnivore that feeds on a variety of ground-dwelling invertebrates and, occasionally, small lizards.	Water metabolised through food
Yellow-bellied Glider	Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Sap trees include: Messmate (*E. obliqua*) Forest Red Gum (*E. tereticornis*) Occasional *Acacia* species	Water metabolised through food, however can also drink water collected in depressions on trees
Yellow-bellied Sheathtail Bat	Feed on flying insects, including beetles.	Water metabolised through food, however wildlife rescue organisations report bats drinking regular amounts of water in captivity

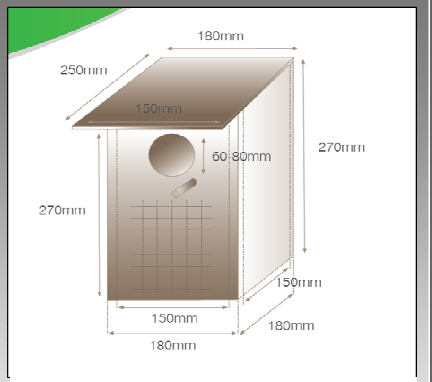
Recruiting and revegetation of hollow-bearing tree species

Hollow-bearing tree species known for earlier hollow development from the south-east region include (Gibbons and Lindenmayer 1997):

- Ribbon gum, manna gum *(Eucalyptus viminalis)*
- Mountain grey gum (*Eucalyptus cypellocarpa*)
- Yellow box (*Eucalyptus melliodora*).

Nest boxes

Nest boxes (or artificial hollows) have been installed extensively in many parts of the world to assist in species recovery in areas where natural hollows have been depleted. Although they should not be viewed as a saviour, they have contributed a lot to research and management of hollow-dependent fauna.



Above: This is the design for an Australian Owlet Nightjar – the full specifications for this and other species can be found here: http://www.birdsinbackyards.net/Nest-Box-Plans

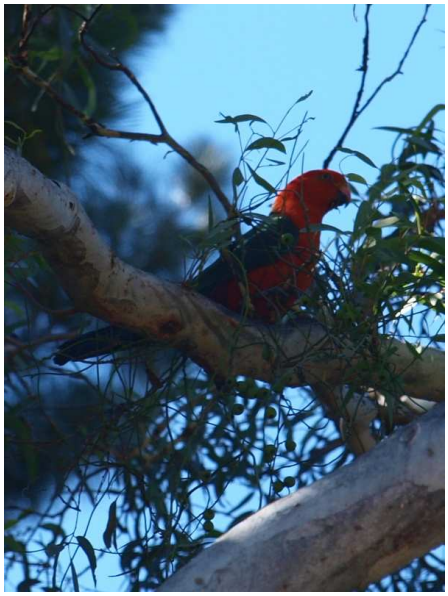
Nest boxes can be constructed to certain specifications depending on the intended occupants and have the advantage of enhanced safety from nest predators compared to many natural hollows. Generally the entrance hole should be no bigger than the size of the intended occupant. Studies suggest that the depth of the box is critical to determining the occupier.

Many designs have been published in Australia for particular species and are available at an affordable price. Importantly, if you intend to install nest boxes, ensure that the height is favourable for your intended species and wire the nest box to the tree. Use wire covered in old hose/pipe to protect the tree rather than screw or fix the box to the tree. The damage to the tree in the long-term is not worth the installation of a nest box.

Boxes can be made from timber or exterior-grade plywood (2mm to 19mm is ideal). To waterproof the box, screw the ends together and paint the exterior. Do not paint inside the box. Sawn timber boxes such as these should be well ventilated and have good drainage (a small gap under the roof and a few small holes in the floor). Avoid using treated timber, toxic paints, chipboard or smelly glues and make sure there are no sharp edges or protruding nails.

Monitoring – what can you do?

- Assess how many hollow-bearing trees you have on your property and estimate the size of the hollows. This can provide you with a list of potential species that may be utilising the hollows.
- Stag watching – stags are old trees. You can observe fauna entering or emerging from hollows by using



the following method. It requires observers to scan the crowns of trees in a stationary position for 20 mins prior to and 40 minutes after dusk. Animals are identified by their outline/behaviour and call (often binoculars are used). *Call playback and spotlighting techniques are not used.*

Should a large hollow bearing tree fall down you can:

- "count the rings" on the tree, then this will start to give you an idea of the age when hollows are existing on tree species in your area.

You can also examine the hollows on felled trees and look for signs such as:

- interior of hollow for nesting material, feathers, hair or scats. A chainsaw can be used to access the chamber of the hollow (ensuring it is unoccupied).
- examine entrance for obvious wear, or chewings.

How to count the rings of a tree:

- Collect a circle of wood from a tree that has been cut down or locate a stump of a tree that is not rotted.
- Examine the wood for a circular pattern of light and dark rings. Each ring represents a layer of wood growth. The light rings represent spring growth and the dark rings represent summer growth. A tree acquires one light and one dark ring annually.
- Count only the dark rings. Start from the middle and move outward toward one side. The number of dark rings equals the number of years the tree has been alive. Do not count the pith at the centre or the bark on the outside of the tree.

I have done this regularly over the last few years. The youngest tree I have encountered with hollows (up to 10cm) was a Spotted Gum (*E. maculata*) down at Batemans Bay that was approximately 150 years of age. Spotted gums with larger hollows were over 200 years old. Up on the tablelands I recently counted rings of several brittle gums (*E. mannifera* that had fallen down in a storm and was later chopped for firewood.) They were all over 100 years of age and had no signs of hollow-development. Bearing in mind that this is a very rough approximation!

The art of aging trees, or **Dendrochronology** is a scientific discipline that requires multiple tree samples to build a history and then cross-reference with other samples from different trees. There are many anomalies (or 'false rings" and other features) that can be mistaken for growth rings.

Wikipedia reports chronologies dating back more than 11,000 years from river oak trees in South Germany. The use of dendrochronology is often used to determine fire dates and other climatic events, archaeology (such as determining dates of painting by aging the timber frames or building timbers etc) and to calibrate radiocarbon ages.

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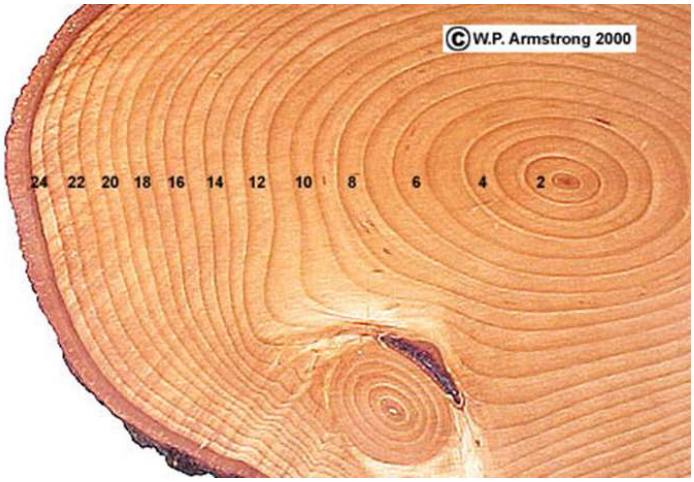


Difference between…..

Serrated Tussock & River Tussock

Sky Kidd writing for USLC's biodiversity program

There are approximately 17 species of native Poa and 6 species introduced species of Poa in the Southern Tablelands region.

River Tussock (Poa labillardieri) and Poa Tussock (Poa sieberiana) are commonly misidentified as Serrated Tussock (*Nassella trichotoma*), and often poisoned regardless, as they are seen as having little agricultural value.

However, River Tussock does have biodiversity value which is important for habitat, and also plays an important role in a native pasture grazing system.

River and Poa Tussocks create instant structure. River Tussock is large, and of varying heights and shapes. It provides a niche habitat under its canopy and I have often observed *Microleana, Austrostipa, Geranium, Glycine* and other species of forbs and grasses growing adjacent and up into tussock grasses. In times of lower rainfall, a poa tussock act as a "safehouse" for these species and can harbour a surprising amount of palatable pasture plants.

As it is often in cold air drainage and lower parts of the landscape, small droplets of dew accumulate on the tussock plant which provide moisture as well as shade for fungi and invertebrates such as earthworms. This leads to greater insect activity which is critical for pollination, and also supports insectivorous (insect eating) birds. The grains produced by River and Poa tussocks also provide foraging habitat for birds such as the Red –rumped parrot.

The DIFFERENCES

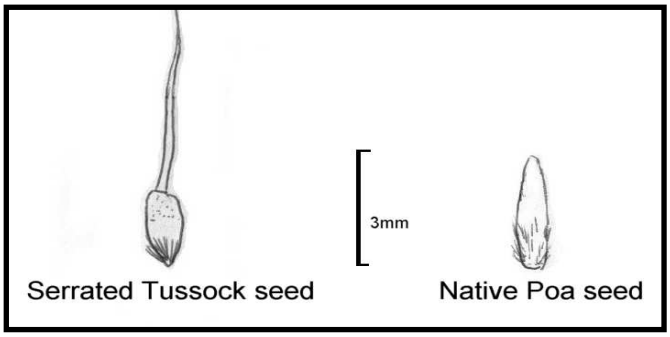
The leaves: Serrated tussock have cylindrical leaves, Poa has flat or inrolled leaves. Pick a leaf blade and if it is folded, like a "v" or a "u" or flattened, then it is likely to be Poa. However as Paul Alessi wrote in "Wild Windellama" in September 2005 about the subject, make sure you are looking at the leaf blade, not the flower stalk, as they are cylindrical in both species.

The inflorescence: The flower head of serrated tussock has a pyramidal shape open panicle, the seed turning purplish with age. It tends to "lie down" and look rather "sweeping". The inflorescence of Poa is upright and erect, very green (or occasional purplish tinge in Poa tussock), much more dense and is made up of a series of spikelets.

Above: Serrated tussock (Linda Ayres)

Left: River tussock (J Miles/M Campbell).

The seed: Serrated tussock has a long awn as shown in the diagram below:



From "Wild Windellama, by Paul Alessi, September 2005: Serrated Tussock (Nassella trichotoma)

The "look" of the plant

There are no hard and fast rules, especially when they are both very young plants they are difficult to tell apart. When they are not flowering, serrated tussock looks more upright, has a subtle "lime green" flush and has finer leaves. Its roots are wiry, dense and if you dig up one plant, it can be split up into hundreds. it's like a dense cluster of individual plants that have their own separate root systems, all growing together to make one larger plant. Serrated tussock can grow in a large variety of habitats and is a dense coloniser of bare or disturbed ground. River tussock is a larger tussock that usually grows in cold air drainage areas

PLANT IDENTIFICATION

If you would like any assistance with identifying tussock grasses or other plants then take an adequate sample of the plant (include part of the roots if possible, leaves and flowers), and seal in a paper bag and write down where you found it, the date and your name and number and drop it in to the Braidwood Local Land Services office (formerly the Braidwood Southern Rivers CMA Office). .

Above: Serrated tussock in full flower.
(Photo: Birgitte Verbeek)

Above: Fresh Serrated Tussock spikelets: (Sky Kidd).

Above: Poa spikelet (J Miles/M Campbell)

Pest and weed control cost Aussie farmers $2.38 billion

According to the 2013 National Landcare Survey, the average Australian farmer has spent about $20,000 on pest and weed control in the past year. Combined, this equates to $2.38 billion nationally.
National Landcare Facilitator Brett de Hayr said, "The sheer scale of this expenditure demonstrates the impact that weeds and pests can have on farm profitability as well as the role farmers have in protecting Australia's natural environment".

This year's survey focused on the key issues farmers raised in last year's survey, including the impact of pests and weeds. It is clear that weed and pest control continues to be a priority for Australian farmers, not only due to the costs of prevention and control, but also in the context of lost production.

The 2013 survey found that 89 per cent of farmers actively manage weeds and 74 per cent work to control pests. With over 70 per cent of farmers being part of an agriculture-related group, it was also clear that a significant number of farmers are working together through Landcare and other groups to tackle landscape scale issues like weeds and pests.

"Without this effort by Australian farmers and the support of Landcare groups as well as Commonwealth, State and Territory government investments, we'd see a very different agricultural landscape" Mr de Hayr said.

It is important to recognise that regulation is not the main driver of action in this area. In fact, only one per cent of farmers stated that regulatory controls were their main reason for controlling pests and weeds. The overwhelming majority of farmers said that the economic impact of weeds and pests on their farms was the number one factor for their enormous efforts.

A summary of the results for the pest and weeds component of the 2013 National Landcare Survey can be found at www.landcarefacilitator.com.au.
For more information, please contact:
Brett de Hayr, Reg. Landcare Facilitator:
Brettdehayr@landcarefacilitator.com or mobile: 0457 750 815

REGIONAL LANDCARE FACILITATOR

Peter Pigott is our Regional Landcare Facilitator (RLF) for the South East Local Land Services region in NSW, hosted by South East Local Land Services. I asked Peter to send me a few words about himself.

I have a keen interest in community engagement, partnerships, behavioural change and land management practices that contribute to the resilience of landscapes and communities. I have been working as a regional facilitator for over seven years in the Southern Rivers CMA region: supporting networks, groups and individuals focussed on natural resource management and sustainable agriculture.

Before working with Landcare I was in Cambodia implementing livelihoods development and sustainable agriculture programs in rural communities. I feel privileged to work with communities in South East NSW and am keen to support groups and networks in whatever way I can to achieve their Landcare goals.

You can contact Peter at:

Peter Pigott

Regional Landcare Facilitator

South East Local Land Services

5 O'keefe Ave (PO Box 309) | Nowra | NSW 2541 |

(02 4429 4449 | Fax: 02 4429 4458 | Mobile: 0429 928 038 |

Email: peter.pigott@lls.nsw.gov.au

Web: http://southeast.lls.nsw.gov.au/

Facebook: South East Regional Landcare Facilitator

In 2014, with the establishment of Local Land Services, this position now covers nearly double the area to take in the whole South East LLS region. The main role of the RLF is to support the partnership with Landcare: at national, state regional and district scales, including working with the existing district Landcare networks in the South East region. I will be working closely with other landholder and community support staff in SE LLS and with partners to achieve this.

WORK EXPERIENCE!!! By Sarah Jebara

Hey guys! I'm Sarah Jebara and I'm in year nine at Braidwood Central School. I'm currently doing my first work experience with Kristy Moyle (my totally awesome boss for the week) at the CMA.

So far it has been really great! Especially since now I can turn around to my parents and be like, "Farmers and Landcarers, are cool people who force feed you lunch!".

As of the last four days we have done jobs such as helping Martin Royds to weigh, sort and measure his cattle which was cool - the cattle were a bit feisty (and Kristy was scared) but I was fine.

We have also been photo-monitoring - we hammered stakes

Weighing cattle with Martin Royds

into the ground (which I failed miserably but Kristy came to the rescue) and spray-painted them to let us know where we had done our 'photo monitoring'. Next time somebody does photo-monitoring they'll be able to see the progress and difference in the landscape since the last time they had been there.

We've also been catching mice in the back shed in friendly cages because we are fabulous eco warriors and don't hurt animals. It seems

Matt, getting Kristy out of the bog

as though every time we go in there one or two mockingly scurry right past our feet, but never fear! We did catch one!

It was an antechinus mouse (I nickname it the 'anti-kindness mouse'). It crawled up my leg and decided to snuggle into my shirt, cause you know everyone wants to be my best friend and all, and it decided to give Kristy a "kiss" (aka vicious bite) goodbye.

Apart from all the awesomeness there were a few troubles, like;

-dropping coffee cups

-Being unable to take photos under a tree for fear that gale-force winds would make the tree topple over and squish us.

-Getting bogged two-feet deep in a river channel we thought was just ordinary field grass

-depositing money in the bank without adult supervision.

Getting nervous at the bank

On Wednesday I went with Kristy to an interview at the Batemans Bay CMA office. Kristy was wearing super fancy clothes to the interview. On the way there we listened to a podcast in which these two guys talked about bees. I learnt that bees can make stuff called 'bee bread' (which is adorable!) and that male bees actually get a pretty raw deal. Once we reached the building we had to go up this massive driveway but we made it there alive.

While Kristy was in her interview, I got to have the question sheet that Kristy had in the interview prep room. I wrote down my own answers, and, although I didn't really understand what half of them meant I gave it my best shot. Kristy thought that they were really good and has asked me to include them here:

SARAH'S RESPONSES

1. Describe a situation in which you have successfully managed a project:

An example of this would have to be when I was working on my most recent HSIE project. I made a poster which gave you information of the longitude and latitude, the measurements of and the geographical description of the soil and types of rocks within the specific city/area in Australia.

The key steps in this process were working out what I needed for the project, how I was going to lay out my information and where I would get my informa-

tion from. My greatest strength as a project manager would be the fact that I myself am a fairly organised person, (although in my everyday life I can be quite a slob) so basically I'm only organised when it comes to working (which is the main involvement of a project manager).

2. Describe a situation where you worked as a team that delivered an outcome:

In Landcare a few years ago my classmates / schoolmates and I were proceeding to build a small hideaway / ground cubby out of numerous sticks and leaves. Although we never actually got around to finishing it we did have the element of success in our ability to communicate and build half of the cubby.

3. Describe how you maintain good relationships with stakeholders. How do some organisations make mistakes, trying to do this?

The way I approach maintaining good relationships with peers / stakeholders is that I pretend I am listening (even though I'm sometimes not) and I nod and laugh whenever needed. I respect other people's opinions, goals and beliefs because they don't have anything to do with me. I care, but what matters to me is my thoughts and actions.

Some organisations make the mistake of placing people in facilities or work spaces that they are uncomfortable with, or where they may be frustrated because they aren't able to use their full ability - e.g. putting someone who just worked at McDonalds in the mechanics section of a car wrecking yard: they might feel more comfortable working at the till / checkout. In future they could try and understand the needs and actions of the person in order to place them in the correct situation.

Hitting stakes in for photomonitoring.

4. What steps would you take to ensure the completion of a successful project:

I would ensure everyone likes the position or job they are doing. For the project, I would help manage a time frame and be sure that each person gets the money (if any is involved) they are suited to receive from the amount of work they do. I just overall would be very supportive of everyone's ideas taking into account what everyone is saying or doing in order to keep the peace so that our project would be awesome.

5. **Provide an example of where you have used your project management skills:**

An example of this is when I was building a box for wood technology. It only required one person (me: the project manager) and the skills I brought into it were my organisation of the products I would need, finishing it within a designated timeframe and using my mathematical and woodwork abilities to see the successful delivery of the project. I managed my time by making a mental list of all the things I had to do and when I had to do them. The box didn't turn out that well but I feel that I managed the project well.

There were also flying fox bats outside the office and they all started itching themselves at one point in time which was creepy, like itching ritual much?

So that leaves me with today in which I am writing this to you readers, I don't know if you really want to hear about my work experience but I don't care because didn't your mum ever tell you, you have to ***heed to the child's need.*** *snaps fingers and struts away*

So considering there is nothing else to tell you I will give an overall summary of what I think about work experience at the CMA. I think that it has a bunch of lovely people who are funny and wonderful to be around, it gives you a fair variety of what goes on (outside activities and inside activities). I especially liked the outside activities, personally because I don't like being inside all day, but I did quite enjoy some of the inside activities such as writing articles, doing some research, eating lunch and surprisingly I really, really liked writing cheques.

Continued overleaf.../

Continued from page 27/..

I'm astonished at how much we have actually done in the last few days and how enjoyable it actually is, although I think that Kristy is doing all the boring work to make my work experience more fun. But eh, anyways it was super fun and awesome, lovely people, and I had heaps of fun doing everything!!

Note from Kristy:

It has been fantastic having Sarah for work experience! Although the office is in a state of flux at present, Sarah was able to experience some of the things that I do each day. She also accompanied me to a job interview and had a go at answering questions from her own perspective!

It's great to work with a young, enthusiastic person like Sarah; she has been a dedicated member of 'Landcare for Sport' since it began, and she has done exceptionally good work whilst here. I'd recommend her to anybody!!!

PS: I was not scared of the cows.

Upper Shoalhaven Landcare Council

Pushing the think button

Ecological insights into Agriculture

By Ben Gleeson, B.LandMgt.(EcoAg), B.Sci.(Hons) Dip.Vit.

No. 1: How much water does it take to grow 1kg of beef?

Shock-Horror! According to the Riverina Environmental Education Centre* (a facility of the Dept of Education and Training) it takes between 50,000 and 100,000 litres of water to produce a single kg of beef. I've seen similar statements elsewhere on the web emanating from various organisations in various countries. They're often used to show how wasteful a meat-based diet can be; the reasoning is that all that water could be saved for other things if only we didn't eat that 1kg of beef. It seems like a staggering amount of water and it is. Given its confronting size, surely it's been checked and double-checked by all sorts of intelligent people? I'm thinking of smart people with degrees in something…some kind of science perhaps?

Well, maybe it has, but one thing's for sure; no scientist with an inkling of ecological insight has ever produced such an outlandishly ridiculous figure. Why do I say this? Because ecological perspectives provide a canny capacity to ask that most fundamental question: '...and then what?' A very useful and enjoyable mental ability to 'join the dots'; to follow the flows of material and energy wherever they may lead and consider the connections between things, and between processes, in our landscapes. If you're a decent farmer you probably have this ability yourself, so let's work this one through together….

Where does this 50-100,000L figure come from? To start with, it includes all of the water an average steer drinks in its lifetime. Added to this is all of the water that it takes to produce the food that it eats to live and grow.

Now, as you probably already know, 1mm of rainfall equals 1L of rain over 1m², so 50,000L is the equivalent of 1mm of rainfall over a paddock of 5ha. This doesn't seem like such a lot of water all of a sudden, does it? Given that Braidwood's mean annual rainfall is supposedly 719mm**, this would work out to be about 35,950,000L per annum across that same 5ha.

That cuts it down to size a bit, but the real reason that the 50-100,000L figure is so unutterably ridiculous is that all that water

doesn't just disappear into our steer and stay there. Our scientist may be surprised to discover that a 350kg steer does not weigh 17,500 tonnes (the equivalent of 50,000L of water per kg). The water that falls as rainfall onto our pastures (when it does rain) comes from the atmosphere and, after it's transpired by actively-growing grass, it returns to the atmosphere to fall on our beautiful Upper-Shoalhaven district once more (preferably). The steer may eat the resultant grass but there is no way it actually consumes the water it took to grow it! That rainfall goes from soil to grass to atmosphere again. A similar thing happens to the water the steer drinks, it goes in one end and (lo!) it actually comes out again at the other. It hasn't been used-up after all, merely cycled, and it goes on being cycled in our landscapes ad infinitum. Clearly our scientific friends have never paused to consider the other end of the cow and that is why some of them have no idea how farming works; they ought to have a closer look.

Nothing exists in isolation except an abstract number, and these are the most dangerous numbers you can get. Like anything abstract, they should be handled with extreme caution. Abstracted thinking isolates parts of the real world from their actual context, when this happens huge pieces of the real picture get lost. Who could possibly think that all that water is used-up or wasted to make 1kg of beef? Hasn't anybody ever asked where it's all supposed to be going?

Whether you're an elevated Upper-Shoalhaven farmer or a lowly caricature of an abstracted number-crunching scientist, remember to always ask yourself '….and then what?' If you aren't joining all of the dots in your landscape, you're probably a few dots short.

*http://www.reec.nsw.edu.au/k6/page/wa49.htm

**http://www.bom.gov.au/climate/averages/tables/cw_069010.shtml

The ACT & Southern Tablelands Weed Spotter Portal

There is a great new website hosted by the Atlas of Living Australia called the ACT & Southern Tablelands Weed Spotter Portal. It is an interactive Portal that allows you to map and monitor the weeds of the ACT and Southern Tablelands. The website includes the following capabilities:

1. Learn about the **priority weeds** to watch for in your local area.
2. Use the **Weed Identification Tool** to help identify unknown plants.
3. Create an **account** so you can report weed sightings online.
4. **Report a weed sighting** using your mobile device or desktop computer.
5. **Map and track** your weed control efforts.
6. Contact a **local expert** for further help with weed management.

The website is under development collaboratively with Federal and local governments, and a range of community landcare groups and regional bodies. It currently lives here: **http://root.ala.org.au/bdrs-core/act-esdd/home.htm**

Weed Spotter
ACT AND SOUTHERN TABLELANDS

Local Land Services South East

PASTURE CROPPING WORKSHOP

"Pasture cropping is the combining of cropping and grazing into one land management system where each one benefits the other. The potential for profit and environmental health in being able to do this are enormous and a lot of landholders in many regions of Australia are showing this to be the case." Colin Seis, "Winona".

If you have an interest in improving the grazing potential of your property, you are invited to attend a workshop. **Colin Seis** will present information to demonstrate how pasture cropping has the potential to help improve soil health, improve the management and function of pastures and farm profits.

Participants will have the opportunity to review information from the "Bobar" pasture cropping trial, established in 2009 and review the changes occurring within this site. The workshop will also include a paddock inspection and opportunities for discussion with Colin Seis; native grasslands advisor, David Eddy and landholder Jamie Ramm.

When:	**Tuesday, 11 March 2014**
Where:	"Bobar" 8299 Kings Highway, Braidwood
Time:	9:30 am – 4:00 pm
Cost:	Free (lunch will be provided)
Who?	Landholders and land managers who are interested in improving the productivity and profitability of their farming enterprise.
RSVP:	Please RSVP by no later than **Wednesday, 5 March 2014**

More information

To register, or for further information contact:

Rebecca Bradley | Senior Land Services Officer (Industry Partnerships) South East Local Land Services
42 Ryrie Street | PO Box 9 | Braidwood NSW 2622
T: 02 4842 2594 | F: 02 4842 2655 | E: rebecca.bradley@lls.nsw.gov.au

Upper Shoalhaven Landcare Council

Upper Shoalhaven Landcare Council &
Braidwood Urban Landcare Group
presents

Habitat Restoration Workshop

Flood Creek, Bombay Rd, Braidwood
Saturday, 22nd February 2014
(Market day)
10:30 am – 1 pm

Bush regeneration techniques

Small scale strategy

Introducing wildlife habitat

Lunch will be provided. No Cost.

RSVPs are essential for catering.

Register your interest by Weds 19th Feb

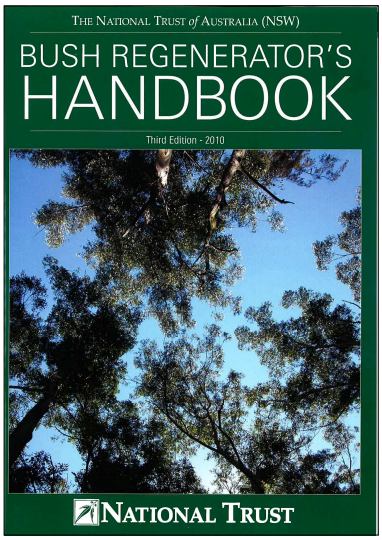
CALL the Landcare Office on 4842 2594,

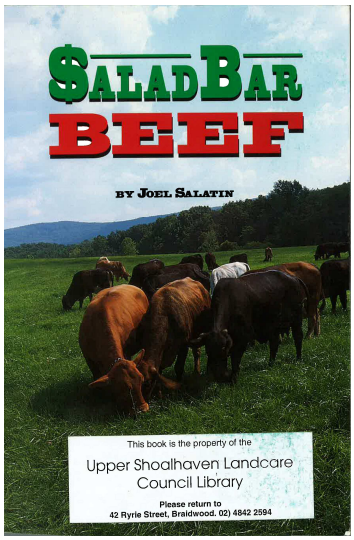
or email upper.shoalhaven@gmail.com

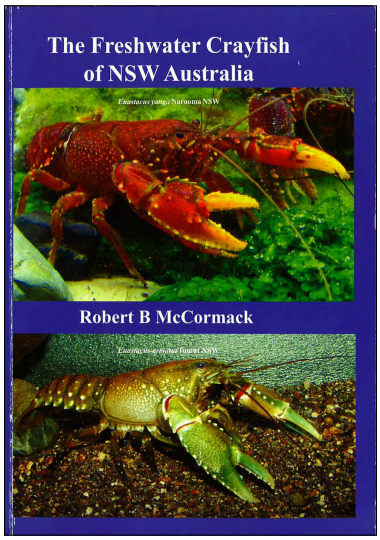
Australian Government

The 'Corridor links and Carbon Sinks: Biodiversity for Carbon and Corridors' project is supported through funding from the Australian Government's Clean Energy Future Biodiversity Fund.

TITLES FROM THE LANDCARE LIBRARY







THE SALEYARD

FREE CLASSIFIEDS

RIPPER

Three-point-link, single-tine ripper. Ideal for preparing soils, removing stumps, rocks and more.
Replaceable / reversible ripper tooth.
Fits easily to tractor.

$25.00 PER DAY

LOT FOR SALE
$156,000

Lot for sale (Lot 17) in Bega Eco-Neighbourhood Development ('BEND')

Wide, high-positioned north-facing block (628.6m²). Own title, share in agricultural, conservation and reafforestation areas, infrastructure; orchards, dams and more. Close to town & Steiner School, fantastic opportunity, tegannorthwood@yahoo.com.au or

0410 769 144

'Kanga' Mini Bobcat Hire

Mini bobcat with driver, available for hire. Trenching, Fencing, Rotary hoeing, excavation work and more.
$65.00 per hour + travel.
Contact Phil Shoemark on 0427 422 046

HIRING LANDCARE EQUIPMENT

When hiring equipment, a $50 deposit will ensure the safe return and good condition of items.
Call 02 4842 2594 to book!

MARQUEE (New!)

Measuring 3 x 6m, this new marquee is great for parties, field days, etc. Requires at least four people to set up.

HIRE COST: $50 PER DAY

($100.00 Deposit required)

Upper Shoalhaven & Upper Deua Landcare Network

To contribute to this newsletter with either new articles or responses to articles in this edition, please write to:

The Upper Shoalhaven Landcare Council
C/- USLC
PO Box 9
BRAIDWOOD NSW 2622
Phone: 02 4842 2594
upper.shoalhaven@gmail.com.au

This newsletter was edited and produced by Felicity Sturgiss & Sky Kidd with articles from Sarah Jebara, Kristy Moyle, Sky Kidd, Rob McCormack, Peter Hazell, Ben Gleeson and Felicity Sturgiss.

SOLUTION: LANDWORD, VOL. V