February 2016 Edition 25

In this issue

2015 NSW Roadside Environment Management Award

The Excellence in the Environment Awards recognise outstanding achievements by Local Government in NSW in managing and protecting the environment. The Awards include a Roadside Environmental Management Award, sponsored by the REC. This Award recognises excellence and innovation in roadside environmental management planning and implementation.

The award incorporates, but is not limited to:

- Assessment of roadside environments.
- Preparation of roadside vegetation management plans or similar.
- Implementation of roadside vegetation management plans or similar e.g. through staff/contactor training, community education, demonstrated integration with other council planning.
- Monitoring and evaluation of roadside vegetation management plans or similar.

The overall winner of the 2015 NSW Roadside Environmental Management Award is Wingecarribee Shire Council. The Award was announced at the 2015 Local Government Excellence in the Environment Awards held at Darling Harbour.

Wingecarribee Shire Council's project involves a tool that helps to prioritise environmental weed management on the Shire's 1,150km of roadsides. The tool uses biodiversity rankings and GIS systems to highlight the roads with the highest environmental / biodiversity need. This approach ensures resources are being spent in the most strategic and beneficial way. Council also won Division B for councils with populations between 20,000-60,000 residents.

A description of Wingecarribee Shire Council's winning project can be found at http://www.lgsa.org.au/files/imce-uploads/90/Roadside_veg_Wingecarribee.pdf

In Division A (population less than 20,000) the winner was Cowra Shire Council for its Roadside Vegetation Management Plan.

Ian Perkins of Wingecarribee Shire Council with the Division B and Overall Winner Awards

Lachlan region Roadside Vegetation Management Plan project pays off

The preparation and implementation of detailed Roadside Vegetation Management Plans (RVMPs) has paid off for the Central Tablelands Local Land Services and the local councils they have worked with. The RVMPs assess the biodiversity value of roadside remnant native vegetation patches on council land and provide guidance on how these important areas of bushland should be managed.

The project began in 2008 and involved 12 local councils: Bland, Blayney, Boorowa, Cabonne, Carathool, Cowra, Forbes, Lachlan, Parkes, Temora, Young, and Weddin.

Central Tablelands Local Land Services General Manager, Peter Sparkes, said that having the RVMPs has highlighted the importance of maintaining the roadside environment, while also dealing with competing demands such as road construction, recreational use, bushfire management, weed control, and road safety.

Brian Parker from Blayney Shire Council said that now that Council has an active RVMP it has saved money by implementing work practices that also achieve better environmental outcomes.

Source: http://centraltablelands.lls.nsw.gov.au/resource-hub/media-releases/2015/lachlan-region-roadside-vegetation-management-plan-project-pays-off

The Flora of Wagga Wagga: A new website

Revegetation projects are a valuable supplement to conservation efforts in the struggle to protect our biodiversity. At their best, revegetation works can return missing species to the landscape or bolster existing populations so as to improve their survival odds. Often, however, the plants used in these projects belong to a very limited floristic spectrum, consisting chiefly of eucalypts and wattles.

Additionally, the species used are not always well chosen: it is not uncommon to see non-local species included in these plantings. Maximising the potential of future plantings means encouraging the use of locally appropriate species.

A new website, *The Flora of Wagga Wagga: A guide for revegetation and restoration* is a step in this process. The website, which extends from an earlier small print-run booklet, profiles roughly 80 species of tree, shrub, forb and grass found near Wagga Wagga and in surrounding districts. The aim of this website is to foster an interest in and a familiarity with some of the more distinctive flora found in our reserves and (particularly) along our roads. Each plant profile provides a description of the species along with notes on flowering time and propagation methods. The text is accompanied by images and a map showing representative locations, often along roadsides. It is hoped that by facilitating identification of interesting species we can foster an appreciation for our local flora and for the value of our roadside vegetation.

An early version of the website can be found at http://scci.csu.edu.au/waggaflora/.

This website is an extension of the Graham Centre for Agricultural Innovation Biodiversity Nursery, which was sponsored by Charles Sturt University's CSU

Green initiative. The booklet was supported by Murrumbidgee Landcare Incorporated.

Source: David Orchard (email: davidorchard0@gmail.com; phone: 0439802850)

Dispersal of native seeds by ants along roads aid habitat connectivity

The maintenance of habitat connectivity is critical in facilitating seed dispersal for the conservation of many native species. Minor rural road networks are an important landscape element, which have gained recent attention for their role in providing landscape connectivity in otherwise cleared or fragmented landscapes.

Seed dispersal by ants, or 'myrmecochory', is a significant ant-plant mutualistic relationship that occurs in many ecosystems worldwide. In myrmecochory, a food 'reward', in the form of a specialized fleshy appendage called an elaiosome, is attached to the seed. Attracted to this food reward, ants move seeds into their nests to consume the elaiosomes, and then discard the seeds into the surrounding area. The extent to which ants disperse seeds in road corridors is largely unknown, but dependent on prevailing habitat conditions in relation to human disturbances such as road maintenance activities.

PhD student Zsophia Palfi from Charles Sturt University (Albury; supervised by Dr Peter Spooner) is close to completing her research to better understand the effects of soil disturbances on ant composition, behaviour and seed dispersal along roadsides in the Lockhart Shire Council area in southern NSW. She found that roadside vegetation provides a refuge for many native ant species which in turn, are important for dispersing seeds of Acacia species - important for habitat.

Some disturbance tolerate species appear to flourish in roadsides, where large meat ants (*Iridomyrmex purpureus*) were responsible for most of the seeds dispersed. Mean seed dispersal distance was 35 metres, where a maximum distance of 120 metres was recorded for one seed removal event. Field observations also recorded secondary dispersal events away from nests once seeds were discarded – which may further aid in seed dispersal. These results will be used to develop a better understanding of seed dispersal processes in roadside corridors and elsewhere.

A meat ant dispersing an Acacia seed

Typical roadside in Lockhart Shire

Source: Zsofia Palfie can be contacted by email for more information zpalfi@csu.edu.au

Feathertop Rhodes grass is on the move and is glyphosate resistant

Four Australian populations of the increasingly widespread annual sub-tropical weed feathertop Rhodes grass (*Chloris virgata*) have been confirmed resistant to the key herbicide glyphosate.

Feathertop Rhodes grass is yet another species that has increased its abundance during the last 10 years largely due to widespread adoption of no-till cropping and the shift to glyphosate-based weed control on road verges.

"We have now confirmed that two populations from cropping land in New South Wales and Queensland and two from roadsides in South Australia are not controlled with glyphosate at the seedling stage and therefore are classified as resistant," said Dr Chris Preston, chair of the Australian Glyphosate Sustainability Working Group (AGSWG).

"Glyphosate is normally effective on actively growing seedlings, however, once feathertop Rhodes grass begins to tiller it is tolerant of very high rates. Again this is another unwanted world first for Australia," said Dr Preston.

Whilst the weed is not listed on any glyphosate herbicide labels, glyphosate has been widely used in Queensland and northern NSW to control seedlings.

Feathertop Rhodes grass has been found across Australia for decades as a weed of roadsides, fence lines and unmanaged land, especially in summer rainfall areas and irrigated agriculture. During the last 15 years it has become a major cropping weed in Queensland and northern NSW as well as horticultural plantings such as vineyards. It is also dominating many roadsides across southern Australia.

Large infestation of feathertop Rhodes grass in southern Western Australia where it is spreading with summer rains. Image: AGRONOMO

Source: www.grdc.com.au/media-news

Response to Crown Lands Legislature White Paper Released

The Response to Crown Lands Legislation White Paper has been released by the NSW Government. The Crown Land estate covers 42 percent of New South Wales and contributes to the social, environmental and economic structure of the State. The Crown Land Management Review took an objective look at how to improve the management of existing assets and plan for the future.

The NSW Department of Industry invited comments on proposed changes to the Crown Lands legislation through a White Paper released in early 2014. At the same time, the Crown Lands Management Review Report was made available online.

The opportunity to comment on the Government's White Paper allowed the people of NSW to have their say about what they think is important for the future management of Crown land. The Response to Crown Lands Legislation White Paper released by the NSW Government summarises the main themes arising from the 626 submissions received by the NSW Department of Industry Review team.

Source:
http://www.lpma.nsw.gov.au/__data/assets/pdf_file/0004/206680/response-to-crown-lands-legislation-white-paper.pdf

An artificial waterway and road restrict movements and alter home ranges of endangered arboreal marsupial

A paper by Kaori Yokochi, Brian K. Chambers, and Roberta Bencini published in the Journal of Mammalogy last year studied the impact of artificial linear structures on movement and home ranges of endangered arboreal marsupials.

The paper documents an important study because the negative impacts of artificial linear structures, especially those other than roads, on arboreal species has rarely been studied in the past.

Radiotrackers were attached to 18 female western ringtail possum (*Pseudocheirus occidentalis*) and 19 males near Brusselton, Western Australia. Over three years, the researchers studied the home ranges of the tracked animals, with a focus on the impacts of a road and an artificial waterway on their movement.

No possum crossed the road successfully during the monitoring period and only one crossed the waterway. Possums near the waterway had larger home ranges than those near the road, and the size of the home range increased with proximity to the waterway. This increase was probably due to the greater availability of nearby canopy connections and the lower availability of preferable foliage close to the waterway.

The results of the study show that both the road and the waterway represent significant physical barriers to the possums, and that the artificial waterway

influenced home ranges more than the road. This suggests that linear infrastructure other than roads can affect movements of strictly arboreal animals, and negative impacts of these structures need to be assessed and mitigated by reconnecting their habitat, just as those of roads.

Source:
http://jmammal.oxfordjournals.org/content/early/2015/09/04/jmammal.gyv137

Quest for a Sustainable Highway

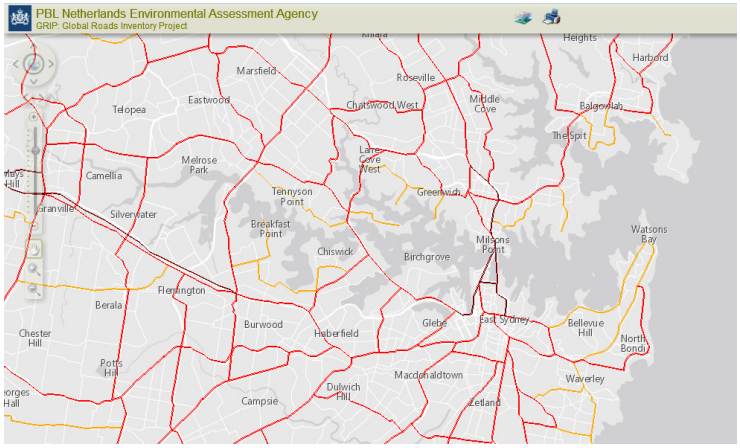
The Mission Zero Corridor project in Troup County West Georgia is totally rethinking the design of travel corridors to create a 'green highway'. The project could incorporate technologies such as algae biodiesel gas stations, smart solar-powered roads, moon-cycle adjusting lights, wildlife bridges, driverless cars, electric-car charging lanes and cultural greenways.

This alternative to traditional highway infrastructure would create highways which have a positive impact on the community and the environment.

Source: http://energy.agwired.com/2015/08/13/the-quest-for-a-sustainable-highway/

Global Roads Inventory Project

The Netherlands Environmental Assessment Agency has created the Global Roads Inventory Project (GRIP). The aim of GRIP is to create and provide the best publicly available database of global roads data. GRIP is a database combining some commercial and many publicly collected roads datasets which can be viewed as an interactive map.



Source:
http://geoservice.pbl.nl/website/flexviewer/index.html?config=cfg/PBL_GRIP.xml&center=5.2,52.1333&scale=5000000

Sampling effects on the identification of roadkill hotspots: Implications for survey design

A paper was recently published in the Journal of Environmental Management on how sampling frequency affects the identification of roadkill hotspots. The study used a database of vertebrate roadkills recorded over a year of daily surveys alone 37 km of road. This data was used to create a baseline dataset in which "true" roadkill hotspots were identified. "True" hotspots were identified as the 500 metre segments of road where the number of killed vertebrates exceeded the upper 95% confidence limit of the mean, assuming a Poisson distribution of roadkills per segment.

The "true" hotspots were compared to "estimated" hotspots, which were identified using datasets representing progressively lower sampling frequencies, which were produced by extracting data from the baseline dataset at appropriate time intervals (1-30 days).

The overlap of "true" and "estimated" hotspots declined rapidly with longer intervals between surveys. The decrease in accuracy was higher for smaller bodied species than for large bodied species. These results suggest that roadkill surveys with an interval of a week or longer may produce poor estimates of roadkill hotspots, particularly for small bodied species.

Source:
http://www.researchgate.net/publication/280236541_Sampling_effects_on_the_identification_of_roadkill_hotspots_Implications_for_survey_design

Global exchange and accumulation of non-native plants

Recent analysis of the global accumulation and exchange of plant species between continents has been conducted using a unique global database on the occurrences of naturalised alien plant species in 481 mainland and 362 island regions.

The research found that in total, 13,168 plant species (3.9% of existing global vascular flora) have become naturalised somewhere in the world as a result of human activity. North America was found to have accumulated the greatest number of naturalised species, and Pacific Islands were found to have the fastest increase in numbers of naturalised species relative to land area.

This study has quantified the extent of plant naturalisation across the world for the first time, and shows the urgent need for globally integrated efforts to understand, control, and manage the spread of alien plant species.

Source:
http://www.nature.com/nature/journal/vaop/ncurrent/abs/nature14910.html#supplementary-information

Introducing the Australian Bird Index

The 2015 State of Australia's Birds report has been released by BirdLife Australia. The report was developed in partnership with the Federal Department of Environment, National Environment Research Program, Charles Darwin University, Australian National University, the Environmental Resources Information Network and the Melbourne Museum.

The report is a guide on the status of Australia's bird populations which can be used to inform decision making on land management, conservation efforts, and policy that affects Australia's birds and biodiversity. In 2015, the report introduced the ground-breaking Australian Bird Index, a project which provides the first quantitative set of indicators for a major component of Australia's biodiversity.

The Australian Bird Index is based on the idea that National Environmental Accounts need to be built on scientific measurement. Birds are an ideal metric for determining the health of the natural environment because they are present in all habitats, are easily counted, and there is a large volunteer base of reliable observers capable of providing large quantities of data.

The Australian Bird Index can be thought of similar to a stock market index. It is made up of trends of several species, grouped and combined in such a way that it reflects the general trend of that bird group. The indices can capture major environmental signals—using birds as the barometer—and provide a powerful basis for making informed decisions about our natural environment.

Source 1: http://birdlife.org.au/state-of-birds/
Source 2: http://birdlife.org.au/images/uploads/e-news/soab/indices/ABI-methods.pdf
Source 3: http://birdlife.org.au/documents/SOAB-2015.pdf

Setting aside half the Earth for 'rewilding': the ethical dimension

Edward Wilson has released a new book proposing an achievable plan to preserve biodiversity by devoting half the surface of the earth to nature. Wilson, a famous biologist and naturalist, believed we could achieve this by establishing huge biodiversity parks to protect, restore and connect habitats at a continental scale.

The need for such a drastic rewilding plan comes from the fact that human depredations, habitat destruction, overpopulation, resource depletion, urban sprawl and climate change has resulted in the sixth great extinction event in the earth's history, with more species being lost today than at any time since the end of the dinosaurs.

Wilson's plan includes an ethical dimension in the need for humanity to shift away from an anthropocentric view of conservation and develop an ethic that cares about all life on this planet and doesn't place the wants and needs of humans

above the wellbeing of all other species. It acknowledges that nature has value in and of itself, not just the value humans place on it in the sense of resources and ecological services.

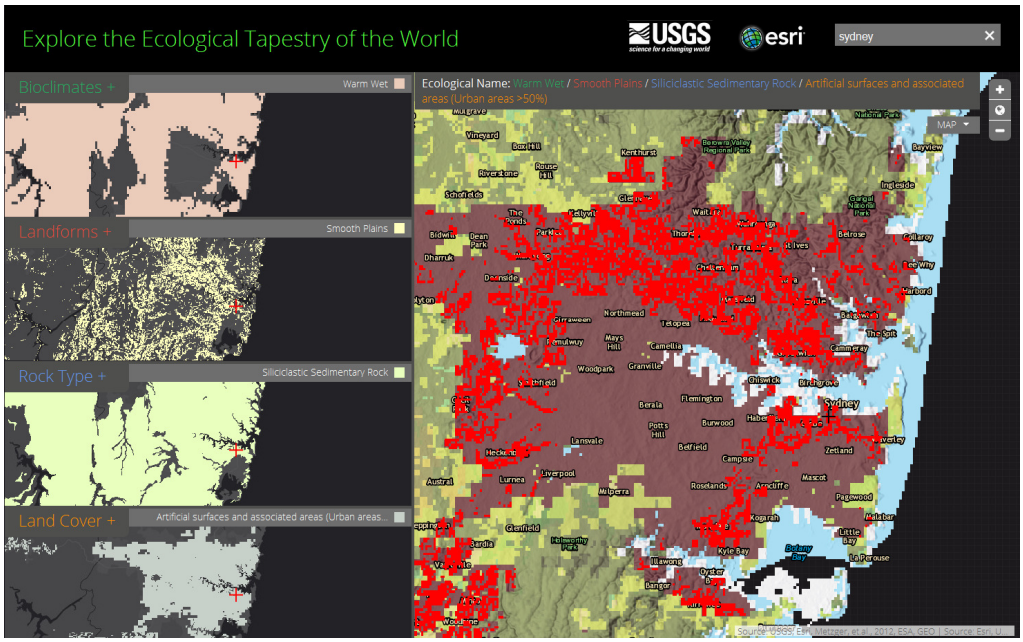
While Wilson's book has promoted the 50% rewilding solution, it is not a new idea. The half-Earth solution first arose in the 1990s as a discussion about wilderness and the deep ecology movement. Various organisations that arose from the movement use a mix of conservation science, education and public policy initiatives to promote protection and restoration of continental-scale habitats and corridors.

Source 1: https://theconversation.com/setting-aside-half-the-earth-for-rewilding-the-ethical-dimension-46121
Source 2: http://books.wwnorton.com/books/detail.aspx?ID=4294989875

The most detailed ecological map of the World

The US Geological Survey (USGS) have teamed up with ESRI to create the most detailed global ecological land units map in the world. The map includes raster data at 250 metre resolution and is fully interactive. It includes four different layers of data, bioclimates, landforms, rock type, and land cover, each with an individual viewing pane. There is also a summary viewing pane with all four layers. This is a different approach to typical GIS layer overlay where different layers have to be turned on and off for viewing.

The map will provide web-based data for land managers, scientists, conservationists, developers, and the public which can be used for global, regional, and landscape analysis and accounting.



Source 1: http://geoawesomeness.com/the-most-detailed-ecological-map-of-the-world/
Source 2: http://ecoexplorer.arcgis.com/eco/maps.html

Funding Opportunities

- Foundation for National Parks and Wildlife - Private Land Conservation Grants http://fnpw.org.au/foundation-grants/private-land-grants-nsw
- NSW Environmental Trust Grants Program http://www.environment.nsw.gov.au/grants/grantsintro.htm
- Saving our Species Partnership Grants Program http://www.environment.nsw.gov.au/grants/sospartnerships.htm

Conferences and Events

- IPWEA NSW Regional Forums. Get updated on current industry issues, be introduced to innovative solutions and share knowledge in an informal environment http://www.ipwea.org/newsouthwales/nswevents/nswevents/regionalforums2016
- Get Flocced Workshop – Get Flocced Lake Mac! http://www.austieca.com.au/events/event/get-flocced-lake-mac
- Australasian Bat Society Conference 29 March-1 April http://ausbats.org.au/2016-conference-agm/4589345616

The aim of this newsletter is to share information about the management of NSW linear reserve environments and profile the NSW Roadside Environment Committee (REC). For more information on the REC, including how to develop roadside vegetation management plans, go to: http://www.rms.nsw.gov.au/about/what-we-do/committees/roadside-environment-committee.html

Please contact the REC Executive Officer if you wish to subscribe or unsubscribe.

NSW Roadside Environment Committee

For more information contact:
Neil Dufty - Executive Officer - (02) 9354 0300
ndufty@molinostewart.com.au