

# Great Southern Great Science

Kalyenup Studio, Albany Entertainment Centre

Friday 14 August 2015

9am to 4pm

The Great Southern Science Council proudly presents a symposium in Albany to showcase the excellent science taking place in, or relevant to, the Great Southern and South Coast regions.

*Great Southern Great Science* includes presentations on nationally significant work that is important for Western Australia's Great Southern and South Coast, and local research and development by scientists and professionals in the region.

Thank you to our event partners, sponsors and supporters:

- the **volunteers** and **coordination team members** and **funding partners** from Great Southern Science Council, South Coast Natural Resource Management, City of Albany, Geological Survey of Western Australia and WA Department of Mines and Petroleum, Western Australian Museum Albany, Great Southern Development Commission, Department of Agriculture and Food WA, Department Parks and Wildlife, University of Western Australia Centre of Excellence in Natural Resource Management Inspiring Australia, and National Science Week
- the **scientists** and **organisations** who have given their time to share presentations and posters, and helpful **local businesses** in Albany for support with materials, rental equipment, venue, catering and local produce gifts.



# Program

## Great Southern Great Science 2015

Time	Title	Presenter	
	0900	Opening and Welcome	Professor Phil Cocks Great Southern Science Council
	0910	Welcome to Country	Vernice Gillies Western Australian Museum Albany
Session One Chair: Helena Stoakley	0915	<i>Science and Creativity- one and the same?</i>	Alec Coles Western Australian Museum
	0930	<i>Science, Perth and Australia</i>	Professor Peter Klinken, Chief Scientist of Western Australia
	0945	<i>A new seadragon species for southern WA</i> <i>J Stiller, NG Wilson and GW Rouse</i>	Nerida Wilson Western Australian Museum
	1005	<i>Great Southern Fish Monitoring Programme</i> <i>Great Southern Grammar Marine Studies</i> <i>students and I Robson</i>	Great Southern Grammar
	1035 to 1040	Poster Briefs 1 - 3	Tahryn Thompson, Department of Fisheries Catherine Spaggiari, Geological Survey Craig Russell, University of WA
1040	<b>Morning Tea and Posters</b>		
Session Two Chair: Wal Anderson	1110	<i>Evolution and biogeography of molluscs:</i> <i>What are the trends in southwestern</i> <i>Western Australia?</i> <i>L Kirkendale and NG Wilson</i>	Nerida Wilson Western Australian Museum
	1130	<i>The 3D geology of Western Australia</i>	Mark Jessell Centre for Exploration Targeting, UWA
	1150	<i>A multi-centre trial of advance care</i> <i>planning among patients with advanced</i> <i>respiratory disease in the Great Southern</i> <i>region of WA</i> <i>C Sinclair, F Williamson, J Thomas, D Price</i> <i>and K Auret</i>	Craig Sinclair and Fiona Williamson Rural Clinical School, UWA
	1210	<i>Using microwaves to kill weed seeds and</i> <i>snails</i> <i>S Micic and J Moore</i>	Svetlana Micic and John Moore Department of Agriculture and Food WA
	1235 to 1240	Poster Briefs 4 - 8	Svetlana Micic, Department of Agriculture and Food WA Mark True, Department Parks and Wildlife Sarah Comer, Department Parks and Wildlife
1240	<b>Lunch and Posters</b>		

Time	Title	Presenter	
Session Three Chair: Paul Wettin	1315	<i>Can manipulation of fox control reveal fox – feral cat interactions?</i> JA Friend, C Mosen and TA Button	Tony Friend Department Parks and Wildlife
	1335	<i>Recovering the critically endangered Western Ground Parrot: 2004-2015</i> S Comer, AH Burbidge, C Clausen and A Berryman	Sarah Comer Department Parks and Wildlife
	1355	<i>The mountain heath and thicket of the eastern Stirling Range: Trends in environmental changes and biodiversity based on long-term monitoring</i> S Barrett, D Rathbone and D Lehmann	Sarah Barrett Department Parks and Wildlife
	1415	<i>Opportunities for more efficient nutrient use.</i> D Rogers, D Rowe, P Richards, T Westrup D Weaver, R Summers and M Clark	David Rogers, Department of Agriculture and Food WA
1435	<b>Afternoon Tea</b>		
Session Four Chair: Phil Cocks	1500	<i>Soil mapping, monitoring and interpretation – high quality agricultural land in Western Australia</i> T Overheu, A Stuart-Street, P Tille and D van Gool	Angela Stuart-Street Department of Agriculture and Food WA
	1520	<i>Peat rehabilitation trials – Mitchell and Timberjack peat swamps in the Walpole Wilderness area.</i> Walpole-Nornalup National Parks Association, K Bain and E Edmonds	Karlene Bain Walpole-Nornalup National Parks Association
	1540	<i>Behaviours and attitudes regarding personal safety of recreational fishers at Salmon Holes, Western Australia</i> MR Jasper, BA Cook and A Knight	Barbara Cook Centre of Excellence in Natural Resource Management, UWA
1600	Closing	Professor Phil Cocks Great Southern Science Council	
1615	Networking at Due South <i>All welcome</i>	Standing tables reserved for Great Southern Science Council	

# Great Southern Great Science 2015 *Posters*

## Poster Title

Moving marine postcodes – monitoring species on the move through citizen science.

*J Brown, T Thompson and K Outhwaite, Department of Fisheries*

Geological significance and age of the Stirling Range and beyond  
*CV Spaggiari and CL Kirkland, Geological Survey of WA*

Managing soil carbon and nitrogen in Kikuyu pastures in the Fitzgerald Biosphere – an evaluation of Nitrous Oxide Emissions  
*C Russell, UWA Centre of Excellence in Natural Resource Management, Albany*

WA- still the only state in Australia with resistant redlegged earth mites?

*S Micic, Department of Agriculture and Food WA*

Does aphid feeding cause yield loss in unstressed determinate canola?

*S Micic, Department of Agriculture and Food WA*

Fauna monitoring and community education in a conservation hotspot

*M True and S Comer*

Disease risk analysis for the captive management of the critically endangered Western Ground Parrot (*Pezoporus flaviventris*)

*Simone Vitali, Abby Berryman, Arthur Ferguson*

*Perth Zoo and Department of Parks and Wildlife, Perth WA*

Genes for conservation: using genetics to inform management of threatened birds

*Saul Cowen, Sarah Comer, Allan Burbidge and David Groth*

*Department of Parks and Wildlife and Curtin University*

## Displaying author

Tahryn Thompson,  
Department of Fisheries

Catherine Spaggiari  
Geological Survey of WA

Craig Russell  
UWA Centre of Excellence in Natural Resource Management, Albany

Svetlana Micic,  
Department of Agriculture and Food WA

Svetlana Micic  
Department of Agriculture and Food WA

Mark True  
Department Parks and Wildlife, Albany

Sarah Comer (representing)  
Department Parks and Wildlife, Albany

Sarah Comer  
Department Parks and Wildlife, Albany



Geological Survey of Western Australia



Government of Western Australia  
Department of Mines and Petroleum



Department of Agriculture and Food



Department of Parks and Wildlife



**Proceedings of the Oral Presentations**  
**Great Southern Great Science Symposium**  
**14 August 2015, Albany Western Australia**

**Science and Creativity - one and the same?**

Alec Coles, Chief Executive Officer

Western Australian Museum, Locked Bag 49, Welshpool DC WA 6062. [alec.coles@museum.wa.gov.au](mailto:alec.coles@museum.wa.gov.au)

**Abstract:** It was as if the Renaissance never occurred: despite the achievements of the polymath giants of the time, centuries on we encounter stereotypes of scientists as geeks, whilst so-called 'creatives' are usually characterised as artists, novelists, playwrights or musicians. The line between science and art has always been blurred and creativity embraces both – and a lot more as well. A long time ago the arts smartly and effectively appropriated the word creativity; perhaps it's time that science claimed it back.

**Science, Perth and Australia**

Professor Peter Klinken, Chief Scientist of WA

**Abstract:** Science has been crucial for the success of Western Australia. The State is a world leader in mining technologies and has natural comparative advantages in sun, wind and wave energy. Western Australia is at the forefront of radioastronomy internationally, a fantastic producer of agriculture, a biodiversity hotspot both terrestrially and aquatically, and boasts a long and proud history of health and medical research.

Whilst these five key areas for science have been identified, it is crucial that we have underpinning technologies that enable all of those sectors to be successful in the future. Technology is advancing very rapidly and science will be critical for the future success of this State. If we go to the cutting edge with all of these technologies, all of our sectors will benefit enormously.

These are exciting times for science and innovation in Western Australia. There are wonderful opportunities moving forward for the State to be a world leader in technologies across all of these sectors. Going forward, it is science that will address the many challenges facing our State in the future. For this reason we need to maintain our standards and capabilities, be able to invest and be ready to grasp opportunities as they arise.

In his role as Chief Scientist of Western Australia, Professor Peter Klinken provides advice on topics that are important to the future of science in Western Australia.

**A new seadragon species for southern WA**

J Stiller<sup>1</sup>, Nerida Wilson<sup>2</sup> and GW Rouse<sup>1</sup>

<sup>1</sup>Scripps Institution of Oceanography, UCSD, La Jolla, California, USA

<sup>2</sup>Western Australian Museum, Welshpool, 6106. [nerida.wilson@museum.wa.gov.au](mailto:nerida.wilson@museum.wa.gov.au)

**Abstract:** Here, we report a new species of seadragon from Western Australia, with substantial morphological and genetic differences to the only two other known species. We describe it as *Phyllopteryx dewysea* n. sp. Although the leafy seadragon (*Phycodurus eques*) and the common seadragon (*Phyllopteryx taeniolatus*) occur along Australia's southern coast in relatively shallow macroalgal reefs, the new species was found in slightly deeper waters. Molecular sequence data show clear divergence from the other seadragons and radiographs and micro-computed tomography were used to describe the morphology.

The discovery provides a spectacular example of the surprises still hidden in our oceans.

## Great Southern Fish Monitoring Programme

Great Southern Grammar, Ian Robson. [ian.robson@gsg.edu.au](mailto:ian.robson@gsg.edu.au)

Great Southern Grammar has partnered with South Coast Natural Resource Management, Curtin University and South Coast Diving Supplies to be involved in the Great Southern Fish Monitoring Programme. This programme builds upon the baseline data collected by Professor Euan Harvey in 2006 and is a fantastic vehicle for citizen science to be conducted. The Year 10 Marine Science Programme is in its first year running at Great Southern Grammar; students were asked to explore and explain the methodology to ensure that they fully understood the scientific nature of the programme they were taking part in. The Great Southern Fish Monitoring Programme is an ongoing project and few “results” are available at this time. This is a presentation on the programme and GSG’s involvement. Following the student presentation, Mr Ian Robson will explain how you might become involved in the wider programme.

## Evolution and biogeography of molluscs: What are the trends in southwestern Western Australia?

Lisa Kirkendale and [Nerida Wilson](#)

Western Australian Museum Department of Aquatic Zoology, Welshpool, 6106. [lisa.kirkendale@museum.wa.gov.au](mailto:lisa.kirkendale@museum.wa.gov.au)

**Abstract:** I will present an overview and update on current malacological research programs at the Western Australian Museum (WAM) of relevance to south western WA. This involves genetic research on key, commercially important taxa (edible oysters, pest mussel species), biodiversity survey (micromolluscs, *Cardiidae*/cockles as well as baseline) and commensal/symbiosis research (galeommatoidaeans) in the marine realm, as well as joint projects on freshwater mussels (*Westralunio*) and terrestrial land snails (*Bothriembryon*). I will discuss gaps in our knowledge and avenues for future collaboration, including recent involvement in leading a community citizen science project in WA.

## The 3D geology of Western Australia

Mark Jessell

Centre for Exploration Targeting, UWA. [mark.jessell@uwa.edu.au](mailto:mark.jessell@uwa.edu.au)

**Abstract:** The geology beneath our feet in Western Australia reflects a 3 Billion year history of oceans, mountains and volcanoes forming, being eroded away, and being deformed in complex ways. The resulting three-dimensional patterns we see in the Earth today reflect this long history, and understanding the present-day geometry of these patterns plays an important role in determining our ability to find and manage water, energy and minerals resources across the state. I will focus in particular on new methods to better characterize the 3D geology of the Great Southern region.

## A multi-centre trial of advance care planning among patients with advanced respiratory disease in the Great Southern region of WA

[Craig Sinclair](#), [Fiona Williamson](#), Jill Thomas, Dot Price and Kirsten Auret

Rural Clinical School of WA, 35 Stirling Terrace Albany, WA, 6330. [craig.sinclair@rcswa.edu.au](mailto:craig.sinclair@rcswa.edu.au)

**Abstract:** Advance care planning (ACP) is a process of discussion between patients, their family/carers, and health professionals, to identify goals and preferences for future medical treatment. ACP has been shown to increase patient satisfaction with care, and improve the quality of end of life care.

Our previous research has explored local issues in implementing ACP. Following this formative work, our team is running the first randomized controlled trial of ACP conducted in Western Australia. This progress report covers trial design, the process of implementing the intervention in the rural primary care setting and preliminary process and outcome data.

## Using microwaves to kill weed seeds and snails.

[Svetlana Micic](#) and [John Moore](#),

Department of Agriculture and Food WA. 444 Albany Hwy, Albany, WA 6330. [svetlana.micic@agric.wa.gov.au](mailto:svetlana.micic@agric.wa.gov.au)

**Abstract:** Microwaves can be used to control seeds and other organisms in soil. This is especially useful for species like resistant ryegrass, noxious weeds or snails that initially occur in patches allowing more expensive treatments like microwaving the soil to be used. Microwaves were at least 6 times more effective at killing snails than annual ryegrass seed. Could this be used on a wider scale for snail control in broadacre cropping?

### **Can manipulation of fox control reveal fox-feral cat interactions?**

Tony Friend, C Mosen and TA Button

Department of Parks and Wildlife, Albany Research, 120 Albany Hwy, Albany, WA 6330, WA. [tony.friend@dpaw.wa.gov.au](mailto:tony.friend@dpaw.wa.gov.au)

**Abstract:** Control of feral cats could be assisted by keeping some foxes in the system, if fox activity reduces cat abundance. This experiment investigated such an interaction by studying cat movements and survival when fox control ceased. In the northern section of Dragon Rocks Nature Reserve, fox baiting ceased in July 2013 but continued in the south. Six feral cats were captured in each section in June 2013 and fitted with GPS collars. Amongst the four cat data sets retrieved from each area after December there was no significant change in home range size or location.

### **Recovering the critically endangered Western Ground Parrot: 2004-2015**

Sarah Comer<sup>1</sup>, AH Burbidge<sup>2</sup>, C Clausen<sup>1</sup> and A Berryman<sup>1</sup>

<sup>1</sup> Department of Parks and Wildlife, 120 Albany Hwy, Albany, 6330. [sarah.comer@dpaw.wa.gov.au](mailto:sarah.comer@dpaw.wa.gov.au)

<sup>2</sup> Department of Parks and Wildlife. Wildlife Place, Woodvale WA 6946

**Abstract:** In 2004 monitoring of the Western Ground Parrot populations on the south coast caused alarm bells to ring. Of three known populations one had disappeared, one declined dramatically and the third appeared to be stable. In the past ten years numerous partners and supporters have combined their efforts to halt this decline, with the future looking much brighter for this and other native species. In this paper we summarise ten years of recovery efforts including integrated predator control, captive management and survey and monitoring for this cryptic parrot.

### **The Montane Heath and Thicket of the Eastern Stirling Range: Trends in environmental change and biodiversity based on long term monitoring**

Sarah Barrett, D Rathbone and D Lehmann

Department of Parks and Wildlife, 120 Albany Hwy, Albany WA 6330. [sarah.barrett@dpaw.wa.gov.au](mailto:sarah.barrett@dpaw.wa.gov.au)

**Abstract:** Mountains provide unique environments and in the floristically diverse Southwest, the Stirling Range provides the region's only distinctly montane environment. The heath and thicket of the eastern Range contain many threatened and endemic plant species and is classified as a Critically Endangered ecological community due to the devastating impacts of the plant pathogen *Phytophthora cinnamomi*. Fire and grazing have also significantly contributed to its decline. Historical sources and longterm monitoring have been intrinsic to understanding causes of change. The TEC, while substantially modified still retains areas with highly significant conservation values. Intensive management of priority areas as well as *ex situ* conservation (seed collection and translocation) of threatened species is critical.

### **Opportunities for more efficient nutrient use**

David Rogers, D Rowe, P Richards, T Westrup, D Weaver, R Summers and M Clarke

Department of Agriculture and Food WA, 444 Albany Hwy, Albany, WA 6330. [david.rogers@agric.wa.gov.au](mailto:david.rogers@agric.wa.gov.au)

**Abstract:** Assessments of soil test data suggests significant opportunities in south west WA to improve fertiliser use efficiency. Thirteen thousand paddocks from over 500 farms representing 140,000 hectares were sampled from 2009 to 2015. 70% of paddocks contained sufficient phosphorus, whilst 36% were deficient in potassium, 33% were deficient in sulphur, and 90% were considered acidic. Dependent on specific circumstances, growers can save thousands on their fertiliser bill, and/or redirect savings to increase production by managing constraints such as K or soil acidity. These changes reduce the risk of P loss from these production systems to waterways with environmental benefits.

### **Soil Mapping, Monitoring and Interpretation - High Quality Agricultural Land in Western Australia**

Tim Overheu, Angela Stuart-Street, Peter Tille, Dennis van Gool

Department of Agriculture and Food, WA, Locked Bag 4 Bentley Delivery Centre WA 6983. [angela.stuart-street@agric.wa.gov.au](mailto:angela.stuart-street@agric.wa.gov.au)

**Abstract:** The Department of Agriculture and Food WA has developed a new approach that identifies High Quality Agricultural Land (HQAL) through spatially merging detailed soil quality, land capability, water resource, climate, agronomic data sets and modelled digital soil data. The identified output is defined as "land which has the most productive and versatile (or resilient) capacity for either irrigated or broadacre agriculture and worthy of protection for agricultural

production into the future.” By embedding agricultural information into rural planning systems, HQAL helps balance demands for development across all sectors amid growing competition for land and water resources. Ensuring that areas of suitable land and water resources are available for agriculture development will reduce the incidence of intensive uses being established on unsuitable sites where they can lead to environmental damage.

The identification of HQAL presents agricultural land use information in a clearer way that is easier for planners to use and to identify and justify whether areas of agricultural land are worthy of more detailed investigation. It contributes to improved understanding of soil resources for strategic planning and resource allocation for future sustainable agricultural development.

The presentation will focus on the HQAL revision of the Swan Planning Act area and briefly compare similar tools and discuss opportunities and implications for other planning areas in Western Australia.

### **Peat Rehabilitation Trials – Mitchell and Timberjack peat swamps in the Walpole Wilderness area.**

Walpole-Nornalup National Parks Association<sup>1</sup>, Karlene Bain<sup>2</sup> and E Edmonds<sup>3</sup>

<sup>1</sup> Walpole-Nornalup National Parks Association, PO Box 8 Walpole WA 6398

<sup>2</sup> Python Ecological Services, PO Box 168 Walpole WA 6398. draconis@wn.com.au

<sup>3</sup> PO Box 20 Walpole WA 6398

**Abstract:** The peat lands in the Walpole Wilderness are under increasing pressure from drying climate, fire regime and feral pigs. Many are listed as wetlands of national significance with high species richness and endemism. Despite significant control efforts, feral pigs have damaged large areas of peat lands by physical disturbance, increasing peat aeration and consequently accelerating decomposition processes of oxidation, acidification and habitat collapse. Without active rehabilitation of the peat areas, critical habitat for many priority species will be lost. Through community partnerships this project aims to prevent further damage, reduce aerobic decomposition of disturbed peat and restore vegetation to two peat systems containing critically endangered species.

### **Behaviours and attitudes regarding personal safety of recreational fishers at Salmon Holes, WA**

Randall Jasper<sup>1</sup>, Barbara Cook<sup>1</sup> and Andrew Knight<sup>2</sup>

<sup>1</sup> Centre of Excellence in Natural Resource Management, University of Western Australia, Albany WA.

Barbara.cook@uwa.edu.au

<sup>2</sup> Rural Clinical School of WA, Albany WA

**Abstract:** Salmon Holes beach, in Torndirrup National Park, is the focus of increasing concern for rock fishing deaths and environmental degradation during the salmon fishing season. During Easter 2015 a survey was conducted to gain information about the demographic characteristics of fishers and their behaviours and attitudes to their safety and care for the environment. There were a total of 236 fishers and other users surveyed. Of those surveyed, most were male, most lived in Perth metro area, over half were born in Asia, 61% “mostly or always” spoke English at home, 22% fished from the rocks that day, and one third self-assessed as poor swimmers. Fishers who were born in Asia, especially Afghanistan, and those who spoke less English at home, were overrepresented in the rock fisher group. The survey found that fishers like those surveyed in New Zealand and New South Wales, appear to underestimate the risks of fishing from the rocks and overestimate their abilities to survive an incident.

The implications of these results are discussed, and future research needs are identified.

