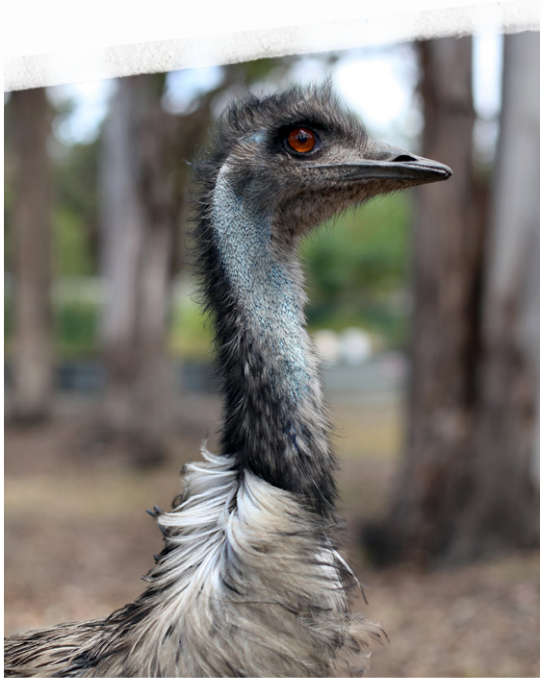
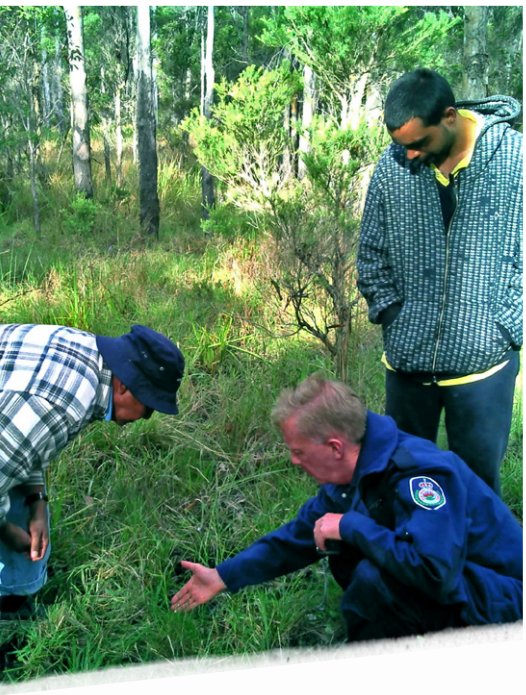
Fire and Restoration

working with fire for healthy lands





2015 Biennial Bushfire Conference

May 26th and 27th

Nature Conservation Council

The voice for nature in NSW

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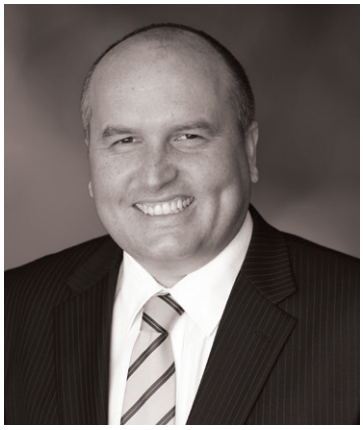
Fire and Restoration

working with fire for healthy lands

Nature Conservation Council The voice for nature in NSW



The Hon. David Elliott MP

Minister for Corrections
Minister for Emergency Services
Minister for Veterans Affairs

Ministers Welcome Message

NSW communities need to be confident that they can rely on emergency services to protect and assist them during bushfires and other emergencies.

The Nature Conservation Council (NCC) has been an important voice in raising awareness of the environmental benefits of appropriate bushfire management strategies.

As Minister for Emergency Services, I understand the importance of exploring initiatives which build community resilience and support a balanced approach to bushfire management.

In the past few years, numerous towns and villages around the State have experienced the long-lasting impacts of severe natural disasters.

Our efforts must continue to increase community resilience through prevention and preparedness activities.

This conference will provide further opportunities to learn from each other and share knowledge and insight on bush fire management.

The lessons learned will ultimately be of great benefit to the people and environment of NSW.

Nature Conservation Council The voice for nature in NSW

Dear Distinguished Guests, Presenters, Representatives and Delegates,

On behalf of Nature Conservation Council's (NCC) Bushfire Program, we would like to welcome you to the 10th Biennial Conference – Fire and Restoration: working with fire for healthy lands.

The conference this year represents not only 20 years of NCC bushfire conferences, but also 35 years of NCC's Bushfire Program and 60 years since the establishment of the Nature Conservation Council. As well as providing the opportunity to participate in an exciting program and share your experiences in using fire for the benefit of biodiversity with like-minded people, this conference will feature interesting historical accounts, focusing on the lessons that have been learnt and the progress that has been made in the field of integrated fire management.

Our program builds on themes identified in previous conferences by further exploring the use of fire as a restoration tool. The program highlights how fire can be used to rehabilitate degraded landscapes, restore ecological integrity and reinstate resilience into the environment and the community. Discussions will revolve around the supporting science, policy issues and on-ground experiences that form the basis for using fire for restoration, as well as the ecological implications inherent in the use and non-use of fire.

Presentations will draw on the understanding of a wide range of land managers and link scientific evidence, on-ground case studies, Aboriginal cultural knowledge and practical risk management strategies to demonstrate how healthy ecosystems are an integral component of prepared and resilient communities. The aspirations and experiences of land managers will be explored as will the different values that underlie restoration work, taking into account the logistics, practical considerations and challenges being faced by those in the field. Finally the program will look at how to build greater confidence and capacity to undertake effective restoration work into the future.

We would like to express our deep appreciation to the platinum conference sponsors - NSW Rural Fire Service, Travers Bushfire and Ecology and the NSW Office of Environment and Heritage; and to our gold sponsor Fire & Rescue NSW. We would not be able to hold these community bushfire conferences that are essential in informing our understanding of fire management without their very generous and continued support.

Conference Committee

Professor Don White
Jane Gye
Rob Pallin
Anne Reeves
Waminda Parker
Greg Banks
Michelle Rose
Stefanie Pillora

CONFERENCE PROGRAM - DAY 1 TUESDAY 26 MAY 2015

Opening Addresses: 9.00 - 9.45am		
Don White	Nature Conservation Council of NSW	Welcome
Uncle Alan Madden	Metropolitan Local Aboriginal Land Council	Welcome to Country
Assistant Commissioner Stuart Midgley	NSW Rural Fire Service	Opening address
Kate Smolski	Nature Conservation Council of NSW, CEO	Address
Session 1: Why use fire for restoration? 9.45 - 10.50am		
Professor Lesley Hughes Keynote Speaker	Macquarie University Climate Council of Australia	Setting the scene: climate change and the changing fire risk
Dr Tein McDonald	T McDonald & Associates, Australian Association of Bush Regenerators	Navigating terminology: When is fire a tool for 'maintaining' vs 'restoring' ecosystems?
Morning Tea: 10.50 - 11.20am		
Session 1: Why use fire for restoration? (Continued) 11.20 - 12.50pm		
Rob Pallin	Nature Conservation Council of NSW, Bush Fire Advisory Committee	Celebrating our 10th Biennial Bushfire Conference
Bruce Pascoe Keynote Speaker	Writer – author of Black Emu	Aboriginal agriculture and land management
Unlce Neil Ingram and Michelle Hines	Orange Local Aboriginal Land Council and Central Tablelands Local Land Service	Lighting the Path – An application of Indigenous traditional burning techniques in the control of serrated tussock (*Nassella trichotoma*) and 'bringing back country'
Andrew Baker	Wildsite Ecological Services	Where has all the fire gone? Quantifying the spatial and temporal extent of fire exclusion in Byron Shire, NSW
Dr Naomi Rea	Mulga Data Services	When is burning good for the bush?
Lunch: 12.50 - 1.50pm		
Session 2: What does it mean to use fire for restoration? 1.50 - 3.10pm		
Dr Paul Gibson Roy	Greening Australia	The management of restored grassy ground cover sites: Fire as a tool in maintaining diversity and influencing vegetation structure
Dr Elizabeth Tasker	NSW Office of Environment & Heritage	Combining science and fire to restore the habitat of a rare bird: a case study from north-eastern NSW
Jamie Bertram	NSW Rural Fire Service	Culture, Burning and Bush Regeneration in Garby Country
Emma Burgess =S=	University of Queensland	Managing fire for nature conservation in sub-tropical woodlands
Justine Leahy =S=	Victorian Country Fire Authority	Case Study: Re-introducing fire to critically endangered grassland ecosystems on Trust for Nature owned properties
Afternoon Tea: 3.10 - 3.40pm		
Session 2: What does it mean to use fire for restoration? (Continued) 3.40 - 5.00pm		
David Curry	NSW Rural Fire Service	Bushfire Resilience for Aboriginal Communities Project (BRAC)
Justin Mallee =S=	Tweed Shire Council	To burn or not to burn: koala habitat regeneration trial Tyagarah, Northern NSW
Dr Emily Moskwa	University of Adelaide, University of South Australia	Vegetation management in peri-urban landscapes: Perceptions and response to fire and risk
Dr Felipe Aires =S=	University of Sydney	Fuel load, structure and flammability of weeds as key factors in Australian classification frameworks
Jonathon Sanders and Dr Charles Morris	NSW National Parks & Wildlife Service University of Western Sydney	Trialling the use of fire to manage priority weeds in Cumberland Plain vegetation
Posters and Drinks Session (open to all) 5.00pm		
Conference Dinner: 6.30pm Rydges Sydney Central Hotel, 28 Albion St, Surry Hills		

CONFERENCE PROGRAM - DAY 2 WEDNESDAY 27 MAY 2015

Opening Addresses: 9.00 - 9.25am		
Robert Quirk	NSW Office of Environment & Heritage	Address
John Travers	Travers Bushfire & Ecology	The significance of the NCC bushfire conference to conservation and human understanding of fire effects
Session 3: How is fire being used for restoration? 9.25am - 11am		
Adjunct Professor Jeremy Russell-Smith Keynote Speaker	Charles Darwin University	Fire management business in Australia's tropical savannas
Dan Pederson	Kleinfelder Australia	Constraints to using fire as a land management tool in the Hunter Valley mining industry
Robert Strauch	Fire & Rescue NSW	Operational planning and logistics - introducing fire into the landscape
Amelia Jones =S=	Hornsby Shire Council	From doom to bloom - ecological burning in an urban bushland reserve
Mick Wilson	Forestry Corporation of NSW	Challenges of resuscitating a fuel management program in a complex regulatory framework
Morning Tea: 11.00 - 11.25am		
Session 3: How is fire being used for restoration? (Continued) 11.25 - 1.00pm		
Roger Lembit =S=	Gingra Ecological Surveys	The State Mine Fire, October 2013 - patterns of vegetation recovery
Dr Malcolm Ridges and Geoff Simpson	NSW Office of Environment & Heritage	Indigenous Grassy Pathways: unpacking how they underpinned regional biodiversity.
Tom Dexter	Eurobodalla Shire Council	Reconciliation in the grasslands
Mark Graham	Nature Conservation Council of NSW	Fire, weeds and healthy ecosystems
Facilitated discussion		Facilitated discussion: How to? Fire, weeds and beyond – exploring innovations, challenges and questions from those using fire for restoration
Lunch: 1.00- 2.00pm		
Session 4: Where do we go from here? 2.00 - 3.45pm		
Phil Patterson	NSW Rural Fire Service	Cooperation to protect communities, koalas and long-nosed potoroos
Andrew Sheath =S=	Department of Environment Water and Natural Resources South Australia	Prescribed burning provides opportunities for site restoration via weed management in the Mount Lofty Ranges
Sam Lloyd =S=	South-East Queensland Fire & Biodiversity Consortium	Supporting and communicating applied subtropical fire research
Dennis Barber =S=	Blue Mts Firesticks	Blue Mountains Fire Sticks
Dr Miles Holmes and Oliver Costello	Beit Holmes and Associates Nature Conservation Council of NSW	Why do we burn? Key themes from cultural burning research in northern NSW
Panel Response		Panel response to questions arising from 'How to?' facilitated discussion
Waminda Parker	Nature Conservation Council of NSW	Fire and restoration: Looking forward
Kate Smolski	Nature Conservation Council of NSW	Closing address
Close: 3.45pm		

OFFICIAL ADDRESSES

ROB PALLIN

Rob Pallin is a member of the Nature Conservation Council of NSW (NCC) Executive Board and was the Chairperson of NCC from 2000 to 2005. He is Chairperson of the Paddy Pallin group of companies and a member of the National Parks and Wildlife Service South Coast Advisory Committee. Robert is currently NCC's representative on the Illawarra Bushfire Management Committee, the Lord Howe Island Bush Fire Management Committee, the Bush Fire Coordinating Committee and the Rural Fire Service Advisory Council. Robert was a councillor on Ku-ring-gai Council from 1991 to 1995 and chaired the Hornsby Ku-ring-gai Bush Fire Management Committee. Robert was a member of the Coal and Candle Bushfire Brigade.

KATE SMOLSKI

Kate Smolski is the Chief Executive Officer of NCC. Kate is an environmental advocate with over twelve years experience in grassroots organising, campaign strategy, media relations, policy and lobbying. Kate has a background as a grassroots organiser and campaigner with several leading US environmental non-profits including Green Corps, the Sierra Club and Greenpeace. Through innovative campaigns and training she has worked with a range of groups to effectively advocate for action on climate change, clean energy and lands and wildlife protection. Kate worked as Campaigns Director for the Nature Conservation Council providing highly effective leadership for the protection of the state's natural environment, delivering high-impact campaigns, building new alliances and growing the base of supporters before moving to her current role as NCCs CEO.

DEPUTY COMMISSIONER ROB ROGERS

Deputy Commissioner Rob Rogers has been involved in emergency management and fire fighting for over 30 years with the New South Wales Rural Fire Service (NSW RFS). Mr Rogers has grown and strengthened the NSW Rural Fire Service's operational capabilities and directed a suite of resilience and risk management strategies to better protect the communities of New South Wales. As a leader in his field, Mr Rogers has been at the forefront of improving land use planning decisions and building controls for the development of bush fire prone areas; overseen bush fire operations including multi-agency responses to major bush fire incidents; and assisted in the Independent Hazard Reduction Panel's review of the hazard reduction programme in NSW. He has also represented NSW RFS on many national and international forums and projects.

MR JOHN TRAVERS

John Travers is Managing Director of Travers bushfire and ecology. He is a landscape ecologist and specialises in bushfire and ecology. John spent 12 years with NSW National Parks and Wildlife Service in various locations before joining the Department of Bush Fire Services as Manager of Planning & Research, where he took on the delivery of fuel management planning across NSW. The totality of that experience led John towards private practice and the eventual undertaking of many exciting fire/ecological management projects. This year marks John's 34th year working with fire and ecology and his passion remains strong.

SESSION 1: WHY USE FIRE FOR RESTORATION?

Setting the scene:

Climate change and the changing fire risk

Professor Lesley Hughes

Pro Vice-Chancellor (Research Integrity and Development)
Distinguished Professor of Biology
Councillor with Climate Council of Australia

Macquarie University
Climate Council of Australia

BSc (Hons), PhD

Climate change is with us, and its impacts on both natural and human systems will accelerate over coming decades. Many of these impacts will come about via an increase in the frequency and/or intensity of extreme events such as fire. Australia is a fire prone country and has always experienced bushfires. But all extreme weather events are now being influenced by climate change because they are occurring in a climate system that is hotter and moister than it was 50 years ago. Climate change is making hot days hotter, and heat waves longer and more frequent. Some parts of Australia are becoming drier. Consistent with these trends, extreme fire weather has increased over the last 30 years in southeast Australia. These changes have been most marked in spring, with fire weather now extending into October and March. The fire season will continue to lengthen into the future, further reducing the opportunities for safe hazard reduction burning. Increasing fire risk has significant implications for the resourcing of emergency services, for urban planning, for natural resource management, and for conservation practice.

This talk will outline the latest climate observations and projections for Australia and NSW and discuss how the climate-fire interaction is, and will continue, to change the way in which we manage both the natural environment, and the urban/bushland interface

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Navigating terminology:

When is fire used as a tool for 'maintaining' vs 'restoring' ecosystems?

Dr Tein McDonald

Principal
Tein McDonald & Associates
Australian Association of Bush Regenerators

PhD, Grad Dip Env Studs

Fire can be considered part of an ecosystem whose species have evolved in its presence - so maintaining fire may be essential to maintaining such ecosystems. But where is the point at which fire stops being a maintenance tool and starts being a restoration tool? It is logical to identify that point as being where damage can be considered to have occurred – but what constitutes that damage and what happens if fire can no longer be applied at traditional regimes? This talk will present a framework for conceptualising ecosystem maintenance, restoration, rehabilitation and transformation, using a resilience view.

Aboriginal agriculture and land management

Bruce Pascoe

Writer, editor, and anthologist

HDT, BEd

Drawing on research undertaken for the writing and publication of my book 'Dark Emu – Black Seeds: agriculture or accident?', this talk presents an argument for the reconsideration of our understanding of the way Aboriginal people lived in colonial times. The material to support this discussion draws extensively from the journals of explorers and also the work of Bill Gammage, Rupert Gerritsen and others.

The presentation discusses the cultivation methods employed by Australian Aboriginal people and the intensity of the tilling and the cyclical cool burning process which kept so much ground open and free of scrub. It considers cultivating practices of murrnong (yam daisy: *microseris lanceolata*) and the associated herbs, orchids and mosses with which the murrnong was grown.

Consideration is given to how we might utilise these plants today and how we might employ different fire regimes. The fundamental subject of the book is that the houses, clothes, food production, preservation and storage meant that Australian Aborigines could not be classified as simple hunter-gatherers as their impact on the landscape was widespread and profound.

Lighting the Path:

An application of Indigenous traditional burning techniques in the control of serrated tussock and 'bringing back country'

Michelle Hines

Senior Strategic Land Services Officer
Central Tablelands Local Land Services

BEnvSci (Hons)*

Neil Ingram

Gaambuwananha Ngurambang Team Mentor Support
Orange Local Aboriginal Land Service

The Gaambuwananha Ngurambang (GN) team from Orange LALC have aspirations for restoring the land under their management. Serrated tussock, a perennial grass from South America is a major threat to biodiversity in the tablelands of New South Wales. The GN team identify the tussock as a significant challenge on their restoration pathway. We commenced an investigation to test if traditional burning can be used as a tool to control serrated tussock.

In November 2014 with the assistance of the NSW Rural Fire Service we conducted our first exploratory burn. The initial burn was a "hot fire" to gauge the impact of what in general terms is considered a destructive fire and to give insight into how we might design our experiment. Previous work by other researchers indicated that a single burn treatment in serrated tussock was an ineffective control. Our initial burn indicated that this conclusion was perhaps reached because the reduction in shade by larger tussocks promotes germination of seed blown in from neighbouring unburnt plants.

Traditional burn techniques are not "a one-off treatment" requiring many repeated burns to achieve the desired outcomes. We have commenced annual burns in both April/May and August/September to simulate two types of cool burn in a repeated measures design to investigate the long-term effects of multiple burns. Here we report together through film how our "country is sick", our aspirations, what is means to apply traditional fire, our activities and our initial findings.

Where has all the fire gone?

Quantifying the spatial and temporal extent of fire exclusion in Byron Shire, NSW.

Andy Baker

Vegetation Ecologist
Wildsite Ecological Services

BAppSc(Hons)

Fire is a major determinant of vegetation structure worldwide, and structural vegetation change following fire exclusion is well documented throughout Australia. Such changes include the displacement of treeless ecosystems by forest, and the transition of open forest to rainforest. These changes displace essential habitat for myriad plant and animal species and are likely drivers of localised species extinctions. Despite these potential consequences, research identifying the spatial extent of fire-excluded ecosystems is largely absent from the ecological literature.

This study identifies the spatial and temporal extent of fire exclusion in Byron Shire in north-east New South Wales. GIS analysis compared modern fire history with recommended fire intervals for the maintenance of fire-dependent vegetation types. Fire exclusion (low-frequency fire) vastly exceeded high-frequency fire, comprising 99.1% of areas affected by inappropriate fire frequency. Most fire-dependent vegetation was fire-excluded, with less than 10% within recommended fire-interval thresholds. Most affected areas were fire-excluded for multiple recommended fire-return cycles, increasing the likelihood of vegetation change and localised extinctions. These findings demonstrate the operation of a major threatening process affecting Byron Shire's biodiversity that has previously been little recognised.

A growing body of ecological literature suggests that irreversible change to fire-excluded vegetation is likely wherever plant growth resources are sufficient to enable transition. Irreversible vegetation change and rapid species declines have already been reported for several communities in Byron Shire, and there is compelling evidence that further change may be widespread. With increasing time since fire, efforts to restore these sites may be complicated by encroaching trees resistant to removal by fire alone, and the difficulties of reintroducing low-intensity understorey fires where the flammable understorey has been lost through shading. Further research into the impacts of fire-exclusion is urgently required, as is the reinstatement of fire to fire-excluded vegetation to prevent ongoing displacement of fire-dependent biodiversity values.

Fire in degrees:

Research ideas that position appropriate burning for ecological purposes

Dr Naomi Rea

Plant Ecologist
Mulga Data Services

BScHons, PhD (Plant Ecology)

Fire is regarded as a natural force that has been either missing or occurring in an unmanaged way, thereby contributing to destructive wildfire. The elevation of burning as a prime management tool is regarded as restoring an important driver of the Australian landscape. Careful examination of statements made by enthusiastic proponents of fire is needed: e.g. 'Australian flora is adapted to fire' and 'long unburnt country poses a major risk of destructive wildfire'. The working together of landowners, land managers, governments, scientists and conservationists is progressive. However, enthusiasm risks the pendulum swinging too far. Promotion of the ecological benefits of fire, and using fire to control fire, is being tempered by concerns, cautions and science. Too frequent fire or any fire may at times be counterproductive to conservation goals and other objectives. What works in one place may be inappropriate elsewhere. Hypotheses and research in the social and biological sciences are proposed that contribute to positioning fire as just one option in ecological restoration. For example, a much improved knowledge of fire and plant ecology. How language and gender underpin the promotion of fire is another proposed topic.

SESSION 2: WHAT DOES IT MEAN TO USE FIRE FOR RESTORATION?

The management of restored grassy ground cover sites:
Fire as a tool in maintaining diversity and influencing vegetation structure

Dr Paul Gibson Roy

Senior Ecologist
Greening Australia

PhD

Temperate native grasslands and grassy woodlands are among Australia's most endangered ecological communities. In recent years Greening Australia's Victorian-based Grassy Groundcover Restoration program demonstrated the efficacy of complex herbaceous restoration on ex-agricultural lands by direct seeding. Following site establishment the program focussed on the management of biomass to preserve diversity and manage fuel loads. Fire and other techniques were repeatedly tested. This presentation will discuss the use of fire as a management tool in restored and remnant grasslands and grassy woodlands. It will explore how and why fire is useful in these systems, but also some of the constraints around its application. There will also be discussion of alternative or complimentary approaches. Examples will illustrate reconstructed grassy-type communities, and the use of fire and other biomass management techniques.

Combining science and fire to restore the habitat of a rare bird:
A case study from north-eastern NSW

Dr Elizabeth Tasker

Principal Scientist Fire Ecology
Office of Environment & Heritage

BSc Hons, PhD (fire ecology)

Scattered throughout the rainforests and wet sclerophyll forests of north-eastern NSW are naturally-occurring open grassy forests that are critical habitat for the highly endangered northern population of the Eastern Bristlebird. These grassy forests have declined markedly in condition and extent over recent decades. Coincident with this, the population of the Bristlebird has plummeted by ~80% in the last 40 years. While clearing and weed invasion have contributed to degradation of these grassy areas, the primary culprit is apparently changing fire regimes. In particular, fire frequency has diminished as a consequence of changing land use patterns and attitudes to fire, and increasing regulation. In this project we are reintroducing more frequent fire to the habitat and studying the fire regimes needed to restore these grassy habitats. The Bristlebirds are dependent on thick tussock grasses and an open over storey. To identify the maximum interval between fires a site can be left before invasive mid-storey plants become resistant to the next fire, we have tagged 934 individuals of invasive shrub, weed and rainforest species across three sites that have been, or soon will be, burnt. Following planned burns, we are resurveying the tagged plants to assess their mortality and determine the size at which they become fire-resistant. A related study is measuring grass structure across a range of currently occupied and recently abandoned Bristlebird sites to determine the density of tree and mid-storey that causes the essential thick grass layer to decline. The results of our work will be used to derive thresholds of maximum and minimum inter-fire intervals needed to maintain Bristlebird habitat. Our project is collaboration between scientists and threatened species officers in the NSW Office of Environment & Heritage, local landholders, National Parks & Wildlife Service staff and the University of Queensland, and is funded by the NSW Environment Trust.

Culture, Burning and Bush Regeneration in Garby Country

Jamie Bertram

Community Safety Officer
NSW Rural Fire Service
DipMant (Emergency Management, Incident Management Planning, Training & Assessment)

Volunteer Leaders Program with Australian Institute of Police

The Cultural, Burning & Bush Regeneration in Garby Country Project brought together key partners including Yarrawarra Aboriginal Corporation, National Parks & Wildlife Service, Crown Lands and the NSW Rural Fire Service. The project aimed to develop and implement an integrated and culturally appropriate program of prescribed burning and bush regeneration at priority coastal lowland and headlands sites within the traditional lands of the Garby People of the Gumbaynggirr Nation. The Garby Elders are traditional custodians of the north-east lowland Gumbanyggirr Country, responsible for the protection and maintenance of Cultural Sites under traditional lore.

The project sites contain Aboriginal heritage assets and culturally important resources, food and medicines and include Endangered Ecological Communities (EECs) and habitat for threatened species. The activities conducted through the project included integrated bush regeneration and prescribed burning programs aiming to improve the ecological and cultural condition and resilience of these culturally important sites. Working with members of the Yarrawarra Bush Regeneration Team and other interested members of the Aboriginal community the NSW RFS provided recognised competency-based fire training and capacity building opportunities and facilitated community participation in on-ground fire operations.

Managing fire for nature conservation in sub-tropical woodlands

Emma Burgess

PhD Student
Landscape Ecology and Conservation Group, University of Queensland

BSc MSc

Increasingly ecological fire management is focused on the broadly accepted paradigm that increased pyrodiversity will beget increased biodiversity. Recent research however, has questioned the relevance of a heterogeneous fire regime to a range of taxa. Controlled burning for biodiversity conservation thus remains a controversial topic.

On Carnarvon Station Reserve managers implement a mosaic burning approach with the overriding goal of restoring the condition and functioning of the ecosystems and their associated fauna assemblages present pre-European settlement. Our project investigated the relative influence of a heterogeneous fire regime on avian assemblages at both the site (1 ha) and landscape-scale (100 ha).

Environmental heterogeneity, as measured by topographic complexity, was consistently important for bird species richness and composition. However, the explanatory power of topographic complexity varied depending on the spatial scale and the component of diversity under investigation. We found different correlates of richness within particular foraging guilds depending on the scale at which richness was measured. Extent of unburnt habitat was the most important variable for the landscape-level richness of frugivores, insectivores and canopy feeders, whereas environmental heterogeneity in the surrounding landscape was more important for site-level richness of these foraging guilds. However, despite fire-mediated heterogeneity being a notable feature of the region, it was of limited importance.

This study highlights (1) that ecological response to landscape elements is influenced by the scale at which the response variable of interest is characterised; and (2) management plans focused solely on maintaining a heterogeneous fire regime mosaic may fail without consideration of the extent of a preferred fire-age class.

Case Study:

Re-introducing fire to critically endangered grassland ecosystems on Trust for Nature owned properties

Justine Leahy

Biodiversity Advisor
Country Fire Authority (Victoria)

BAppSc, Dip Bushfire Management

A partnership project with the Country Fire Authority (Victoria) and Trust for Nature was established to develop and implement a 10 – 15 year fire management plan to restore native grasslands throughout the Riverine Plains of Northern Victoria. Burn prioritisation factored in historical land use, natural values and quality, optimal habitat for threatened flora and fauna, strategic fire risk reduction, and monitoring and reporting leading to an adaptive management approach.

Trust for Nature has progressively purchased native grassland properties over the last 10 years, which cover over 2,300 hectares. These properties are dominated by the nationally listed, Critically Endangered ecological community Natural Grasslands of the Murray Valley Plains. These grasslands contain a suite of state and nationally listed flora and fauna. Of particular interest is the Plains-wanderer (*Pedionomus torquatus*), a small grassland bird that has recently been listed as the number one bird species Australia can least afford to lose to extinction because of its unique genetic lineage.

The majority of the properties have a history of grazing by domestic stock, with little exposure to fire as a management tool before or after purchase by Trust for Nature. Monitoring has occurred since 2004, comparing the role of grazing, fire and removal of these disturbance regimes in the restoration and management of native grasslands. The findings indicated fire is likely to increase diversity and play an important role in management, and lack of fire in recent years has resulted in a significant increase in biomass leading to a reduction of suitable habitat for key species including the Plains-wanderer.

Fourteen months into the project, restorative gains are already evident with 350 hectares (in three separate blocks) burnt in Autumn 2014, and post-fire monitoring providing clear indications that fire is a valuable tool to maintain, create and restore habitat for a range of threatened fauna and increase the diversity of the flora in these systems.

Bushfire Resilience for Aboriginal Communities Project

David Curry

Senior Project Officer
NSW Rural Fire Service

DipMn, Cert IV TAE

The Bushfire Resilience for Aboriginal Communities project (BRAC) carried out by the NSW RFS spanned 22 months and was funded by the NSW Ministry for Police and Emergency Services. It was originally set up to improve the safety and lower the fire risk levels in 34 discrete Aboriginal Communities across the state. This was achieved by handing back fire resilience ownership to the communities. This process included delivering training programs including Bush Fire Awareness or full Bush Fire Fighter where needed. To have the Local Aboriginal Land Councils (LALCs) represented on the Bushfire Management Committees (BFMCs) in fire districts where they reside, gives the LALC's control and input into the fire resilience of their managed land. The BRAC project flew some 30 participants to Sydney for a 2 day training session on the functions and responsibilities of BFMCs. Having local NSW RFS officers that deal with the LALCs in their area travel with the participants in the BFMC training has built a greater rapport between the NSW RFS and the Aboriginal community.

The BRAC project has also participated in a Cultural Burning program in the central-west of NSW run by the Central Tablelands Local Land Services. Our involvement was training Aboriginal participants in Bushfire Awareness and supplying appliances and personal protection equipment for the burns. This was a great catalyst for an improvement in communication between the NSW RFS and the communities involved and has led to an increase in membership in some of the communities.

There has also been considerable work completed to ensure that the risk of fire has been significantly reduced in many communities. For example, Loftus Road community near Crescent Head was evaluated as having extreme risk. Significant hazard reduction was completed by the removal of heavy timber and undergrowth. This fuel was encroaching on dwellings. If a fire started on severe days, it could have destroyed the community and risked many lives. The risk level is now at a moderate level. The Local Aboriginal Land Council has agreed to maintain this Asset Protection Zone with input from local NSW RFS staff and volunteers.

To burn or not to burn:
Koala habitat regeneration trial Tyagarah, northern NSW

Dr Jo Green

Koala Connections Project Officer
Byron Shire Council

PhD

To date there has been few trials to test practical methods to regenerate coastal Koala habitat. The key habitats for koalas on the north coast of NSW are Subtropical Floodplain Forest and Swamp Sclerophyll Forest on Coastal Floodplains, both listed as Endangered Ecological Communities under the Threatened Species Conservation Act 1995. The role of fire has been identified as crucial to the future of the sclerophyll plant communities but proximity to urban and peri urban areas or seasonal conditions such as drought and wet seasons are crucial issues for the timing of burning in regeneration sites.

This project is measuring germination of species from the seed rain and seed bank in experimental plots in cleared paddocks adjacent to remnant vegetation. The project aims to determine the most efficient methods for the regeneration of koala food and shelter trees Melaleuca quinquenervia, Eucalyptus robusta, E. tereticornis and other co-existing swamp sclerophyll species on cleared and previously grazed paddocks.

The project utilises 15 regeneration treatments including fire, herbicide, scraping, tillage and nil treatments, overlayed with seeding, watering and no watering. There are 10 replicates of each treatment giving a total of 150 plots. Measurements include plant species, distance to seed source and closest koala feed trees, climatic factors such as rainfall, temperature, wind speed and direction.

Monthly measurements of germination and of percentage cover of species, plus heights of the target species has indicated an increase in species diversity with different species favoured by different treatments. Species in the burnt plots have responded to reduced competition and subsequent nutrient availability. The project is employing adaptive management techniques to determine the most successful methods for regeneration over the two year project.

Vegetation management in peri-urban landscapes:
Perceptions and response to fire and risk

Dr Emily Moskwa

Postdoctoral Researcher
The University of Adelaide and the University of South Australia

PhDEnvSt, BEnvSt (Honours)

Catastrophic fires in the urban–rural interface are reframing perceptions of what constitutes effective vegetation management. A number of recent fires in South Australia have refocussed attention on bushfire risk and in our study we explore community support for and concerns of vegetation clearance and controlled burns undertaken for hazard reduction and ecological restoration purposes.

In 2014 we conducted a postal survey of 3300 households in the Adelaide-Mt Lofty Ranges and Eyre Peninsula to examine biodiversity conservation challenges associated with living in the urban–rural interface. With 988 responses (30%) our results highlight the level of support for different management regimes within different contexts (e.g. controlled burns in conservation areas / in close proximity to one's house), identifying where perceptions differ and what relationships to the landscape motivate the decisions of urban, peri-urban and rural land owners when faced with a significant threat of bushfire in areas of high biodiversity value.

Now one year into our three-year project funded by the Australian Research Council Linkage grant scheme, the research will assist policymakers with their management of public responses to fire risk and conservation issues, and guide the development of community engagement programs to enhance public awareness of the role of fire in maintaining biodiversity. The project is being conducted by the Universities of South Australia and Adelaide in partnership with the South Australian Department of Environment, Water and Natural Resources and two regional Natural Resource Management Boards (Adelaide-Mt Lofty Ranges and Eyre Peninsula).

Fuel load, structure and flammability of weeds as key factors in Australian weed classification frameworks

Dr Felipe Aires

Research Assistant
University of Sydney

PhD

In Australia, weeds continue to have a major impact on the economy, the environment and society by disrupting natural landscapes, agricultural lands, waterways and coastal areas. Weeds have the potential to change fuel load, structure and flammability of the areas they invade by providing the fine fuel necessary for initiation and propagation of fire. Woody weeds can also provide elevated biomass to sustain and move a fire towards the canopy. Considering these elements, it is likely that fire behaviour in weed-infested areas of Eucalypt forest and woodland will be affected, yet information on this topic is scarce. Testing new methodologies to describe fuels and acquiring information on how weeds in Australia can alter fuel loads, structure and flammability is becoming more important as the rate of weed invasion increases and local climates are predicted to change. In general, criteria used to classify weeds according to importance or significance does not take into account the impacts of weeds on fire behaviour. Including information about plant flammability, the alterations to the fuel complex and the fire-related life history of weed species into nationally recognised databases and established frameworks such as the Australian Weeds Strategy could provide land managers with a powerful tool for integrating fire and weed management.

Cumberland Plain vegetation fire and weeds trial

Jonathan Sanders

Area Manager
National Parks & Wildlife Service

BSc (Hons), PhD

Dr E. Charles Morris

Associate Professor
School of Science and Health, University of Western Sydney

BSc PhD

National Parks & Wildlife Service have been working with a range of project partners using an adaptive management approach to investigate how controlled fire may be used to manage African lovegrass and other priority weeds in Cumberland Plain vegetation, and contribute to ecosystem health.

The stakeholders involved in this collaborative project are NSW National Parks & Wildlife Service, the University of Western Sydney, Australian Association of Bush Regenerators, Muru Mittigar Aboriginal Cultural and Education Centre, Nature Conservation Council of NSW and Aquila Ecological Surveys.

Field trials over the past decade and currently underway have yielded results that will help to guide future management of weed-affected remnants of Cumberland Plain vegetation.

Fire is being used in a controlled trial in conjunction with other weed control techniques. Monitoring of these trials allows the effectiveness of different combinations of techniques in restoring ecosystem health in these endangered ecological communities to be compared and understood. The field trial will directly restore the area under investigation and guide future management of weed-impacted remnants of Cumberland Plain through its publication in the 'Prescription guide for the use of fire for managing priority weeds in Cumberland Plain Vegetation'. The guide will also provide a summary of work conducted on these three species in other vegetation communities and detail minimum standards for monitoring regeneration to inform adaptive management in other locations.

SESSION 3: HOW IS FIRE BEING USED FOR RESTORATION?

Fire management business in Australia's tropical savannas

Adjunct Professor
Jeremy Russell-Smith

Research Coordinator
Darwin Centre for Bushfire Research
Charles Darwin University

Australia's tropical savannas comprise the most fire-prone landscapes of a fiery continent. Over the past 120 years European colonization of the tropical savannas has resulted in the replacement of customary seasonally-based fine-grained fire management practices with a boom-and-bust cycle of frequent (1-3 years) extensive wildfires occurring under relatively severe late dry season conditions. Contemporary fire regimes are contributing to the demise of regional biodiversity values with internationally significant impacts on greenhouse gas (GHG) emissions and other ecosystem services. Over the past 15 or so years concerted efforts have been made to develop economically sustainable options for regional land managers by reinstating ecologically conservative regimes through the realization of market-based opportunities. These developments have been inspired since 2005 by the successful implementation of the Western Arnhem Land Fire Abatement (WALFA) project, which operates as a long-term contractual arrangement between local Indigenous land owners and a multinational energy corporate for the purposes of reducing GHG emissions through enhanced landscape fire management. The presentation discusses the current status of commercial fire management initiatives in northern Australia and the potential for their application elsewhere.

Constraints to using fire as a land management tool in the Hunter Valley mining industry

Dan Pederson

Senior Ecologist/Bushfire
Kleinfelder Australia

BSc, GradDip Bushfire Planning and Design, BPAD-A qualified consultant, Enginerring Technician in Institute of Fire Engineers (IFE)

In NSW, land rehabilitation post mining is playing an increasingly important role in landscape functionality. The current day expectations for mine rehabilitated areas are greater than in previous decades, evidenced by past mine closure criteria. For example, there was an expectation that many mined lands approved in the 1980-90s would rehabilitate mined lands to similar functions as pre mining. Often this was simply classified as 'trees over grassland', and no baseline documentation provided.

Today mine rehabilitation is accountable to provide a functional ecosystem that is representative of a natural ecosystem that would be cleared. The Mangoola Coal Project is an ideal example of the community expectations for mining rehabilitation, whereby the consent conditions require the company to rehabilitate the mined lands to specific natural vegetation community types. This places a great deal of emphasis on the rehabilitation planning and design stage.

Further to land rehabilitation, mining and development approvals can also require significant areas of biodiversity offsets. Burn plans are prepared as part of the approval process for these biodiversity offset lands, guiding the land manager to burn at specified periods.

The rehabilitation and biodiversity offset lands across the Hunter Valley is typically over current and former grasslands and woody vegetated lands. These grasslands and remnant forests/woodlands are bushfire prone vegetation. The evolution of these natural communities has been shaped by specified fire regimes, from pre-human settlement through Aboriginal land management practices, to current day fire management practices.

This presentation explores the implications for fire regimes as a land restoration tool, and links to land rehabilitation and biodiversity offsetting.

This presentation also identifies key issues constraining the use of fire as a land management tool, based on experience from mine land managers, including the lack of acceptance of fire as a management tool, and highlighting possible solutions.

Operational Planning and Logistics:
Introducing fire in a landscape

Robert Strauch

Bushfire Officer
Fire and Rescue NSW
(Operational Capability - Specialised Operations - Bushfire Section)

Prescribed burning as a land management tool has been used by Aboriginal people for thousands of years. Europeans first witnessed and documented introduced fire on Australia's east coast on 28th May 1788 at Sydney's North Head. Since that time introduced fire in the landscape poses many challenges for land management agencies and Firefighting Authorities.

Introducing prescribed fire in a safe manner to urban and peri-urban bushland areas requires rigorous assessment, planning and managed operational execution. The planning process, resource allocation and operational logistics required to undertaken prescribed burning will often be time intensive and require considerable dedication of Firefighting Authorities' finite resources. There are many hazards and risk associated with introducing fire into the Landscape, and those risks need to be assessed and managed and at times the requirement to manage those identified risks may outweigh the desired benefit.

Prescribed fire is not the panacea to manage bushfire risk; however it is an important tool in a holistic structured mitigation strategy. Using fire to manage vegetation fuel loads has a proven ability to reduce the vulnerability of built assets to the effects of bushfire impact, however the effectiveness of this is only for a short period of time – a few years at best.

The knowledge and skills that firefighting and land management agencies have gained over decades of using prescribed fire as a risk mitigation strategy can be transferred to the use of fire as an ecological restoration tool. This is occurring at the very place where introduced fire was first observed in Australia.

Fire as a restoration tool is currently being used and researched in the recovery of the Endangered Ecological Community Eastern Suburbs Banksia Scrub at North Head. This paper will look at the logistical planning and operational resourcing Fire & Rescue NSW was required to implement to support the use of introduced fire as both a hazard reduction and a restoration tool in the landscape of North Head in September 2012.

From Doom to Bloom:
Ecological burning in an urban bushland reserve

Amelia Jones

Bushland Scientist – Fire
Hornsby Shire Council

BSc, GradCert Bushfire Management, Cert II (Bushland Regeneration)

This is the story of an ecological burn at Mount Scout Hall - a small urban bushland reserve at Mount Colah in Hornsby local government area. The burn aimed to support local volunteer activities at an adjacent Bushcare site, increase the representation of above ground biodiversity and reduce fuel hazard. It was undertaken in an area of under one hectare within degraded Bloodwood-Scribbly Gum Woodland and a senescing stand of Allocassuarina littoralis. Fuel structure and loading were deliberately altered to facilitate a diversity of burn intensity and coverage. This strategy was designed to maximise post burn environments and native plant germination. A degree of concern (and in some cases pessimism) regarding preparation activities and burning outcomes was expressed by the community.

The burn was undertaken by Fire and Rescue NSW following consultation on intended ecological outcomes. Burn operations delivered a mosaic of intensity and coverage that successfully promoted a significant increase in plant diversity, whilst treating the bushfire hazard. Comparisons between hand bush regeneration activity (extending over ten years) and areas of high and low intensity burn can be made via examination of sites within the reserve. The positive regeneration outcomes exceeded expectations and turned burning activities from 'doom to bloom' while highlighting the challenges of overcoming perceptions about burning and bushland damage.

This experience demonstrated a need to strengthen positive trust relationships and engage more closely with groups and individuals who have connections to a site, or who are less experienced with ecological burning. It showed that concerns may be exacerbated by social investment in a site, degree of personal experience and expectations relating to site treatment and outcomes.

Challenges of resuscitating a fuel management program in a complex regulatory framework

Mick Wilson

Protection Forester
Forestry Corporation of NSW

BSc (Forestry)

This presentation is aimed at highlighting the challenges of resuscitating a fuel management programme within a complex regulatory framework.

We will present case studies of burns which have either been conducted or are being planned, with objectives ranging from asset protection and silviculture to ecological restoration and protection. These case studies of Yarrat, , Mt Boss, Broken Bago, and Cogo State Forests form about a quarter of FCNSW's Mid North Coast burning program which is about 20,000ha.

The presentation discusses our experiences with planning and implementing fire management under the Integrated Forestry Operations Approval since 1999 and how the Bush Fire Environmental Assessment Code has either changed, eased or in some circumstances complicated the ability of land managers to a) protect life and property, b) achieve enhanced ecological outcomes, and, more importantly these days c) comply!

We will discuss historic trends in fire management within the forests around Wauchope and how these have been influenced by the social, political and economic cycles of the last 100 years or so.

We have developed a range of tools and strategies which aid us in planning an ambitious programme. We will demonstrate how we utilise LiDAR to support decision making in fire management, from identifying suitable containment lines in heavily overgrown forests, to high value forest regeneration, and areas with high elevated fuel hazard. We will also detail how we cater for a large range of threatened species and their habitats, and how we measure compliance and restoration.

Lastly we will dabble in sociology in an attempt to generate some debate about society's expectations of fire managers, and how, as fire managers we can better educate society about fire's place in the landscape.

The State Mine Fire, October 2013

Patterns of vegetation recovery

Roger Lembit

Principal Ecologist
Gingra Ecological Surveys

BScAgr

The State Mine Fire burnt through an extensive area including sections of Blue Mountains National Park, part of the Greater Blue Mountains World Heritage Area. The fire-ground has been subject to 3 intense wildfires in 33 years with fire intervals of 18 and 16 years. Monitoring of fire impacts and vegetation response in heath, pagoda and swamp habitats has been conducted since before the December 1997 fire. These habitats support rare or threatened plant species and upper Blue Mountains endemics, as well as endangered ecological communities.

The response of vegetation had differed depending on fire intensity, the nature of habitat affected and the fire response characteristics of the plant species within each habitat type.

The weather patterns following the fire are also important in terms of soil erosion and the extent to which organic sediments are affected in the longer term.

Understanding these responses can assist in determining the need for restoration works and the mix of suitable species for revegetation.

Indigenous Grassy Pathways:

Unpacking how they underpinned regional biodiversity

Dr Malcolm Ridges

Senior Scientist: Socioeconomic heritage & Aboriginal NRM
NSW Office of Environment and Heritage

BSc Hons, PhD

Recent work in northeast NSW and southeast Queensland has identified that naturally-occurring open grasslands are a critical habitat for a variety of species, including the Eastern Bristlebird. We also know that these landscapes are endangered because of their dependence on high frequency burning regimes and these have not been maintained for a long time since European settlement. The solution to revitalising these landscapes, and their dependent species, is the reintroduction of fire. But the challenge is how fire reintroduction can be coordinated across entire landscapes.

This talk reports on scoping work undertaken to establish the science and implementation mechanisms necessary for the reintroduction of fire to the management of grassy systems at a regional scale. The scoping exercised focused on the following questions:

1. traditional cultural burning practices and the evidence and role of indigenous burning in maintaining healthy grassy ecosystems throughout north-eastern NSW/south-east Queensland
2. documenting and filling knowledge gaps on the fire regime requirements of the grassy ecosystems of interest
3. key knowledge gaps for threatened species dependent on grassy ecosystems in the region that are suffering from a lack of fire, and where this is contributing to their decline
4. active reintroduction of more frequent fire into the landscape in areas that traditionally had more fire, in collaboration with indigenous/cultural burning practices.

We report in this paper on how the solution to reintroducing fire to grassy ecosystems in this region is through revitalising traditional Aboriginal burning practices; partnering with Aboriginal groups active and experienced in this; harnessing networks established through the Firesticks network (www.firesticks.org.au) and promoting the benefits of partnering and shared learning about the use of fire in managing natural grasslands. The scoping project is unique in its findings about the shared interest in integrating traditional practices with science amongst a diverse range of stakeholders.

Reconciliation in the grasslands

Re-introducing burning to Themeda Grass Headland EEC's

Tom Dexter

Environment & Sustainability Officer
Eurobodalla Shire Council

BMusic (Hon), GradDipEd, Cert III Horticulture

In a State first, Eurobodalla Shire Council implemented annual fire management on three Themeda Grassland on Seacliffs and Coastal Headland Endangered Ecological Communities (EEC's). This project provides a significant case study to other land managers of this particular EEC. Baseline data (2012) and repeat annual data has been captured to monitor the effects on both native grassland species invigoration and effects on exotic species. The botanical results have so far shown this to be the most environmentally sound approach to Themeda Grass Headland management. Carefully timed annual burning has reduced the abundance of annual exotic grasses and invigorated native grassland growth including the fragile herbaceous components of this EEC.

Like much of Australia's flora, the existence of Themeda Grass Headlands is uniquely tied to indigenous past practices. Generally, grasslands have had evolutionary guidance by the external influence of fire keeping many headlands in an open 'grassy' state. This was for practical and cultural reasons. However from a scientific standpoint it created a highly specialised grassland community. In the absence of fire Endangered Themeda Grass Headlands are often invaded by native and exotic shrubs.

Slashing keeps the grassland in an open state however botanical evidence proves that slashing is an unacceptable management practice for a variety of reasons. The return to burning is also a positive step toward reconciliation at a grass roots level with traditional management endorsed by the Koori community. These actions display respect for indigenous knowledge and empower the Koori community with decision making capacity. The project also functions as a successful cultural interface into the future. The return to traditional management techniques is vital for the long-term protection and conservation of these grass headlands. It also provides the necessary data for other public land managers to adopt this practice State wide.

Integrated fire and weed management for healthy ecosystems

Mark Graham

Ecologist
Hotspots Fire Project
Nature Conservation Council of NSW

BAppSc (Environmental Resource Management)

There is growing interest in integrating fire and weed management strategies for better restoration outcomes. Land managers with limited time and budgets are trialling combinations of weed control and fire management practices to achieve cost-effective ecosystem restoration, reduction of risk and to limit impacts of inappropriate fire regimes. In collaboration with many partners the Nature Conservation Council's 'Healthy Ecosystems Program' is trialling new strategies for fire and weed management across NSW.

The 'Upper Coldstream Biodiversity Project' is a partnership between NCC and the Clarence Environment Centre involving 40 landholders across the eastern Clarence Valley. The project is working to reduce the impacts of weeds, wildfire and pest animals on nationally significant ecosystems. Recent trials of direct-seeding of Acacia floribunda into small scale burns within exotic grassland dominated by whiskey grass (*Andropogon virginicus*) show great promise for cost-effectively establishing forest on degraded lands.

The 'Firesticks Project' is supporting Minyumai Indigenous Protected Area to manage exotic pigeon grass (*Setaria sphacelata*) through establishing a trial to determine the optimum method of control and replacement with native vegetation. It forms a significant part of Minyumai's fire management strategy. Knowledge gained will help Minyumai to better manage weeds, restore ecosystems and reduce fuel hazards.

The 'Bushfire Program' is working with the NSW NPWS and other partners to explore integrated fire and weed management techniques for African lovegrass (*Eragrostis curvula*) and lantana (*Lantana camara*) in Cumberland Plain vegetation. The 'Hotspots Project' team have partnered with both the Hunter and Greater Sydney LLS to support landholders to combine fire and weed management activities for better environmental restoration outcomes. Over the coming year Hotspots will be developing a literature review investigating the interactions of fire and weeds and their management in NSW. It will bring together peer-reviewed material, grey literature and case studies. Hotspots seeks any practical experiences of integrated fire and weed management. This is an opportunity for the sharing of knowledge and experienes of fire and weed management.

Cooperation to protect communities, koalas and long-nosed potoroos

Phil Paterson

Environment Officer (Hotspots)
NSW Rural Fire Service

AdvDipSc (Horticultural Science)

Whilst much of our native vegetation has adapted to bush fire many animals face greater challenges, particularly with significantly reduced areas of habitat and changing fire regimes. Fire is a key threatening process for many fauna species listed as Vulnerable in NSW including koalas (*Phascolarctos cinereus*) and long-nosed potoroos (*Potorous tridactylus*).

In a collaborative community engagement initiative near Bermagui on the Far South Coast of NSW facilitators from the "Hotspots Fire Project" (NSW Rural Fire Service and the Nature Conservation Council of NSW) teamed up with project managers from Local Land Services, National Parks and Wildlife Service and the Office of Environment & Heritage to deliver a series of workshops and related community activities. The workshop series aimed to support local residents to develop bush fire protection strategies for their properties whilst contributing to management plans protecting local populations of koalas and long-nosed potoroos.

From this approach some definitive and quantifiable outcomes have developed for both the management of those threatened fauna species and bush fire risk. The project delivery team helped develop an increased sense of community ownership by training local volunteer experts (Hotspots Hotshots) to assist with the workshop delivery and creating "community hubs" or "Hotspots Cafes" to support follow-up activities. Community members have actively participated in the development of threated species Plans of Management and become involved in surveying and monitoring of koalas and potoroos. They have also developed individual property management and contributed to detailed fire management plans for their geographic locations. Their efforts are coordinated through a local "Hotshot" while communicating directly with the local Rural Fire Service District.

This project demonstrates the value of connecting with people on points of local environmental interest to strengthen planning processes and fire networks for the protection of communities and the local environment.

Prescribed burning provides site restoration opportunities via weed management in the Mount Lofty Ranges

Andrew Sheath

Fire Management Officer
Department of Environment Water and Natural Resources - South Australia

Prescribed burning is an important tool in managing fuels in the urban fringe of the Mount Lofty Ranges and hills of Adelaide. These areas are typically degraded by weeds and often have a history of disturbance which provides challenges around weed management when burning these sites. Burning can exacerbate weed issues but also provide opportunities to manage weeds to achieve habitat restoration outcomes.

In the greater Adelaide area we use a combination of pre-burn mapping and pre-burn weed treatment to maximise the efficiency and effectiveness of post-burn weed control. We also consider the most appropriate burn timing, frequency and intensity required to gain the upper hand in managing weed infestations.

In this presentation I will demonstrate our electronic weed mapping procedure and provide examples of where the carefully timed treatment of fire responsive weeds has improved the condition of prescribed burn sites. I will also show how we have used burning to manage less fire responsive weeds by carrying out pre-burn treatment.

Supporting and communicating applied subtropical fire research

Dr Sam Lloyd

Manager
SE Queensland Fire and Biodiversity Consortium

PhD, BSc (Hons)

South East Queensland (SEQ) land managers and policy makers face challenges in the application of future fire regimes that are influenced by a changing climate, bushland fragmentation, wildfire interface zones, and weed incursions. There are opportunities for an increase in applied fire research within the SEQ bioregion.

A lot of work has been completed in the field of fire ecology, fire and restoration, and fire management, yet there are still knowledge gaps within the subtropical environments.

SEQ Fire and Biodiversity Consortium (SEQFBC) aims to attract and assist researchers by providing annual scholarship programs for SEQ based fire ecology and fire management research. The SEQFBC Student Scholarship Program aims to provide financial assistance and research support to an honours, masters or PhD student undertaking research into applied fire ecology or fire management in the SEQ bioregion.

The SEQFBC Scholarship program has been in operation for over 2 years and since its inception has funded, supported and helped to disseminated information from the following research projects:

- Small mammal and reptile responses to contemporary fire regimes in eucalypt forests of South East Queensland (D Virkki Griffith University PhD Student)
- Remotely sensed burnt area analysis and validation: A procedure to effectively map spatiotemporal patchiness and severity of fire to guide appropriate ecological management (B Parker, University of the Sunshine Coast (USC) Honours Student)
- Comparing impacts of wildfire and prescribed burning on woody understorey composition in a dry open forest (R Waldron, USC Honours Student).

This presentation will explore the importance of supporting regional fire applied research, the opportunities for dissemination of the key fire applied research findings to landholders and policy makers, and management implications drawn from this research.

Blue Mountains Fire Sticks

Dennis (Den) Barber

Blue Mountains Fire Sticks

BAppSc (Parks, Recreation & Heritage)
Blue Mountains Fire Sticks Holder

This paper aims to share with you the Aboriginal story of fire and how Blue Mountains Fire Sticks (BMFS) strongly believe that cultural fire can help us to care for Country and for ourselves as people. In doing so, we don't pretend to have all the answers to the problems that bushfires present or to suggest that cultural fire is the panacea for the many multi layered issues that this conference hopes to address. However, we do believe that considering a community driven model that is founded on Aboriginal culture, knowledge and traditional practice has multi layered benefits for both Country and people. This presentation explores what the term 'cultural fire' actually means and how it may be incorporated into contemporary land and bushfire management practices.

The paper will explore the more recently known history of bushfire in the Blue Mountains and will challenge perceived notions of how the Blue Mountains bush should look from traditional and contemporary viewpoints. The origins, aims, objectives and aspirations of BMFS will be presented and conference delegates will be asked to keep an open mind to how Firesticks might be used.

Finally, BMFS will offer a broader perspective on cultural fire that has positive outcomes not only for the environment but for Aboriginal social wellbeing and economic advancement. An opportunity exists for collaboration between traditional and scientific knowledge as does the relationship between Aboriginal and non-Aboriginal people. Whilst some may argue that Aboriginal knowledge relating to traditional use of fire in the Blue Mountains has been lost since European colonisation, there exists transferrable cultural knowledge from other parts of Australia where the impacts have been less severe. It is the fundamental principles of using cultural fire that allow consideration for re-introducing this practice into a variety of landscapes including the Blue Mountains.

Why do we burn?

Key themes from cultural burning research in northern NSW

Dr Miles Holmes

Consulting Anthropologist, Honorary Research Fellow, University of Queensland Beit Holmes and Assoc and University of Queensland

BComm, BSocSci (Hons), PhD

Oliver Costello

Firesticks Project Coordinator,
Nature Conservation Council of NSW

Aboriginal Project Officer,
NSW National Parks and Wildlife Service

BArts (Adult Education and Community Management)

Across many areas of NSW Aboriginal people are involved in cultural burning and fire management activities on properties they are managing or have cultural connections with. It is recognised that Aboriginal people's have different cultural values and motivations when approaching these activities and an understanding of these values is important for all involved in fire and land management. Over the past two years the Nature Conservation Council and supporting partners of the Firesticks project have worked with a range of Aboriginal people, reflecting on the question "Why do we burn?"

This paper presents some of the preliminary findings of this exploration of cultural burning with Aboriginal people managing conservation lands in northern NSW. The work draws on themes that emerged during discussions in a series of Firesticks workshops. In 2013 we held workshops at Minyumai (Bandjalang country), Boorabee Willows (Ngoorabul country) and Wattle Ridge (Banbai Country); bringing together Aboriginal Rangers, IPA coordinators, elders, staff from OEH cultural heritage, and Victor Steffensen (TKRP) to discuss cultural burning and cultural burning techniques. As part of the program participants were asked to reflect on the themes identified at previous Firesticks workshops, add any further ideas and then indicate the most significant themes. The importance of themes such as 'responsibility to look after country', 'the cycle of healthy people and healthy country', 'to manage important species and habitats', and to 'protect against wildfire' demonstrate that the motivations for burning are diverse, spanning the social, cultural, economic and natural contexts. Reflection on these findings asks us to consider the value in moving beyond a sole focus on hazard reduction and ecological outcomes by creating pathways for burns and other fire management activities that strengthen cultural identity, support natural and cultural values, develop confidence and provide meaningful learning opportunities.

POSTERS

Rabbits! A major challenge to the use of fire as a restoration tool

Dr Judy Lambert

Dr Geoff Lambert

Volunteers

North Head Sanctuary Foundation

(Judy): BSc(Hons), PhD, GradDipEnvManag, GradDipBusAdmin

Fire is an important factor in the ecology of many plant communities. However, concerns about fire risk in urban and peri-urban bushland have seen strenuous efforts to exclude wildfire from such areas.

In the absence of fire, species dependent on fire for seedling recruitment may become locally extinct, changing the character and composition of the ecological communities in which they exist.

The nationally endangered Eastern Suburbs Banksia Scrub (ESBS) coastal heathland is one such community. After decades of infrequent fire, hazard reduction burns conducted on 6 September 2012 provided an opportunity to study the benefits of fire to ESBS restoration. Within 12 months of the burns, species richness and diversity had increased over pre-fire levels.

North Head harbours high levels of rabbits. In order to test the impacts of rabbit grazing on the regenerating ESBS, simply designed wire-netting fences were erected immediately post-fire and the species richness, diversity and ground cover within fenced plots and external to them were studied at regular intervals.

Rabbit numbers were assessed at approximately monthly intervals using scat counts and spotlighting. The numbers present varied over time, but were generally as much as tenfold higher than those reported to have adverse impacts on seedling survival in other ecological communities.

Floristic richness, diversity, ground cover and mean plant height were all adversely affected in unfenced compared with fenced plots.

The starkness of the results suggests that where regeneration burns are carried out, a rabbit eradication program should precede the fire. Where possible, the burn area should be rabbit-proofed immediately after the burn. However, this approach presents a management dilemma where the ecological community being protected also provides habitat for other species. This is an important consideration where the other species involved is an endangered species or population, such as the Long-nosed Bandicoot population at North Head.

Native grass restoration through the implementation of Traditional Burning techniques in the rangelands of western New South Wales.

Dr Milton Lewis

Senior Land Services Project Officer Central Tablelands Local Land Services

PhD (ecology)

The rangelands of western New South Wales consist of extensive areas dominated by mallee woodlands punctuated by small to moderate sized open grasslands (5 – 100 ha). These grasslands are heavily impacted upon by invasive weeds and grazing by feral goats resulting in a dramatic change in species composition. The predominant fire regime in this region now consists of large uncontrolled hot fires every 20 or more years apart. Discussions with local Indigenous land groups and senior resident non-Indigenous farmers suggests that fire of a greater frequency and lower intensity may be of value in "healing sick country" and restoring the productivity of these once very important grazing leases. The former Lachlan Catchment Management Authority commenced trials in 2011 to investigate the role that Indigenous traditional cool burning techniques might play in the restoration of these grasslands through the enhancement of native grass productivity and reduced competition by weed species. As part of this investigation experimental burns were implemented using a paired repeated measures design on the Indigenous owned property of 'Mawonga' south of Cobar in western New South Wales. The floristic composition of these sites was monitored for change following a cool burn in late spring 2012. Initial data indicated that these plots were dominated by a wide variety of weeds with very few native grasses. Control plots without burning showed no significant change in plant density or species composition over the monitoring period. Plots that were burnt showed a significant loss of weed species and reduced weed plant density. Several native grasses (*Enneapogon ssp.*, *Aristida ssp.*,) responded positively to the burn treatment with increased tussock density and seeding spike number. Grass species such as *Stipa scabra* and Hairy Panic *Panicum effusum* responded poorly with plants either dying or not producing new growth for over 12 months.

Trial use of ecological burning to improve habitat for the endangered Mount Lofty Ranges Southern Emu-wren

Marcus Pickett

Ornithologist
Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Program
Conservation Council of SA

BSc

The Mount Lofty Ranges Southern Emu-wren (*Stipiturus malachurus intermedius*) is a small Endangered (EPBC Act) passerine with a very restricted distribution in swamp and dry-heath habitats in the Mount Lofty Ranges–Fleurieu Peninsula region of South Australia. It has been the focus of a threatened species recovery program administered by the Conservation Council of South Australia since 1993, but has continued to decline and only around 16 local populations remain, comprising an estimated total 160–334 individuals. Range contraction has been caused primarily by habitat loss due to extensive clearance of native vegetation for agricultural development, with wildfire, population isolation, small population size, stock grazing, (autogenic) vegetation succession and climate change threatening remaining populations. Succession in relatively long-unburnt habitats is increasingly viewed as a major threat to remaining populations, due to major shifts (i.e. simplification) in vegetation structure and floristic composition/dominance and the consequent negative effects on productivity and carrying capacity. Population monitoring suggests that the MLR Southern Emu-wren may prefer early- to mid-successional (post-fire) vegetation, therefore actively managing succession (habitat-state manipulation) using ecological (prescribed) burning is being trialled in late-succession, relatively poor quality and vacant to sparsely occupied habitat as a means of restoring or improving habitat carrying capacity and thereby increasing emu-wren distribution and abundance. This poster provides examples of recent trials and includes brief information on operational methods, resourcing, monitoring and challenges met.

Short-term predictions of smoke and heat emissions from prescribed fires in south-east Australia

Sean Walsh

Research Fellow (Bushfire Risk Assessment)
University of Melbourne

BEng, MEnvSc

Prescribed fire is an essential tool for managing forest fuels to mitigate wildfire risks. However, the smoke produced can affect human health and wellbeing, as well as sensitive crops such as grape vines. These impacts can be minimised by managing the timing of burning to seek conditions that disperse smoke away from vulnerable areas. However, this is only possible if there are tools that can accurately predict the emissions and dispersion of smoke from prescribed fires. Although we have dispersion modelling tools, there are no tools for calculating smoke emission rates for burns conducted in south-east Australia.

To address this gap, a model is proposed for short-term prediction of smoke and heat emissions from prescribed fires, over the typical period for which weather forecasts are available (up to 7 days ahead). Heat release is included as this determines the buoyancy of the smoke plume which is important for dispersion calculations. The model will be evaluated using experimental data from a number of burn sites in Victoria, Australia. Model sensitivity to weather forecasts and other key input data is examined.

This work forms part of a larger collaborative effort which aims to provide fire managers with decision support tools for smoke management, using the best available science to support short-term impact predictions under a range of realistic fire scenarios.

Sharing Traditional Fire Knowledge past present and future

Richard McTernan

Indigenous Liaison Officer North East Catchment management Authority

BAppSc (Parks Recreation and Heritage)

This film highlights the worked undertaken with local Traditional owners groups in the north east of Victoria delivering Caring for Our Country and National Landcare Program outcomes under the Federally funded Endangered Grassy Box Gum Woodlands programme.

This project undertaken over the last 7 years has involved the recording and using of traditional ecological knowledge to assist knowledge transfer to Indigenous youth, engage landholders and build partnerships.

Through the engagement of traditional fire knowledge holders over the last two years, the traditional use of fire has created great interest with Landcare groups, the Country Fire Authority and Traditional Owners across the state of Victoria.

Speaker Biographies

1. Professor Lesley Hughes

Pro Vice-Chancellor (Research Integrity and Development)
Distinguished Professor of Biology
Councillor with Climate Council of Australia

Macquarie University
Climate Council of Australia
BSc (Hons), PhD

Lesley Hughes is a Distinguished Professor in the Department of Biological Sciences and Pro Vice-Chancellor (Research Integrity and Development) at Macquarie University. She is an ecologist with a long-standing research interest in the impacts of climate change on species and ecosystems. She is a former Lead Author for the Intergovernmental Panel on Climate Change (IPCC) 4th and 5th Assessment Reports and a former federal Climate Commissioner. She is now a Councillor with the Climate Councillor of Australia, a Director of World Wildlife Fund Australia, and a member of the Wentworth Group of Concerned Scientists.

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2. Dr Tein McDonald

Principal
Tein McDonald & Associates
Australian Association of Bush Regenerators
PhD, Grad Dip Env Studs

Tein combines a background in ecological restoration (as a bush regeneration practitioner, teacher and journal editor) with involvement as a consultant restoration planner and committee work with restoration organisations. One of her current projects involves assisting with the development of a set of national 'Principles and Standards for the Practice of Ecological Restoration' for the Society for Ecological Restoration Australasia and so is keenly interested in the interface between management and restoration.

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3. Bruce Pascoe

Writer, editor, and anthologist
HDT, BEd

Bruce Pascoe is a Bunurong, Tasmanian and Yuin man born in Melbourne. He is a member of the Wathaurong Aboriginal Co-operative of southern Victoria and has been the director of the Australian Studies Project for the Commonwealth Schools Commission. Bruce has had a varied career as a teacher, fisherman, barman, fencing contractor, lecturer, Aboriginal language researcher, archaeological site worker and editor. He is an award winning Australian writer of fiction and non-fiction. His novel, Fog, won the Prime Minister's Award for YA fiction in 2013.

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4. Michelle Hines

Senior Strategic Land Services Officer
Central Tablelands Local Land Services
BEnvSci (Hons)*

Neil Ingram

Gaambuwananha Ngurambang Team Mentor Support
Gaambuwananha Ngurambang Team, Orange LALC

Authors: Neil Ingram, Uncle Pat French, Greg Ingram, Terry McLean, John Gerard, Doug Sutherland, Brian Turnbull, Peter Moore, Michelle Hines, Milton Lewis and Larry Towney

Central Tablelands LLS partnered with the Gaambuwananha Ngurambang (GN) team from Orange LALC to assist in returning traditional land management practises into the region. The partners have been working together for the last 3 years on properties managed by the Orange LALC to investigate the role traditional burning may have in improving biodiversity and reviving cultural practices. Their purpose is both in restoration to improve biodiversity outcomes and to regenerate cultural values in Indigenous and non-Indigenous communities. A substantial component is the implementation of traditional burning and the role this technique may have in future land management.

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5. Andy Baker

Vegetation Ecologist
Wildsite Ecological Services
BAppSc(Hons)

Andy Baker is Managing Director of Wildsite Ecological Services. He is a vegetation ecologist and specialises in restoration and bushfire ecology. Andy established an ecological consultancy in 1997, following 10 years as an ecological restoration practitioner. Extensive management and restoration experience in the coastal vegetation of the NSW north coast has provided Andy with unique insights into the process of vegetation change in the absence of fire. Andy's recent research at Southern Cross University explores the extent of fire-exclusion on NSW Far North Coast, and the current disconnect between fire-ecology science and the management of fire-dependent ecosystems.

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6. Dr Naomi Rea

Plant Ecologist
Mulga Data Services
BScHons, PhD (Plant Ecology)

Naomi has more than 20 years experience as a plant ecologist undertaking research and on-ground land and water management. Working on a Critically Endangered Ecosystem with Conservation Council South Australia (where burning was used as a management tool) and as a landholder in a fire prone landscape, she has contributed to burning policies and guidelines and is a member of the Adelaide and Mount Lofty Ranges Bushfire Management Committee. Over 15 years in the Northern Territory she witnessed changes in burning practises and ecological effects and covered bushfire management in the teaching of the Bachelor of Cultural and Natural Resource Management.

7. Dr Paul Gibson Roy

Senior Ecologist
Greening Australia
PhD

Paul has been involved in research focusing on the restoration of wildflower grasslands and grassy woodlands since 1998. In 2004 he instigated the Victorian 'Grassy Groundcover Research Project' as a multi-regional research project to develop methods for reconstructing species-rich herbaceous communities. He is now based in Sydney applying these techniques to the restoration of Cumberland Plain grassy woodland.

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8. Dr Elizabeth Tasker

Principal Scientist Fire Ecology
Office of Environment & Heritage
BSc Hons, PhD (fire ecology)

Dr Liz Tasker is Principal Scientist Fire Ecology with the NSW Office of Environment & Heritage. She has worked as a fire ecologist for more than 15 years with Office of Environment and Heritage, and completed her PhD in fire ecology at the University of Sydney. Her research interests focus on fire regimes and their effects on animals and plants, and integration of this knowledge into fire management.

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9. Jamie Bertram

Community Safety Officer
NSW Rural Fire Service
DipMant (Emergency Management, Incident Management Planning, Training & Assessment)
Volunteer Leaders Program with Australian Institute of Police

Jamie worked with the Forestry Commission / State Forests / Forests NSW from 1992 – 2009, the last 10 years working as a field ecologist conducting pre-harvest surveys within the north-east Region of NSW. He joined the Volunteer Bush Fire Brigade in Karangi west of Coffs Harbour in 1988 and held the positions of fire fighter, Deputy Captain, Snr Deputy Captain and as Captain for 13 years. He was Volunteer Group Captain for the Western section of the Coffs Harbour Shire for 6 years. Jamie began working with the NSW Rural Fire Service in 2009 in his current position as Community Safety Officer for the Mid-north Coast which takes in the Coffs Harbour and Bellingen Shires.

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10. Emma Burgess

PhD Student
Landscape Ecology and Conservation Group, University of Queensland
BSc MSc

Emma is nearing the end of her PhD at the University of Queensland, which in partnership with Bush Heritage Australia aims to test the assumption that 'pyrodiversity begets biodiversity' by focusing beyond the patch-scale and using woody vegetation and birds as biodiversity surrogates.

11. Justine Leahy

Biodiversity Advisor
Country Fire Authority (Victoria)
BAppSc, Dip Bushfire Management

Justine has worked in Victorian and New South Wales government conservation and fire agencies for over 15 years. Her focus has been on native vegetation conservation and retention, land use planning in bushfire-prone areas, and in recent years, providing biodiversity advice and support to the Country Fire Authority (CFA) vegetation management and planned burning program. Her role with CFA offers opportunities for the development and implementation of projects that combine environmental benefits and strategic fuel reduction through the use of planned burning.

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12. Inspector David Curry

Senior Project Officer
NSW Rural Fire Service
DipMn, Cert IV TAE

Dave comes from a rural background and has worked on properties in Western Qld and NSW up to station manager and mustering pilot. He also worked for Australia's two largest pastoral houses, Elders and Landmark as Branch Manager. Dave was a volunteer of the NSW Rural Fire Service for 30 years before becoming a salaried officer 5 years ago.

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13. Justin Mallee

Koala Connections Project Officer
Tweed and Byron Shire Councils
BEnvSc

Justin has lived in the Northern Rivers since the late 1990's and has enjoyed the challenge of learning about all the plants and critters that call this biodiversity hotspot home. During the last 15 years he has studied agriculture and horticulture at TAFE and Environmental Science at Southern Cross University. He has worked in the rural community in roles ranging from organic farming to nursery and property management. More recently Justin has worked in land conservation, bush regeneration and biodiversity management in the local area. He is currently working with the Tweed Byron Koala Connections project and managing the Tyagarah Regeneration Trial.

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14. Dr Emily Moskwa

Postdoctoral Researcher
The University of Adelaide and the University of South Australia
PhdEnvSt, BEnvSt (Honours)

Emily is a Postdoctoral Researcher working on an Australian Research Council Linkage grant being undertaken by the Universities of South Australia and Adelaide in partnership with the South Australian Department of Environment, Water and Natural Resources and two Natural Resource Management Boards (Adelaide-Mt Lofty Ranges and Eyre Peninsula). Her research examines stakeholder perceptions of vegetation management in areas of high bushfire risk and explores the challenges and implications for policy, planning and community engagement. Emily is presenting on behalf of co-authors Dr Buy Robinson, Dr Delene Weber and Dr Douglas Bardsley

15. Dr Felipe Aires

Research Assistant
University of Sydney
PhD

Felipe Aires has a Bachelor and Teaching degree in Biological Sciences from the University of Brasilia in Brazil. He also obtained a Masters in Ecology investigating the impact of invasive grasses on fire behaviour in the savannas of central Brazil. In Australia he has completed his PhD at the University of Sydney studying the effects of woody weeds on fuels and fire behaviour in Eastern Australian forests and woodlands.

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16. Jonathan Sanders

Area Manager
National Parks & Wildlife Service
BSc (Hons), PhD

Jonathan Sanders trained as a Botanist, specialising in Plant Ecology. He has worked for the NSW NPWS for around three decades, and maintains an active interest in fire and its impact on native and introduced species. For the past 15 years he has been involved with Dr Charles Morris (UWS) in a series of research projects into fire ecology and management in the Cumberland Plain, mainly through adaptive management trials in disturbed areas. His major interest is restoration of native ecosystems, focussing on the Cumberland Plain.

Associate Professor E. Charles Morris

Associate Professor
School of Science and Health, University of Western Sydney.
BSc PhD

Located on the Hawkesbury Campus of UWS, Charles Morris and his students have been active in research on Cumberland Plain Woodland (CPW) for the last 15 years. Topics have included; suitable fire regimes for CPW, use of fire to maintain native plant biodiversity in cleared areas that once supported CPW in Scheyville National Park; and restoration techniques for CPW, including carbon addition to the soil (reverse fertilisation) and seed addition.

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17. Adjunct Professor Jeremy Russell-Smith

Research Coordinator
Darwin Centre for Bushfire Research
Charles Darwin University

Jeremy Russell-Smith is Research Coordinator for Darwin Centre for Bushfire Research, Charles Darwin University. He has over 30 years ecological fire research and management experience in north Australian savannas. Over the past 20 years much of that research effort has involved looking for economic solutions to support more sustainable land management outcomes, especially for Indigenous people.

18. Dan Pederson

Senior Ecologist/Bushfire
Kleinfelder Australia
BSc, GradDip Bushfire Planning and Design, BPAD-A qualified consultant, Enginerring Technician in Institute of Fire Engineers (IFE)

Dan Pedersen has been a Botanist / Bushfire consultant for 11 years and has worked across NSW, Qld, NT, Vic and SA as both a Senior Botanist and principal Bushfire Consultant. Dan was a director and owner of a consultancy firm Ecobiological prior to its acquisition in 2011 by Kleinfelder.

Dan has experience in broad scale vegetation mapping, threatened flora surveys and mapping and vegetation rehabilitation planning. He has acquired extensive experience in Bushfire consulting, having been involved in large scale projects for the Government, gas/mining and land developers. Dan's expertise allows him to identify onsite fire hazards and assets, and relate the impacts and bushfire management to ecological issues.

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19. Robert Strauch

Bushfire Officer
Fire and Rescue NSW
(Operational Capability - Specialised Operations - Bushfire Section)

Robert has been professional Firefighter for 18 years, formerly in Victoria and now in NSW as a Senior Firefighter with Fire and Rescue NSW. He is in the final stages of completing a Bachelor of Emergency Management at Charles Sturt University, and intends on progressing to his Masters. Robert was a member of the Bushfire CRC 2009 Victorian Bushfire Research Task Force. In the last 7 years Robert has been a Bushfire Officer supporting FRNSW Operational Command and Land Management agencies to manage and mitigate the hazards from and risk of bushfire impact. A key strategy of this is to increase the communities' resilience to coexist in the bushland urban interface of Sydney.

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20. Amelia Jones

Bushland Scientist – Fire
Hornsby Shire Council
BSc, GradCert Bushfire Management, Cert II (Bushland Regeneration)

Amelia commenced working in the field of natural resource management as a bush regenerator while completing her undergraduate studies. Her initial training in fire suppression was with the NSW RFS as a volunteer and she has also worked as a volunteer and professional bush regenerator. Through professional roles as Ranger with Forests NSW and the NSW NPWS she has gained experience with environmental education, land management, fire fighting and fire management. Amelia has also worked within local government over the last 8 years in fire management. She enjoys working at the peri-urban interface as it is a nexus between people and the natural world - a microcosm containing many of the issues facing the modern day land manager.

21. Mick Wilson

Protection Forester
Forestry Corporation of NSW
BSc (Forestry)

Mick Wilson is the Protection Forester for the Forestry Corporation of NSW on the Mid North Coast of NSW. He is responsible for fire, feral animals, weeds and roads across about 300,000 hectares of State Forests from the Barrington Tops to Macksville & out to Tamworth. For 23 years Mick been involved with fire-fighting and hazard reduction burning. His experience includes strategic road and trail maintenance, extensive weed management, planning and supervising harvesting and he has spent thousands of hours doing ecological surveys. Mick says 'As I wrote this bio and abstract, I was preparing to go out to Mt Boss SF to search for Myxophyes and Philoria and spotlight for arboreal mammals.'

Mick prepared his paper with Justin Williams who has spent much of the last 20 years as the Ecologist managing FCNSW's ecological survey programmes and is now the State Harvest Planning Manager for FCNSW, Native Forests Branch, and Nick Bush who has a background in Forestry and Fire management in NSW, WA, Victoria, Queensland, ACT, and South Australia and currently prepares all burn plans for State Forest north of Sydney to Macksville. All three authors have extensive solving problems and achieving outcomes spanning an era of rapid evolution of NSW's complex environmental regulatory framework.

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22. Roger Lembit

Principal Ecologist
Gingra Ecological Surveys
BScAgr

Roger is a self-employed ecological consultant. He has been involved in a number of projects relating to fire ecology and the recovery of plant species following bush fires and hazard reduction burns. Much of this work has been undertaken in the Sydney Basin.

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23. Dr Malcolm Ridges

Senior Scientist: Socioeconomic heritage & Aboriginal NRM
NSW Office of Environment and Heritage
BSc Hons, PhD

Dr Mal Ridges has a 15 year background working in the overlap between cultural and natural landscape management. After beginning in Aboriginal landscape archaeology, he moved into biodiversity conservation planning and now works in supporting integrated landscape management. His current focus is the integration of knowledge systems and values in landscape management with the objective of achieving integrated cultural and natural landscape planning. Mal shares the authorship of this conference paper with Lyn Baker, Geoff Simpson, Tara Patel, Liz Tasker and Oliver Costello.

24. Tom Dexter

Environment & Sustainability Officer
Eurobodalla Shire Council
BMusic (Hon), GradDipEd, Cert III Horticulture

For the past 14 years Tom has been a professional native seed collector and grassland/ wetland consultant providing advice on planting design and species choice for large scale revegetation programs. Through his business 'Australian Grasses and Wildflowers' many hundreds of kilograms of native grassland and wetland seed is provided annually to the largest wholesale plant nurseries, government bodies and seed companies Australia wide. Tom also works in the Environment section at Eurobodalla Shire Council (ESC) as a Project Officer and has successfully implemented a diverse range of grant funded projects since 2010. Tom is also a High School Teacher.

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25. Mark Graham

Ecologist
Hotspots Fire Project
Nature Conservation Council of NSW
BAppSc (Environmental Resource Management)

Having worked for nearly 20 years as an ecologist across all tiers of Government as well as within industry and the NGO sector, Mark has developed a good understanding of the ecosystems and human communities of NSW. Mark has been a state-wide ecologist with the Hotspots Fire Project for the last four years. In more recent times he has worked within Nature Conservation Council's Healthy Ecosystem Program as an ecologist for the Upper Coldstream Biodiversity Project and the Western Dorrigo Reconnecting Gondwana (Great Eastern Ranges) project. He was also heavily involved in the early years of the Firesticks project.

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26. Inspector Phil Paterson

Environment Officer (Hotspots)
NSW Rural Fire Service
AdvDipSc (Horticultural Science)

Phil has over thirty years experience in various Horticultural and Agricultural enterprises and consultancy, managing wholesale and retail nurseries and large rural properties. He has worked extensively with symbiotic relationships of vesicular-arbuscular mycorriza and native flora in biological pest management of both horticultural and agricultural enterprises.

Phil is an RFS volunteer with over thirty years experience, having held many positions including Brigade Captain and Deputy Group Captain and has worked in Community Safety in the Shoalhaven, Tamworth and the Northern Tablelands. He has a long history in Community Engagement and Facilitation. Phil also has extensive operational experience and is qualified as an Incident Management Operations Officer and Planning Officer.

27. Andrew Sheath

Fire Management Officer
Department of Environment Water and Natural Resources - South Australia

Andrew Sheath is the Fire Management Officer for the Department of Environment Water and Natural Resources - South Australia. He says 'I grew up wanting to be a Park Ranger and I am yet to get there. Instead, I have spent the last seven years working in a variety of roles ranging from providing incentives for on-ground NRM on the northern Adelaide Plains to pastoral lease condition assessment in the Arid Lands. I now work in Fire Management in the Adelaide Hills where I focus on monitoring and environmental assessment.'

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28. Dr Sam Lloyd

Manager
SE Queensland Fire and Biodiversity Consortium
PhD, BSc (Hons)

Dr Sam Lloyd has 15 years experience in ecology, fire, entomology and natural resource management. She undertook a Bachelor of Science (Biology) at the University of Wollongong (UoW) and graduated with 1st Class Honours in 1998. She then undertook a PhD in pollination ecology at the UoW, graduating in 2006. Sam has managed the South East Queensland Fire and Biodiversity Consortium (SEQFBC) since 2010. Her paper is co-authored with Craig Welden also from SEQFBC

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29. Dennis (Den) Barber

Blue Mountains Fire Sticks Holder
Blue Mountains Fire Sticks
BAppSc (Parks, Recreation & Heritage)

Den is a descendant of the Traditional Custodians from Mudgee of the Wiradjuri. I Acknowledge Country and pay my respect to Elders past and present.

He has worked for the NSW National Parks & Wildlife Service (NPWS) as a Ranger and Aboriginal Co-Management Officer since 2002 and holds a Bachelor of Applied Science (Parks, Recreation and Heritage) Degree from Charles Sturt University. Den is a crew member for NPWS and have 10 years of experience in wildfire, hazard reduction and remote area bushfire fighting.

Den has been taught and has experience in cultural fire (burns) in both Queensland and New South Wales since May 2010.

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30. Dr Miles Holmes

Consulting Anthropologist, Honorary Research Fellow, University of Queensland Beit Holmes and Assoc and University of Queensland
BComm, BSocSci (Hons), PhD

Miles Holmes is a social anthropologist with 15 years experience working with various Aboriginal groups in NSW, Northern Territory, and the Kimberley. He specialises in Aboriginal cultural systems as they apply to land management, land tenure, governance and heritage practice. Further details at http://www.socialscience.uq.edu.au/miles-holmes

Oliver Costello

Firesticks Project Coordinator,
Nature Conservation Council of NSW
Aboriginal Project Officer,
NSW National Parks and Wildlife Service
BArts (Adult Education and Community Management)

Oliver Costello is from Bundjalung country, Northern Rivers of NSW. He works part time with the Nature Conservation Council of NSW as Firesticks Project Coordinator and part time with NSW National Parks and Wildlife Service as an Aboriginal Project Officer in the Aboriginal Heritage and Joint Management Team. He is a Visiting Fellow at Jumbunna Indigenous House of Learning, University of Technology Sydney (UTS). Oliver initiated the original Firesticks initiative with Traditional Knowledge Revival Pathways, Kuku Thaypan Fire Management Research Project and UTS to engage with Aboriginal community groups, Universities, NGO's and Government agencies in the development of collaborative fire projects focusing on south eastern Australia.

Notes

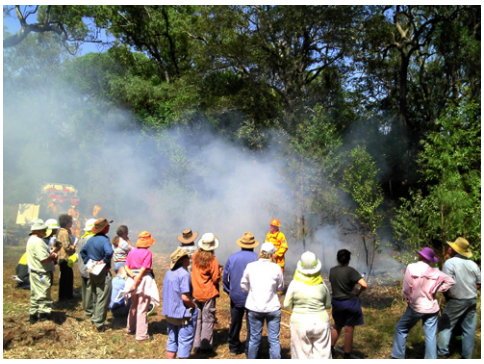
Notes

The Nature Conservation Council of NSW's work on fire and biodiversity

Through partnerships and collaborations, the Nature Conservation Council of NSW Healthy Ecosystem Program delivers community-based programs aimed at supporting land management strategies to maintain, enhance or reinstate biodiversity and cultural values and landscape resilience. These include the Bushfire Program, the Hotspots Fire Project, and the Firesticks Project and the Upper Coldstream Project.

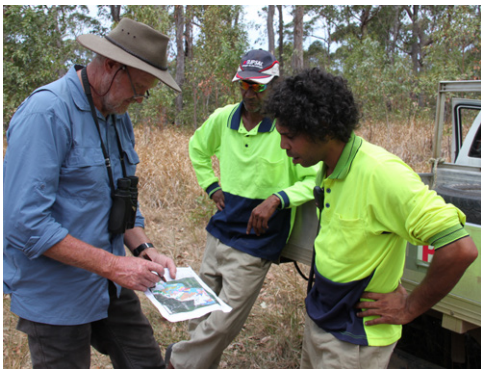
Bushfire Program

The Bushfire Program promotes ecologically sound fire management, policy and planning through its statutory role on bushfire management committees in NSW, including the Bush Fire Coordinating Committee and Rural Fire Service Advisory Committee. The program also supports NCC representatives on Bush Fire Management Committees, and aims to elevate science and practical knowledge as the foundations for good bushfire management through submissions and participation on fire management and policy panels. Established in 1979 to 'ensure that all bushfire management activity is ecologically sustainable while protecting life and property', the program disseminates peer-reviewed science and encourages knowledge exchange between fire and land management agencies, scientists, conservationists and community members. It has held nine over 75 issues-based workshops and forums and this year we celebrate the 10th biennial bushfire conference.



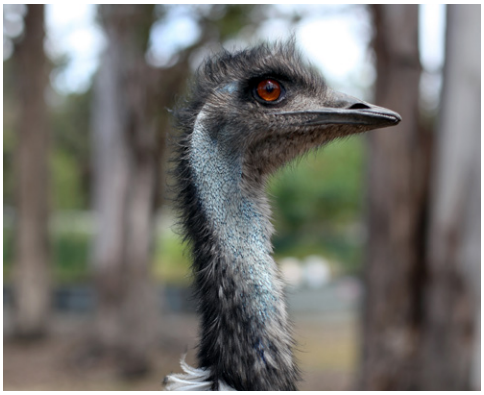
Hotspots Fire Project

Through the Hotspots Fire Project, NCC and the NSW Rural Fire Service provide landholders and land managers with the skills and knowledge they need to participate in fire management planning and implementation to address biodiversity, cultural and risk based values. Established in 2005, Hotspots has delivered over 146 workshops to 1888 landholders, leading to the production of 888 property fire management plans covering over 201,203 hectares. Hotspots operates on a core belief that well-informed and well-prepared communities complement the roles of land managers and fire agencies and that a shared approach to fire management is critical to any form of planning



Firesticks Project

The Firesticks Project is paving the way forward for Aboriginal communities to use fire proactively on their lands to protect significant ecological and cultural values. Working within 6,700 hectares of Aboriginal owned lands including four Indigenous Protected Areas (IPAs) and three Local Aboriginal Land Councils (LALCs) on the NSW north coast and tablelands; Firesticks is supporting the implementation of innovative integrated fire, weed and pest management strategies to enhance ecosystem health, habitat condition and connectivity. Importantly, this project is enabling and empowering Aboriginal, non-Aboriginal communities and external stakeholders to work collectively towards resilient landscapes.



Upper Coldstream Biodiversity Project

The project is implementing habitat restoration works across the nationally-significant Upper Coldstream, combined with capacity-building opportunities to engage and empower landholders in delivering best-practice landscape-scale management. An alliance of private landholders and public land managers the project works collectively to manage the spread of weeds and pest animals, improve habitat condition, reduce the risk of destructive wildfire and enhance ecosystem resilience. The project is focusing on the endangered coastal emu as a flagship species implementing strategies to protect and enhance important food resources for the emu, improving habitat connectivity and reducing the current impacts from wildfire.

Nature Conservation Council

The voice for nature in NSW

www.nature.org.au

ncc@nature.org.au