



FIRE & AIR FORUM

**Biodiversity, Environmental
Sustainability and Human Health**

Friday 5 May 2023

The University Club of Western Australia

WELCOME TO COUNTRY

Custodian Daniel Garlett

Daniel Garlett is a Noongar man from Ballardong Whadjuk and Yued heartlands with cultural connections to all 14 clans of the Noongar nation. He covers WA and the NT as a cultural advisor for his family and as a spokesperson on cultural knowledge and caring for country.

Self-employed for 35 years as cultural performer and manager of his own company, Daniel speaks nationally and internationally on dreaming tracks, cultural heritage and the history of Aboriginal social issues. He is a strong advocate of education through cultural awareness and knowledge of country. He runs school-based programs with the Education Department through Aboriginal and Noongar dance workshops, programs on caring for country and programs on natural resources management. He worked with Native Title as Regional Development Manager (6 years) throughout Noongar Boodja, promoting cultural awareness and knowledge from remote areas to the cities.

Elder Marie Taylor

Marie Taylor was named NAIDOC Elder of the year in 2022. The award acknowledges Ms Taylor's outstanding commitment to both the Aboriginal and non-Aboriginal community at grassroots and organisational levels. She has been dedicated to the betterment of Aboriginal lives and educating for change through a range of organisations, providing cultural advice and protocols regarding the rivers, events and sites of significance.

Marie has contributed her cultural knowledge as Elder in Residence at Holyoake, South of Perth Yacht Club and currently at the Wetlands Centre at Walliabup Bibra Lake.

CONVENOR

Dr Carole Peters

Carole is an educator, writer, researcher and facilitator with special interests in social science and qualitative research, childhood and adult education, gifted and talented education, critical and creative thinking, social justice and the environment. Her PhD thesis (2005) and associated publications investigate leadership, management styles, organisational culture, power dynamics, hierarchies, workplace politics and change.

Convenor and Facilitator:

Fire & Biodiversity Forum 2021 Fire & Air Forum 2023

MASTER OF CEREMONIES

Dr Mignon Shardlow

Dr Shardlow is a senior lecturer in journalism and the coordinator of Communications and Media at the University of Notre Dame Australia. Dr Shardlow is a journalist turned academic with experience in newsrooms from the Republic of Palau in Micronesia to Kununurra in Western Australia, and a few points in between. She has written stories about everything from unexploded bombs to native title claims and knows what it is like to be a fresh journalist looking for work and an editor responsible for hiring journalists.

Josie Alec

Working together from the heartland

Kuruma Marthedunera woman Josie Alec is the First Nations Lead for Australian Conservation Foundation.

"I have been blessed with an extraordinary life journey, from stolen generation to growing up with a wonderful foster family, to making my way back home to my amazing family and culture. Spiritualism runs strong in both of my families and was the grounding I needed upon my return home. My Mum was a traditional healer and held many sacred gifts and knowledge about our country. Through that knowledge I was taught about our native ecology and the traditional use of native plants, their purpose and the connection to everything around them. Fire has played a big part in the rejuvenation and longevity for centuries in my country."

I am pleased to share my journey about learning the importance of our connection with country, and my learning about our 'caring for country' practices.

E/Professor Don Bradshaw

Professor Emeritus Don Bradshaw was appointed to the Foundation Chair of Zoölogy at the University of Western Australia in 1976, at the age of 34. He has worked extensively in overseas laboratories in England, France and the United States and has been involved in numerous field missions to the deserts of North Africa. He is a Membre Correspondant of the Muséum d'Histoire Naturelle in Paris and has held appointments there as a Professeur Invité and as Directeur de Recherche of the École Pratique des Hautes Études. He has worked with Professeur François Morel at the Collège de France on hormone action in the kidney and was appointed Professeur Invité at L'École Normale Supérieure in Paris in the newly-formed Institut d'Ecologie. He was elected a Scientific Fellow of the

Zoological Society of London in 1985 and a Fellow of the Australian Institute of Biology in 1991. He was awarded the Kelvin Medal of the Royal Society of WA in 2010 and in 2015 received a Special Commendation Whitley Award of the Royal Zoological Society of New South Wales for “the promotion of knowledge and conservation of Australasian fauna through many outstanding publications over an extended time period.” Since retiring, his focus has been on the impact of frequent fire on vertebrate fauna.

Fire and fauna

Much of the literature on fire focuses on plants and their responses to frequent fire. Animals, being mobile, are often thought to escape the worst impacts of fire but there are few studies investigating long-term effects of, for example, prescribed burning. Evidence for so-called ‘fire dependence’ of species such as the tammar, woylie and quokka is examined, along with recent research on Honey possums, Western ringtail possums and numbats. Preferred fire regimes for the reproduction of fairy wrens, Mallee fowl and Red-tailed black cockatoos are also reviewed.

Dr Tristan Campbell, E/Professor Don Bradshaw & Professor Kingsley Dixon

Dr Tristen Campbell is a senior scientist at Curtin University in the School of Molecular and Life Sciences. A specialist in spatial science and data analysis with skills in landscape scale patterns and species responses to change, including life impacts.

E/Professor Don Bradshaw - see listing above

Professor Kingsley Dixon is a botanist who specialises in restoration and conservation biology, particularly in relation to threatening processes including fire. His career spans 32 years as the Foundation Director of Science at Kings Park and Botanic Garden and is now John Curtin Distinguished Professor at Curtin University. He is the international Chair of the Society for Ecological Restoration and was 2016 WA Scientist of the Year.

Prescribed burning and wildfire

After land clearing, fire in Western Australia is the most pervasive human-induced impact on landscapes and arises through arson, escapes and prescribed burning. Government funded burning programs, primarily for the protection of lives and property, amounted to 4.2 million ha in 2021-22, with the southwest representing the largest global burning program of the 36 global biodiversity hotspots. Here we present new research on the applicability of broadscale prescribed burning of southwest ecosystems according to the

six-year, 200,000ha target developed by Boer et al (2009). A re-analysis of this paper, with the addition of new data from DBCA up to 2020, shows the protective effect of prescribed burning on wildfires disappears, and modeling predicts that prescribed burning actually increases the likelihood of wildfire by 2.2 times. In addition, impacts on large tree fall are shown to double under prescribed burning, compared to wildfire in a key ecosystem, the wandoo forest, a forest which provides important hollow nesting for threatened black cockatoos. The implications of this research for current fire management practices will be discussed.

Mikey Cernotta

Mikey Cernotta is a South West resident and business owner. With his wife Alexia, they run a commercial beekeeping business and a boutique accommodation venue just outside of Pemberton. Through the nuanced relationship of beekeeping and natural reproductive cycles of native flora, Mikey observes elements of environmental function many take for granted.

Where there is smoke there's fire

Are anthropocentric management techniques of WA's unique flora having positive or negative impacts on natural ecological function, local communities, businesses and human health? For those who give the issue even a little thought, there are often more questions than answers.

Thomas Chvojka

Conserving native forest on private land

Tom Chvojka has had firsthand experience with forestry on his original farm in Bridgetown, where he and his wife established a plantation with several different species of Eucalypts. This obviously led to other related issues such as suitability in a changing climate, wood boring insects, and more. Over many years Tom has also been studying and observing results from various ‘fuel reduction burns’ and soon came to a conclusion that this method is totally unsuitable and counterproductive for the intended purpose. It was also noticeable that this method caused much additional harm to the forests, fauna, flora, soils and climate. Therefore, in 2008 Tom wrote an article ‘Fuel Reduction Burning, Facts and Myths’, which he accompanied with numerous documentary photographs, pointing out the many serious problems associated with this method.

Tom and his wife now live on a multipurpose large farm in Quininup which features about 60 acres of quality Karri, Marri, Jarrah and Blackbutt forest that hasn't been

burnt for 38 years. The health and biodiversity of this forest is superior to forests that have been subjected to fuel reduction burns. Tom will share his photographic evidence from the past 20 years, demonstrating the negative impacts from WA's burning regime.

Daniel Garlett

Independent Manager Dadajaal: All Things Cultural

Working collaboratively for Country

Cultural interpretations in caring for country are extremely important. I apply my understanding of government processes and the Aboriginal Heritage Act when advising local, State and Federal government agencies, also when working with councils across the metropolitan area. As a candidate in State and Federal election campaigns I have developed a deep understanding of politics, including how political processes and gatekeepers influence land management policies and practice. I am aware of conflicts of interest within and across government agencies, often resulting in a continuation of the same old processes; repeated management practices that lead to more disunity, threatening the deep learning, knowledge and wisdom that can lead to change.

My life is dedicated to working together towards better land management programs, in collaboration with a diversity of voices rather than a divided approach. Both public and private agencies and companies need to redirect future plans around land management programs to achieve better outcomes for country and all people who care for the land.

Elder Lynette Knapp and Ursula Rodrigues

Lynette Knapp is a Merinagar Barduk Noongar Elder and Adjunct Research Associate at UWA Albany. She was raised and lives in Albany and adjacent regions of the south coast of Western Australia. She escaped institutionalisation, and was taught culture by her father, aunties and other Elders. She is a gifted speaker, cultural heritage advisor, and author of *Mirnang Waangkaniny* (Batchelor Press 2011).

Ursula Rodrigues is a PhD student at the University of Western Australia, Albany Campus. An affinity with southwest Australian landscapes and an interest in how humans interact with them led Ursula to cross-cultural research. Her PhD focusses on the outcomes for people and Country of contemporary Noongar fire stewardship, and collaboration between land managers and Noongar peoples in fire management.

Kaal Gwabbtich wer Worra (Fire good or bad)

In southwestern Australia, Noongar people have used fire in land stewardship for millennia and fire remains an integral part of Noongar culture despite changes brought by European colonisation. For Noongar people, nuanced and precise kaal gwabbtich (good fire) is necessary for the wellbeing of Country and people (who are part of that Country). However, largescale kaal worra (bad fire) causes environmental and cultural harm. Through a cross-cultural conversation, we explore how small, controlled fire and kaal puay (smoke) can heal and vitalise Country and people, in comparison to the destructive potential of large and hot fires. We discuss how relational worldviews and nuanced knowledge of Country may contribute to ecological and cultural sensitivity in contemporary fire management.

Professor David Lindenmayer AO

Fenner School of Environment & Society, ANU

Professor David Lindenmayer is a world-leading expert in forest ecology and resource management, conservation science, and biodiversity conservation. He has maintained some of the largest, long-term research programs in Australia, with some exceeding 40 years in duration. He is among the world's most productive and most highly-cited scientists, particularly in forest ecology and conservation biology, and has published 1401 scientific articles including 895 peer-reviewed papers in international scientific journals. He has also published 48 books, including many award-winning textbooks and other seminal books. David Lindenmayer held a prestigious Australian Research Council Laureate Fellow from 2013-2018. He is a Fellow of the Australian Academy of Science (elected 2008), a Fellow of the Ecological Society of America (elected in 2019), and was appointed an Officer of the Order of Australia (AO) in 2014. His research has been recognised through numerous awards, including the Eureka Science Prize (twice), Whitley Award (10 times), the Serventy Medal for Ornithology, and the Australian Natural History Medallion. In 2018, he was awarded the prestigious Whittaker Medal from the Ecological Society of America.

Fire and the future of forests

Fire remains one of the most contested and controversial areas of forest and land management in Australia. Living with, and managing fire will become even more challenging in the future. This is not only because of changes in climate, but also because of past land management practices like logging and industrial

thinning that have elevated fire severity in some forest types. Work lead by other researchers also shows that even practices like prescribed (or hazard reduction) burning can have perverse effects and contribute to the proneness of forests to high severity wildfire. Indeed, Australia is now losing more forest to wildfires than any other nation globally (except Portugal). This talk outlines some of the evidence underpinning relationships between forest management and fire severity. It also very briefly discusses some of the key strategies needed to address the problems created by past land management.

Dr Carolyn Orr

If prescribed burning was a medicine, would doctors prescribe it?

Carolyn Orr is a neurologist, medical scientist and public speaker, and a passionate advocate on the connections between human health and our environment. She speaks out fearlessly on climate change, fossil fuel pollution and biodiversity loss, and how these interact to harm human health.

In medicine, doctors assess everything they do using the framework of Evidence Based Medicine. Carolyn uses the power of story to show that prescribed burning - intentionally burning our forests to protect human lives, assets and biodiversity - completely fails the evidence tests routinely used in modern medicine, and actually causes harm to human health, as well as irreversible harm to our environment.

Tony Pedro

Tony Pedro is an environmental activist, experienced firefighter and farmer who has been offering alternative bushfire management strategies to State and Federal Governments for over 40 years. Changing focus from repetitive prescribed burning policies to funding and establishing a vastly improved bushfire surveillance and rapid suppression capacity, using the best available resources and equipment to get to ignitions fast - while fires are small - will significantly reduce their development into wildfire disasters and repeated threats to biodiversity.

Funding for fast detection and rapid suppression

During a lifetime experience living next to South West forests in WA, I have seen how the repetitive firing regime (prescribed burning) used over decades has exacerbated the wildfire potential in forests, coastal heaths and rangelands, severely threatening public security and assets, and the very survival of our natural environment.

I see rapid bushfire suppression as a bridge between those who see repetitive prescribed burning as the only solution and those who wish to retain our natural environment in a healthy and sustainable condition, while at the same time providing bushfire security. As a nation we have the capacity to lead the world in this field but it will require a significant change in funding, providing confidence that bushfires can be contained when small, and avoiding the development of wildfires due to delayed and ineffective suppression.

Dr Fabienne Reisen

Dr Fabienne Reisen is a principal atmospheric research scientist at CSIRO. She specialises in biomass burning emissions. Her research focuses on addressing the issue of population exposures to toxic air contaminants, investigating the chemical composition of smoke plumes and how these impact air quality and public health. She is a lead researcher in the development, validation and improvement to the Air Quality Forecasting System (AQFx), a decision-making tool designed to forecast the transport and chemical reaction of emissions from biomass burning.

Smoke exposure on and off the fire ground - Developing tools to aid management of smoke impacts

Bushfire smoke is a complex and dynamic mixture of gases and particles, and when inhaled can have deleterious impacts on population health. A better understanding of fire emissions and major factors influencing emissions and exposure levels is key for the development of mitigation strategies to effectively manage exposure to smoke and minimise its harmful effects.

In this presentation I will present a web-based smoke visualisation system that is designed to support fire, air quality and health practitioners in the management of smoke impacts. Having access to timely information about current and forecast smoke movement enables decision-makers to issue advisory warnings to affected populations and balance community smoke exposure from prescribed burns with overall bushfire risk mitigation.

Dr Adeleh Shirangi

Dr Adeleh Shirangi is an epidemiologist and population health scientist focusing on environmental pollutants, occupational chemical exposures, and health policy determinants of chronic diseases and reproductive health. She held several independent investigator grants, including an NHMRC Emerging Leadership Fellow (Sidney Sax Overseas Public Health Fellowship) at Imperial College, London, UWA and Telethon Kids Institute. She has worked in academia and government and has over 20 years of research and teaching experience in population health and epidemiology. She holds an adjunct Associate Professor position at Curtin and Murdoch Universities and is a visiting scientist investigating the impact of environmental pollutants on human health.

The health impact of landscape fires in Perth Western Australia

Landscape fires (LFs) include wildfires (WFs) and prescribed/planned burns (PBs) are defined as fires that occur in forest, scrub, or grassland (bushfires). The toxic pollutants released from LFs contain tiny particles, known as PM_{2.5}, that can travel hundreds and even thousands of kilometres from the bushfire site and pollute the air we inhale. During LFs, the levels of PM_{2.5} in the air are significantly higher than the regulatory air quality standards, meaning air becomes extremely unsafe to inhale. This reduction in air quality has a significant and measurable impact on human health.

We recently applied advanced spatial and epidemiological techniques to evaluate air quality across all regions of the Perth metropolitan during LFs. We wanted to see if there was any association between a person's exposure to elevated PM_{2.5} during LFs and their immediate health impacts. This talk will present the results of this study and provide policy and technical recommendations to reduce the effects of LFs on human health.

Dr Emma-Leigh Synnott

Sustainable Healthcare: Links to a healthy natural world

Emma (she/her) is the WA Chair of Doctors for the Environment Australia. A Consultant Physician in Rehabilitation Medicine, she is the Medical Advisor, Sustainable Development Unit at the WA Department of Health. A Working group member to the WA Climate and Health Community of Practice, and an assistant lecturer in Sustainable Healthcare in Practice at Monash University, Emma is also currently undertaking a Master of Environment and Sustainability.

A/Professor Marta Yebra

Associate Professor Marta Yebra is a leading expert in remote sensing and bushfire management and the director of the ANU-Optus Bushfire Research Centre of Excellence, which aims to develop technological solutions to protect Australia from catastrophic bushfires. She has published more than 141 scientific papers and her research has been recognised through numerous awards, including the Max Day Environmental Science Award by the Australian Academy of Science, the CSIRO OCE Pyne-Scott Career Award and the Bushfire & Natural Hazards CRC's Outstanding Achievement in Research Utilization Award. She was finalist for the Australian Space Awards' Academic of the Year and the National Resilient Australia Award. Marta Yebra has served on several advisory government bodies including the Australian Space Agency's Bushfire Earth Observation Taskforce and Earth Observation Technical Advisory Group, the Victorian Department of Environment, Land, Water and Planning's Scientific Reference Panel and the ACT Multi Hazards Advisory Council.

An integrated approach to protecting Australia from catastrophic bushfires

Identifying and combating fires early is paramount to improving emergency response time and reducing the risk of large-scale bushfires. However, identification is still heavily reliant on 000 calls, risky and intermittent surveillance from towers, and crewed aircraft surveillance that can be constrained by resource availability and regulations.

The ANU-Optus Bushfire Research Centre of Excellence has developed a novel solution for early bushfire detection, incorporating existing Earth Observation satellites, drones, cameras on towers, and on-ground sensors. Used in combination, these remote sensing platforms will counteract each other's limitations to produce a more accurate and reliable system. The technologies that we are implementing will be evaluated using planned and unplanned ignitions. These will be used to determine the scenarios under which each technology is most effective, and the extent to which they outperform or complement current practices.

Adjunct A/Professor Philip Zylstra

School of Molecular & Life Sciences Curtin University

Dr Phil Zylstra came from a background of shearing sheds and burning pasture for high country graziers. After moving into fire management, he spent years discussing fire with First Nations knowledge holders, watching it in intimate detail as a specialist remote area fire fighter, and asking the hard questions about the efficacy of his own management and understanding. This ultimately led him to create the first peer-reviewed fire behaviour model to cover all Australian forests, accounting for the complexities he had seen brushed over by earlier attempts. Since these days, Phil has continued to focus on the hardest questions, working alongside world-leading experts to understand the ultimate drivers of fire in the landscape, and to find better ways to live with it. He currently lives on Dharawal country.

Making a path through the firestorm

The bewildering array of arguments and evidence around prescribed burning can leave many in confusion on the subject. Popular narratives present us with a choice between the protection of our own lives or the environment, between fiery inferno or smoky discomfort, between a small planned fire and a catastrophic wildfire. Published evidence and the voices of First Nations often conflict on multiple levels, and making sense of the picture becomes overwhelming. Each narrative or argument is based on a history of ideas and beliefs. In the best cases, we see sound evidence built on foundations of sound evidence. In the worst, we see fortress-like narratives built on nothing more than assumptions and dogma. Weaving through it all is Australia's original sin of invasion, the mist that still clouds our eyes and shapes our judgements. Recognising this is core to understanding: once we see the way it has shaped and continues to shape our perceptions, the pieces fall into place. Once stripped of its colonial bias, the evidence is remarkably consistent. Just as our First Nations have done for tens of thousands of years, it tells us that it is possible to live with our forests in a fiery world without sacrificing vulnerable lives to flames or smoke. Why fight fire with fire when we can cooperate with country and escape the spiral we have created? There is a path ahead, but time is running out for us to grow up as a nation and call off the invasion.

Documentary Videos:

Striking the balance between hazard reduction burns and biodiversity

Landline 21.2.21 ABC iView

Featuring Dr Joanna Young, Dr David Edmonds & Professor Stephen Hopper

Scientists urge prescribed burn review after Walpole forest fire razes 25,000ha

ABC News 11.12.22

Fire Management of the Leeuwin Naturaliste Ridge 'Controlled' Burn BS520 Nov 2011

SiVIDEO Production 2013/2014

Don't Torch the Tingles

Produced by Kim Redman 2010

Featuring Tony Pedro

Online Resources

Fire & Biodiversity Forum

vimeo.com/channels/fabforum

Expert speaker presentations, Margaret River HEART June 2021

The Burning Issue

theburningissue.org

Presenting the latest science on Wildfire Risk Management in Southwest WA and 10 Facts about Prescribed Burning



FaB 2021 online: vimeo.com/channels/fabforum

The Burning Issue: theburningissue.org

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