

Otways Threatened Species Research Network Update 2019/20

Threatened Species and Threatening Processes Research and Conservation in the Otways

The Fight for the Otways - Feral Pigs

Emma Birnbaum – Conservation Ecology Centre

The fight to control feral pigs in the Otways continues. We are working closely with agencies in the region to determine the extent of feral pigs in the Otways and to quickly bring their numbers under control. This involves lots of detective work, as we follow up on reported sightings and areas of damage and increasing monitoring efforts throughout the National Park and on private land. As we increase the efforts on tracking and controlling feral pigs, we're also continuously working to gather data and on their movements, numbers and behaviours in the Otways, so



that we may effectively control their numbers and understand their impacts well into the future. Late last year we hosted workshops with local agency staff to discuss the potential applications for FeralScan, including customised FeralScan alerts for organisations to help with their specific land management needs and utilising FeralScan to help coordinate pest animal programs in the region. We then held a FeralScan workshop for private landholders with Peter West, from the Centre for Invasive Species Solutions and Department of Primary Industries, who shared all the ins-and-outs of FeralScan and how it gives landholders the ability to work together to tackle pests on their properties. It's a team effort and one that will take lots of collaboration to conquer but we have learnt a lot so far and have a good understanding of the work that is required to get on top of feral pigs in the Otways. Our funding to deliver this work comes from the Victorian Government's Biodiversity Response Planning program.

The Impact of Phytophthora

Barbara Wilson and Mark Garkaklis, School of Life and Environmental Sciences, Deakin University, Geelong, 3217.

Our recent work has included analyses of long-term (26 years) impacts of *Phytophthora cinnamomi* infestation on heathy woodland in the Great Otway National Park. Disease progressed dramatically between 1989 and 2005 and by 2015 only 0.08 % of the site was non-diseased. There were significant declines in plant species richness and numbers of susceptible species; and increases in percentage cover of resistant sedges and grasses overall and significant declines of *Xanthorrhoea australis* (Austral Grass-tree), a keystone species that contributes greatly to vegetation structure and fauna habitat. The work has been accepted for publication in Aust J. Botany.

Otway Mammal Declines

Barbara Wilson and Mark Garkaklis, School of Life and Environmental Sciences, Deakin University, Geelong, 3217.

We have published (Australian Mammalogy) a manuscript on patterns of decline of small mammal assemblages in the eastern Otway vegetation communities where we compared the current occurrence and abundance of species and communities (2013–18) to those in previous decades (1975–2007) across major vegetation communities. In total, 67% of sites exhibited large to severe decreases in abundance with major declines following wildfire and drought, with drivers likely to be multifactorial. While regional declines were significant, higher mammal abundance (two- to six-fold) and native species richness were recorded at coastal dune sites, indicating that this community provides important mammal refuges.



Long-nosed Potoroos and Fire

Mark Le Pla, Conservation Ecology Centre

Inappropriate fire regimes and introduced predators have been implicated as a primary driver of post-European mammal extinctions and a growing body of evidence suggests these threatening processes may interact, compounding threats to native fauna. The heathlands of the western Otways are home to several threatened ground-dwelling mammal species that have declined elsewhere. It is also an area intensively managed for wildfire risk through strategic planned burning operations. This presents a unique opportunity to conduct research into how these species respond to current fire practices. Knowing how fauna utilise burnt landscapes is



crucial to understanding how current fuel-reduction practices impact ground-dwelling mammals and determine if these practices need to be altered to improve mammal persistence.

With generous support from the Hermon Slade Foundation, and in collaboration with land managers Forest Fire Management Victoria, the CEC is employing cutting-edge GPS tracking technology to monitor the survival and movements of Long-nosed Potoroos (LNPs) in relation to planned burn operations. This novel study will enable the collection of high-resolution data on LNP behaviour and movements before, during and immediately after planned burns for the first time. We aim to provide key insight into how fire extent, severity, and availability of unburnt refuges can influence LNP survival and recovery post-fire.

Artificial Refuges for Fauna Post Fire

Darcy Watchorn, Barbara Wilson and Mark Garkaklis - School of Life and Environmental Sciences, Deakin University, Geelong, 3217

Darcy has continued his PHD studies in the Otways on Conserving threatened mammals in the face of fire and predation. His project is experimentally testing whether artificial refuges can improve small mammal population persistence in forests post-fire, when the risk of predation by invasive predators may be elevated. He has collected pre and post-fire mammal predator

(camera) and small mammal (trapping) data for one landscape fuel-reduction burn at sites with and without built refuge tunnels. Early results have revealed the utilisation of the tunnels by mammal species and birds. Plans are underway to repeat the experiment at a second landscape in 2021.

We are continuing our work on the identification of natural mammal refuges across the landscape in the Otways with FFMVic Barwon and have collaborated in the construction of built refuges in the post fire environment to compliment the PhD work of Darcy Watchorn.

Otway Landscape Fox Control

Emma Birnbaum – Conservation Ecology Centre

The Otway Ark is a landscape-scale fox-baiting and monitoring program that stretches across 85,000 ha of Great Otway National Park. Given the patchwork nature of the National Park reserve, we sought to improve biodiversity outcomes by expanding the baiting program so that it is not isolated from the management of adjacent land use types and land tenure. Incorporating strategic areas of Otway Forest Park, private forestry and a large, highly



diverse block of private properties, baiting of these expansion areas began in 2019. We also extended the Otway Ark monitoring program onto private land. Whilst data continues to be gathered to assess the effectiveness of a landscape-scale fox control program in the Otways, modelling does suggest that some of the areas of expansion, particularly where large gaps previously existed, are valuable in preventing fox re-invasion into the National Park. This program has also been valuable in increasing collaboration and understanding between landowners and land managers and helping to set the scene for effective landscape-scale programs in the future. This project is funded by the Victorian Government's Biodiversity Response Planning program and Biodiversity On-Ground Action program and is helping to ensure that Victoria's biodiversity is healthy, valued and actively cared for.

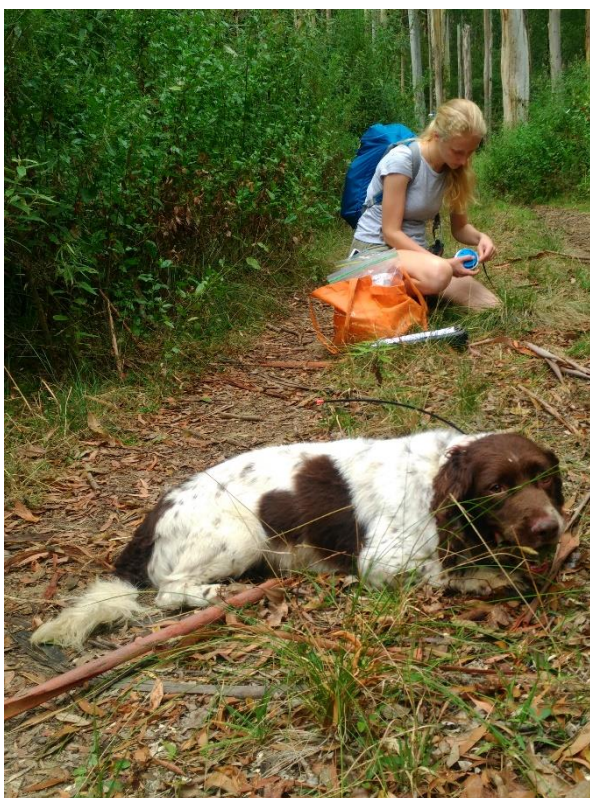
Assessing Fox Control Across the Otway Range

Mark le Pla – Conservation Ecology Centre

Our trial of using genetic sampling to estimate fox density continues to produce valuable insights into the effectiveness of the Otway Ark's lethal baiting in the wet forests of the Otway Ranges. Although our initial surveys have not demonstrated a large effect of baiting on fox numbers, ongoing surveys are tracking fox density as the baiting program proceeds to determine whether this is consistent in the medium to long term.

Additionally, University of Melbourne post-doctoral research fellow Dr Bronwyn Hradsky, in collaboration with the CEC, was recently successful in securing DELWP funding to build upon and expand research into the genetic sampling of foxes. Using the same design devised by the CEC in the Otway Ranges, scat surveys are now being undertaken in additional landscapes such as the woodlands of Glenelg and the Mallee of North West Victoria. Furthermore, this funding has allowed for the development of an alternative approach to genetic analysis of scat samples. By using Single Nucleotide Polymorphisms (SNPs) instead of microsatellites, it is possible that the financial cost and lab time associated with genetic analysis may be dramatically reduced, further improving the cost-effectiveness of this approach for land managers.

Finally, the CEC is continuing to work with specialist detection dog handlers from Phillip Island Nature Park to compare the effectiveness of detection dogs relative to human observers when undertaking scat surveys for genetic analysis. Although detection dogs can consistently outperform human observers when collecting scats, this does not automatically mean detection dogs are the most cost-effective survey method in the context of genetic sampling. As more scats are detected, more financial investment is required to undertake genetic analysis on each of these scats. Moreover, detection dogs may be limited in the area they can survey



each day and the costs required to hire detection dog teams for a single survey may equate to several surveys when using human observers. This research is ongoing and aims to describe when and where it is cost-effective to use detection dogs or human observers for scat surveys when undertaking genetic sampling of fox scats.

Feral Cat Density and Behaviour in the Otway Range

Matt Rees – The University of Melbourne

My PhD is investigating drivers of feral cat population density and behaviour across the Glenelg region and Otway Ranges in south-west Victoria. In the Otway Ranges, with the help of the Conservation Ecology Centre and many volunteers, we deployed camera-traps at around 150 sites, three times annually (2017-19). Our surveys complemented the broad-scale monitoring of the Otway Ark fox control program, allowing us to estimate cat density in the Western Otways. Here, we identified 137 individual cats based on unique spot and stripe coat patterns seen in camera-trap images, uncovering a high density in these rugged wet forests.



In the Otways we found that cat density slightly increased in a landscape with fox control, whereas it decreased in a similar landscape without fox control. This same effect was seen, but much stronger, in the Glenelg region - which has longer-term and more intensive fox control. While the changes seen in the Otways were small, they highlight the importance of keeping an eye on feral cat numbers as we continue to suppress foxes over the longer-term. We also observed some behavioural changes in cats, which I am investigating further throughout the different habitat types of the Otway Ranges. I am testing whether cats change the times of the day when they are active, as well as the space they use, to avoid foxes.

The Otways is home to many feral cats because it supports many native small mammals. Understanding how we can continue to promote healthy populations of native species, while mitigating cat impacts on the rarer species, is a difficult but important challenge.