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INSIDE THIS ISSUE!

1 ECA Office Bearers 2022—2023
1 Message from the President
2 Upcoming ECA Events
2 Membership Report
2 ECA Conference 2022
9 ECA Conference 2023
18 Recent Government Liaison News
20 Photo Competition
34 ECA Research Grants
35 Hanging On: A Short Note on the Potential Resilience of Silky Swainson-Pea (Swainsona sericea)
36 NSW Biodiversity Offset Scheme Approval Pathways
38 The Consultants Conundrum
39 The Mystery of the Pink Cockatoo
42 Help find the Black-throated Finch in NSW and Surrounds
44 Species Conservation — Pairing Classic Ecology with Genetics to Inform a Translocation
49 Whats in a name: The Story of *Lophochroa Leadbeateri*
50 National Recovery Plan for the Koala - Committee News
51 Literature
54 Contributions to the Newsletter, Volume 51
Back cover ECA Photo Gallery

Editors: ***Shelomi Doyle and Stephanie Clark***

Design and Layout: ***Amy Rowles***

Front Cover Photo Winner:

Long-nosed Potoroo - Steve Sass.

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ECA COUNCIL MEETINGS

The ECA Council meet every three months to discuss and deal with any current business of the association. Any member who wishes to view the minutes from any of the ECA council meetings may do so by contacting the Administration Assistant Amy Rowles admin@ecansw.org.au

Message from the President

Dear Members,

Immersed in the challenges of current-day ecological consulting, it is easy to forget how intriguing this industry is. Our subject matter varies from underground orchids and pelagic wanderers to entire ecosystems. Often, the amount we know about a species only highlights the amount we don't know. And, of course, our subjects play games with us – they move, hide, evade, disappear for a season or two, appear where they shouldn't and pretend to be something they are not.

The consulting office may be the back seat of a car or a plush suite overlooking the harbour. Some days, it may be a log under a vast blue sky. We need muscles to wield a shovel yet finesse to tweak state-of-the-art recording equipment. Skills to navigate deep-littered rainforest slopes snared with lianas while carrying bulky equipment, yet also, to navigate department websites.

We may be working alone in peaceful solitude or as a part of a team. We attract friends on our travels - leeches, ticks, mosquitos, sandflies, and sometimes, concerned neighbours. We see spider webs glittering with dew, spectacular sunrises and sunsets, rare flowers, massed wildlife displays and strange courting behaviours.

This journal provides an opportunity to delve into facets of the natural world you may not have encountered, share the weird and wonderful, learn about new advances and methods, and, above all, be reminded of the joy of working in this diverse and evolving field. Every consultant has unique experiences and stories to share. Please consider sharing yours to broaden the skills, knowledge and curiosity of the ecological consulting family.

The ECA Council is here to give members a voice on ecological consultancy matters. Please get in touch with us if you have concerns you would like to raise about the implementation or effectiveness of current legislation and policies or if there is a particular subject you wish to bring to our attention.

Rebecca Hogan

ECOLOGICAL CONSULTANTS ASSOCIATION of NSW

EVENTS

ECA ANNUAL GENERAL MEETING 2024

Date: August 2024

Location: Hunter Valley

ECA ANNUAL CONFERENCE and WORKSHOP

Date: August 2024

Conference Theme: TBA

Workshop Theme: TBA

Location: Hunter Valley

Current Membership

Membership Category	***Total***
Full Member	
Practising Ecological Consultant	118
Early Career Ecological Consultant	14
Retired Ecological Consultant	3
Associate	
Government Ecological / Environment Officer (Associate)	26
Non-practising (Associate)	5
Student	4
Subscriber (Associate)	1
Grand Total	**171**

Still need to renew your 2023 membership? Follow this link

https://www.ecansw.org.au/how-to-join/membership-renewal/

ECA Conference, Workshop and AGM
18-19th July2022

The 2022 ECA Annual Conference 'Bridging the Gap' and Workshop 'Plant Community Type Vegetation Mapping Workshop' was held at Sage Hotel in Wollongong on the 18th-19th July. The event was well attended with 129 at the conference, 125 at the workshop and 73 for the dinner, with a mix of members and non-members, including delegates from ecological consultancies, government agencies and local councils. As always the dinner and trivia was a fun casual event.

Below are the abstracts from the conference day. Full presentations are available on the ECA website https://www.ecansw.org.au/conference-presentations/

SESSION 1: LEGISLATION AND POLICIES

Biodiversity Assessment Method (BAM) and its implementation

Dr Kate Newman
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There's a lot happening in the world of the Biodiversity Assessment Method (BAM)! This presentation will provide some key BAM updates including;

- assessment data and trends,
- resources (released and upcoming),
- recent trends and issues around assuming presence of threatened species,
- advice about interaction of the BAM, 10/50 rule and the boundary clearing code, and
- the upcoming 5 year statutory review

BOS Compliance and Assurance Framework

Tim Sides
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This Biodiversity Offsets Scheme Compliance and Assurance framework has been produced in response to the 2022 Accredited Assessor Audit and to continually improve quality and compliance within Scheme as well as increase confidence in the Scheme's delivery. After initial consultation with a broad range of internal and external stakeholders an interim framework consisting of the Compliance and Assurance Plan, Audit Protocol and De-accreditation Process was developed. This interim framework includes a strategic audit program with the aim of uncovering systemic quality or integrity issues within the work undertaken by Accredited Assessors and a robust and fair process for de-accreditation.

The framework is currently undergoing testing through a pilot audit of selected BDARs and Accredited Assessors to ensure it is fit for purpose. The interim documents have been provided for feedback through ongoing consultation, including with Accredited Assessors. Results from the pilot audits and consultation will be used to create a final version of the framework, which will be released.

Audits will continue monthly after the pilots are completed focussing on routine and themed audits as the Department of Planning and Environment expands its audit capacity and ramps-up the auditing frequency throughout 2022-2023.

EPBC Act

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Cormac Farrell
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DCCEEW presenters will discuss the following:

- Structure of NSW assessment branch
  - NSW North Team – role and contact information
  - NSW South Team role and contact information
  - ACT and Sydney Metro Team role contact information
- Commonwealth has endorsed the BOS for both:
  - Major Projects
  - EPBC alone assessments, e.g. assessment by Preliminary Documentation
- Species not listed under the BOS – what to do?
  - Talk to us early in the assessment.
  - If your project is a Major Project or State Significant and may impact EPBC matters:
  - Speak to the Commonwealth early in the process, so the project can be assessed under the bilat.

The presenters will also cover the following topics, noting they are not the subject matter experts on these

matters, therefore they are limited in answering in depth questions;

- EPBC Act reform
- Wind Farm Guidance on Bird and Bat Management Planning
- Koala listing
- The Portal and Assessment System
- National Environment Offsets System
-

BOS Help Desk

Carlie McClung
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The Biodiversity Offset Scheme (BOS) Help Desk was established in March 2022 and took over from the BAM Support Mailbox support function within the BOS. It is designed to assist with enquiries on the BOS and Biodiversity Assessment Method (BAM) and consists of an 1800 hotline, BOS Help Desk mailbox and continues to operate in conjunction with the existing BOS Enquiry Form.
The BOS Help Desk is operated by dedicated officers with experience in the BOS and BAM who are supported by Subject Matter Experts (SMEs). The BOS Help Desk is currently transitioning to a new customer platform to replace the existing BOS enquiry form and provide alternative customer experience in addition to the hotline and mailbox. The department has recently completed the scoping phase of this new customer platform with an external service provider and hope to have this operational later this year. The addition of this new system will assist in streamlining internal customer processes for receiving and managing enquiries received by the BOS Help Desk and provide an option for external customers to generate their own BOS Help Desk tickets.

Local government & biodiversity: Implementing legislation & policy, the BAM experience, and conservation planning

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Within the context provided by state and Commonwealth legislation and policy, local government can play an important role in conservation planning and integrating biodiversity in land use planning, development and land management.

Lake Macquarie is a coastal local government area with rapid urban growth and high biodiversity values. The Council has extensive experience in implementing measures to consider biodiversity in land use planning and development processes. Biodiversity is also considered in the Council's roles as a service and offset provider and conservation land manager.

The presentation outlines experiences with biodiversity offsetting, including the use of the Biodiversity Assessment Method (BAM). It highlights the range of local government opportunities to conserve biodiversity through land use planning processes, and the importance of considering biodiversity and offsetting at the local scale within a robust strategic regional conservation planning framework.

Gaps in effective biodiversity planning are identified, including avoidance of biodiversity impacts, serious and irreversible impacts, and consideration of local biodiversity values and offsets. These issues are being addressed in the Council's local conservation planning framework.

SESSION 2: ADVANCES IN TECHNOLOGY

Wildlife Drones: aerial radio-telemetry technology bridging the data gap when tracking small animals across large landscapes

Debbie Saunders
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Radio-telemetry is often the only way to shed light on movements of small animals and to gain critical insights for improving the effectiveness of management techniques. This includes threatened wildlife such as Swift Parrots and Corben's Long-eared Bats right through to invasive species such as Asian Giant Hornets that pose a threat to bee populations and other wildlife. However, the ability of these animals to move very fast across landscapes that are not as easily accessible on the ground, combined with the weak signals from their tiny radio tags, poses significant challenges for consultants and wildlife researchers tracking their movements. We provide examples of how innovative drone radio-telemetry technology has been used in both Australia and the United States to bridge the data gap for these tiny species, overcoming many of the challenges faced when radio-tracking animals by hand from on the ground.

Use of drone technology as a wildlife monitoring tool

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Remotely piloted aircraft systems (RPAS or drones) with a range of sensor types have experienced a rapid rise in technological advancement and use globally as an emerging tool for surveying and detecting wildlife. Various studies highlight the utility of drones as a tool to detect cryptic wildlife species in diverse habitats and highlight their cost-efficiency benefits against other conventional wildlife monitoring techniques. In addition, the development of machine learning and automated detection capabilities shows promise to revolutionise wildlife drone monitoring and further increase efficiency and accuracy. Despite this, drone technology and these accompanying technologies are far from optimised for many wildlife species. Applied research questions remain and many practical challenges require solutions before drones can become a mainstream tool in the conservation toolbox. This talk will briefly summarise the emerging evidence for drones as a wildlife monitoring tool using the case study of koala population monitoring, discuss the logistical realities and challenges of using drones to monitor cryptic wildlife in complex terrain, showcase newly captured imagery of wildlife populations for koalas, gliders and waterbirds, and highlight the exciting management and research opportunities across various taxa (e.g., koalas, kangaroos and waterbirds) and their habitats for drones to improve population and habitat monitoring outcomes.

Use of eDNA as an ecosystem monitoring tool

Josh Griffith
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Determining the presence or absence of a species is integral to making informed management decisions and Environmental Impact Assessments. But detecting species, particularly in aquatic environments, can be difficult, time consuming, expensive, and often highly invasive. These challenges tend to restrict the scale and frequency of biological surveys, ultimately limiting information available to environmental managers. This lack of data is accentuated greatly at the landscape-level, where there are few datasets available for understanding biodiversity patterns over large spatial and temporal scales. Environmental DNA has been shown to be a sensitive, efficient and cost-effective method for assessing biodiversity in water samples and shows promise as a method that can be used to assess target species or aquatic biodiversity over large spatial scales.

The Use of Scent Detection Dogs for Conservation Purposes

Steve Austin
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Scent detection dogs for conservation and their handlers trained by Steve have been setting benchmarks in the industry. They are proving more successful than anyone could have predicted. The dogs find their target odour with greater accuracy and in a reduced timeframe when compared with any other techniques employing people and/or technology.

An assessment of two scent detection dogs was recently conducted by an independent assessor and concluded that the dogs had saved their organisation, conservatively, $14.4 M over a twelve month period.

Furthermore, dogs are unbiased and their ecological foot-print is minimal.

SESSION 3: BIODIVERSITY OFFSETS

Monitoring and evaluating biodiversity gain at offset sites, now and in the future

James Brazill-Boast
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The credibility of any biodiversity offsetting programme relies on the ability to accurately quantify biodiversity value loss and gain. The former is relatively simple, while the latter is much more difficult, given it involves predicting the outcome of uncertain ecological processes far into the future. Biodiversity offsetting as a concept is quite new for Australia and internationally, therefore there is limited evidence to support predictions of biodiversity gain in response to management. The BCT has recently undertaken to resurvey a number of the oldest offset sites in NSW, established under the BioBanking Scheme, in order to evaluate realised biodiversity gain and improve understanding of the drivers of ecological condition. This project is part of the BCT's broader Ecological Monitoring Module (EMM), which has been designed to inform adaptive improvement of the Offsets Scheme by providing an empirical evidence base to support the program's various assumptions about biodiversity gain and management effectiveness.

Estimating the value of biodiversity credits from a supply side perspective: Learnings from the development of the BCF Charge System

Justin Williams
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The Biodiversity Offset Scheme is the NSW framework for offsetting the unavoidable impacts on biodiversity due to development with biodiversity gains through landholder stewardship agreements. The NSW scheme is notable for having relatively strict like-for-like requirements which means there are hundreds of different credit types which need to match between development and offset sites. The scheme also allows development proponents to meet their offset obligations by making a payment into a biodiversity conservation fund, which transfers the credit obligation to the government to meet. A major challenge to estimating credit value is that most credits types have never or rarely been generated or traded so there is limited market information. During 2021/2022 the Biodiversity Conservation Trust have developed and consulted on a set of new methods to better estimate the value for each of the numerous biodiversity credits. These methods are proposed to be used to set the charge a developer must pay if they choose to meet their obligation via the fund. Key components of the new methods are estimating the typical supply side cost of establishing credits at stewardship sites. For ecosystem credits the key components of estimating the charge are typical management costs, land value and credit yield per hectare. For species credits key components of estimating the cost of generating credits are relative survey effort and management costs for the species, the availability of sites to generate credits and typical credit yield at a stewardship site. The methods rely on best available ecological maps and threatened species record data, overlain with current land valuation data to estimate the potential offset credit availability

and value. The work highlights the challenges in estimating credit value given the highly variable nature of ecological considerations, land management costs and land values in a rapidly changing economy as well as participant values and motivation.

Biodiversity Credits Supply Fund

Dr Louisa Mamouney
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Biodiversity Credits Supply Fund: bridging the gap between supply and demand in the NSW biodiversity credit market.

Recognising the Government's commitment to enhance operation of the Biodiversity Offsets Scheme, a new $106 million Credits Supply Fund has been established as part of the 2022 Budget, including a dedicated Taskforce to oversee supply of credits to meet the gap between supply and demand for biodiversity credits.

The Taskforce will be responsible for fast-tracking a significant increase in the supply of biodiversity credits by proactively supporting landholders to enter into biodiversity stewardship agreements that generate priority credits, being those credits most likely to be in demand. This will involve addressing barriers to entry and applying new learnings from customer journey mapping, behavioural insights, and process improvements.

Through the Credits Supply Fund, the Taskforce will also acquire priority biodiversity credits and on-sell them to proponents to support the delivery of infrastructure and other projects as those projects are approved. As part of the Fund, the Taskforce will seek to lower the cost of biodiversity credits compared to current forecasts and reduce reliance on the Biodiversity Conservation Fund, increase certainty and reduce delays for proponents, improve liquidity and confidence in biodiversity market and the Biodiversity Offsets Scheme and enhance conservation benefits by targeting opportunities for regional and landscape-scale conservation and integrating private and public land measures. The presentation will cover the work program of the taskforce and highlight the opportunities for market development, participants and accredited assessors, as well as cover how the Taskforce will operate with high degrees of transparency, probity and accountability.

SESSION 4: STUDENT PRESENTATIONS

Threatened plant translocations; Lessons from practitioners

Chantelle Doyle
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Published translocation literature necessarily focuses on the quantified components of the project, number, survival, reproduction and recruitment. But practitioners know some of the most interesting parts of a translocation are unanticipated, unobserved, and anecdotal. Through detailed interviews with 48 Australian translocation practitioners, including those involved in conservation and mitigation, we have explored the qualitative and quantitative aspects of translocation practice including budgets, resourcing, data accessibility, attitudes to translocation, and concepts of success. Contrary to expectations we found many practitioners felt the resources provided were adequate, even when they received little to no funding, and that ideas of success were highly personal and detached from technical working definitions. The research identified numerous opportunities to increase effectiveness of plant translocations and offers examples of how practicing consultants can be leaders in this, undoubtedly, growing field.

The Ecology and Conservation of the threatened Mahony's Toadlet: Are plant community types a suitable proxy for species occurrence?

Grant Webster
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Abstract not provided.

Investigating management solutions to assist post-fire recovery of small mammals

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In Australia, the alteration of fire management away from Indigenous burning and the rising impacts of climate change have combined to increase the intensity of wildfires. High intensity wildfires decimate ground and shrub layers, leaving native small ground-dwelling mammals, birds and reptiles with limited refugia. Additionally, predators such as feral cats are often attracted to fire-affected landscapes, presumably due to the favourable hunting conditions. Small ground-dwelling natives in the bare post-fire landscape are therefore highly vulnerable to predation. As vegetation often recovers too slowly to protect fauna in the critical months immediately after fire, it is imperative to investigate post-fire management solutions.

Here, we tested the use of artificial refuge tunnels in fire-affected areas. These tunnels are low-lying dome-shaped structures made from wire mesh netting that are designed to allow the entry of small mammals but prevent entry of predators. We tested whether artificial refuge tunnels can assist in small mammal post-fire recovery by monitoring animal activity at tunnel sites and control sites (burnt sites without tunnels). Preliminary results indicate that small to medium sized mammals use the tunnels, and that predator activity within tunnels is lower compared to control sites. This suggests that tunnels may assist small mammals in predator evasion within post-fire environments.

Seasonal Migration and Winter Bat Activity

Amy Rowles
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In temperate Australia, microbat survey is focused on Spring and Summer bat activity, encompassing the important maternity season. However, this has resulted in a knowledge gap for roosting and foraging resources, required by microbats over the cooler months. Resources, that may vary from those required during the warmer months and may be available within a current home-range or may require a shift or home-range extension.

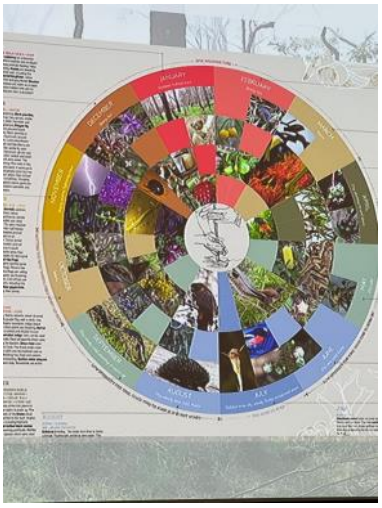
In Australia, the extent to which Australian bats migrate is largely unknown. As part of my PhD investigating the seasonal migration of Australian tree-roosting microbats, I studied the seasonal residency in a microbat community at a montane forest site. A previous long-term mark-recapture study at this site found that a large proportion of the microbat community remained resident from year to year when sampled annually in March. However, the seasonal surveys demonstrated that for some species, capture proportions varied significantly by season, indicating that some partial movement may be occurring. Relatively few captures of *Vespadelus pumilus* occurred during the November sessions and results suggest that this species may move to lower elevations over the maternity season, with the population expanding back up to higher elevations during the cooler months.

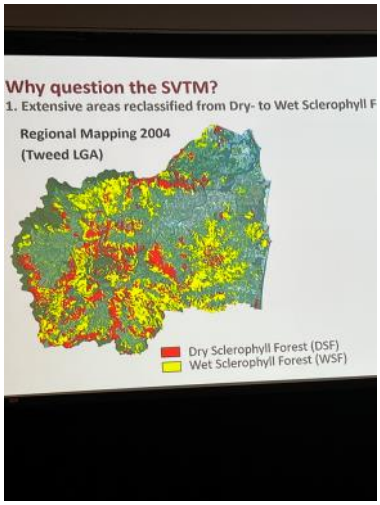
Although microbat activity levels significantly decrease as temperatures drop below the mid-teens, microbats are capable of activity at very low temperatures. Detection and captures of microbats are possible in winter, particularly during warmer periods. Although winter surveys should not replace spring / summer surveys, seasonal surveys should be included where possible, to better understand the seasonal requirements of a species at a particular location and add some bricks towards bridging this knowledge gap.

ECA Conference, Workshop and AGM
7-8th August 2023

The 2023 ECA Annual Conference '*Understanding the Biodiversity Legislation Nexus*' and Workshop '*Ecology Tools and Apps*' was held at the Fairmont Resort in Leura in the Blue Mountains on the 7th and 8th of August.

The spectacular views from the Fairmont were enjoyed by 237 delegates over the two days, with 149 staying to take part in the dinner and trivia quiz. We would like to extend a huge thankyou to all the presenters for sharing the expertise with us over the two days.





Above: photo courtesy of Kat Duchatel

Far left, left, above, right: photos courtesy of Elaway Dalby-Ball

Below are the abstracts from the conference day. Full presentations are available on the ECA website https://www.ecansw.org.au/conference-presentations/

SESSION 1: LLS ACT AND THE BC ACT AND EPBC ACT

The Land Management Framework

Luc Farago
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This presentation provides an overview of the Land Management Framework that includes the following components which work together to regulate native vegetation management on private rural land in New South Wales:

- The Native Vegetation Regulatory Map, Land Management (Native Vegetation) Code 2018, Allowable Activities, and the Native Vegetation Panel under the *Local Land Services Act 2013*.

- Private Land Conservation delivered by the Biodiversity Conservation Trust under the *Biodiversity Conservation Act 2016.*

- The Biodiversity Offset Scheme under the *Biodiversity Conservation Act 2016*, and

Changes to the management of native plants and animals via the Save Our Species program, wildlife licensing, Areas of Outstanding Biodiversity Importance, and modernising threatened species listings.

Interactions between Part 5A of the LLS Act and biodiversity legislation

Jessica Rossell
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An overview of the relationship between the native vegetation provisions in the LLS Act and the Land Management (Native Vegetation) Code with the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and compliance and enforcement under the *Biodiversity Conservation Act 2016* (NSW).

SESSION 2: RURAL FIRES ACT AND THE BC ACT

PFBP 2019 – Overview of APZ, expectations for Management, Monitoring / Compliance

Grahame Douglas
Senior Lecturer at School of Computing, Engineering and Mathematics, Western Sydney University
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Bushfire protection through the use of asset protection zones (APZs) may be seen as conflicting with biodiversity values, however, the real issue is that failure to account for bushfire early in the planning process can be critical is delivering both bushfire safety as well as biodiversity outcomes. The process of identifying and implementing APZs will be considered as well as issues of retention of biodiverse areas. Key decisions of the Land & Environment Court will also be considered.

Controlled Burning: Legal Aspects, Practices and Management

Jim Killen
Community Protection Planning & NSP Coordinator; Planning & Environment Services East, NSW Rural Fire Service
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The NSW Rural Fire Service is responsible for a number of pathways to allow for bushfire hazard reduction works, Ivan will explore the various approval pathways and the differences between an assessment application and an entitlement under the Rural Fires Act. There are various legal obligations with controlled burning that need to be understood before lighting that fire, these are aimed at protection of life, property and the environment and should not be viewed as a hindrance. Ivan will give an oversight of the synergies that exist between fire and the environment along with some practical examples of outcome focused works.

Fire as a Management Tool and Bush Fire Preparedness on Land with a BCT Agreement

Melissa Huntsman
NSW Biodiversity Conservation Trust
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The NSW Biodiversity Conservation Trust landholders interact with the BC Act and Rural Fires Act in the implementation of burning for cultural, ecological or hazard reduction purposes, as well as bush fire preparedness activities.

BCT is continually working to improve cultural appropriate support available for Aboriginal landholders with a BCT agreement, so they can lead the continuation and renewal of cultural burning as a component of Aboriginal land management. The use of traditional ecological knowledge combined with cultural protocol, used to inform interactions with Country and implement cultural practice is consistent with the objectives of the BC Act and Australia's international obligations.

BCT has and is continuing to develop guidance to support landholders to understand the interactions between their agreement and the Rural Fires Act, including the Bush Fire Environmental Assessment Code. For implementing burns, the 'Guide to the implementation of fire as management tool' provides a framework to support landholders understand if burning is an appropriate management tool and help landholders through the complexity of the planning and implementation process. For bushfire preparedness, close engagement with the Rural Fire Service has been essential to support landholders mitigate bush fire risk while adhering to the terms of their agreement.

The NSW State Vegetation Type Map Undermines Ecological Fire Management in Dry Sclerophyll Forests of the NSW North Coast

Andy Baker
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Reliable vegetation maps are crucial for managing fire frequencies for the conservation of biodiversity and bushfire risk. In New South Wales (NSW), recommended fire intervals vary by structural formation and include dry sclerophyll forests (DSF; fire every 7-30 years) and wet sclerophyll forests (WSF; 25-60 years). However, the recent NSW State Vegetation Type Map (SVTM) reclassifies extensive areas formerly mapped as DSF in regional maps, to WSF, effectively doubling the recommended interval between fires in these forests. To assess the validity of SVTM classification of sclerophyll forests, data from BioNet Survey Plots (5213) across the NSW north coast were compared to the diagnostic features of the NSW key to vegetation formations (tree height >30m, floristic indicators). SVTM mapping of WSF was found to be highly inaccurate, with 80.8% of corresponding plots not meeting the diagnostic canopy height threshold for WSF (>30m) and 24.8% of plots meeting neither canopy height nor floristic indicator criteria for WSF. Floristic indicators of *dry sclerophyll forest* were also widespread among plots misclassified to WSF, including in the understorey (50% of plots) and canopy trees (42%). Most plots misclassified to WSF were long-unburnt at the time of survey (73%), likely increasing the cover-abundance of WSF indicators ('soft-leaved shrubs') at the expense of DSF 'grasses' and 'hard-leaved shrubs'. Vital attribute analysis indicates that most taxa on misclassified sites are sensitive to infrequent fire – vulnerable to localised extinction (55%) or decline (3%) - highlighting potential consequences of extended fire intervals following misclassification. Low-frequency fire is already a major threat to the region's dry sclerophyll forests, causing widespread structural change and habitat decline. The widespread misclassification of dry- to wet-sclerophyll forests identified in this study and the subsequent lengthening of recommended fire intervals is likely to further promote ongoing fire exclusion and biodiversity decline in the region's dry sclerophyll forests.

Increasing the Supply of In-demand Biodiversity Credits

John Seidel
Credit Supply Taskforce, DPE
John.Seidel@environment.nsw.gov.au

This presentation will cover the current focus and work program of the Credit Supply Taskforce to increase the supply of in-demand biodiversity credits. The presentation will outline new products that will assist to increase the supply of biodiversity credits, improve operation of the credit market and make it easier for landholders to establish Biodiversity Stewardship Agreements. It will also highlight the work undertaken by the Taskforce over its first 12 months of operation.

SESSION 3: EPBC ACT AND ITS INTERACTIONS

The NSW Biodiversity Offsets Scheme and its interaction with the EPBC Act

Amy Dumbrell
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This presentation focuses on the interactions between the NSW Biodiversity Offsets Scheme and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In 2020, the Australian Government endorsed the NSW Biodiversity Offsets Scheme under the EPBC Act Condition-setting Policy. Under the terms of the NSW Assessment Bilateral Agreement, the NSW Government assesses development applications on behalf of the Australian Government, which remains the decision-maker for EPBC Act approval.
The endorsement has resulted in streamlined benefits for the assessment and determination of major projects requiring both Australian and NSW Government approval. Both Governments continue to work on achieving ever greater alignment, including progressing work under the Common Assessment Method to better align threatened entity listings.

The presentation will provide information about how these streamlined arrangements operate and how assessors accredited under the *Biodiversity Conservation Act 2016* can navigate the process when preparing a Biodiversity Development Application Report.

The Australian Government is progressing reforms to the EPBC Act which will have impacts on the endorsement of the scheme and operation of the Assessment Bilateral Agreement. NSW is looking to ensure existing streamlined benefits are maintained and enhanced during this reform.

EPBC Act Reform Update followed by EPBC Act Referral, Assessment and Bilateral Process

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The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Bilateral Agreement with the NSW Government provides for a single assessment of State and Commonwealth matters. Under the Agreement, the NSW Department of Planning assesses impacts to Matters of National Environmental Significance (MNES) on behalf of the Australian Government. This includes projects designated as NSW State Significant Development (SSD), State Significant Infrastructure (SSI), Critical State Significant Infrastructure (CSSI), and Modifications (Mods) to the above. The Bilateral Agreement with the NSW Government means project proponents deal with one level of Government during their project's assessment. This minimises duplication for both Governments and proponents.

It is the NSW Government that determines whether a project is assessed under the Bilateral Agreement. If projects have progressed too far under the NSW State assessment process before referral under the EPBC Act, the Bilateral Agreement may not be able to apply to a project's assessment. When environmental consultants are working on SSI, CSSI or SSD projects, and MNES are likely to be significantly impacted, consultants should ensure a referral is made under the EPBC Act before the EIS under the NSW assessment is exhibited.

SESSION 4: STUDENT PRESENTATIONS

Passive monitoring facilitates assessment of the multi-scale factors driving bat box usage in urban reserves

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Artificial bat boxes are a popular tool for offsetting natural hollow loss. However, bats often use some boxes within a reserve but not others, and the causative factors are poorly understood. Research has focused on characterising physical attributes of boxes, and struggles to account for bats' unique high mobility and roost switching behaviour. This project aimed to address these gaps by investigating the interactive influence of biological, behavioural, and multi-scale landscape factors on box selection, as well as to test the utility of using camera trapping and new bioacoustic technology to develop novel approaches for capturing bat roost switching and species interactions. We deployed passive acoustic recorders (AudioMoth or Anabat Swift) and remote sensing cameras (Reconyx PC800) on every bat box within four urban reserves across metropolitan Sydney. Boxes were simultaneously and continuously monitored for fourteen nights, allowing monitoring of whole-site box usage over a short but intensive period. Additionally, we measured landscape, microhabitat, box design, and species-specific factors to evaluate their impact.

With this method we successfully captured data on roosting behaviour across a network of boxes. We found moon phase and rainfall strongly influenced roost selection, while spatial factors had less of an effect. We also observed unexpectedly low roost switching, high reuse of boxes as day and night roosts, and high occupancy of some central roosts. This may suggest boxes in these reserves do not sufficiently mimic a natural roost network. Furthermore, results showed that, although camera traps and acoustic detectors were not definitely more accurate than standard methods of manual box checks, they did provide far richer detail about fine-scale occupancy and bat behaviour within boxes. Overall, these results demonstrate the importance of addressing multiple scales, and the potential application of passive recording technology to improve both research and management of bat boxes.

Comparing artificial intelligence (AI) models for the detection of mammals in camera trap images

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The development of artificial intelligence (AI) has opened many doors for the automatic analysis of large volumes of data. Applications of AI technology to analyse imagery data have exploded in the last decade following the success of deep learning models in the Image Net Large Scale Visual Recognition Challenge (ILSVRC) in the 2010s. However, these tools are emerging relatively slowly in the ecological space, especially for the use of detecting threatened species and facilitating their conservation. As the volumes of imagery data increase in the forms of camera trap, aerial, and satellite imagery, there is a need to develop automated tools to improve the efficiency of which ecologists analyse data. In my study, I will compare the performance of different object detection models for the analysis of camera trap images. YOLOv5 and RetinaNet are single-stage detectors, where localisation of individuals and classification of the species are completed in one stage. Whereas Faster R-CNN is a two-stage detector, where localisation and classification are done separately. I will also compare the performance of the detectors on differing number of images to find the threshold that is needed for a viable model. I will then explore the use of data augmentation methods, where new images are generated from existing ones to test if there are any improvements to the performance of the models when there are limited images available.

Microphytobenthos biomass as a potential indicator of bushfire impact

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The 2019-2020 Black Summer bushfire season was declared the worst in Australian history. Such megafires have the potential to create unique environmental impacts and have recently been documented to change phytoplankton productivity far offshore. Post-fire runoff flushes nutrients and contaminants into the waterbodies, that may degrade water quality and harm aquatic life and ecosystems. An increase in the nutrient influx to waterways following bushfires and subsequent rainfall events may promote algal blooms, which can harm aquatic biota that are important for the healthy functioning of the ecosystem. However, we have very limited knowledge of the impact of the fires on the biological state and health of these systems. Estuarine ecosystems are one of the most productive and biologically diverse coastal ecosystems. They provide important ecosystem services such as carbon storage and nutrient cycling, breeding grounds and critical food-chain linkages to broader marine ecosystems, and benefit humans through the provisioning of food and medicinal and genetic resources. Understanding how estuarine systems are affected by bushfires is crucial for conservation strategies and the development of effective management plans that will ensure maintenance of ecosystem functions. Post-fire analyses are also important to assess for an increased risk of algal blooms that may lead to broader impacts to the ecological health of estuaries. To address this knowledge gap, we measured changes in the microphytobenthos biomass (MPB) in soft sediments of six estuaries in New South Wales immediately before (August–September 2019) and after (February–March 2020) the Black Summer bushfire. Microphytobenthos are found in the surface layer of sediments, and it has frequently been used as indicator of environmental quality. Moreover, soft sediments are a vital habitat in marine and coastal ecosystems worldwide and play major roles in global biogeochemical cycles. Sediments provide a long-term indicator of contaminant status and, although the impacts of contaminants on sediment condition are well studied, very little is known about the effects of bushfire-derived material that could be deposited in these habitats. This project's main goal was to assess the impact of bushfires on the ecological health of estuaries using microphytobenthos biomass as indicator of ecological impact. We predicted an increase in the concentration of MPB in the fire-impacted estuaries. Our experimental design included 2 control and 4 fire-impacted estuaries. Soft-sediment samples were collected from the lower estuarine section of each estuary. Each one of these estuaries (Hastings, Karuah, Georges, Shoalhaven, Clyde, and Moruya) had different fire intensities, scale, different background stressors, and distance from the catchment to the burnt areas. As predicted, we detected a significant increase in the concentration of Chl-a (our proxy for MPB) in Moruya. However, no significant differences were found in the other estuaries, independent of fire-impact. Moreover, chl-a levels varied considerably among estuaries independent of bushfire impact. This highlights the importance of a before-impact dataset to detect a short-term change in MPB due to fires. Our results might be, however, reflective of a short-term impact. It is possible that post-fire material continued being transported from the tributaries all the way to the lower estuarine section, mainly after heavy rainfall events. Therefore, we recommend long-term assessments to further our understanding of the long-term impacts of bushfires.

Does fire affect the relationship between plants and their pollinators, or are they capable of rekindling things when burned out

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Australia's flora and fauna have had to deal with fire for millennia, though we know almost nothing about the responses of pollinating insects. In an attempt to gain some insight, I studied plant and pollinator responses after the 2019/20 fire season at 14 locations across the northern tablelands region. Though all sites were heavily impacted by the two years of drought prior, bees in particular, exhibited notable responses to fire.

Restoring Drylands from the Ground Up: Soil health response to reintroduced semi-fossorial mammals

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Soil microbes and invertebrates play crucial roles in driving ecosystem function and biogeochemical processes in dryland environments. However, the decline in biodiversity within drylands due to high extinction rates and threats to many species has disrupted the biogeochemical processes necessary for sustaining these ecosystems. Restoration efforts require a deeper understanding of the interactions between the soil community and key ecosystem engineers. Burrowing and digging mammals have been identified as powerful ecosystem engineers, providing various benefits such as nutrient dispersal, refugia for other species, and increased landscape heterogeneity through their foraging behaviour and burrows. Previous studies have compared habitats with and without these engineers, highlighting variations in microbial and invertebrate abundance, but evidence regarding functional diversity differences is limited. Exploring these differences is crucial for comprehending the ecosystem-level benefits derived from these interactions and predicting the potential impacts if any component of this complex system is altered.

This project aims to enhance our understanding of the intricate relationships within these ecological systems and contribute to the development of effective strategies for dryland ecosystem restoration and conservation. Using 16S and 18S rRNA to identify soil taxa and their associated functional communities, in correlation with soil chemical variables the outcomes of this project will evaluate how reintroducing digging mammals can restore drylands from the ground up.

NSW Wildlife Drone Hub

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The NSW Wildlife Drone Hub, or Drone Hub, was launched in February of 2022 and funded by the NSW Digital Restart Fund. It is committed to giving New South Wales a drone capability for biodiversity monitoring. Since its inception the Drone Hub has trained 60 ecologists to fly drones and collect scientific data using thermal sensors and object detection models. In the last 12 months Drone Hub pilots have conducted over 700 surveys for partners in universities, government and industry across NSW.

https://www.environment.nsw.gov.au/topics/animals-and-plants/surveys-monitoring-and-records/nsw-wildlife-drone-hub

Using Drones for Minesite Rehabilitation

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The environmental sector is undergoing a transformation driven by the emergence of drone technologies, which are revolutionizing environmental rehabilitation and conservation efforts. Drones are now utilised for diverse tasks, including aerial monitoring, surveying through photogrammetry, generating elevation models, enabling precision agriculture, and facilitating low-impact revegetation practices. The mining industry has recently embraced rehabilitation reforms, emphasising performance and completion criteria and objectives. In pursuit of enhanced mine site rehabilitation, a trial was conducted in the Central Tablelands of NSW, utilizing unmanned aerial vehicles (UAVs) or drones to establish a prescribed native vegetation community through aerial application of native seed. This presentation will delve into the benefits of incorporating up-to-date technology in drone-based seed application for site revegetation, exploring the advantages and lessons learned. Achieving a natural replication of the vegetation community is a critical requirement for the site's rehabilitation. Nevertheless, this goal presents challenges due to limitations in native seed supply and conventional seed application equipment and site preparation. The presentation will primarily focus on the research and development efforts of Sky Land Management, particularly regarding seed coating techniques for optimal germination and seedling survival. The trial will assess the advantages of coating native seed to achieve precise application, reducing wastage, and preventing extraneous weed growth compared to conventional broadacre methods. Furthermore, the trial and presentation will showcase improvements in revegetation achieved by enabling overflight and targeted application of ameliorants and supplementary seeding, eliminating the need for large equipment. This approach enhances safety in challenging terrains where traditional machinery or manual traversals are not feasible. The outcomes of the trial will also highlight the scalability of rehabilitation areas, offering flexibility to optimise opportunities based on climate and mine planning. This agile approach can swiftly address issues like weed intrusion, erosion, and dust production in prepared lands without waiting for costjustified large-scale broadacre methods. While the trial encountered challenges, such as seed viability and purity, the development of guidelines for native seed supply promises cost savings and assists resource companies in future rehabilitation endeavours. Ensuring the quality and quantity of ordered seed supply will form a solid foundation for successful revegetation. This pioneering direct seeding with drones trial not only demonstrates numerous benefits for the resource sector but also for the broader industry. It showcases improved quality assurance in supply, enhanced safety, and the capability of achieving effective revegetation using this newly emerging technology. Moreover, the trial presents innovative solutions to address issues within the seed supply chain, thereby contributing to sustainable land management practices and environmental conservation.

Thermal Imaging of Wildlife for Ecological Consultancy Surveys

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Drone thermal imaging is becoming an increasingly recognised tool for rapidly and comprehensively surveying for cryptic nocturnal wildlife. With the ability to detect a wide range of both invasive and threatened species in a comprehensive, efficient and repeatable manner, opens up new opportunities for those monitoring and managing natural resources. Examples of environmental consultancy projects where this technology has been successfully deployed include environmental impact assessments, stewardship site biodiversity accounting and long term monitoring of offset sites and other lands managed for

conservation. This includes surveys across a broad range of industries including extractive resources, renewable energy, large and small-scale infrastructure projects and biodiversity credit/offset projects. We provide examples of the diversity of species that can be detected and identified in real-time in the field, from tiny feathertail gliders to feral deer, as well as insights into the logistics, licencing and skills required for such operations within different ecosystems across Australia.

Seed Collection for Restoration: a practical guide

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This presentation provides a practical guide on seed collection for ecological restoration, focusing on the implementation of the Florabank Guidelines and the significance of market demand signals. The Florabank Guidelines offer best-practice insights for collecting, processing, and storing native seeds, ensuring genetic integrity and adaptability. Additionally, incorporating market demand signals allows practitioners to prioritise species that align with restoration projects while meeting industry needs. Attendees will gain practical knowledge for more successful and economically viable restoration outcomes.

GIS Tools for Ecological Consultants: Enhancing Efficiency and Data Quality

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Problem: GIS data is notoriously hard to collect, maintain and manage. This results in time wasting and potential reporting errors.

Solution: This presentation focuses on solutions to better manage your GIS data. From collecting data in the field to creating data files to supply to government, training and more.

We offer an easy-to-use platform to collect, manage and maintain your critical datasets. This will save time and money for ecological consultants. Digitising the workflows related to species collection, plot analysis and more is available via the platform.

Take control of your GIS data, have more confidence, and stop wasting time and money.

Trees Near Me NSW

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To support the launch of the NSW State Vegetation Type Map. the NSW Department of Planning, Industry and Environment (DPE) released a mobile app that allows anyone to perform complex spatial queries on Plant Community Types. It works just like Google Maps but for trees. We call it Trees Near Me NSW and it recently won an international design award. It is giving DPE a new way to engage directly with our customers is democratising spatial analysis. We need your input to further improve our maps. Trees Near Me NSW has simple tools that allow users to give feedback at specific locations without leaving the app.

https://treesnearme.app/

Credits Near Me App

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Credits Near Me NSW is a new and simple mobile app to support participants in the NSW Biodiversity Offset Scheme. The app is free and helps landholders discover the biodiversity credit potential on their land. It also helps credit buyers locate potential areas of credit supply. It does this by delivering an interactive and searchable map of non-threatened credit types as defined by the scheme. Credit buyers can search for like-for-like credit type locations, either by credit type name or by selecting the NSW Plant Community Type for which retirement credits are required. Bioregions are also displayed and can be used to constrain the results. If a credit type is currently in demand (sought by a buyer) the app highlights candidate supply areas and allows landholders to submit an expression of interest for a biodiversity stewardship agreement. In-demand credit type listings are sourced from the Biodiversity Offset Scheme's public demand registers and the NSW Credit Supply Taskforce. The OTG map is indicative only and derived by translation of the NSW State Vegetation Type map. Credit types

are not shown over areas that are ineligible for biodiversity stewardship agreements. The app is an innovative, simple and responsive platform with potential to host future mapping such as threatened credit types and forecasted demand listings.

Science, Economics and Insights Division. The team exists to make the division's maps work for everyone.

EcoServer: BAM field data collection software

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Lucas collaborated with Michael and Carl Tippler in 2016 to build a BioBanking (BBAM) field data collection app, following the success of Michael and Carl's Rapid Riparian Assessment (RRA) and Rapid Assessment Method (RAM) applications. These applications led to establishing EcoServer platform which will include the forthcoming EcoSites BAM version (an iOS-native field app and web interface to collect, store and report on field data following the BAM). A demonstration of the software will be provided at the conference.

Using Machine Learning to Scale Wildlife Conservation

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Means to acquire data for ecological or other purposes are getting much easier than before with the proliferation of good hardy cameras and other recording devices and alternate means of connectivity, even for remote areas. But the data they generate still needs to be processed. But, when the processing is not done by the domain experts, there's a lot that gets lost in translation. Plus, doing it manually is tedious and prone to errors. We are walking you through a Machine Learning enabled workflow that helps ecologists in an end to end manner.

Acoustic Survey Methods and Technology

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Passive acoustic monitoring (PAM) is increasingly being used to survey for wildlife. For bats, this is a well-established method, but in the case of birds, frogs and other vocalising wildlife, it is an emerging field. The Biodiversity Assessment Method for NSW now outlines the use of PAM to assess many native species, therefore it is essential for ecological consultants to understand the method, including its advantages and pitfalls, to effectively survey for these species. This presentation will outline what wildlife groups and species can be surveyed using PAM, including several examples. The technology will also be examined, including acoustic recorders, bat detectors, differing microphone types and technological tips such as settings, with a specific focus on Titley Scientific products. Deployment tips including positioning and mounting will be covered, as well as the post-recording process of data storage and analysis.

Songmeters / Echometers: products and analysis

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The popularity of bioacoustics in monitoring animal species for conservation has surged greatly in recent years. Huge quantities of data can be collected remotely and discretely with minimal human effort. This allows species, such as birds, bats, frogs, insects and mammals to be surveyed efficiently and without great cost. Within this field there are a number of devices available to assist practitioners, however it can be difficult to know which device is best suited for your project. This workshop will run through the equipment which Faunatech and Wildlife Acoustics provide for monitoring. We will take a look at the Song Meter range of passive autonomous recorders, both acoustic and ultrasonic, as well as the Echo Meter Touch 2 range of active bat detectors which can be plugged into your phone or tablet. We'll run through some examples of projects which use this equipment, not only for conservation, but for education and community engagement too. Following this, we will briefly cover the acoustic analysis software: Kaleidoscope Pro.

Systems and Apps BCT has developed for baseline ecological assessment and montoring

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Above: photo courtesy of Amy Rowles

The NSW Biodiversity Conservation Trust (BCT) has developed an end-to-end solution to the collection and management of data for biodiversity assessment and monitoring. Key features include online data storage, mobile apps for BAM-compliant data collection and navigation, web mapping apps as an alternative to GIS, data-driven document production, automated analytics and operational dashboards. Tools have been thoroughly tested over four years by more than 80 field ecologists working in all parts of NSW.

Passive Acoustic Monitoring and Analysis

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Passive acoustics is a rapidly evolving field involving the recording and identification of wildlife sounds. While the approach has been in use for many years with bats and frogs, it is increasingly being used for other taxa. In the last 5 years or so, hardware for extended deployments with the ability to program unique schedules has become readily accessible and a range of manufacturers have products on offer. The biggest challenge today is processing the vast quantities of data that are recorded. Automated identification, especially the use of artificial intelligence (e.g. CNN's), is currently the most promising approach for recognising sounds produced by different species. This involves collating extensive training data from different regions and testing in real world situations. I will provide examples of recent developments in this space and case studies of how the methods have been deployed in ecological research, especially targeting koalas. In short, the methods are proving to be a game changer for cost-effectively surveying and monitoring of otherwise cryptic species, especially as additional recognisers come on-line to further analyse acoustic recordings.

How e DNA techniques can assist Ecological Consultants

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Reliably determining the presence or absence of threatened species is integral to making informed management decisions and Environmental Impact Assessments. However, traditional surveys can be time and labour intensive and lack sensitivity to detect rare or cryptic species. In recent years, environmental DNA (eDNA) has rapidly emerged as non-invasive, cost-effective, and potentially highly sensitive wildlife survey tool. The ability to apply eDNA techniques across a variety of ecosystems and for many species/taxa makes it a valuable tool but can also create confusion and uncertainty among non-specialists about when, where and how to use eDNA.
Here, we will provide a broad overview of eDNA techniques and applications along with several case studies. Topics covered will include:

- What is eDNA
- Single species detection or biodiversity assessments
- How to take samples
- Sampling design considerations for various species
- eDNA in terrestrial environments
- Interpreting results and limitations

How to enter and extract flora survey plot data in BioNet Atlas to load in the Plot to PCT Assignment Tool in order to determine plant community types

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Getting plot data into BioNet can be a complex process and is a known pain point for Accredited Assessors. Based on recent feedback, this has resulted in reduced uptake of the Plot to PCT Assignment Tool. This talk uses application screenshots to focus on the steps involved in getting your plot data into BioNet Atlas, highlighting critical steps and data that impact the Tool. We will then demonstrate how to extract sample data for upload into the Tool. We will highlight the existing resources, in addition to a new user guide that has just been developed to support Assessors. The opportunity will be provided for Assessors to ask questions while we have a number of staff members present from the BioNet and Vegetation Ecology & Classification teams to assist.

RECENT GOVERNMENT LIAISON NEWS

Andrew Lothian, the ECA Vice President has been fulfilling the role of Government Liaison for the ECA communicating with both DPIE and DEECCW.

DEECCW have been holding regular EPBC Act Stakeholder group meetings, of which Andrew has been attending to represent the ECA. Below are some notes from some of the meetings that will give you some insight as to what topics are discussed.

<u>EPBC Act Stakeholder group meeting held 11 may 2023</u>

More structural changes within department -organisational chart provided

- Consultant feedback from ECAVic, ECAWA, ECANSW, EIANZ(Qld):
  - Can we streamline/enforce quick date setting for pre-referral meetings (Dept acknowledge there were delay from a backlog of referrals late last year and summer break)
  - Greater Glider Conservation advice suggests all habitat within its range is critical – is 1 tree a significant impact? Need more quantitative guidance for significant impacts
  - Information presented in some SPRAT profiles are out of date. Would be good to see some updates/reviews here.
  - Can translocation avoid significant impact if shown to work for the species, thus reducing residual impact and need to offset?
  - Can we get quantitative thresholds for significant impacts on communities as well as species?
  - Discussed appropriateness of offsets for some species – some might need to be mandated avoid only (issue of scarcity)
  - Revolving door of legislative changes/updates mid project means it is hard to close out a project without constant requests for updates – need better way of communicating and searching new listings which are coming thick and fast.
  - Feedback on listing of Pilotbird was that the listing was intended to focus/encourage conservation activities as opposed to impact assessment. Possibility of Ecosystem credit species (listed Federally) to be overlooked/ glossed over with the State legislation level (maybe under consideration of avoid for ecosystem credits, or simply a lack of information presented on them due to lack of survey requirement)
  - Disconnect between species in offset management – plantings encouraged for Koala, but this won't help Greater Glider in the short term which relies on averted loss on offsets
- Nature Positive Plan
  - Better environmental and heritage outcomes – NES, First Nations consultation
  - Faster better decision making and clear priorities – regional planning
  - Accountability and trust
  - Expanding water trigger to other forms of gas, not just underground coal and coal seam gas
  - Want to deal with cumulative impacts and climate consideration
  - DCCEEW looking to establish fund for when you can't find offsets – I noted the issues experienced in NSW and encouraged thorough thought on how it is implemented and allowed to be used
  - New departments – Environment Protection Australia (EPA) and Environment Information Australia (EIA)
  - Public consultation on exposure draft in second half of 2023. Consultant bodies will be notified so they can make public submissions
- Offshore renewables – looking at sharing data between projects in specific zones (Hunter Declaration area, Pacific Ocean off Illawarra) so not reinventing the wheel every proposal
- NE NSW Regional Forest Agreement – in court now, DCCEEW looking at this in light of the Samuels Review
- Referrals Gateway
  - Various business portal improvements have been implemented or are coming July 2023 – mapping

(uploading of shapefiles etc), attachments (logical and clear requirements), referral form preparation guide now downloadable so can prepare offline, cost recovery and invoicing (receipts will be emailed and in portal)
  - Analysing application data to see where issues are resulting in resubmission requests
  - We suggested feedback section within application to facilitate improvement, still want multiple user access for larger companies
- □ Regulatory posture
  - About clarifying who DCCEEW are as a regulator. Needs responsibility of regulator included, not just expectations of proponent. Live on website, but thinking of circulating at pre-referral meetings
- □ Engagement with First Nations Peoples (attached)
  - Sets principles for how to engage
  - Raised issues that some groups are under-resourced which inhibits their ability to engage

<u>EPBC stakeholder engagement meeting summary 22/9/23</u>

- □ General updates – working on avoidance policy, all projects with offsets should be published on website now, adding in historical offset sites that exist, working on cost recovery around EPA, legislation package expected to be presented end of year (Dec 2023)
- □ Action items – lots, most being closed out. I will forward the collection of minutes to Amy for the meetings to date. I am not allowed to send them until they are accepted, which only happens at the next meeting, so by the time they are seen they are in the past.
  - Interim policy being developed for notification of new listings based on feedback about frustration with continual changes
  - Acknowledge more guidance is desired for referral tests of significance (quantitative thresholds). Working on for future material
  - SPRAT profiles lacking newer info – some old info must be retained, but if anyone is working on the species and finds newer information relevant to the species, please email it to sprat@dcceew.gov.au.
  - Request to add searchability of referrals portal by species to see what other projects have presented
- □ State feedback
  - NSW – how does assumed presence under BOS impact EPBC referral – taken on notice but initial advice is that if the assumed presence would then constitute a significant impact, referral would be required.
  - NSW – thanking DCCEEW for presenting at conference
  - WA – mostly referring to black cockatoo, but department stating that at this point some species warrant referral for ANY/EVERY action
  - Vic – implications about rediscovery of grassland earless dragon
- □ Compliance
  - Compliance and enforcement branch mainly looking after triage and operations, environmental audit, approvals compliance and general compliance
  - Slides to be disseminated
  - Explained rationality between leaning towards other forms of action beyond fines, ones that result in better environmental outcomes (remediation orders, conservation agreements, enforceable undertakings, injunctions)
  - Anyone can report breaches on website
  - I pointed out that if fines are used they need to take into account the increasing cost of ecological assessment under the current legislation
  - Consultants asked for compliance action examples to be published on website as a deterrent
- □ Offsets update
  - Currently conducting an audit of 1100 current approvals, including ground truthing 20 sites
  - DCCEEW seeking feedback on current offsets guidance
- □ Environmental Information Australia (EIA)
  - Establish new data division which is where all the new Federal data collating tools will be coming from (Biodiversity Data Repository, Digital Environmental Assessments Program, etc)
  - This will be led by an independent officer
  - All state representatives interested in involvement in development of tools and national standards

- Referrals Gateway
  - Improved guidance for referral template (descriptions and mapping requirements)
  - Now a static offline document available
  - Seeking feedback from anyone who has used referral guidance material
  - Consultants seeking ability to view questions and information before logging in to begin
- EPBC Act reform
  - Nature positive reform target (not no net loss) – ties in with BC Act statutory review
  - Minor tweaks will be made to two protected matters – Nuclear triggers will align with ARPANSA, and water trigger will be broadened to all forms of unconventional gas
  - Averted loss will be a thing of the past. Consultants raised point that averted loss may not be a bad thing for some communities that provide strategic regional benefits but don't necessarily meet "net gain", possibly via lack of longevity or additionality. Taken on notice
  - ECA NSW reiterated BC Act statutory review and lessons to be learned in this space. DCCEEW are aware and have been watching closely.
  - Conservation planning - listing reforms, recovery strategies will become more agile
- Conservation planning reform
  - Consolidating conservation advice and recovery plans into one document – Recovery Strategies
  - These will be housed digitally, be searchable, and will be agile (live updates)
  - Should include protection statements – unacceptable impacts, thresholds, include mapped no go areas
  - Migratory and marine species will stay the same as current under new legislation
  - Improving info in documents now, but those reforms requiring legislative change (i.e. movement from cons advice to strategies) will come later
- Environmental Protection Australia (EPA)
  - Will have independent CEO and budget
  - Decision making will be independent of government, but operate within government network

The ECA made two submissions to the NSW Biodiversity Conservation Act 2016 Review and these are presented on the following pages.

PHOTO COMPETITION

Thank you to everyone who entered our photo competition. Congratulations to Steve Sass, winner for this edition. All entries for this competition have been included in the ECA Photo Gallery on the back cover.

Email your favourite flora or fauna photo to admin@ecansw.org.au to enter a competition and have your photo on the cover of the next ECA newsletter. Win your choice of one year free membership or free entry into the next ECA annual conference. The winner will be selected by the ECA council. Runners up will be printed in the photo gallery. Please ensure that your photo is clear with a high resolution.

Photos entered in the competition may also be used on the ECA website

INTERESTING OBSERVATIONS, TIPS AND FACTS

Share your interesting observations, tips and facts here by emailing admin@ecansw.org.au a paragraph or two, maybe a photo. If it is interesting to you, no doubt it is interesting to other ecologists.

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Biodiversity Conservation Act Review

Department of Planning and Environment

Locked Bag 5022

Parramatta NSW 2124

Email: biodiversity.review@environment.nsw.gov.au

11 April 2023

Re: 5 Year statutory review of the Biodiversity Conservation Act 2016

The following document has been prepared on behalf of the Ecological Consultants Association of NSW, in consultation with Local Government NSW. As key stakeholders involved with everyday implementation of the Act, we are best placed to provide feedback on operational issues with the Act. Issues that have been faced by practitioners are felt across the BC Act, the BC Regulation and the Biodiversity Offset Scheme. Often they are intertwined and BOS issues can be rooted in the Act or the Regulation. For this reason, we think it would be unwise to look at review of one without at least consideration of the others alongside. The table below provides a summary of things we like and those we don't, and includes areas where there might be crossover with the Regulation and BOS.

Issues with the BOS have been well summarised by the Parliamentary inquiry into the integrity of the BOS (https://www.parliament.nsw.gov.au/lcdocs/inquiries/2822/Report%20No.%2016%20-%20PC%207%20-%20Integrity%20of%20the%20NSW%20Biodiversity%20Offsets%20Scheme.pdf), and the Audit Office of NSW examination of the effectiveness of the BOS (https://www.audit.nsw.gov.au/our-work/reports/effectiveness-of-the-biodiversity-offsets-scheme). ECA NSW provided key contributions to both reviews, and reports summarising the outcomes of both have already been released. Both documents should be read alongside the BC Act review. Some solutions have been proposed, but these may require changes in the underlying legislation.

One of the key problems with implementation of the BOS (and this legislation) was a lack of consultation with key stakeholders (namely those who work to it on a daily basis) prior to its release. This review provides the perfect opportunity to address that oversight. Though seeking submissions from stakeholders is a great first step, we believe (as does Local Government NSW) that a working group should be set up involving representatives from the key stakeholders. This will prevent any modifications to the Act that may create further working issues going forward. By working through proposed changes, we can identify areas where real improvements will be made, and those where the underlying change in the legislation makes no real world difference to the problem that needs to be solved. The ECA NSW would be happy to contribute to facilitation of such a working group.

If you have any further questions about our submission, don't hesitate to contact us at admin@ecansw.org.au.

Andrew Lothian
1st Vice President (Government Liaison Representative) ECA NSW

Rebecca Hogan
President, ECA NSW

Good aspects of the BC Act 2016

- Object that recognises the concept of ecologically sustainable development.
- Private land conservation arrangements are strengthened and supported through the BCT.
- Continuing process for listing threatened species and ecological communities, and an independent scientific committee.
- Objective of no net loss of biodiversity recognised (Section 6.73) – however, it is only for the purposes of the BAM and is "a standard that, in the opinion of the Minister, will result in **no net loss** of biodiversity in NSW". Concerns about whether this can actually be achieved with the legislative instruments in their current form.

Issues in response to consultation questions

How effective are the objects of the Act to restore, conserve and enhance biodiversity today and into the future?

Issue	Solution	BC Act	BC Reg	BOS
Objectives – currently the Act only recognises the importance of biodiversity at bioregional and state scales. This should be extended to recognise importance of local biodiversity conservation actions.	The objectives of the Act need to be changed to recognise the importance of local biodiversity and an additional objective should be introduced to clarify the policy objective for native vegetation, i.e. no net loss of native vegetation in NSW and protection of native vegetation at the state, regional and local scales.	X		
Inadequate consideration in decision-making is given to all species and natural ecosystems, in favour of listed threatened species. At present, impacts on non-threatened species are assumed to be not significant, notwithstanding the fact that these species may be essential for the life cycle and survival of other species.	Provide some real world mechanisms to protect non-listed entities in the actual working parts of the legislation. This could include considerations under the BOS, and will ensure all biodiversity is protected, not just threatened components.			X
Complexity of approval processes - disconnect between the planning system and biodiversity legislation.	Consider simplifying approval processes by removing link to Standard Instrument LEP zones (e.g. BAM thresholds). Adjusting BAM thresholds for entry would facilitate raising of credit prices to encourage investment in stewardship from unfairly impacting small land holders. Change entry thresholds from zoning (minimum lot size) based to raw area based.	X		
Lack of legislative clarity about key concepts. This is causing inconsistency in application of the Act/BOS across local Councils (consent authorities).	Better definition of avoidance, serious and irreversible impacts, and no net loss. Better guidance material and support for decisions makers with regard to assessing the above concepts.	X		
Relationship between the operation of the legislation and the Standard Instrument LEP, especially zoning provisions. A lot of stuff is falling between the cracks under grey areas between LLS Act, Vegetation in non-rural Areas SEPP and RFS Act.	Need a consistent approach to regulation of clearing native vegetation that is irrespective of land use zoning. Standard instrument local environmental plan zones should be removed as the basis for regulating native vegetation and determining approval pathways	X		
Insufficient focus on avoid. Enforcement of this principle is hindered by lack of definition around what is required. Consideration not standardised across consent authority jurisdictions.	Reinstate publicly available credit pricing (overestimate if you want) to facilitate planning level decisions towards avoid instead of offset. Without the ability to provide a Client with a cost to clearing native vegetation at the preliminary constraints stage of biodiversity assessment, it is difficult to provide commercial justification for avoiding and minimising impacts during project planning and design.	X		X

Is the current purpose to conserve biodiversity consistent with the principles of Ecologically Sustainable Development appropriate?

Issue	Solution	BC Act	BC Reg	BOS
Would the situation be better without the BOS? No. Does the Act provide for achievement of "No Net Loss"/"Ecologically Sustainable Development" in its current form? No.	Greater focus on avoid (including provision of strict definitions/thresholds/guidance), particularly for SAII species. The system needs to recognise that offsetting is not an appropriate measure for some threatened species, and avoid is the only acceptable measure (i.e. Regent Honeyeater breeding locations).	X		X
Part of the issue rests on voluntary entry into offset site generation. Without providing for strategic acquisition of ecologically valuable land for stewardship, there is no guarantee you will ever be able to offset an impact to a species by development that has been approved years earlier. Time lag between loss due to development, and generation of biodiversity gains on offset sites are currently way too long to be considered "ecologically sustainable".	Allow strategic purchase of land by BCT to facilitate offset generation of key ecological linkage corridors, key threatened species breeding habitat, etc. This may require land purchase prices to be incorporated into credit costs. Facilitate mechanisms for advanced offsets.	X	X	X

How could the Act best support national and international biodiversity aspirations including climate change adaptation, nature positive and restoration goals?

Issue	Solution	BC Act	BC Reg	BOS
	Recognise the 30 x 30 international target in the legislation.	X		
	Recognise the need for linkage of habitats to facilitate movement under climate change scenarios. Generate strategic plan for acquisition of offset lands.			X
	Remove variation rules for offsetting of at least species credits.			X

How could the Act better integrate Aboriginal knowledge and support the aspirations of Aboriginal people in biodiversity conservation?

Issue	Solution	BC Act	BC Reg	BOS

How current and comprehensive are the existing elements of the Act for biodiversity conservation?

Issue	Solution	BC Act	BC Reg	BOS
In some ways the Act is not the problem, more the application of it at the on-ground level. This may come down to lack of clear definitions in the Act, but also flow on effects to how the BOS is governed. This is particularly relevant where offsetting is not recognised as inappropriate for some species and avoidance should be mandated.	Form working group with stakeholders/practitioners to identify working solutions to previously identified hurdles. SAII hints towards the inappropriateness of offsets for some species, but does not provide clear guidance for decisions makers and does not enforce avoidance for such species. Strengthen this area. Provide resourcing for development of guidance and support for consent authorities.	X	X	X

No information was provided when the Act was released to show this was based on worlds best practice (particularly when similar systems interstate had already reported increases in land clearing under this style of legislation).				

Is there other architecture that should be included to achieve the objects of the Act?

Issue	Solution	BC Act	BC Reg	BOS
It would be more efficient to run through proposed changes with practitioners beforehand, rather than releasing constant changes and dealing with "version 2" changes later down the track after more/different problems are created.	I think we can work together to form working solutions from the current architecture. Additional resourcing may be required for certain components, however (i.e. update of PlantNet (the tool that is used to identify the plants that make up the vegetation integrity that is used for calculation of biodiversity values/loss).	X		X

Conserving threatened species and ecological communities

How could the Act best support landscape-scale actions to prevent species from becoming threatened?

Issue	Solution	BC Act	BC Reg	BOS
Inconsistencies between the way this is dealt with in the BC Act and LLS Act (e.g. between urban, conservation and rural land). Native vegetation on rural land to be cleared should not be subject to less scrutiny of its biodiversity value just because it is being cleared for a different type of development (agriculture). Regulation of clearing under different Acts is leading to incorrect advice given to landholders by LLS officers who are not across obligations for assessment under the BC Act.	Remove differing consideration of native vegetation clearing across differing land uses/zones. Native vegetation clearing and development should be regulated under one legislative instrument, preferably the under the *Environmental Planning and Assessment Act 1979* as was the case in the past.	X		
Underling mapping from implementation of Act still not available 5 years on.	Prioritise provision of land category maps – increase resourcing.		X	

Are there improvements that could be made to AOBVs and the SoS program to give them a greater role in enhancing biodiversity?

Issue	Solution	BC Act	BC Reg	BOS
Lack of interaction between the SOS program and the BOS.	Greater engagement between DPE and practitioners. A lot of knowledge exists in "grey literature" (i.e. reports) that SOS officers may not have access to.			X

How can perspectives of Aboriginal people and indigenous knowledge be embedded in the conservation of threatened species and ecological communities?

Issue	Solution	BC Act	BC Reg	BOS

Private land conservation and investment

How could the Act best support partnerships with private landholders to conserve, restore and enhance biodiversity across NSW?

Issue	Solution	BC Act	BC Reg	BOS
Over complicated to set up.	Simplify entry to stewardship – could be difficult when you are trying to guarantee biodiversity gains under unknown and variable future circumstances. Greater communication with stakeholders outside of consulting and Council who can advise on the risks and returns that are possible when investing in this area (financial advisers, investment brokers. Good way to start is to increase credit prices. Creating greater proposition of returns will encourage some to suffer the complexity of setup.			X
Cost prohibitive entry, particularly with low credit prices set originally by BCT	Raise credit prices to encourage investment in stewardship, as current prices do not appear to be hindering development, but are hindering creation of stewardship sites.			X
Lacks strategic planning (i.e. voluntary entry won't facilitate development of movement corridors across the state)	Allow BCT/DPE to purchase land strategically for offsetting of credits in short supply, or that link areas of contiguous vegetation (increasing functional capacity)	X	X	X

How could the Act best support strategic landscape-scale biodiversity conservation outcomes and improve connectivity?

Issue	Solution	BC Act	BC Reg	BOS
Voluntary entry into stewardship provides no security for landscape scale conservation or connectivity.	Recognise the importance of habitat connectivity and supporting functional landscapes. Allow strategic purchase of land for stewardship by BCT (when encouraging voluntary entry into stewardship fails)		X	

How could the Act enable financial investment by government, businesses and philanthropic organisations?

Issue	Solution	BC Act	BC Reg	BOS
Lack of knowledge of the BOS outside of those working with it. Complexity of the scheme is big barrier to entry.	Increase communication with general public, potential investors, etc. Allow purchase of land by BCT, and communicate success stories and working examples with other potential investors.	X	X	X
Credit prices too low to encourage avoidance on development side, or investment on stewardship side.	Increase credit prices and provide public knowledge of prices for the purpose of avoidance planning and feasibility studies for investment purposes.			X

Biodiversity Offsets Scheme

Is the Act providing an effective mechanism to ensure that the right developments and land use changes are being assessed?

Issue	Solution	BC Act	BC Reg	BOS
Inconsistent and regional scale (often inaccurate) mapping data underpinning the operation of the legislation (e.g. BV mapping and PCT mapping).	Provide resourcing for generation of better mapping.			X
Biodiversity offset thresholds should be based on impact not minimum subdivision size in a local environmental plan.	Revise mechanism by which offset thresholds are generated (raw area of native vegetation, not minimum lot size).			X
Preference should be given to resolving biodiversity issues at the rezoning stage, rather than DA. Difficulty to fairly consider biodiversity offset arrangements agreed at the rezoning stage in the BAM process for a DA.				X
Lack of resourcing or commitment to improvements of the workability of the BOS.	Provide resourcing boost to address issues, particularly related to Parliamentary inquiry report and Audit Office report. Commonwealth Government gave big funding/resourcing boost for the EPBC Act review/overhaul that commenced in 2019 and is still underway.			X
Intertwined nature of Act/Regulation/BOS.	Find out what changes are required for the BOS to work better first, then see what mechanisms in the Act or Regulation need changing to facilitate those improvements.			X

Does the Act provide the appropriate framework for avoiding and minimising impacts and addressing serious and irreversible impacts?

Issue	Solution	BC Act	BC Reg	BOS
Current prices of offset credits still don't discourage development on breeding habitat for critically endangered species where they should be encouraging investment in protection instead.	Better definition of avoidance, serious and irreversible impacts, and no net loss. Some species like Regent Honeyeater should be avoid only as there is zero chance of generating new breeding habitat on offset sites. Need provided thresholds for what is considered adequate avoidance rather than waiting for legal precedents to be set in court.	X		
Framework is there, but implementation is problematic.	Find out what changes are required for the BOS to work better first, then see what mechanisms in the Act or Regulation need changing to facilitate those improvements.	X	X	X
Inadequate and inconsistent consideration of assessment for ecosystem credit species in projects that do not trigger the BOS area or map thresholds. The TBDC does not include survey advice or timing for these species to ensure the test of significance is consistently and properly applied.	Update TBDC and species profiles to enable standardised best practice surveys for all threatened species, not just species credit species. Integrate Test of Significance/Flora Fauna reporting requirements with BOS reporting requirements.		X	X
Unclear and inconsistent application of some prescribed impacts, particularly threatened species associated with non-native vegetation.	Could be assisted by providing a list of threatened species that are known to have associations with particular types of non-native vegetation (in particular regions), to ensure adequate survey and consideration is given to these species.		X	X

Can the Act in its current form result in improved ecological and environmental outcomes?

Issue	Solution	BC Act	BC Reg	BOS
The Act, maybe, but not the BOS. Offset credit generation lags way behind demand for credits for developments that have already been approved. This causes further push back in potential for no net loss. If offsetting doesn't keep pace with development, biodiversity loss is inevitable.	Increase credit prices. Provide public availability of pricing (at least for consultants) so avoidance can be commercially justified during project planning and design. This also encourages investment in stewardship and may help overcome perceived barrier to entry around cost/returns on investment.	X	X	X
The BOS is very much a "snapshot in time" tool, which may not have the adaptability to keep up with ecological systems which are constantly in a state of flux. PCTs are locked in, as are species associated with these PCTs. Boundaries in PCTs are mapped at a point in time, but the ecotones are likely to move under changing climatic conditions (or catastrophic events) over the longer term.	As stated earlier, this system isn't perfect, but we might be worse off without it. Some work needs to be done to increase engagement with practitioners prior to the release of updates (not after). Resourcing needs to be increased to run/manage such a complex scheme. Once we deal with the identified issues at hand, we can discuss options for how the scheme facilitates improved ecological function long term in a changing context. This will tie in with strategic acquisition of land for stewardship to ensure increased functional capacity of the landscape.	X		X

How can complexity and costs be minimised while still achieving positive biodiversity outcomes?

Issue	Solution	BC Act	BC Reg	BOS
	Provision of cost estimates for +20 year offset management plans. This could be based off other applications submitted to BCT.			X
	Increasing credit prices will encourage more to enter the scheme, making more data available for modelling costs.			X
	Provision of template for BSSAR.			X

How could the Act better support an effective and efficient offset market?

Issue	Solution	BC Act	BC Reg	BOS
You cannot expect market to operate effectively until you overcome barriers to entry to the scheme. Development is tracking well ahead of stewardship, which says that prices for credits are too low (not high enough to encourage entry for stewardship, not high enough to discourage development).	Reinstate credit pricing availability for consultants for planning purposes. Add a higher demand related cost to those BOP-C credits now being calculated by non-market mechanism modelling.			X
Stewardship side should have been thought about before development side of BOS. BCF was never seen as a premium option by developers as even the department/BCT underestimated the massive establishment/management costs associated with stewardship, not to mention the time lag required to set one up.	There may be a requirement to make changes to the Act/Regulation that remove the ability of major projects to acquit credit obligations by the BCT, at least as an interim measure until offset site generation catches up with development. BDARs for major projects should contain a feasibility study for where the offset credit generation will occur. This will help reduce the time lag between project approval and stewardship setup, and transfers some of the cost of investigating offset potential onto the development side of a project, further reducing barriers to entry.	X	X	X

Information from previous meetings with BCT over new credit pricing mechanism suggested the reluctance for BCT to set higher credit prices was related to the Regulation stating they were not allowed to operate "for-profit". It is highly likely that at this point the Trust will be operating at a loss due to previously underestimated costs for establishment of stewardship sites in the early years of the scheme.	Increasing credit costs (or at least the BCT premium for BCF credits) should encourage more (large) proponents to establish their own stewardship sites. Bringing more credits to market will facilitate more market trades for credits, stimulating the market based mechanism to work.		X	X
Current geographic mismatch between offset credit generation and development credit generation.	Allow strategic purchase of land for stewardship by BCT to meet actual credit requirements, or disallow developments to pay into fund if there are no required credits in existence locally.		X	X
	These are the kind of ideas that need to be workshopped by a working group. It is much easier to see the benefits/issues with these proposed solutions when you have all stakeholders in the room to look at why one party's solution might be a problem for another party.	X	X	X

Biodiversity certification

How can the Act support better 'up front' consideration of impacts on biodiversity from development?

Issue	Solution	BC Act	BC Reg	BOS
Biodiversity certification adds an additional level of decision-making to (EHG and Minister for Environment), making the process extremely unwieldy.	Might be better off with a combined BDAR/BSSAR, or at the very least provide some more guidance around biocertification, when it would be beneficial to use and how to use it.			X
Use of BAM methodology for biocertification is often quite inappropriate as it needs to consider strategic issues. The focus is impact assessment and not the establishment of protected conservation areas, avoidance, advanced offsets and maintaining habitat connectivity.				X
	BDARs for major projects should contain a feasibility study for where the offset credit generation will occur. This will help reduce the time lag between project approval and stewardship setup, and transfers some of the cost of investigating offset potential onto the development side of a project, further reducing barriers to entry.			X

How can the Act support better consideration of impacts on biodiversity from development at a regional level?

Issue	Solution	BC Act	BC Reg	BOS
	BDARs for major projects should contain a feasibility study for where the offset credit generation will occur. This will help reduce the time lag between project approval and stewardship setup, and transfers some of the cost of investigating offset potential onto the development side of a project, further reducing barriers to entry.			X
	Better case by case assessment of the appropriateness of using variation rules for offsetting in neighbouring IBRA subregions.			X
	Increase risk weighting of development credit generation in regions of higher development pressure.			X

	Provide consent authorities with a tool for assessing the impacts of a proposed development in the context of regional development. This may involve setting of thresholds for what biodiversity value has been lost and what proportion should be retained.	X		X

Regulating impacts on, and caring for, native animals and plants

How could the Act best support the protection of native animals and plants?

Issue	Solution	BC Act	BC Reg	BOS
There is little regulation of impacts and no strong mitigation and management controls.	Better definitions of avoid. Setting thresholds for SAII and avoidance for some species. Providing consideration for non-threatened species that may be impacted by developments.	X		X
The lack of requirement for stringent survey to assess biodiversity values on rural lands means large areas of habitat that provides for threatened species is being overlooked. One obvious example is the scaled back definition of potential Koala habitat under the Biodiversity Conservation SEPP (Koala habitat protection) for rurally zoned land as opposed to non-rurally zoned land (Section 3 vs Section 4). Assessment of native vegetation clearing under the LLS Act is subject to less rigour than under the BC Act.	Rural landscapes still contain important habitat for threatened species (e.g. Koala and Superb Parrots in paddock trees). Assessment of the value of these, and consideration of impacts on these, needs to be more consistent across land use zones/legislative instruments.	X		X

Are the requirements and conditions for biodiversity conservation licences in the Act suitable? Do you have any suggestions for improvements?

Issue	Solution	BC Act	BC Reg	BOS
Massive and consistent delays in issue of Scientific Licences and ethic approvals for consultants who are doing the same work year in year out in support of the scheme.	Either increase resourcing towards processing these, or increase the timeframe of renewal to reduce workload on assessing body, particularly for consultants/repeat customers.	X		

How should wildlife licencing be modified to allow for climate-adaptation conservation activities?

Issue	Solution	BC Act	BC Reg	BOS

Compliance and enforcement

Are the Act's penalties and enforcement instruments an effective way to support the Act to achieve its objectives?

Issue	Solution	BC Act	BC Reg	BOS
Currently little/no enforcement of Act, and it is often palmed off by different parties to take up. General consensus is we are waiting for someone to take someone to court to set precedents for key issues. DPE need to stop palming this off to Council or neighbours.	Better compliance monitoring, particularly with regard to illegal clearing. Department should provide better guidance and support for the Local Councils. Additional resourcing is being provided for compliance under the EPBC Act review. The same should be applied under the BC Act.	X		
Many councils do not have the resources to follow up on/enforce vegetation clearing compliance as many of them consider it as a lower priority meaning compliance and enforcement does not occur.			X	
Enforcement relies on concurrence from BCT, which can be time consuming.		X		
Complexity and cost of assessment under current legislation has led many landholders to clear illegally. This has caused problems for consultants being asked to assess the illegal clearing. The legislation says you must assess the vegetation in the footprint, but that is nolonger present. When assessing neighbouring vegetation that is assumed to be in the same condition, this appears to be technically in breach of the legislation. How illegal clearing is dealt with is very different under different Local Councils, leading to inconsistency in assessment/protection. Cases I have been involved with have been referred to DPE, only to come back with "the Council should have their own procedures to deal with illegal clearing". Yes, but the fine for illegal clearing is $4,000 and the credit calculations under the BOS for the same patch of vegetation were over $100,000. I have been told of Councils that require the BDAR be done on the cleared patch before approving the DA, which comes out with no credits as the site is cleared of any native vegetation.	Develop guidelines for how to assess illegal clearing so it is applied equitably across Councils.	X		X
	Remove set fines for illegal clearing and make them the equivalent of credits related to loss of VI.			X

How can the Act give the community more confidence and clarity in the approach to regulation? Should the Act be strengthened to require data collection under the regulatory frameworks in place? Is the risk assessment approach suitable?

Issue	Solution	BC Act	BC Reg	BOS
Community and consultants alike have a lack of confidence in the Act, but mainly in relation to poor implementation of the BOS and the constantly moving goal posts. Some issues were pointed out by ECA NSW prior to introduction of the Act.	Engagement with key stakeholder groups in the form of a working group would be good to develop solutions in a timely fashion with minimal requirement for ongoing changes down the line.	X		X

Other important matters

Do you have any feedback on these matters or other issues you would like considered in the review of the Act?

Issue	Solution	BC Act	BC Reg	BOS
Standardisation of assessment and reporting is difficult.		X		
Inconsistent understanding of interaction with other legislative instruments	Provide better training on BC Act for LLS		X	
	Simplify consideration of vegetation loss (irrespective of land use zone)	X		X
	Involve stakeholders in development of key upgrades (including LLS, RFS, ECA, Local Council…) BEFORE releasing update, not after. Stop constantly moving goalposts.	X		X

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Biodiversity Conservation Act Review
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Dear Madam/Sir,

Submission - NSW Biodiversity Conservation Act 2016 Review

Ecological consultants and local government ecological specialists have important roles in implementing the provisions of the Biodiversity Conservation Act 2016. Representatives of both groups have co-operated in preparing a submission in relation to the statutory five year review of the Act. The submission identifies broad areas of agreement between both groups and has been prepared by members of the Ecological Consultants Association of NSW and local government specialists in consultation with Local Government NSW.

The objectives and provisions of the Biodiversity Conservation Act 2016 are important to achieving biodiversity outcomes, and there are opportunities to improve the operation of the current legislation to support the conservation of biodiversity in NSW. Although this submission comments on the broad legislative arrangements in place, many issues affecting both ecological consultants (including accredited assessors) and local government specialists relate specifically to the operation of the Biodiversity Offset Scheme and Biodiversity Assessment Methodology (BAM). Issues with the BAM are not identified in this submission.

The framework provided by the Biodiversity Conservation Act 2016 is generally supported, especially:

1. Incorporation of the concept and definition of ecologically sustainable development.
2. Strengthening of private land conservation arrangements.
3. Consideration and listing of threatened species and ecological communities by an independent scientific community.
4. The objective of 'no net loss of biodiversity values' underpinning the Biodiversity Assessment on Method and avoiding impacts biodiversity values.

Improvements to the legislative and regulatory framework could be made by:

1. Simplifying the current complex legislative arrangements. Interrelationships with other legislation, including the Environmental Planning and Assessment Act 1979 and Local Land Services Act 2013 contribute to this complexity.

2. Improving integration with other natural resource management legislation, and providing consistency between the consideration of terrestrial and marine biodiversity.
3. Reviewing the inequitable consideration given to clearing of native vegetation and biodiversity impacts between urban, rural and conservation zoned land.
4. Placing additional emphasis on conservation of all biodiversity and natural ecosystems, rather than focusing primarily on listed threatened species and threatened ecological communities.
5. Improving definition and guidance for key concepts underpinning the operation of the Act, such as 'avoiding and minimising' biodiversity impacts and 'serious and irreversible impacts'.
6. Acknowledging the importance of regional conservation planning integrated in strategic planning processes undertaken under the Environmental Planning and Assessment Act 1979, particularly in achieving conservation targets.
7. Improved processes for enabling the provision of local biodiversity offsets.

It is requested that these matters be considered in the review, and that the independent review of Biodiversity Conservation Act 2016 consult directly with specialist practitioners involved in the implementation of its provisions. Effective and continuing engagement with stakeholders is essential to resolve issues with the operation of the Act, and would be facilitated by the establishment of a working group with representation from ecological consultants and local government specialists.

Thank you for the opportunity to make a submission.

Yours sincerely,

Representing ecological consultants:

Mr Andrew Lothian

Vice President
Ecological Consultants Association NSW

Ms Rebecca Hogan

President
Ecological Consultants Association NSW

Representing local government specialists:

Ian Gaskell

Rochelle Lawson

Mathew Bell

ECA RESEARCH GRANTS

2023 Grant Recipients			
Grant	**Recipient**	**Project Title**	**Affiliation**
Ray Williams Mammal Research Grant 2023	James Vandersteen	The role of dingoes as apex predators in the Australian Alps	UNSW
ECA Conservation Grant 2023	Jan Kreibich	Landscape restoration of indigenous managed area, focusing on flood-dependent vegetation health using satellite-based remote sensing	UNSW

Annabel Ellis

ECA Terrestrial Ecology Research Grant Recipient- 2017

Ecology of Invasive Rodents on Islands: Does marine-subsidised overabundance impact a restoring plant community?

Abstract

Invasive rodents are amongst the world's most damaging invasive species linked to declines and extinctions of many vertebrate and invertebrate species, especially in island ecosystems. Island populations of invasive species can reach unusually high densities, due to insular dispersal and reduced predation, as predicted by the Island Syndrome hypothesis. For my project, I studied the impacts of invasive black rats (*Rattus rattus*) on the restoration of an endangered ecological community (Illawarra subtropical rainforest) on two small islands in south-eastern Australia (Gooseberry and Hooka Islands). Despite their mainly plant-based diet, the impact of black rats on plant communities is poorly understood, particularly in Australia.

Firstly, using a mark recapture program, I found very high numbers of black rats on both islands compared to published data of nearby mainland populations. I then studied their diet, using stable isotope analysis of 16 rats, which confirmed that their diet comprised mostly of plant material. In addition to terrestrial plants and invertebrates, the rat population was also being supported by marine dietary subsidies (e.g. marine plants and sublittoral invertebrates), potentially contributing to their high population density. I finally used two experiments to investigate rat herbivory of seeds and seedlings of two woody rainforest species, *Hibiscus heterophyllus* and *Acacia maidenii*, but found limited effects. These species are native to the rainforest and had been used in an assisted restoration program, though an absence of their seeds in the soil seed bank remained. Although black rats had a significant

effect on seeds, they had no effect on seedling herbivory. In conclusion, high population density of black rats on island communities has the potential to contribute to poor restoration, particularly through the added removal of plant seeds (and other reproductive plant materials not studied here). But seedling herbivory and seed removal rates on Gooseberry and Hooka Islands was low compared to black rats impacts in other systems and warrants further investigation.

Hanging On: A Short Note on the Potential Resilience of Silky Swainson-Pea (*Swainsona sericea)*

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Email linda@envirokey.com.au

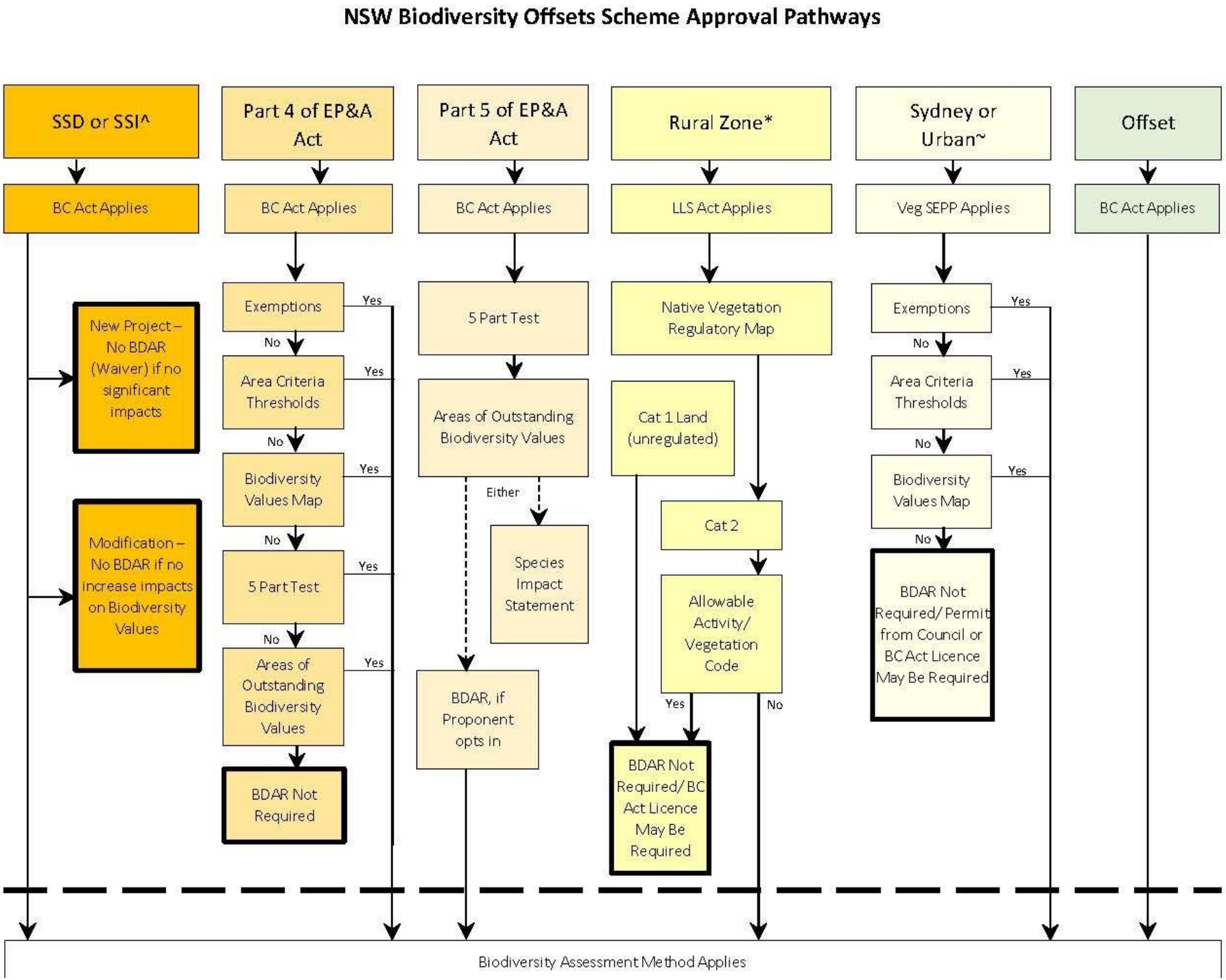
Silky Swainson-pea (*Swainsona sericea*) is currently listed as vulnerable under the NSW Biodiversity Conservation Act 2016. The Threatened Biodiversity Data Collection (TBDC) identifies threats relevant to this species. This includes the "*loss and degradation of habitat and/or populations by intensification of grazing regimes*" and the "*loss and degradation of habitat and/or populations for agricultural developments*".

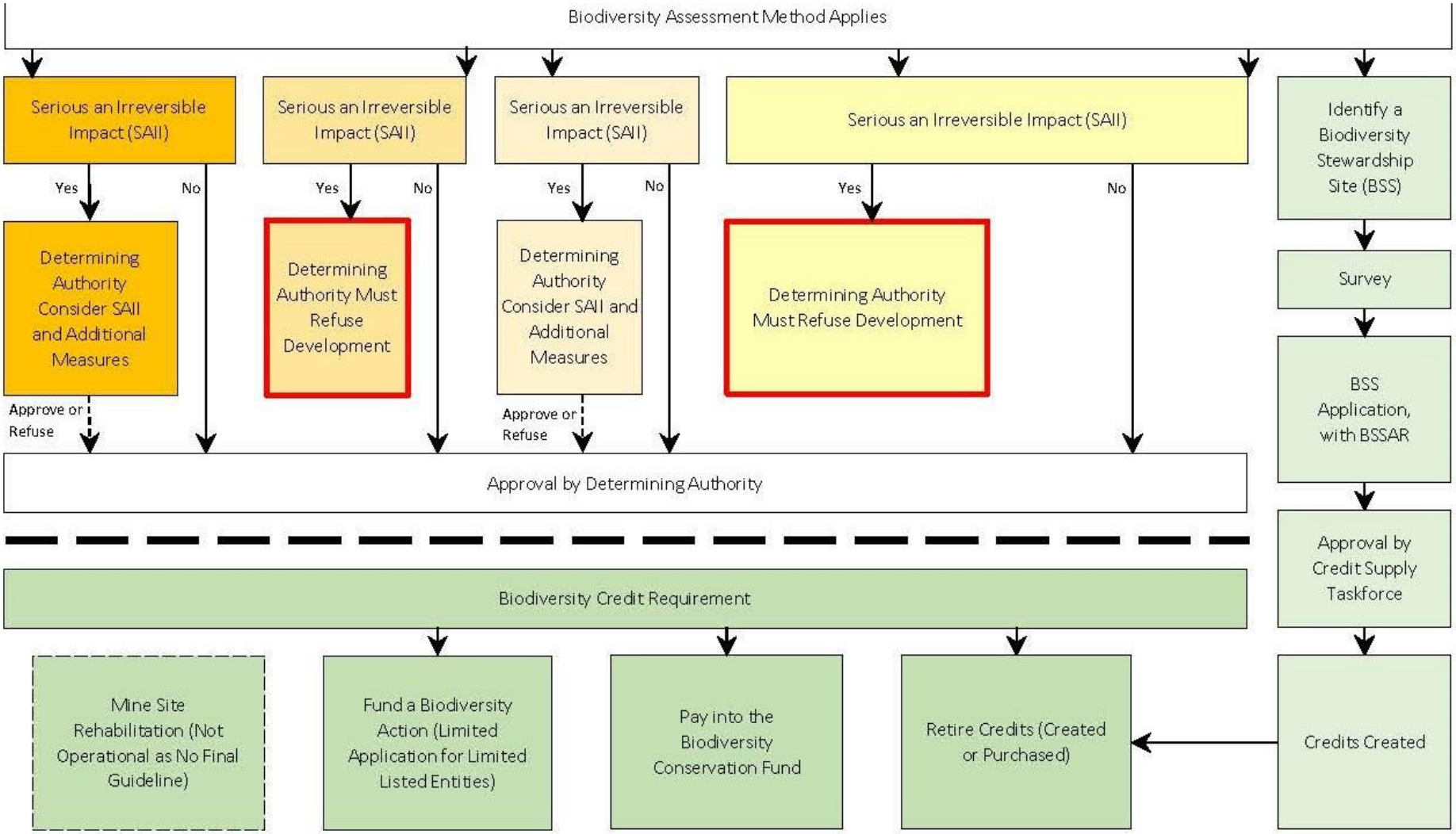
During field surveys in the Southern Tablelands, a population of *Swainsona sericea* was identified that was previously unknown. The study area was best described as a highly degraded area of natural temperate grassland due to overgrazing by sheep with the majority of grass cover non-existent. Despite this, *S. sericea* was the only flora species present in some areas (**Figure 1**). In others, it co-dominated with weed species that dominated disturbed areas on the Monaro.

These observations would suggest that given that the Swainsona genus is considered highly palatable, then in this instance, the dominance of the species may have been the result of early colonisation once grazing pressures were removed as no livestock were observed within the paddock.

Figure 1: *Swainsona sericea* growing in a highly degraded landscape in NSW.

This flow diagram of the BC Act assessment processes has been created by Jamie Gleeson from resource strategies and has decided to share with Consulting Ecology readers as a useful tool in understand the process.





^ State Significant Development or Infrastructure
* Rural Zone (except R5 and RU5) or a Deferred Matter area outside the Sydney Metropolitan Area and Newcastle LGA
~ Non-Rural zone (including R5 and RU5) or within the Sydney Metropolitan Area or Newcastle LGA

Note: this diagram provides a general overview only and does not substitute legislation or NSW Government guidance.
Note: Biodiversity Certification is another process not covered here.

Prepared by James Gleeson

The Consultants Conundrum

Anonymous

Disclaimer: this article presents a personal view and in no way is representative of any opinions held by the ECA as an entity. This piece is not intended to be a gripe about development or developers, rather it is borne out of the frustration I feel a lot of the time where my chosen profession aligns with environmental destruction. This can be ethically, emotionally and spiritually challenging and I'm sure many other consultants may share these feelings.

It's a pretty sure bet that any practicing ecologist has a passion and enthusiasm for and an appreciation of nature – presumably that has all brought us here to this point as consulting ecologists. After many years in the game, the strange irony of what we do has really started to hit home for me and make me pause for thought. Essentially – we spend our time in the field – surveying, inventorying, observing, enjoying flora and fauna and ecosystems to then write reports that chronicle the destruction of these same entities! That may be a slightly sweeping statement, but I'm sure many of you may be nodding in agreement. For example of all those excellent photos that are in the back pages of Consulting Ecology – how much of the habitat is now cleared/modified/ substantially altered? Probably a lot more than we might like to acknowledge. Lately I have been thinking about the perverse absurdity of what we do on a regular basis, and its starting to wear me down.

Of course, this realisation isn't new – its pretty clear from the get go that the consulting game often involves projects (developments, mines, infrastructure) with which we may not be comfortable. I've always softened the blow in these instances in knowing that I do my work well, identify the issues objectively and do my best to get a reasonable outcome. Of course that isn't always the case – when lot yield drives everything and when legislation is weak or Councils are ambivalent, outcomes can be poor. And that can lead to some pretty negative reflection which isn't always a comfortable space to be in.

Some examples:

- I remember walking through some beautiful stretches of forest in the footprint of a large infrastructure project, knowing that I would be the last person to enjoy or witness it before the bulldozers moved in.
- Being involved with a project which was green lit for the destruction of ~400 ha of habitat for an EPBC Act listed species.
- Completing a threatened flora survey and scrupulously tagging hundreds of trees to find they had all been chainsawed by my next visit (and then contesting this in court).
- Being a spotter catcher and watching old growth eucalypts at least 100 year old get knocked to the ground when alternative options existed.

In this sense, our industry is weirdly unique, as we regularly document the destruction of the very ecosystems we appreciate. The reaction of people to knowing I'm an ecologist is often to whimsically wonder on how I must appreciate nature – but when I tell them the flip side, their reaction sometimes changes dramatically. It's a cruel irony.

The reason I'm writing this is just to get this out in the open – when you spell it all out, it really can seem perverse. I'd also like to point out that I'm not coming at this from an 'anti-development' angle – I'm a realist; but I have learnt that as you deal more with the 'big end' of town and the financial stakes are higher, trying to get meaningful concessions is often bloody hard - not to mention just plain exhausting.

The strange thing about this profession is the sheer number of hats we are expected to wear (professional,

ecologist, mediator, faux financial advisor, de facto planner, even counsellor!), but yet all too often the ecologist is always 'the troublemaker' – finding reasons why yield must be reduced, causing complications, or (god forbid!) bringing what is often viewed suspiciously as a 'green' agenda to the table. Its galling to be questioned and critiqued when other professional consultants are not subject to such enquiry.

So what to do? Some might say I need to harden up, face reality – or go and get another job. But really, none of those outcomes is a solution in itself. I think the main thing that we all must frustratingly face on a daily basis is the push and pull of development pressure, the questioning of our findings or opinions or data - and that can be a wearing process. Add to this the circus that is the BAM and the 'guilty until proven innocent' attitude which seems to pervade some offices of BCD and you have a potent mix of pressure and expectation which can be incredibly erosive.

So where to now? I love my profession, appreciate the unique life on this earth and feel privileged to have had the experiences I have. But this can come at a cost and be confusing, maddening and disillusioning at times. These things would apply to any profession, but in consulting ecology the losses can be big, and (to be perfectly honest in my experience), the gains frustratingly small. The COP27 summit is being held now as I write this and climate change is clearly going to be the challenge of the future. So it seems bizarre that tomorrow I'll go out to another patch of forest, lay out my neat plots, collect some data and then write a report which contributes to its proposed destruction. This is essentially, the consultants conundrum – and not always an easy place to be.

The Mystery of the Pink Cockatoo

Glenn Muir

One day, not so long ago, a cockatoo flew over my backyard.

Normally, a cockatoo flying over a backyard would not get a second glance, and I would not be telling you this story. There are so many cockatoos, and so many backyards. This cockatoo, however, received a second look, and then a third. Because the entire underside of this cockatoo was a bright shade of pink.

Now, I know you're thinking, "it was probably just a Galah, you idiot", but you'd be wrong. We saw it proper. We knew it wasn't a Galah. We didn't know what the hell it was, but it wasn't a Galah.

We contemplated it for a few days and figured, oh well, maybe it was a Major Mitchell's Cockatoo that had escaped from some local aviary. A weird-looking one for sure, and a first for the area perhaps, but that must've been it. Surely. Or so we thought.

So we thought, until one day, not long after, as we ran out of the house to jump in the car, we saw this.

It freaked us out. What the ???

We contemplated this for a few more days. We checked our bird book, just to make sure there could be no mistake, and that there was not, somewhere, some kind of bright pink cockatoo species that we knew nothing about.

The bird book agreed with us. It said, dude, this thing, this giant pink thing with a yellow crest and black bill, it does not exist.

We conferred with our ornithologically inclined colleagues. One suggested that it was a hybrid, but that didn't seem right, either. Some others reckoned that it was a Sulphur-crested, which had been dyed pink.

That made sense, except, who would dye a cockatoo pink? Why would you dye a cockatoo? Surely it would take your finger off in the process. But … it had just been Halloween … we figured, maybe it was a Halloween prank. Someone had dyed their pet cockatoo pink, for a Halloween trick, and the pet cockatoo had, in complete disgust, left its owner.

The following day, it all became clear. We had a delivery from the supermarket, dropped out the front. We went out to retrieve our stuff, and there it was. This same ridiculously coloured bird, sitting on our front fence, happily munching on our groceries.

Which brought to mind another day, not long before, when I had had the joyful discovery of finding our bin lid open, the garbage scattered all over the front yard, and a big white cockatoo sitting on the fence right next to it. I had quite a bit to say to it. And it just sat there, and looked me straight in the face, as if to say, "Yeah – that was me – what are ya gonna do about it?"

The damn thing stared me down, then watched smugly as I picked up all the garbage.

So, now I have a theory, a plausible one. This bin-raiding bastard has scattered someone's garbage all over the place, then sat there and tried to stare them down. Only, whoever this person was, they weren't going to be stared down by a goddamn cockatoo. Nope, they chucked a towel over its head, took it inside, and dyed it pink, in revenge.

So that my friends is the story of the Sutherland Pink Cockatoo, *Cacatua galerita* 'Suthoshire'. I will leave you with a photo of it, sitting on a fence, happily munching on one of Diana Chan's Szechuan pork dumplings.

Acknowledgements

Thanks to Dion Hobcroft, David James, Narawan Williams, Carl Corden and John Creighton, Chantelle Doyle and Amy Rowles.

Some notes and comments

1. This story is in no way intended to encourage or condone the dyeing of cockatoos, which is illegal, stressful for the bird and has a high risk of injury for the perpetrator. Those nut-cracking jaws have a PSI force similar to that of a Rottweiler. You really don't want them chewing off the end of your finger.

2. There has been at least one documented case of a naturally-occurring pink Sulphur-crested Cockatoo. Photographs of this rare genetic variant appear in Jim Frazier's autobiography "*Through the lens*". (Thanks for the tip on that one, Nara).

3. The "battle for the bins" in the suburbs of southern Sydney has generated scientific interest. Klump *et. al*. (2021, 2022) documented how the bin-opening tactics of these urban raiders spread from three suburbs to 44 by means of social learning, and how this socially-learned cockatoo behaviour is met with socially-learned bin-protection measures by humans. (Thanks to the Sutherland Shire Environment Centre for the tip on that one).

References

Klump, Barbara C., Martin, John M., Wild, Sonja, Horsch, Jana K., Major, Richard E. and Aplin, Lucy M. (2021). *Innovation and geographic spread of a complex foraging culture in an urban parrot.* Science, vol 373, pp. 456-460.

Klump, Barbara C., Major, Richard E., Farine, Damien R., Martin, John M. and Aplin, Lucy M. (2022). *Is bin-opening in cockatoos leading to an innovation arms race with humans?* Current Biology 32 (17).

I found useful sources of information and good summaries of the scientific articles at The Conversation (theconversation.com/clever-cockatoos-in-southern-sydney-have-learned-to-open-kerb-side-bins-and-it-has-global-significance-164794), at cnetcom (www.cnet.com/science/biology/plucky-cockatoos-clash-with-humans-in-arms-race-to-win-the-garbage-bin-war/) and the ABC website (www.abc.net.au/news/science/2021-07-23/cockatoos-open-wheelie-bin-lid-social-learning-suburbs/100306786).

Help find the Black-throated Finch in NSW and Surrounds

Steve Sass
Principal Ecologist, EnviroKey, PO Box 7231, Tathra NSW 2550

The Help find the Black-throated Finch in NSW and surrounds project is a collaboration between three organisations: the Australian Society for Avian Preservation, EnviroKey and the Finch Society of Australia.

The Black-throated Finch (Poephila cincta) was first described from NSW by John Gould in 1837. The species is now divided into two subspecies, a southern one (the nominal species) and a northern one. The southern subspecies was once known to occur from eastern central Queensland extending south into northern NSW. In the late 1980's and into the 1990's, a large range contraction occurred for reasons unknown, and since the early 2000's, they have only been known only from the north of their range which includes the Gallilee Basin.

It is a small bird, about 10cm in length with a short black beak, lores and throat, pale grey head, and pale pinkish brown wings, chest and belly. The tail is short and black and they have a white rump.

In NSW, the last confirmed sighting was at Pindarri Dam, near Ashford in 1994, and after extensive searches by Birdlife Australia and others in 2000, it was declared "Presumed Extinct" by the NSW Government in 2016.

In recent years, there have been a number of unconfirmed sightings of Black-throated Finches in an area bounded by Tamworth in the south, Gunnedah and Moree in the west, Texas and Stanthorpe in the north and Armidale, Glenn Innes and Tenterfield in the east. With better than ever seasons for native grasses (a known key food resource for them in the Gallilee Basin) over the last few years, this project was conceived. Should the species still occur in NSW, albeit in very small numbers, now is our best chance to find them.

Being listed as "Presumed Extinct" there are no specific actions to help this species. Should it actually still occur, it is very important to target funding towards areas where Black-throated Finch still occur which can help landholders with ongoing future management.

We are encouraging members of the community to report any sightings to us. Based on our general understanding of this species from past records, we encourage the community to be on the look out in open woodlands, along creeks and waterways, and any areas where there are lots of native grasses.

Any sightings can be reported to us by email (btf@asapl.org.au). People should provide details about the location (eg, 3kms south of Tenterfield on the New England Highway), any photos of the birds if possible (even using a phone camera will be ok), and a photo of the habitat if possible would be beneficial. This will allow us to paint a better picture of their current status and hopefully enable us to target specific locations with more detailed surveys by our project ecologists.

The project is also seeking donations to assist with project costs. We encourage any donation, small or large to our crowdfunding page https://www.gofundme.com/f/help-find-the-blackthroated-finch-in-nsw Let's not forget about the 2019 Bird of the Year! We wish you the very best helping us with the search for the Black-throated Finch in NSW and surrounds.

WANTED

HAVE YOU SEEN THIS BIRD?

For further information or to report sightings, email us at:
btf@asapl.org.au

Species Conservation — Pairing Classic Ecology with Genetics to Inform a Translocation

Chantelle Doyle[1]
[1]*Centre for Ecosystem Science, School of Biological, Earth and Environmental Sciences, University of New South Wales Sydney.* *Chantelle.doyle@unsw.edu.au*

Although consultants and field ecologist often work on tight timelines, we can have an important contribution to conservation planning and fundamental ecological research. I started my PhD whilst working as a consultant, because I wanted to improve the way translocations were undertaken. Often, we as consultants work with and develop plans for threatened species about which very little is known (but in the process collect a lot of data!).

In this study (Doyle et al., 2023) we paired some very simple field methods (plus a little genomics!) to understand the reproductive methods and consequentially limitations, of the critically endangered *Hibbertia spanantha* (Julian's Hibbertia). *Hibbertia spanantha* is a recently described species (Toelken & Robinson, 2015) restricted to fragmented populations within the Sydney Basin Bioregion. Understanding its pollinations and breeding system was critical to developing a conservation plan that would be effective and support the long term persistence of the species.

I hope that this small study encourages you to, where possible, share knowledge or data about fundamental species ecology in industry journals or natural history notes and work with government and research institutions to improve our collective threatened species conservation planning.

Although this research required a commitment of time, many of the methods are easily replicable, low cost and could be employed as part of field activities, filling an important gap in fundamental species ecology.

Here are the steps. We:

1. Confirmed pollinator species and presence- with a swanky mobile phone camera trap (Figure 1).
Cost: $0. We used an old mobile phone with motion sensing app *Salient Eye* installed.
Time: Deploying camera and reviewing images. 1-2 days total. Camera was deployed for between 1-2 hours over several months while we were in the field doing other tasks.

2. Identified breeding system- using hand pollination and an electric toothbrush (Figure 2).
Cost: ~$150, we used an old electric toothbrush. $150 for organza bags to capture seed.
Time: 1-2 hrs per day, over 6 days, across a 1 month flowering period

3. Showed the species is preferentially outcrossing, based on seed quantity, meaning it doesn't mate with itself or very well with close relatives (Figure 3).
Cost: $0
Time: Data entry, cleaning, and analysis. Time depends on skills/experience.

4. Investigated population relatedness and showed plants are clonal or closely related (Figure 4).
Cost: ~$20,000 for genomics and analysis

Time: 1 day field time for leaf sample collection. Data entry, cleaning and analysis included in budget as part of researcher's salary.

Outcomes: We identified that this species is predominantly outcrossing, however the plants in the populations are clones or closely related, which is not good for long term population persistence.
Next steps: We have begun the next steps to examine if the high population relatedness is translating to a reduction in seedling fitness. We have germinated seed from hand crossing to check if there is a difference in growth of crossed vs inbred plants. This data will be used to develop a targeted population augmentation strategy.

If you want a deep dive, you can read the open access publication:
https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/csp2.12910

If you want a quick overview, check out the video and podcast:
https://www.plant-heroes.com/species/julianshibbertia

Please get in touch if you have any questions, would like to collaborate or discuss data sharing options with me or the Ooi Lab (who work on fire and threatened plants).

References

Doyle, C., Yap, J. Y. S., Bragg, J., Rossetto, M., Orme, A., & Ooi, M. (2023). Mating system and population genetics as applied conservation tools of small populations in fragmented landscapes. *Conservation Science and Practice*.

Toelken, H. R., & Robinson, A. F. (2015). Notes on Hibbertia (Dilleniaceae) 11. Hibbertia spanantha, a new species from the central coast of New South Wales. *Journal of the Adelaide Botanic Gardens*, *29*, 11-14.

Figure 1. Camera trap image of Syrphid fly (Syrphidae) visiting *Hibbertia spanantha* (top left) and camera trap set up (top right). Bombylid fly (Bombyliidae) foraging (left). Credit: C Doyle.

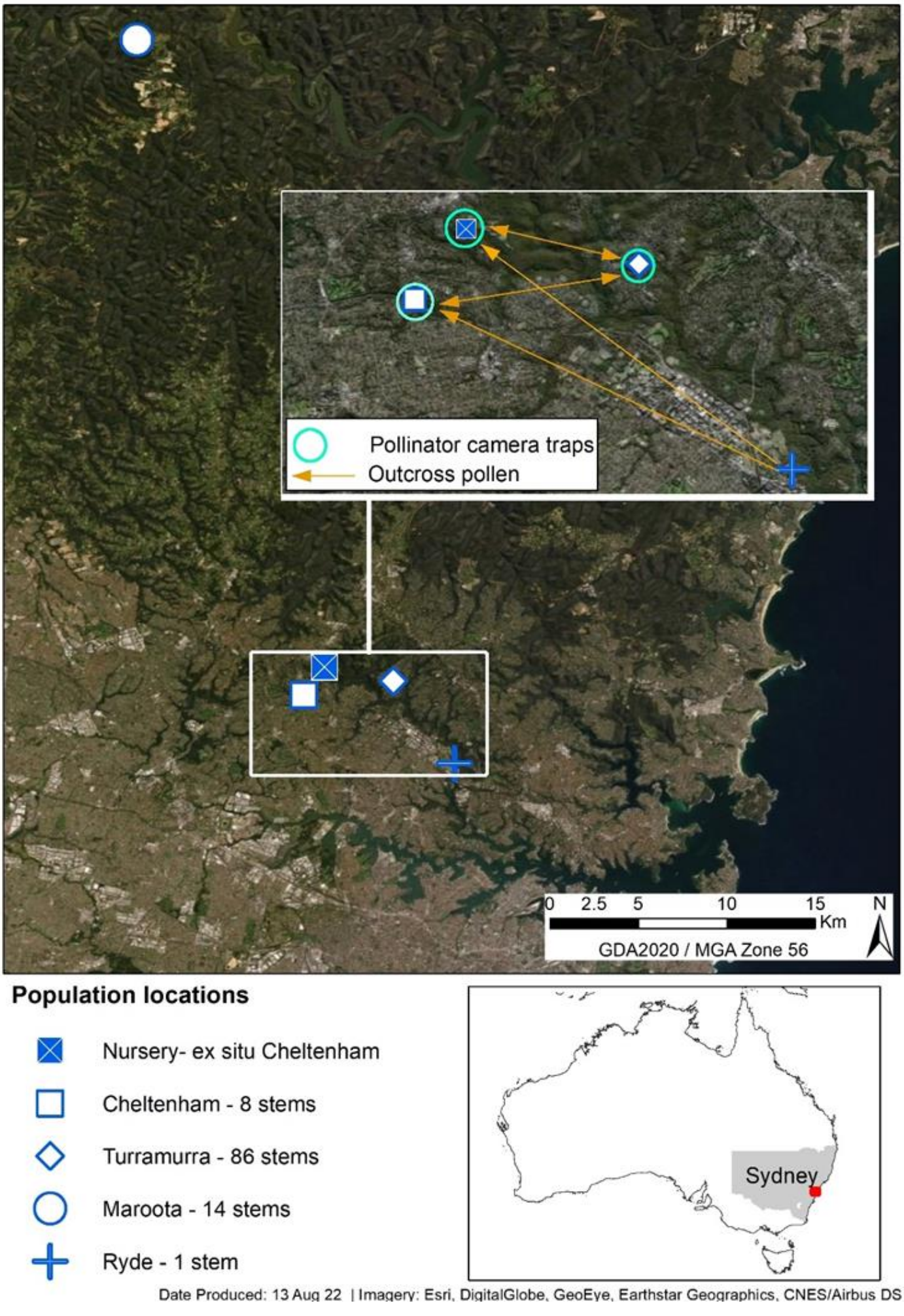


Figure 2. Camera trap locations used to identify pollinators and direction of pollen transfer as part of crossing experiments conducted between the fragmented populations of *Hibbertia spanantha*.

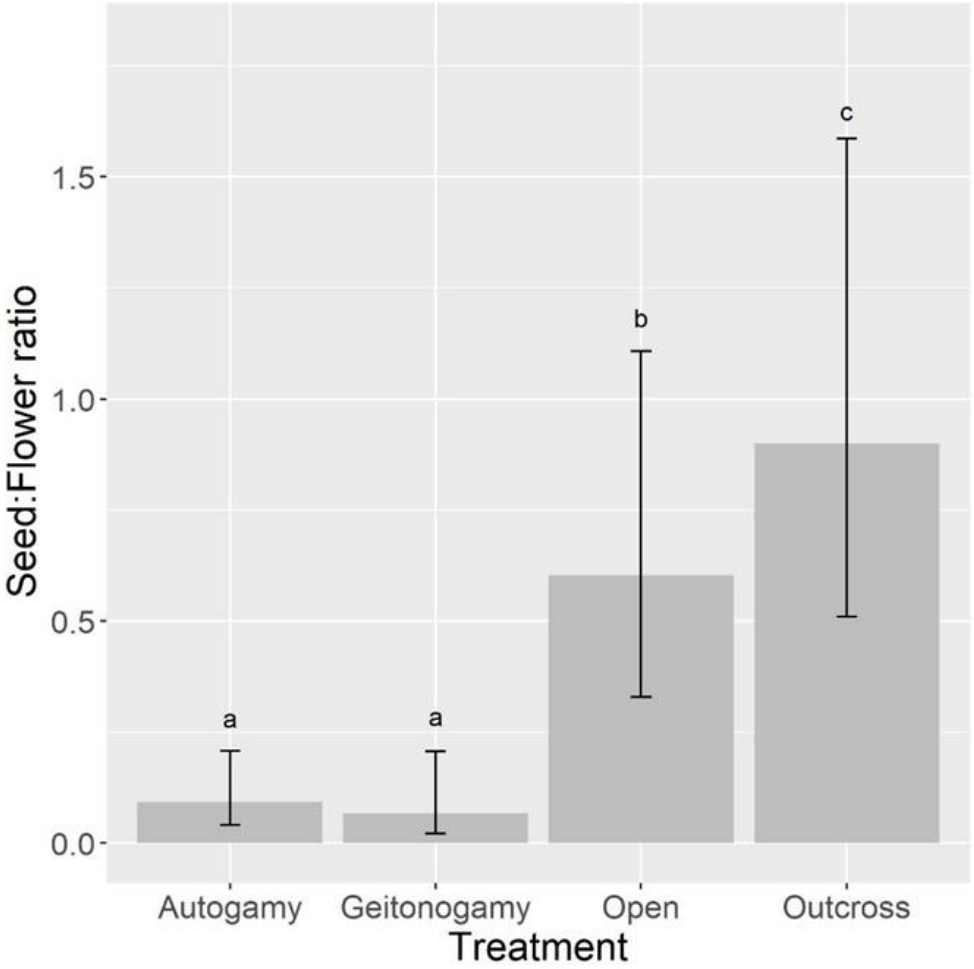


Figure 3. Number of seeds produced per flower under four treatments. There is no significant difference between self-pollination treatments. Open and Outcross pollinated plants produced significantly more seeds than self-pollinated plants. Outcrossed pollinated plants produced significantly more seeds than open pollinated plants. This demonstrates the species has much better seed production when crossed with other individuals and the crossing pollen between less related individuals result in greater reproductive fitness (seed production).

Definitions: Autogamy (self-pollination from the same flower), Geitonogamy (self-pollination from different flowers on the same plant), Open (wild pollination occurring naturally in fragmented populations) and Outcross (hand pollination where pollen was transferred between plants in different populations).

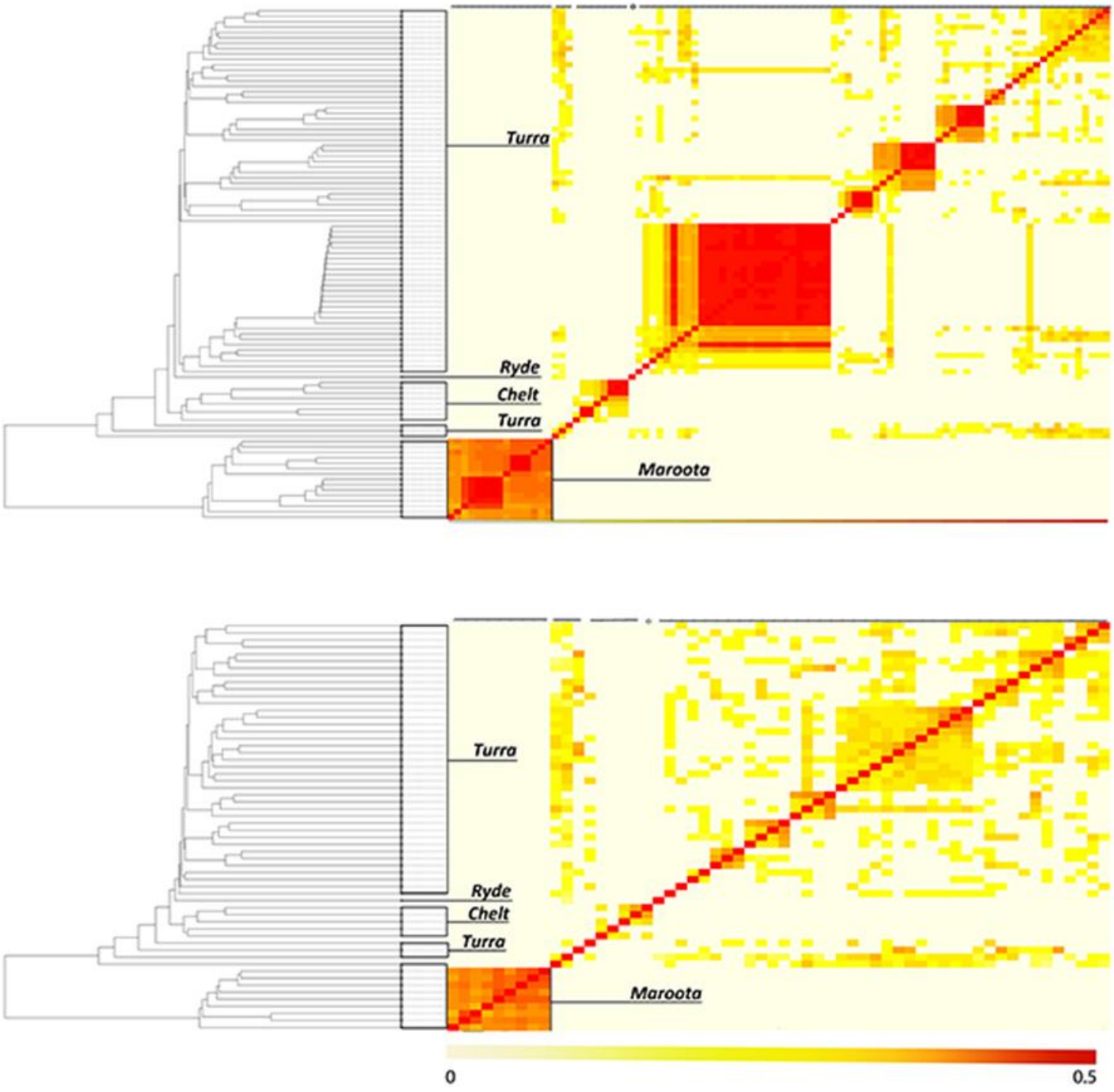


Figure 4. Relatedness of plants in the four tested populations, measured from 0 to 0.5. Where beige (0) represents low relatedness and red (0.45 and above) represents a clone. Many of the plants in the populations are clones (top). After clones were removed from the analysis, it was evident that there was still a high degree of relatedness between the plants in each of the populations (bottom).

Whats in a name: The Story of *Lophochroa Leadbeateri*

Steve Sass
Envirokey
PO Box 7231, Tathra NSW

Please note that his article contains distressing historical content with direct quotes that may be upsetting to the reader.

I never did think too much about controversial bird names until I had a yarn with an Aboriginal Ranger at Mutawinjii National Park in western NSW. He was telling me the story of how his ancestors were slaughtered and he showed me how their rock art was vandalised. The person responsible, Major Sir Thomas Mitchell. And for many ecologists, the name Major Mitchells Cockatoo is well known.

You may have heard of this person before? If you haven't, he was a well-known surveyor and explorer of South Eastern Australia during the 1800s, and he is most famous for his expeditions into western NSW in the 1830s.

One such expedition into western NSW resulted in the deaths of multiple Aboriginal people on 27 May 1836. Mitchell and his surveying team had been followed for several days by a group of Aboriginal people near Lake Benanee, near the present-day town of Euston. Despite an enquiry being held in Sydney, the exact nature of the attack is still unclear. However, it seems that instead of attempting negotiation (which was the government directive at the time), Mitchell and his team decided to launch a surprise attack. In Mitchells own words in a letter to Governor Bourke:

> *"It was difficult to come at such enemies hovering in our rear with lynx-eyed vigilance of savages. I succeeded, however. Attacked simultaneously, the savages took themselves to the river, my men pursuing them and shooting as many as they could. Numbers were shot swimming across the Murray and some even after they had reached the opposite shore as they climbed the bank. Thus in a short time the usual silence of the desert prevailed on the banks of the Murray and we pursued our journey unmolested".*

While an enquiry into his actions lead to only minor reprimand, Mitchell said years later "I still look back on that eventful day with entire satisfaction". Mitchell later published a book in which he justified the event by emphasising that the ambush was an act of self-defence: he portrayed the Aboriginal people as hostile tribes from the region intent on revenge for an incident during his 1835 expedition in which his party shot and wounded an Aboriginal man and killed another man as well as a woman who was carrying a baby.

Seems like an all-round top bloke! Lets get back to *Lophochroa leadbeateri.*

The Major Mitchell's Cockatoo (as it is commonly referred to) is named after Major Sir Thomas Mitchell. However, the species name, leadbeateri, commemorates Benjamin Leadbeater (1760-1837), a London natural history merchant who supplied specimens to the British Museum. To many, including his convict teams, Major Mitchell was considered an absolute horrid man! Major Mitchell ate, screamed and defecated, which is exactly how the convicts described him. It is widely believed that the cockatoo was not named to honour Major Mitchell, but to seemingly ridicule him

given the attributes described.

Throughout his travels, Major Mitchell was responsible for the deaths of hundreds (perhaps thousands) of Aboriginal people in western NSW. He is most noted for poisoning water holes and providing poison laced damper to kill the aboriginal people.

Even though it seems that the naming of the species was to seemingly ridicule Major Mitchell, the man does not deserve the honour. For the Wiradjuri people, the species was referred to as the "Wijagala" which is where the term "Wee Jugler" is likely to have originated. Whatever the name for this incredible species, the use of Pink Cockatoo, Leadbeater's Cockatoo or Wee Jugler is in my opinion, much more appropriate than Major Mitchells Cockatoo.

National Recovery Plan for the Koala

Dr Danny Wotherspoon

The Commonwealth Government has published a new National recovery plan for the Koala. A National Koala Recovery Team includes public servants as administrators and representatives from a range of interest groups. These people will be helping with the strategic coordination of recovery efforts to deliver the National recovery plan for the Koala in NSW, Qld and the ACT. ECANSW was invited and has appointed a representative, being Dr Danny Wotherspoon of Abel Ecology. Danny has more than 25 years professional experience dealing with Koalas.

An introductory on line meeting was conducted recently for the team to meet the Commonwealth staff who manage the Recovery Plan. The Recovery Team comprises two advisory groups, being technical groups and community advisory committees. ECANSW is regarded as a community group rather than a technical specialist group.

The Recovery Plan has the following Goals
- Stop the trend of decline in population size of the listed koala; and
- Increase the extent, quality and connectivity of habitat occupied.

Objectives of the Plan by 2032 are:
1a. The area of occupancy and estimated size of populations are stabilised then increased.
1b. The area of occupancy and estimated size of populations are maintained or increased.
2. Metapopulation processes are maintained or improved.
3. People have a greater role and capability in listed koala monitoring, conservation and management.

Recovery Team terms of reference are advisory in two directions.
The community advisory committee provides advice on delivery of the recovery plan from a community perspective and will:
- provide input and advice on recovery plan implementation
- identify opportunities for implementation of the recovery plan by member organisations and other community stakeholders
- contribute to recovery plan annual reporting.

The community advisory committee will provide its advice to the board. Community advisory committee members will report back to respective member organisations.

Discussion in our introductory meeting was robust from the beginning. Terms such as transparency and practicality were used. It was obvious that private landowners are seen as key to any recovery actions. Serious incentive for private landowners with Koala habitat was raised. As ecological consultants we have a number of paths to follow in educating both public servants and land owners (government and private). I look forward to seeing some real world money for land owners as well as science introduced into the recovery process.

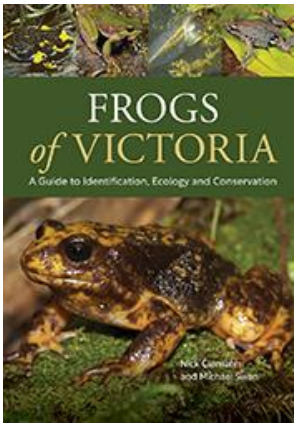
LITERATURE

RECENT BOOK RELEASES

Information Taken from: CSIRO Publishing Website http://www.publish.csiro.au and collated by Amy Rowles.

Title: Frogs of Victoria: A Guide to Identification, Ecology and Conservation

Author: Nick Clemann, Michael Swan
RRP: $49.99
Publisher: CSIRO Publishing
Date: July 2023

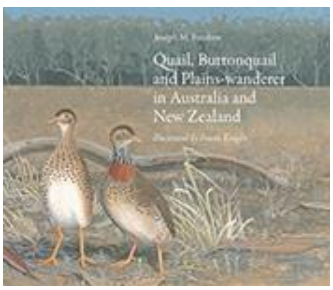


Tapping into the deep knowledge of the best frog experts in south-eastern Australia, Frogs of Victoria not only provides the tools to identify Victorian frogs – including keys, photographs and comparative information on similar species – it also presents detailed information on their biology, habitats, status and threats. Importantly, the authors also detail the urgent actions required to prevent further loss of amphibian diversity in Victoria.

Including stunning images from some of Australia's finest wildlife photographers, Frogs of Victoria is an authoritative resource for ecologists, land managers, conservationists and all who are fascinated by frogs.

Title: Quail, Buttonquail and Plains-wanderer in Australia and New Zealand

Author: Joseph M Forshaw
Illustrated by: Frank Knight
RRP: $170.00
Publisher: CSIRO Publishing
Date: May 2023

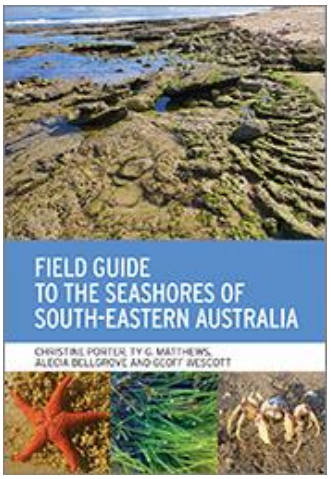


Although not closely related, quail, buttonquail and the Plains-wanderer have much in common. Quail, Buttonquail and Plains-wanderer in Australia and New Zealand examines 14 species of these small, secretive ground-dwelling birds, including Old World and New World quail, the endangered Buff-breasted Buttonquail, the elusive Plains-wanderer and the extinct New Zealand Quail.

Joseph Forshaw presents a comprehensive review of recent studies for these often hard to observe birds. Detailed species descriptions include key features, habitat, status, diet and breeding, along with information on eggs, calls and distribution. Each species is fully illustrated with exquisite colour identification plates by renowned wildlife artist Frank Knight. This is an essential reference for anyone fascinated by these elusive birds.

Title: Field Guide to the Seashores of South-Eastern Australia

Author: Christine Porter, Ty G Mathews, Alecia Bellgrove, Geoff Wescott
RRP: $39.99
Publisher: CSIRO Publishing
Date: May 2023



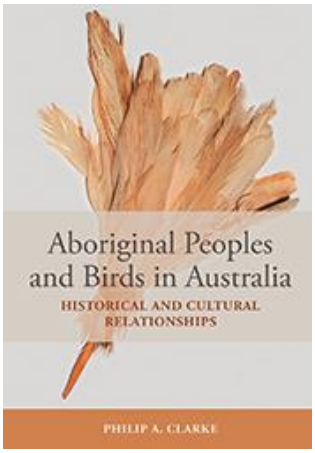
The types of plants and animals that live on seashores in temperate regions are similar around the globe, but many of the individual species in south-eastern Australia are found only in this region.

Field Guide to the Seashores of South-Eastern Australia features colour photographs, descriptions and ecological notes for around 240 species of the more common plants and animals found on rocky, sandy and muddy shores along the coastline from Port Lincoln, South Australia, to the Hawkesbury River, New South Wales, and Tasmania.

This guide will allow beachgoers to learn interesting details about the plants and animals they come across, while also having sufficient scientific detail for natural history enthusiasts and biology students to develop their understanding of these shore ecosystems.

Title: Aboriginal Peoples and Birds in Australia

Author: Philip Clarke
RRP: $59.99
Publisher: CSIRO Publishing
Date: April 2023

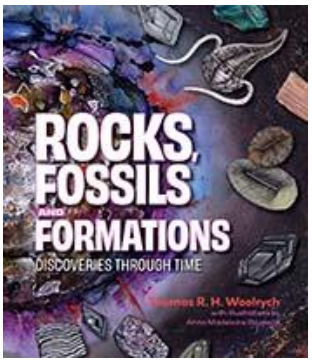


Australia is home to many distinctive species of birds, and Aboriginal peoples have developed close alliances with them over the millennia of their custodianship of this country. Aboriginal Peoples and Birds in Australia: Historical and Cultural Relationships provides a review of the broad physical, historical and cultural relationships that Aboriginal people have had with the Australian avifauna

Title: Rocks, Fossils and Formations

Author: Thomas RH Woolrych
Illustrated by: Anna Madeleine Raupach
RRP: $29.99
Publisher: CSIRO Publishing
Date: February 2023

Go on a 4.6 billion year time travel adventure and explore the story of rocks, minerals and fossils.
Have you ever wondered about those rocks under your feet? How old they might be? How they got their colour and texture? Could they contain some unknown mineral or fossil treasure?

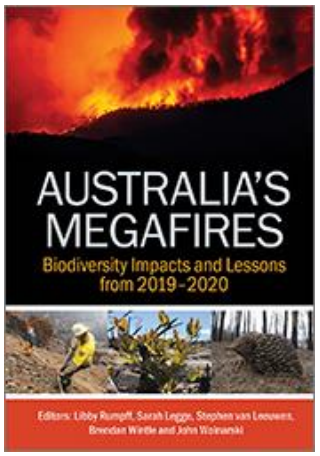


Title: Australia's Megafires: Biodiversity Impacts from 2019 -2020

Author: Libby Rumpff, Sarah M Legge, Stephen van Leeuwen, Brendan A Wintle, John CZ Woinarsk
RRP: $69.99
Publisher: CSIRO Publishing
Date: February 2023

The Australian wildfires of 2019–20 (Black Summer) were devastating and unprecedented. These megafires burnt more than 10 million hectares, mostly of forests in southern and eastern Australia. Many of the fires were uncontrollable. These megafires affected many of Australia's most important conservation areas and severely impacted threatened species and ecological communities. They were a consequence of climate change – and offered a glimpse of how this is likely to continue to affect our future.

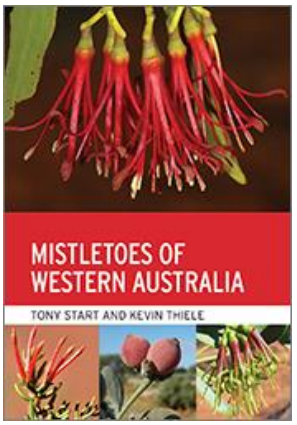
Australia's Megafires includes contributions by more than 200 researchers and managers with direct involvement in the management and conservation of the biodiversity affected by the Black Summer wildfires. It provides a comprehensive review of the impacts of these fires on all components of biodiversity, and on Indigenous cultural values.



These fires also triggered an extraordinary and highly collaborative response by governments, NGOs, Indigenous groups, scientists, landholders and others, seeking to recover the fire-affected species and environments – to restore Country. This book documents that response. It draws lessons that should be heeded to sustain that recovery and to be better prepared for the inevitable future comparable catastrophes. Such lessons are of global relevance, for wildfires increasingly threaten biodiversity and livelihoods across the globe.

Title: Mistletoes of Western Australia

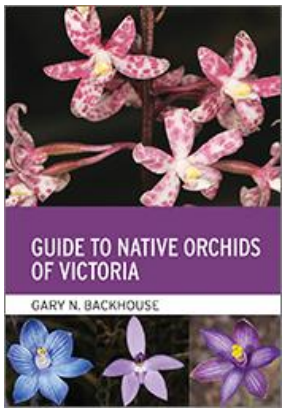
Author: Tony Start and Kevin Thiele
RRP: $59.99
Publisher: CSIRO Publishing
Date: March 2023



Mistletoes of Western Australia is a guide to their identification, ecology, conservation, biogeography and evolution, including how they cope with fire. The book explores the relevance of mistletoes to the biodiversity of the communities in which they live, and provides information on their hosts and simple identification keys to species. Each species is described in simple terms and illustrated with a photo of the species and a map of its known distribution in Western Australia.

Title: Guide to Native Orchids of Victoria

Author: Gary N Backhouse
RRP: $49.99
Publisher: CSIRO Publishing
Date: February 2023



This comprehensive guide describes the 447 species of wild orchids that occur in Victoria, Australia. This region is one of the richest in the world for its diversity of temperate terrestrial orchids. Orchid diversity in Victoria spans some of the smallest to some of the largest orchids in Australia, from the minute Mallacoota Midge Orchid, with flowers just 2 mm across, to the large King Orchid, with big plants having hundreds of fragrant flowers and weighing many kilograms .

RECENT JOURNAL ARTICLES

Rowley J. and Callaghan C. (2022). Tracking the spread of the eastern dwarf tree frog (Litoria fallax) in Australia using citizen science.
Australian Journal of Zoology **70 (6)**:204-210.

Booth D. (2022). Green turtle (Chelonia mydas) hatching success at Raine and Heron Islands.
Australian Journal of Zoology **70 (6)**: 211-215.

Gibson L et. al., (2023). A review of progress of a research program for the endangered northern quoll (Dasyurus hallucatus) in the multi-use landscapes of the Pilbara.
Australian Mammalogy **45(3):** 251-263
https://doi.org/10.1071/AM22028

Goldingay R. (2023). Habitat use by the eastern pygmy-possum in a coastal woodland–heathland mosaic.
Australian Mammalogy **45(3):** 275-284
https://doi.org/10.1071/AM22013

Kutt A. et al., (2023). Untangling two complementary camera trapping data sets to identify patterns in feral cat activity around a known night parrot population in western Queensland.
Australian Mammalogy **45(3):** 285-292
https://doi.org/10.1071/AM22037

Kutt et al., (2023). Camera trapping ekes out some improvement for surveying sparse mammal populations in northern Queensland.
Australian Mammalogy **45(3):** 293-304.
https://doi.org/10.1071/AM22039

Wilson C, Gentle M. and Marshall D. (2023). Feral pig (Sus scrofa) activity and landscape feature revisitation across four sites in eastern Australia.
Australian Mammalogy **45(3):** 305-316.
https://doi.org/10.1071/AM22034

Law et al., (2023). When bat eats bat: diet and roosts of the greater broad-nosed bat (Scoteanax rueppellii) across different regions and habitats.
Australian Mammalogy **45(3):** 324-334. https://doi.org/10.1071/AM23010

Mo M. et.al., (2023) Database records of koalas (Phascolarctos cinereus) in northern Sydney
Australian Mammalogy **45(3):** 335-343 https://doi.org/10.1071/AM22035

McDonald P. (2023) Continuing decline of the common brushtail possum in central Australia.
Australian Mammalogy **45(3):** 344-349
https://doi.org/10.1071/AM23011

Milne D., Reardon T. and Ford G. (2023) BatMap – authoritative distribution maps for Australian bats
Australian Mammalogy **45(3):** 350-355
https://doi.org/10.1071/AM23005

Lothian A. and Hoye G. Emergence patterns at a non-breeding eastern bent-winged bat (Miniopterus orianae oceanensis) roost in New South Wales
Australian Mammalogy **45(3):** 361-368
https://doi.org/10.1071/AM22023

Madani G., Turbill C. and Law B. (2023) The golden tip for better breeding: evidence for polyoestry in the golden-tipped bat (Phoniscus papuensis).
Australian Mammalogy **45(3):** 369-374
https://doi.org/10.1071/AM22032

Mulhall S., Sitters H. and Stefano J. (2023) Vegetation cover and configuration drive reptile species distributions in a fragmented landscape
Wildlife Research **50(10) :** 792-806
https://doi.org/10.1071/WR21063

Pang B. et.al.,(2023) Reducing koala roadkill: a social marketing formative study
Wildlife Research **50(10):** 858-868
https://doi.org/10.1071/WR21172

Wilson T. etal., (2023) Eucalyptus cryptica (Myrtaceae): a critically endangered new species
Australian Systematic Botany **36(5):** 386-400
https://doi.org/10.1071/SB22031

Russell S. et.al., (2023) Mepimbat tedul proujek: Indigenous knowledge of culturally significant freshwater turtles addresses species knowledge gaps in Northern Australia
Austral Ecology **48(7):** 1306-1327

Hall et. al., (2023) Mound-building behaviour of a keystone bioturbator alters rates of leaf litter decomposition and movement in urban reserves
Austral Ecology **48(7):** 1426-1439

Vazquez S., Gonzalez D. and Amico G. (2023) Herbivores but not vegans: Deer as nest predators
Austral Ecology **48**: 1460-1465

Stenhouse P. and Moseby K. (2023) Patch size and breeding status influence movement patterns in the threatened Malleefowl (Leipoa ocellata)
Austral Ecology **48(5):** 904-927
https://doi.org/10.1111/aec.13311

McAlpine C. (2023) Influences on koala habitat selection across four local government areas on the far north coast of NSW
Austral Ecology **48(5):** 928-951

Bell S. (2022) Differing habitat defines two metapopulations of a threatened Hunter Valley eucalypt: Eucalyptus parramattensis subsp. decadens
Cunninghamia **22:** 011–025
doi: 10.7751/cunninghamia.2022.002

Newbery M, Chisholm L. and Mikac K. (2022) Recruitment and mortality of the fire sensitive Eucalyptus fraxinoides after the 2019-20 wildfires, Monga National Park, southern New South Wales. *Cunninghamia* **22:** 053–058
doi: 10.7751/cunninghamia.2022.22.005

"Non-ECA promotional material presented in the ECA Newsletter does not necessarily represent the views of the ECA or its members."

Advertising Opportunities with the ECA

Website:

- **$200 for a banner**
- **$300 for company name with some detail and a link**
- **$500 for company name within box, logo, details and web link**

All website packages run for one financial year and include a small ad in any newsletter produced during the financial year.

Newsletter:

- **$100 for a third of a page**
- **$250 for a half page**
- **$500 for a full page**
- **$1 / insert / pamphlet**

Advertising is available to service providers of the Ecological Consulting industry. The ECA will not advertise a consultant or their consulting business.

If you wish to advertise, please contact the ECA administrative assistant on admin@ecansw.org.au.

Contributions to the Newsletter, Volume 51

Contributions to the next newsletter should be forwarded to the administration assistant Amy Rowles admin@ecansw.org.au by the **30th of November 2023.**

- Articles may be emailed in WORD, with photos included or referenced in an attached file as a jpg. Please save any figures as a jpg, so they can be easily transferred to the newsletter format.
- Please keep file size to a minimum, however there is no limit on article size (within reason)
- Ensure all photos are owned by you, or you have permission from the owner
- Ensure that any data presented is yours and you have permission from your client to refer to a specific site (if not please generalise the location).
- All articles will be reviewed by the editorial committee, and we reserve the right to request amendments to submitted articles or not to publish.
- Please avoid inflammatory comments about specific persons or entity

The following contributions are welcome and encouraged:

- ◊ Relevant articles
- ◊ Anecdotal ecological observations
- ◊ Hints and information
- ◊ Upcoming events
- ◊ Recent literature
- ◊ New publications (including reviews)
- ◊ Photographs

ECA PHOTO COMPETITION ENTRIES

ABOVE: Male Barrier Range Dragon near Broken Hill. *Steve Sass.*

ABOVE CENTRE: *Central-netted Dragon near Broken Hill.* *Steve Sass.*

ABOVE: Snakey Plains Trail, Kosciuszko National Park. *Amy Rowles.*

BELOW: Gouldian Finches, East Kimberley, WA. *Steve Sass.*

ABOVE: Rufous-throated Honeyeater, East Kimberley, WA. *Steve Sass*

BELOW: *Pimelea bracteata*, Snowy Mountains, NSW. *Steve Sass*

ECA PHOTO COMPETITION ENTRIES

LEFT: Border Thick-tailed Gecko *Uvidicolus sphyrurus* (listed as Vulnerable under both the BC & EPBC Act), New England Tablelands. *Troy Jennings.*

ABOVE: Bush Stone Curlew. *Steve Sass*

LEFT ABOVE; ABOVE : Kosciuzko National Park. *Amy Rowles*

ABOVE RIGHT: Southern Leaf-tailed Gecko. *Amy Rowles*

RIGHT: One very cool, very small invertebrate residing in the Snowys. *Amy Rowles*

LEFT: *Nyctophilus corbeni* Corben's Long-eared Bat, listed as *Vulnerable in NSW and Commonwealth.* *Amy Rowles*