ECO FOCUS 2017

ABSTRACTS

An Information Seminar by the Conservation Research unit

30 August 2017, Wednesday, 9.30 AM – 12.30 PM
Gold Creek Station, Victoria St., Hall ACT 2617
# ECO FOCUS SEMINAR 2017

An Information Seminar by the Conservation Research Unit, EPSDD
30 August 2017, Wednesday 9:30 am - 12:30 pm
Gold Creek Station, Victoria Street, Hall, ACT 2618

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Carping at Isabella and Upper Stranger Ponds
By Matt Beitzel, Aquatic Ecologist, Conservation Research

Highlights:
Carp are one of the most invasive species on the planet. They dominate the fish biomass in the lakes and rivers across the ACT region and impact water quality, increasing turbidity, removing water plants and resuspending nutrients for algal outbreaks. In April 2017 the Aquatic group of Conservation Research undertook a Carp removal in Upper Stranger and Isabella ponds in Tuggeranong, as part of the Isabella Weir and Wetland Project. The aim was to be able to benchmark our fish surveys in our stocked lakes, get an estimate of total biomass, rescue and native fauna caught during the drawdown and improve the ponds ecosystem hopefully eliminating Carp from the refilled ponds. The project was funded by CMTED and the ACT Healthy Waterways project. The contractor Guideline assisted by draining both lakes and providing heavy machinery to help access and move the Carp from the pond and volunteers assisted in measuring and weighing carp and removing their heads for future investigations. Pre-electrofishing was undertaken in each pond to compare with other ACT lakes and selected waterbodies upstream were inspected to determine reinvasion risk.

In total, 1510 Carp were removed Upper Stranger Pond and 765 from Isabella Pond. The average weight of Carp was 1.7kg and 3.37kg respectively. The estimate of Carp density for each lake was 588kg/ha for Upper Stranger Pond and 384 kg/ha for Isabella Pond. Weight accumulation curve indicate that more than 80% of the weight is in fish larger than 3 kg for both lakes. This emphasises that although there are large numbers of juvenile fish which are occasionally observed in the ACT lakes contribute a relatively small proportion of the overall biomass.

When comparing to the fish surveys in other lakes in the ACT it shows that the pre electrofishing estimates are relatively close to most of the other lakes with the exception of Lake Burley Griffin which has a higher electrofishing catch of Carp and Yerrabi Pond which was only invaded by carp in 2010 and is yet to be dominated by the species.

Take home messages from this project:
- Carp biomass is high but not super high in the ACT lakes.
- Bigger lakes don’t necessarily have more carp.
- Each lake has a lot of sediment but some of it is consolidated.
- Big Carp are heavy and a lake full of them require lots of manual handling

From here the lakes will be restocked with native fish and the habitat for both lakes will be improved both lakes will be monitored for reinvasion and native fish growth. The information from this project will be used to inform the National Carp Control Plan.

Figure 1: Upper Stranger Pond drawn down to remove carp.

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An overview of the Conservation Effectiveness Monitoring Program (CEMP), including results from the lowland grasslands.

By Renee Brawata, CEMP Officer, Conservation Research

Highlights:
The Conservation Effectiveness Monitoring Program (CEMP) is an ecosystem condition monitoring framework for ACT conservation estate. The framework aims to detect signs of change to ecosystem condition, evaluate the effectiveness of management actions in achieving conservation outcomes, provide evidence to support land management decisions through an adaptive management approach and to identify knowledge gaps to aid in the prioritisation of future research.

Over the next two years, monitoring plans will be developed for the eight broad ecosystems identified within ACT nature reserves. Knowledge and insights gain through monitoring plans will have relevance beyond the reserve boundary, supporting whole of landscape conservation. The framework engages a range of stakeholders, including ACT Government staff, community organisations and research institutions, whose monitoring data contribute to the program, improving communication and sharing of information relevant to nature conservation in the ACT.

An overview of the CEMP framework can be found on the EPSDD website.

The first completed plan, the Lowland Native Grasslands Ecosystem Condition Monitoring Plan, is currently in review. This plan has been used as a proof of concept for the CEMP framework. Some key findings from this plan include the need for increased ecological burning in grasslands and improved mapping of grassland associations, research on grassland restoration techniques that have minimal impact on fauna, improved monitoring of key fauna communities and quantification of the impact of introduced predators on grassland fauna.

Outcomes from monitoring plans can be used for improving ecological monitoring, prioritising future research, adapting management actions and increasing conservation efficacy in ACT reserves. Work on the Aquatic and Riparian Ecosystem Condition Monitoring Plan has commenced, with an intention to develop monitoring plans for the remaining six ecosystems over the next two years.

Figure 2: Ecological burning in Jerrabomberra West. Photo Julian Seddon.

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Grappling with the Groundcover
By Nicki Taws, Project Manager, Greening Australia

Highlights:
Ecosystem restoration has typically focused on restoring the woody component of vegetation, that is the trees and shrubs. Restoring the ground layer is more challenging due to competition from introduced species, changed soil properties, and altered grazing and fire regimes.

In recent years Greening Australia has been working with the ACT Government and other partners in NSW to restore native groundcover through seeding. In areas dominated by introduced grasses and weeds, the soil nutrient levels are often elevated due to the application of fertilisers, and native species are unable to compete. Removal of the topsoil to a depth of 15 cm reduces the high nutrient levels and removes the soil seed bank of introduced species. A diverse seed mix of native grasses and forbs is then sown across the site using a specially modified grass-seeder.

Trials to enhance the native forb component of grasslands have been established this year with PCS. Research has shown that recruitment of native forbs is limited where the soil between the grass tussocks is covered by litter or living vegetation. The amount of bare soil between the grass tussocks can be increased by slashing the grass and then removing litter through raking or burning. After these treatments the trial sites were oversown with a seed mix of native forbs.

Monitoring will be undertaken to measure germination and survival across the different treatments. Ongoing challenges for native groundcover restoration include the management of weeds within the site, recruitment of the native species, management of the biomass as it increases, and the availability and quality of seed to carry out further restoration.

Figure 3: By removing weed seeds and high nutrient levels in topsoil a diverse mix of native grass and wildflower seeds can be sown to restore native grassland. Photos: Greening Australia.

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Little Eagle – flying across Australia
By Sam Reid, Fauna Ecologist, Conservation Research

**Highlights:**
The Little Eagle (*Hieraaetus morphnoides*) has been declared vulnerable in the ACT and NSW. The main threat to Little Eagles in the ACT is loss of habitat due to the encroachment of urban development on foraging territories. To inform planning and conservation and to identify and protect areas deemed critical to Little Eagles, researchers are working together to gain a better understanding of how Little Eagles move through their environment. In spring 2015, a light-weight satellite GPS tracking device was fitted to the male of a pair of Little Eagles nesting in West Belconnen. The resulting analysis has provided fascinating insights into Little Eagle distribution, foraging behaviour, habitat use and territories. It has also shown that Little Eagles can move staggering distances, which has important implications for the conservation of this species. Such evidence-based data will be vital to inform planning and conservation of areas deemed critical to maintain a viable wild population of Little Eagles in the ACT and adjacent NSW.

**Figure 4: The Little Eagle’s northern migration.**
Over 18 days, the GPS tagged Little Eagle flew over 3,300km, settling just north of Daly Waters. It remained there for approximately 5 months, before returning to the ACT. The yellow dots represent individual GPS fixes.

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Spatial data for decision making – flying through the landscape

By Jennifer Smits, Spatial Ecologist, Conservation Research

**Highlights:**

Geographical Information Systems (GIS) and spatial analysis is more than just maps of where environmental phenomena occur. All environmental phenomena occurs somewhere in space—we capture it as discrete spatial data and make maps of known habitat to inform decision-making in relation to land management and development impacts. However, beyond the simple map, spatial analysis and modelling and remote sensing provide innovative ways of gathering information about our landscape. From predicting the unknown, detecting change, looking back in time and capturing large continuous datasets of every square metre of the ACT, Conservation Research is collaborating with the Surveyor General, ACTMapi, Parks and Conservation (PCS) and community groups to utilise spatial analysis and available remotely sensed data to inform research and decision-making. This talk outlines some innovative projects being undertaken, and provides information on the basics and possibilities of remote sensing and LiDAR (Light Detection and Ranging) in the ACT. Examples include:

- GPS collars tracking Kangaroos to determine home ranges and habitat use
- Modelling and prediction of Canberra Spider Orchid habitat to select potential sites for translocations
- use of Web and Mobile Apps such as Collector to capture and share better quality spatial data
- detecting previously unmapped bogs and fens in Namadgi National Park
- determining potential tree height preferences for foraging Superb Parrots moving through our urban landscape
- analysis of historic multispectral satellite data and data products has captured vegetation condition information in grasslands retrospectively to explain population fluctuations of Grassland Earless Dragons
- testing drone detection methods to survey kangaroo populations in Canberra Nature Park collaborating with PCS.

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**Figure 5:** LiDAR Data 3D Point Cloud Model – Harrison ACT 2015 – Urban Habitat

To access freely available ACT Government data products (including LiDAR):

- 1-10m contours. [Visit the Geospatial Data Catalogue Website](#)
- Aerial Imagery. [Visit the ACTMAPi website](#)
- LiDAR Digital Elevation Models (DEM). [Visit the Elevation – Foundation Spatial Data Website](#)

To obtain more information about this talk, contact

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Quolls and Bettongs – how are our new residents going?

By Dr Will Batson, Sanctuary Manager, Mulligans Flat Woodland Sanctuary
Affiliations: PCS, Woodlands and Wetlands Trust

Highlights:
Mulligans Flat Woodland Sanctuary provides a unique opportunity to reintroduce locally extinct species due to the predator-free environment. These reintroductions are driven through the partnership between the ACT Government, the Woodlands and Wetlands Trust, and the Australian National University. Two of the most iconic residents within the Sanctuary are now the reintroduced eastern bettongs and eastern quolls. Both species, were until recently extinct on mainland Australia, surviving only in the absence of foxes in Tasmania. Thirty-two bettongs were released in 2012 have now grown to nearly 200 and have subsequently provided the opportunity to undertake a trial beyond-the-fence reintroduction in the Lower Cotter Catchment. A pilot-study release of quolls into the Sanctuary was undertaken in 2016 leading to nearly half of the animals escaping over the predator-proof fence. However, this enabled the release strategy to refined for 2017 which dramatically decreased the rate of escapes to under 10%. Both of these projects highlight the benefit of our adaptive approach to wildlife reintroductions, and how learning-by-doing improves our success rate and creates conservation opportunities in the future.

Figure 6: One of the eastern quolls recently released into Mulligans Flat Woodland Sanctuary.

This species will not only help secure the longevity of the species, but also help stock other mainland reintroductions and act as an apex predator to maintain the health of various prey species within the Sanctuary.

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Eucalypt Decline in the ACT

*Presented by Margaret Kitchin in behalf of Greg Baines, Vegetation Ecologist, Conservation Research*

**Highlights:**

Tree decline, or dieback as it is often called in the ACT, is a worldwide phenomena whereby stands of trees progressively lose vigour and health without any clearly identifiable cause. Evidence of tree decline in Australia dates back well over a century, whilst in the ACT scientific studies into the causes of tree decline first commenced over 50 years ago. Despite the knowledge gained from previous studies the causes and solutions to local tree decline remain elusive.

Following a period of severe decline in many lowland Eucalypt species during the spring of 2016, ESPD commenced a series of projects aimed at further trying to understand the complex causes of tree decline along with investigations into how the impacts of decline may be reduced in the future. Current projects include; assessing the effect of time since fire on decline parameters, determining if there is a relationship between decline and Phytophthora infection, the effects on remnant trees of thinning surrounding regeneration, provenance trials to identify genetically resistant populations, climate modeling to determine future refugia sites for severely affected species, temporal and spatial modeling of the severity of decline in the ACT and detailed landscape scale relational analysis to quantify the contribution of multiple environmental factors to the problem of decline.

**Figure 7:** Tree decline in a stand of Blakley’s Red Gum at Mt Majura Nature Reserve

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