

## FLORA & FAUNA SURVEYS, and FAMILY NIGHT STALKS

Alison Elvin (from 'Natural Capital') and Dr Fiona Christie (from the University of Melbourne) conducted 30 flora and fauna surveys on 24 properties in the Humula, Kyeamba and Junee areas in September 2013. The aim of the surveys was to provide Cross Property project land holders with a baseline of flora and fauna species that currently exist within our native vegetation remnants, and provide information to land holders on how to encourage greater diversity across their property and beyond their fence lines.

Alison and Fiona also joined Mason Crane (from ANU) to share their knowledge with the community at three free Family Night Stalks: at Eurongilly Halll (11 September 2013), Humula Recreation Ground (12 September 2013) and Toolles Creek TSR at Ladysmith (13 September 2013).

*Right: Mason Crane (second from left) discusses the habitat requirements of sugar gliders with landholders at the Humula night stalk*



### 1. What are flora and fauna surveys, and why are they important?

Dr Fiona Christie, University of Melbourne

#### 1.1 What is a flora and fauna survey?

A survey of any kind, in its most simple sense, is a list of things we see. Most of us probably drove our parents mad on those long road trips, enthusiastically reporting every time we happened to see our particular object of interest, whether it be a specific animal species (horses in our case!) or a car of a particular colour. Whatever your object of interest, the outcome is a list of observations over a particular area or time period.

A flora or fauna survey is no different; it is simply a list of plants and animals (usually vertebrates such as mammals, birds, reptiles and amphibians) which are observed in a given area. Broadly speaking, the purposes of flora and fauna surveys are generally to document "biodiversity" - the number of different species observed.

The presence of a species in a particular area can be detected in a number of different ways. Some commonly used approaches include:

- Direct observations - sighting or hearing a call
- Indirect observations - scats (poo)/hair/tracks
- Stag watching
- Spotlighting
- Live trapping
- Camera trapping.

While knowing what species are present in an area is interesting in itself, flora and fauna surveys can also tell us much more. For example, the presence of parrots may indicate the presence of tree hollows. Hollows are typically found in older trees so this tells us something about not only that parrots may live there, but also the area itself. This in turn can help us consider whether other hollow dependent species or species which require older trees, may be present as well.

Therefore, ecological knowledge of each species (ie where they shelter, what they feed on) can provide vital information beyond a measure of biodiversity, including the potential presence of other species, characteristics of the habitat, habitat quality and ecosystem resilience.

The type of information that flora and fauna surveys provide, will depend on a number of factors, with the most important being an understanding of **why** the survey is desired or required in the first place. Some of the more common aims or reasons as to why a flora and fauna survey is conducted are to:

- Monitor changes in biodiversity over time
- Determine the presence of rare or threatened species
- Determine the presence of pest plant and animals
- Investigate the impact or potential impact of planned developments/operations
- Inform management programs.

Understanding the aim of the survey will help determine what components of biodiversity will be surveyed and what type of information is collected (eg presence of species or abundance, or both).

Typically, birds and plants have been the focus of surveys, with relatively low costs (time and money) associated with the collection of these data compared to the traditionally time-consuming live trapping methods for mammals (see picture below, at top). As plants are generally stationary and many birds are day active and obvious, surveying these groups is generally easier than nocturnal mammals (see picture below, at bottom).

In recent years however, the development of new technologies has significantly increased the capacity to include mammal surveys more regularly as part of fauna surveys. Remote wildlife cameras, or surveillance cameras, are one tool which is proving invaluable in the surveying of mammals.

*Right: A homemade “hair tunnel” trap, consisting of a plastic sheet with sticky pads on the internal walls, and bait suspended from the centre. As an animal approaches the bait, it brushes past the sticky pads, leaving hair samples which can later be identified (Photo by Amanda Ashton)*



*Right: A black or swamp wallaby “playing a flute” (nibbling one of our dropped pencils!) Information on the photograph, taken by an infrared wildlife camera, includes the date, time and temperature - data which can be used to investigate behaviour*



These infrared cameras are simply set up in a location of interest and focused on bait and left undisturbed for a number of days. The camera takes photographs of any animal which comes to investigate the bait (see photo on previous page). Two types of bait are generally used (at different times), one to attract herbivorous or omnivorous species (eg rodents, marsupial mice, bandicoots, potoroos) and one to attract carnivores (eg Tasmanian Devils, quolls, cats, foxes). The camera can then be collected, all photos downloaded to a computer and species identified. These cameras can not only provide information on the presence of a species but also on how they behave. They also definitely beat having to wash hundreds of dirty traps each day in which a rat has spent the night, I can assure you!

## 1.2 Why are flora and fauna surveys important?

Flora and fauna surveys can be a powerful tool to inform management strategies relating to reserve design, fire management, threatened species conservation and restoration works. Surveys can identify species of conservation concern, or declines or increases in species in monitoring situations (whether they are rare or threatened or pest species), which can stimulate management interventions to counteract potentially adverse outcomes.

In Australia, many species have become extinct or have had their geographic range significantly reduced over the last 200 years. Without some knowledge of the presence of species we are often not aware that species may be at risk, or already in decline, until they are gone. Through the information provided by flora and fauna surveys we can gain a better understanding of the ecology of species and the environments in which they live. This understanding is vital to the long-term sustainable management of our environment and the biodiversity it supports. Monitoring communities, through surveys over time, can help predict how and why changes can occur.

Findings from flora and fauna surveys have the capacity to bring communities together, providing opportunities to enhance understanding of our complex ecosystems, their functioning and the inherent value of our native flora and fauna. In Australia we are lucky to have diverse and fascinating flora and fauna. You don't have to be a scientist to do a flora or fauna survey, start with a list of birds you see in the garden, or plants you see in the native remnants on your property. Flora and fauna surveys are a great excuse to get outside and have some fun. So get out there and take a look, you never know what you may find!



Above: Kids learning how to set up a carnivore bait station for camera trapping, then testing the automatic photo trigger!

## 2. Local flora and fauna survey results

Nicole Maher, Cross Property Project Officer, Murrumbidgee Landcare

### 2.1 Survey techniques used

The surveys were conducted on two hectare sites of native vegetation (either remnant or planted) on each property.

Dr Fiona Christie went to each site in the early morning and late afternoon, and recorded all birds seen or heard during a 20 minute period.

Alison Elvin selected a 50 m x 20 m area within each 2 ha site, and recorded and identified all visible flora and fauna within that area. Alison also recorded details about the groundcover (litter, bare ground and presence of mosses and lichens), fallen timber and twigs, the presence of hollow-bearing trees and logs, general soil type, aspect of the site, the presence of rocky outcrops or boulders, and land use activities on the site (both current and past).

### 2.2 Overall results

The survey findings were very positive, particularly in an intensively farmed landscape with recent catastrophic natural disasters, including drought, intense storms and floods, and bushfire.

Across the 30 sites, the surveys recorded:

- Approximately 90 species of native birds
- 7 species of threatened birds: superb parrot, varied sittella, flame robin, scarlet robin, brown treecreeper, grey crowned babbler and diamond firetail
- Over 10 other native fauna species, including echidna, bearded dragon lizard, pobblebonk (eastern banjo frog) and long-necked tortoise
- Over 150 species of native plants, including trees, shrubs, forbs, grasses and sedges.

The survey sites covered five major vegetation communities - box gum grassy woodlands, inland grey box grassy woodlands, dry sclerophyll forests, river red gum forests and revegetation areas. The box gum grassy woodland and inland grey box woodland are both classified as threatened ecological communities.

### 2.3 What can we learn from these surveys?

One of the most striking correlations observed from the survey data related to the size of a vegetation remnant, and its floristic and structural diversity (ie the number of different species and plant sizes within a remnant). Larger and more diverse remnants had a much higher number of bird species found there, and were also more likely to have threatened bird species living there. Remnants that were in close proximity to other native vegetation remnants were also more likely to have a higher number of bird species found there.

Importantly, the smaller insect-eating and nectar-eating woodland birds that are currently declining in our region dominate the bird species recorded in large and ecologically intact remnants. In contrast, remnants that have been cleared for farming and have less floristic and structural complexity are dominated by exotic grass and weed species, and generally record few of the declining insectivorous woodland birds.

The shape, age and connectivity of revegetation areas also affected the suite of bird species found living there, with long, linear sites not inter-connected with larger remnants tending to record mostly common species, exotics such as starlings and sparrows, and many noisy miners (an aggressive native bird that out-competes woodland birds for territory).

Many farmers surveyed are making significant efforts to link up their remnant and revegetation areas with other remnants and mature paddock trees, both throughout their own properties and across into neighbouring farms, increasing the overall landscape connectivity without adversely impacting on productivity.

Another encouraging finding was the number of land holders conserving their tree hollows, dead standing trees and the litter of woody debris and large fallen timber, providing critical habitat for local animal species.

The enthusiasm and vision of the participants of the project is very heartening and bodes well for the continued conservation of the flora and fauna living on and around their farms.



*Above left: Cryptogams, including moss, were seen colonising bare ground in an older revegetation site*

*Above right: Lichen was seen colonising granite boulders*

## **2.4 Recommendations for future works**

The following are some recommendations for land holders to help protect and enhance the native flora and fauna on your properties, based on the results of our surveys:

- Control exotic annual and perennial grasses and woody weeds with grazing strategies that give the perennial native species sufficient rest periods from grazing pressure to set viable seed. To reduce the impact of annual grasses, graze them heavily early in the season, then remove grazing once the native species begin to grow. If grazing rotations aren't possible due to fencing restrictions, slashing exotic annuals before seeding is a viable option
- Control weeds from scattered and isolated patches first, steadily working towards dense infestations over time
- Add the seed of desired native species onto areas bared-out from weed death, as without any other competition the weeds will simply grow again next year
- Maintain year-round ground cover, with living plants, dense leaf litter and cryptogams (organisms such as fungi, lichens and mosses)
- Monitor and release biological control agents for weeds such as patterson's curse, horehound, St John's wort and blackberry
- Retain fallen hollow logs on the ground, and dead trees with hollows (remember to balance the maintenance of woody debris with the potential for fire fuel load)
- Consider adding "perch poles" with indents or hollows as connectors between vegetation sites, for birds and small mammals to move around with less risk of predation
- Continue with feral animal control wherever and whenever possible, ideally coordinated with

your neighbours

- Continue increasing connectivity across the farm and broader landscape with plantings; where possible, increase the size of plantings to reduce the edge effects
- Protect old, often dying paddock trees and encourage recruits to grow around them - this may require assistance with fencing
- Encourage and conserve areas of thick regrowth where appropriate, to provide stepping stones for fauna to shelter, breed and maintain their territory
- Consider connecting vegetation sites to the nearest dam or waterpoint with revegetation, and possibly include the dam into the conservation area.

For more information on the flora and fauna surveys, or any of the discussion and recommendations from the results, contact Nicole Maher at Murrumbidgee Landcare: [nmaher@mli.org.au](mailto:nmaher@mli.org.au), or 0438 452 814.



*Above left: Hollows in mature box gum trees are important habitat for many bird and other animal species*



*Above right: Dead timber (both standing and fallen) provides critical habitat for birds, reptiles and mammals*



*Below right: A white-faced heron's nest, found during one of the surveys*