

## Habitat Enhancements

SWIFFT Video conference notes 2 February 2012

*SWIFFT meeting notes are a summary of the video conference and not intended to be a definitive record of presentations made and issues discussed.*

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### KEY POINTS SUMMARY

Habitat restoration and habitat enhancement project don't have to totally rely on government incentives – organisations like the Habitat Restoration Fund harness community and philanthropic interests to achieve valuable on-ground outcomes.

Woodland birds will continue to decline unless additional habitat is provided - there is a "Window of opportunity" now to re-establish habitat to prevent species losses in woodland birds before it is too late.

Many revegetation projects are inadequate in terms of habitat restoration – they lack the scale and ecological complexity found in natural woodlands.

Revegetation for biodiversity should establish large patches of heterogeneous habitat (at least) 100 ha.

Adding ground layer elements such as rock cover, native plants (tussocks & herbs), fallen timber and litter cover have a major influence on increasing rare reptile species richness and abundance in restoration projects.

Population of Tuans and Sugar Gliders will increase where there is food and adequate shelter (in the form of nest boxes) as the occurrence of natural hollows is very low.

Adequate food and shelter is fundamental to survival – restoration projects need to factor in these necessities for meaningful biodiversity outcomes.

The first video conference for 2012 had a total of 116 participants connected across 16 locations; Mt Gambier, Adelaide, Hamilton, Colac, Warrnambool, Ararat, Horsham, Heywood, Ballarat, Bendigo, Benalla, Mildura, Geelong, Bairnsdale, Box Hill and Nicholson Street Melbourne.

Those attending included participants from;

**Educational:** University of Adelaide, University of Melbourne, Gordon Institute, University of Ballarat, Millicent High School.

**Local Government:** Glenelg Shire, City of Greater Geelong, Moorabool City Council, Frankston City Council.

**Field Naturalist Clubs:** Ballarat, Ararat, Geelong, Hamilton, Portland, Bendigo.

**Community Conservation Groups:** Wedderburn Cons. Mgt. Network, Friends of Eastern Otways, Geelong Environment Network, Ballarat Environment Network, Barwon Coast Committee, Surf Coast and Inland Landcare Network, Bellarine Landcare Network, Ararat Landcare, Torquay Landcare, Port MacDonnell Landcare, Community Action for Sustainability, Interested landholder/farmer.

**Conservation Organisations:** Wimmera CMA, Goulburn Broken CMA, Glenelg Hopkins CMA, Corangamite CMA, Trust for Nature, Birdlife Australia, Victorian National Parks Assoc., Windamarra Aboriginal Corp., Western Coastal Board, Parks Victoria, Nature Glenelg Trust, Red Tail Black Cockatoo Recovery Team, Dept. Primary Industries Victoria and Dept. of Sustainability and Environment biodiversity staff across 13 locations. Also at Mt Gambier staff from the Dept. of Environment and Natural Resources South Australia.

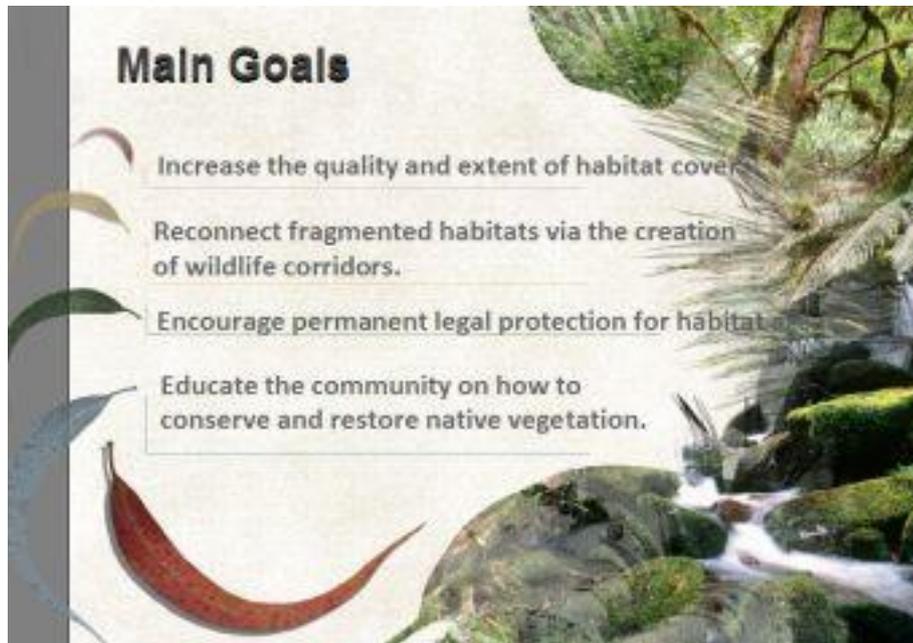
**Industry related:** Treehome Nursery - Victoria, Mimosa Nursery - South Australia, Rural Solutions South Australia.

## **SPEAKER SUMMARIES**

### **Habitat Restoration Fund** - *Daniel Brindley, Environmental Advisor*

#### **About the HR Fund**

Daniel spoke about the formation of the HR Fund which stemmed from landholder interest on the Mornington Peninsula and a desire from landholders to undertake conservation actions on their properties. An important role of the HR Fund has been to assist private landholders in their conservation efforts and access funding opportunities by through private philanthropic interests and liaising between Local Government, Landcare, CMA's , Parks Victoria and Trust for Nature. The HR fund is primarily a volunteer group with which is essentially aimed at assisting private landholders to be part of conservation and habitat restoration initiatives. A key part of the group's formation process was to obtain deductible gift recipient (DGR) status which opens up opportunities for contributions from business and philanthropic interests and provides the necessary funds to engage in on-ground works.



The in-kind work of private landholders is substantial and far beyond what many people would have possible. Private landholders have put substantial amounts of their own funds into projects; for example 35 properties at Red Hill had an initial \$60,000 worth of works by the HR Fund which was matched by \$180,000 from private landholders. In addition, most of the properties are placing conservation covenants through Trust for Nature. Daniel said it was very gratifying to see the return of species a few years after many of the restoration projects.



### HR Fund implementation

Daniel spoke about nine main areas of interest on the Mornington Peninsula and associated habitat linkage corridors. The HR Fund has a planned and costed program to restore 12,470 acres of habitat on the Mornington Peninsula. Create 400 acres worth of corridor habitat to reconnect 'isolated' vegetation pockets and establish covenants via Trust for Nature.

Daniel stressed that unlike many environmental initiatives the HR Fund is in for the long haul, its funding base which is not heavily reliant on short term funding initiatives and its volunteer focus will mean it is capable of maintaining works for the long term.



The HR Fund aims to ensure protection of all sites where works are carried out as it is more likely that philanthropic interests are only interested in funding works on sites which remain protected. The HR Fund has been arranging protection agreements with the Trust for Nature on sites where works are carried out.

Contractors are used to undertake many of the works. Daniel pointed out that contractors are engaged on an outcome based targeted hectares basis rather than an hourly rate. The HR Fund has undertaken on-going monitoring of the ecological changes at a number of sites over the last 6 years. Some sites went from 30 indigenous species to 176 species over a six year period. The HR Fund has now expanded to a point where it has been possible to undertake works in Parks. There is now a works agreement with Parks Victoria which enables the HR Fund volunteers to undertake works on parks land.

### **Promoting HR Fund restoration works**

Daniel felt it was important to show landholders the results of works so more people can become involved at a grassroots level. He said community groups and landholders are very interested in the outcomes achieved. It is also very important to have projects which are tangible to the general community – they see how habitat can be restored and it promotes the conservation effort at a local level.

### **Key points from questions**

- There is a growing conservation ethic on the Mornington Peninsula.
- It is important to keep participants involved in the process and demonstrate tangible results to people and follow up with constant educational material.
- There has been limited reliance on government grants so far but as the complexity and number of projects develops there is an intention to seek access to government funding as well as continuing to source private investment funding.

Contact: Daniel Brindley, Environmental Advisor [Habitat Restoration Fund](#)

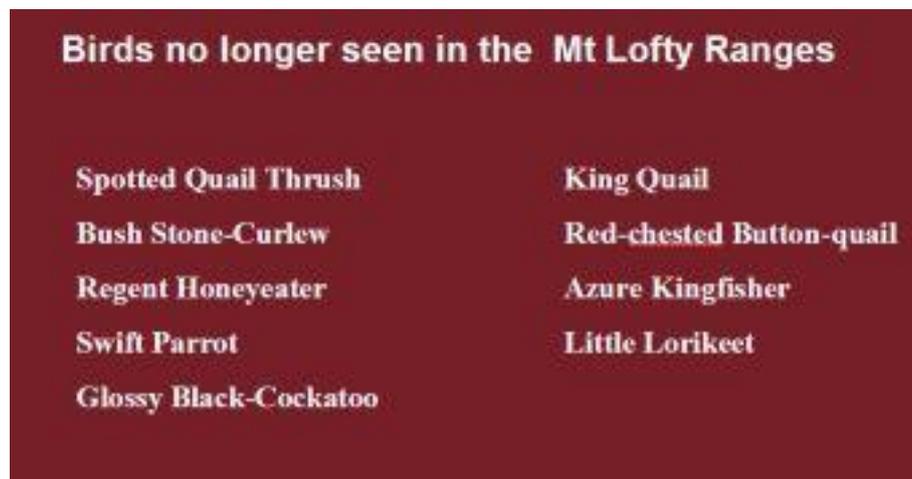
## **The Woodland Recovery Initiative** - Assoc. Prof. David Paton AM, University of Adelaide, Earth and Environmental Sciences

David introduced the topic by saying we need to think about the spatial scale of restoration works i.e. the patch scale and the regional scale required to achieve good recovery and also the temporal scale involving spreading out revegetation and restoration over long periods of time.

David spoke about the Mt Lofty region in South Australia which covers about one million hectares comprising Mallee and chenopod scrublands which have been cleared, with only about 10% of the original vegetation remaining and confined to poor quality agricultural land.

### **Loss of species**

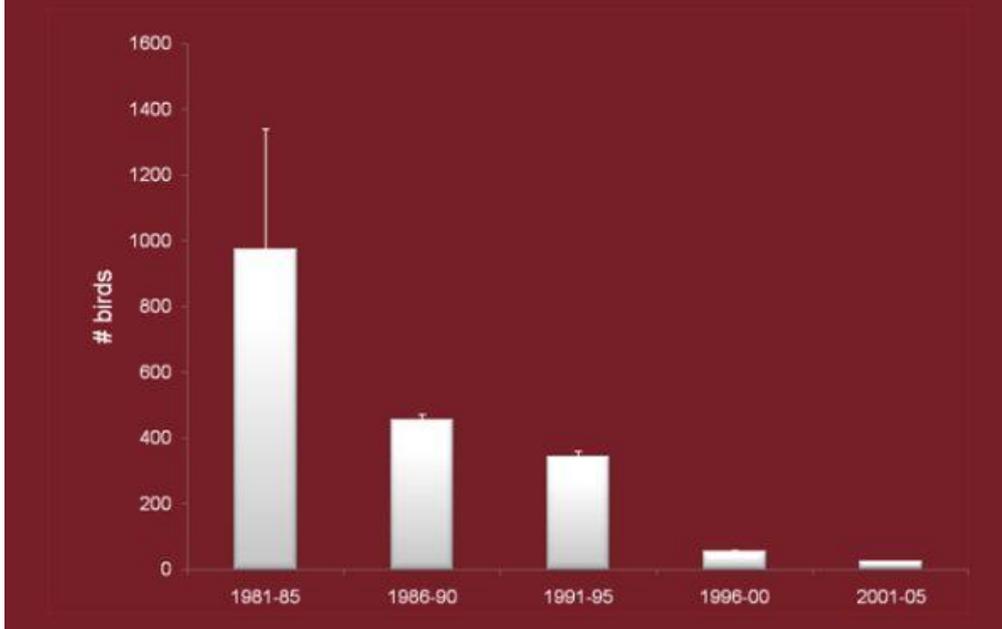
David showed a species abundance to area chart which indicated that it is very likely that we will lose about half of the bird species in the Mt Lofty landscape with the current level of habitat remaining. This means approx. 50 bird species will go regionally extinct in this area. He pointed out there is a time lag between habitat loss and loss of species and importantly there is a “Window of opportunity” now to re-establish habitat to prevent species losses. This needs to happen now as the current opportunity is not available to future generations as species would have already been lost.



David pointed out a number of species which have already been lost to the region and showed a list of other species which have continued to decline since 1980 when restrictions were introduced to control large scale vegetation clearance. This illustrates the time lag between habitat loss and species decline.

He referred to an example of Tree Martin decline over the last 25 years which has been determined by conducting weekly counts since 1981. In the 1980's a typical count was 1000 birds but this has significantly declined to a point where it is now down to very few birds.

## Changes in the abundance of Tree Martins near Gilberton



*Tree Martin decline over the last 25 years.*

## Some of the bird species that have declined in the Mt Lofty region

Square-tailed Kite	Brown Treecreeper
Scarlet Robin	Black-chinned Honeyeater
Crested Shrike-tit	Diamond Firetail
Rufous Whistler	Southern Emu-wren
Dusky Woodswallow	Chestnut-rumped Hylacola
Tree Martin	Tawny-crowned Honeyeater
Red-rumped Parrot	Beautiful Firetail
Jacky Winter	Hooded Robin
Yellow Thornbill	Willie Wagtail
Restless Flycatcher	Southern Whiteface
	Fantail Cuckoo

*David said there were many other species which showed similar levels of decline to Tree Martins.*

Key message -Woodland birds will continue to decline unless additional habitat is provide.

## Habitat replacement needs (habitat complexity and habitat size)

David spoke about the valuable untidiness of natural woodland habitat which comprises different species of vegetation, different age classes and structural form with understory shrubs, leaf litter and bare patches. Unfortunately most revegetation and restoration projects do not adequately mimic the natural woodland system. Revegetation often comprises high density and in many cases single species areas with minimal structural diversity of individual plant species (i.e. lateral branches), many planting are also confined to narrow rows. Revegetation areas often have;

- limited species/floristic diversity
- limited structural diversity
- poor dispersion patterns
- high plant densities for the tree and shrub layer
- poor tree architecture
- small patch size

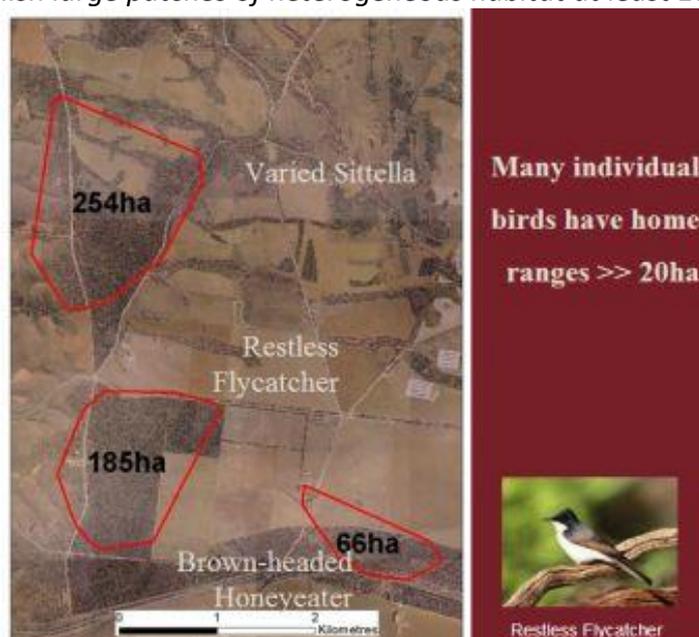
*The above issues result in limited biodiversity gains.*

In many cases habitat replacement does not support a comparable number of birds that is found in remnant vegetation. In addition, current revegetation tends to support more of the common species and does little to support less common species which are in decline.

## Scale of revegetation projects

In the Mt Lofty area most revegetation is less than 1 Ha. with very few revegetation projects exceeding 20 Ha. Those that are large are often associated with agro forestry and not habitat restoration. He pointed out that it is necessary to consider the habitat needs of individual birds to provide appropriate restoration works for them e.g. if the home range of a species is 20 Ha then the minimum size of a revegetation area needs to be 20 Ha or larger.

In essence a revegetation area needs to be at least of scale large enough to cater for the home range of an individual of a species. Key message - *revegetation for biodiversity should establish large patches of heterogeneous habitat at least 100 ha.*



*Habitat patch size must accommodate a species home range.*

## **Monarto revegetation study area in South Australia**

The large scale Monarto revegetation project was conducted in the late 1970's. It comprised 1680 ha, it was planted with 600,000 trees and large shrubs with 250 plant species planted 4.5 – 6 m apart. The area now provides a valuable study area to determine the effectiveness of the plantings for woodland birds. Surveys have detected 80 species of birds which is greater than 90% of the region's woodland avifauna. There is now 17 species breeding (plus 4 species in nest boxes) David pointed out that it will still be 50 to 100 years before natural wood hollows are formed. Other observations are; the home range of selected species tends to be larger in the revegetation areas than natural areas, ground-dwelling species and treecreepers are absent. Key message – *if revegetation is undertaken at a large enough scale with heterogeneous plantings it is possible to expand the population of woodland bird species in decline.*

### **Methods for achieving large scale revegetation**

- Retire whole farms and not bits of farms and consider paying owner to restore native vegetation to the property.
- Address loss of woodland bird species at a regional scale (David used the Mt Lofty region as an example of how there would need to be an increase in native vegetation from 10% of the landscape to 30% of the landscape to arrest decline of woodland species, this equates to 150,000 Ha of revegetation or new habitat required).
- The type of revegetation required is transformational and intergenerational in its vision.
- It is necessary to build capacity (people, knowledge) research, education, and training, learn by doing.
- Build intergenerational ownership; community involvement with a conspicuous presence (some urban examples).
- Secure long-term funding (100 year program).

### **Critical issue for achieving transformational revegetation**

David spoke about the need for long-term secure funding which he felt would not be led by governments as policies are often subject to change and tied to short-term programs which can come and go. Secure funding needs to be community led. David spoke about a Trust Fund concept where the principle is built up and maintained. Only the income from the fund is spent but available over many years. This would provide long-term regular investment towards the program. Sources of funding are: philanthropic, ecological offsets or carbon offsets

### **Contributing to a fund by offsetting an Ecological Footprint (EF)**

David spoke about how people could contribute to the revegetation fund by offsetting against their ecological footprint. An ecological footprint is the resources (land, sea, water) needed to support a human (includes land used for housing etc). An ecological footprint also includes a carbon footprint which contributes to about half of the ecological footprint

The average ecological footprint for an Australian is about 7 ha.  
The Global average is about 2 ha and for a sustainable globe the average needs to stay at 2 ha (which means Australians need to reduce their current ecological footprint).

David showed some costings to offset a person's ecological footprint

- Based on tonnes of carbon a person emits (carbon footprint): the average is about 10 tonnes per person with an average figure of \$20 per ton which would cost about \$200 per annum (for the carbon footprint). This means the ecological footprint (which is about double the carbon footprint) would be about \$400 per annum or just \$1 per day.

Or

- Based on costs to repair one hectare
- If the individuals of this generation decided to contribute to offsetting their ecological footprint by revegetating just one hectare which would cost on average \$25K per hectare to rebuild woodland habitat. If this cost is spread over a person's life contribution of 60 years the cost is only about \$1 per day.

David felt offset payments against persons ecological footprint should be tax deductible. The funding concept is a way of harnessing community ownership and as the number of contributors expands together with corporate contributions it would provide the necessary long term funding for generational rebuilding of woodland habitat.

#### **Key points from questions**

- David felt the concept of wildlife corridors connecting remnant vegetation has its limitations for recovery of woodland birds because their linear form does not provide habitat to support or grow the population. Investment would be better directed to enlarging existing remnants and increasing patch scale.
- A key factor in addressing recovery is to consider the area required to support a suite of species. If recovery for birds provides the necessary area it will also be beneficial for a range of other species ( mammals, plants etc.)

Contact: David Paton: [Woodland Recovery Initiative](http://www.bior.org.au)  
<http://www.bior.org.au>

## Is habitat restoration working? Improving the effectiveness of revegetation for reptiles and beetles - Sacha Jellinek, University of Melbourne, Centre of Excellence for Environmental Decisions (CEED)



Sacha recently completed his PhD in which he studied the effectiveness of revegetation focusing on reptiles and beetles. These taxa are more reliant on ground layers than birds and are not well studied in terms of revegetation. Sacha also studied the attitudes of landholders towards revegetation and remnant areas.

Sasha's research was carried out in the Wimmera and Benalla areas of Victoria which are primarily agricultural areas. He described the methodology used to carry out fauna surveys during the summers of 2008 and 2009 and 400 landholder surveys in which he collected information on revegetation attitudes, management actions and revegetation activities (type, size/shape).

Sacha spoke about revegetation which involves the replanting of native vegetation to make core areas larger and/or to provide linear strips of connectivity for fauna. He felt revegetation and restoration can be effective for maintaining faunal species richness and abundance, but community composition between revegetation and remnant habitats is different both in terms of habitat structure and floristic.

- Linear strips and connectivity – this might benefit species movement and dispersal but there are costs (disease spread, edge effects).
- Patch enlargement – provides greater habitat area benefits for many species but dispersal from the patch is limited.

Sacha felt more information is needed to understand how reptiles, amphibians and some invertebrates respond to habitat restoration and from a social perspective we need to know more about landholder views on revegetation.

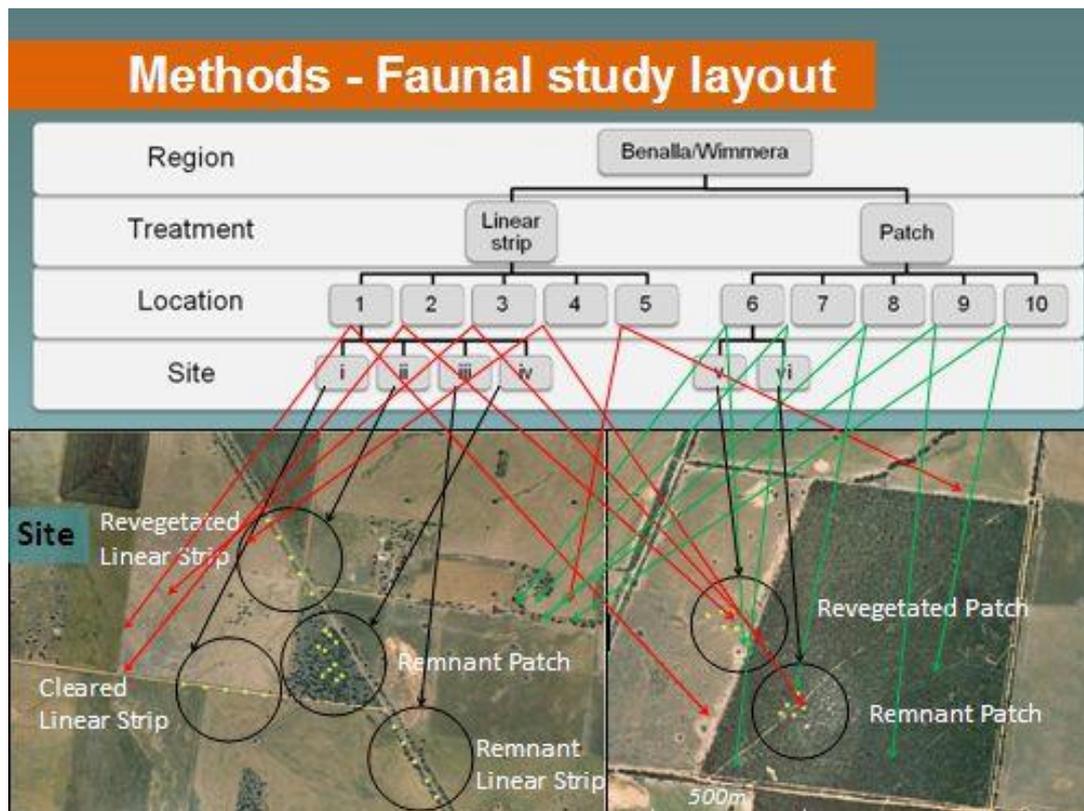
The study looked at linear strips, which were usually roadsides originating from an isolated remnant patch and patches of remnant and adjacent revegetated habitat at 5 locations in the Wimmera and 5 locations in the Benalla region.

Linear strips (corridors) were usually along roadsides and divided into:

- Revegetated Linear Strip
- Cleared Linear Strip
- Remnant Linear Strip and
- Remnant Patch

Enlarged patch were usually larger than 4 ha and divided up into:

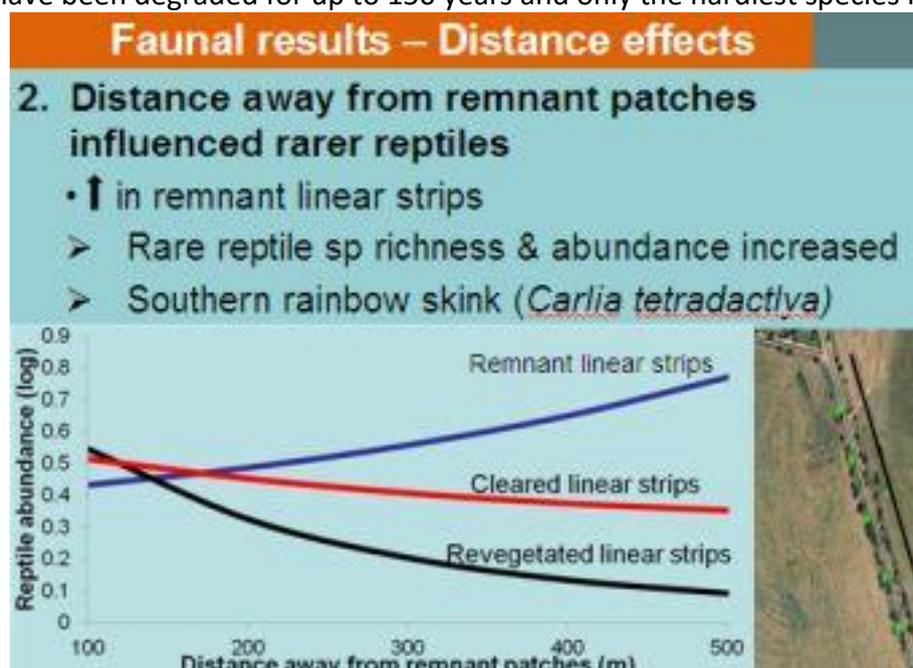
- Remnant Patch
- Revegetated Patch



Fauna study layout, replicated at 5 locations in the Wimmera and 5 locations in the Benalla area.

## Results

Sacha recorded 22 reptile species and 97 species of beetles from 10 families but found there was no substantial difference in reptile or beetle species richness or abundance across all categories between linear strips and patches. The reason for this is thought to be because the areas have been degraded for up to 150 years and only the hardiest species remain.

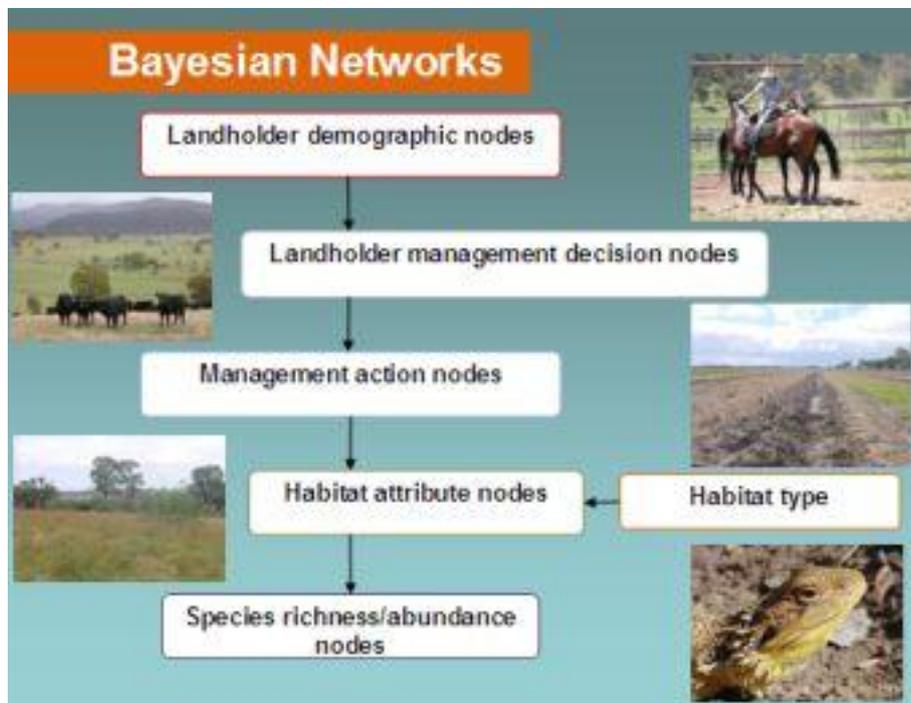


Sacha found some of the more rare reptiles were found along remnant roadsides vegetation, even more so than in remnant patches probably because remnant patches are periodically crash grazed and disturbed so their habitat value is reduced. The remnant roadside areas contained the least modified habitat which also contained fallen timber, leaf litter, rocks, native grasses and herbs.

*Key message: ground layer elements such as rock cover, proportion of native plants (tussocks & herbs), fallen timber and litter cover have a major influence on increasing rare reptile species richness and abundance.*

## Bayesian Networks

Sacha explained that by using a graphical statistical tool that assists in structured and adaptive decision making the Bayesian network enables the integration of ecological and social data and expert opinion. Variables are represented by nodes that represent causal links.



*Bayesian Networks model – from S. Jellinek*

### Key points from questions

- Remnant areas, especially linear strips which contain remnant vegetation are vital for reptile and beetle species (some remnant strips contain better habitat and possibly less predators than the patch areas).
- Deep ripping and the loss of ground covers through herbicide spraying might be detrimental to beetle and reptile communities.
- Revegetation by simply planting trees is not enough for the needs of many ground dwelling species. Revegetation needs to include ground layers by adding rocks, logs, leaf litter and a variety of grasses and herbs.

Contact: Sacha Jellinek: [Sacha Jellinek's research](#)

**Long term nest box study in the Bendigo area** - *Maurice Lewis, Bendigo Field Naturalists Club*



*Tuan (Brush-tailed Phascogale) Image: Maurice Lewis*

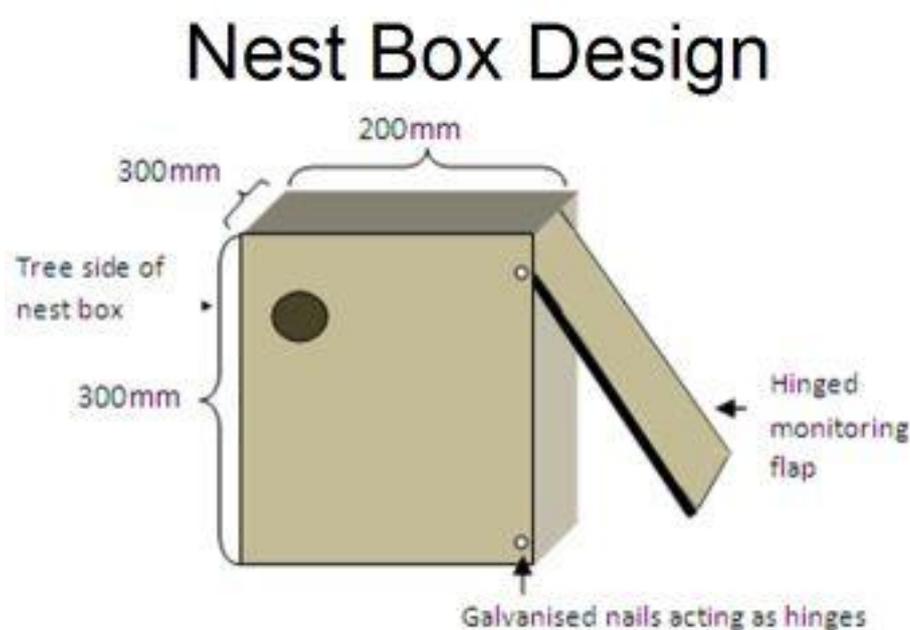
Maurice spoke about his involvement with nest box placement for Tuans (Brush-tailed Phascogales) and Sugar Gliders in the Box Ironbark forests in the Bendigo area over the last 30 years. Over 700 nest boxes have been installed during the program. Nest boxes are also

used by Ringtail Possums; Brushtail Possums; Antechinus; assorted reptiles; bats; and Owlet Nightjars.

Maurice said nest boxes are sometimes occupied within one or two days of being erected which is an indication of how desperate animals are for shelter. He also said he has recorded large increases in populations of sugar gliders at some locations which have also increased the presence of Powerful Owls.

### Nest box design and placement

Through years of trials Maurice has worked out the best design, construction and placement of the nest boxes.



The boxes size reduces the incidence of being taken over by bees. The materials are best made from 19mm external grade ply. The hole size is 41mm which excludes starlings. The box is hung from a 6 inch nail placed into the tree on an angle. The hole can be placed on the side facing the tree so the animal is not easily exposed to predators when entering or leaving. It is very important to place the box so it faces east. The most practical height is between 3-4 metres. For Tuans the boxes are best placed in trees which are interlocking or with a canopy where the Tuan can jump across (max 1m) so the animal does not have to traverse on the ground. The distance between boxes should be no more than 5 m apart as this provides adequate boxes for Tunas and Sugar Gliders otherwise the Sugar Glider will prevent the Tuan from using the box.

### Monitoring

Nest boxes are monitored weekly from January to early June but not during Winter and Spring to avoid disturbance to breeding. Nest boxes should be cleaned out every two years and new wood shavings installed.



Maurice said the nesting boxes have really assisted in increasing the Tuan population and monitoring over the years has shown the bush can sustain a higher population where the nest boxes have been used.

#### Other interesting observations

- Tuans are most usually found in areas with big Red Ironbark trees and plenty of loose litter.
- Fleas are never found on Sugar Gliders, presumably because of the insect deterring properties of Eucalyptus leaves; of which they construct their nests.
- Female Tuans have been found to be living in close proximity; within a hectare of each other.
- The animals are cunning and will hide on the other side of a tree from you,
- Ringtail Possums will enlarge the entry hole of boxes, whilst Galahs will chew the top off a box.
- Few Antechinus have been found occupying boxes, but their round nests of leaves and grass have been found.
- Tuans and Sugar Gliders will be found to have swapped boxes; presumably because the Tuan's is more insulated and the Sugar Glider will take over.

In summary Maurice felt the population of Tuans and Sugar Gliders will increase where there is food and adequate shelter (in the form of nest boxes) as the occurrence of natural hollows is very low. He was very concerned about the impacts of too frequent burning which impacts on the availability both food and shelter for these and many other species. If the current burning regimes are not changed there will be whole sale loss of species from the forests in the Bendigo area.

Maurice acknowledged the assistance provided by other members of the Bendigo Field Naturalists Club.

Contact Maurice Lewis via Bendigo FNC See also: [Environest nest boxes](#)

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