SWIFFT State Wide Integrated Flora and Fauna Teams

SWIFFT Video conference notes 18 April 2013

Reptile ecology and conservation

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

KEY POINTS SUMMARY

Conservation of reptiles is made more difficult because they have an image problem, being the least popular vertebrate fauna.

Victoria has 29 species of reptiles listed under the Victorian (FFG Act 1988), seven species listed under the (EPBC Act 1999) and 48 species listed under the DSE Threatened Fauna Advisory List 2013.

Reptile conservation needs to focus on habitat – not individual animals.

Over the next 20 years urban growth to the west of Melbourne will result in the loss of approx.7,000 ha of native grassland / Striped Legless Lizard habitat.

Loss of native grassland habitat is considered the number one cause of Striped Legless Lizard decline.

To offset habitat loss a 15,000 ha Western Grasslands Reserve will be created where Striped Legless Lizards will translocated.

The Inland Carpet Python has declined throughout its Victorian range and is now an endangered species.

Researchers have been field monitoring Carpet Pythons at selected locations in northern Victoria over the last 17 years.

The diet of Carpet Pythons is reliant on Rabbits because most of the naturally occurring small and medium sizes native mammals in northern Victoria are no longer present.

The first video conference for 2013 had a theme on Reptiles: *Research on the ecology and conservation status of reptiles in south east Australia with special focus on Victoria*. (History of listing threatened reptiles in Victoria and contemporary threats including disturbance processes and their impact, the use of translocation as a management tool and human attitudes to reptile conservation).

A total of 68 participants were connected across 15 locations; Hamilton, Warrnambool, Heywood, Horsham, Mildura, Ballarat, Bendigo, Benalla, Wangaratta, Geelong, Traralgon, Bairnsdale, Orbost, Arthur Rylah Institute, Heidelberg, and Nicholson Street Melbourne.

Those attending included participants from;

Educational: University of Ballarat, Gordon TAFE, South West TAFE, Bendigo TAFE, Ecolinc.

Local Government: City of Hume, Colac Otway Shire, Hobsons Bay City Council, Wyndham City Council, Baw Baw Shire, City of Port Phillip.

Field Naturalist Clubs: Ballarat, Geelong, Hamilton.

Community Conservation Groups: Barwon Coast Committee, Friends of Eastern Otways, ANGAIR, Geelong Environment Council,

Conservation Organisations: Zoos Victoria, Wathaurong Aboriginal Co-op., Caring for Country, Glenelg Hopkins Catchment Management Authority, Wimmera Catchment Management Authority, Parks Victoria, Trust for Nature, Dept. of Sustainability, Environment and Primary Industries staff across 15 locations, inc. Arthur Rylah Institute,

Industry related: Ecology Australia, Biosis, Wildlife Profiles, ABZENCO, Eco-repair, Ecology and Heritage Partners, Farmer/landholder, Central Highlands Water.

SPEAKER SUMMARIES

Cold-blooded disinterest: taxonomic bias and the worsening status of Victorian reptiles - *Nick Clemann, Program Leader, Threatened Fauna, Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Victoria.*

Nick spoke about the influence of humans in causing species extinctions. He said we are the only species which can make things worse or better. In the case of reptiles the task is difficult because there is a significant bias towards directing conservation efforts to the more charismatic vertebrates. Reptiles have an image problem, they are the least popular vertebrate fauna with birds, mammals and frogs being more popular.

Nick pointed out that popularity is an important factor when it comes to investing in conservation. Despite the fact that there are some worrying trends in the status of reptiles,

investment is often directed towards more appealing species. There are entire organisations devoted to conservation of endotherm classes (e.g., Birdlife Australia), and even organisations devoted to single species which are not threatened e.g. Koala and Platypus. But there is not one Australian organisation devoted to the conservation of reptiles.

Status of Victorian reptiles

Nick explained there are about 120 species/sub-species of reptiles in Victoria. They can be the most abundant terrestrial vertebrates in many ecosystems. We have totally herbivorous reptiles in Victoria and reptiles that are pinnacle carnivores in their ecosystems and because of their abundance they form significant components of food webs, nutrient cycling etc.

In Victoria, 29 species of reptiles are listed under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act 1988), seven species are listed under the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act 1999) and 48 species listed under the DSE Threatened Fauna Advisory List 2013. Nick pointed out that some species have been delisted or downgraded but emphasised this is not due to conservation recovery programs but rather re-evaluation of status or taxonomic changes.

Nick discussed an increase in the listing of reptiles compared to other taxonomic groups. There has been a fourfold increase in reptiles being listed under the FFG Act over the last 20 years and a 24 times increase in reptiles being added to the DSE threatened fauna advisory listing.

Nick spoke about the high possibility that we may have already witnessed the first extinction of an Australia lizard, being the Grassland Earless Dragon. At present this is subject to further taxonomic review to determine if the Victorian Earless Dragon is a species in its own right, if this is confirmed the Grassland Earless Dragon will be presumed extinct.

Threats to Victorian reptiles

Nick spoke about a need to focus on big picture habitat protection rather than running around trying to save every individual. We can get caught up in designing actions for salvaging individuals from destruction but lose sight of the fact that the habitat itself is being destroyed.

Climate change: Nick felt it is very difficult to manage climate change threats to reptiles but pointed out thermal biology is a major factor in reptiles and that some species will benefit whilst others will be impacted upon by a warming climate. Species which are unable to adapt either behaviourally or geographically will be most at risk.

We need to do more about the threats we can manage

Habitat loss/ degradation; Nick considers this to be the most important issue and is common to most threatened reptiles. Habitat loss / degradation exacerbates all other threats e.g. when habitat is destroyed populations become fragmented and are more prone to predation from exotic predators. Nick spoke about the extensive loss of native grasslands and implications for the Striped Legless Lizard. He also mentioned the Lace Monitor which has very specific nesting requirements and requires large areas to move over. It is a species which has contracted in its range and is now only secure in far eastern Victoria.

Loss of native grasslands has resulted in a decline of the Striped Legless Lizard.

The Lace Monitor has lost much of its habitat, it is now confined to a small part of its former range.

Predation from introduced predators; Nick used the example of freshwater turtle nests which are highly susceptible to fox predation. Turtles are a long lived animal, loss of eggs and juvenile animals may not show up now but into the future as older animals are not replaced. Nick spoke about the misconception that it is OK to lock your cat up at night to save wildlife but let it out in the day to roam around. Reptiles are diurnal and susceptible to cat predation during daylight. With developments expanding into grasslands west of Melbourne species like the Stripped Legless Lizard are at threat from domestic cats, similarly urban development to the south-east of Melbourne poses a threat to Swamp Skinks from domestic cats.

Unsubstantiated advice / planning; A dilution of quality assessments and advice poses a risk to proper evaluation of developments and mitigation measures. Rapid assessments are often poorly planned ill timed and lack the necessary resourcing to ensure the duration of surveys is adequate and conducted with the necessary expertise.

Unproven mitigations and offsets; Nick questioned the premise that offsets are achieving real conservation benefits. Offsets rarely achieve what they promise or even come close. It is difficult to find examples in literature where offsets are achieving tangible solutions or gains. All in all the literature is quite damming of many current popular techniques to manage threatened species including reptiles. Nick felt there needs to be more proof that mitigations actually work, e.g. relocating a threatened species from a development site. We need to question the current mind set of signing over habitat loss and better understand the biology and ecology of relocating threatened species, costs and consequences.

Things that can be done for threatened reptiles

Given the current political and financial climate resourcing of conservation efforts is a major challenge, but essential to successful outcomes.

Purchase / reserve / protect habitat; habitat protection and connection of habitat is a good use of available financial resources.

Research to underpin management and understand trends; it is vitally important to know what you are managing and how to best manage a species using information on habitat use and biology. There are still many species of reptiles that have limited or no biological data which makes it difficult to formulate effective management outcomes.

Collaborate, enrich the skill set / breadth of investors; bringing together varied skill sets from like minded professionals enhances opportunities. Nick used the Zoos Victoria, Fighting Extinction Program [http://www.zoo.org.au/fighting-extinction/] as a good example of how 20 threatened species are benefiting from collaboration across a wide range of disciplines to achieve outcome far in excess of what could be done by working in isolation.

Vetting of consultant reports / EISs; Nick suggested there needs to be a system to ensure reports are scrutinise much the same way as published papers are done. It is important to ensure ecological information regarding developments is accurate.

Key Points

- Reptile have an image problem that confounds conservation management.
- Human actions determine the fate of species and if the conservation battles are won or lost.
- We need utilitarian / objective criteria when listing, allocating resources and prioritising actions (if we are truly concerned about maintaining biodiversity).

Nick provided a substantial list of references regarding the effectiveness of translocations, offsets and conservation management. See: References Appendix 1.

Key points from questions

- Detection probability studies have been carried out for several species of threatened reptiles e.g. Alpine Skinks, Striped Legless Lizard. But Nick emphasised the information is not static, there are changes over time e.g. climate, habitat and predators.
- Funding for species conservation needs to be linked into developments which impact on habitat loss in urban /semi urban areas.
- A peer review panel for consultants would be very expensive but it is done to some extent in an informal way now but we need to have the discussion to see what can be done.
- Some species of reptiles manage to survive in urban environments but species which have very specific habitat requirement or are susceptible to predation from cats and dogs don't persist.

Evaluating the effectiveness of salvage and translocation of Striped Legless Lizards - *Megan O'Shea, Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Victoria*.

Megan explained this research project is aimed at determining if translocating Striped Legless Lizards can provide positive conservation outcomes for the species using a statistically replicated design. The project is innovative in that it will implement a statistically robust scientific design to evaluate the success of translocation.

About the Striped Legless Lizard

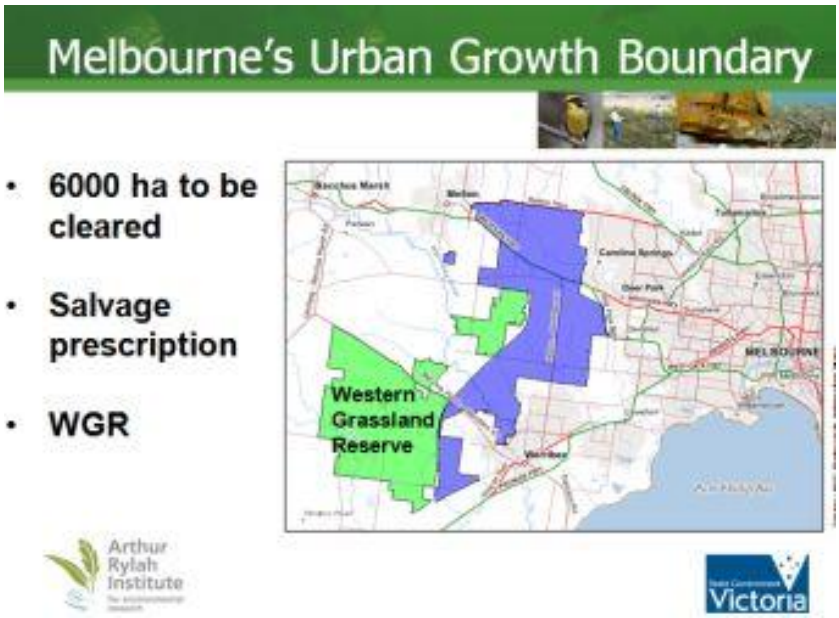
The Striped Legless Lizard *Delma impar* belongs to the Pygopodidae – a family of lizards that are endemic to the Australian region, comprising about 38 species, of which the Striped Legless Lizard has the most southerly distribution. Its range extends from the ACT, through south-eastern NSW, into Victoria and across into south-eastern South Australia. It has a threatened species status in each State and Federally under the EPBC Act 1999.

Habitat

The Striped Legless Lizard is a specialist of temperate native grasslands communities which are also listed as threatened. Loss of native grassland habitat is considered the number one cause of this species decline.

Habitat loss and urban growth

Megan spoke about planned urban growth to the west of Melbourne over the next 20 years (represented blue on map). Urban growth in this area will result in the removal of approximately 7,000 hectares of native grassland. Although fauna surveys have not been conducted, it is assumed that much of the remnant grassland in these areas supports populations of Striped Legless Lizard. The Federal and State government have prescribed that these animals will be salvaged and translocated, as the development progresses.



Offsets to urban growth

As an offset for the loss of remnant grassland, approximately 15,000 hectares of land to the west of the new urban growth boundary will be acquired, to establish the Western Grassland Reserves. (represented green on map). It is intended that recipient sites for translocated Striped Legless Lizards will be found within or near to these reserves in the most suitable areas containing native grassland habitat.

Translocation

Megan spoke about the level of uncertainty regarding translocations of the Striped Legless Lizard. There have been small level translocations of this species in the past but the results are unclear. More broadly, literature suggests that only about one third of reptile translocations are considered successful. Poor post release monitoring is a common problem in determining the level of success. Well planned translocation programs have a higher success rate than ad hoc programs.

Megan said this project is innovative because it will implement a statistically robust scientific design to evaluate the success of translocation with five years of post release monitoring.

Measures of success

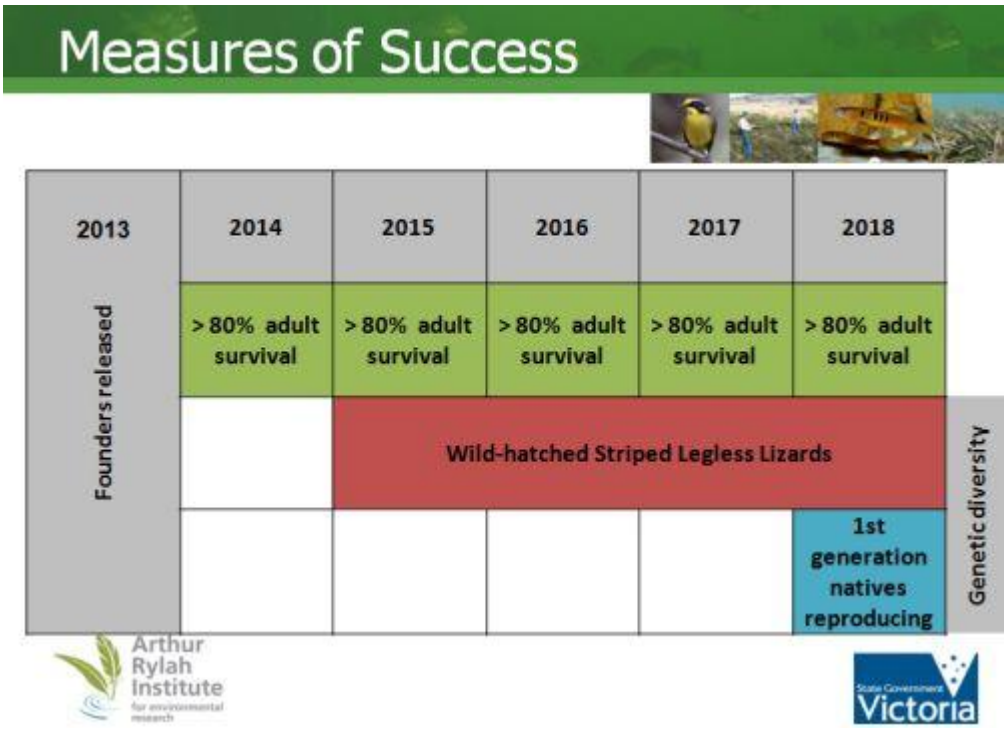
The first lizards will be translocated in 2013 with four measures of success;

*a target of 87% adult survival within each of the study years.

*evidence of lizards that have hatched at the release site, within two years of the release of founders.

*evidence of reproduction (i.e. gravidity or hatched offspring) in first generation natives at about year five.

*hatchlings are derived from a range of adult animals (This will be determined through genetic screening).



Site selection and re-release surveys

There will be 12 replicate release sites. Sites have been assessed and scored on their native vegetation composition, rock cover, extent and connectivity. Only sites where the vegetation is composed of greater than 50% native tussock cover will be selected. Sites that have been cultivated may be considered but they will be given a lower selection criteria score. The practicalities of future management including, fire management, grazing and weed control have also been factored into the site selection process.

The majority of chosen release sites will be permanently protected within the Western Grassland Reserve, which is also within the historic range of the species. In accordance with IUCN guidelines for translocation, release sites must be absent to ensure reintroduced lizards are not competing with any existing populations. Megan said the team has surveyed potential release sites on at least eight occasions, providing a greater than 95% probability of detecting the species if it was present. Only one of the potential release sites had existing Striped Legless Lizards present.

Population viability analysis

Megan spoke about the need to determine how much land is required and what the minimum area for each release site could be. Using a conservative density of 7 SLL/ha, given that many of the potential recipient sites do not support optimum habitat. Modelling was carried out to achieve a less than 5% probability of extinction within 100 years. Results indicated a carrying capacity of 245 animals, which extrapolated out to a minimum of 35 ha of continuous habitat for each release site. Further modelling was carried out to determine the practical number of founders per release site which was determined to be an initial population size of 75 animals per each release site.

Managing release site and monitoring

One of the concerns with releasing the lizards is that they would rapidly disperse away from release sites, resulting in increased risk of stress and mortality. A soft-release enclosure will be constructed at each site which will remain in place for one year. After removal of the soft-release compound there should be slow dispersal across the 35ha site. Three monitoring zones have been created, with the greatest intensity of post-release monitoring to be conducted around the soft-release enclosures. Within each zone there will be four points of monitoring that are randomly located each year.

In summary, in order to robustly evaluate the success or failure of translocation, this project will require at least 900 Striped Legless Lizards to be released in groups of 75 across 12 replicated recipient sites, with a minimum of three sites per release event.

Key points from questions

*Previous translocations of Striped Legless Lizards have not had the level of monitoring which is planned for this project.

*There is a need to monitor what is present both in terms of Aboriginal artefacts and fauna as areas are being dug up during development, because once the land is dug up the information is lost forever. Some salvage of Striped Legless Lizards is already being done and animals held at the Zoo. A question still remains about artefacts.

*It would be far more efficient to plan for salvage operations well before machinery was on site but this would require surveys to determine the presence of lizards, something which current funding does not cater for.

*Salvage operations only focus on 5x5 m plots at 20 metre intervals, soil is dug to about 30 cm to locate the legless lizards.

*There were several questions concerning the small size of soft release holding areas but previous experience using similar techniques had had an 83 % survival rate.

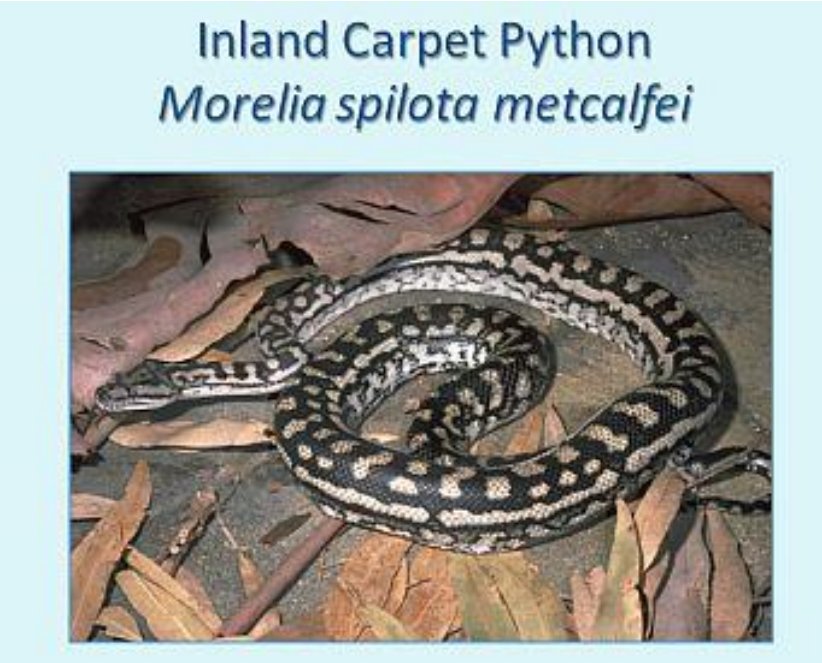
*Translocations into the Northern Plains (Patho Plains) is not included as part of this project. The focus is on the urban growth boundary and refining translocation techniques.

*Translocation sites were selected on a range of criteria, including the presence of cracking clay soils.

Contact: Megan O'Shea, Arthur Rylah Institute, 03 4508600

Overview of Carpet Python Research in Victoria - *Peter Robertson, Wildlife Profiles*

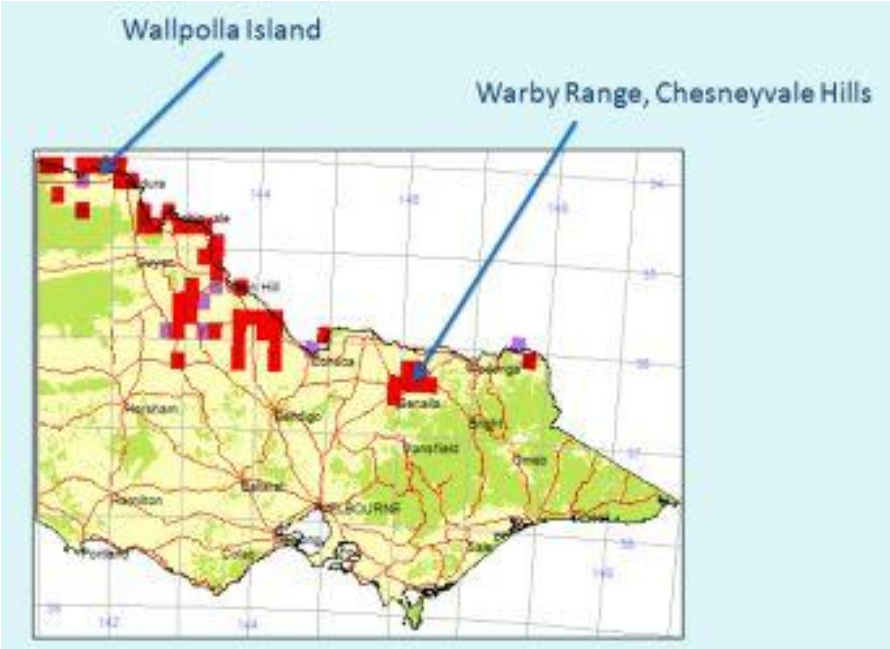
Peter acknowledged other people who have contributed to this research effort which started back in 1996.



The Carpet Python Morelia *spilota metcalfei*, and its close relative the Diamond Python *Morelia spilota spilota* of East Gippsland, are both considered endangered in Victoria.

The Inland Carpet Python is a distinctive, slow-moving snake which can grow to up to 3 metres. It is considered harmless, has no venom but sharp teeth. It can be distinguished from all other Victorian snakes by the broad head and narrow neck, the distinctive 'carpet-like' pattern of grey and black blotches on the back and sides, and very small scales on top of the head. It also has a row of heat-sensory pits in the lower jaw which enables it to find warm blooded prey in the dark.

Distribution



There has been a decline in the distribution of Carpet Pythons across its Victorian range. In Victoria, populations are centred on forests associated with major rivers and swamps in north-western Victoria and a few isolated rocky ranges in north-eastern Victoria. The dry forests and rock outcrops of the Warby Range and Chesneyvale areas appear to support perhaps the largest population known in the State.

Biology

*The Carpet Python is often nocturnal in warmer weather, but may occasionally be seen active or basking during the day.

*Adults prey upon warm-blooded vertebrate animals, such as mammals or birds, with introduced mice, rats or rabbits often comprising much of the diet.

*Hatchling snakes probably feed mainly on small lizards.

*Female Carpet Pythons lay up to 30 eggs, and brood the clutch until hatching, after which the young snakes are independent.

Learning how the Carpet Python interacts with its environment

A number of objectives and knowledge requirements were identified for research. Peter spoke about research at Wallpolla Island in north-east Victoria and Warby Range, Chesneyvale Hills in eastern Victoria, the two sites providing different habitats.

Telemetry methods were used to study pythons. They were surgically implanted with temperature-sensitive radio transmitters, released into the field, and then monitored, approximately weekly, for up to four years (and some less frequently for nearly ten years). At each monitoring visit, a number of habitat and other parameters were recorded.

In north-eastern Victoria seventeen Carpet Pythons were used in the study. Three Pythons were followed for the four years of the study. Four were believed to be killed by foxes and one may have been eaten by a Goanna.

In northwest Victoria three Carpet Pythons were initially monitored at Wallpolla and Lambert islands. These pythons were removed from houses near Mildura and were released into unfamiliar environments. Other Carpet Pythons were examined later in the research.

Home range

Peter discussed results from tracking individual pythons over many years. In the north-west the average home range was about 309 ha (138 to 500 ha). In the north-east the home range varied from 14 to 200 ha, the lower figure associated with pythons living near buildings and not travelling far for food. It was observed that Carpet Pythons can revisit the same habitat trees and rock crevices often at the same time each year.

Habitat features

In north-east Victoria identified features included;

*north and north-west facing rock outcrops, where the ground temperature among the rocks is higher in the winter, and deep crevices provide cool retreats in the summer heat.

*small crevices 50 mm wide for shelter from predators

*sunny spots to bask

*fragmented rock rubble

*hollow logs, dead trees

*shrubs, grass and lily tussocks, sedges and proximity to water

In north-west Victoria habitat included;

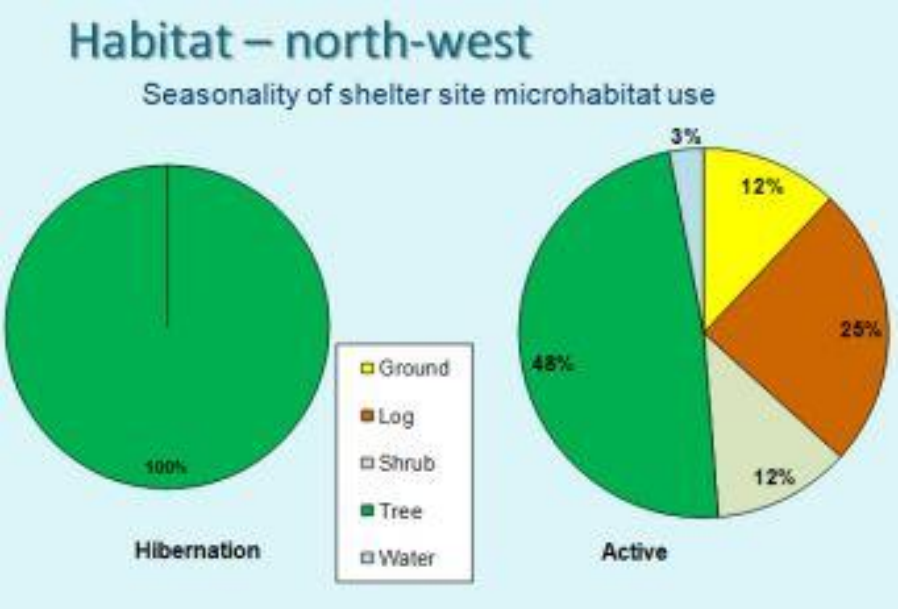
*River Red Gum forests

*50% of shelter sites are in trees (77% of shelter trees >100cm DBH)

*hibernation is always in trees, further from river, often in Black Box

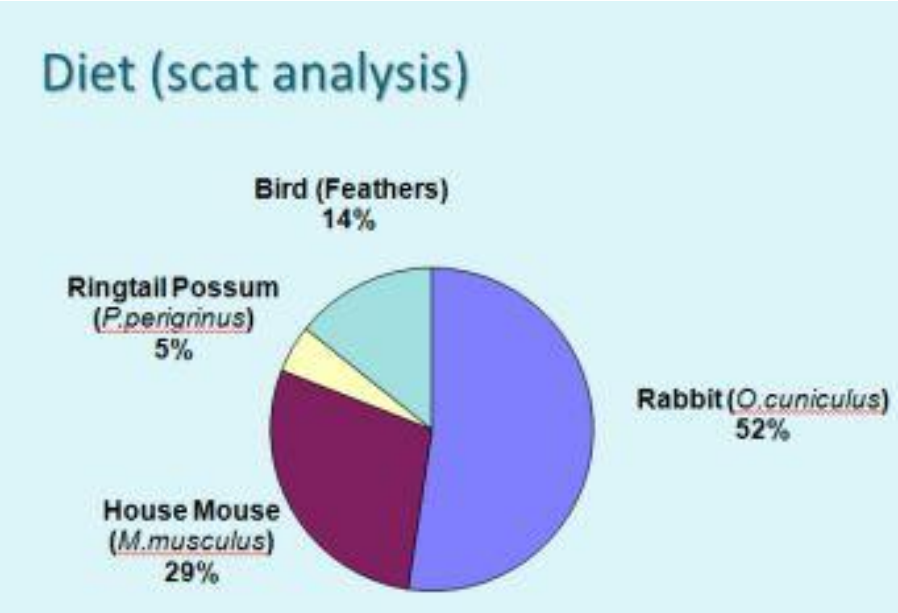
*logs and shrubs provide important shelter sites

*proximity to water (86% of time spent <100m from water)



Ground habitat refers primarily to rabbit burrows

Diet



Hundreds of Carpet Python scats were collected during the research. Rabbits and the House Mouse were the most common component. Most of the naturally occurring small and medium sizes native mammals in northern Victoria are no longer present which means pythons have had to find a replacement prey species.

Things that can be done to protect Carpet Pythons

Fox control; Ongoing control of these predators is considered essential in python habitat. Their effect may be particularly severe in areas where human disturbances have resulted in depletion of cover and shelter sites at ground level, microhabitats favoured by pythons during the summer.

Retain habitat trees; Large, living hollow trees are particularly important. A diversity of cover at ground level (hollow logs, shrubs and other dense vegetation, burrows), both for the snakes and for their mammal prey is desirable.

Habitat manipulation; Retention of fallen and felled timber, encourage development of dense vegetation at ground level, and enhancement of links of vegetated habitat between otherwise isolated patches.

Fire prevention; Aim to prevent loss of habitat on the ground, and avoid burning of hollow trees.

Rabbit control; Timed to minimise non-target mortality, ensure pythons are not in warrens during winter. Be cognisant of importance of rabbits as prey.

Key points from questions

*No pythons were handle during the monitoring which prevents foxes from following human scent trails to a python.

*A water rat and some native waterfowl have been recorded as prey.

*The home range of pythons in the north-west was measured a year after being released.

*Rabbits now form an important part of the Carpet Python's diet. Future rabbit control needs to cater for Carpet Pythons where they are known to exist.

*It is thought Carpet Pythons in Victoria only reproduce once every 3- 4 years.

*Firewood collection is a significant threat to Carpet Pythons.

*Fuel reduction prescriptions need to provide for protection of large trees and hollow logs, this requires intensive supervision during the burning process.

*Fox control needs to done on a broad scale across all land tenure.

*Illegal take of Carpet Pythons is probably not as significant as impacts from predation and habitat loss.

*The impact of wildfire on reptiles is difficult to quantify, rocks, crevices etc. can provide shelter but there is often a depleted food supply post fire. Depending on the severity of the fire and a species distribution it could take many years for reptile population to recover.

*In north-west Victoria Carpet Pythons have an average home range of about 309 ha.

*The diet of Carpet Pythons is reliant on Rabbits because most of the naturally occurring small and medium sizes native mammals in northern Victoria are no longer present.

*Rabbit control works need to be carefully managed in areas where Carpet Pythons are known to exist.

*The introduced Red Fox is major predator of reptiles, even Carpet Pythons.

Contact: Peter Robertson, Wildlife Profiles,

General discussion summary

*There are not enough resources to undertake experiments for determining the best size of SLL soft release enclosures.

*There are cases where offsets have been effective e.g. loss of 30 ha of native grassland with an offset of 300 ha of high quality grassland for Golden Sun Moths and other grassland related fauna.

*Offsets can mask net loss if the offset is an area that would already be protected.

*We need to be careful about developing a mindset where we think it is acceptable to transfer biodiversity from point A to point B all in the name of progress. We need to value what we have in situ and very quickly gain an understanding of what biodiversity assets remain in our landscape, before it's too late.

*There seems to be a proliferation of State planning offset policies which are becoming more reliant on undertaking ad hoc translocations of species but we also know that ad hoc translocations are highly prone to failure.

*Long term monitoring of translocations (10, 20-30 years) is really needed to confirm the success or otherwise of current translocations.

*We need to consider the consequences of failed translocations and responsibilities of proponents.

*Reptiles can be impacted upon by unplanned revegetation through loss of basking sites, therefore an understanding of species present at the site is important.

*There has been a significant decline in Black Snake and Tiger Snake populations in the Murray River area since the 1970's.

Appendix 1- References from Nick Clemann talk

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