Legging it for Lizards

Community Monitoring of the Striped Legless Lizard at Iramoo Wildlife Reserve, Victoria 2010

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NatureWatch is the Victorian National Parks Association's community biodiversity monitoring program.

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Victorian National Parks Association

The Victorian National Parks Association (VNPA) is the leading voice for nature conservation in Victoria. Formed in 1952, we are an independent, not-for-profit membership-based organisation dedicated to the protection of Victoria's unique natural environment and its wildlife. We also run the largest bushwalking and outdoor activities program in Victoria.

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NatureWatch

The Victorian National Parks Association's NatureWatch program is a community-based biodiversity monitoring program which informs, educates and engages the community in conservation management and practice. The NatureWatch program actively builds links between community members, scientists, and land managers, and develops scientifically based, practical projects that contribute to a better understanding of species and ecosystems, threatening processes, and the management of natural areas.

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SUMMARY

Thirty-two volunteers from the Victorian National Parks Association's NatureWatch program participated in surveys for the Striped Legless Lizard, after attending a training workshop in spring 2010.

Previously, extensive surveys for the species had been conducted at Iramoo Wildlife Reserve between 1996 and 2001. These surveys revealed that the site supported a large population of Striped Legless Lizards and a catalogue of individual animals was established.

The 2010 surveys carried out by NatureWatch Volunteers were part of a new study to determine if any of the individuals found over the period from 1996 to 2001 were still present.

It was hoped that the re-trapping of at least some of these individuals would provide information on the species' longevity, rates of growth and habitat use.

This study, conducted with the assistance of NatureWatch volunteers, resulted in the capture and individual identification of 74 Striped Legless Lizards.

Of these 50 per cent were compared to a catalogue of animals that had been recorded in the previous study, using head scale patterns for individual lizard recognition. No matches with those previously recorded were achieved.

Striped Legless Lizard. Photo: Ben Twist

1.0 INTRODUCTION

1.1 Project Background

Iramoo Wildlife Reserve was once part of the former Albion Explosives Factory in Deer Park. As part of decommissioning the factory, flora and fauna surveys identified several intact grassland remnants which supported the Striped Legless Lizard.

Although much of the factory land has now been developed for residential housing, three grassland areas were reserved for conservation purposes, including Iramoo Wildlife Reserve. Intensive surveys for the Striped Legless Lizard were conducted across this area between 1996 and 2001, confirming that Iramoo was a significant site for the species, with a robust and productive population (O'Shea, 2005).

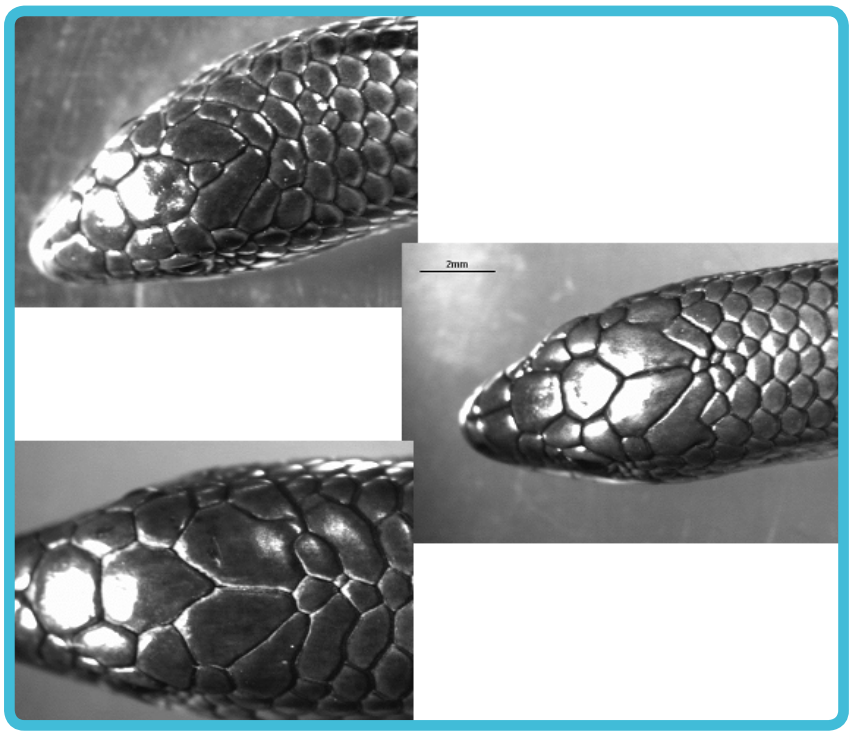
Arising from this study was the usefulness of roof tiles as a survey tool (Striped Legless Lizards are attracted to them for shelter and warmth) and a catalogue of 498 head photos that could be used to identify individual animals.

Using these resources, in 2010 the VNPA NatureWatch program and Victoria University collaborated to return to the site in the hope of rediscovering some of the individual animals that had been recorded in the previous study. The recapture of a proportion of these animals would provide valuable information on growth rates, longevity and habitat utilisation.

1.2 Biology of the Striped Legless Lizard

The Striped Legless Lizard *Delma impar* is a small and cryptic species found in remnants of the natural temperate grasslands of south-eastern Australia (Coulson, 1990). It is a member of the Australian family of flap-footed lizards (Pygopodidae), which are most closely related to geckoes (Greer, 1989), and is characterised by retaining only small flaps of the hind limbs and no external evidence of the forelimbs. Other similarities with geckoes include a round fleshy tongue, visible ear openings and the ability to make high-pitched vocalisations.

Striped Legless Lizards are well suited to their grassland habitat. Their longitudinal stripes provide perfect camouflage among grass thatch and their elongated bodies are well designed for moving



Head scales of the Striped Legless Lizard.

through grass tussocks and cracks in the clay soils. They are active in the day, when they forage for their preferred foods: black field crickets, spiders, caterpillars and cockroaches (Nunan, 1995).

Striped Legless Lizards are most readily observed during the spring after they have emerged from their over-winter dormancy (Kukolic, 1994; O'Shea, 2005). The mating season occurs in spring with females laying a clutch of two eggs in mid-December (Banks et al., 1999). Like some geckoes, the eggs are communally deposited in a cavity below the soil surface, with some nests having in excess of 20 eggs (Banks et al., 1999). After a period of incubation, hatchlings emerge in February (Banks et al., 1999). The hatchlings have a black head, are devoid of stripes and do not receive any parental care.

Due to their cryptic nature, very little is known about the life history of Striped Legless Lizards. It is thought that individuals are able to live in excess of 10 years (Kutt, 1993; Banks et al., 1999). However, there is virtually no data on their rates of growth, the age at which they become reproductively mature or the frequency and success of reproduction. Overall, the species is considered to be long-lived with low reproductive rates.

The conservation status of the Striped Legless Lizard is of international concern and it is recognised as a threatened species under various federal and state conservation legislations in Australia. Habitat loss is the most significant threat to this species, with approximately 99.5% of natural temperate grasslands destroyed or severely degraded since European settlement (Kirkpatrick et al., 1995). Indeed, Natural Temperate Grassland of the Victorian Volcanic Plain is listed as a critically endangered ecological community under the Environment Protection and Biodiversity Conservation Act 1999.

1.3 Objectives

The objective of this project was to undertake monitoring of the Striped Legless Lizard at Iramoo Wildlife Reserve. The main aims were to:

- Determine the ongoing presence and distribution of Striped Legless Lizards at the site.
- Detect animals previously captured in the 1996 – 2001 study.
- Document growth, longevity and location of any recaptured individuals.

The VNPA also sought to:

- Inform NatureWatch volunteers about the Striped Legless Lizard and factors threatening its survival.
- Engage and train volunteers in monitoring techniques.

Striped Legless Lizards are perfectly camouflaged for their grassland habitat. Photo: Megan O'Shea

2.0 METHODS

2.1 Study Area

Iramoo Wildlife Reserve is a 35 hectare remnant of natural temperate grassland located to the west of Jones Creek (pictured below) in the suburb of Cairnlea, Victoria (-37°44', 144°47').

It is roughly an oblong shape that is surrounded by suburbia on three sides and a series of sediment and holding ponds that feed into Jones Creek for the remainder. Features include a stony rise to the west and a series of windbreaks of the introduced Sugar Gum *Eucalyptus cladiocalyx*.

Vegetation consists of large patches of intact swards of Kangaroo Grass *Themeda triandra*, as well as large patches of Kangaoo Grass interspersed with the weed Serrated Tussock *Nassella trichotoma* and large patches of predominantly Serrated Tussock interspersed with other grasses. A range of native herbs and wildflowers occur throughout the reserve, as well numerous weeds, including Chilean Needle Grass *Nassella neesiana*.

Prior to being gazetted, the reserve had a history of light grazing by sheep and is now managed by biomass reduction burns and targeted weed removal programs.

2.2 Survey Methods

Prior to surveys commencing, a one day training program was held for NatureWatch volunteers wishing to participate in the project. Volunteers included a mix of people from the community including skilled ecologists and others with no formal ecological training.

The training day consisted of a lecture-style presentation covering all aspects of Striped Legless Lizard surveys, including an overview of current knowledge about the species, its conservation status, legal and ethical requirements associated with conducting surveys, survey site selection, survey methods and OH&S considerations.

The workshop also included a half day field trip that involved volunteers participating in a supervised Striped Legless Lizard survey and learning capture and handling techniques.

Surveys for Striped Legless Lizards were undertaken at Iramoo Wildlife Reserve between 11 September 2010 and 16 December 2010. Fifteen grids of roof tiles were used to survey for the lizards during the project. Based on the previous study, roof tile survey grids were established in areas of the grassland with the greatest localised abundance of lizards.

Grids consisted of 50 roof tiles, arranged in five rows of 10 tiles. The distance between individual tiles was five metres. To allow for settling, grids were established at least six weeks prior to the commencement of surveys, in July 2010.

To increase the chances of catching Striped Legless Lizards, surveys were conducted using a wooden box with an open top and bottom, and a strip of rubber foam around perimeter of the lower edge (O'Shea, 2005). The wooden box was placed around each roof tile prior to lifting and inspection. Each grid of roof tiles was systematically surveyed by VNPA volunteers and attempts were made to capture any Striped Legless Lizards observed. Attempts were not made to capture any other species of vertebrate animal, although all observations were recorded.

Captured Striped Legless Lizards were immediately placed into individual small calico bags which were tagged with the tile location. Processing of captured Striped Legless Lizards commenced immediately and was conducted by the Principal Investigator (author).

Processing included the collection of the following information:

- Measurement of snout-vent length (mm), total length (mm) and the point of autotomy (if present);
- Weight (g);
- Sex; and
- Dorsal head-scale photographs for individual identification.

Animals were released by VNPA volunteers at the point of capture immediately after processing (approximately 20 minutes after capture). In addition to capturing live animals, any sloughs that were found under the tiles were collected, bagged and labelled as well. If sloughs included any dorsal head scales, then these were used for analysis in an attempt to determine the identity of the individual animal.

On the completion of field work, all data was entered into a spreadsheet and a data card (including the head-scale photo) was developed for each individual. The head-scale photo of each individual Striped Legless Lizard captured was compared to the catalogue of head-scale photos from the previous study, in attempt to obtain a match. It was intended that if a match was obtained, then other morphological data would be compared for consistency, before concluding that the individual had been recorded in the previous study.

Top and left: Megan O'Shea demonstrates roof tile checking. Photos: Ada Nano

Above: Grids consisting of 50 roof tiles were used to survey for Striped Legless Lizards. Photo: David De Angelis

NatureWatch volunteers check roof tiles.

Daniel Gilmore identifies a skink found under a roof tile.

3.0 SURVEY RESULTS

Attempts were made to survey each roof tile grid under suitable weather conditions (O'Shea, 2005) on at least one occasion per fortnight. In total, surveys were conducted on 10 occasions. Not all grids were assessed on all 10 occasions, however, a total of 4450 tile-turns were conducted within this timeframe.

Between two and 13 NatureWatch volunteers participated in each of the surveys, with a total of 32 individual volunteers being involved over the course of the project. The dates of the surveys were as follows:

- September 11
- September 23
- September 25
- October 7
- October 9
- October 20
- October 21
- November 6
- November 18
- November 20
- December 16

Nine vertebrate species, including three amphibians, five reptiles and one mammal were observed under the roof tiles. Of these, only one species was introduced, the House Mouse *Mus musculus*. A summary of the observations is presented in Table 1, however it is important to note that the numbers of observations do not correlate to numbers of individuals given that the animals were not individually marked. Thus, one individual may have been observed numerous times.

Striped Legless Lizard record	Nº of observations
Male	40
Female	31
Undetermined	3
Recaptures	7
Sloughs (skins)	22

Table 2. Summary of Striped Legless Lizards captured at Iramoo Wildlife Reserve.

One-hundred and thirteen observations of the Striped Legless Lizard were recorded during the surveys, equating to 2.5 individuals per 100 tile-turns. Of these, 74 individuals were captured for the collection of morphometric data, with seven individuals captured twice (on separate survey occasions). The greatest distance between capture and recapture locations was 20.6m, with an average distance of 7.8m. An additional 22 Striped Legless Lizard skins were found under the roof tiles.

Of the 74 individuals captured, comparisons have been made between 37 (50%) of the dorsal head-scale photos and the previously existing catalogue. No matches were made with individual animals captured in the previous study. Analysis of the sloughs is yet to be completed.

Common name	Scientific name	Nº of observations
Marbled Gecko	*Christinus marmoratus*	1
Common Froglet	*Crinia signifera*	1
Striped Legless Lizard	*Delma impar*	113
Pobblebonk	*Limnodynastes dumerilii*	3
Spotted Marsh Frog	*Limnodynastes tasmaniensis*	30
House Mouse	*Mus musculus*	10
Tussock Skink	*Pseudemoia pagenstecheri*	154
Little Whip Snake	*Rhinoplocephalus flagellum*	91
Common Blue-tongued Lizard	*Tiliqua scincoides*	22

Table 1. Vertebrate animals observed during 4450 roof tile turns at Iramoo Wildlife Reserve.

Individual ID	Date of capture	Tile location	Date of recapture	Tile location	Distance between capture locations
SLL 8037	7 Oct	Grid D, Tile 34	21 Oct	Grid D, Tile 34	0 metres
SLL 8041	9 Oct	Grid H, Tile 9	20 Nov	Grid H, Tile 48	20.6 metres
SLL 8028	11 Sept	Grid O, Tile 25	23 Sept	Grid H, Tile 25	0 metres
SLL 8030	23 Sept	Grid C, Tile 31	7 Oct	Grid C, Tile 33	10 metres
SLL 8033	7 Oct	Grid A, Tile 36	6 Nov	Grid A, Tile 18	14.1 metres
SLL 8039	9 Oct	Grid A, Tile 35	6 Nov	Grid E, Tile 33	10 metres
SLL 8058	21 Oct	Grid F, Tile 36	6 Nov	Grid F, Tile 36	0 metres

Table 3. Summary of Striped Legless Lizards recaptured at Iramoo Wildlife Reserve between September and December 2010.

4.0 DISCUSSION

The Striped Legless Lizard still survives at Iramoo Wildlife Reserve and was recorded in all survey grids, except one. The species was previously observed at a rate of 4.3 individuals per 100 tile-turns at Iramoo Wildlife Reserve during the months September to January (O'Shea, 2005). Although this is much higher than the rate recorded in the current study, it is not possible to attribute such a result to a declining population.

Variability in observational data could be attributed to a range of factors including slight differences in survey methodology and weather conditions at the time of each survey. Striped Legless Lizards use the tiles for regulating their body temperature, rather than habitation. This means that the lizards only access the tiles under particular weather conditions. Although daily weather conditions are likely to have the greatest influence over tile utilisation, there are also seasonal and probably yearly variations in weather dynamics that influence the rate of tile utilisation. Without taking such variability into account, comparisons of data between years may be limited

It is disappointing that of the 50% of individual dorsal head-scale photos analysed, none of them matched animals in the catalogue. The catalogue of head scale photos was collected between 1999 and 2001, meaning that if these individuals are still alive and present at Iramoo they would be more than than 10 years old. This is within the age range for the species, which has been estimated to be between 12 and 20 years (Kutt, 1993; Banks et al., 1999) – an estimate that is supported by recapture events of animals after seven years that were mature (~3 years) at the time of initial capture (Rauhala, 1997; pers. obs.). At the outset of this project it seemed a reasonable expectation that at least some proportion of the animals in the catalogue would still be alive in the population. If any of these individuals do persist, it has not been possible to detect them using the techniques and survey effort that were adopted in this project.

Although roof tile surveys have assisted with an increase in recapture data within a single survey season, the species remains inherently difficult to recapture between seasons and is notoriously cryptic. The lack of recaptures from the previous study may simply be a result of that cryptic nature, rather than the loss of all previously recorded individuals from the population. Further effort and a different approach to surveys may be required to obtain significant recapture data.

Although no animals from previous surveys could be detected in this study, it is encouraging that the population of Striped Legless Lizards at Iramoo Wildlife Reserve has continued to persist.

Locam community members and volunteers from the Victorian National Parks Association attended a one day workshop that provided an overview of the species, project and methods adopted. These volunteers were then able to assist with the field work, which included setting up roof tile survey grids, looking under tiles for animals, scribing, and returning processed animals to the point of capture. Some volunteers also assisted with comparing dorsal head scale photos to those in the catalogue. Such an approach was mutually beneficial as the volunteers gained detailed knowledge about one of Victoria's threatened reptiles, improved their field biology skills and networked with like-minded people. Without such a team of enthusiastic and supportive volunteers, it would not have been possible to conduct such extensive surveys during the time period available each fortnight – in short, far fewer individual Striped Legless Lizards would have been captured.

4.1 Recommendations

This project attempted to recapture Striped Legless Lizards observed at Iramoo Wildlife Reserve over 10 years ago. To date, analysis of Striped Legless Lizard records obtained during this project has not revealed any of these previously captured animals. Such a result may be due to lack of persistence of the individuals, movement away from the original capture location or an ability to avoid recapture. Recommendations arising from this project are as follows:

- Complete analysis of the remaining dorsal head-scale photos.
- Increase the frequency of surveys to at least once every three years, in an attempt to recapture individual animals and obtain a snapshot of growth and movement data.
- Investigate recent advances in tracking technology and where suitable implement these to obtain data on the movement of individual animals.

4.2 Future survey

The NatureWatch model for this project enabled the collection of a reasonable sized set of data within a single survey season. Volunteers assisted in the capture of animals, which were then processed by the Principal Investigator, Dr Megan O'Shea. Future surveys could involve training a select set of volunteers to handle and process Striped Legless Lizards. In conjunction with a team of volunteers to assist in the capture of animals, such a model would allow for the rapid and repeated survey of a large number of roof tiles distributed across a greater area. Such an approach would potentially increase the chances of recapture and may assist in the recapture of individual animals that have moved away from the original point of capture.

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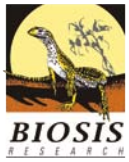
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