



Life on the Edge: The effects of road proximity on the spatial distribution and density of lizards.

Micaela Main^{AB}, Jody Simmons^C, Paul Sunnucks^C and Rodney Van der Ree^B

^A Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment (DSE), 123 Brown Street Heidelberg, VIC 3084, Australia

Email: micaela.main@dse.vic.gov.au

^B Australian Research Centre for Urban Ecology (ARCUE), Royal Botanic Gardens Melbourne, C/- School of Botany, University of Melbourne, VIC 3010, Australia

^C Australian Centre for Biodiversity, School of Biological Sciences, Monash University, Clayton, VIC 3800, Australia

1. Introduction

Linear strips of vegetation are dominant landscape features in many rural and semi-rural landscapes across Australia. These strips, including vegetation adjacent to roads and streams, unused road reserves and travelling stock reserves, often provide the majority of habitat for wildlife. However, the proximity of these habitats to roads and other disturbances may influence their suitability. This study investigated the ability of roadside vegetation in the Northern plains of Victoria to support reptile populations and examined the effect of proximity to the Hume Freeway on lizard abundance.

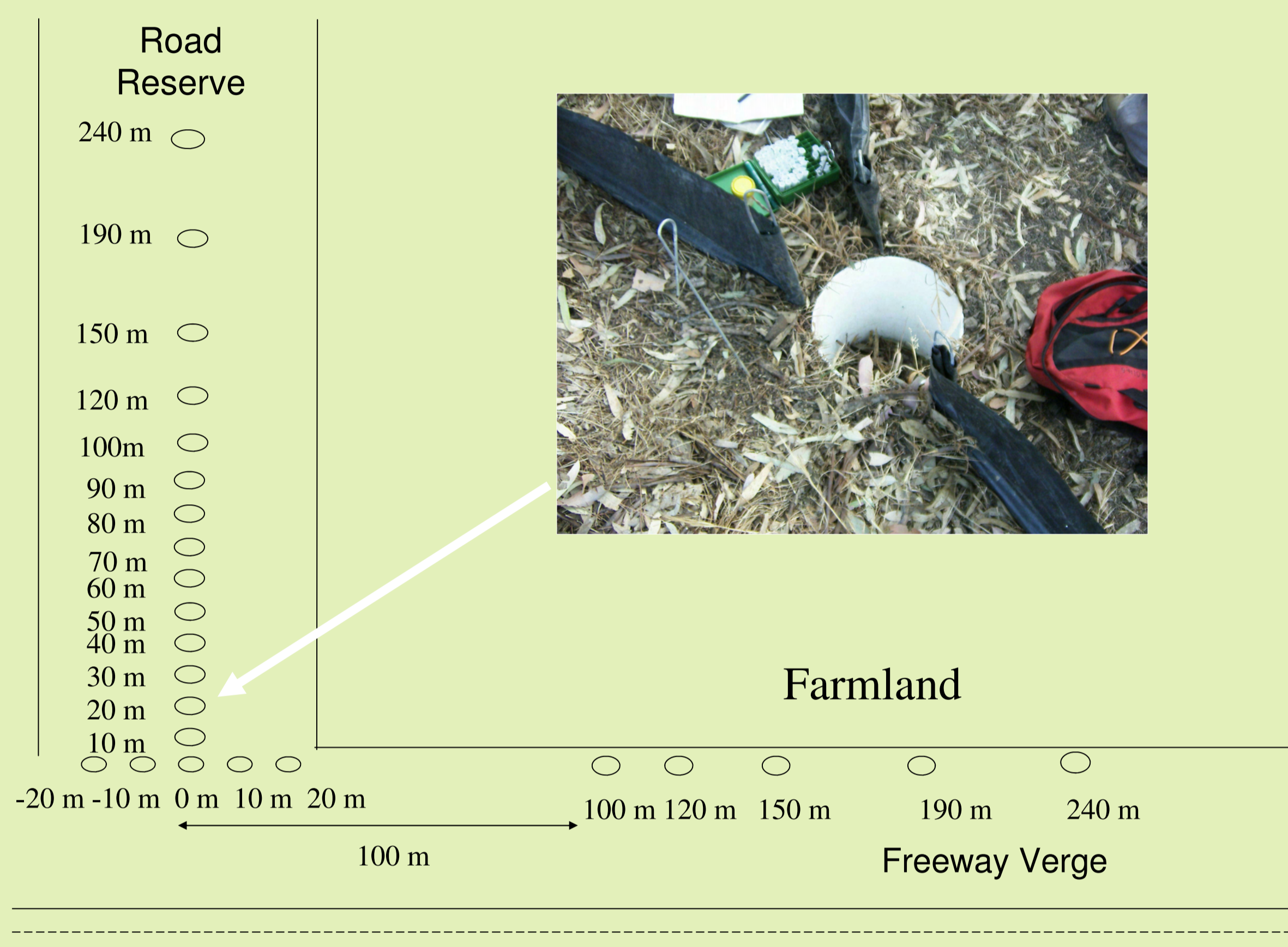


Figure 2: Pitfall trapping design for each site. (Not to scale)



Ctenotus robustus - Large Striped Skink

Christinus marmoratus - Marbled Gecko

Lerista bougainvillii - Bougainville's Skink



Figure 1: Aerial photo of a site. Locations of traps in the freeway verge and perpendicular road reserve woodland are indicated.

2. Methods

Reptiles were surveyed at 9 sites along the Hume Freeway in NE Victoria using pitfall traps. Woodland in the freeway verge (20 – 40 m wide) and in road reserves (≥ 20 m wide) running perpendicular to the freeway (Figs. 1 & 2) were surveyed for 12 nights (range 8 – 16) in Summer 2007/08.

Habitat structure was measured by counting the number of small (< 0.3 m dbh) and large (> 0.3 m) trees at each site, as well as length of fallen branches (> 0.1 m diameter). The depth of leaf litter, as well as the percent cover of rock, leaf litter and tree canopy was assessed at each site.

Generalized linear mixed models were used to relate the abundance of each species of lizard at each site to explanatory variables such as distance from the freeway and structural habitat variables. Models were constructed for the three most abundant species of skink, as well as the combined abundance of all species.

3. Results

278 individuals from 6 species of lizard were captured (5 skinks and 1 gecko) along the freeway verge (22.4%), in the perpendicular road reserves (46%) and intersection (31.6%). Three species, Southern Rainbow Skink, Common Garden Skink and Boulenger's skink made up 94.6% of the total number of captures.

The combined abundance of all lizards within road reserves was significantly higher closer to the freeway (after taking into account variation in habitat quality) than further away. Individually, Common Garden Skink and Boulenger's skink showed similar trends, (Fig 3), while Southern Rainbow Skink showed no response to distance from freeway.

The abundance of Common Garden Skink within the freeway verge was significantly higher closer to the road reserve.

There was no significant relationship between structure of habitat and distance along the freeway verge or road reserve.

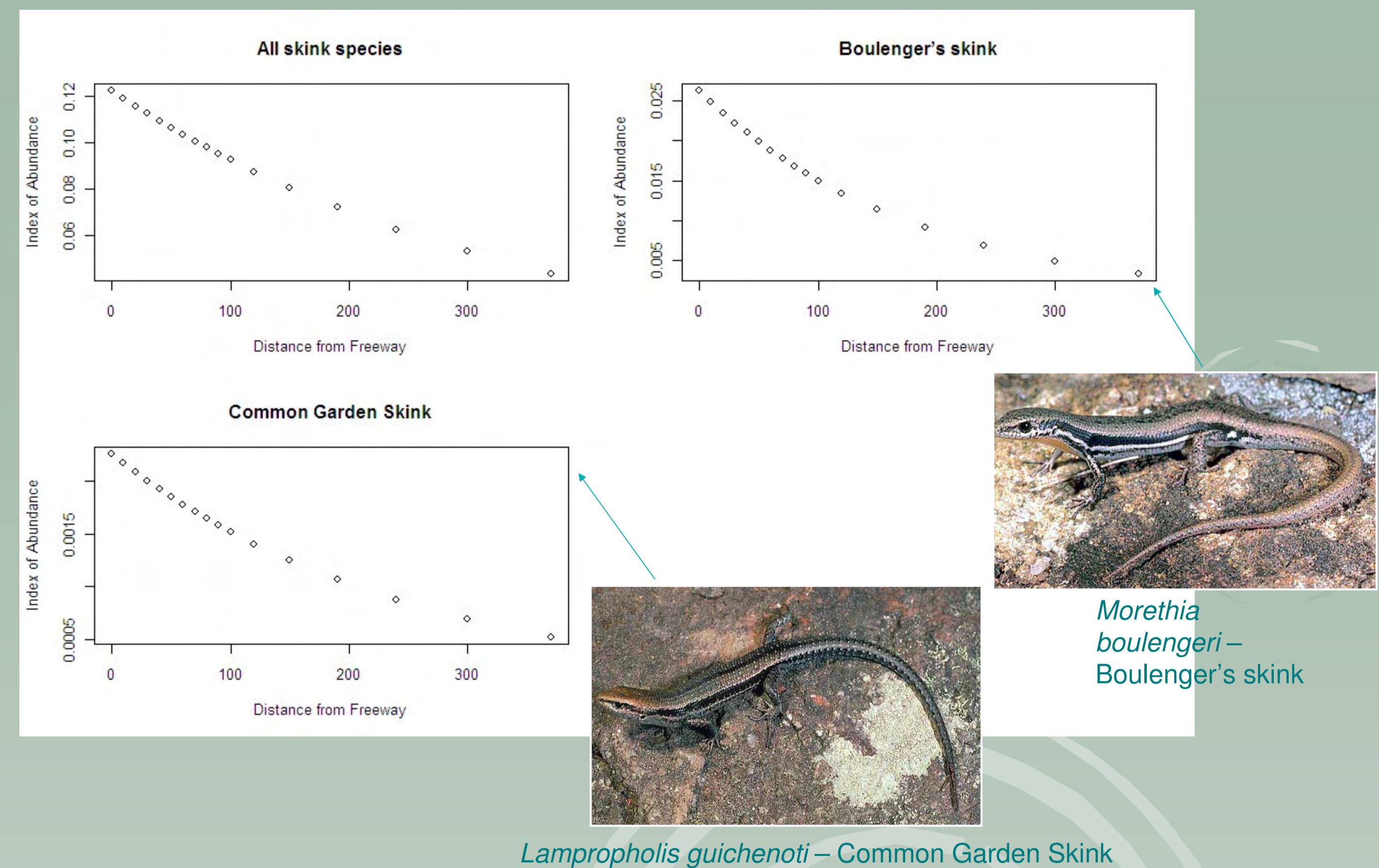


Figure 3: Model projected influence of distance from the freeway on the abundance of skink species.

4. Conclusions

- Linear strips of habitat (e.g. roadsides) support reptile populations
- Significantly higher abundance of at least 2 species of skink closer to the freeway
- Variation in the habitat did not significantly influence lizard abundance
- Roads may cause a "home-range pile-up", with implications for dispersal and survival
- Habitat geometry (i.e. intersection) may provide greater abundance of resources (e.g. Ants – Samways et. al. 1997) than a straight section of habitat
- Linear habitats along roads and other man-made or natural features are important for the conservation of reptile species, thus should be retained and enhanced in landscape planning.



Carlia tetradactyla - Southern Rainbow Skink

Acknowledgements

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References

Samways, M. J., R. Osborn, and F. Carliel. 1997. Effect of a highway on ant (Hymenoptera: Formicidae) species composition and abundance, with a recommendation for roadside verge width. *Biodiversity and Conservation* 6:903-913.