

Threatened Species and Farming

Report No X

Giant Gippsland Earthworm case
study: Management of farm habitats
for Earthworm conservation in South
Gippsland.

ESAI sub-project 05118
Ecologically Sustainable Agriculture Initiative
Protection of Threatened Species in Agricultural Landscapes

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Authors

Beverley Van Praagh

Arthur Rylah Institute for Ecological Research

123 Brown Street, Heidelberg, 3084

bvpraagh@museum.vic.gov.au

Alan Yen

Department of Primary Industry

621 Burwood Hwy

Knoxfield 3180

alan.yen@dpi.vic.gov.au

Neville Rosengren

Department of Physical Sciences and Engineering

La Trobe University

Bendigo

n.rosengren@latrobe.edu.au

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For more information about this publication contact

Annette Muir

Biodiversity Planner

Department of Sustainability and Environment

4/250 Victoria Pde

East Melbourne, 3002

Phone. (03) 9412 4297

Email: annette.muir@dse.vic.gov.au

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SUMMARY

This study was funded by the *Ecologically Sustainable Agriculture Initiative* (ESAI) of the Department of Primary Industries. It is one of seven case studies investigating management techniques for threatened species in the context of improvements in agricultural production that are ecologically sustainable over the long-term.

The GGE has co-existed with agricultural land use since European settlement of South Gippsland in the 1870s and has survived major changes to its habitat mostly associated with agricultural development and expansion. However, the overall effects of these habitat changes on GGE populations and their distribution are not clearly understood. The GGE distribution is confined almost entirely to privately owned agricultural land. Therefore, identifying the effects of agricultural and land management practices on GGE remains crucial to the conservation management of this species. One of the key requirements in furthering our understanding of threatening processes on GGE populations is to more clearly understand the factors responsible for influencing earthworm distribution. The aim of this project was to determine the main topographical and hydrological soil factors influencing the distribution of the GGE within the landscape of an individual farm, and to identify the effects of land management on these factors.

The distribution of the GGE was determined on a dairy farm at Jumbunna, 8 km south of Korumburra and correlated with past and present land use factors, topographical and hydrological features.

The landowner identified three sites that where he had found GGE in the past. However the present study found GGEs at 8 sites, in 4 distinct habitat types within the farm study area. These included; minor creek and drainage lines, flat to gentle sloping alluvial terraces above present flood levels, and steep south facing hillslopes with terracettes and colluvial footslope without terracettes. Examination of the GGE distribution at these sites in relation to geomorphology of the farm site identified various landscape features that may play a role in influencing GGE distribution. These include the nature and depth of the soil, slope, micro-topography and aspect of the steep hillslopes, in addition to site soil and surface hydrology. Density of re-vegetation may also impact upon GGE populations with earthworms found in the more open sections of re-planted stream bank. Each of these habitat types are influenced by different geomorphological processes and may require different management considerations for GGE conservation.

When management on the farm site over the last 50 years is considered, there is only one instance where a known GGE population has become extinct through agricultural activity. This involved concentrating movement of cattle to use one crossing point over a stream. This property has been subject to fairly low level stocking rates and very low levels of cultivation. At least one population of the GGE known to the landowner has survived for over 50 years. Old GGE burrows were also found at a site subject to a landslip some 5 years previously. However, no signs of earthworm activity were visible and the earthworm appeared to no longer be present at the site.

Conservation of GGE on individual farms may need to consider the different habitat types in which the worms are found e.g. minor creek banks and steep slopes. Each habitat type may require different types of management. The main processes identified that may require mitigation for GGE conservation include soil erosion, changes in soil and surface hydrology, and micro-topography of slopes. Agricultural activities that may contribute to these processes include; cultivation, stocking rates (pugging), infrastructure development, water run-off, and effluent production and treatment.

GGE are often very localised in their distribution; hence managing and protecting populations by abatement or exclusion of threats can be feasible and effective. However, broader landscape factors, such soil hydrology dynamics upslope of a GGE site, could have major local impacts on GGE populations.