

Giant Gippsland Earthworm survey at a site of a proposed rezoning, Jumbunna Rd, Korumburra

February 2012

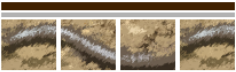


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REPORT - Giant Gippsland Earthworm survey of site of a proposed rezoning, Jumbunna Rd, Korumburra

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Cover Photo: Megascolides australis and subject land © INVERT-ECO

Abbreviations

DSE: Department of Sustainability and Environment

EPBC Act: *Environment Protection and Biodiversity Conservation Act 1999*

FFG Act: Flora and Fauna Guarantee Act 1988

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ATTACHMENT 1 Contingency Plan for the accidental unearthing of Giant Gippsland Earthworms

SUMMARY

Introduction

INVERT-ECO was commissioned by Beveridge Williams Pty Ltd to undertake a targeted survey for the Giant Gippsland Earthworm (GGE), *Megascolides australis* at a site of a proposed rezoning south of the township of Korumburra, South Gippsland. The subject land, situated adjacent to Jumbunna Road, Korumburra comprises two properties referred to as Site 1 (Lot 2 LP139825) and Site 2 (Lot 2 LP139824 & Lot 4 LP135303) and is currently zoned Farming (FZ).

This report provides the results of a targeted field assessment of the subject land to identify any GGE populations in order to address legislative and planning requirements by South Gippsland Shire Council and the Department of Sustainability and Environment as part of the planning process. This assessment will facilitate the planning process for a proposed rezoning and subsequent subdivision of the subject land.

Methods

A field survey of the subject land was undertaken on February 6th 2012. An on ground assessment was undertaken to identify areas of suitable habitat for targeted sampling. Sampling involved digging soil quadrats to look for evidence of the worm including burrows and cast (waste) material and walking over the site listening for gurgles.

Results

No evidence of Giant Gippsland Earthworms was located within Site 1 or 2 and very little potential habitat was identified. Giant Gippsland Earthworms are usually associated with sites comprising clay soils that retain moisture all year but support adequate drainage. While both sites contain soils often occupied by GGE, they did not support the appropriate hydrological conditions required to provide suitable earthworm habitat.

Potential impacts and mitigation measures

As no evidence of GGEs was found within Site 1 or 2, there are no legislative requirements and no anticipated impacts from development of the site in relation to this species.

A contingency plan is provided describing the procedure should any undetected GGE colonies be accidentally uncovered during site works (section 6).

1 INTRODUCTION

1.1 Background

INVERT-ECO was commissioned by Beveridge Williams Pty Ltd to undertake a targeted survey for the Giant Gippsland Earthworm (GGE), *Megascolides australis* at two adjoining properties adjacent to Jumbunna Road, Korumburra, South Gippsland. The subject land referred to as Site 1 (Lot 2 LP139825) and Site 2 (Lot 2 LP139824 & Lot 4 LP135303) is currently zoned Farming (FZ).

The purpose of this report is to provide an assessment of the subject land to identify any GGE populations in order to address legislative and planning requirements by South Gippsland Shire Council and the Department of Sustainability and Environment. This assessment will facilitate the planning process for a proposed rezoning and subsequent subdivision of the subject land.

The Giant Gippsland Earthworm is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Threatened under the *Victorian Flora and Fauna Guarantee Act 1988* (FFG Act) (see section 1.4 and attachment 1) for further background information on GGE). The species is known to occur approximately 1.4 km north-west of the subject land (Van Praagh personal observations).

1.2 Scope of Assessment

The specific tasks required of this assessment are:

- Undertake a targeted field survey for the Giant Gippsland Earthworm within the subject land;
- Provide an assessment of the potential impacts associated with the proposed site development if GGEs are recorded during the survey;
- Describe any opportunities to avoid or mitigate these potential impacts.

1.3 Study area

The study area is situated approximately 1.5 km south-west of the township of Korumburra, South Gippsland, approximately 120 km south-east of Melbourne (Figure 1).

Site 1

Site 1 occurs to the north-east of Sommers Crescent and comprises 6.7 ha. of land largely cleared for grazing (Figure 2). The topography is moderate to steep with a north to north-westerly aspect. The section of the site adjacent to Jumbunna Rd is lower and subject to

water-logging. A small stand of Blackwoods (*Acacia melanoxylon*) is present as a wind break on the property.

Site 2

Site 2 encompasses two parcels of land comprising 12.2 ha. situated to the south of Sommers Crescent (see Fig 2). The site consists primarily of pasture grasses with a large stand of willows (*Salix sp*) in the north western section of the site and additional willows scattered throughout. The site has a predominantly northern aspect, sloping down toward Jumbunna Rd where the site includes flatter areas prone to water-logging. Several drainage channels traverse the property. A large dam is present in the south-west corner of the site.

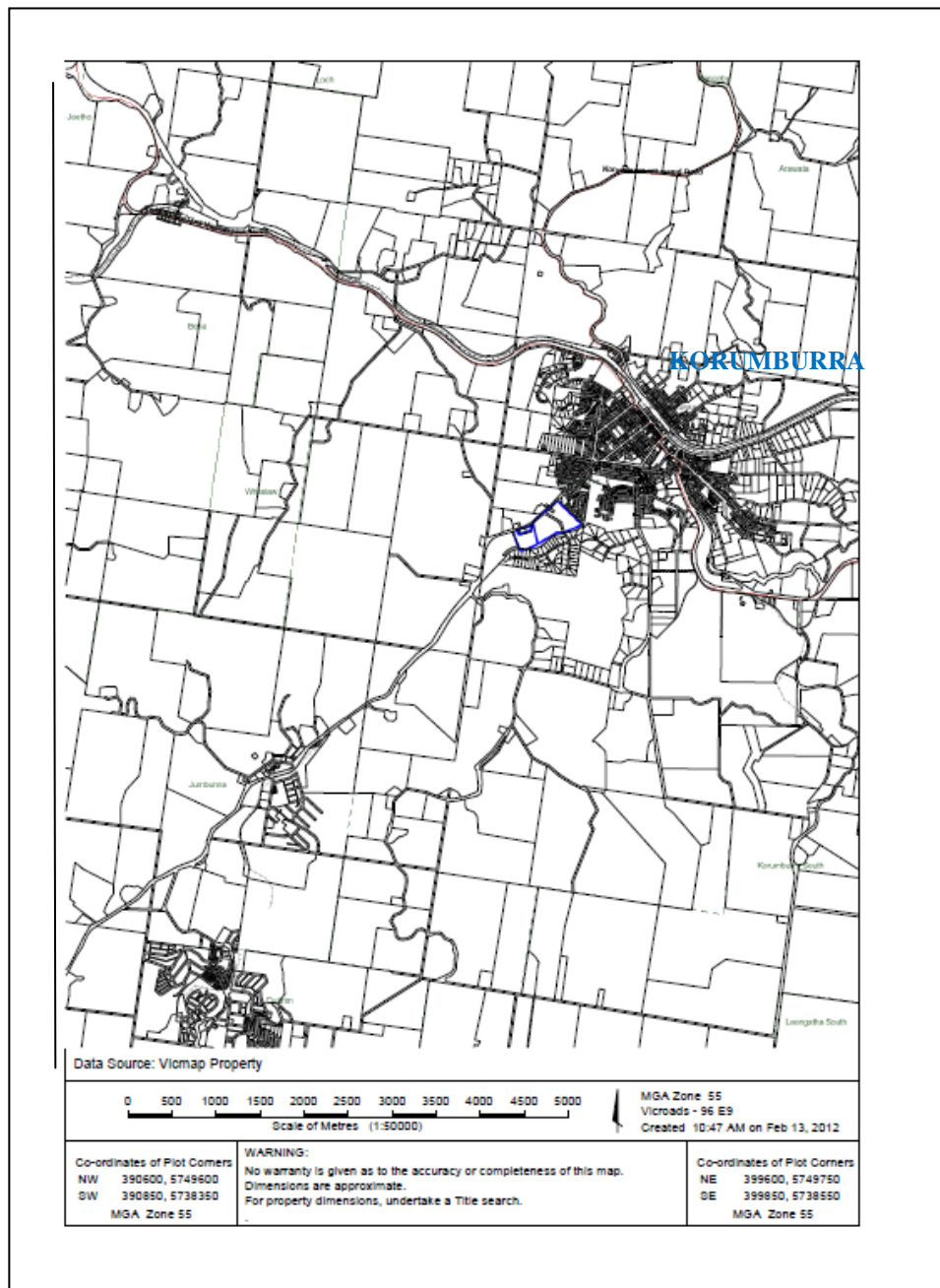


Figure 1 Location of subject land

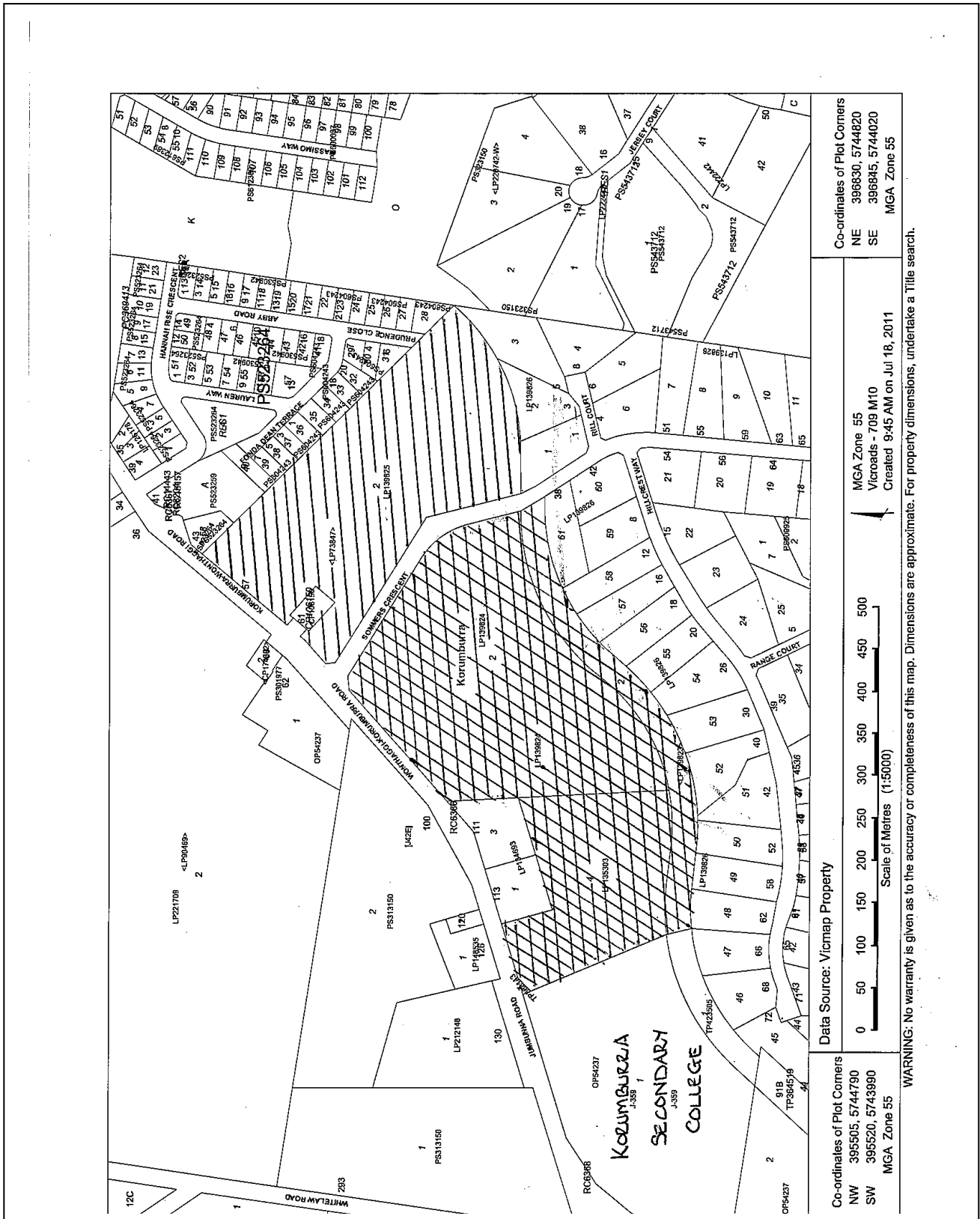


Figure 2 Location of sites 1 & 2 at Jumbunna Road, Korumburra

Data Source: Vicmap Property	
Co-ordinates of Plot Corners NW 395505, 5744790 SW 395520, 5743990 MGA Zone 55	Co-ordinates of Plot Corners NE 396630, 5744820 SE 396645, 5744020 MGA Zone 55
Scale of Metres (1:5000)	
MGA Zone 55 Vicroads - 709 M10 Created 9:45 AM on Jul 18, 2011	

WARNING: No warranty is given as to the accuracy or completeness of this map. Dimensions are approximate. For property dimensions, undertake a Title search.

1. 4 Giant Gippsland Earthworm *Megascolides australis*

The Giant Gippsland Earthworm is a giant species of earthworm, with lengths of over 1.5 m and weights of up to 400 g recorded (Van Praagh 1992, 1994). The extremities of its distribution include Warragul and Drouin in the north of its range and Almurta and Korumburra in the south. Mt Worth represents the most easterly point of distribution. The Giant Gippsland Earthworm is found almost entirely on privately owned land predominantly used for dairy production. The species is generally found in the deep blue-grey clayey soils formed mainly from cretaceous sediments in the rolling to steep hills of the Western Strzelecki Ranges and to the alluvial areas derived from this soil to the north and south west (Smith and Peterson 1982).

While the species occurs over an area of approximately 40,000 ha, areas of suitable habitat within its range are patchy leading to small, fragmented populations. Precise habitat factors governing distribution are little known and difficult to determine because of the completely subterranean nature of this species and the lack of non destructive sampling techniques. However, recent research indicates that its distribution results from a combination of many interrelated factors (e.g. slope, micro-topography and aspect of steep hillslopes, nature and depth of the soil) and most importantly underground hydrological processes (Van Praagh *et.al.* 2007).

Aspects of the biology and ecology of the Giant Gippsland Earthworm, render the fragmented populations particularly vulnerable to threatening processes (Van Praagh 1992, McCarthy *et al.* 1994). These include a long lifespan, low reproductive and recruitment rates, and poor dispersal ability. The species is an hermaphrodite with breeding occurring predominantly in spring and summer (September to February). Large amber-coloured egg cocoons are laid in chambers branching from the adult burrow at an average depth of 22 cm. Only one embryo is found in each egg cocoon, which is thought to take over 12 months to incubate.

Giant Gippsland Earthworms live in complex, permanent burrows that extend to around 1.5 m in depth. Worms remain underground, feeding on the root material and organic matter ingested in the soil. Given the poor dispersal abilities of the species and limited geographic range and connectivity of suitable habitat, it is likely that present-day populations would have been isolated for significantly long periods of evolutionary time, evolving as distinct genetic entities. This has been supported by recent genetic investigations (Woods 2006).

Whilst not all threatening processes operating on the Giant Gippsland Earthworm are known or understood, some key threats can be identified. These include physical disturbances to the soil, and in particular, altering the local hydrological regimes of worm sites.

2 METHODOLOGY

2.1 Field Survey

A survey to establish the presence of the Giant Gippsland Earthworm involves inspecting the area of interest for the presence of suitable habitat (stream banks, soaks, gullies and south facing hillslopes) and targeting these areas for sampling. As there are no above ground signs to indicate whether this species is present, sampling involves digging quadrats of approximately 50 cm³ to examine the soil for evidence of GGEs. Evidence includes burrows and cast (waste) material. The presence of wet burrows indicates an active population is present. If the ground is wet, presence of the worms can sometimes be established by banging the ground with a spade and listening for “gurgles”, the sound that is made when the worms retreat down their burrows.

The banks of drainage channels, where present, were targeted for sampling, along with areas adjacent to sites showing signs of water-logging. Both sites were also traversed on foot to listen for gurgles.

A field assessments of the study area was undertaken on February 6th 2012

2.3 Assessment Qualifications and Limitations

Given the subterranean and patchy distribution of Giant Gippsland Earthworms and the size of the survey area, it is still possible that populations may remain undetected even when extensive surveys have been undertaken. While a targeted survey aims to increase the probability of detecting populations, there is still an inherent risk that population may remain undetected when sampling for such a cryptic species. These risks are addressed by the development of a contingency plan for the accidental exposure of the Giant Gippsland Earthworms (see Section 6).

3 RESULTS

No evidence of Giant Gippsland Earthworms was located within Site 1 or 2 and very little potential habitat was identified. Giant Gippsland Earthworms are usually associated with sites comprising clay soils that retain moisture all year but support adequate drainage. While both sites contain soils often occupied by GGE, they did not support the appropriate hydrological conditions required to provide suitable earthworm habitat.

Site 1

Very little potential suitable habitat was identified within Site 1. The site supported a minor drainage channel with a wetter area occurring in the north western section of the property. The wet area, although dry at the time of sampling, was prone to water-logging and pugging and was therefore not suitable GGE habitat. Subsoil and surface hydrology play a key role in Giant Gippsland Earthworm distribution (Van Praagh *et al.* 2007) and while adequate soil moisture maintained year round is important for this species, it is unable to survive in poorly drained soils.

Conversely, the slopes within the subject land had a predominantly northerly aspect and did not appear to support any underground seepages and were therefore too dry to provide suitable earthworm habitat. When GGE are located on hillslopes, they are generally associated with south facing slopes where underground seepages are present.



Plate 1 Steep, north western slope of Site 1

While Site 2 supported several drainage channels representing potential habitat, the banks were predominantly shallow and prone to flooding, particularly in the lower sections of the site. This reduced the suitability of the site for Giant Gippsland Earthworms due to periodic flooding and water logging of soils. The north, north-westerly slopes present were too dry to provide suitable habitat.



Plate 2 North-eastern view across Site 2



Plate 3 Shallow banks of drainage channels at Site 2

4 POTENTIAL IMPACTS

4.1 Key Threats

Most threatening processes involve disturbances to the GGEs soil habitat (physical and chemical) and alteration to local drainage patterns and water table levels. Any type of earthworks that disturb the soil can impact GGEs both directly and indirectly. Digging in GGE habitat destroys earthworm burrows and may kill individual earthworms and egg cocoons. This species is very fragile and individuals do not recover well, even from minor injury. Indirect impacts include compaction, contamination and actions that alter soil hydrological conditions.

4.2 Potential Impacts

Impacts to Giant Gippsland Earthworm populations from residential developments may occur directly during the construction phase of the development as well as indirectly from changes resulting in loss of suitable habitat post construction. Impacts include loss of habitat through physical destruction of sites and alteration to the local water table and natural drainage patterns at the site as well as upslope or adjacent hydrological changes post construction. Individuals and egg cocoons may also be destroyed through the physical construction process from which populations have little ability to recover

As no Giant Gippsland Earthworms were found within the subject land, no adverse impacts from this proposed residential development on populations are anticipated.

5 ENVIRONMENTAL POLICY AND LEGISLATION

5.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a Commonwealth process for assessment of proposed actions that are likely to have a significant impact on matters of national environmental significance, or on Commonwealth land. The EPBC Act 1999 applies to actions (e.g. developments or projects) that may have a significant impact on matters of national environmental significance. The eight matters of national environmental significance to which the EPBC Act applies are:

- Listed threatened species and ecological communities
- Listed migratory species
- World heritage sites
- National heritage places
- Wetlands of international importance Commonwealth marine areas
- The Commonwealth Marine Environment
- Nuclear actions

An action requires approval from the Commonwealth Environment Minister if it will, or if it is likely to, have a significant impact on a matter protected by the EPBC Act including an endangered or critically endangered species or an 'important population' or critical habitat of a listed or vulnerable species.

Implications

As no evidence of Giant Gippsland Earthworms was recorded within the subject land, no referral to the Commonwealth Minister for DEWHA is required. However, if any undetected populations are found during the construction of the proposed development, a Contingency Plan should be implemented (Section 6 & Attachment 1). This requires the establishment of an immediate 30 m buffer zone around any live populations are found and the local translocation of uninjured worms to a suitable nearby site.

6 CONTINGENCY PLAN

A Contingency Plan should be implemented in the event that previously undetected populations of Giant Gippsland Earthworms are accidentally exposed (see Attachment 1). An immediate 30 m buffer zone should be established if live populations are found. This contingency plan requires the local translocation of uninjured worms to a suitable nearby site. Suitable release areas must be secure sites with long-term protection. There should be a minimum of 30 m between the release site and development. The contingency plan should be read by the contractors undertaking on-site works before any work commences.

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