



GIANT GIPPSLAND EARTHWORM

- recognising habitat on your property

Fact Sheet No. 1, January 2014

What is the Giant Gippsland Earthworm?

The Giant Gippsland Earthworm (GGE) or *Megascolides australis*, is one of a thousand or so earthworms native to Australia. However, it is more famous than most because of its reputation as one of the largest known earthworms in the world. Mature adults have an average length of 80cm, a diameter of up to 2cm and weight of 200gm. However, lengths of over 1.5m and weights up to 400gm have been recorded. They have a purple-coloured head region and pinkish-grey body (Fig. 1).

GGE live entirely in underground colonies, each worm occupying its own permanent burrow system, generally built to depths of between 1-1.5m. They feed on root material and other soil organic matter. They are only seen above ground when washed out of their burrows by heavy rain or exposed by landslips.

GGE are hermaphroditic and breeding occurs in spring and summer. Breeding adults are recognisable by a large swelling (saddle) that occurs near their head. They lay large (up to 9cm long), amber-coloured egg cocoons, in special chambers branching from their burrows, usually within 40cm of the soil surface (Fig. 2).



Fig. 1: Adult Giant Gippsland Earthworm exposed in burrow

Where are they found?

The only place GGE are found in the world is approximately 40,000ha of South and West Gippsland, Victoria where they have a naturally restricted distribution. This area lies roughly between Buln Buln to the north, Jumbunna to the south, Almurta to the west, and Mt Eccles to the east (Fig. 3). Within this range, worms are limited to small, widely dispersed pockets of suitable habitat.

Habitat Requirements

GGE are unusual because they can survive in locations where native vegetation has been completely removed. Most colonies live on farmland under improved pasture. A very small number are found in open or disturbed patches within remnant native forest. However, all of these forest patches have been altered by European settlement.

This makes it difficult to understand the environment in which GGE lived before European settlement of the area in the late 1800's.



Fig. 2: Egg cocoon of Giant Gippsland Earthworm

Colonies are found mainly in two habitats: on the banks and terraces of streams and drainage channels, above the flood-level and on steep, south-facing hillsides, often with terracettes (Fig. 4 & 5). The sites away from waterways are often associated with underground springs or areas of higher soil moisture. Sites with GGE colonies generally have well-draining blue-grey clay soils or red-brown clay loam soils that, critically, remain moist year-round (Fig 6). GGE cannot survive in water-logged soils or areas subject to seasonal flooding.

Although yabbies (burrowing crayfish) are more widely distributed, they are often found together with GGE because they both prefer adequate soil moisture and heavy clay soils. Yabbies excavate large mounds of soil (known as chimneys) surrounding the entrance to their burrows. These chimneys are often mistaken for GGE casts (Fig 6).

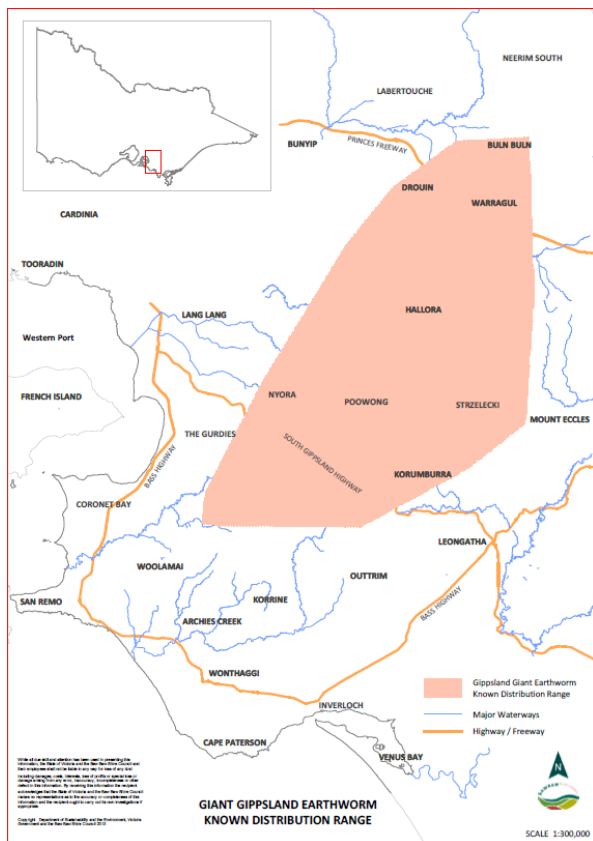


Fig. 3: Known range of Giant Gippsland Earthworm habitat



Fig. 4: Typical stream bank habitat of Giant Gippsland Earthworm



Fig. 5: Typical steep slope habitat of Giant Gippsland Earthworm



The presence of introduced herb Creeping Buttercup *Ranunculus repens* and yabbie mounds can indicate suitable conditions for colonies.



Fig. 6: Clay soil habitat with buttercups and Yabby Mound

Why is the Giant Gippsland Earthworm under threat?

The GGE is of conservation concern because of its very limited geographic range, highly specific habitat requirements and life-history characteristics.

GGE are long-lived for earthworms but they reproduce slowly, producing only one egg cocoon with one young per year. Worms are fragile and rarely recover from injury. The amount of area with the critical soil moisture conditions year-round is a fraction of the overall area across which GGE occurs. These areas are often isolated from each other by natural barriers that prevent worms moving between colonies. Therefore, areas where worms have disappeared are unlikely to be re-occupied by natural dispersal from neighbouring colonies. These features mean that the GGE can only slowly re-build colonies affected by harmful events.

What are the threats to the Giant Gippsland Earthworm?

There are a range of common activities that damage GGE colonies. These activities are a regular part of agriculture, urban and industrial development and construction of infrastructure (such as roads).

They include ploughing, deep ripping, pugging by stock, alteration to drainage systems, minor and major excavation works and hard-surfacing. They cause damage through:

- physical disturbance of soil resulting in direct injury to individual earthworms or whole colonies, collapse of burrows, compaction of soils causing reduced air and water infiltration and poor drainage;
- changes to flood regimes, drainage patterns and soil water movement, resulting in permanent changes to year-round soil moisture levels;
- chemical infiltration into soil (eg. pesticides, effluent) causing death through poisoning; and
- unusual flooding events or long-term drying of soils created by either natural cycles or human-induced climate change.

Soil preparation for re-vegetation and plantations can also damage GGE colonies. Evidence is emerging that the effects of the lowering of water-tables and drying up of springs and soaks in the early growth phase of broad-scale tree planting can dry soils so they are no longer suitable for GGE colonies (See Fact Sheet 2 - Protection Giant Gippsland Earthworm Habitat - guidelines for re-vegetation, agroforestry and plantation projects).

Detecting Giant Gippsland Earthworms

Detecting GGE colonies can be difficult because there are no obvious above-ground signs to determine their exact location.

Searching for areas along creek-banks where buttercup and yabby mounds are present can help identify wetter sites that may support GGE habitat. Similarly, south facing slopes where wetter areas are obvious (e.g. presence of terracettes or landslips) may also help identify potential habitat.

One method that can be easily used is to walk over areas of possible habitat and listen for the gurgling sound that worms make when moving through their moist burrows. This is best done several times in winter and spring when worms are in the parts of their burrow systems that are closest to the surface of the ground.

Formal studies of the GGE rely on digging in systematic patterns to expose direct evidence of colonies.

This method is not recommended to landowners as it damages burrow systems and also has a high of risk of injuring worms and egg cocoons. Efforts to excavate colonies should only be done by suitably-qualified individuals with the necessary permits.

Checklist for identifying habitat of Giant Gippsland Earthworm

Below is an easy-to-use checklist to assist landowners to determine whether their properties may contain areas suitable for GGEs.

1. Is your property located within the known range, or close to the boundaries of the known range of GGE?
(If you answer NO your property is unlikely to have GGE habitat).
2. Does your property have soils composed of either blue-grey clay or brown or red clay loams?
(If you answer NO your property is unlikely to have GGE habitat).
3. Does your property contain high-banked streams or drainage channels?
4. Does your property have south-facing slopes that may have terracettes?
5. Have you heard underground “gurgling” sounds on your property?

If you have answered YES to Questions 1 & 2 and YES to either Questions 3, 4 or 5 your property may have GGE habitat.

Further Information

If you would like more information on GGE you can go to the following websites:

<http://www.giantearthworm.org.au/sitefiles/fact-sheet2.pdf>

http://www.dse.vic.gov.au/_data/assets/pdf_file/0014/103217/077_Gippsland_Earthworm_1997a.pdf

Last updated April 2014
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