



REPORT

Green Foundation Ireland

invites you to an evening online TALK
with **Mark Hodson**, Professor at the
Department of Environment and Geography
in the University of York

Do Healthy Earthworms = Healthy Soils?



Photo by: MARTIN NOLAN, Director of Green Foundation Ireland

Venue: by Zoom (details given after registration)

Thursday 10 November 2022 – 19:30 to 20:30

Admission to this event is **FREE** but you **MUST** register beforehand.
You can do so through **our Eventbrite page**.

Do Healthy Earthworms = Healthy Soils?

THEME

Earthworms are widely regarded as being beneficial to soils and are often used as indicators of soil health. However, as Darwin first observed, sometimes you can dig up soil from two different parts of the same field and, for no apparent reason, find completely different numbers of earthworms.

In this talk Mark Hodson discussed the various benefits that earthworms bring to soils but also some of the reasons why we need to be cautious about how we interpret the presence of earthworms.

ABOUT OUR SPEAKER

Mark Hodson



Mark Hodson, who is Professor at the Department of Environment and Geography in the University of York, has been fascinated by bugs since an early age when he spent lots of time collecting ladybirds and woodlice.

He got diverted by rocks and studied geology at university but for the last thirty years or so has conducted research on a variety of applied soil science topics such as combating the effects of acid rain and decontaminating the soils at former metal mines. Much of Mark's research involves earthworm ecology and understanding how earthworm activity impacts on soil processes.

ABOUT OUR FACILITATOR

Claire Downey

Claire, who is a Director of Green Foundation Ireland, is Policy and Research Director at the Rediscovery Centre, in Ballymun, Dublin.

ABOUT OUR TALK

Claire Downey welcomed everyone to our event and introduced **Mark Hodson**, who began his talk by outlining the various benefits that earthworms bring to soils but giving reasons why we needed to be cautious about how we interpret the presence of earthworms. He tackled his subject in a light and accessible way that made it easy listening for the non-scientist, as well as covering the needs of the number of soil research scientists who joined us for the talk.

Mark opened the session by reminding us that Darwin in 1881 eulogised earthworms saying *"it may be doubted if there are any other animals which have played such an import part in our world"*. Mark agreed with Darwin's views saying that, for example, earthworms decompose organic matter, allow soils to drain and oxygenate, and prevent soil erosion.

Earthworms are widely regarded as being beneficial to soils and are often used as indicators of soil health. This then leads us to consider what is a healthy soil? Do healthy soils always contain earthworms and is a soil that contains earthworms healthy?

We were then given some examples of where earthworms were actually found in toxic soils, where they can modify their DNA to tolerate toxic metals and therefore thrive in these unhealthy soils contaminated by arsenic as well as by metals such as lead and zinc. These earthworms have evolved to tolerate certain toxins; however there is no convincing evidence that they are useful in detoxifying contaminated soils.

Mark went on to describe a major research project covering all parts of Great Britain, from Aberdeen to the south of England and including Wales, which aimed to discover what is controlling earthworm density. They did, in fact, find that density varied considerably even in the same field but found no simple relationship between abundance and chemical or physical properties.

"As Darwin first observed, sometimes you can dig up soil from two different parts of the same field and, for no apparent reason, find completely different numbers of earthworms."

They substantiated Darwin's observation and looked for factors that controlled density such as wetness, coldness, pH, soil moisture, and nitrate preference.

They confirmed that climate related factors, soil density and nitrates all affect earthworm density, as does wetness, coldness, pH and soil moisture. Earthworms are essentially aquatic, so moisture levels in soils are essential for any density. They can endure slurry provided it is not too dry – the immediate impact is to reduce density but as slurry breaks down density increases again.

They also confirmed that it was not always the least managed fields that were the most dense. Teasing out the variables leading to abundance is complex. They can conclude that abundance is greatest in pasture – forest soils are less abundant as are hedgerow soils. So pasture sward has good density but there is no difference in density from different vegetation cover. They arrived at no conclusive evidence for density. Worms thrive on organic matter such as cowpats, but there is not a clear and obvious relationship to abundance.

95 people registered or expressed an interest in our event, out of which almost 50 participated on the evening, and a lively and interesting Q&A session followed Mark's fascinating talk, with some really engaging questions being asked. They were mostly highly scientific, with soil research to the fore —people obviously relished the opportunity to question Mark.

One of the more intriguing questions for generalists was "are earthworms social animals and could this explain density"? The conclusion was there is no evidence for sociability and density was more likely due to other factors such as moisture and soil density.

For further study, an important resource recommended by Mark is Emma Sherlock's book [Key to the Earthworms of the UK and Ireland](#) (Field Studies Council, 2018).

He also mentioned that a good source of information about earthworms can be found on the website of the [Earthworm Society of Britain](#), and that the earthworm citizens science project [Earthworm Watch](#) (although data collection for this project is now closed) may be of interest.

Mark's talk was much appreciated by the audience from Ireland, the UK, other regions of Europe, as well as from the USA and Tasmania in Australia. He was sincerely thanked by Claire for providing us with such an wonderful insight into the world of earthworms.

You can [access our video of the talk here](#).

Green Foundation Ireland

14 November 2022