National Earthworm Recording Scheme Report 2015

Introduction

The Earthworm Society of Britain (ESB) was founded in 2009 to promote earthworms and conduct research. Distribution data for earthworms across the UK and Ireland remains relatively poor compared to other taxa, despite acceptance from the scientific community and general public that earthworms are important organisms providing vital ecosystem services such as soil aeration/drainage, nutrient recycling and decomposition of dead plant material (and even our own garden waste in compost heaps).

In 2009 the ESB began setting up the National Earthworm Recording Scheme (NERS). Between 2009 and 2013 the ESB's main focus was on training new earthworm recorders, achieving grants to build vital equipment and promoting the society to the general public via community events, family orientated workshops and bioblitz's. In 2014 the recording scheme was launched in earnest and the focus of the society shifted. This report summarises the records received for the period of January 2014 to December 2015, with a focus on 2015.

Background to the National Earthworm Recording Scheme (NERS)

In 2012 a paper was published in *Biodiversity Conservation* highlighting the need for recording of earthworms by demonstrating the large gaps in distribution data of British earthworm species. This incorporated the creation of a database of earthworm records from a number of sources (Natural History Museum collections, Soil Biodiversity Group projects, literature searches, Scottish Crop Research Institute and Irish CreBio national soil biodiversity survey). A total of 3,941 records for 28 species were collated. These records require further processing before being incorporated into the NERS and the ESB are currently in the process of achieving this.

In spring 2014 the ESB launched the NERS alongside the release of a range of recording documents in order to standardise earthworm sampling methods and support earthworm recorders (collectively known as the NERS Earthworm Recorder Pack). The website was updated to include all of the above guidance and make it freely available to the general public. Over the course of 2014 the ESB also hosted its first 3 earthworm identification weekends (then under the title of field meetings in Bracknell Forest, London and Kent) with the aim of creating more records, training new recorders and providing support to existing recorders. The ESB also became the verifier for all earthworm records on iRecord and cleared the backlog of earthworm records on iRecord waiting to be verified.

NERS 2015 Updates

At the beginning of 2015 the iRecord Earthworm Survey form was launched. iRecord is an online recording platform that can be used by biological recorders to submit records of different taxonomic groups through one portal. It is a popular submission pathway for biological recorders that record multiple groups as it reduces the amount of administration required of the recorder, and has proved a great success with ESB recorders (and is now the most popular method of submitting earthworm records to the ESB – see figure 1).

Three further earthworm ID weekends were hosted by the ESB:

- Preston Montford with the Field Studies Council TomBio Project
- Yorkshire with York University
- Thames Valley with the British Entomological and Natural History Society

Two one-day identification courses were run in Cumbria (in partnership with the Cumbria Biodiversity Data Centre) and in Northamptonshire (on behalf of the Wildlife Trust for Beds, Cambs and Northants). A two day Shropshire Earthworm Blitz was also run with the FSC TomBio Project during which involved sampling and supporting existing ESB recorders.

Based on feedback from ESB earthworm recorders, the habitat classification system was simplified and several additional fields on the recording form were removed. The Earthworm Recorder Pack documents were updated accordingly and several new documents were incorporated to enhance the guidance and resources:

- The Importance of Recording Earthworms: An introduction to earthworm recording including notes on alternative sampling methods, health & safety and data sharing policy.
- Planning Your Soil Pits: A guide to determining how to arrange and space soil pits when using the ESB standard protocol.
- Microhabitat Searches: A guide to some of the microhabitats that may require additional searching when following the ESB standard protocol.
- Creating & Submitting Earthworm Records: Updated to include a step-by-step guide to using the iRecord Earthworm Survey form.
- Earthworm Identification Features Sheet: This document can be used to record the characters of an earthworm when identifying a specimen using a microscope.

Finally, the ESB worked closely with Soil Biodiversity Group of the Natural History Museum (London) to collate an earthworm data set of all of the research records they have generated and collated through various projects. Most of this is now complete and 4,394 records have been submitted to the NERS (74% of the total earthworm records - see figure 1).

How many records were received?

The NERS now contains a total of 5,927 processed records. In total 3,488 records were submitted to the NERS during 2015. This included 925 records collated by the ESB to form the NERS 2015 data set and 2,563 records being added to the Soil Biodiversity Group (NHM) data set. In summary, there was a 43% increase in the number of records processed within a year compared to 2014.

Earthworm records originate from a number of sources (see figure 1). They can be generated directly by the ESB (through its recorders and field meetings) or can be collated from external sources (such as museum collections, biological records centres, research projects). Please note that the NERS data sets includes records made by recorders within the year and records made in previous years by recorders that were only submitted to the scheme in 2014/2015. The ESB generated 771 records directly during 2015 (through events, ESB recorder submission sheets and the ESB iRecord Earthworm Survey).

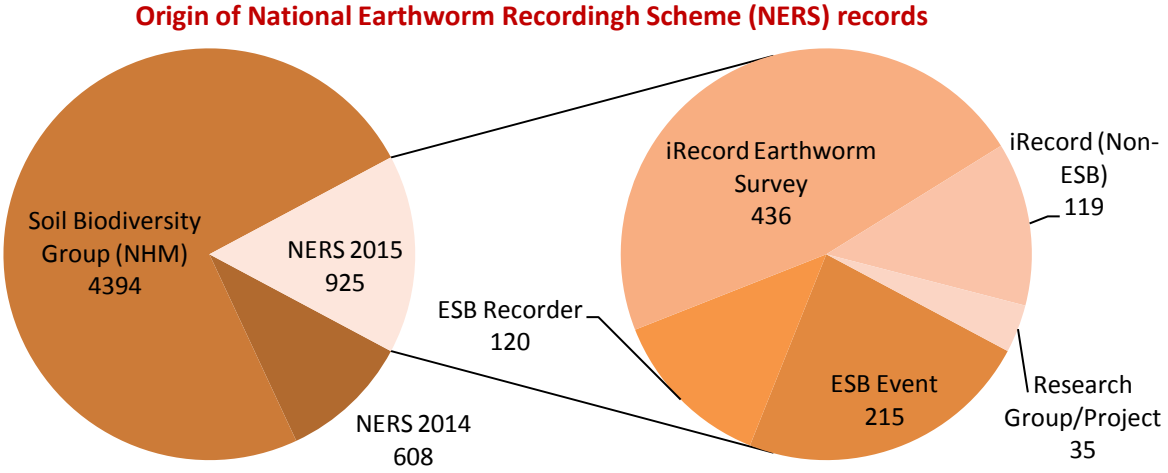

Figure 1 (above): Chart showing the origin of records submitted to the NERS including a breakdown of the NERS 2015 dataset.

What species were recorded?

For the purpose of this section we have excluded the Soil Biodiversity Group records as they included intensive sampling of specific geographic areas and habitats, resulting in a bias towards species found at those locations/habitats. Excluding this data, records for 25 different species of earthworm were submitted to the NERS during 2015 (see figures 2 and 3).

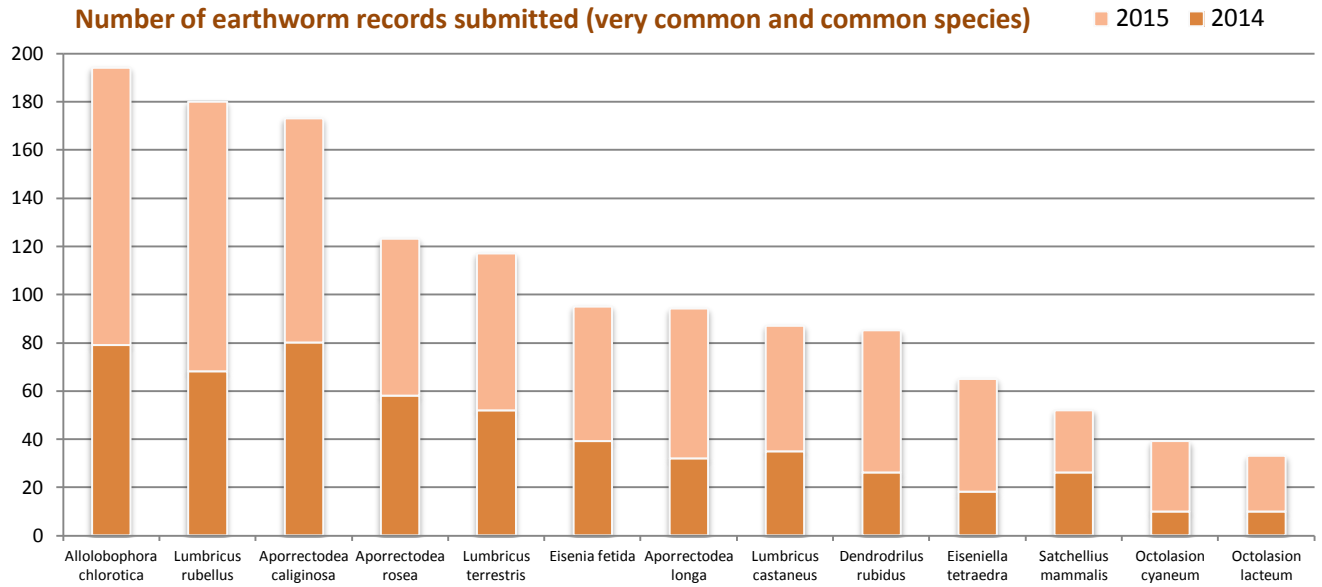

Figure 2 (above): Stacked bar graph demonstrating the number of records received for common and very common species of earthworm (as defined in Sherlock 2012).

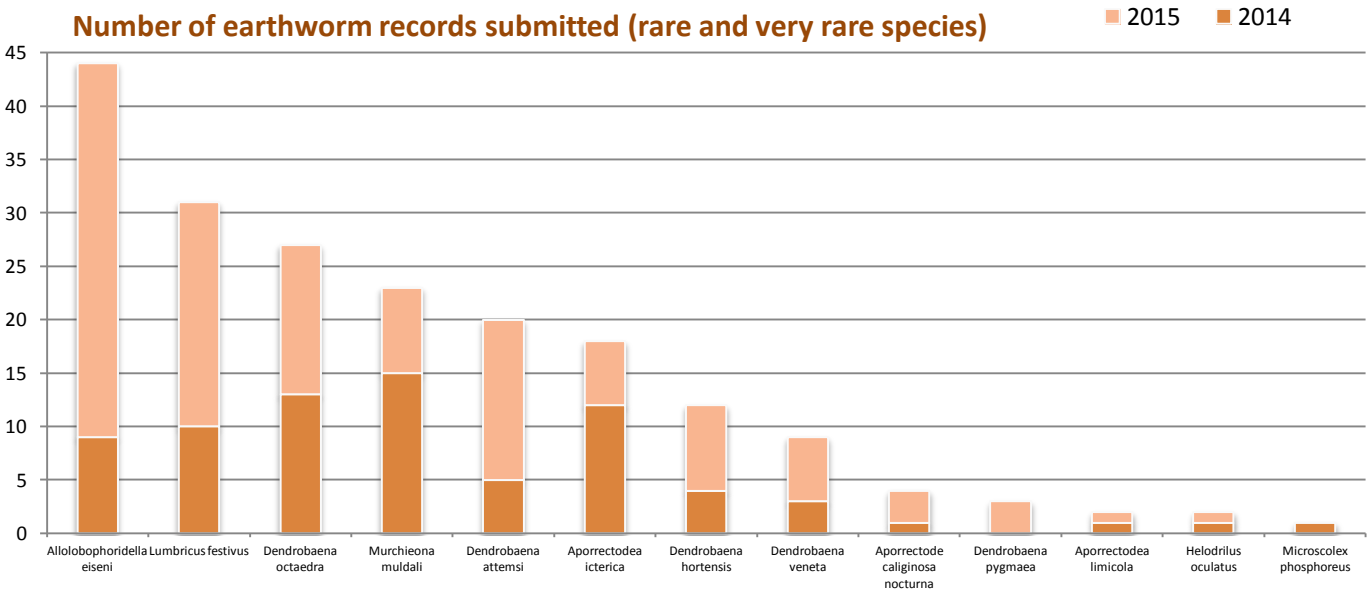

Figure 3 (above): Stacked bar graph demonstrating the number of records received for rare and very rare species of earthworm (as defined in Sherlock 2012). Aporrectodea cupulifera, Lumbricus friendi *and* Sparganophilus tamesis *are omitted as no records were received for these species.*

As expected, these records include a large number of records of the species thought to be most common (such as *Allolobophora chlorotica*, *Aporrectodea caliginosa* and *Lumbricus rubellus*).

Records of 3 species considered extremely rare (NECR145: Earthworms in England: distribution, abundance and habitats) were submitted to the scheme by ESB recorders during 2015:

Aporrectodea limicola:	Found by Keiron Brown in the same garden as found in 2014 (Cumbria).
Helodrilus oculatus:	Discovered by Emma Sherlock in a waterlogged lake bank at the WWT London Wetlands Centre (Surrey).
Dendrobaena pygmaea:	Recorded 3 times. Firstly by Emma Sherlock within deadwood at the NHM Wildife Garden. Secondly by Will Heeney and Keith Lugg under the bark of a tree stump in Kelham Country Park (Nottinghamshire). Thirdly by Keith Lugg under bark at Trap Ground LNR (Oxfordshire).

UK and Ireland earthworm distribution

Figure 4 demonstrates the locations of earthworm records (all species) submitted to the NERS during 2014 and 2015 (indicated by the orange squares). In addition, Soil Biodiversity Group records (indicated by black squares) and records collated for the Carpenter et al paper (indicated by clear squares) were mapped to indicate the complete distribution of earthworm records verified by the NERS.

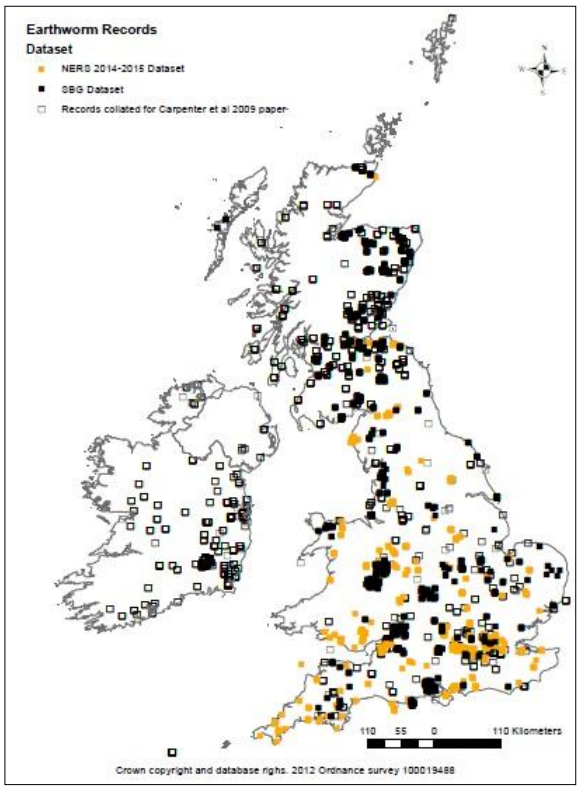

Figure 4: Map of the British Isles showing the distribution of earthworm records for all species.

It can be seen that the NERS has contributed significantly to the number and distribution of earthworm records in England and Wales and the ESB will continue to focus training efforts on establishing active earthworm recorder networks in England and Wales through 2016. However, the NERS has resulted in few new records in Scotland and no new records from Northern Ireland or Ireland. The ESB

However, it can also be seen from this distribution map that there are still large areas of the British Isles where no records of earthworms have been submitted to the NERS. Furthermore, many of the areas where records of earthworm species are present require more sampling in order to create reliable distribution maps for specific species.

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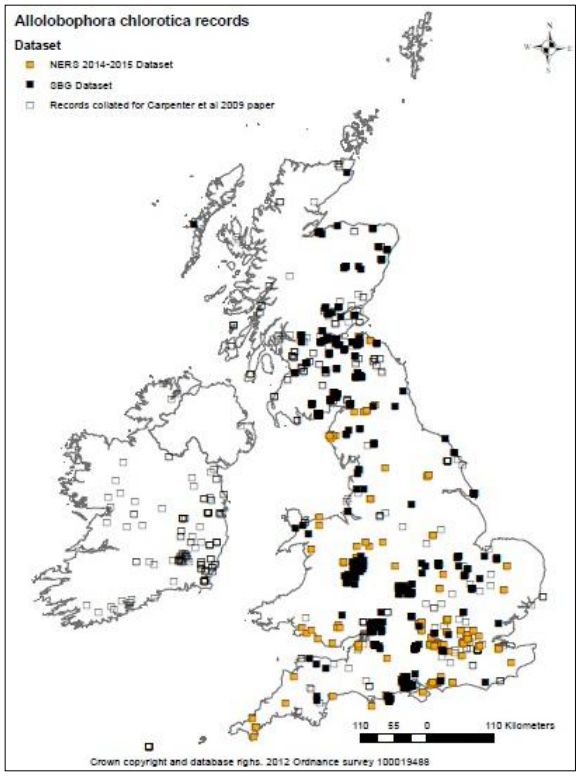

Figure 5 (above): Map of the British Isles showing the distribution of records for Allolobophora chlorotica.

Species distribution focus: *Allolobophora chlorotica*

Allolobophora chlorotica is one of the most common earthworm species in the British Isles. It is an endogeic earthworm that exists in two morphs: pale/pink and green.

Despite this, only 930 records of this species are present in the NERS database (736 of these are from the SBG dataset).

The distribution of the existing records is widespread, though there are some areas where records are particularly patchy North England, West Wales, East Scotland and Northern Ireland).

The species was found across a wide range of habitats including woodland, grasslands and wetlands, as well as human-created habitats such as farmland, gardens and parks.

Species distribution focus: *Allolobophora chlorotica*

Allolobophoridella eiseni is a species of earthworm that is considered rare in the British Isles.

62 records are currently present in the NERS database, 44 resulting directly from the recording scheme. 2015 was a particularly good year for *A. eiseni* records with 35 new records created.

Several of these new records were the first record for this species in counties across England and Wales. The increase in records for this species may be due to increased emphasis on recording microhabitats that was delivered in ESB training course during 2015.

Interestingly, this species was recorded regularly in gardens (as well as it's known habitat of deciduous woodland). It was also recorded twice in tree holes.

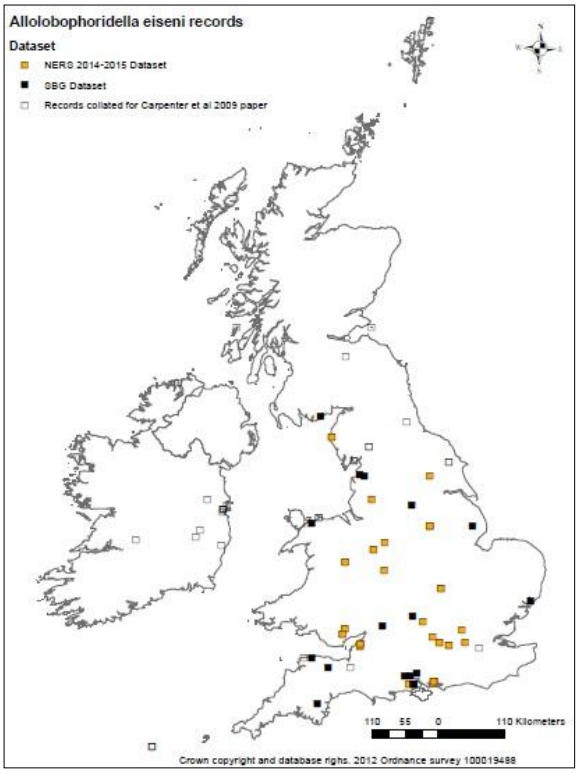

Figure 6 (above): Map of the British Isles showing the distribution of records for Allolobophoridella eiseni.

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Earthworm Recorder of the Year Award 2015

The ESB 'Earthworm Recorder of the Year' award for 2015 goes to **Keiron Derek Brown** who submitted 197 earthworm records. In second place was last year's winner, **Victoria Burton**, with 163 records and in third place was **Keith Lugg** with 121 records. Table 1 below illustrates the top 20 ESB recorders of 2015.

Table 1: Top 20 ESB recorders of 2015

2015 Rank	Name	2015 Records	2014 Records	2014 Rank
1	Keiron Derek Brown	197	126	2
2	Victoria Burton	163	181	1
3	Keith Lugg	121	31	6
4	Ben Crabb	89	0	n/a
5	Emma Sherlock	74	82	3
6	Richard Burkmar	46	5	11
7	Kerry Calloway	31	46	4
8	Charlie Bell	27	0	n/a
9	Felicity Crotty	23	15	9
=	Phillip Playford	23	0	n/a
11	Sam Devine-Turner	17	0	n/a
12	Dan Carpenter	9	15	9
=	Martin Noble	9	0	n/a
14	Becky Wilson	6	0	n/a
15	Irfaan Junaideen	5	4	13
=	Bernard Baverstock	5	0	n/a
=	Salma Mostafa	5	0	n/a
18	Rachel Julie Clark	4	23	7
=	Sasha Gorb	4	0	n/a
20	Ian Wilson	2	0	n/a

Upcoming ESB events in 2016 (please check the ESB website for booking details)

09-10/04/16	**FSC TomBio Shropshire Earthworm ID Weekend**	Shropshire
04-05/06/16	**2016 Annual Field Meeting & AGM**	Staffordshire
30-31/07/16	**Gwynedd Earthworm ID Weekend**	Gwynedd
10-11/09/16	**Devon Earthworm ID Weekend**	Devon

More events will be added to this list throughout 2016 so please check the ESB website.

References

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