National Earthworm Recording Scheme 
Report 2016

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Figure 1: Lumbricus terrestris recorded by Keiron Derek Brown, Kerry Calloway and Emma Sherlock while looking for Sparganophilus tamesis along the bank of the River Thames in Oxfordshire.

The Earthworm Society of Britain’s website can be found at www.earthwormsoc.org.uk and the society can be contacted by email at ESBenquiries@gmail.com.
1 The National Earthworm Recording Scheme in 2016

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).

Between 2009 and 2013 the ESB’s main focus was on training new earthworm recorders, achieving grants to purchase vital equipment and promoting the society to the general public via community events, family orientated workshops and bioblitz events. In 2014 the National Earthworm Recording Scheme (NERS) was launched in earnest and the focus of the society shifted to recording. During 2015, the Earthworm Society of Britain continued to improve the guidance and resources available to earthworm recorders and delivered 6 earthworm identification training events across England. This report summarises the records received for the period of January 2014 to December 2016, with a focus on 2016.

2016 was a great year for ESB earthworm recorder events:

**Earthworm Verification Workshop (London)**  This one-day workshop provided an opportunity for earthworm recorders to have their identifications verified and receive support from ESB tutors.

**Snowdonia Earthworm Identification Weekend**  This two-day training event involved 11 participants and generated 48 earthworm records.

**Annual Field Meeting: Cannock Chase**  The ESB held its first ever annual field meeting in 2016. This event included the 2016 AGM and involved sampling sites across Cannock Chase Forest and earthworm-related talks from Emma Sherlock and Rich Burkmar.

**Devon Earthworm Identification Weekend**  This two-day training event involved 9 participants and generated 50 earthworm records.

**Earl’s Hill Earthworm Blitz**  This two-day event was delivered in partnership with the Field Studies Council and generated 32 earthworm records.

**Lesnes Abbey Wood Earthworm Survey**  This one-day field trip involved 9 participants and generated 33 earthworm records.

**Earthworm Identification Key Testing Workshop (London)**  This one-day workshop involved 15 participants and provided excellent feedback regarding a draft of a new updated earthworm identification key.

**Jersey Earthworm Survey & Identification Weekend**  This event was delivered was delivered in partnership with Société Jersiaise and resulted in 46 new earthworm records and the launch of the National Earthworm Recording Scheme in Jersey.
1.1 Making earthworm data accessible

A key priority of 2016 was to establish a data flow pathway for UK earthworm records to ensure records are readily available to researchers, conservationists and decision makers that can make use of the data collated through the NERS. This involved the following during 2016:

- Becoming a member of the National Biodiversity Network (NBN) and making all NERS earthworm records available through the NBN Gateway (soon to be NBN Atlas). Three datasets have now been submitted and updated on the NBN Gateway:
  - National Earthworm Recording Scheme records (Great Britain)
  - National Earthworm Recording Scheme records (Channel Islands)
  - Soil Biodiversity Group (NHM) earthworm records (Great Britain)
  These datasets can be viewed and downloaded at https://data.nbn.org.uk/Organisations/232
- Producing the ESB Open Data Agreement for Earthworm Records to clarify to data providers (such as earthworm recorders) how earthworm records will be shared and explain the creative commons licenses that are applied to all NERS earthworm records. The Open Data Agreement for Earthworm Recorders can be viewed on the ESB website: http://earthwormsoc.org.uk/earthworm-identification/earthworm-data
- Sharing ESB datasets with every Local Environmental Records Centre (LERC) in Great Britain. Details of the UK LERCs can be found on the Association of Local Environmental Records Centres (ALER) website: www.alerc.org.uk

So what happens to the records submitted by an earthworm recorder?

Earthworm records can be submitted to us through:
- Entering records into iRecord at www.brc.ac.uk/irecord (preferred method)
- Emailing records to the society ESBenquiries@gmail.com
- Emailing records to the Recording Officer at keironderekbrown@gmail.com

Records are then validated, verified and processed by the Recording Officer before being sent to the UK LERCs and uploaded to the NBN Gateway. The NBN Gateway allows anyone to download and use these records at no cost.

Finally, these records are then made available internationally as the ESB allows the NBN to also make our earthworm datasets available through the Global Biodiversity Information Facility at www.gbif.org/publisher/0b8171d0-6b32-4ccc-bf3d-bf34b56c36d3

Figure 2: Earthworm record data flow diagram, demonstrating how earthworm species data flows to the National Earthworm Recording Scheme and on to Local Environmental Record Centres, the National Biodiversity Network Atlas and the Global Biodiversity Information Facility.
1.2 Updating our guidance for earthworm recorders

During 2016 we continued to expand the guidance we provide to earthworm recorders in our Earthworm Recorder Pack. The following sections were added:

**Field Work Assessment** A guide to the permissions needed from land owners, health and safety considerations and a template risk assessment for earthworm recorders.

**Mustard Sampling Instructions** Regarding the use of a mustard-based vermifuge for sampling earthworms.

**Identification Resources** A guide to the existing resources that are available for the identification of British earthworm species.

**UK & Ireland Earthworm Species Checklist (Natural Environments)** A checklist of all earthworm species known to occur in the British Isles in natural environments, with guidance on the levels of verification needed for each species.

**Open Data Agreement for Earthworm Records** An explanation of the NERS policy regarding the sharing of earthworm species records and the data licences that the ESB applies to all of the data that is collated as part of the recording scheme.

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Two earthworm species added to the checklist for the British Isles

2016 saw two species added to the list of species included on the checklist of British earthworm species:

**Aporrectodea nocturna** was formerly considered to be a morph of the species *Aporrectodea caliginosa*. *A. nocturna* is an anecic earthworm. Molecular research has indicated that it is a distinct species and yet to be published morphological work has confirmed this. *A. nocturna* can be distinguished relatively easily as it is larger than *A. caliginosa* and has a deep red colour and flattened tail (in life only) and is known to occur within the British Isles.

**Kenleenus armadus** is a new species of earthworm described by Robert Blakemore belonging to the family Lumbricidae and only known to occur in Ireland.
2 Summary of records received

The NERS now contains a total of 7,335 processed records. In total 1,408 records were submitted to the NERS during 2016. This included 1,336 records collated by the ESB to form the NERS 2016 dataset, 46 records from the Channel Islands and 26 new records from the Soil Biodiversity Group dataset (figure 2).

Earthworm records originate from a number of sources (see figure 2). They can be generated directly by the ESB (through its recorders and events) or can be collated from external sources (such as museum collections, biological records centres, research projects). Please note that the records are incorporated into NERS datasets according to the year they were submitted (rather than according to the date of the record).

Figure 3: Chart showing the origin of records submitted to the NERS including a breakdown of the NERS 2016 dataset.

**Expanding the National Earthworm Recording Scheme to Jersey**

The Société Jersiaise ([http://societe-jersiaise.org](http://societe-jersiaise.org)) was founded in 1873 for the study of Jersey archaeology, history, natural history, the ancient language and the conservation of the environment. In 2016 Société Jersiaise kindly funded and hosted an earthworm survey and training course on behalf of the Earthworm Society of Britain, and marked the launch of the Channel Islands section of the National Earthworm Recording Scheme.

46 earthworm species records were created across a range of sites on the island of Jersey, with records of 18 species, including *Aporrectodea llimicola* which is thought to be extremely rare on mainland Great Britain.

11 individuals were trained by ESB tutors to identify earthworms and the Earthworm Society of Britain has contacted the Jersey Biodiversity Centre to establish a clear data flow pathway for Jersey earthworm records and will continue to support Jersey earthworm recorders.
2.1 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. Data for the Channel Islands has also been excluded. Excluding the aforementioned data, records for 27 different species of earthworm were submitted to the NERS during 2014-2016 (see figure 4).

![Figure 4: The percentage of earthworm records within the National Earthworm Recording Scheme dataset by species. The species are ordered from top to bottom according to decreasing rarity.](image-url)
2.2 How does this compare to previous studies?
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*.

However, the NERS dataset also suggests that some of the species that were classed as ‘Rare’ in the ‘NECR145: Earthworms in England: distribution, abundance and habitats’ report by Natural England were found more frequently than would be expected of rare species. This included *Dendrodrilus rubidus*, *Eiseniella tetraedra* and *Allolobophoridae eiseni*. It is likely that these species are actually common and widespread, but were under-represented in the research data that was used to determine the rarity of British earthworm species for one or both of the following reasons:
- They are associated with habitats that were under-represented in the aforementioned research data;
- They are less likely to be collected using sampling methods undertaken to collect the aforementioned data (such as hand-sorted soil pits, use of a vermicide or leaf litter extraction techniques).

The NERS encourages earthworm recorders to undertake non-standardised sampling methods in addition to the NERS Standard Sampling Protocol to ensure that earthworm species less likely to be found living within the soil are also detected, and it is likely that this is the reason that these species are being detected at a higher rate than they were through standardised sampling methods for research projects.

2.3 Notable 2016 earthworm records
The following notable species records (including species that were deemed to be ‘Extremely Rare’ in the Natural England report) were submitted to the NERS during 2016:

**Aporrectodea limicola**  Recorded 3 times in England. Once in East Sussex (VC14) by Keith Lugg and in two locations in South Lancashire (VC59) by Rich Burkmar. This species was also discovered in 4 locations on the island of Jersey.

**Aporrectodea nocturna**  Recorded 4 times in England. By Jean & Mark Wagstaff in Surrey (VC17), by Ben Crabb in North Somerset (VC6) and twice in West Kent (VC16) by Keiron Derek Brown and Victoria Burton, respectively. All of these species records were from urban habitats.

**Dendrobaena pygmaea**  Recorded 2 times in England. Once by Ben Crabb in North Somerset (VC6) and once by Matthew Shepherd in South Devon (VC3). Both of these records were verified by Emma Sherlock and the specimens were found within soil, rather than within deadwood.

**Helodrilus oculatus**  Recorded 2 times in England. Firstly by Keiron Brown, Kerry Calloway and Emma Sherlock in Oxfordshire (VC23) in the bank of the River Thames and secondly by Rich Burkmar in South Lancashire (VC59) in a ditch that is subject to flooding. In both cases, waterlogged soils were noted by the recorders.

**Lumbricus friendi**  A single record for England was submitted dating back to 2004 by Dr Kevin Butt and Dr Chris Lowe. This is only the fourth species record of *L. friendi* held by the ESB and was recorded at Downe House, the former residence of Charles Darwin in West Kent (VC16).
3 Earthworm distributions in Great Britain (2016 update)

It can be seen from Figure 5 that the NERS has contributed significantly to the number and distribution of earthworm records over the past year.

**England** Significant progress was made in Lancashire, Shropshire, South East and the area surrounding Bristol. North England will be the primary focus of ESB training events in 2017 with earthworm identification weekends running in South Cumbria and the Yorkshire Dales. Data requests have been sent to the University of Central Lancashire and the Environment Agency as they hold significant earthworm species datasets.

**Scotland** Received relatively few new records. A data request has been sent to the Hutton Institute as they have conducted a great deal of earthworm research throughout Scotland and hold significant earthworm species datasets.

**Wales** 85 new records received bringing the total number of Welsh records to 228.

**Northern Ireland** No records received.

**Republic of Ireland** No records received.

**Channel Islands** Received our first Channel Island records from Jersey.

*Figure 5: Map of earthworm records for Great Britain and associated islands. Records submitted in 2016 are highlighted in orange and previous records are displayed in brown.*
3.1 Species distribution focus: *Aporrectodea limicola*

*Aporrectodea limicola* is an extremely rare earthworm species known to occur in England, Scotland and Ireland in the British Isles. It is known to occur in habitats with wet soils only and little is known regarding its distribution in the British Isles.

**Pre-2016 records**

Only actually recorded on one site during 2014 & 2015, a garden in Cumberland (VC70), although 32 historic records were received in 2014/15 from the Natural History Museum’s Soil Biodiversity Group detailing the presence of this species from sites in Scotland and England. Yet to be recorded in N. Ireland and Wales. Known to occur in the Republic of Ireland though no records are held in the NERS database.

**England** 3 records were received in 2016 from sites in England: One in East Sussex (VC14) by Keith Lugg and in two locations in South Lancashire (VC59) by Rich Burkmar.

**Scotland** No new records in 2016, though sampling effort in Scotland was extremely low during 2016.

**Wales** Yet to be recorded in Wales. Any specimens found in Wales should be retained and verified by an earthworm taxonomist.

**Channel Islands** This species was also recorded for the first time on Jersey in 2016 and was found to occur in 4 of the 10 sites that were surveyed, in 3 of these sites multiple specimens were found suggesting it may be locally abundant on the island.

*Figure 6: Map of Aporrectodea limicola species records for Great Britain and associated islands. Records submitted in 2016 are highlighted in orange and previous records are displayed in brown.*
3.2 Species distribution focus: *Dendrodrilus rubidus*

*Dendrodrilus rubidus* is known to occur throughout the British Isles. Natural England class this species as rare, though Sherlock 2012 and Sims & Gerard 1999 both describe the species as common. It is known to occur in Woodland habitats within many microhabitats (such as leaf litter, deadwood and wood ant nests), as well as habitats with high organic content (such as sewage, dung and compost).

**Pre-2016 records**

165 species records spread throughout Great Britain, suggesting a widespread distribution. However, this accounted for just 2.8% of earthworm species records, suggesting that *D. rubidus* may be a rare species.

**Rarity** 2016 saw a large increase in recording using microhabitat searches (rather than soil pit sampling). This resulted in the number of *D. rubidus* records almost doubling within one year and accounting for 11.5% of earthworm records submitted during 2016. This suggests that *D. rubidus* is in fact a common earthworm species and that the previous data may be biased towards soil-dwelling species due to the sampling methods used.

**Distribution** Records received for *D. rubidus* were widespread (with records from England, Scotland and Wales), supporting the theory that this is a widespread species.

**Channel Islands** This species was also recorded for the first time on Jersey in 2016 and was found to occur in 2 of the 10 sites that were surveyed.

*Figure 7: Map of Dendrodrilus rubidus species records for Great Britain and associated islands. Records submitted in 2016 are highlighted in orange and previous records are displayed in brown.*
3.3 Species distribution focus: *Lumbricus rubellus*

*Lumbricus rubellus* is widely accepted to be one of the most common species of earthworm occurring in the British Isles. Found in all habitats with the lowest habitat specificity of any British earthworm species. Sims & Gerard 1999 also note that *L. rubellus* is often numerous.

**Pre-2016 records**

767 species records spread throughout Great Britain, suggesting a widespread distribution and the third most commonly recorded species.

**Rarity** 2016 saw a large increase in recording using microhabitat searches (rather than soil pit sampling). This resulted in *L. rubellus* becoming the most commonly recorded British earthworm species during 2016.

**Abundance** Although *L. rubellus* is relatively common, it appears that it is less locally abundant than the other two very common British earthworm species. Where abundance was recorded, *L. rubellus* had an average abundance of just 2.6 individual earthworms per species record, whereas *Allolobophora chlorotica* averaged 7.8 and *Aporrectodea caliginosa* averaged 5.1.

**Channel Islands** This species was also recorded for the first time on Jersey in 2016 and was found to occur in 6 of the 10 sites that were surveyed, suggesting it is also very common on the island.

*Figure 8: Map of Lumbricus rubellus species records for Great Britain and associated islands. Records submitted in 2016 are highlighted in orange and previous records are displayed in brown.*
4 Earthworm Recorder of the Year Award 2016

The ESB ‘Earthworm Recorder of the Year’ award for 2016 goes to Rich Burkmar who submitted 377 earthworm records, averaging more than one earthworm record per day of the year! In second place was last year’s winner, Keiron Derek Brown, with 152 records and in third place was 2014’s champion Victoria Burton with 145 records. Table 1 below illustrates the top 10 ESB recorders of 2016, but we’d like to say a big thank you to every single recorder that submitted earthworm records during 2016 – every record makes a difference and is a vital piece of the complete jigsaw.

Table 1: Top 10 ESB earthworm recorders of 2016

<table>
<thead>
<tr>
<th>Position</th>
<th>First Name</th>
<th>Surname</th>
<th>2016 Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rich</td>
<td>Burkmar</td>
<td>377</td>
</tr>
<tr>
<td>2</td>
<td>Keiron Derek</td>
<td>Brown</td>
<td>152</td>
</tr>
<tr>
<td>3</td>
<td>Victoria</td>
<td>Burton</td>
<td>145</td>
</tr>
<tr>
<td>4</td>
<td>Keith</td>
<td>Lugg</td>
<td>69</td>
</tr>
<tr>
<td>5</td>
<td>Ben</td>
<td>Crabb</td>
<td>65</td>
</tr>
<tr>
<td>6</td>
<td>Phillip</td>
<td>Playford</td>
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<td>7</td>
<td>Emma</td>
<td>Sherlock</td>
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<tr>
<td>8</td>
<td>Kerry</td>
<td>Calloway</td>
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</tr>
<tr>
<td>9</td>
<td>Sam</td>
<td>Devine-Turner</td>
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</tr>
<tr>
<td>10</td>
<td>Charlie</td>
<td>Bell</td>
<td>20</td>
</tr>
</tbody>
</table>

5 Upcoming ESB recording events in 2017

24/01/17 Earthworm Key Testing Workshop  Shropshire
13-14/05/17 Yorkshire Dales Earthworm Identification Weekend  North Yorkshire
10-11/06/17 South Cumbria Earthworm Identification Weekend  Cumbria
Date tbc  2017 Annual Field Meeting  Location tbc
24/10/17 Earthworm Identification Workshop  Bedfordshire

More events will be added to this list throughout 2017 so please check the ESB website: http://earthwormsoc.org.uk/event-information/event-information1

6 References


Sherlock E (2012) Key to the earthworms of the UK and Ireland. Field Studies Council