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Earthworm Society of Britain

In the UK and Ireland 27 species of earthworm have been recorded living in natural environments. Earthworms are under-recorded and as a result we know very little about the true distribution of many of our species. In fact, distribution maps have only been published for a handful of species. The Earthworm Society of Britain (ESB) was set up to tackle this issue and now manages the National Earthworm Recording Scheme. The aims of this scheme are to train new earthworm recorders and produce new earthworm records.

On 22nd and 23rd March 2014 Dan Carpenter led a team of earthworm recorders to undertake earthworm sampling in Bracknell Forest (Berkshire). This report outlines some background information on earthworm ecology and the results of the sampling.

Earthworm Ecology

Earthworms in the UK are divided into four groups, called ecotypes, each of which has a different life style.

Compost earthworms

As their name would suggest, these are most likely to be found in a compost bin, but can also be found in manure heaps, sewage treatments works and other places with large amounts of organic matter. They prefer warm and moist environments with a ready supply of fresh compost material. They can very rapidly consume this material and also reproduce very quickly. Compost earthworms tend to be bright red in colour and stripy. Compost earthworm species include *Eisenia fetida* and *Eisenia veneta*

Epigeic earthworms

Epigeic earthworms live on the surface of the soil in leaf litter. These species tend not to make burrows but live in and feed on the leaf litter. Epigeic earthworms are also often bright red or reddy-brown, but they are not stripy. Epigeic earthworm species include *Dendrobaena octaedra*, *Dendrobaena attemsi*, *Dendrodrilus rubidus*, *Eiseniella tetraedra*, *Heliodrilus oculatus*, *Lumbricus rubellus*, *Lumbricus castaneus*, *Lumbricus festivus*, *Lumbricus friendi*, *Satchellius mammalis*

Endogeic earthworms

Endogeic earthworms live in and feed on the soil. They make horizontal burrows through the soil to move around and to feed and they will reuse these burrows to a certain extent. Endogeic earthworms are often pale colours, grey, pale pink, green or blue. Some can burrow very deeply in the soil. Endogeic earthworm species include *Allolobophora chlorotica*, *Apporectodea caliginosa*, *Apporectodea icterica*, *Apporectodea rosea*, *Murchieona muldali*, *Octolasion cyaneum* and *Octolasion lacteum*

Anecic earthworms

Anecic earthworms make permanent vertical burrows in soil. They feed on leaves on the soil surface that they drag into their burrows. They also cast on the surface, and these casts can quite often be seen in grasslands. They also make middens (piles of casts) around the entrance to their burrows. Anecic species are the largest species of earthworms in the UK. They are darkly coloured at the head end (red or brown) and have paler tails. Anecic earthworm species include *Lumbricus terrestris* and *Apporectodea longa*

Study Sites

Five sites (see figure 1 and table 1) were chosen across Bracknell Forest that represented a range of habitats, including grassland, woodland and reedbeds. In addition to this, sites were selected within separate square kilometres (using the ordnance survey grid) in order to ensure sampling was distributed across the geographic range of Bracknell Forest.



Figure 1 (above): Ordnance Survey Map of Bracknell Forest showing the location of sampling sites. The numbered red squares show the location of the soil pit sampling sites.

Table 1: Details of sampling locations in Bracknell Forest

Site No.	Site Name	Grid Reference	Habitat	Comments
1	Pope's Meadow	SU842699	Grassland	Mature Oak Parkland
2	Tinker's Copse	SU856704	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
3	Garth Meadows	SU860704	Grassland	Scrub and young trees present; Grazed between July and October
4	Larks Hill	SU870708	Grassland	Grazed between July and October; young trees present
5	Englemere Pond	SU907684	Mixed deciduous/coniferous	Mainly pine; some birch; alder; sweet chestnut; large acidic pond and reedbed; waterlogged in places

Sampling Methods

Five soil pits were excavated at each site measuring approximately 25cm X 25cm X 10cm. The contents of each pit were hand sorted and any earthworms were removed and preserved in 80% alcohol on site. In addition to the sampling, a six figure grid reference of the location and habitat details were recorded.

To improve the probability of finding epigeic species of earthworm, dead wood was examined at three of the sites where soil sampling took place.

Identification

On 23rd March 2014 the ESB ran an identification course in Bracknell (Berkshire) to provide training for inexperienced earthworm recorders and identify the specimens collected in Richmond Park the previous day. Earthworms were identified using binocular microscopes and the Field Studies Council Key to the earthworms of Britain and Ireland (Sherlock, 2012). A second day of identification was done by Kerion Brown, Rachel Clark and Salma Mostafa at the Natural History History during a earthworm public engagement event.

All identifications were verified by experienced ESB recorders (Keiron Brown, Dan Carpenter and Emma Sherlock).

Results

In total 11 species of earthworm were recorded through the soil pit sampling of 4 sites (see table 2).

Allolobophora chlorotica
Apporectodea caliginosa
Apporectodea icterica
Apporectodea longa
Apporectodea rosea
Dendrobaena octaedra
Lumbricus castaneus
Lumbricus rubellus
Lumbricus terrestris
Murchieona muldali
Satchellius mammalis

In total 5 species of earthworm were recorded through the investigation of deadwood at 3 sites (see table 3).

Dendrobaena attemsi
Dendrobaena octaedra
Dendrodrilus rubidus
Lumbricus castaneus
Lumbricus rubellus

In total 1 species of earthworm were recorded through the investigation of leaf litter at 1 site (see table 4).

Lumbricus castaneus

In total 1 species of earthworm were recorded through the investigation of dung at 1 site (see table 5).

Lumbricus castaneus

Recording in Bracknell

All of the records have been submitted to the National Earthworm Recording Scheme and will be shared responsibly with external organisations, such as Local Biological Records Centres and the National Biodiversity Network. Earthworm records will be made freely available, alongside other wildlife records, to the general public.

The ESB website contains guidance on sampling, identifying and recording earthworms and includes PDF copies of our Earthworm Recording Instructions, Soil Pit Sampling Instructions, Earthworm Recording Form and Earthworm Recording Sheet. The ESB is always grateful to receive any new, or old, records. Please note that even single records of a species with no habitat information are still useful as geographic distribution data is still very limited with regards to earthworms. Please feel free to contact us if you are interested in organising any earthworm identification training for your staff.

Further Information

Carpenter D, Sherlock E, Jones DT, Chiminoides J, Writer T, Neilson R, Boag B, Keith AM, Eggleton P (2012) Mapping of earthworm distributions for the British Isles and Eire highlights the under-recording of an ecologically important group. *Biodiversity Conservation* 21:475-485

Natural England (2014) Earthworms in England: distribution, abundance and habitats. PDF available at: <http://publications.naturalengland.org.uk/publication/5174957155811328>

Sims RW, Gerrard BM (1999) Earthworms. *Synopses of the British Fauna (New Series)*. 39. London: Linnean Society of London

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

Please contact the author of this report, Rachel Julie Clark or Keiron Derek Brown, at info@earthwormsoc.org.uk if you have any queries regarding this report.

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Table 2: Records collected through soil pit sampling of all sites across Bracknell by Dan Carpenter on 22nd March 2014.

Species	Grid Reference	Number	Habitat	Comments
<i>Apporectodea caliginosa</i>	SU842699	1	Grassland	Mature Oak Parkland
<i>Apporectodea icterica</i>	SU842699	2	Grassland	Mature Oak Parkland
<i>Apporectodea rosea</i>	SU842699	3	Grassland	Mature Oak Parkland
<i>Lumbricus castaneus</i>	SU842699	4	Grassland	Mature Oak Parkland
<i>Lumbricus rubellus</i>	SU842699	4	Grassland	Mature Oak Parkland
<i>Lumbricus terrestris</i>	SU842699	4	Grassland	Mature Oak Parkland
<i>Dendrobaena octaedra</i>	SU856704	1	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
<i>Allolobophora chlorotica</i>	SU860704	1	Grassland	Scrub and young trees present; Grazed between July and October
<i>Apporectodea caliginosa</i>	SU860704	8	Grassland	Scrub and young trees present; Grazed between July and October
<i>Apporectodea longa</i>	SU860704	4	Grassland	Scrub and young trees present; Grazed between July and October
<i>Apporectodea rosea</i>	SU860704	1	Grassland	Scrub and young trees present; Grazed between July and October
<i>Lumbricus castaneus</i>	SU860704	2	Grassland	Scrub and young trees present; Grazed between July and October
<i>Lumbricus rubellus</i>	SU860704	1	Grassland	Scrub and young trees present; Grazed between July and October
<i>Lumbricus terrestris</i>	SU860704	2	Grassland	Scrub and young trees present; Grazed between July and October
<i>Murchieona muldali</i>	SU860704	12	Grassland	Scrub and young trees present; Grazed between July and October
<i>Satchellius mammalis</i>	SU860704	5	Grassland	Scrub and young trees present; Grazed between July and October
<i>Allolobophora chlorotica</i>	SU870708	4	Grassland	Grazed between July and October; young trees present
<i>Apporectodea caliginosa</i>	SU870708	8	Grassland	Grazed between July and October; young trees present
<i>Apporectodea rosea</i>	SU870708	5	Grassland	Grazed between July and October; young trees present
<i>Lumbricus castaneus</i>	SU870708	2	Grassland	Grazed between July and October; young trees present
<i>Lumbricus rubellus</i>	SU870708	1	Grassland	Grazed between July and October; young trees present
<i>Lumbricus terrestris</i>	SU870708	1	Grassland	Grazed between July and October; young trees present
<i>Satchellius mammalis</i>	SU870708	9	Grassland	Grazed between July and October; young trees present

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Table 3: Records collected through dead wood sampling across Bracknell by Dan Carpenter on 22nd March 2014.

Species	Grid Reference	Number	Habitat	Comments
<i>Dendrobaena octaedra</i>	SU856704	1	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
<i>Dendrodrilus rubidus</i>	SU856704	2	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
<i>Lumbricus castaneus</i>	SU856704	1	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
<i>Lumbricus rubellus</i>	SU856704	2	Deciduous Semi-Natural Woodland	Ancient copse; oak; hazel; Some 400+ year old trees
<i>Dendrobaena octaedra</i>	SU905685	1	Mixed deciduous/coniferous	Mainly pine; some birch; alder; sweet chestnut
<i>Dendrobaena attemsi</i>	SU907684	1	Mixed deciduous/coniferous	Mainly pine; some birch; alder; sweet chestnut
<i>Dendrobaena attemsi</i>	SU907684	3	Mixed deciduous/coniferous	Mainly pine; some birch; alder; sweet chestnut

Table 4: Records collected through leaf litter sampling across Bracknell by Dan Carpenter on 22nd March 2014.

Species	Grid Reference	Number	Habitat	Comments
<i>Lumbricus castaneus</i>	SU842699	1	Grassland	Mature Oak Parkland

Table 5: Records collected through dung sampling across Bracknell by Dan Carpenter on 22nd March 2014.

Species	Grid Reference	Number	Habitat	Comments
<i>Lumbricus castaneus</i>	SU860704	14	Grassland	Grazed between July and October
<i>Lumbricus castaneus</i>	SU860704	1	Grassland	Grazed between July and October

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Table 6: The volunteers that were involved in the earthworm sampling in Bracknell and the identification of specimens.

ESB recorders involved in specimen collection	ESB recorders involved in specimen identification
Keiron Brown	Keiron Brown
Kerry Calloway	Kerry Calloway
Dan Carpenter	Dan Carpenter
Rachel Clark	Rachel Clark
Ian Dunn	Ian Dunn
Vicky Gilson	Vicky Gilson
Keith Lugg	Irfaan Junaideen
Emma Sherlock	Keith Lugg
	Salma Mostafa
	Lucy Robinson
	Emma Sherlock