

Report

This reports contains evidence and information on the proof of life of a variety of wildlife found on Mandale Meadow and in Bluebell Beck . This evidence has been gathered by community activists creating citizen science backed by lab DNA testing of the watercourses on this site.

Method :

Kick sampling and microscopy, DNA testing using water filters and chemical testing using dipstrips.

Dipstrip Testing:

PH 6.8 – Normal

Carbonate Hardness 20 kh – Normal

General Hardness 3 gH - 1 gh below average

Nitrate 10 mg/l – Normal

Nitrite 0.5 mg/l – Normal

Ammonia 0.5 mg/l - Normal

Taxon	Vernacular	Notes
<i>Chorthippus brunneus</i>	Common Field Grasshopper	
<i>Columba palumbus</i>	Wood Pigeon	
<i>Diplolepis rosae</i>	Robin's Pincushion	Gall found
<i>Lasius niger</i>	Black Garden Ant	
<i>Maniola jurtina</i>	Meadow Brown	
<i>Melampsora laricis-populina</i>	Poplar Leaf Rust Fungus	Found on White Poplar
<i>Omocestus viridulus</i>	Common Green Grasshopper	
<i>Pararge aegeria</i>	Speckled Wood	
<i>Pieris rapae</i>	Small White	
<i>Pisaura mirabilis</i>	Nursery Web Spider	
<i>Talpa europaea</i>	Mole	
<i>Zygaena sp.</i>	Burnet Moth	Cocoon found

“Just in case you're not aware of it, I've attached the Tees Valley Local Wildlife Site criteria. When I have looked previously, I couldn't find enough of the needed species for the meadow that is under threat from the road. Under Section G1, the criteria require three grasses and five herbs from Appendix 2. However, when I surveyed this summer, the number of species found from Appendix 2 has gone up to 12, plus one species from Appendix 4.

Some of these species are rare within the meadow itself (they can be found on the other meadows along the beck, which are, presumably, the seed source of these plants), so designation under the Neutral Grassland criteria is a bit iffy. However, I understand from Lauren Teate that Dingy Skippers (*Erynnis tages*) have been recorded, of which Section I2 of the LWS guidelines require 10 individuals, and I recall the Mayor stating publicly recently that he was happy to designate the remains of the meadow after the road goes through as an LWS for those.”

From Barry Jobson

Spotted by community action group:

Green Shieldbug

Sloe Shieldbug

Small White

Common Darter

Hover Fly

Small Copper

Honey Bee

Ichneumon Wasp
Migrant Hawker
Speckled Wood
Toad
Tadpole
Small Freshwater Shrimp
Leech
Common skipper
Water Snail
Swift
Grey Partridge
Curlew
Lapwing
Skylark (breeding)
Sparrowhawks
Linnet
Redwings

Fieldfare
Waxwings
Kingfisher
Barn Owl
Buzzards (breeding and hunting)
Bats
Dingy Skipper (Breeding)
Fauna includes:
Perforate St Johns wort
Yellow wort
Sneeze wort
Creeping thistle
Bee Orchid (Ophrys Apifera)
Marsh Orchid (Dactylorhiza)
Cuckoo Flower



CITIZEN SCIENCE RESULTS

Order number: SO01071
Report number: NM-PRV669
Company: Environmental Smart
Contact: Hermione Crowe
Project: Community groups in Middlesbrough
Sample type: eDNA - Disk filter
Date of report: 25 October 2022
Number of samples: 2

Thank you for submitting your samples to NatureMetrics, we hope that you enjoyed using our eDNA sampling kit. Terms in **bold** are explained in the glossary at the end of the report.

Please find below a list of the 20 **taxa** successfully identified in your sample 'Mandale Beck'. eDNA metabarcoding of vertebrates was not successful for sample 'Mandale Pond', which failed to amplify despite troubleshooting. In some cases only a **genus/family/order** name can be given. This may be because several closely related **species** cannot be distinguished from their DNA, or no species-level matches are available in the **reference database**.

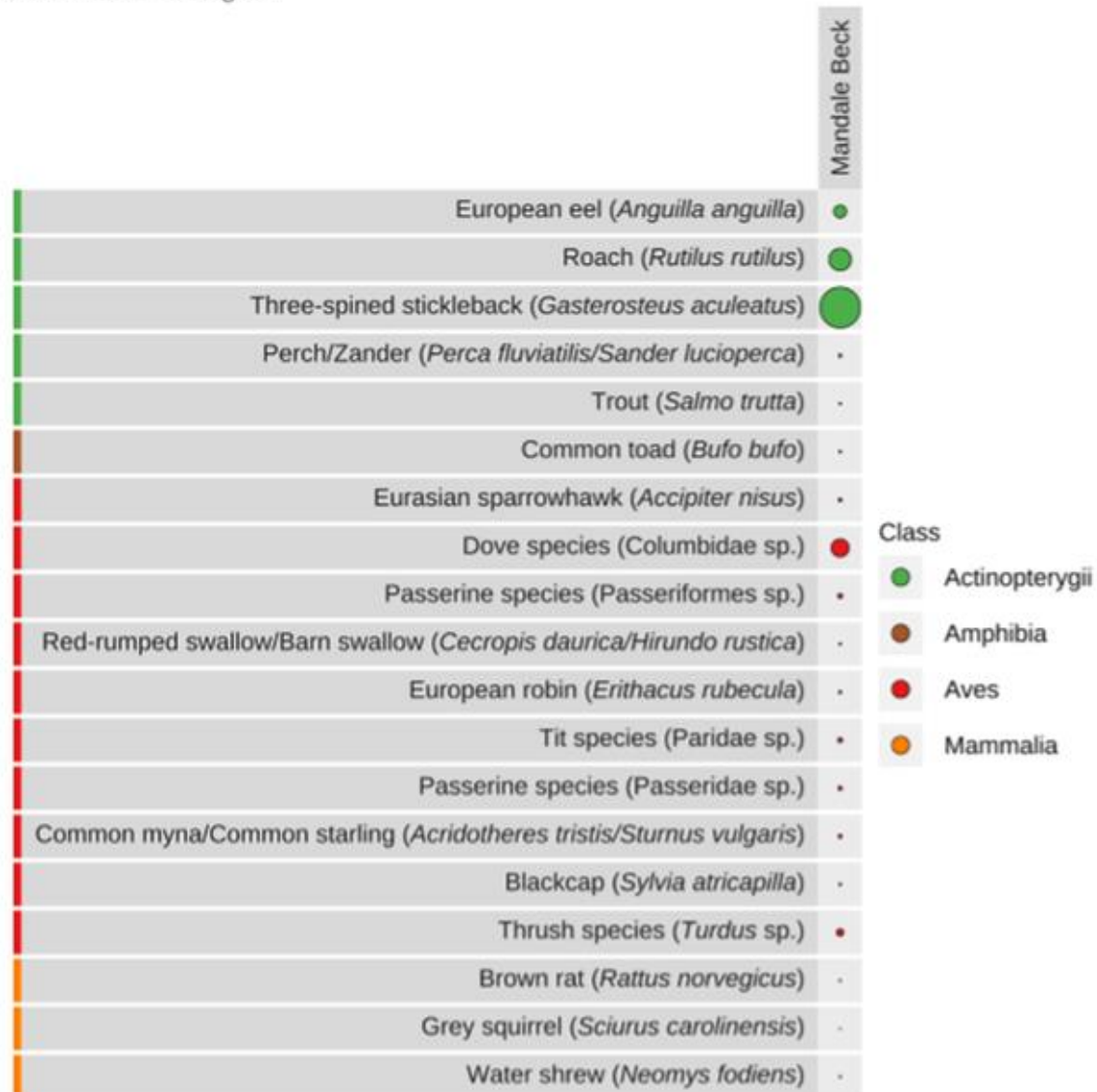
Table 1. List of taxa detected in your samples. Details about the IUCN Red List categories can be found in the glossary.

Group	Common name	Taxon	IUCN Red List
Fish	European eel	<i>Anguilla anguilla</i>	CE
Fish	Roach	<i>Rutilus rutilus</i>	LC
Fish	Three-spined stickleback	<i>Gasterosteus aculeatus</i>	LC
Fish	Perch/Zander	<i>Perca fluviatilis/Sander lucioperca</i>	LC/LC
Fish	Trout	<i>Salmo trutta</i>	LC
Amphibian	Common toad	<i>Bufo bufo</i>	LC
Bird	Eurasian sparrowhawk	<i>Accipiter nisus</i>	LC
Bird	Dove species	Columbidae	-
Bird	Dove species	Columbidae	-
Bird	Red-rumped swallow/Barn swallow	<i>Cecropis daurica/Hirundo rustica</i>	LC/LC
Bird	European robin	<i>Erithacus rubecula</i>	LC
Bird	Tit species	Paridae	-
Bird	Passerine species	Passeridae	-
Bird	Common myna/Common starling	<i>Acridotheres tristis/Sturnus vulgaris</i>	LC/LC
Bird	Blackcap	<i>Sylvia atricapilla</i>	LC
Bird	Thrush species	<i>Turdus sp.</i>	-
Bird	Passerine species	Passeriformes	-
Mammal	Brown rat	<i>Rattus norvegicus</i>	LC
Mammal	Grey squirrel	<i>Sciurus carolinensis</i>	LC
Mammal	Water shrew	<i>Neomys fodiens</i>	LC

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The following chart shows the **taxa** that were detected in your sample. The different **taxa** detected in your sample are listed with their common and Latin names. The size of the bubbles to the right of the species names correspond to the proportion of the data attributable to those **taxa**. Larger bubbles correspond to more abundant sequences. The colours correspond to the different classes as detailed in the legend.



GLOSSARY

IUCN Red List

	<p>The IUCN (International Union for the Conservation of Nature) is a global union of government and civil organisations that disseminates information to assist conservation. The IUCN Red List of Threatened Species is an inventory of the conservation status of over 100,000 species worldwide. The Red List evaluates data such as population trends, geographic range and the number of mature individuals in order to categorise species based on their extinction risk:</p>
Extinct (EX)	No individual of this species remains alive.
Extinct in the Wild (EW)	Surviving individuals are only found in captivity.
Critically Endangered (CE)	The species faces an extremely high risk of extinction in the wild. e.g. Population size estimated at fewer than 50 mature individuals.
Endangered (EN)	The species faces a very high risk of extinction in the wild. e.g. Population size estimated at fewer than 250 mature individuals.
Vulnerable (VU)	The species faces a high risk of extinction in the wild. e.g. Population size estimated at fewer than 10,000 mature individuals and declining.
Near Threatened (NT)	The species is below the threshold for any of the threatened categories (CE, E, V) but is close to this threshold or is expected to pass it in the near future.
Least Concern (LC)	The species is not currently close to qualifying for any of the other categories. This includes widespread and abundant species.
Data Deficient (DD)	There is currently insufficient data available to make an assessment of extinction risk. This is not a threat category - when more data becomes available the species may be recategorised as threatened.

reference databases

Over time, the DNA sequences of many species have been compiled into publicly accessible databases by scientists from around the world. These databases serve as a reference against which unknown sequences can be queried to obtain a species identification. The most commonly accessed database is NCBI (National Center for Biotechnology Information), which is maintained by the US National Institute of Health. Anyone can search for DNA sequences at <https://www.ncbi.nlm.nih.gov>.

taxon (s.) / taxa (pl.)

Strictly, a taxonomic group. Here we use the term to describe groups of DNA sequences that are equivalent to species. We do not use the term species because we are unable to assign complete identifications to all of the groups at this time due to gaps in the available reference databases.



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species (s./pl.)

A group of individuals capable of interbreeding. This is the most important taxonomic unit defined by scientists and the population trends of individual species are a key indicator in judging the effect of conservation programs. Related species are grouped together into progressively larger taxonomic units, from genus to kingdom. *Homo sapiens* (human) is an example of a species.

genus (s.) / **genera** (pl.)

A group of closely related species. Each genus can include one or more species. *Homo* is an example of a genus.

family (s.) / **families** (pl.)

A group of closely related genera. *Homo sapiens* is in the family Hominidae (great apes).





Conclusion:

This report shows that there are three species that need protecting. The European Eel is critically endangered, any bat habitat requires protection as do Dingy Skippers.

“Ancient mystery of European eel migration unravelled to help combat decline of critically endangered species

New research enables a better understanding of the lifecycle of critically endangered European eels and how to combat their decline.

From:

Environment Agency

Published

15 October 2022



Adult European eel being released

- Environment Agency’s world-first research will help combat dramatic decline of the critically endangered European eel
- Adult European Eels tracked to the Sargasso Sea for the first time, unravelling a mystery that has perplexed scientists for centuries
- Journey of the European Eel to its spawning area considered one of the most impressive feats of animal migration observed in nature

A team of researchers led by the Environment Agency have taken a major step forward in solving one of nature’s most enduring mysteries – where do European Eels spawn and how do they get there?

Having suffered a 95% decline in numbers returning to Europe’s rivers since the 1980s, the European Eel is now a critically endangered species.

But ground-breaking research published this week enables us to better understand the lifecycle of this globally important but little-known species and ensure effective protection measures are put in place to combat their decline.

Project lead and Environment Agency researcher Ros Wright said:

The European Eel is critically endangered so it is important that we solve the mystery surrounding their complete life-cycle to support efforts to protect the spawning area of this important species.

This is the first time we've been able to track eels to the Sargasso Sea and we are delighted we have the first direct evidence of adult European eels reaching their spawning area. Their journey will reveal information about eel migration that has never been known before.

The journey of European eels to their breeding place in the Sargasso Sea is up to 10,000km and considered one of the most impressive feats of animal migration observed in nature. It's a mystery that has perplexed scientists for centuries, with the first recorded evidence of scientists looking into this phenomenon dating back to the 4th century BC.

Working alongside the Zoological Society of London, Defra, Cefas, Natural England, the University of Azores and the Denmark University of Technology, the Environment Agency has produced the first ever direct evidence of European eels navigating the last 2,500km leg of their journey. Up until this point, no eggs or eels had been found to confirm this spawning ground.

Back in December 2018 and 2019, researchers fitted 26 large female European eels with satellite tags and released them from the Azores into the Atlantic Ocean. The Azores islands are close to the furthest known point on the eel migration route that was tracked by previous projects.

Programmed to detach and transmit their data after 6-12 months, data were received from 23 satellite tags at various stages of the journey, with six tagged eels reaching the Sargasso Sea. Data transmitted from these tags reveal the eels migrated consistently towards the Sargasso Sea and, remarkably, that this journey to their breeding grounds takes over a year.

Once eels spawn in the Sargasso Sea, their larvae return to the UK and other European waters via a different route, carried on ocean currents on the North Atlantic Drift. They then migrate into rivers as glass eels.

Unravelling the navigation mechanisms, routes taken and locating where eels spawn is critical for understanding the reasons behind their decline and putting in place targeted conservation measures to protect this globally important species.

Chair of the IUCN Anguillid Eel Specialist Group, Matthew Gollock from the Zoological Society of London said:

Populations of the European eel are at a historic low and the more we understand their life-history, the better we are able to develop conservation measures to address the critical status of the species.

Professor José Manuel N. Azevedo from the University of the Azores said:

This discovery emphasizes the role of the Azores in the life cycle of eels. It will help scientist and conservationists to push for measures to restore eel habitats across the archipelago.

The Environment Agency and partners will now conduct a deeper analysis of the satellite tag data to uncover further clues on how eels navigate to their spawning area. This is part of an ongoing project and field teams have returned to the Azores to satellite tag eels with extended life tags to reveal more data on silver eel migration and spawning sites in the Sargasso Sea.

The Environment Agency continue to carry out research on all life stages of the European eel to inform conservation measures. This complements work around England to protect eels, for example improving eel pass design to enhance upstream eel passage into our rivers.

The full research paper is available online.”

<https://www.gov.uk/government/news/ancient-mystery-of-european-eel-migration-unravelling-to-help-combat-decline-of-critically-endangered-species>

<https://www.nature.com/articles/s41598-022-19248-8> For full research paper.

Guidance

Bats: protection and licences

What you must do to avoid harming bats and when you'll need a licence.

From:

Natural England and Department for Environment, Food & Rural Affairs

Published

8 October 2014

Last updated

29 March 2015 — See all updates

Applies to England

- Guidance for Wales
- Guidance for Scotland
- Guidance for Northern Ireland

Contents

1. What you must not do
2. Activities that can harm bats
3. Bat licences
4. Bat roosts

All bat species, their breeding sites and resting places are fully protected by law - they're European protected species.

You may be able to get a licence from Natural England if you cannot avoid disturbing them or damaging their habitats, or if you want to survey or conserve them.

What you must not do

You're breaking the law if you do certain things including:

- deliberately capture, injure or kill bats
- damage or destroy a breeding or resting place
- obstruct access to their resting or sheltering places
- possess, sell, control or transport live or dead bats, or parts of them
- intentionally or recklessly disturb a bat while it's in a structure or place of shelter or protection

Either or both of the following could happen if you're found guilty of any offences:

- you could be sent to prison for up to 6 months
- you could get an unlimited fine

Activities that can harm bats

Activities that can affect bats include:

- renovating, converting or demolishing a building
- cutting down or removing branches from a mature tree
- repairing or replacing a roof
- repointing brickwork
- insulating or converting a loft
- installing lighting in a roost, or outside if it lights up the entrance to the roost
- removing 'commuting habitats' like hedgerows, watercourses or woodland
- changing or removing bats' foraging areas
- using insecticides or treating timber

In many cases you should be able to avoid harming the bats or damaging or blocking access to their habitats. You'll need an expert to do a bat survey. You can find one using the:

- Chartered Institute of Ecology and Environment Management directory
- Environmental Data Services directory

The survey will show what type, how many and how the bats are using the building or area so you can plan to avoid harming them.

Bat licences

If you cannot avoid harming bats or their habitats, you can apply for a mitigation licence from Natural England.

You need a licence from Natural England for other activities, including:

- surveying
- research

- possessing bats
- some conservation activities

Find out what's involved for construction that affects protected species.

Ecological consultants can register to use a class licence that may avoid the need for an individual licence for certain low impact activities.

Bat roosts

Contact the bat helpline if you:

- think you have a bat roost in or near your house or place of worship and you want to do small scale works or pest control
- have any concerns about the bats

They will give you advice and where appropriate can arrange for one of Natural England's volunteer bat roost visitors to inspect your property.

This is a free service for small-scale building works that do not need planning permission.

Source: <https://www.gov.uk/guidance/bats-protection-surveys-and-licences>

Please refer to the Guidelines for the Selection of Local Wildlife Sites in the Tees Valley – Version 7, June 2010 for the recommendations for Dingy Skippers attached alongside this report.