

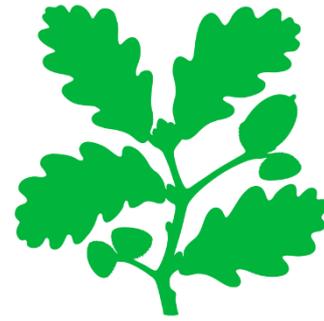
Grassland Fungi Survey Report

High Hirst, Dodnaze

Survey carried out by Steve Hindle

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Report January 2024



**National
Trust**

Summary

The land is northwest facing and currently consists of two fields, a steep meadow and a pasture above. The meadow is cut for hay and has aftermath grazing. Management of the pasture involves some cutting and grazing. One field to the east was preliminarily surveyed to check for potential for CHEGD fungi. The field is currently lacking management and so conditions are not suitable for an effective survey. The meadow was surveyed with a group of volunteers in early November 2023. A quick survey was carried out in late September 2023. The site was previously surveyed in November of 2022 and based on those results was designated as a Local Wildlife Site. The data here are based on 2023 surveys. Twenty-five CHEGD species were recorded including two species designated as Vulnerable by the International Union for Conservation of Nature (IUCN).

Introduction

This survey was undertaken as part of the Grassland Fungi Project. The project aims to identify grassland fungi sites of conservation concern within Calderdale. The area is known to be globally important for a community of fungi referred to as CHEGD species. CHEGD is an acronym used to describe several groups of grassland fungi restricted to semi-natural, mycologically rich unimproved/ancient grasslands, a habitat seriously threatened throughout the UK and Europe.

Each letter stands for a group of related fungi as follows.

C is for the Clavariaceae or Fairy Clubs, Spindles, and Corals

H is for the Hygrocybe or Waxcaps

E is for the Entoloma or Pinkgills

G is for the Geoglossaceae or Earthtongues

D is for the Dermoloma or Crazy Caps and includes a few other species

Of the five groups the most well-known and best recorded are the colourful waxcaps. For this reason, good sites have come to be known as Waxcap Grasslands.

Waxcaps grasslands are often botanically mundane due to persistent grazing but are ancient grassland which is an irreplaceable habitat. The diversity and interconnectedness of the species present has developed over centuries and once lost will take hundreds of years to rebuild.

The fungi, as indicators of habitat, tell us about the importance of the associated communities within the soil. The fungi themselves play an important part in carbon capture and the soil on these sites has a high carbon content. Being highly active the soil tends to hold, store and filter water effectively.

Once sites are identified, the data can be used to support funding. Currently the Countryside Stewardship Higher Tier scheme GS13 Management of grassland for target features is applicable. This pays £528 per hectare and can be used along other options.

Methodology

The survey involves walking the entire site and recording all species of CHEGD fungi seen. The first instance of each species is recorded with GPS. Only species on the IUCN Red List are recorded consistently.

Fungi on the UK Red Data List are also recorded.

Maps do not show total abundance or distribution, only the first record of a species within a field unit.

The survey results are then assessed using various scoring systems.

Constraints

A single fungi survey can only give a snapshot of the fungal community present. The fruiting season can start as early as July and runs through to December with the peak in late October to November. The different groups fruit at different times and different fungi have different fruiting rates, that may be as long as once in thirty years. The results given here are based on sightings from a single visit, this may only capture 20% of the fungi present.

Ground conditions affect the success of the survey, areas which have had no recent management of grazing or cutting will show fewer fruiting bodies. Fields with high stocking numbers will experience a lot of crush damage to the fungi.

The weather and climate also impact, if it is hot and dry or very cold, fruiting bodies die, and fruiting is halted. 2023 had a very wet Summer which brought on early fruiting. A heat wave in early September ended the fruiting and it took several weeks for fruiting to recommence, some groups did not reappear. These conditions meant that a single survey captured a lower number than in previous years.

The meadow was mostly well grazed making survey conditions good. The pasture has a well grazed area of low nutrient grassland, and this area was surveyed. In the neighbouring field a low nutrient bank was surveyed.

Results

Site Map – Two different recording apps were used.



The meadow survey begins at the bottom of the field so it appears that there are more records in the bottom half but there is a good distribution across the field.

The results of each of the three fields are detailed below.

The Meadow

The CHEGD score was C7 H13 E3 G1 D1

Two VU species were recorded, Pink Waxcap (*Porpolomopsis calyptiformis*)

Lilac Pinkgill (*Entoloma porphyrophaeum*)

One UK Red Data Book Species was present, Straw Club (*Clavaria flavipes*)

The presence of 7 species within the C category meets the threshold for SSSI designation.

The presence of 13 species within the H category meets the threshold for LWS designation.

The presence of VU species meets a criterion for LWS designation.

The Top Pasture

The CHEGD score for the field is C2 H6 E0 G0 D0

No rare or threatened species were recorded.

Law Field

The CHEGD score for the field is C2 H1 E0 G0 D0

No rare or threatened species were recorded. With sympathetic management it's hoped that future surveys will reveal more species.

Site Overall

Having been visited twice during the year it's likely that the results for the meadow and pasture capture the CHEGD diversity well. The results from Law Field show that there is potential for further surveys once the site is in positive management.

The CHEGD score for the site is C7 H13 E3 G1 D1 showing diversity across all species groups.

One threshold for designation as a SSSI for grassland fungi is seven species with the Clavariaceae. It's unlikely that this site would be designated based just on this as SSSI sites are chosen on a variety of factors including their standing in the local area. However, there is some desire by Natural England to designate a complex of sites across Calderdale so this site could be a candidate.

Two species assessed as Vulnerable were recorded. These have global significance.

One globally rare species was recorded, one of the Stinking Fanvault complex, *Hodophilus subfoetens*.

Currently there are no UK records for this species although I know of one other find in Wales.

Comparison to 2022

The CHEGD score for the site in 2022 was C5 H12 E3 G2 D0 which included four IUCN Vulnerable species.

In 2022, only the meadow was surveyed but in 2023 all species identified were also found in the meadow.

The numbers are fairly consistent. We might expect to find a few more species on the meadow over the years but extra diversity is more likely to come from Law Field.

The combined CHEGD score for 22/23 is C7 H14 E4 G2 D1

Conclusion

High Hirst is nationally important for its Clavariaceae and internationally important as a reservoir of globally threatened species. Sympathetic management going forwards is encouraged and planned. Sites like this become increasingly important as other grasslands lose diversity through land use change and the effects of climate change.

Management

Ideal conditions for Waxcap Grasslands are areas with high rainfall and good drainage, ensuring moist but not waterlogged soil. The best sites benefit from the movement of water from blanket bog through to the watercourse. Soils are nutrient poor and both physically and chemically undisturbed. The fungi perform different functions within the ecosystem, but many have a symbiotic relationship with grasses and flowering plants which are found in nutrient poor conditions.

There are four major threats to diversity in Waxcap grasslands.

Physical disturbance – digging, ploughing, machinery, large groups of people, too many animals or heavy animals grazing when the ground is moist.

Chemical change – any agro-chemicals, fertiliser, lime, fungicides etc but also the impact of dung or manure. It is the low nutrient levels which generate the great diversity in these grasslands, the plants and fungi must work together to maximise efficient collection and sharing of limited resources. As soon as there is an influx of nutrients the role of certain species becomes redundant and they are lost from the community, other less selective species begin to thrive, and yet more species are lost.

Spread of rank species - Following on from the above, the species make-up can be upset by the addition of nutrients, but also by changes in light levels (through nearby tree/hedgerow growth) and increased soil water levels with poor drainage, leading to Soft Rush encroachment for example.

If grazing levels fall too low, broad-leaved grasses and woody species start to develop.

In best practice, manure should not be applied to pasture and only lightly to meadows.

Competition – CHEGD fungi are restricted to grasslands which are low nutrient. If trees are present with mycorrhizal fungi, these will outcompete the CHEGD fungi as their capacity for accessing nutrients is much greater. This leads to a buffer zone around trees reaching as far as its roots, roughly equivalent to the height of the tree.

The site is managed well to maintain the ancient grassland populations. It is botanically and mycologically diverse.

Scoring and Assessment

To get a good picture of the value of a site it should be surveyed over a period of years. Ideally a site would be surveyed three times between late Summer and Early Winter, for at least three consecutive years.

Criteria for assessment as a SSSI or LWS are usually based on cumulative data.

Several scoring systems have been developed to rate the importance of Waxcap Grasslands. Ratings can be given based on a single survey but are better based on several visits.

Assessment and designation are made by achieving a threshold set for each group. Below are thresholds based on single surveys and multiple visits.

The site classification system of Nitare (1988) (Single visit)

Conservation Category	Clavariaceae	Hygrocybe	Entoloma	Geoglossaceae	Dermoloma
Nationally important	6+	11+	9+	4+	2+
Regionally important	4+	7+	6+	3+	1+

Criteria based on multiple visits

Conservation Category	Clavariaceae	Hygrocybe	Entoloma	Geoglossaceae	Dermoloma
SSSI	7	19	15	5	3
LWS	4	10	8	3	2

A site may meet the threshold in any one of the CHEGD categories, but the best sites will have good diversity across them. This site has some rare species. A score of 27 is nationally important.

Species Lists 2023

Common Name	Scientific Name	Meadow	Top	Law Field	Site	Site 22/23
C						
Apricot Club	Clavulinopsis luteoalba	Y	Y	Y	Y	
Handsome Club	Clavulinopsis laeticolor	Y			Y	
Meadow Coral	Clavulinopsis corniculata	Y			Y	
Smoky Spindles	Clavaria fumosa	Y			Y	
Straw Club	Clavaria flavipes	Y			Y	
White Spindles	Clavaria fusiformis	Y			Y	
Yellow Club	Clavulinopsis helvola	Y	Y	Y	Y	
Total		7	2	2	7	7
H						
Blackening Waxcap	Hygrocybe conica	Y			Y	
Butter Waxcap	Hygrocybe ceracea	Y	Y		Y	
Glutinous Waxcap	Hygrocybe glutinipes	Y			Y	
Golden Waxcap	Hygrocybe chlorophana	Y	Y	Y	Y	
Heath Waxcap	Gliophorus laetus	Y			Y	
Honey Waxcap	Hygrocybe reidii	Y	Y		Y	
Meadow Waxcap	Cuphophyllus pratensis	Y	Y		Y	
Pale Waxcap	Cuphophyllus berkeleyi	Y			Y	
Parrot Waxcap	Gliophorus psittacinus	Y	Y		Y	
Pink Waxcap	Porpolomopsis calyptriformis	Y			Y	
Slimy Waxcap	Hygrocybe irrigata	Y	Y		Y	
Snowy Waxcap	Cuphophyllus virgineus	Y			Y	
Spangle Waxcap	Hygrocybe insipida	Y			Y	
Total		13	6	1	13	14
E						
Lilac Pinkgill	Entoloma porphyrophaeum	Y			Y	
Star Pinkgill	Entoloma conferendum	Y			Y	
Square Spored Pinkgill	Entoloma Rhombisporum agg	Y			Y	
Total		3	0	0	3	4
G						
Unidentified geoglossum	Unidentified geoglossum	Y			Y	
Total		1	0	0	1	2
D						
Stinking Fanvault	Hodophilus subfoetens	Y			Y	
Total		1	0	0	1	1
CHEGD Total						
		25	8	3	25	27
IUCN VU						
		2	0	0	2	

Distribution Maps

This section takes a closer look at some of the species recorded and shows global distribution maps. These maps show all historic records. Species assessed as Vulnerable or Near Threatened are known to be losing habitat and so the maps will show historical records which have since been lost.

Straw Club (*Clavaria flavipes*) - UK Near Threatened



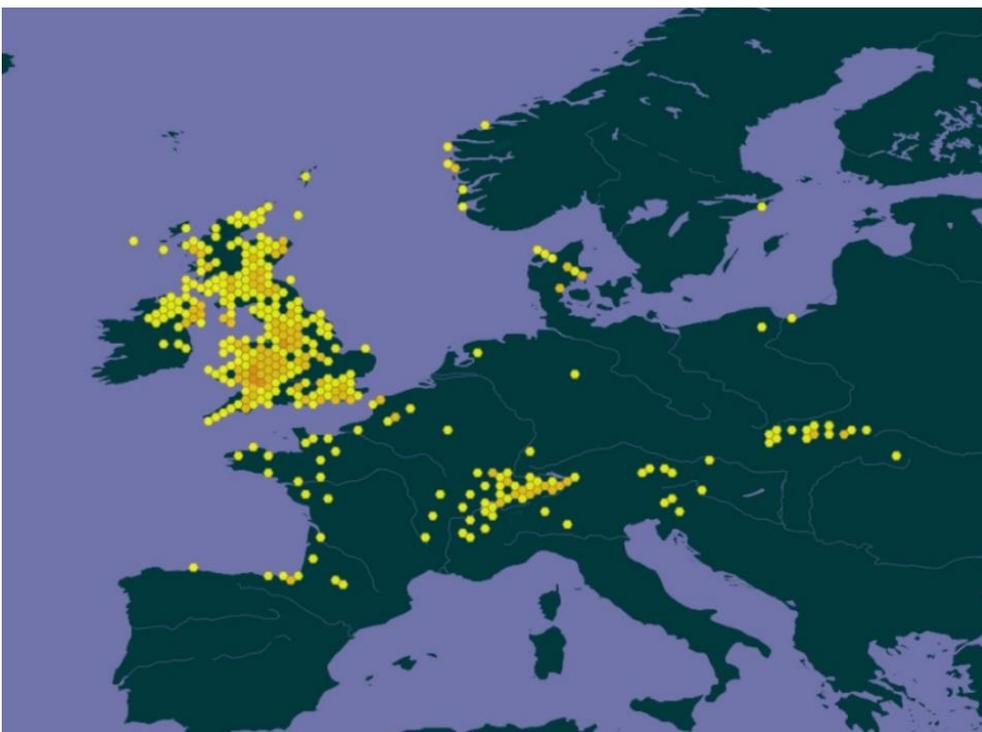
Distribution in the UK.



Pink Waxcap (*Porpolomopsis calyptriformis*) - Vulnerable



Map showing all global records.



A Stinking Fanvault (*Hodophilus subfoetens*) – Globally rare



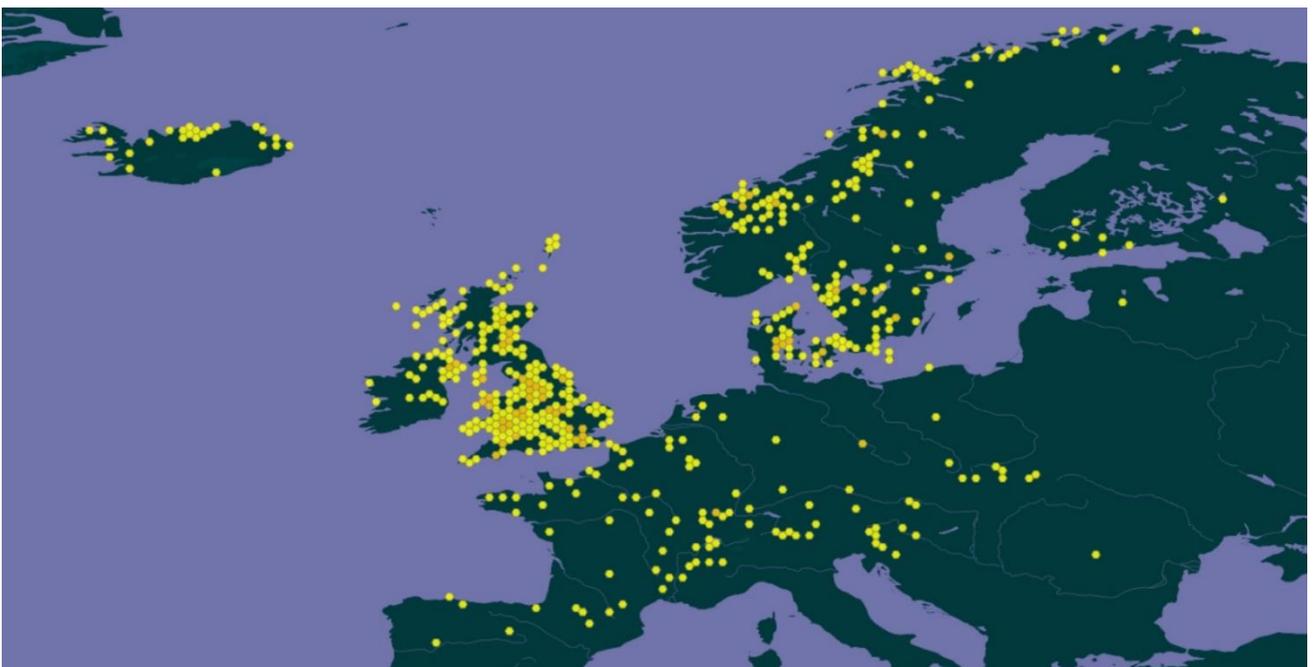
Map showing all global records



Lilac Pinkgill (*Entoloma porphyrophaeum*) - Vulnerable

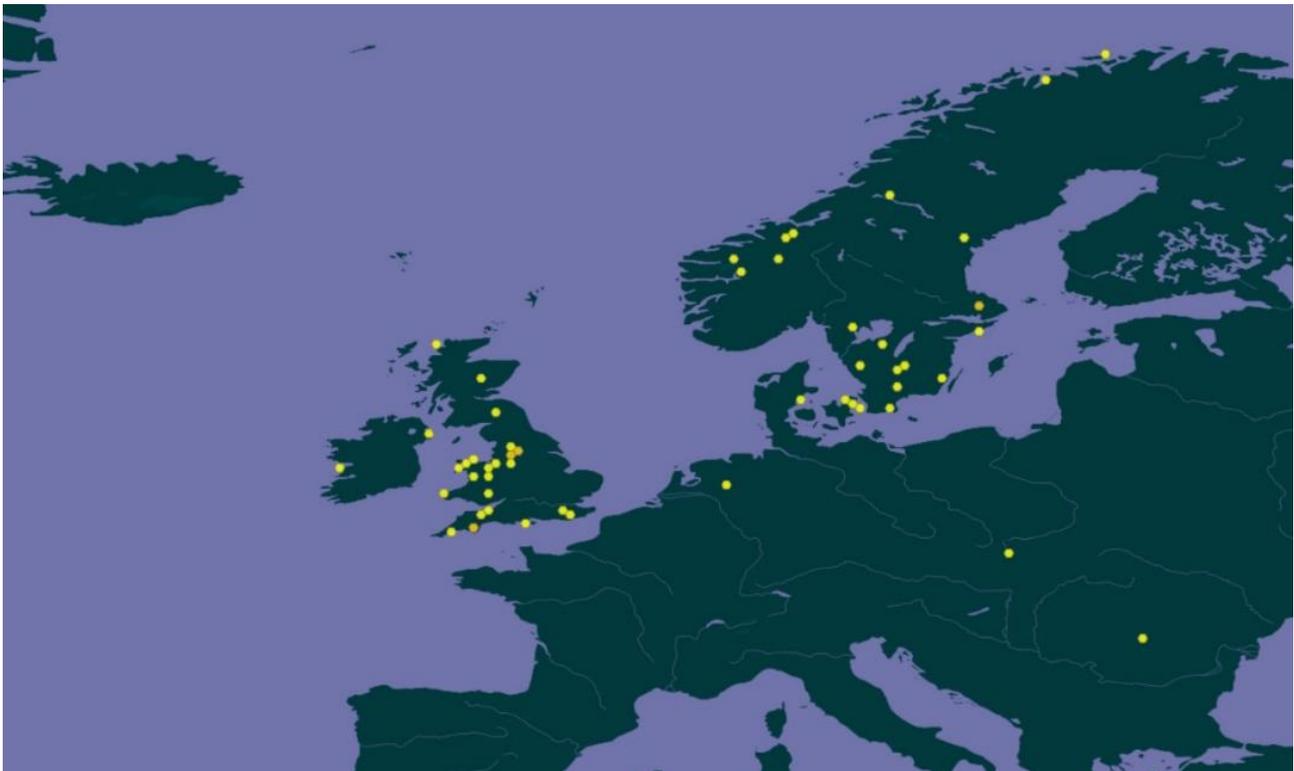


Map showing all global records.



This final map shows the records for Lilac Pinkgill recorded in the years 2020/21/22/23

Here you can see that the number of global records is far fewer and over a much smaller range. Much of the habitat has been lost. Based on this map the most important global area is Calderdale.



What is clear from these distribution maps is that the CHEGD species shown are restricted to a relatively small area of the world with a focus on the countries with an Atlantic influence, mountainous areas and areas with annual snow cover. The UK stands out as a stronghold and almost every map shows Calderdale as one of the more important areas.

The habitat is rapidly declining across Europe, due to many pressures including improvement of grasslands, expanding urbanisation and conservation projects like tree planting, meadow creation and rewilding. Many of the key areas are dependent on annual snow cover to maintain the habitat and this is reducing due to global warming. Calderdale has retained many of these grasslands and for now the Atlantic influence continues and the habitat is in relatively good condition. As time goes on, our populations will become increasingly important as a global reservoir. It's important that we understand the value of our grasslands and make efforts to protect them.

It's worth having context to understand the importance of the IUCN Vulnerable species. Species at risk are rated as Vulnerable, Endangered or Critically Endangered. There are no other species in West Yorkshire facing the same level of extinction threat. A relatively common species in the area which is on the UK Red List is the Curlew, this is assessed as Near Threatened globally. Other species assessed as globally Vulnerable include Snow Leopard, Hippopotamus, Giant Panda and Polar Bear.