Grassland Fungi Survey Report

High Hirst, Wadsworth

Survey carried out by Steve Hindle

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Report February 2023

Summary

High Hirst currently consists of two fields, a steep meadow and a pasture above.
The meadow was surveyed with a group of volunteers in early November 2022
Twenty-one CHEGD species were recorded including four species designated as Vulnerable by the International Union for Conservation of Nature (IUCN).
Two species are designated Near Threatened on the UK Red Data List.

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 Crazed 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, it is hoped that funding will be available through ELMS to support land managers in efforts to conserve this threatened habitat.

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 and UK Red Data Book are recorded consistently.

This survey was carried out with the help of local volunteers. We formed a line and traversed the field planting flags close to each species found. We were then able to look at all the species and learn something about their ecology and identification.

The map does not show total abundance or distribution, only the first record of a species within the field. 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. 2022 had a very long dry Summer which postponed the fruiting season. Many species simply missed their fruiting time. Compared to 2021, fruitbody production was reduced.

Hard rain or low sun can adversely affect visibility.

Results

Site Map

The map appears to show distribution to one side of the site, but CHEGD fungi were spread across the whole field.

The CHEGD score for the field is C5 H12 E3 G2 D0
Four VU species were recorded, Pink Waxcap (*Porpolomopsis calyptriformis*)
Oily Waxcap (*Hygrocybe quieta*)
Lilac Pinkgill (*Entoloma porphyrophaeum*)
Short Spored Earthtongue (*Trichoglossum walteri*)
Two UK Red Data Book Species were present, Straw Club (*Clavaria flavipes*)
Short Spored Earthtongue (*Trichoglossum walteri*)

Five species within the C category exceeds the threshold for Local Wildlife Site (LWS) designation.
Twelve species within the H category exceeds the threshold for LWS designation.
The presence of VU species meets a criterion for LWS designation.

Conclusion

High Hirst is an important ancient grassland supporting a diverse population of CHEGD fungi. It meets three criteria for designation as a Local Wildlife Site.

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 species in 4 of the 5 groups including some rare species. A score of 21 is nationally important.

Species

Clavariaceae

Five species were recorded, of which two are only found in the best grasslands.

Apricot Club (*Clavulinopsis luteoalba*)

Meadow Coral (*Clavulinopsis corniculata*)

Smoky Spindles (*Clavaria fumosa*) a rare species

Straw Club (*Clavaria flavipes*) UK Near Threatened

Yellow Club (*Clavulinopsis helvola*)

Hygrophoraceae

Twelve species were recorded, two Vulnerable species and one High Density Indicator.

Butter Waxcap (*Hygrocybe ceracea*)

Glutinous Waxcap (*Hygrocybe glutinipes*)

Golden Waxcap (*Hygrocybe chlorophana*)

Heath Waxcap (*Gliophorus laetus*)

Honey Waxcap (*Hygrocybe reidii)*

Meadow Waxcap (*Cuphophyllus pratensis*)

Oily Waxcap (*Hygrocybe quieta*) – Vulnerable

Parrot Waxcap (*Gliophorus psittacinus*)

Pink Waxcap (*Porpolomopsis calyptriformis*) - VU

Slimy Waxcap (*Gliophorus irrigatus*)

Snowy Waxcap (*Cuphophyllus virgineus*)

Spangle Waxcap (*Hygrocybe insipida*)

Entolomataceae

Three species were recorded including one Vulnerable species.

Lilac Pinkgill (*Entoloma porphyrophaeum*) - Vulnerable

Silky Pinkgill (*Entoloma sericium*)

Star Pinkgill (*Entoloma conferendum*)

Geoglossaceae

Two species were recorded, one of which is designated by the IUCN and is on the UK Red Data book.

Deceptive Earthtongue (*Geoglossum fallax*) Short Spored Earthtongue (*Trichoglossum walteri*) VU UK NT

Distribution Maps

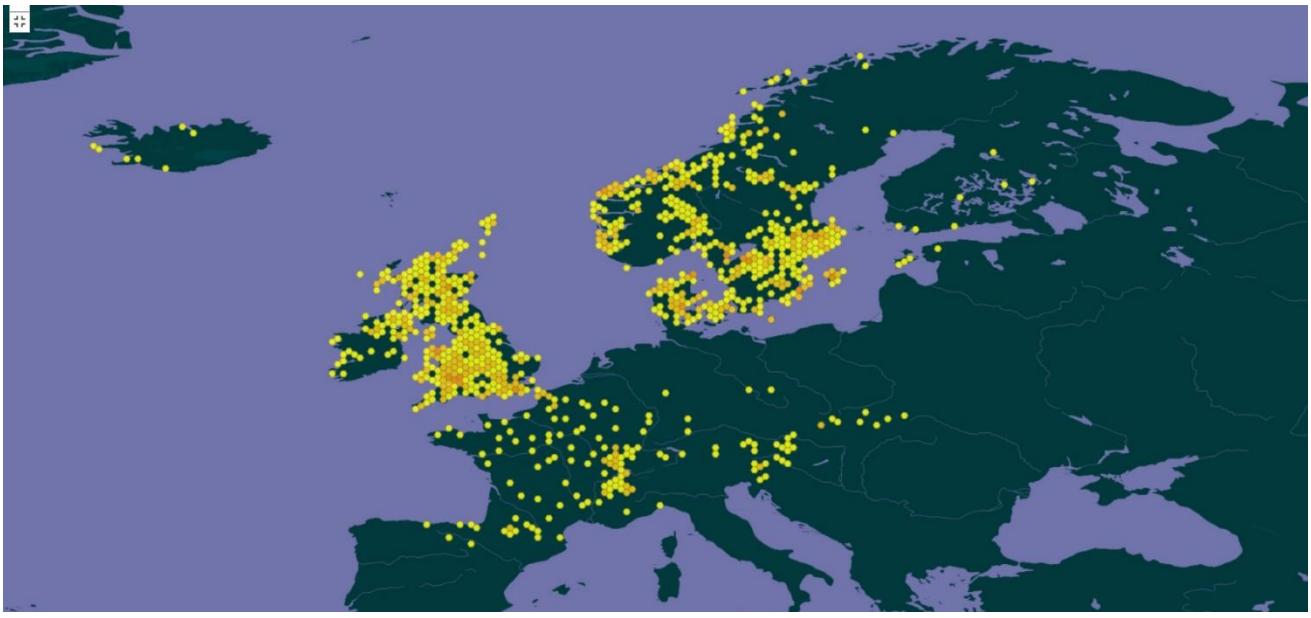
This section takes a closer look at some of the species recorded and shows global distribution maps. These maps show all historic records. Species assessed as Vulnerable or Near Threatened are known to be losing habitat and so the maps will show historical records which have since been lost.

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

Distribution in the UK

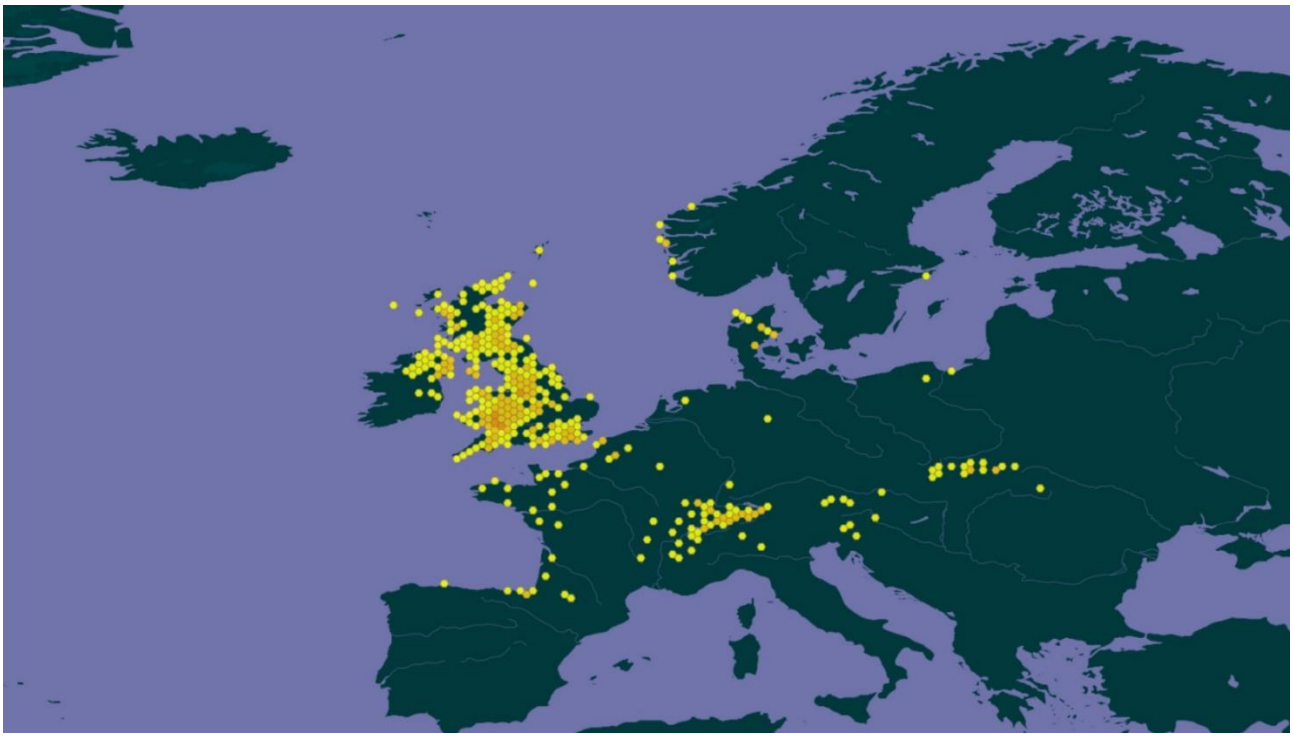
Oily Waxcap (*Hygrocybe quieta*) - Vulnerable

Map showing global records.



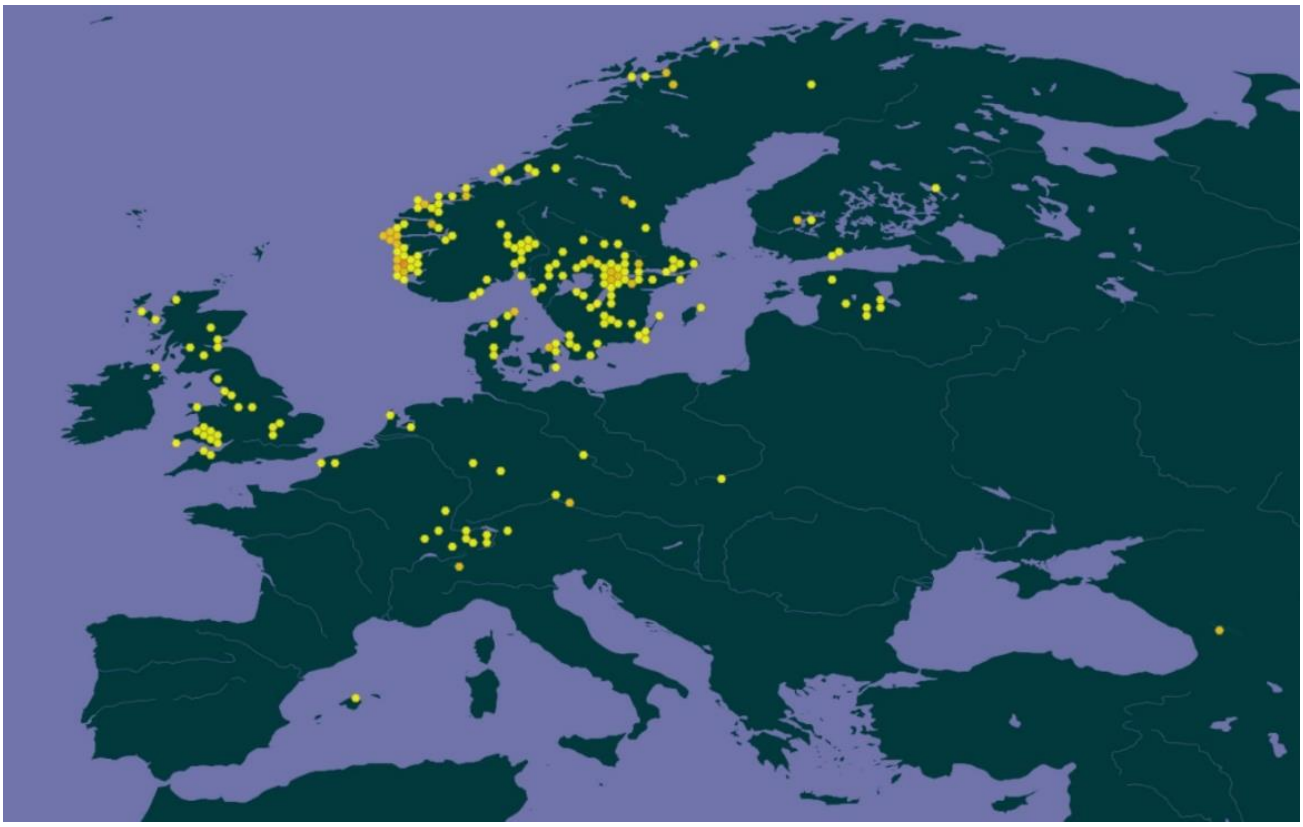
Pink Waxcap (*Porpolomopsis calyptriformis*) - Vulnerable

Map showing all global records.



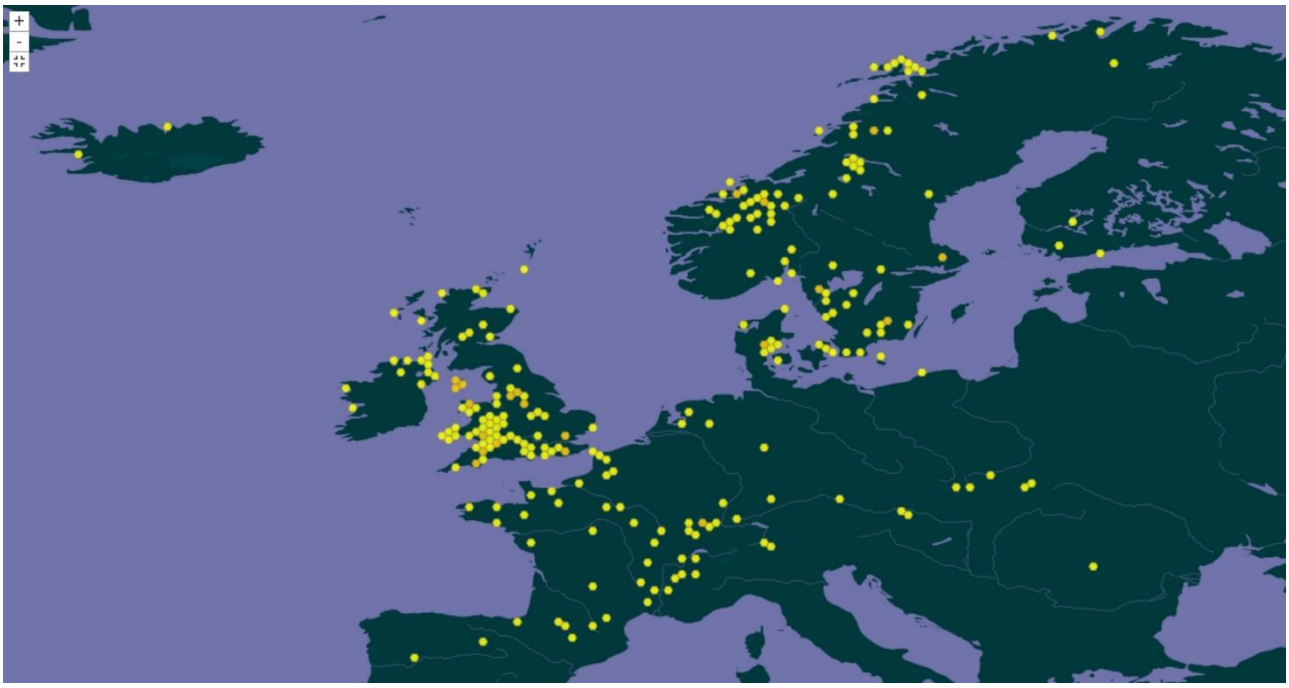
Short Spored Earthtongue (*Trichoglossum walteri*) VU UK NT

Map of European records.

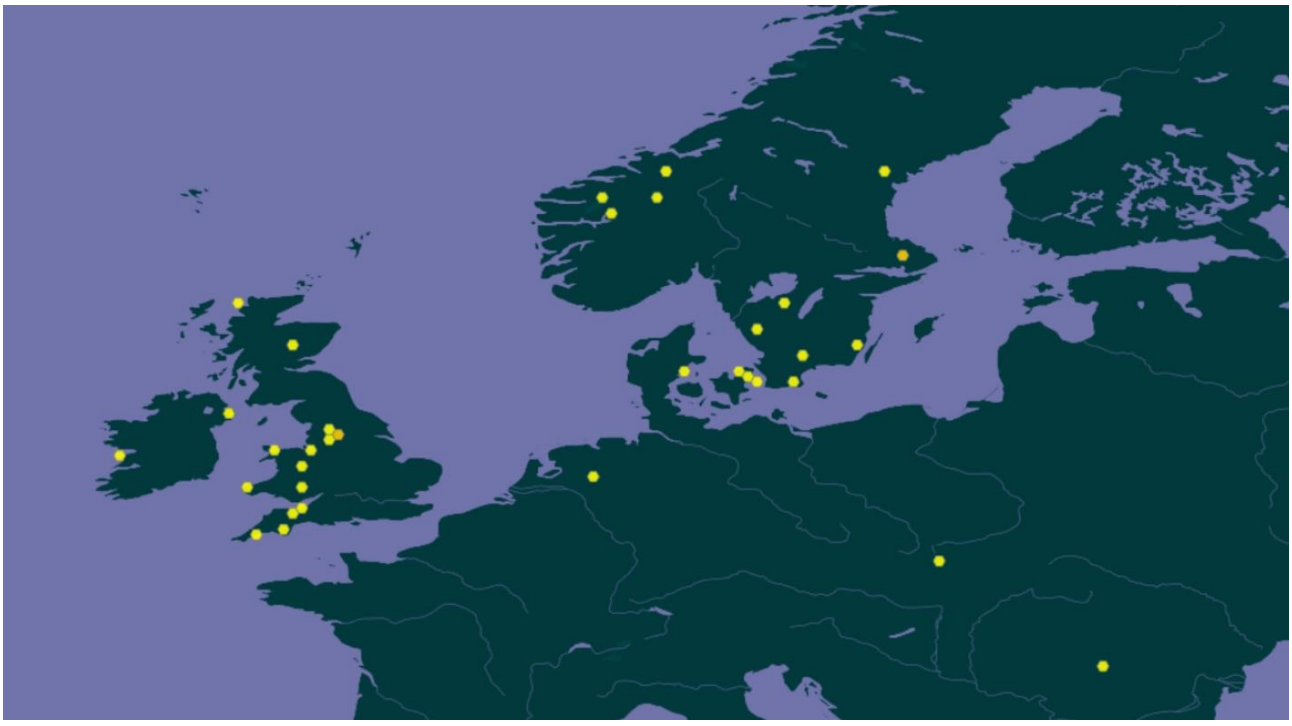


Lilac Pinkgill (*Entoloma porphyrophaeum*) - Vulnerable

Map showing all global records.



The final map shows the records for Lilac Pinkgill recorded in the years 2020/21/22
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.

Species list

Common Name	**Scientific Name**
C	
Apricot Club	*Clavulinopsis luteoalba*
Meadow Coral	*Clavulinopsis corniculata*
Smoky Spindles	*Clavaria fumosa*
Straw Club	*Clavaria flavipes*
Yellow Club	*Clavulinopsis helvola*
Total 5	
H	
Butter Waxcap	*Hygrocybe ceracea*
Glutinous Waxcap	*Hygrocybe glutinipes*
Golden Waxcap	*Hygrocybe chlorophana*
Heath Waxcap	*Gliophorus laetus*
Honey Waxcap	*Hygrocybe reidii*
Meadow Waxcap	*Cuphophyllus pratensis*
Oily Waxcap	*Hygrocybe quieta*
Parrot Waxcap	*Gliophorus psittacinus*
Pink Waxcap	*Porpolomopsis calyptriformis*
Slimy Waxcap	*Gliophorus irrigatus*
Snowy Waxcap	*Cuphophyllus virgineus*
Spangle Waxcap	*Hygrocybe insipida*
Total 12	
E	
Lilac Pinkgill	*Entoloma porphyrophaeum*
Silky Pinkgill	*Entoloma sericeum*
Star Pinkgill	*Entoloma conferendum*
Total 3	
E	
Deceptive Earthtongue	*Geoglossum fallax*
Short Spored Earthtongue	*Trichoglossum walteri*
Total 2	