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## **Mycological Survey of Maelienydd SSSI, Radnor**

**S.E. Evans and P.J. Roberts**

**CCW Regional Report CCW/SEW/12/2**

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## EXECUTIVE SUMMARY

It has been nearly 16 years since the previously poorly known assemblage of grassland macrofungi was first brought to conservation attention in the UK by the launch of the British Mycological Society's (BMS) waxcap-grassland survey (Rotheroe et al. 1996). As a direct result, considerable conservation interest is now focussed on what have become known as the "CHEG fungi" (*Clavariaceae*, *Hygrocybe*, *Entoloma* and *Geoglossaceae*) and in particular the most easily identified component group, the waxcaps (*Hygrocybe* species). Waxcap-grassland CHEG species and associated fungi (*Dermoloma*, *Porpoloma* and *Camarophyllopsis*) inhabit nutrient poor semi-improved grassland in North-Western Europe. The waxcap-grasslands of Wales currently lead waxcap-grassland site rankings in the UK and are considered to be amongst the best in Europe. This gives Wales an unprecedented level of international conservation responsibility for waxcap-grassland fungi.

The main aim of this study is to provide a systematic survey of the waxcap-grassland mycota present in suitable areas of mainly dry acid grassland at Maelienydd Common (both within and outside the SSSI boundary) as well as adjacent common land at Coxhead Bank, Littlehill Common and Llwynpentre Bank and to provide an initial conservation assessment for the areas surveyed. To achieve this a repeat survey was undertaken over 8 weeks in 2011 between 29<sup>th</sup> September and 15<sup>th</sup> November with a total of 13 field days with a minimum of 2.5 days per visit to Maelienydd SSSI and 0.5 days each to Coxhead Bank, Littlehill Common and Llwynpentre Bank.

An initial conservation assessment based on these results shows that both Maelienydd SSSI and abutting common land and Coxhead Bank Common are sites of international conservation importance for their *Hygrocybe* species. Maelienydd SSSI and adjoining common land now rank amongst the top ten sites in Wales for their waxcap-grassland mycota with a total of 56 CHEG species. This places Maelienydd above sites like Clydach SSSI (50) and Llanishen and Lisvane Reservoirs SSSI (51), both of which have been notified for their waxcap-grassland interest.

Management issues which need to be carefully monitored include: a) maintaining appropriate grazing levels to avoid nutrient build-up; b) controlling burning for gorse management to avoid areas of particular waxcap-grassland interest; and c) avoiding excessive mechanical damage to roadside verges. There is no evidence that nearby poultry units threaten waxcap-grassland interest but appropriate monitoring is recommended.

Coxhead Bank, although smaller and only surveyed for the first time in 2011, is already one of the best 20 sites in Wales with a total of 45 CHEG species. This compares well with Clydach and Llanishen SSSIs, given their greater recording intensity. Coxhead Bank also had three of the highest subsite CHEG totals of any surveyed area. Management strategies such as bracken cutting favour waxcap-grassland interest.

Both Littlehill Common and Llwynpentre Common are of national conservation importance for their *Hygrocybe* species with CHEG totals (36 and 29) placing them amongst the top 30 sites for waxcap-grasslands in Wales.

It is recommended that fungi should be considered for inclusion as a qualifying feature at Maelienydd SSSI and thought given to its extension to include Coxhead Bank Common. Further surveys are recommended at both sites as well as in the vicinity of Ddol farm. Positive management strategies for waxcap-grassland fungi should be followed.

# 1 METHODOLOGY

## 1.1 Aims

To provide a systematic survey of the waxcap-grassland mycota present in suitable areas of mainly dry acid grassland at Maelienydd Common (both within and outside the SSSI boundary) as well as areas of adjacent common land at Coxhead Bank, Littlehill Common and Llwynpentre Bank and to provide an initial conservation assessment for the areas surveyed. To compare the conservation assessment with data previously collected and to assess the effectiveness of the current management regime for mycological interest including reference to the development of poultry units on surrounding farms.

## 1.2 Visits

Each of the four sites was visited systematically in 2011 during the autumn, when the majority of fungi produce fruitbodies. Each selected subsite was visited on three occasions, with at least 2½ man-days of fieldwork per visit at Maelienydd Common and a ½ day each at Coxhead Bank, Littlehill Common and Llwynpentre Bank, as detailed in Table 1.1.

To maximise recording of late season target taxa, an additional 1 day field visit was made to the following selected subsites from each of these four sites: Maelienydd Common 5, 12, 13 and 17; Coxhead Bank 2 and 3; Littlehill Common 3 and Llwynpentre Bank 3.

Timing of site visits was at surveyor discretion to maximise recording of target taxa and commenced with the first systematic survey to Maelienydd Common on 29<sup>th</sup> September and ended with the selected visits to all four sites on 15<sup>th</sup> November 2011.

A preliminary visit to Maelienydd Common was made on 18<sup>th</sup> September prior to the commencement of the contract to identify potentially suitable grassland areas and record early fruiting target taxa notably the *Leptonia* group of *Entoloma* species. These records are included in the assessment as many of the species were not subsequently recorded during the contracted survey.

**Table 1.1** Summary of survey visits in 2011

Site name	prelim	visit 1	visit 2	visit 3	addition
Maelienydd Common	18 <sup>th</sup> Sept	29 <sup>th</sup> Sept	10 <sup>th</sup> Oct	28 <sup>th</sup> Oct	15 <sup>th</sup> Nov
(SSSI and adjacent)		30 <sup>th</sup> Sept	17 <sup>th</sup> Oct	30 <sup>th</sup> Oct	
			18 <sup>th</sup> Oct		
Coxhead Bank Common		1 <sup>st</sup> Oct	19 <sup>th</sup> Oct	1 <sup>st</sup> Nov	15 <sup>th</sup> Nov
Littlehill Common		1 <sup>st</sup> Oct	19 <sup>th</sup> Oct	1 <sup>st</sup> Nov	15 <sup>th</sup> Nov
Llwynpentre Bank Common		1 <sup>st</sup> Oct	18 <sup>th</sup> Oct	29 <sup>th</sup> Oct	15 <sup>th</sup> Nov
				1 <sup>st</sup> Nov	



### 1.3 Field Methodology

In order to record species present as fully as possible an intensive walk-over approach was adopted based on that recommended by the BMS waxcap-grassland survey (Rotheroe et al. 1996). This involves walking up and down a site in a ‘mowing’ fashion in as methodical a way as terrain allows, scanning visually for target species. For larger or steep areas, a zig-zag approach was adopted. This enabled as much of the target areas as possible to be surveyed and ensured surveyor effort between sites was comparable.

Not all of the grassland within the four commons was surveyed for waxcap-grassland fungi. It should therefore be emphasised that the survey provides no more than an initial guideline to the extent of fungal interest at the sites. It should also be noted that, in a brief snapshot period like this, the absence of fruitbodies does not necessarily mean that target species are not present. They may be present underground, but not producing visible fruitbodies on the surface.

The four survey sites are composed of a variety of habitats including acid grassland, heath, marshy grassland, flushes and pools of which only a small proportion (around 10 to 15%) was deemed likely to support high numbers of the target waxcap-grassland fungi. Suitable areas identified for this survey included the extensive areas of grazed dry acid grassland, some of the more open areas of *Ulex gallii* heath interspersed with grassy paths, grassy roadside edges, and old grassed-over quarries or stone-workings. These types of areas are similar to those previously identified as of waxcap-grassland fungi interest at Maelienydd SSSI by Woods in 2001 and Mitchel in 2004-5 (pers. comm.).

In order to maximize information on the geographic extent of waxcap-grassland interest across Maelienydd SSSI and the three adjacent areas of commons, 28 separate subsites were identified at the outset, each of which was considered to be a potential fungal hotspot. These included 4 subsites (Maelienydd Common 6, 10, 14 and 15) that were selected to provide information on areas outside but adjacent to Maelienydd SSSI itself. The approximate boundaries of each subsite, together with the subsite number, are shown on the site maps (Figs 2.1, 2.2, 2.3. & 2.4).

Field records were made on site and were supported by additional notes and photographs when weather allowed. GPS readings were also taken at each subsite.

Target taxa for this survey included all species of *Hygrocybe*, *Clavariaceae*, *Geoglossaceae*, *Dermoloma*, *Porpoloma*, *Camarophylloopsis* and relevant indicator species from *Entoloma* s.l. (especially subgenus *Leptonia*). This follows the list first proposed by McHugh et al. (2001) and adopted more recently by the CCW survey of semi-improved grasslands in Wales (Griffiths et al. 2006). Non-target taxa were only surveyed and noted as time allowed and at no detriment to the main target taxa. Amongst these, priority was given to easily identifiable taxa associated with grassland and more difficult but rarely recorded species likely to be new to the county or Wales. Thus non-target species associated with dung, with gorse and woody shrubs, or with *Sphagnum* and wet grassland (e.g. *Coprinus*, *Galerina*, *Conocybe* or *Psilocybe* species) were not included on a systematic basis.

Collections were made for all target taxa requiring further identification work and these were described on the day of collection and dried for later lab-based microscopic identification using specialist literature (see Appendix 1). All retained material will in due course be offered for curation to the UK national fungi collections held in the Mycology Herbarium at the Royal Botanic Gardens, Kew.

## 1.4 Records

Records were made individually for all subsites at each of the four sites and all species identified have been databased in an electronic format. These records include data fields recommended as a minimum for best practice by the Fungal Records Database of Britain and Ireland (FRDBI) managed by the BMS. These records will in due course also be shared with the South East Wales Biological Records Centre and the FRDBI, which in turn shares data with the National Biodiversity Network (NBN).

Species names follow those used in the Royal Botanic Gardens Kew's 'Checklist of the British and Irish Basidiomycota' (Legon & Henrici 2005) and subsequent updates found at [www.basidiochecklist.info](http://www.basidiochecklist.info)

In addition to this written report CCW has been provided with additional data in electronic format in the form of an Excel spreadsheet of all fungal records for this survey as outlined above. Additional worksheets on the spreadsheet include previous fungal records for Maelienydd SSSI for 2001 (R. Woods) and for 2004-05 (D. Mitchel).

## 2 RESULTS

### 2.1 Introduction

Mycological surveys of this kind are based on the identification of visible fruiting bodies which are ephemeral and may not appear every year. The underground mycelium of waxcap-grassland fungi is continually present but cannot be identified visually since it remains below the surface. So any snapshot style survey such as this concentrated over a short span of 8 weeks in the autumn will always provide a species list limited by the vagaries of prevailing fruiting conditions. As such each site list can only reflect a minimum assessment of the species actually present.

The results and any discussion of the conservation importance of these four sites based on the 2011 survey alone or in conjunction with previous surveys (Woods 2001 and Mitchel 2004-5) are limited and should be regarded as a minimum appraisal upon which to base further survey and conservation effort. Nor is it possible to directly compare the results of the 2011 Maelienydd SSSI survey with records made from one ad hoc visit in 2001 that sampled unlocalized roadside verges (R. Woods pers. comm.). Data from 2004 and 2005, however, were based on six localized quadrat surveys across the SSSI (Mitchel 2004-5) and as such are more comparable to the 12 subsites surveyed in 2011.

Analysis has shown that successive surveys year on year will continue to add new species of macrofungi to a site list even after 20 years, albeit under the rule of diminishing returns (Tofts & Orton 1998). Further ongoing surveys are therefore recommended, both to better establish fungal diversity and to monitor long term site management.

### 2.2 Summary

Before discussing individual sites in detail, it may be useful to look at an overview of the results. During the course of the 2011 survey 1314 fungal records were generated covering 70 target waxcap-grassland species as follows: Clavarioid fungi 13; *Hygrocybe* 27; *Entoloma* 22; *Geoglossaceae* 6; *Dermoloma* 1 and *Camarophyllospis* 1.

Four Red Data list species were recorded: *Clavaria incarnata* (Maelienydd Common 14), *Clavaria straminea* (Maelienydd SSSI 17); *Trichoglossum variabile* (Llwynpentre Bank Common 3) and *Omphalina galericolor* (Maelienydd SSSI 5 and Llwynpentre Bank Common 4).

One non-target species *Stropharia albonitens* (Llwynpentre Bank Common) was new to Wales and 25 species were new to the county of Radnorshire. The latter comprised 8 non-target species and no less than 17 target species (2 Clavarioid fungi, 1 *Hygrocybe*, 13 *Entoloma* and 1 *Geoglossaceae*). See Table 2.1.

**Table 2.1** Summary of new County and new Welsh records. Target taxa in shaded rows.

Species	New County	New Welsh	2 <sup>nd</sup> Welsh	3 <sup>rd</sup> Welsh
<i>Arrhenia griseopallida</i>	x			
<i>Camarophyllopsis schulzeri</i>	x			
<i>Cantharellula umbonata</i>	x			
<i>Clavaria straminea</i>	x			
<i>Cystoderma carcharias</i>	x			
<i>Entoloma caesiocinctum</i>	x			
<i>Entoloma exile</i>	x			
<i>Entoloma fernandae</i>			x	
<i>Entoloma hebes</i>	x			
<i>Entoloma jubatum</i>	x			
<i>Entoloma kervernii</i>				x
<i>Entoloma longistriatum</i>	x			
<i>Entoloma papillatum</i>	x			
<i>Entoloma prunuloides</i>	x			
<i>Entoloma querquedula</i>	x			
<i>Entoloma solstitiale</i>				x
<i>Entoloma turbidum</i>	x			
<i>Entoloma undatum</i>	x			
<i>Hygrocybe aurantiosplendens</i>	x			
<i>Omphalina galericolor</i>	x			
<i>Ramariopsis tenuiramosa</i>			x	
<i>Stropharia albonitens</i>	x	x		
<i>Stropharia inuncta</i>	x			
<i>Tephrocybe tylicolor</i>				x
<i>Trichoglossum variabile</i>				x

There are currently four target species listed on the newly revised UK priority Biodiversity Action Plan (BAP) list. They are *Entoloma bloxamii*, *Geoglossum atropurpureum*, *Hygrocybe spadicea*, and *Microglossum olivaceum*. None of these has been recorded at any of the four sites either in 2011 or on previous visits, nor, given the predominantly acid habitat, it is likely that *Entoloma bloxamii*, *Hygrocybe spadicea* or *Microglossum olivaceum* would occur since they prefer neutral to basic habitats. The preference of *Geoglossum atropurpureum* is undetermined.

## 2.3 Site Accounts

The straightforward approach commonly used in the UK to summarize the different groups of waxcap-grassland fungi at sites is the “CHEG” system (Clavarioid fungi, *Hygrocybe*, *Entoloma* and Geoglossaceae) adapted from Rotheroe (1999).

A CHEG shorthand summary for 2011 is included at the top of the four site results tables below (Tables 2.2, 2.3, 2.4, 2.5) and includes *Dermoloma* (also, for 2.3, *Camarophyllopsis*) after the CHEG score for additional information. Presence across each site at individual subsites is also shown, as is a brief list of notable non-target species.

Maps of each site are also included (Figs 2.1, 2.2, 2.3, 2.4) detailing boundaries of the numbered subsites.

It should be noted that for the purpose of this report and all comparisons CHEG numbers only include counts of species and not subspecies, varieties or forms, with the sole exception of *Hygrocybe pratensis* var. *pallida* (here listed as *H. berkeleyi*). This taxon has long been regarded as a distinct species by many mycologists, including the authors of this report, and its status as such has now been confirmed following DNA sequence analysis at RBG Kew (M. Ainsworth, pers. comm.).

A comparative summary of all four sites is shown as part of the conservation assessment (Table 3.2).

### 2.3.1 Maelienydd SSSI and adjacent common land

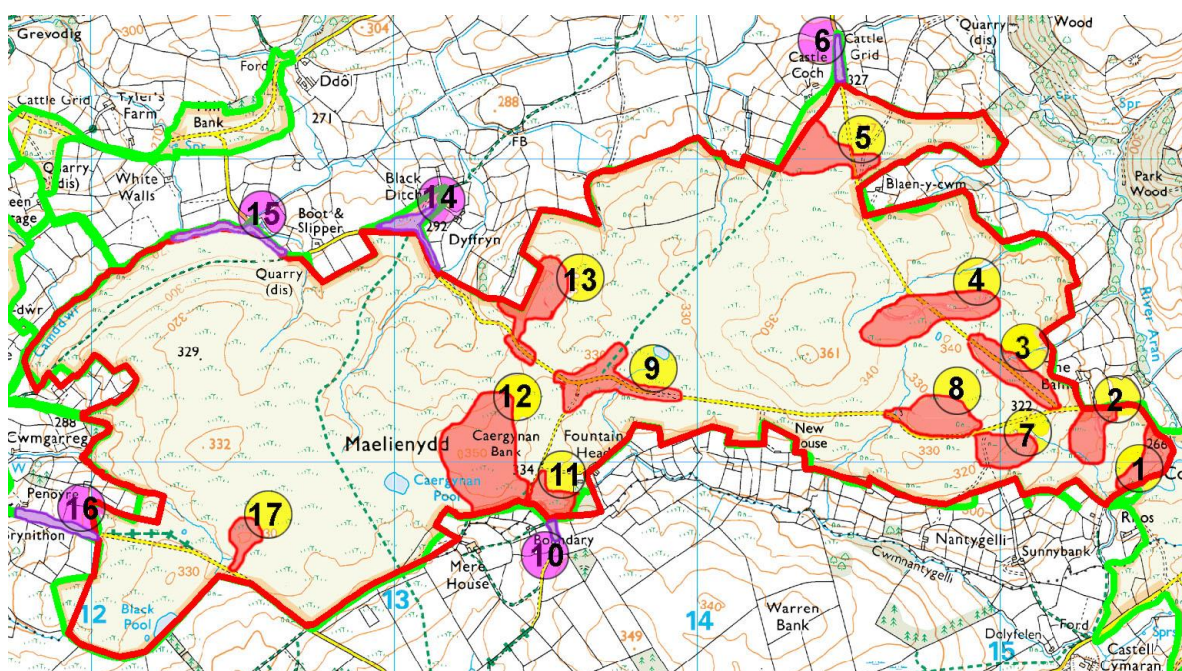


Figure 2.1 Maelienydd SSSI (boundaries in red) and non-SSSI (boundaries in violet) subsite locations

Maelienydd SSSI is an area of some 350 ha supporting a range of habitats including acid grassland, dry *Ulex gallii* heath, wet heath, marshy grassland, flushes and pools. It was originally notified for its breeding bird assemblage at a time when it was the last redshank breeding ground in Radnorshire and for its still thriving population of *Pilularia* in the mawn pools.

The wet heath, marshy grassland, flushes and pools are of very low to no interest for waxcap-grassland fungi and, following a preliminary visit to assess potential subsites, were not included in this survey although they do support their own specialized mycota.

The whole common is grazed by sheep in varying concentrations and is open access land dissected by two surfaced roads and a range of surfaced to ad hoc tracks, including networks of narrow sheep tracks as well as wider grassy access routes across the gorse heath. This results in a range of grassland sward heights in the surveyed subsites from tightly grazed (under 0.5 cm) to medium length (4-8cms). The grass is shortest in the more open well-grazed areas and along paths and roadside edges and longest amongst the gorse and bracken. A few subsite areas (parts of 5 and 13 and most of 8) appear to have attracted higher than average numbers of sheep, perhaps due to additional feeding, and had a correspondingly heavier concentration of dung.

Such build-up of dung nutrients can lead to nettle proliferation and can also have a long-term detrimental effect on waxcap-grassland fungi, all of which prefer nutrient-poor soils.

Large patches of the gorse heath across the SSSI have been subject to burning at different times in the past with regrowth in various stages. It is presumed this is a management strategy used to improve grazing for sheep. Some more recently burnt areas were incorporated into the survey (parts of subsites 9 and 13), but fruiting of target taxa in blackened areas or new-grown grass was noticeably absent compared to the unburnt grassy rides in subsite 13 and the roadside verges in subsite 9. Only a few very common, non-target ruderal species were observed in the burnt areas, such as the Dusky Puffball *Lycoperdon nigrescens* and small brown *Clitocybe* species. If the burn is of short duration, if heat does not penetrate deep below the surface, and if alkaline ash does not build up, it is possible mycelium of any target species below ground may still remain healthy, allowing normal fruiting to resume over time. However, this would require further surveys to confirm and until then any future burns should avoid the known fungal fruiting hotspots based on subsite data.

Although it is open access land, the remoteness of Maelienydd SSSI is presumably the reason why the common has minimal amenity use. During fieldwork for the survey, usage was restricted to a few local dog walkers and horse riders and is not considered a threat to the waxcap-grassland fungi.

The bulk of the site is made up of acid grassland and heath and supports target species characteristic of such habitats, often in great abundance. Typical and conspicuous species include Golden Spindles *Clavulinopsis fusiformis* and the aptly named Heath Waxcap *Hygrocybe laeta*. *Clavulinopsis fusiformis* is a relatively tall (6-10cms) bright yellow club-like species forming unbranched but clustered spindles whilst *Hygrocybe laeta* is an extremely viscid waxcap with dull orange-brown cap, decurrent clear-edged gills and stem greyish at the top. Both these are indicator species of acid grassland. Other less ubiquitous but distinctly acid-loving species recorded at Maelienydd include the Vermillion Waxcap *Hygrocybe miniata* and the Sepia Pinkgill *Entoloma jubatum*.

A small but mycologically important habitat component of Maelienydd is the narrow grass verges bordering the roads which often end in a small ditch or low bank and vary in width from a few metres to barely 30cm. The fungi found on these verges indicate that they are neutral to mildly basic, possibly as a result of the influence of roadbuilding materials. Two species which seem to be indicators of this neutral to base-rich habitat are the Cedarwood Waxcap *Hygrocybe russocoriacea* and the Pink Domecap *Calocybe carnea*, neither of which occur on the acid grassland or heath. The first is a white species similar to the common Snowy Waxcap *Hygrocybe virginea*, but as its name indicates *H. russocoriacea* smells strongly of cedarwood or menthol. *Calocybe carnea* is a small but distinctive species with pinkish cap, comparatively short stem, and contrasting white gills.

These roadside strips are of considerable importance to the site mycologically and significantly increase the fungal diversity of the SSSI supporting a range of species not found elsewhere. In particular most of the blue-toned *Entoloma* species (subgenus *Leptonia*) which typically fruit early in the season were found in such situations, often amongst moss in the ditches or banks.

Nearly all the *Geoglossaceae* were also recorded from these roadside corridors where in late season (November onwards) they were extremely abundant in places, typically growing in mixed species swarms. Other species only growing in this microhabitat at Maelienydd and considered to favour base-rich habitats include: the Meadow Coral *Clavulinopsis corniculata*, the Beige

Coral *C. umbrinella*, the Pale Waxcap *Hygrocybe berkeleyi* (= *H. pratensis* v. *pallida*), and the Bitter Waxcap *Hygrocybe mucronella*.

These roadside verges are vulnerable to mechanical destruction and in a few places (eg subsite 5) were deeply rutted by vehicles either parking or accessing stock.

Prevailing weather conditions during the survey were unusually warm and dry, October 2011 being one of the hottest on record. During the preliminary visit on Sept. 18<sup>th</sup> a number of rather delicate *Entoloma* (*Leptonia*) species were recorded, but unfortunately by the time the contract was confirmed the weather had turned hot and dry and nearly all these ephemeral early-season fungi had disappeared. Further survey work, commencing in early September, is recommended.

In general, target species were well-distributed across the areas surveyed, the best subsites based on all target taxa being: 6 (outside the SSSI) then 5, 9, 12, 3 and 13 (all within the SSSI). Subsites 6, 9, and 3 were predominantly grazed roadside grassland strips, whilst 5, 12 and 13 all had more open areas of grazed grassland bordering fields with grassy access paths. The worst subsites were 10, 14 and 16, all outside the SSSI. The total target taxa recorded within Maelienydd SSSI in 2011 was 49, rising to 56 when the small areas of common land currently outside the SSSI were included.

Table 2.2 Maelienydd SSSI and Maelienydd Common Survey Results 2011

Maelienydd Common SSSI	SSSI Site CHEG: C H E G D																
	11 23 11 3 1																
Maelienydd Common (non-SSSI subsites):	7 17 8 3 1																
Maelienydd Common total (SSSI + non-SSSI):	12 23 16 4 1																
<b>Target species at site (Records in green lie outside the SSSI; Red List species in bold red; R = new record for Radnorshire)</b>																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<b>Clavarioid fungi</b>																	
<i>Clavaria acuta</i>					x	x			x		x						x
<i>C. fragilis</i>									x								
<i>C. fumosa</i>									x								
<b><i>C. incarnata</i></b>														x			
<b><i>C. straminea</i></b>																	<b>R</b>
<i>Clavulinopsis corniculata</i>			x		x	x			x			x					
<i>C. fusiformis</i>	x	x	x	x	x		x	x	x		x	x	x	x			x
<i>C. helvola</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>C. laeticolor</i>		x	x						x			x		x			
<i>C. luteoalba</i>		x	x		x	x	x		x		x	x					x
<i>C. umbrinella</i>		x	x					x									
<i>Ramariopsis tenuiramosa</i>	(preliminary visit – not localized to subsite) <b>R</b>																
<b>Hygrocybe</b>																	
<i>Hygrocybe berkeleyi</i>		x															
<i>H. calyptriformis</i>				x									x				
<i>H. cantharellus</i>	x					x									x		
<i>H. ceracea</i>		x		x	x	x			x			x	x				x
<i>H. chlorophana</i>	x	x	x	x	x	x			x		x	x	x	x	x		x
<i>H. coccinea</i>	x	x		x	x	x			x			x	x		x		

<i>H. conica</i>	x	x	x	x	x	x		x	x		x		x		x	x			
<i>H. flavipes</i>					x		x												
<i>H. glutinipes</i>			x							x	x					x			
<i>H. insipida</i>		x			x	x		x			x	x		x			x		
<i>H. intermedia</i>		x																	
<i>H. irrigata</i>				x	x		x				x				x				
<i>H. laeta</i>	x	x	x	x	x		x	x	x		x	x	x	x	x		x		
<i>H. miniata</i>			x	x				x				x					x		
<i>H. mucronella</i>					x							x							
<i>H. pratensis</i>	x	x		x	x	x		x			x	x	x		x				
<i>H. psittacina</i>	x	x	x	x	x	x	x	x			x	x	x	x	x				
<i>H. punicea</i>		x		x	x						x		x		x				
<i>H. quieta</i>			x			x			x			x	x	x	x				
<i>H. reidii</i>	x	x	x	x	x	x	x	x			x	x	x	x			x		
<i>H. russocoriacea</i>			x		x	x		x	x				x			x			
<i>H. splendidissima</i>					x	x	x		x			x	x						
<i>H. virginea</i>	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x		
<b>Entoloma</b>																			
<i>Entoloma ameides</i>	(preliminary visit – not localized to subsite) x																		
<i>E. asprellum</i>	(preliminary visit – not localized to subsite) x																		
<i>E. caesiocinctum</i>							<b>R</b>												
<i>E. chalybaeum</i>									x		x								
<i>E. conferendum</i>	x		x	x	x	x	x	x			x	x	x		x		x		
<i>E. corvinum</i>						x													
<i>E. exile</i>			<b>R</b>									<b>R</b>			<b>R</b>				
<i>E. fernandae</i>					<b>R</b>												<b>R</b>		
<i>E. hebes</i>						<b>R</b>													
<i>E. jubatum</i>															<b>R</b>				
<i>E. papillatum</i>			<b>R</b>																
<i>E. sericellum</i>		x	x		x				x		x						x		
<i>E. sericeum</i>									x								x		
<i>E. serrulatum</i>						x					x								
<i>E. undatum</i>															<b>R</b>				
<b>Geoglossaceae</b>																			
<i>Geoglossum fallax</i>	x		x		x	x		x	x			x	x		x		x		
<i>G. glutinosum</i>					x								x						
<i>G. umbratile</i>						x							x						
<i>Trichoglossum hirsutum</i>						x													
<b>Dermoloma</b>																			
<i>Dermoloma cuneifolium</i>				x		x		x		x	x	x		x					
<b>Notable non-target fungal species at site</b>																			
<i>Cantharellula umbonata</i>	<b>R</b>																		
<i>Cystoderma carcharias</i>	<b>R</b>																		
<i>Omphalina galericolor</i>	<b>R</b>																		
<i>Tephroclybe tylicolor</i>	x																		
<b>Subsite CHEG values</b>																			
<b>Subsite</b>	<b>C</b>	<b>H</b>	<b>E</b>	<b>G</b>	<b>D</b>	<b>Subsite</b>						<b>C</b>	<b>H</b>	<b>E</b>	<b>G</b>	<b>D</b>			
1	3	10	1	1	-	10						1	2	-	-	1			
2	5	13	1	-	-	11						4	10	4	-	1			
3	6	10	4	1	-	12						5	13	2	1	1			



4	2	13	1	-	1	13	2	15	1	3	-
5	4	16	3	2	-	14	4	8	1	-	1
6	4	13	5	3	1	15	1	12	3	1	-
7	3	7	1	-	-	16	1	3	-	-	-
8	3	8	2	1	1	17	5	7	4	1	-
9	8	12	2	1	-						

### 2.3.2 Coxhead Bank Common

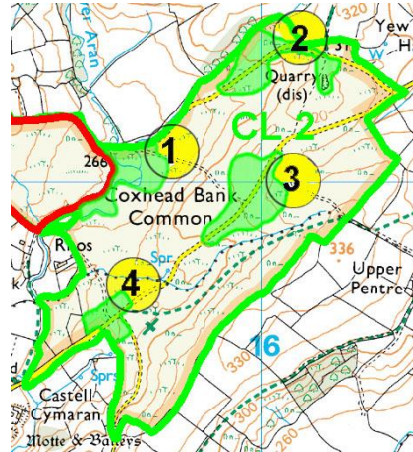


Figure 2.2 Coxhead Bank Common subsite locations (shaded green)

Coxhead Bank Common is a sweeping northwest facing slope of largely open acid grassland with only a few scattered areas of gorse but some extensive areas of bracken. Areas of wet or marshy grassland are few and most of the site appears highly suitable for waxcap-grassland fungi. Two roads cross the perimeter of the common and as with Maelienydd these provide narrow corridors where base-loving species like *Hygrocybe russocoriacea* and *Clavulinopsis corniculata* occur. The disused quarry area to the north east is also of interest, being the only place where White Spindles *Clavaria fragilis* was recorded.

In the southwest corner of the common near subsite 4, however, conditions are less favourable for waxcap fungi. In the vicinity of The Rhos the land appears to have had its topsoil removed and have been reseeded in the recent past whilst an area shown by CCW's boundary to be part of the common is now fenced off as a field. The latter however is largely wet grassland and unlikely to be suitable for waxcap fungi.

The whole area is sheep-grazed with sward height in the main fairly short (2-6cms ) and favourable for the support of target fungi. Most of Coxhead Bank Common with the exceptions noted above, would have been suitable for survey had time allowed. Certainly the concentration of fruiting bodies observed here was much higher than at any other site.

There were no areas of burning as gorse was minimal although bracken control in the form of mowing had occurred at the western end and may periodically have been used to control its spread elsewhere on the site. This is a positive management strategy for waxcap-grassland fungi.

The common is open access land but as it is a remote rural area any disturbance from day-to-day amenity use is not high. Such use seems to be concentrated around the stream bordering subsite 1 where one or two vehicles were often seen parked or being driven over the grass to the ford. On one weekend visit a large hunt was in progress across Coxhead Bank Common with approx 15-20 four-wheel-drive vehicles parked or driving over the common and numerous men on foot. By afternoon the hunt had moved elsewhere and the area was then free to be surveyed for fungi. As conditions were relatively dry, there was very little evidence of damage to the sward by vehicles and only minimal litter.

Waxcap-grassland interest appeared well distributed throughout Coxhead Bank Common with the exception of subsite 4 near the reseeded area which was particularly poor with only 10 target taxa. Subsite 2 was the best subsite of all four areas of common land surveyed with 34 target taxa. Subsites 1, 2 and 3 all had higher counts than any of the subsites on Maelienydd (both SSSI and non-SSSI). The total number of target taxa for Coxhead Bank Common was 45.

**Table 2.3** Coxhead Bank Common Survey Results 2011

Coxhead Bank Common					Site CHEG: C H E G D Cam				
					9	22	9	4	- 1
<b>Target species at site (Red List species in bold red; R = new record for Radnorshire; W = new record for Wales)</b>									
<b>Clavarioid fungi</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<i>Clavaria acuta</i>		x			<i>H. psittacina</i>	x	x	x	x
<i>C. fragilis</i>		x			<i>H. punicea</i>	x			
<i>Clavulinopsis corniculata</i>	x	x	x	x	<i>H. quieta</i>	x	x	x	
<i>C. fusiformis</i>	x	x	x	x	<i>H. reidii</i>	x	x	x	x
<i>C. helvola</i>	x	x	x		<i>H. russocoriacea</i>		x		
<i>C. laeticolor</i>	x				<i>H. splendidissima</i>	x	x	x	
<i>C. luteoalba</i>		x	x		<i>H. virginea</i>	x	x	x	x
<i>C. umbrinella</i>	x		x		<b>Entoloma</b>				
<i>Ramariopsis kunzei</i>		x			<i>Entoloma conferendum</i>	x	x	x	x
<b>Hygrocybe</b>					<i>E. corvinum</i>		x		
<i>Hygrocybe berkeleyi</i>	x	x			<i>E. exile</i>		<b>R</b>		
<i>H. calyptriformis</i>			x		<i>E. hebes</i>		x		
<i>H. ceracea</i>	x	x	x		<i>E. longistriatum</i>	<b>R</b>			
<i>H. chlorophana</i>	x	x	x	x	<i>E. papillatum</i>		x	x	
<i>H. coccinea</i>	x	x	x	x	<i>E. prunuloides</i>		<b>R</b>	<b>R</b>	
<i>H. conica</i>	x	x	x		<i>E. sericellum</i>	x			
<i>H. flavipes</i>		x			<i>E. solstitiale</i>		x		
<i>H. fornicata</i>			x		<b>Geoglossaceae</b>				
<i>H. insipida</i>	x	x			<i>Geoglossum fallax</i>	x	x	x	
<i>H. intermedia</i>			x		<i>G. glutinosum</i>		x		
<i>H. irrigata</i>		x	x		<i>Trichoglossum hirsutum</i>	x		x	
<i>H. laeta</i>	x	x	x	x	<b><i>T. walteri</i></b>		<b>R</b>	<b>R</b>	
<i>H. miniata</i>	x				<b>Dermoloma/Camarophyllopsis</b>				
<i>H. mucronella</i>		x	x		<i>Camarophyllopsis schulzeri</i>			<b>R</b>	
<i>H. pratensis</i>	x	x	x	x					
<b>Notable non-target fungal species at site</b>									
<i>Cantharellula umbonata</i>	<b>R</b>				<i>Stropharia inuncta</i>		<b>R</b>		

Subsite CHEG values													
Subsite	C	H	E	G	D	Cam	Subsite	C	H	E	G	D	Cam
1	5	15	3	2	-	-	3	5	16	3	3	-	1
2	7	17	7	3	-	-	4	2	7	1	-	-	-

### 2.3.3. Littlehill Common

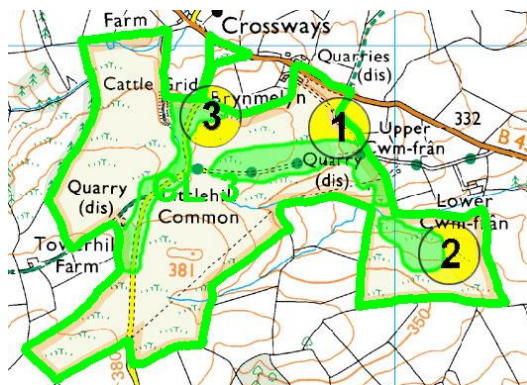


Figure 2.3 Littlehill Common subsite locations (shaded green)

Littlehill Common is largely composed of wet or marshy grassland and dense gorse scrub, neither being suitable for waxcap-grassland fungi. Apart from the roadside verges, the area to the west of the road that dissects the site was not surveyed at all, being mainly wet grassland. The field area around subsite 2 is in part also wet grassland. Subsite 3 is entirely roadside verges with an interesting concentration of blue-toned *Entoloma* (*Leptonia*) species on the eastern bank to the south of the cattle grid and a small concentration of *Hygrocybe* species, including the Pink Waxcap *Hygrocybe calyptriformis*, to the west at the southern edge of the subsite.

Littlehill Common is grazed by both sheep and ponies on the eastern side of the road mainly in the drier part in and around subsite 1. There is quite dense gorse scrub in this area, making much of it unsuitable for survey. There is no evidence of burning or mowing to control vegetation, but there were numerous deeply rutted tracks across the common, some leading to the disused quarry which is being used for fly-tipping.

The best subsite with 27 taxa was subsite 3 along the banks and verges flanking the road whilst the poorest was the field to the south east (subsite 2) with only 12 target fungi. A total of 36 target taxa were recorded from Littlehead Common.

Table 2.4 Littlehill Common Survey Results 2011

Littlehill Common			Site CHEG: C H E G D								
			5 18 8 5 -								
Target species at site (Red List species in bold red; R=new record for Radnorshire)											
Clavarioid fungi	1	2	3		1	2	3				
<i>Clavaria acuta</i>			x	<i>H. reidii</i>	x	x	x				
<i>Clavulinopsis corniculata</i>	x		x	<i>H. russocoriacea</i>			x				
<i>C. fusiformis</i>	x			<i>H. splendidissima</i>	x	x					
<i>C. helvola</i>	x	x	x	<i>H. virginea</i>	x		x				
<i>C. luteoalba</i>	x	x	x	<b>Entoloma</b>							
<b>Hygrocybe</b>				<i>Entoloma anatinum</i>			x				
<i>Hygrocybe calyptriformis</i>			x	<i>E. chalybaeum</i>			x				
<i>H. ceracea</i>	x			<i>E. conferendum</i>	x		x				
<i>H. chlorophana</i>	x	x	x	<i>E. kervernii</i>			<b>R</b>				
<i>H. coccinea</i>	x	x	x	<i>E. prunuloides</i>			x				
<i>H. conica</i>	x	x	x	<i>E. sericellum</i>			x				
<i>H. flavipes</i>	x			<i>E. sericeum</i>			x				
<i>H. insipida</i>			x	<i>E. turbidum</i>	<b>R</b>						
<i>H. lacmus</i>	x			<b>Geoglossaceae</b>							
<i>H. laeta</i>	x	x	x	<i>Geoglossum fallax</i>			x				
<i>H. miniata</i>			x	<i>G. glutinosum</i>			x				
<i>H. pratensis</i>	x	x	x	<i>G. umbratile</i>			x				
<i>H. psittacina</i>	x	x	x	<i>Trichoglossum hirsutum</i>			x				
<i>H. punicea</i>		x		<b><i>T. walteri</i></b>			<b>R</b>				
<i>H. quieta</i>	x		x								
Subsite CHEG values											
Subsite	C	H	E	G	D	Subsite	C	H	E	G	D
1	4	13	2	-	-	3	4	13	6	4	-
2	2	9	-	1	-						

### 2.3.4 Llwynpentre Bank Common

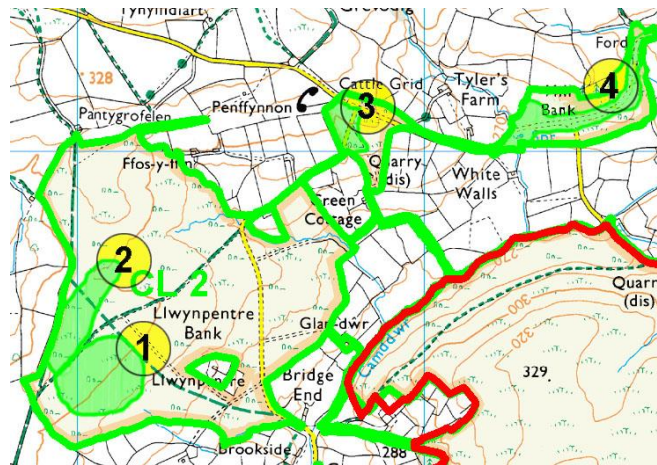


Figure 2.3 Llwynpentre Bank Common subsite locations (shaded in green)

The area termed Llwynpentre Bank Common in this survey not only includes the large area of common land to the west (Llwynpentre Bank, subsites 1 and 2), but two small disjunct areas of common to the east ( subsites 3 and 4) joined by narrow roadside corridors. Much of the common surrounding subsites 1, 2 and 4 is composed of wet to marshy grassland of low interest for waxcap-grassland fungi and has not been included in the survey. The roadside corridors between the three areas of common were surveyed once but not included further due to the complete absence of any target fungi.

Much of the drier areas on the western common (around subsites 1 and 2) is composed of poor quality rank grassland with a high accumulation of dung and large patches of nettles and thistles though the sward is relatively short. This concentration of dung is probably a result of sheep feeding stations situated near the cattle grid on the western edge. As a result, subsite 1 to the south of the unmetalled track was poor in target species, even along the track edges and the disused quarry area, and despite its short, dry sward. Subsite 2 is the only area on this section of common that has any value for target grassland fungi and these are concentrated along a grassy track or ride that runs parallel to the western field boundary fringing the common land.

The common surrounding subsite 3 is less heavily grazed by sheep and has a more acceptable concentration of dung. North of the road dissecting the site is an area of grassland with short sward (1-6cms) that is particularly suitable for waxcap fungi. Much of the area to the south is dense gorse, with some short grass along the roadside verge and the disused quarry. The presence of species such as *Hygrocybe russocoriacea* indicates a less acid area of grassland.

The eastern area of common land surrounding subsite 4 is mainly wet grassland with some sheep grazing, especially along the roadside verges and on the drier areas. Sward height is shortest (1-3 cms) along the roadside corridors and longest (upto 15 cms) near gorse and bracken.

The bank to the east overlooking Ddol chicken farm had the highest number of target species (approximately 12 *Hygrocybe*) including the Crimson Waxcap *Hygrocybe punicea* which is often cited as an indicator of good quality waxcap-grassland habitat. As this is the closest survey site to any of the three chicken farms in the area this would appear to indicate that target fungi are able to fruit in close proximity to such enterprises. However without baseline data to compare fungal diversity before and after the existence of the chicken farm it is not possible to

determine if any deterioration has occurred. Any adverse affects would presumably arise from nitrification, as a result of venting the sheds or through runoff. In either case, this would only be likely to affect habitat quality in areas that are immediately adjacent. As yet, however, there has been no published scientific research into any effects such venting or runoff might have.

The highest number of target species was recorded in subsite 4 with a total of 23 taxa and the worst in subsite 1 with just 2 target species. As a whole Llwynpentre Bank Common was the poorest in target species numbers of all four areas of common land recorded as part of this survey.

**Table 2.5** Llwynpentre Bank Common Survey Results 2011

Llwynpentre Bank Common					Site CHEG: C H E G D 5 18 2 3 1						
<b>Target species at site (Red List species in bold red; R = new record for Radnorshire; W = new record for Wales)</b>											
<b>Clavarioid fungi</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		
<i>Clavaria acuta</i>			x		<i>H. psittacina</i>		x	x	x		
<i>Clavulinopsis corniculata</i>				x	<i>H. punicea</i>		x	x	x		
<i>C. fusiformis</i>	x	x	x	x	<i>H. quieta</i>				x		
<i>C. helvola</i>		x	x	x	<i>H. reidii</i>		x	x			
<i>C. luteoalba</i>				x	<i>H. russocoriacea</i>			x	x		
<b>Hygrocybe</b>					<i>H. splendidissima</i>		x	x	x		
<i>Hyg. aurantiosplendens</i>				<b>R</b>	<i>H. virginea</i>		x	x	x		
<i>H. ceracea</i>				x	<b>Entoloma</b>						
<i>H. chlorophana</i>		x	x	x	<i>Entoloma conferendum</i>		x	x	x		
<i>H. coccinea</i>		x	x	x	<i>E. querquedula</i>			<b>R</b>			
<i>H. conica</i>			x		<b>Geoglossaceae</b>						
<i>H. glutinipes</i>				x	<i>Geoglossum fallax</i>			x	x		
<i>H. insipida</i>				x	<i>Trichoglossum variabile</i>			x			
<i>H. laeta</i>	x	x	x	x	<b><i>T. walteri</i></b>				<b>R</b>		
<i>H. miniata</i>			x	x	<b>Dermoloma/Camarophyllopsis</b>						
<i>H. persistens</i>			<b>R</b>		<i>Dermoloma cuneifolium</i>			x	x		
<i>H. pratensis</i>		x	x	x							
<b>Notable non-target fungal species at site</b>											
<i>Arrhenia griseopallida</i>	<b>R</b>				<i>Stropharia albonitens</i>			<b>W</b>			
<b><i>Omphalina galericolor</i></b>	<b>R</b>										
<b>Subsite CHEG values</b>											
<b>Subsite</b>	<b>C</b>	<b>H</b>	<b>E</b>	<b>G</b>	<b>D</b>	<b>Subsite</b>	<b>C</b>	<b>H</b>	<b>E</b>	<b>G</b>	<b>D</b>
1	1	1	-	-	-	3	3	13	2	2	1
2	2	9	1	-	-	4	4	15	1	2	1

### 3 DISCUSSION

#### 3.1 Conservation assessment of waxcap-grasslands

A number of different methods for gauging the conservation value of waxcap -grasslands have been suggested and reports elsewhere often appear to relish developing new variants, some unduly complex. In any comparison of sites it is therefore important to measure like against like using a similar system, though the actual system used is less important (Evans 2003). If the same dataset is analysed using a range of comparative systems, whether straight species counts (Rald 1985) or weighted counts (Jordal 1997, Vesterholt et al. 1999 and McHugh et al. 2001), studies show the general trend of the outcome is broadly similar. Top known sites remain top sites although there may be some slight jockeying of rankings at local, national or international level (Boertmann 1995, McHugh et al. 2001). However this still leaves potential problems in site designation for those sites further down the rankings which are effectively near the cutoff point for declaration. A well-defined and easy-to-use system of CHEG indicator species which is adopted by all is the best way forward for conservation assessment of waxcap-grasslands.

In the UK, *Hygrocybe* species (waxcaps) are the best-known and best-recorded group amongst the CHEG target taxa. The most widely used system to assess sites for them is that devised by Rald (1985) and adapted by Vesterholt et al. (1999), as set out in Table 3.1.

**Table 3.1** Waxcap assessment of Rald (1985) as adapted by Vesterholt (1999)

Conservation value	Single visit <i>Hygrocybe</i> count	Cumulative <i>Hygrocybe</i> count
Internationally important	15(?)+	22+
Nationally important	11-14	17-21
Regionally important	6-10	9-16
Locally important	3-5	4-8
Of no importance	1-2	1-3

A high species counts for any single CHEG target group generally confirms the conservation importance of the site for that group. High species counts for more than one target group therefore raise the conservation profile of the site further.

In general, especially where several recorders of varying experience have been involved and historical records have been assessed (as at Maeliennydd SSSI and adjacent common land), a species count for *Hygrocybe* is more reliable as a conservation yardstick than a species count for other CHEG taxa. This is because the other groups, especially *Entoloma*, contain species that are more difficult to identify and a count is therefore more subject to bias introduced by recorder expertise.

Nonetheless it is still important when making decisions about the conservation importance of sites to take into account all CHEG groups in the assemblage, where possible, not just *Hygrocybe*. Independent conservation criteria for assessing these other groups are in their infancy but one suggestion for judging site importance (Evans 2003) gives the following CEG species counts as national thresholds: C 7+, E 15+ and G 4+. Ranking sites at county or national level using simple cumulative totals of target taxa is also a useful device although both methods are likely to be less stable in the long term than assessments for *Hygrocybe*.

Evidence (Newton et al. 2003) also indicates that sites important for one group are not necessarily important for another. Sites selected for conservation attention should not be based solely on top sites for *Hygrocybe* but should have a flexible approach to include best sites for individual CHEG fungi as well as sites with predominantly specialised habitats such as acid grassland and heath as at Maelienydd and commons. In these cases overall CHEG numbers are always lower than at sites with mixed ecosystems like acid grassland overlying limestone, especially where land is disturbed by human activity such as quarrying (Evans 2003).

For comparative purposes approximate Welsh rankings of the sites surveyed are given below and are based on CHEGD data extrapolated from the most recently published data (Griffith et al. 2006) and updated using FRDBI and individually held data.

It should also be stressed that year-to-year comparison of fungal fruiting is only of real scientific value over a long term period and continued monitoring of sites of conservation value is strongly recommended to ensure their continued habitat quality.

### 3.2 Maelienydd and satellite commons 2011

**Table 3.2** Waxcap-grassland Taxa Summary of Maelienydd SSSI and satellite commons

<b>2011 Survey Summary</b>							
	<b>TOTAL</b>	<b>C</b>	<b>H</b>	<b>E</b>	<b>G</b>	<b>D</b>	<b>Cam</b>
<b>Maelienydd SSSI</b>	<b>49</b>	<b>11</b>	<b>23</b>	<b>11</b>	<b>3</b>	<b>1</b>	<b>-</b>
Maelienydd Common (non SSSI subsites)	36	7	17	8	3	1	-
Maelienydd Common (SSSI + non SSSI)	56	12	23	16	4	1	-
<b>Maelienydd Common ( above+ 01,04,05)</b>	<b>59</b>	<b>13</b>	<b>24</b>	<b>18</b>	<b>4</b>	<b>1</b>	<b>-</b>
<b>Coxhead Bank Common</b>	<b>45</b>	<b>9</b>	<b>22</b>	<b>9</b>	<b>4</b>	<b>-</b>	<b>1</b>
<b>Littlehill Common</b>	<b>36</b>	<b>5</b>	<b>18</b>	<b>8</b>	<b>5</b>	<b>-</b>	<b>-</b>
<b>Llwynpentre Bank Common</b>	<b>29</b>	<b>5</b>	<b>18</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>-</b>



### 3.2.1 Maelienydd SSSI and adjacent common land

SSSI = C 11 H23 E11 G3 D1  
 SSSI incl common = C12 H23 E16 G4 D1

Based on Rald's scale of assessment (Table 3.1), the 2011 survey results indicate that Maelienydd SSSI is "a site of international importance" for *Hygrocybe* species with 23 species recorded on cumulative visits. The presence of 11 clavarioid fungi suggest it is also a site of at least national importance for this group of fungi (international comparisons do not yet exist).

The additional 5 subsites outside but adjacent to the SSSI surveyed (6,10,14,15, and16) did not alter the total number of *Hygrocybe* species at Maelienydd Common, with subsites 6 and 15 having the highest numbers (13 and 12 respectively). However this evaluation changes when *Entoloma* species are taken into account, the addition of subsites 6 and 15 increasing the total for Maelienydd as a whole from 11 to 16, making it a site of national importance for these fungi. Given the expectation of further records from *Entoloma* hotspots in subsequent years it would seem appropriate to consider incorporating subsites 6 and 15 within the SSSI.

Although Maelienydd SSSI does not rank so highly for its *Hygrocybe* numbers as many sites in Wales and bearing in mind it is a predominantly acid grassland where a number of acid intolerant species will not occur, it is still amongst the top 20 based on all the data available. In addition, it is well within the top ten *Entoloma* sites in Wales and also amongst the top five clavarioid sites in the country.

Three Red Data List species were recorded at Maelienydd together with 10 species new to the county. *Ramariopsis tenuiramosa* and *Entoloma fernandae* were 2<sup>nd</sup> Welsh records and *Tephrocybe tylicolor* was a 3<sup>rd</sup> Welsh record.

Evaluation of all its CHEGD fungi data (including subsites currently outside the SSSI) places Maelienydd Common amongst the top ten waxcap-grassland sites in Wales with 59 target taxa. This places it on a par with Garn Ddyrys on the Bloreng and well above sites like Mynydd Llangattock SSSI, Gilfach Farm SSSI, and Llanishen & Lisvane Reservoirs SSSI. As the latter was notified as a SSSI solely on the basis of its waxcap-grassland mycota, this would strongly suggest that the mycota at Maelienydd SSSI should also qualify as a notifying feature.

Radnorshire is relatively under-recorded for larger fungi, with only a few sites like Gilfach Farm SSSI and Elan Valley with any appreciable waxcap-grassland records and these not on a systematic basis. In ecological terms probably the most similar site with any records is Begwns Common which is an acid upland grassland that has had some incidental recording with a total of 14 *Hygrocybe* species to date.

Management issues to benefit mycological interest at Maelienydd SSSI which require priority currently include:

1. Maintenance of adequate grazing without allowing excessive concentrations of sheep to build up long-term in one area as this could raise nutrient levels and adversely affect waxcap-grassland fungi.
2. Monitoring of burn sites to ensure known hotspots of fungal fruiting are not burnt and ideally implementing further surveys of recently burnt sites to monitor fruiting recovery.

3. Avoiding excessive mechanical damage to roadside verges throughout the site whether by vehicles or ditching activities especially at known fruiting hotspots as indicated by subsite surveys.

With regard to the three chicken farms in the vicinity of Maelienydd SSSI, the two furthest away from the common (Lower Croescynon and Bailey Farm) are deemed too distant to realistically pose any threat to the waxcap-grassland fungi. The nearest (Ddol Farm) is only likely to affect nutrient levels on land in close proximity either by runoff or aerial drift especially when venting the chicken sheds. However, target fungi were found fruiting in some numbers, including indicator species of quality habitat like *Hygrocybe punicea*, both in subsite 4 of Llwynpentre Bank Common the nearest surveyed site to the farm, and at Maelienydd Common SSSI subsite 13 which overlooks the farm. This is a positive sign that fruiting is thriving in the vicinity of Ddol Farm. However, it is not possible to state categorically that fruiting here has or has not been adversely affected as baseline data predating the chicken farm does not exist. However future survey work is recommended to monitor both these vicinities to evaluate any changes.

Further surveys of the macrofungi of Maelienydd SSSI, targeting fruiting hotspots as a minimum, is strongly recommended.

### 3.2.2. Coxhead Bank Common

**TOTAL = C9 H22 E9 G4 Cam 1**

Based on Rald's scale of assessment (Table 3.1), the 2011 survey results indicate that Coxhead Bank Common also qualifies as a site of international importance for *Hygrocybe* species with 22 species on cumulative visits. As with Maelienydd Common, its clavarioid fungi also suggest that it is a site of at least national importance (no international comparisons exist).

Although Coxhead Bank Common does not rank so highly for its *Hygrocybe* numbers as many sites in Wales, being like Maelienydd a predominantly acid grassland, it is still amongst the top 20 based on all the data available and amongst the top 15 for clavarioid fungi. One Red Data list species (*Trichoglossum walteri*) was recorded, as well as 7 species new to the county and one 2<sup>nd</sup> Welsh record (*Entoloma solstitiale*).

Coxhead Bank Common exhibited the highest concentration of target taxa of any area surveyed, with subsite 2 the best subsite of all (with 34 target taxa) and with subsites 1,2 and 3 exceeding any of the subsite totals on Maelienydd SSSI.

After only three visits, evaluation of its CHEGD fungi already places Coxhead Bank Common amongst the top 20 sites in Wales with 45 target taxa. This is only slightly less than Clydach SSSI (with 50 taxa) and Llanishen & Lisvane Reservoirs SSSI (with 51 taxa), both of which have been notified for their waxcap-grassland fungi and both of which have been surveyed on repeated occasions for over five years. Coxhead Bank Common is therefore in a strong position for notification as part of an extension to Maelienydd SSSI with fungi as a notifying feature.

Habitat condition across the subsites was in the main very favourable for waxcap-grassland fungi with the exception of the reseeded area to the west which was of low interest. There was perhaps a slight falling off in fruiting numbers on grassland to the east of the disused quarry bordering farmland possibly as a result of spray drift. Bracken management was a positive benefit and verge deterioration minimal.

Further surveys are strongly recommended to more fully assess its conservation importance.

### 3.2.3. Littlehill Common

**TOTAL = C5 H18 E8 G5 D1**

Littlehill Common qualifies at least as a site of national conservation importance for its *Hygrocybe* species based on Rald's scale with one Red Data List species (*Trichoglossum walteri*) present (subsite 2), 3 new county records, and one 3<sup>rd</sup> Welsh record (*Entoloma kervernii*). Evaluation of all its CHEGD fungi places amongst the top 30 sites for waxcap-grassland fungi in Wales with a total of 36 target fungi present.

Unlike Coxhead Bank Common, waxcap-grassland interest is restricted to just a few parts of the site, mainly on the apex of the common (subsite 1) and along the roadside verges (subsite 3). The disused quarry area to the east of subsite 1 was of interest but fly tipping made any thorough survey difficult.

Management issues include mechanical degradation of the site, both on the roadside verges and on the common itself (subsite 1), with some heavily rutted areas.

### 3.2.4 Llwynpentre Bank Common

**TOTAL = C5 H18 E2 G3 D1**

Llwynpentre Bank Common qualifies at least as a site of national conservation importance for its *Hygrocybe* based on Rald's scale. One Red Data List species (*Trichoglossum walteri*) was present, 6 species new to the county and a 2<sup>nd</sup> Welsh record (*Trichoglossum variabile*).

Evaluation of all its CHEGD fungi places it amongst the top 30 sites for waxcap-grassland fungi just below Littlehead Common with a score of 29 target taxa.

Large areas of the common were completely unsuitable for waxcap-grassland fungi either being too wet or too rank as a result of the concentration of sheep and accumulation of dung. The large area of Llwynpentre Common to the west (subsites 1 and 2) was extremely poor with only 14 target taxa whilst subsite 3 had 21 target taxa and subsite 4 abutting Ddol chicken farm had 24 target taxa.

As an integral site Llwynpentre Common had the least number of target fungi of all the sites surveyed. Further survey is only recommended on subsites 3 and 4 the latter in particular to monitor potential effects of the proximity of Ddol chicken farm.

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## 5 REFERENCES

- Boertmann, D. (2010). *The Genus Hygrocybe – 2<sup>nd</sup> revised edition: Fungi of Northern Europe - Vol. 1*. Danish Mycological Society.
- Boertmann, D. (1995). *The Genus Hygrocybe: Fungi of Northern Europe - Vol. 1*. Danish Mycological Society.
- Evans, S. (2003). *Waxcap Grasslands - an assessment of English sites*. English Nature Research Report no. 555.
- Griffith, G.W., Holden, L., Mitchel, D., Evans, D.E., Aron, C., Evans, S., and Graham, A. (2006). *Mycological Survey of selected semi-natural grassland in Wales*. Report to Countryside Council for Wales no. 743. Bangor.
- Jordal, J. B. (1997). *Sopp i naturbeitemarker i Norge. En kunnskapsstatus over utbredelse, økologi, indikatorverdi og trusler i et europeisk perspektiv., Utredning for DN 1997-6*. Direktoratet for naturforvaltning. Trondheim
- Legon, N. and Henrici, A. (2005). *Checklist of the British and Irish Basidiomycota*. Royal Botanic Gardens, Kew
- McHugh, R., Mitchel, D., Wright, M., Anderson, R., (2001). The Fungi of Irish Grasslands and their value for Nature Conservation. *Biology and Environment*, 225-243
- Newton, A., Davy, L., Holden, E., Silverside, A., Watling, R., Ward, S., (2003). *Survey of 'waxcap' Hygrocybe grasslands and compilation of species dossiers on three grasslands fungi*. Report to Scottish Natural Heritage
- Rald, E. (1985). Vokshatte som indikatorarter for mykologisk verdifulde overdrevslokalteter. *Svampe* (11), 1-9
- Rotheroe, M., Newton, A., Evans, S. and Feehan, J. (1996). Waxcap-grassland Survey. *Mycologist* **10**, 23-25
- Rotheroe, M. (1999). *Mycological survey of selected semi-natural grasslands in Carmarthenshire*. Contract Science Report No. 340. Countryside Council for Wales
- Tofts, R.J., and Orton, P.D. (1998). The species accumulation curve for agarics and boleti from a Caledonian pinewood. *Mycologist* **12**, 98-102
- Vesterholt, J., Boertmann, D. Tranberg, H. (1999). et usædvanlig godt år for overdrevssvampe. *Svampe* **40**, 36-44



## APPENDIX 1: IDENTIFICATION LITERATURE CONSULTED

Arnolds, E., (1990) *Hygrocybeae* (Kuhner) Bas & Arnolds. In *Flora Agaricina Neerlandica* Vol.2. pp. 70-115. Rotterdam

Boertmann, D. (2010). *The Genus Hygrocybe – 2<sup>nd</sup> revised edition: Fungi of Northern Europe - Vol. 1.* Danish Mycological Society.

Boertmann, D. (1995) *The Genus Hygrocybe: Fungi of Northern Europe - Vol. .* Danish Mycological Society

Henrici, A., (1996) *Keys to grassland species of Leptonia s.l.* British Mycological Society

Henrici, A., (1997) *Keys to British Clavariaceae.* British Mycological Society

Noordeloos, M.E., (1988) *Entolomataceae Kotl. & P.* In *Flora Agaricina Neerlandica. Vol. 1.* pp. 77-182. Rotterdam

Noordeloos, M.E. (1992) *Entoloma, s.l. (Fungi Europaei 5).* Libreria editrice Giovanna Biella. Saronno

Noordeloos, M.E., (2004) *Entoloma, s.l. supplemento. (Fungi Europaei 5a).* Candusso

Roberts, P. (2007) Black and Brown *Clavaria* Species in the British Isles. *Field Mycology* **8(2)** pp. 59-62. Elsevier

Roberts, P. (2005) *Provisional Key to Clavarioid Fungi in British Grasslands.* Unpublished from Grassland Fungi Workshop. British Mycological Society

Spooner, B.M. (2005) *British Geoglossaceae: checklist and provisional keys.* Unpublished from Grassland Fungi Workshop. British Mycological Society

Vesterholt, J., - 2002: *Contribution to the knowledge of species of Entoloma subgenus Leptonia. Fungi non delineati ParsXXI.* Candusso