

Mycological Survey of Mynydd Epynt Ranges, Sennybridge, Powys

S.E. Evans and P.J. Roberts

NRW Evidence Report No 176

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Crynodeb Gweithredol

Mae bron i 20 mlynedd ers i'r casgliad o facroffyngau glaswelltir, nad oedd yn adnabyddus iawn cyn hynny, gael ei ddwyn i sylw cadwraethol yn y DU gyntaf yn dilyn lansio arolwg glaswelltir-capiau cŵyr (Rotheroe *et al.* 1996) gan Gymdeithas Mycolegol Prydain (*British Mycological Society* / BMS). O ganlyniad uniongyrchol i hyn, mae cryn ddiddordeb cadwraethol bellach yn cael ei ffocysu ar yr hyn a adnabyddir fel y "ffyngau CHEG" (y rhywogaethau 'clavarioid', *'Hygrocybe', 'Entoloma'* a 'geoglossoid') ac, yn benodol, aelodau'r grŵp cydrannol rhwyddaf i'w hadnabod, sef y capiau cŵyr (*Hygrocybe*). Mae glaswelltir-capiau cŵyr rhywogaethau CHEG a ffyngau cysylltiedig (*Dermoloma, Porpoloma* a *Camarophyllopsis*) yn byw ar laswelltir sydd wedi ei wella'n rhannol ac sydd heb fawr ddim maetholion yng ngogledd-orllewin Ewrop. Ar hyn o bryd mae glaswelltir-capiau cŵyr Cymru ar ben y rhestr o safleoedd glaswelltir-capiau cŵyr y DU ac maent yn cael eu hystyried ymhlith y gorau yn Ewrop. Mae hyn yn golygu bod gan Gymru lefel ryngwladol digyffelyb o gyfrifoldeb cadwraeth am ffyngau glaswelltir-capiau cŵyr.

Prif nod yr astudiaeth hon yw darparu arolwg systematig o'r mycota glaswelltir-capiau cŵyr sy'n bresennol mewn ardaloedd addas o laswelltir sur, sych yn bennaf, ar Fynydd Epynt (ac eithrio'r Ardal Effaith) ac i ddarparu asesiad cadwraethol cychwynnol ar gyfer yr ardaloedd ble cynhaliwyd yr arolygon. I gyflawni hyn, cynhaliwyd arolygon ychwanegol mewn 46 is-safle dethol, yn cwmpasu oddeutu 25% o'r glaswelltir addas ar draws y mynyddoedd, dros gyfnod o dair blynedd rhwng 2012 a 2014.

Mae asesiad cadwraethol cychwynnol, yn seiliedig ar y canlyniadau hyn, yn dangos nid yn unig bod Mynydd Epynt yn ei gyfanrwydd yn safle o bwysigrwydd cadwraethol rhyngwladol ar gyfer rhywogaethau *Hygrocybe*, ond hefyd bod 11 o'r 46 is-safle (yn cynnwys SoDdGA Disgwylfa) o bwys rhyngwladol, yn eu rhinwedd eu hunain. Dengys asesiad sy'n defnyddio Canllawiau JNCC ar gyfer Dethol SoDdGA Biolegol, bod dros 60% o'r is-safleoedd (29 o 46) yn cyflawni un neu fwy o'r criteria canllaw ar gyfer cael eu hystyried ar gyfer statws SoDdGA, ar sail eu ffyngau glaswelltir-capiau cŵyr. O'r rhain, mae saith cystal â neu'n well nag Is-safle 39 (Disgwylfa), sydd eisoes wedi ei ddynodi'n SoDdGA am ei gasgliad o laswelltir-capiau cŵyr.

At hynny, gyda chyfanswm o 98 o rywogaethau CHEG wedi eu cofnodi, Mynydd Epynt yw'r safle gorau ar gyfer ffyngau glaswelltir-capiau cŵyr nid yn unig yng Nghymru, ond y gorau ar draws y DU gyfan a, cyn belled ag y gwyddom, y gorau yn Ewrop.

Mae argymhellion rheoli penodol i safle ar is-safleoedd sy'n cyflawni safonau SoDdGA yn cynnwys: a) atal pob defnydd o gerbydau trymion oddi ar y ffordd / llwybr, atal gwaith agor ffosydd a lledu ffyrdd yn enwedig ar ymylon ffyrdd sy'n gyfoeth o laswelltir-capiau cŵyr; b) peidio â gosod unrhyw seilwaith hyfforddi newydd fel safleoedd tanio, tyllau ymochel, coed neu berthi; c) peidio â chwalu gwrtaith neu stopio unrhyw arferion porthi allai beri difrod (fel porthi gyda silwair, gwair neu blociau porthi) ar is-safle neu o fewn clustogfa addas, ac ch) stopio defnyddio unrhyw chwynladdwyr neu blaladdwyr ar is-safle neu o fewn clustogfa addas. Nid oes unrhyw dystiolaeth bod gweithgareddau hyfforddi personél milwrol sydd ddim yn defnyddio cerbydau'n cael unrhyw effaith negyddol ar y ffyngau dan sylw.

Dylid cyflawni pob strategaeth rheoli gadarnhaol gyffredinol ar gyfer ffyngau glaswelltircapiau cŵyr trwy Fynydd Epynt, yn cynnwys cynnal y patrymau lefel pori cyfredol ac osgoi defnyddio cemegau. Argymhellir yn gryf y dylid parhau i fonitro a chynnal arolygon cyfnodol ar safle sydd â'r potensial i fod yn safle o bwysigrwydd byd-eang.

Executive Summary

It has been nearly 20 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" (clavarioid, *Hygrocybe, Entoloma* and geoglossoid species) and in particular the most easily identified component group, the waxcaps (*Hygrocybe*). Waxcap-grassland CHEG species and associated fungi (*Dermoloma, Porpoloma* and *Camarophyllopsis*) inhabit nutrient poor semi-improved grassland in northwestern 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 in the Mynydd Epynt Ranges (excluding the Impact Zone) and to provide an initial conservation assessment for the areas surveyed. To achieve this, repeat surveys were undertaken in 46 selected subsites, covering approximately 25% of the suitable grassland across the ranges, over a three-year period between 2012 and 2014.

An initial conservation assessment based on these results shows not only that the Mynydd Epynt Ranges are collectively a site of international conservation importance for their *Hygrocybe* species, but also that 11 of the 46 subsites (including Disgwylfa SSSI) are individually of international importance. Assessment using JNCC Guidelines for the Selection of Biological SSSIs show that over 60% of the subsites (29 of 46) meet one or more of the guideline criteria for consideration for SSSI status on the basis of their waxcap-grassland fungi. Of these seven are on a par with or better than Subsite 39 (Disgwylfa) which is already notified as a SSSI for its waxcap-grassland assemblage.

Furthermore, with a total of 98 CHEG species recorded, the Mynydd Epynt Ranges are collectively not only the best site for waxcap-grassland fungi in Wales, but the best in the whole of the UK and as far as is known the best in Europe.

Site specific management recommendations at subsites meeting SSSI standards include: a) ceasing offroad/track use of all heavy vehicles, ditching and road widening activities especially at road verges rich in waxcap-grassland fungi; b) ceasing placement of any new training infrastructure such as firing positions, dugouts, trees or hedges; c) ceasing application of fertiliser or potentially damaging feeding practices (such as foddering with silage, hay or feed blocks) on a subsite or within a suitable buffer zone, and d) ceasing application of all herbicides or pesticides on a subsite or within a suitable buffer zone. There is no evidence that non-vehicular military personel training activities have any negative impact on the target fungi.

All generic positive management strategies for waxcap-grassland fungi should be followed throughout Epynt Ranges including maintaining current grazing level patterns and avoiding chemical applications. Continued periodic survey and monitoring is highly recommended at such a potentially world-class site.

1 Introduction

1.1 Aims

To provide a systematic survey of the waxcap-grassland mycota present in suitable areas of unimproved grassland on the Mynydd Epynt ranges (excluding the Impact Zone). Additionally, to provide an initial conservation assessment for the areas surveyed as well as an assessment of the effectiveness of the current management regime and any risks posed to the fungal interest from other sources.

1.2 Selection of Sample Subsites

The Mynydd Epynt Ranges contain a very large area of grassland (estimated at some 1500 ha) potentially suitable for waxcaps and associated grassland fungi. For the current project, sample subsites together totalling approximately 372 ha were surveyed for target species. It should therefore be emphasised that this survey only provides an initial minimum guideline to the extent of fungal interest in the ranges.

The first 40 subsites were selected based on areas of grassland previously identified as being of potential interest in the summary report by Woods (2010). Maps were provided outlining these potentially interesting areas and almost all were surveyed in whole or in part (except those lying entirely within the Impact Zone). These subsites included the single SSSI component currently notified for its waxcap-grassland fungi (subsite 39, Disgwylfa) and four additional areas considered to meet SSSI standards but not currently notified (subsites 16, 25, 31, and 38). A further six subsites deemed of potential interest by the surveyors were also added, making 46 subsites in total. The location of the subsites within the ranges is shown in the area maps (Figs 1.1 & 1.2). The approximate boundaries of each subsite, together with the subsite number, are shown on the site maps (Figs 3.1 to 3.46).

The sites surveyed were composed of a variety of habitats including acid grassland, neutral to basic grassland, dry and marshy grassland (including flushes), old grassy hedgebanks, ditches, and roadside verges.

1.3 Target Waxcap-Grassland Fungi

Target waxcap-grassland fungi for this survey included all species of *Hygrocybe*, the clavarioid fungi, the geoglossoid fungi, *Dermoloma* (with *Camarophyllopsis* and *Porpoloma metapodium*), and grassland *Entoloma* following the list first proposed by McHugh *et al.* (2001) and adopted by the CCW survey of semi-improved grasslands in Wales (Griffith *et al.* 2006). Non-target taxa were only noted as time allowed and at no detriment to the main target species. Amongst these, priority was given to easily identifiable species associated with grassland and more difficult but rarely recorded species likely to be of conservation interest, new to the county or to Wales.



Figure 1.1 Map of Mynydd Epynt Ranges (western side) showing numbered and circled subsite locations



Figure 1.2 Map of Mynydd Epynt Ranges (eastern side) showing numbered and circled subsite locations

1.4 Conservation Assessment

Initial assessment of the value of the subsites, collectively and individually, for waxcapgrassland fungi was made using standard published protocols based on numbers of species recorded. This allows grassland areas to be graded according to their importance (or lack of it) at regional, national, and international (European) levels (section 4.1). Additionally, subsites were compared with other waxcap grasslands in Powys, in Wales, and in the United Kingdom (section 4.2).

A separate assessment was made using JNCC's published Guidelines for the Selection of Biological SSSIs: Grassland Fungi (Genney *et al.* 2009), which provides guideline criteria for assessing sites based on the number of target waxcap-grassland species present (section 4.1).

1.5 Management Assessment and Potential Threats

Routine range management affecting waxcap-grassland fungi was observed and assessed. In addition to the technical tender specification the surveyors were asked to informally assess the effects of using eco-friendly herbicide sprays on thistles and aerial spraying of bracken (section 4.3).

Potential threats to the continued presence of target fungi were assessed, both in general terms (section 4.4) and at specific subsites (section 3.3).

2 Methodology

2.1 Subsite Visits

Subsites were visited over a three-year period (2012-2014) during the autumn, when the majority of fungi produce fruitbodies. Timing of site visits was at surveyor discretion (in liaison with the relevant MOD staff) to maximise recording of target species. In year one field visits commenced as soon as the contract was awarded, starting on the 22nd October and finishing on 17th November 2012. In year two visits started on 1st October and were completed by 16th November 2013. In year three visits started on 27th September and finished on 20th November 2014.

Excepting some of the least promising subsites (27, 37, 40, 41, 42, and 43), each subsite was visited at least three times during the survey period, with all the better subsites receiving at least six visits.

2.2 Field Methodology

In order to record the species present as fully as possible an intensive walk-over approach was adopted based on that recommended by the British Mycological Society waxcapgrassland 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.

Field records were made on site and were supported, where necessary, by additional notes and photographs. GPS readings were also taken at each subsite.

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 Fungarium at the Royal Botanic Gardens, Kew.

2.3 Records

Records were made individually for all subsites 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 British Mycological Society. These records will in due course also be shared with the Biodiversity Information Service for Powys (BIS) and the FRDBI, which in turn shares data with the National Biodiversity Network (NBN).

Species names follow those used in the 'Checklist of the British and Irish Basidiomycota' (Legon & Henrici 2005) and subsequent updates found at www.basidiochecklist.info. For the geoglossoid fungi (Ascomycota), species names follow those given in Spooner (2005).

In addition to this written report NRW has been provided with data in electronic format in the form of an Excel spreadsheet of all fungal records for this survey as outlined above.

3 Results

3.1 Target Species

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 survey 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 straightforward approach commonly used in the UK to summarize the different groups of target waxcap-grassland fungi at sites is the "CHEG" system (an acronym for clavarioid fungi, *Hygrocybe, Entoloma*, and geoglossoid fungi) adapted from Rotheroe (1999). The clavarioid fungi (also known as club and coral fungi) comprise grassland species of *Clavaria, Clavulinopsis*, and *Ramariopsis*; the geoglossoid fungi (also known as earthtongues) comprise grassland species of *Geoglossum, Microglossum*, and *Trichoglossum*; also included within the CHEG (or CHEGD) system are species of *Dermoloma, Camarophyllopsis*, and *Porpoloma metapodium*.

It should be noted that for the purpose of this report CHEGD numbers only include counts of species and not subspecies, varieties or forms, with the sole exception of the pale waxcap *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.).

Since the current survey covered a three-year period, the results are more robust than for a single-year survey. Table 3.1 lists the number of target species recorded for all Epynt subsites in each survey year. Had the survey been limited to one year (2012), it is clear from this table that more than half the target species would have been missed which emphasizes the need for surveys over several years.

Year	Clavarioid	Hygrocybe	Entoloma	Geoglossoid	Dermoloma	Total
2012	13	25	2	5	1	46
2013	14	30	29	6	5	84
2014	14	30	25	8	4	81
Total	15	34	34	8	6	97

Table 3.1 Total numbers of target species recorded during each year of the 2012-2014 survey

A previous survey of two sample sites ("A" and "B") was undertaken in November 2002 (Rotheroe 2003a). Site A comprised the current Subsite 20, part of Subsite 16 east of the Tirabad road, and part of Subsite 19. Site B comprised most of the current Subsite 7, part of Subsite 25 west of the road, and some additional fields extending to the southwest into Subsite 5. Based on current species concepts, the CHEGD total resulting from this November 2002 survey was 35 (C 5; H 22; E 4; G 3; D 1).

This and other ad hoc visits to grassland within the Mynydd Epynt Ranges (up to 2006) had produced a CHEGD total of 64 (C 10; H 33; E 12; G 7; D 2) (Woods, quoted in Griffith *et al.* 2006) prior to the current survey.

All the target taxa from these previous surveys were recorded again in the course of the present survey, except for the toasted waxcap *Hygrocybe colemanniana*, a species of base-rich grassland, recorded by R.G. Woods from Disgwylfa SSSI (Subsite 39) in 2001. The addition of this species brings the current CHEGD total for the ranges up to 98.

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.

3.2 Species Records

During the course of the 2012-2014 survey 4138 fungal records were generated, the great majority of which related to 97 target waxcap-grassland species, as noted in Table 3.1.

All the subsites surveyed contained at least some of the commoner waxcap-grassland species. The meadow waxcap *Hygrocybe pratensis* was the only target species found at all 46 subsites, but several additional species were almost as common and are probably also present at all the subsites. These include the star pinkgill *Entoloma conferendum* (42 subsites), the golden waxcap *Hygrocybe chlorophana* (44 subsites), the parrot waxcap *H. psittacina* (43 subsites), the honey waxcap *H. reidii* (41 subsites), and the snowy waxcap *H. virginea* (43 subsites).

The crimson waxcap *Hygrocybe punicea* is considered a good indicator for species-rich waxcap grasslands, since (unlike some commoner waxcap species) it is "exclusively found in grasslands where many other *Hygrocybe* species occur and which most likely have a very long continuity as grassland" (Boertmann 2010). *Hygrocybe punicea* was recorded at 70% of subsites (32 of 46).

Since most of the Mynydd Epyynt Ranges are considered to be acid grassland, it was no surprise that the heath waxcap *Hygrocybe laeta*, an indicator species for acidic conditions (Boertmann 2010), was recorded at 85% of subsites (39 of 46).

Conversely two indicator species for basic grassland, the limestone waxcap *Hygrocybe calciphila* and the toasted waxcap *Hygrocybe colemanniana* (Boertmann 2010), were not recorded during the survey, though several species with a preference for basic to neutral conditions were present at a minority of subsites. These include the earthtongue *Geoglossum cookeanum* (1 subsite), the dotted fanvault *Camarophyllopsis atropuncta* (1 subsite), the stinking fanvault *C. foetens* (3 subsites), the matt fanvault *C. schulzeri* (4 subsites), and the cedarwood waxcap *Hygrocybe russocoriacea* (17 subsites). These and other species often occur along roadside verges and banks. This "roadside corridor effect", where base-loving grassland fungi are confined to narrow strips alongside roads, has been noted at other acid grassland sites (Evans & Roberts 2012). On the Mynydd Epyynt Ranges some of these species also occur in small areas of grassland associated with basic flushes (as noted, for example, in Subsites 3, 16, and 39).

3.3 Notable Species

Two UK priority Biodiversity Action Plan (BAP) species were recorded: the dark-purple earthtongue *Geoglossum atropurpureum* (at two subsites) and the olive earthtongue *Microglossum olivaceum* (also at two subsites). Given the predominantly acid habitat, it is unlikely (though not impossible) that the remaining two BAP-listed target species, the big blue pinkgill *Entoloma bloxamii* and the date waxcap *Hygrocybe spadicea*, occur at Epynt since they prefer more basic grassland.

Three Welsh Section 42 species were recorded: the two BAP-listed species noted above plus the violet coral *Clavaria zollingeri* (at 11 subsites).

The locations of all BAP and Section 42 species are marked on the individual subsite maps.

Four target species on the current UK Red List (Evans et al. 2006) were recorded, as well as one non-target species. Eighteen target species on the current Welsh Red List (Rotheroe 2003b), as well as two non-target species, were also recorded. Names and status of these red-listed taxa are given in Table 3.2.

Table 3.2 Summary of UK and Welsh red-listed species recorded during the survey, with target taxa in shaded rows. VU = Vulnerable; EX = Extinct.

Species	UK Red List	Welsh Red List
Camarophyllopsis foetens		VU
Camarophyllopsis schulzeri		VU
Clavaria incarnata	VU	
Clavaria straminea (C. flavipes)	VU	VU
Clavulinopsis laeticolor		VU
Clavulinopsis umbrinella		VU
Entoloma asprellum		VU
Entoloma cruentatum		VU
Entoloma exile		VU
Entoloma indutoides	VU	
Entoloma lividocyanulum		VU
Entoloma mougeotii		VU
Entoloma prunuloides		VU
Geoglossum atropurpureum		EX
Geoglossum glutinosum		VU
Geoglossum umbratile		VU
Hygrocybe ovina (as H. nitiosa)		VU
Hygrocybe phaeococcinea		VU
Hygrocybe radiata		VU
Omphalina galericolor var.		VU
lilacinicolor		
Ramariopsis tenuiramosa		VU
Squamanita contortipes	EX	
Squamanita paradoxa		VU
Trichoglossum walteri	VU	

It should be noted that the Welsh Red List is in urgent need of revision as a result of new data on the frequency and distribution of macrofungi in Wales. Several species listed as vulnerable (VU) on the current Welsh Red List have now been recorded more widely as a

result of increased survey of unimproved grasslands and would be unlikely to be assessed in a threat category, notably the handsome club *Clavulinopsis laeticolor*.

Though a non-target species, the contorted strangler *Squamanita contortipes* is of particular interest since it is only the second British record of this unusual parasitic fungus. It was first recorded in Scotland in the 1950s, but has not been refound since and is on the current red list as "extinct". Dr Gareth Griffith at Aberystwyth University has obtained DNA from the Epynt specimen which has now been deposited in the Fungarium at the Royal Botanic Gardens, Kew.

Three target species and one non-target species were new Welsh records, whilst a further five species were second or third Welsh records (based on data in FRDBI). Twenty-six species were new vice-county records for Breconshire. All are listed in Table 3.3. Note that the collection of *Entoloma cocles*, listed in the second interim report as a new Welsh record, has been redetermined as *Entoloma indutoides*.

Species	New Welsh	2 nd Welsh	3 rd Welsh	New Brecon
Arrhenia baeospora		Х		Х
Arrhenia velutipes				х
Clavaria tenuipes				х
Cystoderma carcharias				Х
Dermoloma magicum				х
Entoloma asprellum				х
Entoloma caeruleopolitum	х			х
Entoloma caeruleum				х
Entoloma caesiocinctum				х
Entoloma clandestinum				х
Entoloma cruentatum				х
Entoloma cuspidiferum	х			х
Entoloma fernandae		Х		х
Entoloma indutoides				Х
Entoloma infula				Х
Entoloma kuehnerianum	х			Х
Entoloma lividocyanulum				х
Entoloma mougeotii				х
Entoloma ochromicaceum				х
Entoloma pratulense				х
Entoloma pseudoturci				х
Entoloma tibiicystidiatum		Х		х
Entoloma turbidum				х
Gamundia striatula			X	
Ramariopsis tenuiramosa				Х
Squamanita contortipes	X			X
Stropharia albonitens			х	х

 Table 3.3 Summary of new Welsh and new vice-county (Breconshire) records. Target species in shaded rows.

One target species of *Entoloma* found at four subsites does not match any known species occurring in Europe and may represent a new and undescribed taxon. It has been listed in the current report as *Entoloma* aff. *hirtipes*, but *E. hirtipes* (which it superficially resembles) is said to be a woodland species and differs in microscopic detail.

A non-target species occurring with bracken and recorded at Subsite 39 and in The Warren area most probably represents the newly described species *Tricholomopsis pteridicola* which has not yet been recorded in the British Isles. For the moment, it has been listed as *Tricholomopsis* aff. *rutilans*, a species which it closely resembles but which grows on rotten conifer wood.

3.4 Site Accounts

The 46 subsites are distributed across the ranges, as marked on the area maps (Figs 1.1 & 1.2), and vary in area from 1 to 29 ha. Table 3.4 lists the size of each subsite, gives a grid reference from within each subsite (enabling it to be relocated with the aid of the subsite maps), and provides target species totals and comparative rankings for each subsite. The subsites are outlined in red on aerial photographs in Figs 3.1 to 3.46, with any hotspots of high concentration of interest (for those subsites meriting it) outlined in yellow.

Note that the first interim report treated Subsites 29, 44, and 45 as a single large area (Subsite 29), but since the three subsites are not contiguous they have subsequently been listed separately. Both interim reports treated Subsites 9 and 46 as a single area (Subsite 9). These two sites are also not contiguous and are now listed as separate.

In the following individual subsite accounts each subsite is briefly described, its importance for waxcap-grassland fungi assessed, notable species listed, and potential threats assessed. The accompanying maps show subsite boundaries in red and (for a minority of subsites) areas of particular interest in yellow. The location of each subsite is circled in red in the inset area map (western ranges or eastern ranges). Within the subsites, the locations of Section 42 species, identified in the captions, are marked with arrows

Rankings listed for each subsite account are based on the total number of CHEGD target species rather than *Hygrocybe* species alone.

Where a reference is made to the frequency of occurrence of an individual species, the following terms are used: very rare = less than 10 Welsh sites; rare = 10-19; uncommon = 20-49; common = 50-99; very common = over 100.

Table 3.4 List of subsites with grid reference, approximate size in hectares, CHEGD species total and ranking, *Hygrocybe* species total and ranking. Top 10 CHEGD and *Hygrocybe* subsites are highlighted.

Subsite Grid Approx Total number Rank Total number	r Rank
Number Reference Size of CHEGD (out of of Hygrocyb	e (out of
(ha) target species 46) species	46)
1 SN861318 5 23 34 12	35=
2 SN871326 7 34 22= 18	21=
3 SN874331 10 51 5 22	7=
4 SN877335 11 21 36 12	35=
5 SN887348 14 44 8= 22	7=
6 SN882351 3 22 35 14	33
7 SN891353 5 41 12= 21	12=
8 SN883358 12 54 2 21	12=
9 SN869366 5 34 22= 17	24=
10 SN861365 12 27 31 17	24=
11 SN868379 5 52 3= 25	2=
12 SN876396 15 32 25= 16	29=
13 SN886408 17 35 20= 19	18=
14 SN892408 2 42 10= 23	6
15 SN898416 6 24 33 13	34
16 SN884383 19 61 1 27	1
17 SN882386 4 17 38= 11	37=
18 SN880376 13 13 40= 9	40=
19 SN897379 7 39 16= 19	18=
20 SN884380 9 32 25= 22	7=
21 SN886374 6 33 24 18	21=
22 SN893371 12 44 8= 20	15=
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	24=
24 SN900369 3 26 32 17	24=
25 SN894351 13 39 16= 24	4=
26 SN898359 12 41 12= 17	24=
27 SN903355 4 10 42 5	44=
28 SN909359 15 40 15 20	15-
29 SN913358 7 45 7 21	12-
30 SN933375 7 42 10= 24	4=
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7=
32 SN954388 3 39 16= 16	29-
33 SN965385 5 30 27= 19	18-
34 SN980393 5 9 43= 8	42
35 SN983397 4 30 27- 20	15-
36 SN087/10 15 38 10 18	21-
37 SN991417 6 7 45 5	44-
38 SN997429 11 50 6 22	7-
30 SN004437 7 52 3- 25	2-
40 SN988446 2 0 43- 0	40-
<u>41</u> SN853345 8 20 27 11	
12 SN846340 5 2 46 2	16
12 010000000 3 2 40 2 13 SN061386 1 13 40 7	40
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	- 43 - 20_
17 31/31/300 4 23 23 10 15 SN021360 8 17 29_ 11	29=
46 SN872368 6 28 30 15	37

Subsite 1

ca 5 ha

Subsite 1 is an area of some 5 ha, comprising open sheep-grazed grassland that may once have been two or three fields, bisected by a partly surfaced military road, on level ground or shallow to steep east-facing slopes at the boundary of the ranges (see Fig. 3.1). The road edges are of no particular fungal value.

A total of 23 target species was recorded, giving the following CHEGD totals: C 5; H 12; E 3; G 3; D 0. This makes Subsite 1 34th-best overall subsite at Epynt and equal 35th-best subsite for *Hygrocybe* species.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its geoglossoid fungi.

Subsite 1 was not marked on the maps provided for this survey, but was added by the surveyors as being of potential interest. The subsite was visited six times between 2012 and 2014. Comparatively few species were found, however, and fruitbodies were sparse. The fields appear to be acid grassland, routine for the Mynydd Epynt Ranges, so it is not clear why Subsite 1 is comparatively poor. Possibly the fields have been semi-improved in the past or have been affected by past or present agricultural practices on the adjoining farmland.

A species of conservation concern for this subsite is the Welsh red-listed glutinous earthtongue *Geoglossum glutinosum*. Also notable are the pinkgills *Entoloma infula* and *E. pratulense*, both new records for Breconshire, which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 1 were apparent.



Figure 3.1 Subsite 1 : Grid Ref SN861318

Subsite 2 : site of national importance

ca 7 ha

Subsite 2 is an area of some 7 ha, comprising parts of six or so unenclosed sheep-grazed fields, now separated by shallow banks and ditches, on a steep to shallow north-facing slope, bisected by an unsurfaced military road (see Fig. 3.2). The road edges and associated banks are of some fungal interest.

A total of 34 target species was recorded, giving the following CHEGD totals: C 5; H 18; E 7; G 3; D 1. This makes Subsite 2 equal 22nd-best overall subsite at Epynt and equal 21st-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 2 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its geoglossoid fungi.

Subsite 2 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. In general, the fields appear to be acid grassland, routine for the Mynydd Epynt Ranges, but quite rich in species with the crimson waxcap *Hygrocybe punicea* (a good indicator species) present. Additional, more basic species were mainly found along the road edges and banks, including the only Epynt record of the pearly powdercap *Cystoderma carcharias* (a non-target species) which is very rarely recorded in Wales, with less than 10 known sites, and is a new record for Breconshire.

Species of conservation concern for this subsite include three Welsh red-listed species, namely the handsome club *Clavulinopsis laeticolor*, the glutinous earthtongue *Geoglossum glutinosum*, and the plain earthtongue *Geoglossum umbratile*. Also notable is the pinkgill *Entoloma caesiocinctum*, a new record for Breconshire, which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 2 were apparent.



Figure 3.2 Subsite 2 : Grid Ref SN871326

Subsite 3 : site of international importance

ca 10 ha

Subsite 3 is an area of approximately 10 ha comprising two unenclosed sheep-grazed fields, now separated by a shallow ditch and bank, on a south-facing steep to shallow slope (see Fig. 3.3) bordered to the east by a steep river valley. The subsite has no road edges.

A total of 51 target species was recorded, giving the following CHEGD totals: C 9; H 22; E 17; G 2; D 1. This makes Subsite 3 fifth-best overall subsite at Epynt and equal seventhbest subsite for *Hygrocybe* species. It is the best subsite for *Entoloma* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 3 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi and also for its *Entoloma* species (no international guidelines have yet been proposed for these taxa).

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its *Entoloma* species, and for its *Hygrocybe* species.

Subsite 3 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. Based on the diversity of fungi present, part of the grassland bordering the river cliff (marked in yellow in Fig. 3.3) is neutral to basic and far less acidic than is typical for Mynydd Epynt, whilst the outer areas of the subsite were more typically acidic. The majority of records for Subsite 3 came from this neutral to basic grassland which was notably the richest area surveyed in the ranges for *Entoloma* species. The rarely recorded base-loving waxcap *Hygrocybe phaeococcinea* was found twice here, but nowhere else at Mynydd Epynt, and it is quite possible that further survey work would reveal additional interesting fungi.

Species of conservation concern for this subsite include four UK red-listed species: the skinny club *Clavaria incarnata*, the straw club *Clavaria straminea*, the drab pinkgill *Entoloma indutoides*, and the powdercap strangler *Squamanita paradoxa* (a non-target species) which was found at three locations within the subsite. Six additional species on the Welsh red list were recorded, namely the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma asprellum*, a pinkgill *Entoloma exile*, the glutinous earthtongue *Geoglossum glutinosum*, and a waxcap *Hygrocybe phaeococcinea*. Other notable species are the club fungus *Clavaria tenuipes*, the pinkgills *Entoloma asprellum*, *E. caesiocinctum*, *E. fernandae*, *E. indutoides*, *E. infula*, *E. pratulense*, and *E. turbidum*, and the non-target species *Arrhenia velutipes*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Several metal covered firing positions have been dug into the upper parts of the slope, but appear to have been in place for some time. Extending these would clearly pose a threat to the subsite and if possible this should be avoided within the yellow marked zone.



Figure 3.3 Subsite 3 : Grid Ref SN874331

Subsite 4

ca 11 ha

Subsite 4 is an area of some 11 ha, comprising open sheep-grazed grassland that may once have been two or three fields, with an unsurfaced military road on its western and northern edge. The subsite is partly on level ground, partly on shallow to steep west- and southeast-facing slopes at the boundary of the ranges (see Fig. 3.4). The road edges to the north are of minor fungal interest.

A total of 21 target species was recorded, giving the following CHEGD totals: C 2; H 12; E 4; G 3; D 0. This makes Subsite 4 36th-best overall subsite at Epynt and equal 35th-best subsite for *Hygrocybe* species.

The subsite meets JNCC guidelines for SSSI status for its geoglossoid fungi.

Subsite 4 was not marked on the maps provided for this survey, but was added by the surveyors as being of potential interest since this western slope lies opposite the base-rich and mycologically interesting Subsite 3. Comparatively few species were found, however, and the subsite was only visited three times between 2012 and 2014. The grassland appears to be particularly acid, with large quantities of the acid-loving heath waxcap *Hygrocybe laeta* and sparse fruiting of other species, several of which (including the geoglossoid fungi) were only present along the northern road edge.

A species of conservation concern for this subsite is the Welsh red-listed glutinous earthtongue *Geoglossum glutinosum*. Also notable is the yellowfoot pinkgill *Entoloma turbidum*, a new record for Breconshire, which was also recorded at several other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 4 were apparent.



Figure 3.4 Subsite 4 : Grid Ref SN877335

Subsite 5 : site of international importance

CHEGD rank 8th equal

ca 14 ha

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 5 is an area of approximately 14 ha comprising some seven or so unenclosed sheep-grazed fields, now separated by hedges and remains of hedges, ditches and banks, on flat to undulating ground that includes north-, east- and west-facing shallow slopes intersected by a non-surfaced military road (see Fig. 3.5). Parts of the subsite are covered by gorse and scrub. The road edges are disturbed by ditching and are comparatively poor for fungi.

A total of 44 target species was recorded, giving the following CHEGD totals: C 6; H 22; E 11; G 3; D 2. This makes Subsite 5 equal eighth-best overall subsite at Epynt and equal seventh-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 5 is thus a site of international importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its *Hygrocybe* species, for its geoglossoid fungi, and for its *Dermoloma* and associated species.

Subsite 5 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. The grassland appears to be acidic, routine for the Mynydd Epynt Ranges, but rich in species with the crimson waxcap *Hygrocybe punicea* (a good indicator species) present in large troops and the uncommon dingy waxcap *Hygrocybe ingrata* also present. Fungal interest is spread across the fields and it is quite possible that further survey work would reveal additional species.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and four additional species on the Welsh red list: the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma mougeotii*, the glutinous earthtongue *Geoglossum glutinosum*, and the plain earthtongue *Geoglossum umbratile*. Also notable is the pinkgill *Entoloma kuehnerianum*, a new Welsh record, and the pinkgills *Entoloma infula*, *E. mougeotii*, and *E. turbidum*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 5 were apparent.



Figure 3.5 Subsite 5 : Grid Ref SN887348 - SSSI Standard

Subsite 6

ca 3 ha

Subsite 6 is a comparatively small area of some 3 ha, comprising three or so sheepgrazed fields on mostly level ground, with an unsurfaced military road along the eastern edge (see Fig. 3.6). The site includes a small, partly overgrown quarry on its eastern edge, but this has proved to be of no fungal interest. The road edge is equally of no fungal interest.

A total of 22 target species was recorded, giving the following CHEGD totals: C 3; H 14; E 3; G 1; D 1. This makes Subsite 6 35th-best overall subsite at Epynt and 33rd-best subsite for *Hygrocybe* species.

Subsite 6 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. The grassland appears to be acidic, but poor in species (by Epynt standards) with sparse fruiting. The old quarry was included within the subsite since such areas, when grassed over, often have variable pH providing habitat for less common fungi. This, however, was not the case here or at other quarries on the ranges.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 6 were apparent.



Figure 3.6 Subsite 6 : Grid Ref SN882351

Subsite 7 : site of national importance

ca 5 ha

Subsite 7 is an area of approximately 5 ha comprising parts of two sheep-grazed fields on a south-facing steep to shallow slope bisected by a surfaced military road (see Fig 3.7). The subsite abuts the northwestern edge of Subsite 25. The road edges and associated banks are of some fungal interest.

A total of 41 target species was recorded, giving the following CHEGD totals: C 4; H 21; E 12; G 3; D 1. This makes Subsite 7 the equal twelfth-best overall subsite at Epynt and also the equal twelfth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 7 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its *Entoloma* species, for its *Hygrocybe* species, and for its geoglossoid fungi.

Subsite 7 was not marked on the maps provided, but was added by the surveyors as an area of potential interest and for comparison with the adjacent area of high waxcapgrassland interest (Subsite 25). Subsite 7 was visited six times between 2012 and 2014. The grassland appears to be acidic, routine for the Mynydd Epynt Ranges, but quite rich in species without being particularly special. The road edges and associated banks are less acidic and have some species of interest.

Species of conservation concern for this subsite include four species on the Welsh red list, namely the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma exile*, the glutinous earthtongue *Geoglossum glutinosum*, and the plain earthtongue *Geoglossum umbratile*. Also notable is the pinkgill *Entoloma caesiocinctum*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 7 were apparent.



Figure 3.7 Subsite 7 : Grid Ref SN891353

Subsite 8 : site of national importance

CHEGD rank 2nd

ca 12 ha

Meets all 5 JNCC criteria for SSSI status

Subsite 8 is an area of approximately 12 ha comprising six or so unenclosed sheep-grazed fields, now separated by the remains of hedges (some partly replanted), ditches and banks, on a south-west facing shallow slope alongside a surfaced military road (see Fig. 3.8). The road edges provide much of the fungal interest.

A total of 54 target species was recorded, giving the following CHEGD totals: C 11; H 21; E 14; G 5; D 3. This makes Subsite 8 the second-best overall subsite at Epynt, but only the equal twelfth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 8 is thus only a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi and also for its geoglossoid fungi (no international guidelines have yet been proposed for these taxa).

The subsite meets JNCC guidelines for SSSI status on all five counts: for its clavarioid fungi, for its *Entoloma* species, for its *Hygrocybe* species, for its geoglossoid fungi, and for its *Dermoloma* and associated species.

Subsite 8 was not marked on the maps provided, but was added by the surveyors as an area of potential interest. The subsite was visited nine times between 2012 and 2014. Much of the grassland is acidic (noticeably so in the most westerly field), but there appear to be some less acidic flushes. Grassy banks and ditches alongside the surfaced road are basic and provide much of the fungal interest in the subsite. Several base-loving species that were otherwise rare or unrecorded in the ranges were found here, including an earthtongue *Geoglossum cookeanum* (the only Epynt record), the very rare dotted fanvault *Camarophyllopsis atropuncta* (the only Epynt record), and the equally rare stinking fanvault *Camarophyllopsis foetens* (found at two other subsites). The Section 42 listed violet coral *Clavaria zollingeri* was also found close to the road, as were many of the clavarioid, geoglossoid, and *Entoloma* species.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.8) and the UK red-listed straw club *Clavaria straminea*, scattered throughout the grassland. Seven additional species on the Welsh red list were recorded, namely the stinking fanvault *Camarophyllopsis foetens*, the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, the mealy pinkgill *Entoloma prunuloides*, the glutinous earthtongue *Geoglossum glutinosum*, the plain earthtongue *Geoglossum umbratile*, and a coral *Ramariopsis tenuiramosa*. Other notable species are the pinkgills *Entoloma infula*, *E. pratulense*, and *E. turbidum*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The roadside areas with associated banks and ditches are the most vulnerable part of Subsite 8 and need to be protected from any potential damage caused by road maintenance or widening, ditching, or passage of large vehicles.



Figure 3.8 Subsite 8 : Grid Ref SN883358. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*. SSSI Standard. **!AVOID ROADSIDE DAMAGE!**

Subsite 9 : site of national importance

ca 5 ha

Subsite 9 is an area of some 5 ha, comprising parts of four unenclosed sheep-grazed fields on steep to shallow north-facing slopes, with an unsurfaced military road at its southern edge (see Fig. 3.9). The road edges are of little fungal interest.

A total of 34 target species was recorded, giving the following CHEGD totals: C 4; H 17; E 10; G 2; D 1. This makes Subsite 9 equal 22nd-best overall subsite at Epynt and equal 24th-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 26 is thus a site of national importance for its waxcap fungi.

Subsite 9 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited four times between 2012 and 2014. The grassland is not particularly special by Epynt standards, with fruiting rather sparse. The most easterly field is poor in species and when seen from the opposite side of the valley shows ridging, suggesting it may have been disturbed or agriculturally improved in the past.

Species of conservation concern for this subsite include three Welsh red-listed species, namely the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma asprellum*, and the plain earthtongue *Geoglossum umbratile*. Also notable is the pinkgill *Entoloma cuspidiferum*, a new Welsh record recorded at other subsites, and the pinkgills *Entoloma asprellum* and *E. infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 9 were apparent.


Figure 3.9 Subsite 9 : Grid Ref SN869366

Subsite 10 : site of national importance

ca 12 ha

Subsite 10 is an area of some 12 ha, comprising six or so unenclosed sheep-grazed fields on level ground or shallow south-facing slopes (see Fig. 3.10). There are no road edges and the fields form a detached, low plateau bordered by marshy ground or woodland.

A total of 27 target species was recorded, giving the following CHEGD totals: C 4; H 17; E 6; G 0; D 0. This makes Subsite 10 equal 31st-best overall subsite at Epynt and equal 24th-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 10 is thus a site of national importance for its waxcap fungi.

Subsite 10 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. The grassland appears to be acidic and not particularly special by Epynt standards, with fruiting rather sparse. The marshy area on the western edge was, however, the only site where the damp-loving waxcap *Hygrocybe vitellina* was recorded during the survey.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and two Welsh red-listed species, namely the handsome club *Clavulinopsis laeticolor* and a pinkgill *Entoloma exile*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 10 were apparent.



Figure 3.10 Subsite 10 : Grid Ref SN861365

Subsite 11 : site of international importance

CHEGD rank 3rd equal

ca 5 ha

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 11 is an area of approximately 5 ha comprising two unenclosed sheep-grazed fields, now separated by a shallow ditch and bank, on a north-west facing shallow slope alongside a surfaced military road (see Fig. 3.11). Most of the fungal interest in Subsite 11 is spread across the two fields, the road edges being comparatively poor, possibly as a result of ditching or road surfacing work.

A total of 52 target species was recorded, giving the following CHEGD totals: C 10; H 25; E 13; G 2; D 2. This makes Subsite 11 equal third-best overall subsite at Epynt and equal second-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 11 is thus "a site of international importance" for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi (no international guidelines have yet been proposed for this group).

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its *Entoloma* species, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 11 was part of a much larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited eight times between 2012 and 2014. Based on the diversity of fungi present, the grassland is less acidic than is typical for Mynydd Epynt and appeared to be the best of several possible subsites sampled within a large area in the western part of the ranges. Not only was the crimson waxcap *Hygrocybe punicea* (a good indicator species) present but also the dingy waxcap *Hygrocybe ingrata* and the blushing waxcap *Hygrocybe ovina*, both uncommon species.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri*, present in two locations (marked on Fig. 3.11). Two UK red-listed species were also recorded: the straw club *Clavaria straminea*, scattered throughout the grassland, and the drab pinkgill *Entoloma indutoides* found as a single specimen. Six additional species on the Welsh red list were recorded, namely the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma cruentatum*, a pinkgill *Entoloma exile*, the mealy pinkgill *Entoloma prunuloides*, the glutinous earthtongue *Geoglossum glutinosum*, and the blushing waxcap *Hygrocybe ovina*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, and the club fungus *Clavaria tenuipes*, pinkgills *Entoloma cruentatum*, *E. indutoides*, and *E. infula*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 11 were apparent.



Figure 3.11 Subsite 11 : Grid Ref SN868379. The violet arrows indicate the approximate locations of the Section 42-listed violet coral *Clavaria zollingeri*. SSSI Standard.

Subsite 12

ca 15 ha

Subsite 12 is an area of some 15 ha, comprising parts of six or more sheep-grazed fields on level ground and shallow northeast-facing slopes, bisected by a surfaced military road with a working quarry or roadstone storage site to the west (see Fig. 3.12). The road edges are of minor fungal interest.

A total of 32 target species was recorded, giving the following CHEGD totals: C 4; H 16; E 7; G 2; D 3. This makes Subsite 12 equal 25th-best overall subsite at Epynt and equal 29th-best subsite for *Hygrocybe* species.

The subsite meets JNCC guidelines for SSSI status for its *Dermoloma* species and associated fungi.

Subsite 12 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited seven times between 2012 and 2014. Much of the grassland appears to be acidic and not particularly special by Epynt standards, with fruiting rather sparse. Most records were made within the area outlined in yellow in Fig. 3.12.

Species of conservation concern for this subsite include the UK red-listed drab pinkgill *Entoloma indutoides*, as well as five Welsh red-listed species: the matt fanvault *Camarophyllopsis schulzeri*, the handsome club *Clavulinopsis laeticolor*, the glutinous earthtongue *Geoglossum glutinosum*, the slender waxcap *Hygrocybe radiata*, and a coral fungus *Ramariopsis tenuiramosa*. This last species and the pinkgill *Entoloma indutoides* are both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 12 were apparent, though any very substantial extension of the quarry area would clearly have an impact on the grassland.



Figure 3.12 Subsite 12 : Grid Ref SN861365

Subsite 13 : site of national importance

ca 17 ha

Subsite 13 is an area of some 17 ha, comprising six or so unenclosed sheep-grazed fields, separated by the remains of banks and hedges, on shallow east- and west-facing slopes between the boundary of the ranges on the western side and the Tirabad road on the eastern side (see Fig. 3.13). The bank along the road edge has little or no fungal interest.

A total of 35 target species was recorded, giving the following CHEGD totals: C 6; H 19; E 9; G 0; D 1. This makes Subsite 13 equal twentieth-best overall subsite at Epynt and equal eighteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 13 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its *Hygrocybe* species.

Subsite 13 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. Much of the grassland appears to be acidic and routine for the Mynydd Epynt Ranges, but quite rich in species with the crimson waxcap *Hygrocybe punicea* (a good indicator species) present.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and two species on the Welsh red list, namely a pinkgill *Entoloma exile* and the slender waxcap *Hygrocybe radiata*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, and the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 13 were apparent.



Figure 3.13 Subsite 13 : Grid Ref SN886408

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Subsite 14 : site of international importance

ca 2 ha

Subsite 14 is a comparatively small area of approximately 2 ha comprising parts of two unenclosed sheep-grazed fields, now separated by shallow ditches and banks, on flat ground intersected by a surfaced military road (see Fig. 3.14). The main fungal interest in Subsite 14 (marked in yellow in Fig. 3.14) is partly in the small field to the south of the road abutting a conifer plantation in the Impact Zone, and partly along the road edge ditches and banks.

Despite its small area, a total of 42 target species was recorded, giving the following CHEGD totals: C 8; H 23; E 8; G 2; D 1. This makes Subsite 14 equal tenth-best overall subsite at Epynt and equal sixth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 14 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi (no international guidelines have yet been proposed for this group).

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its *Hygrocybe* species.

Subsite 14 was part of a much larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited eight times between 2012 and 2014. Based on the diversity of fungi present, the grassland (at least in the small southern field) is less acidic than is typical for Mynydd Epynt. Not only was the crimson waxcap *Hygrocybe punicea* (a good indicator species) present but also the dingy waxcap *Hygrocybe ingrata* and the blushing waxcap *Hygrocybe ovina* both uncommon species in Wales.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.14), as well as the UK red-listed straw club *Clavaria straminea* and the powdercap strangler *Squamanita paradoxa* (a non-target species). Four additional species on the Welsh red list were recorded, namely the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, the plain earthtongue *Geoglossum umbratile* and the blushing waxcap *Hygrocybe ovina*. Also notable is the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The concentration of target species in the small southern grassland area would make any disturbance to the status quo in the subsite a significant threat. Any change in land use (e.g. for parking or buildings) in this vulnerable corner next to the Impact Zone should be avoided.



Figure 3.14 Subsite 14 : Grid Ref SN892408. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*

Subsite 15 ca 6 ha

Subsite 15 is an area of some 6 ha, comprising two sheep-grazed fields on a shallow southwest-facing slope, with a surfaced military road along the eastern edge (see Fig. 3.15). The road edge is of little fungal interest.

A total of 24 target species was recorded, giving the following CHEGD totals: C 3; H 13; E 7; G 0; D 1. This makes Subsite 15 the 33rd-best overall subsite at Epynt and 34th-best subsite for *Hygrocybe* species.

Subsite 15 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited four times between 2012 and 2014. The grassland does not seem to be particularly acidic, but is poor in species (by Epynt standards) with sparse fruiting.

A species of conservation concern for this subsite is the Welsh red-listed handsome club *Clavulinopsis laeticolor*. Also notable is the pinkgill *Entoloma turbidum*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 15 were apparent.



Figure 3.15 Subsite 15 : Grid Ref SN898416

Subsite 16 : site of international importance

CHEGD rank 1st

ca 19 ha

Meets all 5 JNCC criteria for SSSI status

Subsite 16 is a comparatively large area of approximately 19 ha, comprising some 11 well established fields on an east-facing, steep to shallow slope bisected by the Tirabad road (see Fig. 3.16). The area to the east of the road abuts the Blaen Cilieni part of the Epynt SSSI to the north, site of the recent (August 2014) first Welsh record for the BAP-listed fen puffball *Bovista paludosa* (pers comm. S. Bosanquet). All the fields are now unenclosed, leaving remains of hedges and shallow hedge-banks, and are sheep-grazed. In addition to the fields, the raised bank and ditch on the western side of the Tirabad road is of particular value for its fungi.

A total of 61 target species was recorded, giving the following CHEGD totals: C 11; H 27; E 15; G 5; D 3. This makes Subsite 16 the best overall subsite at Epynt, as well as the best subsite for *Hygrocybe* species, the equal best subsite for clavarioid, geoglossoid, and *Dermocybe*-group species, and the second best subsite for *Entoloma* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 16 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi, also for its *Entoloma* species, and also for its geoglossoid fungi (no international guidelines have yet been proposed for these taxa).

The subsite meets JNCC guidelines for SSSI status on all five counts: for its clavarioid fungi, for its *Entoloma* species, for its *Hygrocybe* species, for its geoglossoid fungi, and for its *Dermoloma* and associated species.

Subsite 16 (with a small extension northwards) was previously assessed as meeting JNCC guidelines for consideration for SSSI status as a waxcap grassland (Woods, 2010) and was so marked on the maps provided for the present survey. The subsite was visited nine times between 2012 and 2014. The part outlined in yellow (see Fig. 3.16) indicates the main area of interest from which most of the target species were recorded. Based on the high diversity of fungi present, the grassland is more basic than is typical for Mynydd Epynt. The crimson waxcap *Hygrocybe punicea* (a good indicator species) was present in large troops, but some of the rarer waxcaps were not found suggesting there is still scope for further survey work within this comparatively large area. The subsite is clearly the leading candidate for any extension to the existing Mynydd Epynt SSSI.

Species of conservation concern for this subsite are the Section 42 and BAP-listed darkpurple earthtongue *Geoglossum atropurpureum*, present in large troops on the raised bank and lower fields on the western side of the Tirabad road, and the Section 42-listed violet coral *Clavaria zollingeri*, present in several parts of the first northern field on the eastern side of the Tirabad road. Both species are marked on Fig. 3.16. Three UK red-listed species were also recorded: the skinny club *Clavaria incarnata*, found on the raised bank on the western side of the Tirabad road; the straw club *Clavaria straminea*, scattered throughout the grassland; and the drab pinkgill *Entoloma indutoides*, found in fields to the west of the Tirabad road. Eight additional species on the Welsh red list were recorded, namely the matt fanvault *Camarophyllopsis schulzeri*, the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma exile*, the mealy pinkgill *Entoloma prunuloides*, the glutinous earthtongue *Geoglossum glutinosum*, the plain earthtongue *Geoglossum umbratile*, and the slender waxcap *Hygrocybe radiata*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, as well as the club fungus *Clavaria tenuipes* and the pinkgills *Entoloma indutoides*, *E. infula*, and *E. turbidum*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

In terms of threats, the most vulnerable part of Subsite 16 is the bank on the western side of the Tirabad road which needs to be protected from any potential damage caused by road maintenance or possible road widening on this bend. In addition, ditching (work in progress 2014) and possibly herbicide application take place along the edges of the military road to the east and probably explains why these road edges are comparatively poor for fungi. However one of the two Mynydd Epynt records of the waxcap *Hygrocybe helobia*, an uncommon species, was made here. Given time if undisturbed these banks might well recover and future work to all the roadside edges in Subsite 16 should be closely regulated and avoided if possible.

Also noted was extensive disturbance of the turf, by pockmarking or probing 'stab' holes together with some shallow but completely bare areas, in the lower fields to the west of the Tirabad road. This is almost certainly made by corvids searching for larvae. The long-term effect on the fungi is unknown, but the disturbance is presumably natural and as long as corvid numbers remain stable and do not rise it is not considered of significance, given the large extent of the subsite and assuming that the areas disturbed change over time. It may, however, be advisable to monitor corvid numbers.



Figure 3.16 Subsite 16 : Grid Ref SN884383. The pale violet arrows indicate the approximate locations of the Section 42-listed violet coral *Clavaria zollingeri*; the dark purple arrows indicate the approximate locations of the Section 42-listed dark-purple earthtongue *Geoglossum atropurpureum*. SSSI standard. **!AVOID ROADSIDE DAMAGE!**

Subsite 17

CHEGD rank 38th equal

ca 4 ha

Subsite 17 is an area of some 4 ha, comprising open sheep-grazed grassland on a steep northwest-facing slope (see Fig. 3.17). The site has no road edge, but adjoins Subsite 16 along its southeastern edge.

A total of 17 target species was recorded, giving the following CHEGD totals: C 2; H 11; E 4; G 0; D 0. This makes Subsite 17 equal 38th-best overall subsite at Epynt and equal 37th-best subsite for *Hygrocybe* species.

Subsite 17 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. Although adjoining the species-rich Subsite 16, Subsite 17 lies on the northern slope of the hill and its grassland appears to be acidic and poor in species (by Epynt standards) with sparse fruiting.

A notable species is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 17 were apparent.



Figure 3.17 Subsite 17 : Grid Ref SN882386

Subsite 18

ca 13 ha

Subsite 18 is an area of some 13 ha, comprising parts of two or so sheep-grazed fields on shallow to steep west- to southeast-facing slopes (see Fig. 3.18). The site has no road edge

A total of 13 target species was recorded, giving the following CHEGD totals: C 2; H 9; E 2; G 0; D 0. This makes Subsite 18 equal 40th-best overall subsite at Epynt and equal 40th-best subsite for *Hygrocybe* species.

Subsite 18 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. No target species at all were found in 2012. The grassland appears to be acidic but is very poor in species (by Epynt standards) with sparse fruiting.

A notable species is the pinkgill *Entoloma fernandae*, a new record for Breconshire also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 18 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.18 Subsite 18 : Grid Ref SN880376

Subsite 19 : site of national importance

ca 7 ha

Subsite 19 is an area of some 7 ha, comprising parts of six or so unenclosed sheepgrazed fields, partly bisected by and partly to the south of a surfaced military road, on level ground or shallow west-facing slopes (see Fig. 3.19). Almost all the target species were recorded in the northern field (outlined in yellow in Fig. 3.19). The field has a shallow bank and ditch of fungal interest alongside the road.

A total of 39 target species was recorded, giving the following CHEGD totals: C 6; H 19; E 9; G 4; D 1. This makes Subsite 19 equal sixteenth-best overall subsite at Epynt and equal eighteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 19 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its geoglossoid fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its geoglossoid fungi, and for its *Hygrocybe* species.

Subsite 19 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. The northern field (outlined in yellow in Fig. 3.19) is species-rich acid grassland, but the area to the south of the road is comparatively species-poor. The roadside bank and ditch of the northern field and the road verge to the east of this field are both of some fungal interest, particularly for geoglossoid fungi.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.19) and two UK red-listed species: the straw club *Clavaria straminea* and the small-spored earthtongue *Trichoglossum walteri*. Two species on the Welsh red list were also recorded, namely the handsome club *Clavulinopsis laeticolor* and the glutinous earthtongue *Geoglossum glutinosum*. Also notable are the pinkgills *Entoloma fernandae and E. infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Ditching takes place along the edges of the military road adjacent to the northern field, where one of the two Mynydd Epynt records of the waxcap *Hygrocybe helobia*, an uncommon but unendangered species, was made. Such ditching is presumably of regular occurence and if continued in moderation probably poses no great threat to the overall fungal interest of the subsite.



Figure 3.19 Subsite 19: Grid Ref SN897379. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*

Subsite 20 : site of international importance

ca 9 ha

Subsite 20 is an area of some 9 ha, comprising nine or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on steep to shallow north-facing slopes (see Fig. 3.20). The subsite has no road edges.

A total of 32 target species was recorded, giving the following CHEGD totals: C 4; H 22; E 4; G 1; D 1. This makes Subsite 20 no more than twenty-fifth-best overall subsite at Epynt but equal seventh-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 20 is thus a site of international importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its *Hygrocybe* species.

Subsite 20 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. The grassland appears to be comparatively acidic, with few *Entoloma* species recorded, but has a considerable diversity of waxcap species spread across the fields, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon blushing waxcap *Hygrocybe ovina*.

Species of conservation concern for this subsite are the UK red-listed straw club *Clavaria straminea* and the Welsh red-listed blushing waxcap *Hygrocybe ovina*. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 20 were apparent.



Figure 3.20 Subsite 20 : Grid Ref SN884380

Subsite 21 : site of national importance

ca 6 ha

Subsite 21 is an area of some 6 ha, comprising parts of five or so unenclosed sheepgrazed fields on a steep to shallow north-facing slope, with a surfaced military road at its southern edge (see Fig. 3.21). The road edges are of minor fungal interest.

A total of 33 target species was recorded, giving the following CHEGD totals: C 5; H 18; E 8; G 2; D 0. This makes Subsite 21 the 24th-best overall subsite at Epynt and equal 21st-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 21 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its *Hygrocybe* species.

Subsite 21 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. The grassland appears to be acidic and not particularly special by Epynt standards, though still with a good range of *Hygrocybe* species.

Species of conservation concern for this subsite include two Welsh red-listed species, namely the beige coral *Clavulinopsis umbrinella* and the glutinous earthtongue *Geoglossum glutinosum*. Also notable is the pinkgill *Entoloma pseudoturci*, a new record for Breconshire which was not recorded elsewhere at Epynt. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 21 were apparent.



Figure 3.21 Subsite 21 : Grid Ref SN886374

Subsite 22 : site of national importance

CHEGD rank 8thequal

ca 12 ha

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 22 is an area of approximately 12 ha comprising some five unenclosed sheepgrazed fields, now separated by remains of hedges, ditches and banks, on a north-east facing shallow slope below a surfaced military road (see Fig. 3.22). The road edge and adjacent field edge banks are of fungal interest.

A total of 44 target species was recorded, giving the following CHEGD totals: C 10; H 20; E 9; G 3; D 2. This makes Subsite 22 equal eighth-best overall subsite at Epynt and equal fifteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 22 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi.

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its geoglossoid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 22 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited seven times between 2012 and 2014. The grassland appears to be acidic, routine for the Mynydd Epynt Ranges, but quite rich in species, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon blushing waxcap *Hygrocybe ovina*. The very rare target species *Dermoloma magicum* was recorded here at one of its two known Epynt locations. The road edge and adjacent field edge banks are of some interest, particularly for clavarioid and geoglossoid fungi.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.22), the UK red-listed straw club *Clavaria straminea*, and four additional species on the Welsh red list: the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, the glutinous earthtongue *Geoglossum glutinosum*, and the blushing waxcap *Hygrocybe ovina*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, as well as the club fungus *Clavaria tenuipes*, the agaric *Dermoloma magicum*, and the pinkgill *Entoloma infula*, all new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The road edge and adjacent field edge banks are the most vulnerable part of Subsite 22 and need to be protected from any potential damage caused by road maintenance or possible road widening, as well as careful regulation of any pesticide applications for thistles, etc.



Figure 3.22 Subsite 22 : Grid Ref SN893371. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*. SSSI Standard. **!AVOID ROADSIDE DAMAGE!**

Subsite 23 : site of national importance

ca 7 ha

Subsite 23 is an area of some 7 ha, comprising six unenclosed sheep-grazed fields on steep to shallow northeast-facing slopes, with a surfaced military road at its eastern edge (see Fig. 3.23). The road edges and associated shallow banks are of some fungal interest.

A total of 41 target species was recorded, giving the following CHEGD totals: C 7; H 17; E 14; G 2; D 1. This makes Subsite 23 equal twelfth-best overall subsite at Epynt but only equal 24th-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 26 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its *Entoloma* species.

Subsite 23 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited seven times between 2012 and 2014. The grassland appears to be less acidic than is normal for the Mynydd Epynt Ranges, with comparatively high numbers of *Entoloma* species recorded in the fields as well as the base-loving stinking fanvault *Camarophyllopsis foetens* near the roadside at one of its three Epynt locations. It is quite possible that further survey work would reveal additional interesting fungi.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and seven Welsh red-listed species, namely the stinking fanvault *Camarophyllopsis foetens*, the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma asprellum*, a pinkgill *Entoloma exile*, the mealy pinkgill *Entoloma prunuloides*, and the glutinous earthtongue *Geoglossum glutinosum*. Also notable is the pinkgill *Entoloma cuspidiferum*, a new Welsh record recorded at other subsites, as well as the pinkgills *Entoloma asprellum* and *E. infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The road edge and adjacent field edge banks are the most vulnerable part of Subsite 23 and need to be protected from any potential damage caused by road maintenance or possible road widening, as well as careful regulation of any pesticide applications for thistles, etc.



Figure 3.23 Subsite 23 : Grid Ref SN897368.!AVOID ROADSIDE DAMAGE!

Subsite 24 : site of national importance

ca 3 ha

Subsite 24 is an area of some 3 ha, comprising three unenclosed sheep-grazed fields on steep to shallow northeast-facing slopes, with a surfaced military road at its northern edge (see Fig. 3.24). The road edges and associated shallow banks show signs of recent ditching and are of little current fungal interest.

A total of 26 target species was recorded, giving the following CHEGD totals: C 3; H 17; E 4; G 1; D 1. This makes Subsite 24 the 32nd-best overall subsite at Epynt and equal 24th-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 26 is thus a site of national importance for its waxcap fungi.

Subsite 24 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited four times between 2012 and 2014. The grassland appears to be acidic and not particularly special by Epynt standards.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and the Welsh red-listed handsome club *Clavulinopsis laeticolor*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 24 were apparent.



Figure 3.24 Subsite 24 : Grid Ref SN900369

Subsite 25 : site of international importance

ca 13 ha

Subsite 25 is approximately 13 ha in area, comprising nine or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on shallow southeast- to southwest-facing slopes at the boundary of the ranges (see Fig. 3.25). The fields are bisected by a surfaced military road which is somewhat sunken, with high banks, and leads off the ranges. The main areas of interest are marked in yellow on Fig. 3.25.

A total of 39 target species was recorded, giving the following CHEGD totals: C 5; H 24; E 5; G 4; D 1. This makes Subsite 25 no more than equal sixteenth-best overall subsite at Epynt but equal fourth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 25 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its geoglossoid fungi (no international guidelines have yet been proposed for this group).

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its geoglossoid fungi, and for its *Hygrocybe* species.

Subsite 25 is part of a larger area previously assessed as meeting JNCC guidelines for consideration for SSSI status as a waxcap grassland (Woods, 2010) and was so marked on the maps provided for the present survey. The subsite was visited six times between 2012 and 2014. Much of the grassland at Subsite 25 is acidic which may account for the paucity of *Entoloma* species recorded, though the diversity of *Hygrocybe* species is high. The site is rather variable, with the northwestern field being possibly less acidic and rich in species (including the dark-purple earthtongue *Geoglossum atropurpureum* at one of its two Epynt locations and the uncommon dingy waxcap *Hygrocybe ingrata*) whilst barely any target species were found in the field on the opposite side of the road. The eastern edge of the subsite is acid grassland of little interest.

Species of conservation concern for this subsite include the Section 42 and BAP-listed dark-purple earthtongue *Geoglossum atropurpureum*, recorded in a single location in the northwestern field, and the Section 42 listed violet coral *Clavaria zollingeri*, recorded in a single location on the eastern side of the road. Both species are marked on Fig. 3.25. Also recorded were two UK red-listed species: the short-spored earthtongue *Trichoglossum walteri* and the powdercap strangler *Squamanita paradoxa* (a non-target species). Three additional species on the Welsh red list were recorded, namely the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma lividocyanulum*, and the glutinous earthtongue *Geoglossum glutinosum*. Also notable are the pinkgills *Entoloma infula* and *E. lividocyanulum*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Since the subsite lies on the boundary of the ranges, there is a potential threat resulting from any future change in land use (including spraying and agricultural improvement) on the adjacent farmland.



Figure 3.25 Subsite 25 : Grid Ref SN894351. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*. The dark purple arrow indicates the approximate location of the Section 42-listed dark-purple earthtongue *Geoglossum atropurpureum*.

Subsite 26 : site of national importance

ca 12 ha

Subsite 26 is an area of some 12 ha, comprising parts of eight unenclosed sheep-grazed fields on steep to shallow southwest-facing slopes, with an unsurfaced military road at its northern edge (see Fig. 3.26). The road edges and associated banks are of little fungal interest.

A total of 41 target species was recorded, giving the following CHEGD totals: C 9; H 17; E 12; G 2; D 1. This makes Subsite 26 equal twelfth-best overall subsite at Epynt but only equal 24th-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 26 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi and for its *Entoloma* species.

Subsite 26 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited seven times between 2012 and 2014. The grassland appears to be less acidic than is normal for the Mynydd Epynt Ranges, with comparatively high numbers of *Entoloma* species. It is quite possible that further survey work would reveal additional interesting fungi.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.26) and the UK red-listed straw club *Clavaria straminea*. Also recorded were four Welsh red-listed species, namely the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma exile*, the mealy pinkgill *Entoloma prunuloides*, and the glutinous earthtongue *Geoglossum glutinosum*. Also notable is the pinkgill *Entoloma caeruleum*, a new record for Breconshire not recorded elsewhere at Epynt, and the pinkgills *Entoloma infula* and *E. turbidum*, two further new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

A possible threat is patchy disturbance of the turf, almost certainly by corvids, in parts of the grassland. The long-term effect of this on the fungi is unknown, but it is a natural feeding process that has existed for some time, Although fungal fruiting may be disrupted in the short term over the longer-term waxcap interest appears robust across the site. Monitoring corvid numbers is advised as a precautionary approach.



Figure 3.26 Subsite 26 : Grid Ref SN898359. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*.
ca 4 ha

Subsite 27 is an area of some 4 ha, comprising a single enclosed, sheep-grazed field on a southeast-facing slope at the boundary of the ranges (see Fig. 3.27). The site has no road edge.

A total of 10 target species was recorded, giving the following CHEGD totals: C 2; H 5; E 2; G 0; D 1. This makes Subsite 27 the 42nd-best overall subsite at Epynt and equal 44th-best subsite for *Hygrocybe* species.

Subsite 27 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited twice between 2012 and 2013, after which it was not considered worth revisiting. Only a few commonplace target species were recorded and fruitbodies were sparse. The grassland does not appear excessively acidic, but the subsite is (unusually) enclosed and on the boundary of the ranges. It may possibly have been improved at some stage or influenced by adjacent farmland.

A species of conservation concern for this subsite is the Welsh red-listed handsome club *Clavulinopsis laeticolor*. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 27 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.27 Subsite 27 : Grid Ref SN903355

Subsite 28 : site of national importance

ca 15 ha

Subsite 28 is an area of some 15 ha, comprising eight or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on steep southeast-facing slopes at the boundary of the ranges (see Fig. 3.28). The subsite has no road edges.

A total of 40 target species was recorded, giving the following CHEGD totals: C 6; H 20; E 9; G 2; D 3. This makes Subsite 28 fifteenth-best overall subsite at Epynt and equal fifteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 28 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 28 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. An initial visit in 2012 suggested this subsite looked promising though very few target species were recorded. Subsequent visits produced quite high species counts until the last visit in 2014 when again very few fungi were found. It seems that much of the lower slope is a frost pocket with fungal fruiting brought to a close by early frosts. The grassland appears to be acidic, routine for the Mynydd Epynt Ranges, but quite rich in species, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon dingy waxcap *Hygrocybe ingrata*. The very rare target species *Dermoloma magicum* was recorded here at one of its two known Epynt locations.

Species of conservation concern for this subsite include the Section 42 listed violet coral *Clavaria zollingeri* (marked on Fig. 3.28) and two UK red-listed species: the straw club *Clavaria straminea* and the small-spored earthtongue *Trichoglossum walteri*. Three taxa on the Welsh red list were also recorded, namely the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma cruentatum*, and a pinkgill *Entoloma exile*. Also notable are the agaric *Dermoloma magicum* and the pinkgill *Entoloma cruentatum*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Since the subsite lies on the boundary of the ranges, there is a potential threat from changes in land use or chemical applications on the adjacent farmland.



Figure 3.28 Subsite 28 : Grid Ref SN909359. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*.

Subsite 29 : site of national importance

CHEGD rank 7th

ca 7 ha

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 29 is an area of approximately 7 ha comprising four unenclosed sheep-grazed fields, now separated by remains of hedges and banks, on shallow south-facing slopes east of the Afon Cilieni close to the boundary of the ranges (see Fig. 3.29). The subsite has no road edges.

A total of 45 target species was recorded, giving the following CHEGD totals: C 8; H 21; E 10; G 4; D 2. This makes Subsite 29 seventh-best overall subsite at Epynt and equal twelfth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 29 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi and for its geoglossoid fungi.

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its geoglossoid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 29 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. The grassland appears to be mainly acidic but with some more basic areas, since the base-loving olive earthtongue *Microglossum olivaceum* was recorded in the subsite at one of its two known Epynt locations. The fields are quite rich in species, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon dingy waxcap *Hygrocybe ingrata.*

Species of conservation concern for this subsite include the Section 42 and BAP-listed olive earthtongue *Microglossum olivaceum* and the Section 42-listed violet coral *Clavaria zollingeri*, which was present in large numbers (100+fruitbodies) in 2014 at several locations (marked on Fig. 3.29). Also recorded were the UK red-listed straw club *Clavaria straminea* and four additional species on the Welsh red list: the beige coral *Clavulinopsis umbrinella*, the mealy pinkgill *Entoloma prunuloides*, the glutinous earthtongue *Geoglossum glutinosum*, and the plain earthtongue *Geoglossum umbratile*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, and also the pinkgills *Entoloma fernandae* and *E. infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Since the subsite lies close to the boundary of the ranges, there is a potential threat resulting from any future change in land use (including spraying and agricultural improvement) on the adjacent farmland.



Figure 3.29 Subsite 29 : Grid Ref SN894351. The violet arrows indicate the approximate locations of the Section 42-listed violet coral *Clavaria zollingeri*. The pale green arrow indicates the approximate location of the Section 42-listed olive earthtongue *Microglossum olivaceum*. SSSI Standard.

Subsite 30 : site of international importance

ca 7 ha

Subsite 30 is an area of approximately 7 ha comprising seven unenclosed sheep-grazed fields, now separated by hedges and remains of hedges, together with shallow ditches and banks. The grassland is on flat to southeast-facing shallow slopes intersected by an unsurfaced and little-used military access road (see Fig. 3.30).

A total of 42 target species was recorded, giving the following CHEGD totals: C 3; H 24; E 9; G 4; D 2. This makes Subsite 30 equal tenth-best overall subsite at Epynt and equal fourth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 30 is thus a site of international importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its geoglossoid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 30 was part of a much larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited eight times between 2012 and 2014. The fungal interest in Subsite 30 (marked in yellow in Fig. 3.30) is spread across five of the fields, particularly the slopes of the lower eastern field which lead down to the Nant Brân. The two western fields are notable in having many scattered old anthills. The grassland appears to be mainly acidic but with some more basic areas, since the base-loving olive earthtongue *Microglossum olivaceum* was recorded in the subsite at one of its two known Epynt locations. The fields are quite rich in species, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon dingy waxcap *Hygrocybe ingrata.*

Species of conservation concern for this subsite include the Section 42 and BAP-listed olive earthtongue *Microglossum olivaceum* at two locations (marked on Fig. 3.30), as well as the UK red-listed contorted strangler *Squamanita contortipes* (a non-target species) at its first site in Wales and only its second site in Britain since 1950. This species was previously considered to be extinct in the British Isles. Four additional species on the Welsh red list were recorded, namely two pinkgills *Entoloma exile* and *Entoloma lividocyanulum*, as well as the glutinous earthtongue *Geoglossum glutinosum* and the plain earthtongue *Geoglossum umbratile*. Also notable are the pinkgills *Entoloma infula* and *E. lividocyanulum*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 30 were apparent.



Figure 3.30 Subsite 30 : Grid Ref SN933375. The pale green arrows indicate the approximate locations of the Section 42-listed olive earthtongue *Microglossum olivaceum*.

Subsite 31 : site of international importance

ca 29 ha

Subsite 31 is a comparatively large area of some 29 ha, comprising eight or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on steep to shallow northwest-facing slopes at the boundary of the ranges (see Fig. 3.31). The subsite has no road edges.

A total of 35 target species was recorded, giving the following CHEGD totals: C 5; H 22; E 6; G 0; D 2. This makes Subsite 31 no more than equal twentieth-best overall subsite at Epynt but equal seventh-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 31 is thus a site of international importance for its waxcap fungi (but see note below).

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 31 was previously assessed as meeting JNCC guidelines for consideration for SSSI status as a waxcap grassland (Woods, 2010) and was so marked on the maps provided for the present survey. The subsite was visited six times between 2012 and 2014. Most of the grassland at Subsite 31 is very acidic and has limited fungal interest which is largely confined to three base-rich gullies at the eastern end of the site (visible on Fig. 3.31). The great majority of target species records came from one small western field of some 1.3 ha (marked in yellow on Fig. 3.31). Even this field is comparatively acidic with few *Entoloma* species recorded, but is quite rich in *Hygrocybe* species including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon dingy waxcap *Hygrocybe ingrata*. Essentially, it is only this single field that is a site of international importance for waxcap fungi.

Notable species for this subsite are three taxa on the Welsh red list, namely the matt fanvault *Camarophyllopsis schulzeri*, a pinkgill *Entoloma asprellum*, and a pinkgill *Entoloma exile*. Also notable is the pinkgill *Entoloma cuspidiferum*, a new Welsh record recorded at other subsites, and also the pinkgills *Entoloma asprellum* and *E. infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Although the subsite lies on the boundary of the ranges, there is a substantial gap between the boundary and the one field of value, so any potential threat from changes in land use on the adjacent farmland is minimal.



Figure 3.31 Subsite 31 : Grid Ref SN940376

ca 3 ha

Subsite 32 is an area of some 3 ha, comprising a sheep-grazed area of grassland on steep to shallow south- and east-facing slopes, with a surfaced military road along its northern edge (see Fig. 3.32). The road edges are of some fungal interest.

A total of 39 target species was recorded, giving the following CHEGD totals: C 6; H 16; E 13; G 3; D 1. This makes Subsite 32 equal sixteenth-best overall subsite at Epynt and equal 29th-best subsite for *Hygrocybe* species.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its geoglossoid fungi, and for its *Entoloma* species.

Subsite 32 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. The grassland appears to be less acidic than is normal for the Mynydd Epynt Ranges, with comparatively high numbers of *Entoloma* species recorded.

Species of conservation concern for this subsite include the UK red-listed skinny club *Clavaria incarnata* and the straw club *Clavaria straminea*, as well as four Welsh red-listed species: the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma exile*, the mealy pinkgill *Entoloma prunuloides*, and the glutinous earthtongue *Geoglossum glutinosum*. Also notable is the pinkgill *Entoloma clandestinum*, a new record for Breconshire not recorded elsewhere at Epynt, and the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 32 were apparent. The road edges are quite wide and the fungal interest is not close to the road itself.



Figure 3.32 Subsite 32 : Grid Ref SN954388

Subsite 33 : site of national importance

ca 5 ha

Subsite 33 is an area of some 5 ha, comprising four or so unenclosed sheep-grazed fields on steep to shallow southwest-facing slopes, bounded at the western and southern edges by surfaced military roads (see Fig. 3.33). The road verges and banks have little or no fungal interest.

A total of 30 target species was recorded, giving the following CHEGD totals: C 4; H 19; E 5; G 2; D 0. This makes Subsite 33 equal 27th-best overall subsite at Epynt and equal eighteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 33 is thus a site of national importance for its waxcap fungi (but see note below).

The subsite meets JNCC guidelines for SSSI status for its Hygrocybe species.

Subsite 33 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. Most of the grassland was poor, with only a few commonplace target species recorded and fruitbodies sparse. Since the grassland does not appear excessively acidic, the fields may possibly have been semi-improved in the past. All or almost all the target species were found in a comparatively small area outlined in yellow on Fig. 3.33, which was surprisingly rich in *Hygrocybe* species. It is only this small area that is a site of national importance for its waxcap fungi.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 33 were apparent.



Figure 3.33 Subsite 33 : Grid Ref SN965385

ca 5 ha

Subsite 34 is an area of some 5 ha, comprising seven unenclosed sheep-grazed fields, divided by hedges and banks, on more or less level ground adjoining the Ysgir Fawr (see Fig. 3.34). The subsite has no road edges.

A total of 9 target species was recorded, giving the following CHEGD totals: C 0; H 8; E 0; G 0; D 1. This makes Subsite 34 the equal 43^{rd} -best overall subsite at Epynt and 42^{nd} -best subsite for *Hygrocybe* species.

Subsite 34 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. The grassland is much wetter than on other subsites, with some fields waterlogged and composed mainly of sedges. The non-target species *Stropharia albonitens* was found in such an area and is a new record for Breconshire. Few target species were recorded, however, and fruitbodies were sparse.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 34 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.34 Subsite 34 : Grid Ref SN980393

Subsite 35 : site of national importance

ca 4 ha

Subsite 35 is an area of some 4 ha, comprising three or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on shallow to steep southwest-facing slopes (see Fig. 3.35). On its western side the subsite has a steeply banked edge to a surfaced military road.

A total of 30 target species was recorded, giving the following CHEGD totals: C 4; H 20; E 4; G 2; D 0. This makes Subsite 35 no more than equal 27th-best overall subsite at Epynt but equal fifteenth-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 35 is thus a site of national importance for its waxcap fungi.

The subsite meets JNCC guidelines for SSSI status for its *Hygrocybe* species.

Subsite 35 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited six times between 2012 and 2014. The grassland appears to be acidic, routine for the Mynydd Epynt Ranges, but quite rich in *Hygrocybe* species without being particularly special.

Species of conservation concern for this subsite include two species on the Welsh red list, namely a pinkgill *Entoloma exile* and the plain earthtongue *Geoglossum umbratile*. Also notable is the non-target species *Arrhenia baeospora*, a new record for Breconshire not recorded elsewhere at Epynt, and the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

As noted for some other subsites, there was extensive disturbance of the turf in places, by pockmarking or probing 'stab' holes, almost certainly made by corvids searching for larvae. In addition, large flaps of turf were turned over, almost certainly by badgers. The long-term effect on the fungi is unknown, but the disturbance is presumably natural and as long as corvid and badger numbers remain stable and do not rise it is not considered of significance, assuming that the areas disturbed change over time. It may, however, be advisable to monitor badger and corvid numbers.



Figure 3.35 Subsite 35 : Grid Ref SN983397

Subsite 36 : site of national importance

ca 1.5 ha

Subsite 36 is a comparatively small area of some 1.5 ha, comprising a narrow strip of sheep-grazed grassland on a steep to shallow east-facing slope, bounded at the northern edge by a surfaced military road; also included within this subsite is a separate disused, grassed-over, roadside quarry to the south (see Fig. 3.36). The quarry was surveyed since such old disturbed areas often prove interesting for target species. In this case, however, the quarry was of no special interest, though the UK red-listed small-spored earthtongue *Trichoglossum walteri* was found there. The extensive roadside verge is of fungal interest.

A total of 38 target species was recorded, giving the following CHEGD totals: C 6; H 18; E 9; G 4; D 1. This makes Subsite 36 nineteenth-best overall subsite at Epynt and equal 21st-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 36 is thus a site of national importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its geoglossoid fungi.

The subsite meets JNCC guidelines for SSSI status for its clavarioid fungi, for its *Hygrocybe* species, and for its geoglossoid fungi.

Subsite 36 (excluding the quarry) was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. The grassland appears to be largely acidic but with some more basic areas and supports a good range of *Hygrocybe* species, including the uncommon blushing waxcap *Hygrocybe ovina*. The ivory coral *Ramariopsis kunzei* was also recorded here, at one of its two Epynt locations.

Species of conservation concern for this subsite include the UK red-listed small-spored earthtongue *Trichoglossum walteri* (as noted above) and five Welsh red-listed species, namely the handsome club *Clavulinopsis laeticolor*, a pinkgill *Entoloma exile*, the glutinous earthtongue *Geoglossum glutinosum*, the plain earthtongue *Geoglossum umbratile*, and the blushing waxcap *Hygrocybe ovina*. Also notable are the club fungus *Clavaria tenuipes* and the pinkgill *Entoloma infula*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The extensive road edges are the most vulnerable part of Subsite 36 and need to be protected from any potential damage caused by road maintenance or possible road widening, as well as careful regulation of any pesticide applications for thistles, etc.



Figure 3.36 Subsite 36 : Grid Ref SN987419. !AVOID ROADSIDE DAMAGE!

ca 6 ha

Subsite 37 is an area of some 6 ha, comprising two enclosed, sheep-grazed fields on a steep northeast-facing slope (see Fig. 3.37). The site has no road edge.

A total of 7 target species was recorded, giving the following CHEGD totals: C 1; H 5; E 1; G 0; D 0. This makes Subsite 37 the 45^{th} -best overall subsite at Epynt and equal 44^{th} -best subsite for *Hygrocybe* species.

Subsite 37 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited twice between 2012 and 2013, after which it was not considered worth revisiting. Only a few commonplace target species were recorded and fruitbodies were extremely sparse. No target species at all were found in the northern field. The grassland does not appear excessively acidic, but the subsite is (unusually) enclosed and the grassland may possibly have been improved at some stage.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 37 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.37 Subsite 37 : Grid Ref SN991417

Subsite 38 : site of international importance

CHEGD rank 6th

ca 11 ha

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 38 is approximately 11 ha in area, comprising six or so unenclosed sheep-grazed fields, now separated by hedges or steep and shallow ditches and banks, on predominantly level ground or shallow east-facing slopes at the boundary of the ranges (see Fig. 3.38). The roadside verge and shallow bank, partly protected from the road by a wooden rail, are of good fungal interest.

A total of 50 target species was recorded, giving the following CHEGD totals: C 10; H 22; E 11; G 4; D 3. This makes Subsite 38 sixth-best overall subsite at Epynt and equal seventh-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 38 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi and for its geoglossoid fungi (no international guidelines have yet been proposed for these taxa).

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its geoglossoid fungi, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 38 was previously assessed as meeting JNCC guidelines for consideration for SSSI status as a waxcap grassland (Woods, 2010) and was so marked on the maps provided for the present survey. The subsite was visited nine times between 2012 and 2014. Some of the fields, particularly the two adjoining the B4519 road, have substantial areas of sedge or rough grass which are species-poor. The main areas of interest are the two south-eastern fields and the roadside strip, part of which is shallowly banked and part protected by a wooden rail. These areas are marked in yellow on Fig. 3.38. The grassland is mainly acidic but in these areas is species-rich and in places may be more basic, particularly along the roadside where the base-loving matt fanvault *Camarophyllopsis schulzeri* was recorded.

Species of conservation concern for this subsite include two UK red-listed species: the skinny club *Clavaria incarnata* and the straw club *Clavaria straminea*. Six additional species on the Welsh red list were recorded, namely the matt fanvault *Camarophyllopsis schulzeri*, the handsome club *Clavulinopsis laeticolor*, the beige coral *Clavulinopsis umbrinella*, the glutinous earthtongue *Geoglossum glutinosum*, the plain earthtongue *Geoglossum umbratile*, and a navel agaric *Omphalina galericolor* var. *Iilacinicolor* (a non-target species). Most of these red-listed species were found alongside the road. Also notable are the pinkgills *Entoloma infula* and *E. turbidum*, both new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

The roadside area is the most vulnerable part of Subsite 38 and need to be protected from any potential damage caused by road maintenance or possible road widening, as well as careful regulation of any pesticide applications for thistles, etc. Since the subsite lies on the boundary of the ranges, there is also a potential threat resulting from any future change in land use (including spraying and agricultural improvement) on the adjacent farmland.



Figure 3.38 Subsite 38 : Grid Ref SN997429. SSSI Standard. !AVOID ROADSIDE DAMAGE!

Subsite 39 (Disgwylfa SSSI) : site of international importance

ca 7 ha

CHEGD rank 3rd equal

Meets 4 out of 5 JNCC criteria for SSSI status

Subsite 39 is part of the Mynydd Epynt SSSI and has been specifically notified in 2002 for the quality and diversity of its waxcap grassland. It is approximately 7 ha in area, comprising four or so unenclosed sheep-grazed fields, now separated by remains of hedges, shallow ditches and banks, on predominantly south- or south-west-facing slopes (see Fig. 3.39). The subsite has no road edges.

A total of 52 target species was recorded, giving the following CHEGD totals: C 8; H 25; E 14; G 2; D 3. This makes Subsite 39 equal third-best overall subsite at Epynt and equal second-best subsite for *Hygrocybe* species. Following the guidelines proposed by Rald (1985) and Vesterholt *et al.* (1999), Subsite 39 is thus a site of international importance for its waxcap fungi. Following the guidelines proposed by Evans (2003), it is also a site of national importance for its clavarioid fungi (no international guidelines have yet been proposed for this group).

The subsite meets JNCC guidelines for SSSI status on four counts: for its clavarioid fungi, for its *Entoloma* species, for its *Hygrocybe* species, and for its *Dermoloma* and associated species.

Subsite 39 was visited eight times between 2012 and 2014. Based on the diversity of fungi present, the grassland on part of the south-facing slope is neutral to basic and far less acidic than is typical for Mynydd Epynt. Most of the fungal interest in Subsite 39 is within this area (marked in yellow on Fig. 3.39), which is rich in species, including the crimson waxcap *Hygrocybe punicea* (a good indicator species) and the uncommon dingy waxcap *Hygrocybe ingrata.* The base-loving stinking fanvault *Camarophyllopsis foetens* was also recorded here as well as the ivory coral *Ramariopsis kunzei* at one of its two locations.

Species of conservation concern for this subsite include the Section 42-listed violet coral *Clavaria zollingeri* (marked on Fig. 3.39). Two UK red-listed species were also recorded: the skinny club *Clavaria incarnata* and the straw club *Clavaria straminea*. Four additional species on the Welsh red list were recorded, namely the stinking fanvault *Camarophyllopsis foetens*, the beige coral *Clavulinopsis umbrinella*, a pinkgill *Entoloma exile*, and the mealy pinkgill *Entoloma prunuloides*. Also notable is the pinkgill *Entoloma caeruleopolitum*, a new Welsh record recorded at other subsites, the pinkgill *Entoloma tibiicystidiatum*, a second Welsh record not recorded at other subsites, and the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

As noted for some other subsites, there was extensive disturbance of the turf in places, almost certainly by corvids searching for larvae. In addition, large flaps of turf were turned over, probably by badgers. The long-term effect on the fungi is unknown, but the disturbance is presumably natural and as long as corvid and badger numbers remain stable it is not considered of significance, assuming that the areas disturbed change over time. It may, however, be advisable to monitor badger and corvid numbers.



Figure 3.39 Subsite 39 : Grid Ref SN994437. The violet arrow indicates the approximate location of the Section 42-listed violet coral *Clavaria zollingeri*. Disgwylfa SSSI.

ca 2 ha

Subsite 40 is an area of some 2 ha, comprising open sheep-grazed grassland above a steep bank onto the B4519 road (see Fig. 3.40). The road edge itself has no fungal value.

A total of 9 target species was recorded, giving the following CHEGD totals: C 0; H 9; E 0; G 0; D 0. This makes Subsite 40 equal 43^{rd} -best overall subsite at Epynt and equal 40^{th} -best subsite for *Hygrocybe* species.

The subsite was not marked on the maps provided for this survey, but was added by the surveyors as being of potential interest, mainly because of the steep roadside banks (which, however, proved of no fungal value). The subsite was visited twice between 2012 and 2013, after which it was not considered worth revisiting. The grassland above the banks appears to be notably acidic and comparatively rough. Fruitbodies were sparse, though the crimson waxcap *Hygrocybe punicea* was present.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 40 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.40 Subsite 40 : Grid Ref SN988446

ca 8 ha

Subsite 41 is an area of approximately 8 ha, comprising one enclosed and three unenclosed sheep-grazed fields bisected by a military access road. The area is part of a former farmstead now largely surrounded by plantation woodland (see Fig. 3.41). The road edge has no fungal value.

A total of 20 target species was recorded, giving the following CHEGD totals: C 2; H 11; E 6; G 0; D 1. This makes Subsite 41 the 37th-best overall subsite at Epynt and equal 37th-best subsite for *Hygrocybe* species.

Subsite 41 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited twice between 2012 and 2013, after which it was not considered worth revisiting. Not many target species were recorded and fruitbodies were sparse. The grassland does not appear excessively acidic, but may possibly have been improved at some stage. No target species at all were found in the enclosed southwestern field which certainly appears to have been improved or cultivated.

A species of conservation concern for this subsite is the Welsh red-listed pinkgill *Entoloma exile*. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 41 were apparent.



Figure 3.41 Subsite 41 : Grid Ref SN853345

ca 5 ha

Subsite 42 is an area of approximately 5 ha, comprising parts of three enclosed sheepgrazed fields bisected by a military access road. The area is part of a former farmstead now largely surrounded by plantation woodland (see Fig. 3.42). The road edge has no fungal value.

A total of 2 target species was recorded, giving the following CHEGD totals: C 0; H 2; E 0; G 0; D 0. This makes Subsite 42 the lowest-ranking subsite at Epynt: 46th-best overall and 46th-best for *Hygrocybe* species.

Subsite 42 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited once in 2012, but in 2013 appeared to be in long-term military use. It was not considered worth revisiting in 2014. Only two target species were recorded on the single visit. The grassland does not appear excessively acidic, but may possibly have been improved at some stage.

Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 42 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.42 Subsite 42 : Grid Ref SN846349

ca 1 ha

Subsite 43 is a small area of around 1 ha, comprising open sheep-grazed grassland on level ground intersected by the Ysgir Fechan. The grassland surrounds some military buildings alongside a surfaced military road (see Fig. 3.43). The road edge has little fungal value.

A total of 13 target species was recorded, giving the following CHEGD totals: C 2; H 7; E 2; G 2; D 0. This makes Subsite 43 equal 40th-best overall subsite at Epynt and 43rd-best subsite for *Hygrocybe* species.

Subsite 43 was not marked on the maps provided for this survey, but was added by the surveyors in 2013 as being of potential interest, mainly because of its short-sward grassland. The subsite was frequently in military use but was visited twice in 2013, after which it was not considered worth revisiting. Nearly all the target species were recorded in the grassland south of the stream, with very few fruitbodies in the area to the north.

A species of conservation concern for this subsite is the Welsh red-listed handsome club *Clavulinopsis laeticolor.* Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

Subsite 43 appears poor in waxcap-grassland taxa and there is no specific management advice.



Figure 3.43 Subsite 43 : Grid Ref SN961386

ca 4 ha

Subsite 44 is an area of some 4 ha, comprising five or so sheep-grazed fields, separated by low banks and ditches, on a steep to shallow southeast-facing slope, with a surfaced military road along the northern edge (see Fig. 3.44). The road edges are of minor fungal interest.

A total of 29 target species was recorded, giving the following CHEGD totals: C 3; H 16; E 8; G 1; D 1. This makes Subsite 44 equal 25th-best overall subsite at Epynt and equal 29th-best subsite for *Hygrocybe* species.

Subsite 44 was marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. The grassland appears to be acidic and not particularly special by Epynt standards.

Species of conservation concern for this subsite include the UK red-listed straw club *Clavaria straminea* and two Welsh red-listed species: the handsome club *Clavulinopsis laeticolor* and the mealy pinkgill *Entoloma prunuloides*. Also notable is the pinkgill *Entoloma ochromicaceum*, a new record for Breconshire not recorded elsewhere at Epynt, and the pinkgill *Entoloma infula*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 44 were apparent.



Figure 3.44 Subsite 44 : Grid Ref SN917366
Subsite 45

ca 8 ha

Subsite 45 is an area of some 8 ha, comprising open sheep-grazed grassland on steep southwest- to northwest-facing slopes, with a little-used unsurfaced military access road along the eastern edge (see Fig. 3.45). The road edges are of no fungal interest.

A total of 17 target species was recorded, giving the following CHEGD totals: C 1; H 11; E 3; G 1; D 1. This makes Subsite 45 equal 38th-best overall subsite at Epynt and equal 37th-best subsite for *Hygrocybe* species.

Subsite 45 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited three times between 2012 and 2014. The grassland appears to be acidic and rather poor by Epynt standards.

A notable species is the pinkgill *Entoloma turbidum*, a new record for Breconshire which was also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 45 were apparent.



Figure 3.45 Subsite 45 : Grid Ref SN921360

Subsite 46

ca 6 ha

Subsite 46 is an area of some 6 ha, comprising open sheep-grazed grassland on steep and somewhat rocky southwest-facing slopes, with a surfaced military road along the eastern edge (see Fig. 3.46). The road edges and associated banks are of minor fungal interest.

A total of 28 target species was recorded, giving the following CHEGD totals: C 3; H 15; E 7; G 2; D 1. This makes Subsite 46 the 30th-best overall subsite at Epynt and 32nd-best subsite for *Hygrocybe* species.

Subsite 46 was part of a larger area marked as potentially interesting grassland on the maps provided for this survey. The subsite was visited five times between 2012 and 2014. The grassland does not appear to be unusually acidic, but is rather poor by Epynt standards with fruitbodies sparse and mainly on the upper slopes.

Species of conservation concern for this subsite include three Welsh red-listed species: the mealy pinkgill *Entoloma prunuloides*, the plain earthtongue *Geoglossum umbratile*, and a coral fungus *Ramariopsis tenuiramosa*. The last species and the pinkgill *Entoloma caesiocinctum* are new records for Breconshire which were also recorded at other subsites. Full lists of target species and records for this subsite are given in the Excel spreadsheets accompanying this report.

No specific threats to Subsite 46 were apparent.



Figure 3.46 Subsite 46 : Grid Ref SN872368

4 Discussion

4.1 Conservation Assessment of Waxcap-Grasslands

A number of different methods for gauging the conservation value of waxcap-grasslands have been suggested, 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 differences in 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 CHEGD indicator species which is adopted by all is the best way forward for conservation assessment of waxcap-grasslands.

In the UK, waxcaps *Hygrocybe* species are the best-known and best-recorded group amongst the CHEGD 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 4.1.

Conservation value	Single visit Hygrocybe count	Cumulative Hygrocybe 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

Table 4.1 Waxcap assessment of Rald (1985) as adapted by Vesterholt et al. (1999)

Using these guidelines, 11 subsites at Epynt are of international importance (Subsites 3,5,11,14,16,20,25,30,31,38,39), with a further 17 of national importance. It should be emphasised that these figures are not static, since additional subsite visits will always add further records. It is therefore probable that additional survey work will result in many if not all of the nationally important subsites being upgraded to sites of international importance.

A high species counts for any single CHEGD 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, a species count for *Hygrocybe* is more reliable as a conservation yardstick than a species count for all CHEGD taxa. This is because the genus *Entoloma* contains a large number of grassland target species which a) have a strong bias towards basic grasslands; b) occur rather sporadically and often in small numbers, and c) are more difficult to identify than other CHEGD species. Total CHEGD counts may therefore be subject to bias by the presence or absence of *Entoloma* species at the time of visit and by recorder expertise. As noted by Mitchel (2009), "adding CHEGD scores together can just end up highlighting sites where mycologists who can identify *Entoloma* have visited."

Nonetheless it is clearly still essential when making decisions about the conservation importance of sites to take into account all species groups in the assemblage, not just *Hygrocybe*. This is especially true since evidence (Newton *et al.* 2003) indicates that sites important for one group are not necessarily important for another. Independent conservation criteria for assessing these other groups are in their infancy but one suggestion for judging the value of waxcap-grassland sites (Evans 2003) gives the following threshold species counts for sites of national importance: clavarioid fungi 7+, *Entoloma* 15+ and geoglossoid fungi 4+. No threshold figures have yet been proposed for sites of international importance.

Using these guidelines, 11 subsites at Epynt are of national importance for their clavarioid fungi, 2 subsites for their *Entoloma* species, and 8 subsites for their geoglossoid fungi.

Another proposal for assessing sites based on species counts has been published by JNCC. Their Guidelines for the Selection of Biological SSSIs now include Grassland Fungi (Genney *et al.* 2009) and provide guideline criteria for assessing sites based on the number of CHEGD species present (See Table 4.2).

Table 4.2 JNCC guideline figures for the number of CHEGD species that should be present at a site for it to be considered for SSSI status

CHEGD Grouping	JNCC guideline
Clavarioid fungi	5+
Hygrocybe	18+
Entoloma	12+
Geoglossoid fungi	3+
Dermoloma et al.	2+

Using these guideline figures, 29 of the 46 subsites in the Mynydd Epynt Ranges meet at least one of the minimum guideline criteria for consideration for SSSI status on the basis of their grassland fungi (see Table 4.3 for list). Of these, subsites 8 and 16 meet all five of the guideline criteria, whilst subsites 5, 11, 22, 29, 38, and 39 meet four out of five.

Table 4.3 Subsites meeting JNCC guideline SSSI figures for each group of CHEGD species. Subsites are shaded if they meet four out of five of the criteria or if they meet all five.

Subsite Number	Clavarioid fungi	Hygrocybe	Entoloma	Geoglossoid fungi	Dermoloma et al.
1	x			X	
2	х	х		x	
3	х	х	х		
4				X	
5	х	х		x	х
6					
7		Х	Х	Х	
8	Х	Х	Х	Х	Х
9					
10					
11	Х	Х	Х		Х
12					Х
13	х	х			
14	х	х			
15					
16	х	х	х	х	х
17					
18					
19	х	х		х	
20		х			
21	х	х			
22	Х	Х		x	Х
23	x		Х		
24					
25	Х	Х		Х	
26	х		Х		
27					
28	Х	Х			Х
29	х	Х		Х	Х
30		х		Х	х
31	х	х			х
32	х		Х	Х	
33		Х			
34					
35		Х			
36	Х	Х		Х	
37					
38	Х	х		X	х
39	Х	Х	Х		X
40					
41					
42					
43					
44					
45					
46					

Subsite 39 (Disgwylfa) is already a SSSI notified in 2002 for its waxcap-grassland fungi meeting 4/5 JNCC criteria (Table 4.2) with a CHEGD rank placing it equal 3rd of the subsites in this survey. By comparison both Subsite 16 (CHEGD rank 1st) and 8 (CHEGD rank 2nd) are the most highly rated subsites on the Epynt Ranges and it follows should also

be considered for SSSI status as they already meet 5/5 JNCC criteria. Subsite 11 is on a par with Disgwylfa SSSI (CHEGD rank equal 3rd) and meets 4/5 JNCC criteria, whilst subsites 22, 29, 38 and 5 also meet 4/5 JNCC criteria with CHEGD ranking in the top 10 at Epynt. All are of national importance (subsites 8, 22 and 29) or international importance (subsites 5, 11,16, and 38) for their *Hygrocybe* species based on the guidelines proposed by Vesterholt *et al.* (Table 4.1). All merit consideration for SSSI status, though further survey work to determine their precise boundaries would be useful.

Four additional subsites are also highly rated, namely Subsites 3, 25, 30, and 31 which are internationally important for their *Hygrocybe* species whilst meeting 3/5 JNCC criteria. Subsite 3 is of particular note for its *Entoloma* species. Further survey at all these subsites to monitor site condition and better establish conservation status is recommended.

4.2 Comparison with other Welsh and UK sites

For comparative purposes UK rankings of waxcap-grasslands are given in Table 4.4 which is based on the most recently available data (Griffith *et al.* 2013; Holden 2014; D. Harries, pers. comm.). The toasted waxcap *Hygrocybe colemanniana* is added to the Epynt CHEGD total based on a pre-survey record, as noted above (Section 3.1). From this it can be seen that the Mynydd Epynt Ranges are currently the leading area for waxcap-grassland fungi not only in Wales, but throughout the UK and probably throughout Europe. This is true whether *Hygrocybe* species are considered on their own or whether all CHEGD taxa are counted. Note also that Subsite 16 on its own ranks 10th best site in the UK.

	Site Name	Location	Area (ha)	Hygrocybe Total	CHEGD Total
1	Mynydd Epynt Ranges	Powys, Wales	372	35	98
2	Somerton Farm	Pembrokeshire, Wales	20	24	84
3	Trawscoed	Gwynedd, Wales	418	34	78
4	Longshaw Estate	Derbyshire, England	280	30	74
5	St Kilda	Highlands, Scotland	1500	27	70
6	Alport	Derbyshire, England	na	30	67
7=	Hadrian's Wall	Northumberland, England	250	31	66
7=	Kindrogan	Perthshire, Scotland	10	26	66
9	Crimsworth Dean	Yorkshire, England	na	25	62
10	Mynydd Epynt: Subsite 16	Powys, Wales	19	27	61

Table 4.4 Comparison of Mynydd Epynt Ranges (total subsites and best single subsite) with other waxcap

 grassland sites in Wales and the UK, ranked by total CHEGD species recorded. Epynt sites are highlighted.

It should be stressed that these UK rankings only provide a rough guide to the comparative value of the Mynydd Epynt grasslands. The UK areas compared differ dramatically in size, may have indistinct site boundaries, be based on a limited number of site visits and varying levels of recorder expertise as well as being in need of some updating. Data on fungal fruiting are only of real scientific value over a long-term period and continued monitoring of sites of conservation value is strongly recommended.

Comparatively few grasslands have been surveyed in Powys, but Table 4.5 lists sites for which totals have been published (Griffith *et al.* 2013; Evans & Roberts 2012) and shows

that several individual subsites at Mynydd Epynt are comparable to larger sites elsewhere in Powys.

	Site Name	Location	Area (ha)	<i>Hygrocy</i> be Total	CHEGD Total
1	Mynydd Epynt Ranges	Breconshire	372	35	98
2	Mynydd Epynt: Subsite 16	Breconshire	19	27	61
3	Mynydd Epynt: Subsite 8	Breconshire	12	21	54
4	Gilfach Farm SSSI	Radnorshire	85	27	53
5=	Mynydd Epynt: Subsite 39	Breconshire	7	25	52
5=	Mynydd Epynt: Subsite 11	Breconshire	5	25	52
7	Mynydd Epynt: Subsite 3	Breconshire	10	22	51
8	Mynydd Epynt: Subsite 38	Breconshire	11	22	50
9	Maelienydd SSSI	Radnorshire	350	23	49
10	Blaen Nedd SSSI	Breconshire	187	25	47

Table 4.5 Comparison of Mynydd Epynt Ranges (total subsites and best subsites) with other waxcapgrassland sites in Powys, ranked by total CHEGD species recorded. Epynt sites are highlighted.

4.3 Current Management

Current management practice within the Mynydd Epynt Ranges appears both sensitive and sympathetic to biodiversity needs, including those of fungi, and engages proactively in positive dialogue with stakeholders. In particular communication and co-operation between Landmarc staff on the ground and relevant staff at NRW was observed to be working well.

There is no evidence that non-vehicular military personel training practices (at least outside the Impact Zone) have any detrimental effect on the waxcap-grassland fungi. Usage is comparatively diffuse and damage to turf by heavy vehicles or digging is relatively low over such a large area and is almost certainly less than would be expected on some open access grassland. Discarded ordnance, flares, bullet casings and other waste is minimal. Minor debris occasionally observed by the surveyors was always removed by subsequent visits suggesting an efficient clearing-up process in place.

Public access restrictions to the Epynt are a positive benefit to the fungi removing threats observed at some other waxcap-grassland sites across South Wales (such as physical destruction of turf by trail bikes and 4x4 convoys, large-scale fly-tipping, and excessive dog fouling).

The surveyors were asked informally whether the recently adopted management practice of spraying thistles with an eco-friendly herbicide had any positive or negative effect on waxcap-grassland fungi. Without baseline data on fungal distribution before spraying, however, it was not possible to provide a before-and-after assessment. All that can be said was that some but not high numbers of target species were still present in areas that had been sprayed. In any event, spraying had historically taken place with a range of herbicides and with little regard to any side-effects they might have. The effects of these historic herbicides could well have an impact on waxcap-grassland fungi for 40 years or more. Once lost, many of these fungal species are very slow to recolonize grassland habitats. The switch to eco-friendly herbicides using targeted spraying techniques must, therefore, be commended as a positive move, providing waxcap-grasslands with a better long-term environment than was previously the case.

The surveyors were also asked whether aerial spraying against bracken at a specific target area of The Warren had any negative effect on waxcap-grassland fungi. Again, without baseline data on fungal distribution before spraying, it was not possible to provide a before-and-after assessment. Nonetheless a visit was made on 1st October 2014 to the Warren area (SN977468) where spraying (with Asulox) had recently taken place. The bracken had been cut and was lying in rows, but in a brief survey only the agaric *Tricholomopsis* aff. *rutilans* and the dusky puffball *Lycoperdon nigrescens* (both non-target species) were found in the strips of grassland between the rows. The whole area, however, appeared from spot-survey checks to be highly acidic, largely bracken-covered, and unpromising for waxcap-grassland fungi (one reason this area was not selected for survey). A brief spot-survey of a nearby field with bracken (SN979473) revealed only three or four fruitbodies of common target species over a large area, but nothing more.

4.4 Possible Threats

Waxcap-grassland fungi grow in nutrient-poor, short-sward grassland, characterised by very low soil levels of dissolved nitrate and phosphate (Boertmann 2010). These nutrient-poor grasslands have become an increasingly threatened habitat throughout Europe as a result of changes in agricultural practices.

The Mynydd Epynt Ranges are extremely unusual if not unique in preserving such highly grazed short-sward grassland that remains naturally nutrient-poor and agriculturally unimproved creating an optimum environment for waxcap-grassland fungi to flourish across much of its extent.

However the grassland on some of the poorest subsites surveyed (notably Subsites 37, 41, and 42) appears to have been improved or semi-improved at some point in time, possibly thirty or more years ago, and contains pastures that had only a few token target fungal species as well as fields containing no target species at all.

In several subsites (e.g. Subsites 16, 26, 35, and 39) it was noted that areas of turf had been cut up and turned over. It seems probable that this was caused by corvids (rooks or crows) looking for leatherjackets or other invertebrates. It may not be a coincidence that such disturbance occurs in some of the best waxcap-grasslands at Epynt, since it has been observed elsewhere that feeding choughs favour waxcap-rich coastal grasslands (Mitchel 2009). Presumably such behaviour is natural and has always taken place, without causing any long-term or extensive damage. In some of the same sites large flaps of turf had been turned over, presumably by badgers. The same comments apply, but it may nonetheless be advisable to monitor badger/corvid numbers and damage at best subsites.

Throughout the Mynydd Epynt Ranges all generic positive management strategies for waxcap-grassland fungi should be followed including maintaining current grazing level patterns, avoiding physical damage and chemical applications of fertilisers or pesticides. As discussed, targeted use of eco-friendly pesticide brands is preferable but only at those subsites with low waxcap-grassland interest.

Site specific management recommendations at the eight SSSI standard subsites (highlighted in table 4.3) include:

- a) ceasing off-road/track use of all heavy vehicles including ditching and road widening activities especially at roadside verges rich in target fungi (as noted under the individual site accounts) including subsites 8, 16, 22, and 38;
- b) ceasing placement of any new training infrastructure such as firing positions, dugouts, trees or hedges;
- avoiding increase of nutrient levels by ceasing any application of fertiliser or potentially damaging feeding practices (such as foddering with silage, hay or feed blocks) on the subsite and within a suitable buffer zone around it;
- d) ceasing the application of all herbicides or pesticides on the subsite and within a suitable buffer zone around it;
- e) keeping any serious bracken or thistle encroachment in check without use of herbicides.

There is no evidence that non-vehicular military personel training activities at Mynydd Epynt Ranges have any negative impact on the fungi present .

However continued periodic survey and monitoring is highly recommended at this potentially world class waxcap-grassland site.

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