Hygrocybe calyptriformis (Berk. & Broome) Fayod

PLANTLIFE

Pink Waxcap or **Pink Meadow Cap**

TRICHOLOMATACEAE

BASIONYM: *Hygrophorus calyptriformis Berkeley & Broome in Berkeley, Outl. Brit. Fungol.: 202, 1860. Diagnosis based on material from the British Isles*
MISAPPL.: H. amoena s.s. F.H. Møller.

Status

RDB Category: International responsibility
in draft revised red list (Evans, 2005)
365 10km squares post 1960 in the UK

UK BAP Priority species

H. calyptriformis was one of 33 fungal species proposed for inclusion in Appendix 1 of the Bern Convention.

Lead Partner: Plantlife International

UK Biodiversity Action Plan (BAP)

BAP targets following the 2001 Targets Review:

T1 - Maintain populations of this species at all extant sites.

T2 - Increase the extent of populations at extant sites where appropriate and biologically feasible.

Proposed single target to replace T1 and T2 above, following the 2005 BAP Review:
T1 – Maintain the overall geographic range of this species.

Progress on targets as reported in the UKBAP 2002 reporting round can be viewed online at: http://www.ukbap.org.uk/Library/2002ReportPamphlet.pdf

The full Action Plan for *Hygrocybe calyptriformis* can be viewed online at:
http://www.ukbap.org.uk/UKPlans.aspx?ID=382

Work on *Hygrocybe calyptriformis* is supported by:

NATURAL ENGLAND

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

SCOTTISH NATURAL HERITAGE

Contents

1 Morphology, Identification, Taxonomy & Genetics

1.1 Morphology & Identification

DESCRIPTION

This elegant and delightful species is highly distinctive, with a conical pink cap and pale stipe. In its prime the cap is a bright, clear pink often flaring out at the margin, creating an effect likened by some to a ballerina dancing. When fresh it is unlikely to be misidentified although beginners have been known to confuse it with Lilac Bonnet *Mycena pura* or even Parrot Waxcap *Hygrocybe psittacina*, the latter being occasionally pink. A white form (*H. calyptriformis f. nivea*) is known (regularly fruiting in Wales, R. Woods pers. comm.); this latter might easily be confused with white, conical species of Tricholoma. An illustration of this form can be found at: http://www-biol.paisley.ac.uk/bioref/Fungi_basidiomycetes/Hygrocybe_calyptriformis.html

Figure 1 - The young fungus is tightly conical, expanding with age to produce the characteristic flared cap.

Figure 2 - Hygrocybe calyptriformis growing at Haddo House (National Trust for Scotland, Aberdeenshire)

The species is illustrated in many popular field guides including Phillips (1981), Bon (1987), Courtecuisse & Duhem (1995) and Courtecuisse (1999). The English name 'Waxcap' for the genus Hygrocybe, refers to the waxy texture of many of the caps and particularly the gills. The long, thin basidia that cover the gills, and are characteristic of the genus, contribute to this feature.

The following description is based on Boertmann (1995) and Arnolds (1990) and taken from Newton et al (2000):

CAP: 25-70mm, acutely conical to expanded-conical, irregularly lobed, often with a splitting margin when expanded. Slightly greasy to finely radially fibrillose. Colour: a distinctive pale violaceus rose or flesh pink, becoming pale salmon to whitish with age. Flesh: thin and fragile.
LAMELLAE: Subdistant, free or narrowly adnate/adnexed; pink to lilaceous pink or whitish.
STIPE: 40-120 x 5-15 mm. Smooth or finely fibrillose, dry; white or pale lilac to pink.
SPORES: (5.5-)6.5-9 x (4-) 4.5-6.0 (-7) µm; Q = 1.2-1.8, average 1.4-1.5. Broadly ellipsoid to ellipsoid. Basidia mostly four-spored.
MICROSTRUCTURE: Hymenophoral trama regular. Pileipellis an ixocutis up to 70 um thick with a few gelatinised hyphae; stipitipellis a cutis.

1.2 Taxomic Considerations

BASIONYM: *Hygrophorus calyptriformis* Berkeley & Broome in Berkeley, Outl. Brit. Fungol,: 202,1860. Diagnosis based on material from the British Isles
MISSAPPL.: H. amoena ss. F.H. Møller.

1.3 Genetic Implications

Very little work undertaken on the genetics of this species.

2 Distribution & current status

2.1 World

Hygrocybe calyptriformis is widespread in Northern Europe, but generally rare and occurring locally. The fungus is also known in North America, Asia and Japan (Arnolds 1990, Breitenbach & Kränzlin 1991, Boertmann 1995, Dennis 1986).

2.2 Europe

Dahlberg & Croneborg (2003) list 17 European countries that have recorded *H. calyptriformis* since 1980. It is listed on published or draft Red Lists in 11 of these.
The UK contains more than 50% of the known European sites (S. Evans pers. com).

Table 1 - European Countries in which H. calyptriformis has been recorded since 1980.

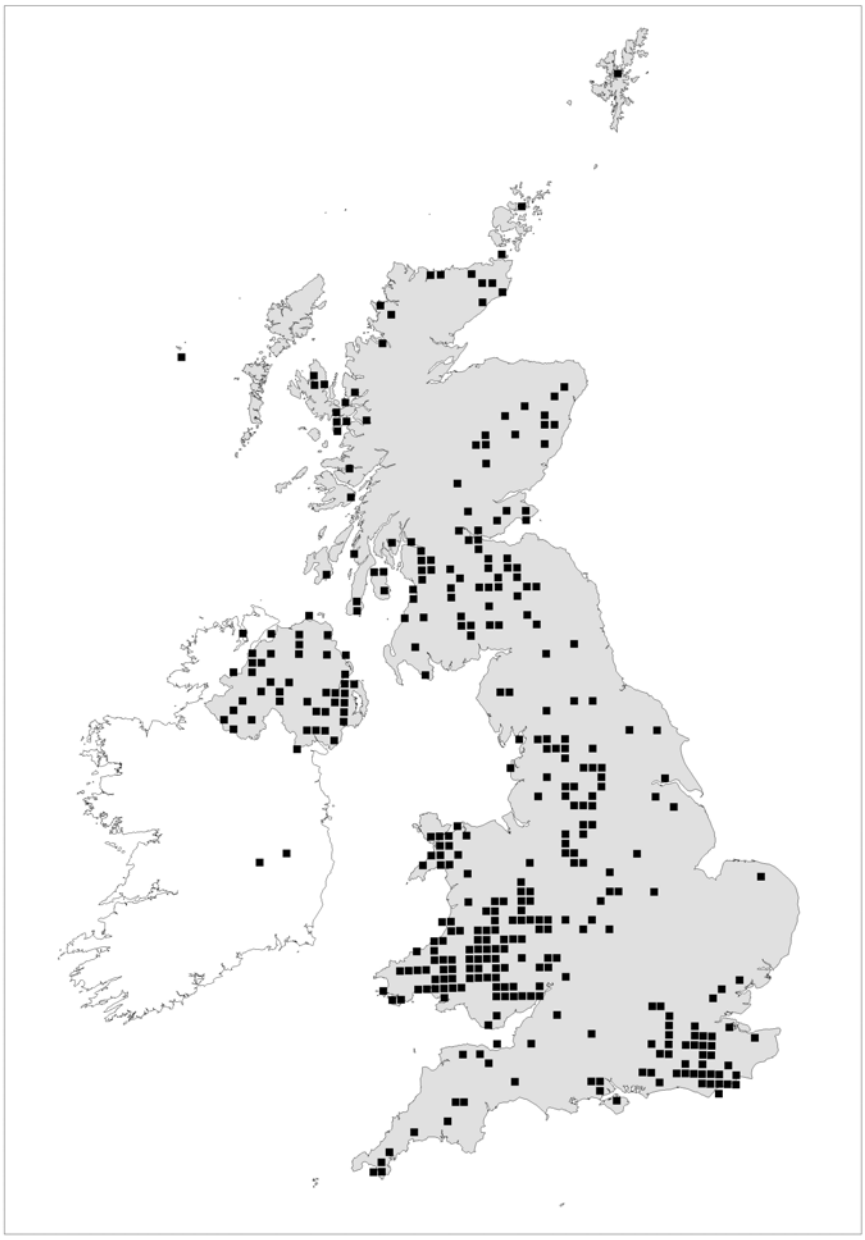
Country	Red List Category
Austria	V
Belgium	
Croatia	
Denmark	E
France	CR
Germany	CR
Hungary	V
Italy	yes
Latvia	
Norway	
Poland	V
Portugal	
Republic of Ireland	
Slovakia (no data since 1980)	DD
Slovenia	
Spain	EN
Switzerland	EN
United Kingdom (1992 prov.)	VU

2.3 UNITED KINGDOM

Recent survey work suggests that the species is currently widely distributed throughout the UK in suitable habitat. Since 1960, sites have been recorded within the UK from 365 10km squares with three additional 10km squares noted for the Republic of Ireland.

It is difficult to determine whether or not there has been a decline of the species in the UK since most of the sites where it has been recorded since 1960 have not been previously surveyed. The huge increase in known sites since 1960 is likely to be a reflection of the increased survey effort rather than an actual increase in range or frequency of the species.

Figure 3 - Distribution of 10km squares in which Hygrocybe calyptriformis has been recorded since 1960. (For summary of records see Appendix 1).



2.3.1 ENGLAND

Reported from 149 10km squares (1960 – 2005). Widespread in suitable habitat. Many records from lowland areas are from churchyard or lawn sites.

2.3.2 NORTHERN IRELAND

Reported from 40 10km squares (1960 – 2005) Widespread in suitable habitat. Many records from lowland areas are from churchyard or lawn sites.

2.3.3 SCOTLAND

Reported from 95 10km squares (1960 – 2005). Widespread in suitable habitat. Many records from lowland areas are from churchyard or lawn sites.

2.3.4 WALES

Reported from 81 10km squares (1960 – 2005). Widespread in suitable habitat. Many records from lowland areas are from churchyard or lawn sites.

3 Ecology & Life cycle

Fungi generally reproduce sexually by means of tiny, usually single-celled bodies called spores, although many fungi can also reproduce asexually by fragmentation of the mycelium or by the production of spores from asexual structures on the mycelium (Watling 2003). The function of the fruitbody, usually the only visible part of the organism, is to produce and distribute the spores. In contrast to the ephemeral fruitbodies, the mycelium remains in place throughout the year.

In the UK Pink Waxcap Survey, most records of fruiting were reported between September and November with a peak in October. A limited number of fruitbodies were also recorded in August and December (Duckworth 2005). Duckworth (2005) also notes that less than 10% of the Pink Waxcap Survey records of *H. calyptriformis* were for sites containing more than 20 individual fruitbodies. The appearance of fruitbodies on favourable sites is known to correspond with climatic variables and thus the very dry year of 2003 meant that normally productive sites were virtually barren (Holden 2004).

The maintenance of a short sward appears to stimulate the fruiting of Hygrocybe species. Two thirds of all the records generated by the Pink Waxcap Survey were from swards of less than 10cm in height (Duckworth 2005); the average sward height for *H. calyptriformis* from the same survey being 6.6cm (J. Duckworth pers. comm.). It is not known whether, or for how long, the organism can continue to persist in a vegetative form, beneath dense vegetation. It is possible to speculate that organisms reliant on air currents to disperse their spores would not expend the energy required to produce a fruitbody in conditions that were not favourable to airborne dispersal, for instance under dense vegetation (G.W.Griffith pers. comm.).

Nutritional mode: Kreisel (1987) suggested that the genus Hygrocybe may be mycorrhizal although Newton et al (2000) follow the more generally held opinion that they are saprotrophic. It has so far proved difficult to confirm the nutritional mode although various techniques, outlined below under 'Research', are currently being employed to try and unravel the mystery. Very little work has been done on the autecology of the genus Hygrocybe, the tools to do so are only just becoming readily available; our current knowledge of waxcap ecology is largely built on circumstantial evidence (Griffith et al 2002, 2004). Until fundamental issues such as these are resolved, the role of *H. calyptriformis* (and the other fungi which share the same habitat) in grassland ecosystems will remain unclear.

4 Habitat Requirement

4.1 The Landscape Perspective

H. calyptriformis is found in old, undisturbed, unfertilised semi-natural grasslands including both lowland and montane sites. In general the sward is short and the fungus fruits under both mown and grazed conditions. It is reported from both acidic and base rich sites including meadows, grazed pastures, parks, lawns and churchyards. The importance of this latter habitat is commented on by Duckworth (2005), who states that approximately one third of all the *H. calyptriformis* records generated by the Pink Waxcap Survey were from churchyards and cemeteries.

In general the moss layer is well developed, the soil contains only small quantities of exchangeable nitrate and phosphate (Arnolds 1980) and the sites tend to be well drained rather than bogs or wet meadows (Boertmann 1995). The grasslands are usually old, at least 20-30 years, but often centuries (Keizer 1993) or even millennia (Feehan & McHugh 1992). Watling (1962) describes the typical habitat of Hygrocybe species in upland Britain as being either sheep-grazed alluvial areas or hill slopes with relatively base-rich flushes. Rotheroe (1999) reports a slight preference for *H. calyptriformis* on acidic/neutral soils in his survey of grasslands in Carmarthenshire.

It should be noted that in North America, Hygrocybe are considered to be woodland species. The reasons for this are unclear but may be related to similarities in summer soil temperature between the grasslands in the Atlantic regions of Europe and the woodlands of North America (Griffith *et al* 2002) or even simply that the prairie has not been thoroughly investigated (G. Mueller, D. Mitchell pers. comm.). Watling (1984) has suggested that Hygrocybe species originally evolved in grassy woodland glades and that historic deforestation and agriculture has in effect expanded the habitat of these fungi.

4.2 Communities & Vegetation

Ray Woods (pers. comm.) has observed that the most consistent plant associates of *H. calyptriformis* are the lawn moss *Rytidiadelphus sqarrosus*, *Agrostis capillaris* and *Luzula campestris*. This observation has not been tested outside of Wales but the association with moss has been reported elsewhere for instance in the Netherlands (Arnolds 1981, 1982) and also in the results of the UK Pink Waxcap Survey (Duckworth 2005). It is unclear whether the fungus and the moss share a preference for the same microhabitat or whether there is an association between them.

Graham Motley and Ray Woods (personal comment) report fruit bodies of *H. calyptriformis* in semi-natural grasslands to be associated with the following National Vegetation Communities (NVC) in Wales: - **U4a**, **U4b**, **MG5a**, **MG5b** and **MG6b.** In churchyards it has rarely been found in tall **MG1**, preferring the better mown areas which have proved difficult to assign with confidence to an NVC type but appear to be forms of **MG5** or **6**. Griffith et al (2004) note that waxcaps in general are found in a wide range of NVC categories including **CG1**, **CG2**, **MG5**, **MG6**, **U4**, **U5** as well as heaths, mires, sand dunes and maritime cliffs.

Dahlberg & Croneborg (2003) list the following Natura 2000 habitats as supporting *H. calyptriformis*:

- Fixed coastal dunes with herbaceous vegetation.
- Wooded dunes with *Pinus pinea* and/or *Pinus pinaster.*
- Siliceous alpine and boreal grasslands.
- Alpine and subalpine calcareous grasslands.
- Seminatural dry grassland and scrublands facies on calcareous substrates.

- Species-rich Nardus grasslands on siliceous substrates in mountain areas.
- Dehesas with evergreen Quercus spp.
- Lowland hay meadows.
- Mountain hay meadows.
- Medio-European limestone beech.
- Galicio-Portuguese oak woods with *Quercus robur* and *Q. pyrenaica.*
- Cupressus forests.
- Machair.

4.3 SUMMARY OF HABITAT REQUIREMENTS

The important habitat requirements in northern Europe seem to be old, undisturbed, unfertilised grasslands where a short sward is maintained either by grazing or mowing.

Figure 4 - Typical sheep grazed grassland habitat in Northern Ireland.

Figure 5 - Typical churchyard habitat in Wales.

Figure 6 - Typical lawn habitat in Scotland.

5 Management Implications

Very little research has been undertaken specifically on land management for *H. calyptriformis* and so the following have been suggested by extrapolation from work done on other Hygrocybe species. It should be noted that future specific investigation might show some differences in management needs, as there is anecdotal evidence that *H. calyptriformis* might occupy a slightly different ecological niche to members of the genus (R. Watling pers. comm.).

Maintenance of old, undisturbed grassland: It is suggested that Hygrocybe species establish themselves more slowly and are longer lived than flowering plants (Keizer, 1993) and that this is one reason why they are very sensitive to disturbance such as ploughing or excessive poaching by animals. It makes them better indicators of old, undisturbed grasslands than flowering plants. Physical disturbance of the soil would be likely to eliminate Hygrocybe species from a site and should be avoided.

Trampling and compaction: Excessive trampling just before or during the fruiting season may well damage the young fruitbodies and reduce fruiting performance. No specific research has been undertaken to indicate the impact on fruiting of different levels of trampling at different times of the year. Significant soil compaction may increase water retention and thus decrease aeration in the soil, which could inhibit fungal growth (Dix & Webster 1995). The precautionary principal would suggest that caution is exercised on sites known to support colonies of *H. calyptriformis*.

Fertiliser / lime application: A considerable body of evidence exists to suggest that fertiliser application is detrimental to the fruiting of Hygrocybe (Arnolds 1980, 1981, 1989; Brunner 1987, Nitare 1988). The application of nitrogen (NH^4NO^3 at a rate of 120kg ha^{-1}) has resulted in an approximate four-fold decrease in fruiting (Griffith et al 2002, 2004). Research continues into the effect of fertilisers on this group of fungi with replicated plots for different treatments at Sourhope, Scotland (Griffith et al 2004). The effect of the application of lime is much less clear with conflicting results from different research programmes. High concentrations of lime ($CaCo^3$ at 6 t ha^{-1} annually) would appear to be detrimental to fruiting (Griffith et al 2004) but it is possible that more normally used levels of application may not interfere as seriously with the fungi (J.N. Hedger unpublished data). Please see the Fungus Conservation Forum leaflet 'Grassland gems: managing lawns and pastures for fungi'.

Sward height: A short sward can be maintained either by mowing or grazing. Very little research has been undertaken on the effects of either grazing intensity, gazing by different animals or different mowing regimes on the occurrence of this fungus. Regular mowing or grazing in the peak fruiting period (August – November) will undoubtedly damage fruitbodies but it is not known whether there is any negative effect on the organism as a whole. Peak fruiting tends to coincide with a time of decreasing grass growth and mowing can generally be reduced accordingly. Wherever possible the grass cuttings should be removed.

Keizer (1993) suggests that appropriate management for Hygrocybe rich grasslands would include grazing with a low density of cattle (one animal per 2-3ha) or mowing with removal of the hay followed by grazing, without fertilizing. Newton et al (2000) suggest that moderate grazing by sheep in upland Britain appears to be entirely compatible with the maintenance of Hygrocybe species.

Drainage: Maintain drainage systems to prevent well-drained sites from becoming waterlogged.

Fungicides and Moss Killers: Avoid the use of fungicides on sites known to contain *H. calyptriformis*.
Avoid the use of moss killers, as it is not known to what extent *H. calyptriformis* may depend on the moss.

Iron sulphate is the most widely used moss killer (turns moss black) but may also have fungicidal activity (see http://www.wctaturf.com/topics/inse7.html).
Example from http://experts.about.com/q/725/3690526.htm. Iron Sulphate and commercial Broad-spectrum FUNGICIDE chemicals can be used to control/prevent FUNGI and MUSHROOM outbreaks. Iron Sulphate and fungicides can be found at garden/Farm supply stores.

Commercial fungicides are widely available in hardware and department stores. For instance copper hydroxide/mancozeb (Junction) is recommended for moss and fungi and carfentrazone is antifungal.
Other products (unspecified ingredients) show cross-toxicity for mosses and fungi (http://www.bugspray.com/catalog/products/page1623.html).

Useful advice is also given in the Fungus Conservation Forum leaflet 'Grassland gems: managing lawns and pastures for fungi' (http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/management-guide-Grassland-gems-managing-lawns-pastures-for-fungi.pdf), which recommends either avoiding the application of lime or at least caution when using.

6 Threats/Factors Leading to Loss or Decline or Limiting Recovery

The principal threats to grassland species such as *H. calyptriformis* are (Arnolds 1991):

- The application of dung and artificial fertilizers.
- Ploughing and reseeding of grassland.
- Abandonment followed by spontaneous forest development (Nitare 1988).
- Afforestation (Nitare 1988).
- Suboptimal management (Arnolds 1991).

Agricultural improvement and intensification including ploughing, reseeding and the application of organic and inorganic fertilisers are known to present a threat to Hygrocybe habitat. There has been a sixty-fold increase in the use of nitrate fertilisers since 1930 (Frink, Waggoner & Ausubel, 1999) and up to a two-fold increase in the aerial deposition of nitrogen due to increased air pollution and fertiliser use (Griffith et al 2002, 2004).

Planting of trees or removal of grazing to enable the regeneration of woodland appears to suppress the fruiting of Hygrocybe species. It is not known whether the fungi can survive in a vegetative state for any length of time under these conditions. It should be noted that Woodland Grant Schemes have on occasion been the vehicle for the development of woodland on sites that were previously good waxcap grasslands.

Newton et al (2000) point out that unimproved semi-natural grassland is an endangered habitat over much of northern Europe because of the above threats. For example, in Sweden, only 15% of grassland sites have remained unaffected by these factors during the period 1970 - 1990 (Keizer 1993); some groups of fungi have declined by more than 93% as a result (Arnolds 1991, Nitare 1988). In the Netherlands, only 50 relict unimproved grasslands remain, covering less than 10km^2 in total.

7 Current Conservation Measures

7.1 In-Situ Measures

Only two SSSIs have been specifically notified in the UK for grassland fungi, Disgwylfa in the Brecon Beacons and Roecliffe Manor in Leicestershire. Llanachaeron Mansion lawn, Ceredigion is still awaiting notification. All three sites contain *H. calyptriformis*.

7.2 Ex-Situ Measures

There is a single unpublished report of culturing of a Hygrocybe (H. laeta) by Lewis Deacon at King's College, which grew very slowly.
Spore germination limited, if at all, in all species so far tested, Easton and Griffith (unpublished data).

RESEARCH DATA
Investigations into the ecology of waxcap fungi are being undertaken at Aberystwyth University (http://www.aber.ac.uk/waxcap/). A range of techniques, both field and laboratory based, are being utilised but the work is still at an early stage. There are a number of difficulties in studying the autecology of Hygrocybe species:

The difficulty of culturing Hygrocybe in laboratory conditions makes the study of mycelial development difficult. There is a single unpublished report of culturing of a Hygrocybe (*H. laeta*) by Lewis Deacon at King's College, which grew very slowly.
It is not possible to see the mycelia macroscopically in the soil profile, although their presence has been demonstrated by the use of species-specific PCR primers (A.W.Jones, Easton & Griffith, unpublished data).
The organisms are too large to study in any kind of microcosm system. In some species rings can grow as large as 10m in diameter so that the biomass of a single genet may be many kg (G.W. Griffith pers. comm.).

Spore germination and viability: An investigation into the germination of spores suggests that there is a link between the germinability of the spores and ecological fastidiousness (i.e. rarer waxcap species). Spores of *H. calyptriformis* have failed to germinate at all under the conditions tested so far and only limited germination of the commoner species (e.g. *H. virginea*, *H. psittacina*) has been observed. Experimental work with vital stains to determine whether the spores are dead or merely dormant, suggests that most spores have good viability (G.W.Griffith, unpublished data).

Nutritional mode: Initial investigation into the nutritional mode of Hygrocybe has produced interesting if somewhat conflicting data. Preliminary results from ^{14}C bomb radiocarbon analysis have indicated that the carbon in a fruitbody of *H. calyptriformis* was fixed in the same year that the fruitbody was formed. The implication is that this waxcap is potentially mycorrhizal or possibly even parasitic on mycorrhizal fungi (G.W.Griffith, unpublished data). It is hoped that recognisable sequences will be revealed by examining root materials from swards near to waxcap fruitbodies with basidiomycete-specific primers. Experiments with glyphosate may also help to determine whether or not the fungi are mycorrhizal (G.W. Griffith pers. comm).

In contrast to the above results, the initial results of stable isotope analysis present data consistent with the suggestion that these fungi are humic saprotrophs, more particularly of deep humus rather than surface litter (Griffith et al 2004).

Application of fertilisers and biocides: Fieldwork on the effects of different substances (nitrogen as NH^4NO^3, lime as $CaCo^3$ and the biocide Dursban) continues at a site in the Scottish Borders (Griffith et al 2002, 2004).

Translocation: A number of translocation experiments have been conducted where turves 30cm^3 containing H. calyptriformis have been removed to sites where they are not known to occur. The results of this work are not yet available (GW Griffith pers. comm.).

7.4 Monitoring Hygrocybe Calyptriformis

The irregular fruiting patterns and the ephemeral nature of the fruitbodies make fungi a difficult group to monitor. A minimum of three years recording is recommended to gain insight into the fruiting potential of any site. It should be noted that it is only possible to monitor the fruiting patterns of fungi as the technology to determine what is present in a vegetative state underground is not yet readily available. Systematic recording of fruitbodies has only recently been taking place and baseline data does not exist for most species and sites. Mapping of the fruitbodies of *H. calyptriformis*, to establish baseline data, has been undertaken at one site in Aberdeenshire (Holden 2005).

Only two SSSIs have been specifically notified so far in the UK for grassland fungi, Disgwylfa in the Brecon Beacons and Roecliffe Manor in Leicestershire both of which contain H. calyptriformis. Common Monitoring Standards have not yet been developed for this organism.

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10 Contacts

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11 Links

- ARKive species web page for *Hygrocybe calyptriformis*: http://www.arkive.org/species/ARK/fungi/Hygrocybe_calyptriformis/
- The Association of British Fungus Groups

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Appendix 1

Summary of 10km square localities from which Hygrocybe calyptriformis has been recorded since 1960.

GRID	LOCALITY	COUNTRY	LAST YEAR RECORDED
NY19	Hutton & Corrie Church	England	2002
NY22	St John's Church Yard, Keswick	England	1999
NY32	Blencathra Field Study Centre	England	2000
NY32	Fields at Blencathra FSC	England	2000
NY69	Kielder Forest, Castle Wood	England	2001
NY70	Bowberhead Farm garden, Ravenstondale	England	1996
NY70	Ravenstonedale Churchyard	England	1997
NY76	Housesteads	England	1971
NZ01	Brignall Banks, near Barnard Castle	England	1988
NZ01	Deepdale area, near Barnard Castle	England	1963
NZ07	East Matfen	England	2003
NZ21	Darlington West Cemetery	England	1998
SD34	Watergrove	England	1998
SD47	Victorian Lawn, Merlwood Research Station	England	1997
SD61	White Coppice	England	1988
SD67	Lenny Wood, Ingleton	England	1975
SD73	Smalley's Farm	England	1997
SD76	Oxenber/Feizor/Wharfe Wood area, Austwick	England	1996
SD76	Wood End	England	1996
SD77	Crummack Dale	England	1999
SD77	Trow Gill area, Ingleborough	England	1996
SD86	Over Kinsey	England	2000
SD91	Turn Slack Clough	England	2001
SD92	Broadhead, Crag Vale	England	1993
SD92	Craggale, near Mytholmroyd	England	1993
SD92	Hebden Bridge	England	2001
SD95	Flasby Moor N.	England	1996
SD95	Skipton	England	2003
SD96	Bastow Wood	England	2000
SD96	Wood Nook, near Grassington	England	1997
SD97	Cam Head (Area above Starbotton)	England	2001
SD97	Cray Village Area	England	2000
SE00	Arkengarthdale	England	2002
SE02	Saltonstall (Near Lower) 'Grave Field'	England	2004
SE10	Digley Dam. near Holmfirth	England	1998
SE14	Darwin Gardens, Millenium Green	England	2003
SE20	Cawthorne area, near Barnsley	England	1987
SE21	Bretton Lake NR	England	1999
SE24	Leathley Mill, near Farnley, Otley	England	1978
SE26	Ripley Castle Grounds	England	2001
SE32	Saltonstall, near Lower, SW Yorks	England	1997
SE33	Saw Wood area, near Thorner	England	1981
SE34	Harewood Park E	England	2000
SE68	Sleightholme Dale, near Kirkbymoorside	England	1965
SE91	Risby Warren	England	2001
SE98	Forgealley, near Scarborough	England	1994

SJ40	Earl's Hill	England	2004
SJ40	Pontsford Hill	England	1997
SJ40	Pulverbatch	England	2004
SJ41	Shrewsbury Cemetery	England	1998
SJ42	Cockshutt Churchyard	England	1998
SJ42	Myddle Churchyard	England	1998
SJ50	Attingham Park (NT)	England	1998
SJ51	High Ercall	England	2004
SJ54	Melverley Farm (SWT Reserve)	England	2005
SJ95	Dunwood Hall	England	1997
SJ96	Barleyford	England	1997
SJ96	Hollinhall	England	1997
SJ96	Wincle Minn Pasture	England	1998
SJ97	Kerridge Hill	England	1996
SJ97	Macclesfield Forest Pasture	England	1997
SK04	Oakamoor churchyard	England	2002
SK05	Grindon, land above Weags Barn	England	2002
SK05	Manifold Valley Trail	England	2003
SK14	Ashbourne cemetery	England	2002
SK17	Wardlow Hay Cop, part of Cressbrookdale SSSI	England	2002
SK18	Ladybower	England	1970
SK28	Longshaw Estate	England	2002
SK30	Sibson Church	England	1992
SK41	Ulverscroft Reserve	England	1997
SK43	Dale Hills	England	2004
SK51	Quorn, 6 Buddon Lane	England	2001
SK51	Roecliffe Manor SSSI	England	2001
SK75	Bingham cemetery	England	2000
SK91	Clipsham Park Wood	England	1997
SN33		England	2004
SO25	Hergest Croft garden	England	2002
SO36	Kinsham Court	England	2001
SO38	Hopesay Hill (NT)	England	2004
SO44	Garnons	England	1966
SO44	Garnons, Bridge Sollers	England	1967
SO46	Fishpool Valley	England	1993
SO48	Hopesay Hill (NT)	England	2005
SO49	Bagbatch (Long Mynd Area)	England	2005
SO49	Church Stretton Garden (Long Mynd area)	England	1990s
SO49	Haddon Hill (Long Mynd NT)	England	2001
SO49	Pole Bank (Long Mynd NT)	England	2004
SO50	Brockweir	England	1994
SO58	Boyne Water (Clee Hill Area)	England	2004
SO58	Brown Clee Hill	England	2004
SO60	The Patches	England	1999
SO61	Hope Wood	England	1994
SO63	Putley churchyd	England	1999
SO67	Baveney Wood	England	1996
SO67	Baveney Wood (Wyre Forest Area)	England	1996
SO67	Catherton Common (Clee Hills Area)	England	2004
SO67	Clee Hill, Titterstone	England	2000
SO67	Craven Cottage (Clee Hills Area)	England	2000
SO68	Ditton Priors Churchyard	England	1998

SO68	Neenton Churchyard	England	2004
SO73	News Wd Malv'ns	England	1982
SO73	Walm's Well Woods	England	1985
SO74	Wellington Heath chy	England	2001
SO77	Bliss gate (Wyre Forest)	England	1999
SO77	Corbet's Park (Wyre Forest)	England	2004
SO77	Longdon (Wyre Forest)	England	2004
SO77	Sturt (pipetrack - Wyre Forest)	England	1999
SO77	Willow Bank, Callow Hill	England	2002
SO77	Wyre Forest, Lodge Hill Farm meadows	England	1999
SO78	Dudmaston Estate	England	1982
SO78	River Severn (Upper Arley to Severn Valley Country)	England	2001
SO84	Madresfield	England	1987
SO92	Cleeve Common	England	1997
SO98	Stennels Field	England	2000
SP17	Tamworth-in-Arden	England	1998
SP28	Meriden Hall	England	1998
SP28	Packington Park	England	1969
SP28	Stratford on Avon	England	1997
SP47	Draycote Meadows	England	1998
SS74	Pinkworthy	England	1997
SS94	Dunster	England	1997
ST03	Bird's Hill (Nettlecombe): near Monksilver	England	2002
ST03	Nettlecombe	England	1997
ST15	Cockercombe (Round Hill) Quantock Hills	England	1999
ST31	Dillington House	England	2000
ST55	Chancellors Farm	England	2000
ST88	Silkwood, Westonbirt	England	1997
SU21	Bramble Hill Hotel	England	2004
SU26	Cadley	England	2002
SU26	Cadley Church Churchyard	England	2004
SU26	Cadley, Savernake Forest	England	2002
SU26	Savernake Forest	England	1995
SU26	St Katherine's Churchyard	England	1997
SU30	Denny Woods, churchyard	England	1966
SU31	Busketts Lawn	England	1998
SU82	Stedham Church	England	1999
SU92	Churchyard, Ebernoe, near Northchapel	England	1998
SU92	Ebernoe Church	England	1998
SU92	Ebernoe Common, near Northchapel	England	1998
SU92	Petworth Old Cemetery	England	1999
SU95	Brookwood Cemetery, Woking	England	2002
SU99	Penn Wood (vicarage lawn), near Amersham	England	2000
SU99	Penn Wood (W/Trust)	England	2001
SW62	Helston: Cemetery	England	2000
SW72	Trelowarren Gardens	England	1994
SW73	Perranarworthal: churchyard	England	2000
SW73	Perranaworthal, St. Piran's Church	England	2000
SW84	Truro: Truro Cemetary	England	2000
SX16	St Neot's Church	England	2000
SX57	Walkhampton Churchyard	England	2004
SX69	Trowleigh St Mary the Virgin Churchyard	England	2004
SX79	Castle Drogo	England	2004

SX79	Drewsteignton Churchyard	England	2004
SZ59	Osborne Estate	England	1997
TA03	Westwood area, Beverley	England	1997
TA10	Mausoleum Wood	England	1982
TG13	Felbrigg Hall	England	2004
TL60	Chelmsford Cemetery	England	2001
TL60	Fryerning Church, Chelmsford	England	2001
TL71	Little Leighs Church	England	2001
TL92	Holmwood House school	England	2001
TQ01	Fittleworth Church	England	1998
TQ04	White Lane, Guildford	England	2003
TQ09	Chorleywood Common	England	1998
TQ14	Holmwood Common	England	1977
TQ15	Dorking (near): Ranmore Church (churchyard)	England	2001
TQ16	West Molesey, Elmbridge Cemetery	England	2000
TQ17	Edge of Richmond Park near Cambrian Rd Gate	England	2002
TQ17	Kew: Royal Botanic Gardens (Conservation area)	England	2000
TQ18	Ealing: Hanwell, Kensington Cemetery	England	1992
TQ22	Slaugham Church	England	1998
TQ22	Staplefield Church	England	2000
TQ32	Haywards Heath Church	England	1999
TQ33	St Dunstan's Farm	England	1997
TQ35	Woldingham: St Agatha's Church	England	2002
TQ42	Danehill Church	England	2004
TQ42	Framfield Church	England	1999
TQ42	Isle of Thorns	England	1998
TQ42	St Bartholomews Church Maresfield	England	2004
TQ42	St Mary Newick	England	2004
TQ45	Church on the Chert	England	1996
TQ45	French Street Valley Sundridge	England	1986
TQ45	St Andrews churchyard, Limpsfield, Surey	England	1998
TQ46	Chelsfield Church	England	1984
TQ46	Chislehurst	England	1984
TQ46	Downe House, Downe	England	1997
TQ46	Orpington, Chelsfield	England	1984
TQ47	Chislehurst Common	England	1992
TQ51	Horsebridge Cemetery	England	2000
TQ52	Old Heathfield Church	England	1998
TQ53	Tunbridge Wells Cemetary	England	2004
TQ54	Leigh churchyard	England	1996
TQ54	Southborough Cemetery Southborough	England	2002
TQ54	Stonewall Park, Chiddingstone Hoath	England	2002
TQ55	Knole Park	England	1967
TQ55	St Lawrence`s Church Seal	England	1998
TQ56	Lullingstone Park, near Shoreham	England	1980
TQ61	Ashburnham Church	England	2004
TQ61	Herstmonceux Castle	England	2004
TQ61	St Dunstan's Farm	England	2004
TQ61	Warbleton Church	England	2004
TQ62	St Thomas A Beckett Brightling	England	2004
TQ62	Willingford Farm	England	1998
TQ64	Brenchley Church	England	1997
TQ64	Horsmonden Church	England	1999

TQ65	Oxen Hoath and environs Hadlow	England	1994
TQ66	Cobham Hall	England	1992
TQ70	St Marks Little Common	England	2004
TQ71	Battle Crematorium	England	2004
TQ71	St John the Baptist, Seddlescombe	England	2004
TQ71	St Laurence Catsfield	England	2004
TQ71	St Mary the Virgin, Battle	England	2004
TQ72	St Leonards Church The Moor Hawkhurst	England	1996
TQ81	Hastings Crematorium	England	2004
TQ83	Benenden Hospital	England	2001
TQ87	Tunbridge	England	1966
TQ91	Winchelsea Churchyard	England	2004
TQ92	Rye	England	1968
TQ92	Rye: Rye Hill	England	2000
TR16	East Blean Wood near Herne	England	2002
C33	Buncrana	Northern Ireland	2003
C40	Donagheady St James church (C of I)	Northern Ireland	2004
C40	Raspberry Hill Bridge, Altinaghree Burn	Northern Ireland	2004
C41	Woodburn House, Magee College	Northern Ireland	1997
C50	Caranbane, St Joseph's church (RC)	Northern Ireland	2004
C50	Claudy church (RC)	Northern Ireland	2004
C50	Cumber Presbyterian church	Northern Ireland	2004
C61	Bovevagh Presbyterian Church	Northern Ireland	2003
C63	Binevenagh NNR	Northern Ireland	1999
C91	Kilrea (St. Patrick's Church	Northern Ireland	2003
C92	Roseyards Presbyterian Church	Northern Ireland	2003
C93	Church of St. Coleman	Northern Ireland	2003
C93	Church of St. Colman (C of I), Dervock	Northern Ireland	2003
D05	Kebble Nature Reserve, Rathlin Island	Northern Ireland	2001
D21	Gortnagory ASSI	Northern Ireland	2002
D23	Cushleake Mountain North	Northern Ireland	2003
D23	John McSparran Memorial Hill Farm	Northern Ireland	2000
D41	Ballycastle Coalfields	Northern Ireland	2002
H14	Church of St Molaise, Monea	Northern Ireland	2004
H14	St Molaise Church of Ireland Church, Monea	Northern Ireland	2000
H23	St. Mary's R.C. Arney	Northern Ireland	2004
H25	Sacred Heart Church, Irvinestown	Northern Ireland	2004
H29	Clady Church of Ireland	Northern Ireland	2002
H36	Dromore Presbyterian Church	Northern Ireland	2004
H36	Dromore unnamed church with tower	Northern Ireland	2004
H44	Colebrook Church, Parish of Aghalurcher	Northern Ireland	2004
H44	St. John's, Fivemiletown	Northern Ireland	2004
H49	Glenga roadside	Northern Ireland	2004
H57	Holywood Golf Club	Northern Ireland	1997
H68	Beaghmore Stone Circles	Northern Ireland	2004
H76	Parkanaur Forest Park	Northern Ireland	2005
H77	Drum Manor Forest Park	Northern Ireland	1999
H88	Lissan Estate	Northern Ireland	2004
H91	Creggan Church	Northern Ireland	2002
J03	Church of Ireland, Parish of Acton, Poyntz Pass	Northern Ireland	2002
J03	Drumbanagher Parish Church	Northern Ireland	2002
J06	Lady Dixon Park, Belfast	Northern Ireland	2002
J13	Knockiveagh	Northern Ireland	2002

J15	Waringstown House	Northern Ireland	1995
J23	Lisnavaghrog Church	Northern Ireland	2002
J25	Annahilt, Co. Down	Northern Ireland	2002
J25	Dromore Motte & Bailey	Northern Ireland	1997
J25	Hillsborough Parish Church	Northern Ireland	1997
J27	Collin Mountain	Northern Ireland	1997
J27	Divis Mountain	Northern Ireland	1998
J27	Slievenacloy ASSI	Northern Ireland	1997
J32	Silent Valley, Mourne Mountains	Northern Ireland	1999
J36	Barnett's Park, Belfast	Northern Ireland	2001
J36	Carryduff Reservoir (LS)	Northern Ireland	1999
J36	Edenderry	Northern Ireland	1997
J36	Knockbreckan Reservoir	Northern Ireland	1999
J37	Lisburn Road, Belfast	Northern Ireland	2000
J44	Clough, Co. Down	Northern Ireland	2002
J44	Killinchy Presbyterian Church	Northern Ireland	2002
J45	Saintfield Presbyterian Church	Northern Ireland	2002
J45	Saintfield Co. Down	Northern Ireland	2002
J46	Ballyallolly House, Co. Down	Northern Ireland	2002
J46	Killinchy, Co. Down	Northern Ireland	2002
J47	Holywood	Northern Ireland	2002
J47	Holywood Golf Club, Old Belfast Road, Holywood	Northern Ireland	1997
J48	Bangor	Northern Ireland	2001
J48	Crawfordsburn House, Crawfordsburn	Northern Ireland	1994
J48	Westburn Crescent, Bangor	Northern Ireland	2001
J49	Duffs Hill, North East Division Td.	Northern Ireland	2002
J49	Loughmourne	Northern Ireland	2002
J58	Castle Park, Bangor	Northern Ireland	2000
N80	Curragh	Republic of Ireland	1988
S59	Ballyprior Commonage, Co.Laios	Republic of Ireland	1997
HU47	Booth of Toft	Scotland	1992
HY53	Eday: Flaughton Hill	Scotland	1990
NC13	Nedd	Scotland	2003
NC22	Inchnadamph	Scotland	2003
NC66	Invernaver NNR: Torrisdale dunes	Scotland	1984
NC76	Bettyhill	Scotland	1974
ND06	Broubster	Scotland	1996
ND06	Crosskirk	Scotland	1997
ND13	Dunbeath Strath	Scotland	2000
ND15	Westerdale Bridge	Scotland	1997
ND25	Loch Watten	Scotland	1998
ND34	Groats Loch Ulbster	Scotland	1996
ND34	Osties Hill	Scotland	1996
ND38	South Walls Hoy	Scotland	2000
NF19	St. Kilda village enclosure	Scotland	1988
NG45	Isle of Skye: The Storr W	Scotland	2001
NG46	Isle of Skye: Brogaig	Scotland	2000
NG55	Isle of Skye: The Storr	Scotland	2000
NG60	Bharabhaig 9 Tormore	Scotland	2001
NG60	Isle of Skye: Bharabhaig 7	Scotland	2001
NG61	Isle of Skye: Bharabhaig 1	Scotland	2001
NG61	Isle of Skye: Ord	Scotland	2001
NG62	Isle of Skye: Suardal Strath	Scotland	1983

NG71	Isle of Skye: Kinloch	Scotland	2001
NG73	Drumbuie	Scotland	2000
NG84	Rassal	Scotland	2000
NG91	Shiel Bridge	Scotland	2000
NH19	Ullapool River	Scotland	1994
NJ31	Colquhonnie Hotel on A944 garden	Scotland	2000
NJ52	Leith Hall	Scotland	2004
NJ70	Drum Castle	Scotland	2001
NJ71	Fetternear	Scotland	2000
NJ80	Blairs clerical graveyard	Scotland	2000
NJ83	Haddo Hall	Scotland	2004
NJ94	Aden Country Park	Scotland	2002
NM73	Isle of Mull: Craignure	Scotland	2000
NM76	Mull: Salen	Scotland	1969
NN84	Bolfrack gardens	Scotland	2000
NN91	Geordie's Wood (Ochils)	Scotland	2004
NO08	Inverey Flats	Scotland	1998
NO08	Inverey Youth Hostel field	Scotland	2004
NO16	Glen Isla Folda	Scotland	2000
NO18	Corriemulzie north	Scotland	1999
NO19	Braemar Golf Course	Scotland	1997
NO19	w of Keiloch on trackside to Invercauld House	Scotland	2000
NO20	Craigmead Meadows	Scotland	2001
NO31	Hill of Tarvit	Scotland	2004
NO49	Dinnet NNR	Scotland	1992
NO50	Barnsmuir	Scotland	2000
NO51	Rock & Spindle	Scotland	2000
NO78	Glenbervie church	Scotland	2000
NR45	Kildalton Cross	Scotland	1993
NR71	Kilkerran Church, Campbeltown	Scotland	1980
NR72	Campbeltown	Scotland	1980
NR77	Castle Sween	Scotland	2002
NR95	Lochranza	Scotland	1998
NS03	Brodick	Scotland	2004
NS05	St Blane's Monastery	Scotland	1982
NS18	Benmore Estate	Scotland	1964
NS18	Younger Botanic Garden	Scotland	1991
NS20	Culzean Country Park	Scotland	1986
NS32	Auchencrive Estate	Scotland	2003
NS33	Troon Reservoir	Scotland	1999
NS38	Creinch, Loch Lomond	Scotland	1979
NS40	Dunaskin Glen Ayreshire	Scotland	1997
NS44	Stewarton	Scotland	2003
NS44	Rowallan Castle	Scotland	1999
NS44	Stewarton	Scotland	2002
NS45	Walled Garden/Loop	Scotland	2000
NS46	Gleniffer Braes	Scotland	2000
NS46	Paisley: Ferguslie Gardens	Scotland	2000
NS47	Holly Brae	Scotland	2000
NS55	Barrhead	Scotland	1977
NS55	Clarkston, Glasgow	Scotland	2004
NS55	Linn Park	Scotland	2001
NS55	Netherlee, Glasgow	Scotland	2004

NS55	Newton Mearns, Glasgow	Scotland	2004
NS56	Cathcart (Holmlea Park)	Scotland	2004
NS72	Carmacoup	Scotland	2000
NS73	Blackside	Scotland	2000
NS75	Chatelherault	Scotland	1990
NS80	Drumlanrig Park	Scotland	2000
NS84	Lanark	Scotland	1997
NS84	Lower Nethan Gorge	Scotland	1990
NS89	Menstrie Glen	Scotland	1987
NS98	Blair Castle Fife	Scotland	2000
NT03	Glenhighton	Scotland	2000
NT07	Beecraigs Country Park	Scotland	1998
NT07	Hopetoun House	Scotland	2002
NT08	Headwell golf course	Scotland	1997
NT09	Steelend golf course	Scotland	1997
NT11	Carrifran	Scotland	2000
NT11	North Esk Reservoir Slope	Scotland	1997
NT13	Tinnis Castle	Scotland	1998
NT15	Newhall, Midlothian	Scotland	1996
NT15	West Linton Golf Course	Scotland	2000
NT16	Heriot-Watt University	Scotland	1973
NT16	Loganlea Howe	Scotland	2000
NT23	Peebles: Tantah	Scotland	2000
NT24	White Meldon	Scotland	1999
NT35	Carcant	Scotland	1998
NT35	Temple	Scotland	2000
NT36	Preston Hall	Scotland	2001
NT36	Vogrie Country Park	Scotland	1990
NT42	Bowhill Estate	Scotland	1998
NT44	Stow: St Mary in Wedale	Scotland	1999
NT45	Linn Dean	Scotland	1997
NT50	Langside Brae	Scotland	2000
NT50	Shankend	Scotland	2000
NT53	Abbotsford	Scotland	2000
NT53	Maxpoffle	Scotland	2000
NT53	Melrose	Scotland	1999
NT53	Melrose cemetery - Huntly Road	Scotland	1999
NT63	Mellerstain House	Scotland	1992
NX37	Barjarg Girvan	Scotland	2003
NX44	Sorbie: Whitehills Farm	Scotland	1999
NX89	Townhead	Scotland	2000
NX98	Ae	Scotland	2000
NX99	Auchencairn	Scotland	2000
NY29	Effgill	Scotland	2000
SH34	Trefor, area to E of Quadrat	Wales	2004
SH45	Y Fron, Caernarfon	Wales	2002
SH47	Bodrwyn	Wales	2003
SH54	Cwm Pennant	Wales	2004
SH54	Cwm Pennant, above Braich Dinas	Wales	2005
SH55	New Cemetery, Rhosgadfan	Wales	2004
SH56	Bryn Cul	Wales	2004
SH56	Carreg Y Garth, Rhiwlas	Wales	2004
SH56	Plas Newydd	Wales	2000

SH56	Rhiwlas	Wales	2000
SH56	Tal-y-cae	Wales	2000
SH56	Tregarth, N of Moel y ci	Wales	1999
SH57	Bangor	Wales	1999
SH57	Brewery Fields, Bangor	Wales	2004
SH57	Brewery Fields, Bangor	Wales	2004
SH57	Canolfan, Penrhosgarnedd	Wales	2004
SH57	Road to Menai Bridge, near Antelope	Wales	2003
SH64	Aber Valley	Wales	1980
SH64	Ffatri Farm	Wales	2005
SH66	Maes Caradog Nant Ffrancon	Wales	2004
SH66	Nant Ffrancon, Maes Caradoc, Quadrat	Wales	2004
SH67	Coedydd Aber	Wales	1980
SH75	Capel Curig	Wales	1988
SH78	Great Orme	Wales	2004
SH80	Llan Church	Wales	1998
SH83	Trawscoed	Wales	1997
SH87	Tyddyn Ucha	Wales	2002
SJ10	Coed Ty Mawr SSSI	Wales	1997
SJ10	Llangyniew Churchyard	Wales	1997
SJ20	Llanerchydol Hall Lawn, Welshpool	Wales	1999
SM81	Rosemoor, Walwyn's Castle	Wales	1994
SM81	Walwyn's Castle, Rosemoor	Wales	1994
SM90	Somerton Farm quadrat	Wales	2005
SN00	Paskeston	Wales	1999
SN03	Cwm Clydach	Wales	1999
SN03	Mynydd Carningli	Wales	2002
SN13	Llanfair Nant Gwyn Church	Wales	2000
SN21	Llanfihangel Abercywyn	Wales	2000
SN23	Hermon Cemetry	Wales	2000
SN25	Aberporth	Wales	2004
SN31	Cana Chapel, Bancyfelin	Wales	2000
SN31	Llanllwch	Wales	2000
SN31	Llanybri	Wales	2000
SN41	Bancffosfelen, Pisgah Chapel	Wales	2000
SN41	Meinciau Cemetery	Wales	2000
SN41	St Annes	Wales	2000
SN42	Rhyd Uchaf, White Mill	Wales	2000
SN44	Llanllwni graveyard	Wales	2000
SN45	Neuaddlwyn Chapelyard, Cards.	Wales	2000
SN46	Llanerchaeron	Wales	1993
SN50	Parc Howard	Wales	2002
SN51	Cross hands Chapel	Wales	2000
SN51	Eglwys yr Efengyliaidd, Penygroes	Wales	2000
SN51	Golden Grove	Wales	2000
SN51	Jerusalem Chapel, Penygroes	Wales	2000
SN51	Penygroes, Jerusalem Chapel	Wales	2000
SN51	Trawscoed, Middleton	Wales	1996
SN51	Waun Las, Middleton	Wales	1996
SN52	Llanegwad Cemetry	Wales	2000
SN53	Abergorlech Churchyard Carms.	Wales	2000
SN53	Brechfa Church	Wales	2000
SN54	Maestir Churchyard, Lampeter, Cards.	Wales	1998

SN56	Llanrhystud Chapel yard	Wales	1998
SN58	Aberystwyth University	Wales	2001
SN58	UCW Principals Lawn, Aberystwyth	Wales	1997
SN61	Pal y Cwrt Trapp	Wales	1999
SN62	Bethel Chapel, Llandeilo	Wales	2000
SN63	Llansawel Chapel	Wales	2000
SN63	Llety Wen SSSI, Cwmddu	Wales	1998
SN63	Talley Abbey, Carms.	Wales	1999
SN64	another Chapel between Farmers and Pumpsaint	Wales	2000
SN64	Cae Blaen-dyffryn SSSI	Wales	1998
SN64	Cellan Churchyard	Wales	2000
SN64	Cwrt y Cadno	Wales	2000
SN64	Farmers, nr	Wales	1999
SN64	Parc Mawr	Wales	2000
SN67	Trawscoed	Wales	1966
SN68	Penrhyncoch	Wales	2005
SN71	Mynydd Du SSSI Tro'rgwcw	Wales	2000
SN77	Hafod Estate	Wales	1996
SN77	Hafod Estate, Cards.	Wales	1966
SN77	Pwllpeiran Trail, Cards	Wales	2001
SN82	Crai: St Ilid's Church	Wales	2003
SN82	Cray Churchyard	Wales	1997
SN83	Epynt Ranges	Wales	2001
SN85	Abergwesyn	Wales	1997
SN92	Libanus Churchyard	Wales	2000
SN93	Cwm Ffrengig	Wales	1999
SN93	Eppynt Ranges	Wales	2004
SN94	Garth Village Hall	Wales	2000
SN94	Lake Hotel, Llangammarch	Wales	1999
SN94	Lawn Maesderwen, Llangammarch	Wales	1999
SN94	Pennau Common	Wales	2001
SN95	Cae Comin Coch SSSI	Wales	2004
SN95	Llanafanfawr Churchyard	Wales	1997
SN95	Pen y Garreg, Llanafanfawr	Wales	1997
SN96	Carn Gafallt	Wales	2001
SN96	Elan Village Church	Wales	2000
SN96	Elan Village: riverside	Wales	1998
SN96	Llansantfraidd Cwmdeuddwr Churchyard	Wales	1999
SN96	Llanwrthwl Churchyard	Wales	1997
SN96	Troed-rhiw-draed SSSI	Wales	2005
SN97	Gilfach Farm SSSI	Wales	2004
SO02	Brecon: Ffrwdgrech House	Wales	2003
SO02	Cwm Sere Wood	Wales	1967
SO02	Ffrwdgrech Lawn	Wales	1998
SO02	Priory Groves, Brecon	Wales	1996
SO04	Blaen Gwdu, Allt Ddu, Brecon	Wales	2000
SO04	Epynt Ranges, Concrete Hill, SW of Dixie's Corner	Wales	2000
SO04	Gledwen- ganol, Gwenddwr	Wales	1999
SO04	Maesmynis Churchyard,	Wales	2000
SO04	Pwll du, Mynydd Epynt, nr	Wales	2000
SO05	Corwen Hall, Howey	Wales	1997
SO05	Disserth Churchyard	Wales	2001
SO05	Newbridge on Wye, Merry Hall, lawn	Wales	2001

SO06	Ithon Road, Llandrindod	Wales	1999
SO06	Ithon Road, Llandrindod Wells	Wales	2005
SO06	Llandridnod Wells	Wales	1997
SO06	Llandrindod Wells	Wales	1997
SO07	Bwlch y sarnau Churchyard	Wales	1999
SO07	Llanbadarn Ffynydd	Wales	2000
SO07	St Padarns Church	Wales	2000
SO09	Gregynog	Wales	1966
SO09	Tregynon Churchyard	Wales	1997
SO10	Cwm Merddog	Wales	2000
SO11	Aberhowy, Llangynidr	Wales	1997
SO11	Craig Cwm Cleisfer (Mynydd Llangynidr)	Wales	2000
SO11	Ffynnon Tal-y-pyst	Wales	1998
SO11	Fynnon Tal-y-pyst quadrat	Wales	2004
SO11	Mynydd Llangattock SSSI, Craig y Cilau NNR	Wales	2000
SO11	Mynydd Llangynidyr	Wales	2002
SO11	Pasture beside Usk to N of Aberhowy	Wales	1999
SO12	Bwlch, Darren Rd Church	Wales	1999
SO12	Cwmdu	Wales	2005
SO13	Bronllys Churchyard	Wales	1997
SO13	Lower Pen y lan, Glasbury on Wye	Wales	2000
SO14	Begwns Common	Wales	2001
SO14	Cilcenni	Wales	2004
SO14	The Begwns	Wales	2005
SO15	Glascwm Churchyard	Wales	1999
SO17	Cwm Saise	Wales	2005
SO17	Maelienydd common	Wales	2004
SO18	Eglwys Sant Paul, Dolfor	Wales	2000
SO19	Llanwchiairn Churchyard	Wales	1997
SO20	Craig yr Allt, Goose and Cuckoo	Wales	1991
SO21	Garn Ddyrys ironworks, Blorenge	Wales	1997
SO21	Gilwern Hill quadrat	Wales	2004
SO21	Glangrwyney Court	Wales	2000
SO21	Pen-y-pound cemetry	Wales	1999
SO21	St. Mary's Vale, Abergavenny	Wales	1997
SO23	Hay Common	Wales	2004
SO26	Burfa Bog SSSI, Walton	Wales	1999
SO26	Evancoyd Churchyard	Wales	1999
SO30	Bryngwyn	Wales	1999
SO30	Trostrey, St David's Church	Wales	2000
SO31	Great Hardwick	Wales	2000
SO31	Llanarth	Wales	1999
SO31	Llandewi Rhydderch	Wales	1999
SO40	Dingestow Court Lawns	Wales	1999
SO40	Fishpool Farm Orchard	Wales	1999
SO50	Nortons Hill, Tintern	Wales	1976
SO50	Pentwyn meadows, field 1	Wales	2001
ST07	Talygarn	Wales	1997
ST18	Cefn Onn	Wales	2001
ST18	Llanishen	Wales	2003
ST18	Parc Cefn Onn, Lisvane	Wales	2000

Data sources:

- British Mycological Society Fungus Recording Database (at March 2005).
- Grampian Fungus Group database (at July 2005).
- Mycological survey of selected semi-natural grassland in Wales.
- Northern Ireland Survey of Waxcap Grassland Fungi data.
- Pink Waxcap Survey (Fungus Conservation Forum).