



WAXCAP GRASSLAND ACTION PLAN



Biodiversity Action Plan

Background

Up until 2015 the fungus records came mainly from woodland sites (glens and plantations) where the Isle of Man Fungus Group took forays. In autumn 2015 the British Mycological Society overseas foray came to the island with visiting mycologist, Eef Arnold, from the Netherlands. Grassland fungi was his specialism and he gave an inspiring lecture on the subject.

Since that time grassland sites have been discovered and surveyed, many regularly, leading to a realisation that the Island has a significant area of waxcap grassland in public areas, and in 2022 also in many extensively-used agricultural grasslands, mainly on the upland margin.

Description

This Habitat Action Plan covers all waxcap fungi belonging to the *Hygrocybe* genus (and those with new names).

There are other important grassland fungi in the CHEGD¹ group, *Clavariaceae*, *Entolomas*, *Geoglossum* and associated species, and the crazed caps (*Dermoloma*). By conserving the waxcaps these other fungi will also be protected. The wider group can be taken account of in scoring grasslands to prioritise their conservation.

British Isles Distribution

In the UK alone there are over 40 *Hygrocybe* species². The British Isles is responsible for a significant proportion of the European waxcap population. This responsibility for conservation also extends to the island.

Isle of Man Distribution

41 species (excluding colour variants) in the waxcap genera have been recorded on the Isle of Man as of February 2023 (see Appendix I). 5 species use old names or have not been seen for 40-50 years.

Manx waxcaps which have been seen this century can be divided into those regularly recorded and those which are infrequently recorded (less than 4 sites currently known).

Those infrequently recorded on the Island include *Hygrocybe fornicata*, *H. vitellina*, *H. citrinovirens*, *H. miniata*, *H. nitrata*, *H. colemanniana*, *H. ingrata* and *H. mucronella*.

Habitat

¹ Rotheroe, M. (2001). A preliminary survey of waxcap grassland indicator species in South Wales. In D. Moore, M.M. Nauta, S.E. Evans & M. Rotheroe (Eds.). Fungal conservation – issues and solutions. Cambridge

² Griffith GW, Bratton JH & Easton G; 2004. Charismatic megafungi – the conservation of waxcap grasslands, *British Wildlife*, Vol 16 (1), pp 31-43.

In the Isle of Man grassland fungi occur in a range of semi-natural and semi-improved grasslands on acidic, base-rich and neutral substrates. They also occur in dune grassland, as well as in lowland grassy heath and heath land. Some heavily-used amenity grasslands and neat churchyards are important for their fungi. The island's waxcap grasslands are mainly mossy lawns (often *Rhytidiadelphus sp*) and sheep grazed pastures.

Relatively fewer waxcap sites remain among farmland, except in the uplands and upland margins. Key features of grassland fungi sites include:

- Grassland or grassy heath that is long-established and undisturbed;
- Sites where there has been little or no use of fertilisers;
- Sites where there has been no use of herbicides.

Ecology

In the UK and the rest of northern Europe *Hygrocybe* species tend to favour unimproved or semi-improved grasslands where they seek the warmer temperatures provided by direct sunlight. Occasionally waxcaps are found in woodlands in Britain and on the island.

Legal protection and priority status

International - None known

UK legislation - a UK BAP Priority. Two UK BAP priority waxcap species have been recorded in on the island, namely the pink meadow waxcap *Popolomopsis calyptriformis* (relatively frequent) and date-coloured waxcap *Hygrocybe spadicea* (rarely seen).

Isle of Man - proposed Isle of Man Priority Habitat

As of 06 December 2021, waxcaps are now a [cited feature for ASSIs on the Isle of Man](#). They may also be indirectly protected through associated habitat features on designated sites such as Langness, Derbyhaven and Sandwick ASSI and the Ayres NNR. As a Manx Priority Habitat they are also now eligible for payments under Species-rich Grasslands under the Agri-Environment Scheme.

Grassland fungi habitats can be designated as Wildlife Sites under criterion LP3: 'All sites supporting populations of one or more species of fungi that are: nationally rare / listed in the relevant British Red Data Book or classified as nationally scarce.'³ As of February 2022 no Wildlife Sites have been designated under LP3.

Across the UK there are seven species of grassland fungi that are considered a priority: date-coloured waxcap (*Hygrocybe spadicea*)*, grey waxcap (*Hygrocybe lacmus*), blushing waxcap (*Hygrocybe ovina*), big blue pinkgill (*Entoloma bloxamii*)*, olive earthtongue (*Microglossum olivaceum*)*, dark-purple earthtongue (*Geoglossum atropurpureum*) and violet coral (*Clavaria zollingeri*)*. The ones with * are present on the Isle of man and conserving waxcap grasslands will conserve these other species too.

³ Manx Wildlife Trust; 2007. *Manx Wildlife Sites Handbook*.

Threats

FACTORS AFFECTING THIS GENUS IN THE ISLE OF MAN

- Destruction of hay meadow and permanent grassland habitats through agricultural intensification e.g. ploughing, re-seeding and high levels of fertiliser
- Destruction of habitats through tree planting and urban or suburban building programmes
- Land abandonment and reduction in the levels/or cessation of grazing or mowing, leading to growth of rank vegetation and woody species
- Heavy human disturbance i.e. trampling and soil compaction can be a problem for some species
- Potentially damaging gardening activities include excessive shade, moss killers, and the use of fungicides.
- Lack of awareness of grassland fungi and its importance. A lack of knowledge of species distribution.
- A lack of legal protection and the low percentage of grassland area protected by statutory and non-statutory designations.

Reason for BAP

These grasslands are under threat for this variety of activities. Little has been written about them until recently. They can be associated with botanical richness but often are not so have been missed from habitat evaluations.

Aims

- 5.1 To establish the current status and distribution of waxcaps on the Isle of Man and understand its basis.
- 5.2 To protect, maintain and enhance current populations of waxcaps and other grassland fungi and habitats at all existing sites of significance (defining significance first).
- 5.3 To restore and enhance other suitable sites to increase the population and distribution of waxcaps. Consider active management of their buffer zones.
- 5.4 Raise awareness of the diversity and biological importance of waxcaps among landowners and managers including the public who may have them on their lawns.
- 5.5 Ensure the Agri-Environment Scheme adequately caters for waxcap conservation on farmland.
- 5.6 To improve and maintain fungus ID skills to enable informed advice and decisions.

Linked BAPS

Lowland semi-improved neutral grassland	Action plan written.
Farmed permanent grassland	Action plan is recommended.
Lowland dry acid grassland, Upland acid grassland.	
Dune grassland	
Coastal heath	

Delivery Options	Active	Challenges
<p>Site and habitat protection through designation Waxcaps are found in areas of the island already designated as NNR and ASSIs as well as those identified as Wildlife Sites. DEFA have recognised and adopted the criteria developed in the UK for designating SSSIs for fungi⁴. The first ASSI for grassland fungi has been designated at Douglas Head and several more meet the criteria.</p>	NO	DEFA capacity and political support for site designation is lacking.
Many of the sites on the island are expected to meet the criteria for Wildlife Sites	NO	Manx Wildlife Trust capacity for Wildlife Sites designation
Currently citations of the Ayres NNR and all but the recently designated waxcap ASSI do not include importance for waxcaps/grassland fungi and no deliberate management is undertaken.	NO	To add fungi to existing designations requires site re-designation – also needing DEFA capacity and political support for site designation.
<p>Management and programmes of action Traditional short grass management inadvertently benefits waxcaps (for example churchyard mowing) but fashionable wildlife projects can unwittingly halt this effective waxcap grassland management (for example leaving long grass and flowers for pollinators, or planting trees).</p>	NO	Time of IOMFG members to discuss management of sites with their owners and managers.

<p>Survey, research and monitoring A study of over 50 sites in 2021 by Liz Charter and the Isle of Man Fungus Group, identified the most significant sites (with 5-23 waxcap species at a site). In 2022 another 10 farmland permanent pasture sites were added.</p> <p>The IOMFG revisit and re-survey many grassland sites regularly adding new species each year.</p>	YES	Time and lack of experienced mycologists on the island. Currently 3-4 people record and 2 regularly use microscopes.
<p>Site evaluation This study used the method devised (by Rald, 1985)⁵ to evaluate the conservation value of nutrient poor grasslands through the use of waxcaps and other fungi (such as pink gills - <i>Entoloma</i> spp. And corals – <i>Clavariaceae</i>) as indicator species. A weighted score using rarity of species on the isle of Man (based on number of tetrads in which a species occurs) is also included in the evaluation enabling rarity of species to add value.</p>	YES	The discussion about whether the island should have a lower threshold for ASSI as it has fewer waxcap species.

⁴ Guidelines for selection of biological SSSIs: Chapter 14 Non-lichenised fungi. 2018.

⁵ Grasslands are scored in terms of the number of CHEG species (fairy clubs Clavarioid, waxcaps *Hygrocybe*, pink gills *Entoloma* and earth tongues *Geoglossum*) which are found on site: 17-32 (national importance), 9-16 (regional importance) and 4-8 (local importance).

<p>Updating the checklist of fungi occurring on the Isle of Man The 10th Anniversary checklist publication and the associated collation of records will assist in ensuring all the waxcap data are included in the site comparison. This verification helps ensure the best sites are proposed for protection.</p>	<p>YES Culture Vannin grant covers this project</p>	
<p>Biennial review and update of this document</p>	<p>By Liz Charter and IOMFG</p>	
<p>Delivery Plan</p>		
<p>Action</p>	<p>Lead</p>	
<p>Collate records for waxcaps and grassland fungi found in the Isle of Man and create a waxcap and other fungi mapping layer which can be disseminated to appropriate partners. Target regular and future survey work, recognising that all species do not fruit every year.</p>	<p>TIMESCALE: Ongoing. PARTNERS: IOMFG, MWT, DEFA (Ecosystem Policy Team).</p>	
<p>Improve and maintain fungus identification skills to ensure records are validated and a good basis for conservation decisions. TARGET: to build up a core of 5 or more people with microscopy skills as well as at least 10 with good field skills by 2025</p>	<p>PARTNERS: IOMFG with funding partners</p>	
<p>Encourage more survey work of suitable sites through partnership with other organisations, particularly through co-operation with the Agri-environment officer in MWT, bringing in farmland sites.</p>	<p>TIMESCALE: Ongoing. PARTNERS: IOMFG, MWT</p>	
<p>Ensure developments in sensitive locations are compatible with conservation of waxcaps and other grassland fungi through the planning process.</p>	<p>TIMESCALE: Ongoing and open-ended. PARTNERS: IOMFG with relevant partners DEFA (Planning and Ecosystem Policy Team).</p>	
<p>Designate all known waxcap sites of a particular quality as Wildlife Sites and propose that important sites for grassland fungi are designated as ASSIs (using SSSI and Wildlife Site selection guidelines⁶ and using the fungus database to identify Island appropriate thresholds of grassland species diversity and rarity, including fungi other than waxcaps). TARGET: Designate the top 5 sites as ASSI by 2025.</p>	<p>PARTNERS: DEFA (Ecosystem Policy Team) IOMFG (recommendations) and MWT (Wildlife Sites).</p>	

⁶ Guidelines for the selection of Biological SSSI's Chapter 14 Non-lichenised fungi (JNCC 2018)

<p>Promote and support land management grant schemes and / or use management agreements where appropriate to secure favourable habitat management of sites with established waxcap populations, and adjacent areas which could provide linkages between isolated populations, taking into account the needs of other associated BAP species and habitats.</p>	<p>TIMESCALE: Ongoing and open-ended.</p> <p>PARTNERS: DEFA (Agriculture and Forestry), MWT as AES Delivery Partner.</p>
<p>Raise awareness of the existence of grassland fungi with farmers and landowners (including churches) by producing an information leaflet, and through local agricultural shows and events.</p> <p>TARGET: Produce leaflet and signs by end of 2023.</p>	<p>TIMESCALE: Ongoing and open ended.</p> <p>PARTNERS: IOMFG, Manx Utilities, the Diocese of Sodor and Man, MWT.</p>
<p>Ensure that the potential presence and management requirements of waxcaps are considered within any relevant management plans or grant schemes (including ASSI management plans, by liaison including consultation and provision of comments) between key organisations.</p>	<p>TIMESCALE: Immediate and urgent for current sites.</p> <p>PARTNERS: DEFA (Agriculture and Forestry)</p>
<p>Provide integrated advice to landowners and managers on appropriate management of all grassland fungi, such as the continuation of grazing/mowing, and no reseeding, fertiliser or pesticide inputs.</p>	<p>PARTNERS: Isle of Man Fungus Group and MWT through the Agri-Environment Scheme</p>
<p>Give legal protection to the rarest grassland fungus species. By analysing the fungus database and with reference to protected species and red lists in adjacent jurisdictions make recommendations of species to be listed in a schedule of the Wildlife Act.</p> <p>TARGET: Protect rarest fungus species by adding to schedule of the Wildlife Act 1990 by 2025.</p>	<p>PARTNERS: IOMFG with DEFA</p>

PARTNERS & OPPORTUNITIES

Overall Lead Partner for BAP IOMFG (Liz Charter)

Key Partners DEFA, MWT, Diocese of Sodor and Man, Manx Utilities

Opportunities for involvement; Volunteers, public, students, farming unions, landowners and managers.

ACKNOWLEDGEMENTS

Principal Author: Liz Charter (May 2023)

Consultees: IOMFG, BAP Leaders, MWT, DEFA.

ABBREVIATIONS

AES: Agri-Environment Scheme.

ASSI: Area of Special Scientific Interest,

BAP: Biodiversity Action Plan,

DEFA: Department of Environment, Food and Agriculture,

HAP: Habitat Action Plan,

IOMFG: Isle of Man Fungus Group,

MWT: Manx Wildlife Trust,

NNR: National Nature Reserve,

SAP: Species Action Plan,

VALUABLE LINKS

ASSI selection criteria <https://www.gov.im/media/1375161/guidelines-for-the-selection-of-biological-assis-iom-grassland-fungi-061221.pdf>

Waxcap grasslands <https://www.plantlife.org.uk/uk/discover-wild-plants-nature/habitats/grassland/waxcaps-fungi>

Academic waxcap website <https://www.aber.ac.uk/waxcap/index.shtml>

2014 Fungus checklist – to be replaced shortly <http://www.manxbiodiversity.org/PDF/fullchecklist2014.pdf>

APPENDIX 1 Waxcaps of the Isle of Man

(Probable synonyms in brackets)

Scientific name	Common name
Cuphophyllus pratensis	
Cuphophyllus pratensis var. pallida	Pale waxcap
Cuphophyllus pratensis var. pratensis	Meadow waxcap
Cuphophyllus russocoriaceus	Cedar waxcap
Cuphophyllus virgineus	
Cuphophyllus virgineus var. ochraceopallideus	
Cuphophyllus virgineus var. virgineus	Snowy waxcap
Gliophorus euoperplexus	Butterscotch waxcap
Gliophorus irrigatus	Slimy waxcap
Gliophorus laetus	Heath waxcap
Gliophorus psittacinus	Parrot waxcap
Hygrocybe acutoconica	
Hygrocybe acutoconica var. acutoconica	Persistent waxcap
Hygrocybe acutoconica var. konradii	
Hygrocybe aurantiosplendens	Orange waxcap
Hygrocybe cantharellus	Goblet waxcap
Hygrocybe ceracea	Butter waxcap
Hygrocybe chlorophana	Golden waxcap
Hygrocybe citrinovirens	Citrine waxcap
Hygrocybe coccinea	Scarlet waxcap
Hygrocybe colemanniana	Toasted waxcap
Hygrocybe conica	Blackening waxcap
Hygrocybe conica var. conicopalustris	
Hygrocybe conicoides	Dune waxcap
Hygrocybe flavescens (H. chlorophana)	Golden waxcap
Hygrocybe flavipes	Yellow-foot waxcap
Hygrocybe fornicata	
Hygrocybe fornicata var. fornicata	Earthy waxcap
Hygrocybe glutinipes	
Hygrocybe glutinipes var. glutinipes	Glutinous waxcap
Hygrocybe helobia	Garlic waxcap
Hygrocybe ingrata	Dingy waxcap
Hygrocybe insipida	Spangle waxcap

Hygrocybe intermedia	Fibrous waxcap
Hygrocybe marchii	
Hygrocybe miniata	Vermillion waxcap
Hygrocybe mollis + (H. miniata var. mollis)	
Hygrocybe mucronella	Bitter waxcap
Hygrocybe nigrescens (H. conica var. nigrescens)	
Hygrocybe nitrata	Nitrous waxcap
Hygrocybe obrusea (H. quieta)	
Hygrocybe punicea	Crimson waxcap
Hygrocybe quieta	Oily waxcap
Hygrocybe reidii	Honey waxcap
Hygrocybe spadicea	Date waxcap
Hygrocybe splendidissima	Splendid waxcap
Hygrocybe substrangulata	
Hygrocybe turunda	
Hygrocybe vitellina	
Hygrocybe xanthochroa+	Alpine waxcap
Porpolomopsis calyptriformis var. calyptriformis	Pink or ballerina waxcap

+ last recorded in the 1970s