

the
species
recovery
trust

SPECIES HANDBOOK

Marsh Clubmoss
(*Lycopodiella inundata*)

Part 2
Survey and management





SURVEY

Habitat

Marsh Clubmoss predominantly grows on areas on bare wet peat, often on track edges. It can however grow in a wide range of habitats as outlined above. It is a poor competitor so it is generally worth focussing on areas which support bare ground, or sparser vegetation. In mire systems it can however appear anywhere where the cover of Sphagnum exceeds that of Purple Moor-grass, so searches may have to be extensive and population may be encountered by good fortune rather than scientific rigour.

What to record

Number of plants; Area occupied; Associate species and habitat (if possible); Threats (i.e. drying out, scrub, too much trampling etc)

Techniques

It is extremely useful to carry pegs or canes to mark where plants are found, especially for larger populations. These help with calculating areas, can be used to photograph where plants are, and save losing plants halfway through looking for them!



Lycopodium clavatum

Confusable species

Marsh Clubmoss rarely occurs with other Clubmoss species, which tend to favour drier ground at higher elevations. It does occasionally grow with Stag's-horn Clubmoss (*Lycopodium clavatum*) which can be differentiated for the hair-like projections on the leaves, giving it a more bushy look, upright rather than creeping stems and branched rather than single strobili.

When surveying is it more likely that the plants will be visually confused by procumbent stems of Cross-leaved Heath (*Erica tetralix*) and larger specimens of *Polytrichum* moss.



Polytrichum commune

Associate species

Marsh Clubmoss has a high affinity with a narrow range of species, and recognising these and the specific habitat they grow in will make finding the plants much easier.



Erica tetralix



Counting Individuals

One of the more challenging aspects of surveying populations is how to achieve accurate counts of individual plants. There is likely to be some variance between surveys, but from experience normally everyone is within the right ballpark. When plants are in the process of splitting and growing on top of each other there is always a level of 'guesstimation'.

General rule of thumb

- Individual plants are Y-shaped, but sometimes split more and can run underground
- If you can't see a joint between two fragments, count as two
- Surveys in late summer/autumn when growth has completed tend to produce easier results
- Count plants, rather than stroboli; but make a note of how many are fruiting



Counting Individuals





For some large and dense populations counting becomes much harder. For these sites it is recommended to visualise a clump of ten, or even 50 plants, and then count the site in units of these clumps. Carry out the count three times, starting at different points and then take an average of the three results for your final count.

Use of Pegs



Peg marking small and hard to relocate plant during count



Pegs marking outer edges of patch of plants

Associate species



Drosera intermedia



Drosera rotundifolia



Erica tetralix

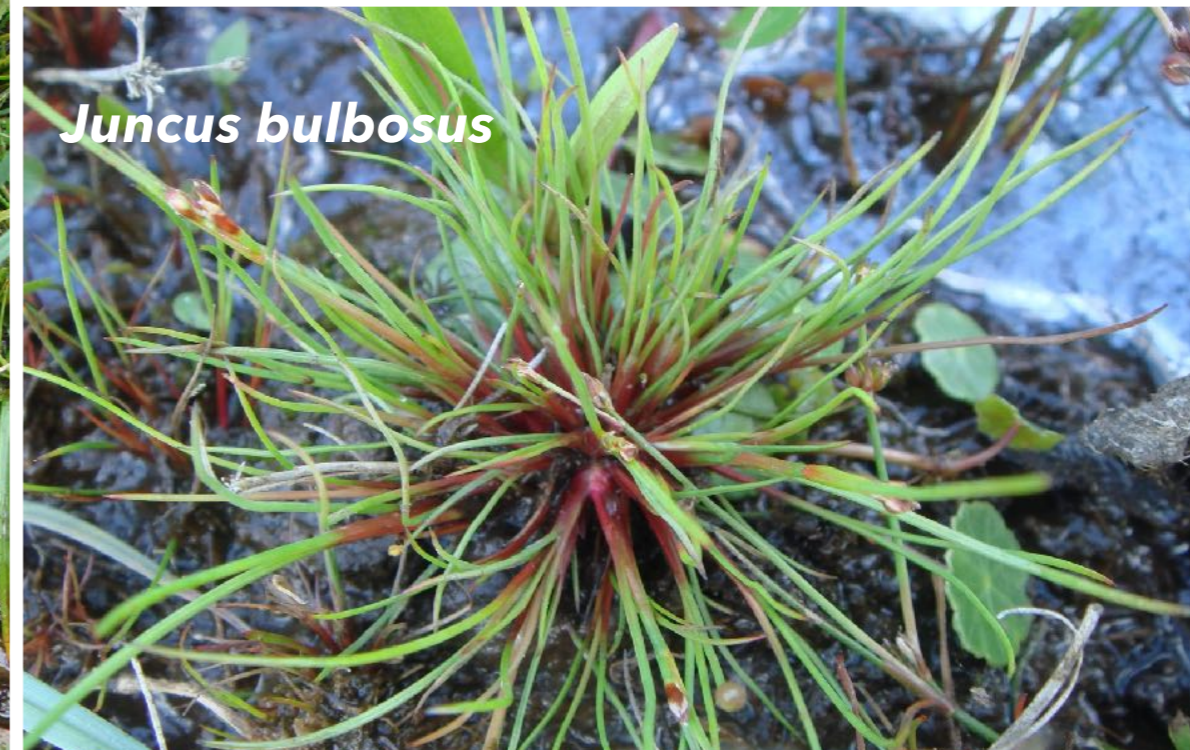


Narthecium ossifragum

Associate species



Carex panicea



Juncus bulbosus



Molinia caerulea



Rhynchospora alba

Associate species

Sphagnum cuspidatum

Sphagnum papillosum

Sphagnum compactum

Sphagnum denticulatum



MANAGEMENT

Management for the conservation or restoration for Marsh Clubmoss is extremely challenging, and the majority of historical attempts at it have sadly ended in failure.

The key factor to understand is that this is a species which favours disturbed habitats, but does not like disturbance in itself. It will therefore do well on areas of open bare peat which are already present, but will often not favour newly created habitat of this type.

Historically the main method of management has been to create large mechanical scrapes, but longterm monitoring of these has revealed that in the majority (but not all) cases Clubmoss plants have either failed to colonise these, or have briefly appeared before declining and vanishing.

Conversely some of the best sites for Clubmoss are on areas where disturbance has occurred in the past, not even aimed at conservation, and this has inadvertently created some of the best habitat for it.



LANDSCAPE SCALE

Undoubtedly the best way to manage for Marsh Clubmoss is on a landscape scale, with large herds of grazing animals (cattle or ponies) freely moving over large areas. This has produced many thriving populations in the New Forest, which has unique patterns of grazing. Of most relevance in this system is the way cattle will create temporary areas of quite heavily disturbed ground, followed by periods where they will not return to that same area - creating the ideal post-disturbance conditions Marsh Clubmoss thrives in.

In reality it is extremely hard to recreate this mixed grazing pressure on smaller and more fragmented sites, but consideration can be given to erecting temporary cattle enclosures and 'mob grazing' areas for short periods to re-create this pattern of disturbance and protection.

SITE SCALE

Where extensive grazing is not an option, then mechanical means can be used to attempt to boost and restore populations. Over the last three decades this has involved the creation of 'scrapes' which have the intention of removing competing vegetaotn and created bare damp peaty soil which the plants are known to favour.

However, continued monitoring of these sites have shown that this approach has had limited success, and may in some cases may have had an adverse impact on pre-existing populations.



Extensive grazing in the New Forest © Bryan White

Research from the continent, and data from monitoring work in the South-east in England, has shown that often these scrapes develop a narrow assemblage of similar species which often then come to dominate the scrapes - the most typical plant being Bulbous Rush (*Juncus bulbosus*) and later on Purple Moorgrass (*Molinia caerulea*). Bulbous Rush thrives on newly created ground, and is able to develop rapidly on a wider range of hydrological types, from relatively dry ground to fully submerged aquatic situations.

The other issues with the scrapes is that in grazed situations they tend to attract cattle in large quantities - it is uncertain why this happens, possibly due to minerals being exposed in the soil or just a preference to have their legs out of taller vegetation in wet periods. This can then lead to over-trampling and accumulation of dung, neither of which will benefit Marsh Clubmoss.

Where scrapes have worked it tends to be where islands of vegetation have been retained, which allow the Clubmoss a base to colonise from.

Recent work on mycorrhizal interactions has also shown the close relationship Clubmoss has with the endophytic fungi of other plants, which explains why plants are seldom found in the centre of these large scrapes, and often when they are they soon die out.



Top picture:

Damp scrape with narrow range of recolonising plants

Below:

Partial scrape with Clubmoss colonising off island of retained vegetation



COMPACTION, NOT EXTRACTION

One of the more successful techniques which has emerged in recent years (sometimes accidentally) is the emergence and enlargement of populations in areas where vehicles have tracked over. Historically large populations of plants have occurred on track edges in the New Forest, where the ground is periodically compacted, creating areas of bare ground closely bordered by established mire vegetation. The two largest populations in Dorset occur on the Bovington tank training area and at Barnsfield Heath, both where vehicles have tracked over damp ground in the past.

In the Thames Basin heaths there have been many incidences where populations of plants have been found in vehicle ruts , and in Dorset in 2018 a technique of driving over damp ground where plants already were occurring, was trialed very successfully by the RSPB and Plantlife. The advantages of this form of management is that it opens up the swards and creates small areas of bare ground, while at the same time reducing the dominance of some of the larger plants. It additionally conserves the soil structure and any fungal activity which is occurring in the soil.

In addition it removes the need to create waste piles of spoil, and is a more carbon neutral way of conserving soil. They are also less unsightly, especially in landscapes where the public visit.

While these compacted areas will not last as long as the traditional soil scrapes, they are theoretically much easier and cheaper to create, and would ideally be mainlined on a rotational basis around sites where the existing or relic populations occur.



OUR WORK

- Setting up and running a national monitoring network
- Coordinate annual monitoring in the New Forest
- All other sites monitored on 5-year rolling programme
- Site management at high risk sites
- Ecological research
- Fighting to protect sites under threat

SUCCESS

- All populations in England and Wales surveyed and risk register produced
- Annual monitoring network for New Forest set up

Marsh Clubmoss is at a critical time in its conservation. It still has a good distribution of sites across England, but we believe the Dorset Heaths can no longer be described as a stronghold due to fragmentation of sites, and there is a very real chance of losing it from most of the sites in Southeast England if we cannot reverse current population declines.

As a strong indicator of well-managed mire systems, these losses are sadly symptomatic of the deterioration of so many areas of lowland heath, despite a wide range of conservation programmes targeted at the habitat.

What happens in the next two decades will be absolutely crucial for the long-term survival of this species in the British Isles.



*Survey training day
in the New Forest*

The Species Recovery Trust is a charity set up to tackle the loss of some of the rarest species in the UK.

There are over nine hundred native species in the UK that are classed as under threat, with several hundreds more currently widespread but known to be in significant decline. The countryside is now bereft of many species that were a familiar sight a mere generation ago.

A small number of these species are on the absolute brink of existence, poised to become extinct in our lifetimes; our goal is to stop them vanishing.

Our aim is to remove 50 species from the edge of extinction in the UK by the year 2050. In addition we are reconnecting people with wildlife and the natural world through training programmes and awareness raising.



A photograph of a forest floor in spring. The ground is covered with a dense carpet of small, purple-blue bell-shaped flowers (bluebells). In the foreground, a large, moss-covered tree stump lies horizontally. The background is filled with tall, slender trees with green foliage, and sunlight filters through the canopy, creating dappled light on the forest floor.

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