

Looking after rare mosses and liverworts in coastal dune slacks



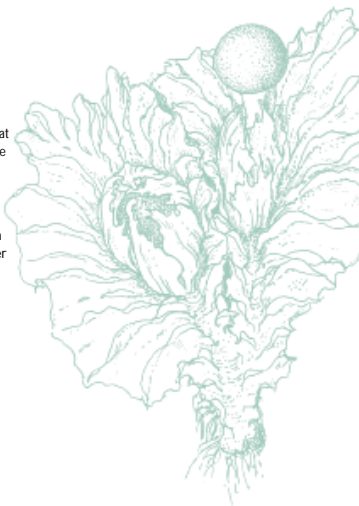
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Coastal dune slacks, the damp, low-lying areas between sand dunes, provide an important habitat for mosses and liverworts. These fascinating miniature plants, known collectively as bryophytes, are particularly sensitive to changes in their surroundings, and several species that reside in dune slacks are threatened in Britain and indeed throughout Europe.

These species thrive mainly where there are bare patches of calcium-rich sand which they can colonise. Such habitats occur naturally where the build-up of sand produces new dunes and slacks, or where cycles of erosion and re-deposition provide fresh surfaces of bare damp sand. Once these areas become colonised by larger flowering plants such as Creeping Willow and the bare sand disappears, the slacks become less suitable for bryophytes.

In many places dune slacks have been destroyed over the past century by coastal developments including industry and housing, golf courses, drainage and sea-defence works. Elsewhere, vegetation has covered over the sand following the cessation of grazing by sheep or cattle, or loss of rabbits following myxomatosis. Encroaching scrub, especially Sea Buckthorn, has added to this problem in some dune systems. This combination of pressures has meant that we are left nowadays with only a small fraction of the dune slacks present a century ago and many of their bryophytes are threatened.

This leaflet introduces some of the special and more threatened bryophytes of dune slacks that have been identified as needing conservation management under the UK Biodiversity Action Plan, and provides information on the care of their habitats to ensure their survival.



Site management

Erosion control and footpaths

On many of our coasts, there has been an emphasis on reducing damage from erosion and on 'repairing' dunes which has led to very low levels of sand erosion. This has prevented the formation of the open sandy areas required by these bryophytes in neighbouring dune slacks. With its ability to colonise bare areas, Petalwort positively benefits from trampling by people in dune slacks, especially where wide diffuse pathways grade from a rather bare centre to short rabbit-grazed vegetation at the edges. The rare Thread-mosses show less direct benefit from trampling, but suffer when trampling pressures become extreme.

Grazing

The rate at which vegetation develops in a dune-slack depends very much on grazing pressure, with rabbit grazing able to maintain an open sandy surface for decades or more. Where strong rabbit populations graze slacks with rare bryophytes, care should therefore be taken to avoid changes that harm the rabbits. For example, scrub provides refuges for rabbits and so small amounts should be retained where possible. Large increases in dog numbers may also reduce rabbit activity or populations. Where there are now few rabbits, grazing by domestic stock should be considered in order to maintain short vegetation. If grazing by domestic stock is introduced, care needs to be taken to prevent serious poaching of the ground around pools in slacks (especially by cattle), in location of fences, and stocking levels should be sufficiently low to ensure that there is no need for additional winter-feeding.

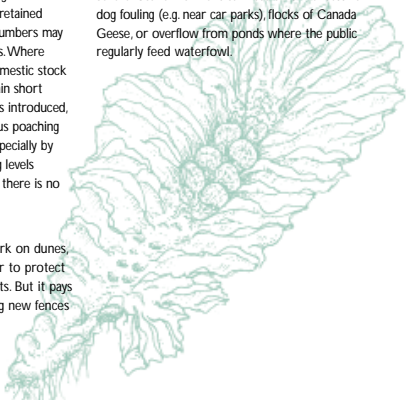
Fencing

Fencing has a place in conservation work on dunes, to direct pedestrians, control grazing or to protect rare plants from being nibbled by rabbits. But it pays to exercise some caution when locating new fences

near populations of rare bryophytes, for example tanalised fence posts may leak chemicals that can damage bryophytes, whilst galvanised wires can cause zinc run-off which is thought to be toxic to some bryophytes. Indirect effects of new fences should also be anticipated, for example increasing trampling in some places and reducing trampling elsewhere, and through an increase or decrease of grazing pressure.

Drainage and nutrient enrichment

Drainage of dune-slacks causes irreversible damage. Ditches or abstraction of water from boreholes provide obvious threats, whilst afforestation or even scrub growth on neighbouring land may be a less obvious cause of a falling water-table. Efforts to maintain conditions in drying slacks by scraping down to the water-table have met with at least some temporary success, but seem a poor substitute for preventing drainage. Nutrient enrichment of water reaching slacks is an obvious threat because it leads to increased plant growth, thus shading out the interesting bryophytes. Besides run-off due to water contaminated with sewage or agricultural fertilisers, severe local enrichment can result from excessive dog fouling (e.g. near car parks), flocks of Canada Geese, or overflow from ponds where the public regularly feed waterfowl.



Threatened dune slack bryophytes

Petalwort *Petalophyllum ralfsii* is a bright green liverwort that resembles an incredibly minute lettuce. The green parts, known as thalli, are less than 5mm across, and are mainly seen on the ground from autumn through the winter until spring. As dune slacks dry out in spring only the thick underground parts of the thalli survive, to produce new growth again in autumn. Large populations of Petalwort still survive in Wales and at a few locations in Cornwall, north Devon, Merseyside, Northumberland and at one location on the west coast of Scotland, whilst there are small populations in Norfolk, south Devon and Northern Ireland.

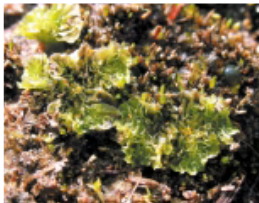
Blunt bryum *Bryum calophyllum* is a small upright moss that gains its English name from its oval, blunt or more often shortly pointed leaves. This colonist of bare sand in dune slacks is now feared extinct in England. It is known to persist in small amounts at one locality in Wales (on Anglesey) and at three sites in Scotland. A century ago it occurred at seven English and five other Welsh localities, so its extinction in Britain seems quite possible unless we can arrest the declining trend.

Long-leaved Thread-moss *Bryum neodamense* has blunt upper leaves on a red stem and is rare throughout Europe, despite occurring in a range of habitats that include calcareous fens in the Alps and many lakeshores in Ireland. The only surviving population in England is on the Sefton Coast of Merseyside, and this population is unusual in growing in dune slack habitats. At its one Scottish site, it grows on the bed of a shallow loch.

Warne's Thread-moss *Bryum warneum* is distinctive in bearing its pear-shaped fruiting capsule on a disproportionately long stalk known as a seta. Once known from as many as 35 localities around the British coast, it has declined drastically and is now known to survive at only five places in Scotland,

four in England and three in Wales, a dire warning that the species is at serious risk.

Other rare and threatened bryophytes occurring in coastal dune slacks include Knowlton's Thread-moss *Bryum knowltonii*, which is known to occur at three sites in Scotland, two in England, and one in Wales, but others, such as Sand Thread-moss *Bryum mamillatum* are now feared extinct.



Petalwort *Petalophyllum ralfsii*



Warne's Thread-moss *Bryum warneum*

Management advice

- Open habitats are best - aim to keep the dune system as dynamic as possible.
- Light trampling is important for maintaining the open conditions needed by these species. Try to avoid placing boardwalks or diverting paths in areas where these species are known to occur.
- Grazing is important to maintain open areas. Encourage rabbit grazing or consider the introduction of grazing stock on dunes where rabbit numbers are low.
- Where possible avoid the use of tanalised fences and galvanised wire in fences or on boardwalks near populations of rare bryophytes
- Remember that drainage will affect the dune system as a whole, not just the immediate vicinity.
- These species are very sensitive to enrichment by nutrients.
- Seek advice from the organisations listed at the end of this leaflet if you have any further queries.



Open areas of damp bare sand are particularly important habitats for rare dune bryophytes such as petalwort



Further information and advice can be obtained from:

Plantlife International
14 Rollestone Street, Salisbury,
Wiltshire SP1 1DX
Tel: 01722 342730
Email: enquiries@plantlife.org.uk

English Nature
Northminster House,
Peterborough PE1 1UA

Plantlife International wishes to acknowledge the financial support of English Nature in this jointly resourced project

Scottish Natural Heritage
2 Anderson Place,
Edinburgh EH6 5NP

Countryside Council for Wales
Plas Gogerddan
Aberystwyth SY23 3DE

For more information about bryophytes contact:

The British Bryological Society at
Ivy House, Wheelock Street,
Middlewich, Cheshire CW10 9AB
(Email: roseblade@one-name.org)
or visit www.rbge.org.uk/bbs/

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