ENGLISH NATURE

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Main photo: Purple moor-grass pasture with devil's-bit scabious, South Wales. Gill Barter
Top left: Narrow-bordered bee hawk-moth. Mike Hammett/CCW
Bottom left: Snipe.
Mike Hammett/CCW

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ENGLISH NATURE

Purple moor-grass and rush pastures

working today
for nature tomorrow

Purple moor-grass and rush pastures

What are purple moor-grass and rush pastures?

The marshy grasslands known as purple moor-grass and rush pastures were often seen as the bane of the farmer, only providing useful grazing or a haycrop in dry summers. As with so many of our wildlife habitats, their value has become more widely recognised as the majority has disappeared. Anyone who has experienced the sights and sounds of these grasslands on a sunny June afternoon, with marsh fritillary butterflies flitting amongst the purple flowering heads of meadow thistle, will appreciate their immense value for wildlife.

The grasslands covered by this booklet occur on farmland in the lowlands, including enclosed land around the margins of hills. Wet grasslands in the unenclosed uplands are excluded. Most of the rarer species associated with wet grasslands occur in the lowlands.

Most of these wet grasslands are kept as rough grazing for beef cattle and farm horses, mainly during the drier summer months. In the past, many were cut for hay, but this use is in decline. Now only a few sites are managed as hay-meadows, usually with grazing of the aftermath, which is the vegetation re-growth following mowing.

Meadow thistle. David Stevens

Culm grassland, Devon. Peter Wakely/English Nature 16,585

Various names have been given to these wet pastures in different parts of the UK. In Wales, they are often referred to as 'rhôs pastures', although this term can also be used to include heath and peatland habitats; 'rhôs' is a frequent element of Welsh place-names, suggesting that these habitats were much more common in the past. In Devon and Cornwall, the term 'Culm grassland' has been coined, after the Culm Measures on which they are predominantly found. In East Anglia, they have been called 'litter meadows', because of the practice of cutting them for bedding.

Changes in agricultural practices have caused the loss of many marshy pastures, but those that do remain and are managed appropriately are often havens for wildlife, full of birdsong in the spring and humming with insects in summer.

Where are they found?

Purple moor-grass and rush pastures are most frequent in the west of the UK, extending eastwards where wet soils are found. It is estimated that less than 70,000 hectares remain, distributed among all four countries. In England, there are important concentrations in Devon and Cornwall, the Somerset Levels, New Forest, Weald and East Anglia. In Wales, they are particularly characteristic of the south Wales coalfield, extending westwards into Pembrokeshire and northwards through Ceredigion to Snowdonia and the Llŷn peninsula. In Scotland, they are found throughout the lowlands, from Dumfries and Galloway to the Northern Isles, and from the Western Isles to Aberdeenshire. In Northern Ireland, they are a distinctive habitat particularly in west Fermanagh, where groups of small fields are traditionally managed as hay-meadows, the cut material being kept either for winter feed or for bedding.

These pastures occur mostly on gently sloping land, where there is lateral movement of water through the soil, but also on river and lake floodplains, where they may be periodically flooded during the winter and early spring. They may be small and isolated, or form large tracts of rough grazing, and are often mixed with other habitats, such as heaths, fens, drier grasslands and scrub or woodland.

Rush pasture with whorled caraway, South Wales. Jon Turner

Why are they important for wildlife?

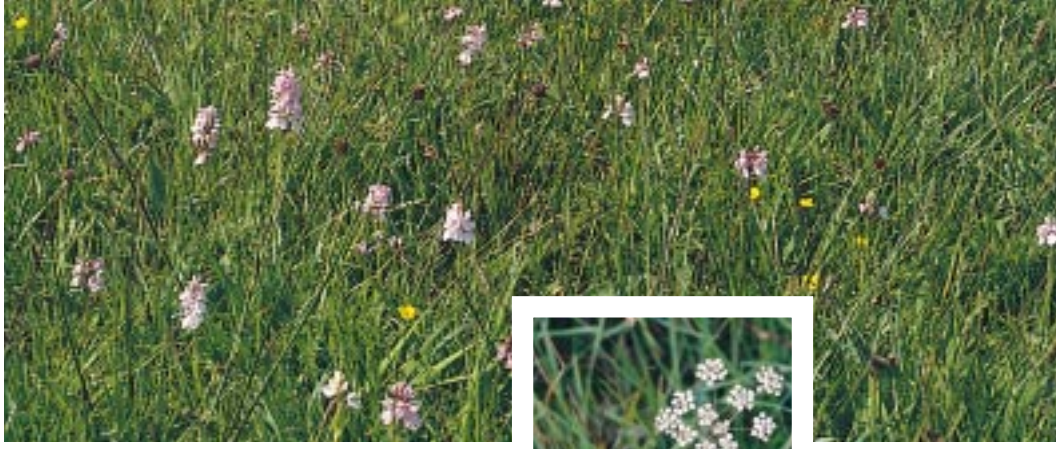
Although they can appear drab from a distance, on close inspection these wet pastures are often full of wildlife, with up to 50 different plant species in a 2 x 2 metre square. Plants include a variety of grasses, rushes, sedges and broad-leaved herbs, underneath which there may be extensive patches of mosses and liverworts. The vegetation may be tall, usually dominated by large tussocks of purple moor-grass or tall rushes; or fairly short and even, often with an abundance of small sedges amongst the grasses.

The richest forms of this habitat, sometimes referred to as fen-meadows, occur on soils that are naturally slightly limey. Fen-meadows are often dominated by purple moor-grass, and may include a variety of uncommon plants, such as lesser butterfly-orchid and fragrant orchid. In southern Britain, the flower-heads of meadow thistle add splashes of purple to many of these fen-meadows in mid-summer. Marsh hawk's-beard is frequently found in a scarce form of fen-meadow in the hill country of Scotland, northern England and north Wales, where you may also find occasional plants of the aptly named globeflower, a striking relation of the buttercup. A rarer form of fen-meadow is dominated by the uncommon blunt-flowered rush. A wealth of herbs may be found amongst the rushes, including marsh valerian, with its delicate pale-pink flowers, and the scrambling stems of fen bedstraw.

Southern marsh-orchid. David Stevens

Lesser butterfly-orchid. Adrian Fowles

Globeflower. David Stevens



Purple moor-grass pasture with heath spotted-orchids. Gill Barter

Other forms of the habitat occur on more acidic soils. These too may be dominated by purple moor-grass or rushes, and brightened by tall herbs such as the robust white-flowered wild angelica and the pungent meadowsweet. Smaller in stature but equally distinctive are ragged-robin, with its finely cut pink flowers, the aromatic water mint, and tormentil, an almost ubiquitous associate of purple moor-grass. Orchids are also well-represented, usually by the heath spotted-orchid and southern or northern marsh-orchids. Visually drabber forms of the habitat may be no less rich in plants, with inconspicuous species often concealed within the tangle of grasses and rushes.

Wavy St John's-wort. Peter Wakely/English Nature 8,567

Whorled caraway.
Peter Wakely/English Nature 20,637

Purple moor-grass and rush pastures contain a number of 'Atlantic' plants, which are restricted within Europe to the western fringes, where the influence of the Atlantic Ocean makes for a mild, wet climate. Some of these, such as whorled caraway, with its plates of white flowers and feathery, fragrant leaves, and the miniature gorse-relative petty whin, can be found fairly easily by looking in the right places. Others are more restricted in their distribution and harder to find. Examples include the magenta-flowered heath lobelia of southern England; the yellow-flowered wavy St John's-wort of south west

Petty whin. David Stevens

Purple moor-grass pasture with viper's-grass. Mike Alexander

Viper's-grass.
Mike Alexander

England and west Wales; and the delicate blue-eyed-grass, which in the UK only occurs naturally in Northern Ireland. Rarer still is the viper's-grass, which is known from only a single site in Dorset and two recently discovered sites in south Wales.

Mosses and liverworts which occur in springs and seepages in these marshy pastures include the scarce slender green feather-moss, and the descriptively named bog earwort; both are easily confused with commoner related species, but have been reliably recorded at a number of new localities during recent survey work. Two other mosses that sometimes occur in this habitat grow on unusual substrates: the increasingly rare thatch moss grows on decaying plant remains at sites in eastern England (as well as on the thatch roofs that give it its name), while the cruet collar-moss is a more frequent but probably also declining coloniser of decomposing cattle dung.

Curlew and lapwing breed in marshy pastures, their musical calls ringing out over surrounding fields and hills. Snipe may be seen darting for cover when disturbed, and in spring the 'drumming' of their tail feathers as they vibrate in the air-stream of a shallow dive is a particularly evocative sound. Characteristic perching birds include grasshopper warbler, which broadcasts a song remarkably like the insect after which it is named, and reed bunting, with its black and white head markings.

Common frogs are the most likely amphibians to be seen in marshy pastures. They breed in shallow pools between grass and rush tussocks, while common toads breed in deeper ponds, foraging for invertebrates in the wet grassland. Grass snakes and adders take advantage of the range of sunny and shady conditions provided by the tussocks for basking and seeking their prey, which includes frogs, common lizards and small mammals.

Bog earwort. Alan Hale

Adder. Mike Hammett/CCW

Curlew. Mike Hammett/CCW

Otters may use these pastures when hunting for food items like frogs. Where there is sufficient cover, they may use them for breeding. Water voles may occur where there are suitable banks for burrows. They will feed on many of the wide range of plants found, including sedges and rushes.

Otters. P and J Weaner/FLPA

This habitat is home to a varied invertebrate fauna, which includes insects found almost exclusively in this habitat in parts of their range. The best known example is the uncommon and declining marsh fritillary butterfly, which in western Britain is largely restricted to wet pastures rich in its larval foodplant, devil's-bit scabious. Another insect dependent on this plant is a type of jewel beetle, the larvae of which emerge from shiny, black eggs to leave thin white trails as they 'mine' the leaves. The bizarre, day-flying narrow-bordered bee hawk-moth is also a specialist of these pastures. With its clear wings and short body covered by hair-like scales, this moth mimics the appearance of a bumblebee.

Devil's-bit scabious. Adrian Fowles

Marsh fritillary caterpillar. Jim Porter

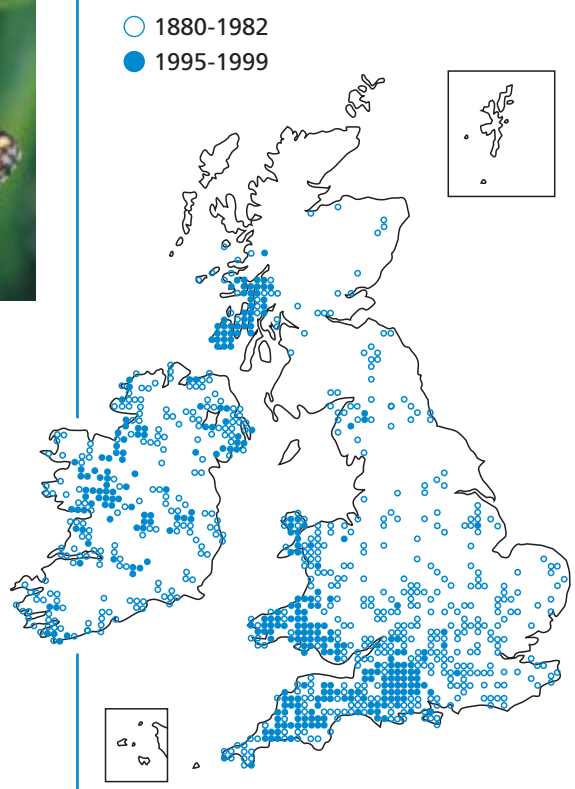
Marsh fritillary chrysalis. Martin Warren

Marsh fritillary adult. Adrian Fowles

The chequered wings of the marsh fritillary were once a locally common sight in southern and western parts of the UK. Today, it has disappeared from many counties, and is one of the most rapidly declining butterflies in Europe. Adults are on the wing in late May and June. The females lay batches of eggs on the undersides of the leaves of devil's-bit scabious, and the young caterpillars live colonially within a silky web. These caterpillars face a macabre challenge from small parasitic wasps, which inject their eggs into the newly hatched larvae; up to 70 wasps may emerge from a single caterpillar, ready to parasitise the next crop of larvae. The surviving caterpillars disperse the following spring in search of food, before turning into chrysalids and emerging as butterflies.

Distribution of marsh fritillary

From: Butterflies for the New Millennium project, Butterfly Conservation and Biological Records Centre



Ragged-robin. Mark Wright

Why are marshy pastures now so scarce?

Unimproved lowland grassland of all types has declined in extent over the last 70-80 years. In England and Wales, 97% of enclosed unimproved grassland was lost between the 1930s and 1980s. More recently, the Devon Wildlife Trust has recorded a decline in the area of Culm grassland amounting to 8% per year during the period 1984-1990. Observations in south Wales suggest that losses are still occurring, mainly due to drainage followed by ploughing and re-seeding, and application of chemical fertilisers. Elsewhere in Europe, the habitat was formerly frequent around the Atlantic fringes, but has declined extensively, primarily through agricultural intensification.

As marshy grasslands have dwindled, management of the remaining examples has become increasingly precarious. Farmers have sometimes stopped actively farming them, because of a perception that the inconvenience outweighs the economic returns. These sites rapidly become rank and impenetrable and may change over time into dense scrub or woodland. This means that smaller plants, such as devil's-bit scabious, are rapidly shaded out, and dependent species such as the marsh fritillary are then also lost.

Scrub invading marshy grassland. Graham Motley

Ruby Red cattle, Devon. Rob Wolton/English Nature

How can these pastures be conserved?

The future of purple moor-grass and rush pastures is bound up with that of livestock farming. The wealth of wildlife in these pastures depends on their careful management and the right level of grazing (neither too heavy nor too light). Light early summer grazing by traditional breeds of cattle is usually ideal, or by hardy breeds of pony if cattle are unavailable. As a general guide, a variable height, with the shorter patches usually no less than 5 cm, should be the aim. Some species of insect are particularly sensitive to sward structure and have more stringent requirements, for example 8-25 cm in the case of the marsh fritillary. Where grazing animals are in short supply, local grazing networks may be able to match animals available to grazing requirements. You can get advice on where these networks exist and how they can be established from the Grazing Animals Project (see contact details on page 15).

Winter burning can be effective in some areas, if the summer growth of purple moor-grass has not been adequately removed by grazing; but burning can be damaging to over-wintering invertebrates unless carried out sensitively. This may mean burning only a proportion of

Rush bales, Co Fermanagh, Northern Ireland. Mark Wright

the site at any one time. Mowing changes the structure of the vegetation suddenly, and this can harm invertebrates. It is best used where it has been the traditional management regime. Patch mowing is a way of enabling grazing stock to return to pastures that have become too rank to be grazed.

Farmers may worry that animals kept for prolonged periods on these wet pastures gain little in weight and may even lose condition (particularly in late summer). However, recent research by the Institute of Grassland and Environmental Research (IGER) has shown that cattle can be maintained in good condition with respectable weight gains if grazed on these pastures in rotation with more productive grassland. On the other hand, wet pastures are generally unsuitable for modern breeds of sheep, and particularly lactating ewes, because of the low sodium and calcium content of the forage.

Heath lobelia. Robin Chittenden/FLPA

It is possible to manage purple moor-grass and rush pastures in a way which benefits wildlife and provides a valuable resource for the farmer. Cattle reared on traditionally managed grassland often fetch premium prices, as the Devon Wildlife Trust's 'Green Gateway' project has demonstrated.

The most important examples of this marshy grassland habitat are designated as Sites or Areas of Special Scientific Interest (SSSIs/ASSIs). Funds are available to owners and managers of these sites from the country conservation agencies for undertaking wildlife-friendly management. While some of the best marshy pastures are nature reserves, many more are managed under voluntary environmental land management schemes. Different schemes operate in the four countries, but all offer financial incentives to manage land for wildlife and landscape conservation. Most of the schemes also offer additional payments for management to re-establish wet pastures of wildlife value from agriculturally improved and partially improved grassland or arable land. Benefits for wildlife from these payments are likely to be greatest where re-establishment occurs in poorly drained fields that have not been heavily fertilised, and especially where they adjoin or link existing areas of habitat.

Blue-eyed-grass. Mark Wright

Bog asphodel. David Stevens

Intensive farming is very damaging to the wildlife of marshy pastures. As with all other semi-natural habitats, an Environmental Impact Assessment (EIA) is now required before agricultural management can be intensified on purple moor-grass and rush pastures.

The importance of these pastures is recognised by their inclusion as a priority habitat in the UK Government's Biodiversity Action Plan. The Action Plan for purple moor-grass and rush pasture was published in 1995 as part of this initiative. It sets out a range of targets and actions that should help conserve and expand the habitat for the benefit of future generations.

Further reading

CROFTS, A. & JEFFERSON, R.G., eds, 1999. *The Lowland Grassland Management Handbook.* 2nd edition. Peterborough: English Nature/The Wildlife Trusts. Available electronically from www.english-nature.org.uk/pubs/Handbooks/default.asp

ELKINGTON, T., DAYTON, N., JACKSON, D.L. & STRACHAN, I.M. 2001. *National Vegetation Classification: Field Guide to Mires and Heaths.* Peterborough: Joint Nature Conservation Committee. Available electronically from www.jncc.gov.uk/communications/pubcat/heathland.htm

GOODYEAR, J., TALLOWIN, J., BULLOCK, J. & SMITH, R. 2001. Grazing purple moor-grass and rush pastures. *Enact*, 9(4): 19-22.

HOBSON, R., BOURN, N. & WARREN, M.S. 2002. Conserving the marsh fritillary in Britain. *British Wildlife*, 13: 404-411.

UK BIODIVERSITY STEERING GROUP. 1995. *Biodiversity: the UK Steering Group Report.* London: HMSO. Action plan for purple moor-grass and rush pastures available electronically from www.ukbap.org.uk/habitats.htm

Contact names and addresses

Butterfly Conservation, Manor Yard, East Lulworth, Wareham, Dorset, BH20 5QP.
Tel: 01929 400209.
www.butterfly-conservation.org.uk
Charitable body concerned with the conservation of butterflies, moths and their habitats.

Countryside Council for Wales, Maes y Ffynnon, Penrhosgarnedd, Bangor, Gwynedd, LL57 2DW.
Tel: 08451 306229. **www.ccw.gov.uk** Contact for all matters concerning nature conservation in Wales including Sites of Special Scientific Interest and the Tir Gofal/Tir Cymen Schemes. Lead agency for the Purple Moor-grass and Rush pastures Habitat Action Plan.

Department of Agriculture and Rural Development for Northern Ireland, (Countryside Management Division), Dundonald House, Upper Newtownards Road, Belfast, BT4 3SB.
Tel: 028 9052 0100. **www.dardni.gov.uk** Contact for information on environmental land management schemes and agricultural regulations in Northern Ireland.

Tormentil. David Stevens

Department for Environment, Food and Rural Affairs, Nobel House, 17 Smith Square, London, SW1P 3JR. Tel: 0207 238 6000.
www.defra.gov.uk Contact for information on environmental land management schemes and agricultural regulations in England.

Department for Environment, Food and Rural Affairs, Block 3, Government Buildings, Burghill Road, Westbury-on-Trym, Bristol, BS10 6NJ.
Tel: 0117 959 1000. **www.defra.gov.uk**
Co-ordinates implementation of the UK Biodiversity Action Plan.

Environment & Heritage Service, Commonwealth House, 35 Castle Street, Belfast, Northern Ireland, BT1 1GU. Tel: 028 9025 1477.
www.ehsni.gov.uk Contact for all matters relating to the conservation of the natural and built heritage in Northern Ireland including responibility for the Areas of Special Scientific Interest.

Farming and Wildlife Advisory Group, The National Agricultural Centre, Stoneleigh, Kenilworth, Warwicks, CV8 2RX.
Tel: 02476 696 699. **www.fwag.org.uk**
Charitable organisation providing farm conservation advice throughout the UK.

Grazing Animals Project, The Kiln, Mather Road, Newark, Nottinghamshire, NG24 1WT.
Tel: 01636 670095.
www.grazinganimalsproject.info/ Contact for advice on grazing networks and grazing management for conservation.

National Assembly for Wales, Department for Environment, Planning and Countryside, Crown Buildings, Cathays Park, Cardiff, CF10 3NQ.
Tel: 029 2082 5111. **www.wales.gov.uk** Contact for information on environmental land management schemes and agricultural regulations in Wales.

National Trust, Conservation Directorate, 33 Sheep Street, Cirencester, Gloucestershire, GL7 1RQ. Tel: 01285 651818.
www.nationaltrust.org.uk Charitable body concerned with the conservation of places of historic interest and natural beauty in England, Wales and Northern Ireland.

Plantlife, 14 Rollestone Street, Salisbury, Wiltshire, SP1 1DX. Tel: 01722 342730.
www.plantlife.org.uk Charitable body concerned with the conservation of wild plants and their habitats.

Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, SG19 2DL.
Tel: 01767 680551. **www.rspb.org.uk** Charitable body concerned with the conservation of wild birds and their habitats.

Scottish Executive Environment and Rural Affairs Department, Pentland House, 47 Robb's Loan, Edinburgh, EH14 1TY. Tel: 0131 556 8400.
www.scotland.gov.uk Contact for information on environmental land management schemes and agricultural regulations in Scotland.

Scottish Natural Heritage, 12 Hope Terrace, Edinburgh, EH9 2AS. Tel: 0131 447 4784.
www.snh.org.uk Contact for all matters concerning countryside conservation in Scotland including Sites of Special Scientific Interest.

Scottish Wildlife Trust, Cramond House, Cramond Glebe Road, Edinburgh, EH4 6NS.
Tel: 0131 312 7765. **www.swt.org.uk** Voluntary conservation organisation concerned with the conservation of wildlife in Scotland including the management of nature reserves.

The Wildlife Trusts, The Kiln, Waterside, Mather Road, Newark, NG24 1WT. Tel: 0870 0367711.
www.wildlifetrusts.org.uk Voluntary conservation organisation concerned with the conservation of wildlife in the UK. Contact for information on local Wildlife Trusts.

Ulster Wildlife Trust, 3 New Line, Crossgar, Downpatrick, Co Down, BT30 9EP.
Tel: 028 4483 0282. **www.ulsterwildlifetrust.org**
Voluntary conservation organisation concerned with the conservation of wildlife in Northern Ireland including the management of nature reserves.