

Calcareous Grasslands

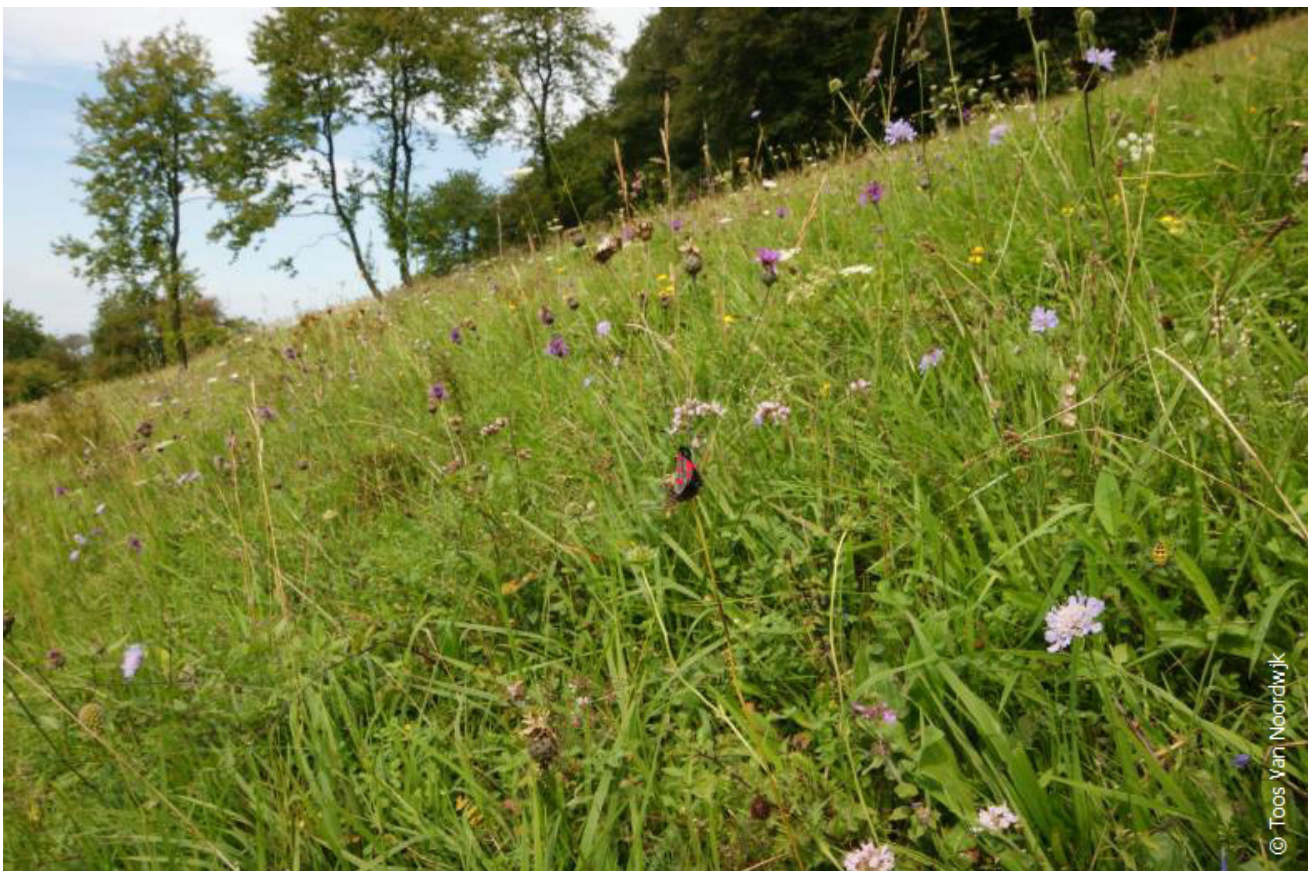
Calcareous grasslands form on soils that are base rich - have a higher pH than 7. The underlying rock, which may be chalk or limestone, dominates the soil, or the soil is comprised of calcareous sands of sea shells. The plants have had to adapt to the highly alkaline conditions. Species-rich calcareous grasslands are generally the most diverse in terms of wildflowers and grasses.

Dry limestone and chalk grasslands

Chalk and limestone grasslands are some of our richest grasslands for wildflowers, including salad burnet, wild thyme, common rockrose, harebell, great burnet, marjoram, wild basil and grasses, such as the delicate quaking-grass. Lowland chalk grasslands occur on the chalk downs in Hampshire, Kent and South Downs, whilst low-lying limestone

ridges, including the Mendip Hills, boast areas of calcareous grassland. Upland limestone grasslands in the Cumbria Fells, Yorkshire Dales and Derbyshire Pennines have some very specific plants: bloody crane's-bill and bird's-eye primrose, for example. Caterpillars of the rare chalkhill blue and adonis blue butterflies, feed solely on horseshoe vetch, while small blue caterpillars feed on kidney vetch, and brown argus on common rock-rose.

Calcareous grasslands tend to be dry due to the soil structure and texture. Rainfall quickly drains through the earth and into the bedrock of limestone areas, forming underground channels and caves (the more acid water slowly erodes the calcium carbonate bedrock). Limestone and chalk grasslands are a rare habitat across the UK with less than 33000-41000 ha of lowland calcareous





grassland remaining. In terms of the National Vegetation Classification (NVC) the two categories encompassing species-rich calcareous grasslands in the lowlands are 'CG2 sheep's-fescue - meadow oat-grass grassland', which is very species-rich and usually present on thin soils, and 'CG3 upright brome grassland' which is usually on deeper soils. 23000-25000 ha of upland calcareous grassland remains. Upland species-rich calcareous grassland is a wide group with many sub-communities within NVC. The typical and most widespread species-rich community is 'CG10 sheep's-fescue-common bent-wild thyme grassland'.

Calcareous grasslands are usually managed as extensive grazing pasture rather than as hay meadows. Steep slopes, rock outcrops and limestone pavement are features of the landscape and the soils are thinner and prone to desiccation during the summer months. The remaining areas of calcareous grassland have been left agriculturally unimproved due to the difficulty of using modern farming methods and machinery. They may still be used for rough grazing, but commercial

livestock breeds may struggle to put on the desired bulk. This has led to abandonment and under-grazed allowing rank grasses, such as tor grass and upright brome, and scrub to encroach on the grassland shading out the wildflowers. Flatter fields have been agriculturally improved, using fertiliser and over-seeding with agricultural grass varieties. This has led to a dramatic decline and fragmentation of calcareous grassland. The largest tract remaining in Europe is across Salisbury Plain and Porton Down in Wiltshire.

Limestone heath

Limestone heath is a very rare habitat where heather, which is more often found on acidic earth, grows in limestone grassland. Acidic windblown soils collect on calcareous bedrock forming a covering that can support both lime- and acid-loving plants. Limestone heath is part of a calcareous grassland mosaic and usually managed in a similar manner to limestone grassland. The extent of limestone heath is not known, and there is no direct fit to an NVC category.

Whin grassland

Whin grassland describes the vegetation that forms on skeletal soils over outcrops of the whin sill and associated dykes in Northumberland. The greatest natural extents are found on the dip slopes, but it also occurs on the ledges of scarp slopes and in quarries. The soils are thin base-rich land, but nutrient poor and prone to drought. This has led to the development of a species-rich sward on the best sites, with a distinctive flora that includes a number of stress-tolerant, national and regional rarities. There are also specific moss and lichen communities associated with whin grassland.

The lime-loving vegetation is typically a short-grazed turf, with patches of bare ground and exposed rock. Spring and early summer annuals, such as annual knawel and knotted hedge-parsley, are all well-represented together with drought-tolerant perennials, including maiden pink, purple milk-vetch and rue-leaved saxifrage. There is an unusually high proportion of legume plants such as slender trefoil, rough clover, knotted clover and hare's-foot clover. Whin grassland is part of a grassland mosaic, including calcareous and neutral species-rich grasslands. The northern brown argus is associated with whin grassland as it hosts its sole larval food plant, common rock-rose.

The full extent of whin grassland is not known but it has a very low coverage and is very confined to areas where the whin sill and dykes occur close to the surface creating the thin soils. Four types of whin grassland have been recognised; 1) coastal, 2) inland, 3) maritime, and 4) limestone sub-communities. The low distribution and coverage of whin grassland means that it was not sampled for the NVC and is a poor fit to any of these categories.

Whin grassland is an open mosaic that is maintained by grazing, and a reduction in intensity can lead to dominance by competitive coarse grasses and eventual succession to woodland. Over-grazing can be equally damaging, and the intensity, type and seasonality are all critical to the long-term maintenance of the habitat. Scrub invasion is

common, but the dense patches of blackthorn and hawthorn scrub on whin at the coast are important as shelter for migrating passerine birds.





Machair Grassland

Machair grassland is part of the sand dune community within NVC and is called 'SD8 red fescue - lady's bedstraw grassland'. Sub-communities of plants are recognised according to whether the machair is wet or dry. The flowers tend to be widespread meadow plants: red clover, lady's bedstraw, self-heal, and bird's-foot trefoil, along with sand dune plants such as marram grass, and sand sedge. Rare plants present in this habitat are Scottish primrose, a marsh-orchid only found in Machair, Irish lady's-tresses and slender niaad. The great yellow bumblebee has been lost from 80% of its range in the UK and is now restricted to north-west Scotland and the Scottish Islands, predominantly associated with the flower-rich machair grasslands.

Machair grassland is restricted globally to western Scotland and the Scottish Islands,

Shetland, Orkney, and north-west Ireland. In total there are only 25000 ha. Machair is a Gaelic word referring to the low-lying sand plain between the fore-dunes and peat inland, which can be fertile enough to support a good range of plants, up to 45 per metre square.

Machair is a transitory habitat ranging from recently cultivated land for cereal crops in a short-medium term rotation to older permanent grasslands. Seaweed and manure from grazing livestock, usually traditionally cattle breeds, is used to fertilise the very nutrient poor pasture. A decline in traditional crofting is the greatest threat to machair grassland. Machair is particularly susceptible to agricultural change, including the loss of the arable rotation (where this is traditional), changes in grazing, land abandonment, sand and shingle extraction.

Management of Calcareous Grassland

Calcareous grasslands are generally managed as part of pasture system with low-intensity (termed extensive) sheep and cattle grazing throughout the majority of the summer, autumn and winter. Livestock are usually removed at the end of March or when the spring warmth triggers the plants to start growing, and remain off the pasture until the plants have flowered and set seed. After flowering, livestock are brought back to eat the vegetation growth and break up the sward, treading seeds into the soil. The earth and vegetation tend to be thin and the grassland can easily be damaged, if over-grazed. Occasionally, higher numbers of livestock are used to pulse graze (also called mob grazing) calcareous grasslands for a shorter period of time. This is the process of putting on a higher number of animals to graze for a short time. Plants, like tor-grass, can dominate becoming problem species if grazing is relaxed, and cause thick scrub to

develop. Heavier livestock, such as cattle or ponies, may be used to graze calcareous grasslands to help break-up tussocky vegetation. Generally, the agricultural productivity of calcareous grassland is low and it cannot support commercial cattle breeds. Traditional livestock that are slower growing are used to graze extensively.

Wildlife relies on the creation of micro-habitats such as bare open areas or patches of scrub, so a diversity of management is required. Creation of scapes in dry chalk grasslands or patches that are trampled provides bare ground, which can help early successional perennial plants and solitary bees for example. At the other end of the scale, small scrub patches should be allowed to develop as they provide an essential habitat for many insects, including butterflies. Calcareous grassland should be managed as a mosaic to fulfil all of the requirements for wildlife.



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Habitat restoration by implementing suitable management is the first consideration for restoring calcareous grassland. Plants may be lying dormant in the soil seed bank, or are present but hidden underneath scrub or rank grasses. Implementing restoration management may help these plants thrive again without the need of seed augmentation.

Further restoration work may be required if the grassland has been agriculturally improved leading to a loss of plant species. Seed can be imported onto grassland through livestock movement, green hay or brush-harvested seed, to restore the missing plants or recreate calcareous grassland from arable land.

Further information

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