

B.2. Limestone Country

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B.2.1. Description

The limestone country of the Yorkshire Dales National Park is of national and international biodiversity importance. Table B.4 lists the broad habitat types that are typical of the limestone country of the Yorkshire Dales National Park. As the name implies the distribution of limestone country habitats is directly linked to the extent of Carboniferous limestone. Consequently the majority of the limestone country of the National Park is concentrated in the uplands around Ingleborough, Malham and Wharfedale. In these areas the Great Scar Limestone, lain down on seabeds some 300 million years ago dominates the landscape and forms the giant outcrops of Malham Cove and Kilnsey Crag as well as the extensive limestone pavements. The soils lying over this rock are usually very thin and of low fertility and, in combination with consistent grazing, often results in a rich diversity of lime loving grasses and wildflowers for which the limestone country of the Dales is famous. Outside of this area limestone habitats are limited in extent associated primarily with outcrops, cliffs and screes associated with the Yoredale Series which overlays the Great Scar Limestone further north.

B.2.2. Local Biodiversity Importance

Small Base-Rich Wetlands

These wetlands are areas of low lying ground which receive water and nutrients from the soil, rock and groundwater as well as from rainfall and are also known as fens. They are generally small in extent and are usually associated with areas of surface water movement such as springs, rills and flushes. In the limestone country they are fed by mineral – enriched calcareous (base rich) water. Base rich fens in the Yorkshire Dales support a number of important plants which are characteristic of these lime-enriched conditions. These include the nationally scarce bird's eye primrose of which the Yorkshire Dales has a significant proportion of the UK population. Small base-rich wetlands are of very high biodiversity importance in the Yorkshire Dales National Park.

Limestone Pavement

Limestone pavement is a unique and rare habitat in Britain with the majority of the area occurring in western North Yorkshire and south and east Cumbria. The Yorkshire Dales National Park contains approximately half of the limestone pavement area in Britain and is therefore an extremely important area for this internationally recognised habitat.

Limestone pavements consist of a near horizontal surface of Carboniferous limestone, irregularly corrugated and furrowed by chemical weathering, with deeper fissures or 'grikes' corresponding to natural joints within the rock, resulting in the formation of discrete separated blocks or 'clints'. The biodiversity of limestone pavements depends primarily on the depth of grikes and the level of grazing by livestock and rabbits. The majority of limestone pavements in the Dales are heavily affected by grazing with vegetation growth confined to the deeper and less accessible grikes. Ferns are the most characteristic plant species of limestone pavements. Some of these, like rigid buckler fern and baneberry, are extremely rare and confined exclusively to limestone pavements. Limestone pavements are of very high biodiversity importance in the Yorkshire Dales National Park.

Limestone Rock Outcrops, Cliffs & Scree

The majority of natural cliffs in the Dales occur in limestone areas. Exposed limestone cliffs support species such as wild thyme and blue moor grass in association with specialist cliff species such as common whitlowgrass, hairy rock-cress, thale cress, hoary whitlowgrass and wall whitlowgrass, biting stoncrop and the rare winter hutchinsia. More shaded and sheltered cliffs support ferns such as wall-rue, maidenhair spleenwort, green spleenwort, brittle bladder-fern and lesser clubmoss. Wetter flushed cliffs support marsh hawk's-beard, Pyrenean scurvygrass, mossy saxifrage and stone bramble. In very sheltered, stable areas more robust flowering plants can occur such as, rock-rose, small scabious, bloody crane's-bill and marjoram. Limestone screes also support a rich diversity of lime-loving species such as maidenhair spleenwort, wall-rue, herb Robert and more specialist species such as the limestone polypody fern. Limestone rock outcrops, cliffs and scree are of high biodiversity importance in the Yorkshire Dales National Park.

Table B.4 Broad habitat types in the limestone country of the Yorkshire Dales National Park and their related National Vegetation Classification codes (see Appendix 4). Area figures are derived from Drewitt (1991) based on a vegetation survey of The National Park carried out between 1985 and 1988 and from the Yorkshire Dales Natural Area Profiles.

Habitat	NVC Communities	Total area / number in Park (ha)	Proportion of Yorkshire Dales area (%)	Biodiversity Importance
Small Base-Rich Wetlands	M10, M37?	~263	~0.1	Very High
Limestone Pavement	Not applicable	1360	0.8	Very High
Calcareous Grassland	CG2 - CG10.	6624	3.8	Very High
Lime-rich Natural Lakes	Not applicable	59	< 0.1	Very High
Limestone Woodland & Scrub	W8, W9, W19, W21	~500	~0.3	See Woodland & Scrub
Limestone Rock Outcrops, Cliffs and Scree	Not applicable	204	0.1	High
Caves	Not applicable	> 600	-	High
Purple Moor-Grass & Rush Pasture	M26	?	?	High
Limestone Quarries	Not applicable	?	?	Medium
Total area (excl. caves & quarries)		> 9010	> 5.1	

Caves

The Yorkshire Dales National Park is renowned for its caves the majority of which are in the limestone areas of the Park. It is the geological and archaeological interest of the caves which is of primary importance as well as their recreational use for potholing. Caves do however, provide habitats for a number of important species. Bats are known to use caves for hibernating over the winter as are a number of butterflies and moths such as the tissue moth, herald moth, peacock and small tortoiseshell butterflies. There are also some species of invertebrate that live solely in caves such as the cave spider *Meta menardi* for which the Dales caves are probably notable. Caves are of high biodiversity importance in the Yorkshire Dales National Park.

Calcareous Grassland

The dissolved limestone and low nutrient status in soils in the limestone country favour a high diversity of lime-loving grasses and herbs that will thrive at appropriate levels of grazing. These calcareous grasslands are broadly of two types. The first and least widespread are the blue moor-grass dominated upland grasslands. These are generally rare nationally, being largely restricted to the North Pennines. The Yorkshire Dales National Park contains the largest amount of this habitat. The more widespread type of calcareous grassland is more lowland in character and dominated by fescues and characterised by the presence of fine-leaved sedges. Richer grasslands may include common milkwort and common rock rose. Calcareous grasslands are of very high biodiversity importance in the Yorkshire Dales National Park.

Limestone Woodland & Scrub

The majority of woodland habitats in the limestone country of the Yorkshire Dales National Park are composed of ash woodlands which is the dominant type of woodland in the Dales and has strong associations with limestone areas. Scrub is a very rare habitat in the National Park but where it does occur it is important for a range of bird species and rare butterflies such as the northern brown argus. Juniper scrub has a strong affinity with limestone areas and is a high priority for conservation in the Dales.

Purple Moor Grass & Rush Pasture

These are wet meadows or pastures containing a species-rich mixture of grasses (especially purple moor grass *Molinia caerulea*), sedges, herbs and mosses. This type of habitat is extremely rare in the Yorkshire Dales National Park occurring in one or two locations in the limestone country. Purple moor grass and rush pasture is of high biodiversity importance in the Yorkshire Dales National Park.

Lime-Rich Natural Lakes

This habitat refers primarily to Malham Tarn. Lakes like this are extremely rare and unusual because limestone substrates are free draining. Malham Tarn is rich in calcium, but poor in other nutrients. It is particularly important for its submerged beds of stoneworts *Chara* spp. Malham Tarn is of very high biodiversity importance in the Yorkshire Dales National Park.

Limestone Quarries

There are many disused quarries in the Yorkshire Dales National Park the majority of these being situated in limestone areas. The majority of these quarries are generally species poor although one or two are developing a reasonable limestone flora. It is likely that this interest will develop further as long as quarries remain undisturbed. There are also a number of large active quarries which are generally of low wildlife importance although some do provide nesting sites for peregrines and ravens. Limestone quarries are, therefore of medium biodiversity value.

Other Habitats

A key feature of the limestone country of the Dales is the complexity of habitats that occur there. Many of the limestone habits occur in a complex mosaic together with bog and heath, hay meadow and pasture habitats. A key objective for biodiversity conservation in limestone country is to maintain these mosaics through appropriate management.

B.2.3. National & International biodiversity importance

Table B.5. lists the national and international importance of limestone country habitats in the Yorkshire Dales National Park. National importance is defined as those habitats that have, or will have, Habitat Action Plans in the UK Biodiversity Action Plan. International importance is defined as those habitats listed in Annex I of the European Habitats & Species Directive 92/43/EEC which sets out those habitats in need of conservation and protection in the European Community area. Table B.5. shows that the limestone country of the Yorkshire Dales contains many habitats of national and international importance and is one of the most important areas for these habitats in Europe.

B.2.4. Current issues, opportunities & threats to limestone country biodiversity

As with much of the National Park, the limestone country has changed significantly over the last 50 years due to a substantial increase in sheep grazing levels. Base rich wetlands, calcareous grassland and limestone pavements are best managed through light grazing with cattle. Currently there are only small numbers of farmers who graze cattle in preference to sheep. In a small number of cases fertiliser has been applied to increase the fertility of calcareous grasslands leading to reductions in species diversity. As a result about 30 % of the area has been impoverished to such an extent that restoration is now impractical. More recently the decline in biodiversity in limestone country habitats has slowed as a result of more sustainable management carried out by farmers through incentives from environmental land management schemes such as the Countryside Stewardship Scheme (administered by MAFF / FRCA), the Wildlife Enhancement Scheme (administered by English Nature) and the Farm Conservation Scheme (administered by the National Park Authority).

Woodland habitats in the limestone country have declined as a result of a combination of neglect, inappropriate management and grazing pressure from livestock and rabbits. This decline is being reversed through the use of incentives to landowners such as the Woodland Grant Scheme administered by the Forestry Commission and grants from the Yorkshire Dales Millennium Trust.

Rabbit numbers have increased considerably and have reached or even exceeded pre-myxomatosis levels leading to species loss in all limestone country habitats through grazing pressure. There is currently little rabbit control carried out except in circumstances where woodland planting or management schemes have been agreed.

In addition to the issues above, by far the biggest impact on limestone pavements, limestone rock outcrops, cliffs and scree has been quarrying and removal of limestone pavement for garden

rockeries. There are a number of large quarries still working in the Park under existing planning permissions but it is unlikely that further permission will be granted to extend the area of these or to create new quarries. Virtually all of the limestone pavements in the Yorkshire Dales National Park are now covered by Limestone Pavement Orders which makes it illegal to remove or damage limestone from these sites. This has led to a considerable reduction in removal for garden rockeries although a small amount of illegal removal still takes place. The Limestone Pavement Action Group is campaigning for a ban on the sale of water worn limestone to remove the demand for this product.

In recognition of the national and international importance of the limestone country of the Yorkshire Dales large areas of the most important habitats have been designated as Sites of Special Scientific Interest. Additionally, the Ingleborough Limestone Complex and the Craven Limestone Complex covering over 11000 ha have been proposed as Special Areas of Conservation under the European Union Habitats Directive in recognition of their international importance. These designations will lead to better protection of important habitats through legislation and co-operative working with land owners and managers.

Increased use of the countryside for recreation can be ecologically damaging due to footpath erosion, trampling and the physical damage caused by large numbers of people together with disturbance to wildlife particularly during the breeding season. There are, however, considerable benefits in enabling managed access to the countryside for the full cross-section of the human community as it provides an opportunity to educate and raise awareness of biodiversity and countryside issues. Conserving biodiversity is very dependent on the support of a well-informed human community with a sense of belonging and a genuine involvement in the process.

Table B.5. National and international importance of habitats in the limestone country of the Yorkshire Dales National Park. National importance is defined as those habitats that have, or will have, Habitat Action Plans in the UK Biodiversity Action Plan. International importance is defined as those habitats listed in Annex I of the European Habitats & Species Directive 92/43/EEC.

Habitat	UK Biodiversity Action Plan	European Union Habitats & Species Directive
Small Base-Rich Wetlands	Fens	Petrifying springs with tufa formations.
Calcareous grassland	Lowland Calcareous Grassland. Upland Calcareous Grassland.	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>).
Purple Moor Grass & Rush Pasture	Purple Moor Grass & Rush Pasture	<i>Molinia</i> meadows on chalk and clay (Eu-Molinion)
Lime-Rich Natural Lakes	Mesotrophic Lakes	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> formations
Limestone Woodland & Scrub	Upland Mixed Ash Woods	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>). <i>Juniperus communis</i> formations on calcareous heaths or grasslands.
Limestone Pavement	Limestone Pavement	Limestone Pavements
Limestone Rock Outcrops, Cliffs and Scree		Chasmophytic vegetation on rocky slopes – calcareous sub-types
Limestone Quarries	-	-

B.2.5. Action Plans & Statements

