

# **The Yorkshire Wolds Natural Area Profile**

**Yorkshire Wolds**



**English Nature  
North and East Yorkshire Team  
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## Summary

The Yorkshire Wolds form a very distinct Natural Area, representing the northernmost chalk outcrop in Britain. The stratigraphy of the Natural Area, exposed in quarries and cuttings, and its characteristic landforms - undulating hills, deeply-incised dry valleys and karst landscapes - are of major earth science interest. The geology and landforms of the Wolds are also a major influence upon the most characteristic semi-natural habitats of the Natural Area: chalk grassland, spring-fed flushes, chalk streams and calcareous woodland.

Chalk grassland comprises a mosaic of plant communities from tall, tussocky swards dominated by tor-grass or upright brome through to the short, herb-rich turf of well-grazed sheepwalks. These grasslands support butterflies and moths such as the marbled white, brown argus and cistus forester along with other specialised insects. Their flora includes both characteristic species such as salad burnet, rockrose and thyme and special rarities including perennial flax, green-winged orchid and thistle broomrape.

Chalk grassland was once the predominant habitat over much of the Yorkshire Wolds but is now reduced to 1.3% of the land area as a result of conversion to arable, other agricultural intensification and forestry. Some remaining chalk grasslands have deteriorated due to adverse grazing regimes, piecemeal improvement invasion or encroachment of coarse grasses.

Open habitats on chalk include screes, disused quarries and railway cuttings. These support both typical chalk grassland species and specialised plants and animals dependent upon early-successional conditions.

Springs and flushes fed by calcareous groundwater occur in some of the valleys and on the scarp slopes of the Yorkshire Wolds, and along the coastline. These support species such as marsh valerian, marsh marigold and various sedges with bogbean, marsh orchids and butterwort at a few of the richer sites. These springs are sometimes the source of chalk streams, the most northerly in Britain. Near their source these streams support distinctive invertebrate communities whilst constantly-flowing streams support water-crowfoot beds as they descend into the surrounding plains. Standing water is scarce on the Wolds but dew ponds are a characteristic - albeit disappearing - landscape feature.

The Natural Area is sparsely wooded but there are a small number of calcareous ash woods of nature conservation importance. The most well-known of these is Millington Wood which supports a rich ancient woodland flora. The nationally scarce baneberry grows at this and a handful of other sites in the Natural Area.

Hedgerows predominantly date back to the Enclosure era and are composed largely of hawthorn but a proportion of mixed hedges contain calcicolous shrubs such as purging buckthorn, dogwood and wild privet. Hawthorn and gorse scrub has spread in some Wolds valleys following reduction in grazing pressure. Scrub encroachment can threaten to overwhelm valuable chalk grassland but scrub remains an integral part of the diversity of habitats.

Arable cultivation is now the predominant land use in the Natural Area. Although arable habitats have become increasingly poor in biodiversity as a result of modern farming methods, they are important for species such as grey partridge, corn bunting and hare. A suite of scarce

and declining arable weeds associated with thin calcareous soils is an interesting feature of the Natural Area.

# **1. Introduction**

## **1.1 The Natural Area concept**

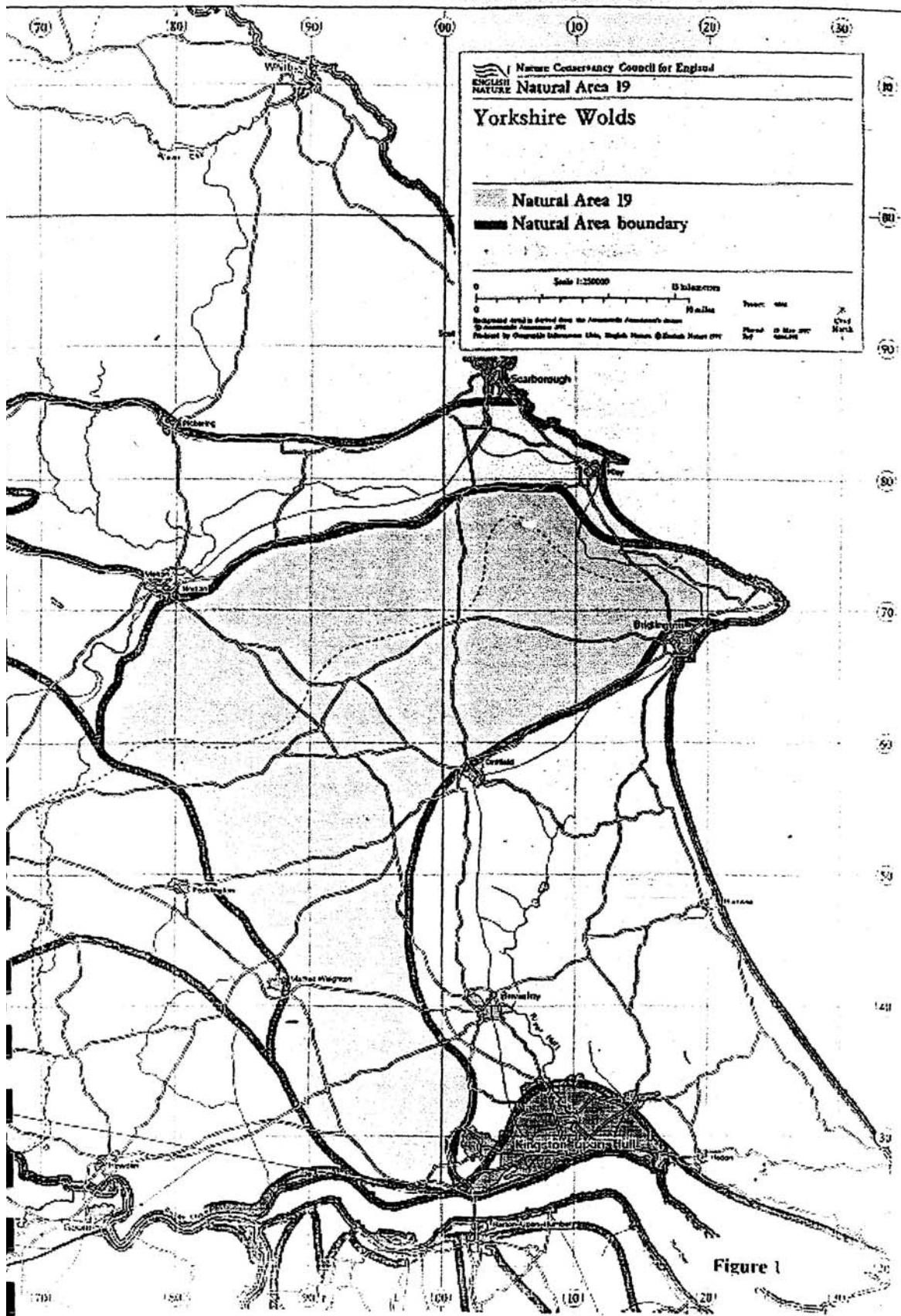
A Natural Area is not a designation but an area of countryside identified by its unique combination of physical attributes, wildlife, land use and culture. These features give a Natural Area a 'sense of place' and a distinctive nature conservation character. The concept is based on the premise that since wildlife rarely pays heed to administrative boundaries, a more natural division of the countryside is necessary as a framework for identifying nature conservation and earth science priorities and co-ordinating action.

The use of Natural Areas provides a strategic framework for setting nature conservation objectives across England as part of the UK Biodiversity Action Plan. English Nature is using the Natural Area framework to translate national biodiversity targets into local objectives and encourages other bodies involved in the development of local action plans to use this framework.

## **1.2 The role of this profile**

This profile describes the important habitats of the Yorkshire Wolds Natural Area together with some of the characteristic plants and animals which these support. The area it covers is detailed in Figure 1. It also sets out objectives for priority habitats and species within the NA.

This draft profile is provided as a basis for consultation with our key partners. The final version will be produced, following consultation, by April 1998.



## **2. Description**

### **2.1 Physical features**

The Yorkshire Wolds form a crescent-shaped area of hills sweeping around from the River Humber near the Humber Bridge to the Flamborough headland on the East Yorkshire coast. The scar slopes rise steeply from the Vale of Pickering to the north and the Vale of York and Humberhead Levels to the west. The dip slopes grades more gradually into the Holderness Plain to the east. The maximum height of the hills is around 250 m. AOD.

The Wolds are an outcrop of Upper Cretaceous chalk, an almost pure limestone, and represent the most northerly chalk formation in Britain. These rocks originated 80-100 million years ago as a calcareous ooze - the remains of microscopic algae - on the bed of a tropical sea. Earlier Jurassic rocks bound the base of the chalk along the Northern and western escarpments; these are principally oolitic limestone around the northern edges with sandstones and shales to the west. The undulating, rounded hills of the Wolds are dissected by numerous deeply-incised dry valleys which run in various directions and are sometimes inter-connected in complex systems, forming a characteristic chalk karst landscape.

Soils are predominantly chalky tills formed around 18,000 years ago from an admixture of chalk rubble shattered under the periglacial climate of the last Ice age, boulder clays and silty loess thought to have been windblown from the North Sea basin. These shallow calcareous soils support distinctive chalk grassland communities maintained by centuries of pastoral farming. At the south western edge of the Wolds near Hotham, the Jurassic outcrop forms a distinct bench of foothills. Surface deposits of wind-blown sand give rise to small remnants of acidic grassland and heath on cultivated slopes in this area.

The NA is important for geological science with sections through the Jurassic and Cretaceous sedimentary strata exposed by quarrying, and a range of characteristic landforms. Five Sites of Special Scientific Interest (SSSIs) are notified wholly or partly for their earth science importance and 29 Regionally Important Geological Sites (RIGS) have been identified within the Natural Area.

### **2.2 Habitats and Species**

#### **2.2.1 Chalk grassland**

Chalk grasslands are the most important and characteristic habitat of the Yorkshire Wolds with 20 Sites of Special Scientific Interest designated primarily as examples of this habitat.

Amongst the most characteristic plants of Wolds grasslands are calcicolous species such as salad burnet, wild thyme, common rockrose, common milkwort, burnet saxifrage, clustered bellflower, dropwort, field scabious, small scabious, crested hair-grass and quaking grass. More localised associates include bloody cranesbill, purple milk-vetch, autumn gentian, carline thistle and woolly thistle. Southern herbs scarce this far north include stemless thistle, squinancywort, horseshoe vetch and knapweed broomrape; all of these are highly localised and often confined to south-facing situations.

Two great specialities of the Yorkshire Wolds are perennial flax and thistle broomrape. Perennial flax grows at five sites in the Natural Area, which is of national importance for this species. Thistle broomrape is confined to one locality where it grows as a parasite of creeping thistle and woolly thistle. Its habitat is rank, disturbed grassland and an adjoining chalk pit.

Orchids are a particularly attractive feature of chalk grassland, although the Yorkshire Wolds support only a limited number of species compared with the downs of Southern England. Pyramidal orchid is widespread in unimproved chalk pasture and on road verges whilst bee orchid is locally frequent in open situations including old quarries. Green-winged and frog orchids are undoubtedly much less common than they once were but sizeable populations can still be found at several sites. Other species have fared less well, however: autumn lady's tresses survives precariously at a single site and burnt-tip orchid is now probably extinct within the Natural Area.

The major concentrations of chalk grassland are in the karst valleys above Pocklington, around Thixendale and in the north-east of the Natural Area. Differences in aspect, topography, soil profiles and management history result in marked variations in the structure and composition of these grasslands. Communities typical of calcareous soils range from dense, tussocky swards dominated by tor-grass to the open, herb-rich turf of well-grazed sheepwalks. On north-facing slopes or where leaching has occurred, species characteristic of less base-rich conditions may be locally prominent including devilsbit scabious, saw-wort, betony and heath-grass. Deeper profiles may support mesotrophic grassland communities similar to those found in species-rich meadows and pastures on neutral soils.

A number of surveys of chalk grassland were undertaken between 1979 and 1991 and data from these can be used to estimate the extent of different grassland communities within the Natural Area. These figures do not take into account subsequent changes which include loss or deterioration of some sites and, conversely, restoration of sympathetic management on others.

Around 40% of grasslands surveyed were dominated by the tor-grass community coded CC4 in the National Vegetation Classification (NVC). These are generally rank, under-grazed swards. The sheep's fescue/meadow oat-grass community (CG2) is the typical species-rich grassland of the Natural Area, representing 29% of the area in these surveys. More mesotrophic grasslands of the crested dogstail/common knapweed community (MG5) make up approximately 12.7%. Tall swards with abundant upright brome (CG3) constitute just under 6% and unclassified calcicolous grasslands around 5%. Coarse grasslands of fertile soils dominated by false oat-grass (MG1) and unclassified mesotrophic grasslands represent around 4% of the resource. Minor communities comprising less than 2% each of the grassland surveyed include the sheep's fescue/mouse-ear hawkweed/wild thyme community (CG7), which is confined to south-facing slopes; swards in which upright brome and tor-grass co-dominate (CG5); and calcifugous grasslands of the sheep's fescue/common bent/heath bedstraw community (U4).



### Grassland Communities in the Yorkshire Wolds NA

Predominant Community	Area	%
CG4: Tor-grass	592ha	40.4
CG2: Sheep's fescue-meadow oat-grass	428ha	29.2
MG5: Crested dogstail-common knapweed	175ha	11.9
CG3: Upright brome	83ha	5.7
CG: unclassified calcicolous communities	65ha	4.4
CG7: Sheep's fescue-mouse-ear hawkweed-wild thyme	23ha	1.6
CG5: Upright brome-tor grass	17ha	1.2
U4: Sheep's fescue-common bent-heath bedstraw	11ha	0.8
	1465ha	100

In addition to their floristic interest, the chalk grasslands of the Yorkshire Wolds are well-known for their butterflies and moths. Although much less rich than the Downs of Southern England notable species include marbled white, brown argus, grayling, dingy skipper and the cistus forester and forester moths.

At the northern edge of its British range, the marbled white has undergone large fluctuations in abundance in Yorkshire during the past century. This conspicuous butterfly is currently widespread and common and can be seen in summer in almost all suitable habitats. The brown argus, by contrast, occurs in small, discrete and widely-scattered colonies and may often be overlooked. This is another species at the edge of its British range here and some populations may belong to the closely-related northern brown argus. The grayling was formerly more widespread but is currently confined to a single location where it is dependent upon the availability of bare ground for basking in the sun.

A number of other scarce invertebrates are dependent upon chalk grassland in the Natural Area. Many of these are associated with specific foodplants. Common rockrose, for example, is the host plant of the leaf beetle *Cryptopcephalus aureolus* and the nationally rare pollen beetle *Meligethes brevis* as well as the cistus forester moth and brown argus butterfly. The nationally scarce hoverfly *Cheilosia cynocephala* and the weevil *Ceutorhynchus trimaculatus* are associated with musk thistle.

Conversion to arable, improvement by reseeded and chemical treatments and to a lesser extent afforestation have resulted in large-scale losses of chalk grassland in the Natural Area in recent decades. During the 1980s it is estimated that 35% of chalk grassland outside of SSSIs was lost due to agricultural intensification and forestry, and only 1.3% of the Natural Area is now semi-natural grassland. In 1982 it was estimated that there were 1,100 ha of high quality chalk grassland on the Yorkshire Wolds (800 ha. within SSSIs) and a further 600 ha. of modest or poor ecological interest. Extrapolation from these figures would suggest that there are now rather less than 1,000 ha of wildlife-rich chalk grassland left on the Yorkshire Wolds.

### 2.2.2 Open habitats on chalk: screes, quarries and bare rock

Open or sparsely-vegetated chalk occurs in disused quarries and railway cuttings as well as eroded screes. Such habitats are of great value to wildlife, their plant and animal communities overlapping with those of chalk grassland but including a range of specialised species dependent upon bare ground or the absence of competition. Notable plants associated with both open habitats on chalk and grazed sheepwalks include bee orchid, hairy rock-cress and autumn gentian but long-stalked cranesbill, knotted hedge parsley and the nationally scarce red hemp-nettle are largely confined to screes and cuttings.

Scarce invertebrates associated with early successional habitats on the chalk include the nationally rare snail-killing fly *Pherbellia knutsoni*, the bug *Trigonocranus emmeae*, the predatory ground beetle *Licinus depressus*, the flea beetle *Longitarsus suturalis* and the declining calcicole snail *Helicella itala*.

### 2.2.3 Springs and flushes

Springs occur in several valleys and along the western escarpment of the Yorkshire Wolds. Irrigated by calcareous ground-water, spring-fed flushes support plants such as marsh valerian, marsh marigold, long-stalked yellow sedge, flea sedge and various calcicolous mosses. More locally, water whorl-grass, flat sedge and marsh orchids occur. In a few places such as at Millington Pastures and North Newbald, more extensive spring-fed fens have developed.

A few flushes also appear on the coastal strip, a good example being Hoddy Cows Spring SSSI near Speeton. Here water rises through boulder clay from the underlying chalk aquifer; a rich flush flora features bog pimpernel, bogbean and butterwort. Flushes on the Flamborough headland are also of significant botanical interest.

### 2.2.4 Chalk streams

The Natural Area contains Britain's most northerly chalk streams. These include the headwaters of the River Hull which flow from the chalk above Driffield into the Holderness plain, and Settrington Beck which descends the northern scarp into the Vale of Pickering to join the River Derwent. Beds of stream water-crowfoot are the most characteristic vegetation of the constantly-flowing reaches of these watercourses with lesser water parsnip, water-cress and water starworts where the flow slackens.

Some Wolds chalk streams have relatively constant flows whilst others have more intermittent or seasonal flows and are known as winterbourne. The Gypsy Race which runs east towards Bridlington is a typical winterbourne but there is concern that abstraction of groundwater from the chalk aquifer has diminished flows in a number of Wolds streams.

Close to their sources, chalk streams support a cold-water fauna dependent upon a relatively stable temperature regime. Characteristic species in this zone include the oligochaete worm *Rhyacodrilus subterraneus* and the flatworm *Crenobia alpina*. As the spring fauna gives way to a headwater stream community, freshwater shrimps become abundant and a high diversity of caddis flies may be present including such uncommon species as *Beraea maurus* and *Rhyacophila septentrionis*. There have been historic records of the threatened white-

clawed crayfish from at least one chalk stream in the Natural Area but its present status is not known.

### **2.2.5 Ponds**

Due to the chalk geology of the Natural Area, standing water is more-or-less confined to man-made ponds. Dew ponds are a characteristic feature of the Yorkshire Wolds. These small stock-watering ponds are dependent upon rainfall to fill them and thus have strongly fluctuating water levels with episodic periods of drying-out and re-wetting. The flora of these ponds is limited to species tolerant of such conditions like common and thread-leaved water-crowfoots, broad-leaved pondweed and branched bur-reed. Their fauna is rather poorly known but even isolated ponds on the arable plateaux may support small amphibian populations and Great Crested Newt has been found in at least one such pond. Aquatic invertebrates include mobile species such as small diving beetles of the genus *Hydroporus* and various water bugs.

With the increase in arable cultivation and the advent of piped water supplies for livestock, dew ponds have become largely redundant. Many have been left to silt up and become overgrown or have simply been filled in. A recent study of a sample area within the Natural Area indicated that 80% of dew ponds had disappeared between the 1950s and 1980s.

### **2.2.6 Woodland**

The Wolds are rather sparsely wooded with scattered shelter belts and dale-head plantations of ash, beech, sycamore or larch typical of much of the area. These woods have a characteristically dull flora typical of disturbed secondary woodland, or a species-poor herb layer dominated by dog's mercury. A few woods on more acidic sandy till in the northern part of the Wolds support species such as bluebell, wood sorrel and bracken but none of these are of outstanding nature conservation interest.

Distinct clusters of woodland occur on the foothills of the western scarp above Pocklington, around Londesborough Park and some other large estates, and along the northern escarpment where recent conifer plantations have been established. A concentration of woodland is also found along the Gypsey Race in the vicinity of Boynton. Boynton Willow Garth is one of the very few stands of wet woodland in the Natural Area and the indigenous black poplar is thought to be native here.

Woodland on the Yorkshire Wolds typically supports rather impoverished plant communities and little, if any of it is likely to be primary. However, a handful of sites do appear to have a long continuity of woodland cover. Millington Wood is particularly notable, even though much of it was converted to plantations in 1950s. Work is now underway to reverse this process and encourage a native ash dominated woodland. Species characteristic of ancient calcareous woods found here include lily-of-the-valley, nettle-leaved bellflower, toothwort and woodruff.

A species of special interest at Millington is baneberry, a plant of shallow calcareous woodland soils. Baneberry occurs in Britain only in three regions: in North and East Yorkshire, in the West Yorkshire Pennines and as a plant of limestone pavements in Cumbria. This species can also be found at Beck Dale Plantation and two or three other locations within the Natural Area.

Few other woods in the Natural Area are of comparable conservation interest to Millington but species indicative of long-established woodland such as early purple orchid, wood anemone, early dog violet and wood melick do occur here and there.

Redstart is a localised breeding bird in valley ash woodland in the south of the Wolds. One or two pairs of common buzzard may now breed within the Natural Area but populations of this raptor are much below natural levels as a result of past persecution by game-rearing interests.

### **2.2.7 Hedgerows and scrub**

Hedgerows on the Yorkshire Wolds predominantly date back to the Parliamentary Enclosure era (ca. 1750 to 1850) and are composed mainly of hawthorn. Some hedges have been colonised by shrubs typical of calcareous soils: purging buckthorn was found in 50% of mixed hedges on the Wolds in 1980, dogwood in 25% and wild privet in 10%.

There have probably always been stands of scrub amongst the valley grasslands of the Yorkshire Wolds but changes in management during recent years have resulted in the colonisation or spread of hawthorn and gorse thickets over considerable areas. Where scrub forms dense stands, the grassland flora may be shaded out of existence and permanent changes in soil characteristics may take place.

Although it may encroach on valuable chalk grassland, scrub should be recognised as an important wildlife habitat in its own right. Large populations of linnets breed in gorse scrub in the dry valleys and grey partridges may use gorse as nesting cover. Other characteristic scrub birds include warblers, yellowhammer, little owl and, very locally, long-eared owl. The invertebrate interest of grassland-scrub mosaics in the Natural Area is poorly recorded but includes uncommon spiders. Occasionally stands of scrub may contain shrubs such as purging buckthorn and dogwood but there has been little assessment of the botanical interest of scrub communities in this area.

### **2.2.8 Arable**

The thin calcareous soils of the Wolds have long been renowned for their ease of cultivation and extensive tracts of arable now dominate the landscape, especially on the plateaux and more gentle slopes of the High Wolds.

Although field sizes are often large and cultivation methods intensive, arable farmland is important for a number of declining species in the Natural Area. Corn bunting, grey partridge and hare are all widespread though turtle dove is reported to have declined seriously. Curlews breed on arable land in scattered localities, although this species has only colonised the Yorkshire Wolds since the late 1950s.

A suite of scarce or declining arable weeds occurs in the Natural Area, although most of these are now increasingly infrequent. These species tend to be associated with thin calcareous soils and include night-flowering catchfly, yellow-juiced poppy, Venus' looking glass, common cornsalad, dwarf spurge and the nationally scarce fine-leaved fumitory and narrow-fruited cornsalad. The rare red hemp-nettle now occurs primarily in open habitats on chalk rather than as a weed of cultivation. Such species have declined due to increased use of

fertilisers and herbicides, the shift from spring to autumn tillage and the rapid ploughing- in of stubbles.

### **2.2.9 Churchyards**

A number of churchyards in the Natural Area provide interesting wildlife habitats. Churchyards may contain remnants of semi-natural chalk grassland: St Andrews at Weaverthorpe, for example, supports typical species such as field scabious, salad burnet and lady's bedstraw as well as a colony of marbled white butterflies. Lichens growing on headstones and church buildings may also be of interest: the very localised saxicole *Lecanora pannonica* is found in a cluster of churchyards on the Yorkshire Wolds but is known elsewhere in Britain only from Northamptonshire.

## **3. Influences and issues**

### **3.1 The physical environment**

The geology and topography of the Yorkshire Wolds are unifying influences upon the landscape and ecology of the Natural Area. It is these physical attributes, combined with the influences of traditional land use, which determine the distribution of plant and animal communities. In recent decades, modern farming methods have increasingly obscured the importance of physical influences; use of artificial fertilisers has allowed continuous cultivation of the thinnest tills, for example, whilst aerial spraying of fertilisers has reached some of the steepest valley slopes. Conservation of biodiversity in the Natural Area depends not only upon protecting individual sites, species and communities but also upon maintaining the full range of natural physical features and influences.

In addition to its wildlife interest, the Natural Area is of prime earth science interest. Features such as landslip terraces, dry valleys and the complex karst system around Millington are important examples of landforms created by geomorphological processes. Exposures of rock in quarries and cuttings are also of considerable interest as a stratigraphic record of the Cretaceous and Jurassic periods.

### **3.2 Traditional land use**

The Wolds have been farmed since early Neolithic times and there is a wealth of archaeological evidence left by these early settlers in the form of burial mounds and earthworks (25% of SSSIs contain features of archaeological interest). Settlement continued through the Bronze Age and Iron Age into the historic period and numerous settlements were established by the Middle Ages.

Tree cover had largely been cleared before the arrival of the Romans, with most of the Natural Area given over to pastoral or arable farming during the following centuries. Prior to the Enclosure Awards, chalk grassland was the predominant landscape over much of the Wolds: "a desolate, grassy and stony sheepwalk ... over which a horseman might ride for thirty miles at a stretch without meeting a fence or other obstruction" in the words of one contemporary. These great expanses of dry grassland were the haunt of birds such as great bustard and stone curlew.

Following the Enclosures, grassland became increasingly fragmented as the area of arable increased. The great bustard finally disappeared from the Wolds around 1830 and became extinct in Britain as a whole shortly thereafter. Stone curlews persisted in dwindling numbers on unreclaimed rabbit warrens for a century or so longer, whilst ancient chalk grassland became increasingly confined to steep-sided valley and scarp slopes. In recent decades, large areas of remaining semi-natural grassland have been 'improved' by reseeding and fertiliser treatment to allow more intensive grazing; even where slopes are too steep for tractors, grassland has sometimes been fertilised by slurring or aerial spraying.

Loss of habitat has also resulted in increased fragmentation. Although there are still extensive parcels of chalk grassland in the valley systems at Thixendale and Millington, some other sites are now islands among arable or improved pasture.

In addition to agricultural intensification, other changes have diminished the quantity or quality of the chalk grassland resource. Where extensive grazing has become unprofitable, hillsides have often been left under-grazed or management has been abandoned altogether. This has resulted in widespread encroachment of scrub and tor-grass. Factors such as atmospheric pollution and the introduction of less hardy breeds of livestock may also have contributed to the invasion of chalk grassland by coarse grasses.

Of the 35% of non-SSSI chalk grassland lost during the 1980s, 3770 had been ploughed and resown, 60% had undergone more partial improvement (eg. fertiliser treatment) and a small proportion had been planted with trees. One-fifth of the remainder was threatened by serious encroachment of rank grasses (mainly tor-grass) and one-tenth by scrub invasion. These problems are not confined to non-statutory sites: in 1993, 42% of SSSI chalk grassland in the Natural Area was considered to be under-grazed and 17% was at risk from scrub invasion.

In recent years, conservation initiatives such as the Countryside Stewardship scheme and management agreements with SSSI owners and occupiers have encouraged the restoration of traditional management to maintain characteristic chalk grassland communities. There are currently around 40 Countryside Stewardship agreements in effect in the Natural Area.

### **3.3 Issues affecting nature conservation**

- Loss of chalk grassland through agricultural improvement and conversion to arable.
- Changes in grazing management resulting in under or over grazing.
- Encroachment of scrub and tor-grass on species-rich grasslands.
- Fragmentation of semi-natural habitats amidst large areas of intensive farmland.
- Tipping and infilling of old chalk pits. Vegetation obscuring sections through geological strata. Natural succession on open chalk habitats.
- Afforestation and tree planting resulting in habitat loss or obscuring important landforms.
- Loss of dew ponds.

- Abstraction from the chalk aquifer; impact on water tables, stream flows and spring-fed sites.
- Water quality: diffuse eutrophication, farm effluents, pesticide leachates.

## 4. Objectives

The Yorkshire Wolds Natural Area has experienced major changes in land use in recent decades, accelerating the loss and fragmentation of semi-natural habitats such as chalk grassland. The wildlife resources which remain are an essential part of the character of the Natural Area. These survive not only within ‘special’ sites such as SSSIs and nature reserves but also in the wider countryside, including refuges such as disused quarries and railway lines, road verges, green lanes and churchyards.

Habitat and species losses are a recurring thread throughout lowland England and have been well documented. At least one species lost from the Yorkshire Wolds Natural Area, the great bustard, is extinct in Britain as a whole. Others such as the stone curlew are seriously threatened. Losses of over a third of unprotected chalk grassland during the 1980s and perhaps 80% of dew ponds in recent decades emphasise the fragility of wildlife resource in the Natural Area, especially outside of statutorily-designated sites. English Nature seeks to work with others to maintain the wildlife character of the Natural Area and to start the process of restoring the nature conservation resource where appropriate.

To this end, the following objectives reflect English Nature’s assessment of the nature conservation priorities for the Natural Area. We hope that these will assist in the development of a clear ‘vision’ for the future, shared with others and incorporated within proactive strategies such as Local Biodiversity Action Plans.

### OBJECTIVE 1

**Manage characteristic wildlife habitats and species in a sustainable way, and begin the process of restoring losses in the Natural Area.**

- **Background:** In common with all other Natural Areas, the Yorkshire Wolds would once have comprised natural and semi-natural habitats. These have been shaped by millennia of human land use but recent agricultural intensification has resulted in the massive loss and fragmentation of semi-natural habitats. Important habitats such as chalk grassland depend upon continuous ‘traditional’ management such as extensive sheep and cattle grazing to maintain their character, rapidly reverting to scrub and eventually woodland in the absence of such management. Sympathetic management is thus essential to maintain the surviving wildlife resource. In the long-term, however, maintenance of biodiversity in the Natural Area depends upon restoring some of the lost habitats and reinstating linkages between fragments. Without such action, species and communities confined to isolated sites may be unable to sustain viable populations and opportunities for re-colonisation or re-introduction of lost species will remain minimal.

## Aspirations

- Chalk grassland will be managed to sustain its full diversity of constituent flora and fauna, reflecting the full range of physical and environmental influences within the Natural Area.
- There will be no further loss of chalk grassland and restoration of degraded or impoverished examples will be encouraged. New areas of chalk grassland will be created using locally-native seed sources, with priority given to linking fragments and extending existing sites. At least 2% of the Natural Area will be maintained as or restored to chalk grassland.
- All springs, flushes and fens will be conserved by ensuring sympathetic management of surrounding land and preventing pollution, eutrophication or drainage.
- The chalk aquifer will be protected from eutrophication and over-abstraction to maintain the quantity and quality of water feeding springs, fens, flushes and chalk streams.
- Chalk streams will be protected from pollution, over-abstraction and impoundment as well as unnecessary modification. Sympathetic management of chalk stream catchments and corridors will include the creation of grass buffer strips where watercourses run through arable land.
- Calcareous ash woods and plantations will be managed to restore native tree cover using local seed sources and natural regeneration. Selected stands of mature scrub will be managed to promote natural succession to ash woodland. Further scrub encroachment on chalk grassland will be curtailed but existing wildlife-rich scrub habitats will be conserved. Woodland planting will be confined mainly to arable and intensively-improved grassland.
- Quarries, disused railways and screes will be managed to create and maintain areas of early-successional habitat throughout the Natural Area.
- Arable land will be managed to accommodate wildlife such as farmland birds, hares and arable flowers. Areas specifically managed to conserve scarce arable weed communities will be established.



## OBJECTIVE 2

### **Consolidate populations of scarce, threatened or declining species to ensure that they are self-sustaining within the Natural Area.**

- Background: Changing agricultural practices and habitat loss have resulted in many once-familiar species becoming scarce within the Natural Area, and in more vulnerable species becoming rare or even extinct. Careful management of remaining habitats and re-creation of lost habitats is essential to maintain and restore the full diversity of naturally occurring plants and animals within the Natural Area.

### **Aspirations**

- **Farmland birds.** The distribution and populations of grey partridge, turtle dove, skylark and corn bunting will be maintained and increased. Agri-environmental incentives will take account the ecological requirements of these species within the Natural Area.
- **Scarce arable weeds.** Self-sustaining populations of red hemp-nettle, common cornsalad, narrow-fruited cornsalad, fine-leaved fumitory, small-flowered buttercup, dwarf spurge and other uncommon or declining arable flowers will be maintained throughout their natural range within the Natural Area.
- **Perennial flax.** Existing populations will be maintained and encouraged to increase through appropriate management of grassland communities.
- **Thistle broomrape.** The existing population will be maintained and opportunities for expansion of the population will be sought.
- **Baneberry.** All known sites for this species will be managed sympathetically, with restoration of native tree cover, avoidance of clear-felling and protection from nutrient-enrichment.
- **White-clawed crayfish.** Calcareous streams within the NA will be surveyed for the species. Appropriate measures will be taken to protect any relict population and if none is present re-introduction of the species will be considered.

## OBJECTIVE 3

### **Maintain the diversity of earth science interest found within the Natural Area.**

- Background: The Yorkshire Wolds Natural Area is of prime interest to earth science with key features including sections through the Cretaceous and Jurassic strata and characteristic landforms such as dry valley systems. These provide a valuable resource for scientific study and education. Sympathetic after-use of excavations and conservation of important landforms are key issues.

## Aspirations

- Access will be maintained to all currently exposed geological sites and important sections will be kept free of obscuring vegetation to encourage current and future study.
- Geological interest will be taken seriously when considering after-use of quarries, with a proportion of sites allocated to a ‘geological conservation after-use’ at the planning stage.
- Local conservation strategies which include geology will be encouraged and the work of the East Yorkshire RIGS group supported.
- Characteristic landforms will be protected from adverse land use, eg afforestation of karst valleys.
- Earth sciences will be promoted by improved on-site interpretation and educational use of selected sites.

## 5. Glossary

<b>ancient woodland</b>	a site where woodland cover is believed to have been continuous since the Middle Ages.
<b>biodiversity</b>	biological diversity; the range of naturally-occurring species, communities and their habitats, including genetic variation within species.
<b>calcareous</b>	rocks or soils containing a high proportion of calcium carbonate, principally limestone and chalk.
<b>calcicole</b>	species or communities strongly associated with calcareous soils.
<b>calcifuge</b>	species or communities strongly associated with calcium-deficient or acidic soils.
<b>Cretaceous</b>	the geological period of ca. 136-65 million years ago, during which chalk rocks were laid down.
<b>dew pond</b>	a small man-made pond lined with layers of quicklime, straw, clay and chalk rubble. Dew ponds were created to provide water from livestock on the dry wolds and depend upon rain to maintain water levels.
<b>Jurassic</b>	the geological period of ca. 180-135 million years ago when sedimentary rocks were laid down in fluctuating shallow seas. Jurassic rocks include various limestones, clays and sandstones.

<b>loess</b>	fine-textured soil deposits probably wind-blown.
<b>mesotrophic</b>	soils which are neither markedly acidic nor alkaline in reaction (neutral), and their associated vegetation.
<b>periglacial</b>	the area or climate at the edge of an ice sheet.
<b>primary woodland</b>	woodland which has existed more or less continuously on a site and has never been entirely cleared and replaced by open land.
<b>saxicolous</b>	plants, especially lichens, which grow on rocks or stonework rather than on trees or on the ground.
<b>semi-natural</b>	vegetation composed predominantly of locally-indigenous (ie unsown) species but modified by traditional management practices.
<b>till</b>	an unsorted, variable mixture of rocks, clays and sands deposited by melting ice sheets.
<b>UK Biodiversity Action Plan</b>	a plan setting out targets for the conservation of threatened species and habitats, published in 1994 as the UK Government's response to the Convention on Biological Diversity signed at the Earth Summit in Rio de Janeiro in 1992.

## 6. References

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## Appendix: Scientific names of species referred to in this profile

Autumn gentian  
autumn lady's tresses

*Gentianella amarella*  
*Spiranthes spiralis*

**B**aneberry  
bee orchid  
betony  
black poplar  
bloody cranesbill  
bluebell  
bogbeam  
bracken  
branched bur-reed  
broad-leaved pondweed  
brown Argus butterfly  
burnet saxifrage  
burnt-tip orchid  
butterwort

*Actaea spicata*  
*Ophrys apifera*  
*Stachys officinalis*  
*Populus nigra* ssp. *betulifolia*  
*Geranium sanguineum*  
*Hyacinthoides non-scripta*  
*Menyanthes trifoliata*  
*Pteridium aquilinum*  
*Sparganium erectum*  
*Potamogeton natans*  
*Aricia agestis*  
*Pimpinella saxifraga*  
*Orchis ustulata*  
*Pinguicula vulgaris*

Carline thistle  
cistus forester moth  
clustered bellflower  
common bent  
common buzzard  
common cornsalad  
common milkwort  
common rockrose  
common water-crowfoot  
corn bunting  
creeping thistle  
crested dogstail  
crested hair grass  
curlew

*Carlina vulgaris*  
*Adscita geryon*  
*Campanula glomerata*  
*Agrostis capillaris*  
*Buteo buteo*  
*Valeriana locusta*  
*Polygala vulgaris*  
*Helianthemum nummularium*  
*Ranunculus aquatilis*  
*Miliaria calandra*  
*Cirsium arvense*  
*Cynosurus cristatus*  
*Koeleria macrantha*  
*Numenius arquata*

**D**evilsbit scabious  
dingy skipper butterfly  
dog's mercury  
dogwood  
dropwort  
dwarf spurge

*Succisa pratensis*  
*Erynnis tages*  
*Mercurialis perennis*  
*Cornus sanguinea*  
*Filipendula vulgaris*  
*Euphorbia exigus*

**E**arly dog violet  
early purple orchid

*Viola reichenbachiana*  
*Orchis mascula*

False oat-grass	<i>Arrhenatherum elatius</i>
field scabious	<i>Knautia arvensis</i>
fine-leaved fumitory	<i>Fumaria parviflora</i>
flat sedge	<i>Blysmus compressus</i>
flea sedge	<i>Carex pulicaria</i>
frog orchid	<i>Coeloglossum viride</i>
<b>Grayling butterfly</b>	<i>Hipparchia semele</i>
great crested newt	<i>Triturus cristatus</i>
greater knapweed	<i>Centaurea scabiosa</i>
green-winged orchid	<i>Orchis morio</i>
grey partridge	<i>Perdix perdix</i>
<b>Hairy rock-cress</b>	<i>Arabis hirsuta</i>
hare	<i>Lepus europaeus</i>
heath bedstraw	<i>Galium saxatile</i>
heath-grass	<i>Danthonia decumbens</i>
horseshoe vetch	<i>Hippocrepis comosa</i>
<b>Knapweed broomrape</b>	<i>Orobanche elatior</i>
knotted hedge parsley	<i>Torilis nodosa</i>
<b>Lady's bedstraw</b>	<i>Galium verum</i>
lesser water-parsnip	<i>Berula erecta</i>
lily-of-the-valley	<i>Convallaria majalis</i>
linnet	<i>Carduelis cannabina</i>
little owl	<i>Athyene noctua</i>
long-stalked cranesbill	<i>Geranium columbinum</i>
long-stalked yellow sedge	<i>Carex viridula</i> ssp. <i>brachyrrhyncha</i>
<b>Marbled white butterfly</b>	<i>Melanargia galathea</i>
marsh valerian	<i>Valeriana dioica</i>
meadow oat-grass	<i>Helictotrichon pratense</i>
mouse-ear hawkweed	<i>Pilosella officinarum</i>
musk thistle	<i>Carduus nutans</i>
<b>Narrow-fruited cornsalad</b>	<i>Valerianella dentata</i>
night-flowering catchfly	<i>Silene noctua</i>
northern brown argus butterfly	<i>Aricia artaxerxes</i> ssp. <i>salmacis</i>
<b>Perennial flax</b>	<i>Linum perenne</i>
purging buckthorn	<i>Rhamnus catharticus</i>
purple milk vetch	<i>Astragalus danicus</i>
pyramidal orchid	<i>Anacamptis pyramidalis</i>

Quaking grass

*Briza media*

Red hemp-nettle  
redstart

*Galeopsis angustifolia*  
*Phoenicurus phoenicurus*

Salad burnet  
saw-wort  
small scabious  
squincywort  
stream water-crowfoot  
stemless thistle

*Sanguisorba minor*  
*Serratula tinctoria*  
*Scabiosa columbaria*  
*Asperula cynanchica*  
*Ranunculus penicillatus* var. *pseudofluitans*  
*Cirsium acaule*

Thistle broomrape  
thread-leaved water-crowfoot  
toothwort  
tor-grass  
turtle dove

*Orobanche reticulata*  
*Ranunculus trichophyllus*  
*Lathraea squammaria*  
*Brachypodium pinnatum*  
*Streptopelia turtur*

Upright brome

*Bromopsis erecta*

Venus' looking glass

*Legousia hybrida*

Water-cresses

water-starworts  
water whorl grass  
white-clawed crayfish  
wild privet  
wild thyme  
wood anemone  
wood melick  
woodruff  
wood sorrel  
wooly thistle

*Rorippa masturtium-aquaticum* and  
*Rorippa microphyllum*  
*Callitriche* spp.  
*Catabrosa aquatica*  
*Austropotamobius pallipes*  
*Ligustrum vulgare*  
*Thymus praecox*  
*Anemone nemorosa*  
*Melica uniflora*  
*Galium odoratum*  
*Oxalis acetosella*  
*Cirsium eriophorum*

Yellow-juiced poppy

*Papaver lecoqii*