



LOCAL DEVELOPMENT FRAMEWORK FOR CRAVEN
DISTRICT OUTSIDE THE YORKSHIRE DALES NATIONAL
PARK

Craven District Council

**APPROPRIATE ASSESSMENT
SCREENING REPORT**

Prepared by Envision Consultants on behalf of
Craven District Council

Craven District Council
Appropriate Assessment Screening Report

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APPROPRIATE ASSESSMENT SCREENING REPORT JULY 2007

Introduction

The Habitats Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna provides legal protection for habitats and species of European importance (Natura 2000 sites). The Directive requires an Appropriate Assessment to be carried out in relation to 'any plan or project not directly connected with or necessary to the management of the site but likely to have significant effects thereon, either individually or in combination with other plans or projects.'

All plans and projects should aim to identify any possible impacts early in the plan-making process and then either alter the plan to avoid them or introduce mitigation measures to the point where no adverse impacts remain. The 'competent national authorities' (in this case the EIP Inspector) shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate having obtained the opinion of the general public.'

For the purposes of the Craven draft Core Strategy, the assessment must first of all identify the European sites in and around Craven District and assess the implications of the Preferred Option strategic objectives and policies in terms of the conservation objectives of all the relevant Natura 2000 sites. These are designated as Special Areas for Conservation (SAC) or Special Protection Areas (SPA) and include sites identified in the UK as RAMSAR sites.

Envision were commissioned to undertake this Appropriate Assessment Screening report on behalf of Craven District Council.

Process of Appropriate Assessment (AA)

Appropriate Assessment (AA) is based on the 'precautionary principle' and requires the assessors to prove that the plan or policies will not have a significant impact on the integrity of any designated site. Sites are said to have a high degree of integrity 'where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained and a minimum of external management support is required' (EC 2002 guidance).

The integrity of the sites is said to be affected where they can no longer sustain and ensure the continued viability of the complex of habitats and populations of species for which they were designated. Where uncertainty remains, an adverse impact should be assumed and, where significant negative effects are identified, alternative options should be examined to avoid any potentially damaging impacts.

Screening for Appropriate Assessment (AA)

Recent guidance (Planning for the Protection of European Sites DCLG 2006) advises that there are several stages to the AA process. In the initial stages, 'screening' should be used to determine whether there are likely to be any adverse effects on the integrity of Natura 2000 sites arising from the plan. AA will only be required if significant adverse effects are identified.

There are five designated European sites of international importance within and in the vicinity of Craven District. 'Screening' is therefore necessary to assess whether the draft Core Strategy DPD will have an impact on those designated sites and whether an AA should be undertaken.

This Appropriate Assessment Screening Report therefore identifies the Natura 2000 sites that may be affected by the Preferred Option Core Strategy together with other plans and projects which may have 'in-combination' effects. The assessment of the potential effects of the Core Strategy on the designated sites will be submitted to Natural England, the Environment Agency, DeFRA and the relevant neighbouring local authorities for formal consultation.

Identification of Natura 2000 sites which may be affected

SAC and SPA areas have been mapped, using information from the following web-sites www.jncc.gov.uk and www.natureonthemap.org.uk and the Council's in-house GIS system. The Natura 2000 sites that fall in part within the Craven District boundaries and others that are within 10km of the Craven District boundary within an adjacent or neighbouring authority's area were included in the screening exercise to determine whether they could possibly be affected.

A series of 3km, 5km and 10km buffer zones around the SAC and SPA boundaries were mapped to identify those settlements where new development may be promoted by means of the emerging Craven Core Strategy.

Table 1 Proximity to SAC/SPA Sites

Name of site	Settlements within 3km buffer	Settlements within 5km buffer	Settlements within 10km buffer
North Pennine Moors SAC and SPA	N part Skipton	Skipton	Glusburn Crosshills
South Pennine Moors SAC and SPA	Glusburn Crosshills Sutton in Craven		Skipton
Ingleborough Complex SAC	Ingleton	Giggleswick N part Settle	High Bentham

North Pennine Dales Meadows SAC			Ingleton
Craven Limestone Complex SAC			Settle Giggleswick

Table 2 Natura 2000 Sites - Site Analysis

(Qualifying features marked * are priority habitat types)

Site	North Pennine Moors SAC
Location	NE of Skipton
Potential impact locations	Skipton, Glusburn, Crosshills
Qualifying features (Annex 1 habitats)	European dry (upland) heaths; Juniper on heaths or calcareous grasslands; Blanket bogs *; Petrifying springs*; Siliceous rocky slopes; Old sessile oak woods
Conservation objectives, nature conservation importance	<p>Bogs, marshes, heath, scrub, dry grassland.</p> <p>The North Pennine Moors also hold much of the upland heathland of northern England. At higher altitudes and to the wetter west and north of the site complex, the heaths grade into extensive areas of blanket bogs.</p> <p>The North Pennine Moors hold the major area of blanket bog in England. (The UK has a special responsibility for protection of this priority habitat type which has formed in areas where there is a climate of high rainfall and a low level of evapo-transpiration, allowing peat to develop over large expanses of undulating ground). A significant proportion remains active with accumulating peat, although these areas are often bounded by sizeable zones of currently non-active bog, albeit on deep peat.</p> <p>The petrifying springs habitat is very localised in occurrence within the North Pennine Moors, but where it does occur it is species-rich with abundant bryophytes, sedges and herbs.</p>

Site	South Pennine Moors SAC
Location	SE of Crosshills

Qualifying features (Annex 1 habitats)	European dry (upland) heaths, Blanket bogs*, old sessile oak woods
Conservation objectives, nature conservation importance	<p>Bogs, marshes, heath, scrub.</p> <p>The site is representative of upland dry heath at the southern end of the Pennine range, the habitat's most south-easterly upland location in the UK. Dry heath covers extensive areas, occupies the lower slopes of the moors on mineral soils or where peat is thin, and occurs in transitions to acid grassland, wet heath and blanket bogs. The upland heath of the South Pennines is strongly dominated by heather <i>Calluna vulgaris</i>.</p> <p>This site represents blanket bog in the south Pennines, the most south-easterly occurrence of the habitat in Europe. The bog vegetation communities are botanically poor and the usual bog-building <i>Sphagnum</i> mosses are scarce. Bog pools provide diversity. Substantial areas of the bog surface are eroding, and there are extensive areas of bare peat. In some areas erosion may be a natural process reflecting the great age (9000 years) of the South Pennine peats.</p>

Site	North Pennines Dales Meadows
Location	East of Settle
Qualifying features (Annex 1 habitats)	Mountain hay meadows (isolated fields)
Conservation objectives, nature conservation importance	<p>Humid grassland, rare and local meadow species.</p> <p>Many examples of traditionally managed meadows form part of the 'in-bye' land of the North Pennine hill farms, where they are cut for hay between early July and August, once the food value of the crop has peaked and the flowers have set seed. Following the cut, grazing animals are re-introduced once more until winter. Most meadows also receive a light application of farmyard manure which helps to maintain a healthy hay crop and a healthy wild flower community.</p> <p>These meadows support plants such as wood cranesbill, great burnet, pignut, bugle, globeflower, marsh hawk's-beard, lady's mantles and yellow rattle. They are also of great importance for breeding birds such as yellow wagtail, redshank, and lapwing, and for feeding birds such as twite.</p> <p>Mountain hay meadows appear to have declined in extent due to agricultural intensification and are at</p>

	<p>risk from modern farming practices and neglect. They now cover a very small area in the UK, considered to be less than 1,000 ha. They occur as scattered fields or small isolated groups of fields in a series of valleys in northern England and the plant communities they support are considered to be some of the rarest in England.</p>
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Site	Craven Limestone Complex
Location	East of Ingleton
Qualifying features (Annex 1 habitats)	Dry grassland, scrub, water bodies (Malham Tarn), active raised bogs, limestone pavements
Conservation objectives, nature conservation importance	<p>Malham Tarn in northern England is considered the best example of an upland stonewort Chara-dominated lake in England. It is an example of a lake on limestone and is the highest marl lake in the UK. The water drains from surrounding Carboniferous limestone and is calcareous and low in plant nutrients,</p> <p>Craven in northern England supports strong populations of white-clawed crayfish <i>Austropotamobius pallipes</i> in the limestone streams feeding Malham Tarn, and in Malham Tarn itself. This site is well-isolated and is therefore an important refuge, unlikely to be invaded by non-native crayfish species.</p> <p>Craven represents bullhead <i>Cottus gobio</i> in calcareous, upland becks and streams in the northern part of its range in England. The clean calcareous waters with their stony bottoms support good numbers of bullhead.</p> <p>Craven Limestone Complex is the single remaining native site for Lady's-slipper orchid <i>Cypripedium calceolus</i>. Formerly reduced to a single plant, careful habitat management, together with hand-pollination of the few flowers that appear, and more recently re-establishment of plants from ex-situ propagation, has led to a steady increase in the size of the colony.</p> <p>Craven is one of three Carboniferous limestone sites in northern England selected for petrifying springs with tufa formation. The site contains extensive complexes of tufa-forming springs associated with a wide range of other habitats, Locally calcareous springs emerge within areas of acid drift supporting heath and acid grassland. The flora of these habitat mosaics is outstandingly species-rich and includes</p>

	<p>many rare northern species, such as alpine bartsia <i>Bartsia alpina</i> and bird's-eye primrose <i>Primula farinosa</i>.</p> <p>Malham Tarn Moss represents active raised bogs in central northern England, in an area overlying limestone where wetlands are more typically base-rich fens. It displays a classic raised dome with transition from raised bog (base-poor) to base-rich conditions at the bog margin where it interfaces with land influenced by water from the limestone.</p> <p>There are extensive spring-fed alkaline flush fens throughout the site, typically associated with calcareous grassland and limestone scars.</p> <p>The Craven Limestone Complex in northern England is the second most extensive area of calcareous grassland in the UK. The site exhibits an exceptional diversity of structural types, ranging from hard-grazed open grasslands, through to tall herb-rich grasslands on ungrazed cliff ledges, such as at Malham Cove, in woodland margins and around Limestone pavements and screes. It is thus an important example of grassland-scrub transitions.</p> <p>Craven is one of three sites representing <i>Molinia</i> meadows in the northern England centre of distribution. This site contains what are believed to be the largest expanses of <i>Molinia caerulea</i> – <i>Crepis paludosa</i> mire in the UK, amidst Alkaline fens and active raised bog communities of the Malham Tarn area; smaller fragments are associated with meadows, wood edges and river banks elsewhere on the site.</p> <p>Craven is one of four sites representing Limestone pavements in northern England. It is selected on the basis of its size and as an example of mid-altitude pavement. There is a wide range of transitions to other habitats.</p>
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Site	Ingleborough Complex
Location	NE of Ingleton
Qualifying features (Annex 1 habitats)	Juniper formations on heaths or calcareous grasslands; Alkaline flushes; Calcareous rocky slopes; Limestone pavements
Conservation objectives, nature conservation importance	Heath, scrub, dry grassland. Ingleborough represents upland <i>Juniperus communis</i> formations on a calcareous substrate in northern England. It occurs here at its highest altitude on limestone in the UK. Amid stands of calcareous grassland it has the only large stands of juniper on

	<p>Limestone pavements at high altitude in the UK. The scrub is of the relatively species-poor type typical of these situations.</p> <p>Alkaline fens consist of a complex assemblage of vegetation types characteristic of sites where there is tufa and/or peat formation with a high water table and a calcareous base-rich water supply. The core vegetation is short sedge mire (mire with low-growing sedge vegetation)</p> <p>Spring-fed flush fens of <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire are extensive across Ingleborough, commonly associated with calcareous grassland types, but also found amidst acid grasslands and heathland communities. They are often species-rich communities, in which rare or locally distributed species</p> <p>Ingleborough is one of four sites in northern England representing Limestone pavements on Carboniferous limestone. It has the most extensive series of Limestone pavements in the UK, varying from moderate altitude to montane in character (300-640 m).</p> <p>Ingleborough is one of three sites representing the Calcareous rocky slopes with chasmophytic vegetation found in northern England. Crevice communities occur on extensive limestone scars and are characteristic of the area.</p>
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Key environmental conditions required to sustain site integrity

Priority habitat types and the key conditions that sustain their integrity are described in Appendix A attached. The Appendix includes information taken from the Natural England web-site www.naturalengland.org.uk.

The key management issues that are relevant to each habitat type are summarised as follows:

Blanket bogs are a peatland habitat; these habitats have traditionally been managed for livestock and/or for grouse shooting. Where this management has been intensive, damage may have occurred through overgrazing, trampling, burning and drainage. Such damage may destroy the peat soils or prevent the formation of new peat, which can result in peat erosion.

Active raised bogs form where plants decompose very slowly under waterlogged conditions. The aim of management is to re-start the peat-forming process by restoring a high and stable water table in the peat. Groundwater must be protected from contamination by agricultural fertilisers or pollution and drainage schemes should not intercept the source. Low intensity sheep grazing can be helpful but the addition of

unwanted plant nutrients should be avoided. Access to these sites, and any recreational activities within them, also needs to be managed.

Petrifying springs (tufa formation) are associated with hard-water springs, where groundwater rich in calcium bicarbonate comes to the surface. On contact with the air, carbon dioxide is lost from the water and a hard deposit of calcium carbonate (tufa) is formed.

Mountain hay meadows are maintained in isolated fields by a regime of carefully timed hay-making, usually one cut between early July and August, aftermath grazing and avoidance of artificial fertilisers.

Water bodies including tarns, springs and streams need to be protected to maintain their structural diversity and water quality; increases in the amount of nutrients within the water body can lead to a loss of aquatic plants and species. Recreational activities associated with tarns and their surroundings should be managed carefully to avoid harm to their nature conservation value from contamination and/or erosion.

Limestone pavements are outcrops of rock, typically horizontal or gently inclined, which have taken a long time to develop and will, if damaged, never re-form. The plant and animal species associated with limestone pavement require the habitat to remain intact and undisturbed. The characteristic plant communities of open pavements are often sparse and are largely the result of a long history of grazing. Management should aim to maintain open conditions on the limestone pavement and the associated plant communities, but should ensure grazing levels are light enough for plants to flower, set seed and spill out onto the clint tops.

Management of limestone grassland habitats is important for maintaining the characteristic species-rich sward and invertebrates. Traditionally, management is achieved by grazing which should generally aim to keep a relatively open sward without causing excessive poaching. Light trampling can be beneficial by breaking down leaf litter and providing bare patches for seed germination and some invertebrates. Heavy grazing should be avoided and excessive scrub should be controlled.

Upland acid grasslands develop on nutrient-poor, acidic soils. Where the objective of management is to retain acid grassland as part of the upland mosaic active management is required. Traditionally, acid grasslands are managed by grazing at appropriate stocking rates and can support stock throughout the year. However, the precise timing and intensity of grazing will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds.

Dry upland heath tends to be semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors. It develops in nutrient-poor, acidic conditions and is dominated by dwarf shrubs, especially heather.

Dry upland heaths have a long history of active management, primarily by grazing. The numbers and types of grazing animals present as well as the duration and time of year of grazing are all important in determining the value of the vegetation to wildlife. Cutting is a possible alternative to grazing on dry heath. If cutting is used, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. The areas of heathland at Ingleborough should not be burnt due to their small size.

Juniper scrub has become increasingly scarce in England through a history of felling and heavy grazing. As it is a rare habitat in England, management should aim to maintain or increase its extent where it occurs. If grazing pressure is too high the structure of the scrub vegetation may become impoverished, and in time much of the juniper scrub woodland will become even aged. The juniper may not be able to regenerate itself naturally, leading to a loss of cover over time. As natural regeneration of juniper can be notably difficult, it may be necessary to actively plant juniper of local provenance to allow regeneration to occur in and around juniper scrub areas. However, the promotion of natural regeneration is preferable.

Rocky slopes and steep-sided gills support a rich association of plant species. The thin soils and physical structure of rocky habitats can support rare plant and animal communities not found elsewhere. The shade provided by tree cover and in deep ravines is important for mosses, ferns and other plants which thrive in shade and cool humid environments. A number of birds of conservation importance, such as peregrine falcon, use rock ledges as safe nesting sites.

Species that are associated with gills, scree and crags may require protection from damage and disturbance caused by walkers and rock climbers. Scree and rock can be highly unstable and the fragile plant communities that develop in these habitats are easily damaged by frequent trampling. Wherever possible, new footpaths should be routed around scree rather than through it. The routes used by climbers and scramblers and the time of year they use them may require careful management where sensitive vegetation and/or cliff-nesting birds are known to be present.

Implications of Craven Core Strategy Preferred Options

The conservation objectives of the relevant of all the relevant Natura 2000 sites are identified above. The next stage of the assessment is to consider the implications of the Craven Core Strategy Preferred Option strategic objectives and policies in terms of those objectives.

The majority of SAC/SPA sites are located at higher altitudes than any of the settlements in Craven, on the tops of the moors and fells. Their survival depends primarily on management of grazing regimes and the maintenance of existing high rainfall and water tables. The potential

pathways for impacts/contaminants between the potential areas for long term future development within Craven district and the boundaries of the Natura 2000 sites are therefore limited by the elevated topography, remote hydrology and isolated locations of the protected sites.

The potential impacts of draft Preferred Options policies are summarised in the following tables.

Table 3 Predicted Impacts

Preferred Policy Option	Predicted Impact on SAC/SPA sites
Sustainable Infrastructure	Policies that aim to reduce the need to travel by car are potentially positive;
Settlement Hierachy	Distribution of future development within the larger settlements, away from the rural areas and smaller villages, could have positive impacts; Distribution of new development within Ingleton, Sutton in Craven and the northern part of Skipton could have indirect impacts on SAC/SPA sites, depending on proximity; Growing population in Craven could generate increased demand for leisure/recreation access to SAC/SPA sites, which could have potential negative impacts unless carefully managed;
Housing	New housing development including rural exception housing could have impacts on SAC/SPA sites depending on location and proximity; Avoidance of development on sites which would extend the existing built up areas in the direction of SAC/SPA sites will avoid direct negative impacts such as noise, disturbance, air pollution, loss of water resources;
The Economy	New employment development including rural diversification and/or tourism sites could have impacts on SAC/SPA sites depending on location and proximity; Avoidance of development on sites which would extend the existing built up areas in the direction of SAC/SPA sites will avoid direct negative impacts such as noise, disturbance, air pollution, loss of water resources;
Environment and Design	Policy options that aim to minimise impacts on climate change, to protect natural and heritage resources and to enhance biodiversity are potentially positive;

As described above, Appropriate Assessment guidance explains that the integrity of SAC/SPA sites is said to be affected where they can no longer sustain and ensure the continued viability of the complex of habitats and populations of species for which they were designated.

The emerging Core Strategy deals with the spatial strategy for Craven and will therefore not propose site specific allocations for future development. The majority of draft policies in the Preferred Options will have no impacts, either positive or negative, on the integrity of the designated sites. Other policies, for example those seeking to achieve environmental protection and biodiversity gains or minimise climate change and car travel, could have positive effects.

Policies such as the Settlement Strategy, which identifies those towns and villages that could accommodate future housing and employment growth, have implications in terms of general population growth. This could generate increased demand for leisure/recreation access to SAC/SPA sites, which could itself have potential negative impacts unless carefully managed. The Core Strategy will indicate 'future directions for growth' in the larger settlements, including Skipton, Settle, Crosshill/Glusburn/Sutton in Craven (South Craven), High Bentham and Ingleton. The screening report indicates that there could be potential harmful effects where new development may be proposed in locations that are closer to SAC/SPA sites than existing settlement boundaries.

At this stage in the LDF process it is possible to develop alternative options to avoid, reduce or mitigate any potential negative effects from future development in the most sensitive locations. Acceptable mitigation measures need to reduce the impact to the point where it no longer presents any risk of an adverse effect. These could involve moving new development to a different location and/or creating vegetation buffers to prevent and/or reduce disturbance to sensitive species.

The following table indicates where policies and/or proposals need to be reconsidered in light of the Appropriate Assessment scoping exercise.

Table 4 Mitigation Measures

Site	Potential impacts from Core Strategy policies	Likely effect on site integrity	Possible measures to mitigate impacts
North Pennine Moors	New development within 3km in northern part of Skipton; Visitor pressure; Increased traffic	Trampling, accidental fires	Avoid further development to north side of Skipton (Castle Cons. Area); Create 'buffers' to prevent/reduce disturbance to

			sensitive species; Re-route footpaths; Locate car parks in less sensitive locations
South Pennine Moors	New development within 3km in South Craven; Visitor pressure; Increased traffic	Trampling, accidental fires	Avoid further development to south side of Sutton in Craven (Landscape Cons. Area); Create 'buffers' to prevent/reduce disturbance to sensitive species; Re-route footpaths; Locate car parks in less sensitive locations
North Pennines Dales Meadows	Visitor pressure; Increased traffic	Trampling, theft of rare plants	Create 'buffers' to prevent/reduce disturbance to sensitive species; Re-route footpaths; Locate car parks in less sensitive locations
Craven Limestone Complex	Visitor pressure; Increased traffic	Contamination of water bodies; trampling	Create 'buffers' to prevent/reduce disturbance to sensitive species; Re-route footpaths; Car parks in less sensitive locations
Ingleborough Complex	New development within 3km in Ingleton; Visitor pressure; Increased traffic	Contamination of water bodies; trampling	Avoid further development to east side of Ingleton (National Park); Create 'buffers' to prevent/reduce disturbance to sensitive species; Re-route footpaths; Car parks in less sensitive locations

Summary of potential effects

Sites are said to have a high degree of integrity 'where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained

and a minimum of external management support is required' (EC 2002 guidance).

The relevant components of the Preferred Options draft policies which may generate direct, indirect, secondary or combined effects are predicted to be minimal. Where Table 3 indicates that development should not be permitted in locations that would extend existing built up areas in Ingleton, Sutton in Craven and North Skipton in the direction of SAC/SPA sites, the proposed mitigation measures taken from Table 4 have been incorporated into the concurrent Environmental Capacity Study (ECS).

Appropriate Assessment Report - Conclusions

This screening report has been used to determine whether there are likely to be any adverse effects on the integrity of Natura 2000 sites arising from the draft Craven Core Strategy Preferred Options.

The European sites that have been considered are those located in or near the boundaries of the district. These include the North Pennine Moors SAC and SPA, the South Pennine Moors SAC and SPA, the Ingleborough Complex SAC, the North Pennine Dales Meadows SAC and the Craven Limestone Complex SAC. The assessment has been carried out for specific locations where the larger settlements proposed for 'future growth' lie within 3km, 5km or 10km of the boundaries of the designated sites.

The majority of locations are far removed from any SAC/SPA site with no potential harmful effects; there are no identified locations adjacent to any SAC/SPA site that would have direct impacts; there are only three locations in Ingleton, Sutton in Craven and North Skipton that are distant from any SAC/SPA site but could have indirect effects related to traffic, noise, disturbance or increased recreation demand.

In those locations alternative options have been examined to avoid any potential damaging impacts. The Environmental Capacity Study (ECS) has now been refined to ensure that locations that would extend existing built up areas in Ingleton, Sutton in Craven and North Skipton in the direction of SAC/SPA sites are identified as being subject to severe environmental constraints.

In summary, the findings of this Appropriate Assessment Screening Report make it clear that the Craven Core Strategy Preferred Options will not have any significant adverse effects on the integrity of any of the designated European sites considered in this assessment.

Therefore it is recommended that Craven District Council should submit this screening report for formal consultation to Natural England, DeFRA and the Environment Agency to determine whether Appropriate Assessment is required.

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Appendix A
Key environmental conditions required to sustain site integrity

Priority habitat types	Key conditions necessary
Blanket bogs	<p><u>Blanket bogs</u> are a peatland habitat confined to cool, wet climates. Peat forms where certain plants decompose very slowly under waterlogged conditions. In ideal circumstances, the peat develops over large expanses of uplands, effectively 'blanketing' them. The wet, nutrient-poor growth conditions provided by peat means that the bogs and their associated pools support unique communities of specialised plants and animals. Many of these habitats have traditionally been managed for livestock and/or for grouse shooting. Where this management has been intensive, damage may have occurred through overgrazing, burning and drainage. However, the nutrient-poor and waterlogged conditions of blanket bogs that are not degraded and are in 'favourable' condition often means that very little management is actually needed and such sites should require little intervention.</p> <p>On some sites light grazing may be beneficial. This can be used to control the development of invasive vegetation on the blanket bog, especially on those sites that may have suffered from drainage and previous intensive management. Heavy grazing must be avoided, as it may lead to an increase in the cover of grazing tolerant plants, such as purple moor-grass, and a consequent reduction in the extent of important moss and lichen species, and can also cause damage through trampling.</p> <p>Burning blanket bog can also reduce its conservation value by reducing the diversity of plant and animal species present on the bog, and should not be introduced on high quality blanket bog. On peat, burning can gradually lead to an increase in the cover of heather to the exclusion of other plant species. Certainly, sensitive areas, such as those that contain pools should not be burnt, as it can be very damaging to the invertebrate and amphibian populations that they support. Burning can also damage the peat soils themselves and can prevent the formation of new peat. This can result in peat erosion and the loss of peat by wind or water.</p> <p>No new drainage should be introduced to blanket</p>

	<p>bogs and deepening of any existing drains or grips should be avoided. It is likely to be necessary to block existing drains to prevent further drying out of the bog and damage to peat soils.</p>
<p>Active raised bogs</p>	<p>Raised bogs form where plants decompose very slowly under waterlogged conditions. The wet, nutrient-poor growth conditions provided by the resulting peat means they support unique communities of specialised plants and animals. They are also an important habitat for wading birds. The aim of management is to re-start the peat-forming process, ideally without going through the fen phases that in most cases preceded acid peat formation in the first instance. Management must restore a high and stable water table in the peat, not falling more than about 10 cm below the surface over the course of the year.</p> <p>Groundwater sometimes breaks out on the surface, either as gentle seepages, which give rise to flushes, or through greater flows that are evident as springs. Mosses, liverworts, sedges and rushes are common and often predominate, whilst several species of orchid are also associated with these communities.</p> <p>The quantity and quality of the groundwater must be maintained, though the quantity is not likely to be naturally constant throughout the seasons or between wet and dry years. Groundwater is often susceptible to contamination by agricultural fertilisers, or by pollution leaking from landfill sites. Drainage schemes should not intercept the source of groundwater to springs or flushes, or reduce the area of surface they irrigate.</p> <p>The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas. Low intensity sheep grazing can be helpful but the addition of unwanted plant nutrients should be avoided. Access to these sites, and any recreational activities within them, also needs to be managed.</p>
<p>Petrifying springs</p>	<p>Tufa formation is associated with hard-water springs, where groundwater rich in calcium bicarbonate comes to the surface. On contact with the air, carbon dioxide is lost from the water and a hard deposit of calcium carbonate (tufa) is formed. These conditions occur most often in areas underlain by limestone or other calcareous rocks,</p>

		and particularly in the uplands of northern England.
Mountain meadows	hay	<p>Many examples of traditionally managed meadows form part of the 'in-bye' land of the North Pennine hill farms, where they are cut for hay between early July and August, once the food value of the crop has peaked and the flowers have set seed.</p> <p>Mountain hay meadows appear to have declined in extent due to agricultural intensification and are at risk from modern farming practices and neglect. They are maintained by a regime of carefully timed hay-making, aftermath grazing and avoidance of artificial fertilisers.</p>
Water bodies		<p>Conservation value of water bodies is largely determined by structural diversity and water quality. Increases in the amount of nutrients within the water body can lead to a loss of aquatic plants in favour of excessive growths of algae.</p> <p>Lakes and their surroundings are often also a popular environment for recreational activities which should be managed sympathetically to avoid conflict with the management of the lake for nature conservation.</p>
Limestone pavements		<p>Limestone pavements are outcrops of rock, typically horizontal or gently inclined, although a few are steeply inclined. The surface has been dissolved by water over millions of years into 'paving blocks', known as clints, with a complex reticulate pattern of crevices, known as grikes, between them.</p> <p>The vegetation of limestone pavements is unusual because of the combinations of floristic elements, including woodland and woodland edge species, such as hart's-tongue <i>Phyllitis scolopendrium</i> and dog's mercury <i>Mercurialis perennis</i>. On the clint surfaces or the upper walls of the grikes there are plants of rocky habitats, such as wall-rue <i>Asplenium ruta-muraria</i> and maidenhair spleenwort <i>Asplenium trichomanes</i>. The grikes provide a shady, humid environment favouring woodland plants. One rare species, the rigid buckler-fern <i>Dryopteris submontana</i>, has its main centre of population in limestone pavement and, in common with two other rare species, dark-red helleborine <i>Epipactis atrorubens</i> and angular Solomon's-seal <i>Polygonatum odoratum</i>, flourishes in the low- to mid-altitude pavements.</p> <p>Grazing pressure is a key factor in determining ecological variation in limestone pavements. Where</p>

	<p>grazing is light, woodland may cover the pavement and woodland vegetation may mask the limestone surface. Here only the massive areas of pavement may be exposed as clearings. Where there is heavy grazing pressure, vegetation may be found only in the grikes, but, where grazing is lighter, dwarf trees, herbs and ferns may protrude from the grikes. Grikes that are about 60 cm deep provide shelter without unduly limiting light and are usually the best floristically.</p> <p>Limestone pavements have taken a long time to develop and, if damaged, they will never re-form. The plant and animal species associated with limestone pavement require the habitat to remain intact and undisturbed. The vegetation is largely a reflection of past management and differences in the geological structure of the underlying rock. The characteristic plant communities of open pavements are often sparse and are largely the result of a long history of grazing.</p> <p>Management should aim to maintain open conditions on the limestone pavement and the associated plant communities, but should ensure grazing levels are light enough for plants to flower, set seed and spill out onto the clint tops. Some areas can be left ungrazed to increase the diversity of the limestone pavement resource as a whole. High rabbit populations may impact on the vegetation and control may be necessary.</p>
<p>Dry limestone grassland</p>	<p>Management plays an important role in the survival of limestone grassland habitats and is important for maintaining the characteristic species-rich sward and its associated insects and other invertebrates associated with these grasslands. Heavy grazing should be avoided as it is more likely to result in a uniformly short and less diverse sward, which is likely to be of lower nature conservation importance. Without management it rapidly becomes dominated by stands of rank grasses, such as Tor-grass. These grasses, together with the build up of dead plant matter, suppress less vigorous species and lower the diversity of the site. Eventually, the site will scrub over.</p> <p>Traditionally, management is achieved by grazing which should generally aim to keep a relatively open sward without causing excessive poaching. Light trampling can be beneficial by breaking down leaf litter and providing bare patches for seed germination and some invertebrates. An element of</p>

	<p>managed scrub, both within and fringing calcareous grassland can be of great importance to certain birds and invertebrates, but excessive scrub should be controlled.</p>
<p>Upland acid grasslands</p>	<p>Upland acid grasslands develop on nutrient-poor, acidic soils and are a natural component of the uplands, although acid grasslands are also sometimes the result of heavy grazing on dwarf shrub communities. When found in a mosaic with other habitats, such as dwarf shrub heath and mire communities, acid grasslands can be an important addition to the diversity, structure and function of the upland landscape.</p> <p>Where the objective of management is to retain acid grassland as part of the upland mosaic active management is required. If neglected, the build up of dead plant material may suppress less vigorous species and reduce the botanical richness of the site. Traditionally, acid grasslands are managed by grazing at appropriate stocking rates and can support stock throughout the year. However, the precise timing and intensity of grazing will depend on local conditions and requirements, such as the need to avoid trampling ground-nesting birds.</p>
<p>Dry upland heath</p>	<p>Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors.</p> <p>Dry upland heath develops in nutrient-poor, acidic conditions and is dominated by dwarf shrubs, especially heather. Upland heaths can support a rich variety of plants and animals, including many rare and scarce species of plants, birds and invertebrates.</p> <p>Dry upland heaths have a long history of active management. Grazing is a very important form of management but must be carefully managed. The numbers and types of grazing animals present as well as the duration and time of year of grazing are all important in determining the value of the vegetation to wildlife. Too little grazing could, in the long term lead to excessive domination of trees and shrubs. Too much grazing (especially in the autumn and winter whilst plants are not actively growing) leads to loss of dwarf shrubs and domination by grasses and rushes. Increasing altitude and wetness reduces the ability of moorland vegetation to cope</p>

	<p>with grazing pressure. Cutting is a possible alternative to grazing on dry heath. If cutting is used, care must be taken to remove the resultant litter, or germination of seedlings will be inhibited. Care must be taken when using the machinery required for cutting as this can be damaging to fragile peat soils, in particular those of wet heaths and the use of machinery should be avoided where possible on wetter areas. The areas of heathland at Ingleborough should not be burnt due to their small size.</p>
<p>Juniper scrub</p>	<p>Juniper scrub has become increasingly scarce in England through a history of felling and heavy grazing. Juniper can reach a considerable height when mature, when it develops more of a woodland character. As it is a rare habitat in England, management should aim to maintain or increase its extent where it occurs. However, stock levels and rabbit numbers may need to be carefully managed. If grazing pressure is too high the structure of the scrub vegetation may become impoverished, and in time much of the juniper scrub woodland will become even aged. The juniper may not be able to regenerate itself naturally, leading to a loss of cover over time. As natural regeneration of juniper can be notably difficult, it may be necessary to actively plant juniper of local provenance to allow regeneration to occur in and around juniper scrub areas. However, the promotion of natural regeneration is preferable. This is normally attained through the control of stock by fencing. It may also be necessary to disturb or break up the vegetation mat and create regeneration niches, for example on bare patches of soil, where young plants can become established. This can be achieved through a number of ways such as cattle grazing, burning management, or mechanical scarification of the ground. Care must be taken as heavy grazing can wipe out young seedlings as well as cause damage to more mature plants, whilst burning around existing bushes to open up the ground can result in fire damage.</p>
<p>Calcareous rocky slopes</p>	<p>Steep-sided gills support a rich association of plant species from a variety of habitats including woodlands, heathlands, flushes, screes and ledges. It is the rocky habitats found within gills (including ledge, scree and outcrop) that are often key to their</p>

	<p>richness and diversity. The thin soils and physical structure of rocky habitats can support rare plant and animal communities not found elsewhere. The shade provided by tree cover and in deep ravines is important for mosses, ferns and other plants which thrive in shade and cool environments. In gills this is often coupled with high humidity from streams or waterfalls allowing luxuriant mossy vegetation cover to develop. A number of birds of conservation importance, such as peregrine falcon, also use rock ledges as safe nesting sites.</p> <p>The key management principle for gills and associated rocky habitats is the control of grazing stock. Low levels of grazing can be beneficial in certain circumstances - light grazing can prevent invasive scrub from shading out the less vigorous plants. Species that are associated with gills, scree and crags may require protection from damage and disturbance caused by walkers and rock climbers. Scree and rock can be highly unstable and the fragile plant communities that develop in these habitats are easily damaged by frequent trampling. Wherever possible, new footpaths should be routed around scree rather than through it. The routes used by climbers and scramblers and the time of year they use them may require careful management where sensitive vegetation and/or cliff-nesting birds are known to be present. Disturbing and removing stone from gills can also be very damaging to the species they support and should be avoided.</p>
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