Rocky outcrops and scars near Winskill Stones above Ribblesdale

LCA 11 Great Scar Limestone Uplands

Yorkshire Dales National Park - Landscape Character Assessment

YORKSHIRE DALES
National Park Authority

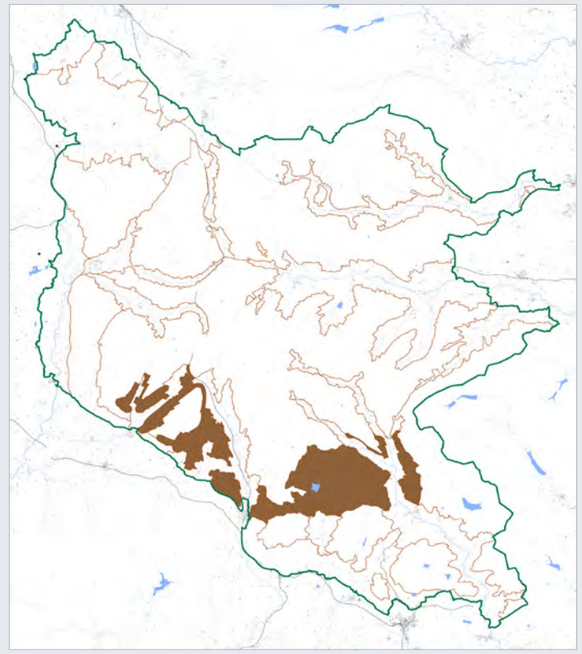
LCA 11 Great Scar Limestone Uplands

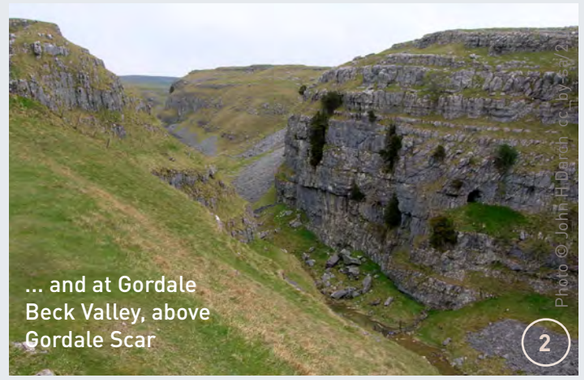
Key characteristics

- A series of areas following the exposed Great Scar Limestone across the southern part of the National Park, separated by the southern dales, containing areas of international and national biological/geological value.
- Exposed limestone features including cliffs, screes, gorges, pavements and scattered boulders dominate the landscape, creating a rugged, worn character. These combine with shallow soil cover, shakeholes, potholes and caves to form classic karst landscape.
- Panoramic views across the southern dales and southern dales fringes. In the western part of the area views are dominated by the Three Peaks landforms of Ingleborough, Whernside and Pen-y-ghent.
- Closely grazed, springy, flower-rich grasslands form a neat, bright green carpet between exposed rock features.
- Scattered trees or open, grazed woodland on scree slopes and cliffs, with occasional windblown trees or shrubs in cliffs and pavements at higher levels. Several large, semi-natural, undergrazed woodlands occur on the dale sides and a few, small, isolated plantations at higher elevations.
- A general absence of streams and surface water features, with the exception of occasional small tarns and limited numbers of springs at the base of the limestone moors, mainly around Ingleborough. Malham Tarn is atypical.
- Settlement is very limited, comprising mainly upland farmsteads in the Malham/Arncliffe area. Road network is also very limited
- Quarries eat into the sides of the limestone moors but are often hidden from view.
- Extensive network of historic routes and modern footpaths/tourist routes; former drove roads form wide, walled green lanes.
- Drystone walls are frequent, forming medium size enclosures on the dales fringes giving way to larger enclosures or limited open areas. Wall pattern is strongly rectilinear, passing straight over and taking little or no account of natural features.

Numbered photographs illustrate specific key natural, cultural and perceptual features in the Great Scar Limestone Uplands LCA (see page 7)





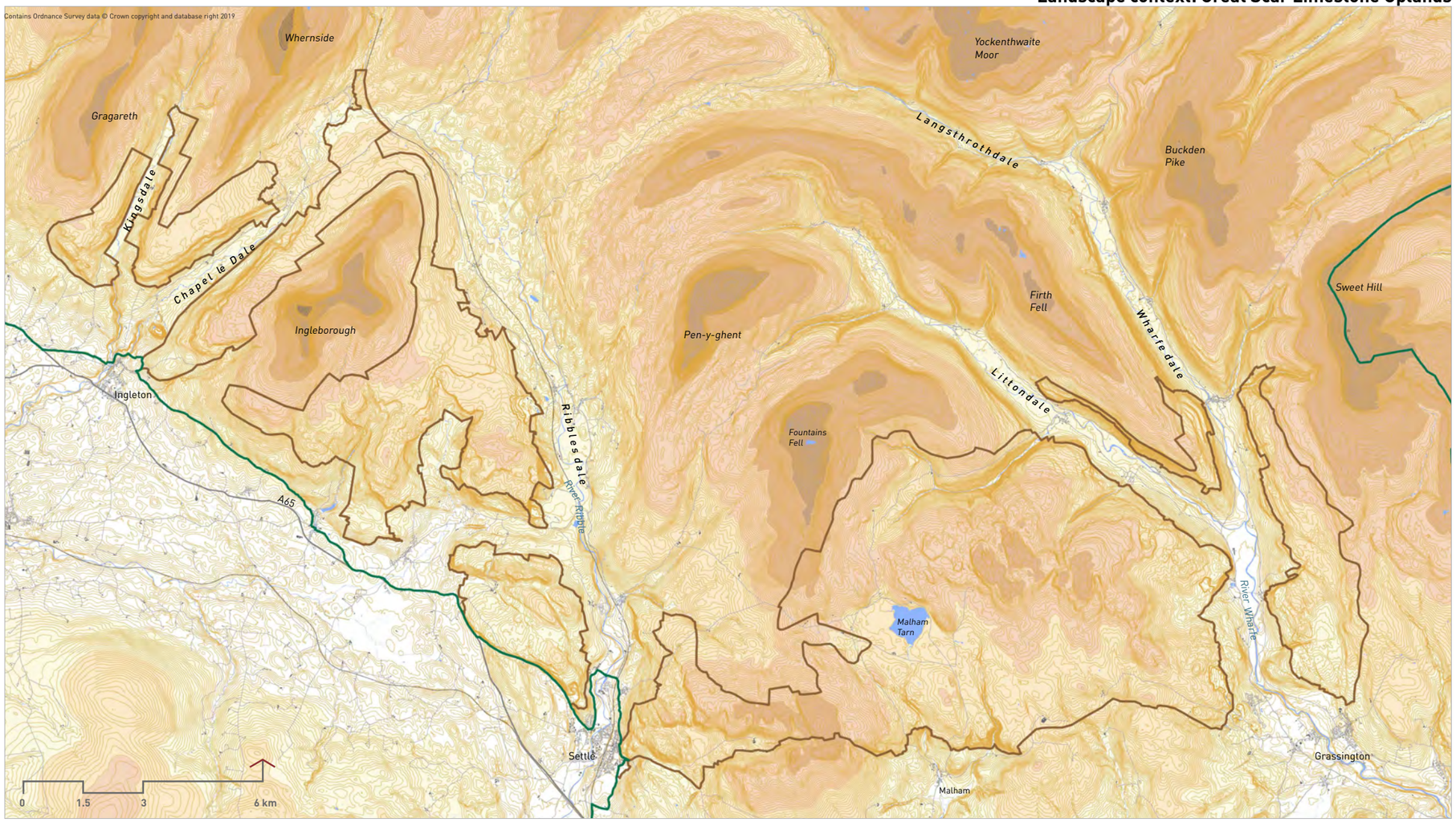








Landscape context: Great Scar Limestone Uplands



YDNP Boundary
Great Scar Limestone Uplands LCA

Above 500 m
400 - 500 m
300 - 400 m

200 - 300 m
Below 200 m
Open water

Landscape context

The Great Scar Limestone comprises a number of layers of limestone beds of varying thickness and hardness and up to 200m in overall depth. The oldest layer of the Great Scar Limestone is the dark grey Kilnsey Limestone, seen outcropping most extensively within Wharfedale and Ribblesdale. Overlying the Kilnsey Limestone is the Horton Limestone, a light grey limestone with poorly developed bedding, which forms scree-covered slopes with sporadic scars in Wharfedale and Ribblesdale. Of a similar age is the Cove Limestone, which forms the spectacular cliff at Malham Cove, the lower half of Gordale Scar and the brow of Kilnsey Crag.

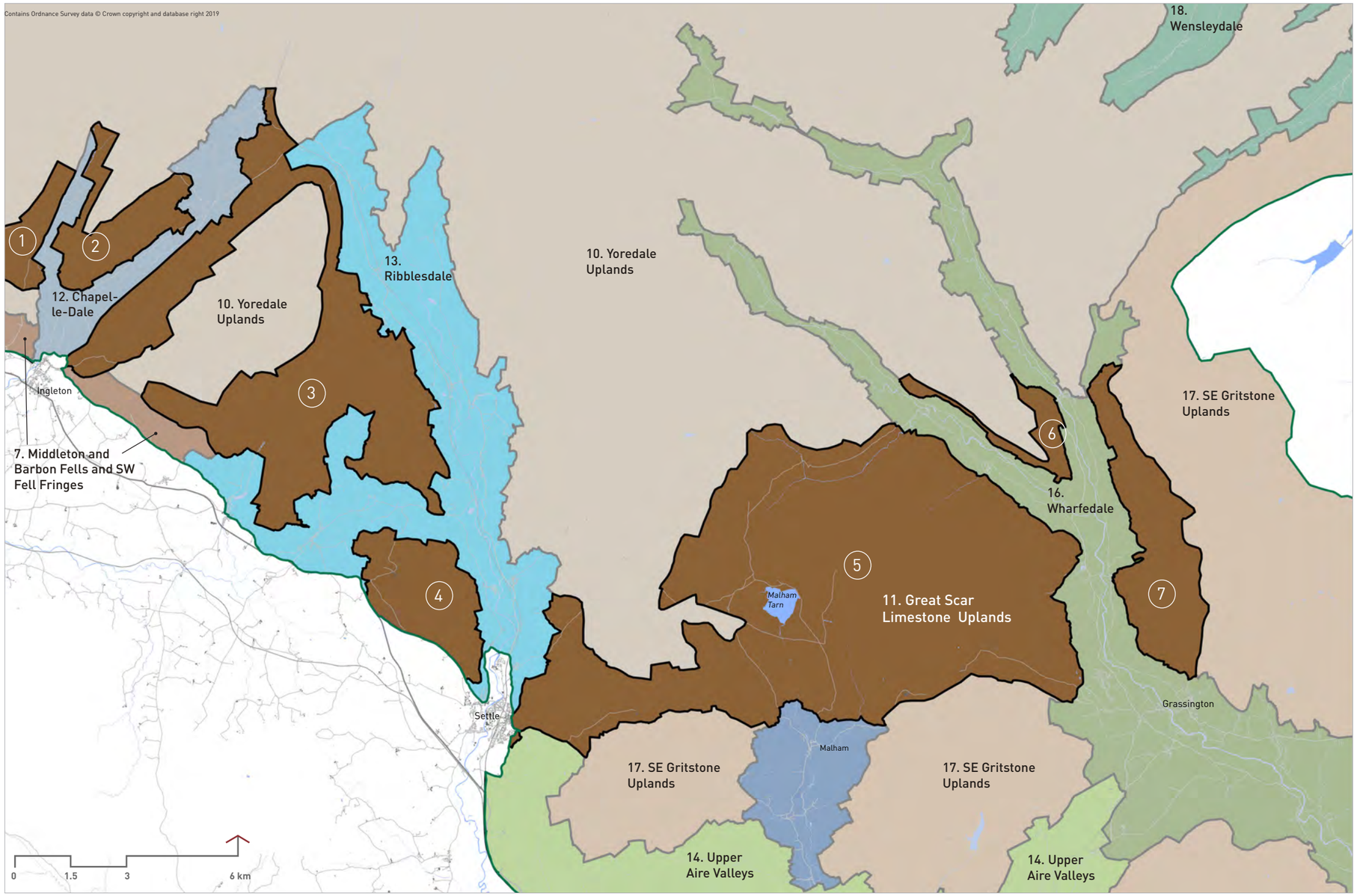
Overlying these limestones is the Kingsdale Limestone, light grey in colour and about 120 metres thick. Typically, it has weathered to form a series of steps in Wharfedale, Littondale and Kingsdale, overlooking scree slopes. In the Malham area, Gordale Limestone takes the place of Kingsdale Limestone, forming the stepped upper cliffs at Gordale Scar.

The Middle Craven Fault marks the southern limit of the Great Scar Limestone in the National Park. Easy erosion of soft shales to the south of the fault has left a sharp southern edge to the limestone plateau, identified by a band of impressive scarp slopes and limestone cliffs including Giggleswick Scar, Attermire Scar, Malham Cove and Gordale Scar.

The North Craven Fault has created a small band of gritstones, sandstones and slates within the wider mass of the Great Scar Limestone. This is most evident in a bed of impervious slate sealing the base of Malham Tarn.

Meltwater, from the retreating glaciers of the last Ice Age, carved out the dramatic landmarks of Gordale Scar and Malham Cove. Glacial ice scraped away the soil cover from higher ground exposing the limestone bedrock. Weathering and the dissolution of limestone in water caused exposed joints (grikes) to widen, creating intervening blocks (clints), forming the distinctive, internationally important limestone pavements of today. Smaller-scale Ice Age features include erratic boulders as seen at Scales Moor and the impressive erratics of Norber (north of Austwick).

Landscape character: Yoredale Uplands



Landscape character

Within the Great Scar Limestone LCA, the primary outcrops of limestone occur in a chain west-east across the south of the National Park, following the line of the Craven Faults at (in west to east order):

1. Keld Head and adjoining scars west of Kingsdale;
2. Scars and pavements at Twisleton Scars and Scales Moor between Kingsdale and Chapel le Dale;
3. Extensive scars and pavements around the base of Ingleborough between Chapel le Dale and Crummackdale/Ribblesdale including White Scars, Moughton Scars and Thwaite Scars;
4. Giggleswick Scar and pavements between Crummackdale and Ribblesdale;
5. The Malham/Arncliffe area, extending in a broadly triangular shape between Ribblesdale, Littondale and Wharfedale including Attermire Scar, Malham Cove, Gordale Scar, Malham Moor, Kilnsey Moor, Hawkswick Clowder, Yew Cogar Scar, Kilnsey Crag and Malham Tarn. The character area encompasses an island of deeper drift cover and acidic soils over limestone at Mastiles Moor;
6. A small area on the southern edges of Hawkswick Moor at the junction of Wharfedale and Littondale, including Gate Cote Scar and Knipe Scar;
7. The western edge of Conistone Moor/Grassington Moor above Wharfedale between Grassington in the south and Kettlewell in the north.


Underground drainage, with potholes, sinkholes and extensive cave systems

Gaping Gill

Distinctive landscape character

The Great Scar Limestone has developed its own distinctive scenery – the karst landscape, a mixture of towering cliffs, bare rock, scree slopes, deep gorges, limestone pavements, potholes, sinkholes and cave systems. Weathering of the Great Scar Limestone allows a surface patina to develop on the exposed cliffs and crags, giving them their characteristic white colour. The variety of this landscape stems from a combination of weaker shale bedding planes, dense systems of vertical joints and the ability of limestone to dissolve in water yet retain mechanical strength. The porosity of the fissured rock prevents the development of surface streams, with water draining to underground cave systems via shakeholes (depressions formed as overlying soils are washed down into fissures in the underlying bedrock) or sinkholes (larger vertical shafts which form direct natural entrances to cave systems), which are spread across the limestone moors.

Exposed rock is the principal characteristic of the limestone moors, with extensive limestone cliffs ('scars'), screes, pavements and scattered boulders. Outcrops are often banded, exhibiting the differential strengths of the various layers of limestone from which the Great Scar Limestone is composed eg at Keld Head, Twisleton Scars and at Yew Cogar Scar near Arncliffe. Further variation is seen in the shape and form of limestone cliffs: steep, sheer sided cliffs are found at Great Close Scar east of Malham Tarn; tumbling, knobbly cliffs occur at Twisleton Scars and Attermire Scar; and classic 'buttresses' and extensive screes at Great Hill Scar on the eastern edge of Fountains Fell. Deeper, atypical drift deposits create an open landscape, with little exposed rock, in the centre of the Malham/Arncliffe area around Malham Tarn and Mastiles Moor.

Major limestone features including Kilnsey Crag and Malham Cove sit on the boundary of the limestone moors whilst Gordale Scar with its spectacular cliffs is contained within the Malham/Arncliffe area.

Limestone pavements are most extensive in the western parts of the LCA at Keld Head, Twisleton and around the base of Ingleborough. At Giggleswick, Malham/Arncliffe and Conistone large pockets of pavements are broken by limestone grassland or acidic grassland in areas of glacial drift. Pavements typically form level, often stepped, plateaux above the dale sides and extending back from cliff tops. At Norber (north of Austwick), sandstone erratics, carried by glaciers during the last Ice







Numbered photographs illustrate specific key natural, cultural and perceptual features in the Great Scar Limestone Uplands LCA (see page 7)



Age, have been deposited on the limestone pavements, producing dramatic sculptural effects.

Caves are sometimes visible as dark spots in the limestone cliffs. At Ingleborough, White Scar Cave and Ingleborough Cave are popular tourist destinations and near Attermire Scar, Horseshoe, Victoria, Albert and Jubilee Caves are considered to be of archaeological value for the prehistoric remains they contain.

The limestone moors are characterised by a general absence of watercourses, resulting from the porosity of shallow soil layers over the fissured limestone bedrock. The route of surface water into the bedrock is marked by numerous shake holes and potholes. Shakeholes produce a 'dimpled' landform when sufficiently close together whilst potholes form larger, open shafts leading directly down into the bedrock (eg Gaping Gill, Alum Pot).

Occasional springs and small tarns are found within some of the elevated limestone areas around Ingleborough, Malham and Conistone. More extensive springs are present around the base of the Ingleborough limestone moors and at higher elevations on the eastern side of Ingleborough at Selside. Malham Tarn forms an exception to the above, comprising a large water body in the landform bowl in the centre of the Malham/Arncliffe area. Pockets of deeper, impermeable drift geology to the west and east (at Mastiles Moor) of Malham Tarn are an anomaly within the limestone moors character area, creating small moorland streams which are more typical of the Yoredales geology found to the north. Becks running off Mastiles Moor feed Gordale Beck, a shallow, fast flowing rocky watercourse which runs through Gordale Scar.

Landcover is primarily herb-rich calcareous grassland, supported by thin, well drained soils and maintained by livestock farming (sheep and cattle) with additional grazing by rabbits. The closely grazed character and brighter colours of the calcareous grasslands contrast with the darker, often brownish colours of the acidic and neutral grasslands. Although atypical of the limestone moors character area, a concentration of flower rich hay meadows occurs at lower elevations on calcareous soils around Bordley, on the southern edge of the Malham/Arncliffe area.

Woodlands are generally limited to occasional large blocks adjacent to the dale fringes (eg Wharfe Wood, Oxenber Wood, and Feizor Wood at Giggleswick and Bastow Wood at Conistone) or linear strips which follow the shelter of gills (eg along Clapdale Drive near Ingleborough Cave). A few mixed plantations are found at higher elevations, such as Rayside Plantation at Ingleborough. In the central bowl of the Malham/Arncliffe area woodland cover is more extensive where a chain of mixed woodlands has been established around Malham Tarn.

Ash, hawthorn, rowan and sycamore occur as scattered individuals on grassland and limestone pavements and are more commonly found together on steep slopes and cliffs, sometimes with yew (as at Yew Cogar Scar near Arncliffe). On the pavements and more exposed cliffsides trees and shrubs are often windblown, producing dramatic leaning shapes.

Evidence of earlier human activity in the area is seen in the form of enclosure, settlement and field system remains at higher elevations, for example on Conistone Moor. Bellpits, shafts, adits and tips remaining from the lead mining industry are mainly scattered across the eastern parts of the character area at Malham/Arncliffe and Conistone.

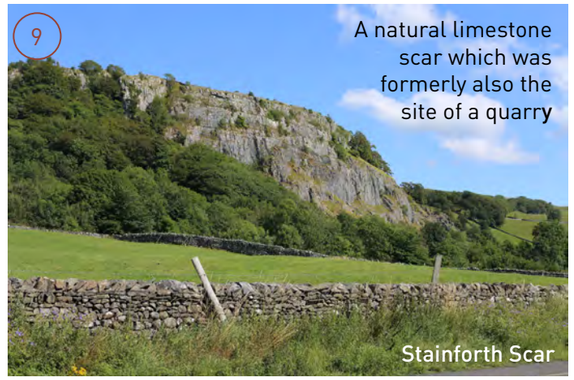
Settlement and roads are limited to the Malham/Arncliffe area where there are a few scattered upland farms and a network of minor lanes. Roads near Malham are enclosed by tall drystone walls but often have wide verges (a remnant of drove roads) and small roadside quarries (excavated for walling stone).

Large quarries are located on the edges of the Ingleborough (Arcow, Foredale and Beecroft Quarries), Giggleswick (Giggleswick Quarry), and Malham/Arncliffe (Threshfield and Kilnsey Quarries) areas.

There are panoramic views from these uplands across the southern dales and dales fringes. The internal bowl of the Malham/Arncliffe area, centred on Malham Tarn is visually self contained, with an almost sheltered quality compared to other, more exposed upland areas. In the western part of the LCA, the limestone moors are closely juxtaposed with the summits of Pen-y-ghent, Ingleborough and Whernside (in LCA 10), which dominate local views.

Limestone drystone walls enclose the majority of the limestone moors, with rectilinear enclosure patterns taking little or no account of natural features, often passing directly over pavements, scars and outcrops. Gate posts are typically made of gritstone. Field pattern varies considerably but typically comprises medium size enclosures on the edges of dales giving way to larger enclosures and some open areas on the pavements above. Sheep creeps and folds occur throughout the area.

Numbered photographs illustrate specific key natural, cultural and perceptual features in the Great Scar Limestone Uplands LCA (see page 7)

















Key natural, cultural and perceptual features

NATURAL

Dramatic exposed limestone rock, which breaks out from the surrounding turf as boulders, scars, screes and vertical cliffs, defining the fringes of the Great Scar Limestone. There are spectacular examples throughout the area, including Attermire Scar near Settle, Yew Cougar Scar near Arncliffe and Gate Cote Scar near Kettlewell. The area is of international importance for its geological and botanical interest (Malham-Arncliffe SAC and Ingleborough Complex SAC). (1) (2) (3) (4) (10) (13)

Extensive limestone pavement, with blocky, weathered clints and shade-loving plants within the deep grykes. The best examples are at Keld Held and Twistleton Scars near Kingsdale and Chapel-le-Dale, on the slopes of Ingleborough, above Malham Cove and at Conistone near Wharfedale. (15)

Distinctive and awe-inspiring karst features at Malham Cove, Goredale Scar and Kilnsey Crag, which reveal the power of erosion. (1) (7) (8)

Underground drainage, with **potholes, sinkholes, extensive cave systems and dry valleys.** Dramatic examples are Gaping Gill and Marble Pot on the slopes of Ingleborough. (5)

Light grey or whitish colour of the limestone contrasts with the surrounding darker upland areas. (6)

Ancient semi-natural ash-hazel woodland clinging to rocky scars and as narrow strips along sheltered gills. Some woods are used as wood pasture (eg Wharfe Wood, Oxenber Wood, and Feizor Wood at Giggleswick)

CULTURAL

Prehistoric archaeological ritual monuments eg. Bronze Age cairns) and important archaeological deposits (including Roman finds) within rock shelters and caves eg Kilnsey Cave, Giggleswick Scar and Jubilee and Victoria Caves near Langcliffe Scar. (14)

Extensive Iron Age/Romano-British field systems and settlement sites eg on Kilnsey Moor, and Malham Lings. Site of a Roman Marching Camp on Malham Lings. (3)

Medieval field systems - strip lynchets and earthworks eg on the eastern slopes of Kilnsey Moor, near Goredale Scar, near Oxenber Wood (Austwick) and on the western and southern slopes of Ingleborough.

Historic walled drove roads with wide verges. Mastiles Lane connected Fountains Abbey with its monastic estates in Kilnsey and Malham across Kilnsey Moor. (12)

Limestone quarries - numerous small disused quarries throughout the area, including at natural scars, such as Stainforth Scar, Ribblesdale and Cool Scar, Wharfedale, which made use of the natural rock cliff face; there are huge contemporary quarries on the fringes of the Great Scar Limestone at Horton in Ribblesdale and Skirwith Bridge near Ingleton. (9)

Former limestone field kilns on the upper slopes of dales, typically sited within easy reach of field enclosures and limestone quarries or pavements.

PERCEPTUAL

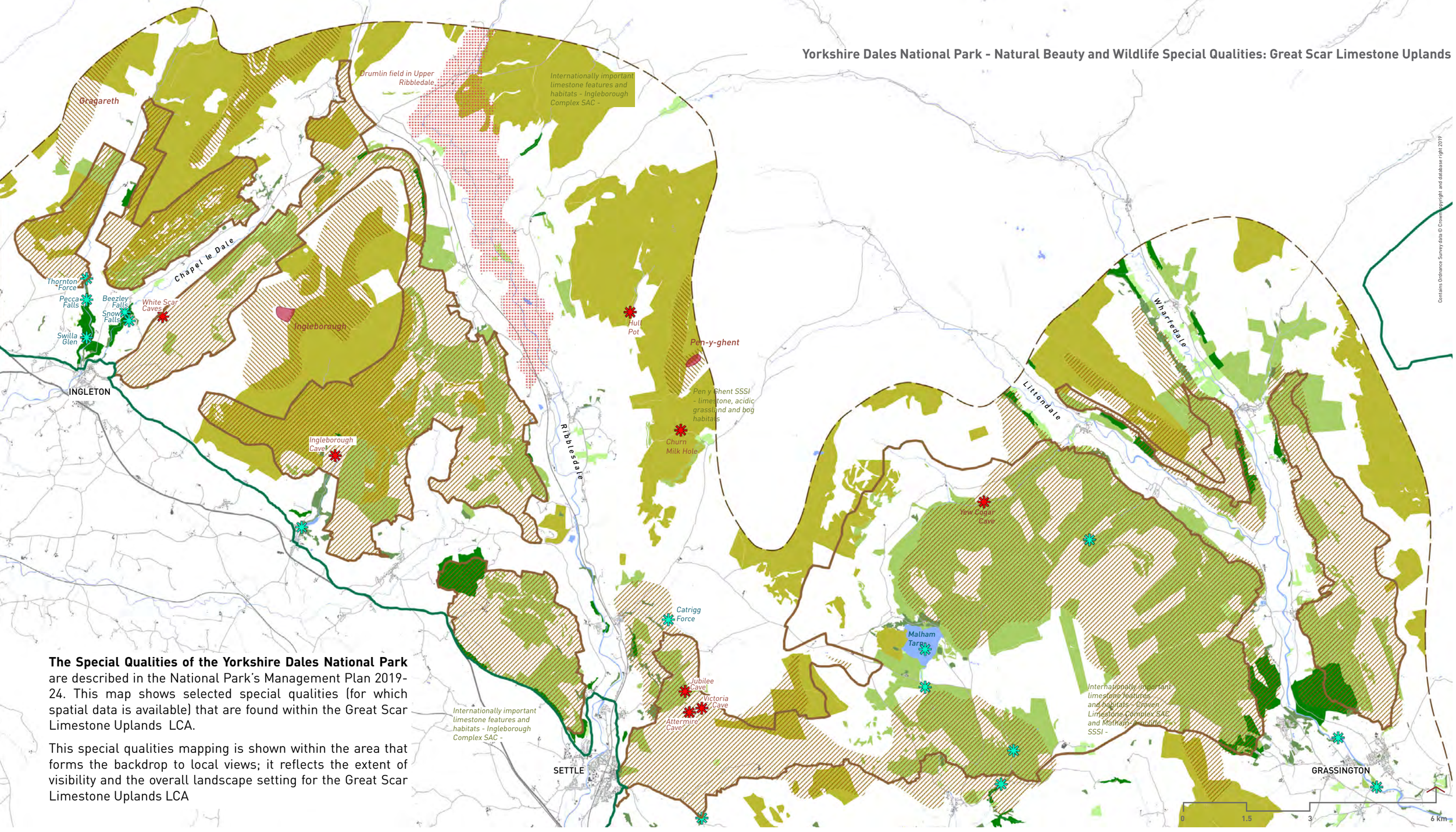
A strong sense of time-depth and connection with the past - the extent of exposed rock lends a rugged, worn character, weathered over the centuries. (16)

In close range views the fractured patterns of limestone pavements and the delicacy of calcareous wildflowers provide **a level of detail and interest** which sets the Great Scar Limestone uplands apart. (3) (15)

Stunning views from 'the edge' of the uplands. The scars and cliffs on the fringes of the Great Scar Limestone seem 'broken off' and there is a real sense of the power of geological forces along the Craven Faults. (11)

Photos that illustrate specific key natural, cultural and perceptual features are numbered eg. (10)

Yorkshire Dales National Park - Natural Beauty and Wildlife Special Qualities: Great Scar Limestone Uplands



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The Special Qualities of the Yorkshire Dales National Park are described in the National Park's Management Plan 2019-24. This map shows selected special qualities (for which spatial data is available) that are found within the Great Scar Limestone Uplands LCA.

This special qualities mapping is shown within the area that forms the backdrop to local views; it reflects the extent of visibility and the overall landscape setting for the Great Scar Limestone Uplands LCA

Special Qualities of the YDNP

- YDNP Boundary
- Great Scar Limestone Uplands LCA boundary
- Extent of area that forms the backdrop to views from the Great Scar Limestone Uplands LCA

Natural beauty

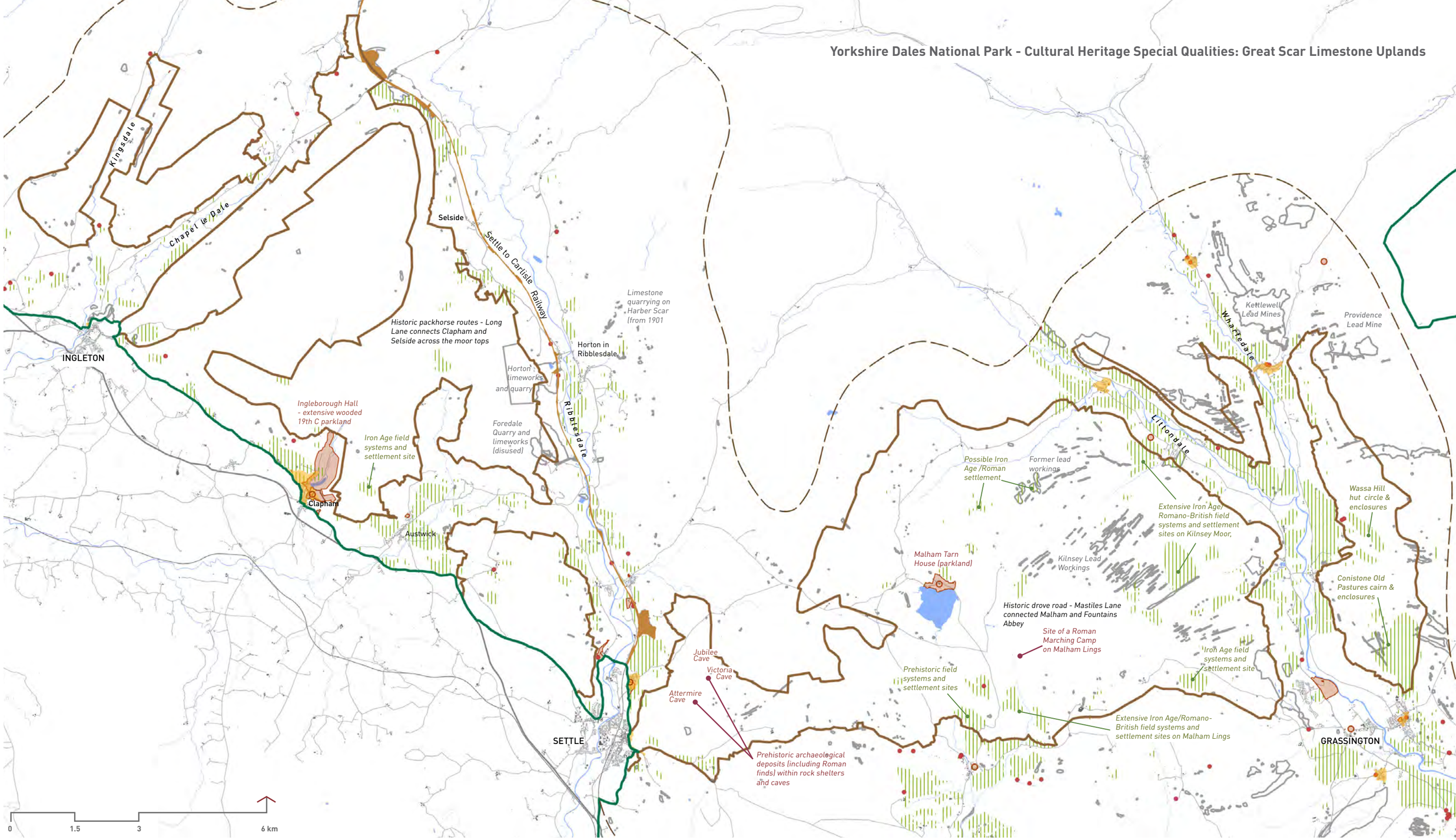
- **Dales with distinctive stepped profiles**
  [Displaying outcrops of rocks from the Yoredale series]
- **Fells that rise to over 700m**
  [eg the Millstone Grit capped 'Three Peaks']
- **Outstanding classic limestone scenery**
  [Underlain by Great Scar Limestone & displaying distinctive karst character]
- **Extraordinary cave systems**
  ['Caves' noted as 'recognised attraction' in YDNPA Visitor Strategy]
- **Significant glacial/post-glacial features**
  [Prominent drumlins and glacial drift landforms]
- **Spectacular waterfalls**
  ['Water features' noted as 'recognised attraction' in YDNPA Visitor Strategy]

Wildlife*

*Priority Habitats [S41 NERC Act 2010]

- **Flower-rich hay meadows and pastures**
  [Lowland meadows; Upland hay meadows]
- **A range of rare limestone habitats**
  [Limestone pavements; Lowland calcareous grassland; Upland calcareous grassland]
- **Extensive areas of moorland**
  [Upland heathland; Blanket bog; Lowland raised bog]
- **Small areas of broadleaf woodland**
  [Deciduous woodland; ancient woodland (darker tone)]

Yorkshire Dales National Park - Cultural Heritage Special Qualities: Great Scar Limestone Uplands



Special Qualities of the YDNP

- YDNP Boundary
- Great Scar Limestone Uplands LCA boundary
- Extent of area that forms the backdrop to views from the Great Scar Limestone Uplands LCA

Cultural heritage*

- **A traditional pastoral landscape**
  [Traditional stone-built field barns]
- **An exceptional range of archaeology**
  [Strip lynchets & prehistoric field systems that are prominent]
- **Powerful reminders of periods of dominance by large estates and religious houses**
  [Ancient & historic parklands & other ornamental landscapes]
- **The remains of former rural industries**
  [Sites of former lead & coal mines & lime kilns]
- **Settle-Carlisle Railway Line**
  [Conservation Area]
- **Historic settlements with distinctive traditional architecture**
  [Conservation Areas - Note: the Swaledale and Arkengarthdale Barns and Walls Conservation Area is not shown]

* YDNPA Historic Environment Record

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