

Upland Calcareous and Calaminarian (Metaliferous) Grasslands



Duck Hill Quarry, AONB

Our objective for this habitat is: to conserve and enhance these habitats in the Harrogate district.

Carboniferous limestone occurs in the district as the most easterly outlier of the great scar limestone of the Yorkshire Dales, which is better known in places such as Malham. In the Greenhow area it occurs as an outcrop in the two peaks of Coldstones Hill and Greenhow Hill. At How Stean Gorge and Goyden Pot, underlying limestone is exposed by watercourses (How Stean Beck and the River Nidd) cutting through the overlying rocks.

The geology of the area is complex and calcareous (limestone) bedrocks occur in immediate proximity to acid gritstones. Within the district, much of the limestone occurs as an intimate mosaic with grasslands on former lead mine wastes so these two are considered under the same Habitat Action Plan.

Lead mine waste has been created by past industrial activity followed by natural colonisation, creating a notable landscape of industrial archaeology, of which the distinctive flora is an integral part. Spoil heaps support a number of highly specialised species of rare flowering plant, mosses and lichens that are tolerant of inhospitable soils and they are an EU priority habitat. Lead mine waste contains high concentrations of heavy metals. It is actually zinc in the spoil, rather than the lead which was economically important, which gives a unique character to the vegetation. The principle plant community is described by the National Vegetation Classification (NVC) as the OV37 sheep's fescue - spring sandwort (*Festuca ovina* - *Minuartia verna*) community. It occurs in intimate association with both acidic and calcareous parent rock, both of which occur in the Greenhow area, but is especially rich in association with the latter.

Sites support a range of soil conditions, from calcareous to neutral to acid. Some disused mines were re-worked for fluorspar and barytes in the mid-20th century, creating a mix of older and more recently disturbed spoil heaps. The full range of hydrological conditions is also found, from open water to marshy and to well-drained ground. This diversity of micro-habitats supports a wide-ranging biodiversity. Calaminarian grasslands are composed of metallophyte species or ecotypes of vascular plants, such as spring sandwort, mountain pansy, alpine pennycress, Pyrenean scurvey grass together with stress-tolerant lichens and bryophytes. The rough terrain has ensured that a relatively high proportion of this grassland is little improved.

National status

There are about 10,000 ha of upland Calcareous grassland in England with some 25,000 ha in the UK. No data has been collated on the extent of lead mine spoil but they are rare at a European scale and the UK is considered to have international responsibility for conservation of calaminarian grasslands.

Regional status

North Yorkshire, the North Pennines and Cumberland contain the majority of upland calcareous grassland in England. The Craven Limestone Wildlife Enhancement Scheme in the Yorkshire Dales National Park includes 3,400 ha of upland calcareous grassland. Calaminarian grassland occurs in the region but has a scattered distribution in the Yorkshire Dales Natural Area and is never widespread. Lead mining waste is notable around Grassington Moor and in Upper Swaledale in the Yorkshire Dales National Park and in the Greenhow/Bewerley part of the Nidderdale AONB.

Local status

Greenhow (Duck Hill) Quarry and Upper Nidderdale are both geological SSSIs, designated for their limestone geology. Duck Hill quarry probably represents the finest piece of upland calcareous grassland in the district but the extent of limestone grassland in Upper Nidderdale SSSI (which includes How Stean Gorge and Goyden Pot and a subterranean stretch of the River Nidd) is unknown.

Other sites with unimproved calcareous grassland include the Toft Gate limekilns, the burial ground and some of the road verges around Greenhow. Further fragments of upland calcareous grassland may also occur along road verges near Bishopdale and on ballast along the former Nidderdale Valley Light Railway. There may also be some fragmented outcrops near Brimham.

Spoil heaps are mentioned in the citation as part of West Nidderdale, Barden and Blubberhouses Moor SSSI. Greenhow Pastures SSSI is designated primarily for its neutral grassland but it also contains lead mine spoil heaps and Calcareous elements.

Sites of Importance for Nature Conservation (SINC) are currently being extended and rationalised around Greenhow but Coldstones Quarry, Cock Hill and Sunny Side Lead Mines, Prim Gap and Galloway Pastures are designated as SINC's which include lead mine spoil heaps. These are also found at other sites including Prim Gap and Galloway Pastures.

Local priority species:

- Spring sandwort - *Minuartia verna*
Occurs predominantly in the Pennines, rare elsewhere in Britain. Grows on carboniferous limestone and especially around mining spoil, where it occurs around Greenhow.
- Alpine pennycress - *Thalapsi alpestre*
Extremely localised largely restricted to metaliferous soils on which it occurs around Greenhow.
- Pyrenean scurvy grass - *Cochlearia* sp.
Restricted to upland limestone areas. Grows on mine spoil, roadverges and stream-sides around Greenhow.
- Mountain pansy - *Viola lutea*
Perhaps Greenhow's most characteristic wildflower, growing on mine spoil heaps and poor grassland around Greenhow.
- Moonwort - *Botrychium lunaria*
- Rigid buckler fern - *Dryopteris submontana*.
Occurs predominantly in the limestone uplands of NW Yorkshire and Cumbria. A small population occurs on lead mine spoil near Cock Hill in Greenhow.
- Mossy saxifrage - *Saxifraga* sp.
a northern montaine plant. In Yorkshire confined to the Pennines. Occurs in SINC's around Greenhow .
- Frog orchid - *Coeloglossum viride*
- Mosses and lichens - Rare and specialised mosses and lichens are known to occur on lead mine spoil in the Northern Pennines but little is known of this flora for the Greenhow area.

Requirements

- Identify sites.
- Survey sites (including biological value of geological SSSIs).
- Appropriate grazing regimes.

Threats

- Several of these small areas of grassland have been lost to improvement for aesthetic reasons (including inappropriate tree-planting).
- Restrictions on slaughter of sheep, because of contamination with heavy metals, may disincentivise sheep-grazing.
- Quarrying – may encroach onto calaminarian or upland calcareous grasslands. Over time spoil sites may lose their distinctive character through leaching and natural succession. Cessation of traditional mining has limited the renewal of the substrate.

Current local action

- Qualifying sites can be designated as SINC's and agreement sought for their favourable management.
- Greenhow Conservation Group is working to enhance nature conservation in and around the village.
- Some SINC sites are managed by grazing with Exmoor ponies.
- Modern quarrying operations have led to translocation of metaliferous spoil which may help to renew the resource.

Opportunities

- The Greenhow Quarry Landscape Enhancement Scheme operated by Hansons and the Nidderdale AONB provides grants for landscape and habitat enhancement and restoration in the Greenhow area.

Key reference

'Greenhow Ecology Report' Martin Hammond (available through Nidderdale AONB).

LINKS WITH OTHER HDBAP PLANS:

None.



- The UK HAP definitions: <http://jncc.defra.gov.uk/page-5706>
- Upland Calcareous Grassland HAP.
- UK BAP Review, 2007, identified 'Calaminarian Grassland' as a new priority habitat.