

CALAMINARIAN GRASSLANDS

Nationally



Calaminarian grasslands include a range of semi-natural and human-created sparsely-vegetated habitats on substrates which are characterised by high levels of heavy metals such as lead, chromium and copper, or other unusual minerals. These are associated with outcrops of serpentine and river gravels rich in heavy metals, as well as with artificial mine workings and spoil heaps. Open-structured plant communities typically occur, composed of ruderal/metallophyte species of lichens, bryophytes and vascular plants, such as spring sandwort (*Minuartia verna*), alpine pennycress (*Thlaspi arvense*), and genetically adapted races of species such as thrift (*Armeria maritime*) and bladder campion (*Silene maritime*).

Calaminarian grassland at Highcliffe Mine © Karen Shelley-Jones

**Extent in UK:
<330 ha**

In the Peak District

Centuries of mining the mineral veins in the White Peak have resulted in a distinctive network of hillocks and hollows, sometimes stretching in lines across the limestone plateau and dalesides. It is these surface remains, referred to here as lead rakes, which are covered by this action plan. These features, some dating back to Roman times, form part of the historic character of the landscape and provide a habitat for varied and unique plant communities. Lead rakes support a complex mosaic of different vegetation types, reflecting their great range in topography and the varied nature of the waste material. Sometimes the hillocks are made up of rock. More often it is a mix of fluor spar, calcite, barytes and soil, all materials which were of no use to the old miner and thus cast aside as waste. As a result of this variation many different species with contrasting environmental requirements grow in close proximity to each other making lead rakes ecologically very exciting. Notably, the toxic nature of the some of the lead rake material results in distinct areas of specialised metallophyte (metal tolerant) vegetation which are considered to be internationally important.

A range of different communities can be found from rich calcareous and neutral swards to acid grasslands with mountain pansy and open sparsely vegetated areas of metallophytes on spoil which is rich in heavy metals. Here large populations of spring sandwort (known locally as leadwort) can occur. Many interesting species are present in the rich grasslands, such as moonwort, frog orchid and fragrant orchid. Nationally, the range and populations of such species has declined dramatically in recent decades. Areas such as lead rakes can provide a true haven for a variety of plants and associated wildlife.

Each rake is unique, a complex reflection of a myriad of historical, management and environmental factors. Fundamentally they are a vivid link with the history of the site. The complexity of lead rakes makes it impossible to re-create the inherent interest of a site. In essence, the holistic value of lead rakes is not re-createable even if the science were available for the re-creation of the constituent plant communities. Once a lead rake is lost, to either agricultural improvement or to re-working for their minerals, this unique complexity is lost forever.



Leadwort © Karen Shelley-Jones

Lead rakes are not only important for plants but for a range of other wildlife associated with flower rich grasslands. The profusion of different species provides a wealth of nectar for insects and seed for birds and small mammals. The sparsely vegetated areas of spoil are important for lichens and provide 'hot spots' for invertebrates. In addition, features such as old mine shafts can provide roosts for bats and the stony heaps, hibernation sites for amphibians.

The majority of lead rakes are confined to the White Peak can also be found on the edge of the Dark Peak Natural Area and around Ashover, in the Derbyshire Peak Fringe Natural Area.

There are concentrations of ecologically important lead rakes across the orefield including the parishes of Bonsall, Castleton, Bradwell, Elton, Winster, Monyash,

Cromford, Middleton-by-Wirksworth, Wirksworth and Brassington.

A recent assessment of aerial photographs by the National Park's Archaeology Service has concluded that only about a quarter of hillocks that existed in the 19th century are archaeologically in a reasonable condition. Losses across the ore-field have now reached a critical point; conservation of remaining important lead rakes is essential if vital parts of the lead rake resource are not to be lost forever.



Extent in PD:
c.41 ha

Aerial photograph of Bonsall Moor © Richard Bird

Current Factors Affecting the Habitat & Habitat Condition

Calaminarian grassland commonly exists as very small areas within an intimate mosaic of other grassland types particularly lowland acid and calcareous grassland, and lowland hay meadow. These sites can be threatened by re-working for mineral deposits, agricultural improvement, agricultural abandonment and successional change. They are of very restricted occurrence throughout Europe and are considered to be of international conservation importance, listed in the European Union Habitats and Species Directive 1992 and the Habitats Regulations 1994.

Recent Work

A report on the losses of important historic lead mining sites was published in 2004 by the National Park Authority in partnership with English Nature and English Heritage. Further ecological surveys of lead rakes have been ongoing since that time, with emphasis placed on identifying lead rakes which support the BAP priority habitat calaminarian grassland and the key associated species. A successful project bid to SITA Trust in 2011 will enable the National Park Authority to complete the survey and mapping of calaminarian grassland and to deliver a programme of capital works to enhance the ecological condition of key sites.

Associated BAP Species in the Peak District

No known UKBAP species are associated with calaminarian grasslands in the Peak District.

Locally Significant Species in the Peak District

Spring sandwort	<i>Minuartia verna</i>
Alpine penny-cress	<i>Thlaspi caeruleans</i>
Pyrenean scurvy-grass	<i>Cocklearia pyrenaica</i>

NVC Communities

The principal vegetation types (and their associated sub-communities) included in this habitat are:

OV37 - *Festuca ovina*-*Minuartia verna* community

And other un-described types not fully covered by NVC.

Annex I: synonymous with H6130 Calaminarian grasslands of the *Violetalia calaminariae*