

1.1 Introduction

This project has comprised an archaeological evaluation to assess the nature and scope of mining remains around Greenhow Hill village and identify sites requiring further action, i.e. further detailed survey, consolidation work, statutory protection. This comprised a rapid GPS (Global Positioning System) mapping of shafts and other excavation features, dressing areas, buildings, spoil tips, and water management features, a brief text description of features (i.e. shaft mound 4m diameter 1m, dressing area 10m x 6m), and a photographic survey of key features in order to produce a RCHME level 2 survey.

The survey has been undertaken by Martin Roe on behalf of the Northern Mine Research Society commissioned by the Nidderdale AONB using money from the Aggregate Levy Sustainability Fund, administered by English Heritage.

The Northern Mine Research Society (NMRS) is the leading mining history organisation in the north of England and has been involved in the recording and preservation of mining history since the late 1950s. The society has long standing connections with the Greenhow area having revised and republished its Greenhow Mines monograph three times between 1970 and 1998. As well as an accumulated knowledge of the area a considerable amount of documentary material has been collected and is held in the society records. In the last few years society members have developed new fieldwork strategies which have been applied very successfully to lead mining landscapes in the Yorkshire region, the result of which have been deposited in the North Yorkshire and Yorkshire Dales National Park Sites and Monuments Registers (SMRs)

1.2 Report Layout

This report is divided into three main sections. Following this introduction the main body of the report comprises the survey data followed by the final interpretation section. For convenience the survey area has been divided up into eleven individual units, each treated as a separate survey. For each survey a description of the main features present is followed by an annotated plan of the area, together with a gazetteer of features, followed by photographs of key features.

1.3 Survey Area

This survey has recorded multi-period lead extraction, ore dressing and smelting sites around the village of Greenhow Hill, in the parish of Bewerley, North Yorkshire centred on N.G.R. SE113 642. The land is currently used for agricultural purposes ranging from enclosed pasture to unenclosed moorland. Part of the survey area is an active limestone quarry. The area surveyed is under multiple ownership and determining who owned what and then obtaining permission to carryout the survey was at times difficult as not all the landowners live in the village.

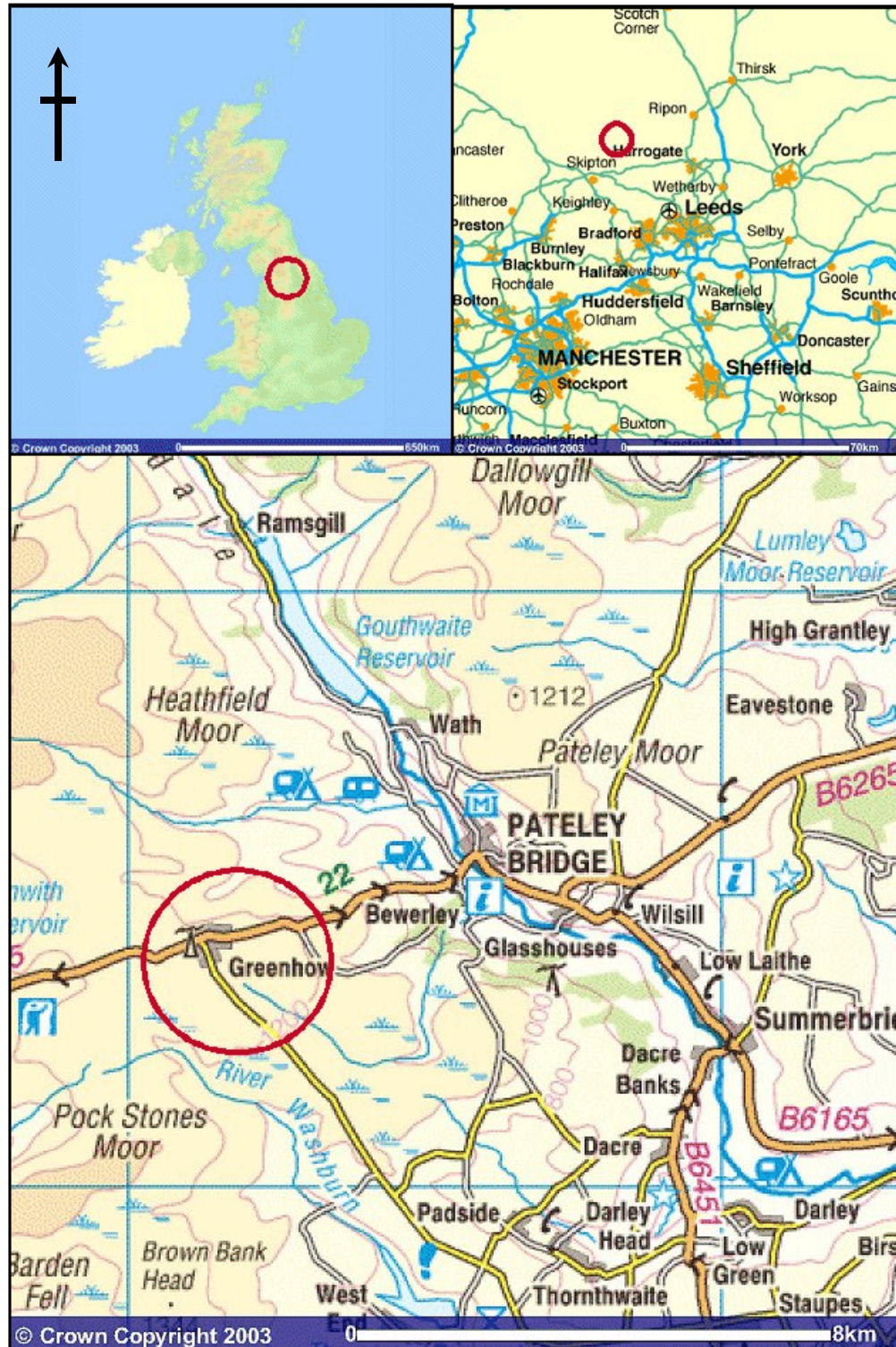


Fig.1 Location

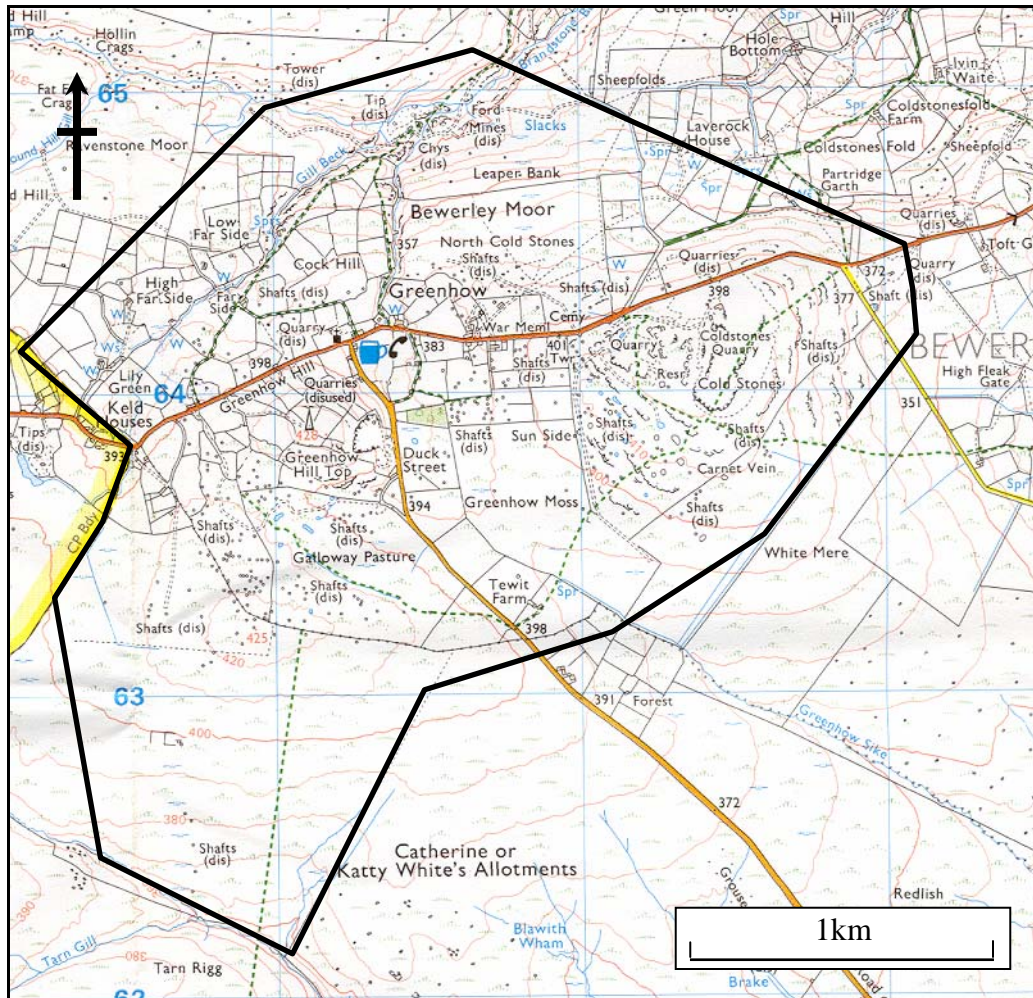


Fig.2 Survey area (OS Explorer sheet 298 Nidderdale)

1.4 Project Outcomes

This project has:

- Defined the mining remains around Greenhow village.
- Substantially enhanced the coverage of this area in the North Yorkshire SMR.
- Identified sites at risk.
- Identified areas requiring further survey.
- Identified sites requiring consolidation work.
- Identified areas that would benefit from statutory protection.
- Identified areas and features that could be incorporated into guided walks and other heritage interpretation projects.
- Produced a record of any open shafts and other features that may be perceived as a danger to the public.
- By making the survey results available to local people it has improved local awareness and understanding of the history and heritage of Greenhow.
- Created a useful archive for researchers.

1.5 Historical Background

Lead mining at Greenhow Hill is documented back to the early medieval period, but two finds of lead ingots bearing Roman inscriptions suggest an earlier origin. Although not proof of mining and smelting in the area these Roman ingots form a very significant portion of the evidence for Roman mining in Yorkshire and make the area regionally significant.

The first written reference to mining in Nidderdale dates from 1151 when Roger de Mowbray granted Fountains Abbey “***All copper, iron, lead and every kind of metal and stone in his forest of Niderdala in whatsoever place found, below ground or above...in shafts, mines, and minerals***” This grant included the township of Bewerley which includes the area which would become the village of Greenhow Hill. A further grant gave land in the dale to Bylands Abbey and included “***iron ore and a 10th of my lead house, through all my forest of Nidderdale***” It therefore appears that both Abbeys were granted the same right to mine lead over an ill defined area and this led to a number of disputes which generated much of the surviving documentation from this period and provide glimpses into the scale and nature of medieval mining.

A legal document from 1225 mentions lead mines at Kaldstanes and le Feldberg. Kaldestanes is interpreted as Coldstones Hill and le Feldberg (an unenclosed low hill) as Greenhow Hill, these are also prominent topographic features in Greenhow Hill village. A later document states that around 1600 mining was confined to the summits of Greenhow and Coldstones Hills, which suggests that the early mining was confined to the outcropping limestone that forms these hills. Lead from the area was used on prestigious medieval buildings such as Windsor Castle, which was supplied with 168 pigs of lead weighing a total of 20 fothers in 1363. Although there are variations in the weight of a fother it was commonly equal to 22cwt (Gill 1988). This gives a total of 22.4 tons, which would represent a respectable yearly output for a small 19th century mine.

As with the medieval period the early post medieval period is poorly documented however at the end of the 17th century just less than 3000 tons of lead from Greenhow passed through York between 1692 and 1699. It is likely that most of this was mined from outcropping veins of Coldstones and Greenhow Hills but it is possible that by this date the miners had begun to follow the veins where they disappear under drift and had probably therefore discovered the important Cockhill / Waterhole Vein system. This is confirmed by a set of accounts from Sir Thomas Whites mines in 1707 that mention mining at Galloways (south of Greenhow Hill), Lumb (part of the Cockhill Vein west of Greenhow Rake), as well as Coldstones.

From the mid 18th century a series of deeper shafts were sunk, and name evidence suggests that some were equipped with horse powered winding engines, known by various names such as whim, gin, and engine. These shafts mainly accessed veins in the limestone beneath shale cover, sometimes by crosscuts driven through barren rock from the foot of the shafts.

The Cockhill and Gillfield Levels were driven in the 1780s from Brandstone Beck to the north of the village initially to the Cockhill and Water Hole Veins but both were continued so that they eventually drained most of the veins under the village. These levels were driven as horse levels and equipped with rails to enable ore mainly, but not exclusively from stopes above the levels to be taken directly to mechanised dressing floors adjacent to smelt mills. Both Cockhill and Gillfield levels have branches that run under Coldstones Hill and continued in use throughout the 19th century and during twentieth century fluorspar mining operations.

1.6 Geology

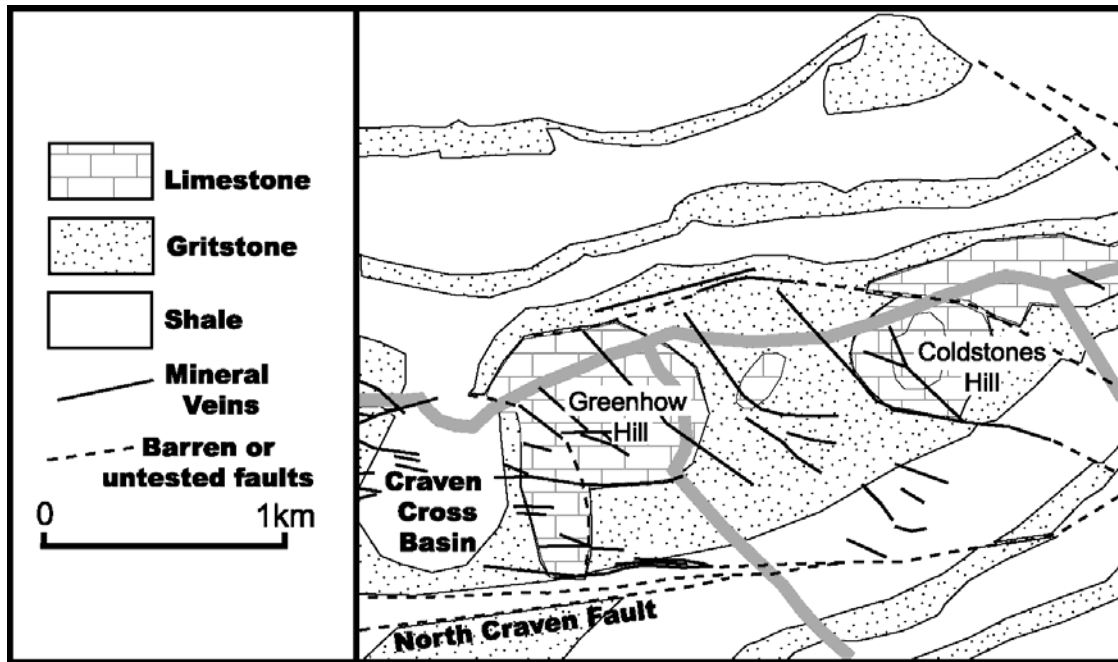


Fig.3 Geology of Greenhow Hill (After Dunham (1985))

The Greenhow mining field consists of limestones overlain by the shales and gritstone of the Millstone Grit Series. In this respect the Greenhow area is similar to other mining areas of the Yorkshire Dales, however here, the beds are not found in nice regular horizontal bed but have instead been distorted by an east to west anticlinal fold known as the Greenhow Anticline. This has resulted in two outcropping islands of limestone, Greenhow Hill and Coldstones Hill, surrounded by gritstone and shale beds.

The geology is further disrupted by the North Craven Fault which throws the limestone down as much as 228m on the south side of the fault which results in the Millstone Grit Series outcropping. The beds of limestone are of the Yoredale series, but here the intervening beds of grits and shales are thinner than elsewhere, which Dunham considers is a direct result of the thickening of the limestone beds. This has left an almost continuous bed of limestone where oreshoots have been proved over a height 500ft. Several deep basins of shale and gritstone are also found in this area, such as that at Craven Cross, and veins passing into these areas have proven to be barren. Oreshoots are mainly confined to the limestone with a little ore in the gritstone where the veins

approach the North Craven Fault. The area is therefore defined by the Craven Cross Basin to the west and the North Craven Fault to the south. To the north the edge of the mineralisation is marked by the Waterhole Vein, and to the east the veins die out beyond Coldstones Hill.

1.7 Survey Methodology

This survey used a Garmin Etrex Global Positioning System receiver (GPS) to record lead mining features. Features recorded were either point features, linear features or areas. Small shaft mounds under 5m diameter were treated as points, as were small pit features. Linear features such as open cut trenches, and water leats were recorded as a series of points. Area features such as dams; areas of dressing spoil, and the perimeter of larger shafts mounds were recorded with points taken every few metres. A brief text description of each feature was recorded on a pre-printed sheet as well as the number of the point or points defining the feature. Descriptions were based on a typology of site components developed from a list of components included in the Monument Protection Programme Lead Industry Step One Report and are included as appendix 1. The header of the survey sheet includes details of the survey location, date, instrument used, accuracy of the readings (as quoted by the GPS, usually 5-6m), and the name of the surveyor.

After collecting the information in the field the data from the GPS receiver was downloaded using Gartrip, a GPS utility. The recorded waypoints were then printed off and filed with the descriptions of the features. The points were also plotted and then exported into Adobe Illustrator where the points were assigned suitable symbols and produced as a scaled vector drawing. Field boundaries have been taken from available OS mapping and may not be representative due to recent changes to boundaries. It was not possible to resurvey all field boundaries however some adjustment was made where obvious changes have been made. The scale of 1:2500 was adopted to allow integration with existing desktop mapping. A copy of the Gartrip plot and the vector drawing were added to the filed data to form a survey archive. Vector drawings were combined to produce a larger plan, which has been used to produce individual drawings for interpretation drawings.

From the vector drawings a new set of waypoints was produced assigning a single grid reference for each individual feature. These waypoints were exported as a text file and added to an excel spreadsheet together with information from the record sheet in order to produce a gazetteer of features, accompanied by annotated maps of each survey area. This method has inbuilt inaccuracy due to the limitations of the equipment and data used, but at the chosen plot scale of 1:2500 this should not have resulted in any loss of archaeological information, although where present it has not been possible to record fine detail, however this problem has been addressed by photographing and writing a short description of key features. The amount and type of information collected makes the data suitable for input into a geographic information system.

2.1 Survey Data

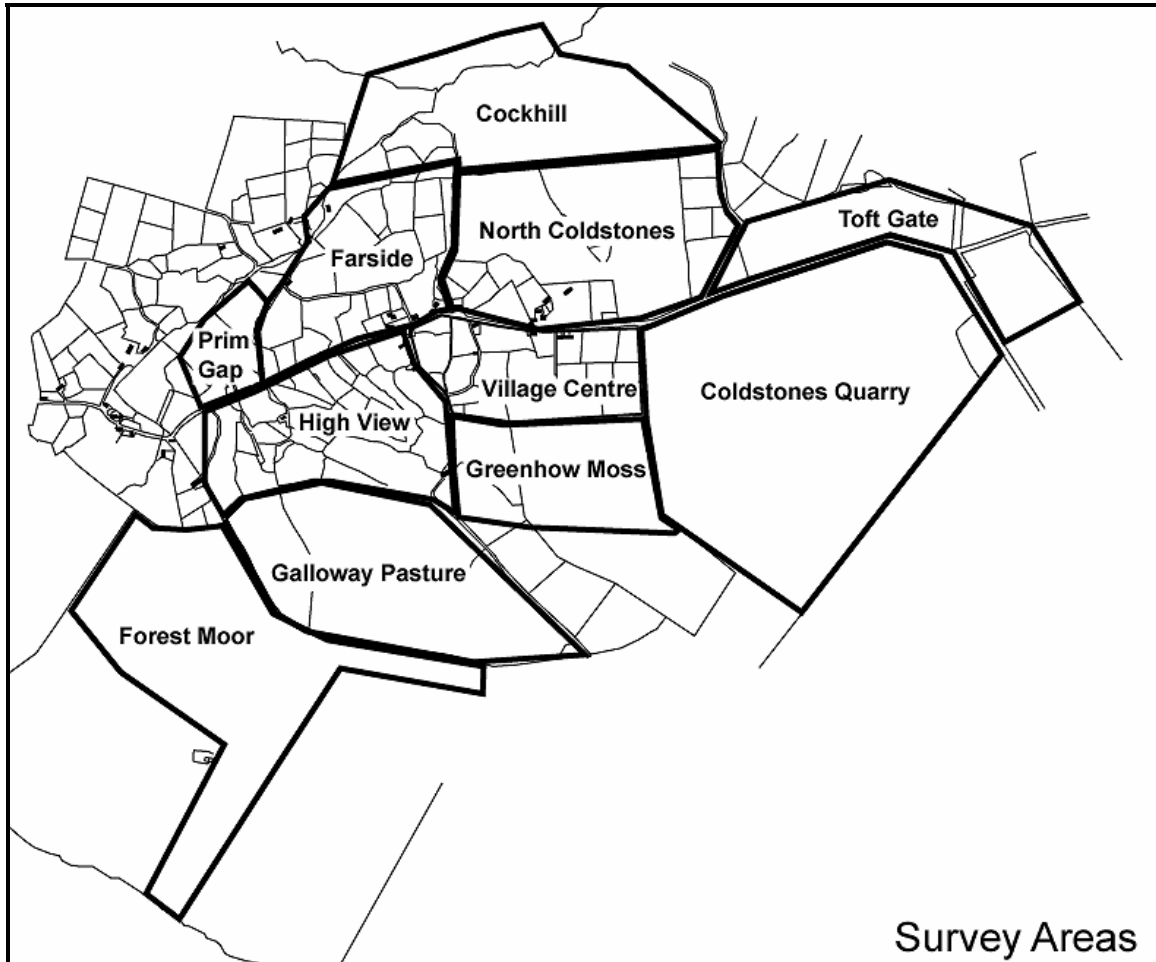


Fig.4 Survey areas








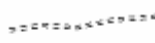

Shaft Mound	
Shafts (less than 5m dia)	
Pits (less than 5m dia)	
Trenches	
Level	
Ore dressing area	
Water leat and dam	
Shakehole	
Holloway / trackway	
Building platform	

Fig.5. Survey Conventions