

Warton Crag
Local Nature Reserve
Management Plan
2016 – 2020



Previous Warton Crag management plans and updates

This five-year management plan update follows on from a seven-year update and three previous five-year plans that have been produced on behalf of the Warton Crag Advisory Group, Lancaster City Council and the Arnsdale & Silverdale AONB Team. The management plan is for reference and use by the partners of the Warton Crag Advisory Group, Natural England, the Royal Society for the Protection of Birds, Lancashire Wildlife Trust, Lancashire County Council and Warton Parish Council; and for detailed site interpretation, educational and research use.

The original plan, 1989 to 1994, was compiled and produced by Jonathan Blowers, Assistant Countryside Officer for Arnsdale & Silverdale Area of Outstanding Natural Beauty (AONB).

The first revised update, 1994 to 1999, was compiled by Graeme Skelcher, Ecology Consultant, Warton.

The second revised update, 1999 to 2004, was compiled by Jane Harvey, Part-time Warden for Warton Crag Local Nature Reserve.

The third and fourth updates, 2004 to 2009, and 2009 to 2016, were revised by Tony Riden, Countryside Officer for Arnsdale & Silverdale AONB.

The fifth revised update, 1st January 2016 to 31st December 2020, to run concurrently with the new Countryside Stewardship agreement for this period, was compiled by Jim Turner, the part-time Warden for Warton Crag LNR and by Tony Riden Countryside Officer for Arnsdale & Silverdale AONB.

Front cover photo: Beacon Breast, Warton Crag

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Introduction

Warton Crag is a limestone hill situated at the southern end of the Arnside & Silverdale Area of Outstanding Natural Beauty (AONB) just to the north of Warton and Carnforth in the County of Lancashire. The summit is 163 metres O.D. making it the highest point within the AONB. Its limestone cliffs and crags, woods and large disused quarry form a conspicuous feature from the A6, M6 and railways when travelling northward to Carlisle and Barrow. In 1976 a large part of the crag was designated a Site of Special Scientific Interest (SSSI) (see Appendix 2) because of its limestone grassland and scars supporting a wealth of rare plants and animals. The summit area of Warton Crag is also a Scheduled Ancient Monument as an Iron Age hillfort (see Appendix 6).

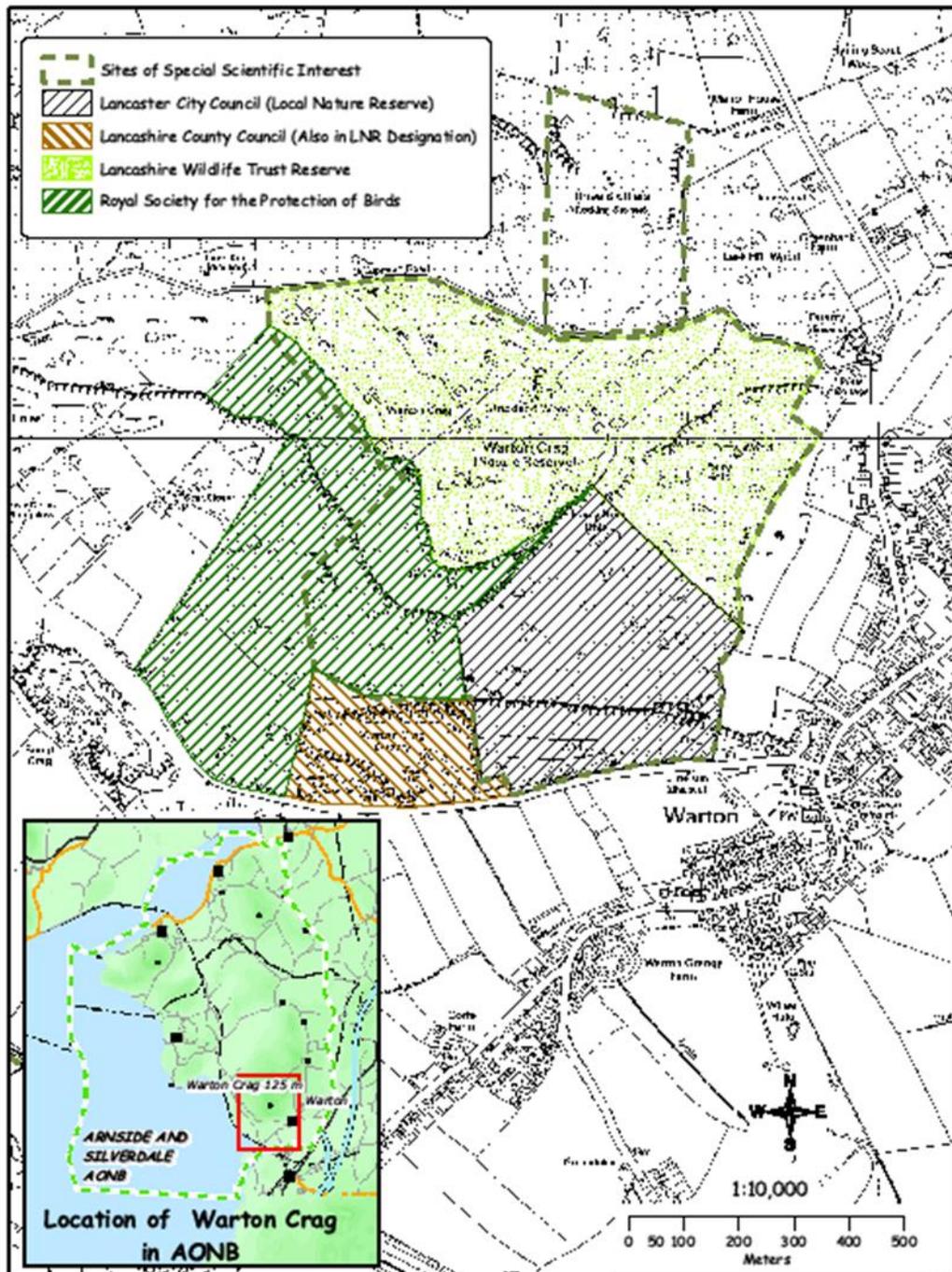
Warton Crag is of national importance for butterflies and moths, it is an important link in a network of limestone areas round Morecambe Bay that are now one of the last remaining strongholds in the UK for the High Brown Fritillary. This most attractive large butterfly is in national decline but still flies on Warton Crag in July.

Most of the Crag is owned and managed by four separate bodies, Lancaster City Council, the Royal Society for the Protection of Birds (RSPB), Lancashire County Council and Lancashire Wildlife Trust (LWT) have a ninety-nine-year lease of West Field, Strickland Wood and Potts Wood from Leighton Hall Estate. The land owned by Lancaster City Council comprises 19.4 hectares (48 acres) to the south and was left to the former Lancaster Rural District Council for the perpetual use by the public for the purpose of exercise and recreation. In 1984 the section owned by Lancaster City Council was designated a Local Nature Reserve (LNR) and an Advisory Group set up. This group is comprised of representatives of Lancaster City Council, Natural England, LWT, RSPB, Lancashire County Council, British Mountaineering Council representative and Warton Parish Council. In 1987 the RSPB purchased 27 hectares (66.7 acres) adjoining the LNR to the west, as an addition to the Leighton Moss Nature Reserve. LWT lease 33.6 hectares (83 acres) to the north and east of the LNR from Leighton Hall Estate since 1988. The 6.5 hectares (16.4 acres) of disused main quarry was bought by Lancashire County Council in 1991 and added to the LNR in 1993. A map showing the four ownership areas and boundaries of the whole of Warton Crag is on page 4.

These four combined parcels of land are collectively known as Warton Crag Nature Reserve. Although the four parts of the reserve are managed separately, a combined Warton Crag Advisory Group meets twice a year and provides an informal basis for consultation and the exchange of ideas and co-ordination of management methods. Further meetings and aspiration to work in a more coordinated effect of management taking place over the whole Crag are to be arranged in 2016 in order to improve the coordinated management of the Crag as a whole. Although original management plans covered the whole reserve, each organisation (RSPB, LWT, Lancashire County Council and Lancaster City Council) update and modify their own plans for their respective sections of the Crag as each organisation has its own specific Countryside Stewardship grant agreement. It was hoped that a single agreement could have been arranged, but this was not possible under the agreement terms required by Natural England. As a result, this Management Plan is for the Lancaster City Council LNR area only.

This plan provides background information on location, tenure, legal status, topography and natural habitats, in addition to management objectives and proposals. The management objectives focus on the need to protect the limestone habitat and to ensure the continuing diversity of nationally rare plants and animals.

Map 1 Boundaries of Warton Crag Nature Reserve



1. Site description

1.1 General information

Location

Parish: Warton

Local Planning Authority: Lancaster City Council

Grid reference: SD 474730

Maps: O.S. 1:50000 sheet 97
1:100000 SD 47 SE

Access: Pedestrian access only, from Crag Road, Warton. There are three pedestrian gates, one from Warton Parish Council car park, one 'Ged's Gate' and one from the main quarry car park. Footpaths also link from the west from the RSPB north via Occupation Road (public bridleway) and LWT Reserve area and RSPB Reserve area.

1.1.2 Area

86.5 ha (214.1 acres)

(The SSSI covers 73 ha (180.4 acres) of which 10 ha (24.7 acres) lie outside the Local Nature Reserve – see boundary map, page 4).

1.1.3 Tenure

Lancaster City Council: Local Nature Reserve 19.4 ha (48 acres) freehold donated in 1948; Royal Society for the Protection of Birds: 27 ha (66.7 acres) purchased in 1987;

Lancashire Wildlife Trust: 34.6 ha (85.49 acres) leased from R.G. Reynolds for 99 years from July 1988;

Lancashire County Council: 6.5 ha (16.4 acres) purchased in 1991.

1.1.4 Status

SSSI date notified 1976 under 1949 Act. Revision 1986 under 1981 Act (see Appendix 2).

Grade 2 elite site in "A Nature Conservation Review".

Hill Fort listed in the Schedule of Monuments (Monument Number 23643) under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979 as Amended (see Appendix 7).

Warton Crag is protected by a Limestone Pavement Order (LPO) under Section 34 of Wildlife and Countryside Act 1981 made 10 March 1992 (see details in Appendix 4).

Designation of Arnside & Silverdale Area of Outstanding Natural Beauty (AONB) status 15th December 1972.

Local Nature Reserve declared 30th March 1984; Main quarry added to LNR in 1993.

1.1.5 Legal responsibilities

LNR: left to Lancaster Rural D.C. by the Whinnerahs, on April 23 1948 “for the perpetual use by the public for the purposes of exercise and recreation, pursuant to the provisions of the Open Spaces Act 1906”. Deeds held by Lancaster City Council, Palatine Hall.

LWT area: no trespass off the permissive footpaths permitted; after 80 years timber assets return to the landlord

SSSI: Consent to be obtained from Natural England before any work listed as a Potentially Damaging Operation is carried out (see Appendix 3).

Heritage site: Consent to be obtained from Historic England before any potentially damaging work is carried out (see Appendix 6 - applies to RSPB and LWT only).

1.1.6 Map and photographic coverage

Tithe map of Warton, 1846.

Series of photographs of LNR taken in September 1982 by Tony Aldridge (ACA SEPT 1982 - LWT Warton Crag Scientific File).

Aerial photographs for years 1946 (R.A.F., available for inspection at the County Record Office), 1956, 1961 (Hunting Surveys Ltd. 1:10 560 - 32 & 66/0403,0404 and 31 & 104/1181,1180, held by Lancashire County Council) and 1988 (JAS Air Survey Ltd. 1:10 000 - 140,141 & 142/3888 and 157,158 & 159/3888, held by Lancashire County Council and Natural England N.W. Region).

1.1.7 Management

Each organisation has final control and responsibility over its respective land. However, an informal Warton Crag Advisory Group meets twice a year, with representatives from the Arnside & Silverdale AONB Team, Natural England, Lancaster City Council, Lancashire County Council, Lancashire Wildlife Trust, Royal Society for the Protection of Birds, the British Mountaineering Council, Leighton Hall Estate and Warton Parish Council.

1.2 Environmental information

1.2.1 Physical and biological information

The LNR covers the south-facing slope of a limestone hill rising from 45m to 145m (the summit at 163m lies within the LWT reserve). Three main terraces separate four limestone scars in a text-book example of ‘desk’ structure. The lowest bed of limestone is a hard, poorly jointed rock, which has been extensively quarried to the west and east of the City Council land. Within this land it gives rise to the most extensive area of calcareous grassland in Lancashire on rendzina soils, with many nationally and locally rare plants as well as large colonies of Lepidoptera of local and national importance (see Appendix 9). The scar at the top of this slope is also botanically very rich. The uppermost scar forms an impressive cliff up to 10 metres high, which is very popular with rock climbers. At its base lies an extensive scree slope. The middle terrace widens towards the east where there is a fine exposure of limestone pavement. Elsewhere the terraces are covered with acidic brown-earth soils derived from loess, and support Bracken, scrub and Birch wood. Secondary

Hazel-Ash woodland has developed over much of the southern and eastern edges of the Reserve, since the abandonment of sheep grazing in the 1940s.

The RSPB reserve lies on the western extension of these scars and terraces. This area has been more or less grazed by cattle up to the present and its flora provides a valuable comparison with the LNR of differing management regimes. The lower slopes are covered by semi-improved grassland, and much of the area has been invaded by scrub and trees. There is an attractive small area of limestone pavement, good calcareous grassland with more flowers and less rank grass than on the LNR, and areas of limestone heath near the summit. As on the LNR, the terraces support a good deal of Bracken.

The LWT reserve covers the summit plateau and the wooded eastern slopes, Potts Wood and Strickland Wood. In the main, these are secondary Hazel-Ash woods with relatively few fine Sessile Oak, some Yew, Wych Elm, a good deal of Sycamore and the occasional Small-leaved Lime. Limestone pavement occurs both within Potts Wood and on the western section of the reserve, an area with extensive stands of Bracken alternating with pavement, calcareous grassland and limestone heath, together with scrub.

In 1993, the large quarry, disused since 1966, was added to the LNR. The quarry face is up to 51 metres high and supports a breeding Jackdaw colony, a pair of Raven, a pair of Peregrine and a pair of Kestrel. Peregrine are often seen and breed in the Main Quarry, and they are a Schedule 1 protected species. Outside of the Peregrine nesting periods, the Main Quarry face is used by BMC members and climbers, though in smaller numbers than elsewhere on the Crag due to the difficulty of the slopes and the instability of much of the rock-face. The area immediately below the face has been fenced off by Lancashire County Council to control casual access to their part of the LNR. Access to this area is by arrangement only with the County Council and requires hard hats to be worn. This area contains early successional habitat communities developing from the bare substrate left after the cessation of quarrying. Ephemeral ponds on the quarry floor support aquatic plants and Palmate Newt. To the south of the quarry face, a car park has been built and surrounding mounds seeded with a wild flower mix and planted with saplings, but much of this area is now colonised by plants from the adjoining areas of the Crag, including Dark Red Heleborine, Bee Orchid and Bird's-eye Primrose. To the west a circular path runs through a small, relatively recent ash wood, and to the east an area of rank *Sesleria* limestone grassland requiring intermittent cutting of developing scrub.

1.2.2 Biological communities identified on the reserve by National Vegetation Classification (NVC)

W9 woodland is the mixed deciduous of northern and western Britain, with Ash dominant again, Wych Elm, Hazel and Hawthorn frequent, and Sessile Oak occasional. The "southern" shrubs are absent and the ground flora less diverse with dryopterid ferns, Common Dog Violet and Wood Sorrel abundant. This community is found on the damper soils.

W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland

Small pockets of this oak-birch woodland are scattered throughout the site, possibly on deeper soils. It is most notable on some areas of the terraces of Potts Wood.

W21 *Crataegus* - *Hedera* scrub

Dominated by Hawthorn and Ash saplings, with Blackthorn, Purging Buckthorn, Wild Privet and Yew, and occasional Juniper and Dogwood. An extensive ground flora occurs with Dog's Mercury, False-brome and Wood Sage.

W22 *Prunus spinosa* - *Rubus fruticosus* underscrub

Dominated by Blackthorn and bramble, with little else. Usually found in exposed situations.

W23 *Ulex - Rubus* scrub

Characteristic of moderate to strong acid brown, free-draining soils and encouraged by disturbance or agricultural neglect. This occurs in patches on the RSPBland.

W25 *Pteridium - Rubus* underscrub

Bracken dominated land with little ground flora generally, although English Bluebell and Common Dog Violet can be frequent, and Honeysuckle abundant in some areas. Covers large areas of the reserve area.

U20 *Pteridium - Galium saxatile* underscrub

Bracken dominated land on more acidic soils in West Field with Tormentil, Heath Bedstraw, Sheep's Fescue, Common Bent and some Bilberry.

CG9 *Sesleria albicans - Galium sternerii* grassland

A northern limestone grassland community type dominated by *Sesleria* with Sheep's Fescue, Crested Dog's-tail, Quaking Grass, Crested Hair-grass, Hairy and Field Oat grasses. Limestone Bedstraw, Common St John's-wort, Rockrose, Bird's-foot Trefoil, Eyebright and Wild Thyme are well represented. This grassland forms a complex with limestone escarpments and pavement.

**MG1e *Arrhenatherum elatius* grassland,
Centaurea nigra sub-community**

False-oat Grass, Cock's-foot, Yorkshire Fog and large umbellifers characterise this neutral grassland community, with Knapweed prominent.

H8 *Calluna vulgaris - Ulex gallii* heath

Limestone heath with calcicolous species such as rockrose and *Sesleria* intermixed with Heather and, very occasionally, Bilberry. Slender St. John's-wort, Heath Grass, Flea Sedge and Tormentil are frequent. This is a very scattered community type at Warton Crag.

1.2.3 Biological Action Plan (BAP) implications

The Crag has three habitats listed in the Lancashire Habitat Action Plan (HAP) and at least six priority species listed in the Species Action Plan (SAP). HAP include Calcareous Grassland, Broad-leaved Woodland and Limestone Pavement. Species listed in the SAP include Lancashire Whitebeam *Sorbus lancastriensis* (which is also listed in the Red Data Book);

Butterflies:	Important food plants
Northern Brown Argus <i>Aricia artaxerxes</i>	Rockrose
Pearl-bordered Fritillary <i>Boloria euphrosyne</i>	Violets High
Brown Fritillary <i>Argynnis adippe</i>	Violets
Moths:	
Barred Tooth-stripe <i>Trichopteryx polycommata</i>	Privet, Ash

Reptiles:

- Slow-worm *Anguis fragilis*
- Adder *Vipera berus*
- Common Lizard *Zootoca vivipara*

Birds: Song Thrush *Turdus philomelos*
 Tree Pipit *Anthus trivialis*

Hedge Accentor (Dunnock) *Prunella modularis*
Marsh Tit *Parus palustris*
Bullfinch *Pyrrhula pyrrhula*

Schedule I breeding bird species:
Peregrine *Falco peregrinus*

1.2.4 Cultural information

There is evidence that Warton Crag was occupied in Neolithic and Roman times. The summit area of the crag was an Iron Age (possibly Bronze Age) Hill Fort and is a designated Scheduled Ancient Monument (SAM). In 2015 Morecambe Bay Partnership began survey research work with English Heritage, Historic England and a Lancaster University Archeological team. Initial surveys produced striking images of a LIDAR survey. The archeological research, interpretation and management plan for the SAM is ongoing and findings and recommendation by Historic England are being progressed and developed in conjunction with the land-owner partners and respective Countryside Stewardship scheme agreements.

In Roman times and later the summit of the Crag was probably fenced off for enclosure of domestic animals. More recently, the "History of Warton" (Lucas 1700s) mentions grazing by goats and sheep. The Crag was divided into allotments by stone walls, as shown on the tithe map of 1846 and these can still be seen. This century, rabbits appear to have been the main grazing force and were present in abundance until myxomatosis in the 1950s. Sheep (Warton and Masham breeds) were grazed until the 1940s and winter grazing by cattle has continued on the western side (RSPB) to the present. Grazing by sheep was re-introduced onto the LNR in 1990 and by cattle from 1996. Trees were sparse in the first half of the 1900s, and it is only since the 1950s that there has been rapid and dense invasion by birch and ash. Hazel was probably coppiced in the past, and Bracken may have been cut regularly for various uses.

Limestone has been quarried here for many years with the easiest rock to quarry found in the lowest beds, the Park Limestone. Within the City Council land there are old quarries just above Crag Road boundary, and a good deal of the richest grassland probably covers the site of an old quarry. Elsewhere rocks were probably extracted to make walls, and a number of areas of limestone pavement show signs of removal of rocks. The large quarry site, now owned by Lancashire County Council, was worked between 1931 and 1966 and in the latter working years, much of the quarried material went to construct the M6 motorway.

The Crag is predominantly used by dog-walkers and rock-climbers. Fine weather, particularly in spring and autumn, brings out casual walkers in good numbers.

Climbing is permitted on the Warton Parish Council car park escarpment and the Upper Craggs. However, organisation group climbing is not permitted in the Upper Craggs. Climbing on the very friable and loose Main Quarry face is restricted and closed during the nesting and breeding period of the Peregrine, usually from March to the end of July each year, as Peregrine are a protected Schedule 1 species. The British Mountaineering Council (BMC) has published a revised 'Lancashire Area Climbing Guide' in 2016, which details routes and climbing access.

2. Evaluation and objectives

2.1 Evaluation of features

Evaluation against Criteria used in "A Nature Conservation Review" (Ratcliffe 1977).

2.1.1 Size

The 86.5 ha (214.1 acre) reserve includes most of the SSSI and a large part of the limestone hill (see map on page 5). It is a reasonable size for a lowland habitat, comparable to Arnside Knott, but much less extensive than the nearby Whitbarrow Scar or Hutton Roof Crag and Farleton Fell.

2.1.2 Diversity

Most of the limestone habitats are represented, with cliffs, scars, screes and pavement, as well as calcareous grassland, hazel-ash woodland, and scrub, plus a limited range of acidic habitats, bracken, scrub and woodland (see Appendix 1). Soils are varied, derived partly from limestone (rendzina), partly from wind-blown loess and partly from brown earths formed from decomposed vegetation. The topographic diversity means that most of the habitats occur at a range of altitudes and exposures.

2.1.3 Naturalness

Plants growing on the cliffs, escarpments, unstable scars and screes and limestone pavements, probably represent the nearest to natural vegetation, and most of the rare plants are found here. The grassland is semi-natural, either the result of fairly recent colonisation of quarried areas or maintained by grazing. Scrub has advanced to shade ungrazed grassland and many of the low scars. The woodland is all relatively recent secondary semi-natural, with Birch, Ash, Sycamore and Hazel predominant.

2.1.4 Rarity

Limestone pavement is a nationally rare habitat dependent on an unusual sequence of geological events. Calcareous grassland is a threatened habitat because of its dependence on traditional management. An indication of the importance of the various geological and geomorphological features present, as well as the range of species of plants and animals found is given in Appendix

10. The reserve supports an impressive number of nationally rare plants and animals including three Red Data Book species, i.e. Dark Red Helleborine (*Epipactis atrorubens*), Least Minor Moth (*Photedes captiuncula*), High Brown Fritillary (*Argynnis adippe*), as well as many regionally rare species, e.g. Northern Brown Argus (*Aricia artaxerxes*) and Pearl-bordered Fritillary (*Clossiana euphrosyne*).

2.1.5 Fragility

The hard limestone rock habitats are relatively robust in terms of visitor pressure (although the scree areas are more sensitive). Increased recreational use, particularly by dog-walkers, widening of some paths such as the main escarpment path and fouling and disturbance of wildlife, are all of increasing concern. The main threat however is unmanaged natural succession and invasion of the calcareous grassland by scrub and domination of slightly more acidic areas by Bracken.

2.1.6 Typicalness

Warton Crag supports a high proportion of the species typical of these north-west England lowland

limestone sites, where the mild winters of the coastal climate and the south facing slopes permit many more typically southern species to thrive. It is the best example in Lancashire of screes, scars and limestone grassland.

2.1.7 Recorded history

Biological records are sparse as compared with the much better known Arnside Knott and Hutton Roof. There is some documentation of land use through village history, including Lucas' "History of Warton" (Lucas 1700s). As already mentioned, the summit area of the crag was an Iron Age (possibly Bronze Age) Hill Fort and is a designated Scheduled Ancient Monument (SAM). In 2015 Morecambe Bay Partnership began survey research work with English Heritage, Historic England and a Lancaster University Archeological team. Initial surveys produced striking images of a LIDAR survey. The archeological research, interpretation and management plan for the SAM is ongoing and findings and recommendation by Historic England are being progressed and developed in conjunction with the land-owner partners and respective Countryside Stewardship scheme agreements.

2.1.8 Ecological position

Warton Crag represents the most southerly of a set of limestone hills encircling the head of Morecambe Bay classified as the 'Morecambe Bay Limestones' in the Countryside Agency/English Nature 'Natural Areas Classification'. It lies at the southern end of the Arnside & Silverdale AONB outcrop of limestone and provides an important reservoir of invertebrates which might be able to spread on to smaller limestone exposures under suitable conditions.

2.1.9 Potential

Accessibility, size and attractiveness make the reserve suitable for educational use, but there is already evidence of damage to main footpaths and a proliferation of minor footpaths. The terms of the LWT lease prevent development of new footpaths within the LWT area. Greater use in summer, when the ground is drier and visitor numbers appear smaller, could be encouraged, but autumn to spring use is causing some problems. In particular horse riding is causing serious wear on the concessionary footpaths of the LWT reserve.

Limited control of Bracken litter where the fern is present in extensive stands will increase species diversity in these areas. Some bracken litter is, however, important to the breeding ecology of the High Brown Fritillary butterfly.

Controlled management of dense invading scrub, cutting back around the edges, creating glades and increasing the area of the important scrub-edge habitat, will open up and help maintain areas, for wildlife and views.

Positive management of the whole reserve through implementing a well-thought-out schedule of works and controlled grazing is intended to increase the ecological potential of the habitats and therefore the biodiversity.

2.1.10 Intrinsic appeal

The wide scenic variety combined with fine views provide great attraction. The spring and summer floral displays are appealing and on a fine day the numbers and variety of butterflies can be striking.

2.2 Management objectives

Objective 1

To maintain and enhance the calcareous limestone grassland, limestone pavement, areas of successional scrub and broad-leaved woodland for the benefit of optimizing conditions and habitats for biodiversity, for the rare flora and their associated invertebrates, and to increase the extent of grassland as far as possible, in agreement with Natural England, and by means of a continued Countryside Stewardship agreement.

Objective 2

To maintain and enhance the habitats required by lepidoptera, especially the important populations of High Brown Fritillary, Pearl-bordered Fritillary and Northern Brown Argus.

Objective 3

To maintain and enhance the woodland structure and areas of successional scrub, and provide appropriate conditions for breeding birds including warblers, finches, tits and song-birds, as well as birds of prey, bats, reptiles and other fauna known to inhabit the Crag.

Objective 4

To monitor populations of the key species, especially in relation to the effects of reserve management, and to undertake and encourage research into ways of retaining and improving habitats for their benefit. This will involve continued collaboration with field workers from Lancaster University and other institutions.

Objective 5

To maintain the existing path system and boundary walls; promote only quiet recreational use of the site and discourage public use of dangerous or particularly sensitive areas.

Objective 6

To promote the main quarry and car park as a self-contained amenity site and thus limit the numbers that might otherwise visit more ecologically sensitive parts of the nature reserve and SSSI.

Objective 7

To maintain good relations and communication between all organisations concerned with the management of the whole of Warton Crag Nature Reserve by coordinated site management and regular Advisory Group meetings, site visits and networking.

Objective 8

To work in partnership with all the other conservation partners and organisations that have responsibility of ensuring the good safeguarding and suitable management of the ecological, geological and historic features and interests of the Crag.

Objective 9

To educate and inform the public as to the interest and value of the site and the need for habitat management to maintain it.

Objective 10

To safeguard the site and meet all legal and other obligations, including SSSI designation, LPO, Scheduled Monument, protected species and habitats under the Wildlife Act.

2.3 Main factors influencing management of the site

2.3.1 Natural trends

Limestone Bedrock and Limestone Pavement

The underlying bedrock of Warton Crag, and practically the whole of Arnside & Silverdale AONB is Carboniferous Limestone. Some of the exposed limestone areas on the LNR show evidence of having been worked historically, with some areas of what would have been water-worn limestone pavement removed. These were probably used in local building and garden features during Edwardian and Victorian period.

Limestone pavement is now protected by law by Limestone Pavement Orders, and it is illegal to damage or remove rocks. (See Appendix 4).

The glacial and water-worn features of limestone pavement are a fascinating geological aspect, as well as providing habitat niche for plants, such as Hart's-tongue Fern, Maidenhair Fern, Polypody Fern, Wall Rue, Rue-leaved Saxifrage, Herb Robert and other species, that find shelter and moisture within the grykes and hollows.

Colonisation of the main area of pavement by trees is very slow, because of the drought-stress of this habitat during dry spells, trees growing on the limestone pavement areas are stunted and restricted in growth as a result. In a few places, the shade cast by sycamore is such that mosses survive and start the process by which the rocks are covered. Removal of such Sycamore has been considered, but further research on the mosses is necessary as some of these may be of interest in their own right.

Grassland

Some areas of grassland are on very steep slopes with a scree rendzina (a thin soil derived from limestone fragments) which appear to be sufficiently unstable and drought stressed to prevent trees and shrubs from colonising readily. Elsewhere there is colonisation of Blue Moor Grass *Sesleria albicans* grassland by birch, ash, oak and shrubs, which has occurred since grazing by stock and rabbits ceased in the early 1950s. Clearance of scrub where *Sesleria* and other calcareous grassland herbs still survive is desirable, followed by regular clearance to maintain open grassland. Unmanaged *Sesleria* becomes very dense and shades out low-growing herbs. Short periods of a few weeks of grazing in the winter period and a limited spell of summer grazing, with low numbers of cows, will maintain their open nature and improve the diversity of herbs within the sward. Availability of drinking water for livestock is a limiting factor, and the only water available on the LNR is from three water-troughs filled by rain-water. Ant-hills are prevalent in grassland areas and are a very important component of the grassland ecology.

Bracken

The main terraces have acidic brown-earth soils derived initially from loess, a wind-blown post-glacial deposit, and added to by accrued dead plant material, which support extensive stands of Bracken. Without management intervention, the Bracken habitat is invaded by hawthorn, hazel and blackthorn scrub.

Violets, the food plant for High Brown Fritillary caterpillars, grow beneath the Bracken but do not grow where Bracken leaf-litter is excessively deep. However, research by Dr Martin Warren (1991) showed that areas with small gaps in deep Bracken litter were more productive for the fritillaries than the more open Bracken with grass below. The eggs of the High Brown Fritillary are usually laid on a firm substrate such as dead bracken stalks, moss or rocks. The larvae benefit from the warmth of a bed of bracken litter or mossy rocks where the temperature may rise 10^o to 20^o above the air temperature. Presence of Violet foliage

is essential for the larvae to feed, so Bracken litter should not be allowed to build up sufficiently to prevent Violet growth, but litter clearances should not be attempted too often (an 8-year rotation at most) and small areas only should be cleared each time to avoid disturbing too many eggs.

Bracken crozier cutting in late-May/early June has been found to be most effective in controlling the most vigorous fronds and thus limiting the litter build-up. However, cutting at this time may disturb the breeding of potential ground-nesting Tree Pipit, Willow Warbler, Chiffchaff, Woodcock and other bird and mammal species which sometimes nest in the Bracken. Before areas of Bracken are to be trodden in May/June, it is first necessary to cut and rake these areas in the preceding winter (in January) so that there is less nesting cover to attract birds to the areas in the spring. Close proximity of ant-hills are also very important aspect of the ecology of Violet, as the Yellow Field Ant is known to distribute and in effect plant Violet seeds.

The management of the Bracken area was visited and reviewed by Dr Martin Warren and other conservation partners in April 2016. It was agreed that less Bracken-leaf-litter would be removed from the two annual plots and that instead of cutting the croziers, they would be trodden-down by foot. It was hoped that the perceived increased incidence of grasses in the Bracken bed would thereby be reduced and help increase numbers Violet.

Woodland

There is significant colonisation by birch on the lower slopes of the LNR. In some areas dense stands of spindly ash continue to develop. The densest shade is under ancient hazel stools grown up since coppicing ceased. Since the onset of Dutch Elm disease, the population of Wych Elm has declined, but does show signs of resilience and regrowth. At some stage, it is likely that Ash will be affected by Chalara (Ash Dieback) disease. In the meantime efforts should be made to prevent the spread of the disease and close monitoring should take place. Some thought should go in to species that could be affected by the decline of Ash and providing possible alternative habitat for them (such as Privet). Otherwise, selective felling and thinning to encourage regeneration of ground flora, shrub layer, trees and better growth of saplings and fruiting of Hazel is desirable.

The new Countryside Stewardship agreement (1st January 2016 to 31st December 2020) for the LNR includes a Small Woodland element to manage the most significantly wooded areas of the LNR, aside the areas of transitional scrub and the priority habitat of calcareous limestone grassland.

The three main areas of woodland on the LNR will have a few small woodland glades and Hazel coppice areas and a small amount of selective tree-thinning undertaken over the 5-year agreement. As extraction of cut timber is too much of a problem from the upper areas of the LNR, only the section of woodland near the lower Crag Road boundary will have wood removed. All other cut timber will be safely stacked as dead-wood habitat around the margins of the glades and coppice-worked areas.

Fifty new bird nest-boxes and bat-boxes will be provided by the new CS funding to increase nesting and roost opportunities, and also to enable a local licenced nest-box bird-ringing scheme to monitor bird breeding population and success.

2.3.2 Man-made trends

Paths

The effects of pressure from visitors is very apparent on the main paths, in places tracks up to 4 metres wide have been significantly trampled. On the main path into the LNR from Crag Road eutrophication by dog excreta is apparent in the abundance of Perennial Rye-grass and Stinging Nettle. Dog-walkers are asked to respect the site for other users, and follow the Countryside Code, to bag and take away their dog-waste. Bagged dog-waste can be deposited in either the dog-waste bin in the Main quarry car park, or in the black litter-bin at the side of the lay-by on Crag Road. Thankfully, the majority of dog-owners are responsible and clear-up their dog-waste, but those who don't leave a very unpleasant and unhealthy mess for other visitors and site users. To help encourage responsible dog-waste removal, local primary school children have produced aptly illustrated and worded posters.

Mountain biking is not allowed on the Crag, and is prohibited by the site Byelaws and SSSI designation.

Damage caused by rock climbers to cliff vegetation, particularly the rare hawkweeds, and Lancashire Whitebeam needs careful monitoring as is damage to the sensitive scree areas underneath the upper crag that have been used in the past as access by climbers.

Landscaping

After quarrying activity came to an end in the 1960s and with the eventual designation of the Local Nature Reserve (LNR) the quarry area was landscaped and restored with planting and reseeded in the 1990s. The area has eventually naturalised and includes several notable species, including Common-spotted Orchid, Bee Orchid and Dark Red Helliborine, as well as breeding Palmate Newt.

Grazing

Grazing is an important, more natural and sustainable means of managing and maintaining a diverse grassland sward. Mixed livestock grazing for short periods is thought to be best for achieving optimum ecological benefits. However grazing livestock on Warton Crag presents many challenges, such as hazards of limestone cliffs, escarpments and pavement clints and grykes, potentially toxic vegetation with Bracken, Yew and Ragwort prevalent, and many dog-walkers running dogs off the lead. For these reasons, grazing livestock are restricted to cows, usually young heifers, owned by Morecambe Bay Conservation Grazing Company. Warton Crag and these livestock are registered organic status, as no chemicals or pesticides are used, and this is very beneficial for the good health of the soil, SSSI condition and wildlife of the site.

Autumn-winter grazing on the LNR is for 6 to 8 weeks, sometime between October and February each year. This is in conjunction with RSPB for shared grazing access and livestock water-bowser located on RSPB land. Three water troughs were purchased for the LNR in 2009, with the hope that they will fill with rain-water to provide livestock drinking water independently of the RSPB water-bowser supply, to give the option for a short spell of 3 weeks of summer grazing in July. Grazing livestock numbers are low (i.e. 4 to 8) with suitable docile, sure-footed cattle.

It is recommended that the grassland vegetation is monitored every five years by sample quadrats and fixed point photographs.

3. Overall management principles for the whole of Warton Crag nature reserves

3.1 Habitat and species management

Working operations are to be kept within the constraints of generic and task specific Health and Safety regulations and practices; within the designated SSSI, within the constraints given in the SSSI Notification (Appendix 2) and with respect to the Countryside Stewardship agreement during the term of the agreement.

3.1.1 Limestone grassland

Natural succession means that open grassland will develop scrub and eventually trees/woodland. This can only be averted if there is very strong grazing pressure from wild animals such as rabbits and deer or by the introduction of domesticated grazing animals.

Winter grazing by a small number (e.g. 8 to 12) docile, sure-footed breeds of cattle (e.g. Devonshire Reds and English Whites) during the late Autumn-Winter period (between October and February) has been introduced to produce a more diverse sward for plants and butterflies (see section 3.1.2 Wood Pasture). The 'sheep enclosure' on the LNR was formerly grazed by a hardy native breed of Hebridean sheep during September and October. However, this proved difficult to manage and to shepherd livestock in and out, so the enclosure has now (2003) been opened up with two large gaps in the fence line, to allow the cattle to graze this area when they are on the rest of the LNR.

Winter grazing needs to be supplemented with manual scrub control using staff, volunteers, and/or contractors to keep herb-rich calcareous grassland areas open by cutting back developing and regenerating woody thorn-scrub and colonising saplings. Scalping the peripheral edges of scrub by one or two metres will help prevent it spreading, but some thickets are to be retained as nesting habitat for breeding birds, as shelter and nectar sources for invertebrates and to act as a wind-break against the prevailing westerly winds. The number of scattered clumps of scrub should be reduced and common species of trees that cast shade over herb-rich grassland and escarpments removed. Brash-wood should be either made into habitat piles or bonfired on suitable sites and logs stacked securely and tidily in woodland as deadwood habitat. Glades and/or 'embayments' or 'scallops' should be cut into dense thickets of Blackthorn and Hazel scrub to expose any relic grassland and associated ant hills. Winter graze to enhance sward. Colonising or regenerating scrub should be removed in the winter months where there are ant-hills, in order to allow them full warmth of sunshine. Damage to ant-hills should be avoided as they are a very important component of the ecology of grassland and of Violet.

Since 2011 a short period of summer grazing for 3 weeks in July by a small number of heifers (usually 4 to 8) has been trialed. This grazing period is restricted to ensure that nectar-providing plants, such as Knapweed, are not grazed off during the most significant nectar-feeding period of insects, particularly the fritillary butterflies. The summer grazing is also restricted by the availability of drinking water for the cows, which is only available from 3 rain-catchment water-troughs.

3.1.2 Wood pasture

Historically, grazing is likely to have played an important part in determining the structure and nature of our woodlands, whether by wild herds or domestic animals. Chatters and Sanderson (see bibliography) have identified three types of grazed lowlands woods - grazed high forest, parkland and grazed coppice. The last is defined as wood managed as a coppice but which is also subject to deliberate grazing by domestic animals. This is the scenario that has prevailed in much of this area since pre-history (Romano/British Period).

It is felt that since the introduction of light winter grazing with cattle, in addition to the existing uncontrolled deer browsing and grazing by Rabbit, this wood pasture/grazed coppice most satisfactorily describes the scrub and woodland management, particularly within the LNR.

After cutting, coppiced hazel stools are allowed to regrow as scrub woodland or woodland under-storey, to the point where there is bare earth on the ground as part of a normal cycle of coppicing (usually 10 to 15 years). Attempts to protect the coppice re-growth by fencing and dead-hedging have not shown significant benefits and it is now thought more beneficial to leave coppiced locations open for longer to browsing and grazing to benefit the ground flora, particularly if close to calcareous grassland sward. To compensate, when coppicing hazel, as many new young shoots as possible should be left growing from the base, allowing regeneration and fruit production to be that much sooner than may otherwise have been the case. However, by not fencing the coupes, the resultant browsing means that the cycle will take longer to reach high woodland. This is not a problem as the topography and inaccessibility of the site means that it is not feasible to manage the scrub or woodlands for economic commercial purposes. It is important however, to continue the coppice rotation of Hazel regeneration to benefit flora and invertebrates and enhance the mosaic of habitats.

3.1.3 Rock habitats, escarpments, pavements, screes and scars

Cut and clear common vegetation species from the southerly aspect of rocks and boulders in order to maximise the amount of solar radiation to heat up the rock. This heat often radiates the habitat after dark and is helpful to invertebrate activity. Cut and clear common trees and thorn-scrub from the foot of the escarpments to expose the rock faces. Above the escarpments, clear thorn-scrub back by one or two metres, to open up grassland rides along the top. Keep the limestone grassland on the herb-rich escarpments open from scrub invasion. Avoid cutting and damaging the ground flora along the base of rocks and escarpments in order to avoid disturbance and damage to funnel-web spiders and their nests, which are frequently located at the base of these rocks.

Cotoneaster shrubs (non-native) may be found on many parts of the Crag, particularly on rocks and pavements where they have probably established from gardens via bird-droppings. As non-native species, they should be cut and removed or bonfired, minimising spillage of berries, to avoid further germination. When possible, pulling-up cotoneaster by the roots is preferable to cutting to avoid regrowth.

Scattered patches of scrub on screes at foot of the lower scarp on the LNR are useful for nectaring and perching for butterflies and do not threaten the Dark Red Helleborine but should be cut back as they begin to spread.

Thin the scrub peripheral to the pavement areas to prevent encroachment. Many of the trees are stunted but any that cast too much shade should be removed, e.g. Sycamore. See 3.2.1 Recreation (also Objective 5, page 13). When necessary, cut and remove scrub to maintain areas of open pavements. Grazing these areas may help with this.

3.1.4 Bracken management

Management of the Bracken areas is dominated by the need to maintain suitable breeding conditions for the threatened High Brown, Pearl-bordered, Small Pearl-bordered and Dark Green Fritillary butterflies. Suitable habitats for these species occur in open sheltered situations often where there are mosaics of grass, bracken and scrub. The Bracken fronds act like a woodland edge for the Violet food plants and Bracken litter

provides a warm micro-climate for development of the immature stages (see bibliography re. High Brown Fritillary Action Group reports). On the LNR, the butterfly transect walks highlight the main Bracken field as the main area where High Brown Fritillaries are present and active.

The previous 16-plot management of the main bracken field on the LNR is to continue, but with modifications to the 8-year 2-plot rotation. Also the re-introduction of grazing livestock during this time has additional effects. After more than 12 years of implementing recommendations by Butterfly Conservation officers, a review of the regime was discussed at a field meeting with Butterfly Conservation officers on the LNR bracken field in 2016. Plots in the lower half of the field generally have deeper leaf-litter and an ideal incidence of violet, whereas plots in the upper half have a greater incidence and an apparent increase of grasses beneath the bracken, and violets are not quite so frequent. Abundant frequency and optimum growing conditions for violet plants and optimum conditions for egg-laying and larvae of fritillary species, is the management objective (Objective 2, page 13).

The LNR bracken field is divided into 16 plots, with a cutting rotation of numbered plots relating to a specific year. The boundaries of each plot are identifiable in the field as more permanent static features of boulders, trees and hawthorn 'hedge-lines'. A maximum of two plots are to be cut each year, sometimes restricted to one plot in a year, depending on the incidence of violet plants and grass cover beneath the bracken.

The previous 8-year rotation of managing 2 plots per year should be further relaxed if an increased incidence of grasses occurs; and leaf-litter raking much lighter in plots of the upper half of the field. Mowing with a power scythe, either one, or occasionally two plots per year, also cutting any regenerating thorn-scrub or common tree saplings within the plots, but avoiding damage to ant-hills, Violet plants, etc.. Lightly rake off bulk of Bracken leaf-litter in January, prior to treading the new Bracken croziers in late-May/early June in the same plots. All shoots within the plot are to be left where they fall on the ground.

Winter grazing by cattle helps to trample and break up the bracken leaf-litter, thereby increasing germination sites for violets. The cattle trampling in the bracken will also help create a woodland edge effect for light, warmth and high brown fritillaries to penetrate the bracken area in summer when egg-laying.

3.1.5 Woodland and scrub

Maintain areas of 'high forest' that are present in the LWT reserve, with glades to encourage flora and invertebrates. Maintain woodland areas in LNR as wood pasture by selective thinning of common trees species and permitting cattle to graze in winter. Leave dead trees as standing timber and habitat for insects and woodpeckers where there is no danger to the public. Otherwise make safe by felling and leave timber on the woodland floor as deadwood habitat. Differentiate management of grassland and woodland by raking off cuttings and brash from grassland to keep an open sward, and in woodland, leave moderate amounts of brash and deadwood on the ground as woodland habitat. Between lateral bands of scrub some bands will be cut (while retaining shelter from winds) so as to provide flight-corridors between rides for butterflies.

3.2 Visitor recreation, interpretation and education

3.2.1 Recreation

The reserve is within the Arnside & Silverdale AONB so appropriate quiet recreational pursuits such as walking; bird-watching, studying natural history, sight-seeing, picnicking and small group climbing (less than

6 people) are welcome.

The site is regularly used by dog walkers, and dog fouling near the entrances from Crag Road is an unpleasant and health risk problem. Removal of dog-waste by dog-owners should be encouraged and enforced. Dog-waste should be put in sealed plastic bags and deposited in the litter-bin box at the Warton Parish Council car park, the Main Quarry car park, or in the litter bin by the lay-by on Crag Road. Dog-owners also frequently allow their animals to run off their lead on the reserve and therefore may disturb wildlife, particularly roe deer and their young, other small mammals and ground-nesting birds. Owners should control their dogs when there are grazing livestock in winter and the cattle should be robust enough not to be intimidated by dogs.

Rock climbing by private individuals on Pinnacle and Upper Crag is permitted but no large, commercial or educational groups are allowed for Health & Safety reasons and because of the botanically sensitive nature of the site. Rock climbing in the Main Quarry is restricted and closed during the nesting and breeding season of the Peregrine and other species in the main quarry.

Other outdoor 'amenity' activities, such as loud music, drinking parties, bonfire parties, mountain bike riding, horse riding, model aeroplane flying, hang gliding, the use of drones, etc. are not regarded as appropriate quiet recreation for this important nature conservation site, and should be discouraged (see LNR By-laws Appendix 5).

3.2.2 Interpretation boards

Interpretation boards for the Crag are located at the two entrances to the LNR from Crag Road, and at two entrances into the LWT reserve from Occupation Road bridleway. They give details of the natural history of the site and indicate the permissive paths. In addition a copy of the by-laws (Appendix 5) has been affixed to the rear of each interpretation board. Lancashire County Council has an alternative four-panel display in the main quarry car park. All signs need to be regularly checked for damage or graffiti and maintained in good order.

3.2.3 Educational information and Guided Visits

In 2009 a free site leaflet, 'A Guide to Warton Crag Nature Reserves' was produced by the AONB Team on behalf of the Warton Crag nature reserve partners. This leaflet is available from Warton Post Office village store, the AONB office at Arnside, Leighton Moss RSPB Visitors Centre and from the Wildlife Trust for Lancashire. The leaflet can also be viewed and downloaded from the Arnside & Silverdale AONB website at www.arnsidesilverdaleaonb.org.uk

The reserve is regularly used for educational and study purposes by groups and individuals, ranging from primary schools to universities and national organisations (e.g. Butterfly Conservation, National Grazing Forum) and this should be encouraged. Feed-back and copies of any study reports are always of interest to the land managing organisations. Permission, advice and guidance for specific studies is readily discussed and encouraged by staff on the management teams, such as the Arnside & Silverdale AONB Team (for contact details see final page). However, no collecting of specimens is permitted under the SSSI notification, and any particular studies and projects must be in consultation with Natural England and the AONB Team. Any research findings are always welcome and will help add to the understanding of the ecology and management of the Crag.

Guided Educational Visits, particularly for Key Stage 1 to Key Stage 4 (Primary school Year 1, age 6, to Secondary school, Year 11, age 16) can be arranged by contacting the Arnside & Silverdale AONB Team.

3.3 Estate services

3.3.1 Maintenance of main path network

Paths will be kept clear of obstructions, e.g. encroaching vegetation such as bramble and shrubs. Fallen wind-blown trees will be cleared from paths as soon as reasonably feasible (3.4.4 Warden duties, page 22). Wind-blown, leaning or hazardous trees to access paths will be checked, assessed and made safe as soon as reasonably feasible, and will be taped off with red and white hazard warning zebra-tape as soon as recognized as a hazard, until the hazard can be dealt with appropriately.

3.3.2 Maintenance of boundaries

Boundary dry-stone walls, gates and fences will be repaired as and when necessary as soon as is feasible. Boundary walls and fences to the east, north and western sides of the LNR are the responsibility of the respective adjoining land-owners.

3.3.3 Maintenance of notices and interpretation boards

A regular check should be made on the condition of entrance notice and interpretation boards and arrangements made when necessary for their re-varnishing, repair or replacement at the earliest opportunity. Beyond annual maintenance of panels and frames, it may be reasonably expected to need to renew and update panels every 10 years or so.

3.3.4 Litter and debris

Litter and debris will be removed from site. Dog waste should be scooped and bagged by the dog-owners and deposited in either of the bins, located in the Main Quarry car park, by the lay-by on Crag Road, or in Warton Parish Council car park.

3.3.5 Photographic evidence and monitoring

Photographic evidence of practical habitat management work, before and after, is required by Natural England to be submitted with each annual claim.

Photographic monitoring, observations and notes of the effects of grazing by livestock are also required to help monitor and inform decisions about the effectiveness and timing of grazing livestock, particularly in the summer grazing period.

3.4 Public relations and administration

3.4.1 Advisory Management Group meetings

An Advisory Group meets at least twice a year, with representatives from Arnside & Silverdale AONB Team, Lancaster City Council, RSPB, LWT, Lancashire County Council, Natural England and Warton Parish Council to discuss management of the whole Warton Crag Nature Reserve.

3.4.2 Permits for research and sampling

Written permits and consent for research work on the SSSI must be obtained from Natural England on an

individual basis for study of insects, invertebrates and other ecological studies. Permission and agreement must also be obtained from the respective land-owner.

3.4.3 Site safeguard

Any unauthorised activities on or near to the reserve should be reported immediately to Lancaster City Council, Lancashire County Council, RSPB, LWT or the Police if appropriate, with outline details of the offence and any details of vehicle registration numbers, vehicle type and colour, date, time, etc. (see Appendix 3). Individuals are not advised to approach a miscreant directly, but to note details and contact the appropriate authority. A set of by-laws have been approved for the LNR and are displayed on the reverse of the entrance interpretation boards to the LNR (Appendix 5).

3.4.4 Warden for Warton Crag Local Nature Reserve

Ensure regular, frequent and varied patrol visits around the site. These are combined with warden duties at Trowbarrow LNR in Silverdale.

Check for damage and repair or report to appropriate authority. See that visitors and users of the site are abiding to the By-laws and SSSI Notification.

Ensure general maintenance of the site, removing litter and carrying out minor repairs, or reporting more significant requirements to the AONB Team, or Lancaster City Council, or local Police, or other authority, as appropriate.

Monitor the site on a regular basis, particularly after strong winds, for dangerous wind-blown trees or other hazards that may arise and report to the AONB Team, or Lancaster City Council, or Police, or other authority, as appropriate and take remedial measures to make safe (i.e. hazard notices, call upon appointed qualified chain-saw operator).

Advisory Group meetings

Attend and report to the twice-yearly Advisory Group meetings and site visits.

Grazing monitoring

Assist grazier when grazing livestock are on site in autumn-winter by ensuring gates and boundaries are secure and report relevant observations of grazing regime.

Monitor effects of grazing by carrying out a botanical survey of grasses and flora by quadrats survey and fixed point photography once every two years in July (Objective 4).

Carry out ecological monitoring by photographs, transects and quadrats (Objectives 4, 8 and 10).

Education group visits guide, and research studies and projects

Host and guide a minimum of four Educational group visits per year that conform to the criteria set out by Natural England for educational visits in the stewardship agreement, and actively promote and encourage local primary schools to take advantage of the Educational group visits. Liaise and offer advice and guidance to groups or individuals wanting to carry out investigative surveys or research, ensuring that any pre-requisite permissions and written consent have been obtained from both the land-owner and Natural

England for the SSSI.

Butterfly transect – liaise with, and give support to, the volunteer butterfly transect surveyor(s) to ensure they can maintain their weekly survey from April to September each year, along established transect (Objective 4) and arrange substitute stand-in to cover absences.

3.5 Helpful research, survey and monitoring project ideas and suggestions

Educational institutions and individual students in particular, frequently enquire after possibilities and permission to carry out investigative survey projects on the Crag. These should be encouraged, ensuring that any pre-requisite permissions and written consent have been obtained from both the land-owner and Natural England for the SSSI. The following suggestions and project study ideas are some of the areas of study and information gathering that would be most useful:

Grazing livestock monitoring

Any research and study of the effects of the grazing livestock and the ecology of the site.

Vegetation monitoring

Any research and study of the effects of the grazing livestock on the grassland sward, tree and scrub browsing and the ecology of the site.

Ecology of Violet

Study of distribution, numbers and general ecology of *Viola* species with special reference to their use by fritillary butterflies as food plants (see Sutcliffe 1992). (Objectives 1 & 4)

Ecology of High Brown Fritillary

Study of habitat preferences of High Brown fritillary for feeding of adults and larvae, courtship etc. (see Warren 1991, Robinson 1992) (Objectives 2 & 4).

Monitoring vegetation changes

Following coppicing, scrub clearance, mowing, grazing and bracken control by means of photographs taken from marked points and some permanent quadrats (see Skelcher and Day 1994, Lewis 1991). Monitor the effects on the fauna (Objective 4).

Butterfly transect surveys

Weekly counts along three existing transect routes (RSPB, LNR and LWT - see Wilson 1988-93 and Map 13, Skelcher 1992 & in prep. and Map 11, and Newton 1990-93 and Map 15 respectively), including where possible managed areas. Records of nectaring plants to be collected at the same time if possible (Objectives 2 and 4). (Any netting under licence from Natural England).

Census of breeding birds

Annual census (using Common Bird Census methods) of breeding birds. Point counts of all species every three years (Objectives 3 and 4). Nest-box monitoring (under licence)

Invertebrate surveys

Encourage work on snails, moths, beetles, ants, bees, wasps and other invertebrates, by local naturalists and students, with appropriate licences if required (Objectives 2 and 4).

Small mammal surveys

The effects of coppicing on small mammals at Warton has already been investigated (Day, 1991). Further study of the recolonisation of recent coppice by small mammals and samples from other habitats would be useful (Objectives 3 & 4).

Plant and vegetation surveys

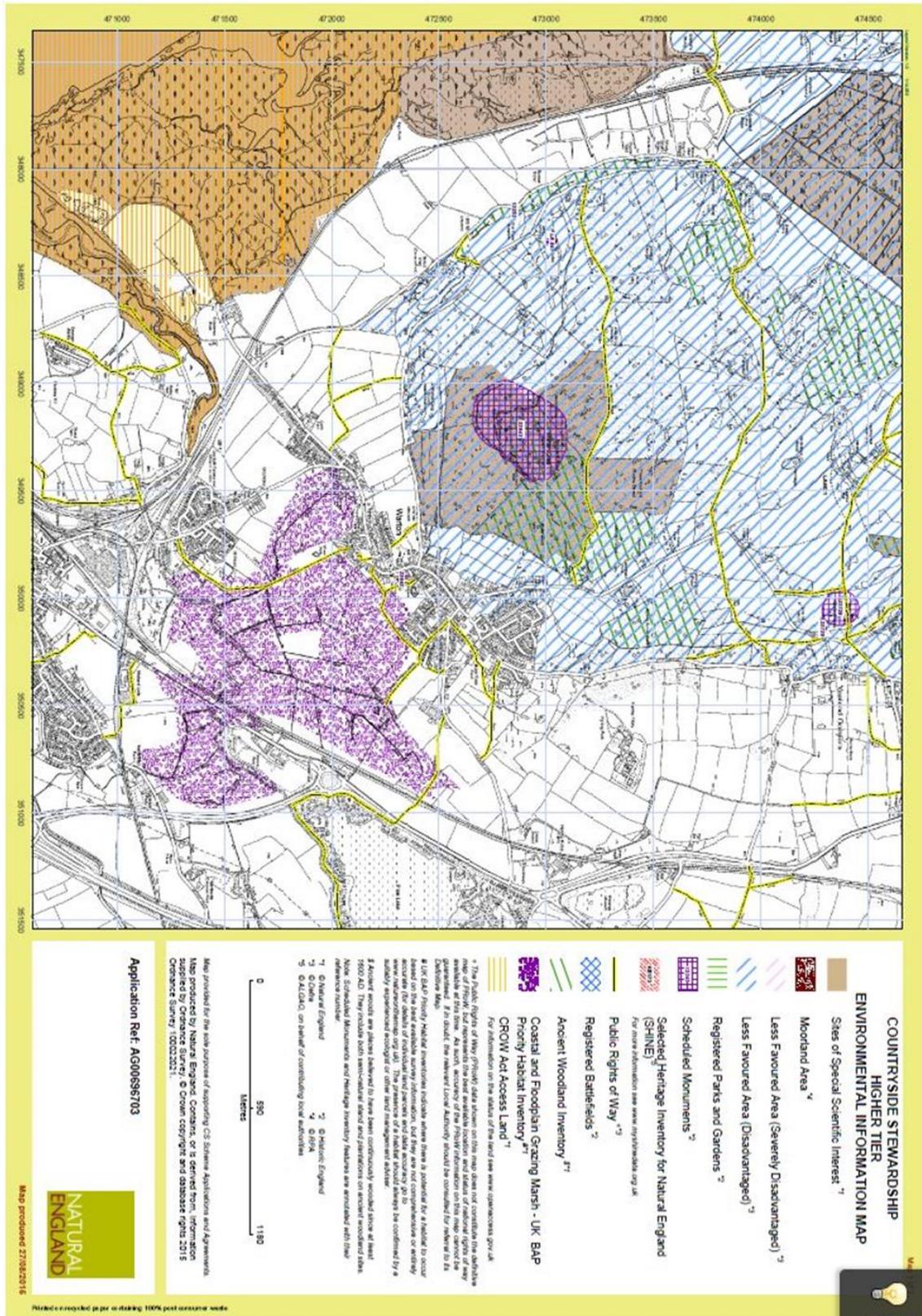
Fungi, lichens, mosses, liverworts and higher plants (Objectives 1, 3 & 4).

Visitor surveys and path surveys

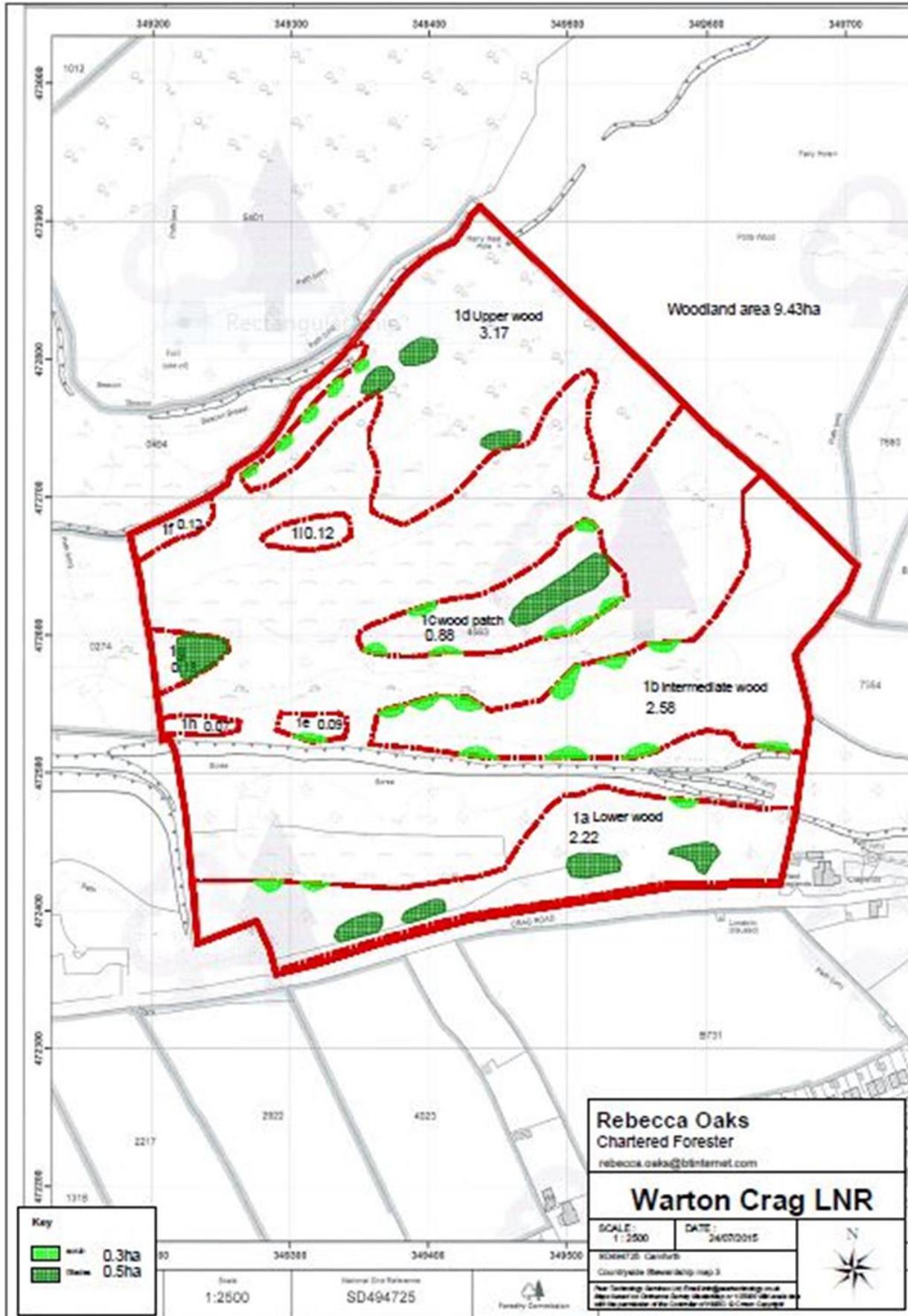
Monitoring use of the sites, car parks, effects of trampling on path sides, etc..

Appendix 1 Maps

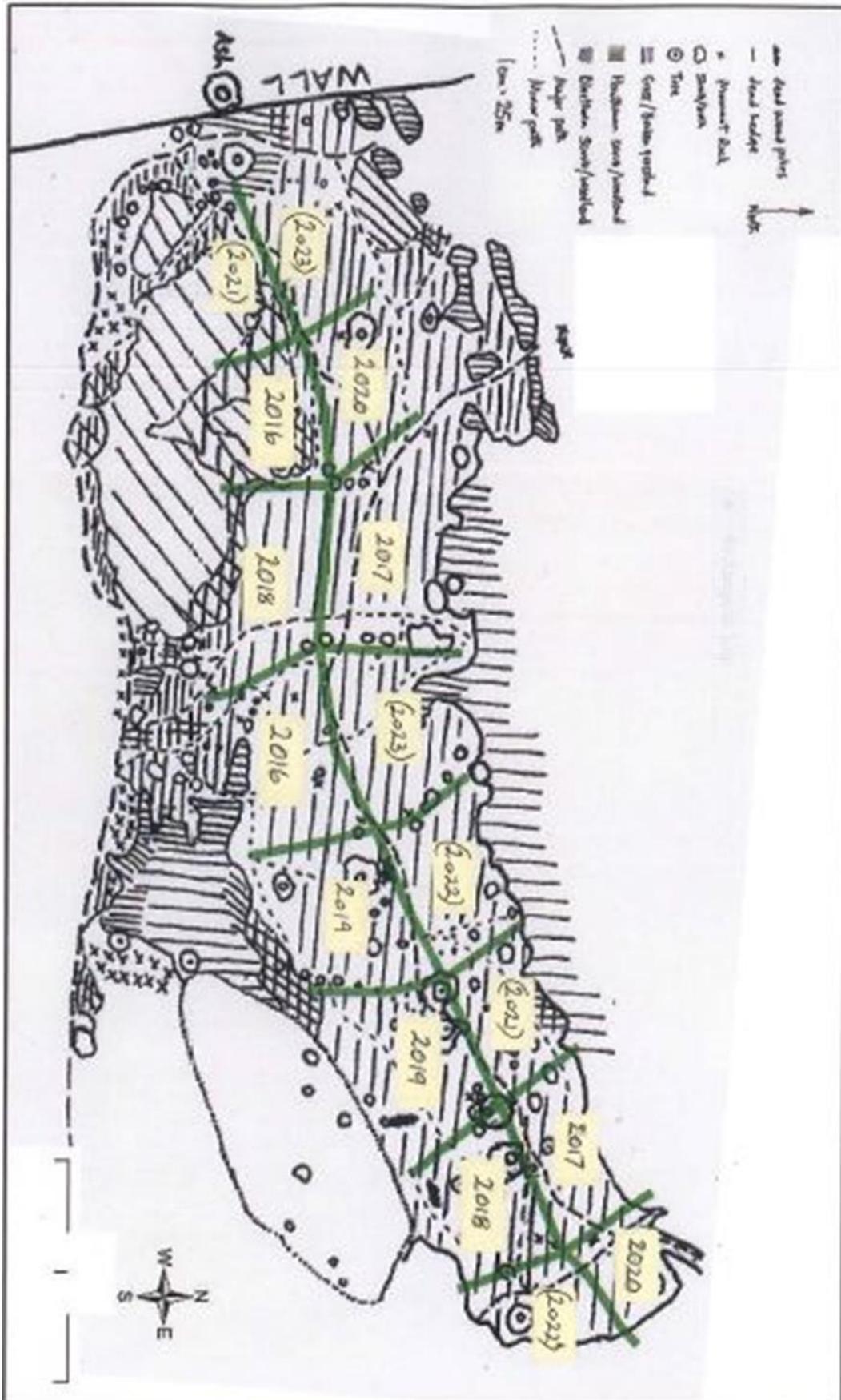
Countryside Stewardship Environmental Information Map of the area around Warton Crag



Countryside Stewardship agreement WD2 and WD7 Woodland areas Map



Bracken plots 2016 to 2020 (and 2023)



Appendix 2

Warton Crag SSSI Notification COUNTY:

LANCASHIRE

SITE NAME: WARTON CRAG DISTRICT:

LANCASTER

Status: Site of Special Scientific Interest (SSSI) notified under section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: Lancaster City Council

National Grid Reference: SD 494730

Area 73 ha. 180.4 ac.

Ordnance Survey Sheet 1:40,000: 97

1:10,000: SD 47 SE Date

Notified
(Under 1949 Act): 1976

Date of Last
Revision: ----

Date Notified
(Under 1981 Act): 1986

Date of Last
Revision: 1986

- Other Information:
1. This site is listed in "A Nature Conservation Review", ed. D A Ratcliffe (1977), Cambridge University Press.
 2. This site lies within the Arnside and Silverdale AONB.
 3. 48 acres of the site was designated as a Local Nature Reserve by the Lancaster City Council on 30 March 1984.
 4. *Sorbus lanceolata* is listed in the British Red Data Book - "Vascular Plants".
 5. Red Squirrel, a protected species listed under Schedule 5 of the above Act, are resident. (This was the case up to circa 1986 when Red Squirrel were affected by arrival of Grey Squirrel and Parapox virus they carried).
 5. Boundary revised by partial deletion on renotification.

Reasons for Notification:

Warton Crag is a limestone hill rising to a height of 163m, overlooking Morecambe Bay 2km north of Carnforth. It supports the best example of limestone grassland in Lancashire, some good examples of limestone pavement, an area of northern calcareous hazel-ash woodland and a number of plant species which are nationally rare or very restricted in their distribution, being confined to limestone habitats. The Crag is divided into Allotments by stone walls indicating an earlier history of use as rough grazing land but only two Allotments are grazed at present.

The limestone strata form a series of scars and terraces on the south side of the Crag. The terraces are covered by loess, a wind-blown post-glacial deposit which has given rise to quite a deep brown earth soil

supporting neutral grassland, now largely dominated by bracken and scrub. On the scars, screes and places where limestone pavement has been removed in the past the soil is a rendzina, a thin soil derived from limestone fragments. It is here that the limestone grassland is to be found, consisting mainly of Blue-moor Grass *Sesleria albicans*, (common on limestone but very restricted nationally) accompanied by Sheep's-fescue and Meadow Oat-grass with many characteristic herbaceous plants such as Rockrose, Wild Thyme, Lady's Bedstraw, Purging Flax, Kidney Vetch, Horseshoe Vetch, Ploughman's Spikenard, Mullein, Common Centaury, Rue-leaved Saxifrage, the Biting and White Stonecrop and species which are restricted nationally such as Spring Cinquefoil, Limestone Bedstraw and Spring Sandwort. The population of the nationally rare Dark Red Helleborine is the best in the Arnside and Silverdale AONB. On rocks and cliffs the ferns Wall-rue and Maidenhair Spleenwort are common, and Red Valerian and Marjoram are conspicuous. In a few places the nationally rare Lancashire Whitebeam *Sorbus lancestransis*, which is confined to the vicinity of Morecambe Bay, and an uncommon species of Polypody Fern *Polypodium australe* occur. A number of hawkweeds have been recorded including two nationally rare species; *Hieracium cymbifolium* and *H. psuedostenstroemii*.

Potts Wood and Strickland Wood consist mainly of northern calcareous Hazel-Ash woodland, which is typical of limestone situations which have reverted to woodland from a former history of grazing use. They are dominated by ash and sycamore, with occasional Sessile Oak, Birch and groves of Yew. Hazel and Holly are common shrubs, and the ground vegetation is dominated by Dog's Mercury and False Brome grass. This type of woodland is also invading the terraces and pavements of the more open allotments in the form of scrub accompanied by Hawthorn, Blackthorn, Wild Rose and other shrubs.

The open areas on the south facing slopes of the Crag are a valuable site for butterflies. Over 20 species occur including the High Brown Fritillary and Northern Brown Argus which are notably rare species nationally. The woodlands are valuable for breeding birds and up to the mid-1980s, Red Squirrel.

Appendix 3

Operations Likely to Damage the Features of Special Interest

Natural England, under the Wildlife and Countryside Act, 1981, must be informed and consent gained from them before any of the following operations can be carried out within the area designated SSSI: -

Standard Ref. No.	Type of operation
1.	Cultivation, including ploughing, rotovating, harrowing and re-seeding.
2.	Changes in the grazing regime (including type of stock, intensity or seasonal pattern of grazing and cessation of grazing).
3.	Changes in stock feeding practice.
4.	Changes in the mowing or cutting regime (including hay-making to silage and cessation).
5.	Application of manure, fertilisers and lime.
6.	Application of pesticides, including herbicides (weedkillers).
7.	Dumping, spreading or discharge of any materials.
8.	Burning (and) changes in the pattern or frequency of burning.
9.	The release into the site of any wild, feral or domestic animal*, plant or seed.
10.	The killing or removal of any wild animal *, including pest control.
	* "animal" includes any mammal, reptile, amphibian, bird, fish or invertebrate.
11.	The destruction, displacement, removal or cutting of any plant remains, including tree, shrub, herb, dead or decaying wood, moss, lichen, fungus, leaf-mould, turf etc.
12.	Changes in tree and/or woodland management, including afforestation, planting, clear and selective felling, thinning, coppicing, modification of the stand or underwood, changes in species composition, cessation of management.
13a.	Drainage (including moor-gripping, the use of mole, tile, tunnel or other artificial drains).
14.	The change of water levels and tables and water utilisation (including irrigation, storage and abstraction from existing water bodies and through boreholes).
20.	Extraction of minerals including peat, shingle, sand and gravel, topsoil, sub-soil, chalk, lime, limestone pavement, shells and spoil.
21.	Construction, removal or destruction of roads, tracks, walls, fences, hard-standing, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground.

22. Storage of materials likely to damage or destroy interest.
23. Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling.
24. Modification of natural or man-made features (including cave entrances), clearance of boulders, large stones, loose rock scree and battering, buttressing or grading rock-faces and cuttings, infilling of pits and quarries.
26. Use of vehicles or craft likely to damage or destroy features of interest.
27. Recreational or other activities likely to damage or destroy features of interest.
28. Introduction of game or water fowl management and hunting practices.

Appendix 4

Warton Crag Limestone Pavement Order

WILDLIFE AND COUNTRYSIDE ACT 1981 SECTION 34 NOTIFICATION TO LANCASHIRE COUNTRY COUNCIL

The Limestone Pavement Order and Schedule applicable to Warton Crag is duplicated verbatim on the following pages, 34 to 39.

LIMESTONE PAVEMENT AT WARTON CRAG AND GRISEDALE WOOD LOCATION AND STATUS

County;	Lancashire
District	Lancaster City Council
Parishes	Warton and Yealand Conyers
Local Planning Authority:	Lancaster City Council National
Grid Reference:	SD 490734

The pavement is situated at the southern end of the Arnside & Silverdale Area of Outstanding Natural Beauty (AONB), immediately north-west of Warton village and three kilometres north of Carnforth.

In addition to Warton Crag and Grisedale wood the notification covers a number of other areas of scrub, woodland and pasture both north and south of Occupation Road. It includes Warton Crag Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981. Part of the SSSI is designated as a Local Nature Reserve by Lancaster City Council, whilst Potts Wood and Strickland Wood are leased by the Lancashire Trust for Nature Conservation. The Royal Society for the Protection of Birds owns land within and adjoining the SSSI and these three bodies jointly manage their combined land holdings as Warton Crag Nature Reserve.

LANDSCAPE

Warton Crag is a very prominent Carboniferous limestone hill. It rises to an altitude of 163m OD and is the highest point in the AONB. From the south, the limestone character of the Crag dominates the landscape with a striking series of scars and terraces and a large disused quarry. From the north, the landscape is more gentle and predominantly wooded in character, forming an attractive background to views from Leighton Hall and an impressive contrast with the flat, low-lying reed-beds and marshes of the adjoining Leighton Moss.

Limestone pavement occurs extensively throughout the area and is a very important landscape feature. Spectacular outcrops of open and semi-open pavement are found around the top of the Crag on either side of Occupation Road, on the southern terraces of the Crag and elsewhere. In addition, almost all of the many copses and areas of woodland occur on pavement, and in some cases (e.g. Grisedale Wood, Stoney Wood and Strickland Wood) the outcrops are very impressive, despite some scattered damage which has occurred in the past. The retention of copses on outcrops of pavement amidst improved pastures is an attractive and important feature of the area, especially on the Leighton Hall Estate.

A good network of well-used public rights of way and concessionary paths traverse the area and enable the public to see and enjoy the pavements and the superb views of the Pennines, Bowland Fells, Morecambe Bay and the Lake District. A nature trail leaflet is available for the Local Nature Reserve.

The Crag has been of importance to man for a very long time. Objects of Neolithic age (2000 BC) and of Romano-British age (200 AD) have been found in caves at Crag Foot. On the summit there are remains of ramparts forming part of the defence of a hill fort built by the Brigantes (Ancient Britons).

FLORA AND FAUNA

Most of the outcrops of open pavement were examined in detail by Ward and Evans¹ (1975) in their nationwide survey of limestone pavements. Floristically these pavements are generally of a very high quality, some ranking amongst the most valuable in the Arnside and Silverdale area, and indeed in Britain. They are of special interest for the following reasons:

1. The occurrence of a number of nationally rare* species whose presence is closely associated with the pavement habitat. These include rigid buckler-fern (*Dryopteris villarii*), dark red helleborine (*Epipactis atrorubens*), mountain St John's-wort (*Hypericum montanum*), limestone fern (*Gymnocarpium robertianum*) and angular solomon's-seal (*Polygonatum odoratum*).

In addition, the nationally rare+ Lancashire whitebeam (*Sorbus lancestransiensis*), occurs in a few places².

2. The occurrence of a number of uncommon* herbs and ferns including enchanter's- nightshade (*Circaea lutetiana*), traveller's-joy (*Clematis vitalba*), lily-of-the-valley (*Convallaria majalis*), brittle bladder-fern (*Cystopteris fragilis*), ploughman's-spikenard (*Inula conyza*), mountain melick (*Melica nutans*), wood melick (*M. uniflora*), wall lettuce (*Mycelis muralis*), hard shield-fern (*Polystichum aculeatum*) and hairy violet (*Viola hirta*). Nationally uncommon* trees and shrubs include juniper (*Juniperus communis*), buckthorn (*Rhamnus catharticus*), and yew (*Taxus baccata*). There are also occurrences of the uncommon³ spindle (*Euonymus Europaeus*) and the small-leaved lime (*Tilia cordata*) which is near to the northern limit of its range³.
3. The frequent occurrence of the nationally scarce+ blue moor-grass (*Sesleria albicans*).
4. The occurrence of many characteristic limestone pavement species. Those found most frequently include false oat-grass (*Arrhenatherum elatius*), maidenhair spleenwort (*Asplenium trichomanes*), wall-rue (*Asplenium ruta-muraria*), false brome (*Bachypodium sylvaticum*), cock's-foot (*Dactylis glomerata*), male-fern (*Dryopteris filix-mas*), wild strawberry (*Fragaria vesca*), herb-Robert (*Geranium robertianum*), dog's mercury (*Mercurialis perennis*), hart's-tongue (*Phyllitis scolopendrium*), bracken (*Pteridium aquilinum*), wood sage (*Teucrium scorodonia*), and common dog-violet (*Viola riviniana*).

Many of the extensive outcrops of ungrazed wooded pavement support good examples of a characteristic limestone woodland flora. Ferns such as hart's-tongue and male-fern are widespread and the most frequent herbs include herb-Robert, dog's mercury, ivy (*Hedera helix*), honeysuckle (*Lonicera periclymenum*), wood sage and false brome, whilst trees and shrubs include, ash, oak, , sycamore, birch, hazel, holly, hawthorn and blackthorn. Of particular interest is the unusually frequent occurrence in places of yew and small-leaved lime, especially in Grisedale Wood.

Warton Crag is a very important site for butterflies. Over 20 species occur including the high brown fritillary (*Argynnis adippe*) which is classed as critically endangered)

and the northern brown argus (*Artica artaxerxes*) which is vulnerable. The woodlands are also valuable for breeding birds.

GEOLOGY AND PHYSIOGRAPHY

The area shows a wide variety of limestone pavement features typical of the varied ground conditions.

There is a good range of surface features including pits, rills, pools and capture situations and many different runnel forms and patterns. Whilst these features can be most readily seen on the many open pavement areas, they are also present on the wooded pavements.

Of particular interest is some massive inclined pavement, dipping at 15-20° to the east. This has an irregular, slightly undulating surface with sparse medium to deep grykes and sub-linear runnels of varying depths. There is also a small, but very good, example of a whale back ice scoured scar edge pavement.

BOUNDARY

The following information is appended:

1. Location Plan
2. Limestone pavement notification boundary map.
3. Land ownership map and notes.

NOTIFICATION

The Nature Conservancy Council for England and the Countryside Commission are both of the opinion that the limestone pavements within the area indicated on the accompanying map are of special interest by reason of their flora, fauna, geological and physiographical features. They hereby notify this fact to Lancashire County Council in accordance with the duty imposed upon them by Section 34(1) of the Wildlife and Countryside Act 1981.

RECOMMENDATION

The Nature Conservancy Council for England and the Countryside Commission advise that the character and appearance of the land hereby notified to you would be adversely affected by the removal of the limestone or by its disturbance in any way whatever, and recommend that Lancashire County Council should make a Limestone Pavement Order under Section 34(2) of the Wildlife and Countryside Act 1981.

REFERENCES

¹ Ward, S D and Evans, D F 1975. 'Limestone Pavements'. Volume III. Morecambe Bay East.

*As defined in Ward, S D and Evans, D F. 'Conservation Assessment of British Limestone Pavements based on Floristic Criteria'. Biological Conservation (9) 1976.

+As defined in 'Guidelines for the selection of Biological SSSIs'. NCC. 1989.

² Rich, T C G and Baeckers, M 'The Distribution of *Sorbus lancstriensis*'. Watsonia, Vol 16, Part 1, 1986.

³ As defined in Livermore, L A and PD 1987. The flowering plants and ferns of North Lancashire.

Dated 10th March 1992

THE LANCASHIRE COUNTY COUNCIL

(Warton Crag and Grisedale Wood) LIMESTONE

PAVEMENT ORDER 1992

G A JOHNSON

CHIEF EXECUTIVE/CLERK LANCASHIRE COUNTY

COUNCIL PO BOX 78

COUNTY HALL PRESTON PR1

8XJ

LANCASHIRE COUNTY COUNCIL LIMESTONE

PAVEMENT ORDER

WILDLIFE AND COUNTRYSIDE ACT 1981: Section 34

WHEREAS

1. The Lancashire County Council ('the County Council') is the local planning authority for the area within which the land described in the first Schedule hereto is situated.
2. The County Council has been jointly notified by the Nature Conservancy Council for England and the Countryside Commission under the provisions of Section 34(1) of the Wildlife and Countryside Act 1981 ('the Act') that they are of the opinion that the land described in the First Schedule hereto and which comprises a limestone pavement is of special interest by reason of its flora, fauna, geological and physiographical features.
3. It appears to the County Council that the character or appearance of the said land is likely to be adversely affected by the removal of the limestone or by its disturbance in any way whatever.

IT IS HEREBY ORDERED that:

1. The land situate at Warton Crag and Grisedale Wood, Warton and Yealand Conyers in the County of Lancashire described in the First Schedule hereto be designated and the removal or disturbance of limestone on or in the said land be prohibited in accordance with the provisions of Section 34(2) of the Act.
2. This Order shall take effect from the date hereof and shall cease to take effect nine months from that date unless the Secretary of State for the Environment has previously given notice under paragraph 6 of Schedule 11 to the Act that he has considered the Order and does not propose to amend or revoke it or he has amended or revoked it or the County Council has itself revoked it.
3. With effect from the date hereof the provisions of Section 34(4) and 34(5) of the Act (which are set out in the Second Schedule hereto) shall take effect as respects the land designated by this Order.
4. This Order may be cited as 'The Lancashire County Council (Warton Crag and Grisedale Wood) Limestone Pavement Order 1992'.

GIVEN under the Common Seal of the Lancashire County Council this 10th day of March One thousand nine hundred and ninety two.

THE FIRST SCHEDULE

ALL THAT land situated at Warton Crag and Grisedale wood in the parishes of Warton and Yealand Conyers in the County of Lancashire as the same is shown edged red on the plan attached to this Order.

THE SECOND SCHEDULE

34(4) If any person without reasonable excuse removes or disturbs limestone on or in any land designated by a limestone pavement order he shall be liable:-

- a) on summary conviction, to a fine not exceeding the statutory maximum
- b) on conviction on indictment, to a fine.

34(5) it is reasonable excuse in any event for a person to remove or disturb limestone or cause or permit its removal or disturbance, if the removal or disturbance was authorised by a planning permission granted on an application under Part III of the Town and Country Planning Act 1990.

THE COMMON SEAL of

The Lancashire County Council was
hereunto affixed in pursuance of a
resolution dated the 12th day
of February 1992 authorising the sealing
hereof.

Appendix 5

Byelaws for Warton Crag Local Nature Reserve

Lancaster City Council in exercise of the powers conferred upon it by Sections 20, 21(4) and 106 of the National Parks and Access to the Countryside Act 1949 in accordance with Section 236 of the Local Government Act 1972 hereby make the following byelaws for the protection of the Local Nature Reserve at Warton Crag in the Parish of Warton in the County of Lancashire.

1. In these byelaws

- (1) "The Reserve" shall mean the pieces or parcels of land containing in the whole 19.4 hectares or thereabouts and situated in the Parish of Warton in the County of Lancashire declared to be managed as a Local Nature Reserve by the declaration dated 30 March 1984 made by Lancaster City Council in pursuance of Section 21 of the National Parks and Access to the Countryside Act 1949, and the Reserve, is for the purpose of identification, shown as nearly as may be, on the map annexed to these byelaws and therein coloured pink.
- (2) "The Council" shall mean Lancaster City Council.
- (3) "Firearm" shall have the same meaning as in Section 57 of the Firearms Act 1968.

2. Within the Reserve the following acts are hereby prohibited unless authorised by a permit issued by the Council in accordance with Byelaw 3, or are necessary to the proper execution of his duty by an Officer of the Council or by any person, or servant of any person, employed or authorised by the Council.

DAMAGE TO OR DISTURBANCE OF THINGS IN THE RESERVE

- (2) Spreading or using any net, or setting or using any lamp or other instrument, or any snare or lure, for the taking, injury or destruction of any living creature.
- (3) Taking, molesting or intentionally disturbing, injuring or killing any living creature.
- (4) Taking or intentionally disturbing or destroying the eggs, larvae, pupae or other immature stages, or the place used for the shelter or protection of any living creature.
- (5) Intentionally removing or displacing any tree, shrub, plant, fungus or part thereof, or any unfashioned mineral thing including water.

BRINGING ANIMALS INTO THE RESERVE

- (6) Intentionally bringing or permitting to be brought, into the Reserve any living creature, or the egg of any living creature, or any plant, or any seed of any other plant, in circumstances that it is likely that such creature or plant will reproduce or propagate itself, or such egg will hatch, or such seed will germinate.
- (7) Bringing into, or permitting to remain within, the Reserve any dog unless it is kept on a lead or under proper control, or any other animal unless it is kept under proper control and is prevented from worrying or disturbing any animal or bird.

- (8) Turning out any animal or poultry to feed or graze.

USE OF VEHICLES

- (9) Driving, riding, propelling, or leaving any mechanically propelled vehicle or bicycle elsewhere than on a highway or on a road, or in a place indicated by a notice as being available for the purpose.
- (10) Landing any aircraft except in case of emergency.
- (11) Launching or landing a hang glider except in an emergency.
- (12) Operating any hang glider at such a height that persons on the ground or in buildings may be inconvenienced or annoyed.

USE OF CERTAIN EQUIPMENT

- (13) Using any apparatus for the transmission, reception, or amplification of sound, speech or images by electrical or mechanical means, except apparatus designed and used as an aid to defective hearing and apparatus used in a vehicle so as not to produce sound audible by a person outside the vehicle.
- (14) Using any device designed or adapted for detecting or locating any metal or mineral in the Reserve.

USE OF FIREARMS ETC.

- (15) Being in possession of a firearm (with ammunition suitable for use in that firearm) otherwise than on a public paved road, or discharging a firearm or lighting a firework.
- (16) Projecting any missile manually or by artificial means.

GENERAL PROHIBITIONS

- (17) Erecting, occupying or using any tent, shed, caravan or other structure for the purpose of camping.
- (18) Flying a model aircraft.
- (19) Erecting any post, rail, fence, pole, booth stand, building or other structure.
- (20) Neglecting to shut any gate or to fasten it if any means of doing so are provided.
- (21) Posting or placing any notice or advertisement.
- (22) Selling or offering or exposing for sale, or letting for hire, any commodity or article, or selling or offering for sale any service.

- (24) Intentionally, or recklessly removing or displacing, any notice board, notice exhibited by order of the Council, apparatus, wall, boundary, bank, fence, barrier, railing, post or hide.
- (25) Skiing or tobogganing.
- (26) Lighting any fire, stove, heater or any other appliance capable of causing fire, elsewhere than in any area indicated by a notice as being available for camping.
- (27) Letting fall, or throwing any lighted match or lighted substance in a manner likely to cause a fire.
- (28) Intentionally leaving items, in a place other than a receptacle provided by the Council for deposit of litter or refuse.

INTERFERENCE WITH DULY AUTHORISED OFFICER

- (29) Intentionally obstructing any officer of the Council or any person, or the servant of any person, employed or authorised by the Council in the execution of any works (including research or scientific work) connected with the laying out, maintenance or management of the Reserve.
3. The Council may issue permits authorising any person to do any act or class of acts within the Reserve or any part thereof which would otherwise be unlawful under these byelaws.
- (1) Any such permit shall be issued subject to the following conditions:-
 - a. that it must be carried whenever a visit is made to the Reserve and produced for inspection when required by a person duly authorised by the Council in that behalf; and
 - b. that it may be revoked by the Council at anytime.
4. These byelaws shall not operate so as to interfere with the exercise:-
- (1) by a person of:
 - a. a right vested in him as owner, lessee or occupier of land in the Reserve;
 - b. any easement or profit a prendre to which he is entitled;
 - c. any public right of way.
 - (2) of any functions of a local authority, statutory undertaking or of a water authority or other drainage authority;
 - (3) by a constable or a member of the armed forces or any fire brigade or ambulance service of the performance of his duty.
5. Any person who offends against any of these byelaws shall be liable on summary conviction to a fine on level 2 as laid down in the Criminal Justice Act 1982, or as amended, and in the case of a continuing offence to a further fine not exceeding £5 for each day during which the offence continues after the said conviction.

Appendix 6

Historic England Entry in the Schedule of Monuments and Guide for Owners and Occupiers of Scheduled Monuments.

ENTRY IN THE SCHEDULE OF MONUMENTS COMPILED AND MAINTAINED BY THE SECRETARY OF STATE UNDER SECTION 1 OF THE ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979 AS AMENDED.

MONUMENT: Warton Crag small multivallate hillfort

PARISH: WARTON

COUNTY: LANCASHIRE

DISTRICT: LANCASTER

NATIONAL MONUMENT NO: 23643

NATIONAL GRID REFERENCE(S): SD49227289

DESCRIPTION OF THE MONUMENT

The monument is an Iron Age small multivallate hillfort containing remains of stone huts located on the summit of Warton Crag overlooking Morecambe Bay. It includes a sub-rectangular enclosure of approximately 3.2 ha in extent occupying the summit of the crag, and is defended by a combination of rock scarps and steep slopes to the south and west, and three stone ramparts to the north and east. The ramparts measure between 3m-7m wide and are up to 1.3m high and are set roughly parallel to each other and approximately 50m-60m apart. Within the enclosure are boulder foundations of three sub-rectangular huts constructed against a long low rock escarpment. Immediately outside the inner rampart a further two hut foundations are located against the same escarpment. To the south, below the main summit of the crag, faint traces of a bank and ditch have recently been observed along the edge of a limestone shelf. To the north of the outer rampart antiquarian sources noted the existence of numerous oval tumuli. These are no longer clearly visible as earthworks, but below ground remains, including the remains of any deep burial pits, are anticipated to survive well.

The summit cairn, which is a modern construction, and all walls and fences are excluded from the scheduling but the ground beneath these features is included.

ASSESSMENT OF IMPORTANCE

Small multivallate hillforts are defined as fortified enclosures of varying shape, generally between 1 and 5 ha in size and located on hilltops. They are defined by boundaries consisting of two or more lines of closely set earthworks spaced at intervals of up to 15m. These entirely surround the interior except on sites located on promontories, where cliffs may form one or more sides of the monument. They date to the Iron Age period, most having been constructed and occupied between the sixth century BC and the mid-first century AD. Small multivallate hillforts are generally regarded as settlements of high status, occupied on a permanent basis. Recent interpretations suggest that the construction of multiple earthworks may have had as much to do with display as with defence. Earthworks may consist of a rampart alone or of a rampart and ditch which, on many sites, are associated with counterscarp banks and internal quarry scoops. Access to the interior is generally provided by one or two entrances, which either appear as simple gaps in the earthwork or inturned passages, sometimes with guardrooms. The interior generally consists of settlement evidence including round houses, four and six post structures interpreted as raised granaries, roads, pits, gullies, hearths and a variety of scattered post and stake holes.

Evidence from outside numerous examples of small multivallate hillforts suggests that extra-mural settlement was of a similar nature. Small multivallate hillforts are rare with around 100 examples recorded nationally. Most are located in the Welsh Marches and the south-west with a concentration of small monuments in the north-east. In view of the rarity of small multivallate hillforts and their importance in understanding the nature of settlement and social organisation within the Iron Age period, all examples with surviving archaeological potential are believed to be of national importance.

Despite a thick covering of trees and vegetation, Warton Crag small multivallate hillfort survives reasonably well. It remains largely unencumbered by modern development, and will retain evidence for the settlement within the hillfort's interior and for the construction methods and phasing of the ramparts. It is a rare example of a small multivallate hillfort in north-west England and one of only three examples of this class of monument in Lancashire.

MAP EXTRACT

The site of the monument includes a 2 metre boundary around the archaeological features, considered to be essential for the monument's support and preservation.

SCHEDULING HISTORY

Monument included in the Schedule on 30th November 1925 as:

COUNTY/NUMBER: Lancashire 41

NAME: Crag Hill Fort

The reference of this monument is now: NATIONAL

MONUMENT NUMBER: 23643

NAME: Warton Crag small multivallate hillfort

SCHEDULING REVISED ON 03rd March 1994

SIGNED BY: A R Middleton

On behalf of the Secretary of State for National Heritage.

GUIDE FOR OWNERS AND OCCUPIERS OF SCHEDULED MONUMENTS

1. The monument on your land is scheduled under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979, as amended, and is protected as part of this country's heritage. This guide attempts to summarise the main provisions of that Act as it may affect you: it is not a comprehensive interpretation of the Act, and is for guidance only. If you are unsure about any aspect of scheduled monument controls then it would always be prudent to consult English Heritage or to seek other professional advice.

2. Under the Act, you are required to submit an application to the Secretary of State for National Heritage for Scheduled Monument Consent before you carry out any work which will have the effect of:-

demolishing destroying damaging removal repairing altering adding to flooding, or tipping material onto the monument

3. Consent is also required for archaeological excavation. Application forms for Scheduled Monument Consent are obtainable from either English Heritage or the Department of National Heritage at the addresses given below. Applicants are also required to complete a certificate of ownership, or notify part owners, and in some cases an Inspector of monuments will visit to discuss the application. The Secretary of State may advertise the application in any way he thinks fit and may hold a public inquiry into it.

4. If you farm the area of the monument you need not apply for consent if the agricultural work involved is the same as has been carried out in that location for five years or more prior to 9 October 1981. However, you do need consent for ploughing at a greater depth, subsoiling, drainage, the planting and uprooting of trees and other works below the previous plough depth. Extending the area of agricultural activity beyond that used in the five years prior to 9 October 1981 would require scheduled monument consent.

5. Normal gardening activities of a kind previously carried out in the same location for five years or more prior to 9 October 1981 may be carried out without consent but prior written consent IS required for such gardening and horticultural activities as the planting and uprooting of trees, hedges and ponds, tennis courts and the construction of garden buildings, fencing etc. which would disturb the subsoil. The felling of trees does not require consent provided it does not cause ground disturbance or other damage to the monument (e.g. the grubbing out of roots).

6. Consent is not needed for works urgently necessary in the interests of health and safety, provided you advise the Department of National Heritage as soon as possible that you intend carrying out the works or, in cases of particular urgency, that you have carried them out. Advice on applications for Scheduled Monument Consent is available from the addresses given at the end of this guide.

7. The obtaining of planning permission to develop land or any other consent or authorisation does not remove the need to obtain Scheduled Monument Consent when it is required.

8. In some cases compensation may be available if consent is refused, or granted subject to onerous conditions.

HELP FOR CARE AND MAINTENANCE

9. You are not required to undertake any additional maintenance of the monument, but if you should choose to do so English Heritage may be able to offer some advice and assistance.

10. You are not obliged to give the public access to the monument. Accredited representatives of English Heritage have the authority to obtain entry, but your permission will normally be sought first.

11. Regular visits are made to scheduled monuments by locally based field Monument Wardens, who will seek permission from owners and occupiers first. The wardens will be able to advise about the history and answer questions on the management of scheduled monuments.

PROTECTION AND PENALTIES

12. The carrying out of any unauthorised works to a scheduled monument is a criminal offence. In addition it is an offence for anyone to use a metal detector on a monument without Historic England's consent. A further, more serious offence is to remove, without permission, an object found by a metal detector on a monument. Any damage caused to a monument in removing a 'find' may also constitute a further offence. If you encounter trespassers with metal detectors on the monument, please do what you can to obtain their names, addresses or car numbers, and let the police know.

13. Enquiries and application forms for Scheduled Monument Consent are available from:

Historic England
North West local office
3rd Floor Canada House
3 Chepstow Street
MANCHESTER
M1 5FW

Telephone 01612 421 416.

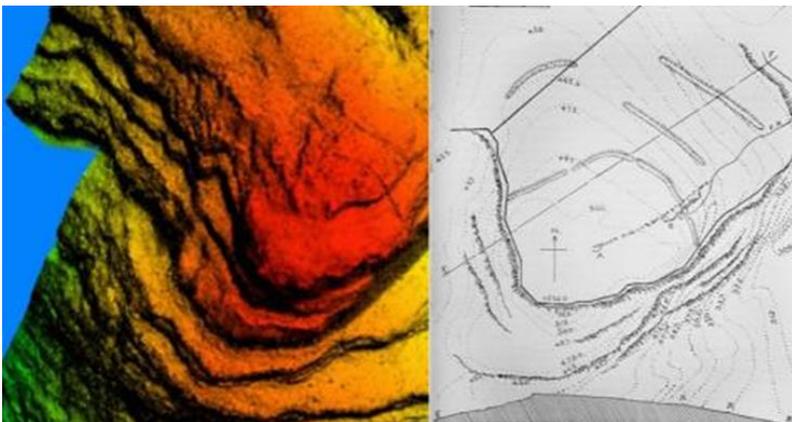
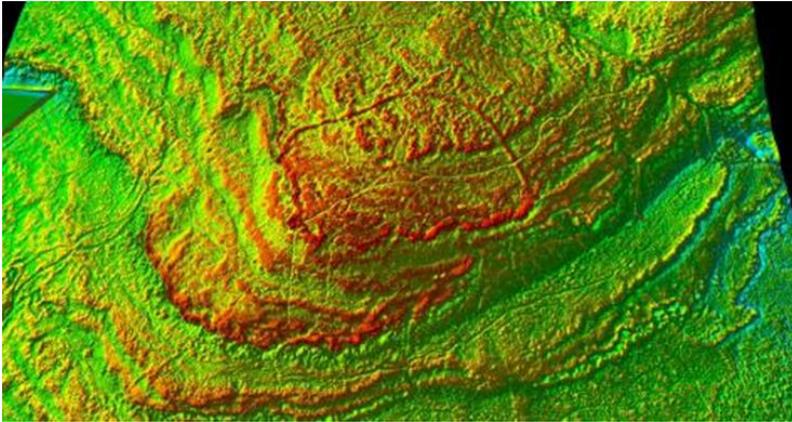
Email northwest@HistoricEngland.org.uk

Website <https://www.historicengland.org.uk/about/contact-us/local-offices/north-west/>

The following information is published on the Morecambe Bay Partnership website

<http://www.morecambebay.org.uk/BaysPast/Projects/WartonCrag>

Understanding Warton Crag Iron Age hillfort



Warton Crag Iron Age hillfort is a Scheduled Ancient Monument and currently on Historic England's Heritage at Risk register.

As part of Morecambe Bay Partnership's Headlands to Headspace Scheme, we want to understand what remains on the site and help to develop appropriate land management which balances the needs of the archaeology of the site with the natural heritage and environmental importance of the site.

We are delivering:

- Collection of new LIDAR survey data (carried out in February 2016)
- Analysis of the LIDAR data (with the help of partners including Historic England, and David Ratledge)
- Landscape survey of site to define feature and produce a Level 3 record (Historic England team using RCHME survey and LIDAR data as a guide), including a record of vegetation (working in partnership with H2H Natural Heritage Officer/RSBP/Lancashire Wildlife Trust)
- Clearance of vegetation in target areas by voluntary groups
- Interpretation and dissemination of results

The Morecambe Bay Partnership is working with the landowners and managers of the site: Arnside and Silverdale AONB, RSPB, Leighton Hall Estate and Lancashire Wildlife Trust.

Appendix 7

Management prescription tables and map for LNR

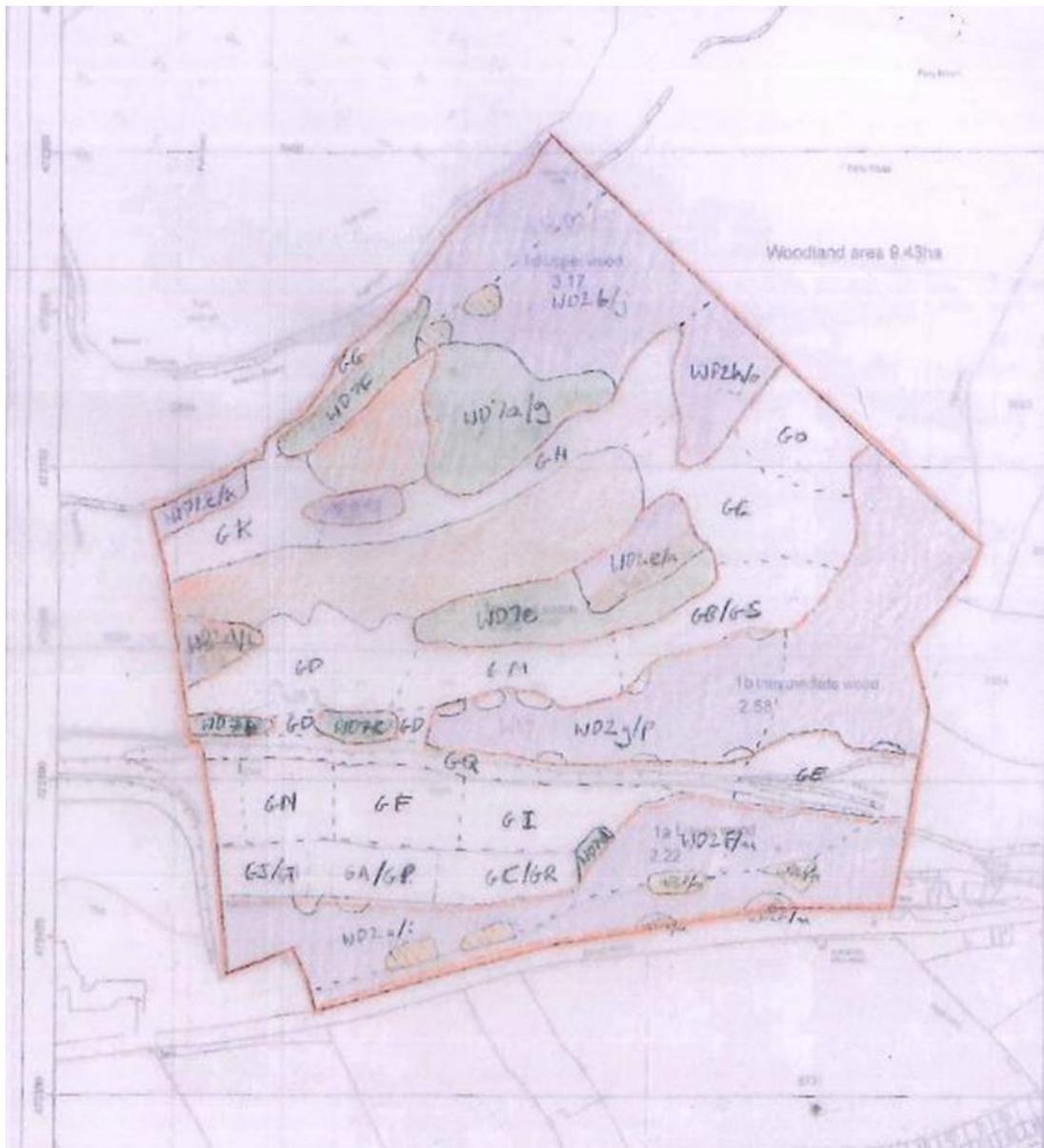
Work programme for Countryside Stewardship for LNR 2016 to 2020

Detailed programme of work to be carried out on the LNR under the present 5-year Countryside Stewardship agreement, running from 1st January 2016 to 31st December 2020.

Note: Each year in this Countryside Stewardship agreement begins 1st January and ends 31st December. Year 1 = 2016; Year 2 = 2017; Year 3 = 2018; Year 4 = 2019; and Year 5 = 2020.

The following is a copy of an interim sketch map that is due for digitising when a mapping programme system is made available at the earliest opportunity. Apologies for the unclear quality of this sketch map.

MAP AND PLAN FOR 2016-2020



Concise summary of Multi-Year Options for Countryside Stewardship agreement 2016 to 2020

Option Code	Option Title	Total Parcel Area	Option Area/length	Option Duration	Start Date	End Date
GS6	Management of species-rich grassland	18.57ha	7.58ha	5 years	01/01/2016	31/12/2020
GS13	Management of grassland for target features	18.57ha	3ha	5 years	01/01/2016	31/12/2020
SP3	Bracken control supplement	18.57ha	3ha	3 years	01/01/2018	31/12/2020
SP4	Control of invasive plant species supplement	18.57 ha	0.25 ha	5 years	01/01/2016	31/12/2020
SP6	Cattle grazing supplement	18.57 ha	13.19 ha	5 years	01/01/2016	31/12/2020
SP9	Threatened species supplement	18.57 ha	3 ha	5 years	01/01/2016	31/12/2020
WD2	Woodland improvement	18.57 ha	5.38 ha	5 years	01/01/2016	31/12/2020
WD7	Management of successional areas and scrub	18.57 ha	2.61 ha	5 years	01/01/2016	31/12/2020
ED1	Educational access			5 years	01/01/2016	31/12/2020
SB1F	Scrub control and felling diseased trees		2.5 ha		01/01/2016	
SB1F	Scrub control and felling diseased trees		0.66 ha		01/01/2016	
SB5	Mechanical bracken control		3		01/01/2016	
WB1	Small wildlife box		50 boxes		01/01/2016	
WB2	Medium wildlife box		5 boxes		01/01/2016	
WB3	Large wildlife box		3 boxes		01/01/2016	

5. Summary of Multi-Year Options

The following is a summary of the Multi-Year Options agreed to be implemented under the Agreement:

Multi-Year Options: Summary									
Parcel Name	OS Map Sheet ref/National Grid no.	Option Code	Option Title	Supplement	Total Parcel Area	Option Area/length	Option Duration	Option Start date	Option End date
Warton Crag	SD49724563	GS6	Management of species rich grassland		18.57	7.58ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	GS13	Management of grassland for target features		18.57	3ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	SP3	Bracken control supplement		18.57	3ha	3	01/01/2018	31/12/2020
Warton Crag	SD49724563	SP4	Control of invasive plant species supplement		18.57	0.25ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	SP6	Cattle grazing supplement		18.57	13.19ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	SP9	Threatened species supplement		18.57	3ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	WD2	Woodland Improvement		18.57	5.38ha	5	01/01/2016	31/12/2020
Warton Crag	SD49724563	WD7	Management of successional areas and scrub		18.57	2.61ha	5	01/01/2016	31/12/2020
		ED1	Educational access				5	01/01/2016	31/12/2020

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7. Eligibility Requirements, Prescriptions and Indicators of Success for Multi-Year Options

The following tables set out the detailed requirements which the Agreement Holder must comply with. Please note, however, that the "Aim" and the "Indicators of Success" in each table are not binding, though the Indicators of Success will be used as a tool to assess the outcomes and objectives of the Agreement. The location(s) of the Multi-Year Options are identified on the Agreement Map(s).

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success

Option Code and Description	GS6 Management of species rich grassland
Option Group	Grassland
Parcel Name	Watton Crag
OS Map Sheet ref/National Grid no.	SO49724563
Parcel Area	18.57ha
Option Area	7.58ha
Aim (not binding)	To maintain and enhance Priority Grasslands (as defined by Section 41 of the NERC Act 2006). The option can also contribute to protecting valued landscapes and archaeology, and the promotion of good soil conditions.
Eligibility Requirements	E41 You must submit a standard soil analysis including organic matter (by Loss on ignition) with the application - see Soil sampling for habitat recreation and restoration. E174 Only available on Section 41 Grassland Priority Habitat, as defined in BEHTA Manual Keys
Prescriptions	P2 Do not apply any fertilisers or manures. P10 Only use pesticides, including herbicides, to spot-treat or weed-whip for the control of injurious weeds, invasive non-natives, nettles, rushes or bracken. P31 Do not narrow or roll on historic or archaeological features. P42 Control scrub by cutting and grazing so that by year 3 cover of scrub/bramble/tree growth in the GS6 areas is no more than 30% overall and 5% in currently species rich areas. P121 Maintain a continuous grass sward/vegetation cover over historic and archaeological features so that bare patches and erosion do not cover more than 5% of the features. P135 Only top between 1 August and 30 September.

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Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success

Option Code and Description	GS6 Management of species rich grassland
Option Group	Grassland
P239	Prevent additional scrub encroachment on historic or archaeological features.
P300	Prevent the spread of bracken on historic and archaeological features.
P400	Only plough, cultivate or re-seed as part of an agreed sward enhancement programme.
P441	Only carry out mechanical operations or allow other activities that may cause disturbance to breeding &/or non-breeding birds between 16 July and 31 October.
P450	The Soil Phosphorus Index must not increase from the application level.
P455	Manage dense Bracken stands / deep Bracken litter layers rotationally in years 1 to 5 by cutting/burning. Cut bracken by hand on all historic and archaeological features.
P464	Maintain the extent of habitats/features of interest within the grassland/scrub/successional area/mosaic as identified in the BEHTA map.
P470	By year 2, at least 3 moderate/high value indicator species horseshoe vetch, kidney vetch, bird's foot trefoil, rock rose, small blue green sedges, thyme, orchid spp., blue-moor grass, for Priority habitat feature Lowland calcareous grassland must be frequent and in flower during May and June.
P520	Do not supplementary feed.
P667	From year 1, manage by grazing by cattle for limited periods (up to 5 weeks in July/August and up to 10 weeks from October to early February) to maintain a species rich calcareous grassland so that sward height is between 2-15cm.
P673	Agree all drainage works, including modification to existing drainage, in writing with Natural England before undertaking any works.
P706	Keep a monthly record of stock numbers grazing on Parcel 4563. Make the record available on request.
Indicators of Success (not binding)	
IOS1	By year 2, there should be between 1% and 5% cover of bare ground, including dry crumbly soil, soft damp soil, bare rock, cobble, gravel and encrusting lichens.
IOS27	By year 1, there should be at least 2 species from the table below - horseshoe vetch, kidney vetch, bird's foot trefoil, rock rose, small blue green sedges, thyme, orchid spp., blue-moor grass at least occasional/locally frequent across the area and flowering during May to July.
IOS68	By year 1, there should be an average sward height between 2 - 15cm in November.
IOS97	By year 1, there should be between 20% and 50% cover of wildflowers in the sward (excluding thistles, ragwort /dock) but including rushes and sedges). At least 40% of wild flowers should be flowering between May to July.

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Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	GS13 Management of grassland for target features
Option Group	Grassland
Parcel Name	Watton Crag
OS Map Sheet referential Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	3ha
Aim (not binding)	
To maintain the permanent, semi-improved rough grassland/bracken mosaic that will benefit target frillitary butterfly species, protect soils and reduce diffuse pollution.	
Eligibility Requirements	
E41	Submit a standard soil analysis including organic matter (by Loss on Ignition) with the application - see Soil sampling for habitat recreation and restoration.
E189	Only available on parcels that meet the following criteria: Grassland that is: <ul style="list-style-type: none"> not a Grassland Priority Habitat as defined in the BEHTA Manual (Key 2a and Key 2b) and has moderate or low potential as defined in BEHTA Manual (Key 2c) to be restored to a Grassland Priority Habitat; and is clearly associated with a targeted species or feature which would benefit from focussed management under this option. OR Priority coastal and floodplain grazing marsh as defined in [currently G15 in FEP manual] that is not targeted for the wet grassland options (GS9, GS10, GS11 and GS12) and is clearly associated with a species or feature that is targeted which would benefit from focused management under this option.
Prescriptions	
P10	Only use pesticides, including herbicides, to spot-treat or weed-wipe for the control of injurious weeds, invasive non-natives, nettles, rushes or bracken.
P31	Do not narrow or roll on historic or archaeological features.
P59	In years when the parcel is not cut for hay/ haylage/ silage do not apply any fertilisers or manures.
P121	Maintain a continuous vegetation cover over historic and archaeological features so that bare patches and erosion do not cover more than 5% of the features.

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Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	GS13 Management of grassland for target features
Option Group	Grassland
P138	Retain some well-established scrub over at least 3%, and a maximum of 10% of the parcel area. It must be retained as discrete small patches, lines and occasional individual bushes scattered across the site.
P299	Prevent additional scrub encroachment on historic or archaeological features.
P300	Prevent the spread of bracken on historic and archaeological features.
P400	Only plough, cultivate or re-seed as part of an agreed sward enhancement programme.
P441	Only carry out mechanical operations or allow other activities that may cause disturbance to breeding birds between 16 July and 31 March.
P455	Manage dense Bracken stands / deep Bracken litter layers rotationally in years 1 to 5 by cutting / brushing (bracken under 8 year rotation/ as agreed with your NE adviser). Cut bracken by hand on all historic and archaeological features.
P513	Between 1 September to 31 December and 1 January and 29 February inclusive allow grasses to go to seed over at least 10% of the total area covered by this option and leave the seed heads undisturbed.
P520	Do not supplementary feed.
P667	From year 1 onwards, manage by cattle grazing (and cutting bracken under 8 year rotation) to maintain the mosaic of light bracken so that bluebells and violets can flower.
P673	Agree all drainage works, including modification to existing drainage, in writing with Natural England before undertaking any works.
P706	Keep a monthly record of stock numbers grazing on Parcel 4563. Make the record available on request.
Indicators of Success (not binding)	
IO527	By year 1, there should be abundant bluebells and occasional to frequent violets under the bracken cover and presence of target butterflies - high brown and peat bordered fritillaries.
IO583	By year 3, there should be between 50% and 80% cover of light bracken cover.
IO597	By year 1, there should be between 20% and 90% cover of wildflowers in the sward (excluding thistles, docks and ragwort including rushes and sedges). At least 40% of wild flowers should be flowering during May to July.

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Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success

Option Code and Description	WD2 Woodland Improvement
Option Group	Woodland and scrub
Parcel Name	Warton Crag
OS Map Sheet referential Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	5.38ha
Aim (not binding)	Change the woodland structure or management regime to improve biodiversity or enhance resilience to climate change. Dependent on the operation, multi-annual agreements will show a gradual restructuring or improvement in the condition of the woodland.
Eligibility Requirements	Justification for support will be provided in the pre-existing woodland management plan, approved by the Forestry Commission, which is required under the regulation.
Prescriptions	
P2001	Create and/or manage permanent open space and access rides
P2002	Create or maintain appropriate levels of deadwood habitat in line with UKFS.
P2006	Manage ride edges through cyclical cutting
P2007	Manage successional scrub through cyclical cutting.
P2009	Re-occupy 0.17 ha of hazel and mixed broadleaved species.
P2010	Release 10 veteran trees from competing tree growth.
P2011	Thin/selective fell 3ha.
P2012	UKFS compliant operational activities evidenced by completion of an Operational Site Assessment or similar
P2014	Vegetation management - remove 0.25ha of competing and/or non-native or invasive vegetation of the species colonaster by either mechanical or chemical control
	Monitor changes to be achieved through this support and provide reports in years 3 and 5 - Methodology could include fixed point before/after photography.

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	WD7 Management of successional areas and scrub
Option Group	Woodland and scrub
Parcel Name	Watton Crag
OS Map Sheet ref/National Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	261ha
Aim (not binding)	
To enhance habitats for specific target species, to improve the quality of the woodland edge environment, to protect soils and watercourses and to provide habitat structure.	
Eligibility Requirements	
E208	Only available on parcels adjacent to existing areas of scrub or woodland or in areas where target species occur already.
E209	Only available on areas with a minimum of 10% scrub cover.
E210	Must not be located on historic or archaeological features; existing open habitats (where scrub can be incorporated as part of the relevant option; or where scrub would be detrimental to the landscape).
Prescriptions	
P2	Do not apply any fertilisers or manures.
P10	Only use pesticides, including herbicides, to spot-treat or weed-wipe for the control of injurious weeds, invasive non-natives, nettles, rushes or bracken.
P30	Do not plough, cultivate or re-seed.
P35	There must be no supplementary feeding.
P42	Manage scrub by cutting so that by year 5 cover of scrub is no more than 50%
P49	Protect trees to prevent damage from livestock and wild animals. Manage tree guards to prevent any damage to growing trees.
P1141	Exclude all livestock from 15 February to 30 April and from 1 September to 30 September.
P189	Do not narrow or roll.
P365	Only cut to maintain the scrub and grass mosaic and for the control of injurious weeds and invasive non-native species.

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	WD7 Management of successional areas and scrub
Option Group	Woodland and scrub
P366	Cut no more than a third of the shrubby growth in any one calendar year. Do not cut during the bird breeding season (1 March to 31 August).
P362	Retain all mature and veteran standing trees and all standing and fallen deadwood, provided that it is consistent with the National Tree Safety Group document 'Common Sense risk management of trees: Landowner Summary', to do so. Fallen deadwood must be left uncut and in situ.
P673	Agree all drainage works, including modification to existing drainage, in writing with Natural England before undertaking any works.
Indicators of Success (not binding)	
IOS55	By year 5, there should be between 10% and 30% cover of mature scrub.

WD7 Management of successional areas of scrub

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	SP3 Bracken control supplement
Option Group	Woodland and scrub
Parcel Name	Warton Crag
OS Map Sheet retriational Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	3ha
Aim (not binding)	
To control the spread of, or remove, existing dense stands of bracken to maintain or restore biodiversity value and protect archaeological sites.	
Eligibility Requirements	
E34	This supplement can only be used in combination with an annual management option.
E35	It must not be used on the same area in the same year as the bracken control capital items S84 Chemical bracken control and S85 Mechanical bracken control.
E36	Relevant consents from the Environment Agency are required for chemical control in a water catchment.
Prescriptions	
P42	Manage bracken in the V06 area of parcel by cutting annually so that by year 5 cover of bracken in the V06 area is no more than 60% - the idea is to retain bracken cover but with less thatch for violets, and target butterflies and not to eradicate it – see Warton Crag Management Plan prepared by the AONB Partnership.
P125	Do not carry out chemical control of bracken in the areas identified in the whole parcel.
P128	Control to benefit target butterflies any re-infestation during the term of the agreement.
Indicators of Success (not binding)	
There are no indicators of success for this supplement.	

SP3 Bracken control supplement

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	SP4 Control of invasive plant species supplement
Option Group	Additional Supplements
Parcel Name	Warton Crag
OS Map Sheet retriational Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	0.25ha
Aim (not binding)	
To introduce a programme of active management aimed towards the eradication of the named invasive plant species.	
Eligibility Requirements	
E34	This supplement can only be used in combination with an annual management option.
E167	Must not be used for rush control.
Prescriptions	
P42	Control cotoneaster on the limestone pavement and adjacent grassland by cutting so that by year 2 cover of cotoneaster in the parcel is no more than 1% and 0% by Year 5. Remove all cut material.
Indicators of Success (not binding)	
There are no indicators of success for this supplement.	

SP4 Control of invasive plant species supplement

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success

Option Code and Description	SP6 Cattle grazing supplement
Option Group	Additional Supplements
Parcel Name	Watton Crag
OS Map Sheet (national grid no.)	SD49724563
Parcel Area	18.577a
Option Area	13.197a
Aim (not binding)	
To provide a more varied sward structure to increase wildlife diversity. Cattle are also often more suitable for controlling bracken and scrub and grazing wet habitats.	
Eligibility Requirements	
E104	This supplement can only be used in combination with a land management option where cattle grazing is appropriate for delivering the aims of the option.
Prescriptions	
PS93	Only graze Parcel 4563 in accordance with the stocking calendar which includes minimum and maximum stocking rates by grazing animal type by month.
PT05	Keep a monthly record of stock numbers grazing on Parcel 4563. The record must include the number of animals by species, cattle and the number of grazing days by each species. Make the record available on request and submit a copy with your annual claim.
Indicators of Success (not binding)	
The underlying option should have at least one IOG for the target feature that will benefit from this supplement. If it cannot be shown that cattle grazing is needed in order to deliver at least one IOG then the supplement should not be used.	

SP6 Cattle grazing supplement

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success

Option Code and Description	SP9 Threatened species supplement
Option Group	Additional Supplements
Parcel Name	Watton Crag
OS Map Sheet (national grid no.)	SD49724563
Parcel Area	18.577a
Option Area	37a
Aim (not binding)	
To deliver targeted, bespoke habitat management for priority species.	
Eligibility Requirements	
E178	This supplement can only be used in combination with a land management option where a priority species, or assemblage of priority species, is present on the site or where the site can be managed to provide the right conditions needed to allow for the possible translocation, re-colonisation or range extension of a named priority species. The management work must have written support from a specialist.
Prescriptions	
PS97	Carry out the management for in particular priority s41 species High brown and pearl bordered fritillaries and northern brown argus butterflies so that by year 2 bracken, scrub and grassland are suitable as set out in Watton Crag Management Plan produced by AONB Partnership dated 2009-2016 and any future amendments agreed with Natural England.
Indicators of Success (not binding)	

SP9 Threatened species supplement

ED1 Educational access

Countryside Stewardship Agreement Document

Multi-Year Options: Eligibility Requirements, Prescriptions and Indicators of Success	
Option Code and Description	ED1 Educational access
Option Group	Educational access
Parcel Name	Warton Crag
OS Map Sheet ref/National Grid no.	SD49724563
Parcel Area	18.57ha
Option Area	N/a
Aim (not binding)	
To enable educational visits for school pupils and care farming visits.	
Eligibility Requirements	
	None
Prescriptions	
P475	Carry out a Health and Safety check and prepare a Risk Assessment for the farm, and provide this to potential group leaders.
P477	Complete the Farm Facts Template for your farm within 3 months of the start of your agreement.
P479	Carry out adequate promotion to ensure a minimum of one and a maximum of 25 educational visits every year.
P481	All visits must be free of charge, and you must receive no other direct income from government funds relating to the educational visit.
P482	Visits must comprise a conducted tour of the farm by a member of farm staff or volunteer to fit the requirements of the visiting party concerned. An eligible visit must last at least 2 hours. The tour must explain the links between farming, conservation and food production using the agreement land as a classroom.
P483	Complete and submit Farm Visit Evaluation forms for each visit you are claiming.
Indicators of Success (not binding)	
	There are no Indicators of Success for this option.

CAPITAL ITEM: SB1F Scrub control and felling of diseased trees

<p>Countryside Stewardship Agreement Document</p> <p>10. Eligibility Requirements and Specifications for Capital Items</p> <p>The following tables set out the detailed requirements which the Agreement Holder must comply with. Please note, however, that the "Aim" in each table is not binding. The location(s) of the Capital Item(s) are identified on the Agreement Map(s).</p> <p>Capital Items: Eligibility Requirements and Specifications</p>	
<p>Item Code and Description:</p>	<p>SB1F Scrub control and felling diseased trees</p>
<p>Item Group:</p>	<p>Scrub, tree and bracken control</p>
<p>Parcel Name</p>	<p>Warton Crag</p>
<p>OS Map Sheet rehabilitational Grid no.</p>	<p>SD49724563</p>
<p>Length/bunt no.</p>	<p>2.5ha and 0.66ha</p>
<p>Aim (not binding)</p> <p>To remove invasive scrub, in order to restore or maintain priority habitats or protect historic or archaeological features. To manage scrub to restore or maintain its habitat value. To remove infected young trees to maintain tree health.</p>	
<p>Eligibility Requirements</p>	
<p>E1</p>	<p>This capital item is only available: EITHER • for the control or management of scrub with the agreement of Natural England or Forestry Commission. OR • for the removal of diseased immature trees in agreement with Forestry Commission.</p>
<p>E2</p>	<p>This capital item is available for: • Machine cutting of thin (less than 7cm stem diameter) or scattered (less than 50% ground cover) scrub/young trees, or • Manual cutting of thin or scattered scrub/young trees, or • Machine cutting of thick (7 cm or more stem diameter) or dense (50% or more ground cover) scrub/young trees; or • Manual cutting of thick or dense scrub/young trees.</p>
<p>Specifications</p>	
<p>S3</p>	<p>Obtain any relevant consents before carrying out the work e.g. consent from English Heritage for work on a Scheduled Monument or consent from Natural England for work in a SSSI.</p>
<p>S4</p>	<p>Obtain dated photographs of the entire area as evidence of its condition when you joined the scheme. Retain these photographs and produce them on request.</p>
<p>S5</p>	<p>Carry out the work between 1 January and 28 February or 1 October and 31 December.</p>
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<p>Countryside Stewardship Agreement Document</p> <p>Capital Items: Eligibility Requirements and Specifications</p>	
<p>Item Code and Description:</p>	<p>SB1F Scrub control and felling diseased trees</p>
<p>Item Group:</p>	<p>Scrub, tree and bracken control</p>
<p>S5</p>	<p>Cut or fell scrub down to ground level without disturbing the roots and leave no protruding stems.</p>
<p>S8</p>	<p>Control scrub/tree re-growth for the duration of the agreement.</p>
<p>S9</p>	<p>Control injurious weeds as the site regenerates.</p>
<p>S10</p>	<p>Dispose of cut material by removing it from the site/stacking it in piles/ burning on non species rich areas. Locate tree sites at least 10 m away from the canopy of any tree.</p>
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Capital Items: Eligibility Requirements and Specifications	
Item Code and Description:	SBS Mechanical bracken control
Item Group:	Scrub, tree and bracken control
Parcel Name	Warton Crag
OS Map Sheet referential grid no.	SD49724563
Length/hunt no.	3ha
Aim (not binding)	
To control bracken using mechanical means to restore or maintain high value natural habitats and their associated wildlife, protect archaeological features and help maintain and enhance the character of the landscape.	
Eligibility Requirements	
E1	This item can only be used in association with a land management option and where agreed by Natural England.
Specifications	
S2	Control bracken by cutting/brushing/rolling in the areas shown as V06 areas on FER in years 1 and 2 between June to September or as agreed with Natural England.

CAPITAL ITEM: SB5 Mechanical bracken control

Capital Items: Eligibility Requirements and Specifications	
Item Code and Description:	WB1 Small wildlife box
Item Group:	Wildlife boxes
Parcel Name	Warton Crag
OS Map Sheet referential grid no.	SD49724563
Length/hunt no.	50
Aim (not binding)	
To provide artificial nesting, roosting and hibernation sites for specific mammals and birds, notably Tree Sparrow, Dormouse, targeted bat species or targeted invertebrate pollinators.	
Eligibility Requirements	
E1	This item can only be used where the other year round requirements of the target species (summer and winter foraging habitat) are being met on the holding or nearby.
E2	This item can only be used for Tree Sparrow, Dormouse or targeted bat or invertebrate pollinator species, unless use for another species is supported by the ROPB, Buglife or a Natural England specialist.
Specifications	
S1	Agree with Natural England a specification for the box for marsh tit, tree sparrow and bats.
S2	Site the box in the agreed location.
S3	The nest box must be cleaned out in the autumn (October and November), unless hibernating or roosting bats are using the box.

CAPITAL ITEM: WB1 Small wildlife box

Capital Item: Eligibility Requirements and Specifications	
Item Code and Description:	WB2 Medium wildlife box
Item Group:	Wildlife boxes
Parcel Name	Warton Crag
OS Map Sheet reNational Grid no.	SD49724563 SNIP
Length/unit no.	5
Aim (not binding)	
To provide artificial nesting, roosting and hibernation sites for mammals and birds, notably Tree Sparrow or targeted bat species.	
Eligibility Requirements	
E1	This item can only be used where the other year round requirements of the target species (summer and winter foraging habits) are being met on the holding or nearby.
E2	This item can only be used for a triple box for Tree Sparrow or bats, unless use for another species is supported by the RSPB or a Natural England bird specialist.
Specifications	
S1	Agree with Natural England a specification for the box for nutrition and woodpeckers.
S2	Site the box in the agreed location.
S3	The box must be cleaned out in the autumn (October and November), unless hibernating or roosting bats are using the box.

CAPITAL ITEM: WB2 Medium wildlife box

Capital Item: Eligibility Requirements and Specifications	
Item Code and Description:	WB3 Large wildlife box
Item Group:	Wildlife boxes
Parcel Name	Warton Crag
OS Map Sheet reNational Grid no.	SD49724563 SNIP
Length/unit no.	3
Aim (not binding)	
To provide artificial nesting and roosting sites for large birds, notably Barn Owl and Kestrel.	
Eligibility Requirements	
E1	This item can only be used where the other year round requirements of the target species (summer and winter foraging habits) are being met on the holding or nearby.
E2	This item can only be used for Barn Owl or Kestrel unless use for another bird species is supported by the RSPB or a Natural England bird specialist.
Specifications	
S1	Agree with Natural England a specification for the nest box for tawny and barn owls.
S2	Site the box in the agreed location.
S3	The nest box must be cleaned out in the autumn (October and November), unless hibernating or roosting bats are using the box.

CAPITAL ITEM: WB3 Large wildlife box

Grazing Management and Supporting Documents

Countryside Stewardship Agreement Document

11. Grazing Management

The relevant limits are as agreed within the Management Plan provided by the AONB Partnership and agreed with NE.

For further details on this obligation, please see the Countryside Stewardship Manual.

12. Supporting Documents

The following table provides a non-exhaustive list of some of the key supporting documents relevant to the Agreement. Details of the Agreement Holder's obligations in relation to these documents and further information about the documents are set out in the Countryside Stewardship Manual.

Please note that whilst some of the consents, permissions and authorisations required for the Agreement are listed here, it is the Agreement Holder's responsibility to make sure that it obtains, maintains and complies with any permits, licences, permissions, consents, approvals, certificates and authorisations (whether statutory or otherwise) which are required for the performance of its obligations under the Agreement.

Supporting Documents	
Agreement Map(s)	<input checked="" type="checkbox"/>
Farm Environment Record (FER)	<input checked="" type="checkbox"/>
Historic Environment Record (HER)	<input checked="" type="checkbox"/>
Baseline Evaluation of Higher Tier Agreements (BEHTA)	<input checked="" type="checkbox"/>
Woodland Management Plan	<input checked="" type="checkbox"/>
SSSI consent	<input checked="" type="checkbox"/>
Scheduled Monument Consent	<input type="checkbox"/>
Environment Agency Consent	<input type="checkbox"/>
Environmental Impact Assessment	<input type="checkbox"/>
Implementation Plan	<input type="checkbox"/>
Feasibility Study	<input type="checkbox"/>
Other supporting documents: Additional agreement objectives relating to Woodland Improvement WD2 Warton Crag management plan	<input checked="" type="checkbox"/>

Appendix 8

5-Year Work Programme Calendar of Stewardship options and site map location codes 2016 to 2020.

Note: Photographic evidence of the works, before and after, are required by Natural England as part of the Stewardship agreement and are required to be submitted with each annual claim.

2016								
January	February	June	July	August	Sep	October	November	December
SB5 a/b Mechanical bracken control		GS13 a/b Bracken						
GS6 B Manage species-rich grassland	GS6 B Manage species-rich grassland			SP4 Cotoneaster control		GS6 D Manage species-rich grassland	GS6 D Manage species-rich grassland	GS6 D Manage species-rich grassland
GS6 A Manage species-rich grassland	GS6 A Manage species-rich grassland					GS6 C Manage species-rich grassland	GS6 C Manage species-rich grassland	GS6 C Manage species-rich grassland
						WD2 a Woodland improvement	WD2 a Woodland improvement	WD2 a Woodland improvement
						WD2 c/d Woodland improvement	WD2 c/d Woodland improvement	WD2 c/d Woodland improvement
						WD7 a Manage successional areas of scrub	WD7 a Manage successional areas of scrub	WD7 a Manage successional areas of scrub
						WD7 a Manage successional areas of scrub	WD7 a Manage successional areas of scrub	WD7 a Manage successional areas of scrub
			SP6 Grazing			SP6 Grazing	SP6 Grazing	SP6 Grazing
							SB1F Scrub control and fell diseased trees	SB1F Scrub control and fell diseased trees
WB1, WB2, WB3 Wildlife boxes								
Work to be carried out by:								
Volunteers								
Contractors								
Grazier								

2017								
January	February	June	July	August	September	October	November	December
SB5 a/b Mechanical bracken control		GS13 a/b Bracken						
GS6 E Manage species-rich grassland	GS6 E Manage species-rich grassland			SP4 Cotoneaster control		GS6 H Manage species-rich grassland	GS6 H Manage species-rich grassland	GS6 H Manage species-rich grassland
GS6 F Manage species-rich grassland	GS6 F Manage species-rich grassland					GS6 G Manage species-rich grassland	GS6 G Manage species-rich grassland	GS6 G Manage species-rich grassland
						WD2 f/g/h Woodland improvement	WD2 f/g/h Woodland improvement	WD2 f/g/h Woodland improvement
						WD2 f/g/h Woodland improvement	WD2 f/g/h Woodland	WD2 f/g/h Woodland improvement
						WD7 b/c/d Manage successional areas of scrub	WD7 b/c/d Manage successional areas of scrub	WD7 b/c/d Manage successional areas of scrub
						WD7 b/c/d Manage successional areas of scrub	WD7 b/c/d Manage successional areas of scrub	WD7 b/c/d Manage successional areas of scrub
			SP6 Grazing			SP6 Grazing	SP6 Grazing	SP6 Grazing
						SB1F Scrub control and fell diseased trees	SB1F Scrub control and fell diseased trees	
Work to be carried out by:								
Volunteers								
Contractors								
Grazier								

2018								
January	February	June	July	August	Item	October	November	December
GS13 a/b Bracken		GS13 a/b Bracken						
GS6 I Manage species-rich grassland	GS6 I Manage species-rich grassland			SP4 Cotoneaster control		GS6 K Manage species-rich grassland	GS6 K Manage species-rich grassland	GS6 K Manage species-rich grassland
GS6 J Manage species-rich grassland	GS6 J Manage species-rich grassland					GS6 L Manage species-rich grassland	GS6 L Manage species-rich grassland	GS6 L Manage species-rich grassland
						WD2 j Woodland improvement	WD2 j Woodland improvement	WD2 j Woodland improvement
						WD2 j Woodland improvement	WD2 j Woodland improvement	WD2 j Woodland improvement
						WD7 e Manage successional areas of scrub	WD7 e Manage successional areas of scrub	WD7 e Manage successional areas of scrub
						WD7 e Manage successional areas of scrub	WD7 e Manage successional areas of scrub	WD7 e Manage successional areas of scrub
			SP6 Grazing			SP6 Grazing	SP6 Grazing	SP6 Grazing
Work to be carried out by:								
Volunteers								
Contractors								
Grazier								

2019								
January	February	June	July	August	Item	October	November	December
GS13 a/b/c Bracken		GS13 a/b/c Bracken						
GS6 M Manage species-rich grassland	GS6 M Manage species-rich grassland			SP4 Cotoneaster control		GS6 O Manage species-rich grassland	GS6 O Manage species-rich grassland	GS6 O Manage species-rich grassland
GS6 N Manage species-rich grassland	GS6 N Manage species-rich grassland					GS6 P Manage species-rich grassland	GS6 P Manage species-rich grassland	GS6 P Manage species-rich grassland
						WD2 m Woodland improvement	WD2 Woodland improvement	WD2 Woodland improvement
						WD2 Woodland improvement	WD2 m Woodland improvement	WD2 m Woodland improvement
						WD7 f Manage successional areas of scrub	WD7 f Manage successional areas of scrub	WD7 f Manage successional areas of scrub
						WD7 f Manage successional areas of scrub	WD7 f Manage successional areas of scrub	WD7 f Manage successional areas of scrub
			SP6 Grazing			SP6 Grazing	SP6 Grazing	SP6 Grazing
Work to be carried out by:								
Volunteers								
Contractors								
Grazier								

2020								
January	February	June	July	August	Item	October	November	December
GS13 a/b Bracken		GS13 a/b Bracken						
GS6 Q Manage species-rich grassland	GS6 Q Manage species-rich grassland			SP4 Cotoneaster control		GS6 S Manage species-rich grassland	GS6 S Manage species-rich grassland	GS6 S Manage species-rich grassland
GS6 R Manage species-rich grassland	GS6 R Manage species-rich grassland					GS6 T Manage species-rich grassland	GS6 T Manage species-rich grassland	GS6 T Manage species-rich grassland
						WD2 p Woodland improvement	WD2 p Woodland improvement	WD2 p Woodland improvement
						WD2 p Woodland improvement	WD2 p Woodland improvement	WD2 p Woodland improvement
						WD7 g Manage successional areas of scrub	WD7 g Manage successional areas of scrub	WD7 g Manage successional areas of scrub
						WD7 g Manage successional areas of scrub	WD7 g Manage successional areas of scrub	WD7 g Manage successional areas of scrub
			SP6 Grazing			SP6 Grazing	SP6 Grazing	SP6 Grazing
Work to be carried out by:								
Volunteers								
Contractors								
Grazier								

Appendix 9

Notable Species (recorded 1989 - 1994)

Flora

Red Data	LNR	RSPB	LWT	Habitat	No [*]
Dark-red helleborine (<i>Epipactis atrorubens</i>)	X	X		scree and grass	3
Nationally rare					
Lancashire whitebeam (<i>Sorbus lancastriensis</i>)	X	X		cliffs	1
Nationally scarce					
Rigid buckler fern (<i>Dryopteris villarii</i>)		X		pavement	2
Hawkweed (<i>Hieracium cymbifolium</i>)	X	X		cliff and grass	2
Hawkweed (<i>Hieracium decolor</i>)	X			grass	2
Hawkweed (<i>Hieracium silvaticoides</i>)	X	X	X	cliff & scree	2
Southern polypody (<i>Polypodium australe</i>)		X		scar	1
Sterner's bedstraw (<i>Galium sternerii</i>)	X	X	X	grass	3
Limestone oak fern (<i>Gymnocarpium robertianum</i>)	X		X	scree & pavement	2
Stinking hellebore (<i>Helleborus foetidus</i>) Last record -	X 1993			scar	1
Mountain St John's-wort (<i>Hypericum montanum</i>)	X	X	X	grass & pavement	3
Vernal sandwort (<i>Minuartia verna</i>)	X	X		scar & grass	3
Spring cinquefoil (<i>Potentilla tabernaemontani</i>)	X			scars	3

Blue moor grass (<i>Sesleria albicans</i>)	X	X	X	grass & rocks	4
Locally uncommon					
Deadly nightshade (<i>Atropa belladonna</i>)	X	X		scrub	1
Moonwort (<i>Botrychium lunaria</i>)	X	X	X	woodland	2
Lily-of-the-valley (<i>Convallaria majalis</i>)		X	X	pavement	2
Dogwood (<i>Cornus sanguinea</i>)	X		X	scrub	2
Hounds-tongue (<i>Cynoglossum officinale</i>)	X			scree	1
Blue fleabane (<i>Erigeron acer</i>)	X		X	grass	1
Spindle-tree (<i>Euonymus europaeus</i>)	X	X	X	scrub	2
Felwort (<i>Gentianella amarella</i>)	X	X		grass	3
Horse-shoe vetch (<i>Hippocrepis comosa</i>)	X	X		scars	3
Tutsan (<i>Hypericum androsaemum</i>)	X	X		woodland	2
Ploughman's spikenard (<i>Inula conyza</i>)	X	X	X	grass & rocks	2
Juniper (<i>Juniperus communis</i>)	X	X	X	pavement & grass	2
Privet (<i>Ligustrum vulgare</i>)	X		X	scrub	2
Gromwell (<i>Lithospermum officinale</i>)		X	X	grass	1
Mountain melick					

(<i>Melica nutans</i>)	X		X	pavement	1
Fly orchid					
(<i>Ophrys insectifera</i>)	X			grass	1
Adder's-tongue fern					
(<i>Ophioglossum vulgatum</i>)	X	?	?	woodland?	3?
Buckthorn					
(<i>Rhamnus catharticus</i>)	X	X	X	scrub & pavement	2
Small-leaved lime					
(<i>Tilia cordata</i>)			X	woodland	1
Soft trefoil					
(<i>Trifolium striatum</i>)		X		scars	2

* 1 = 1-9, 2 = 10-99, 3 = 100-999, 4 = 1000+

Fauna

	LNR	RSPB	LWT	Foodplant
Lepidoptera				
Red Data species				
High brown fritillary				
(<i>Argynnis adippe</i>)	X	X	X	violets
Least minor				
(<i>Photedes captiuncula</i>)	X	X	X	<i>Carex flacca</i>
Nationally rare				
Northern brown argus				
(<i>Aricia artaxerxes</i>)	X	X	X	rockrose
Pearl-bordered fritillary				
(<i>Boloria euphrosyne</i>)	X	X	X	violets
Cistus forester				
(<i>Adscita geryon</i>)	X	X	X	rockrose
Barred carpet				
(<i>Perizoma taeniatum</i>)	X			rose
Barred toothstripe				
(<i>Trichopteryx polycommata</i>)	X			privet and ash

Brown scallop				
(<i>Philereme vetulata</i>)	X			buckthorn
micro-moth				
(<i>Anania funebris</i>)			X	
Regionally uncommon				
Dingy skipper				
(<i>Erynnis tages</i>)	X	X	X	bird's foot trefoil
Grayling				
(<i>Hipparchia semele</i>)	X	X		grasses
Green hairstreak				
(<i>Callophrys rubi</i>)	X	X	X	rockrose, birch etc.
Small pearl-bordered fritillary				
(<i>Boloria selene</i>)	X	X	X	violets
Dark green fritillary				
(<i>Argynnis aglaja</i>)	X	X		violets
Holly blue				
(<i>Celastrina argiolus</i>)	X	X	X	holly and ivy
Purple hairstreak				
(<i>Quercusia quercus</i>)		X		oak
Small elephant hawk moth				
(<i>Deilephila porcellus</i>)	X			bedstraw
Dog's tooth				
(<i>Lacanobia suasa</i>)	Quarry			dock, plantain
Dark umber				
(<i>Phiereme transversata</i>)	X			buckthorn
The tissue				
(<i>Triphosia dubitata</i>)	X	Quarry		buckthorn

Clouded magpie				
(<i>Abraxas sylvata</i>)			X	elm
Red-green carpet				

(<i>Chloroclysta siterata</i>)	X			oak, rowan
Small autumnal moth (<i>Epirrata filigrammaria</i>)			X	heather and bilberry
Ash pug (<i>Eupithecia fraxinata</i>)	X			ash
The annulet (<i>Gnophus obscuratus</i>)		Quarry		b-foot trefoil, rockrose etc.
Triple spotted clay (<i>Xestia ditrapezium</i>)	X			birch, bramble & others
The anomalous (<i>Stilbia anomala</i>)	X	Quarry		wavy hair-grass
Coleoptera				
Nationally scarce				
Longhorn beetle (<i>Saperda scalaris</i>)	X			
Regionally scarce				
Glow-worm (<i>Lampyrus noctiluca</i>)	X	X		
Isopoda				
Nationally scarce				
Pill bug (<i>Armadillium pulchellum</i>)			X	
Regionally scarce				
Ant woodlouse (<i>Platyarthrus hoffmannseggii</i>)			X	
Hemiptera				
Plant bug (<i>Centrotus cornutus</i>)	X			
Mollusca				
Regionally rare				
Snail (<i>Pomatias elegans</i>)	X	X	X	
Snail (<i>Vallonia costata</i>)			X	
Snail				

<i>(Pupilla muscorum)</i>	X?			
Snail				
<i>(Clausilia dubium)</i>			X	
Snail				
<i>(Vertigo pygmaea)</i>			X	

	LNR	RSPB	LWT
Mammals			
Breeding Birds			
Tree pipit			
<i>(Anthus trivialis)</i>	X	X	X
Whitethroat			
<i>(Sylvia communis)</i>	X	X	
Lesser whitethroat			
<i>(Sylvia curruca)</i>	X	X	
Reptiles			
Adder			
<i>(Vipera berus)</i>	X		
Common lizard			
<i>(Lacerta vivipara)</i>	X	X	X

Appendix 10

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Appendix 11

Statement of condition of SSSI Unit

Main habitat	Unit no.	Unit area (ha)	Latest assessment date	Condition	Condition assessment comment
Calcareous grassland - lowland	1	18.50	16 Jun 2004	Favourable	<p>Areas of limestone grassland on lower scree slopes, and around rocky ledges higher up the Crag, continue to be well grazed by stock during the winter months resulting in herb rich swards. It was noticeable however that the flowering heads of dark red helliborine had recently been grazed off by rabbits or deer. Areas of bracken on deeper soils between the limestone ledges /outcrops on top of the Crag otherwise continue to be cut on rotation for the benefit of high brown butterflies.</p> <p>Similarly areas of ash/hazel woodland on the lower most slopes and the NE part of the Crag continue to be coppiced in accordance with the management Plan. Both actions, including the clearance of scrub along areas of rocky outcrops have enabled areas of limestone grassland interest to expand during recent years in terms of area and extent which is a welcomed positive long term change.</p>

Natural England carried out a subsequent assessment in May 2010 and reported the SSSI to be in 'favourable condition'.



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