



Raisby Hill Quarry SSSI Durham

Supporting Information

A supplement to the notification document

Issued by Natural England's Northumbria Team on **18 October 2019**

Contact points and further information

This supplement is issued on request by Natural England's Northumbria Team and is intended to be read in conjunction with the notification document for owners, occupiers and other notified parties. Our address for correspondence is:

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Summary

Raisby Hill Quarry was last notified as a Site of Special Scientific Interest (SSSI) under section 28 of the Wildlife and Countryside Act 1981 on 23 January 1991.

The notification is **varied** under section 28A of the Wildlife and Countryside Act 1981, to include a revised list of operations requiring Natural England's consent and a re-presented statement of Natural England's views on the management of the SSSI. The features of special interest have not changed but the citation describing them has been re-presented to describe them more clearly.

The SSSI has also been **extended** to include additional land notified under section 28B of the Wildlife and Countryside Act 1981.

Natural England is of the opinion that part of the SSSI is not of special interest and it is therefore proposed for **de-notification** under section 28D of the Wildlife and Countryside Act 1981.

The site is considered to be of special interest for its nationally important:

The site is considered to be of special interest for its nationally important geological features: Raisby Hill Quarry uniquely exposes the complete thickness of the Upper Permian Raisby Formation, and provides its 'Type' or 'Reference' section. It is nationally important and forms part of the Durham Province of the Marine Permian network of sites in the Geological Conservation Review (GCR).

1. Information used to support the modification of Raisby Hill Quarry SSSI

Feature	Data source	Author	Date	Content
Geology	Marine Permian of England. Geological Conservation Review Series No. 8. Chapman & Hall, London. http://archive.jncc.gov.uk/page-2953	Smith, D.B.	1995	Detailed description and justification for inclusion of Raisby Hill Quarry in the Geological Conservation Review
	An Introduction to the Geological Conservation Review. Geological Conservation Review Series. JNCC, Peterborough. http://archive.jncc.gov.uk/default.aspx?page=2965	Ellis, N.V. (ed.), Bowen, D.Q., Campbell, S., Knill, J.L., McKirdy, A.P., Prosser, C.D., Vincent, M.A. & Wilson, R.C.L.	1996	Background to the Geological Conservation Review
	Guidelines for the removal of an SSSI notification (de-notification)	English Nature	2005	National guidelines for identifying cases where de-notification may be appropriate
	Natural England SSSI archive site file (General and Scientific)	Natural England	1990-2017	Historical details of planning and development matters
	Specialist support for the modifications to Raisby Hill Quarry SSSI	Larwood, J.	2019	Support from Natural England's Senior Geologist

2. Explanation of how the notification of additional land at Raisby Hill Quarry meets the SSSI selection guidelines

This section explains how the information listed in section 1 has informed our decision to notify the additional land, according to the selection guidelines listed in *An Introduction to the Geological Conservation Review* (Ellis *et al.* 1996).

2.1 Geology

2.1.1 Selection of Geological Conservation Review sites

The special geological interests within Raisby Hill Quarry SSSI were selected for inclusion in the Geological Conservation Review (GCR) of Great Britain and are described under 'Raisby Quarries'. The GCR systematically assessed sites to identify key localities that aid the interpretation of the geological evolution of Great Britain. Each GCR site demonstrates a unique and/or representative feature of this geological evolution, and the relationship between sites is particularly important in building up a picture of landscape evolution, and biological and environmental change over time.

All SSSIs with a geological interest have been assessed through the GCR process and sites described in the Review are eligible for selection on the basis of one or a number of the following categories:

- (1) Sites of importance to the **international** community of Earth scientists.
- (2) Sites that are scientifically important because they contain **exceptional** features.
- (3) Sites that are nationally important because they are **representative** of an Earth science feature, event or process that is fundamental to Britain's Earth history.

Raisby Hill Quarry SSSI has been selected under category three as it represents the type locality of the Raisby Formation, Upper Permian.

Raisby Hill Quarry was selected as part of the Marine Permian GCR network. The network consists of 28 GCR sites in three geographical areas: north-west England, Durham and Yorkshire. Collectively, the Marine Permian GCR network demonstrates the Upper Permian evolution of the North Sea and Irish Sea areas. Raisby Hill Quarry is one of 17 GCR sites in the Durham Province; it uniquely exposes the full thickness of the Raisby Formation and is the type locality of the Raisby Formation. It is complemented by other exposures of the Raisby Formation at Dawson's Plantation, High Moorsley Quarry and the Durham Coast SSSIs, where the Raisby Formation is less complete and representing a more marginal and outer slope marine environment.

2.1.2 The geology of Raisby Hill Quarry

Raisby Hill Quarry SSSI is situated on the prominent Magnesian Limestone escarpment that extends from the Durham coast to Nottingham. It is part of a network of sites that document the extreme environmental changes experienced in the Upper Permian in what was a hot, arid environment. Repeated evaporation of shallow seas lead to cyclic sedimentation – the English Zechstein Cycles – and the extensive deposition of the Magnesian Limestone which is today naturally exposed on the Durham coast, and in quarry, road and rail cuttings throughout the area.

Quarried for its Magnesian Limestone, Raisby Hill Quarry exposes (in restored and working faces) the lowermost part of the Magnesian Limestone, the Raisby Formation. Uniquely, the complete thickness of the Raisby Formation is present in the northern and eastern quarry faces. As such, Raisby Hill Quarry provides the type section for the Raisby Formation and is a key reference locality for current and future study. Here the Raisby Formation consists of three broad units: a basal brown-buff dolomite in sharp contact with the underlying Marl Slate; a uniformly bedded grey to blue-grey median limestone (a primary, unaltered limestone which is rarely seen in the Magnesian Limestone sequence); and an upper unit of cream-buff dolomite which is conformably overlain by the dolomitic Ford Formation (see photograph 3 in section 7). Fossils, including foraminifera, bryozoan, brachiopod, bivalve and ostracod assemblages, as well as trace fossils, are largely concentrated in the unaltered limestone. Secondary mineralisation is also relatively common including a range of copper, carbonate and dolomite minerals as replacement and cavity fill mineralisation.

The Magnesian Limestone was deposited approximately 255 million years ago in the relatively shallow Zechstein Sea which occupied much of the present-day North Sea Basin. Extensive reefs (seen exposed in the Sunderland area) around the edge of the Zechstein Sea produced high volumes of carbonate which formed the Magnesian Limestone. Periodic evaporation and flooding of the Zechstein Sea in the hot, arid environment of the Upper Permian lead to cyclic deposition known as the English Zechstein Cycles (ECZ) – the Raisby Formation represents the lowermost carbonate deposit of the first of these cycles (ECZ 1). The Raisby Formation at Raisby Hill Quarry was deposited on the marginal shelf and adjoining slope of the Zechstein Sea. This contrasts with other localities where the Raisby Formation is present, such as Dawson's Plantation and High Moorsley Quarry SSSIs, which represent slope and outer slope environments with evidence of marine debris flows which are not present at Raisby Hill Quarry.

2.1.3 Site boundary determination

Raisby Quarry is an active quarry owned and worked by Breedon Group. The previously notified SSSI boundary was drawn to encompass the quarry faces described by Smith (1995) and extended to coincide with existing mineral permissions. The notified area was subject to planning permissions that allowed extraction of the Magnesian Limestone. In this context quarrying has proceeded broadly eastwards leaving an exposed northern face. Throughout this management, exposures demonstrating the features of interest were maintained.

Subsequently, planning permission has been extended further eastwards. The extended boundary has been drawn to retain features of interest in the exposed northern face and coincide with the new planning permission boundary, ensuring that the progression of working faces displaying

features of interest remain within the boundary during the working life of the quarry (see photographs 1 and 2 in section 7).

3. Explanation of why part of Raisby Hill Quarry SSSI is not considered to be of special interest

This section explains why Natural England is of the opinion that part of the SSSI is not of special interest, according to the *Guidelines for the removal of an SSSI notification (denotification)* (English Nature, 2005), hereafter referred to as the 'Denotification Guidelines'.

The Denotification Guidelines (section 3.1, p.5) state that:

'[Natural England] will adopt a precautionary approach to the question of the existence of special interest in cases where denotification is under consideration and in doing so will apply a set of guiding principles to assess whether a site (or part of a site) is of special interest' these are:

- i. Whether the interest meets the requirements of...the *Geological Conservation Review*.
- ii. If restoration of the special interest is possible or practicable.
- iii. Where the special interest has moved entirely outside the site, but remains adjacent or in close proximity, the site will not be denotified until the land now containing the special interest is notified.
- iv. iv. Where there is some prospect that natural processes may return the special interest within a reasonable time, the site is unlikely to be denotified.
- v. v. Where cartographical errors were included in the original notification of the site.
- vi. vi. A change of special interest from that for which it was notified, or a change that will lead to a new special interest, will not usually be a reason for denotification.

The first of these principles is applicable at Raisby Hill Quarry. The part of Raisby Hill Quarry proposed for de-notification has been lawfully worked out under pre-existing mineral permissions and is now either quarry void or restored/back-filled. The scale of the excavation within the quarry is to the base of the Raisby Formation, the pit floor is not of special interest, and consequently the feature of interest at that location is destroyed. Natural England is therefore of the opinion that it is no longer possible to conserve that part of the site. Accordingly it does not meet the required operational criteria of the GCR site selection process and is proposed for de-notification as it is not of special interest.

4. Assessment of the current condition of Raisby Hill Quarry SSSI

Site unit numbers*	Interest features	Reported condition**	Date of last assessment
1	Upper Permian Raisby Formation	Favourable	1 November 2017
2		Destroyed	
3			

* **Site units** are divisions used by Natural England for administrative purposes only.

** **Reported condition**

SSSIs are notified because of special biological or geological features. When these features are being managed so that their special nature conservation interest is being maintained they are reported to be in a favourable condition. This is a United Kingdom standard and the terminology and definitions are more fully described in A Statement on Common Standards Monitoring, produced by the Joint Nature Conservation Committee (JNCC) in 1998.

5. Selection of ‘operations requiring Natural England’s consent’

Natural England selects operations from a master list when determining the list of operations requiring consent for individual SSSIs. The selection is based on the likelihood that the operations may cause damage to the special features that are the reasons for notification of the SSSI. As well as selecting operations from the master list, the precise wording of each operation may be tailored to suit the particular circumstances at the site.

It is not possible to predict every possible eventuality that may arise on a site but the aim is to identify all operations where it is reasonably foreseeable that, if carried out at certain times or in a particular manner somewhere within the SSSI, they are likely to damage the special interest features. The table below records at least one reason justifying the inclusion of each operation in the list for Raisby Hill Quarry SSSI. The reasons for listing the operations identified are not intended to be exhaustive and in most cases there will be other ways in which the specified operation is likely to cause damage.

Some amendments to the list recognise that the site’s management will change from operational quarry with associated processing and depot functions, to a post-operational aftercare stage over the life of the current planning consents.

Standard reference number	Type of operation	At least one reason for listing
7.	Dumping, spreading or discharging of any materials on or against geological exposures of importance.	Risk of obscuring the geological features and access for study
12.	Tree and/or woodland management and alterations to tree and/or woodland management (including planting, felling, pruning and tree surgery, thinning, coppicing, changes in species composition and removal of fallen timber).	Vegetation obscures the features of interest and hinders access for study. Tree roots can damage geological features and management operations may damage or obscure exposed and near-surface geological features.
14.	Alterations to water levels and tables and water utilisation (including irrigation, water storage in disused quarries and abstraction from existing water bodies and through boreholes). Also the modification of current drainage operations (such as the installation or removal of pumps).	Operations which could impact upon the hydrology or increase erosion of the features of interest or prevent safe access.
15.	Infilling, creation or digging of ditches, dykes, drains, ponds, pools, marshes or pits.	Operations which could impact upon the hydrology or increase erosion of the features of interest or prevent safe access. Could also cause direct damage or destruction of geological features.
20.	Extraction of minerals including hard rock, sand, gravel, limestones and spoil.	Could cause direct damage or destruction of geological features.
21.	Destruction, construction, removal, rerouting, or regrading of roads, tracks, quarry floor, walls, fences, hardstands, banks, ditches or other earthworks, including soil and soft rock exposures or the laying, maintenance or removal of pipelines and cables, above or below ground.	Could cause direct damage or destruction of geological features.

Standard reference number	Type of operation	At least one reason for listing
22.	Storage of materials on or against quarry faces showing geological features of interest, specifically exposure of limestone sequence.	Risk of obscuring or damaging features of interest or impeding access to the features.
23.	Erection, removal or destruction of permanent or temporary structures, or the undertaking of engineering works, including drilling.	Risk of obscuring or damaging features of interest or impeding access to the features.
24a.	Modification of natural or man-made features and clearance of boulders, large stones, loose rock or spoil.	Direct loss of or incidental damage to important features. Loss of resource for study, education and amenity.
24b.	Battering, buttressing, grading or seeding of geological exposures and cuttings (rock and soil) and infilling of pits and quarries.	Direct loss of or damage to important features. Loss of resource.

6. Site unit map

The modified SSSI boundary encompasses land that is divided into three units for the purposes of reporting on the condition of the special interest feature. Unit 1 is the remaining quarry face in the part of the quarry now used for processing and storage. Unit 2 is the additional notified land which will form the restoration area following completion of the works in 2042-44. Unit 3 is the land proposed for de-notification.

The map on the following page shows the provisional boundaries of the site units, which are divisions used by Natural England for administrative purposes only.

Insert site unit map here

7. Photographs



Photograph 1

**Raisby Hill Quarry SSSI
boundary shown in red**



Scale (at A3): 1:5,410

Map produced by Denise Rose,
Resilient Landscapes & Seas Team
Date: 19/09/2019.

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Photograph 2: Panoramic view showing west, north and east (working) faces from viewing area to the south of the quarry



Photograph 3: Eastern working face showing variation in the Raisby Formation including brown, blue-grey and buff coloured Magnesian Limestone

