Chapter 5: PRACTICAL GEOLOGICAL CONSERVATION REVIEW

SELECTION METHODS

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Site selection criteria

The three essential components of the Geological Conservation Review are explained in Chapter 4: Principles of site selection. Practical guidelines were also developed so that the Geological Conservation Review sites can be selected from the range of candidate sites.

First, two operational criteria are employed.

- there should be a minimum of duplication of interest between sites, and
- it should be possible to conserve any proposed site in a practical sense.

All scientific factors being equal, sites that cannot be conserved or which entirely or largely duplicate the interest of another are excluded. Sites which are least vulnerable to potential threat, are more accessible, and are not duplicated by other sites are preferred.

Preference is given to sites that:

- demonstrate an assemblage of geological features or scientific interests
- show an extended, or relatively complete, record of the feature of interest. In the case of geomorphological sites this often equates to sites which contain features which have been least altered after formation. For Quaternary networks, this might relate to sites containing an extended fossil record, including pollen, insects and molluscs. This can be used to infer vegetation history or environmental change
- have been studied in detail and which have a long history of research and re-interpretation
- have potential for future study
- have played a significant part in the development of the Earth sciences, including former reference sites, sites where particular British geological phenomena were first recognised, and sites which were the focus of studies that led to the development of new theories or concepts

Application of these criteria ensures that sites chosen for a particular network in the Geological Conservation Review have the greatest collective scientific value and can be conserved.

Minimum number and minimum area of sites

In order to ensure that Geological Conservation Review site status is confined to sites of national importance, the number of sites selected is restricted to a reasonable minimum. Only those that are necessary to characterise the network in question, that is, to demonstrate the current understanding of the range of Earth science features in Britain for the network, are selected. These factors are important in the justification of the scientific value of a Geological Conservation Review site if it is to be subsequently designated a Site of Special Scientific Interest. For example, the scientific case for conserving a given site is stronger if it is the only one of its kind, or if it is demonstrably the best of a set of similar examples.

The area of a Geological Conservation Review site is always kept to a minimum. For example, in tracing the form of a major structure over a distance of several kilometres, a small number of dispersed, representative ‘sample’ sites might be selected – the minimum number and size required to describe and interpret the feature adequately. There are, however, exceptions to this general rule: for example, large sites will be required to represent the range of large-scale glacial landforms in the uplands of Wales or Scotland. In contrast, mine spoil heaps, typically of limited size, normally form relatively small sites.
Methods and working practice
The process of site assessment and selection for the Geological Conservation Review was led by Nature
Conservancy Council staff supported by several hundred Earth scientists contracted to assess sites within
their particular area of expertise.

The starting point for this process was to devise a comprehensive classification of blocks to sub-divide the
geology and geomorphology of Britain into a series of subject areas. Work on particular blocks then typically
followed four stages.

Stage 1: Building and briefing the block team
For the larger blocks, a co-ordinator (a specialist member of the Nature Conservancy Council or an external
expert Earth scientist) was appointed to oversee the task of assessing and selecting the sites. The co-
ordinator’s role was to advise on site selection criteria and collate the work of a number of contributors who
dealt with networks of sites within the block. For the smaller blocks, a single Geological Conservation Review
contributor often undertook the work, in consultation with other experts within the field.

Stage 2: Literature review and site shortlisting
The block co-ordinator or contributor then undertook an extensive literature sear ch of both published and
unpublished sources to create a list of all known Earth science sites of potentially national or international
importance, relevant to the subject of the block. Where appropriate, early historical references to specific
sites were researched so that potential sites from the earliest days of British Earth science could be
considered for inclusion in the review.

Each of the sites on the draft list was given standard basic documentation (e.g. site location, brief summary
of scientific interest, possible justification for inclusion within a network).

Draft lists were circulated among the appropriate experts for critical assessment and comment. Sites with
significant research potential were considered. Following this peer review, a shortlist of candidate sites was
drawn up. In the case of the Jurassic–Cretaceous reptilia block, 380 potential Geological Conservation
Review sites were identified from the literature as potentially special; this number was reduced to about 150,
after first-stage sifting.

Stage 3: Field visits and detailed site investigation
Shortlisted sites were usually visited by the block co-ordinator or relevant expert to assess and validate the
scientific interest.

Following the initial field visits, the list of potential sites was further refined by the co-ordinator, in liaison with
the specialist advisors for the block. At this stage, sites where the significant deterioration of the interest had
taken place were usually dropped from the list. In some cases it proved necessary to clear exposures of
vegetation and soil, or to sample them remotely, for example by augering, before an assessment of potential
could be made. This was particularly true of some historically important Quaternary localities.

Stage 4: Final assessment and preparation of Geological Conservation Review site documents
The draft list of potential sites was then reviewed and the sites were once again scrutinised against the
selection and operational criteria. A final list of sites meriting inclusion within the particular Geological
Conservation Review network was then prepared. From the list of 150 shortlisted potential Jurassic–
Cretaceous reptilia sites, a final list of 28 actual Geological Conservation Review sites was produced.

For each proposed Geological Conservation Review site the following documents were prepared:

- a site boundary enclosing the important features of the site, drawn on 1:10,000 Ordnance Survey
  maps
- a concise statement of the scientific interest, typically between 100 and 200 words in length
- a longer statement describing the scientific importance of the site and citing key references from the
  literature
**Specimen citation**

**Dinas Dinlle, Gwynedd, Wales.**

GCR NETWORK Quaternary of Wales  
NAME OF SITE Dinas Dinlle  
COUNTY/DISTRICT Gwynedd  
GRID REFERENCE SH 437562  
The GCR site overlaps in part with the existing SSSI named Dinas Dinlle

Photo: Stewart Campbell, CCW

**GCR INTEREST:**  
Dinas Dinlle is an important coastal exposure for interpreting Late Pleistocene glaciation in North Wales. The sequence comprises a complex series of Irish Sea and Welsh tills with associated sands, silts and gravels. It is complicated by well-developed glaciotectonic structures including folds, faults and overthrows, and by cryoturbation features which occur in the uppermost horizons. The sections have been regarded as showing the northernmost occurrence of Irish Sea till belonging to the oldest known glacial episode in the area (the Trevor Advance), while the glaciotectonic structures have been interpreted as evidence for a later readvance of ice. However, recent research suggests that the sediments and glaciotectonic structures need not be the product of different glacial advances, but can be adequately explained as a multiple drift sequence formed during one glaciation. The drift sequence, and particularly the glaciotectonic structures, make Dinas Dinlle a site of significant interest for reconstructing Late Pleistocene processes and events in North Wales.  
The statement and a map form the basis of a key part of the documentation required to notify the Geological Conservation Review sites as components of the SSSI system under the Wildlife and Countryside Act 1981. Site of Special Scientific Interest may contain more than one Geological Conservation Review site; an example is Durlston Bay, South Dorset, which contains six Geological Conservation Review sites.

**Continuing developments**  
The final concept to be considered is ‘current understanding’. It is unlikely that the entire geological and geomorphological record will ever be fully understood. Given the speed of scientific change within geology, there is a continual need to re-survey to ensure the Geological Conservation Review blocks and their constituent networks reflect the current state of knowledge. The Geological Conservation Review is, therefore, an ongoing process of refinement and updating to ensure that conservation keeps pace with current understanding.

The physical character of sites is constantly being changed by weathering and vegetation growth. Some sites are lost to development, while other new exposures are created by quarrying and engineering works. Thus a site series is inherently dynamic and should be reviewed periodically. In practice, such reviews have resulted in only modest changes since 1990.