
Fossil arthropods of Great Britain

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Access to the countryside

This volume is not intended for use as a field guide. The description or mention of any site should not be taken as an indication that access to a site is open. Most sites described are in private ownership, and their inclusion herein is solely for the purpose of justifying their conservation. Their description or appearance on a map in this work should not be construed as an invitation to visit. Prior consent for visits should always be obtained from the landowner and/or occupier.

Information on conservation matters, including site ownership, relating to Sites of Special Scientific Interest (SSSIs) or National Nature Reserves (NNRs) in particular counties or districts may be obtained from the relevant country conservation agency headquarters listed below:

Countryside Council for Wales, Maes-y-Ffynnon, Penrhosgarnedd, Bangor, Gwynedd LL57 2DW.

Natural England, Northminster House, Peterborough PE 1 1UA.

Scottish Natural Heritage, Great Glen House, Leachkin Road Inverness N3 8NW.

Conserving our fossil heritage — JNCC policy statement

Fossils are a key part of our natural heritage and a major scientific, educational and cultural resource. They are fundamental to understanding the evolution of life and the character of ancient environments. Fossils also provide a basis for comparing the ages of rocks the world over.

The discovery, collection and study of the fossilized remains of ancient life can be enjoyable and stimulating activities that give people a fascinating insight into the geological and biological history of the Earth. However, the available fossil resource is finite. It is only through maintaining a prudent approach to the management of important fossil sites that future generations will be able to experience, study and enjoy them.

Responsible fossil collecting

In most circumstances, responsible fossil collecting is not harmful to the conservation of fossil sites. It can actually benefit our understanding of geology. This is particularly true where the fossils are relatively common or the sites in which they are found are subject to high levels of natural or artificial degradation, such as coastal cliffs that are being eroded, or quarries that are being actively worked. In such situations collecting fossil specimens that might otherwise be destroyed can be beneficial to science, provided that they are properly documented and made available for study. Responsible fossil collecting can therefore be a valuable activity in the sustainable management and safeguard of our fossil heritage.

Irresponsible fossil collecting

Irresponsible collecting provides no scientific or educational gain and is therefore an unacceptable activity resulting in irreparable damage to our fossil heritage. It will pose a clear threat where fossils are rare or the fossil source is limited in extent, for example in a cave or a river channel deposit. Collecting without proper recording and curation, inexperienced collecting, over-collecting and inappropriate use of power tools and heavy machinery are likely to reduce or even destroy the scientific value of such sites. Unless the activity is undertaken in an appropriate manner, the statutory nature conservation agencies, the Countryside Council for Wales, Environment and Heritage Service, Natural England and Scottish Natural Heritage, will oppose fossil collecting on the small number of Sites of Special Scientific Interest/Areas of Special Scientific Interest where this activity would cause significant damage to the features of special interest.

Code of Good Practice

Adopting a responsible approach to collecting is essential for conserving our fossil heritage. The basic principles set out below should be followed by all those intending to collect fossils.

Access and ownership — permission to enter private land and collect fossils must always be gained and local bylaws should be obeyed. A clear agreement should be made over the future ownership of any fossils collected.

Collecting — in general, collect only a few representative specimens and obtain these from fallen or loose material. Detailed scientific study will require collection of fossils *in situ*.

Site management — avoid disturbance to wildlife. Many invertebrates and lower plants live on or under loose rocks that should be replaced in their original positions whenever possible. Do not leave the site in an untidy or dangerous condition for those who follow.

Recording and curation — always record precisely the locality at which fossils are found and, if collected *in situ*, record relevant details of the position of the rock layer from where the fossil was collected. Ensure that these records can be directly related to the relevant specimens. Where necessary, seek specialist advice on specimen identification and care. Fossils of prime scientific importance should be placed in a suitable repository, normally a museum with adequate curatorial and storage facilities.

Management of our fossil heritage

In order to achieve the successful management of the fossil heritage of the United Kingdom, the statutory nature conservation agencies will:

- Promote the responsible approach outlined in the *Code of Good Practice*, above.
- Encourage the placement of scientifically important fossils into a suitable repository (such as a museum) in order to ensure their proper curation, longterm security and accessibility.
- Recognize the contribution that responsible fossil collectors can make to geological and palaeontological study.
- Encourage collaboration within the geological community to ensure that maximum educational and scientific gain is made from our fossil resource.
- Support and encourage initiatives that increase awareness and understanding of the value of our fossil resource and the need to conserve it.
- Increase awareness and understanding of the differing management needs of fossil sites. In particular, encourage landowners and occupiers to become advocates for conservation of the fossil resource.
- Review the need for export and import controls on the international trade in fossil specimens.

JNCC, 1997

Preface

There is such a diversity of rocks, minerals, fossils and landforms packed into the piece of the Earth's crust we call 'Britain' that it is difficult to be unimpressed by the long, complex history of geological change to which they are testimony. But if we are to improve our understanding of the nature of the geological forces that have shaped our islands, further unravel their history in 'deep time' and learn more of the history of life on Earth, we must ensure that the most scientifically important Earth science sites are conserved for future generations to study, research and enjoy. Moreover, as an educational field resource and as training grounds for new generations of geologists on which to hone their skills, it is essential that such sites continue to remain available for study. The first step in achieving this goal is to identify the key sites, which is a primary aim of the Geological Conservation Review (GCR).

The GCR, launched in 1977, is a world-first in the systematic selection and documentation of a country's best Earth science sites. No other country has attempted such a comprehensive and systematic review of its Earth science sites on anything near the same scale. After three decades of site evaluation, consultation with the scientific community, and site documentation, we now have an inventory of over 3000 GCR sites, selected for 100 categories covering the entire range of the geological and geomorphological features of Britain.

The minimum criterion for GCR site selection is that sites should offer the finest and/or the most representative feature for illustrating a particular aspect of geology or geomorphology. The resulting GCR sites are thus, at the very least, of national scientific importance and many of these include features regarded 'as either 'classic' (i.e. a 'textbook example'), internationally important, or simply 'unique'. Some are, in addition, visually spectacular.

The present volume is the 35th to be published in the GCR series of books, which, when complete, will stretch to more than 40 volumes and provide a vast geoconservation information resource. The volume, in describing the ultimately selected GCR sites, represents the results of that part of the GCR assessment and selection programme for Fossil Arthropods and Palaeoentomology. Both of these palaeontological themes provided the basis for site selection categories for the GCR. This volume summarizes the considerable research that has been undertaken on the localities and will be invaluable as an essential reference source for those engaged in their study and aims to provide a stimulus for further investigation. It will also be helpful to teachers and lecturers and for those people who, in one way or another, have a vested interest in the GCR sites: owners, occupiers, planners and those concerned with the practicalities of site conservation. The conservation value of the sites is mostly based on a specialist understanding of the Earth science features present and is, therefore, of a technical nature. The account of each site ends, however, with a brief summary of the geological interest, framed in less technical language, in order to help the non-specialist. The first chapter of the

volume, used in conjunction with the glossary, is also aimed at a less specialist audience.

This volume deals with the state of knowledge of the sites available at the time of writing, and it must be seen in this context. There is still much to learn about the GCR sites documented here, in increasing our knowledge and understanding of geological history and processes. Geological studies, like any other science, are ever-developing, with new discoveries being made, and existing models being subject to continual testing and modification as new data comes to light. While the existing sites continue to enable us to add to our geological knowledge, increased or hitherto unrecognized significance may be seen in new sites. Indeed, during the writing of this volume, a number of additional localities were considered for inclusion and, after a period of assessment, were ultimately deemed to be worthy of GCR status and were included in this account. That fact is almost inevitable when one considers that some of the original networks of sites were drawn up over two decades ago.

Therefore, it is possible that further important sites will be identified in future years for the GCR as research continues. However, it must be stressed that the GCR is intended to be a *minimalist* scheme, with the selection of only the best, most representative, example of a geological feature, rather than the selection of a series of sites showing closely analogous features.

This account clearly demonstrates the value of the GCR sites to the study of fossil arthropods and their importance within the wider context of Britain's outstanding scientific and natural heritage, and I am grateful to the authors for their valuable contribution in assisting JNCC in its conservation goals.

N.V. Ellis, GCR Publications Manager and Geoconservation Adviser, JNCC January 2010

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