Natural England Technical Information Note TIN119

# Managing geological specimen collecting: Writhlington case study

**This case study has been written to help explain the guidance provided in TIN111. It illustrates the management of geological specimen collecting of fossil collecting from mine dumps. Writhlington Geological Nature Reserve and Site of Special Scientific Interest is located to the east of Radstock in Bath & North East Somerset and forms part of a disused colliery tip. A controlled collecting approach has been adopted.**

## Background

The Coal Measures mudstones within the mining waste contain a diverse Carboniferous Westphalian D age fossil assemblage and around 3,000 tons of material was set aside as the Writhlington Geological Nature Reserve.

In addition to over 100 species of plant fossils, Writhlington has yielded the largest known collection of Carboniferous arthropods, especially insects, in Britain including cockroaches, giant millipedes and spiders (Austen, 2001). Writhlington is protected as a geological Site of Special Scientific Interest.

## Understanding the fossil resource

### The nature of the site

The fossil resource is finite with limited resource (fossiliferous mining waste). Complete removal of material would destroy the features of interest.

### The process of exposure

Predictable exposure through artificial turning over of the mining waste. A greater abundance of fossils is available immediately after the rock store is turned over.

Fossil collecting from the mine dumps. © Colin Prosser

### The nature of collecting

This nationally renowned site is popular and important for collecting and the collecting pressure is potentially high. Specimens can be easily recovered then studied off site by specialists.

### The nature of the interest

The diverse range of fossils at Writhlington provides an insight into the world's earliest known 'tropical forest' ecosystem. Significant finds include the earliest known damselfly and the largest-known Late Westphalian cockroach assemblage.

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The study of Writhlington finds (particularly fossil insect assemblages) has contributed to a thorough understanding of the British Upper Carboniferous. Many finds have been new to science.

### Ownership

Straightforward: ownership of the dump, except fossil finds, lies with the former mineral operator. The West London Wildlife Group has responsibility for the management of the reserve.

### The nature of the access

Access is controlled effectively by fencing. It is restricted and there is mandatory site supervision by geological specialists.

### The skills of collecting

Low level skills required and low cost of collecting. Specimens are recovered easily from loose spoil. Supervision by geological specialists is provided for visitors at all times.

### Research and museum collections

Local finds are housed at the City of Bristol Museum and Art Gallery (insects), Manchester Museum (spider-like arthropods and horseshoe crabs) and the National Museum of Wales in Cardiff (plants), with some donations to Taunton Castle Museum, Kew Gardens, Maidstone Museum & Bentlif Art Gallery, the Booth Museum of Natural History (Brighton) and the Natural History Museum.

## Management options and issues

The geological resource at Writhlington is finite, but the processes of exposure are predictable. These comprise digging by fossil collectors and artificial turning over of the mine waste material. Productivity fall-off is in part due to the spent spoil becoming mixed up with fresh rock in the store; and the weathering and crumbling of the mudstone after the material is turned over.

The finite nature of the site and the scientific significance of the fossils mean that the vulnerability of the resource to collecting pressure is high and requires careful management. As a consequence organised 'rescue collecting' of fossils has been undertaken since 1984, and the benefit to science has been huge.

## Management approaches

Ownership and management of the Writhlington site requires collaboration between the West London Wildlife Group and the contractor who owns the mineral rights. These bodies have adopted a 'controlled collecting approach' to management. Access to the site is controlled by perimeter fencing, which is gated and locked. The key to the site is currently held by Radstock Museum; use of the site is by permission only and all educational visits must be supervised by geological specialists.

'Conditions for Use of Site' were drawn up with all visitors complying with eight site rules. These include:

- making rare finds available to experts or museums;
- taking appropriate safety precautions whilst working on site;
- the prohibition of vehicles on site;
- keeping within the conservation area boundary; and
- leaving the site in a tidy and secure state on departure.

The Conditions are complemented by an Indemnity Form to be signed by all visitors.

Every individual who makes a find at the site has an obligation to record details. Fossil insects must be made available for study. Details about fossil plant finds must also be recorded but unless of particular interest, may be retained by the collector (Prosser and others, 2006).

Finds are housed at the City of Bristol Museum and Art Gallery (insects), Manchester Museum (spider-like arthropods and horseshoe crabs) and the National Museum of Wales in Cardiff (plants), with some donations to Taunton Castle Museum and Kew Gardens (Austen, 2001). Collecting fossils for commercial gain is strictly prohibited.

## Monitoring and progress

The use of these management approaches at Writhlington have proved successful in allowing significant scientific and educational gain from a classified finite resource.

Monitoring of the condition of Writhlington is undertaken as a requirement of SSSI designation and, as anticipated, the abundance of fossils has been observed to have lessened throughout the collecting life of the site. As a controlled collecting approach was adopted the scientific return (in particular fossil insects and arthropods) has been significant over the life of the Reserve.

## Selected references

Austen, P.A. 2001. *The Writhlington experience*. In Bassett, M.G., King, A.H., Larwood, J.G., Parkinson, N.A. and Deisler, V.K. eds. *A Future for Fossils.* 67-70. National Museum of Wales, Geological Series No 19, Cardiff.

Prosser, C.D., Murphy, M. & Larwood, J.G. 2006. *Geological conservation: a guide to good practice*. Peterborough: English Nature. URL: **http://publications.naturalengland.org.uk/publication/83048** [Accessed March 2012].

## Further information

Natural England Technical Information Notes are available to download from the Natural England website: **www.naturalengland.org.uk**. In particular see:

- TIN111: *Managing geological specimen collecting*
- TIN112: *Managing geological specimen collecting: responsible collecting*
- TIN113: *Managing geological specimen collecting: caves*
- TIN114: *Managing geological specimen collecting: Charmouth case study*
- TIN115: *Managing geological specimen collecting: Fowlmead Country Park case study*
- TIN116: *Managing geological specimen collecting: rock coring*
- TIN117: *Managing geological specimen collecting: Whittlesey Brick Pits and King's Dyke Nature Reserve case study*
- TIN118: *Managing geological specimen collecting: Wren's Nest case study*
- TIN127: *Managing geological specimen collecting:Caldbeck Fells case study*

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail **enquiries@naturalengland.org.uk**.

### Authors and acknowledgements

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**Table 1 Summary of management approaches used at Writhlington**

| Management approach taken | Controlled collecting approach |
|---|---|
| **Benefits of chosen management approach** | • Safe and responsible learning encouraged and supervised by geological experts.<br>• Controlled access prevents excessive damage and depletion of geological resource.<br>• Controlled rescue collecting maximises the recovered fossil resource available for scientific study. |
| **Drawbacks of chosen management approach** | • Organised 'rescue collecting' optimises the contribution to scientific understanding, but diminishes the resource available for future recreational users to explore. |
| **Current monitoring situation** | • There is no formal management plan and no monitoring is undertaken, although the more regular collectors have noticed a significant decrease in fossil recovery over the years. However, reported arthropod finds are given consecutive field numbers and the decrease in productivity is consistent with the original funding estimate of ten years of productivity before levelling off. |