THE PRESERVATION AND RE-CREATION OF CONSERVATION VALUE IN MINERAL WORKINGS

C. G. DOWN, BSc, PhD
Department of Mineral Resources Engineering,
Imperial College, London SW72BP, UK

ABSTRACT
The importance of abandoned mineral workings to nature conservation is discussed, together with the conflicts posed by proposed new developments. Four ways of preserving, re-creating and/or enhancing conservation value are presented and considered. The need for additional research is emphasised.

INTRODUCTION
The conflicts between mineral development and conservation interests, especially though not exclusively biological conservation, are well known in principle but scarcely solved in practice. When such conflicts arise, the ‘solution’ is usually to make the stark choice either to permit the development and damage (or eliminate) the features of conservation value, or to refuse the development and preserve the competing values. Such a situation leaves, on the face of it, very little room for any compromise. Indeed, the most that can normally be achieved is a slight alteration in either the location of some components of the development, or its timing, the latter in order to permit last-minute ‘rescue’ studies to be performed. Archaeologists who carry out rescue digs in advance of new roads, or on building sites, will be familiar with this dilemma. One cannot re-site an office block at the last minute any more than a new orebody can be located to order in some less sensitive location.

The precise nature of the problem and the ways of handling it vary from country to country. At one extreme might be placed the North American barring of land from mineral or other development via the implementation of a wilderness concept. Such a course certainly avoids the conflict, though may well create difficulties in other directions. At the other extreme might be placed countries such as the United Kingdom, Malaysia and some African nations. This apparently disparate grouping in fact includes nations which have little if any land legally debarred to mineral operations, but fairly extensive areas of national parks and other designated lands within which there is some degree of presumption against mining and wherein the burden of proof of the need for the mineral usually lies squarely upon the developer.

Such situations are ‘large scale’ in the sense that objections to mineral development are not usually based primarily upon the perhaps severe but local impact that it may cause, but at least as much upon the principles involved and the ‘thin end of the wedge’ fear. Although this paper might have some relevance to this type of conflict, that is not its aim; the matters to be considered are those of a relatively very local scale, namely the physical destruction of habitats deemed of biological conservation value by mineral (or other) development. Such conflicts arise frequently in the UK where an abundance of conservation sites (often only one or two hectares in extent) exists.

Although the judgement has already been stated in terms of stark choice between the existing habitat or the new land use, in fact it is becoming increasingly apparent that intermediate possibilities do exist. This is not to suggest that anything like a perfect compromise can as yet be identified but it nonetheless seems that the granting of permission for mining upon land of conservation value need no longer entail total loss of that value. At least four possibilities can be suggested:

1. to plan reclamation of the site such that natural recolonisation can take its course;
2. to accelerate and direct natural recolonisation of the site;
3. deliberately and rapidly to re-create the valuable ecosystem by planting either at the mine site or elsewhere;
4. before development commences, to transplant or re-locate the whole ecosystem to another place.

These four possibilities can now be discussed.

NATURAL RECOLONISATION
There is today a widespread realisation that ‘derelict’ mineral workings make a contribution to nature conservation in the UK and, in some instances, a vital contribution.1,2 This has generally arisen as a result of the invasion of the mine site by the more mobile species from surrounding undisturbed land. Its importance is often due to a curious reversal of that event: the abandoned mine is now frequently the undisturbed land, and its surroundings have vanished under some other development. At least locally, therefore, mineral workings can be the last refuges of a variety of wildlife.

It is one of the more disturbing aspects of mined-land reclamation that standardised, widely applicable, techniques are so frequently applied, with scant regard for the local characteristics. Partly this no doubt arises from a natural desire to have reliable and economic reclamation techniques; partly also from a residual triumph at being able to achieve a plant cover at all. Whatever may be the underlying reason, the result all too often is a landscape which conforms to a standard type – bleak and featureless are adjectives often applied. Only rarely is it pointed out that the standard landscape is also a standard ecosystem and that typically it lacks any semblance of biological interest. Depending on the land use, such interest may or may not develop subsequently. Overall, the consequence of our modern skills in reclamation, when married with our almost universal insistence upon reclamation, is to eliminate the possibility of any future ‘derelict’ land and to prevent the natural development of conservation interest thereon. It is certainly conceivable that some decades hence the damage of present policies will become apparent.

One way to remedy this is of course to deliberately leave unreclaimed a percentage of mineral workings in selected locations and geological strata. However desirable this may be, it is probably politically and legally an
The preservation and re-creation of conservation value in mineral workings

This rate could easily be dramatically reduced to 1 ha per 20–30 days. This would imply costs of around £3000/ha, or within the same range as the more expensive conventional seeding techniques, such as hydroseeding. Thus, although originally envisaged as a means of preserving threatened valuable plant communities, it may be that the technique could also find application in normal landscaping work.

This work has to date proved the technical and economic feasibility of large-scale transplanting. The most important question has yet to be answered: does the vegetation it is desired to preserve actually survive the transplanting process unchanged? Initial indications are favourable, but much remains to be ascertained and, indeed, understood.

CONCLUSIONS

There seems little doubt that in the United Kingdom the reservation and enhancement of conservation interest at mineral workings will become of increased importance. This arises not only because of the continued loss of natural habitat, but because of the demonstrable value of abandoned mineral workings as sites of scientific interest. The approaches and techniques discussed above are neither wholly distinct from one another, nor mutually exclusive. They do however have in common the fact that important aspects of them are yet to be understood and much further work remains to be performed before any can be reliably employed at mineral operations.

ACKNOWLEDGEMENTS

Many organisations and individuals have provided important help in formulating the ideas discussed, and in implementing field trials. I particularly wish to acknowledge Dr Alan Morton, with whom most of the practical work mentioned has been conducted.

REFERENCES

1 Holiday, R. J. and Johnson, M. S. The contribution of derelict mineral and industrial sites to the conservation of rare plants in the United Kingdom. Minerals and the Environment, 1(1), 1979, 1–7.