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# Developing guidelines for identifying Biodiversity Action Plan habitats in quarries: a feasibility study

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# Developing guidelines for identifying Biodiversity Action Plan habitats in quarries: a feasibility study

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## About this Research Report

This work was commissioned and jointly funded by English Nature, The Quarry Products Association and the Silica and Moulding Sands Association working together as the Minerals and Nature Conservation Forum. The project forms part of the actions arising from the Statement of Intent between the three organisations, originally signed in July 1998. In particular, it contributes to our aim of working together to ensure the land and operations of the mineral industry are managed more effectively for nature conservation.

The project was produced under contract by Philip Horton BSc MIEEM and steered by members of the Minerals and Nature Conservation Forum - the body that manages the delivery of the Statement of Intent. The project manager was Andy Butler (Tarmac Central Ltd.). This report reflects the independent opinions of the contractor under the project brief and not necessarily those of English Nature or the trade associations.

In commissioning this project, the partners to the Statement of Intent recognised three clear issues. Firstly, that there is a lack of a standardised ecological audit of the land owned and managed by the aggregates and silica sand industries. This audit would have great use in identifying the range of habitats managed by industry bodies and the opportunities to contribute to the UK Biodiversity Action Plan. Secondly, that there is no consistent and simple management guidance available that would allow quarry operators to identify appropriate management on the range of habitats commonly associated with such operations. Finally, there would be significant gains in having all quarry operatives aware and mindful of the potential nature conservation benefits to be gained from managing operational and non-operational land appropriately. This is a training and awareness issue. The project was thus commissioned to cover all three aims through piloting a simple methodology to audit land in a bid to develop thinking and stimulate discussion on the subject.

In receiving the final project report, the Minerals and Nature Conservation Forum welcomed the excellent work in developing a proposal on the basis of BAP habitats – an approach supported by English Nature. However, significant issues became apparent in a number of areas – e.g. the advantages of using a BAP- based audit rather than Phase 1 or NVC; the difficulty of squaring a useful and quality criteria-based level of survey with a simple and understandable system; the application of the system to bare ground; the resource issues in an industry wide application. For these and other reasons, the Forum agreed that the approach was bold but unworkable in its proposed form and should not proceed beyond this exploratory phase. The report does however open useful avenues for discussion. We do however hope that future work will take some of the strands and recommendations in this report forward. It is presented here as a useful record for future debate. Readers should note that this does not therefore represent a recommended methodology.

Tom Moat, English Nature
Chair of the Minerals and Nature Conservation Forum

# Executive summary

The project was initiated in July 2001 to develop guidelines to allow non-specialists from the extractive industries industry to assess for themselves the contribution which their quarries are making to the wildlife content (biodiversity) of the countryside. The project arose out of the wish of quarry operators to maximise their contribution to the UK Government's Biodiversity Action Plan (BAP) targets. The guidelines were developed following visits to three quarries. A detailed analysis was carried out of the wildlife habitats present to determine their current and potential contribution to national and local BAP targets. This analysis revealed problems in the way BAP habitats were defined in the relevant UK and local BAP reports and in the Natural Area profiles produced by English Nature. This makes analysis of any habitat recorded in relation to specific BAP difficult for a non-specialist. In addition English Nature have indicated their wish to ensure that any candidate BAP habitats identified as a result of the guidelines were of a minimum quality standard before they could be included in a BAP habitat inventory. This also militates against analysis by a non-specialist. English Nature have indicated that they are tightening up their definitions of BAP habitats.

The study has however identified wildlife habitats within and around the trial quarries which are already making a significant contribution to the overall biodiversity of the British countryside, even if they do not qualify for inclusion on any official inventory. In addition wildlife habitat, ranging from heathland to reed bed, was identified which could contribute significantly to national and local BAP targets for habitat creation.

It is considered that the guidelines produced here for use by a non-specialist would form a valuable tool in the process of identifying the biodiversity of a site at a general habitat level. In particular it would give quarry operators a degree of 'ownership' of the habitats on their land, and hopefully motivate them to manage them to maintain or enhance their value. Guidelines for the management of these habitats is also contained in the report.

The report concludes with recommendations that the guidelines are trialled on the ground and a final set produced in a user friendly, illustrated format. Companies should establish an internal management structure to ensure that, where operationally possible, any important areas of wildlife habitat identified are maintained and enhanced.

Detailed work to classify the habitat to the level necessary for inclusion in the relevant official BAP habitat inventory is likely to require an experienced ecologist.

# Acknowledgements

The author would like to acknowledge the assistance received during the production of this report, both from the industry and English Nature. In particular I would like to thank Andy Butler of Tarmac, and Andrew Denley and Dave Southgate of Hanson Aggregates for their help and advice.

## Contents

# 1. Introduction and project brief

In July 2001 the Quarry Products Association and Silica & Moulding Sands Association commissioned a pilot project to develop a methodology would allow the industry to assess for itself the contribution which their quarries are making to the wildlife content (biodiversity) of the countryside. The project arose out of the wish of quarry operators to maximise their contribution to the UK Government's Biodiversity Action Plan (BAP) targets (UK Government, 1995). The brief was as follows:

i. To provide a simple process and mechanism to audit the existing or potential biodiversity value of a company's landholdings.

ii. To provide some management guidelines for illustrative purposes. These were to be habitat based although the potential to cover particular species of interest was also to be considered.

To be most useful this mechanism was to fulfil the following criteria:

i. It must provide a practical basis for making decisions on what actions might be taken to manage the land to maintain, enhance or create biodiversity interest.

ii. It must be able to link with other existing/future audits and biodiversity action to maximise its potential usefulness should companies wish to pursue a biodiversity element in managing a site.

iii. It should be simple enough for local staff with little or no ecological expertise to follow, use and understand.

In order to develop these guidelines a number of quarries were to be selected for detailed study. This study was to include a site report and habitat plan, based on BAP classification (amended/extended as necessary). The quarry operator was to provide existing available information on all relevant issues.

The report was to conclude with comments on the applicability of the scheme both in terms of its contribution to identification and management of biodiversity interest and its development by non-specialists.

The present project follows on from earlier work commissioned by the Associations, the results of which are published in the report 'Biodiversity and minerals: extracting the benefits for wildlife" (English Nature, Quarry Products Association and Silica & Moulding Sands Association, 1999). This earlier report explains the relevance of biodiversity to the mineral industry, and the UK Government's commitment to promote biodiversity. The report sets out in general terms how national targets for biodiversity can be converted into local action and explores a series of options by which the mineral industry can maximise its potential to contribute to these targets.

# 2. Implementing the brief

In order to meet the requirements of the brief the study has involved four stages as set out below.

## 2.1 Detailed professional audit of the existing and potential contribution to BAP of three sample quarries

The quarries assessed were Ballidon Quarry, Staffordshire (Tilcon), Croxden Quarry, Staffordshire (Tarmac) and Middleton Hall Quarry, Staffordshire (Hanson). Existing biological information was supplied by the operator along with details of local biodiversity priorities published in local Biodiversity Action Plans. Natural Area Profiles for each of the Natural Areas in which each quarry was situated were supplied by the English Nature Local Team.

A one day site visit was then made to each quarry to check the existing ecological information and to fill in gaps where necessary. An assessment was then made of the existing and potential contribution that the habitats present could make to biodiversity. Other adjacent land in the ownership of the company was also visited and assessed. The objectives of the project were also discussed with each of the quarry managers.

The results of these audits are contained in three separate reports:

- Ballidon Quarry – assessment of wildlife habitats in relation to Biodiversity Action Plan priorities;
- Croxden Quarry – assessment of wildlife habitats in relation to Biodiversity Action Plan priorities;
- Middleton Hall Quarry – assessment of wildlife habitats in relation to Biodiversity Action Plan priorities.

A summary of their conclusions is contained in Appendix 1 of this report.

## 2.2 Development of guidelines to undertake a simplified biodiversity audit

The information collected from both the desk and field studies has been used to develop the proposed guidelines. These should enable a simplified biodiversity audit to identify existing and potential features of value on land controlled by the company. The guidelines are considered to be suitable for use by non specialists including quarry managers and the company's own landscape design staff.

## 2.3 Habitat management

Simple guidelines have been produced for the management of those BAP habitats and species most likely to occur on mineral sites. These aim to maintain and where possible to enhance the value of each of the listed features and vegetation. The case for the creation of new habitat is also considered.

## 2.4 Consultation

A draft of the proposed guidelines was sent to members of the Mineral and Nature Conservation Forum which includes representatives of the Quarry Products Association and Silica & Moulding Sands Association and English Nature. A meeting was held at Tunstead Quarry Buxton on 23 October to discuss the draft guidelines and attended by members of the Forum. Following the views expressed at the meeting the guidelines were substantially altered and extended to meet the requirements of the group.

Keith Porter of English Nature who is developing the BAP initiative at their Peterborough Headquarters has also commented on the draft guidelines.

# 3. Conclusions from the three detailed case studies

The three case studies identified a number of features and vegetation types (habitats) which were making or could potentially make a significant contribution to local BAP targets. A number of these also supported key BAP species. In all three quarries the operators had already taken steps to maximise their potential contribution. A summary of each quarry's potential contribution to BAP is given in Appendix 1.

It will be noted that these identify further contributions, which could be made at each quarry, and also areas where one BAP priority appears to conflict with another. This is particularly true in cases where areas of species-rich grassland and heathland have been planted with trees.

The process of converting information on the ground to the published BAP targets was not found to be straightforward. While the information published in the two local Biodiversity Action Plans relevant to the quarries concerned (Staffordshire and the Peak District National Park) was very comprehensive, it was not always easy to relate the information presented with national BAP habitat and species priorities. The following problems were identified:

i. Basic differences in naming the habitat concerned.

   To give just one example; a key BAP habitat is 'Lowland Meadows'. The same habitat is described as 'Lowland wet grassland', in the Staffordshire LBAP and as both 'Hay Meadows' and 'Unimproved Pastures' in the Peak District LBAP. A further confusion in the Peak District is that lowland meadows and upland hay meadows are separate key habitats in BAP. Those in the Peak District geographically fall into both categories although the two types would be difficult to separate these on botanical grounds.

ii. Dealing with BAP 'Broad Habitat' types

   While the UK BAP targets are quite clear for the priority or 'Key' habitats, a further 'Broad Habitat' category exists where targets and priorities have yet to be determined. The specific habitats which should be included within each broad habitat type is not currently clear. Examples include most deciduous woodland in the UK which falls into the broad category 'Broadleaved, Mixed and Yew Woodland'. Similarly most

rivers in the UK fall into the broad category of 'Rivers and Streams, while many lakes and all ponds and ditches come under the broad category of 'Standing Open Water and Canals'.

The difficulty of assessment increases if these broad habitats also support key BAP species. An example would be ponds (potentially a BAP broad habitat type) which supports a colony of great crested newt (a key BAP species).

iii. Identifying national and local priorities

In addition to the key BAP habitats and species the local BAPs and Natural Area Profiles also identify habitats and species of local interest. While the presentation of the information is extremely valuable it makes assessment in terms of BAP priorities difficult. This is particularly so if a key BAP species, such as skylark, is more commonly found, both nationally and locally than other non BAP species which are only listed as locally important.

NB. It is understood (K. Porter, pers. com.) that English Nature are in the process of tightening up the definitions of the BAP priority habitats and hope to enter into consultation on these soon. English Nature would also wish to ensure that any candidate BAP habitats identified as a result of these guidelines were of a minimum quality standard before they could be included in a BAP habitat inventory.

# 4. Basis for developing the guidelines

## 4.1 Selecting the Target BAP Habitats

The detailed studies have shown that a much simplified approach is needed if a non-specialist is to carry out even a basic biodiversity audit of any piece of land. In general terms however the types of vegetation which are most likely to be of wildlife value, growing in and around a quarry, are fairly easy to identify. For instance, short grassland with many wildflowers is likely to be of some value. If the grassland has a lot of heather growing in it, it is also likely to be valuable but as heathland rather than grassland.

The problems arise when trying to decide the exact type of habitat present, for instance whether the grassland identified is technically classified as a lowland meadow or one of the other BAP grassland types. In addition the habitat then has to be assessed to establish whether it is valuable enough to count as a BAP habitat. For instance what plant species occur in the grassland and does it support other species, birds or insects perhaps, which are BAP species in their own right?

It is most unlikely that a non-specialist could make an accurate assessment at this level of biological complexity. The guidelines therefore concentrate on those features which would enable the layman to identify the range of basic habitats of wildlife value which may be present within the quarry. Once these have been established their contribution or potential to BAP targets can be determined, by someone with more ecological expertise.

The guidelines therefore concentrate on how to identify the most widespread wildlife habitats which are associated with quarries across most of the UK. These habitats were selected on the

basis of those which were found to be most widespread in the three case study quarries. These were also found to feature regularly in local BAPs.

For the purposes of this report these are termed 'Widespread BAP Habitats' and are identified, in bold, in Appendix 2. These should also be the priority habitats to be maintained, enhanced and where possible recreated by the quarry operator.

## 4.2 Other BAP Habitats

Appendix 2 also lists all the key and broad BAP habitats which are likely to occur in and around quarries.

Those habitats which appear on the list but have not been identified as 'Widespread' include those which are only found in the more sensitive or specialised types of quarry. They are most likely to be encountered when the quarry is situated in a National Park, the UK uplands or coastal regions, or where an unusual material such as peat is being extracted. The list of target habitats has been further refined as BAP includes a number of habitats of relatively low Biodiversity. These include built up areas and gardens, (agriculturally) improved habitats and conifer plantations. These have also been excluded from the list of target habitats.

## 4.3 Developing a methodology for identifying the Widespread BAP Habitats

The process of identifying the Widespread BAP Habitats has been divided into three stages as follows:

i. The basic habitat type
ii. The General Habitat type
iii. The Widespread BAP Habitat type

In general physical features of the vegetation are used to distinguish the 'Basic' and 'General' habitat types. The features selected which should be easy to recognise on the ground are listed in Tables 1a and 1b. A small number of key indicator plant species: trees, shrubs or wild flower (herbaceous plants or 'herbs') are sometimes listed to help confirm the type of habitat present. (NB. Illustrations of these species should be included in the final guidelines).

Further details of the methodology are given below.

### 4.3.1 Identifying the basic habitat category

Seven basic habitat categories have been identified. These can easily be recognised from their basic physical or vegetational characteristics.

The seven are as follows:

i. land with little or no vegetation (including cliffs);
ii. land dominated by grasses;
iii. land dominated by heather;
iv. land dominated by tall herbaceous vegetation;
v. land dominated by bracken;

vi. land containing woody species (trees and shrubs);
vii. wetland habitats.

All except 'tall herbaceous vegetation' may involve a Widespread BAP Habitat type.

### 4.3.2 Identifying the General Habitats

To identify the General Habitats present slightly more detailed physical or vegetational characteristics are used. Twenty seven different General Habitats have been identified. These are listed in Tables 1a & 1b.

As an aid to recognising these General Habitats they have been divided into those found on dry soils and those only associated with permanently waterlogged soils or with open water.

### 4.3.3 Identifying the Widespread BAP Habitats

Tables 1a & 1b show that fifteen of the twenty seven different General Habitats relate to existing Widespread BAP Habitats. In addition a further seven types of General Habitat have the potential to develop into BAP habitats if managed appropriately. Therefore all that is needed to identify all Widespread BAP Habitats is to list these given in the tables for each General Habitat.

### 4.3.4 Carrying out a survey on the ground and reporting

Tables 1a & 1b should contain all the background information necessary to make an initial survey of wildlife habitats in your quarry. A full set of the guidelines including what is required to carry out a survey on the ground and to report afterwards, including the production of a simple habitat map, are given in Appendix 3. This information as it stands could be used to carry out a trial of the guidelines on the ground.

When carrying out a survey it is important to record the operational status of the land. The following five categories have been identified.

i. undisturbed land outside the current planning permission;
ii undisturbed land within the current planning permission;
iii land already disturbed but not currently being worked;
iv active working area;
v. restored land.

An assessment can then be made regarding which length of time a habitat is likely be available for future management. There is little point in investing resources to enhance a habitat which is purely temporary.

# 5. Assessing the results of the survey

## 5.1 Dealing with any widespread BAP habitats found

Once the results of the survey have been written up and a neat map produced they can be checked against other available information. It would need to be decided whether this is done by the person who undertook the survey or another more experienced ecologist. Relevant information will be found in the following:

i. Any previous survey information on the wildlife habitats held by the Company, including any collected for an Environmental Assessment.

ii. Copies of the local BAP and Natural Area Profile from English Nature, the County Wildlife Trust or, where relevant, the National Park Authority.

In view of the problems, discussed above, in identifying key objectives from the documents listed in (ii); English Nature or the County Wildlife Trust should be asked to provide a summary list identifying all key habitats and species. The list should be annotated to indicate the national and/or local status of the habitat or species concerned.

## 5.2 Dealing with other BAP habitats not listed as widespread

It is possible that a key BAP habitat may be present which is not listed as a Widespread Habitat. If you think you have identified one of these habitats check initially with the full list of the BAP habitats given in Appendix 2.

If it appears that one of the other habitats listed in Appendix 2 has been identified the view of the English Nature, the County Wildlife Trust, National Park Authority or experienced ecologist should be sought.

## 5.3 Assessing the wildlife value of the widespread BAP habitat

Once any areas of a Widespread BAP Habitat have been identified their value should be assessed and a strategy developed to maintain and enhance the areas identified. Again it will need to be decided whether this is done by the person who undertook the survey or by a more experienced ecologist.

An indication of the importance of the dry and wet habitats is given in Tables 2a & 2b along with a summary of the management, which may be required to maintain and enhance them.

## 5.4 Form and presentation of the guidelines

The exact form in which the guidelines will be presented cannot be decided until their content has been agreed. It would be appropriate to illustrate the guidelines with diagrams and/or photographs of the listed features and vegetation, and also the key indicator species.

Although not included in the brief photographs were taken of representative habitats in each of the three quarries and are reproduced on the Habitat Plans in each report.

# 6. Management

## 6.1 General principles

The general principles of habitat management together with a list of simple management techniques are given in Appendix 4. Basic management techniques are also summarised in Table 2a and 2a for dry and wet habitats respectively. Appendix 4 also contains examples of when specialist advice should be sought. This may be needed, both to increase the value of certain of the developing habitats such as reed bed, or to manage established ones.

Established habitat may include land notified as a Site of Special Scientific Interest (SSSI) by English Nature, or which is managed as a nature reserve by County Wildlife Trust, RSPB, Local Authority or other conservation body.

Quarry managers should ensure that they are aware of the presence of these sites and their management implications. Further details are given in Appendix 5.

## 6.2 Implementing management measures

Options for implementing the various management measures fall outside the scope of this report. These however might include action by the Quarry Company alone or in partnership with the County Wildlife Trust, RSPB, Local Authority or other conservation body. The Countryside Stewardship Scheme can financially support a range of habitat enhancement and creation schemes on farmed land.

Any programme which contributes to the national and local BAP priorities is likely to have financial implications for the Company. The person responsible within the Company therefore needs to be identified, at an appropriate management level. This person should be able to take decisions regarding which features should been maintained, enhanced or created and for implementing any management work and financing it.

A structure also needs to be developed to ensure that all those involved with the quarry's management, its planning and/or its restoration are aware of the biodiversity priorities and how these are to be managed.

# 7. Conclusions and recommendations

This pilot project has confirmed the extent and diversity of existing and potential habitat listed in the UK Biodiversity Action Plan occurring in and around quarries. The exercise to develop guidelines which would enable the layman to recognise examples of these habitats has however identified a number of problems. These include a lack of clear definition of each BAP habitat found within the local BAPs investigated. The presence of Key and Broad Habitat definitions exacerbate this situation. Identification of many of the habitats into sub habitat types, such as grassland into calcareous, meadow types etc, requires the surveyor to be able to identify a range of plant species present.

English Nature has indicated that they are aware of the problems of BAP habitat definitions and are in the process of addressing them. They have also stated that they would wish any candidate BAP habitats identified as a result of these guidelines to be of a minimum ecological quality before they could be included in a BAP habitat inventory.

The conclusion of this report must therefore be that it is unlikely to be possible to produce guidelines which would enable a non-specialist to identify BAP habits to a level which would allow them to be included in any official inventory of BAP habitats.

The study has however confirmed that such habitats do exist, particularly those habitats which range from heathland to reed bed, which could contribute significantly to national and local BAP targets for habitat creation.

The study also confirmed that wildlife habitats within and around quarries are already making a significant contribution to the overall biodiversity of the British countryside, even if they do not qualify for inclusion on any official inventory. As indicated above there is considerable potential to increase this contribution in the future. It is important that the presence of these habitats or their potential is recognised at an early stage.

It is considered that the guidelines produced here form a valuable tool which would allow quarry operators to identify and manage important wildlife habitats on their land. In particular they give quarry operators a degree of 'ownership' of the habitats on their land, and hopefully motivate them to manage them to maintain or enhance their value.

Detailed work to classify the habitat to the level necessary for inclusion in the relevant habitat inventory is likely to require an experienced ecologist. This would include reclassification of the General Habitats identified from the guidelines to the correct BAP habitat, once these have been defined by English Nature.

The following recommendations are therefore made.

1. The draft guidelines should be trialled on the ground next summer using quarry company staff. Some prior training will be required.

2. Depending on the outcome of the trial the guidelines should be refined, in consultation with English Nature, and produced in a user friendly format, with appropriate illustrations.

3. Quarry operators should use the guidelines to compile their own unofficial inventories of General Habitats and the existing and potential BAP habitats which these potentially indicate, for each of their sites.

4. Compilation of the inventories should have regard to the operational status of the land. The listing of habitats on land which is about to be reworked should be avoided.

5. Quarry operators should produce a clear structure at an appropriate management level within the company to ensure that action is taken on the ground to protect and enhance any existing and potential BAP habitat identified.

6. English Nature should be pressed to produce clearer definitions of the various BAP habitats and to produce quality guidelines.

7. The unofficial inventories should be reviewed by an experienced ecologist to identify likely candidate sites for inclusion on the official BAP inventory. These should then be professionally assessed on the ground.

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## Table 1a. Identifying existing and potential widespread BAP habitats from vegetation on dry ground

All BAP habitats shown in **bold**

| Habitat number | Phase I Code | Basic Habitat | Description of General Habitat | Widespread BAP Habitat |
|---|---|---|---|---|
| 1 | I.2.1 | Land with little or no vegetation | High cliffs/ quarry faces in hard rock | **Inland rock** |
| 2 | I.2.1/2 | | Medium to high cliffs in sand or other loose material | **Inland rock** |
| 3 | J.1.3 | | Extensive areas of generally flat spoil with scattered herbs and grasses, with or without low banks and cliffs | Ephemeral (Important non-BAP Habitat) |
| 4 | J.1.3 | Land dominated by grasses | Ground almost covered with wild flowers and grasses. | Potential grassland |
| 5 | B.1/2/ 3<br><br>B.1<br>B2<br><br>B3 | | Good cover of low growing grasses with colourful herbs. May include occasional clumps of taller plants such as willowherb. May be mown or grazed<br>On thin acidic soils (key species heath bedstraw & sheep's sorrel)<br>On deeper neutral soils, usually in flood plains (key species: oxeye daisy, dandelion, red clover)<br>On thin limestone soils (key species: carnation sedge, salad burnet) | **Grassland**<br><br>**Acidic Meadow**<br><br>**Calcareous** |
| 6 | B.4 | | Closely grazed (farmed) grassland - no wild flowers | - |
| 7 | D.1.1 | Land dominated by heather | 25% of vegetation is composed of heather or bell heather. Less than 25% should be classified as acidic grassland | **Heathland** |
| 8 | C.3.1.1 | Tall vegetation | Tall herbaceous vegetation with rank grasses and/or docks, nettles, thistles, willowherb and/or scattered bracken. | - |
| 9 | C.1.1 | Land dominated by bracken | Stands of bracken (over 0.5ha) with other few other species | **Bracken** |
| 10 | A.2.2 | Land containing woody vegetation | Grassland, both tall & short) which is being colonised by scattered small trees and shrubs(hawthorn, birch, gorse and/or brambles.) | Potential scrub |
| 11 | A.2.1 | | Ground covered with young trees and shrubs. Identify main components (hawthorn, birch, gorse etc.) | Scrub (Important non-BAP Habitat) |
| 12 | A.2.1 | | Dense scrub, not possible to walk through. Identify main components (hawthorn, blackthorn, gorse etc.). If birch or other trees are abundant record as young woodland (Habitat no. 13) | Scrub (Important non-BAP Habitat) |
| 13 | A.1.1 | | Young woodland with bare ground underneath. Identify main components (birch, ash, oak, sycamore etc). | Potential BL woodland |
| 14 | A 1.1.2/ A.1.2.2 | | Young plantation of broadleaved trees or conifers including small trees and shrubs growing in tubes. Identify main components and proportion of broadleaved trees to conifer. | Potential BL woodland |

| Habitat number | Phase I Code | Basic Habitat | Description of General Habitat | Widespread BAP Habitat |
|---|---|---|---|---|
| 15 | A 1.1.2/ A.1.2.2 | | Old plantation of broadleaved trees or conifers with trees growing in straight lines. Identify main components and proportion of broadleaved trees to conifer. | Potential BL woodland |
| 16 | A.1.1 | | Mature woodland with old trees. Identify main components: ash, oak, sycamore, lime, yew etc, with hazel and/or hawthorn beneath. Shaded ground with woodland flowers including bluebell, bramble and/or bracken. | **Broadleaved, mixed & yew woods** |
| 17 | J.2.1 | | Recently planted hedge including small trees and shrubs growing in tubes. Identify main components. | Potential species-rich hedge |
| 18 | J.2.2 | | Remains of old hedge with gaps. Identify main components. | Potential species-rich hedge |
| 19 | J.2.1 | | Mature hedge with or without trees. Identify main components and count number of types of tree or shrub per 30m. (Above 5 = important hedge) | **Species-rich hedge** |

## Table 1b. Identifying existing and potential widespread BAP habitats from vegetation on wet ground

All BAP habitats shown in **bold**

| Habitat number | Phase I Code | Basic Habitat | Description of General Habitat | Widespread BAP Habitat |
|---|---|---|---|---|
| 20 | G.1.1.4 | Wetland Habitats | Body of open water > 5ha, with fringing, emergent and/or floating vegetation | **Eutrophic Lake** |
| 21 | G.1.1.1 | | Body of open water < 5ha, with fringing, emergent and/or floating vegetation<br>Includes ponds and ditches | **Standing open water** |
| 22 | G.2.1 | | Flowing water in a channel, with fringing, emergent and/or floating vegetation | **Rivers & streams** |
| - | - | | **Sub habitats of open water:** the number of these sub-habitats present give a rough indication of the biodiversity of the main habitat | |
| - | -<br><br>(E.1) | | i. What % of the water surface covered by floating vegetation ie duckweed or water-lily leaves?<br>(If sphagnum moss is dominant) | -<br>(Classify as **bog:** non Widespread Habitat) |
| - | - | | ii. What % of the water covered by emergent vegetation (reeds and grasses)? | - |
| - | - | | iii. What % of bank-side covered by emergent vegetation? | - |
| - | - | | iv. What % of bank-side covered by trees and bushes? | - |
| - | - | | v. extent of exposed sediments? | - |
| - | - | | vi. number and extent of islands? | - |
| 23 | B.5<br>(D.2) | | Whole area covered by short vegetation including orchids and other colourful herbs.<br>(May include more than 25 % cover of heather and/or bell heathers) | **Fen/marsh**<br>(classify as **heathland)** |
| 24 | F.1.2 | | Whole area covered by mixed tall grasses and/or reeds (0.5 –1.0m) | **Marsh /swamp** |
| 25 | F.1.1 | | Tall vegetation (above 1.0m) dominated by common reed. Fringes of reed around lakes should be classified as part of Eutrophic Lake. | **Reed bed** |
| 26 | A.1.1 | | Whole area covered by young woodland of willow and/or alder. | Potential wet woodland |
| 27 | A.1.1 | | Area of tall mature woodland with willows, alder and/or poplar. | **Wet woodland** |

## Table 2a. Assessment and management of quarry wildlife habitats: Habitats on dry ground.

All BAP habitats shown in **bold**

| Habitat description | Habitat number | Potential wildlife value | Management to retain or enhance habitat |
|---|---|---|---|
| **Inland Rock:** High cliffs/ quarry faces in hard rock | 1 | Peregrine and raven nesting with bats in crevices. Scree at foot of face may support specialist flora. | It is an offence under the Wildlife & Countryside Act to disturbing nesting birds or roosting bats if this cannot reasonably be avoided. Do not disturb cliffs if nests are present between May and July. If bats suspected a specialist survey should be commissioned. |
| **Inland Rock:** Medium to high cliffs in sand or other loose material | 2 | Sand martin nesting site and use by solitary wasps and bees. | It is an offence under the Wildlife & Countryside Act to disturbing nesting birds if this cannot reasonably be avoided. Do not disturb cliffs if nests are present between May and July. |
| Extensive areas of generally flat spoil with scattered herbs and grasses, with or without low banks & cliffs<br>**Important non BAP habitat** | 3 | Little ringed-plover nesting. Specialist ephemeral flora developing.<br>Use by solitary wasps and bees, especially if sandy banks and cliffs present. | It is an offence under the Wildlife & Countryside Act to disturbing nesting birds if this cannot reasonably be avoided. Try to locate any nests and avoid.<br>Do not landscape or plant trees on low banks and cliffs until wasps etc have been properly assessed.<br>To maintain scarify or rotovate half every winter. |
| **Grassland:** Ground almost covered with wild flowers and grasses. | 4 | Little ringed plover, grey partridge, lapwing and skylark. Lizards, insects including solitary wasps & bees, wild flowers | Scarify or rotovate half every year in winter, or allow to develop naturally towards, **grassland**, scrub and woodland. |
| **Grassland:** good cover of low growing grasses and herbs. Sub divided into those occurring on acidic, neutral and limestone stone soils. | 5 | Grey partridge, lapwing, skylark, meadow pipit. Vegetation will provide food for the larvae of butterflies, moths and other insects. Flowers will also provide nectar for insects. | Mow annually in late summer or autumn, removing all cut material. Or arrange for light grazing with no additional feeding or artificial fertiliser.<br>Do not plant trees in this habitat until the wildlife value of grassland has been properly assessed. |
| Closely grazed (farmed) grassland – no wild flowers | 6 | Little value without management to increase diversity | Specialised management required. Seek advice |
| **Heathland:** good cover of low growing grasses and herbs, but dominated by heather | 7 | Lapwing, skylark, meadow pipit, lizards, insects including solitary wasps & bees. Flowers will also provide nectar for insects. | Mow annually in late summer or autumn, removing all cut material. Or arrange for light grazing with no additional feeding or artificial fertiliser.<br>Do not plant trees in this habitat until the wildlife value of heathland has been properly assessed. |
| Tall rank grasses with docks, nettles and thistles. | 8 | Shelter for voles, some birds and grass snake. Seed source for goldfinch and linnet. Nettles food for butterfly larvae. | Increase floral diversity by mowing or cutting as above. This may be required by neighbours to prevent spread of injurious weeds. Or leave to develop naturally into scrub and woodland |

| Habitat description | Habitat number | Potential wildlife value | Management to retain or enhance habitat |
|---|---|---|---|
| **Bracken** | 9 | Limited value but supports specialist invertebrate fauna and provides cover for other species. | Do not eradicate bracken but check spread using suitable herbicide or regular cutting. |
| Vegetation with brambles and scattered small trees and shrubs | 10 | Cover for nesting birds, bramble provides nectar for insects, and fruit for field mice and birds. Shrubs provide food for insects (leaves) and birds (fruits). | Increase floral diversity by removing scrub and mowing or cutting grassland as above.<br>Or leave to develop naturally into dense scrub and woodland. |
| Ground covered with young trees and shrubs.<br>**Important non BAP habitat** | 11 | Further cover for nesting birds, fruit for birds in winter and leaves and flowers for insects and their larvae. | Cut down (coppice) part every few years so whole is cut over once in ten years. Or leave to develop naturally into dense scrub and woodland. In both options remove invasive species such as sycamore or rhododendron. |
| Dense scrub<br>**Important non BAP habitat** | 12 | Cover for badger and other larger mammals. Further cover for nesting birds, fruit for birds in winter and leaves and flowers for insects and their larvae. | Cut down (coppice) part every few years so whole is cut over once in ten years. Or leave to develop naturally into dense scrub and woodland. In both options remove invasive species such as sycamore or rhododendron. |
| Young woodland with bare ground underneath. | 13 | Value will increase as woodland matures to provide habitat for woodland plants, insects, birds and other animals, including cover for badger. | Leave to develop naturally into **mature woodland.** Remove invasive species such as sycamore or rhododendron. |
| Young plantation of broadleaved trees or conifers | 14 | Value will increase as woodland matures but only a limited number of specialised species (goshawk) will colonise conifers. Plantations will still provide cover for badger, deer and other larger mammals. | Plant trees that already occur locally. Avoid invasive species like sycamore or grey alder. Leave existing plantations to develop naturally into **mature woodland.** Remove invasive species such as sycamore or rhododendron. |
| Old plantation of broadleaved trees or conifers | 15 | Provide cover for badger, deer and other larger mammals and some birds.<br>Value can be increased by allowing some trees to become over mature: hole nesting birds and bats. | As trees mature, fell and replant with trees that already occur locally to create **mature woodland.** Avoid invasive species like sycamore or grey alder. Remove existing invasive species such as sycamore or rhododendron. Leave some trees to become over mature. |
| **Broadleaved, mixed & yew woods:** mature woodland with old trees | 16 | High wildlife value for woodland mammals, birds insects and plants. | Leave to develop naturally apart from removing existing invasive species such as sycamore or rhododendron.<br>If management is required then seek specialised management advice |
| Recently planted hedge | 17 | Will provide shelter and food source for mammals, birds and insects. Wild flowers will colonise. | Plant trees and shrubs that already occur locally. Leave to develop naturally, removing growing tubes as trees and shrubs become established. Once well established introduce programme of trimming. Do not trim whole hedge length in any one year. **Potential species-rich hedge.** |
| Remains of old hedge with gaps. | 18 | Very little existing value but this can be increased to that described above by management. | Plant trees and shrubs that already occur locally in gaps. Leave to develop as above. Established programme of trimming for remaining hedge as above. **Potential species-rich hedge.** |

| Habitat description | Habitat number | Potential wildlife value | Management to retain or enhance habitat |
|---|---|---|---|
| **Species-rich hedge:** mature hedge with or without trees | 19 | Old hedges have high wildlife value especially if many woody species and trees are present, often retaining woodland flora and fauna in un-wooded areas | Established programme of trimming. Do not trim whole hedge length in any one year. Consider possibility of traditional hedge laying. |

## Table 2b Assessment and management of quarry wildlife habitats: Habitats on wet ground.

All BAP habitats shown in **bold**

| Habitat description | Habitat number | Potential wildlife value | Management to retain or enhance habitat |
|---|---|---|---|
| **Eutrophic lake:** open water – lakes | 20 | Value will depend on factors like shape of shoreline, depth, and the presence of sub habitats listed below. Should include breeding and over wintering wildfowl, aquatic insects and plants. | Keep area free from human disturbance. Little other management required but see management for sub habitats below. |
| **Standing open water:** open water – ponds | 21 | Value will depend on factors like depth, light reaching the surface and the presence of sub habitats listed below. Should support breeding amphibians including great crested newt, aquatic insects and plants. | Management will be required to prevent pond from being smothered by aquatic vegetation or shaded out by over hanging trees, but see management for sub habitats below. |
| **Rivers and Streams** | 22 | Value will depend on factors like flow, depth, light reaching the surface and the presence of sub habitats listed below. Should support breeding birds, aquatic insects and plants. | Management may be required to prevent river/stream from being smothered by aquatic vegetation or shaded out by over hanging trees. Management of most rivers/streams is carried out by the Environment Agency. |
| Open water sub habitats: | | | |
| Floating vegetation of duckweed or water-lily etc. (If sphagnum is present) | i. | If only part of water surface is covered by floating vegetation indicates healthy aquatic environment likely to support good flora and fauna. | If water surface is covered with floating vegetation especially blanket weed, consider physical removal. Sphagnum indicates the presence of **a mire** – seek specialist advice. |
| Emergent vegetation of reeds and rushes etc. | Ii | Such vegetation is vital for nesting wildfowl, reed and sedge warbler. If only part of the water surface is covered by emergent vegetation indicates healthy aquatic environment likely to support good flora and fauna. | If extensive common reed is developing – seek specialist advice to develop as a reed bed. If water surface of a pond is covered with dense emergent vegetation consider physical removal of part of it. |
| Bank-side covered by emergent vegetation including reeds and rushes | Iii | Supplements emergent vegetation around the edge of the water body and provides both additional habitat and buffer area for aquatic birds. | No management likely to be necessary |
| Bank-side covered by trees and bushes | iv | Supplements emergent vegetation and provides a habitat for additional aquatic birds including reed bunting and willow tit. | Only cut back when trees are shading out other important aquatic vegetation of the whole of a pond. |
| Exposed sediments | v | Used as a loafing area for wild fowl and waders, nesting little ringed plover and terns. Also a habitat for specialist invertebrates. | Exposed sediments are difficult to manage as they rapidly become colonised by vegetation. Suitable conditions can be maintained by regular flooding (outside of nesting season) or by placing a polythene sheet below the sediments. |
| Islands | vi | Islands should support the fringing and other habitats described above. They will then provide additional security for | Islands should be created within lakes, with areas of shallows and exposed sediments around them. Management for the individual |

| Habitat description | Habitat number | Potential wildlife value | Management to retain or enhance habitat |
|---|---|---|---|
| | | nesting aquatic birds | habitats as above. |
| **Fen/marsh**: area covered by short vegetation colourful herbs. (May include heathers: **heathland**) | 23 | Nesting and feeding waders – lapwing, snipe, redshank and curlew. Also range of wet meadowland plants and insects. | Mow annually in late summer or autumn, if dry enough removing all cut material. Or arrange for light grazing with no additional feeding or artificial fertiliser.<br>Do not plant trees in this habitat until the wildlife value of grassland/ heathland has been properly assessed. |
| **Marsh/swamp**: whole area covered by tall grasses and/or reeds | 24 | Nesting and feeding sedge warbler, other aquatic birds | May need occasional management to prevent development of wet woodland. |
| **Reed bed:** whole area covered by common reed | 25 | Nesting and feeding reed and sedge warbler. Other specialists birds if reed bed is large enough (>20 ha) | If extensive common reed is present - seek specialist advice to develop as a reed bed. |
| Area covered by young woodland of willow and/or alder. | 26 | Nesting and feeding for reed bunting, willow tit, willow warbler and other warblers. Foliage of trees available food source for moths and other insects. | Allow to develop into mature **wet woodland**. |
| **Wet woodland**: area of tall mature woodland with willows, alder and/or poplar. | 27 | Value as above but likely to include more specialist species of wet woodland plants and animals. | Leave without management unless trees are becoming moribund. |

# Appendix 1. Summary of the existing and potential contribution to BAP at Ballidon, Croxden and Middleton Hall Quarries

## 1. Summary of Ballidon Quarry's potential contribution to BAP

Details of the important habitats relevant to Ballidon Quarry which are identified in the Natural Area Profile and Local BAP along with national and local targets for their conservation are given in Appendix 1. Table 1.1. The range of priority BAP and NAP species which each of these habitats can support is also summarised

A summary of the contributions made to biodiversity both through BAP and Natural Area Profile targets is shown in Appendix 1. Table 1.2. Each habitat has been given a rating of 0 to 5 to indicate the contribution to these biodiversity initiatives. This scale is a subjective assessment based on the contribution of a habitat to the LBAP area as a whole (The Peak District). A habitat given a low score on a county basis may still therefore have local significance.

The habitat considered to make the most valuable contribution to BAP priorities at Ballidon Quarry is the existing limestone grassland within the Ballidon Dale SSSI. High potential exists to create further areas especially if grazing can be introduced. The potential to create hay meadow and ash woodland is given medium status, along with the present rock faces which support NAP species. The conservation of pond and scree habitats is assessed as low although both would be worthwhile exercises. The potential for retaining rock face habitat is considered low because of planning and safety constraints.

The contribution of existing plantations is low. Not only are these primarily of exotic species, particularly sycamore and grey alder, but these species are colonising other areas from the plantations. Management of these plantations including the pruning of side shoots is also unfavourable to wildlife as the resulting woodland lacks undergrowth to provide shelter for nesting birds and other wildlife.

## 2. Summary of Croxden Quarry's potential contribution to BAP

Appendix 1 Table 2.1 gives details of the important habitats relevant to Croxden Quarry which are identified in the Natural Area Profile and Local BAP along with national and local targets for their conservation. The range of priority BAP and NAP species which each of these habitats can support is also summarised

At Croxden Quarry the areas of existing semi-natural vegetation are relatively small. Nevertheless areas of three BAP habitats, sessile oak woodland, acid grassland and heathland are present and could make a medium to small contribution to the LBAP. In all cases conservation management would be a worthwhile exercise in BAP terms

Restoration of the quarry provides an opportunity to make an increased contribution through the creation of further acid grassland and heathland.

The existing ponds and other wetland habitats also make a small contribution and this could be significant increased if new habitat is produced on restoration. The potential also exists to create a sizeable reedbed on one of the old silt lagoons although a more detailed feasibility study would be required before this could be attempted.

There are two areas where two LBAP potential habitats conflict with each other for priority. Firstly the current ponds are developing into wet woodland. The suggested option here is to allow existing ponds to develop into wet woodland while creating new ponds as restoration progresses.

Secondly new broad-leaved woodland is being planted into areas of species-rich grassland. In general species-rich grassland is more difficult to create than woodland. Careful consideration is therefore needed before even broad-leaved woodland is planted into developing flower-rich grassland. If retained the later would require management by grazing or cutting. Where conifers have been planted into such grassland no contribution to BAP will be achieved.

A summary of the contribution made to biodiversity both through BAP and Natural Area Profile targets are shown in Appendix 1. Table 2.2. Each habitat has been given a rating of 0 to 5 to indicate the contribution to these biodiversity initiatives. This scale is a subjective assessment based on the contribution of a habitat to the LBAP area as a whole (Staffordshire). A habitat given a low score on a county basis may still therefore have local significance.

## 3. Summary of Middleton Hall Quarry's potential contribution to BAP

Appendix 1. Table 3.1 gives details of the important habitats relevant to Middleton Hall Quarry which are identified in the Natural Area Profile and Local BAP along with national and local targets for their conservation. The range of priority BAP and NAP species which each of these habitats can support is also summarised

A summary of the contribution made to biodiversity both through BAP and Natural Area Profile targets are shown in Appendix 1. Table 3.2. Each habitat has been given a rating of 0 to 5 to indicate the contribution to these biodiversity initiatives. This scale is a subjective assessment based on the contribution of a habitat to the LBAP area as a whole (Staffordshire). A habitat given a low score on a county basis may still therefore have local significance.

The areas of existing semi-natural vegetation at Middleton Hall Quarry are confined to Coneybury Wood, a short length of old hedgerow and habitats within the Middleton Pool SSSI. As the SSSI is not within the control of the operating company it falls outside the scope of this report.

Nevertheless two areas of BAP habitat within the study area could make a medium to small contribution to the LBAP. In both cases conservation management would be a worthwhile exercise in BAP terms.

Restoration of the quarry provides an opportunity to make a much more significant contribution to BAP. The range and species composition of habitats proposed for creation in the current restoration plan, if successfully implemented and the managed, should maximise the potential.

The most significant contribution is likely to come from the creation of a large reedbed. Work on this has already started and reeds are becoming established. Its size gives the reedbed the potential to attract the full range of reedbed species including bittern.

Another significant contribution would be the management of grassland areas to create an extensive area of flower-rich wet grassland.

The other wetland habitats, lakes, ponds and ditches will also make a significant contribution augmenting the work already done on the Langley Brook and River Tame.

Although the creation of new hedgerows has only been given a “low” contribution status in Appendix 1. Table 3.2 this scale relates to the contribution to the LBAP area as a whole. In local terms their creation will still make a worthwhile contribution.

**Appendix 1. Table 1.1 Ballidon Quarry Derbyshire BAP information**

Natural Area No. 83: 'White Peak'.

Local Biodiversity Action Plan (LBAP): 'A Living Landscape' – a Biodiversity Action Plan for the Peak District. Peak District National Park Authority 2001.

Key Habitats and Species relevant to Ballidon Quarry which are identified in the NAP and the LBAP:

| **Habitat** | **Existing or potential** | **BAP/LBAP/NAP Habitat** | **UK BAP objective** | **Local BAP objective** | **NAP objectives** | **Benefit to BAP species (s & m lists only)*** | **Benefit to other selected NAP species*** |
|---|---|---|---|---|---|---|---|
| Ashwood<br><br>BAP = upland mixed ashwood | Potential | BAP/LBAP/NAP | Initiate planting of 6000ha on un-wooded or ex plantation sites by 2015. Half by 2010. | Produce register of potential sites by 2005. | Develop semi natural communities in plantation woodland<br>Extend range of native lime<br>Extend range of white-letter hairstreak | Song thrush | Wild service tree<br>Native limes |
| Scrub | Existing & potential | NAP | No national target. | No LBAP target. | Encourage scrub to develop away from dalesides in association with wood margin and grassland | Song thrush<br>Linnet<br>Grey partridge | Buckthorn<br>Western gorse |
| Limestone grassland<br><br>BAP = lowland calcareous grassland | Existing & potential | BAP/LBAP/NAP | Agree favourable management on all SSSIs by 2005.<br>Achieve favourable status by 2010<br>Secure 30% of resource outside SSSIs by 2005 and 100% by 2015. Re-establish 1000ha of calcareous grassland by 2010. | Secure favourable management on 100% of daleside SSSIs by 2005.<br>Identify opportunities for creation a minimum 10ha of daleside habitat by 2010. | Safeguard existing sites<br>Manage appropriately<br>Adopt appropriate grazing regimes<br>Manage for all spp. | Red hemp-nettle<br>Chalk carpet<br>Light-feathered rustic | Species rich flora<br>Butterflies and moths |

| Habitat | Existing or potential | BAP/LBAP/NAP Habitat | UK BAP objective | Local BAP objective | NAP objectives | Benefit to BAP species (s & m lists only)* | Benefit to other selected NAP species* |
|---|---|---|---|---|---|---|---|
| Unimproved pastures<br><br>BAP = Lowland meadows | Existing & potential | BAP/LBAP/NAP | Secure 30% of resource outside SSSIs by 2005 and 100% by 2015. Re-establish 500ha of lowland hay meadow by 2010. | Bring all important unimproved pastures into favourable condition. Identify opportunities for creation of unimproved pasture in appropriate locations by 2010 | Not identified as a separate habitat in the NA profile | Brown hare<br>Skylark<br>Grey partridge | General flora |
| Neutral grassland<br><br>BAP = Lowland meadows | Potential | BAP/LBAP/NAP | Secure 30% of resource outside SSSIs by 2005 and 100% by 2015. Attempt to re-establish 500ha of lowland hay meadow by 2010. Develop researched guidelines to restore hay meadows. | Identify opportunities for creation a minimum 10ha of hay meadow by 2010. | Increase extent on plateau | Skylark<br>Grey partridge<br>Tree sparrow<br>Corn bunting<br>Brown hare | Species rich flora<br>Lady's bedstraw<br>Field scabious<br>Great burnet<br>Hay rattle<br>Knapweed<br>Meadow saxifrage<br>Ox-eye daisy<br>Lapwing |
| Ponds<br><br>BAP = Standing open water (broad habitat) | Existing & potential | LBAP/NAP | No national target | Restore 20% of ponds in poor condition by 2005, 50% by 2010. Priority to ponds linking with others. | Strengthen network of dewponds in association with complementary habitats<br>Maintain populations of amphibians | Great crested newt | Water beetles |
| Limestone scree<br><br>BAP = Inland rock (broad habitat) | Potential | NAP | No national target. | No LBAP target. | Develop management techniques to maintain successional scree communities | Red-hemp-nettle | Whiskered bat |

| Habitat | Existing or potential | BAP/LBAP/NAP Habitat | UK BAP objective | Local BAP objective | NAP objectives | Benefit to BAP species (s & m lists only)* | Benefit to other selected NAP species* |
|---|---|---|---|---|---|---|---|
| Rock exposures etc<br>BAP = Inland rock (broad habitat) | Existing & potential | NAP | No national target. | No LBAP target. | Maximise opportunities in the reclamation of quarries<br>Increase population of peregrine and raven<br>Protect winter hibernation sites for bats. | Light-feathered rustic moth | Rock whitebeam<br>Peregrine<br>Raven |

* species selected from the BAP, LBAP & NAP priorities as most appropriate potential target species.

**Appendix 1. Table 1.2 Potential contribution to BAP targets from habitats in Ballidon Quarry**

| Habitat | BAP/LBAP or NAP priority | Established | Newly created or potential |
|---|---|---|---|
| Lowland calcareous grassland | BAP | Extensive SSSI (5) | Extensive areas newly created (4) |
| Lowland meadows | BAP | None | One potential area (3) |
| Upland mixed ashwoods | BAP | None | Potential on quarry benches (3) |
| Ponds | LBAP (BAP Broad Habitat) | Existing dewpond in SSSI (2) | Potential for expansion (2) |
| Scrub | NAP | Within Ballidon Dale SSSI & elsewhere (2) | Potential for expansion (2) |
| Limestone scree | NAP | Areas of scree forming (2) | Potential for expansion (2) |
| Inland rock | NAP (BAP Broad Habitat) | Quarry faces (3) | Potential for retention (2) |
| Established plantations | None | Around periphery of quarry (0) | Potential to create ash woodland (3) |

Contribution to relevant BAP/NAP: Very high (5), high (4), medium (3),low(2), very (1), none (0).

**Appendix 1. Table 2.1 Croxden Quarry Staffordshire, BAP information**.

Natural Area No. 28: 'Potteries and Churnet Valley'.

Local Biodiversity Action Plan (LBAP): 'Staffordshire Biodiversity Action Plan 1st Edition', Jon Webb Ed., The Staffordshire Biodiversity Action Steering Group

Key BAP Habitats and Species relevant to the Potteries and Churnet Valley area of the LBAP:

| **Habitat** | **Existing or potential** | **BAP/ LBAP/ NA Habitat** | **UK BAP objective** | **Local BAP objective** | **Relevant NA objectives** | **Potential benefit to BAP species (s & m lists only)*** | **Potential benefit to selected BAP long list & NA species*** |
|---|---|---|---|---|---|---|---|
| Ancient semi-natural broad-leaved woodland BAP = broadleaved, mixed and yew woodland (broad habitat) | Existing & potential | BAP/ LBAP/NA | No specific BAP target available, | Maintain and enhance existing s-n b-l w.<br>Restore degraded existing s-n b-l w.<br>Re-create s-n b-l w. | Convert plantations on ancient sites back to s-n b-l w.<br>Create new woodland by natural regeneration<br>Maintain or restore population of pipistrelle bat. | Pipistrelle bat<br>Spotted flycatcher.<br>High brown fritillary. | Other bats<br>Fallow and red deer<br>Pied flycatcher.<br>Redstart<br>Woodcock<br>Wood warbler.<br>Selected inverts and plants. |
| Lowland acid grassland<br><br>Key BAP Habitat | Existing & potential | BAP/LBAP/NA | Arrest depletion of unimproved acid grassland in UK.<br>Secure favourable status for 30% of resource outside SSSIs by 2005, 100% by 2010.<br>Attempt to re-establish 500ha of lowland acid grassland of value | Maintain and enhance important areas of acidic grassland. Restore degraded egs.<br>Increase extent by 200 hectares by 2010.<br>Increase floral diversity through management | Restore semi-improved grassland, increasing species richness through management. | Skylark | Lapwing.<br>Common lizard.<br>Solitary bees & wasps. |

| Habitat | Existing or potential | BAP/ LBAP/ NA Habitat | UK BAP objective | Local BAP objective | Relevant NA objectives | Potential benefit to BAP species (s & m lists only)* | Potential benefit to selected BAP long list & NA species* |
|---|---|---|---|---|---|---|---|
| Heathland (with mire in the NAP)<br><br>Key BAP Habitat | Existing & potential | BAP/ LBAP/NA | Maintain and improve all existing heathland.<br>Re-establish 6000ha of heathland by 2005. | Maintain and improve all existing lowland heath.<br>Re-create 200 hectares by 2010. | Safeguard all existing heathland<br>Reduce fragmentation by creating "stepping stones" to link isolated sites. | Nightjar.<br>Woodlark. | Stonechat.<br>Whinchat.<br>Slow worm.<br>Adder.<br>Solitary bees & wasps.<br>Western gorse. |
| Peat bogs (or mires, see heathland in the NAP).<br><br>BAP = bogs (broad habitat) | Existing & potential | BAP/ LBAP/NA | BAP targets relate only to restoration of existing raised bog. | Maintain and enhance all existing peatland. Restore degraded egs,. | See objectives for heathland | - | Adder<br>Selected invertebrates and plants including Sphagnum moss. |
| Reedbed<br><br>Key BAP Habitat | Potential? | BAP/ LBAP | Create 1200 ha of new reedbed by 2010. | Seek to create 100 ha in large blocks (20 ha) on land of low nature conservation interest. | No NAP objective | Reed bunting. | Reed warbler.<br>Sedge warbler. |
| Ponds<br>BAP = Standing open water (broad habitat) | Existing & potential | BAP/LBAP/NA | No BAP target | Maintain and enhance existing ponds<br>Re-create new ponds, 50 on land of low conservation value by 2010. | Maintain & enhance waterside habitats | Pipistrelle bat.<br>Great crested newt.<br>Floating water-plantain. | Other bats<br>Grass snake<br>Other amphibians.<br>Dragonflies & water beetles |

* species selected from the BAP, LBAP & NAP priorities as most appropriate potential target species.

**Appendix 1. Table 2.2 Potential contribution to BAP targets from Habitats in Croxden Quarry**

| Habitat | BAP/LBAP priority | Established | Newly created or potential |
|---|---|---|---|
| Broadleaved, mixed and yew woodland | LBAP (BAP Broad Habitat) | Areas of sessile oak wood (3) | Small areas of sessile oak (2) |
| Wet woodland | BAP | None | Small areas around silt lagoons (2) |
| Lowland dry acidic grassland | BAP | Small areas (2) | Extensive potential (3) |
| Lowland heathland | BAP | Small areas (2) | Extensive potential (4) |
| Lowland bog | BAP (BAP Broad Habitat) | Very small areas (2) | Some potential (2) |
| Mesotrophic lakes | BAP | None | Existing silt lagoons (1) |
| Reedbeds | BAP | None | Some potential (3) |
| Ponds | LBAP (BAP Broad Habitat) | Several existing ponds (2) | Potential for expansion (3) |
| Established conifer plantations | None | Several existing plantations (0) | Potential to create further sessile oak and wet woodland (2) |

Contribution to relevant BAP/NAP: Very high (5), high (4), medium, (3), low (2), none (0).

**Appendix 1. Table 3.1 Middleton Hall Quarry Staffordshire/Warwickshire BAP information**

Natural Area No. 33: 'Trent Valley & Rises'.

Local Biodiversity Action Plan (LBAP): 'Staffordshire Biodiversity Action Plan 1st Edition', Jon Webb Ed., The Staffordshire Biodiversity Action Steering Group. There is currently no LBAP for Warwickshire.

Key BAP Habitats and Species relevant to the Trent Valley & Rises area of the LBAP:

| **Habitat** | **Existing or potential** | **BAP/ LBAP/ NAP Habitat** | **BAP objective** | **Local BAP objective** | **NAP objectives** | **Potential benefit to BAP species (s & m lists only)*** | **Potential benefit to selected BAP long list & NAP species*** |
|---|---|---|---|---|---|---|---|
| Ancient semi-natural broad-leaved woodland BAP = broadleaved, mixed and yew woodland (broad habitat) | Existing & potential | LBAP/ NAP | Currently no specific BAP target available. | Maintain and enhance existing s-n b-l w.<br>Restore degraded existing s-n b-l w.<br>Re-create s-n b-l w. | Protect and enhance existing examples.<br>Implement a programme to re-create woodland habitats. | Pipistrelle bat<br>Spotted flycatcher.<br>. | Other bats<br>Fallow deer<br>Woodpeckers<br>Selected inverts and flora |
| Wet woodland<br><br>BAP = Key Habitat | Potential | BAP/ LBAP/ NAP | Initiate planting of 6,750 ha of new wet woodland on un-wooded sites or plantations.<br>Establish half by 2015. | Increase extent by 100ha by 2010 on land of low nature conservation interest. | Protect and enhance existing examples.<br>Implement programme to re-create woodland habitats | Tree sparrow | Woodcock<br>Willow tit<br>Grass snake<br>Black poplar |
| Ancient and diverse hedgerows.<br><br>BAP = Key Habitat | Existing & potential | BAP/ LBAP/ NAP | Achieve favourable management of 25% by 200, 50% by 2005. | Achieve favourable management for 25% of all important hedges by 2000.<br>Increase net amount of hedges by 10% by 2010 | Increase number of linear and stepping stone habitats including hedges. | Pipistrelle bat<br>Bullfinch<br>Linnet<br>Song thrush<br>Tree sparrow | Other bats |

| Habitat | Existing or potential | BAP/ LBAP/ NAP Habitat | BAP objective | Local BAP objective | NAP objectives | Potential benefit to BAP species (s & m lists only)* | Potential benefit to selected BAP long list & NAP species* |
|---|---|---|---|---|---|---|---|
| Lowland wet grassland<br><br>BAP = Lowland Meadows | Existing & potential | BAP/ LBAP/ NAP | Arrest depletion of unimproved meadows throughout UK.<br>Attempt to re-establish 500 ha of lowland hay meadow of wildlife value by 2010. | Maintain and enhance important areas of wet grassland. Restore degraded egs,.<br>Increase extent by 200 hectares by 2010.<br>Increase floral diversity through management including raising water levels. | Protect and enhance existing examples.<br>Implement programme to re-create lowland wet grassland habitats | | Lapwing.<br>Snipe<br>Yellow wagtail<br>Grass snake |
| Rivers and streams<br><br>BAP = Broad habitat | Existing | LBAP/ NA | Currently no BAP target for this river type. | Restore the Trent and Tame river corridors between Burton-on-Trent and Tamworth through Central Rivers Project.<br>Increase extent of all associated habitats specifically to met regional habitats species plan targets. | Encourage appropriate habitat creation | Otter<br>Water vole<br>Pipistrelle bat<br>Great crested newt.<br>Spined loach<br>Depressed river mussel | Other bats<br>Water shrew<br>Kingfisher<br>Wildfowl & waders<br><br>Grass snake<br>Fish and aquatic invertebrate populations<br>Aquatic plants |
| Mesotrophic Lakes<br><br>BAP = Key Habitat | Existing & potential | BAP/ LBAP/ NAP | BAP targets for mesotrophic lakes: maintain characteristic plant & animal communities.<br>Address problems of nutrient-enrichment by 2010 | Ensure that the restoration of gravel pits incorporates priority nature conservation interests.<br>Maintain and enhance existing ponds | Encourage appropriate habitat creation | Otter<br>Water vole<br>Pipistrelle bat<br>Spined loach | Other bats<br>Kingfisher<br>Wildfowl & waders<br>Grass snake<br>Amphibians.<br>Dragonflies & water beetles<br>Aquatic plants |

| Habitat | Existing or potential | BAP/ LBAP/ NAP Habitat | BAP objective | Local BAP objective | NAP objectives | Potential benefit to BAP species (s & m lists only)* | Potential benefit to selected BAP long list & NAP species* |
|---|---|---|---|---|---|---|---|
| Ponds & ditches<br><br>BAP = Standing open water (broad habitat) | Existing & potential | LBAP/ NAP | Currently no BAP target for ponds & ditches | Re-create new ponds, 50 on land of low conservation value by 2010. | Encourage appropriate habitat creation | Great crested newt. | Grass snake<br>Amphibians.<br>Dragonflies & water beetles<br>Aquatic plants |
| Reedbed<br><br>BAP = Key Habitat | Potential | BAP/ LBAP/ NAP | Create 1200 ha of new reedbed by 2010. | Seek to create 100 ha in large blocks (20 ha) on land of low nature conservation interest. | Encourage appropriate habitat creation | Otter<br>Water vole<br>Pipistrelle bat<br>Bittern<br>Reed bunting<br>Great crested newt. | Reed warbler.<br>Sedge warbler. |

* species selected from the BAP, LBAP & NAP priorities as most appropriate potential target species.

**Appendix 1. Table 3.2 Potential contribution to BAP targets from Habitats at Middleton Hall Quarry**.

| Habitat | BAP/LBAP or NAP priority | Established | Newly created or potential |
|---|---|---|---|
| Broadleaved woodland | LBAP (BAP Broad habitat) | One woodland (4) | Potential to plant more (2) |
| Wet woodland | BAP | Existing poplar plantations (2) | Extensive potential (3) |
| Ancient and/or species rich hedgerow. | BAP | One length (2) | Some potential (1000m proposed) (2) |
| Lowland meadow | BAP | None | Extensive potential (3) |
| Rivers and streams | LBAP (BAP Broad habitat) | Existing river & stream (2) | Enhancement work carried out (3) |
| Mesotrophic lakes | BAP | Middleton Pool SSSI (4) | Extensive potential (4) |
| Standing open water (ponds & ditches) | LBAP (BAP Broad habitat) | Silt lagoons (2) | Potential for expansion (2) |
| Reedbeds | BAP | None | 24 ha being created (5) |

Contribution to relevant BAP/NAP: Very high (5), high (4), medium, (3), low (2), none (0).

## Appendix 2. Key and Broad BAP Habitats which may occur in and around quarries

The UK Biodiversity Action Plan includes virtually every habitat in the UK which might support wildlife. These range from common habitats of low biodiversity such as 'built up areas and gardens' to rare a restricted habitats supporting a wide range of rare species. Forty three habitats which may potentially occur in and around quarries are listed below. This list includes both BAP 'key' and 'broad' habitat types. National targets have been published for key habitats but have not yet been specified for the broad habitats. Targets for both are included in some local BAPs.

Those habitats which are potentially of high biodiversity and which are most commonly encountered throughout the UK are shown in **bold**. These referred to as the 'Widespread BAP Habitats' in the guidelines.

Other widespread habitats associated with urban habitats, intensive farmland and commercial forestry have been excluded as they are generally of low biodiversity.

1. Land/rock with little or no vegetation

| | | |
|---|---|---|
| i. | **Inland rock:** | **broad habitat type** |
| ii. | Limestone pavement: | limited to areas of carboniferous limestone |

2. Land dominated by grasses in lowland UK (below 250-300m OD)

| | | |
|---|---|---|
| **i.** | **Grassland – calcareous:** | **on limestone soils** |
| ii. | **Grassland – dry acid:** | **on acidic soils** |
| iii. | **Grassland – meadow:** | **on deeper neutral soils, especially in river floodplains** |
| iv. | Grassland - purple moor grass and rush pastures: | on wet acidic soils in western England and South Wales |
| v. | Improved grassland: | includes most farmed grassland, of low biodiversity (see also group 11: Urban & Agricultural land) |

3. Land dominated by grasses in upland UK (above 250-300m OD)

| | | |
|---|---|---|
| vi. | Grassland – calcareous: | on calcareous soils |
| vii. | Grassland – dry acid: | on acidic soils |
| viii. | Grassland – meadow: | on deeper neutral soils |
| ix. | Improved grassland: | includes most upland farmed grassland, of low biodiversity (see also group 11: Urban & Agricultural land) |

4. Habitats dominated by heather in lowland UK (below 250-300m OD)

| | | |
|---|---|---|
| **i.** | **Heathland:** | **on acidic soils, may be wet or dry** |

5. Land dominated by heather in upland UK (above 250-300m OD)

| | | |
|---|---|---|
| i. | Heathland (heather moorland): | on acidic soils, may be wet or dry |

6. Land dominated by bracken

| | | |
|---|---|---|
| **i.** | **Bracken:** | **broad habitat type** |

7. Land dominated by woody (trees and shrubs) species

| | | |
|---|---|---|
| **i.** | **Broadleaved, mixed and yew woodland:** | **broad habitat type** |
| ii. | Coniferous woodland: | typically commercially managed plantain of low biodiversity |
| iii. | Lowland beech and yew woodland: | restricted type on calcareous or acidic soils in Southern England |
| iv. | Lowland wood-pasture and parkland: | restricted type usually originating from woodland with common grazing rights or medieval deer park. |
| v. | Native pinewoods: | restricted to Scotland |
| vi. | Upland mixed ash: | on calcareous soils above 250-300m |
| vii. | Upland oakwood: | usually on acidic soils above 250-300m |
| **viii.** | **Wet woodland (**see also group 8: Wetland habitats) | |
| **ix.** | **Ancient and/or species-rich hedgerows** | |

8. Wetland habitats

| | | |
|---|---|---|
| i. | Chalk rivers: | restricted to where bedrock is chalk |
| **ii.** | **Fen, marsh and swamp:** | **broad habitat type** |
| iii. | Fens: | restricted to calcareous soils where lime-rich water is present. |
| **iv.** | **Eutrophic standing water** | |
| v. | Mesotrophic lakes:<br>eg some lakes in the Lake District. | uncommon lakes with low nutrient status |
| **vi.** | **Reedbeds** | |
| **vii.** | **Rivers and streams:** | **broad habitat type** |
| **viii.** | **Standing open water and canals:** | **broad habitat type** |
| **ix.** | **Wet woodland** | |

9. Wetland habitats dominated by Sphagnum moss

| | | |
|---|---|---|
| i. | Bogs: wetland with sphagnum moss - broad habitat type | |
| ii. | Blanket bogs: | restricted to acidic soils in areas of high rain fall. Most common above 250-300m |
| iii. | Lowland raised bog: | restricted to acidic soils in areas of high rain fall. |

| | | |
|---|---|---|
| **10. Land near to the sea:** | | all restricted to coastal areas |
| i. | Coastal floodplain grazing marsh | |
| ii. | Coastal saltmarsh | |
| iii. | Coastal sand dunes | |
| iv. | Coastal vegetated shingle | |
| v. | Maritime cliff and slopes | |
| vi. | Saline lagoons | |
| **11. Urban & Agricultural land** | | |
| iv. | Built up areas and gardens: | broad habitat type |
| v. | Cereal field margins: | potentially includes all arable farmland, of low biodiversity unless specially managed for wildlife |
| iii. | Improved grassland: | includes most farmed grassland, of low biodiversity |

# Appendix 3. Guidelines for identifying widespread BAP Habitats

## 1. The Target BAP Habitats

These guidelines have been developed to allow the layman to identify the most widespread types of vegetation (habitats) of value to wildlife, which are found in and around quarries in the UK. By using the information contained in the guidelines a series of these habitats can be recognised, some of which are listed in the UK Biodiversity Action Plan (BAP).

The guidelines identify a simple range of features which are easily recognised on the ground. In general physical features of the vegetation are used to distinguish the various types. Sometimes a key indicator plant species: trees, shrubs or wild flower (herbaceous plants or 'herbs') is listed which helps to confirm the type of habitat present. (NB. Illustrations of these species should be included in the guidelines).

The process has been divided into three levels of detail as follows:

iv. The Basic Habitat type
v. The General Habitat type
vi. The Widespread BAP Habitat type

## 2. Identifying the basic habitat category

Seven basic habitat categories have been identified. These can easily be recognised from their basic physical or vegetational characteristics.

The seven are as follows:

ii. Land with little or no vegetation (including cliffs)
iii. Land dominated by grasses
iv. Land dominated by heather
v. Land dominated by tall herbaceous vegetation
vi. Land dominated by bracken
vii. Land containing woody species (trees and shrubs)
viii. Wetland habitats

All except 'tall herbaceous vegetation' may involve Widespread BAP Habitat types.

## 3. Identifying the general habitats

To identify the General Habitats present slightly more detailed physical or vegetational characteristics are used. Twenty seven different General Habitats have been identified. These are listed in Tables 1a & 1b.

As an aid to recognising these General Habitats they have been divided into those found on dry soils and those only associated with permanently waterlogged soils or with open water. As a simple rule of thumb dry habitats are those you can walk over during most of the year without getting your feet wet!

- the dry features and vegetation are listed in Table 1a, Habitat nos. 1 – 19.

- the wet features and vegetation are listed in Table 1b, Habitat nos. 20 – 27.
- the open and running water habitats (nos. 20 to 22) have been subdivided into six sub habitats. These are not BAP habitats in their own right but their presence and extent can give a measure of the wildlife value (biodiversity) of the main open water habitat.

## 4. Identifying the widespread BAP habitats

Tables 1a & 1b show that fifteen of the twenty seven different General Habitats relate to existing Widespread BAP Habitats. In addition a further seven types of General Habitat have the potential to develop into BAP habitats if managed appropriately. Therefore all that is needed to identify all Widespread BAP Habitats is to list these given in the tables for each of the General Habitats.

Two of the General Habitats should be regarded as important non BAP habitats. These are extensive areas of generally flat or undulating and sparsely vegetated spoil and areas of scrub, which often support rare and local species.

A special note should be made of the location of these habitats if present

## 5. The contents of Tables 1a & 1b

The columns of Tables 1a & 1b give the following information:

i. The 'Habitat Number': these numbers have been specifically devised for these guidelines. Each of the General Habitats has its own number.

ii. The 'Phase I Code': this allows another ecologist to cross reference the Habitat Codes with those listed on the national survey methodology. These are not needed for the present exercise.

iii. Lists the 'Basic Habitat' types.

iv. Provides a brief description of each of the 27 different physical or vegetational characteristics of the 'General Habitats'.

v. Identifies the existing or potential 'Widespread BAP Habitat', if any.

## 6. Identifying features on the ground

Tables 1a & 1b should contain all the background information necessary to make an initial survey of wildlife habitats in your quarry.

The following actions are now required:

i. Obtain copies of site map at least 1:10,000 scale of quarry and any adjacent land owned by the Company.

ii. Ensure land under the control of the Company is clearly identified and that the land is divided into the following five categories:

- undisturbed land outside the current planning permission;
- undisturbed land within the current planning permission;
- land already disturbed but not currently being worked;
- active working area;
- restored land.

iii. Seek information from the Company about any nature reserve or Site of Special Scientific Interest (SSSI) which may be present within the area under its control. Mark these on the map.

iv. Carry out a series of walkover surveys in spring, summer, autumn and winter. If only a single walk is made it should be in summer ideally between mid May and mid July.

v. Walk the land and mark up areas which seem to support examples of the General Habitats listed in Tables 1a & 1b.

vi. Note the underlying geology, soil type and soil wetness. Estimate the depth of water if a pond or lake is present.

vii. Delineate the boundary of each of the General Habitats as far as possible and list as many herbaceous and woody species as you are able including herbs growing beneath woodland.

vii. If vegetation forms a mosaic of any of the above types show it as one area and list component habitats.

viii. If a camera is available take photographs of each habitat and mark location and direction of photograph.

**7. Reporting**

i. Draw up a neat copy of the site map with the different General Habitat types clearly numbered with the Habitat Number. (Ignore the Phase I codes at this stage). If more than one area of the same habitat is present number as follows: Habitat no. 1.1, Habitat no. 1.2 etc.

ii. List all the habitats present and give their approximate area in hectares. Highlight those you think are Widespread BAP Habitats. Some operators may wish these totals to be divided into the five operating categories listed in para. 6 (ii) above.

iii. Write a brief description against each area identified. Record any notable physical (eg land flat, undulating) or vegetational (land dominated by thistles) features, plus any wild flowers, trees or shrubs you can identify.

# Appendix 4. Simple management techniques

## 1. General principles

As soon as new bare ground is created, whether wet or dry, steep or flat, it will start to be colonised by vegetation. The rate at which this happens depends on the type of substrate involved, particularly its nutrient status and liability to droughtiness. Nutrient poor, dry substrates will be the slowest to colonise.

Colonisation follows a typical sequence of sparse herbs and annuals, established grassland composed largely of perennials, tall coarse grassland, coarse grassland with young bushes and trees, land dominated by bushes and trees and finally mature woodland.

It is quite legitimate to allow this sequence to occur naturally without management, as mature woodland is one of the most valuable wildlife habitats. However if particular species are to be favoured, orchids in flower-rich grassland for instance then intervention management is required.

## 2. Simple management techniques

The simple techniques listed in the Tables 2a & 2b involve the following key activities:

i. Scarify or rotovate areas of sparse vegetation to maintain open conditions. Avoid the nesting season when doing this.

ii. Mow flower-rich grassland at least once a year in late summer or autumn. Always remove cut material. Alternatively arrange for grazing. The type of stock is not too important provided that no additional feed or inorganic fertilisers are used. Heathland can be similarly treated although a specialist cutter may be required.

    Trees should not be planted into flower-rich grassland or heathland without specialist assessment.

iii. Tall coarse grassland can be converted back to flower-rich grassland by cutting at least once a year in late summer or autumn and removing the cut material. This process however may take some time and it may be preferable to allow scrub to develop or to plant trees.

iv. Where injurious weeds such as thistles, dock or ragwort are present in coarse grassland they will need to be controlled. Each group of plants has wildlife value so a policy of containment should be adopted not eradication. The same principle applies to bracken.

v. If it is desirable to maintain scrub or woodland at a young stage this can be achieved by rotational cutting so that each area is cut every ten years or so.

vi. If scrub or young woodland is to be allowed to develop into mature woodland, invasive species like sycamore, grey alder and rhododendron should be removed at an early stage.

vii. Once mature woodland has developed no further management is essential. However if the woodland still includes invasive species like sycamore, grey alder and rhododendron these should be removed.

viii. Both new and established hedgerows will require trimming on a regular basis. This should be carried out on a rotational basis so that the whole hedge length is not trimmed every year. No trimming should be carried out in the nesting season (April to July).

Traditional hedge laying may be appropriate for the more mature hedgerows.

ix. Where the aim is to maintain open water conditions, occasional clearance to prevent them becoming clogged with aquatic vegetation will also be required. This is particularly necessary for smaller water bodies, including those likely to support great crested newt. Trees that shade out the pond should be cleared, at least on the southern side.

Fish should not be introduced to ponds with great crested newt.

x. Where the aim is to develop an expanse of reed or to allow wet woodland to develop then obviously no clearance is required. However to maintain reed beds, bushes and trees will have to be removed.

Specialist advice is recommended when developing and managing a reed bed.

**3. Features and vegetation which require specialist advice**

Certain features and vegetation require specialist advice. These may occur in either developing or established habitats. Some examples are given below:

i. Developing habitats

A number of potential, developing habitats have been identified where specialist advice is recommended. This is either because the developing habitat is likely to be of particular value or a third party is likely to be involved. Examples of the first include areas where sphagnum is colonising wet areas (Habitat No. 22(i)) or where a reed bed is developing or being created (Habitat No. 25).

Examples of the second type are those habitats which occur on farmland. The borders of arable fields are particularly valuable for BAP species such as grey partridge and are a key BAP habitat. Species schemes are available through the Countryside Stewardship scheme to promote these. Other schemes cover farmed grassland (Habitat No. 6) which has been improved agriculturally. The potential for these habitats should therefore be discussed with the local Stewardship Officer.

ii. Established habitats

Specialist advice should also be sought where existing mature habitats are present within the control of the operator. This is particularly the case where a Site of Special Scientific Interest (SSSI) is involved. The condition of these sites are the

responsibility of English Nature and are subject to Wildlife and Countryside Act and Countryside Act legislation

English Nature, in consultation with a site's owners and occupiers, is required to produce a Site Management Statement for each SSSI. This explains the interest of the site and sets out the management required to maintain this interest.

Quarry managers should familiarise themselves with the Site Management Statements for any local SSSIs within the control of the Company. They should also determine present management and assess whether this conforms to that on the management statement.

Land within the control of the Company may also include areas of established vegetation which is managed by the County Wildlife Trust, RSPB, Local Authority or other conservation body. Although not necessarily covered by legislation such areas are likely to be subject to some kind of management plan. Quarry managers should familiarise themselves with these plans and assess whether current management conforms with it.

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Paul Glendell/English Nature 23,020
Middle left: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
Paul Glendell/English Nature 24,888
Bottom left: Using a home-made moth trap.
Peter Wakely/English Nature 17,396
Main: $Co_2$ experiment at Roudsea Wood and Mosses NNR, Lancashire.
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