

## STAGE1/2 GUIDANCE FOR REVIEW OF UK BAP TERRESTRIAL AND FRESHWATER PRIORITY HABITATS

### Appendix A. Conclusions and recommendations from the 1999-2001 Review of gaps in the BAP priority habitats series (extracted and adapted from various UK Target Group papers, 2000-01)

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#### BACKGROUND

At the request of the UK Biodiversity Targets Group, JNCC initiated a review of the priority habitat series in 1999, concentrating on the terrestrial and freshwater habitats. The focus of the review was on identifying significant gaps in the list rather than reviewing the existing priority habitats. Following wide consultation and discussions within ad hoc working groups proposals for seven new priority habitats were supported by the Targets Group, together with a range of other measures and changes. The conclusions of the review are summarised in Table 1.

Two of the new types proposed, *Upland birchwoods* and *Lowland mixed deciduous woodland*, have since been approved as priority habitats, and ministerial approval of the Action Plans for these types is expected shortly. Implementation of the remaining conclusions of the 'gaps' review was put on hold in 2002 by the UK Biodiversity Partnership Standing Committee, pending the outcome of the 2005 review. Details of the remaining five proposed new types are given in tables 2-6 and further explanation is given in sections 1-6 below, all extracted from various papers to the UK Targets Group in 2000 and 2001. Details of other conclusions are given in sections 7-10.

Four criteria were used for selecting the original priority habitat series:

- Habitats for which the UK has international obligations

- Habitats at risk, such as those with a high rate of decline especially over the last 20 years, or which are rare
- Areas, particularly marine areas, which may be functionally critical (essential for organisms inhabiting wider ecosystems)
- Areas important for key species [i.e. BAP priority species].

These were adopted for the 1999 gaps review with certain caveats and adopting various additional principles, extracted below from a paper to targets Group in 2001 (NB not all applicable for 2005 review)

i. *Habitats for which the UK has international obligations*

HAPs are seen by Government as an important tool for achieving favourable conservation status for habitats listed on Annex I of the Habitats Directive. However, inclusion on Annex I is not considered to be sufficient justification on its own for priority habitat status. Certain Annex I habitats are very rare in the UK and are considered to be protected adequately by the SAC network. Others are more widespread but are not considered to be sufficiently at risk to merit the preparation of HAPs at the present time.

ii. *Habitats at risk, such as those with a high rate of decline especially over the last 20 years, or which are rare*

It is considered essential that any new priority type should meet this criterion, although in many cases it has proved difficult to quantify. Decline or threat in terms of habitat quality rather than extent is often the critical issue.

iii. *Areas, particularly marine areas, which may be functionally critical (essential for organisms inhabiting wider ecosystems)*

This criterion is difficult to assess satisfactorily and is of varying relevance to the habitats proposed. It is particularly important for some freshwater types.

iv. *Areas important for key species [i.e. BAP priority species]*

This criterion has been interpreted widely to include not just BAP priority species but also other species considered to be important in a national or international context, e.g. Red Data Book species and species listed on Annex II of the Habitats Directive. It was generally agreed that priority status should only be considered for a particular habitat if the production of a HAP would bring benefits additional to those of the action plans for associated species.

Following consultation, a number of additional principles have been applied in assessing or developing new proposals for priority habitats.

- i. For any habitat to qualify as a priority type, there needs to be a demonstrable conservation benefit from having a HAP.
- ii. The series of priority habitats should be a sub-set of semi-natural vegetation types for which co-ordinated conservation action across the UK is required, rather than a comprehensive list of habitats.
- iii. Habitat definitions should be clear, mutually exclusive, and where possible defined in terms of existing vegetation classifications (e.g. NVC and Phase I).

New priority types should generally fit within a single broad habitat.

- iv. Priority types should be mappable and should have measurable quantitative or qualitative attributes for monitoring purposes.
- v. Priority habitats should be defined at a broadly consistent hierarchical level.

Assessment of the proposals was guided by the need to maintain consistency with the existing HAPs, as these set several important precedents. For example, there is no reason why extensive habitats should not be given priority status, provided, of course, that they are sufficiently threatened to justify a UK-wide action plan. This principle has been established by the inclusion of Upland heathland and Blanket bog (which each cover more than a million hectares in northern and western Britain) as priority habitats for which HAPs have been published (Annex C).

Another important principle is that recognition as a priority habitat does not necessarily mean that every example of the habitat is considered to be of equal biodiversity value. The purpose of a HAP is to set a framework for conservation across the UK so that actions can be prioritised in a rational fashion. This approach has been adopted by the steering groups set up to co-ordinate implementation of the existing woodland and standing water HAPs. In both these cases, criteria have been developed to ensure that action is targeted where it is most needed. Similarly, Lowland dry acid grassland probably covers in excess of 250,000 ha in the UK and includes many upland-edge examples of limited biodiversity value. The action plan for this habitat indicates that stands lying remote from the upland edge are the focus of conservation measures.

## **SPECIFIC CONCLUSIONS OF THE GAPS REVIEW 1999-2001 (extracted from relevant papers to Targets Group)**

### **1. General comments on freshwater priority habitats**

- 1.1 Only four of the 45 existing priority habitats are freshwater types. The new proposals include three further freshwater habitats (see sections 4-6 of this paper). The EC Water Framework Directive places a range of obligations on Member States with respect to the quality of surface waters, and the HAP process could provide an effective contribution towards implementation of the Directive by establishing a UK-wide framework for the conservation of freshwater habitats of high biodiversity value.
- 1.2 The review has been discussed in detail by the Freshwater Lead Co-ordination Network (LCN) which includes specialists from each of the statutory conservation agencies in the UK. The LCN has confirmed its support for the three new proposed types and has been actively involved in their development and refinement for this paper.

### **2. Oligotrophic lakes**

- 2.1 The issues raised by the Targets Group at their February meeting have been considered by the Joint UK Steering Group for the Mesotrophic lakes and Eutrophic standing waters HAPs. The Steering Group has submitted a formal response to the Targets Group, on which sections 4.2-4.6 are based.

#### *International obligations*

- 2.2 Oligotrophic lakes are covered by four Annex I habitats. Because water bodies of this

type are widespread in upland areas, only a relatively small proportion of the total UK resource is contained within SACs. A HAP would provide a framework for developing effective conservation measures outside designated sites, thus helping to achieve favourable conservation status across the UK.

### **Threats and decline**

- 2.3 Work by UCL, MLURI and SEPA<sup>1</sup> has indicated that even the most apparently pristine oligotrophic waters in Scotland have undergone significant phosphorus enrichment over the last century or so. Hydro power, water abstraction, fish farming, afforestation and recreational development have all affected oligotrophic lakes in recent decades, and SEPA believes that oligotrophic lochs continue to be under significant threat from development pressure. Acidification has also affected, and continues to affect, many sites.

#### *Overall coverage of lake types within the UK BAP*

- 2.4 Two-thirds of the trophic spectrum of lakes in the UK is covered by the existing HAPs for Mesotrophic lakes and Eutrophic standing waters. There is a very strong case for extending the HAP approach to cover oligotrophic waters - the remaining part of that continuum - particularly as these waters are the most sensitive to ecological damage through nutrient enrichment. This would provide a sound basis for meeting the requirements of the Water Framework Directive in relation to standing waters.

#### *Prioritisation of conservation effort*

- 2.5 Annex C shows that oligotrophic lakes are comparable in extent to some existing priority habitats and markedly less extensive than, for example, Lowland mixed deciduous woodland. Although oligotrophic waters are numerous in Scotland, this applies equally to eutrophic waters in England, and does not preclude the production of a UK HAP.
- 2.6 The Joint UK Steering Group is developing a risk/harm-based approach to the prioritisation of standing waters, as recommended in the Eutrophic standing waters HAP, to ensure that action is targeted on sites of high conservation value which are in need of protection or rehabilitation. The same approach would be adopted for oligotrophic lakes; indeed, the intention is that this approach, which is being developed for Water Framework Directive purposes as well as BAP, is applicable to lakes of all types. A HAP for Oligotrophic lakes would only require conservation action to be undertaken on water bodies which are under significant threat (cf 2.4 above).

### **3. Ponds of high ecological quality**

- 3.1 A meeting was held on 20 April with representatives of MAFF, EA, Plantlife, EN, the Ponds Conservation Trust and JNCC to consider the issues raised by the Targets

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<sup>1</sup> The MLURI work was published as a key element of the 1995 Scottish Office classification of waters. It was also published in *Hydrobiologia* **395/396**: 433-453, 1999 (A quality classification for management of Scottish standing waters). The UCL work on the palaeolimnology of 29 Scottish standing waters was funded by SNIFFER and SNH, and the project was managed by SNH and SEPA. The final report was approved in March 2001 and should be published very soon. The findings support the MLURI data.

Group. Their conclusions are summarised in 5.2-5.8 below.

### **Coverage of the proposed priority habitat**

- 3.2 Ponds support an exceptional diversity of flora and fauna, including a large number of BAP priority species and other species of conservation concern, many of which are restricted to small water bodies. Whilst temporary or seasonal ponds have a distinctive suite of threatened species, certain examples of permanent ponds are similarly important, and there is a strong case for including a wide range of high-quality ponds within a single priority habitat. Several types of pond are covered by Annex I of the Habitats Directive.
- 3.3 To ensure that the proposed HAP is tightly focussed, it is recommended that a range of biological criteria is used to identify high-quality ponds based on the occurrence of exceptionally rich plant, invertebrate or amphibian assemblages and the occurrence of BAP or Red Data Book species (see Annex A). Data from the 1996 Lowland Pond Survey indicate that only 2-5% of UK ponds would be included under these criteria.
- 3.4 To facilitate the implementation of a HAP for Ponds of high ecological quality, it is proposed that (i) a national inventory of high-quality ponds is established, and (ii) rapid, plant-based, field survey methods are developed to enable high-quality ponds to be identified by using simple indicators. It is anticipated that the national inventory will be prepared in part by an EA-funded project to develop a National Pond Monitoring Network (currently awaiting final approval for funding).

### **Conservation benefits of a HAP**

- 3.5 Despite the acknowledged biodiversity value of some small water bodies, they are poorly covered by existing conservation initiatives.
- i. Existing HAPs and SAPs cover only a small proportion of high-quality ponds and their associated species of conservation interest.
  - ii. Large numbers of high-quality ponds lie outside existing BAP priority habitats. For example, the high-density clusters of ponds in north-west England occur primarily in improved agricultural grassland, and many ponds in the Weald in southern England are within semi-natural woodland of no particular conservation interest.
- 3.6 The implementation of a HAP for Ponds of high ecological status would deliver significant conservation benefits.
- i. A HAP would contribute to the delivery of core conservation business in the UK, particularly with respect to the Water Framework Directive and the Habitats Directive. It would also help to target pond management measures within agri-environment schemes.
  - ii. It would provide a UK-wide framework for the implementation of local policies dealing with issues such as the reduction of diffuse pollution from urban and agricultural landscapes, and the control of invasive species.
  - iii. Although many local BAPs (LBAPs) include ponds, conservation priorities are often poorly focused and the nature and quality of actions relating to ponds are highly varied. A UK plan would help to target LBAP actions more effectively.

### **Threats and decline**

- 3.7 Results from Countryside Survey 2000 (CS2000) indicate that the number of ponds in GB is now more-or-less stable. However, it is pond quality rather than pond numbers that has, for many years, been the main concern of conservationists. The 1996 Lowland Pond Survey showed that at least 50% of ponds in the wider countryside were highly degraded. There is widespread evidence of nutrient enrichment and other diffuse pollution impacts, as well as growing concern that ponds are at risk from air-borne pollution and climate change, to which small shallow water-bodies are recognised as being particularly vulnerable.
- 3.8 The Lowland Pond Survey and CS2000 both show that although pond numbers are relatively stable, there is an exceptionally high turnover of ponds, with 1% of the total resource both destroyed and created each year. There is currently no indication of the quality of ponds lost compared to those gained. However the 1996 survey suggests that most new ponds are created (a) with stream inflows (which will often be polluted), and (b) as fishing lakes. Both trends are worrying.

#### **4. Active shingle rivers**

- 4.1 The issues raised by the Targets Group were considered by the inter-agency Freshwater LCN at their meeting on 14 March. Further views have been obtained from various sources.

##### *Definition*

- 4.2 The definition of the habitat has been tightened to characterise the river type more precisely in geomorphological terms (see Annex A). In some cases whole rivers exhibit the characteristics of this habitat type, but in many rivers the lower reaches lack the dynamic features and associated fauna and would be excluded from a HAP.

##### *Importance for invertebrates*

- 4.3 Exposed riverine sediments (ERS) represent a relatively natural habitat. Recent surveys in England, Wales and Scotland have shown that ERS can support a highly distinctive assemblage of rare invertebrates, and especially beetles. For example, surveys in Scotland recorded 764 species of beetle (of which 14% were nationally scarce or rare), while 314 species of beetle were found in central England and Wales (of which 11% were nationally scarce or rare). A summary of ERS species suggests that there are about 130 nationally rare or scarce species which are largely or exclusively found in ERS. These numbers are comparable to those for other natural habitats such as bogs and fens.

##### *Threats and decline*

- 4.4 The biota associated with this river type rely on natural processes of erosion, sediment transport and deposition. These processes can be interrupted or altered by a range of engineering works. Recent evidence indicates that engineering work leading to increased stabilisation or fossilisation of channels is common across the UK. Schemes to prevent bank erosion, to extract gravel, for fisheries management, and to provide flood defences are part of a trend towards the prevention of channel change and increased human control over natural processes. Although extensive long-term data are not available, studies indicate significant losses of exposed shingle habitat on several river systems in the UK.

#### **5. Montane heaths**

- 5.1 The review has been discussed in detail by the inter-agency Upland LCN. The LCN has confirmed its support for this proposal and has contributed to the comments below.

*Habitat definition and extent of resource*

- 5.2 This proposal encompasses only those types of dwarf-shrub heath and grass heath which are restricted to the montane zone (i.e. above the former natural tree-line), together with associated snowbed communities and montane willow scrub. It excludes anthropogenic grasslands derived from these near-natural vegetation types. The estimated UK extent, 240,000 ha, is considerably less than that of the Upland heathland and Blanket bog priority habitats, and is similar to that for Lowland mixed deciduous woodland (see Annex C).

*International obligations*

- 5.3 This proposal encompasses three important habitat types listed on Annex I of the Habitats Directive. For Sub-Arctic *Salix* spp. scrub most of the UK resource is included within SACs, whereas only a relatively low proportion of Alpine and boreal heaths and Siliceous alpine and boreal grasslands is included. A Montane heaths HAP would therefore help the UK to meet its conservation commitment to these habitats.

*Threats and decline*

- 5.4 Montane heaths include some of the most extensive areas of near-natural vegetation in the UK, and are highly susceptible to human influences. They are threatened by grazing, recreation, use of all-terrain vehicles (ATVs), acidic deposition, and climate change.
- 5.5 Heavy grazing (especially by sheep) is a major mechanism for the loss of characteristic *Racomitrium* moss cover in summit heath vegetation and its replacement by fine-leaved grasses. Much of the *Carex-Racomitrium* moss-heath south of Scotland has lost *Racomitrium*, while the Southern Uplands have a partial cover of grasses. Heavily grazed areas further north, such as on the Trotternish Ridge in Skye, also have a high grass cover, and on some montane moss-heaths in the Scottish Highlands (e.g. West Drumochter) there are indications of incipient *Racomitrium* decline. Similar grazing-related impacts take place in montane *Vaccinium-Cladonia* heaths. In many cases there is evidence that loss of *Racomitrium* has taken place over the last 30-40 years (e.g. in north Wales). In some areas there are signs of recovery where grazing levels have been reduced.
- 5.6 Threat from recreational activities is more localised but erosion of montane vegetation can be serious where footpaths are ill-defined. Skiing developments continue to pose a threat to montane habitats in some parts of Scotland. Use of ATVs is a recent development that can have highly damaging consequences for fragile summit lichen- and moss-rich heaths. High ground is subject to high levels of acidic occult deposition which has been suggested as a factor in loss of *Racomitrium* from montane summit heaths. All forms of montane vegetation are likely to be adversely affected by climate change.
- 5.7 The level of threat to this habitat varies geographically. It is relatively severe in England, Wales, Northern Ireland and southern Scotland, but more limited in the Scottish Highlands, although further research is needed. The proposed HAP would acknowledge this geographic variation. Habitat restoration and expansion measures

would be targeted on the more degraded examples in southern Britain.

## **6. Rock outcrops and mine spoil rich in heavy metals**

- 6.1 A proposal to include Post-industrial pioneer habitats as a BAP priority habitat was included in a paper presented to the May meeting of the UK Targets Group (UKTG-01-P12). Group members expressed a wide range of views regarding the need for a HAP covering these habitats. JNCC was asked to prepare a revised proposal, focusing on the Annex I habitat Calaminarian grasslands which is a distinctive vegetation type of metalliferous substrates in both artificial and near-natural situations.
- 6.2 The proposed priority habitat has been provisionally named 'Rock outcrops and mine spoil rich in heavy metals'. Full details of the proposal, which was originally put forward by the Lowland Grasslands Lead Co-ordination Network and by Plantlife, are given in the standard format in Annex 1. The key points are summarised below.
- Description and conservation value*
- 6.3 Rock outcrops, screes and mine spoil rich in heavy metals and other unusual minerals provide an important habitat for Calaminarian grasslands and related vegetation, in which certain species or races of vascular plants, lichens and bryophytes occur which are specifically adapted to the conditions. These include five BAP priority plant species, mainly bryophytes, and a range of other rare species. The vegetation is typically sparse and open due to the toxicity and low nutrient status of the substrate.
- 6.4 Vegetation on metalliferous substrates is found in three distinct settings in the UK:
- i. Near-natural substrates.
  - ii. Mine spoil, in situations where naturally occurring metalliferous outcrops have been quarried away.
  - iii. Metalliferous river gravels, sometimes derived from washed-out mine workings.

### *Distribution and abundance*

- 6.5 Although 'Rock outcrops and mine spoil rich in heavy metals' occur widely across the north and west of the UK, their extent is restricted because of the limited occurrence of suitable rock types. Near-natural examples are highly localised on outcrops and scree of serpentine and related rock types, mostly in the Scottish Highlands and Islands. Metalliferous mine spoil and river gravels are more widespread, particularly in parts of England and Wales. Comprehensive survey data are not available, but the total UK extent is estimated to be less than 10,000 ha.

### *Threats*

- 6.6 Anthropogenic stands in particular are under considerable threat from programmes for the rehabilitation of derelict land, as well as from landfill schemes. On some sites active disturbance may be required to set back natural successional processes although vegetation succession is generally curtailed by the toxicity of the substrate.

### *International obligations*

- 6.7 Although Calaminarian grasslands are listed on Annex I of the Habitats Directive, only a relatively small proportion of the total UK resource is included within SACs. Achieving favourable conservation status for the habitat will therefore require co-ordinated conservation action outwith designated sites. A HAP for 'Rock outcrops and mine spoil rich in heavy metals' would provide a suitable mechanism for delivering this objective.

## **7. Other post-industrial pioneer habitats**

- 7.1 There remains a range of other post-industrial habitats which are clearly of high biodiversity importance, in particular examples which support assemblages of rare

invertebrates, bryophytes or lichens. The most important sites tend to be relatively old, or include workings which were started several decades ago. Their important flora and fauna may be relics of colonisation from adjacent more natural habitats, such as heathland, which have subsequently been destroyed. Such sites are often subject to threats such as landfill, restoration for arable, industrial or housing use, or inappropriate conservation after-use. This habitat is especially important in lowland areas where more 'natural' equivalents are rare, and where threats of development or reclamation may be intense.

- 7.2 There are considerable difficulties in defining important post-industrial sites satisfactorily while excluding the many examples which are of low conservation interest. The lack of a national habitat classification for urban and related habitats is a significant factor, although the Urban Inter-agency Working Group is proposing to address this in the coming year. Sites are of variable conservation significance, and further work is required to develop criteria for prioritising conservation action on a clearly defined sub-set of post-industrial habitats. Action would be focused on sites of high biodiversity value containing specialist species in high-stress environments.
- 7.3 Because of these difficulties, it would be premature to include the full range of post-industrial pioneer habitats within the BAP priority habitat series. Work over the next couple of years may enable a more focused proposal for a HAP to be made in the future.

## 8. Cross-cutting issues

- 8.1 Several habitats proposed as new priority types cut across recognised habitat classifications and/or are 'microhabitats' which form components of broader habitat categories. The most significant of these are detailed below; others are listed in Table 2.

### 8.2 *Habitat mosaics*

- 8.2.1 Many species either depend on the transition zone between traditionally defined habitats or vegetation types, or utilise a range of different habitats. The importance of mosaics at various scales has long been recognised by ecologists and conservationists but is sometimes neglected when action is focused on specific habitats rather than ecosystems. *Biodiversity: making the links* (published by EN in 1999) discusses this issue in some detail and highlights several priority species for which habitat mosaics are particularly important. Although it would be unworkable to treat 'mosaics' as a priority habitat in its own right, the importance of mosaics and transitions should be recognised in the implementation of all HAPs. Ruderal habitats (8.4) and scrub (8.5) represent two important components of this.

### 8.3 *Upland flushes and rock exposures*

- 8.3.1 Some habitats are undoubtedly of high conservation value in national/international terms but are relatively widespread in the UK and do not appear to be severely threatened. Assessment of the proposals for new priority types identified two habitats in this category: Upland fens and flushes and Natural rock exposures. Both encompass a number of Annex I habitats and many examples support rich assemblages of rare species, including many arctic-alpines. They are widely distributed in northern and western Britain, and typically occur in mosaic with other existing or proposed priority habitats, e.g. upland heathland, blanket bog, and montane heaths and grasslands.

8.3.2 In general, measures taken under other upland HAPs should be sufficient to ensure that the main conservation issues affecting Upland fens and flushes and Natural rock exposures are addressed. Although these habitats are clearly of high biodiversity value, there would appear to be little benefit in producing costed action plans at present.

#### 8.4 *Ruderal communities*

8.4.1 This type was proposed because of the important pioneer communities of plants and invertebrates associated with disturbed ground. These communities are found in a wide range of situations, including most existing and proposed priority habitats. It is recommended that recognition of the need for disturbance, to ensure continuity of ruderal plant and animal assemblages, is incorporated into all HAPs as appropriate.

#### 8.5 *Scrub*

8.5.1 Scrub is a very broad category which is associated with many different habitat types and is explicitly covered by a number of existing HAPs. Many forms of scrub are successional and scrub control is often a major management issue, but others form climax vegetation, e.g. at the upper altitudinal limit of tree growth and on exposed coasts. Various types of scrub provide essential habitat requirements for many species, including BAP priority species, and there are several Annex I types which include scrub.

8.5.2 Montane willow scrub is specifically included within the proposed Montane heaths and grasslands priority habitat. Juniper scrub should be addressed through the Species Action Plan for juniper. Otherwise it is recommended that scrub should be dealt with as an integral component of the various woodland, coastal, grassland, wetland, heath and rock HAPs. This is consistent with the conclusions of the recent inter-agency review of scrub (JNCC Report 308 *The nature conservation value of scrub in Britain*). It would be desirable to produce a guidance note regarding scrub conservation and management issues which could be circulated to all relevant HAP Steering Groups.

#### 8.6 *Coppice woodland*

8.6.1 Coppicing is a woodland management system, which creates suitable habitat conditions for many species, especially rare and threatened invertebrates. Most of the woods in which coppice management is important fall into the proposed lowland mixed deciduous woodland priority type. It is therefore recommended that coppice woodland is not recognised as a distinct type, but that coppice management is promoted, where appropriate, as a key element of the relevant woodland HAPs.

### **9. Habitats of Conservation Concern**

9.1 Some habitats are undoubtedly of high conservation value in national/international terms but are relatively widespread in the UK and do not appear to be sufficiently threatened to require an action plan at the UK level. It is recommended that a category of 'Habitats of Conservation Concern' is

established for habitats of this type. This would parallel the treatment of comparable species.

- 9.2 Examples of possible Habitats of Conservation Concern include upland fens/flushes and natural rock exposures (see Annex B). Both encompass a number of Annex I habitats and many examples support rich assemblages of rare species, including many arctic-alpines. They are widely distributed in northern and western Britain, and typically occur in mosaic with other existing or proposed priority habitats. In general, measures taken under other upland HAPs should be sufficient to ensure that the main conservation issues affecting these habitats are addressed.
- 9.3 If the concept of Habitats of Conservation Concern is accepted, then the list of habitats to be included within this category would require further consideration. It is proposed that a short statement highlighting the conservation importance of each habitat should be prepared, and that their conservation status should be reviewed after an appropriate period. To achieve the latter objective it will be necessary to ensure that appropriate surveillance schemes are in place to provide data on changes in habitat status over time.

## **10. Recommendations for changes to existing priority habitats**

- 10.1 The review was not intended to encompass existing priority habitats, but inevitably assessment of proposals for new priority types involved some consideration of existing types. The following changes are therefore recommended.
- 10.2 *Fens*
- 10.2.1 The scope of the existing Fens priority habitat is ambiguous. The introductory section of the published HAP refers to a wide range of topogenous and soligenous mire types, both lowland and upland, but the later sections of the plan focus on lowland, mainly topogenous, fens. In practice, the Fens HAP Steering Group has only covered these latter types.
- 10.2.2 Soligenous fens in both the lowlands and uplands are of high conservation importance, including several Annex I types and many priority BAP plants and invertebrates. In the lowlands they have declined and remain under threat from hydrological and agricultural activities. Upland fens are subject to different impacts and are generally less threatened.
- 10.2.3 It is recommended that the definition of the existing Fens priority type is revised to cover only lowland fens, but including soligenous types (flushes and springs) as well as topogenous types. For upland fens see section 5.
- 10.3 *Cereal field margins*
- 10.3.1 During the consultation process it was suggested that the scope of this type might be expanded to encompass other forms of cultivated land which support rare or declining plant communities. This proposal has been discussed by the HAP Steering Group for Cereal field

margins, which decided that it was not appropriate to afford priority habitat status to all low-input arable and horticultural weed communities. However the group did conclude that the HAP should explicitly cover all cropping systems where cereals are a regular part of the rotation.

**Table 1. Review of gaps in the BAP Priority habitats series, 1999-2001: list of proposals received for new priority habitats, with summary of final recommendations agreed by UK Targets Group (key conclusions in bold).**

BAP broad habitat	Proposed new BAP priority habitat	Proposer <sup>2</sup>	Recommendation
Broad-leaved, mixed and yew woodland	<b>Lowland mixed deciduous woodland</b>	K Kirby, EN	<b>New priority habitat (approved)</b>
	<b>Upland birchwoods</b>	K Holl, SNH	<b>New priority habitat (approved)</b>
	Northern birchwoods	K Kirby, EN (97)	Superseded by proposal for Upland birchwoods
	Coppice woodland	A Stubbs, BC	Incorporate into relevant woodland types
	Mature aspen stands	A Stubbs, BC	Incorporate into relevant woodland types
	Juniper scrub	K Kirby, EN (97)	Covered by Juniper SAP
	<b>Scrub</b>	A Stubbs, BC (97)	Incorporate into all relevant HAPs <b>(guidance required)</b>
Coniferous woodland	Coniferous plantations	K Kirby, EN (97)	Interest covered by existing SAPs
Arable and horticultural	Traditional (low-input) arable and horticultural weed communities	J Rodwell, UVS	Consider extending scope of Cereal field margins HAP
	<b>Traditionally managed orchards</b>	R Key, EN	<b>Further consideration required</b> (submitted too late for consultation)
Bracken	Species-rich bracken	N Bourn, BC	Covered by existing butterfly SAPs
Fen, marsh and swamp	Soligenous mire	M Yeo, CCW (97)	See below
	Soligenous mires	M Harper, Plantlife	Lowland types should be covered by Fens priority habitat; upland types as 'Upland fens and flushes' below
	Soligenous mires	M Drake, EN	See above
	<b>Upland fens and flushes</b>	D Stevens, CCW	Not sufficiently threatened at present; <b>possible 'habitat of conservation concern'</b>
	Springs, spring-fed streams and seepages	A Stubbs, BC	As 'soligenous mires' above
Standing open water and canals	<b>Oligotrophic lakes</b>	I Fozzard, SEPA	<b>Proposed new priority habitat 'Oligotrophic lakes'</b>
	Oligotrophic lakes	D Stevens, CCW	See above
	Marl lakes with <i>Chara</i> growth	K Duigan, CCW (97)	Cuts across trophic typology. Incorporate larger examples into existing and proposed lake types as appropriate, and smaller examples into new Ponds priority type
	Marl lakes	M Harper, Plantlife	See above

<sup>2</sup> (97) indicates proposals made during the review of the BAP broad habitat classification in 1997.

BAP broad habitat	Proposed new BAP priority habitat	Proposer <sup>2</sup>	Recommendation
	Dystrophic pools and ponds	I Fozzard, SEPA	Incorporate into proposed Ponds priority type except for bog pools, which should be addressed by existing HAPs for raised bogs and blanket bogs. Any dystrophic water bodies >1 ha to be covered by proposed Oligotrophic lakes priority type.
	Permanent and temporary ponds	R Snow/ J Biggs, PCT	See below
	<b>Ponds</b>	M Drake, EN	<b>Proposed new priority habitat 'Ponds of high ecological quality'</b>
	Ponds	M Harper, Plantlife	See above
	Ponds	A Stubbs, BC	See above
	Temporary pools and amphibious habitats	J Hopkins, JNCC (97)	Incorporate into proposed Ponds priority habitat
	Ephemeral ponds	M Harper, Plantlife	As above
Rivers and streams	Flowing water and margins	A Stubbs, BC	Too broad; covered, in part, by existing Chalk rivers priority habitat and proposed Active shingle rivers priority habitat
	Crowfoot rivers	R Weyl, EHS	Included, in part, within existing Chalk rivers priority habitat and proposed Active shingle rivers priority habitat
	Salmonid-dominated Atlantic oligotrophic rivers	D Stevens, CCW	Included, in part, within proposed Active shingle rivers priority habitat
	<b>Gravel bed rivers</b>	I Fozzard, SEPA	<b>Proposed new priority habitat 'Active shingle rivers'</b>
	Exposed riverine sediments	M Drake, EN (97)	Incorporate major examples into proposed Active shingle rivers priority habitat; fine sediment sites should be covered by existing ERS invertebrate SAPs
	Headwaters	P Boon, SNH (97)	Included, in part, within existing Chalk rivers priority habitat and proposed Active shingle rivers priority habitat
Montane habitats	<b>Montane habitats</b>	M Yeo, CCW (97)	<b>Proposed new priority habitat 'Montane heaths'</b>
	Montane habitats	D Horsfield & D Thompson, SNH	See above
Inland rock	<b>Natural rock exposures</b>	M Yeo, CCW (97)	Not sufficiently threatened at present; <b>possible 'habitat of conservation concern'</b>
	Ravines and narrow gorges	M Hill, CEH	Part covered by various woodland and river priority habitats; see also Natural rock exposures.
	Calaminarian grasslands	R Jefferson/ D Stevens, CCW (97)	Include in proposed 'heavy metals' priority habitat
	<b>Outcrops and mine spoil rich in heavy metals</b>	M Harper, Plantlife	<b>Proposed new priority habitat 'Rock outcrops and mine spoil rich in heavy metals'</b>

BAP broad habitat	Proposed new BAP priority habitat	Proposer <sup>2</sup>	Recommendation
	Serpentine habitats	M Usher, SNH	Include in proposed 'heavy metals' priority habitat
	Quarries/post-industrial habitats	A Stubbs, BC (97)	See Pioneer habitats below
	<b>Pioneer habitats with arrested succession</b>	R Key, EN	<b>Needs further consideration</b> ; only partly included in proposed new 'ponds' and 'heavy metals' priority types.
	Caves and mines	A Stubbs, BC (97)	Bat fauna covered by SAPs; invertebrate fauna not sufficiently important or threatened to justify a HAP.
Supralittoral rock	Landslips and soft cliff slopes	A Stubbs, BC	Already covered by Maritime cliffs and slopes HAP
General	<b>Ruderal communities</b>	A Stubbs, BC	Incorporate into all relevant HAPs ( <b>guidance needed</b> ); see also 'Pioneer habitats' above.
	<b>Mosaics</b>	A Stubbs, BC (97)	Incorporate into all HAPs ( <b>guidance required</b> )

Organisational abbreviations: BC Butterfly Conservation; CCW Countryside Council for Wales; CEH Centre for Ecology and Hydrology; EHS Environment and Heritage Service (DoENI); EN English Nature; JNCC Joint Nature Conservation Committee; PCT Ponds Conservation Trust; SEPA Scottish Environmental Protection Agency; SNH Scottish Natural Heritage; UVS Unit of Vegetation Science.

**Tables 2 - 6. Proposal forms for new priority habitat types as supported by the UK BAP Targets Group in 2001 (see details of background in Annex A.)**

<b>Table 2. Oligotrophic lakes</b>	
<b>CORRESPONDING HABITATS</b>	
Broad Habitat:	Standing open water and canals
Phase 1:	G1 Standing water
NVC:	Various, including A7, A9, A13, A14, A22- A24; S4, S8-S11, S19b
Annex I:	Oligotrophic waters containing very few minerals of sandy plains: <i>Littorelletalia uniflora</i> ; Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i> (part); Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> species (part); Natural dystrophic lakes and ponds (part)
Other:	Palmer lake macrophyte classification types 2 and 3
<b>DESCRIPTION</b>	
<p>Oligotrophic lakes are water bodies &gt;1 ha in size which are characterised by their low nutrient levels and low productivity. Their catchments usually occur on hard, acid rocks, most often in the uplands. This habitat type encompasses a wide range of size and depth, and includes the largest and deepest water bodies in the UK. Good examples may support some of the least disturbed aquatic assemblages in the UK.</p> <p>Oligotrophic lakes usually have very clear water, although some examples with dystrophic characteristics have peat-stained waters. Characteristic plankton, zoobenthos, macrophyte and fish communities occur, including several BAP species and species of economic importance. Fish communities, generally dominated by salmonids, may include charr <i>Salvelinus alpinus</i> and <i>Coregonus</i> spp. A number of benthic and planktonic invertebrates, found only in oligotrophic lakes, are possibly glacial relicts. Macrophytes are typically sparse, with species such as shoreweed <i>Littorella uniflora</i> and quillwort <i>Isoetes</i> spp. Shores are typically stony, and emergent vegetation is generally restricted to sheltered bays, where species such as bottle sedge <i>Carex rostrata</i> and bulrush <i>Scirpus lacustris</i> may be found.</p>	
<b>GEOGRAPHIC DISTRIBUTION</b>	
Throughout the UK but mostly in upland areas of the north and west.	
<b>REASONS FOR RECOMMENDATION</b>	
<p><i>Habitats for which the UK has international obligations</i></p> <p>This type includes all or part of four Annex I habitats.</p> <p><i>Habitats at risk</i></p> <p>The ecological functioning of oligotrophic lakes is critically dependent upon low nutrient levels, making them very vulnerable to eutrophication. Throughout the UK oligotrophic lakes have suffered deleterious changes due to nutrient enrichment and/or acidification. Work by UCL, MLURI and SEPA has indicated that even the most apparently pristine oligotrophic waters in Scotland have undergone significant phosphorus enrichment over the last century or so. The MLURI work was published as a key element of the 1995 Scottish Office classification of waters. It was also published in <i>Hydrobiologia</i> <b>395/396</b>: 433-453, 1999 (A quality classification for management of Scottish standing waters). The UCL work on the palaeolimnology of 29 Scottish standing waters was funded by SNIFFER and SNH, and the project was managed by SNH and SEPA. The final report was approved in March 2001 and should be published very soon. The findings support the MLURI data.</p> <p>Hydro power, water abstraction, fish farming, afforestation and recreational development have all affected oligotrophic lakes in recent decades, and oligotrophic lochs continue to be under significant threat from development pressure. Acidification has also affected, and continues to affect, many sites.</p> <p><i>Habitats which are functionally critical</i></p> <p>This habitat is important for certain wide-ranging species e.g. salmon, otter, divers.</p> <p><i>Habitats important for key species</i></p> <p>Oligotrophic lakes support a range of BAP priority species and other species listed on Annexes of the Habitats and Birds Directives, e.g. slender naiad <i>Najas flexilis</i>, salmon <i>Salmo salar</i>, common scoter <i>Melanitta nigra</i>, black-throated diver <i>Gavia arctica</i>, and otter <i>Lutra lutra</i>.</p>	
<b>CONSERVATION GAIN</b>	
Two-thirds of the trophic spectrum of lakes in the UK is covered by the existing HAPs for Mesotrophic lakes and Eutrophic standing waters. There is a very strong case for extending the HAP approach to cover oligotrophic waters - the remaining part of that continuum - particularly as these waters are the most sensitive to ecological damage through nutrient enrichment. This would provide a sound basis for meeting the requirements of the Water	

Framework Directive in relation to standing waters. The Joint UK Lakes HAP Steering Group is developing a risk-based approach applicable to all lake types which would ensure that conservation effort is directed to appropriate sites to gain the greatest benefit.

Whilst the scenic and amenity value of oligotrophic lakes is well recognised in the UK, their international biodiversity importance is less so. A national HAP would raise awareness and understanding of the nature conservation issues associated with oligotrophic lakes and help to direct conservation effort, which requires a multi-partner catchment approach.

SUGGESTED LEAD AGENCY  
SEPA or SNH

NAME OF PROPOSER/ORGANISATION  
Ian Fozzard (SEPA)/Freshwater LCN

<b>Table 3. Ponds of high ecological quality</b>	
<b>CORRESPONDING HABITATS</b>	
BAP broad habitat:	Standing open waters and canals
Phase 1:	G1 Standing water
NVC:	Various aquatic, swamp and fen communities; OV28-OV35; and others
Annex I:	Oligotrophic waters containing very few minerals of sandy plains (part); oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoeto-Nanojuncetea</i> (part); Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> species (part); Natural dystrophic lakes and ponds (part); Mediterranean temporary ponds; Natural eutrophic lakes (part)
<b>DESCRIPTION</b>	
Ponds of high ecological quality are defined as permanent and seasonal standing water bodies up to 1 ha in extent which meet one or more of the following criteria:	
<ul style="list-style-type: none"> <li>• <i>Wetland plants</i>. Ponds supporting an exceptionally rich plant assemblage (defined by the National Pond Survey of minimally impaired sites in semi-natural areas)</li> <li>• <i>Amphibians</i>: Ponds supporting exceptional amphibian populations or numbers of species (based on populations sizes specified in guidelines for the selection of biological SSSIs)</li> <li>• <i>Dragonflies</i>. Ponds supporting an exceptional number of dragonfly species (based on numbers of species specified in guidelines for the selection of biological SSSIs).</li> <li>• <i>Other invertebrates</i>. Ponds supporting an exceptionally rich invertebrate assemblage (based on criteria defined in the National Pond Survey).</li> <li>• <i>Red Data Book and BAP species</i>. Ponds supporting any Red Data Book or BAP species.</li> </ul>	
Data from the Lowland Pond Survey suggest that about 2-5% of ponds would fall into the category of 'high ecological quality' based on these criteria. It should be noted that the criteria are intended to take account of natural regional variations in species richness (e.g. naturally species-poor acid upland ponds). Thus examples of various trophic types would be included, although bog pools are more appropriately dealt with through the two bog HAPs. Temporary or seasonal ponds and pools, which may be very important for their specialist flora and fauna, are also included.	
<b>GEOGRAPHIC DISTRIBUTION</b>	
Widespread throughout the UK, but high-quality examples are highly localised, especially in the lowlands.	
<b>REASONS FOR RECOMMENDATION</b>	
<i>Habitats for which the UK has international obligations</i>	
Six Annex I types are included within this habitat (either entirely or in part), and several Annex II species. The importance of ponds as 'stepping stone' habitats is recognised in Article 10 of the Habitats Directive. Whilst the conservation interest of some types of ponds and some pond species is recognised by their inclusion on the Annexes of the Habitats Directive, the majority of important ponds and associated species will not be covered by SACs.	
<i>Habitats at risk</i>	
Ponds are vulnerable to loss and damage through uncontrolled factors (e.g. nutrient enrichment, infilling) on a scale that is not possible to counter using existing mechanisms. The 1996 Lowland Pond Survey (LPS96) shows that at least 50% of the ponds in the wider countryside are highly degraded and that there is widespread evidence of enrichment and other diffuse pollution impacts. Temporary ponds are, if anything, even more degraded than permanent ponds. There is also growing concern that even ponds in semi-natural landscapes are at risk from air-borne pollution (e.g. acidification, nutrient-enriched rainfall) and climate change, to which small shallow waterbodies are recognised as being particularly vulnerable. In addition, LPS96 and CS2000 show that although pond numbers are relatively stable, there is an exceptionally high turnover of ponds, with 1% of the total resource both destroyed and created each year. There is currently no indication of the quality of ponds lost compared to those gained. However, LPS96 suggests that most new ponds are created (a) with stream inflows - a practice discouraged in many other European countries, since most inflows are polluted, and (b) as fishing lakes. Both trends are worrying.	
<i>Habitats which are functionally critical</i>	
Ponds are used by species that do not spend all their life in water, e.g. amphibians, bats for feeding. They form stepping stones and isolated patches of benign habitat for many species, especially if associated with wetland vegetation.	
<i>Habitats important for key species</i>	
Ponds are at least as rich as lakes and rivers in invertebrate and plant species, and support many nationally rare	

<p>species. They are the breeding sites of all amphibians, most dragonflies, and are used by about 20 species of native fish. A large number of wetland species are associated with water margins, which are provided by ponds in many areas of the countryside where wetlands are scarce. At least 40 BAP priority species are associated with small standing water bodies (e.g. water vole, tadpole shrimp, medicinal leech, lesser silver water and spangled water beetles, starfruit, pennyroyal, three-lobed crowfoot), as are the Habitats Directive Annex II species great crested newt, crayfish and otter.</p>	
<p><b>CONSERVATION GAIN</b></p> <p><i>Issues</i></p> <ul style="list-style-type: none"> <li>• Ponds as a habitat are not adequately covered by wildlife legislation. They fall through the SSSI network - they are hardly mentioned in the <i>SSSI Selection Guidelines</i>.</li> <li>• Pond species cannot be supported by surrounding terrestrial habitat and often are not found in larger water bodies (lakes, canals) that are given specific treatment in the SSSI series.</li> <li>• The Environment Agency (and water resources legislation) cannot deal adequately with pond conservation.</li> <li>• Existing HAPs and SAPs currently protect only a small proportion of high-quality ponds. Only a small proportion of species of conservation concern found in ponds have SAPs. So, for example, the National Pond Survey shows that 89% of the ponds supporting a Red Data Book plant or animal species do not support BAP species and so are not covered by existing SAPs. Large numbers of high-quality ponds lie outside existing priority habitats (e.g. most ponds in the high-density clusters in NW England are primarily in rather intensive agricultural grassland; many ponds in the Weald in southern England are in semi-natural woodland of no particular conservation interest).</li> </ul> <p><i>Benefits of a HAP</i></p> <p>Major conservation benefits would accrue following the implementation of a HAP for Ponds of high ecological quality compared to relying on existing LBAPs and SAPs. In particular, a national HAP would:</p> <ul style="list-style-type: none"> <li>• Set realistic targets to offset the known losses and provide a strategic framework for the conservation of ponds across the UK. It would send a strong message that ponds are important for biodiversity and should be managed for this interest, and not just for fishing, wildfowl, amenity and landscape.</li> <li>• Contribute to the delivery of core conservation business in the UK, particularly with respect to the Water Framework Directive, the Habitats Directive, Water Level Management Plans etc. A HAP would also help with better targeting of funds already being spent on ponds in agri-environment schemes.</li> <li>• Assist in the development of policies which must be determined first at a national level before they can be effectively implemented locally (e.g. policies to reduce diffuse pollution from urban and agricultural landscapes, policies to control the spread of invasive species).</li> <li>• Ensure that LBAPs are more effectively implemented (e.g. ensuring that LBAPs incorporate measures specifically designed for ponds, rather than less effective generic 'standing water' measures).</li> <li>• Assist with the integration of HAPs and SAPs that influence ponds.</li> </ul> <p>Compared with many other priority habitats, ponds are easy and inexpensive to create and restore, the rates of return for effort are high, and results are easily measured and monitored. Both the wildlife and political gains will therefore be delivered quickly.</p>	
<p><b>SUGGESTED LEAD AGENCY</b></p> <p>Environment Agency and Pond Conservation Trust in joint lead role</p>	<p><b>NAME OF PROPOSER/ORGANISATION</b></p> <p>Martin Drake (EN), R Snow/J Biggs (PCT), M Harper (Plantlife) and others</p>

<b>Table 4. Active shingle rivers</b>	
<b>CORRESPONDING HABITATS</b>	
BAP broad habitat:	Rivers and streams
Phase 1:	G2 Running water; possibly I1.4 Other rock exposures (part)
NVC:	Various
Annex I:	Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation (part); Calaminarian grasslands (part)
Other:	River shoals
<b>DESCRIPTION</b>	
<p>This habitat comprises those rivers which have significant reaches composed of a gravel or pebble bed material (with grain sizes in the range 2-256 mm), sometimes with discrete sandy reaches or deposits (0.064-2 mm diameter) in areas of lower slope, and having characteristic suites of features generated by the processes of erosion, sediment transport, deposition, and storage. Their headwaters are usually in upland areas which generate high-energy discharges, resulting in intermittent sediment movement. Average bed sediment size usually declines downstream (with the downstream reduction in underlying gradient and stream power) generating a commensurate change in habitat.</p> <p>Typically, these rivers have extensive reaches of gravel, pebble and sand bed material in their middle reaches and in the piedmont zone, these shingle deposits being associated with a wandering, dynamic meandering or divided channel and active erosion and sediment deposition features. The gravel bed reaches exhibit characteristic macro-scale bed form morphology with features including point bars and eroding cliffs, side and mid channel bars, and pool-riffle sequences. These features are typically unvegetated, reflecting their dynamic nature. Sediment transport and the formation of the characteristic habitat features typically occur only at high flows, when bedload may comprise up to 50% of the total sediment load in transit. Many of the macro-scale features are exposed in the channel as shingle during low flow conditions. Sand bed reaches or deposits typically exhibit micro-scale bed form morphology with features such as ripples, dunes and plane beds. The transport and deposition of sand-sized material occurs across a wide range of discharges.</p> <p>The dynamic nature of these river channel and bank habitats is critical for the species they support. Active shingle rivers have a characteristic fauna of fish and aquatic invertebrates associated with the well-oxygenated conditions, flow and substrate characteristics. Shingle and sand banks form the habitat for an important fauna of 'terrestrial' invertebrate species characteristic of exposed riverine sediments (ERS). ERS support a large assemblage of invertebrates specialised for life at the humid water margin where vegetation is absent or sparse. Dominant groups are ground beetles, rove beetles, flies and spiders. About half the species found on ERS are restricted to this habitat.</p> <p>On a number of these rivers, banks of gravel rich in heavy metals support a specialist flora characteristic of Calaminarian grasslands, an Annex I habitat. Some of these gravels have washed down from old mine workings upstream.</p> <p>Some rivers may meet the criteria in their upper/middle reaches but lack the dynamic characteristics and associated fauna in their lower stretches. In such cases the lower reaches, which are often heavily modified, would not be included in the definition.</p>	
<b>GEOGRAPHIC DISTRIBUTION</b>	
This habitat occurs predominantly in upland and piedmont areas of north and west UK.	
<b>REASONS FOR RECOMMENDATION</b>	
<p><i>Habitats for which the UK has international obligations</i></p> <p>Includes part of the UK resource of two Annex I types.</p> <p><i>Habitats at risk</i></p> <p>The biota associated with this river type rely on natural processes of erosion, sediment transport and deposition. These processes can be interrupted or altered by a range of engineering works. Recent evidence indicates that engineering work leading to increased stabilisation or fossilisation of channels is common across the UK. Schemes to prevent bank erosion, to extract gravel, for fisheries management, and to provide flood defences are part of a trend towards the prevention of channel change and increased human control over natural processes. Although extensive long-term data are not available, studies also indicate significant losses of exposed shingle habitat on several river systems in the UK. Other threats include agricultural pollution (especially the use of pyrethroid sheep dips), acidification, introduction of cyprinids, and stocking of inappropriate strains of salmonids (which damages or destroys the genetic distinctiveness of populations).</p> <p><i>Habitats which are functionally critical</i></p> <p>Active shingle rivers provide important habitats for part of the life cycle of migratory fish species (e.g. salmon), and for wide-ranging species such as otter.</p>	

<p><i>Habitats important for key species</i></p> <p>Rivers of this type are especially important for their ERS fauna. This includes a very large number of rare invertebrates, e.g. 180 ERS beetle species are nationally rare (RDB) or scarce (notable). Ten BAP species occur on ERS. The sites known to hold the richest assemblages of ERS invertebrates are rivers with coarse to sandy substrates. Recent surveys of ERS have found 764 species of beetle in Scotland, of which 14% were nationally scarce or rare, 314 species of beetle in central England and Wales, of which 11% were scarce or rare, and 313 species of beetles in Devon: of which 12% were scarce or rare.</p> <p>Active shingle rivers are also important for their populations of salmon and a number of other Habitats Directive Annex II species, such as freshwater pearl mussel, otter and lampreys.</p>	
<p><b>CONSERVATION GAIN</b></p> <p>These dynamic river systems are seriously threatened by inappropriate management activities. They support a rich fauna, and are particularly noteworthy for the exceptional invertebrate assemblages associated with shingle and sand banks. Protection and enhancement of their biodiversity interest would be greatly aided by the development of a HAP, which would provide a co-ordinated national framework for conservation action.</p>	
<p><b>SUGGESTED LEAD AGENCY</b></p> <p>SNH or SEPA</p>	<p><b>NAME OF PROPOSER/ORGANISATION</b></p> <p>Ian Fozzard (SEPA), Freshwater LCN and Martin Drake (EN)</p>

<b>Table 5. Montane heaths</b>	
<b>CORRESPONDING HABITATS</b>	
BAP broad habitat:	Montane habitats
Phase 1:	D3 lichen/bryophyte heath; D4 montane heath/dwarf herb; D1 dry dwarf-shrub heath (part); A2 scrub (part)
NVC:	H13-H15, H17-H20, H22; U7-U15, U18,W20; also montane forms of H10, H12, H16
Annex I:	Alpine and boreal heaths; Sub-Arctic <i>Salix</i> scrub; Siliceous alpine and boreal grassland
<b>DESCRIPTION</b>	
<p>This habitat encompasses a wide range of natural or near-natural vegetation occurring in the montane zone, lying above or beyond the former natural tree-line. It includes dwarf-shrub heaths, grass-heaths, dwarf-herb communities, willow scrub, and snowbed communities. The most abundant vegetation types are heaths dominated by <i>Calluna vulgaris</i>, <i>Vaccinium myrtillus</i>, <i>Carex bigelowii</i> and <i>Juncus trifidus</i>, typically with abundant bryophytes (e.g. <i>Racomitrium lanuginosum</i>) and/or lichens (e.g. <i>Cladonia</i> species). Rarer vegetation types include snow-bed communities with <i>Salix herbacea</i> and various bryophytes and lichens, and sub-arctic willow scrub.</p> <p>The lower altitudinal limit of montane communities varies in different parts of GB, descending to lower altitudes in the north and west of Britain. Most communities occur on thin soils, which may be acidic or calcareous. Some communities are characteristic of very exposed ridges and summits, whereas others are restricted to sheltered situations where there is late snow-lie. A range of important rock and scree types, including tall herb ledge vegetation, often occur in close association with this habitat, along with high-altitude springs, flushes and other mire types.</p>	
<b>GEOGRAPHIC DISTRIBUTION</b>	
Extensive in the Scottish Highlands, but highly localised in southern Scotland, England and Wales. Some montane communities (e.g. sub-arctic willow scrub and snowbeds) are extremely rare in the UK, and are restricted to the higher Scottish mountains.	
<b>REASONS FOR RECOMMENDATION</b>	
<i>Habitats for which the UK has international obligations</i>	
This habitat encompasses two moderately extensive Annex I types (Alpine and boreal heaths and Siliceous alpine and boreal grassland), and one very rare Annex I type (Sub-Arctic <i>Salix</i> scrub). It also provides a major breeding habitat for dotterel (listed on Annex I of the Birds Directive).	
<i>Habitats at risk</i>	
Montane habitats include the most extensive areas of near-natural vegetation in the UK, and are highly susceptible to human influences. They are threatened by grazing, recreation, use of all-terrain vehicles (ATVs), acidic deposition, and global warming.	
Heavy grazing (especially by sheep) is a major mechanism for the loss of characteristic <i>Racomitrium</i> moss cover in summit heath vegetation and its replacement by fine-leaved grasses. Much of the <i>Carex-Racomitrium</i> moss-heath south of Scotland has lost <i>Racomitrium</i> , while the Southern Uplands have a partial cover of grasses. Heavily grazed areas further north, such as on the Trotternish Ridge, also have a high grass cover, and on some montane moss-heaths in the Highlands (e.g. West Drumochter) there are indications of incipient <i>Racomitrium</i> decline. Similar grazing-related impacts take place in montane <i>Vaccinium-Cladonia</i> heaths. In many cases there is evidence that loss of <i>Racomitrium</i> has taken place over the last 30-40 years (e.g. in north Wales). In some areas there are signs of recovery where grazing levels have been reduced (e.g. Rhinns of Kells).	
Threat from recreational activities is more localised but erosion of montane vegetation can be serious where footpaths are ill-defined. Skiing developments continue to pose a threat to montane habitats in some parts of Scotland. Use of ATVs is a recent development that can have highly damaging consequences for fragile summit lichen- and moss-rich heaths.	
High ground is subject to high levels of acidic occult deposition which has been suggested as a factor in loss of <i>Racomitrium</i> from montane summit heaths. All forms of montane vegetation are likely to be adversely affected by climatic change.	
<i>Habitats which are functionally critical</i>	
Montane habitats are important for summer migrants such as dotterel, and as hunting ground for wide-ranging species such as golden eagle.	
<i>Habitats important for key species</i>	
These include six vascular plants, six bryophyte species, eight lichen species and a moth. Many other rare and local arctic-alpine plants and invertebrates occur. Notable birds include dotterel and ptarmigan.	

<p><b>CONSERVATION GAIN</b></p> <p>Mountain ecosystems support some of the most natural plant and animal communities in the UK. They provide a habitat for many scarce species and despite their comparatively low altitude UK examples are of considerable importance in a European context. Their contribution to mountain landscapes and their social value as relatively extensive 'wilderness' areas are also noteworthy. Montane communities are threatened across the UK by a range of anthropogenic impacts which require co-ordinated mitigation measures at both local and national levels. This process would be facilitated by the preparation of a UK HAP.</p>	
<p><b>SUGGESTED LEAD AGENCY</b></p> <p>SNH</p>	<p><b>NAME OF PROPOSER/ORGANISATION</b></p> <p>David Horsfield/Des Thompson (SNH) and Marcus Yeo (CCW)</p>

<b>Table 6. Rock outcrops and mine spoil rich in heavy metals</b>	
<b>CORRESPONDING HABITATS</b>	
BAP broad habitat:	Inland rock
Phase 1:	I1.2 Scree; I2.2 Spoil
NVC:	OV37 and other undescribed types
Annex I:	6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i>
<b>DESCRIPTION</b>	
<p>Includes a range of semi-natural and anthropogenic sparsely vegetated habitats on substrates characterised by high levels of heavy metals such as lead, chromium and copper, or other unusual minerals. These are associated with outcrops of serpentine and river gravels rich in heavy metals, as well as with artificial mine workings and spoil heaps. Seral succession is slowed or arrested by the toxicity of the substrate. Open-structured plant communities, sometimes known as 'Calaminarian grasslands', typically occur, composed of ruderal/metallophyte species of lichens, bryophytes and vascular plants, such as spring sandwort <i>Minuartia verna</i>, alpine pennycress <i>Thlaspi arvense</i>, and genetically adapted races of species such as thrift <i>Armeria maritima</i> and bladder campion <i>Silene maritima</i>. Notable species include <i>Epipactis youngiana</i>, <i>Asplenium septentrionale</i> and <i>Ditrichum plumbicola</i>. In northern parts of the UK there are local populations of boreal species which characterise these habitat conditions in Scandinavia, such as Scottish sandwort <i>Arenaria norvegica</i> and the endemic Shetland mouse-ear <i>Cerastium nigrescens</i>.</p> <p>In most sites the metalliferous outcrops which would have been the natural habitat for these species have been quarried away but the mine spoil still provides suitable habitat.</p>	
<b>GEOGRAPHIC DISTRIBUTION</b>	
<p>Natural occurrences are restricted to serpentine exposures and scree in scattered parts of the Scottish Highlands and Islands and other upland areas, and on river deposits. Anthropogenic stands are more common but still local, in certain urban and post-industrial areas, especially in the north and west.</p>	
<b>REASONS FOR RECOMMENDATION</b>	
<i>Habitats for which the UK has international obligations</i>	
<p>This habitat includes the total UK resource of the Annex I type 6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i>.</p>	
<i>Habitats at risk</i>	
<p>Sites supporting this habitat are often considered to be of low value, unsightly, and sometimes hazardous. The toxic nature of the soils means that successional changes are slow but a greater threat is the rehabilitation of derelict land, often with grant aid from the EC and Government. Such restoration is often misinformed, usually involving landscaping, levelling topography, spreading topsoil and planting grasses, herbs and trees, all of which are usually very damaging to the intrinsic wildlife interest.</p>	
<i>Habitats which are functionally critical</i>	
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<i>Habitats important for key species</i>	
<p>Plants of heavy metal spoil include the following BAP species: Cornish path moss <i>Ditrichum cornubicum</i>, lead path moss <i>Ditrichum plumbicola</i>, western rustwort <i>Marsupella profunda</i> (also listed on Annex II of the Habitats Directive), the liverwort <i>Cephaloziella nicholsonii</i>, and Young's helleborine <i>Epipactis youngiana</i>.</p>	
<b>CONSERVATION GAIN</b>	
<p>The conservation of this habitat is a very complex and neglected issue which requires a strategic approach involving many parties. A HAP would provide an excellent mechanism for taking this forward.</p>	
<b>SUGGESTED LEAD AGENCY</b>	<b>NAME OF PROPOSER/ORGANISATION</b>
English Nature or Countryside Council for Wales	Martin Harper (Plantlife); Richard Jefferson (EN) & David Stevens (CCW) for the Lowland Grassland LCN.