LOCAL BIODIVERSITY ACTION PLAN

FOR BRIDGEND COUNTY BOROUGH

Volume 2

Species and Habitat Action Plans

BRIDGEND BIODIVERSITY PARTNERSHIP

Compiled by Planning Department, Bridgend County Borough Council and David Clements Ecology on behalf of the Bridgend Biodiversity Partnership, January 2002

CONTENTS

Acknowledgements

The Bridgend Biodiversity Partnership wishes to acknowledge the work of the Association of Local Government Ecologists in providing support to the biodiversity work of local authorities.

INTRODUCTION

Volume 1 of a draft Local Biodiversity Action Plan (or 'LBAP') for Bridgend County Borough was launched by the Bridgend Biodiversity Partnership at the Glamorgan Wildlife Trust's 'Festival of Wildlife' on 15th July 2000. Volume 1 served as the first stage of consultation with the wider public. It contained statements about issues affecting biodiversity, put forward a strategy for action and suggested broad actions that should be taken to help conserve biodiversity in the county borough. Volume 1 should be read alongside this new document.

The launch of Volume 1 of a draft LBAP for Bridgend County Borough was attended Mr Win Griffiths MP, Mr Carwyn Jones AM, and Cllr H. Clive Davies, Bridgend County Borough Council's Cabinet Member for Environmental, Planning, Highways and Technical Services. Also present at the launch were members of the Bridgend Biodiversity Partnership, officers and members of the Glamorgan Wildlife Trust, and members of the public visiting GWT's Tondu headquarters.

The present document, Volume 2 of the draft LBAP for Bridgend, provides the technical detail of the action plan, setting out the actions and partnerships required to conserve and enhance the County Borough's wildlife resource.

The LBAP for Bridgend County Borough remains very much in draft form. Volume 1 has already been amended to include constructive comments received during the six-month consultation period, which began on 15th July 2000. Volume 2 has been issued for consultation at this time to enable a further period of consultation and consolidation. Everyone still has an opportunity to comment on, improve on and amend what has been done so far.

The development of species and habitat action plans, even the clarification of the status and distribution of those same species and habitats, is of necessity a continuing project. Initiatives such as the disaggregation of habitat data held by the national conservation agencies, and the working-up of relevant targets for habitat management and enhancement, are still in progress at the time of writing. Without the knowledge and commitment of a wide partnership, inclusive of all sectors of society, there is little prospect of effective long-term action. These therefore are continuing steps in building consensus and support for action.

Volume 2 will therefore need to be amended over time as information becomes available and new partnerships are identified.

BRIDGEND BIODIVERSITY PARTNERSHIP

The Bridgend Biodiversity Partnership (BBP) was initiated in August 1998 and consists of a range of conservation organisations involved with the collection and collation of wildlife data within the Bridgend County Borough area. The Partnership feeds into, and is informed by, a grouping of key partners responsible for delivering the Countryside Strategy and Integrated Action Programme for Bridgend.

Our goal is to maintain and enhance the physical and biological integrity of the biodiversity of Bridgend County Borough to a condition capable of supporting its characteristic range of habitats and species, and to encourage human contact with and enjoyment of its biodiversity, so that present and future generations can benefit from its environmental, aesthetic and economic benefits.

BRIDGEND BIODIVERSITY PARTNERSHIP

Botanical Society of the British Isles (East Glamorgan Recorder)
Butterfly Conservation (South Wales Branch)
Countryside Council for Wales
Glamorgan Bird Club
Glamorgan Moth Recording Group
Glamorgan Wildlife Trust
British Trust for Ornithology
Coed Cymru
Environment Agency
Forestry Commission
Forest Enterprise
Groundwork Bridgend
Prince's Trust - Cymru
Royal Society for the Protection of Birds
Wales Tourist Board
Welsh Development Agency

Organisations in bold type are members of the Bridgend Biodiversity Partnership Steering Group; the other organisations are a grouping of key partners also involved with delivering the Countryside Strategy and Integrated Action Programme for Bridgend County Borough.

GLAMORGAN BIODIVERSITY ADVISORY GROUP

The work of BBP is supported by the Glamorgan Biodiversity Advisory Group (GlamBAG), a forum established in July 1997 whose remit is to develop biodiversity objectives and action plan targets for the old Glamorgan County area (often referred to as the Watsonian Vice-County 41). This 'strategic approach' was seen as both sensible and logistically essential, considering the limited resources of not just the eight local authorities that comprise Glamorgan, but also of the old county's statutory and non-statutory environment organisations. In any event, such an approach is consistent with '*Planning Guidance (Wales): Planning Policy*', which stresses that 'landscape and nature conservation issues are not confined by administrative boundaries, and should be addressed strategically and discussed with adjoining planning authorities'.

The first major success of GlamBAG was the development of a genuine partnership between local authorities, statutory and non-statutory nature conservation organisations, as well as land-use and development bodies. The group's next

important output was the '*Habitat Action Plans (First Tranche)*' (GlamBAG 1999), which contained worked-up and internally agreed guidance for seven Priority Habitats, namely: 'Fens', 'Upland Oak Woodland', 'Purple Moor-grass and Rush-Pasture', 'Coastal and Floodplain Grazing Marsh', 'Lowland Heathland', 'Reedbeds' and 'Species-rich and/or Ancient Hedgerows'. This first tranche of seven plans was launched for consultation in May 1999 at the Welsh Development Agency's offices in Penllergaer, Swansea.

A second tranche of regional habitat action plans is currently in production, and these are at various stages of consultation with the Countryside Council for Wales, prior to their public consultation phase. These plans include:

- *Lowland Hay Meadow*
- *Lowland Dry Acidic Grassland*
- *Lowland Calcareous Grassland*
- *Eutrophic Standing Waters and Ponds*
- *Sand Dunes*
- *Shingle*
- *Coastal Cliff & Slope*
- *Cereal Field Margins*
- *Wood Pasture & Parkland*
- *Wet Woodland*
- *Upland Mixed Ash Woodland*
- *Beech & Yew Woodland*
- *Saltmarsh*

The work of GlamBAG continues to guide the development of this Local Biodiversity Action Plan for Bridgend County Borough.

For further information about the Local Biodiversity Action Plan for Bridgend County Borough, please contact:

Implementation and Environment Section, Planning Department, Directorate of Environmental and Planning Services, Bridgend County Borough Council, Civic Offices, Angel Street, Bridgend, CF31 4WB
Telephone: 01656-643170, Fax: 01656-643190
e-mail moonsj@bridgend.gov.uk.

PART 1: HABITAT ACTION PLANS

Ancient and/or Species-Rich Hedgerows

Ancient and/or Species-Rich Hedgerows are a UK BAP Priority Habitat.

Definition and Description:

'Ancient hedgerows' are defined as those which were in existence before the Enclosure Acts, which in Glamorgan were largely effective during the period 1809 to 1936. The age of a hedgerow is often a factor in determining its biodiversity, with older hedges often being considerably richer in species than younger ones, but it is not the only factor. Younger hedges may have been planted with a diversity of species at the outset, or derived from the remnants of other species-rich habitats. Hedgerows adjacent to roads, green lanes, trackways and woodlands tend to be especially species-rich.

In lowland areas, species-rich hedgerows are defined as those which contain 5 or more native woody species in a 30m length, whilst in upland areas 4 or more woody species are considered as defining a species-rich hedgerow. Hedges which contain fewer woody species but which have a rich and diverse herbaceous flora at their foot are also included.

Boundaries which consist only of an earthen bank, stone bank or a wall are generally excluded from this plan unless they are associated with a boundary line of trees and shrubs, in which case they are considered to form part of a hedgerow.

Tall, wide hedges with few gaps, a thick cross-section, an associated bank or ditch, mature trees and a wide range of woody species are especially important in supporting the widest range of flowering plants and ferns, birds, bats, reptiles and invertebrates. However, research has shown that some key species, especially of birds, actually prefer shorter, less diverse hedges or hedges without mature trees etc, showing that it is important to conserve a wide variety of hedge types in the countryside. Hedgerows are also important in allowing the movement of some species through the farmed landscape, and in providing a matrix which connects together patches of habitats such as woodlands and wetlands.

At least 47 of the Species of Conservation Concern identified in the UK Biodiversity Action Plan are associated with hedges, including 13 globally threatened or rapidly declining ones. In total, over 600 plant species, 1500 insects, 65 birds and 20 mammals have been recorded living or feeding in hedgerows, making it one of the most biodiversity rich habitats in Britain. Britain is one of the few places in Europe where hedgerows are common.

Many hedgerows are also of historic, archaeological, landscape or amenity value. Older hedges in particular may represent an important resource for original research.

Current Status:

In 1993 it was estimated that about 49,000km of hedgerow remained in Wales, about 42% of which is reckoned likely to be ancient and/or species-rich in kind. Glamorgan has the largest remaining resources of hedgerows in South Wales, supporting an

average of about 2.5km or more of hedge per square kilometre, and has the fourth largest resource in Wales.

In 1999, the *Bridgend Hedgerow Survey 1999* was undertaken as a collaborative project between Bridgend County Borough Council and the National Museum and Gallery of Wales (NMGW) to survey and characterise a random sample of 200 hedges and to provide a basic assessment of the hedgerow resource in the Bridgend County Borough area. The survey was carried out in autumn 1999 and used a combination of survey methods, including the Hedgerow Evaluation and Grading System (HEGS) and the wildlife and landscape evaluation criteria of the *Hedgerow Regulations 1997* (see below). It was not possible to estimate the total length of hedgerow remaining in the county borough, but the survey found that:

- Hedges in the county borough average 3.2m in height, 2.9m in width and 152m in length.
- The hedges contain an average of about 4.8 woody species per 30m length, and a total number of about 7 woody species in all.
- Most of the hedges have an associated bank of some kind, but only about a quarter have an associated ditch.
- Increasing hedgerow species-richness was highly correlated with increasing width and length, and thicker cross-section.
- About 70% of the hedgerows in the county borough would probably qualify as 'Important Hedgerows' as defined by the Hedgerows Regulations 1997.
- The hedgerows of Bridgend compare well in terms of species richness with those elsewhere in South Wales, and are richer than the average for Britain as a whole.

Threats:

- Neglect - many hedges are no longer cut or laid, and are overgrazed by stock, their function having been largely replaced by wire fences. This reflects modern high labour costs and the declining labour force now working on Welsh farms.
- Approximately one quarter of the total length of Welsh hedgerows was lost between 1984 and 1990, due to neglect and lack of management. The rate of hedge removal has now levelled-off, but deterioration through neglect is continuing apace.
- Inappropriate cutting methods – for example, cutting all hedges on a farm every year, cutting during the bird nesting season, felling or lopping of hedgerow trees and cutting during or after harvest-time and thus destroying hedge fruit.
- Cessation of traditional hedge-laying or coppice management which is essential to maximise and maintain the nature conservation interest of hedgerows.
- Fertiliser and pesticide drift into hedge-bottoms.
- Removal of hedges and/or hedge banks for agricultural or development purposes, including access for modern farm machinery, road widening etc.
- Erosion of banks and overgrazing of hedgerows through heavy stocking (e.g. 'ranching' of sheep, particularly in winter).
- Loss of large networks of hedgerows as a result of planning permissions for new developments (e.g. housing, business and retail parks, road schemes etc.

- Loss of hedgerow trees through senescence and felling, without creating replacements.
- Conversion of pasture to arable farming: hedges needed previously for stock control or shelter become unwanted sources of crop-shade and are either removed or cut very low.
- Ploughing too close to the hedge base, disrupting root systems.
- Shortage of modern accurate data on the extent and quality of the remaining Glamorgan hedgerow resource.
- Lack of consensus on the optimum hedgerow management regime.
- Lack of knowledge of invertebrate requirements in hedge management.

Current Action:

Current action aims to halt the loss of species rich areas. A number of initiatives are already in position. These include:

- The *Hedgerows Regulations 1997* which introduced some element of planning control over hedge removal and mechanisms for protecting the most important hedges. Since the Regulations became law only a small number of hedge removal notices have been received. The Regulations are used in planning applications, and survey, assessment and mitigation measures are now required for most planning applications which affect hedgerows.
- Grant aid schemes to encourage positive management, including the Countryside Council for Wales (CCW) Hedgerow Renovation Scheme (although this scheme was over-subscribed and under-funded) and the Tir Gofal Agri-Environmental Scheme for Wales.
- Positive use of countryside designations such as Area of Outstanding Natural Beauty (AONB), Environmentally Sensitive Area (ESA) and Heritage Coast, to attract relevant funds, assistance and initiatives.
- Hedgerow management advice is available from a number of organisations including the CCW and Glamorgan Wildlife Trust (GWT).
- The implementation of Tree Preservation Orders (TPOs) has been used to protect a number of hedgerows.
- On-going research and policy development, including the Welsh Development Agency (WDA) *Landscapes Working for Wales* studies, emerging Unitary Development Plan (UDP) policies and LBAPs.

Future Action:

- Seek increased grant aid for hedgerow management and conservation (Action: BCBC).
- Ensure that the emerging UDP contains adequate policies to protect hedgerows in planning and development, and to actively encourage the conservation and positive management of hedgerows generally (Action: BCBC).
- Ensure that any new developments which adversely affect hedgerows incorporate mitigation and compensation measures which ensure that the overall stock of hedgerows does not decline (Action: BCBC).
- Encourage the resumption of traditional hedge management techniques (e.g. hedge laying, coppicing) wherever possible (Action: BCBC; GWT).

- Encourage the restoration of neglected hedgerows through closure of gaps, reconnection into the surrounding hedge network, fencing against stock, buffer zones against agrochemical sprays etc, wherever possible (Action BCBC; GWT).
- Encourage the planting of new species-rich hedgerows using locally indigenous native woody species, and planting stock of local provenance (Action: BCBC).
- Support the development of Hedgerow Tree Schemes; hedgerow management should promote the retention and recruitment of standard trees in hedges (Action: BCBC).
- Continue and extend the baseline survey of the character and quality of the hedgerow resource in the county borough; establish a reasonably accurate estimate of the total length of hedgerows remaining (Action: BCBC; BBP; NMGW).
- Seek to maintain the existing stock of ancient hedgerows at present levels, bearing in mind that these are effectively irreplaceable; increase the stock of more recent species-rich hedgerows by at least 10% by 2005 (this will require accurate survey data of the type referred to above) (Action: BCBC; CCW).
- Achieve favourable conservation status of 50% of ancient and/or species-rich hedgerows by 2005 (this will require accurate survey data of the type referred to above) (Action: BCBC; CCW).
- Increase public appreciation of the importance of hedgerows for wildlife, farming, landscape and archaeology (Action: BCBC; BBP; GWT; CCW).

Information Sources:

Clements & Tofts (1992)
GlamBAG (1999)
UKSG (1995b)
White *et al* (2000)

Lowland Ancient Woodlands

Lowland mixed deciduous woodlands are not currently a Priority Habitat in the UK BAP, although a 'shadow' UK Habitat Action Plan has been published. CCW guidance suggests that these habitats should nevertheless be considered a priority in the Welsh context, and they are considered to be an important habitat resource both in Glamorgan and in Bridgend County Borough.

Definition and Description:

'Ancient semi-natural woodland' used to be a comparatively common habitat in Britain, so called because the tree cover can be shown by documentary and other means to be many hundreds of years old, and the trees and shrubs present are very largely native, locally-indigenous species. However, in the latter half of the 20th Century, a very large proportion of these woodlands were either cleared entirely or were replanted for timber production, often with non-native softwood species. In addition, a large number of new woodlands were established as plantations on previously unwooded land.

These so-called 'secondary' and 'plantation' woodlands do not support anything like the range and diversity of species which are found in ancient semi-natural woodlands, which have built up their biodiversity over very long periods of time under native wooded cover. Ancient semi-natural woodlands tend to be much more varied in structure than more recent woodlands, and are particularly notable for the range and diversity of their ground flora. They are the single most diverse habitat that occurs in the British Isles, supporting many hundreds of species of mammals, birds, invertebrates, plants, fungi, mosses and lichens, many of which are highly adapted and restricted to the ancient woodland habitat.

Many of the more specialised species of invertebrates are associated with the senescence, death and decay of trees, with some species requiring large hulks or fallen timber. Other species are associated with springs, ponds and streams in woodlands, or require sunlit rides and clearings.

Where ancient woodlands have been replanted with hardwood species similar to the native cover they may retain much of this interest, although some of the more specialist species are likely to have been lost.

The main target of this Habitat Action Plan is therefore the conservation of remaining ancient semi-natural woodlands, together with some classes of broadleaf-replanted ancient woodland, in the lowland of the county borough. In Glamorgan these are typically woodlands dominated by Ash or Oak, with understoreys which include species such as Hazel, Field Maple and Hawthorn. Ancient semi-natural woodlands dominated by beech and yew are also important but are not thought to occur in the county borough, whilst wet woodlands dominated by Alder and Willows, and upland woodlands, are dealt with under separate action plans.

Many ancient lowland woodlands were traditionally managed for coppice or coppice-with-standards, and some species of plants and invertebrates were specifically associated with the coppice cycle, such as High Brown and Pearl-Bordered Fritillary butterflies, for example. However, coppice management has all but disappeared both in the county borough and throughout the wider UK as a whole, except in a few carefully managed sites. A great many woodlands are not even managed for timber any more, even where they may previously have been replanted to produce a timber crop, and have fallen into neglect. Most remaining woodlands are therefore of a high forest type.

Current Status:

Britain is one of the least well-wooded countries in Europe. Recent estimates indicate that woodland of all types covers about 800,000ha of Britain, but that ancient semi-natural woodland makes up only about 302,000ha of this figure. There are estimated to be perhaps 12,000ha of lowland ancient woodland remaining in Wales.

Hard information for Glamorgan is presently unavailable, the best available data being that which was compiled for the *Ancient Woodland Inventory* in the 1980s. According to this data, the Glamorgan countryside appears well-wooded, with about 34,5000ha of woodland being present at that time, but the great majority of this was

either secondary or plantation woodland of comparatively low nature conservation interest. Ancient woodland made up only about 19% of the total area, comprising about 6750ha. Of this roughly half (about 3700ha) was found to comprise ancient semi-natural woodland, whilst the remainder (about 3050ha) was identified as replanted ancient woodland, both softwood and hardwood. It is likely that these figures have declined in the period since the survey was undertaken, although this may be off-set to some extent by the fact that the survey did not consider small woodlands under about 2ha in extent.

No figure is presently available for these habitats in Bridgend County Borough, but there are known to be a large number of small ancient woodlands remaining, as well as a few larger sites.

Threats:

- Clearance of woodlands for development, including residential and business developments, road schemes, quarrying etc.
- Clearance or underplanting with non-native timber trees, especially softwoods.
- Inappropriate management, including broadscale clear-felling and even-aged replanting, clearance of all fallen and standing dead timber etc.
- Access to woodlands by grazing stock, which prevents natural regeneration, suppresses ground flora and causes poaching of soils.
- Neglect, leading to increased overshadow, closure of rides and clearings, shading of ponds and streams, and general loss of structural diversity.
- Agricultural practices which lead to greater fragmentation and isolation of woodlands (for example through the removal of interlinking hedgerows) and nutrient enrichment of the soils, especially at the woodland edges.
- Fragmentation of woodlands leading to the creation of small 'islands' of habitat which are inherently less biodiversity rich and more vulnerable to deterioration and loss of species.
- Cessation of traditional management practices, such as thinning and coppicing, which leads to a reduction in structural diversity.
- Invasion by non-native species such as Sycamore, Rhododendron, Cherry Laurel and other species, leading to changes in the composition of the woodland.
- Lack of younger generations of trees is producing a skewed age structure.
- Dumping or rubbish, including garden waste, especially at roadsides and along accessible rides. This can lead to eutrophication of soils and the ingress of weed and non-native garden species.
- Inappropriate and damaging recreational use, including paint-ball enterprises, car rallying, scrambling by motorbikes, shooting of wildlife etc.
- Vandalism, burning of trees etc.
- Climate changes and atmospheric pollution leading to changes in the vegetation composition, loss of specialised lichens and invertebrates etc.

Current Action:

- Some key sites are designated SSSIs, and their proper management is actively promoted by CCW.

- Many other sites are likely to qualify for selection as candidate SINCs, potentially affording some protection against adverse development.
- The Forestry Commission now has a presumption against the clearance of native broadleaved woodland for conifer planting or agricultural use, and provides guidance on woodland management.
- A number of grants are available through the Forestry Commission Woodland Grant Scheme, and other agencies, to encourage woodland owners to manage these woodlands sympathetically.
- Some significant sites may be eligible for consideration under the Inheritance Tax Exemption Scheme.
- Local authorities can issue Tree Preservation Orders to protect individual woodlands.
- Coed Cymru, an advisory body funded by CCW and the local authorities provides landowners and managers with woodland management guidance and can advise on sources of funding, sustainable timber management and the marketing of woodland produce.
- The Tir Gofal agri-environment scheme for Wales should encourage farmers to maintain and enhance the agricultural landscape and its wildlife, including ancient woodlands.
- Ancient woodland status is regarded as a material planning consideration with regard to applications for development or change of land use.
- Ancient woodland status is usually specifically recognised as a site constraint for development, and as a resource requiring sensitive management, in UDPs, Local Plans and SPG.

Future Action:

- Map, survey and assess all remaining sites and consider for selection as SINCs where appropriate (Action: BCBC).
- Improve the condition of woodlands by increasing the area under sustainable management. Positive management would prevent further loss of habitat and species, and could restore many deteriorated sites. Aim to restore at least 10% of the current total area of habitat by 2005 (Action: BCBC; CCW; CC; FC).
- Identify areas of potential for the expansion of woodlands (by natural regeneration, colonisation, and clearance of plantation and replanting) being careful not to damage other habitats of nature conservation interest in adjacent areas. Aim to expand the current area of habitat by at least 10% by 2005 (Action: as above).
- Identify degraded upland mixed ash woodlands as targets for grant-aided restoration (Action: BCBC; CC).
- Promote the use of natural methods of restocking (for example, natural regeneration) and the use of native planting stock of local provenance to protect local genetic integrity (Action: BCBC; CCW; CC; FC).
- Encourage conversion of conifer-planted ancient woodlands back to a native woodland character (Action: BCBC; CC; FC).
- Actively promote management advice for woodland owners through Coed Cymru, and support the development of markets for sustainable woodland products (Action: BCBC; CC).

- Develop and promote the use of long term management plans (20+ years) by woodland owners, aimed at creating and/or maintaining appropriate diversity of species and woodland structure (age classes etc) (Action: BCBC; CC; FC).
- Identify key ancient semi-natural woodlands as sources of tree and shrub seed production and seedling harvesting for replanting in woodlands elsewhere (Action: CC).
- Encourage and support the eradication of non-native species such as Sycamore and Rhododendron (Action: BCBC; CCW; FC; CC).
- Where appropriate, encourage the diversification of age and species composition through selective felling and thinning under an approved Woodland Grant Scheme (Action: CC; FC).
- Encourage the creation of entirely new woodlands on previously improved farmland using seed and/or stock of local provenance, planted in compositions which mirror the native pattern; where possible, use these new plantings to link existing ancient woodlands together (Action: BCBC; CCW; CC; FC).
- Promote training and raise public awareness of native woodlands and their traditional management, through seminars, workshops, newsletters etc (Action: CCW; CC; FC).

Information Sources:

Sothern (1986)
UKSG (1995b)

Upland Oak Woodlands

Upland Oak Woodlands are a UK BAP Priority Habitat.

Definition and Description:

Upland oak woodland consists mainly of Sessile Oak and Birch, together with an understorey of smaller trees and shrubs such as Hazel, Rowan and Holly, growing on higher ground above about 300m on valley sides and hill slopes. Although influenced by human activities over many centuries, they represent one of the least modified climax vegetation types in the British uplands. The great majority are 'ancient woodlands', having developed naturally over many centuries. They occur throughout Wales with particular concentrations in western counties, typically covering the steep valley sides on the Pennant Sandstone.

The ground flora often contains Bluebell, Bramble, Ferns, Heather and Bilberry, but this depend on a range of factors including soil fertility, pH, drainage conditions and grazing. Species diversity is characteristically somewhat restricted, but includes a number of specialist and characteristic species. Distinctive fungus, lichen, moss and liverwort communities occur, and there are a number of rare and declining deadwood-associated invertebrate species which prefer this habitat. Uncommon and declining birds such as pied flycatcher, redstart and wood warbler are also a common component of these habitats.

Upland oak woodlands were traditionally managed for fuel wood, charcoal, coppicing and other timber production, but this declined as the coal industry developed. Most upland oak woods are now neglected and deteriorating, with many now being open to sheltering and grazing stock.

Current Status:

There are between about 70-100,000ha of upland oak woodland remaining in the UK, much of it concentrated in the north and west of Britain and Ireland. There is estimated to be about 39,000ha in Wales, with between 2500-3500ha present in Glamorgan. The precise extent in Bridgend County Borough is not presently known, but is unlikely to exceed more than a few hundred hectares. Two known sites of importance in the county borough area are the Cwm Du Woodlands in the lower Llynfi Valley and Blackmill Woodlands, both of which are designated SSSIs. The Blackmill Woodlands have recently been designated a candidate Special Area of Conservation (EU Habitats Directive).

Threats:

- Over-grazing, which prevents natural regeneration and suppresses ground flora development.
- Invasion by non-native species, especially Rhododendron, Sycamore and Cherry Laurel.
- Lack of appropriate woodland management along more traditional lines.
- Atmospheric pollution and global warming: deteriorating air quality is a threat especially to rare and characteristic lower plants such as lichens.
- Economic development pressures, which may lead to clearance.
- Past practice of under-planting ancient woodland sites with non-native species, or replacing native trees with conifers to create softwood plantations.
- Loss of local genetic integrity through restocking with trees not of local provenance.
- Fragmentation and isolation of individual woodlands, creating small ‘islands’ of habitat which are inherently less biodiversity rich and more vulnerable to deterioration and loss of species.

Current Action:

- CCW actively promotes the proper management of ancient woodlands within SSSIs.
- Most key sites are designated SSSIs, and many other sites are likely to qualify for selection as SINCs, affording a certain level of protection against adverse development.
- The Forestry Commission now has a presumption against the clearance of native woodland for conifer planting or agricultural use and provides guidance on woodland management.
- A number of grants are available through the Forestry Commission Woodland Grant Scheme, and other agencies, to encourage woodland owners to manage these woodlands sympathetically.

- Some significant sites may be eligible for consideration under the Inheritance Tax Exemption Scheme.
- Local authorities can issue Tree Preservation Orders to protect individual woodlands
- Coed Cymru, an advisory body funded by CCW and the local authorities provides landowners and managers with woodland management guidance and can advise on sources of funding, sustainable timber management and the marketing of woodland produce.
- The Tir Gofal agri-environment scheme for Wales should encourage farmers to maintain and enhance the agricultural landscape and its wildlife, including upland oak woods.
- Ancient woodland status is regarded as a material planning consideration with regard to applications for development or change of land use.

Future Action:

- Identify and map all known upland oak woodland sites in the county borough, together with their current conservation status (Action: BCBC; BBP; CCW).
- Survey and assess all known sites and consider for selection as SINCs where appropriate (Action: BCBC).
- Improve the condition of upland oak woods by increasing the area under sustainable management. Positive management would prevent further loss of habitat and species, and could restore many damaged sites. Aim to restore at least 10% of the current total area of habitat by 2005 (Action: BCBC; CCW; CC; FC).
- Identify areas of potential for the expansion of upland oak woodlands (by natural regeneration, colonisation, and clearance of plantation and replanting) being careful not to damage other habitats of nature conservation interest in adjacent areas. Aim to expand the current area of habitat by at least 10% by 2005 (Action: as above).
- Develop policies in emerging UDP, Local Plans and SPG which specifically protect upland oak (and ash, see later) woodlands (Action: BCBC).
- Identify degraded upland oak woodlands as targets for grant-aided restoration (Action: BCBC; CC).
- Promote the use of natural methods of restocking (for example, natural regeneration) and the use of native planting stock of local provenance to protect local genetic integrity (Action: BCBC; CCW; CC; FC).
- Encourage conversion of conifer-planted ancient woodlands back to a native woodland character (Action: BCBC; CC; FC).
- Develop and promote the use of long term management plans (20+ years) by woodland owners, aimed at creating and/or maintaining appropriate diversity of species and woodland structure (age classes etc) (Action: BCBC; CC; FC).
- Actively promote management advice for woodland owners through Coed Cymru, and support the development of markets for sustainable woodland products (Action: BCBC; CC).
- Identify key upland oak woods as sources of tree and shrub seed production and seedling harvesting for replanting in woodlands elsewhere (Action: CC).
- Encourage and support the eradication of non-native species such as Rhododendron, Sycamore and Cherry Laurel (Action: BCBC; CCW; FC; CC).

- Where appropriate, encourage the diversification of age and species composition through selective felling and thinning under an approved Woodland Grant Scheme (Action: CC; FC).
- Encourage the creation of entirely new oak woods on previously improved farmland using seed and/or stock of local provenance, planted in compositions which mirror the native pattern; where possible, use these new plantings to link existing oak woods together (Action: CCW; CC; FC).
- Promote training and raise public awareness of native woodlands and their traditional management, through seminars, workshops, newsletters etc (Action: CCW; CC; FC).

Information Sources:

GlamBAG (draft RHAP)
UKSG (1995b)

Upland Mixed Ash Woodlands

Upland Mixed Ash Woodlands are a UK BAP Priority Habitat.

Definition and Description:

Upland mixed ash woods are chiefly restricted to areas of limestone in the north and west of Britain, and are associated with free-draining, base-rich soils. Generally these woodlands occur on higher ground, above about 300m, but the title refers more to the type of woodland than to its location, and some so-called 'upland' mixed ash woods actually occur almost at sea level. Ash is a major canopy species, although other species such as Oak, Birch, Elm, Small-leaved Lime and even Hazel may be also be dominant locally. Despite these variations in the canopy, the ground flora remains fairly constant throughout and is notable for the diversity of species present. These often include species such as Bluebell, Primrose, Wood Crane's-bill and Wild Garlic.

Upland ash woodland is a scarce habitat nationally due to the comparative rarity of upland limestone and the effects of intensive sheep grazing, often over many generations. In South Wales the boundary between upland mixed ash wood and lowland mixed deciduous woodland is not always clear, because the two types form an ecological continuum largely determined by climate and topography.

Most upland mixed ashwoods are probably 'ancient woodlands', having developed naturally over many generations. However, ash is a vigorous colonist of open ground and some woods may therefore be mosaics of both ancient woodland comparatively recent, secondary woodland. Colonisation of the recent areas by species of interest from the ancient areas appears to occur fairly easily, however, so both elements may be valuable in biodiversity terms.

Most of these woods were treated as coppice, or coppice-with-standards, in the past. Others may have been wood-pastures, but most now tend to have a high forest structure.

Mixed ash woods are one of the richest habitats for wildlife in the uplands, and support a number of rare and characteristic species, including High Brown Fritillary Butterfly and Dormouse.

Current Status:

There are no precise data on the extent of upland mixed ash woods in the UK, but in the late 1980s it was estimated that the total extent of ancient semi-natural woodland of this type was between about 40,000-50,000 ha. It is estimated to have declined by as much as 30-40% in the last 50 years due to clearance, overgrazing and re-planting of non-native species. Current crude estimates therefore place the UK resource at about 67,500ha in total.

There is estimated to be a resource of about 16,100ha of upland mixed ashwood in Wales as a whole, of which about 3200ha is believed to occur in Glamorgan. It is not presently known how much is present in Bridgend County Borough.

Threats:

- Overgrazing by sheep, deer and rabbits in western and northern areas, and deer in the southern areas, which prevents natural regeneration and suppresses ground flora.
- Invasion by non-native species such as sycamore, beech (outside its native UK range) and other species, leading to changes in the composition of the woodland.
- Dutch Elm Disease, which kills elms and leaves canopy-gaps, opening the woodland up to windblow impacts.
- Quarrying: many of the remaining woodlands lie on commercially valuable limestone resources.
- Replacement of native trees with planted conifers and broad-leaved timber species.
- Agricultural practices which lead to greater fragmentation and isolation of woodlands, and nutrient enrichment of the soils.
- Cessation of traditional management practices, leading to a reduction in structural diversity.
- Climate changes and atmospheric pollution leading to changes in the vegetation composition.

Current Action:

- Key sites are designated SSSIs, and their proper management is actively promoted by CCW.
- Most other sites are likely to qualify for selection as candidate SINCs, potentially affording some protection against adverse development.
- The Forestry Commission now has a presumption against the clearance of native broadleaved woodland for conifer planting or agricultural use, and provides guidance on woodland management.

- A number of grants are available through the Forestry Commission Woodland Grant Scheme, and other agencies, to encourage woodland owners to manage these woodlands sympathetically.
- Some significant sites may be eligible for consideration under the Inheritance Tax Exemption Scheme.
- Local authorities can issue Tree Preservation Orders to protect individual woodlands
- Coed Cymru, an advisory body funded by CCW and the local authorities provides landowners and managers with woodland management guidance and can advise on sources of funding, sustainable timber management and the marketing of woodland produce.
- The Tir Gofal agri-environment scheme for Wales should encourage farmers to maintain and enhance the agricultural landscape and its wildlife, including upland mixed ash woods.
- Ancient woodland status is regarded as a material planning consideration with regard to applications for development or change of land use.

Future Action:

- Identify and map all known upland mixed ash woodland sites in the county borough, together with their current conservation status (Action: BCBC; BBP; CCW).
- Survey and assess all known sites and consider for selection as SINCs where appropriate (Action: BCBC).
- Improve the condition of upland mixed ash woods by increasing the area under sustainable management. Positive management would prevent further loss of habitat and species, and could restore many damaged sites. Aim to restore at least 10% of the current total area of habitat by 2005 (Action: BCBC; CCW; CC; FC).
- Identify areas of potential for the expansion of upland mixed ash woodlands (by natural regeneration, colonisation, and clearance of plantation and replanting) being careful not to damage other habitats of nature conservation interest in adjacent areas. Aim to expand the current area of habitat by at least 10% by 2005 (Action: as above).
- Develop policies in emerging UDP, Local Plans and SPG which specifically protect upland mixed ash (and oak, see earlier) woodlands (Action: BCBC).
- Identify degraded upland mixed ash woodlands as targets for grant-aided restoration (Action: BCBC; CC).
- Promote the use of natural methods of restocking (for example, natural regeneration) and the use of native planting stock of local provenance to protect local genetic integrity (Action: BCBC; CCW; CC; FC).
- Encourage conversion of conifer-planted ancient woodlands back to a native woodland character (Action: BCBC; CC; FC).
- Actively promote management advice for woodland owners through Coed Cymru, and support the development of markets for sustainable woodland products (Action: BCBC; CC).
- Develop and promote the use of long term management plans (20+ years) by woodland owners, aimed at creating and/or maintaining appropriate diversity of species and woodland structure (age classes etc) (Action: BCBC; CC; FC).

- Identify key upland mixed ash woods as sources of tree and shrub seed production and seedling harvesting for replanting in woodlands elsewhere (Action: CC).
- Encourage and support the eradication of non-native species such as Sycamore, Beech and Cherry Laurel (Action: BCBC; CCW; FC; CC).
- Where appropriate, encourage the diversification of age and species composition through selective felling and thinning under an approved Woodland Grant Scheme (Action: CC; FC).
- Encourage the creation of entirely new upland ash woods on previously improved farmland using seed and/or stock of local provenance, planted in compositions which mirror the native pattern; where possible, use these new plantings to link existing ash woods together (Action: CCW; CC; FC).
- Promote training and raise public awareness of native woodlands and their traditional management, through seminars, workshops, newsletters etc (Action: CCW; CC; FC).

Information Sources:

UKBG (1998b)

Wet Woodlands

Wet Woodlands are a UK BAP Priority Habitat.

Definition and Description:

Wet woodlands, also known as 'carr woodlands' occur on poorly drained or seasonally wet soils and are usually dominated by Alder, Willows and Downy Birch, although other tree species may also be present. They typically occur in floodplains, alongside streams and in peaty hollows, often in matrices of other wetland habitats such as bog, fen, mire and marshy grasslands. The underlying soils can vary from nutrient-rich mineral soils to nutrient-poor, acid or peat soils.

Often wet woods occur as a component of other woodlands, for example as a belt along the course of a valley-bottom stream, the slopes of which may support dry broadleaved woodland dominated by ash or oak. Many alder-dominated carrs are ancient woodland, often with along history of coppice management, whilst willow woods tend to develop secondarily through natural succession on unmanaged wetlands and have been little influenced by forestry management. Alder carrs tend to be the commonest type of wet woodland in South Wales, occurring especially along streamsides on the Pennant Sandstone.

Wet woodlands are important for a range of species, many of which are adapted or restricted to this type of habitat. The high levels of humidity tend to encourage lichen and bryophyte growth, whilst moist timber and semi-submerged deadwood acts as a substrate for the larvae of specialist rare craneflies and beetles. Otter frequently breeds and shelters in carr woodland.

Current Status:

Precise data on the extent of these habitats is unavailable, but estimates indicate that there is probably between about 50-70,000ha remaining in the UK, about 10% of which occurs in Wales.

Between about 900 to 13,000ha of these habitats are believed to occur in Glamorgan, but the extent in Bridgend County Borough is unknown at present.

Threats:

- Lack of knowledge regarding the extent and location of the resource.
- Clearance and conversion to other land uses, such as pasture or plantation woodland (softwood or Poplars).
- Habitat loss to development for housing, business and industrial sites, road schemes etc.
- Neglect, including cessation of traditional coppice management, leading to succession towards 'dry' woodland types, rubbish dumping and vandalism etc.
- Lowering of water tables through increased abstraction, resulting in succession to 'dry' woodland types.
- Grazing by stock, leading to poaching of soils, disruption of woodland structure and suppression of regeneration and ground flora.
- Hydrological changes resulting from flood-prevention and river engineering measures.
- Poor water quality arising from eutrophication of aquifers, pollution by agrochemicals, effluent drainage from industrial sites, landfill leachates etc.
- Invasion by alien species such as Himalayan Balsam and Japanese Knotweed.
- *Phytophthora* disease, which affects Alder and which is increasingly prevalent.
- Climate change, leading to changes in vegetation composition.

Current Action:

- Key sites are designated SSSIs, and their proper management is actively promoted by CCW.
- Most other sites are likely to qualify for selection as candidate SINCs, potentially affording some protection against adverse development.
- The Forestry Commission now has a presumption against the clearance of native broadleaved woodland for conifer planting or agricultural use, and provides guidance on woodland management.
- A number of grants are available through the Forestry Commission Woodland Grant Scheme, and other agencies, to encourage woodland owners to manage these woodlands sympathetically.
- Some significant sites may be eligible for consideration under the Inheritance Tax Exemption Scheme.
- Local authorities can issue Tree Preservation Orders to protect individual woodlands.
- Coed Cymru, an advisory body funded by CCW and the local authorities provides landowners and managers with woodland management guidance and

can advise on sources of funding, sustainable timber management and the marketing of woodland produce.

- The Tir Gofal agri-environment scheme for Wales should encourage farmers to maintain and enhance the agricultural landscape and its wildlife, including wet woodlands.
- Ancient woodland status is regarded as a material planning consideration with regard to applications for development or change of land use.

Future Action:

- Identify and map all carr sites in the county borough, together with their current conservation status; assess extent of *Phytophthora* infection of alder (Action: BCBC; BBP; CCW).
- Survey and assess all known sites and consider for selection as SINCs where appropriate (Action: BCBC).
- Improve the condition of wet woodlands by increasing the area under sustainable management. Positive management would prevent further loss of habitat and species, and could restore many damaged sites. Aim to restore at least 10% of the current total area of habitat by 2005 (Action: BCBC; CCW; CC; FC).
- Identify areas of potential for the possible expansion of wet woodlands (by natural regeneration, colonisation, and clearance of plantation and replanting) being careful not to damage other habitats of nature conservation interest in adjacent areas. Aim to expand the current area of habitat by at least 10% by 2005 (Action: as above).
- Develop policies in emerging UDP, Local Plans and SPG which specifically protect wet woodlands (Action: BCBC).
- Identify degraded wet woodlands as targets for grant-aided restoration (Action: BCBC; CC).
- Promote the use of natural methods of restocking (for example, natural regeneration) and the use of native planting stock of local provenance to protect local genetic integrity (Action: BCBC; CCW; CC; FC).
- Encourage continuous cover sylviculture with a diverse age range, and resumption of coppice management where possible (Action: BCBC; CCW; CC; FC).
- Encourage conversion of conifer or poplar planted ancient wet woodlands back to a native woodland character (Action: BCBC; CC; FC).
- Actively promote management advice for woodland owners through Coed Cymru, and support the development of markets for sustainable woodland products (Action: BCBC; CC).
- Develop and promote the use of long term management plans (20+ years) by woodland owners, aimed at creating and/or maintaining appropriate diversity of species and woodland structure (age classes etc) (Action: BCBC; CC; FC).
- Identify key wet woodlands as sources of tree and shrub seed production and seedling harvesting for replanting in woodlands elsewhere (Action: CC).
- Where appropriate, encourage the diversification of age and species composition through selective felling and thinning under an approved Woodland Grant Scheme (Action: CC; FC).

- Encourage the creation of entirely new wet woodlands on previously improved farmland using seed and/or stock of local provenance, planted in compositions which mirror the native pattern; where possible, use these new plantings to link existing woodlands together: aim to create at least 5ha of new woodland by 2010 (Action: CCW; CC; FC).
- Promote training and raise public awareness of native woodlands and their traditional management, through seminars, workshops, newsletters etc (Action: CCW; CC; FC).

Information Sources:

UKBG (1998b)

Lowland Wood-Pastures and Parklands

Lowland Wood-Pastures and Parklands are UK BAP Priority Habitats.

Definition and Description:

Lowland wood-pasture and parklands are the product of ancient and historic land management systems, and as such represent a certain class of habitat structure rather than specific categories of plant communities. Often these habitats developed as features of large country houses and estates with landscaped grounds, but they may also be a product of former common land and ancient hunting forest management. Typically they comprise populations of large, over-mature ('veteran') timber trees dotted across open pasturelands, rough grasslands or deer-grazed woodlands

Wood-pasturage is a medieval land management method whereby livestock were grazed in woodlands amongst trees which were managed to provide a harvestable supply of timber. Often wood-pastures arose on common lands, where the grazing stock were usually cattle or sheep, but sometimes they were originally established as hunting forests where deer were encouraged as game. Parklands are broadly similar to wood-pastures, except that they were more usually established as artificial landscape features associated with large country houses, where deer (and sometimes other livestock) could be viewed amongst a tree-covered landscape. Sometimes landscape parklands were derived from pre-existing medieval wood-pastures, and both types of habitat were commonly derived originally from ancient woodland sites. Recent parks (i.e. 19th Century or later) tend to be of comparatively limited nature conservation interest by comparison.

Typical lowland wood-pastures and parklands today consist of large veteran trees, often of 'pollard' form, in various densities within a matrix of grazed grassland, bracken, heathland or regenerated woodland. Included in the definition are neglected wood-pastures with veteran trees which are now within a matrix of secondary woodland or scrub which has developed either through regeneration or planting, as well as parkland or wood-pasture that has been converted to other uses but where large veteran trees still persist.

A wide range of rare, declining and characteristic species occur in these habitats, especially associated with veteran trees. These include hole-nesting birds such as Owls, roosting bats, rare deadwood beetles, molluscs, fungi and lichens.

Current Status:

Because of changing agricultural and land tenure practices, many former parkland landscapes have wholly or partially disappeared. Wood-pasturage is seldom practised and many sites are set to decline in interest as their present population of veteran trees reaches senescence.

There are no reliable statistics on the extent of the overall resource, or on the historical and current rates of loss and deterioration. It is estimated that there are between about 10-20,000ha these habitats 'currently in working condition' in the UK. A survey of medieval deer-parks (an important class of ancient wood-pasture sites) in the early 1980s indicated the presence of about 2050 sites in England and Wales, with about 30 known sites in the latter (Cantor 1983).

No figures are presently available for the total area of these habitats present in Wales, Glamorgan or Bridgend County Borough.

Threats:

- Lack of knowledge about the location and extent of the resource both locally and in Wales generally.
- Loss through change of use, for example to arable cultivation, housing or developments such as golf courses.
- Lack of tree regeneration due to overgrazing and lack of management.
- Neglect, lack of appropriate management expertise, insufficient resources and loss of habitat structure through scrub and bracken invasion; over-grazing leading to bark browsing, soil compaction and loss of ground flora diversity.
- Lack of younger generations of trees is producing a skewed age structure.
- Loss of veteran trees through disease, physiological stress, such as drought and storm damage and competition for resources with surrounding younger trees.
- Damage to trees and roots from soil compaction and erosion caused by trampling by livestock, pedestrians and car parking.
- Changes to ground-water levels leading to water stress and tree death, resulting from abstraction, drainage, neighbouring development, roads, prolonged drought and climate change.
- Isolation and fragmentation of remaining parklands and wood-pasture sites in the landscape.
- Misguided maintenance such as over-zealous tree surgery because of public liability fears, removal of fallen deadwood to 'tidy-up' the site, etc.
- Pasture improvement through reseeding, deep-ploughing, fertiliser application and other agrochemical treatments.
- Pollution derived from industry and traffic, or locally from agrochemical application and spray-drift, soil nitrogen-enrichment from pasture overstocking etc.

Current Action:

- Many key sites in Wales are designated SSSIs (and in some cases, NNRs) and are actively managed to promote nature conservation.
- Certain species which are dependant on these habitats, such as the Moccas Beetle, Violet Click-Beetle and Orange-Fruited Elm Lichen are fully protected under the Wildlife and Countryside Act, as are all species of bat and most hole-nesting birds.
- Other sites may receive some indirect protection through initiatives such as the Inheritance Tax Exemption Scheme.
- For any woodland component of parkland and wood-pasture, national forestry policy includes a presumption against clearance of native broad-leaved woodland to other land uses.
- Local authorities can assist in the conservation of these habitats through planning designations such as SINCs, TPOs and Conservation Areas (which provide for the protection of trees), Country Parks and Heritage Coast; also by the implementation of appropriate policies in the emerging UDP, Local Plans and SPG.
- Woodland management assistance and marketing advice can be supplied through Coed Cymru.
- Grant aid may be available from sources such as MAFF's Countryside Stewardship Scheme, Tir Gofal and CCW's Orchards & Parkland Trees Scheme. The Forestry Commission's Woodland Grant Scheme is available for woodland with over 20% canopy cover.
- The Veteran Trees Initiative (VTI), launched in 1996, aims to promote the value and importance of veteran trees and to conserve them wherever possible. Other initiatives include the Welsh Historic Gardens Trust.

Future action:

- Map the extent and location of all sites for these habitats in the county borough and assess their current condition and conservation status; select examples for SINC designation where appropriate (Action: BCBC; BBP; CCW; GWT).
- Undertake veteran tree surveys to assess condition and safety risk etc (Action: BCBC; CC; FC).
- Protect and maintain the current extent and distribution of lowland wood-pasture and parkland in a favourable ecological condition (Action: BCBC; CC; FC; others).
- Implement the conclusions of the 1994 review of Tree Preservation Orders, including amendments to the Town and Country Planning Act 1990, to offer appropriate protection to veteran and dead trees (Action: BCBC).
- Examine whether improvements should be made in safety legislation, with respect to liability on owners in the event of injury or damage resulting from old trees and its interpretation to reduce any unnecessary felling of trees on safety grounds (Action: BCBC).
- Promote modification of CAP to recognise and promote extensive pastoral systems, including wood-pasture (Action: BCBC; CCW; FC; CC).

- Provide specific management guidance for parklands, wood-pasture and veteran trees in Planning Policy Guidance notes (PPGs) by 2001 (Action: BCBC).
- Promote re-establishment of grazing where appropriate in derelict wood-pasture and encourage the development of subsequent generations of veteran trees in all sites by 2010 (Action: BCBC; CCW; FC; CC).
- Investigate possible expansion of parkland and wood-pasture sites in targeted areas (Action: BCBC; CCW; FC; CC).
- Consider relocation of key species dependent on veteran trees via translocation to suitable trees elsewhere (Action: CCW; GWT).
- Encourage research into parkland and wood-pasture, including trees, vegetation and fauna in relation to tree and pasture management practices (Action: CCW; GWT; FC; CC).
- Increase awareness of this type of habitat, emphasising its vulnerability and value (Action: BCBC; BBP; GlamBAG; CCW; CC).

Information Sources:

Cantor (1983)
Sothern (1986)
UKSG (1995b)
UKBG (1998b)

Hay Meadows & Old Pastures

Lowland Hay Meadows are a UK BAP Priority Habitat. Unimproved neutral grasslands generally have declined sharply throughout the UK, although they remain comparatively widespread in South Wales. However, they more often take the form of old pastures rather than hay meadows, hence their additional inclusion.

Definition and Description:

Hay meadows, as conventionally understood, comprise unimproved, species-rich grasslands, usually neutral, which are traditionally allowed to grow throughout the spring and summer period and are then mown in late summer to produce a hay crop used as winter feed and bedding for stock. Many meadows were traditionally grazed briefly in the period after mowing (‘aftermath grazing’). They used to be a common and widespread feature of the British countryside, but have become largely redundant in modern agricultural practice.

The term ‘hay meadow’ is in fact too narrow to encompass all the types of grassland of interest which are covered by this action plan. In south Wales, the great majority of the remaining species-rich neutral grassland is old pasture grazed by cattle, horses and sometimes sheep.

Both grassland types are ‘permanent grasslands’, which for generations have been managed either for livestock grazing or hay production and which have not been intensively ‘improved’, either by the application of artificial fertilisers or with

pesticides, herbicides and insecticides, or by ploughing and re-seeding with rye grass. The soils underlying these habitats have a relatively low nutrient status and the traditional management methods directly support a wide diversity of flowering plants and bryophytes. Low intensity, traditional management is the key to the survival of these floristically biodiversity rich grasslands. There has been a great decline in these types of habitats in the period since the 2nd World War. Between 1930 and 1997 it is estimated that a 97% loss in semi-natural, lowland grassland took place in England and Wales, as modern agricultural practice took over.

Truly unimproved neutral grassland is now extremely rare, being dominated by fodder grasses such as Crested Dog's-tail, Red Fescue and Common Bent, together with a very wide range of flowering plants such as Common Knapweed, Primrose, Ox-eye Daisy and Meadow Buttercup. Most of the remaining neutral grasslands in the region are in fact 'semi-improved', containing fewer species and a much higher proportion of high productivity grasses such as Perennial Rye-Grass. However, there is great variability in the extent to which improvement has occurred, with the best examples containing many of the characteristic species of the unimproved grasslands.

Many rare and declining species are associated with unimproved neutral grasslands including various Orchids, Pepper-Saxifrage and Adder's-Tongue Fern. The nesting bird fauna includes Skylark, Meadow Pipit and other 'open ground' species. Many of these species are adapted to, and characteristic of, the hay meadow management cycle.

Current Status:

As noted above, these habitats have declined dramatically in extent in recent decades. Recent estimates indicate that there may be no more than about 15,000ha of species-rich meadow left in the UK lowlands.

Glamorgan is estimated to support about 500ha of lowland hay meadow and old pasture, which is both nationally and regionally significant. This represents about a quarter of the total figure for Wales and 3-5% of the estimated UK area of species-rich lowland neutral grassland. There is no figure presently available for these habitats in Bridgend County Borough. The grassland mosaic at Island Farm (the former Prisoner-of-War Camp) is of special interest, but remains un-grazed and un-mown.

Threats:

- Loss of habitat to industrial, residential and road scheme developments, opencast mining, land reclamation schemes, landfill operations and tipping.
- Agricultural improvement (drainage, fertiliser-input and reseeding) and change of use from hay to silage production and spring/summer grazing.
- Conversion to commercial forestry and grant-aided woodland planting.
- Cessation of traditional management of cutting and light grazing, a situation exacerbated by the recent BSE crisis.
- Over-grazing, leading to deterioration in sward diversity and loss of species.

- Under-grazing, leading to coarsening of the sward and encroachment by tall herbaceous and scrub species.
- Remaining sites are often fragmented and isolated, creating 'islands' of habitats which are inherently less biodiversity rich and more susceptible to loss of species and deterioration.
- Lack of agri-environment grants, with the exception of Tir Gofal.
- Lack of awareness of the significance of unimproved hay meadows and old pasture, particularly within planning authorities and amongst farmers, statutory landowner managers and government bodies.
- Planning developments, which affect species-rich grasslands are increasingly being supported by unproven 'habitat translocation' proposals, in which the grasslands of interest are lifted and moved to another location. These schemes are usually poorly designed and executed, and gathering research evidence indicates a poor rate of success even where the operations are carried out to a high standard.

Current Action:

- A small number of key sites in Glamorgan are designated SSSIs and are actively managed to promote their conservation interest.
- Most other examples would probably qualify for selection as candidate SINCs, affording some protection against adverse development proposals.
- The old Habitat Scheme administered by FRCA was targeted at species-rich grassland, which included some hay meadow and old pasture sites.
- Tir Gofal may allow the inclusion of some species-rich grassland, conferring eligibility for grant-aided management.
- Roadside verges may support hay meadow species and can be managed sympathetically be local authorities.
- Markets exist for good quality, organic hay produce (e.g. amongst pony and horse-owners), and there is an increasing market for organically produced traditional beef products.
- CCW have completed a Phase I habitat survey for Glamorgan and a detailed Phase II survey of many important species-rich grassland sites. As a result there is a very good understanding of floristic identity of Glamorgan grasslands.
- Environmental policies in UDPs, Local Plans and SPG often recognise the importance of these habitats and offer varying degrees of protection.

Future Action:

- Identify and map all sites for these habitats in the county borough, together with their current conservation status: survey and assess sites for selection as candidate SINCs (Action: BCBC; BBP; CCW; GWT).
- Develop a network of managed hay meadow and old pastures across Glamorgan, to allow and encourage species dispersal and movement between sites (Action: BCBC; GlamBAG; BBP; CCW; GWT).
- Aim to protect and conserve all remaining sites by statutory designation, planning practice and habitat management, and aim to maintain/restore 75% of the county borough resource to a favourable conservation status by 2010 (Action: BCBC; CCW; GWT).

- Aim to create at least 5ha of new species-rich hay meadow and/or pasture at selected sites by 2010 (Action: BCBC; CCW; GWT).
- Influence the Tir Gofal agri-environment scheme at the review stage, to better and more efficiently target SINC lowland hay meadows and old pastures and to recognise the importance of grant aiding in the conservation of the regional resource (Action: BCBC; GlamBAG; CCW; GWT).
- Develop a consensual approach to dealing with planning applications on SINC lowland hay meadows and old pastures in Glamorgan, to include a standard requirement for habitat and species assessment, and habitat protection, conservation and mitigation (Action: BCBC; GlamBAG; CCW; GWT).
- Set up a meadow management unit at the regional (county) level, equipped with an Alpine hay-bailer to cut small SINC lowland hay meadows and old pasture sites on a three yearly basis (Action: BCBC; GlamBAG, CCW; GWT).
- Investigate and develop marketing opportunities for species-rich hay and organic beef produce (Action: BCBC; GlamBAG; CCW; GWT).
- Raise awareness of the significance of lowland hay meadow and old pastures at all levels – agricultural, business, government and the general public (Action: BCBC; CCW; GWT).
- Through a National Heritage Lottery grant bid develop an agri-environmental grant scheme for species-rich grassland SINCs in Glamorgan (Action: BCBC; CCW; GWT; GlamBAG).

Information Sources:

GlamBAG (draft RHAP)
UKSG (1995b)
UKBG (1998b)

Lowland Dry Acid Grasslands

Lowland Dry Acid Grassland is a UK BAP Priority Habitat.

Definition and Description:

Acid grassland is one of the main habitat types of unenclosed mountains and hills in the northern and western parts of the UK, and is well known as a characteristic upland habitat. However, acid grassland is much rarer and more restricted in as a lowland habitat. In lowland situations acid grassland is restricted to well-drained, often leached, acid soils. In Glamorgan it occurs chiefly on the enclosed, traditionally managed valley sides, appearing as an acid soil analogue of neutral hay meadow and old pastures. These habitats have suffered much the same pressures and decline, and lowland acid grasslands are now every bit as endangered and valuable as species-rich neutral grasslands.

Lowland acid grasslands are permanent grasslands which have been traditionally managed over many generations either for livestock grazing or hay production. In their unimproved state they are typically dominated by grasses such as Sheep's Fescue, Common Bent or Wavy Hair-Grass, together with characteristic flowering

plants such as Tormentil, Heath Bedstraw and sometimes also dwarf-shrubs such as Ling Heather and Bilberry. Often they occur in mosaics with other habitats such as lowland heathland (another Priority Habitat), marshy grasslands, bracken slopes and scrub. The range of plant species represented is rather narrower than for other grassland types, but there is considerable variability in the sward composition. Many of the plant species represented are more-or-less restricted to this habitat type.

The diversity of these grasslands stem from a combination of low soil nutrient status, low pH and traditional, non-intensive management. Their decline has been hastened particularly by the drive towards greater productivity which has resulted in the great majority of these grasslands being agriculturally improved, and in some cases re-seeded.

A number of rare and declining species are associated with these habitats, including birds such as Skylark and Lapwing, Heath Spotted-Orchid, Hornet Robberfly and butterflies such as Grayling.

Current Status:

As noted above, these habitats have declined dramatically in extent in recent decades. Recent estimates indicate that there may be no more than about 30,000ha of unimproved lowland acid grasslands left in the UK, and there may be as little as 2000ha remaining in Wales.

Glamorgan is estimated to support about 900ha of unimproved lowland acid grasslands, which is both nationally and regionally significant. There is no figure presently available for these habitats in Bridgend County Borough, but key sites are believed to occur north of Pencoed and near Gilfach Goch.

Threats:

- Loss of habitat to industrial, residential and road scheme developments, opencast mining, land reclamation schemes, landfill operations and tipping.
- Agricultural improvement (fertiliser-input and reseeding) and change of use from hay to silage production and spring/summer grazing.
- Conversion to commercial forestry and grant-aided woodland planting.
- Cessation of traditional management of cutting and light grazing, a situation exacerbated by the recent BSE crisis.
- Over-grazing, especially by horses and sheep, leading to deterioration in sward diversity and loss of species.
- Remaining sites are often fragmented and isolated, creating ‘islands’ of habitats which are inherently less biodiversity rich and more susceptible to loss of species and deterioration.
- Lack of agri-environment grants, with the possible exception of Tir Gofal.
- Lack of awareness of the significance of unimproved lowland acid grasslands, particularly within planning authorities and amongst farmers, statutory landowner managers and government bodies.

Current Action:

- A number of key sites in Glamorgan are designated SSSIs and are actively managed to promote their conservation interest.
- Most other examples would probably qualify for selection as candidate SINCs, affording some protection against adverse development proposals.
- The old Habitat Scheme administered by FRCA was targeted at species-rich grassland, which included some lowland acid grassland sites.
- Tir Gofal may allow the inclusion of some species-rich grassland in the future, conferring eligibility for grant-aided management.
- CCW have completed a Phase I habitat survey for Glamorgan and a detailed Phase II survey of many important species-rich grassland sites. As a result there is a very good understanding of floristic identity of Glamorgan grasslands.
- Environmental policies in UDPs, Local Plans and SPG may recognise the importance of these habitats and offer varying degrees of protection.

Future Action:

- Identify and map all sites for these habitats in the county borough, together with their current conservation status: survey and assess sites for selection as candidate SINCs (Action: BCBC; BBP; CCW; GWT).
- Develop a network of managed lowland acid grasslands across Glamorgan, to allow and encourage species dispersal and movement between sites (Action: BCBC; GlamBAG; BBP; CCW; GWT).
- Aim to protect and conserve all remaining sites by statutory designation, planning practice and habitat management, and aim to maintain/restore 75% of the county borough resource to a favourable conservation status by 2010 (Action: BCBC; CCW; GWT).
- Aim to create at least 5ha of new species-rich lowland acid grassland at selected sites by 2010 (Action: BCBC; CCW; GWT).
- Influence the Tir Gofal agri-environment scheme at the review stage, to better and more efficiently target SINC lowland acid grasslands and to recognise the importance of grant aiding in the conservation of the regional resource (Action: BCBC; GlamBAG; CCW; GWT).
- Develop a consensual approach to dealing with planning applications on SINC lowland acid grasslands in Glamorgan, to include a standard requirement for habitat and species assessment, and habitat protection, conservation and mitigation (Action: BCBC; GlamBAG; CCW; GWT).
- Investigate and develop marketing opportunities for species-rich hay and organic beef produce produced on lowland acid grassland SINCs (Action: BCBC; GlamBAG; CCW; GWT).
- Raise awareness of the significance of lowland hay meadow and old pastures at all levels – agricultural, business, government and the general public (Action: BCBC; CCW; GWT).
- Through a National Heritage Lottery grant bid develop an agri-environmental grant scheme for species-rich grassland SINCs in Glamorgan (Action: BCBC; CCW; GWT; GlamBAG).

Information Sources:

GlamBAG (draft RHAP)
UKSG (1995b)
UKBG (1998b)

Calcareous Grasslands

Lowland Calcareous Grasslands and Upland Calcareous Grasslands are both UK BAP Priority Habitats.

Definition and Description:

'Calcareous grasslands' are grasslands which have developed on base-rich soils, usually overlying alkaline geology such as the Carboniferous Limestone of South Wales. Where the limestone is exposed, or lies close to the surface, thin, well-drained soils develop which are leached of nutrients and alkaline in nature. These develop specialised, species-rich floras which contain many characteristic grasses and flowering plants which are not able to thrive in other situations, being intolerant of high nutrient levels and/or acid or neutral soil conditions. Many of these species are rare and declining in the UK.

A very wide range of characteristic plant species occur in these grasslands, including grasses such as Quaking Grass, Meadow Oat-Grass, Upright Brome and Tor Grass, together with flowering plants such as Wild Thyme, Salad Burnet, Rockrose, Lady's Bedstraw, Kidney Vetch and a number of Orchid species. Calcareous grasslands can also be of particular importance for their invertebrate faunas, which also include many rare and specialised species. A number of notable butterflies are associated with these grasslands, including Small Blue, Silver-Studded Blue, Dingy Skipper and Brown Argus, for example.

Calcareous grasslands may sometimes develop secondarily in situations where alkaline rock has been exposed, for example in quarries and road cuttings, and sometimes also on tipped industrial spoil such as flue-ash or railway ballast. These 'secondary' grasslands may become quite species-rich over time, especially where they lie close to existing natural grasslands, but are seldom as diverse as naturally-developed 'primary' grasslands.

Calcareous grasslands in the open countryside were traditionally managed as downland sheep walks, and would not have been intensively 'improved', either by the application of artificial fertilisers or with pesticides, herbicides and insecticides. As noted above, the soils underlying these habitats have a low nutrient status and the low intensity, traditional management is the key to the survival of these floristically biodiversity rich grasslands. However, many areas of former sheep walk have either been improved for agriculture in recent decades or have fallen into neglect, becoming scrubbed over or invaded by coarse grasses with finer swards remaining only where they are maintained by grazing rabbits.

Unimproved, or species-rich semi-improved, calcareous grasslands in South Wales are nowadays found largely on topographical features such as sea-cliffs and

escarpments, steep dry-valley slopes and ancient earthworks, although a few areas of downland also survive.

Current Status:

As with other traditional grasslands, calcareous grasslands have declined dramatically in extent in recent decades throughout their range, with over 50% having been lost in the period since the 1950s. Recent estimates indicate that there is between about 33,000 to 41,000ha remaining in the UK, but that the extent in Wales is no more than about 1000ha in total.

Glamorgan is estimated to support about 270ha of lowland calcareous grassland, about half of which is unimproved with the remainder being semi-improved. There is no figure presently available for these habitats in Bridgend County Borough, but key sites include the area around the Cornelly quarries, and lowland grassland associated chiefly with the coast.

Threats:

- Loss of habitat to development, including industrial, residential and road schemes, landfill and tipping etc.
- Loss of habitat to quarrying: many sites lie on commercially significance limestone resources,
- Agricultural improvement (drainage, fertiliser-input and reseeding).
- Conversion to commercial forestry and grant-aided woodland planting.
- Cessation of traditional management of light grazing with sheep, leading to coarsening and scrub-invasion.
- Over-grazing, leading to deterioration in sward diversity and loss of species.
- Under-grazing, leading to coarsening of the sward and encroachment by tall herbaceous and scrub species.
- Remaining sites are often fragmented and isolated, creating ‘islands’ of habitats which are inherently less biodiversity rich and more susceptible to loss of species and deterioration.
- Lack of agri-environment grants, with the exception of Tir Gofal.
- Lack of awareness of the significance of calcareous grasslands, particularly within planning authorities and amongst farmers, statutory landowner managers and government bodies.
- Planning developments, which affect species-rich grasslands are increasingly being supported by unproven ‘habitat translocation’ proposals, in which the grasslands of interest are lifted and moved to another location. These schemes are usually poorly designed and executed, and gathering research evidence indicates a poor rate of success even where the operations are carried out to a high standard.

Current Action:

- A small number of key sites in Glamorgan are designated SSSIs and are actively managed to promote their conservation interest.

- Most other examples would probably qualify for selection as candidate SINCs, affording some protection against adverse development proposals.
- The old Habitat Scheme administered by FRCA was targeted at species-rich grassland, which included some calcareous grassland sites.
- Tir Gofal may allow the inclusion of some species-rich grassland in the future, conferring eligibility for grant-aided management.
- Roadside verges may support species-rich calcareous grasslands and can be managed sympathetically be local authorities.
- There is an increasing market for organically produced lamb.
- CCW have completed a Phase I habitat survey for Glamorgan and a detailed Phase II survey of many important species-rich grassland sites. As a result there is a very good understanding of floristic identity of Glamorgan grasslands.
- Environmental policies in UDPs, Local Plans and SPG often recognise the importance of these habitats and offer varying degrees of protection.

Future Action:

- Identify and map all sites for these habitats in the county borough, together with their current conservation status: survey and assess sites for selection as SINCs (Action: BCBC; BBP; CCW; GWT).
- Develop a network of managed calcareous grasslands across Glamorgan, to allow and encourage species dispersal and movement between sites (Action: BCBC; GlamBAG; BBP; CCW; GWT).
- Aim to protect and conserve all remaining sites by statutory designation, planning practice and habitat management, and aim to maintain/restore 75% of the county borough resource to a favourable conservation status by 2010 (Action: BCBC; CCW; GWT).
- Aim to create at least 5ha of new species-rich calcareous grassland at selected sites by 2010 (Action: BCBC; CCW; GWT).
- Influence the Tir Gofal agri-environment scheme at the review stage, to better and more efficiently target SINC grasslands and to recognise the importance of grant aiding in the conservation of the regional resource (Action: BCBC; GlamBAG; CCW; GWT).
- Develop a consensual approach to dealing with planning applications on SINC grasslands in Glamorgan, to include a standard requirement for habitat and species assessment, and habitat protection, conservation and mitigation (Action: BCBC; GlamBAG; CCW; GWT).
- Set up a grassland management unit at the regional (county) level, suitably equipped to graze, mow or cut small SINC grassland sites in accordance with a suitable conservation management plan (Action: BCBC; GlamBAG, CCW; GWT).
- Investigate and develop marketing opportunities for organic lamb produce (Action: BCBC; GlamBAG; CCW; GWT).
- Raise awareness of the significance of calcareous grasslands at all levels – agricultural, business, government and the general public (Action: BCBC; CCW; GWT).
- Through a National Heritage Lottery grant bid develop an agri-environmental grant scheme for species-rich grassland SINCs in Glamorgan (Action: BCBC; CCW; GWT; GlamBAG).

Information Sources:

GlamBAG (draft RHAP)
UKSG (1995b)
UKBG (1998b)

Heathlands

Upland Heathland and Lowland Heathland are both UK BAP Priority Habitats.

Definition and Description:

Heathland includes a variety of vegetation types in which low-growing ericaceous shrubs are prominent. Dry heath occurs on free-draining, usually acid soils, and is characterised by species such as Ling Heather, Bell Heather, Bilberry and Western Gorse. On waterlogged ground wet heath is more typical, containing species such as Cross-leaved Heath, Deer-grass, Sphagnum mosses, Cotton-sedges and Sundews. Mosaics of wet and dry heathland types may occur together, along with associated marshy grasslands, acid grasslands and scrub. A wide variety of specialised plants and animals are associated with heathland, including a large number of rare and declining species.

Heathland is normally associated with thin, nutrient-poor soils such as peat or mineral soils. Usually these soils are acidic, although heathland can also develop on limestone soils where these are very freely-drained and leached, the key factor being the relative absence of soil nutrients. Heathland habitats can develop secondarily, and quite rapidly, on disturbed soils where these have the right characteristics, and are thus an important feature of some re-vegetated coal and mineral spoil sites such as tips and abandoned workings. Secondary heathland can support many of the rare species associated with this habitats, especially if they have developed near an existing natural heathland site. However, they are rarely as biodiversity rich as natural, primary heathlands which have developed over much longer periods of time.

Heathland habitats can be broadly divided into ‘lowland’ and ‘upland’ types, with the latter chiefly occurring above 300m. Upland heathland is usually less diverse in species and still occurs over quite large areas of unenclosed mountainous and hillside habitats. Lowland heathland has a different, more biodiversity rich character and is much rarer in occurrence. In Glamorgan, due to the oceanic climate and topography, a clear altitudinal distinction between lowland and upland heath often cannot be made, and most of the heathland is essentially lowland in nature.

Current Status:

Heathland habitats require a very particular range of climatic, topographic and soil conditions, and are rare in a global context. Much of the world’s heathland is confined to western Europe, with about a fifth of the world total occurring in Britain and Ireland. Unfortunately, heathland is one of the most threatened habitats in

Britain, especially in the lowlands, and is a rapidly declining resource throughout its global range.

It is estimated that approximately 58,000ha of lowland heathland occurs in Britain and Ireland, of which only about 12,000ha occurs in Wales. About 17% of the Welsh lowland heathland resource occurs in the valleys and upland fringes of Glamorgan, which supports about 2100ha of these habitats in total. Only about 160ha of lowland heathland occurs in Bridgend, however, about 60% of which is acid dry heath.

By contrast there is estimated to be between 2-3 million hectares of upland heathland remaining in Britain and Ireland, about 69,220ha of which occurs in Wales, chiefly in the mountainous northern and central regions. Because of the relative absence of high ground in Glamorgan only about 3140ha of these habitats occur in the county, with about 400ha of this estimated to occur Bridgend. Key sites in Bridgend include Cefn Hirgoed, Hirwaun Common and Stormy Down.

Threats:

- Development, particularly new roads and road widening schemes, housing and business park development, minerals extraction and infrastructure schemes. Many secondary heathland sites are targeted for 'land restoration', either to agriculture or for redevelopment.
- Inappropriate management, including uncontrolled burning, overgrazing by sheep and agricultural 'improvement' which leads to raised nutrient levels.
- Afforestation schemes, both commercial forestry and grant-aided woodland planting schemes. Although less of a problem today, large areas of upland heathland have been afforested in the past in Wales.
- Neglect, leading eventually to scrub encroachment or invasion by coarse grassland species or Bracken.
- Recreational pressure, flytipping, vandalism, motorbiking and burning problems: dogwalking may lead to nutrient enrichment of soils (through deposition of droppings) on some sites.
- There is a lack of adequate survey information for heathland, and some small areas may have gone unrecorded.
- There is presently very little conservation effort directed towards the heathland resource in the region, outside of the Gower district.

Current Action:

- Some of the larger heathland areas are designated SSSI, although many other suitable areas are not.
- Lowland heathland is a significant selection feature for SINC designation, and all remaining sites should potentially be considered, thus affording them some protection in the planning process.
- The RSPB have a heathland regeneration programme operating in Wales.

Future Action:

- Prepare a map indicating all known sites for these habitats in the county borough, and their current conservation status (i.e. SSSI or proposed SINC) (Action: BCBC; GlamBAG; BBP).
- Consider designation of all remaining heathlands in the county borough as SINCs (Action: BCBC).
- Influence the Tir Gofal agri-environmental scheme to recognise the importance of grant-aiding these sites as a nationally and regionally important resource (Action: BCBC; CCW; GWT).
- Publicise the need for continuing protection and management of these areas, and their importance to biodiversity in the region and nationally (Action: BCBC; BBP; GWT; CCW).
- Encourage appropriate land management practices necessary to maintain the habitats (Action: BCBC; GWT; CCW).
- Protect and maintain all remaining heathlands in the county borough (Action: BCBC).
- Seek to establish at least 15ha of new heathland habitats of at selected sites by 2005 (Action: BCBC; CCW).

Information Sources:

GlamBAG (1999)
UKSG (1995b)

Purple Moor-grass and Rush Pastures

Purple Moor-Grass and Rush Pastures are a UK BAP Priority Habitat.

Definition and Description:

These habitats are characteristic grasslands of wet, acid to neutral, generally poorly drained and nutrient-poor mineral or peat soils. Also known as 'Rhos Pastures' in Wales, these habitats often occur on low-lying valley bottoms, hillsides and commons and are especially a feature of the edge of the South Wales coalfield. The British Isles support the great majority of the world resource of these habitats, and they are particularly prominent and extensive in Wales and the west of England.

These habitats embrace a wide range of related vegetation types, the species composition of which varies in response to gradients in climate, altitude, soil wetness and chemistry, and to differences in land management. About five main categories are recognised in the region, varying from wet acid grass-heath, through acid-neutral pastures dominated by Purple Moor-grass or Rush species, to neutral or slightly calcareous wet meadows.

Many rare and characteristic species are associated with these grasslands, including for example the Marsh Fritillary butterfly, Narrow-bordered Bee-hawk moth and Whorled Caraway.

Current Status:

It is estimated that approximately 56,000ha of Purple moor-grass and rush pasture is present in the UK, of which about 35,000ha (i.e. over half) occurs in Wales. Glamorgan supports about 5600ha, i.e. around 10% of the UK total, and CCW's Phase 1 maps indicate that about 1000 hectares occurs in Bridgend. These habitats are widespread and key sites include Fernbank and the Cefn Cribwr complex, part of which is designated a Site of Special Scientific Interest (SSSI), with some SSSIs also forming the candidate Cefn Cribwr Meadows Special Area of Conservation (EU Habitats Directive).

Threats:

- Industrial, residential and road development; many sites have been lost or fragmented by developments, the fragmented sites often suffering deterioration through disrupted drainage regimes and cessation of traditional management.
- agricultural improvement – draining, infilling and re-seeding for conversion to improved pasture or cropping.
- Neglect, especially through cessation of grazing and invasion by scrub, a situation which has been exacerbated by the recent BSE crisis**.**
- Conversion to sheep grazing.
- Changes in land-use, including landfill operations, commercial forestry, grant aided woodland planting and opencast mining operations.
- Inappropriate management, including over-grazing, year-round grazing and frequent burning.
- Limited availability of appropriate agri-environmental grants.
- Lack of information on the extent and nature conservation significance of these habitats. In particular there is a problem in differentiating species-poor upland fringe stands and the more vulnerable and species-rich lowland pastures.
- Lack of awareness of the significance of rhos pastures, particularly within planning authorities, and amongst statutory landowners and many government agencies.

Current Action:

- All species-rich and larger rhos pasture sites in the county borough are identified as Proposed Sites of Importance for Nature Conservation (SINCs), which should afford some protection against inappropriate development in the future.
- The Habitats Scheme administered by FRCA targets species-rich grassland, which includes Purple Moor-grass and Rush Pasture
- Tir Gofal offers grant aid on a whole farm basis in exchange for management which respects nature conservation interests. One or two farms in Bridgend which contain rhos pastures have taken up this scheme.
- Grants for suitable management may become available through the Tir Gofal agri-environmental scheme in the future.

- The full statutory protection now accorded to Marsh Fritillary butterfly under the Wildlife and Countryside Act, should theoretically lead to an element of statutory protection of sites which support this species.
- Butterfly Conservation's *Butterfly Action Plan for Wales* (1998) provides a framework for identifying important sites on the basis of their butterfly fauna.
- Environmental policies in the emerging UDP, existing Local Plans and Supplementary Planning Guidance (SPG) offer varying degrees of protection for SINCs and marshy grasslands generally.

Future Action:

- Prepare a map indicating all known sites for these habitats in the county borough, and their current conservation status (i.e. SSSI or proposed SINC); survey and assess the current extent of the remaining resource in the county borough (Action: BCBC; GlamBAG; BBP).
- Survey and assess all remaining sites which are not so designated, and consider designation of any better-quality examples as SINCs (Action: BCBC).
- Promote designation of best examples in the county borough as SSSIs, especially where these support Marsh Fritillary butterfly (Action: BCBC; CCW).
- Influence the new Tir Gofal scheme to effectively target SINC rhos pasture sites and to recognise the importance of grant-aiding these sites as a nationally and regionally important resource (Action: BCBC; CCW; GWT).
- Develop an integrated approach to dealing with planning applications affecting rhos pasture sites, especially SINCs; review existing practices and develop suitable best-practice guidance; in particular seek to minimise further fragmentation of sites (Action: BCBC; GlamBAG; CCW; GWT).
- Publicise the need for continuing protection and management of these areas, and its importance to biodiversity in the region and nationally (Action: BCBC; BBP; GWT; CCW).
- Seek sources of grant aid to support traditional farming practices, and especially to support livestock farming, and promote these to the appropriate landowners and farmers (Action: BCBC).
- Encourage appropriate land management practices to maintain the habitats (Action: BCBC; GWT; CCW).
- Within SSSIs, initiate rehabilitation management of all significant stands of rhos pasture habitats which are presently in a deteriorated condition by 2005, with the aim of achieving favourable conservation status in all areas by 2010 (Action: BCBC; CCW).
- For sites outside SSSIs, aim to secure a favourable conservation condition of at least 30% of the county borough resource by 2005, and as near as possible to 100% by 2015 (Action: BCBC; CCW; GWT).
- Seek to establish through improved management at least 20ha of new purple moor-grass and rush-pasture habitats of wildlife value at selected sites by 2010 (Action: BCBC; CCW).
- Liaise with other Unitary Authorities in Glamorgan to achieve regional objectives suggested by GlamBAG, including the development of a county-wide network of managed sites and Heritage Lottery Funded management initiatives (Action: BCBC; GlamBAG).

Information Sources:

GlamBAG (1999)
UKSG (1995b)

Coastal and Floodplain Grazing Marshes

Coastal and Floodplain Grazing Marshes are a UK BAP Priority Habitat.

Definition and Description:

Grazing marshes are defined as grazed grasslands and wetlands which are subject to periodic flooding due to their low-lying position near the coast or in the floodplain of a river, and may hence be either brackish or freshwater in nature. They may be inundated seasonally in an uncontrolled manner through natural causes, but are perhaps more often flooded in a controlled manner at a particular season, for a fixed period and to a predetermined depth, by human intervention. The periodic flooding causes nutrient enrichment of the soils due to the deposition of suspended silts, and the resulting rich pastures are used for livestock rearing, dairy production or silage production when the flooding recedes.

Grazing marshes provide an important breeding and feeding place for many species of bird, especially waders such as Lapwing, Curlew and Snipe, and wildfowl and migratory birds. The drainage ditches may support interesting and diverse aquatic plant and invertebrate communities. Several rare species of invertebrates, such as water-beetles, and plants are associated specifically with grazing marsh habitats.

Current Status:

Grazing marshes and floodplain grasslands remain widespread in lowland Britain, covering an estimated area of 300,000ha, although the great majority of this is improved grassland. In Wales there is estimated to be about 74,000ha of these habitats, with about 8400ha present in Glamorgan, 450ha of which is present in Bridgend County Borough Council. This represents about 0.6% of the total Welsh resource of these habitats.

Threats:

Grazing marsh is frequently improved and/or drained in order to allow more intensive grazing, thus, resulting in a loss of important biodiversity. The main threats to this type of habitat include:

- Intensive drainage schemes.
- Nutrient enrichment as a result of the intensive use of artificial fertilisers.
- Reduced biodiversity as a result of herbicides, pesticides, insecticides etc, which can reduce the productivity of soil invertebrates used by foraging waders and other species.
- Neglect, especially in not cleaning-out and maintaining the ditches, leading to imprecise flooding and eutrophication of waterways.

- Changes in water level management regimes due to transition from traditional to modern farming methods; decline in traditional management and in the livestock industry generally.
- Permanent drainage and conversion to arable production or other cropping.
- Development for minerals or aggregate extraction.
- Increased groundwater abstraction and lowering of the water table.
- Pollution from minewater run off, both coal and iron workings, landfill leachates, agricultural and other run-off, and other sources.
- Industrialisation, road building and rapid spread of urban areas.
- Inappropriate flood defence work.
- Permanent or uncontrolled extended inundation as result of rising sea levels and changed weather patterns, possibly stemming from global warming impacts.

Current Action:

- Over 50% of the coastal and floodplain grazing marsh in Glamorgan is designated as SSSI, and is thus afforded statutory protection.
- Many of the remaining areas lie in current or proposed SINCs, and should therefore be afforded some protection from adverse development in the future.
- Planning permission has been granted to some of these habitat areas, but CCW and Local Planning Authorities (LPA) liaise with developers to seek the protection of important features which are fundamental to the habitat.
- A £1m minewater scheme has recently been implemented in order to reduce the minewater pollution problem.
- The Tir Gofal scheme contains provisions which may benefit the management of coastal and floodplain grazing marsh in the future. This scheme encourages farmers in the use of land management practices which are sensitive to the needs of the wildlife.

Future Action:

- Prepare a map indicating all known areas of these habitats in the county borough, and the current conservation status (i.e. SSSI, proposed SINC etc) of each area (Action: BCBC; BBP).
- Consider designation of any unprotected areas as SINCs in the near future (Action: BCBC)
- Maintain the extent of existing coastal and floodplain marsh at current levels, where these are not affected by existing planning consents (Action: BCBC).
- Publicise the need for continuing protection and management of these areas, and its importance and benefits to biodiversity in the region (Action: BCBC; BBP; GWT; CCW).
- Seek sources of grant aid to support traditional farming practices, and especially to support livestock farming, in these areas and promote these to the appropriate landowners and farmers (Action: BCBC).
- Encourage appropriate land management practices to maintain the habitats, including the incorporation of buffer zones on adjacent land to prevent spray-drift and eutrophication (Action: BCBC).

- Seek rehabilitation of deteriorated grazing marsh habitats, including re-wetting, restoration of flood-drainage systems, control of overgrazing, conversion and revegetation of land put over to cultivation (Action: BCBC).
- Seek to create at least 20ha of new grazing marsh habitat by 2005, on land which is currently in arable production (or other uses) but which is surplus to present production requirements; this should concentrate on land which is adjacent to existing grazing marsh (Action: BCBC; CCW).

Information Sources:

UKSG (1995b)

Reedbeds

Reedbeds are a UK BAP Priority Habitat.

Definition and Description:

Reedbeds comprise a type of swamp habitat, a broad category which covers tall wetland vegetation on soils where the water level is usually distinctly higher than the ground level for part or all of the year.

As the name suggests, reedbed is typically dominated by Common Reed, although many other plant species may also occur. Reedbeds are still a comparatively common feature around many Welsh lakes and ponds, although the habitat is nationally and regionally threatened and declining. The sheltered conditions within the reedbeds provide many species with valuable habitat, and some of these species (such as birds and invertebrates, for example) are reedbed specialists. The habitat can include areas of both 'reed-swamp', which retains some water throughout the year, and 'reed-fen', which becomes dry during the summer.

Reedbeds often contain areas of open water and/or ditches and sometimes also small areas of 'carr' (wet woodland) and marshy grassland. Reedbeds have a very specialised bird fauna including the declining Bittern, the globally threatened Aquatic Warbler, Cetti's Warbler, Bearded Tit, Reed Bunting, Marsh Harrier and Reed Warbler.

Current Status:

There are about 5000ha of reedbed remaining in the UK, but of the 900 or so sites which make up this total only about 50 are greater than 20ha. There are about 1800ha of reedbed in Wales, and 40 or so sites totalling about 390ha in Glamorgan. The great majority of these sites are small and only three sites are of an area of greater than 2.5 ha, none of which occur in Bridgend County Borough. The precise extent of reedbed in Bridgend County Borough is not presently known, but is unlikely to exceed about 5ha. However, key sites occur at Kenfig Pool, Kenfig Rivermouth and Parc Slip.

Threats:

- Conversion to agricultural production, with consequent draining, infilling and replanting.
- Loss through development, including residential, business and road schemes.
- Grazing and trampling by livestock and waterfowl.
- Neglect or inappropriate management, leading to accumulation of plant material, scrub encroachment or desiccation.
- Increased water abstraction, drought and climate change, leading to desiccation.
- Loss through tipping and infilling, or through river engineering schemes.
- Water pollution, which kills reed and also poisons fish and amphibians, thus reducing the food web of associated species such as birds.
- Recreational disturbance, including shooting of wildlife, clearance and disruption by anglers, disturbance by dogs etc.
- Japanese Knotweed invasion and pond excavation, the latter often as a result of ill-considered 'conservation' schemes.
- Lack of accurate survey information about the resource in Bridgend County Borough.

Current Action:

- Many reedbeds are designated SSSIs and a number are positively managed for nature conservation.
- Reedbeds are a key selection feature for SINC designation, and all remaining examples are likely to qualify for selection.
- Reedbed bio-filtration technology is increasingly used in water treatment facilities, for example in sewage treatment works and roadside balancing ponds, although most schemes to date have been small-scale.
- Two international treaties have been set up, targeting the conservation of birds, comprising the EC Birds Directive and the Ramsar Convention, both of which give support to the conservation of reedbeds as a key bird habitat.
- Water Level Management Plans can play an important part in the conservation of Reedbeds by maintaining suitable hydrological conditions; there are currently none in Bridgend County Borough area.

Future Action:

- Prepare a map indicating all known reedbed sites in the county borough, and their current conservation status (i.e. SSSI or proposed SINC) (Action: BCBC; BBP; CCW).
- Consider designation of all remaining reedbeds in the county borough as SINCs, and ensure protection through appropriate UDP and SPG policies (Action: BCBC).
- Publicise the need for continuing protection and management of these habitats, and their importance to biodiversity in the region and nationally (Action: BCBC; BBP; GWT; CCW).
- Encourage appropriate land management practices necessary to maintain the habitats (Action: BCBC; GWT; CCW; EA).

- Seek to establish at least 5ha of new reedbed habitats at selected sites by 2005, for example through water treatment, balancing pond or tip restoration projects (Action: BCBC; CCW; EA).

Information Sources:

GlamBAG (1999)
UKSG (1995b)

Fens and Flushes

Fens are a UK BAP Priority Habitat. Flushes are a related habitat type which commonly occur with, and share, many of the same features as fens in Glamorgan,

Definition and Description:

Fens are a particular type of wetland habitat which forms where lack of drainage is coupled with the inflow of water from surrounding lands, sometimes enriched with dissolved nutrients, leading to the development of characteristic marshland vegetation. They usually occur on peat which is 0.5m or more in depth, although they can also form on certain mineral soils, usually in topographic depressions. The vegetation is usually of an acidic, peatland mire type although this will depend on the chemistry of the inflowing water, and neutral or base-rich fens may also arise.

A distinction can be made between fens where the dominant plane of water movement is lateral (soligenous) or vertical (topogenous). The former usually occurs on flushed hill tops and valley sides, and the latter in valleys, hollows and depressions. The two categories commonly grade together via a seamless transition.

In South Wales, flushes often occur with fens and intergrade with them in such a way that it is difficult to distinguish the two. Flushes can be defined as wetlands which form on mineral soils or peat which is *less* than 0.5m deep, and in which there is a distinct and continuous flow of water through the habitat. Flushes are normally confined to sloping ground, and in practice they are often very similar to valleyside fens. For the purposes of this LBAP the two habitats are therefore considered together.

Grasses, sedges and Sphagnum mosses are usually the principal components of fen and flush vegetation, although a wide variety of other plant species may also occur. Numerous rare and declining fauna and plant species are associated with fens and flushes, including a number which are more or less confined to these habitats. Invertebrate groups such as dragonflies, flies, moths and beetles are well represented, and they can be extremely important for their amphibian and reptile populations. Water Vole, Otter, Bittern, Reed Bunting and Cetti's Warbler may all be associated with fens and flushes.

Current Status:

The UK is believed to support a large proportion of the total European resource of fen habitats, with major strongholds in areas such as the Norfolk Broads, Cambridgeshire Fens and parts of Ireland. However, the habitat has declined dramatically in extent throughout the UK and in Europe in the last 100 years or so.

Wales supports some of the finest fenland habitats remaining in the UK, including sites such as Crymlyn Bog in neighbouring Neath Port Talbot County Borough and Nelson Bog in Caerphilly County Borough. There are estimated to be about 2700ha of fen habitats remaining in Wales, together with a further 2100ha of flush vegetation. Glamorgan supports about 180ha of fen and about 280ha of flush.

These habitats are comparatively rare in Bridgend County Borough. Current estimates suggest that the county borough supports only about 3.3ha of fen and 22ha of flush, comprising a number of small, scattered sites.

Threats:

- Drainage has been used to convert fens into land suitable for intensive grazing and the production of cereal, or for development.
- High concentrations of dissolved nutrients and agrochemicals in water running into fens and flushes from adjacent farmland cause changes in the vegetation and the loss of rare and characteristic species.
- Lack of management of existing fens and swamps results in drying-out, scrub evasion and eventual succession to woodland.
- Increased water abstraction from underlying aquifers also results in drying-out or reduction in the water flow from spring lines, lowering of water tables, and changes in water quality.
- Small areas of poorly drained land are generally vulnerable to agricultural improvement, flood alleviation schemes and development pressures.

Current Action:

- A national database of fen sites (FenBASE) is in preparation under contract to CCW, and should be available for consultation in the near future.
- All of the known key sites for these habitats in Glamorgan have been notified as SSSIs and in some cases as NNRs, LNRs, SACs or Ramsar Sites. CCW are in the process of compiling management plans for all fenland SSSIs in Wales.
- All other fen sites and the majority of flushes should be eligible for selection as SINCs.
- Development of appropriate management prescriptions and grazing levels is being achieved through agri-environmental schemes.
- The Tir Gofal agri-environmental scheme, which superseded the Tir Cymen Farm Stewardship Scheme and WOAD's Habitat Scheme, has been open to applications since April 1999 and includes whole-farm categories specific to fen management.
- Environment Agency Water Level and Local Area Plans are in preparation to counteract the adverse impacts of drainage.

- At some sites, water levels have been raised by blocking drainage ditches, whilst at others grazing has been re-introduced to control vegetation growth and the development of scrub.

Future Action:

- Identify and map all sites for these habitats in the county borough, together with their current conservation status: survey and assess sites for selection as SINCs (Action: BCBC; BBP; CCW; GWT).
- Ensure that all existing fen and key flush sites are protected from further damage or loss, through appropriate planning control and grant aid measures (Action: BCBC; CCW).
- Complete agreed management plans for key sites (Action: CCW).
- Ensure that all of the remaining fen habitats, and all key flush sites are appropriately managed and/or restored (Action: BCBC; CCW; GWT).
- Contribute to, and support, Glamorgan-wide audit and evaluation of fen and flush sites not subject to statutory protection (Action: BCBC; GlamBAG; CCW; GWT).
- Encourage the restoration of fen and flush habitats and investigate the possible creation of new habitats at appropriate locations, for example on river flood plain and in the vicinity of surviving valley mires (Action BCBC; CCW; GWT).
- Seek to ensure appropriate water quality and volume for continued maintenance of all fens and key flushes (Action: BCBC; EA; CCW).
- Increase public awareness and understanding of these habitats, their conservation significance and management needs (Action BCBC; CCW; GWT).

Information Sources:

GlamBAG (1999)
UKSG (1995b)

Blanket Bog

Blanket Bog is a UK BAP Priority Habitat.

Definition and Description:

‘Blanket bog’ refers specifically to peatland habitats in which rainfall constitutes the sole supply of water and nutrients, and there is no input from ground or surface water sources. The peat is usually more than 0.5m deep, the water level is normally maintained at or just below the surface and there is little or no topographical containment. Blanket bog habitats may occur in the lowlands but are more usually a feature of uplands, occurring chiefly on plateaux and hill slopes, especially in the north and west of the British Isles. The habitat accumulates in response to the very slow rate of plant decomposition under waterlogged conditions, which produces very acidic conditions, but is not restricted to areas of poor drainage.

In 'unmodified bog' the vegetation is normally dominated by various Sphagnum mosses, often with appreciable quantities of ericaceous dwarf-shrubs such as Ling Heather, Cross-Leaved Heath, Bilberry or Crowberry, together with various grasses and sedges. These bogs are normally 'active', peat-generating habitats.

Unmodified bog is an increasingly rare habitat, especially in the lowlands. Human factors such as drainage and water abstraction form adjacent lands has often led to the creation of 'modified bog' habitats in which Sphagnum mosses are rare and the vegetation is dominated by grasses and sedges. Purple Moor-Grass is often a feature of modified bogs, which are not normally peat-generating.

Blanket bog habitats often occur within mosaics of related habitats, including marshy grassland, flush, fen and wet heathland, and it may be difficult to distinguish between the various categories with any precision, especially on sloping ground in the intermediate upland/lowland zone. In the uplands, however, blanket bog can form a very extensive and distinctive habitat.

Many rare and declining species are associated with these habitats, some of which are highly adapted and restricted. Several species of wader and other bird species nest, forage or winter on blanket bogs, including Golden Plover, Redshank and Dotterel.

Current Status:

The British Isles are believed to support between about 10-15% of the global resource of these habitats which, like heathlands, are largely restricted to the boreal uplands of Eurasia. The total extent of blanket peat in the UK amounts to some 1.5 million hectares or so, most of which comprises blanket bog. The largest proportion of these habitats occurs in Scotland, although Wales is estimated to support about 70,000ha of blanket bog. The Welsh resource has particular biogeographical significance since blanket bog habitats are largely absent across the Welsh latitudinal range across the remainder of Britain and much of western Europe.

Blanket bog is most extensive in Wales at elevations above 250m where annual rainfall exceeds 1200mm, and is therefore concentrated in the central and northern uplands. It is comparatively scarce in Glamorgan, which is estimated to support about 924ha in total, 880ha of which is in upland situations. Bridgend County Borough is estimated to support only about 34ha of blanket bog in the uplands, and about 9ha in the lowlands. Most of the upland bog is thought to be unmodified, but only 4ha of the lowland habitats are unmodified blanket bogs.

Threats:

- Afforestation is one of the main threats to these habitats, especially the planting of conifers in upland situations. Whilst large scale planting has now largely ceased, new small scale plantations are still being proposed. Existing large plantations are causing hydrological impacts through increased dessication and acidification.
- Drainage has been used to convert many blanket bogs into land suitable for more intensive grazing. The drainage of adjacent lands, and abstraction from

aquifers, can lead to increased dessication of blanket bogs, resulting in erosion and modification.

- Heavy grazing by sheep, cattle, deer and horses can cause changes in vegetation, erosion and modification, especially where there is also supplementary feeding which can cause eutrophication.
- Inappropriate management, especially regular and/or severe burning, can be detrimental. 'Deep fires' resulting from uncontrolled burning can cause permanent damage though loss of peat to erosion.
- Atmospheric pollution, especially by sulphates and nitrates, can cause changes in bog vegetation, with the loss of some sensitive moss and other species.
- Agricultural improvement, through drainage, fertiliser-input and conversion to pasture, leading to loss of habitat.
- Development (e.g. housing, industrial and road schemes) is a problem especially in the lowlands, although some upland sites are also threatened by wind-farm and hydroelectric schemes.
- Recreational use, especially the use of all-terrain and 4x4 vehicles, causes damage through erosion.
- Continued demand for peat extraction is a major problem in some areas of the UK, less so in Wales.
- There is a general lack of knowledge about the extent and condition of the resource, and its significance to nature conservation.
- Climate change could potentially affect many areas of blanket bog, especially through decreased precipitation.

Current Action:

- Some key sites for these habitats in Glamorgan have been notified as SSSIs and in some cases as NNRs, LNRs, SACs or Ramsar Sites.
- It is likely that most other sites would be eligible for selection as SINCs.
- Development of appropriate management prescriptions and grazing levels can be achieved in some cases through agri-environmental schemes including Tir Gofal.
- Current Forestry Commission policy is unlikely to support further planting of blanket bog habitats.
- Environment Agency Water Level and Local Area Plans are in preparation to counteract the adverse impacts of drainage.
- At some sites, water levels have been raised by blocking drainage ditches, whilst at others grazing has been re-introduced to control vegetation growth and the development of scrub.

Future Action:

- Identify and map all sites for these habitats in the county borough, together with their current conservation status: survey and assess sites for selection as SINCs (Action: BCBC; BBP; CCW; GWT).
- Ensure that all existing blanket bog sites are protected from further damage or loss, through appropriate planning control, management and grant aid measures (Action: BCBC; CCW).

- Seek agreed management plans for key sites, and target these with grant-aid such as Tir Gofal (Action: BCBC; CCW).
- Seek restoration of modified/degraded blanket bog sites wherever possible, for example through the blockage of drainage ditches to raise water levels (Action: BCBC; CCW; GWT).
- Encourage and publicise alternatives to peat use in horticulture and elsewhere (Action: BCBC; CCW).
- Seek removal of any conifer plantations on blanket bog at harvestable maturity, and reversion of habitat back to blanket bog (Action: BCBC; CCW; FC; CC).
- Ensure that all of the remaining blanket bog sites in the county borough are appropriately managed and/or restored by 2010 (Action: BCBC; CCW; GWT).
- Increase public awareness and understanding of these habitats, their conservation significance and management needs (Action BCBC; CCW; GWT).

Information Sources:

UKBG (1999c)

Coastal Sand Dunes

Coastal Sand Dunes are a UK BAP Priority Habitat.

Definition and description:

Coastal sand dunes form wherever there is a sufficient supply of sand in the intertidal zone to form a beach plain, the surface of which is able to dry out between tides, and where there are prevalent onshore winds. The dry sand can then be blown inland and deposited above the High Tide Mark, where in time it can become trapped by specialised grasses before eventually developing into more stable communities. Sand dunes may also more rarely develop inland in areas where prehistoric sand deposits are exposed.

Wales is particularly important for what are known as ‘western calcareous’ dune systems, and the prevailing westerly winds have produced some outstanding ‘hindshore dune systems’, where dunes build inland parallel with the edge of the sea. Such systems form where large quantities of sand are driven inland over low-lying terrain. Other types of systems include ‘bay dunes’, where sand is trapped between two headlands, and ‘spit dunes’, which form a sandy promontories at the mouths of river estuaries.

Sand dunes support an extremely diverse assemblage of flora and fauna, many of which are specially adapted to survive in dune habitats. Many rare plants, insects and fungi are associated with dunes. In addition, sand dune systems are themselves very diverse in terms of structure, being greatly affected by the physics of sand accretion and movement. Sand dunes are a complex habitat which in their unmodified state exhibit a broad transition from open sand and strandline habitats, through ‘embryo’ and mobile foredunes with skeletal vegetation (‘yellow dune’) to increasingly fixed, immobile dunes with denser vegetation (‘grey dunes’), to dense swards of coastal

grassland and scrub on sand. Where freshwater seepages occur, or fresh water is impounded by clay soils, permanent wetland areas known as 'dune slacks' may develop. All of these phases are important in supporting rare and characteristic plant and fauna species, many of which are narrowly confined to a particular phase or type of dune development.

Often fixed dune habitats are, or have been, traditionally maintained through grazing, either by stock or by rabbits. In their absence, succession rapidly proceeds to rough grassland and scrub. Dune grasslands and slacks, especially in base-rich systems, may support a rich diversity of flowering plants including a number of rare orchid species.

Current status:

Britain is estimated to contain perhaps 53,000ha of sand dunes in total, with about 8100ha in Wales. Glamorgan is estimated to support about 1400ha, with 815ha present in Bridgend County Borough. Key sites include Kenfig and Merthyr Mawr.

Threats:

- Loss through development, especially for industrial and commercial uses, and waste tipping.
- Loss through development for sand extraction; including tidal disruption caused by offshore marine aggregate extraction.
- Neglect or inappropriate management, the latter including afforestation.
- Kenfig is a registered common and the lack of fencing makes controlled grazing difficult.
- Erosion or sand-loss caused by factors such as disrupted tidal patterns, climate change, falling water tables, recreational pressure or overgrazing.
- Falling water tables may also lead to the loss of dune slack habitats, and important and specialised element of many systems.
- Loss of mobile dune elements as a result of ill-considered dune stabilisation and sea defence works; loss of mobility may lead to succession towards rough grassland and scrub.
- Scrub invasion can be a major problem, especially where sea buckthorn becomes established. This species is not native to the Glamorgan dunes and can become highly invasive, shading out important dune flora. Willow scrub may choke dune slacks.
- Ill-considered beach management, including the scouring of strandlines which is an important habitat element for many species.

Current Action:

- Most of the significant sand dune systems in Glamorgan are designated SSSIs, including both Kenfig and Merthyr Mawr
- Kenfig and Merthyr Mawr are also designated as National Nature Reserves (NNRs) and together form a candidate Special Area of Conservation (SAC) to be designated under the EC Habitats Directive.

- Scrub clearance operations are recognised as a priority on these sites, including the mechanical removal of sea buckthorn from Merthyr Mawr. There is also mechanical mowing of grasslands for nature conservation purposes.
- There is a hydrological surveillance programme in place for Merthyr Mawr and Kenfig.
- Any other smaller systems of significance would be likely to qualify for selection as SINCs.

Future Action:

- Any areas of sand dune currently outside of the existing SSSIs should be surveyed, assessed and selected for SINC designation where significant nature conservation interest remains (Action: BCBC).
- Existing sand dune resources should be protected for any losses which might arise from human sources, whether direct or indirect, including as a result of offshore minerals extraction and sea defence works (BCBC; CCW).
- Anticipated net losses due to natural causes of about 2% of the existing resource over the next 20 years should be offset by encouraging new dunes to accrete naturally, and where possible by allowing mobile dunes to move inland (Action: BCBC; CCW).
- Monitor and regulate sand and aggregate extraction schemes that might affect sand dune systems, through appropriate policies in the emerging UDP, Local plans and SPG (Action: BCBC).
- Monitor and regulate water abstraction and land drainage schemes where these might affect water tables in sand dune systems, and promote/require remedial measures where necessary, supported by appropriate policies in the UDP etc (Action: BCBC; EA).
- Encourage and promote appropriate management practices, including controlled grazing; rabbit populations are to be boosted at Kenfig as an experimental measure to increase grazing activity (Action: BCBC).

Information Sources:

GlamBAG (draft)
UKBG (1999c)

Marine Habitats Statement

1. Introduction – UK context.

Within the territorial waters of the UK a total of 19 species or species groups and 15 habitats are covered by dedicated action plans, with 12 and 10 respectively relevant in a Welsh context. The number of action plans for Welsh marine species/species groups is much less than the equivalent combined Welsh total for the terrestrial and freshwater environments (184) and this reflects the comparative scarcity of information concerning the rarity and vulnerability of marine species. In contrast, marine habitats are generally better known and the Welsh total of 10 habitats (66% of the UK total) compares more favourably with the equivalent Welsh figure of 27 priority terrestrial and freshwater habitats.

2. The significance of the UKBAP for the conservation of the marine environment, with particular reference to HAPs and SAPs.

The BAP process has made a significant contribution to the conservation of the Welsh marine environment. Broad areas of progress include the following:

- Encouraging the involvement of local people by participating in the implementation of action plans for intertidal habitats and reporting mammal and turtle strandings and sightings.

- Highlighting the importance and vulnerability of marine habitats and species in Wales in relation to specific impacts, for example bait digging in sheltered muddy gravels.

- Adding pressure to the reform of the Common Fisheries Policy – fishing features as an activity of primary concern in many marine plans.

- Bringing together experts and users of the marine environment as a means of helping to resolve difficult 'user' versus 'conservationist' issues via practical actions on the ground. The recent CCW Fisheries Seminar is a prime example.

In terms of individual action plans, areas of substantial recent progress include the following:

- UK-level steering groups are now up and running for the majority of marine plans. An action plan is being put together on a UK level to help co-ordinate plan implementation.

- Two reports documenting the Welsh distribution of Seagrass Beds and Saline lagoons have been published.

- The 1st volume of the Welsh Marine BAP Atlas has been published, a 2nd volume is due in 2001.

- The Marine SACs Life Project in Wales has include positive action for many BAP species and habitats.

- Some Welsh LBAP Plans are now including marine HAPs and SAPs.

3. Key recommendations for the future.

- Many marine habitats and species occur below Mean Low Water (see Table 1 on page 54) and thus lie outside Local Authority boundaries. Their resultant exclusion from the mainstream of LBAP activity is a serious concern and the early stages of implementation have focussed instead upon broad actions at a UK level. Mechanisms need to be found to enable more effective implementation, with actions under Natura 2000 or possibly wider sea initiatives representing two possible options.

- The Sea Fisheries Committees require extra funding if they are to contribute meaningfully to the LBAP and wider BAP process, for example by attending meetings and designating & policing no take zones etc.

- A travel fund should be established to enable participation in the BAP process by individual users of the marine environment without ready access to institutional funding – this important sector includes fishermen, bait collectors and anglers.

- There needs to be more local co-ordination within Wales of bodies such as MAFF, SFCs, CCW, EA and the Universities & Museums. These bodies have a crucial role to play in 'picking-up' those actions outside the jurisdictional control of Local Authorities.

- Many LBAPs operate in a vacuum when drafting local marine plans. There needs to be a formal process of scientific validation to ensure data accuracy and complementation between national and local plans. There is an urgent need to forge formal and practical links between LBAP officers and Marine BAP Steering Groups operating at a UK level.

- Many LBAP officers are approaching the end of short-term contracts just as marine information is becoming available for their LBAP area. Funds need to be secured to support the development of local plans and initiatives for marine priority habitats and species across Wales.

- The collation and reporting of marine BAP data needs to be co-ordinated via existing specialists in centres such as the National Museum & Gallery, Welsh Universities and CCW. This would enable validation of marine data entered onto recorder via the NBN gateway and is seen as preferable to recreating specialist expertise in Local Record Centres (which tend to have a terrestrial emphasis). Wales is unique in this respect in that the marine scientific community is already well on the way to agreeing this sort of structure.

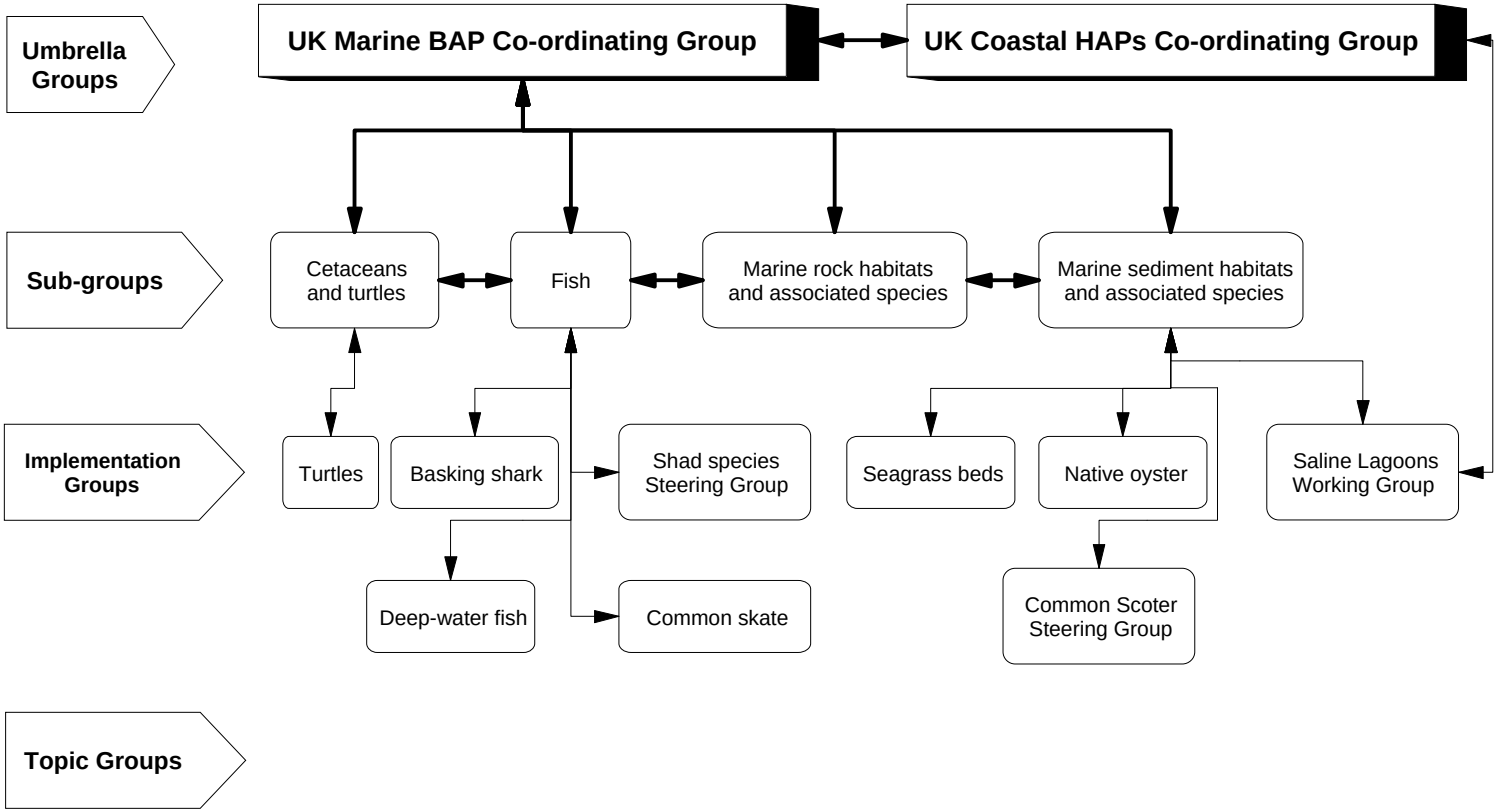
Table 1. Distribution of Welsh marine priority habitats and species in relation to Local Authority (LA) administrative boundaries.

Welsh marine priority habitats and species	Within LA boundaries and above MLW	Within LA boundaries but below MLW (in estuaries)	Outside LA boundaries. Below MLW
Native oyster		*	*
Rare red alga			*
Pink sea fan			*
Fan shell			*
Harbour porpoise			*
Baleen whales			*
Toothed whales			*
Small dolphins			*
Marine turtles			*
Basking shark			*
Common skate			*
Commercial fish species			*
Mudflats	*	*	*
Sheltered muddy gravels	*	*	*
Honeycomb worm reefs	*	*	*
Subtidal sands and gravels		*	*
Saline lagoons	*		
Tidal rapids	*		*
Horse mussel beds			*
Maerl beds			*
Seagrass beds	*	*	*
(*Sabellaria spinulosa* reefs)		*	*

- CCW, EA, LAs and others should include BAP targets within the existing management plan structure adopted for LEAPs, SAC and SSSI, NNR and MNR and coastal fora action plans.

Gabrielle Wyn
Intertidal Biologist
Countryside Council for Wales
22.06.01

Maritime Biodiversity Action Plan Management Structure



PART 2: SPECIES ACTION PLANS

Hazel Dormouse (*Muscardinus avellanarius*)

Background:

Dormice used to be a relatively common and widespread mammal in Britain, but have declined very dramatically in the period since the 1960s with the cessation of traditional coppicing and other changes in forestry practice. Today it is a rarely encountered species, having disappeared over much of its former range and being increasingly confined to the southern counties of England and Wales.

Dormice need a succession of available food sources through the course of the summer, and are thus associated with habitats where there is a great diversity of plant species available. Rapid weight gain is essential in the period following breeding and before winter hibernation if the adults are to survive the winter. Preferred foods include the fruits and nuts of Hawthorn, Hazel, Elder, Wild Cherry, Raspberry, Bramble, Oak and other trees and shrubs, as well as the flowers of species such as Honeysuckle. Bramble berries are an important food source because of their long flowering and fruiting seasons, whilst honeysuckle bark is also used as a nesting material.

Dormice rarely, if ever, descend from the woodland canopy and therefore require an abundance of arboreal continuity to act as walkways and routes from one area of a habitat to another. They are therefore most often a species of ancient semi-natural woodlands and similarly diverse habitats such as ancient hedgerows, mixed scrubland and, occasionally, other habitats such as reedbeds. Traditional management of these habitats helped to maintain the structural and species diversity of these habitats in the past, and was probably a key factor in the former abundance of dormouse.

Current Status:

Population densities are always low, even in good habitats. They never occur at densities of greater than about 10 per hectare.

Dormouse is scarce in South Wales generally, with only a scatter of known locations in Glamorgan. There are only three sites in Bridgend County Borough where reports of Dormouse have been reliably made in recent years: these are at the Island Farm Prisoner-of-War camp south of Bridgend, at Heol-y-Cyw (east) and at Craig-yr-Aber. The county borough contains numerous habitats which appear superficially suitable for this secretive species, however, and other populations may have been overlooked.

This species is fully protected under the Wildlife & Countryside Act and is a species of conservation concern throughout Europe, being listed as a European Protected Species in the EU Habitats Directive. It is a Priority Species in the UK BAP.

Current Factors Causing Loss or Decline:

- Loss and reduction of suitable woodland habitats, scrub and hedgerows.

- Increased fragmentation and isolation of habitats, leaving small non-viable dormouse populations unable to disperse and forage.
- Inappropriate management of habitats, including mechanical flailing of hedgerows.
- Cessation of traditional small-scale block coppicing of woodlands; where commercial coppicing still occurs this is often large-scale and affects too much of the woodland habitat all at once.
- Plantation of semi-natural woodlands with even-aged, monoculture stands of timber trees, often of non-native species.
- Removal of woodland understorey to facilitate forestry access.
- Neglect of woodlands, for example self-seeded regeneration not thinned leading to shading and loss of species diversity.
- Mature woodland cover not harvested, leading to increased shading.
- Lack of knowledge about the distribution of this species in the county borough.
- Climate change may be leading to localised extinctions, especially in elevated or exposed locations.

Current Action:

- The species is fully protected under current legislation.
- All remaining sites in Glamorgan are likely to qualify as SINCs.
- There has been significant research nationally to investigate the conservation requirements of dormice.
- A *Dormouse Conservation Handbook* has been published (Bright *et al* 1996).

Future Action:

- Maintain all existing dormouse populations in the county borough, and encourage expansion of populations into suitable habitats elsewhere.
- Encourage public participation in surveys for this species through workshops and schools, ‘nut hunts’ (for the characteristically gnawed hazelnut shells discarded by dormice in autumn), workshops and so on (Action: BCBC; CCW; GWT).
- Identify and map suitable habitats in the county borough, and target surveys to check for dormouse presence (Action: BCBC; CCW; GWT; BBP).
- Assess all suitable sites and consider for SINC designation where appropriate (Action: BCBC; BBP; GlamBAG).
- Require dormouse surveys and suitable mitigation/compensation for all development proposals affecting, or potentially affecting, dormouse habitats (Action: BCBC).
- Promote suitable management for dormice and target grant aid towards suitable habitats, for example through Tir Gofal and the Woodland Grants Scheme (Action: BCBC; CCW; GWT; CC; FC).
- Investigate reinstatement of small-scale coppice management in council-owned woodlands (Action: BCBC).
- Encourage landowners with suitable woodlands to take up hedge-planting and native woodland planting schemes to increase continuity between habitats (Action: BCBC; CCW; GWT).

- Liaise with Forestry Commission regarding appropriate management of any suitable broadleaved woodlands remaining within commercial plantations (Action: BCBC; CCW; GWT).
- Promote suitable management of hedgerows (see under 'Ancient and/or Species-Rich Hedgerows', above) (Action: BCBC; CCW; GWT).
- Promote dormouse nest-box schemes in suitable woodlands (Action: BCBC; CCW; GWT).
- Investigate possibility of reintroduction projects in the county borough (Action: BCBC; CCW; GWT).

Information Sources:
Bright *et al* (1996)
Harris *et al* (1995)
Morris (1993)
UKSG (1995b)

Bats (*Chiroptera*: All Species)

Background

There are about 16 or 17 species of bat resident in the UK and almost all of these are believed to be in decline, some seriously so. They are a difficult group to survey and identify in the field, requiring specialised knowledge and equipment. However, many of their conservation needs are similar and it is therefore deemed appropriate to consider all of the British bat species under a single Species Action Plan.

All bat species and their roosts are fully protected under the Wildlife and Countryside Act and are also European Protected Species under the EU Habitats Directive. Bats are Priority Species in the UK BAP.

Bats are flying insectivorous mammals. The different species have differing habitat requirements and differ in the details of their life-cycle strategies, but in general all of the species require suitable hibernation sites where they can pass the winter. These must offer stable temperature and humidity conditions within fairly narrow tolerances, and are most often found in features such as caves, mines, cellars and underground structures. In the spring and early summer they all need nursery roost sites, often with high ambient temperatures, where pregnant females can give birth and rear their young. These are usually in locations such as roof spaces, under roofing felt and in tree hollows and crevices, etc. During the remainder of the summer and autumn, aggregations of males especially, and groups and individuals of both sexes, require day-time roosts in a variety of locations depending on weather conditions and proximity to seasonally available food sources. In addition, all adult bats need suitable foraging habitats which are highly productive of prey invertebrates, and in some cases they also need linear habitat features to navigate through the countryside and social congregation sites where courtship and other behaviour can take place.

Current Status:

As noted above, all bat species are considered to be threatened in the UK and the most are actively declining in range and numbers. About half of the resident species classed as 'rare' in the UK, two are classed as 'endangered' and one is now more-or-less extinct.

Bat species known or believed to occur in Bridgend County Borough include Lesser Horseshoe, Pipistrelle, Soprano Pipistrelle and Brown Long-eared bats. Other species which are likely to occur, but for which firm recent data are lacking, include Daubenton's, Whiskered, Brandt's and Natterer's bats, as well as Noctule and perhaps also Serotine.

Current Factors Causing Loss or Decline:

- Destruction or disturbance of roost sites, especially hibernation and nursery roosts, for example in mines, caves, roof spaces and large standing trees.
- Destruction of invertebrate-rich foraging areas, such as woodlands, hedgerows, marshy grasslands and unimproved pastures.
- Fragmentation and isolation of bat foraging habitats, especially for species such as Lesser Horseshoe Bat which requires linear habitat corridors through the countryside.
- Use of toxic chemicals to treat timbers in roof spaces, and agrochemical pesticides, which either cause direct toxicity or deprive foraging bats of prey.
- Lack of knowledge about the distribution and numbers of bats in the county borough.

Current Action:

- All bat species and their roosts are fully protected under current legislation, affording some protection where roost sites are known about or detected during planning and development.
- Important roost sites would qualify for SINC status, affording further protection.
- The Glamorgan Bat Group (GBG), a voluntary group of specialist surveyors and advisors working in close liaison with CCW, responds to public concerns and queries about bats, and carries out some survey work, although this is hampered at present by low membership.
- Public awareness and sympathy towards bats has been improved in recent decades through positive promotion by the conservation agencies and other bodies.
- A *Bat Worker's Manual* (Mitchell-Jones & McLeish, 1999) and a range of other advisory manuals and booklets are available.

Future Action:

- Maintain all roosts in the county borough of the rarer species, and all significant roosts of less threatened species (i.e. Pipistrelle, Soprano Pipistrelle and Brown Long-eared bats), in close liaison with CCW (Action: BCBC; CCW; GWT; GBG).

- Maintain significant areas of bat foraging habitats, especially through the HAPs for Priority Habitats in Bridgend County Borough (see Part 1, above) (Action: all parties).
- Encourage the creation of new roost sites, and expansion of suitable foraging habitats (Action: BCBC; CCW; GWT; GBG and others).
- Designate all sites which are significant for bats in the county borough as SINCs.
- Require bat surveys and suitable mitigation/compensation for all planning proposals which affect, or potentially affect, bats in the county borough (Action: BCBC).
- Contribute to county-wide surveys of bats and take action to map and record all known roost sites in the county borough (Action: BCBC; GBG).
- Encourage public participation in the discovery of bat roosts and the conservation of bats through publicity campaigns, workshops and events etc (Action: BCBC; BBP; GBG; GWT).
- Encourage the use of bat boxes and bat-friendly management on all council-owned sites (Action: BCBC; GBG).
- Disseminate the *Code of Practice for Tree Works Affecting Bats* (BCT 1997) amongst foresters, landowners and all persons engaged in works affecting trees (Action: BCBC; FC; CC).

Information Sources:

Arnold (1993)
Bat Conservation Trust (1997)
Harris *et al* (1995)
Mitchell-Jones & McLeish (1999)
Morris (1993)
UKSG (1995b)
UKBG (1998a)

Otter (*Lutra lutra*)

Background:

Otters were formerly widespread in Wales, but in keeping with much of the rest of the UK, virtually disappeared during the 1960s and 1970s as result of pesticide use, habitat destruction and direct persecution. The toxic pesticides responsible were withdrawn in the 1980s, and together with more sympathetic management and conservation effort, otter is now making a comeback in many of its former haunts. This species is now believed to have recovered much of its pre-1960s range, but its numbers remain very low in many areas.

The Otter is a carnivorous mammal feeding mainly on fish and therefore associated with rivers, streams, canals, lakes and wetlands. It requires comparatively undisturbed habitats with good bankside vegetation cover where it can move unseen. It makes nests for breeding and resting-up in sites such as hollows beneath bankside tree roots and under flood debris etc. Otters may range over long distances, often exploiting whole river catchment systems from their headwaters in the hills to their

coastal estuaries, sometimes foraging in the maritime habitats of the coastal strip and inter-tidal zone. Otters will even range unseen through built-up areas and urban locations where there are river systems with suitable cover and lack of disturbance.

The Otter is a fully protected under the Wildlife & Countryside Act and is a European Protected Species under the EU Habitats Directive. It is a Priority Species in the UK BAP.

Current status:

The Otter is widespread in all parts of the UK, although still comparatively rare in the Midlands, southeast England and south Wales. As noted above, it seems to be expanding its range to occupy former haunts, although numbers remain very low outside of the key strongholds in undisturbed parts of Scotland, central Wales and south-west England.

There has been a steady increase of records in Glamorgan in recent years, usually associated with the less-disturbed and rural parts of the major river systems but also in small numbers in suburban locations and along the coast. In Bridgend County Borough otters presently occur on the Ewenny and Ogmore Rivers.

Current Factors Causing Loss or Decline:

- Poor water quality in many rivers, especially localised pollution arising from abandoned mine-workings. This depresses prey numbers.
- River engineering works resulting in continuing disturbance, loss of bankside vegetation cover and replacement of natural river beds with hard-engineered alternatives (e.g. blockstone).
- Disturbance by anglers, who clear bankside vegetation and cause localised disturbance.
- Intensive management and landscaping of river, canal and lake banks for human access and recreation, causing loss of vegetation cover and nesting sites.
- Waterborne recreational uses, including motorised boats, jet-ski activities etc, causing disturbance and localised oily pollution.
- Road kills: many otter foraging routes are severed by roads which otters are unable to pass beneath.
- Incidental deaths caused by drowning in eel-traps and discarded angling gear.
- Direct persecution: illegal shooting and hunting with dogs is probably rare at present, but could increase as otter numbers increase in the future. There may also be future conflict with fishing interests and commercial fish-rearing operations.

Current Action:

- The Otter is fully protected under current legislation. Any site supporting otter populations would qualify for designation as a SINC.
- The Wildlife Trusts & Welsh Water 'Otters & Rivers Project' has its Welsh officer based in Tondu, Bridgend, with a brief to promote the JNCC *Framework for*

Otter Conservation in the UK. This continues the work of the former *Otter in Wales* project (1979-1999).

- Target surveys of Welsh otters have been undertaken at 5-7 yearly intervals in the past by the Vincent Wildlife Trust (VWT) and other bodies, most recently in 1991, and may be repeated in the future.
- The *Otter and River Habitat Management* handbook is available (EA, 1999).

Future Action:

- Maintain all existing otter habitats and populations in the county borough and encourage the expansion of this species into suitable habitats elsewhere (Action: BCBC; CCW; GWT; EA).
- Assess and select all suitable otter habitats as SINCs (Action: BCBC; EA).
- Target grant aid through mechanisms such as Tir Gofal towards the good management of land bounding river systems (Action: BCBC; CCW).
- Require an otter survey, together with suitable mitigation/compensation, for all development proposals affecting, or potentially affecting, otters and their habitats (Action: BCBC).
- Encourage public awareness and participation in otter survey and conservation, through workshops, publicity campaigns and events etc (Action: BCBC; CCW; GWT; EA).
- Compile and co-ordinate records of known otter activity in the county borough (Action: BCBC; CCW; GWT; BBP; EA).
- Identify otter conservation, including the maintenance/creation of suitable bankside cover, water quality issues, artificial nest sites etc, as a key objective in any operations undertaken by the council affecting rivers, canals and suitable lakes (Action: BCBC; EA).
- Agree and implement management plans for otter on suitable watercourses where human access and amenity use is being encouraged (Action: BCBC; CCW; GWT; EA).
- Ensure that all new road schemes which cross watercourses used, or potentially used, by otters incorporate suitable otter tunnels which allow continued access by otters beneath the road (Action: BCBC; CCW; EA).
- Consider the provision of suitable otter crossing beneath any known road-kill 'blackspots' in the county borough (Action: BCBC; EA; HA).
- Liaise with the EA, anglers groups and fishery bodies on good practice, conflict-reduction and conservation measures for otter; support fish-farm owners in reducing otter predation of stocks (Action: BCBC; CCW; GWT; EA).
- Identify key pollution issues affecting major river systems and other otter habitats, and plan remediation as far as possible; liaise with mine-owners on reduction of mine-water impacts (Action: BCBC; EA).

Information Sources:

Andrews *et al* (1993)
Environment Agency (1999)
Harris *et al* (1995)
Morris (1993)

Water Vole (*Arvicola terrestris*)

Background:

The Water Vole is a small rodent associated with watercourses, lakes and wetlands. It was a common and widespread species until comparatively recently, but appears to have declined in distribution and numbers very sharply since about the mid-1980s. The reasons for its decline are probably a combination of habitat loss or degradation, pollution and predation by Mink, and possibly also the effects of climate change which cause prolonged drought and/or flooding of habitats.

Water Voles are herbivorous, primarily feeding on the lush aerial stems of a wide range of waterside plants. In the winter period the roots and bark of woody species are eaten, together with bulbs and rhizomes. Each vole has a series of burrows, which may be a complex network of residential burrows, bolt-holes, food storage and nesting chambers. Occasionally nests may be woven from shredded vegetation at the bases of tall swamp vegetation in reedbeds and emergent swamp. They live in colonies, but these are usually strung out over a length of waterway, forming a series of contiguous family territories.

In general, Water Voles prefer sluggish, narrow, fresh watercourses up to about 3m wide and 1m deep which are not subject to extreme fluctuations in water level. Permanent water is essential, especially in summer, whilst sites which suffer prolonged winter flooding (i.e. about 7 days or more at stretch) are avoided. Steep earth or clay banks are preferred for burrowing, and continuous vegetation cover is probably essential. They are not especially affected by disturbance, but are vulnerable to predation.

The national decline of the Water Vole has led to its partial protection under the Wildlife and Countryside Act, whereby it is now an offence to damage or destroy, or obstruct access to, any of the habitats which the voles use for shelter, or to disturb the animals whilst they are occupying such habitats. The presence of Water Voles can be a material consideration in the determination of a planning application.

The Water Vole is a UK BAP Priority Species.

Current Status:

Water Voles remain widespread in the UK, but are commonest in the south and east of England. The species is widespread but comparatively scarce in Wales, is rare over much of South Wales, with only a very limited number of sites in the former county of Glamorgan.

In the late 1990s it became apparent that the Kenfig River supported a population of Water Voles, confirmed by the surveys carried out by the GWT. The only other substantial Water Vole population in the county borough is believed to be at Parc Slip.

Current Factors Causing Loss or Decline:

- Loss and fragmentation of habitats, especially as a result of development and river engineering works.
- Degradation of habitats, through factors such as overgrazing, recreational pressure, pollution of watercourses, siltation and neglect of watercourses.
- Disturbance of watercourses through development as human amenities, recreational use, motorised boats etc.
- Predation by Mink: American mink have escaped, or been released, from many fur farms in the British Isles and the naturalised population is growing and consolidating.
- Pollution of watercourses by agrochemicals, including rodenticides, mine-water outfalls and leachates etc: these may either have direct toxicity to the water vole or may suppress the growth of plants which are essential as food sources.
- Water level fluctuation caused by climate change, leading to prolonged winter flooding and/or summer drought.

Current Action:

- Water Vole is afforded considerable statutory protection under current legislation.
- All sites supporting Water Vole populations are likely to qualify as SINCs.
- Water Vole conservation is a key consideration in recent Local Environment Agency Plans (LEAPs) for the management of water catchments in the county borough.
- Tir Gofal offers opportunities to enhance riparian management for Water Voles.
- A national Water Vole survey was carried out in 1989-1990 (Strachan & Jefferies, 1993)
- A *Water Vole Conservation Handbook* is available (Strachan, 1998).
- A draft detailed SAP has been prepared for Water Vole in Bridgend County Borough (BCBC, 2000)
- Research has indicated that watercourse which are occupied, or reoccupied, by Otter have lower Mink populations, and that this may also therefore assist in the protection and recovery of Water Voles.

Future Action:

- Maintain and enhance all remaining populations of Water Vole in the county borough, and encourage its spread into suitable habitats elsewhere (Action: BCBC; CCW; GWT; EA).
- Compile and co-ordinate recording of Water Vole in the county borough, and map all known occurrences now and in the future (Action: BCBC; CCW; GWT; EA).
- Investigate possible locations for the enhancement and/or creation of habitats suitable for use by Water Vole (Action: BCBC; CCW; GWT; EA).
- Assess and select all suitable Water Vole habitats as SINCs (Action: BCBC; EA).
- Target grant aid through mechanisms such as Tir Gofal towards the good management of land bounding river systems (Action: BCBC; CCW).

- Require a Water Vole survey, together with suitable mitigation/compensation, for all development proposals affecting, or potentially affecting, Water Voles and their habitats (Action: BCBC).
- Encourage public awareness and participation in Water Vole survey and conservation, through workshops, publicity campaigns and events etc; ensure that public utilities are aware of important colonies (Action: BCBC; CCW; GWT; EA).
- Identify Water Vole conservation as a key objective in any operations undertaken by the council affecting rivers, canals and suitable lakes (Action: BCBC; EA).
- Agree and implement management plans for Water Voles on suitable watercourses where human access and amenity use is being encouraged (Action: BCBC; CCW; GWT, EA).
- Ensure that all new road schemes which cross watercourses used, or potentially used, by Water Vole incorporate suitable underpasses which allow continued access beneath the road (cf Otter) (Action: BCBC; CCW; EA).
- Identify key pollution issues affecting major river systems and other Water Vole habitats, and remediate as far as possible; liaise with mine-owners on reduction of mine-water impacts (Action: BCBC; EA).
- Monitor Mink population and consider possible control measures if required in the future (Action: BCBC; CCW; GWT, EA).
- Investigate the possibility of reintroducing Water Voles to former haunts or where habitat is suitable.

Information Sources:

BCBC/BBP (2000)
Harris *et al* (1995)
Morris (1993)
Strachan (1998)
Strachan & Jefferies (1993)
UKSG (1995b)

Barn Owl (*Tyto alba*)

Background:

The Barn Owl is a medium-sized nocturnal bird of prey found in a variety of lowland habitats, but which is almost always associated with open grassland, woodland edges and mixed traditional farmland where its main food source, voles and mice, are abundant. Small field systems are preferred, with mixtures of grazing and crop cultivation and with an abundance of traditional lowland pastoral features such as hedgerows, small woods and copses, rough verges, lanes and untreated field boundaries. Nest sites are usually found in buildings, preferring traditional style barns, sheds and outbuildings, but also utilising ruined farmhouses, chimneys and mature trees. Nesting usually occurs on an elevated ledge or crevice with a clear line of flight for entry. Tree cavities and rock ledges are also sometimes used for nesting.

The Barn Owl has been declining in the UK since the 1930s, probably as result of a combination of factors, including changed farming practices, the decline of traditional mixed farming, elimination of small-scale farm habitat features and field systems, habitat fragmentation, agrochemical pollution, the suppression of rodents around farms and increased rates of road-kill. The decline has been particularly marked since the mid-1950s.

The Barn Owl is fully protected under the Wildlife & Countryside Act and is also a UK BAP Species of Conservation Concern. This species has been subject to quite extensive captive-rearing and release, but with generally rather poor results.

Current Status:

Current estimates suggest a population of about 1300 pairs of nesting Barn Owl in the British Isles, widespread but commonest away from Scotland and the Midlands. There are probably around 450 pairs in Wales, with only around a dozen or so pairs confirmed breeding in Glamorgan.

Barn Owls are scarce in Bridgend County Borough, with only one recent confirmed breeding site near Caerau, Maesteg in recent years, and a second possible site at nearby Nant y Ffallon. Single birds are often reported from around Bridgend town, many as road casualties in the M4/A48 corridors.

Current Factors Causing Loss or Decline:

- Loss of habitat due to changes in agricultural practice, afforestation and development. The loss of small fields, hedgerows, species-rich hay meadows and unimproved pastures has been especially significant.
- Loss of nest and roost sites through dereliction or renovation of traditional farm buildings, or their replacement with modern alternatives which are generally unsuitable for Barn Owl.
- Toxic pesticides residues, especially rodenticides, which accumulate in Barn Owl tissues.
- Reduction of prey densities by rodenticides, leading to diminished food supplies for owls.
- Increased urbanisation, leading to fragmentation and isolation of habitats.
- Road-kills resulting from increased levels of road building and concomitant traffic levels, higher traffic speeds and increasing dependence of Barn Owls on road verges for hunting as traditional farmland habitats become unsuitable.
- Climate change may be affecting this species, which is at the edge of its European Range in the British Isles.

Current Action:

- The Barn Owl is fully protected under current legislation.
- All sites supporting breeding Barn Owl are likely to qualify as SINCs.
- Presence of Barn Owl would be a material planning consideration with respect to change of use or other development proposals.

- Tir Gofal agri-environmental scheme should result in improved habitat management for this species.
- Proposed HAPs for key habitats such as Lowland Hay Meadows and Old Pastures (see Part 1, above) should benefit this species.
- Glamorgan Bird Club (GBC) is compiling records for Barn Owl in Glamorgan, and monitors any changes.

Future Action:

- Maintain all existing sites for nesting barn owl and encourage expansion into suitable habitat elsewhere (Action: BCBC; CCW; GWT).
- Target grant aid through mechanisms such as Tir Gofal into the appropriate management of key habitats for this species (Action: BCBC; CCW; GWT).
- Encourage public participation in survey and conservation of Barn Owl, through workshops, publicity campaigns and events etc (Action: BCBC; CCW; GWT).
- Require Barn Owl surveys, and appropriate mitigation/compensation, for any development proposals which affect, or potentially affect, Barn Owls or their habitats (Action: BCBC).
- Consider conditioning of planning consents affecting agricultural buildings, including barn conversions, to require provision of Barn Owl nesting sites or nest boxes (Action: BCBC).
- Encourage use of Barn Owl nest boxes in suitable locations, and facilitate purchase and installation through appropriate grant aid; these could include new telecommunications masts (Action: BCBC; CCW).
- Encourage and facilitate appropriate management of field margins etc for Barn Owl use through advisory services, grant aid etc (Action: BCBC; CCW; FRCA).
- Ensure that appropriate management for Barn Owls is practised on any suitable land owned and/or managed by the council (Action: BCBC; CCW).
- Identify any road-kill 'blackspots' and investigate possible remediation, for example through landscape measures or management which reduce their suitability and attractiveness to foraging Barn Owls (Action: BCBC; CCW; GWT; GBC).

Information Sources:

BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Hurford & Lansdown (1995)
Gibbons *et al* (1983)
Shawyer (1987)

Lapwing (*Vanellus vanellus*)

Background:

Lapwing is a wader species which breeds on open ground with very short, patchy vegetation, but which also requires tall marshy vegetation nearby for its chicks to feed and shelter in. It was formerly a very widespread and common bird of lowland farmland throughout the UK which although still comparatively common has

nevertheless declined very dramatically in the period since the mid-1980s over much of its range.

Changes in agricultural practice appear to have been one of the main causes of this decline, especially the movement away from spring tillage and spring-sown cereals which formerly provided ideal nesting conditions at the right time of the year. The decline of mixed farming, conversion of pasture grazing from sheep to cattle and poor productivity of invertebrate prey under intensive agriculture are also thought to be significant.

Increasingly, Lapwings have been unable to find suitable nesting habitats in the farmland environment and have been forced to find alternatives. They are therefore increasingly to be found nesting on large industrial and commercial sites which have been cleared and levelled for re-development. If these sites are left undeveloped for any length of time there is a risk that breeding Lapwings can become well established, resulting in conflict when development eventually takes place. Any breeding Lapwings are displaced, often immediately before or even during nesting, causing loss of recruitment to the population. In any event, these sites are often sub-optimal for breeding Lapwing, and support far fewer pairs in total than would originally have been present in the surrounding farmland. Small colonies or isolated pairs are especially vulnerable to predators, especially carrion crows. Research indicates that poor reproductive success is a major factor in the Lapwing's decline.

In winter the total population of adult lapwings in the UK is boosted by migrants, and the UK's wintering Lapwing population is therefore regarded as being of international significance. However, agricultural intensification is believed to be having an adverse impact on wintering populations as well, leading to reduced survivorship and poor breeding condition.

Lapwing is a protected species under the Wildlife & Countryside Act, and is a UK BAP Species of Conservation Concern.

Current Status:

Recent estimates suggest that the total number of pairs in England and Wales has declined by nearly half during the 1990s. It is probable that the total breeding population in the British Isles as a whole is about 130,000 pairs, but many of these are concentrated in northern England and eastern Scotland. There has been a decline of 20% or more in the past five years.

It is a scarce species throughout Wales, where the total breeding population is now estimated to be no more than about 1500 pairs. The species has declined by 77% in Wales in the period 1987-1998. There are probably about 120-130 pairs in Glamorgan. Breeding occurs at a small number of sites in Bridgend County Borough, notably at Parc Slip, which annually supports between 6 and 10 pairs. Numbers at Kenfig NNR have dwindled from a maximum of 14 pairs in the 1980s to just one or two pairs in recent years. Five pairs nested in fields close to Cornelly in recent years, but these birds invariably fail due to the onset of agricultural activity following egg-laying. In winter, Lapwing occurs in moderate numbers along the coast.

Current Factors Causing Loss and Decline:

- Cessation of spring-tillage and spring-sown cereal production, and increased mechanisation of arable production.
- Loss of unimproved grassland and general intensification of farm grassland management.
- Increased livestock numbers and, therefore, trampling of nests..
- Switch from sheep production to cattle production, with increased trampling of nests.
- Reduction in mixed farming practice in favour of intensive cereal production or cattle grazing.
- Fragmentation and isolation of suitable nesting habitats.
- Drainage and improvement of marginal grasslands.
- Afforestation of upland grasslands.
- Climate change, resulting in more frequent extreme winter weather conditions, autumn flooding and summer drought.
- Human disturbance of nesting and wintering sites, through recreation and amenity use, vehicle movement etc.

Current Action:

- The RSPB *Lapwing in Wales* project is monitoring populations in Wales and characterising the Lapwing's breeding requirements.
- The Wetland Bird Survey (WeBS) organised by The Wildfowl & Wetlands Trust (WWT) monitors winter populations on wetlands, estuaries and waterbodies.
- Strategic approaches to the enhanced survival of remaining populations are being developed throughout the region.
- Key sites for breeding and wintering Lapwing are likely to qualify as SINCs.
- The species is being accommodated where possible on industrial and commercial development sites.

Future Action:

- Co-operation with, and contribution to, strategic conservation initiatives in the region arising from the *Lapwing in Wales* project (Action: BCBC; GBC).
- Require Lapwing surveys and, where possible, negotiate mitigation/compensation measures in developments affecting nesting Lapwings (Action: BCBC).
- Use grant aid (e.g. Tir Gofal) to encourage appropriate management of key sites for nesting Lapwing (Action: BCBC; CCW; RSPB; GWT).
- Identify key breeding sites and select as SINCs where appropriate (Action: BCBC; CCW; RSPB; GWT; GBC).
- Investigate possible sites for habitat creation for nesting Lapwing, and target for action (Action: BCBC; CCW; RSPB; GWT).
- Assess vacant industrial and commercial landholdings, and where likely to remain undeveloped for periods of 5 years or more, manage for nesting Lapwing; where development is imminent, manage such sites to *deter* use by nesting Lapwing (Action: BCBC; CCW; RSPB; GWT).

- Encourage appropriate management of key habitats through implementation of the HAPs set out in Part 1, above (Action: all bodies).
- Develop public and developer awareness of Lapwing as a species in need of active conservation, through publicity campaigns, leaflets, workshops etc (Action: BCBC; CCW; RSPB; GWT).

Information Sources:
BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Gibbons *et al* (1983)
Hurford & Lansdown (1995)
Tucker *et al* (1994)

Skylark (*Alauda arvensis*)

Background:

Skylark is a characteristic species of open, rough grassland of many kinds, together with open habitats of other kinds including heathland, arable land and saltmarsh, the adults proclaiming their territory with a clear, warbling song delivered on the wing in high, hovering flight. Habitats containing trees, scrub, abundant hedges or bushes are avoided. Nesting takes place usually against a small tuft or clump of grassy vegetation in spring and early summer. Skylarks form flocks in winter, the numbers of which are augmented by migrants from Europe and elsewhere.

It was a common and widespread bird until the 1980s, being the single most widely distributed breeding species at the time of the 1968-72 bird atlas project. More recent surveys have shown that it remains a very widely distributed species in the British Isles, but that population densities have fallen by more than half in the period up until about 1991, representing a loss of almost 1.6 million pairs in just over 20 years.

The main reasons for these losses appear to be changed agricultural practices, in particular the trend towards autumn-sown cereals and away from and vernally-sown cereals. Changes in stocking and agricultural intensification have also had an impact on this species, as has the increase in urban development.

The Skylark is fully protected under the Wildlife & Countryside Act, and is a UK BAP Priority Species.

Current Status:

There are presently estimated to be about 2 million breeding pairs of Skylark remaining in the British Isles. In Wales there has been a slow, progressive loss of suitable habitat since the Second World War, mainly due to urban development, afforestation and agricultural intensification. The rapid post-war expansion of sheep farming in Wales also produced many swards which were too close-cropped for nesting Skylark. Nevertheless it remains a widespread and comparatively common

species, although clear declines in numbers have been evident over the period since about 1980.

In Glamorgan, the Skylark is regarded as a common and widespread breeding resident, widely distributed in the county although preferring the coast, and absent only from the urban and wooded areas. Some local increases may have occurred in some parts of the county, but these are recognised to have occurred against a general national trend of continuing decline. The species is widespread but declining in Bridgend County Borough, with key sites including Sker, the Llynfi Valley, Kenfig and the Ogmore Estuary.

Current Factors Causing Loss or Decline:

- Continuing intensification of agriculture land, especially grasslands.
- Routine use of pesticides, herbicides and insecticides which cause both direct toxicity and the depression of food sources.
- Switch away from spring-sown to autumn-sown cereals, depriving Skylark of nesting habitats.
- Winter stubble is more often ploughed-in, removing food sources.
- Increased stocking rates in grazed pastures, leading to loss of nest sites through trampling and over-shortening of the turf.
- Early silage-cutting, which destroys nests and/or exposes nesting birds to predation.
- Climate change, leading to more prolonged winter flooding of potential nesting sites.

Current Action:

- Little direct action is currently being taken. Breeding and wintering populations are being monitored through national recording schemes.
- Key sites for nesting Skylark are likely to qualify as SINCs.

Future Action:

- Seek to halt the present decline in breeding numbers at least at existing levels, and encourage increases in numbers through appropriate management (Action: all bodies).
- Ensure a high profile for the issue of declining farmland birds generally, using skylark as a key example, amongst landowners, farmers and the public at large (Action: BCBC; CCW; RSPB; GWT).
- Continue contribution towards national and regional survey and monitoring (Action: GBC; RSPB; BTO)
- Seek more suitable management of landholdings through mechanisms such as the Tir Gofal agri-environment scheme, and target grant aid accordingly (Action: BCBC; CCW).
- Require surveys, and appropriate mitigation/compensation for development proposals which affect, or potentially affect, sites for nesting Skylark (Action: BCBC).

Information Sources:
BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Gibbons *et al* (1993)
Hurford & Lansdown (1995)
UKSG (1995b)

Whinchat (*Saxicola rubetra*)

Background:

Whinchat is a breeding summer visitor typically preferring upland and semi-upland areas, where it nests on the ground amongst open grassland, bracken, heather and gorse. It occurs most commonly in Scotland, northern England and Wales, favouring the central and western upland regions of the latter. The rough, uneven landscapes left by former mining activity often suit this species, as do cleared industrial sites in the upland fringes. Open lowland and coastal sites also used to be occupied quite extensively in Britain, but the species has steadily withdrawn from these in recent decades.

Whinchat has declined as a breeding species very considerably in the period since about 1980, with some areas of the country showing declines of 70% or more. As with many other bird species, the main reasons for this decline appear to have been agricultural intensification, especially the drainage and improvement of formerly damp, uncultivated habitats in the lowlands, and afforestation and improvement in the uplands and bracken slopes. Declines have been recorded throughout the Whinchat's western European range.

Whinchat is protected under the Wildlife & Countryside Act, and is a UK BAP Species of Conservation Concern.

Current Status:

Whinchat still occurs quite extensively in northern and western Britain, but is declining nationally with marked loss of range in former lowland habitats, especially in southern, central and eastern regions. It remains widespread in northern, central and southern Wales, but is scarce to the east, favouring the uplands.

Whinchat is an uncommon breeding summer visitor in Glamorgan, with strong affinity for bracken-covered valleys in the coalfield river-valleys. It is more-or-less absent from lowland areas of the county. About 100 pairs are recorded annually, with numbers remaining reasonably stable in recent years. It is an uncommon species in Bridgend County Borough, with perhaps 6 pairs being present in the Llynfi Valley and only scattered occurrences elsewhere.

Current Factors Causing Loss or Decline:

- Continuing agricultural improvement in lowlands and semi-upland areas.
- Loss of habitat diversity.

- Reclamation and redevelopment of mine spoil and upland fringe industrial sites.
- Loss of habitat to residential, commercial and industrial development.

Current Action:

- Little direct action is currently being taken. Breeding and wintering populations are being monitored through national and local recording schemes.
- Key sites for nesting Whinchat are likely to qualify as SINCs.

Future Action:

- Seek to halt the present decline in breeding numbers at least at existing levels, and encourage increases in numbers through appropriate management (Action: all bodies).
- Continue contribution towards national and regional survey and monitoring (Action: GBC; RSPB; BTO)
- Seek more suitable management of landholdings through mechanisms such as the Tir Gofal agri-environment scheme, and target grant aid accordingly (Action: BCBC; CCW).
- Require surveys, and appropriate mitigation/compensation for development proposals which affect, or potentially affect, sites for nesting Whinchat (Action: BCBC).

Information Sources:
BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Gibbons *et al* (1993)
Hurford & Lansdown (1995)

Reed Bunting (*Emberiza schoeniclus*)

Background:

Reed Bunting is typically a lowland species of reedbeds, emergent swamp and Willow carr in wetlands around lakes and gravel pits, along rivers and in marshlands, and less often of drier habitats such as overgrown ditches and hedgerows. It may also occur occasionally in young forestry plantations and rape fields. It usually nests close to the ground amongst tall wetland vegetation and is a widespread species of lowlands throughout the British Isles, favouring the south and east of England, and Ireland.

Reed Bunting was a common and widespread species until the mid-1970s but there was subsequently a steep decline in breeding numbers in Britain in the 1980s, which dropped to less than half of previous levels. The species is still apparently in decline in many areas, although elsewhere numbers have stabilised. The main reasons appear to be agricultural improvement, especially land-drainage and the loss of suitable wetlands.

Reed Bunting is fully protected under the Wildlife & Countryside Act and is a UK BAP Priority Species.

Current Status:

There are estimated to be about 220,000 pairs of Reed Bunting nesting in Britain, and is estimated to have declined by over 70% in the past 30 years. It is a comparatively scarce species in Wales, being more or less absent from the upland areas. It is thinly distributed and scarce in Glamorgan, with about 150-200 pairs being recorded annually in recent years. There are probably about 20-30 pairs annually in Bridgend County Borough, with key sites at Maesteg and at Kenfig Pool.

Current Factors Causing Loss or Decline:

- Agricultural intensification, including the drainage and improvement of wetlands, increased use of pesticides and the loss of habitat diversity. 'Weedy' patches and rough vegetation formerly used for foraging are more often sprayed-out.
- Trend towards autumn-sown crops, with concomitant loss of winter stubbles for feeding.
- Loss of nest sites and wetlands generally through urban and industrial developments.
- Climate change, especially severe winter weather.

Current Action:

- Little direct action is currently being taken. Breeding and wintering populations are being monitored through national and local recording schemes.
- Key sites for nesting Reed Bunting are likely to qualify as SINCs.

Future Action:

- Seek to halt the present decline in breeding numbers at least at existing levels, and encourage increases in numbers through appropriate management (Action: all bodies).
- Continue contribution towards national and regional survey and monitoring (Action: GBC; RSPB; BTO)
- Seek more suitable management of landholdings through mechanisms such as the Tir Gofal agri-environment scheme, and target grant aid accordingly (Action: BCBC; CCW).
- Require surveys, and appropriate mitigation/compensation for development proposals which affect, or potentially affect, sites for nesting Reed Bunting in the county borough (Action: BCBC).

Information Sources:

BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Gibbons *et al* (1993)
Hurford & Lansdown (1995)
UKBG (1998a)

Spotted Flycatcher (*Muscicapa striata*)

Background:

Spotted Flycatcher is an insectivorous summer visitor, typically arriving quite late in the spring. It nests in open holes in trees and shrubs and can be found foraging in open deciduous woodlands, parklands, gardens and cemeteries. It is a classic garden bird in the UK, favouring warm, sheltered gardens with walls, climbers and an abundance of insect food. However, it is less common as a garden bird in Glamorgan.

It is a widespread species in the British Isles, but has been in decline since the 1960s, and sharply so in the period since about 1980. The reasons for this decline are unknown but may be chiefly climatic, although loss of nest sites and foraging habitats may be a factor locally.

The Spotted Flycatcher is fully protected under the Wildlife & Countryside Act and is a UK BAP Priority Species.

Current Status:

There are currently estimated to be about 120,000 pairs of nesting Spotted Flycatcher in Britain, fairly evenly distributed across the country, but has declined by over 70% in the past 30 years. About 150-200 pairs nest annually in lowland Glamorgan, where it remains widely distributed if somewhat scarce being noticeably absent from intensively farmed areas such as the Vale. The only regular breeding sites in Bridgend County Borough in recent years have been in Bryngarw Country Park and Norton Woods, although it also occurs sporadically elsewhere including at Blackmill Woods recently.

Current Factors Causing Loss or Decline:

- Cooler, wetter summers in Britain may be affecting breeding success.
- Climatic factors outside Britain such as drought in the African wintering grounds, and failure of the rains in the Sahel region which is used as a migratory route.
- Loss of nesting sites in mature trees in the wider countryside, and through restoration (i.e. clearance of vegetation, re-pointing of walls etc) in urban locations.
- Use of agrochemical insecticides to control pests may suppress insect prey in intensively farmed areas.

Current Action:

- There is limited action currently undertaken to conserve this species. Numbers are monitored annually by GBC.
- Key sites for this species are likely to qualify as SINCs.

Future Action:

- Seek to halt the present decline in breeding numbers at least at existing levels, and encourage increases in numbers through appropriate management (Action: all bodies).
- Continue contribution towards national and regional survey and monitoring (Action: GBC; RSPB; BTO)
- Assess potential of land owned and/or managed by the Council (e.g., cemeteries, parks etc) for this species, and manage sympathetically (Action: BCBC; GBC).
- Encourage suitable management for all farmland birds, including Spotted Flycatcher, where possible through agri-environment schemes such as Tir Gofal (Action: BCBC; CCW; GWT).

Information Sources:
BCBC (2000)
BTO website (www.bto.org/birdtrends/index.htm)
Gibbons *et al* (1993)
Hurford & Lansdown (1995)
UKBG (1998a)

Great Crested Newt (*Triturus cristatus*)

Background:

The Great Crested Newt was once a common and widespread species in Britain. It is the largest species of newt in the British Isles. Adults spend most of the year on land, foraging over quite long distances in moist habitats such as hedge bottoms, tall grassland, ditches, marshy grasslands and woodlands. In spring they return to customary spawning waters to breed, mating and sometimes moving between ponds over a period of 3-4 months. Young newts hatch from May onwards and develop in the water as juveniles until the late summer/early autumn, before they too begin to migrate into the surrounding terrestrial habitats. Adults and immatures hibernate through the winter in frost-protected locations such as deep leaf mould, inside large grass tussocks, inside rotted tree stumps and under rubble.

Great Crested Newt populations have declined steadily throughout the period since the Second World War, throughout the whole of their European range. Many factors have been implicated but the main ones are probably loss and fragmentation of habitats and pollution of the aquatic environment. The rate of loss of colonies nationally was estimated to be about 2% over 5 years in the 1980s, and is probably still continuing. Nevertheless, Britain remains a European stronghold for this species.

This species is fairly conservative in its choice of spawning waters. These are usually still, shallow and well-vegetated, often partially or wholly shaded. Predatory fish, and large populations of other amphibians or predatory invertebrates (e.g. large Diving Beetles) make ponds unsuitable through predation of young and eggs. Ponds need to lie in a suitable matrix of terrestrial habitats, often pastureland with

hedgerows, through which the adult newts can migrate to foraging and hibernating grounds. Individual ponds may dry out in high summer and need only be wet in spring and the early part of summer - seasonal ponds support fewer potential predators. Presence of wildfowl is usually contra-indicative, but poaching by cattle seems to have no adverse impact. Many suitable ponds may appear, superficially at least, to be in quite a degraded condition.

The Great Crested Newt is fully protected under the Wildlife & Countryside Act and is a European Protected Species under the EC Habitats & Species Directive. It is also a UK BAP Priority Species.

Current Status:

The Great Crested Newt remains a widespread species in the lowlands of England and Wales, but is scarce in the north (including all of Scotland), west and south-west of Britain, and absent from Ireland. It is commonest in the south and east of England, but is also reasonably frequent in the west Midlands and the eastern half of Wales. It occurs sparingly throughout Gwent and Glamorgan, being considered generally scarce but locally frequent in the latter, and is rare in Bridgend County Borough. Key sites include Sker Farm, Pink Bay Pond, Kenfig NNR, Parc Slip Nature Park, Bryngarw Country Park, Merthyr Mawr and Candleston.

Current Factors Causing Loss and Decline:

- Loss of breeding ponds to development, and through agricultural intensification.
- Neglect, drainage and infilling of ponds with rubbish, rubble etc, alongside change to piped water supplies which make traditional field ponds redundant.
- Fragmentation of terrestrial habitats by features such as roads, new developments and conversion of intervening land to intensive agriculture, which prevents movement between ponds and through the landscape to foraging grounds etc.
- Deepening of ponds and other alterations to their character, including ill-advised ‘conservation’ restoration.
- Stocking of ponds with fish or wildfowl.
- Pollution of ponds by agrochemicals which may be directly toxic.
- Increased water abstraction, leading to falling water tables.
- Lack of knowledge about this species’ distribution and occurrence in the county borough.
- Climate change which leads to rapid and prolonged drying out of ponds in summer, or deep flooding in winter and spring.

Current Action:

- Great Crested Newt is a fully protected species, and this protection extends to its habitats.
- The presence of this species is a qualifying factor for SINC designation.
- The presence of Great Crested Newt is a material planning consideration which requires statutory consultation.

- Developments affecting sites supporting Great Crested Newt are now subject to added scrutiny which must include proof of the social or economic need for the development, and the consideration of alternative sites.

Future Action:

- All existing populations in the county borough should be maintained in a suitable condition (Action: BCBC; CCW; GWT).
- Key sites should be designated as SINCs (Action: BCBC).
- Detailed surveys should be required for all development proposals affecting, or potentially affecting, this species in the county borough (Action: BCBC; CCW).
- Development affecting Great Crested Newt sites should be resisted strongly, and where unavoidable, should be adequately compensated for (Action: BCBC; CCW).
- Continuity of terrestrial habitats should be maintained between breeding ponds and the open countryside, utilising means such as amphibian road underpasses (Action: BCBC; CCW).
- The creation of new ponds of suitable type should be investigated wherever possible, especially within landscaping schemes for new developments, country parks etc (Action: BCBC; CCW; GWT).
- Promote suitable management of ponds and terrestrial habitats for this species, and target grant aid through mechanisms such as Tir Gofal (Action: BCBC; CCW).
- Target surveys should be carried out in the county borough to obtain a better idea of this species' occurrence and distribution (Action: BCBC; CCW; GWT; BBP).

Information Sources:
Arnold (1995)
Countryside Council for Wales (1999b)
Gent & Gibson (1998)
UKSG (1995b)

Marsh Fritillary Butterfly (*Eurodryas aurinia*)

Background:

Marsh Fritillary butterfly was formerly widespread in Britain, occurring in two main habitat types: dry calcareous grassland and marshy grasslands, where its larvae feed on Devil's-Bit Scabious. It has declined dramatically in the period since the 1970s, and has more-or-less disappeared from much of its former range in central, southern and eastern England. Increasingly it is confined to western parts of the British Isles, with a stronghold in the western half of Wales. These declines have been mirrored throughout the European range of this species and the British populations have assumed international importance, now comprising more than a fifth of remaining populations in north-western Europe.

In south Wales, Marsh Fritillary is a characteristic occupant of the species-rich neutral marshy grasslands which occur around the edge of the coalfield and known locally as 'rhos pastures'. These grasslands fall within the Purple Moor-Grass and Rush Pastures Priority Habitat dealt with in Part 1, above.

In order to support this species, the habitats must contain an abundance of the foodplant and be only lightly grazed, ideally in late summer to winter period. Much of the decline of this species is attributable to the loss of these habitats to development and agricultural improvement, the latter through drainage and improvement, increased stocking or, conversely, neglect which leads to coarsening, shading and scrubbing-over.

The butterfly is known to survive through a 'metapopulation' strategy, where a number of sites are responsible for the long-term survival of a single population. Individual colonies within the population have the potential to become extinct for a variety of reasons, but are likely to be recolonised over time from other parts of the population. This is one reason why it is important that habitats which are suitable for marsh fritillary but which are presently unoccupied by this species should nevertheless be maintained in a suitable condition to receive it in the future. Sites within a metapopulation range which become unsuitable may suffer more permanent localised extinctions, but should they subsequently return to a suitable condition they can be recolonised from neighbouring sites within the metapopulation. However, Marsh Fritillary is not a strong flyer and has comparatively limited powers of dispersal, and it appears that the fragmentation and isolation of habitats has been a key factor in its decline. Barriers caused by roads, developments and areas of intensive agriculture prevent the movement of individuals between colonies, with resulting vulnerability to localised and permanent extinction often over quite short periods of time, followed by collapse of the population as a whole.

Recent attempts to move populations and their habitats from the path of development appear to have been uniformly unsuccessful. Asher *et al* (2001) state that although over 80 reintroduction projects have been documented all have ultimately failed.

Marsh Fritillary is fully protected under the Wildlife & Countryside Act, and is a UK BAP Priority Species.

Current Status:

As noted above, Wales is a UK stronghold for this internationally threatened species. A review carried out in 1990 indicated that there were about 432 known populations in the UK, some 111 of which were in Wales. There are currently believed to be about 50 populations in Glamorgan, representing about 45% of the Welsh resource.

There are about a dozen populations in Bridgend County Borough, making it the second most significant unitary authority area for this species after Rhondda Cynon Taff. Key sites occur around Caerau, Maesteg, Cefn Cribwr, Blaen Cwmdu, Llangynwyd, Fernbank and Bryngarn.

Current Factors Causing Loss or Decline:

- Loss of sites to development for residential, industrial, commercial, afforestation and roads uses.
- Agricultural intensification, leading to drainage and improvement of habitats, increased stocking or stocking in spring and summer.
- Change from cattle and pony grazing to sheep grazing: sheep crop the sward too closely.
- Promotion of foreign cattle breeds in preference to native Welsh breeds which are better able to graze Purple Moor-Grass.
- Cessation of grazing, which allows habitats to coarsen and become shaded and unsuitable.
- Fragmentation and isolation of habitats.
- Ill-advised 'translocation' schemes put forward as mitigation for development of Marsh Fritillary sites: there is no evidence that these have any significant probability of success.

Current Action:

- Marsh Fritillary is afforded statutory protection.
- All remaining Marsh Fritillary sites would qualify as SINCs.
- A Glamorgan Regional Plan has been produced for Purple Moor-Grass and Rush Pasture which includes action for Marsh Fritillary.
- A *National Action Plan for Wales* has been published by Butterfly Conservation.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough, and sites are monitored annually.
- The presence of Marsh Fritillary is a material planning consideration.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: designate all remaining sites as SINCs (Action: BCBC; CCW; GWT).
- Encourage expansion by Marsh Fritillary onto other suitable sites through appropriate management (Action: all bodies).
- Undertake a strategic review of Marsh Fritillary sites in the county borough to identify, assess and characterise all known and potential sites, their planning status and threats, ownership and opportunities for enhanced management (Action: BCBC; CCW; BC; BBP; GWT).
- Require detailed survey for Marsh Fritillary, and suitable mitigation and /or compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).
- Contribute to the regional action plan for the habitats of Marsh Fritillary in Glamorgan and the development of a strategic, regional approach to its conservation (Action: BCBC; BBP; GlamBAG and others).
- Develop a policy stance which does not recognise 'translocation' as viable mitigation, and which accepts this only as a final resort (Action: BCBC).

- Raise the profile of this species as a regionally important species amongst landowners, farmers and the general public, through publicity campaigns, workshops, events etc (Action: BCBC; CCW; GWT; BC; BBP).

Information Sources:
Asher *et al* (2001)
BCBC/Butterfly Conservation (1999)
Barnett & Warren (1995a)
Butterfly Conservation (1998)
UKSG (1995b)

High Brown Fritillary Butterfly (*Argynnis adippe*)

Background:

High Brown Fritillary was formerly widespread and reasonably common in woodlands throughout the southern half of England and Wales until the 1950s, but has since undergone one of the most sudden and extensive declines of any British butterfly. In the past it was associated with well-managed coppice woodlands, feeding on Dog-Violet species in the early part of the coppice cycle.

When widescale commercial coppicing declined in Britain from the 1950s onwards, High Brown Fritillary was one of a number of related butterfly species which declined with it. However, it was discovered in the 1980s that this and some of the other traditional 'coppice woodland fritillaries' was also able to utilise bracken-covered slopes where these have a species-rich ground flora which includes abundant Dog-Violets. These habitats are probably not as suitable as the coppice woodlands which it formerly occupied, but may nevertheless support viable populations of this rare and endangered butterfly.

Conditions for its survival on Bracken-covered slopes appear to be confined to the west of Britain, and the species is now confined to a few strongholds in south-west and north-west England, the Welsh Marches and south Wales. Not all Bracken slopes are suitable for High Brown Fritillary, which seems to prefer habitat patches in excess of 5ha which are grazed. Cattle-grazing seems to be preferred in Wales, although some sites are grazed by combinations of cattle, sheep and/or ponies. The litter layer needs to be dense enough to produce the correct thermal requirements for the developing larvae, but where ungrazed can become too dense to support the foodplants. The 'ffridd' slopes and Bracken hillsides of Glamorgan are a Welsh and UK stronghold.

High Brown Fritillary is fully protected under the Wildlife & Countryside Act and is a UK BAP Priority Species.

Current Status:

There are probably no more than about 50 or 60 viable populations of this species remaining in Britain, about five or so of which occur in Wales. The Welsh sites are mostly in Glamorgan, and there are three known sites in Bridgend County Borough.

Current Factors Causing Loss or Decline:

- Overgrazing of Bracken slopes by sheep, destroying Dog-Violets.
- Lack of cattle and/or horse grazing on Bracken slopes, leading to build-up of litter, scrub-invasion and loss of Dog-Violets through shading.
- Woodland Grant Schemes (including 'Bracken Challenge') targeting Bracken slopes for planting, leading to loss of habitats.
- Land Reclamation Schemes.
- Burning of Bracken slopes, which can cause localised extinctions.

Current Action:

- High Brown Fritillary is afforded statutory protection.
- All recently populated High Brown Fritillary sites would qualify as SINCs.
- A *National Action Plan for Wales* has been published by Butterfly Conservation.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough, and sites are monitored annually.
- A *Butterflies & Bracken* leaflet has been produced by Butterfly Conservation.
- The presence of High Brown Fritillary is a material planning consideration.

Future Action:

- Seek to retain all recently populated sites in the county borough with appropriate management: designate all remaining sites as SINCs (Action: BCBC, CCW, GWT).
- Encourage expansion by High Brown Fritillary onto other suitable sites through appropriate management, especially grazing by cattle (Action: all bodies).
- Where possible, encourage positive management of coppice woodlands, woodland rides, cycle track verges etc to create Violet-rich habitats, especially where these occur near suitable Bracken slopes (Action: BCBC; FC; CC; BC).
- Require detailed survey for High Brown Fritillary butterfly, and suitable mitigation/compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).
- Where possible, encourage suitable woodland, scrub and Bracken management through Woodland Grant Schemes and other grant aid means (e.g. Tir Gofal) (Action: BCBC; CCW; FC).
- Seek review of any Woodland Grant Scheme applications which potentially affect High Brown Fritillary habitats, and suitable amendment of the Bracken Challenge scheme (Action: BCBC; FC; CC).
- Review any land reclamation schemes for their potential to affect High Brown Fritillary sites (Action: BCBC).
- Contribute to the regional action plan for the habitats of High Brown Fritillary in Glamorgan and the development of a strategic, regional approach to its conservation (Action: BCBC; BBP; GlamBAG and others).
- Raise the profile of this species as a regionally important species amongst landowners, farmers and the general public, through publicity campaigns, workshops, events etc (Action: BCBC; CCW; GWT; BC; BBP).

Information Sources:
Asher *et al* (2001)
BCBC/Butterfly Conservation (1999)
Barnett & Warren (1995b)
Butterfly Conservation (1998)
UKSG (1995b)

Small Blue Butterfly (*Cupido minimus*)

Background:

This is our smallest resident butterfly, occupying calcareous grasslands containing an abundance of the larval foodplant, Kidney Vetch. Sites are usually sheltered and contain mosaics of short, eroding vegetation where the foodplant is abundant and taller grassland which is used for shelter by the adults. Periodic ground disturbance (for example, through erosion) or light grazing by cattle is necessary to maintain the early succession vegetation needed by this species. A variety of habitats may be used, including downland, coastal grassland and sea cliffs, dunes and man-made habitats such as quarries, gravel pits, road verges, railway embankments and some industrial sites.

Small blue is a reasonably widespread species in Britain, occurring throughout southern England, south Wales, western Scotland and locally elsewhere. In recent decades the range has contracted southwards, and the species has generally become scarce and localised throughout its range. Loss and fragmentation of habitat, agricultural intensification and changes in grazing pattern appear to be the main reasons for its decline.

Small Blue is a UK BAP Species of Conservation Concern, and is a High Priority Species in Wales.

Current Status:

Small Blue butterfly remains widespread in southern England and in coastal south Wales, but is scarce and declining throughout its range. In Wales it is confined to the south and west, strongly favouring the coast, with a number of populations in Glamorgan. There are three known sites in Bridgend County Borough, comprising Kenfig, Parc Slip and Brynmenyn. This species has also been recorded on one occasion each (in 2000) at Maesteg, and on Lock's Common, Porthcawl.

Current Factors Causing Loss and Decline:

- Loss, fragmentation and isolation of habitats, through development, afforestation and agricultural intensification.
- Cessation of grazing, which leads to coarsening of the sward and scrubbing-over.
- Overgrazing of sites.
- Loss of man-made sites to redevelopment.

Current Action:

- Key sites for Small Blue butterfly would qualify as SINCs.
- A *National Action Plan for Wales* has been published by Butterfly Conservation.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough.
- The HAPs for Lowland Calcareous Grassland and Coastal Sand Dunes should assist in addressing the conservation needs of this species.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess remaining sites as SINCs and designate where appropriate (Action: BCBC; CCW; GWT).
- Encourage expansion by Small Blue onto other suitable sites through appropriate management (Action: all bodies).
- HAPs for Lowland Calcareous Grasslands and Coastal Sand Dunes, should benefit this species (Action: BCBC and others).
- Encourage suitable management for this species, and target grant aid to key sites through mechanisms such as Tir Gofal (Action: BCBC; CCW; BC)

Information Sources:

Asher *et al* (2001)
BCBC/Butterfly Conservation (1999)
Bourne & Warren (2000)
Butterfly Conservation (1998)

Double Line Moth (*Mythimna turca*)

Background:

Double Line moth was formerly widespread and frequent in woodlands in the south and west of England and Wales, but has declined considerably in recent decades. It is now more often found in marshy grasslands although it also occurs open moorland, and in woodland clearings and rides. Little is known of its larval requirements. The larvae feed on a range of grasses, including Common Bent, Creeping Soft-Grass, Wood Meadow-Grass and Cock's-foot, and Wood-Rush species. In south Wales it appears to be associated chiefly with the marshy grasslands known locally as 'rhos pastures', a habitat which is dealt with under Purple Moor-Grass and Rush Pastures in Part 1, above.

Double Line moth is now a Nationally Scarce species in Britain and is a UK BAP Priority Species. The loss of unimproved marshy grasslands is thought to be one of the major causes of its decline.

Current Status:

Double Line moth has strongholds on the culm grasslands of southwest England and the rhos pastures of central, western and south Wales, although it has shown signs of withdrawal from the latter area. There are a small number of sites in Bridgend County Borough where the species occurs, including Blackmill Woodlands cSAC, Bryngarw Country Park, Kenfig cSAC, Lock's Common pLNR, Park Pond, Bryncethin and Cefn Hirgoed. The latter-named site is considered by the Glamorgan Moth Recording Group to be potentially the best site in Glamorgan for species. Since Glamorgan is the most important Watsonian Vice-County in the United Kingdom for the Double Line Moth, it follows that Cefn Hirgoed could prove to be one of the top five sites in UK for the species.

Current Factors Causing Loss or Decline:

- Loss of sites to development for residential, industrial, commercial, afforestation and roads uses.
- Agricultural intensification, leading to drainage and improvement of habitats.
- Cessation of grazing, which allows habitats to coarsen and become shaded and unsuitable.

Current Action:

- All sites supporting Double Line moth would be likely to qualify as SINCs.
- A Glamorgan Regional Plan has been produced for Purple Moor-Grass and Rush Pasture which includes action which would favour this species.
- Double Line is listed as a Medium Priority species in BC's *Action Plan for Lepidoptera in Wales*.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough, which includes reference to Double Line moth.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess all remaining sites as potential SINCs (Action: BCBC; CCW; GWT).
- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Require detailed survey for moths, and suitable mitigation/compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).
- Contribute to the regional action plan for marshy grassland habitats in Glamorgan and the development of a strategic, regional approach to their conservation (see Part 1 HAPs, above) (Action: BCBC; BBP; GlamBAG and others).
- Continue to encourage moth surveying and recording in the county borough, and raise the public profile of this group, through the Glamorgan Moth Recording Group (GMRG) and other channels (Action: BCBC; CCW; GWT; BC).

Information Sources:

BCBC/Butterfly Conservation (1999)
Butterfly Conservation (1998)
Gilmore & Stewart (1999)
UKBG (1999b)

Bordered Gothic Moth (*Heliophobus reticulata*)

Background:

Bordered Gothic is associated chiefly with open calcareous grasslands, but its larval biology in the wild in unknown. The seed capsules of a range of herbaceous plants are indicated as food for the larvae.

The moth was formerly widespread and common in England and the southern half of Wales, but it has now declined significantly and its range has contracted, especially in central areas of inland Britain. The reasons for this decline are not known, but it is likely that the loss of unimproved and semi-improved calcareous grassland is significant.

Bordered Gothic moth is Nationally Scarce and it is a UK BAP Priority Species.

Current Status:

This species remains widespread but is now mainly concentrated in southern England and East Anglia. South Wales is also a stronghold, with most recent records coming from the coastal fringe. There are several recent records from Glamorgan, including Rest Bay, Porthcawl and Lock's Common in Bridgend County Borough.

Current Factors Causing Loss or Decline:

- Not known in detail.
- Probably loss of calcareous grassland habitats through agricultural intensification and development.
- Lack of knowledge about the species' biology in the wild.

Current Action:

- Limited action for this species in the county borough.
- A Calcareous Grassland HAP has been prepared which should benefit this species.
- Listed as being of Medium Priority in BC's *Action Plan for Lepidoptera in Wales*.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough, which includes reference to Bordered Gothic moth.

Future Action:

- Continue to investigate the distribution and biology of this species in the county borough (Action: BCBC; CCW; GWT; GMRG).
- Encourage appropriate management of other suitable habitats through the HAP and targeted grant aid schemes such as Tir Gofal (Action: BCBC; CCW). Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Require detailed survey for moths, and suitable mitigation/compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).

Information Sources:
BCBC/Butterfly Conservation (1999)
Butterfly Conservation (1998)
Gilmore & Stewart (1999)
UKBG (1999b)

Waved Carpet Moth (*Hydrelia sylvata*)

Background:

Waved Carpet was formerly a widespread species of lowland coppice woodlands, where its larvae feed on a variety of tree and shrub species. With the gradual cessation of coppicing as a commercial activity from the 1960s onwards, this species has declined very significantly over much of its previous range, and is now much more restricted in distribution.

In south Wales at least, this species now appears to be increasingly associated chiefly with damp and wet woodlands, especially where these contain Alder. Glamorgan may be a stronghold for this species.

It is a Nationally Scarce species in Britain and a UK BAP Priority Species.

Current status:

Recent records of this species are concentrated in the south-west and south-east of England, the Forest of Dean area and the southern half of Wales. Less than 100 sites are now known in the UK.

Waved Carpet has a scattered distribution in Wales, but is perhaps most frequent in south Wales. There are six recent records from Glamorgan, where it appears to be associated with forestry land in the east and more open habitats to the west. It was recently recorded from the Lower Llynfi Valley in Bridgend County.

Current Factors Causing Loss or Decline:

- Cessation of coppice management in woodlands.

- Conversion of lowland broadleaved woodlands to conifer plantations.

Current Action:

- All sites for Waved Carpet would be likely to qualify for selection as SINCs.
- HAPs have been prepared for Lowland Ancient Woodlands, Wet Woodlands and Lowland Wood-Pasture & Parklands, which should benefit this species in the county borough (See Part 1, above).
- The species is classed as a Medium Priority species in BC's *Action Plan for Lepidoptera in Wales*.
- An *Action Plan for Lepidoptera* has been prepared for Bridgend County Borough.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess all sites for possible selection as SINCs (Action: BCBC; CCW; GWT).
- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Require detailed survey for moths, and suitable mitigation/compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).
- Encourage appropriate management (including the resumption of coppicing) for this species through HAPs and targeted grant aid schemes such as Tir Gofal and the Woodland Grant Scheme (action: BCBC; CCW; FC).
- Continue to encourage moth surveying and recording in the county borough, and raise the public profile of this group, through the GMRG and other channels (Action: BCBC; CCW; GWT; BC).

Information Sources:
BCBC/Butterfly Conservation (1999)
Butterfly Conservation (1998)
Gilmore & Stewart (1999)
UKBG (1999d)

Hornet Robberfly (*Asilus crabroniformis*)

Background:

This is one of the largest flies occurring in the British Isles. It occurs in a range of habitats including semi-improved pastures and downlands, marshy grasslands and grass-heaths, dry heathlands, dunes and sea-cliffs, but appears to have complex habitat requirements. These include the presence of herbivore dung, chiefly either horse or cattle, light, well-drained soils, a sunlit, warm aspect and nearby roosting cover for adults. Adults spend a great deal of time basking on, and hunting from, dried dung and the eggs are usually laid on and around such dung. The larvae develop in the soil and are believed to be predatory on dung-beetle larvae.

Individual populations may be confined to quite small sites but it is likely that these form part of a 'metapopulation' structure (see under Marsh Fritillary butterfly, above) which is vulnerable to fragmentation. The species used to be widespread and quite common in lowland parts of southern England and Wales, but has declined sharply in the period since about 1970. This decline has probably occurred as a result of a combination of factors including the direct loss, fragmentation and isolation of populations, shifting trends away from cattle rearing and the use of avermectin anti-parasite drugs in cattle which may render the dung toxic to this species.

Hornet Robberfly is a Nationally Scarce species and a UK BAP Priority Species.

Current Status:

There are just over about 100 extant populations of this species in southern Britain, and about 30 known sites in Wales. There are a number of important populations in Glamorgan, especially in the area of the Gower and Crymlyn Bog. There is at least one known recent site for this species in the Cornelly area of Bridgend County Borough, and several historic records.

Current Factors Causing Loss and Decline:

- Fragmentation and isolation of habitats.
- Loss of habitats to development, afforestation or through agricultural intensification.
- Conversion of cattle pasture to sheep or arable production.
- Use of avermectin anti-parasite drugs in cattle.
- Lack of knowledge about its distribution in the county borough.

Current Action:

- Hornet Robberfly in Wales has recently been the subject of a three-year research project into its ecology, undertaken by CCW.
- All sites for this species would be likely to qualify as SINCs.
- HAPs for Lowland Meadows and Old Pastures, and Lowland Heathlands, should benefit this species.
- CCW and FRCA have produced a management guidance leaflet.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess all remaining sites as potential SINCs (Action: BCBC; CCW; GWT).
- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Carry out surveys of potential sites for this species, especially in the Cornelly area of the county borough (Action: BCBC; BBP).
- Encourage suitable management through HAPs and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).

Information Sources:
Clements & Skidmore (1998)
Falk (1991)
UKSG (1995b)

Brown-Banded Carder-Bee (*Bombus humilis*)

Background:

Brown-Banded Carder-Bee makes nests on the ground at the base of long vegetation, often under leaf-litter. It nests and forages in species-rich grasslands, especially of the types dealt with in the HAPs for Calcareous Grasslands, Hay Meadows and Purple Moor-Grass & Rush Pastures in Part 1, above.

The Brown-Banded Carder-bee used to widespread and comparatively common throughout the southern half of Britain, but in common with many other bee species it has declined sharply in recent decades and its range has greatly contracted. This species is now more-or-less confined to a few sites in southern England and the south coast of Wales. The main reason for this decline is believed to be the loss of species-rich grasslands through agricultural intensification and development.

Brown-Banded Carder-Bee is a UK BAP Priority Species.

Current Status:

There are only about 20 modern records for this species, about 12 of which are from south Wales. Glamorgan may well turn out to be a national stronghold for this bee, supporting several sites on the Gower and elsewhere along the coast. Key sites in Bridgend County Borough include Kenfig and Merthyr Mawr dunes.

Current Factors Causing Loss or Decline:

- Loss of species-rich grassland habitats through agricultural intensification and development for residential, industrial, commercial and roads uses.

Current Action:

- Key sites for this species would be likely to qualify as SINCs.
- HAPs have been produced for key grassland habitats, the conservation and appropriate management of which would favour Brown-Banded Carder-Bee (see Part 1, above).

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess all remaining sites as potential SINCs (Action: BCBC; CCW; GWT).

- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Encourage suitable management through HAPs and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).

Information Sources:
UKBG (1999b)

Shrill Carder-Bee (*Bombus sylvarum*)

Background:

Shrill Carder-Bee is a type of bumblebee which usually nests and forages in species-rich grasslands and other habitats such as sand dunes, shingle and saltmarsh. It used to widespread and comparatively common throughout the southern half of Britain, but in common with many other bees it has declined sharply in recent decades and its range has greatly contracted. This species is now more-or-less confined to a few sites in southern England and Wales, most of which are coastal. The main reason for this decline is believed to be the loss of species-rich grasslands through agricultural intensification.

Shrill Carder-Bee is Nationally Scarce and a UK BAP Priority Species.

Current Status:

There are few modern records for this species, mostly in southern and eastern England. It occurs rarely in south Wales, including scattered records from the Glamorgan coast. In Bridgend County Borough it has been recorded at Parc Slip, which is one of the few known inland sites in Glamorgan.

Current Factors Causing Loss or Decline:

- Loss of species-rich grassland habitats through agricultural intensification, and also from factors such as neglect (leading to scrub encroachment) and development for residential, industrial, commercial and roads uses.

Current Action:

- Key sites for this species would be likely to qualify as SINCs.
- HAPs have been produced for key grassland habitats, the conservation and appropriate management of which should favour Should Carder-Bee (see Part 1, above).

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management: assess all remaining sites as potential SINCs (Action: BCBC; CCW; GWT).

- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Encourage suitable management through HAPs and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).

Information Sources:

Falk (1992)
UKSG (1995b)

Hairy Dragonfly (*Brachytron pratense*)

Background:

Hairy dragonfly breeds in unpolluted mesotrophic ponds, lakes and slow-moving watercourses such as canals where there is abundant emergent vegetation. The adults emerge early in the summer. It is widespread in lowland Britain but occurs mainly in the south of England and Wales, and is often associated with coastal levels and grazing marshes (see Coastal and Floodplain Grazing Marshes HAP in Part 1, above).

Hairy Dragonfly has declined nationally over much of its range, although it is locally abundant in strongholds such as the Norfolk Broads, Kent and Sussex marshes and Somerset Levels. Changes in agricultural practice and lowering of water tables have contributed to its decline.

Hairy Dragonfly is a scarce species regionally and locally, but does not currently have any national conservation status.

Current Status:

Hairy Dragonfly remains widespread but local in the southern half of Britain, and is generally scarce in Wales. Glamorgan is a stronghold for this species in Wales, and one of the best sites in the county is Kenfig Pool in Bridgend County Borough. This appears to be the only known site in the county borough, however.

Current Factors Causing Loss or Decline:

- Eutrophication of breeding waters by agrochemical fertilisers and urban run-off.
- Pollution of breeding waters by agrochemical pesticides, insecticides and herbicides.
- Loss of breeding habitats through agricultural intensification, leading to the drainage and infilling of ponds.
- Loss of breeding habitats through residential, industrial, commercial and road developments.
- Increased abstraction and/or inappropriate drainage management in grazing marsh systems.

- Insufficient knowledge about the distribution of this species in the county borough.

Current Action:

- The Kenfig site is well protected and suitably managed.
- Any other sites which become evident would probably qualify for designation as SINCs.
- A HAP for Coastal & Floodplain Grazing Marshes has been prepared (see Part 1, above).

Future Action:

- Maintain the current population at Kenfig (Action: BCBC).
- Encourage survey effort to discover new sites suitable for this species (Action: BCBC; GWT; BBP).
- Encourage suitable management of potential habitats through Grazing Marsh HAP and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).
- Investigate possible creation of new sites for this species in suitable habitats in the county borough (Action: BCBC; CCW; GWT).

Information Sources:
Merritt *et al* (1996)

Scarce Blue-Tailed Damselfly (*Ischnura elegans*)

Background:

This damselfly favours small and often shallow mineral-enriched water bodies which are either slow moving or still, and which have emergent vegetation. Typical habitats include seepages, runnels, ditches or small ponds, often on neutral or acid substrates in upland or semi-upland situations. In south Wales it is often found on mineral spoil heaps from former mining activity around the edge of the coalfield. Scarce Blue-Tailed Damselfly is a local species in Britain, being chiefly confined to the south and west, but it does not currently have any national conservation status. However, it has suffered declines in south Wales especially as a result of the reclamation of old coal spoil sites.

Current Status:

Scarce Blue-Tailed Damselfly is reasonably widespread in southern and western Wales, but is scarce in the lowland parts of Gwent and Glamorgan. It occurs infrequently in Bridgend County Borough, especially in the Parc Slip, Tondu and Cefn Hirgoed areas.

Current Factors Causing Loss or Decline:

- Reclamation of former coal and mineral spoil sites.

- Loss of habitats through agricultural intensification in semi-upland areas.
- Lack of detailed data about distribution and habitat preferences in the county borough.

Current Action:

- Limited current action being undertaken.

Future Action:

- Encourage targeted recording of this species in the county borough to build up a better picture of its distribution, preferences and any significant threats.
- Require surveys for this species and others with respect to planning applications for the reclamation of mineral spoil and former mining sites, and the incorporation of suitable mitigation/compensation measures.

Information Sources:
Merritt *et al* (1996)

Bog Bush-Cricket (*Metrioptera brachyptera*)

Background:

Bog Bush-Cricket is an uncommon species of humid lowland heaths and marshy grasslands, often in clearings amongst scrub. It was formerly found mostly in southern and eastern England, where it has recently undergone localised declines, but in recent decades it appears to have extended its range northwards and westwards. Loss and fragmentation of habitat remains a significant threat to this species, however.

Bog bush-cricket is a Nationally Scarce species.

Current Status:

Bog bush-cricket is rare in Wales, being known from only six sites. Only two sites are known in Glamorgan, including the eastern end of Cefn Hirgoed (Hirwaun Common) in Bridgend County Borough. This site is currently allocated as a development site in the draft Unitary Development Plan for Bridgend County Borough.

Current Factors Causing Loss or Decline:

- Loss of habitats to development for industrial, commercial, residential and road uses.
- Neglect and degradation of habitats, leading to drying-out and encroachment by scrub.
- Loss of habitats through agricultural intensification (e.g. drainage and reseeding).

- Fragmentation and isolation of habitats by roads and other development.

Current Action:

- Sites for this species would probably qualify for selection as SINCs.
- HAPs have been prepared for Heathlands and Purple Moor-Grass & Rush Pastures in the county borough, which should benefit this species.

Future Action:

- Maintain the existing site at Hirwaun Common with appropriate management (Action: BCBC; GWT).
- Encourage survey of suitable habitats elsewhere for evidence of this species (Action: BCBC; GWT; BBP).
- Assess all remaining sites for possible selection as SINCs (Action: BCBC; GWT).
- Encourage expansion onto other suitable sites through appropriate management (Action: all bodies).
- Require detailed survey, and suitable mitigation/compensation, for all developments affecting, or potentially affecting, habitats for this species (Action: BCBC).
- Encourage suitable management through HAPs and targeted grant aid schemes such as Tir Gofal (Action: BCBC; CCW; GWT).

Information Sources:
Jones (2001)
Haes & Harding (1997)

Medicinal Leech (*Hirudo medicinalis*)

Background:

The Medicinal Leech is now a rare and endangered inhabitant of ponds and small lakes. Once widespread and famed for its medical applications, this species is now rarely seen or recorded in Britain. It feeds on the blood of mammals, amphibians and small fish, but little is otherwise known about its biology in the wild.

Medicinal Leech is fully protected under the Wildlife & Countryside Act and is a UK BAP Priority Species.

Current Status:

There are probably no more than 20 isolated populations of this species in Britain, in widely scattered locations which may be a result of past introductions and importations by the 19th Century medical trade. In Wales it is largely restricted to Anglesey, but there is a scatter of sites in south Wales and elsewhere. There is a well-established population present in Kenfig Pool in Bridgend County Borough.

Current Factors Causing Loss or Decline:

- General loss of ponds through drainage and infilling for agriculture or development.
- Pollution of ponds by agrochemicals.
- Loss of ponds through drying out as a result of increased water abstraction, lowering of water tables etc.
- Reduction in the numbers of stock-grazed ponds.
- Lack of knowledge about the present distribution of this species elsewhere in Bridgend County Borough.

Current Action:

- The species is afforded full statutory protection.
- The Kenfig site is well protected and suitably managed.
- Any other sites which become evident would qualify for designation as SINCs.

Future Action:

- Maintain the current population at Kenfig (Action: BCBC).
- Encourage survey effort to discover new sites suitable for this species (Action: BCBC; GWT; BBP).
- Encourage suitable management of potential habitats through HAPs and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).
- Investigate possible creation of new sites suitable for introductions of this species in suitable habitats in the county borough (Action: BCBC; CCW; GWT).

Information Sources:
UKSG (1995b)

Fen Orchid (*Liparis loeselii*)

Background:

Fen Orchid is a plant species which in Britain is now restricted to the fens of East Anglia and the dunes of the south Wales coast. It was formerly more widespread in eastern England but has declined very substantially in recent decades, so that its main UK stronghold is now in south Wales. The two British populations are morphologically distinct, the south Wales one being assigned to the variety *ovata* which is otherwise only known in Europe from Brittany.

The Welsh Fen Orchid populations are associated with wet hollows (‘slacks’) in the early stages of dune formation, and has declined as a result of the stabilisation of dunes in some areas.

Fen Orchid is fully protected under the Wildlife & Countryside Act and is a European Protected Species under the EU Habitats Directive. It is a Red Data Book species in Britain and a UK BAP Priority Species.

Current Status:

There are about six recent records of this species in the UK, three of which are in south Wales. Fen Orchid is currently known from dune systems at Whitford, Crymlyn Burrows and Kenfig, the latter being the only known population in Bridgend County Borough.

Current Factors Causing Loss or Decline:

- Natural processes in dune systems causing stabilisation of open dunes and the encroachment of slacks by coarse wetland vegetation and scrub.
- Undergrazing of dune systems, leading to stabilisation of mobile areas.
- Artificial stabilisation of dunes resulting either from arrestment by development on the landward edges, or by deliberate dune-planting to stop wind-blow.
- Lowering of water tables causing the drying-out of slacks.
- Pollution of water entering slacks by agrochemical and urban run-off.
- Coastal works, onshore and offshore, which affect dune-building patterns.

Current Action:

- The species is afforded full statutory protection.
- The Kenfig site is well protected and suitably managed.
- Any other sites which become evident would qualify for designation as SINCs.
- A Fen Orchid Working Group has been set up by CCW to investigate the conservation needs of this species in Wales.
- A Coastal Sand Dune HAP has been produced which should benefit this species in the county borough.

Future Action:

- Maintain the current population at Kenfig (Action: BCBC; CCW).
- Encourage survey effort to discover new sites suitable for this species (Action: BCBC; GWT; BBP).
- Encourage suitable management of potential habitats through HAP and targeted grant aid (e.g. Tir Gofal), including the restoration of degraded dune slacks through clearance and deepening (Action: BCBC; CCW; GWT).
- Review any extant or proposed dune stabilisation projects for impact to this species and adjust accordingly (Action: BCBC; CCW).
- Ensure constancy and quality of ground water supplies (Action: BCBC; CCW; EA).
- Investigate possible creation of new sites suitable for this species (i.e. young dune slacks) in suitable locations in the county borough (Action: BCBC; CCW; GWT).

Information Sources:
Wigginton (1999)
UKSG (1995b)
Wade *et al* (1984)

Whorled Caraway (*Carum verticillatum*)

Background:

Whorled Caraway is a plant of neutral, species-rich marshy grasslands and hay meadows of the types dealt with under the HAPs for Purple Moor-Grass & Rush Pasture and Hay Meadows & Old Pastures in Part 1, above.

Whorled caraway is comparatively widespread in the north and west of Britain, with a particular stronghold around the edge of the south Wales coalfield. It is, however, declining as the characteristic neutral grasslands of these areas are lost to development and agricultural intensification.

Whorled caraway is a local species in the UK, but is not currently accorded any special conservation status. Britain is, however, a European stronghold for this species, which is globally threatened. It is also scarce in Bridgend County Borough.

Current Status:

Widespread and locally common in the north and west of Britain, including south and west Wales. It is associated particularly with the edge of the south Wales coalfield and is therefore frequent in the north-western parts of Glamorgan. It is, however, scarce in Bridgend County Borough, occurring at perhaps 2-3 sites including the area around Fernbank and the Brynna.

Current Factors Causing Loss or Decline:

- Loss of sites to development for residential, industrial, commercial, afforestation and roads uses.
- Agricultural intensification, leading to drainage and improvement of habitats, increased stocking etc.
- Change from cattle and pony grazing to sheep grazing: sheep crop the sward too closely.
- Cessation of grazing, which allows habitats to coarsen and become shaded and unsuitable.

Current Action:

- Key sites for this species would probably qualify for selection as SINCs.
- A Glamorgan Regional Plan has been produced for Purple Moor-Grass and Rush Pasture.
- HAPs have been produced for key habitats in Bridgend County Borough.

Future Action:

- Seek to retain all existing sites in the county borough with appropriate management (Action: BCBC; CCW; GWT).
- Consider any remaining sites for selection as SINCs (Action: BCBC; CCW; GWT).
- Encourage suitable management of habitats for this species through HAPs and targeted grant aid schemes such as Tir Gofal (Action: BCBC; CCW; GWT).

Information Sources:
Wade *et al* (1994)

Shore Dock (*Rumex rupestris*)

Background:

Shore Dock is a maritime species typically occurring on rocky or sandy shores and the lower slopes of cliffs, and more rarely on wet cliff-ledges, strandlines and in west dune slacks. It seems to require a constant supply of fresh water, and so is often found where streams empty onto the shore and where there are freshwater seepages. In Glamorgan it is found on densely vegetated sea cliffs, growing 8-12m above the high water mark.

Shore Dock used to be fairly widespread in south-west England and south Wales, but has disappeared from many former locations in recent decades. Many sites have been lost through shore defence projects, culverting of streams and through recreational visitor pressure, as well as through natural erosion or storm damage. It has declined by over 80% in Britain in the last century and is threatened throughout its European range. It is a Red Data Book species in Britain.

Shore Dock is fully protected under the Wildlife & Countryside Act, and is a UK BAP Priority Species.

Current Status:

This species occurs at about 15 known locations in the UK, scattered along the south coast of England, south coast of Wales, and locally at Anglesey and the Isles of Scilly. There are two or three extant stations along the Glamorgan coast, but the species has not recently been recorded in Bridgend County Borough. It used to occur at Kenfig and on Merthyr Mawr, but has seemingly been lost from these sites in recent years. However, it is possible that the species is still present in suitable habitats in the county borough, or could recolonise in the future.

Current Factors Causing Loss or Decline:

- Loss of habitat through natural processes such as erosion and storm damage.

- Loss of habitat through coarsening of maritime vegetation and scrub encroachment.
- Loss of habitat through development, recreational pressure and shore defence projects.
- Culverting of streams, and lowered flows in streams and seepages through increased abstraction.
- Climate change, leading to more frequent storm damage and higher tides.
- Insufficient knowledge about occurrence and distribution in the county borough.

Current Action:

- Shore Dock has full statutory protection.
- All sites would qualify for selection as SINCs.
- Most sites are within SSSIs or other sites managed for conservation, such as NT land.

Future Action:

- Maintain sites where Shore Dock used to occur in a suitable condition for this species and seek to encourage recolonisation (Action: BCBC; CCW; GWT).
- Encourage target surveys to locate any remaining populations and assess suitable habitats along the coast, for example in the Ogmore Estuary (Action: BCBC; CCW; GWT).
- Ensure any suitable sites not within SSSIs are designated SINCs (Action: BCBC; GWT).
- Ensure continued flow rate and quality of water sources supplying locations suitable for this species (Action: BCBC; CCW; EA).
- Require detailed surveys for this species in any planning applications which could potentially affect it, together with appropriate mitigation/compensation measures (Action: BCBC; CCW).
- Investigate possible sites for re-introduction using propagated material from locally-collected seed sources (Action: CCW; GWT).

Information Sources:

Wigginton (1999)
UKSG (1995b)
Wade *et al* (1984)

Viper's-Grass (*Scorzonera humilis*)

Background:

Viper's-Grass is a species of damp, unimproved lowland grasslands or fen-meadow. It has always been a scarce species in Britain, and is presently confined to a handful of locations in southern England and south Wales. It may be limited in Britain primarily by climatic factors, but is also threatened by agricultural intensification and the loss suitable grassland habitats.

Viper's-Grass is fully protected under the Wildlife & Countryside Act and is a Red Data Book species in Britain.

Current Status:

There are three known, extant populations of this species in the UK, occurring in Dorset and Glamorgan. Two populations occur in the latter county, one of which is at Cefn Cribwr SSSI in Bridgend County Borough.

Current Factors Causing Loss or Decline:

- Agricultural intensification, especially the improvement of damp, species-rich grasslands through drainage, fertiliser application, reseeding and intensive grazing.
- Climatic factors.

Current Action:

- The species is afforded statutory protection.
- The known site in the county borough is an SSSI and is managed appropriately for this species.
- HAPs have been prepared for Hay Meadows and Old Pastures, and Purple Moor-Grass and Rush Pastures, which should benefit this species (see Part 1, above).

Future Action:

- Maintain present population in the county borough and encourage its expansion into suitable habitats elsewhere through appropriate management (Action: BCBC; CCW).
- Encourage suitable management of grassland habitats elsewhere in the county borough through HAPs and targeted grant aid (e.g. Tir Gofal) (Action: BCBC; CCW; GWT).

Information Sources:
Wigginton (1999)
Wade *et al* (1984)

Arable Weed Species (*Group Plan*)

Background:

A number of rare plants used to occur in Bridgend County Borough associated chiefly with the margins of arable crops, including species such as **Shepherd's Needle** (*Scandix pecten-veneris*), **Meadow Clary** (*Salvia pratensis*), **Cornflower** (*Centaurea cyanus*), **Deptford Pink** (*Dianthus armeria*), **Red Hemp-Nettle** (*Galeopsis*

angustifolia), **Small-Flowered Catchfly** (*Silene gallica*) and **Broad-Fruited Corn-Salad** (*Valerianella rimosa*).

These species all depended on frequent soil disturbance and/or the absence of competing species and were therefore common associates of arable field margins in the days before intensive arable production and the widespread use of agrochemical herbicides and fertilisers. All of these species, and others from this specialised plant community, have declined very substantially throughout the UK in the period since about 1960, so that most are now either Nationally Scarce or Red Data Book species, and in some cases endangered or possibly extinct.

Most of these species occur now only sporadically and unpredictably, in situations where soil disturbance takes place in the absence of heavy fertiliser or herbicide use. These situations may include 'wasteground' sites and marginal sites such as road verges and mine spoil, but these are usually temporary. In the absence of regular soils disturbance, arable weed species are soon lost to encroaching coarse ruderal vegetation.

Meadow Clary and Deptford Pink are both fully protected under the Wildlife & Countryside Act, and along with all of the other species listed above, are UK BAP Priority Species.

Current Status:

All of the above used to widespread and common in Britain but are now rare and restricted in distribution. None of have been recorded recently from the county borough, and several are known only from pre-1950 records.

Current Factors Causing Loss or Decline:

- Increased use of herbicides and artificial fertilisers on arable land, and the introduction of dense, high-productivity crop varieties.
- Destruction of field edge refuges, and cropping right to the field edge.
- Loss of field edges through amalgamation of fields.
- Cessation of traditional crop rotations.
- Removal of hedge banks and associated marginal verges.
- Conversion of marginal arable cropping to pasture.
- Early harvesting (e.g. of winter wheat) which destroys plants before they can set seed.
- Conversion of open, unmaintained urban or industrial waste grounds to mown recreational amenity areas, or redevelopment of such sites.
- Loss of sandy open ground near the coast to housing, car parks and tourist development.

Current Action:

- Limited current action in the county borough.

- Any sites where these species occur would probably qualify as SINCs.
- Insufficient modern survey data to assess the current status and distribution of these species.

Future Action:

- Encourage survey of field margins and other potential sites for arable weed species and identify any key sites (Action: BCBC; CCW; GWT; BBP).
- Promote suitable management of land in arable areas through Set-Aside and agri-environment schemes such as Tir Gofal (Action: BCBC; CCW; GWT).
- Investigate possible use of council-owned land, including road verges, as managed refuges for arable weed species (Action: BCBC; CCW; GWT).
- Raise awareness of arable weed species amongst landowners, farmers and the general public through publications, publicity campaigns, workshops etc (Action: BCBC; CCW; GWT).

Information Sources:
Stewart *et al* (1984)
UKSG (1995b)
Wigginton (1999)
Wade *et al* (1984)

The Lichen *Bacidia incompta*

Background:

Bacidia incompta is a crust-forming species of lichen which grows on mature trees, especially Elm, but also on Beech, Ash and other species, typically in parkland or open woodland situations. It was formerly a widespread and common species but declined dramatically in the 1970s as a result of Dutch Elm Disease, and more generally as a result of increased atmospheric pollution. It remains widespread in the UK today but is now much rarer than previously and is probably still declining. It is a Red Data Book and UK BAP Priority Species.

Current Status:

There are about a dozen recent sites for this species scattered throughout Wales. It is considered to be rare in Glamorgan with about 3-4 known sites. It was recorded twice from the Bridgend area in the 1940s-1950s, but has not been recorded recently and may now be lost.

Current Factors Causing Loss or Decline:

- Clearance and non-replacement of parkland and wayside trees, especially following Dutch Elm Disease outbreaks and severe wind-blow events.
- Spray-drift from agrochemical treatment of fields contaminating wayside trees.
- General loss of hedgerow trees.

- General increase in atmospheric pollution, especially around urban centres.
- Lack of detailed survey information regarding the occurrence and distribution of this species.

Current Action:

- Limited current action for this species in the county borough.
- Any remaining sites would probably qualify for selection as SINCs.
- HAPs for Lowland Wood Pasture & Parklands and Ancient and/or Species-Rich Hedgerows should benefit this species (see Part 1, above).

Future Action:

- Encourage specialist recording of lichens in the county borough, through workshops and contract research (Action: BCBC; CCW; GWT; BBP).
- Encourage appropriate management of parkland and wayside trees generally in the countryside through HAPs and agri-environmental schemes such as Tir Gofal (Action: BCBC; CCW).
- Use TPOs to protect individual trees of interest (action: BCBC; CCW).

Information Sources:

Church *et al* (1996)
UKBG (1999a)
Wade *et al* (1994)

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Glossary of Abbreviations

AONB	:	Area of Outstanding Natural Beauty
BBP	:	Bridgend Biodiversity Partnership
BC	:	Butterfly Conservation
BCBC	:	Bridgend County Borough Council
BCT	:	Bat Conservation Trust
BEEP	:	Bridgend Environmental Education Partnership
BSE	:	Bovine Spongiform Encephalopathy disease
BTCV	:	British Trust for Conservation Volunteers
BTO	:	British Trust for Ornithology
CAP	:	Common Agricultural Policy (of the EU)
CC	:	Coed Cymru
CCW	:	Countryside Council for Wales
CLA	:	Country Landowners Association
CROW	:	Countryside & Rights of Way Act 2000
DETR	:	Department of Trade, Industry & the Regions
EA	:	Environment Agency
ESA	:	Environmentally Sensitive Area
EU	:	European Union
FC	:	Forestry Commission
FCGS	:	Forestry Commission Grant Scheme
FRCA	:	Farming & Rural Conservation Agency
FUW	:	Farmers Union of Wales
FWAG	:	Farming & Wildlife Advisory Group
GBC	:	Glamorgan Bird Club
GBG	:	Glamorgan Bat Group
GlamBAG	:	Glamorgan Biodiversity Advisory Group
GMRG		Glamorgan Moth Recording Group
GWT	:	Glamorgan Wildlife Trust
HAP	:	Habitat Action Plan
HEGS	:	Hedgerow Evaluation and Grading System
HMIP	:	Her Majesty's Inspectorate of Pollution (now part of EA)
HMSO	:	Her Majesty's Stationery Office
JNCC	:	Joint Nature Conservation Committee
LA21	:	Local Agenda 21
LBAP	:	Local Biodiversity Action Plan
LEAP	:	Local Environment Agency Plans
LNR	:	Local Nature Reserve
LPA	:	Local Planning Authority
MAFF	:	Ministry of Agriculture, Fisheries and Foods
NAW	:	National Assembly of Wales
NCC	:	Nature Conservancy Council (now split into CCW and others)
NFU	:	National Farmers Union
NMGW	:	National Museum and Gallery of Wales
NNR	:	National Nature Reserve
NRA	:	National Rivers Authority (now part of EA)
OU	:	Open University
PG(W):PP	:	Planning Guidance (Wales): Planning Policy
PPG	:	Planning Policy Guidance

RH/SAP	:	Regional Habitat/Species Action Plan
RIGS	:	Regionally Important Geological/Geomorphological Site
RSPB	:	Royal Society for the Protection of Birds
RTPI	:	Royal Town Planning Institute
SAC	:	Special Area of Conservation (EU Habitats Directive)
SAP	:	Species Action Plan
SES	:	Severn Estuary Strategy
SEWSPG	:	South East Wales Strategic Planning Group
SINC	:	Site of Importance for Nature Conservation
SPA	:	Special Protection Area (EU Birds Directive)
SPG	:	Supplementary Planning Guidance
SSSI	:	Site of Special Scientific Interest
TAN	:	Technical Advice Note
TPO	:	Tree Preservation Order
UA	:	Unitary Authority
UDP	:	Unitary Development Plan
UDP	:	Unitary Development Plan
UK BAP	:	United Kingdom Biodiversity Action Plan
UKBG	:	UK Biodiversity Group
UKLIAG	:	UK Local Issues Advisory Group
UKSG	:	UK Steering Group (for biodiversity)
UNCED	:	United Nations Conference on the Environment & Development ('the 1st Earth Summit')
VTI	:	Veteran Tree Initiative
VWT	:	Vincent Wildlife Trust
WALSIN	:	Wales Inventory of Surveys
WBG	:	Wales Biodiversity Group
WCA	:	Wildlife & countryside Act 1981
WDA	:	Welsh Development Agency
WGS	:	Woodland Grant Scheme
WLIAG	:	Wales Local Issues Advisory Group
WOAD	:	Welsh Office Agricultural Department
WWT	:	Wildfowl & Wetlands Trust

PART 3: APPENDICES

Appendix 1: Statutory & Policy Framework

Nature conservation in the UK is affected by a complex framework of legislation and policy at the international, national, regional and local levels. This Appendix summarises current legislation and policy as it affects Bridgend County Borough.

International Obligations

There is increasing awareness and concern at the need to protect natural habitats and their biodiversity at both the global and the European scale. This has resulted in a number of important international conventions, directives and agreements in the period since about 1970, to which the UK has either become a signatory or has incorporated into national law. The most significant of these are as follows:

Convention on Wetlands of International Importance Especially as Waterfowl Habitat, 1971 (The 'Ramsar Convention')

The Ramsar Convention requires signatory nations to identify, designate and protect wetlands of international value within their jurisdiction, to promote the conservation of wetlands generally and to foster the wise use of wetlands. Wetlands are an especially important habitat for many species of flora and fauna, particularly birds such as wildfowl and waders, and are threatened and declining throughout the world largely as a direct result of human activities.

The UK became a signatory to the Convention in 1973. In the UK all confirmed 'Ramsar Sites' are also required to be notified as Sites of Special Scientific Interest (SSSIs) under domestic legislation.

Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 (The 'World Heritage Convention')

This convention, ratified by the UK in 1984, is aimed at the identification, designation and protection of sites which are deemed to be of outstanding international importance for either cultural, historical, archaeological or ecological reasons. The UK is required to identify such sites and to state the measures and resources which will be made available for their future protection and management. These sites are known as 'World Heritage Sites'.

In the UK this Convention has been applied primarily to cultural, historic and archaeological sites, but it could also be applied to sites of outstanding natural heritage in the UK in the future.

Convention on the Conservation of European Wildlife and Natural Habitats, 1979 (The 'Bern Convention')

The Bern Convention imposes obligations to ensure the protection of flora and fauna species, with especial emphasis on endangered and vulnerable species and their habitats. The requirements of the Bern Convention were addressed by the UK, which became a signatory in 1979, initially through the Wildlife & Countryside Act 1981 and subsequently through its implementation of the EU Habitats Directive (see below).

EU Council Directive on the Conservation of Wild Birds, 1979 (The 'Birds Directive')

The Birds Directive (No. 79/409/EEC) applies to wild birds, their eggs, nests and habitats, and provides for the protection, management and control of all species of birds naturally occurring within member states. It requires the UK to take measures to ensure the preservation of sufficient diversity of habitats to maintain populations of all such birds at ecologically and scientifically supportable levels.

The habitats of certain rare and vulnerable birds (listed in Annex 1 of the Directive), and regular migratory species, are to be conserved by special measures including the identification, designation and protection of key areas of habitat. These designated areas are known as 'Special Protection Areas' or SPAs, and in the UK are also required to be designated as SSSIs under domestic legislation.

Convention on the Conservation of Migratory Species of Wild Animals, 1979 (The 'Bonn Convention')

The Bonn Convention is aimed at the conservation of migratory species, requiring special measures for the protection of certain specified threatened species. It also encourages separate international agreements covering the protection of particular species or groups of species (see the EU Bats Agreement, below).

The UK ratified this Convention in 1985, but its implementation has largely been deemed to have already been addressed through domestic legislation such as the Wildlife & Countryside Act 1981 and the obligations under other conventions and directives.

EU Council Directive on the Conservation of Natural Habitats of Wild Flora and Fauna, 1992 (The 'Habitats Directive')

The Habitats Directive (No. 92/43/EEC) requires the UK to maintain and/or restore naturally occurring habitats, especially those which are deemed to be vulnerable and declining in Europe. It also requires the protection of many species of plants and animals which are similarly threatened and declining throughout their European range, therefore giving effect to both site and species protection objectives.

The Directive requires the UK to designate sites, on land and at sea, which will form part of a network of special sites within a broader, sensitively managed landscape. The designated sites, referred to as Special Areas of Conservation (or SACs), together with the SPAs designated under the Birds Directive, will form part of the EC 'Natura 2000' network of sites which are deemed to be of 'Community Interest', i.e. of significance in the pan-European context.

SACs may be selected for their importance as natural habitat types and/or as habitats for the rare and vulnerable species listed in Annexes I and II of the Directive. The UK Government was required to present a list of candidate SACs by June 1998, and is now in the process of refining and confirming the listed sites.

In the UK, the requirements of the Habitats Directive are implemented through the Conservation (Natural Habitats etc) Regulations 1994. All SACs are required to be notified as SSSIs under domestic legislation.

EU Agreement on the Conservation of Bats in Europe, 1992 (The 'Bats Agreement')

This Agreement was drawn up under the auspices of the Bonn Convention and commits the UK to taking appropriate measures to ensure the protection of all species of bats and their habitats (including both roosting and feeding habitats) occurring within its jurisdiction.

No additional legislation or changes to existing legislation was required, the objectives of the Agreement being deemed to be met under the Wildlife and Countryside Act 1981.

Convention on Biological Diversity, 1992 (The 'Rio Convention')

The Rio Convention on Biodiversity was one of several products arising from the *1st Earth Summit: a UN Conference on the Environment and Development* (UNCED) held in Rio de Janeiro in 1992.

The Rio Convention sets out an agreement between over 120 countries to investigate how the world's biodiversity - the entire range and variety of life on earth or any part of it - can best be conserved. It covers issues such as the sustainable use of environmental resources, the rehabilitation of degraded ecosystems and recovery of threatened species. Each of the participating nations is required to produce a Biodiversity Action Plan (BAP) setting out its own national targets and initiatives for meeting the objectives of the Convention (see below).

Other products from the Earth Summit included *Agenda 21* - a comprehensive programme of action needed throughout the world to achieve a more sustainable pattern of development into the next century and agreements on matters such as global climate change and the sustainable development of forestry. Within this context, local planning authorities in the UK are required to develop and adopt their own sustainable development strategies at the local level – 'Local Agenda 21' (LA21).

Local Agenda 21 is concerned primarily with wider actions to create and maintain the local quality of life and environment, providing an opportunity for communities to think through the priorities for their local area and to establish action plans to influence the direction of change. The development of nature conservation strategies and locally-applicable biodiversity action plans (LBAPs) form important elements of the LA21 process in so far as it affects the sustainable use of nature conservation and earth science resources.

EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment, 1997 (The 'EA Directive')

The first EU Directive on Environmental Assessment (No. 85/337/EEC) was published in 1985 and was implemented in the UK primarily through the *Town & Country Planning (Assessment of Environmental Effects) Regulations 1988* and its various amendments. This required the UK to implement a formal framework for assessing the impacts of certain types of development on the environment, particularly where these are of a large or potentially damaging nature, before a decision is taken on whether or not they should proceed. This includes an assessment of the impact of the development on nature conservation and ecology.

The Directive was revised in 1997 (No. 97/11/EC) in order to clarify certain ambiguities in the original directive, whilst extending the range of projects that are now to be subject to formal Environmental Assessment, and this has been transferred into UK legislation via the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* which came into force on the 14 March 1999.

National Legislation and Policy Framework

The UK now possesses a complex framework of domestic legislation and Government guidance concerned with nature conservation and the protection of both habitats and species. The legislative approach has generally stemmed in the past from the protection of individual sites and species, but has more recently broadened into concern for the wider environment and towards integrated policies for sustainability and the conservation of all species.

The key strands of national legislation and policy are outlined below:

National Parks and Access to the Countryside Act 1949 (as amended by the Local Government Act 1972 and others)

This Act introduced the concept of National Nature Reserves (NNRs) and SSSIs designated in recognition of their importance for fauna, flora, geological or physiographical features. Local authorities were also granted powers to designate Local Nature Reserves (LNRs) under Section 21 of the Act to protect sites of local nature conservation significance.

The Countryside Act 1968

Section 11 of this Act requires local authorities 'to have regard to the desirability of conserving the natural beauty and amenity of the countryside'. This is interpreted to include the conservation of fauna, flora and geological features in both urban and rural areas. Where local authorities own land they are encouraged to consider nature conservation issues in their management practices.

Wildlife and Countryside Act 1981 (amended by the Wildlife and Countryside (Amendment) Act 1985 and others)

This Act, which has been greatly amended by subsequent legislation, remains the central pillar of statutory nature conservation in the UK. It provides the statutory basis for the legal protection of a wide range of specified plants and animals, and sets out the current principles for the designation, administration and protection of NNRs, SSSIs and LNRs.

The provisions of the Wildlife & Countryside Act (or 'WCA') with respect to SSSIs have recently been revised and enhanced by the Countryside & Rights of Way Act 2000 (see below).

The Environmental Protection Act 1990

This Act sets out the constitution of the present statutory nature conservation agencies, including the Countryside Council for Wales (CCW) which took over the responsibilities previously held by both the Nature Conservancy Council (NCC) and the Countryside Commission in Wales. The Act also strengthened the protection of SSSIs.

The Town and Country Planning Act 1990

Section 106 of this Act enables local authorities to enter into agreement with landowners covering matters such as the conservation, management and enhancement of habitats for wildlife. Section 198 grants local authorities the power to serve Tree Protection Orders (TPOs). TPOs are normally served in the interests of landscape and amenity, but they can also assist in the protection of woodlands which are of nature conservation value.

The Planning and Compensation Act 1991

This Act improved the ability of local authorities to safeguard conservation and amenity areas by strengthening their enforcement and development control powers. It also requires that policies for the protection of nature conservation be incorporated in statutory development plans.

The Protection of Badgers Act 1992

This Act consolidated and strengthened previous legislation for the protection of badgers. Under its provisions, badgers and their nests (or 'setts') are protected from injury, disturbance and destruction. Badgers are protected primarily on welfare grounds, rather than on strict conservation grounds, although populations of this widespread mammal are threatened in many parts of the UK (especially near urban centres) and the species is generally declining in Europe.

The Conservation (Natural Habitats etc) Regulations 1994 (The 'Habitats Regulations')

This Statutory Instrument formally transposes the requirements of the EU Habitats Directive into British Law.

Biodiversity - The UK Action Plan; Command 2428, 1994 (The 'UK BAP')

The Rio Convention (see above) recognised that action must be taken to halt the world-wide loss of animal and plant species, and their potential genetic resources. It was agreed that national plans would be drawn up by each of the participating nations.

The UK BAP sets out the following objectives:

> '*To conserve and where practical enhance:*
>
> *i) the overall populations and natural ranges of native species and the quality and range of wildlife habitats and ecosystems;*
> *ii) internationally important and threatened species, habitats and ecosystems;*
> *iii) species, habitats and natural and managed ecosystems that are characteristic of local areas;*
> *iv) the biodiversity of natural and semi-natural habitats where this has been diminished over recent past decades.*
>
> *To increase public awareness of, and involvement in, conserving biodiversity;*
>
> *To contribute to the conservation of biodiversity on a European and global scale.*'

The UK Steering Group was subsequently set up to develop costed targets for key species and habitats, and to set out recommendations for achieving the objectives of the UK BAP. The findings and

recommendations of this group are set out in *Biodiversity: The UK Steering Group Report* (UKSG), published in 1995.

The UK Steering Group, and its successor body the UK Biodiversity Group, have published costed action plans at the UK level for about 40 Priority Habitats and 400 Priority Species, together with shorter and less detailed statements for a further 100 or so Priority Species (UKSG 1995; UKBG 1998a/b; 1999a-d).

The Environment Act 1995

This Act sets out the constitution of the Environment Agency which was created from the former National Rivers Authority (NRA) and HM Inspectorate of Pollution (HMIP). It also adds to legislation concerning contaminated land, disused mines and National Parks, and provides new powers concerned with air quality issues. A mechanism for the protection of hedgerows is also set out (see below).

The Hedgerows Regulations 1997

This Statutory Instrument (No. 1160) introduced new measures for the protection of hedgerows in England and Wales. All hedgerows which meet certain basic criteria now require notice to be given to the local authority before they can be removed or breached, except under certain stated conditions. If the hedge concerned meets other, more-detailed criteria listed in the Regulations it is classed as an 'Important Hedgerow', and the authority is empowered to refuse permission for its removal either in whole or in part.

Since 1997 a Government Review Group has been monitoring the working of the Hedgerows Regulations and in particular the implementation of the criteria for identifying Important Hedgerows, which are rather complex. Simplified criteria were put forward for consultation in 1998, together with refined definitions covering the scope and interpretation of the Regulations. The outcome of the consultation exercise is awaited at the time of writing but is likely to result in a simpler system which extends protection to a greater percentage of hedgerows in the countryside.

The Conservation (Natural Habitats etc) Regulations 2000

This statutory instrument extends the provisions of the 1994 Regulations (see above) to sites in England which have been submitted to the European Commission as Candidate Special Areas of Conservation (cSACs). The existing Regulations only applied once sites had been formally adopted by the EC as 'Sites of Community Importance' (a category which includes both SACs and SPAs). Candidate SACs are formally placed on a par with SPAs, which are already covered by the 1994 Regulations. In light of the extensive delays which have so far been experienced in agreeing the UK SAC boundaries and getting these adopted by the EC, the new Regulations have been brought forward to prevent possible damage to candidate sites in the interim. It is assumed that similar measures will be brought forward by the National Assembly for Wales in the near future.

The Countryside and Rights of Way Act 2000

This Act came into force on 30 January 2001 and will considerably improve the protection and administration of SSSIs, giving additional powers to the agencies and local authorities. Amongst the measures proposed would be:

- a duty on public bodies to secure positive management on land which they control or occupy;
- rights to refuse consent for damaging activities not currently subject to regulation;
- licence or rights-holders to be treated the same as owners/occupiers;
- more flexible compulsory purchase powers;
- restrictions on third party users;
- amendments to permitted developments rules;
- improved enforcement, etc.

n addition to measures affecting SSSIs, the Act requires all Government ministers, departments and the National Assembly of Wales (NAW) to have statutory regard to the purpose and objectives of the UK BAP. The National Assembly for Wales, in association with CCW, will be required to publish lists of

habitats and species which are regarded as being of principal importance in this regard. The Assembly will also be required to take steps, and to promote the taking of steps by others, to further the conservation of the listed habitats and species.

Precise interpretation of the implications of these measures is not possible at present, but a likely interpretation might be that local planning authorities would be required, through secondary legislation in the future, to formally recognise the importance of UK and Wales BAP habitats and species and afford these due protection in the planning and development process.

Government Planning Guidance

Government guidance for planning authorities is set out in a series of planning guidance documents. These are intended to ensure consistency between local authorities in interpreting the law and in defining their responsibilities and powers regarding matters such as development control.

Wales has its own series of planning guidance documents. These take the form of a general policy statement document (*Planning Guidance (Wales): Planning Policy* 1999) which is supplemented by a series of *Technical Advice Notes* (TANs) which amplify the guidance with respect to key areas of detail. Many of the current documents make reference to nature conservation issues. The main strands are as follows:

Planning Guidance (Wales): Planning Policy (First Revision) 1999 ('PG(W): PP')

This sets out the broad principles for the operation of the planning system in Wales. The document contains general commitments to sustainable development, the protection of biodiversity and protection of the environment as a whole.

PG(W): PP indicates that local authorities should determine planning applications strictly in accordance with the policies contained in the current development plan, and should only do otherwise when there are significant material considerations which make this desirable. Development plans are required to have reasonably detailed policies with respect to nature conservation, and the document goes on to give guidance as to what these should cover.

PG(W): PP notes that '*both statutorily designated sites and other [i.e. locally] designated sites are important for the conservation of natural heritage, as are some non-designated areas and features which provide wildlife corridors*'. Development plans should '*ensure that relevant international, national and local conservation interests are properly provided for*' and that they should '*also be concerned with other land of conservation value, including wildlife sites in urban areas and the possible provision of new habitats*'.

The importance of protecting locally designated sites is acknowledged in the guidance, provided these are of 'substantive nature conservation value', have been assessed against formal criteria and are not unduly or unreasonably restrictive of development. PGW also states that the presence of a protected species is a material consideration when considering planning applications, and notes that applicants must conform with any statutory species protection provisions affecting the site concerned.

PG(W): PP is presently undergoing revision, and a consultation version of the revised document has been circulated.

Planning Guidance (Wales): Technical Advice Note (Wales) 5: Nature Conservation and Planning 1996 (TAN 5)

TAN 5 amplifies the broad provisions of PG(W):PP with respect to nature conservation and is the main source of current planning guidance for this subject in Wales. In summary, the guidance:

- sets out the Government's objectives for nature conservation and the framework for safeguarding our natural heritage under domestic and international law;

- describes the key role of local authorities and CCW;

- emphasises the importance of both designated sites and non-designated habitats for nature conservation;

- advises on the treatment of nature conservation issues in development plans;

- states development control criteria, particularly for SSSIs and sites with additional national and international designations;

- sets out the implications and implementation of the EU Habitats and EU Birds Directives.

Local Planning Guidance

Bridgend County Borough is a Unitary Authority (UA) established under the local government reorganisation of 1996, and as such is required to prepare a Unitary Development Plan (UDP) which will ultimately replace the existing county structure plans, local plans and minerals plans which previously applied to the area covered by the unitary authority.

At the time of writing, a UDP for the period 2001 to 2016 has been issued as a Deposit Draft dated 24th May 2001. This plan includes the following 33 policies which deal with, or touch upon, nature conservation and the protection of the natural environment:

EV1 - Development in the Countryside
EV3 - Development Affecting Agricultural Interests
EV6 - Conversion/Extension/Rehabilitation of Rural Buildings
EV7 - Nature, Siting, Scale and Design of Rural Development
EV8 - Replacement Dwellings in the Countryside
EV9 - Development in Nationally Important Landscapes
EV15 - Development in the Coastal Zone
EV16 - Development in Areas of Flood Risk
EV18 - Development Affecting National and International Sites for Nature Conservation
EV19 - Development Affecting Local/Regional Sites for Nature Conservation
EV20 - The General Protection of Biodiversity
EV21 - The Protection of Wildlife Corridors
EV22 - The Protection of Habitats or Species
EV23 - The Protection/Maintenance of Broad-leafed Trees, etc.
EV24 - The Protection of Trees, Woodlands and Hedgerows
EV25 - Afforestation Proposals
EV33 - External Lighting of New Development
EV42 - Proposals Within Conservation Areas
TM1 - Development for Tourism and Leisure
TM3 - Accommodation for Visitors Outside Urban Areas
TM5 - Camping & Touring Caravan Sites
RC1 - Sport and Recreation Development
SC1 - Provision of Social and Community Facilities
M2 - Mineral Extraction Criteria
M10 - Conditions to Protect and Improve the Environment
M13 - Securing High Quality and Prompt Restoration and Aftercare
W3 - Reduction and Control of Landfill Sites
W4 - Provision of Sites for the Recycling of Mineral waste
W7 - Control over the Disposal of Special Waste
W8 - Provision of Civic Amenity Sites
U2 - Exploiting Renewable Energy Sources in Principle
U3 - Detailed Considerations to be Assessed in Exploiting Energy Sources
U10 - Constraints on the Location of Telecommunications Development

Bridgend County Borough falls within the South East Wales Region along with nine other unitary authorities from the former counties of Glamorgan and Gwent. Regional strategic planning policies for

this area have been devised by the South East Wales Strategic Planning Group (SEWSPG) and are published in *Strategic Planning for South East Wales, Jan 2000*.

Additional Non-Statutory Guidance

Additional guidance on nature conservation issues is also contained in, or will soon be augmented by, various non-statutory documents including:

- *A Biodiversity Guide for the Planning and Development Sectors in Wales* (Consultation Draft) (ALGE 1999)
- *Landscapes Working for Bridgend County Borough* (Opus 1997)
- *Criteria for the Selection of Wildlife Sites in Gwent, Glamorgan & Carmarthenshire* (Clements & Pryce 2000)
- *Developing Naturally, a handbook for Incorporating the natural environment into planning and development* (Mike Oxford, ALGE, 2001*)*
- *Countryside Benefits from Developers Contributions - a Report to the Countryside Agency* (Planning Policies Research Group, Oxford Brookes University 1999)
- *Biodiversity Impact - Biodiversity and Environmental Impact Assessment: A Good Practice Guide for Road Schemes* (Helen Byron, 2000)
- *The Environmental Management of Highways* (The Institution of Highways & Transportation 2001)
- *Local Environment Agency Plan 2000-2005 for Neath, Port Talbot and Bridgend* Area (Action Plan, June 2000)
- *The Severn Estuary Strategy* (SES1997: Management Plan imminent)
- *A Good Practice Guide: Planning for Biodiversity* (RTPI 1999)
- *Welsh Development Agency Biodiversity Guidelines* (in preparation)

Appendix 2: Sources of Wildlife Data for Bridgend County Borough

Published Sources and Survey Databases

Barne, J H (1996) *Coasts and Seas of the United Kingdom: Coastal Directories Series*. Region 11: The Western Approaches: Falmouth Bay to Kenfig. Joint Nature Conservation Committee, Peterborough.

Bridgend Biodiversity Partnership (2000) *Water Vole Biodiversity Action Plan* (Consultation draft).

Bridgend County Borough Council (2000) *The Birds of Bridgend*. Moon, S.J. and Donaghy, N. (authors) BCBC, Bridgend.

Bridgend County Borough Council & Butterfly Conservation (1999) *Bridgend County Borough Council Action Plan for Lepidoptera*. BCBC/BC (draft report).

Buck, A L (1993) *An Inventory of UK Estuaries.* 2: South West Britain. Joint Nature Conservation Committee.

Burd, F (1987) *Saltmarsh Survey of Great Britain.* Nature Conservancy Council, Peterborough.

Cooke, R & Saunders, G R (1990) *Woodland surveys in South Wales region and Brecknock district (1989), using the National Vegetation Classification*. Chief Scientist Directorate Report 1013, Nature Conservancy Council, Cardiff.

Countryside Council for Wales (1993) *Welsh Estuaries Review*. CCW Science Report, Bangor.

Countryside Council for Wales (1994-1995) *Phase 1 Habitat Survey of Glamorgan*. CCW, Cardiff.

Countryside Council for Wales (1992 to date) Phase 2 Habitat Surveys: survey database, chiefly grasslands. CCW, Cardiff.

Dargie, T C D (1995) *Sand dune Vegetation of Great Britain: a National Inventory*. 3: Wales. Joint Nature Conservation Committee, Peterborough.

Deeming, J,C. (1995) *Diptera (True Flies) from the Kenfig National Nature Reserve, Glamorgan.* Entomology Series No. 4, National Museums and Galleries of Wales

Ellis, R G (1983) *Flowering Plants of Wales*. National Museum of Wales, Cardiff.

Fowles, A (1991) *Invertebrates of Wales*. Joint Nature Conservation Committee, Peterborough.

Gilmore, D & Stewart, B (1999) *Provisional Atlas of Macro-moths of Glamorgan*. Glamorgan Moth Recording Group.

Heppinstall, K, Hedley, S M, Francis, I S, Penford, N & Aitchison, J W (1991) *Biological Survey of Common Lands*. 20: Mid Glamorgan. Rural Surveys Research Unit, University of Wales, Aberystwyth.

Herpetofauna Consultants International (1994) Crested newt survey of selected areas in South Wales 1994 (Final Report). Countryside Council for Wales.

Hurford, C & Lansdown, P (1995) *Birds of Glamorgan*. National Museum of Wales, Cardiff.

Jones, G H (2001) *The Orthopteroid Fauna of the Bridgend County Borough*. Bridgend Biodiversity Partnership (unpublished report).

Lovegrove, R, Williams, G & Williams, I (1994) *Birds in Wales*. T & A D Poyser.

Murphy, J & Warwick, D (1968) *Carboniferous Limestone Vegetation in Glamorgan*. Nature Conservancy Council Report.

Rees, J (1983) Review of the invertebrate sites in Wales: review of South & Mid Glamorgan. *Invertebrate Site Register* Report **32**. Nature Conservancy Council, Peterborough.

Smith, L P (1979) *A survey of saltmarshes of the Severn Estuary*. Nature Conservancy Council, Peterborough.

Sneddon, P & Randall, R E (1993) *Coastal Vegetated Shingle Structures in Great Britain*. Main report. Joint Nature Conservation Committee.

Sneddon, P & Randall, R E (1993) *Coastal Vegetated Shingle Structures in Great Britain*. Appendix 1: Shingle Sites in Wales. Joint Nature Conservation Committee.

Sothern, E (1986) *Glamorgan Inventory of Ancient Woodlands* (Provisional). Nature Conservancy Council, Peterborough.

Wade, A E, Kay, Q O N & Ellis R G (1994) *Flora of Glamorgan*. HMSO Publications.

Historic Deerpark Information

Blaeu, Johannes (1645) *Map of the County of Glamorgan*.

CADW/ICOMOS (2000) *Register for Landscapes, Parks & Gardens of Special Historic Interest in Wales*, 1: Parks & Gardens. HMSO.

Ogilby, John (1675) *The continuation of the road from London to St Davids, commencing at Cardiff and extending to Swansea*. [Ribbon Map].

Particular Table of Glamorgan [c.16^{thC}, appendix to Rice Merrick]

Rice Merrick *Morganiae Archaiographia*. [17thC transcript of 16thC manuscript, published by the South Wales Record Society, 1983].

Royal Commission on Ancient & Historical Monuments in Wales (1982) *Medieval Secular Monuments. 2: Non-defensive*. HMSO.

Saxton, Christophorus (1578) *Glamorgan Comitatus, Australis Cambriae pars Descriptio*. [map of Glamorgan].

Organisations/Individuals

Botanical Society of the British Isles: plant records and site data.

Bridgend County Borough Council: sites and species records, general information; detailed information about key sites owned or managed by the Council.

British Trust for Ornithology: site and species records, including annual wader counts etc.

Butterfly Conservation: sites and species information; strategic plans for key species.

Coed Cymru: information about sites and key woodland species.

Countryside Council for Wales: SSSI Notification Schedules and site records; Phase 1 survey; Phase 2 survey database; Red Data Book and rare species records; geological sites and survey records; *Wales Inventory of Surveys* ('WALSIN').

Environment Agency: information about waterways, wetlands and key associated species such as otter, water vole, fisheries, native crayfish etc.

Glamorgan Bird Club: site and species records published in *East Glamorgan Bird Report*.

Glamorgan Moth Recording Group: site and species records.

Glamorgan Wildlife Trust: site and species records.

National Amphibian Survey of Wales: based at University of Wales, Cardiff; compiles amphibian distribution and ecology data.

National Museum & Gallery of Wales, Cardiff: information from collections and records.

University of Wales, Cardiff: general information, student studies and records.

Wildfowl and Wetlands Trust: wildfowl species and site records, including annual counts.

Woodland Trust: information relating to Woodland Trust Reserves and other woodlands in Glamorgan.

Appendix 3: Advice and Guidance on Management for Sites & Species

MANAGEMENT OF HABITATS

The following table sets out broad management principles for key habitats in the county borough. The management of habitats for nature conservation is a specialist field, but it is possible to make broad recommendations in many cases. It is, however, recommended that expert guidance be sought where protected species or special interests are involved.

There are many sources of advice and guidance for the management of habitats for nature conservation. The following general sources are also recommended:

General management of habitats

Andrews & Rebane (2000) *Farming & Wildlife: A practical management handbook*
Bacon & Coleshaw (1999) *Practical Solutions Handbook* [technical manual of machines, devices etc]
Barker & Graf (1989) *Principles for Nature Conservation in Towns & Cities*
Countryside Council for Wales (2000) *Habitat Monitoring for Conservation Management and Reporting 1: Case Studies, 2: Field Methods, 3: Technical Guide* LIFE-Nature Project no. LIFE95 NAT/UK/000821
Emery (1986) *Promoting Nature in Cities & Towns*
Sutherland & Hill (1995) *Managing Habitats for Nature Conservation*

Creation of new habitats

Baines & Smart (1991) *A Guide to Habitat Creation*
Campbell & Ogden (1999) *Constructed Wetlands in a Sustainable Landscape*
Ecoscope Applied Ecologists (in press) *Wildlife Management & Habitat Creation on Landfill Sites*
ENACT (1996) Heathland Re-creation : Special Issue [articles]
Environmental Advisory Unit (1988) *Heathland Restoration: A Handbook of Techniques*
Francis & Dixie (1996) *Planting Recommendations Based on the NVC System*
Gilbert & Anderson (1998) *Habitat Creation & Repair*
Kerr (1999) *Woodland Creation: Experience for the New National Forest*
Luscombe & Scott (1994) *Wildflowers Work*
Mitchell & Hare (1999) *Heathland Creation on Arable Land at Minsmere*
Parker (1995) *Habitat Creation: A Critical Guide*
Rodwell & Patterson (1994) *Creating New Native Woodlands*
Wells *et al* (1981) *Creating Attractive Grasslands Using Native Plant Species*
Welsh Development Agency (1984) *Grass Seed Mixes for Reclaimed Land*
Williams *et al* (1997) Designing new ponds for wildlife [article]

Woodlands

Broad (1998) *Caring for Small Woods*
BTCV (1988) *Woodlands*
BTCV (1991) *Trees & Aftercare*
Buckley (1992) *Ecology & Management of Coppice Woodlands*
Countryside Council for Wales (1995) *Habitats Series 1: Woodlands*
English Nature (1990) *Woodlands : Practical Conservation*
English Nature/Open University (1990) *Practical Conservation: Woodlands*
Forestry Commission (1986) *Guidelines for the Management of Broadleaved Woodland*
Forestry Commission (1990) *Forest nature Conservation Guidelines*
Forestry Commission (1992) *Community Woodland Design Guidelines*
Forestry Commission (1994) *The Management of Semi-Natural Woodlands: Forest Practice Guides*
Green (2000) Coppicing like a beaver [article].
Hart (1995) *Alternative Silvicultural Systems to Clear Cutting in Britain*
Harris & Harris (1997) *Wildlife Conservation in Managed Woodlands & Forests*
Hodgetts (1996) *The Conservation of Lower Plants in Woodland*
Kirby (1987) *Forestry Operations and Broadleaved Woodland Conservation*

Warren & Fuller (1993a) *Woodland Rides & Glades: Their Management for Wildlife*
Warren & Fuller (1993b) *Coppice Woodlands: Their Management for Wildlife*
Worrell (1999) *The Birch Woodland Management Handbook*

Scrub

Crofts & Jefferson (1999) *Lowland Grassland Management Handbook*
Hopkins (1996) Scrub ecology & conservation [article]

Parkland & Veteran Trees

English Nature (1996) *Guide to the Care of Ancient Trees*
English Nature/Veteran Trees Initiative (2000) *Veteran Trees: A Guide to Good Management*
Green (1997) Pollarding: origins and practical advice [article]
Read (1996) *Pollard & Veteran Tree Management*

Hedgerows & Field Boundaries

BTCV (1986) *Practical Handbook: Fencing*
BTCV (1998) *Practical Handbook: Hedging*
BTCV (1999) *Practical Handbook: Drystone Walling*
English Nature/Open University (1992) *Practical Conservation*: *Boundary Habitats*
Sotherton & Page (1998) *A Farmers' Guide to Hedgerow & Field Margin Management*
Watt & Buckley (1994) *Hedgerow Management & Nature Conservation*

Grasslands

Anon (1993) *The Wildflower Handbook*
Ash *et al* (1992) *Flowers in the Grass: Creating & Managing Grasslands with Wild Flowers*
Crofts & Jefferson (1999) *The Lowland Management Handbook*
ENACT (1995) Wet Grasslands: Special Issue [articles]
English Nature/Open University (1992) *Practical Conservation: Grasslands, Heaths & Moors*
Treweek *et al* (1997) *The Wet Grassland Guide*
Ward (1994) Management of lowland wet grassland for breeding birds [article]

Heathlands

Bacon (1999) Back to purple with mean machines [article]
Countryside Council for Wales (1997) *Habitats Series: Lowland & Coastal Heath*
ENACT (1993) Lowland Heathlands: Special Issue [articles]
ENACT (1996) Heathland Re-creation : Special Issue [articles]
English Nature/Open University (1992) *Practical Conservation: Grasslands, Heaths & Moors*
Environmental Advisory Unit (1988) *Heathland Restoration: A Handbook of Techniques*
Farrell (1983) *Heathland Management*
Gimmingham (1993) *The Lowland Heathland Management Handbook*

Bracken

Robinson (1999) Bracken clearance [article]
RSPB (1989) *Management Techniques for the Control of Bracken*

Bogs & Upland Habitats

Stoneman & Brooks (1997) *Conserving Bogs: The Management Handbook*

Rivers, Streams & Ditches

Briggs (1997) Canals: wildlife value and restoration issues [article]
Newbold *et al* (1983) *Nature Conservation & River Engineering*
Newbold *et al* (1989) *Nature Conservation and the Management of Drainage Channels*

Painter (2000) Managing ditches for wildlife [article]
River Restoration Centre (1999) *Manual of River Restoration Techniques*
RSPB (1994) *The New Rivers & Wildlife Handbook*
Wade *et al* (in press) *The Ecology & Management of Drainage & Irrigation Channel Systems*

Lakes, Ponds & Wetlands

Biggs *et al* (1994) New approaches to the management of ponds [article]
BTCV (1997) *Practical Handbooks & Waterways & Wetlands*
Countryside Council for Wales (1996) *Ponds & Conservation*
English Nature (1998) *Managing Ponds for Wildlife*
English Nature/Open University (1992) *Practical Conservation: Water & Wetlands*
Environment Agency (1998) *Pond & Conservation*
Porter (1988) *The Pond Book*

Reedbeds

Burgess & Evans (1989) *The Management of Reedbeds for Birds*
ENACT (1998) Reedbeds: Special Supplement [articles]
Hawke & José (1996) *Reedbed Management for Commercial & Wildlife Interests*

Sand Dunes & Coastal

BTCV (1991) *Practical Handbooks*: *Sand Dunes*
Mitchley & Malloch (1981) *Sea Cliff Management for Great Britain*

Urban Land, Ruderal Habitats & Miscellaneous

Andrews & Kinsman (2000) *Gravel Pit Restoration for Wildlife*
BTCV (1992) *Practical Handbooks*: *Footpaths*
Child & Wade (2000) *The Japanese Knotweed Manual*
DETR (1998) *Good Practice Guide on Managing the Use of Common Lands*
Ecoscope Applied Ecologists (in press) *Wildlife Management & Habitat Creation on Landfill Sites*
English Nature/Open University (1992) *Practical Conservation: Urban Habitats* (1993
Welsh Development Agency (1994) *Working With Nature*
Welsh Development Agency (1984) *Grass Seed Mixes for Reclaimed Land*
Welsh Development Agency (1994) *The Control of Japanese Knotweed: Model Specification*
Welsh Development Agency (1994) *The Eradication of Japanese Knotweed: Model Tender*
Yates & Ruff (1991) *Encouraging Nature in Urban Public Parks*

MANAGEMENT FOR SPECIES

Management for species is an even more specialised field and will usually require expert guidance, especially where protected species are involved. However, the following sources are recommended for basic management advice and general guidance:

Invertebrates

Butterflies Under Threat Team (1992) *The Management of Chalk Grassland for Butterflies*
Kirby (2000) *Habitat Management for Invertebrates: A Practical Handbook*
Kirby & Drake (1993) *Dead Wood Matters* [timber dwelling invertebrates]

Herptiles

Bray & Gent (1997) *Opportunities for Amphibians and Reptiles in the Designed Landscape*
Countryside Council for Wales (1999) *Great Crested Newts: A Guide for Developers*
Gent & Gibson (1998) *Herpetofauna Worker's Manual* [amphibians & reptiles]

Birds

Petty (1998) *Ecology & Conservation of Raptors in Forests*
Ramsden & Ramsden (1995) *Barn Owls on Site*
Shaw & Dowell (1990) *Barn Owl Conservation in Forests*
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