



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Welsh Assembly Government

Bioamrywiaeth Cymru

Trunk Road Estate Biodiversity Action Plan 2004 -2014



Biodiversity Wales



If you have any comments on this document, its contents, or its links to other sites, please send them by post to: Environmental Science Advisor, Transport Directorate, Welsh Assembly Government, Cathays Park, Cardiff CF10 3NQ or by email to len.wyatt@wales.gsi.gov.uk

The same contact point can be used to report sightings of wildlife relating to the Trunk Road and Motorway network.

Prepared by



on behalf of the Welsh Assembly Government

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Foreword

FOREWORD BY THE MINISTER FOR ECONOMIC DEVELOPMENT AND TRANSPORT

The publication of this Action Plan is both a recognition of the way the Assembly Government has been taking forward biodiversity and an opportunity for the Transport Directorate to continue to contribute to the wealth of biodiversity that occurs in Wales.

Getting the right balance between the needs of our society for road-based transport, and the effects of the Assembly's road network on our wildlife is a complex and often controversial issue.

The Plan itself is designed to both challenge and inspire those who work with the Directorate on the National Assembly's road network – and, as importantly, to challenge those of us who use the network to think more about the wildlife there. Whilst many of the actions will take time to deliver, and possibly even longer to show benefits to the habitats and species involved, I hope the Directorate will be able to set the standard for work in Wales and beyond on similar issues.

In conclusion, I welcome this plan and the vision behind it, and I look forward to hearing how the Directorate applies it and the outcome of their work.



A handwritten signature in black ink that reads "Andrew Davies". The signature is written in a cursive, flowing style.

Andrew Davies AM

Executive Summary

What is biodiversity?

Biodiversity encompasses all of the variety of life on earth and relates, in particular, to the importance of preserving a complex system of habitats and species in order to maintain the ecological health of the planet.

In the United Kingdom, certain types of habitat and species have been identified as being of particular importance for biodiversity, and many organisations are taking forward measures through Biodiversity Action Plans to maintain and, where practical, enhance them.

Why is the Transport Directorate involved?

The Transport Directorate is responsible for the Trunk Roads and Motorway Network in Wales. This network extends across the whole of Wales, crossing through a wide variety of rock types, landscapes and habitats. These areas can be upland, lowland and occasionally coastal. The area within the highway boundary but not including the hard road surfaces is known as the “soft estate,” and currently extends to approximately 1700 hectares.

This land can contain areas of biodiversity interest but, conversely, the construction and use of roads can have negative effects on biodiversity.

Under Section 74 of the Countryside and Rights of Way Act 2000, the Assembly Government has a duty to have a regard for the conservation of habitats and species of principal importance to Wales.

This plan includes a number of these habitats and species.

With this information in mind, the Directorate has produced this Plan.

Objectives of the Trunk Road Estate Biodiversity Action Plan (TREBAP)

The objectives of the TREBAP, within the constraints of resources and road safety, are to:

- set practical and realistic actions and targets for the period 2004 – 2014;
- link with other relevant Biodiversity Action Plan targets for habitats and species;
- increase awareness of the Transport Directorate’s staff and contractors, its environmental partners, and the general public, of the biodiversity interest of the trunk road and motorway network;
- encourage the use, and dissemination, of best practice for biodiversity in the management and development of the trunk road and motorway network; and
- reflect the requirements of the Assembly’s Sustainable Development Scheme and Action Plan where relevant.

Executive Summary

How was the Plan developed?

A consultation to determine the approach the plan should take was carried out in Autumn 2001.

During the summer of 2002, Government Policies, UK and Local Biodiversity Action Plans, and existing information on biodiversity of the network, were audited to provide information to support the preparation of the Plan. The preparation of the plan was directed by a Partnership of representatives from wildlife, transport and public organisations. The draft Plan was subject to a Technical Consultation between February and May 2003.

What does the Plan cover?

The Plan is divided into two parts. The first describes the background to biodiversity, the responsibilities and functions of the Directorate, and the detail of the process through which the Plan has been developed. The second part contains the Action Plans for the Habitats and Species.

Eleven **Habitat Action Plans** have been included within the TREBAP. These are: Boundary Features; Calcareous Grassland; Coastal and Estuarine Habitats; Heathlands; Lowland Dry Acid Grassland; Lowland Meadows; Purple Moor Grass and Rush Pastures; Rivers and Streams; Rock Faces and Scree; Water bodies; and Woodlands and Planted Native Trees and Shrubs.

Seventeen **Species Action Plans**, some for individual species, others for groups of species, have also been included. These are: Amphibians; Aquatic Species; Barn Owl; Bats; Dormouse; Marsh Fritillary; Butterfly; Otter; Reptiles; Water Vole; Welsh Clearwing Moth; Native Black Poplar; Bluebell; Deptford Pink; Limestone Woundwort; Orchids; Spreading bellflower; Wood Bitter Vetch.

Additionally, two **Generic Action Plans**, have been included (*Ecological Survey*, and *Education and Awareness*) as the results of the actions therein will inform and enable other actions to take place.

Overall, 251 actions are listed for the Directorate to undertake. These actions include: reviewing and publishing new advice; finding out more about the habitats and species on the network; amending the way new roads and roadside verge management are undertaken; where practical, restoring or creating new habitats; and raising awareness of the importance of the network to biodiversity.

Delivery, monitoring and reporting

Because of the health and safety implications of working on roads, most of the actions will need to be carried out by the Directorate, through both new schemes and ongoing maintenance. However, the Directorate acknowledges that, without assistance from those with specialist knowledge of wildlife issues, and the support of the general public, the application of the TREBAP would be less effective. The Directorate welcomes the continuing involvement of other organisations and individuals in this work.

The Directorate will be recording actions taken on an annual basis, reporting to the Partnership biennially; and providing information to the UK-wide Biodiversity Action Reporting System (BARS), once its requirements and compatibility with the Directorate's needs have been established.

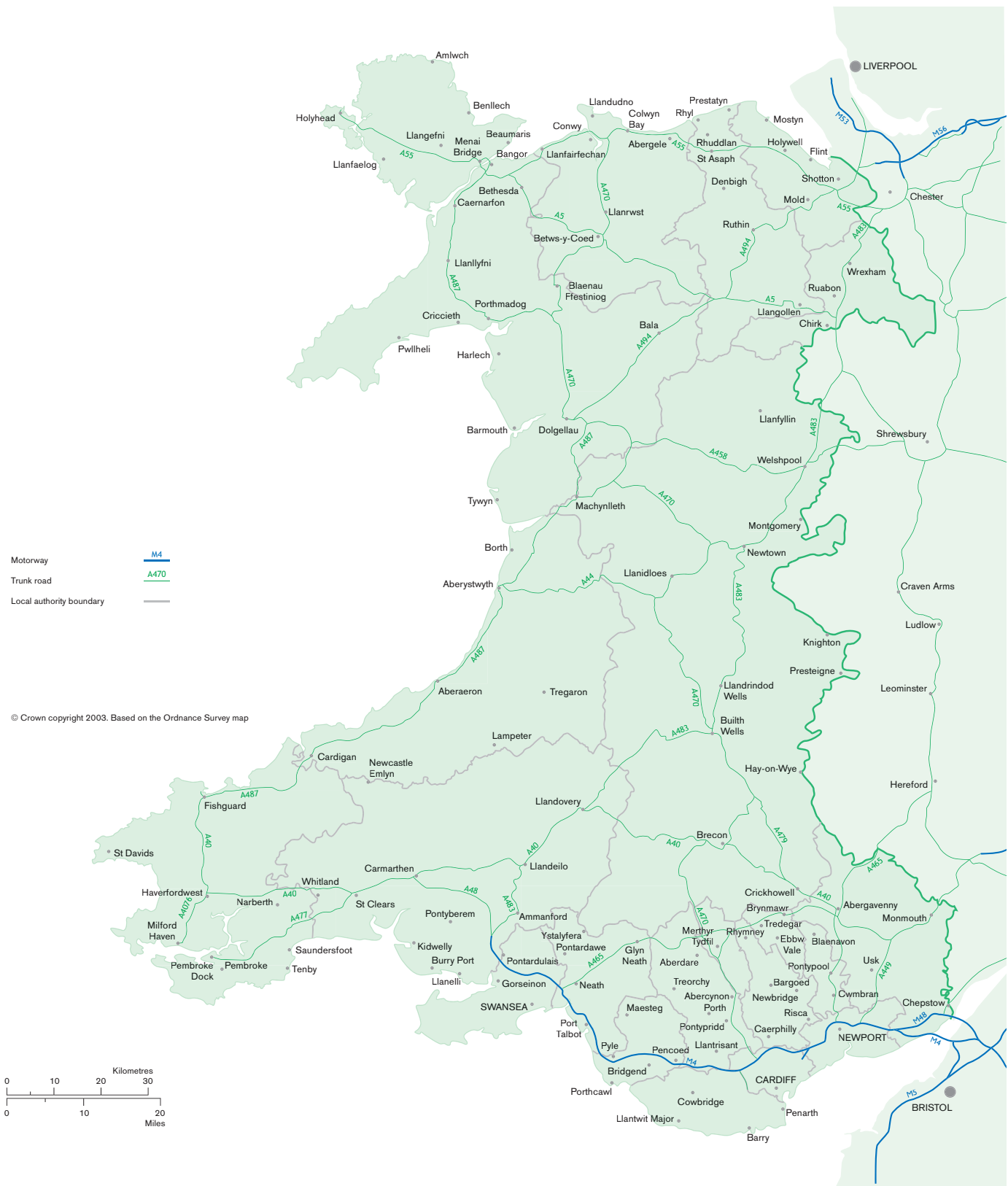
Review

The plan will be reviewed in 2009 with the Partnership. Existing Action Plans will be reviewed, and new species and habitats considered for inclusion.

Feedback

If you have any comments on the TREBAP please contact the Directorate's Environmental Science Advisor, whose contact details can be found on the front of this document.

The Trunk Road and Motorway Network



If you experience problems viewing this page, please enlarge using the 'zoom' tool.

How to use this document

The TREBAP has been produced in three formats:

- as a freestanding paper-based document;
- as a computer-based Adobe Acrobat file for downloading from the internet at;
<http://www.wales.gov.uk/subitransport/content/trebap/index-e.htm>
- and as a computer-based interactive Adobe Acrobat document at;
<http://www.wales.gov.uk/subitransport/content/trebap/index-e.htm>

If you are reading this as a paper-based document the text has been altered so that relevant information sources, which are shown as an internet hyperlink on computer-based versions, are listed under the Glossary and the References.

The Adobe Acrobat based version allows navigation within the document and is suitable for printing.

The interactive Adobe Acrobat document allows for links to external sites using the underlined/highlighted hyperlinks in the document, but is not so suitable for printing.

1 Introduction

The term ‘biodiversity’ encompasses all of the variety of life on Earth, and relates in particular to the importance of preserving a complex system of habitats and species, and the interactions between them, in order to maintain the ecological health of the planet.

The [National Assembly for Wales](#), as the Highway Authority for Wales, has direct responsibility for the maintenance, improvement and development of the trunk road and motorway network of Wales. Under the [Countryside and Rights of Way \(CRoW\) Act 2000](#), the National Assembly for Wales has a duty to have a regard for the conservation of biodiversity in its work. Conservation includes both the protection, and the enhancement, of the habitats and species of principal importance in Wales.

The Welsh Assembly Government [Transport Directorate](#) is already incorporating biodiversity into its work, and the Trunk Road Estate Biodiversity Action Plan, or ‘TREBAP’ is to contribute to this ongoing process.

Objectives of the TREBAP

The objectives of the TREBAP, within the constraints of resources and road safety, are to:

- set practical and realistic actions and targets for the period 2004 – 2014;
- link with other relevant Biodiversity Action Plan targets for habitats and species;
- increase awareness of the Transport Directorate's staff and contractors, its environmental partners and the general public, of the biodiversity interest of the trunk road and motorway network;
- encourage the use, and dissemination, of best practice for biodiversity in the management and development of the trunk road and motorway network; and
- reflect the requirements of the Assembly's [Sustainable Development Scheme](#) (*Learning to Live Differently*) and [Action Plan](#) where relevant.



Oxeye daisies along the A55

2 Background to biodiversity in the UK

In June 1992, over 150 heads of state or government (including the UK Prime Minister) signed the Convention on Biological Diversity at the UN Conference on Environment and Development at Rio de Janeiro, committing them to take action to conserve and enhance biodiversity within their national boundaries. To find out more about the UK's contribution to biodiversity, access the [UK Biodiversity web-site](#).

The UK government, in consultation with over three hundred organisations throughout the UK, identified a number of key issues in conservation, with a broad range of activities to be undertaken over the next twenty years. Fundamental principles were established, including:

- a partnership approach to achieving goals;
- the establishment of targets, i.e. measurable outcomes that address the needs of species and habitat types;
- the need for policy integration;
- the requirement for comprehensive and well-managed information from a variety of sources; and
- the value of, and requirement for, public awareness and support.

These principles were incorporated into the **UK Biodiversity Action Plan**, described in the box below, which sets out the actions required to achieve the detailed conservation objectives for a number of habitats and species.

- 1994: '*Biodiversity: the UK Action Plan*' published.
- 1995: '*Biodiversity: the UK Biodiversity Steering Group report*' published.
- 1996 and 1999: '*UK Biodiversity Group Tranche 2 Action Plans, Volumes I - VI*', published.



Resurfacing works on the A40



Bluebell wood

The UK Biodiversity Action Plan sets out the plans for habitats and species into priority action plans and broad statements.

- Priority Habitat Action Plans provide more detailed descriptions for 45 specific types of habitats. These plans set out detailed actions that can be undertaken to safeguard and enhance these habitats.
- Broad Habitat Statements provide summary descriptions of all habitats found within the UK. They include natural habitat types such as 'broadleaved woodlands' and 'rivers and streams'. The Statements provide a general description of the habitat type, identify current issues affecting that habitat, and outline broad policies which can be put in place to address these.

To find a UKBAP Habitat Action Plan or statement, [click here](#)

- Priority Species Action Plans have been produced for 391 species within the UK to date. These provide detailed information on the threats facing these species as well as opportunities for maintaining and enhancing their populations. Detailed actions are set out for a number of organisations to achieve the targets for these species.
- 'Grouped' Species Action Plans have also been produced where a range of common policies and actions are required for a number of similar species, for example, marine turtles or commercial fish.
- 'Species Statements' have also been prepared, which provide an overview of the status of particular species and set out the broad policies that can be developed to conserve them.

To find a UKBAP Species Action Plan or statement, [click here](#)

The conservation of Priority Species and Habitats is currently being translated into local action by the production of Local Biodiversity Action Plans ([LBAPs](#)), produced largely by local authorities in partnership with other interested parties, including the Countryside Council for Wales, [local Wildlife Trusts](#) and the [Environment Agency Wales](#).

Special-interest groups such as [Butterfly Conservation](#) have produced Action Plans for particular taxonomic groups. Various sectors have also created their own Action Plans: these include, for example, [Aggregate Industries UK](#), and the [Highways Agency](#) in England. Farms and businesses have also been encouraged to develop farm or [Company Biodiversity Action Plans](#).

3 Background to Biodiversity in Wales

A number of initiatives already underway have informed the approach of the TREBAP, either during the Audit process, undertaken as part of the preparations of the plan, or subsequently as the plan has developed.

Countryside and Rights of Way (CRoW) Act 2000

As part of the National Assembly for Wales' responsibilities under Section 74 (2) of the CRoW Act, the habitats and species considered to be of principal importance in Wales have been identified. These habitats and species are collectively known as the '[Section 74 List](#)'. The List is based on the UK Biodiversity Action Plan, but there are a number of additions reflecting biodiversity in Wales. Where habitats and species included within the TREBAP appear on the Section 74 List, this has been stated in the relevant Action Plan.

'Action for Wildlife' and 'Priority Habitats of Wales'

The document [Action for Wildlife](#) (CCW, 1997), produced by the Countryside Council for Wales as 'a contribution to the work of the Wales Biodiversity Action group', provides additional information on those UKBAP species (54) and habitats (12) occurring in Wales, which had been identified in the UK Biodiversity Steering Group Report. CCW have also recently produced "Priority Habitats of Wales: a technical guide" which provides details of the characteristics and distribution of UK Biodiversity Action Plan priority habitats in Wales.

Local Biodiversity Action Plans (LBAPs)

Twenty-four LBAPs have been (or are in the process of being) produced by Local Authorities and National Parks in Wales. Those plans available in 2002 were reviewed when the Network Audit was undertaken in order to inform the TREBAP.

Woodlands for Wales

The strategy document '[Woodlands for Wales 2001](#)', published by the National Assembly for Wales, has a diverse and healthy environment as one of its strategic objectives. Priorities for action under this strategic objective are: to conserve and enhance the biodiversity of our woodlands; to conserve and enhance the landscapes of Wales; and to better integrate woodlands with other countryside management.

Sustainable Development

The National Assembly has a duty to promote Sustainable Development in the exercise of its functions. The TREBAP provides a framework for the Transport Directorate's work with wildlife, which would contribute to the action described in Section 5C of the National Assembly's [Sustainable Development Scheme](#), to preserve biodiversity.

4 The Trunk Road Estate

‘The Transport Framework for Wales’, published in November 2001, sets out the Welsh Assembly Government’s vision for improving the transport system of Wales, enabling authorities and operators responsible for both public and private transport to work towards achieving the aims of this policy document.

The Welsh Assembly Government is responsible for approximately 1700 kilometres of motorway and trunk roads extending across Wales. [These are shown on the map on page 7](#). Trunk roads and motorways are those routes identified as being of strategic importance to Wales. They constitute about 5% of the length of roads in Wales but they carry over 50% of all traffic, and so the maintenance and improvement of this service is vital. The standard of this network varies from three-lane motorways, to dual carriageways and single carriageways. Traffic flows on the network vary from about 3,000 to 120,000 vehicles per day depending on location.

Long-term traffic growth has continued since 1989, especially on the trunk roads and motorways that connect the main areas of population in Wales. With an increase in the demand for transport, it is forecast that traffic on major inter-urban routes (i.e. mainly trunk roads and motorways in South and North Wales) will continue to grow.

The document *Driving Wales Forward* (1998) identified within the (then Welsh Office’s) road network, a new core network of strategic roads. The [Trunk Road Forward Programme](#) (2002) highlighted key corridors: the North-South corridor and the East-West corridors in South, Mid and North Wales.

The [Trunk Road Forward Programme](#) (2002) states that the over-arching objective associated with the trunk road corridor development is to maintain and improve the trunk road network in Wales in a sustainable manner, taking into account the social, economic and environmental needs and obligations of the nation. In addition, the environmental objectives are to:

- improve the quality of life for people in communities close to the trunk road network;
- promote cycling and walking and provide opportunities for healthy lifestyles;
- minimise any adverse effects on the environment generally; to conserve and enhance, where appropriate, landscapes, townscapes and historic and cultural resources; and
- conserve and enhance, where appropriate, biodiversity on the network through the Biodiversity Action Plan.

A [review of the trunk road network](#) has been completed which considers the extent of the trunk roads and motorways, for which the Welsh Assembly Government is responsible. The application of this review will inform the application of the TREBAP.

The Trunk Road Estate



Traffic in a mid-Wales village

The soft estate

The Welsh Assembly Government Transport Directorate's soft estate extends across the whole of Wales, traversing (and therefore influencing and being influenced by) a wide variety of rocktypes, landscapes and habitats, from purple moorgrass and rush pasture to reedbed, coastal floodplain grazing marsh, and rock and scree habitats. The associated soft estate currently extends to approximately 1700 hectares. Whilst much consists of narrow strips of grassland, scrub, or woodland close to the carriageway, there are also more extensive areas of land within large interchanges, or land acquired as a result of severance.

Highways land has many uses, including those relating to engineering requirements, road safety, signing and traffic management, drainage, and the provision of mitigation for the visual and other environmental effects of the road and traffic, as well as measures relating specifically to biodiversity and nature conservation. The same verges can have impacts on visual and cultural heritage interests.

Increasingly, the soft estate is being acknowledged as holding areas of value for biodiversity. This can be:

- because of the presence of remnants of original habitats;
- the often low ecological value of adjacent land;
- its value as a wildlife corridor; either as a link between habitats or as a stepping stone between them; and
- in some cases, as a result of the management applied (e.g. appropriate grass cutting and reduced pesticide use).

Road verges can be of particular value if they comprise intrinsically valuable habitat that also abuts larger (sometimes protected or designated) areas of the same habitat type (such as Sites of Special Scientific Interest or local wildlife sites).

Conversely, roads are considered to have significant negative effects on biodiversity, although these may not be as widespread as other human activities. Roads are considered to be a significant current factor affecting decline or loss of some habitats and species in some circumstances. Among the potential negative effects on biodiversity are:

- road construction (resulting in habitat loss and fragmentation);
- barriers to species movements;
- incidental mortality on roads (for example, badgers, otters and barn owls);
- pollution (of air, water and land resources);
- incidentally enabling the spread of alien or invasive species;
- noise disturbance; and
- artificial lighting.

Many existing biodiversity action plans also refer to 'built development' as a general threat, and it can be assumed that road construction and widening schemes are included in this.

Operation of the network

- For operational purposes, the trunk road and motorway network of Wales is currently divided into eight trunk road agencies.
- The agencies are mostly partnerships of several local authority highway and engineering sections, although there are one or two single authorities.
- All agencies have a trunk road manager, supported by senior or route engineers and area highway inspectors.
- [Forest Enterprise](#) operates as agents for the landscaped or planted areas on highways under a Landscape and Management Services business manager, with support from four area managers.

In July 2003, the Directorate announced a consultation on revised arrangements for the organisation and procurement of the management of the network. The results of this consultation will inform the application of this Action Plan.

In conclusion, the Transport Directorate has the potential to make a significant contribution to national and local biodiversity targets, particularly for those habitats and species that occur commonly on the Welsh trunk road and motorway network. The results of the analysis of information from the [audit of the network](#) information identified those habitats and species that are most at risk from the operation of the trunk road network, and those that could benefit from appropriate management of the soft estate.

In certain circumstances, conservation management can be expensive, and the Welsh Assembly Government, as a public body, will need to balance biodiversity benefits against financial cost, other environmental requirements (such as landscape and cultural heritage) and road safety. However, although such 'flagship' practices as habitat recreation and species reintroduction may be considered on a small number of sites, relatively simple and cost-effective alterations to routine maintenance, such as changes to cutting regimes, could have significant benefits for biodiversity.



Night time on the M4

5 Existing guidance and advice

The Welsh Assembly Government has a general responsibility to limit the impact of the road network on biodiversity and should ensure that any proposals take full account of the possible presence of adjacent habitats and species of biodiversity interest and any possible impacts on these. This is usually taken forward through an appropriate ecological assessment of habitats or species affected by proposals from which appropriate mitigation measures are implemented.

The Directorate currently relies on two main sources of advice – the Design Manual for Roads and Bridges (DMRB) and the Welsh Trunk Road Maintenance Manual (WTRMM). Further advice on individual species and landscape management is being prepared.

- Guidance on the application of Environmental Assessment techniques is given in Volume 11 of the [DMRB](#) (1992 onwards). This volume is currently under review.
- Key issues with respect to Nature Conservation are outlined in Volume 10 of the [DMRB](#) (1992 onwards), and its associated Nature Conservation Advice Notes. The key issues, which are applicable to all operations on the network, [are reproduced in the box overleaf](#).
- The Welsh Trunk Road Maintenance Manual (WTRMM) 1999, provides guidance on the management of highway verges. The main points of the advice in relation to biodiversity [are produced in the box overleaf](#).



Cowslip bank

Key issues from the DMRB Volume 10, Nature Conservation and Biodiversity Advice Note

- Natural processes which affect species and habitats are dynamic and interrelated. All nature conservation proposals should reflect this.
- Road infrastructure projects wherever possible should maintain and protect surrounding habitats, including the systems on which they depend e.g. hydrology, soils, geology.
- It is essential where nature conservation work is required that appropriately qualified professionals are used and advice from suitably experienced specialists, statutory consultees and other conservation bodies is obtained.
- Projects must take into account local, regional, national or international wildlife sites and protected/rare species and habitats. Habitats, species and sites covered by UK and European legislation need to be considered in the light of the relevant legislation and policy guidance so as to avoid the implications of non-compliance.
- Nature conservation issues must be incorporated from the earliest stages of project development as part of the decision making process.
- Negative impacts (e.g. habitat loss, territory severance, pollution), should be avoided wherever possible. If this is not possible the impacts should be mitigated for. Only as a last resort should techniques such as translocation/relocation be considered.
- Road infrastructure projects need to consider both the area to be affected and the surroundings to an appropriate scale for the species and habitats involved.
- Where specific nature conservation measures are to be applied, appropriate aims and objectives should be agreed before design starts, if necessary, with the overseeing organisation and statutory consultees.
- When developing project timetables, it is essential that the most appropriate time of the year is identified for undertaking surveys and carrying out the works.
- Designs for nature conservation measures should ensure that they are able to maintain their purpose through appropriate ongoing management.
- Opportunities for habitat creation and enhancement should be taken wherever possible.
- Projects must include consideration for the post-construction management within the design process.
- Records should be kept of the design, application and management of specific nature conservation measures for future reference.
- An Environmental Site Coordinator/Clerk of Works should be appointed to oversee the design and implementation of nature conservation works where appropriate.

Issues relating to biodiversity in the Welsh Trunk Road Maintenance Manual (WTRMM).

The WTRMM describes routine landscape maintenance and inspection for grass areas, hedges and trees, which are required for keeping the highway safe (such as cutting vegetation to ensure visibility of signs, making safe all trees which might fall onto the carriageway, etc.). It also covers advice on the use of pesticides, and how to deal with injurious weeds and pest species.

Examples of the advice related to biodiversity, which needs to be considered alongside the other advice in the Manual are:

Grassed areas:

- The prime concern for the Directorate is for the safety of the road user, but, as owner and/or occupier of the highway land, there are also legal and moral obligations to adjacent land users and the public at large.
- Certain sites adjacent or within the highway boundary shall be maintained in accordance with management advice from CCW. These sites include Sites of Special Scientific Interest, National Parks, Areas of Outstanding Natural Beauty, Conservation Areas, Areas designated as Habitat Creation or Wild Flower areas; areas of naturally occurring wild flowers.
- Cutting should as far as possible be restricted to once in a growing season, other cuts shall be subject to approval of the Directorate, and shall only be considered in the following circumstances:
 - i) Specific urban areas may be selected for cutting up to four times per year. In exceptional circumstances, where visual and operational benefits can be demonstrated, certain key areas may warrant more frequent cutting.
 - ii) Grassed areas where wildflower sowing or planting has been undertaken require cutting accompanied by the removal of all arisings.
 - iii) Other verge areas where the existing sward has developed botanical and/or nature conservation interest may be considered for grass cutting if it can be demonstrated that this represents value for money in visual and conservation benefits.

Hedges and Trees (other than those planted as landscape features)

- Cutting or clearance to safeguard visibility at junctions, bends and accesses and of signs shall be carried out only as needed and at a time which gives maximum effect, but care shall be taken to avoid permanent damage to the hedge or tree.
- Hedges and trees overhanging carriageways shall be trimmed to provide a minimum of 5.2m headroom.
- Where agreed with Wildlife Trusts or other accredited bodies, hedges and trees within SSSIs or areas of conservation interest shall be maintained in the agreed manner.
- Trees should not be felled, nor hedges cut during the bird-nesting season.

6 TREBAP Development

Development of the plan

The Plan was developed through the following activities:

- A consultation on its approach
- An Audit of existing information
- A Partnership
- A technical consultation

A [consultation](#) on the approach to be taken to the TREBAP was undertaken between September and November 2001. An audit of all of the Local Biodiversity Action Plans that are currently available, and of existing information relating to biodiversity on the network, was undertaken between August and October 2002. A summary of the results are reported in the [Audit section](#).

The TREBAP partnership consists of representatives from a wide range of national wildlife, transport and public organisations, as shown.

The TREBAP Partnership held its first meeting in October 2002 and its second meeting in November 2002. In June 2003, it met to consider the responses to the technical consultation.

The objectives of this Partnership were to:

- ensure that this TREBAP contributes, in a cost-effective manner, to the Assembly's objective of conserving and, where possible, enhancing biodiversity; while reflecting the Assembly's Sustainable Development Scheme and Action Plan where relevant;
- ensure that this TREBAP reflects best practice in linking with relevant UK and [Local Biodiversity Action Plan](#) targets; and
- ensure that this TREBAP sets practical and realistic targets, so that the Transport Directorate's contribution to biodiversity on its road network can be maximised, within the constraints of the operational requirements of that network.

THE TREBAP PARTNERSHIP

The Welsh Assembly Government

[Transport Directorate:](#)

Chair: John Rees, Chief Highway Engineer
Major Projects Rep: Simon Shouler
Network Management Rep: Peter Jones
Environmental Advisor: Len Wyatt

The Welsh Assembly Government

[Agricultural Division:](#) Alan Starkey

[Sustainable Development:](#) Lisa Dobbins

Countryside Division: Steve Lucas
(seconded from CCW)

[Countryside Council for Wales](#)

Matthew Ellis

[Environment Agency Wales](#)

Chris Formaggia (until November 2002)
Nick Bialynicki-Birula (from March 2003)

[The Wildlife Trusts Partnership](#)

Dyfrig Jones

[RAC Foundation](#)

Bill Billington

[Friends of the Earth](#)

Neil Crumpton

[RSPB](#)

Tony Prater*

[Country Landowners' Association](#)

Julian Salmon*

Welsh Transport Strategy Group

Stuart Watkins

[Welsh Association of Local Government](#)

Ecologists

Kris Roberts (Torfaen CBC)

[Cresswell Associates](#)

Stephanie Wray (Consultancy support)
Paola Reason (Consultancy support)

* by correspondence



A470 in the Wye Valley

The Technical Consultation

A technical consultation was undertaken by contacting a number of parties, both external to, and within, the Assembly Government's Transport Directorate. Consultees were contacted by a letter, which indicated a number of ways to access the draft TREBAP. Primarily, a web-site address was included where the document could be accessed directly as an Adobe Acrobat file. Electronic copies were also offered by e-mail or on a disc, and hard copies were available by post.

In addition, a press release was issued, and articles were placed in the UK-wide [Biodiversity News](#), and in the [Welsh Local Issues Advisory Group](#) newsletter.

The consultation was launched in February 2003, and consultees were given a twelve-week period in which to respond. Twenty-six respondents provided responses.

All the responses were broadly supportive of the TREBAP, with many welcoming the initiative, and hoping it would provide an example to, and best practice guidance for, other highway operatives.

Many of the comments have been included in the final plan, but there were a number of conflicting suggestions, particularly in relation to the use of [Generic Action Plans](#), the inclusion of more bird species action plans, and the overall size of the document.

One concern expressed in the responses related to the need to include an invasive and alien species action plan, as concern about the negative effects of these species on wildlife is increasing. It was decided not to include a separate plan, but to strengthen the issue in existing plans, and to include in the first part of the plan a reference to the [Welsh Trunk Road Maintenance Manual \(WTRMM\)](#) guidance.

Results of the Audit

As part of the preparation of this plan, a review of the following information was undertaken between August and October 2002.

Designated sites

A large number of protected sites of international, national and local importance were identified as being within 100m of the trunk road and motorway network. The length of interface of these sites with the network is approximately 4% of the total length of the network. The sites involved range from internationally important [Special Areas of Conservation \(SACs\)](#) and [Special Protection Areas \(SPAs\)](#) through to Local Nature Reserves.

Review of LBAPs

Twenty-three LBAPs, covering the majority of Wales, were reviewed. No specific references to the Welsh Assembly Government or the Transport Directorate were found within the LBAPs reviewed, but there were many references to roads and the impacts of roads. Roads are mentioned in LBAPs most frequently in the section of Action Plans entitled 'Current factors affecting decline or loss'. Factors identified here in connection with roads included habitat loss and fragmentation, inappropriate management of boundary features, pollution, and incidental mortality on roads.



Great burnet on the A470

The need to carry out appropriate environmental assessment, and provide adequate mitigation was highlighted, as were issues relating to habitat management.

A number of [LBAPs](#) included Habitat Action Plans specifically dedicated to road verge habitats (Anglesey; Caerphilly; Carmarthen; Ceredigion; Conwy; Pembrokeshire; Powys; Rhondda Cynon Taff and Snowdonia).

Audit of the trunk road and motorway network

Information on the network is currently limited, though surveys of road verges are ongoing. However, although the network information is clearly incomplete, it is important to stress that a lack of information does not necessarily reflect a lack of biodiversity interest, and there may be a number of BAP species and habitats which do occur in the soft estate but which have yet to be recorded in surveys. It should therefore be emphasised that the proposed actions within the Action Plans have not been biased by the network information collected to date, as its coverage is acknowledged to be limited.

Results of consultations

A number of informal consultations with interested parties were undertaken in order to identify specific issues, and to obtain previously unpublished information relating to biodiversity on the network.

Selection of species and habitats

The selection of habitats and species for inclusion within the TREBAP was influenced by the results of the audit of the trunk road and motorway network, and the status of any habitat or species found there; the review of the UKBAP and all of the available [LBAPs](#) in Wales; and the legislative status of species and habitats concerned.

The final criteria for inclusion within the TREBAP were deemed to be one or more of the following:

- Species or habitats which already occur on the trunk road estate – or are known to have the potential to be reintroduced – and for which actions undertaken through the TREBAP could make a positive difference.
- Priority habitats/species in the UKBAP and/or species included on the '[Section 74](#)' List.
- Species/habitats included in UKBAP, Local, or Specialist BAPs with a request for action by the Transport Directorate or highway authorities (where Local Highway Authorities had not been identified as the Highway Authority).
- Species or habitats protected by European and/or UK legislation.
- Species or habitats of nature conservation value that have an attraction to the general public because of the sensory nature of their presence (e.g. visually attractive to road users).

The [habitats and species selected for inclusion](#) in the first stage of the TREBAP are shown in the box overleaf.

Species that are affected by the trunk road and motorway network, but which are not species of biodiversity concern themselves, and which are comprehensively dealt with by existing advice, have not been selected for inclusion within the TREBAP at this stage. This particularly applies to badgers, which are covered by an Advice Note within Volume 10 of the [Design Manual for Roads and Bridges](#), and to invasive and alien species, which are covered by the [Welsh Trunk Road Maintenance Manual \(WTRMM\)](#).

Issues relating to deer will be considered in the light of the results of UK-based research into the significance of road casualties to deer.

ACTION PLANS WHICH HAVE BEEN PREPARED

Generic Action Plans

Ecological Survey
Education and Awareness

Habitat Action Plans

- Boundary features
- Calcareous grassland
- Coastal and estuarine habitats
- Heathlands
- Lowland dry acid grassland
- Lowland meadows
- Purple moorgrass and rush pastures
- Rivers and streams
- Rock faces and scree
- Water bodies
- Woodlands and planted native trees and shrubs

Species Action Plans

Animals

- Amphibians
- Aquatic species*
- Barn owl
- Bats
- Dormouse
- Marsh fritillary butterfly
- Otter
- Reptiles
- Water vole
- Welsh clearwing moth

**excluding otters and water voles*

Plants

- Bluebell
- Deptford pink
- Limestone woundwort
- Native black poplar
- Orchids
- Spreading bellflower
- Wood bitter-vetch

7 Delivery

A wide range of policies, guidance and information, which will influence the way the Transport Directorate will deliver this Plan, has been referenced in this section of the TREBAP. The links between these different sources is described in the [diagram overleaf](#).

Delivery of the TREBAP will be through three main mechanisms:

- new road schemes
- existing maintenance operations
- specific biodiversity-related surveys and works

An Officer has been nominated within the Transport Directorate itself, to coordinate and take forward the TREBAP. In addition, to ensure that actions are implemented, Environmental Coordinators and Ecological Clerks of Works, through normal scheme management for new road schemes, will be appointed with a duty to take forward and report on the application of the plan. Trunk Road Agents and Forest Enterprise will appoint an officer with similar responsibility for maintenance operations.

Following publication of the TREBAP, each Trunk Road Agency will identify the actions it will be taking forward from the plan each year, and advice will be issued to those working on new road schemes requiring the consideration and application of relevant TREBAP targets to schemes.

Funding for the actions will be taken forward on an annual basis.

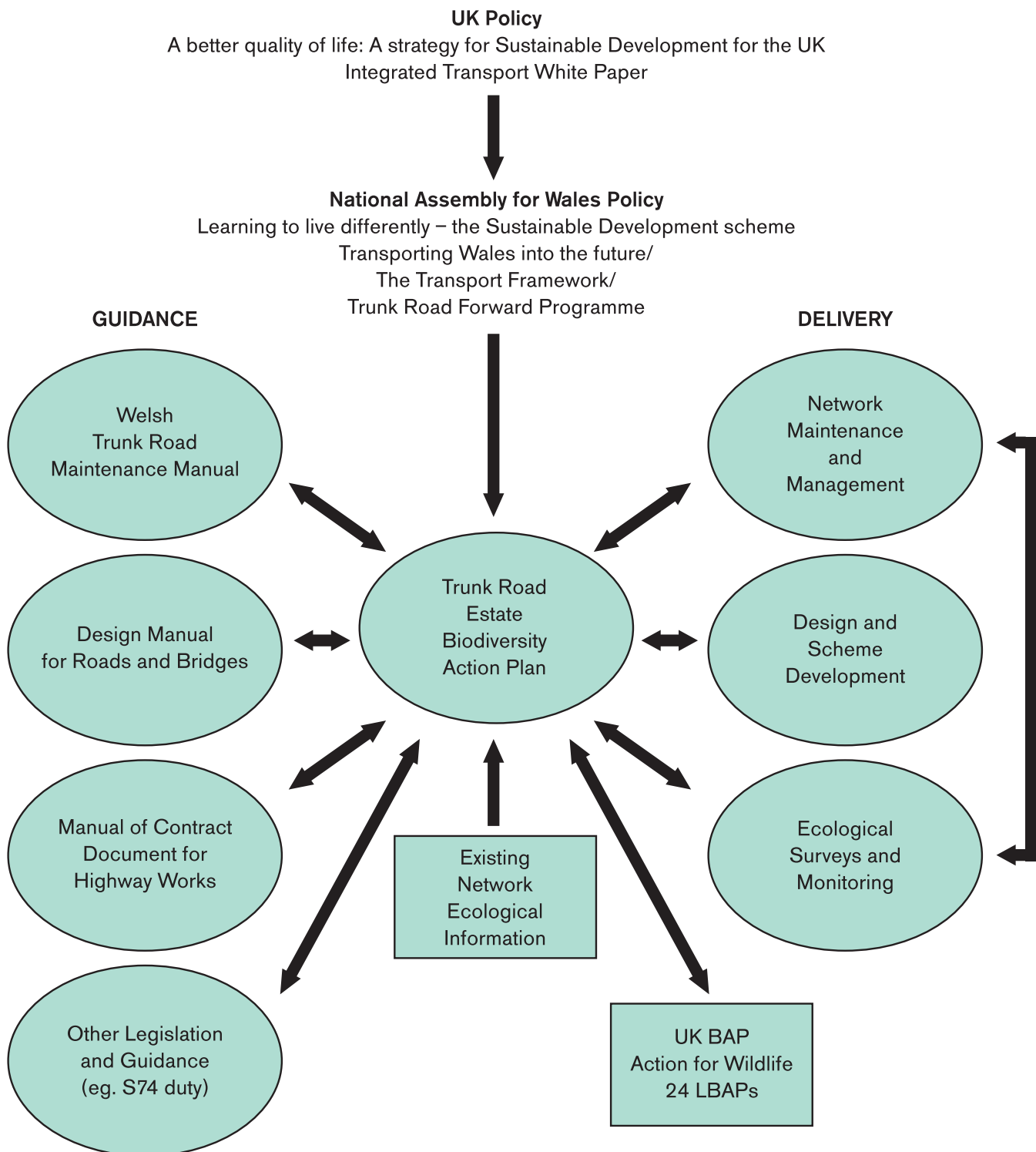
Critical to the delivery of the TREBAP will be the actions to be undertaken as part of the Generic Action Plans for Ecological Survey, and Education and Awareness; and the need for the Directorate to continue to work in partnership with others.

Monitoring and reporting

Monitoring and reporting arrangements will be undertaken as follows:

- the Transport Directorate will record actions undertaken on an annual basis
- reporting biennially on progress on targets to the Partnership, and others on request
- completion of Biodiversity Action Reporting System (BARS) records, pending confirmation of the system's requirements and compatibility with the Directorate's work.

If you would like to receive copies of the biennial reports, please contact the person identified at the [front of this document](#).





Aerial view of the A494 / A55

Review of the Plan

The TREBAP will be reviewed by the Partnership every five years; the first five-year review is scheduled for 2009. At this stage, the existing Action Plans will be reviewed, and new species and habitats will be considered for inclusion.

Species and habitats which may be considered for inclusion within the TREBAP at the five-year review will include:

- Those commonly represented within [LBAPs](#) in Wales, including those LBAPs which have been reviewed, changed or published since the TREBAP was launched.
- Those considered important in a Welsh context: as defined under a revised 'Section 74' List or the UKBAP.
- Those found to be on or adjacent to the network as a result of further survey work.

Examples of species and habitats that could be considered:

- Brown hare
- Welsh groundsel
- Kestrel
- Lower plants (eg: lichens, mosses, liverworts and fungi): particularly those associated with woodlands, and with rock and scree habitats
- Scrub
- Brown hair-streak butterfly
- Arable weeds
- Double-line moth
- Netted carpet moth
- Waved carpet moth
- Bumble bees (*Bombus*)

8 Links to other Organisations

Delivery of actions in this Plan will be primarily the responsibility of the Transport Directorate, especially in areas of the trunk road and motorway network where health and safety requirements restrict unsupervised access.

However, the Directorate acknowledges that without assistance from those with specialist knowledge of wildlife issues, and the support of the general public, the application of the TREBAP would be less effective. Therefore, while partners for action plans have not been identified in each plan, the Directorate welcomes the continuing involvement of other organisations and individuals in this work.

If you or your organisation has information or initiatives which you think may be of assistance to the Transport Directorate's work, please write to the contact identified at the [beginning of this document](#).

Throughout this document, reference is made to other organisations and initiatives. Where possible further details have been provided either in the [Glossary](#) section in the paper-based version, or through hyperlinks to that organisation's/initiative's website.



Second Severn Crossing

9 The Plans

Generic Action Plans

Habitat Action Plans

Species Action Plans

Each Action Plan contains the following sections

General background to species or habitat contains a short description and general ecology relevant to the Action Plan.

Current status is given for that species or habitat in the UK and/or in Wales, and then specifically for the trunk road and motorway network. Relevant legislative protection or conservation designations are included. A simple map is provided of the general distribution of the habitat or species as far as is currently known.

Current factors affecting the species or habitat include all major factors contributing to a species' or habitat's decline, and are not limited to the factors which are caused by, or could be influenced by, the operation of the trunk road and motorway network.

Current actions include advice, guidance, initiatives, or research already undertaken, in place or underway, both in relation to the trunk road and motorway network and in the UK and Wales generally.

Plan objectives and targets summarises the overall objectives and aims of the plan.

Proposed actions to meet the specified objectives are divided into five types:

- **Policy, guidance and advice:** where there is a need for policy/guidance or advice to be provided;
- **Surveying:** where there is a need to better define the extent of the habitat/species on the network;
- **Road design, construction and maintenance:** where there are specific actions which need to be carried or considered at these stages – includes safeguard and mitigation measures;
- **Future research and monitoring:** where there is a need to undertake research, or to learn from other research, to allow a better understanding of the habitat and species in the road context;
- **Communications and publicity:** where there is a need for specific actions designed to raise awareness.

Links with other plans indicate links with the UKBAP, and with other plans within the TREBAP. Action Plans used to derive the TREBAP are also listed. The links with other TREBAP plans are important as changes as a result of actions in one plan, could result in changes to habitats and species in another plan.

Lead or partner organisations, the Lead Partners for UKBAP habitats and species are provided. As most of the actions are going to be the responsibility of the Transport Directorate to apply, no specific partners are indicated in the plan.

Generic Action Plans



Surveying the network

Ecological Survey

Rationale

Information on biodiversity within the network is currently limited, though surveys of road verges are ongoing. However, it is apparent that a lack of information does not necessarily reflect a lack of biodiversity interest, and there may be a number of species and habitats of value which do occur in the soft estate but which have yet to be recorded.

It is clear that certain species or habitats would benefit from targeted surveys in relatively restricted geographical areas. Such surveys have been proposed as specific actions within the relevant Action Plans; in some areas, the network surveys below may overlap with these.

Surveys are usually undertaken:

- for new road schemes;
- in advance of certain maintenance operations.

It is essential that surveys should be undertaken at the appropriate time of year by specialists, over a sufficient time period, and with appropriate coverage of the surrounding area to give meaningful results.

Current actions

- Road verge surveys have been completed on the A470/A44 in Powys.
- Surveys in relation to specific schemes and works continue.
- Information is submitted to Local Record Centres on an informal basis as and when required.
- A number of specific initiatives have also been undertaken, for example, the Powys County Council / Brecknock Wildlife Trust road verge project "Living Highways" which identifies and manages valuable road verges for wildlife.

Plan objectives and targets

The objectives of this plan are to take forward surveys on the network, and to improve existing information on the biodiversity resource on the network.

Proposed actions

ACTION	TARGET
Surveying	
Undertake two route surveys of 50 km each, per year.	1000 km by 2014
Ensure results relating to existing or potential TREBAP species and habitats are sent to the trunk road managers in the relevant network area(s).	Ongoing
Identify grassland verges of importance, as defined in the WTRMM, such that the relevant management required can be applied.	Ongoing
Road design, construction and maintenance	
Ensure records of TREBAP and protected habitats/species in road verges (e.g. an area of species-rich calcareous grassland) or structures (e.g. a bat roost within a particular bridge) are considered within all stages of new schemes.	As schemes arise
Ensure that surveys for new road schemes comply with developing best practice and DMRB advice.	Ongoing
Ensure that surveys for routine and one-off maintenance procedures comply with the DMRB and WTRMM advice.	Ongoing
Ensure records of biodiversity interest (e.g. TREBAP and protected habitats/species) in road verges (e.g. an area of species-rich calcareous grassland) or structures (e.g. a bat roost within a particular bridge) are used to influence the maintenance of that road verge or structure.	Ongoing

Generic Action Plans

Communications and publicity

In areas where LBAPs include a Road Verge Action Plan, liaise with BAP originators and Lead Partners to ensure all parties are aware of current actions that may complement, or may be complemented by, actions undertaken by Trunk Road Managers. Take steps to eliminate or modify actions which conflict with proposed LBAP targets where possible.

Ongoing

Collate survey results relating to UKBAP species and habitats that are found to be on the network, but which are not the subject of TREBAP Action Plans, for consideration at the five-year review.

2009

Links with other plans

The results of this Generic Action Plan will feed into all of the existing Action Plans, where appropriate. LBAP Road Verge Action Plans have been produced for [Anglesey](#); [Caerphilly](#); [Carmarthen](#); [Conwy](#); [Pembrokeshire](#); [Powys](#); and [Rhondda Cynon Taff](#).

Lead or partner organisation

The Lead Partner for this Action Plan will be the TREBAP Partnership itself.



Computer-based network information

Education and Awareness

Rationale

One of the most important factors in determining the success of the TREBAP will be the degree by which its proposed actions and intended targets are communicated to Directorate Staff, Trunk Road Agents, those working for the Directorate and the general public.

Current actions

- A biodiversity web-page is included in the web-site for the [Conwy Tunnel Group](#).
- Advice on design and assessment of biodiversity is included in the DMRB Volumes 10 (Environmental Design and Management) and 11 (Environmental Assessment).
- Advice on the management of verges for biodiversity is included in the Welsh Trunk Road Maintenance Manual (WTRMM).
- The work of the 'Roads and Otters Steering Group – Wales' provides a focus for coordinating information on otter road casualties, and distributes information to the relevant highway and ecological bodies so they can provide appropriate mitigation at 'blackspots'.
- Support has been given by the Transport Directorate for two seminars in 2002/2003 for engineers and ecologists on wildlife mitigation for roads.
- The Transport Directorate provides ongoing internal training for staff and Trunk Road Agents on issues such as biodiversity.

Plan objectives and targets

The objectives of this plan are to support the implementation of the TREBAP Action Plans; and to raise awareness of biodiversity in relation to the network.

Generic Action Plans

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Participate actively in the development of DMRB advice with the other UK National Highway Authorities.	Ongoing
Review WTRMM advice to ensure staff and Trunk Road Managers are aware of constraints in relation to the bird-breeding season and the effects of management operations (including, for example, the potential effects of spreading chippings on valuable grasslands; pollution from fuel spillage; not removing arisings from grasslands; pesticide use; etc).	2004/2007
Review, and if necessary update, current advice in WTRMM on control practices with respect to invasive weed and alien species on road verges.	2007
Road design, construction and maintenance	
Ensure that those involved in these actions are familiar with relevant advice in DMRB and WTRMM.	2004/2008
Communications and publicity	
Organise training seminars for Trunk Road Managers to ensure that they understand their responsibilities for implementing actions under the TREBAP and the requirements for reporting and maintaining records.	2004
Liaise with interested parties to ensure that road verges that carry any kind of designation are known to Trunk Road Managers.	2005
Liaise with CCW and LAs to ensure that all other lands within the soft estate which carries a statutory or non-statutory wildlife designation, or which are covered by existing Management Plans, are known to Trunk Road Managers.	2005
Produce publicity information relating to the TREBAP.	Launch
Produce public information on the value of highways verges and the rationale for management techniques.	2006
Review the way information is collected and reported in relation to existing data systems to ensure information on biodiversity issues is available to Trunk Road Agents and contractors.	2007/2009

Links with other plans

This Generic Action Plan is intended to support the TREBAP Action Plans.

Lead or partner organisation

The Lead Partner for this Action Plan will be the TREBAP Partnership itself.

Habitat Action Plans



Clawdd, dry stone wall

Boundary Features

Boundary features are undoubtedly the most prevalent feature on the trunk road network.

The different features that make up this group include hedgerows, tree-lines, walls and ditches. Of particular interest in a Welsh context are the stone-faced earthbanks known as cloddiau (singular clawdd). These features can have significant landscape and cultural heritage interest, in addition to their biodiversity value.

The conservation value of these features is variable, but these habitats can be very diverse and contain a number of rare and protected species. However, perhaps the greatest value of boundary features is their potential use by some species as wildlife corridors, particularly within a fragmented and species-poor landscape. Habitats that may have become severed by the line of a new road may be linked to others by the use of boundary features and roadside planting in order to maintain their value to wildlife.

Hedgerows are perhaps the most structurally diverse boundary feature. They may contain a high number of woody and herbaceous species that support a diverse assemblage of invertebrates, reptiles, birds and mammals.

Walls, particularly dry-stone walls, can provide an excellent substrate for a wide variety of common and rare lichens, bryophytes and higher plants. They also act as ideal habitat for a broad array of invertebrates, amphibians and reptiles. Detail of design and construction can be especially important in some areas.

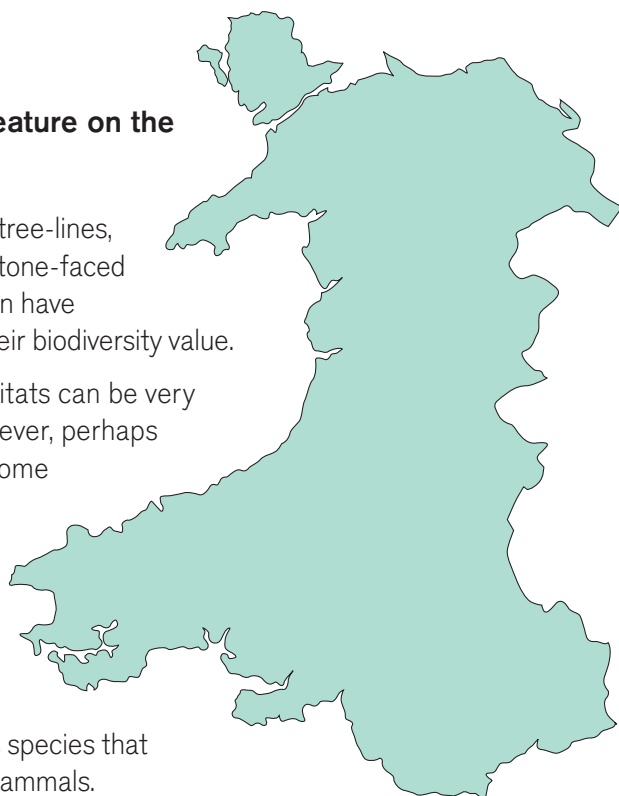
Ditches are perhaps the most common of the boundary features as they often occur alongside other boundary features. Ditches can be both wet and dry, and thus play host to a very varied array of plant and animal species.

Current status

Status in the UK and in Wales

Because boundary features are almost ubiquitous throughout the trunk road network, they can be an extremely important ecological resource. Hedgerows, in particular, are important and may be designated individually at either a county or local level. Legal protection is given to some hedgerows and the wildlife that is supported by them.

The loss of hedgerows became significant from about the middle of the 20th Century. Agricultural intensification is largely responsible, but the pressures from development (including those from road construction) are also significant. In 1993, it was estimated that 450,000 km of hedgerows remained in the UK, with Wales supporting approximately 49,000 km in 1994. Between 1984 and 1990, the net loss of hedgerow length in Wales was estimated to be 25%. Because of the legislative protection now in place, an increasing number of hedgerows are under favourable conservation management.



Habitat Action Plans



Ancient and species-rich hedgerow

The decline in walls, particularly dry stone walls, has occurred mainly due to them falling into disrepair, and the subsequent cost of restoration. It is estimated that as many as half of all dry-stone walls within the UK are in disrepair. The construction of these walls is also particularly time- and resource-consuming, and fencing is often used in preference. Recently, it was estimated that 40,000kms of dry stone walling has been lost from England and Wales in the last two decades.

Boundary features are covered by the following statutory instruments and Biodiversity Action Plans:

- The Hedgerow Regulations 1997 and Conservation (Natural Habitats, &c.) Regulations 1994.
Note: while the Transport Directorate is exempt from The Hedgerow Regulations 1997, the policy is that important hedgerows should be treated in the spirit of the Regulations.
- Linear features are included in Article 10 of the EC 'Habitats' Directive 1992, with a view to improving the ecological coherence of the Natura 2000 network.
- Ancient and/or species-rich hedgerows are included in the list of habitats of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- [Boundary Features](#) are a UKBAP Broad Habitat.
- [Ancient and/or species-rich hedgerows](#) are a UKBAP Priority Habitat.

Status on the network

Boundary features are ubiquitous throughout the network. However, the management of these features is often complicated by ownership issues. Although motorway boundary hedges are under Transport Directorate control, the majority of hedges and dry-stone walls alongside trunk roads belong to the owners of the adjoining land.

Current factors affecting the habitat

Habitat loss and deterioration

Although new boundary features may be created as part of road developments, the widening and realignment of roads has led to the loss of many traditional boundary features. Cloddiau, for example, have often been replaced by features which balance safety and landscape issues. The ecological value of boundary features is generally associated with their age, continuity and stability, thus disturbances to these features, either through maintenance works, deterioration or damage by traffic, can severely detract from their conservation value.

Inappropriate or unfavourable management

The maintenance of boundary features is particularly important if they are to continue to be of conservation value. Poor management (rather than removal) may be a more significant factor in the loss of these habitats. For example, the cutting of hedges is not always conducted in an environmentally sensitive manner, and is often done at inappropriate intervals or times of the year, sometimes for reasons of road safety.

The control of weed growth through the use of herbicides, and the use of fertilisers to promote the growth of planted hedgerows, results in a lower species diversity. Furthermore, new hedgerows may have been initially planted with a low number of species, often using non-local stock that further detracts from their value to biodiversity.

Current actions

- Guidance is available from DEFRA (formerly ADAS), the Forestry Commission and the Centre for Ecology and Hydrology (formerly ITE) on the status and management of hedgerows in Britain. (This guidance may be relevant to hedgerow management adjacent to roads, but is not specifically road-related.)

Plan objectives and targets

The objective of this Action Plan is to conserve and enhance boundary features of conservation value wherever possible. Specifically, to:

- ensure that impacts of new developments on boundary features, particularly those which are considered 'ancient' or 'important', are avoided where ever possible;
- mitigate against unavoidable impacts to boundary features;
- document the current distribution of boundary features within the soft estate so as to develop targeted management plans; and
- raise awareness of those involved in design, construction and maintenance processes of the ecological importance of boundary features of all types, and provide detailed advice to management contractors.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review existing advice within the WTRMM to ensure it reflects best practice, particularly with respect to boundary features classified as ancient and/or species-rich hedgerows, cloddiau, or hedgerows classified as 'important' under the Hedgerow Regulations.

2004/2007

Review, with the UK Highway Authorities, the need for boundary features advice in the DMRB.

Date to be agreed

Surveying

Ensure any surveys that are undertaken are extended sufficiently to assess the connectivity of boundary features and to identify opportunities for new linkages, as well as covering any legal requirements.

Ongoing

Road design, construction and maintenance

For all proposed road schemes, seek to identify boundary features of ecological value and identify areas where the boundary features may be improved for the benefit of biodiversity. Identification of valuable boundary features within the scoping phase should help avoid impacts and highlight any potential opportunities.

As schemes arise

Where road widening is to be carried out to the detriment of existing boundary features, aim to preserve features on one side of the improvement scheme.

As schemes arise

Where a hedgerow classified as 'important' under The Hedgerow Regulations is removed, replace and/or (as a last resort) translocate it as part of the mitigation.

As schemes arise

Habitat Action Plans

Where valuable non-hedgerow boundary features will be lost through new roads or improvement schemes, replace and enhance remaining features through re-creation and translocation. As schemes arise

Promote, through Environmental Management Plans wherever possible, environmentally-sensitive management of hedgerows in the Directorate's control. This should include appropriate cutting regimes, retention of standing trees and the use of native species of local provenance where available in planting regimes. Ongoing

Future research and monitoring

Monitor successes of hedgerow translocations, replanting and enhancements that have been carried out as mitigation measures. Ongoing

Communications and publicity

Include information on the value and management techniques of boundary features within environmental training for the Transport Directorate staff and Trunk Road Agents. 2007

Links with other plans

Ancient and/or Species Rich Hedgerows are a UKBAP Priority Habitat. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Bridgend](#); [Cardiff](#); [Torfaen](#); [Brecon Beacons](#); [Neath Port Talbot](#); [Carmarthenshire](#); [Caerphilly](#); [Merthyr Tydfil](#); [Rhondda Cynon Taff](#); [Pembrokeshire](#); and [Greater Gwent](#).

TREBAP Action Plans that should also be consulted include: [Woodlands and Planted Native Trees and Shrubs](#); [Barn Owl](#); [Bats](#); [Dormouse](#); [Amphibian](#); and [Reptiles](#).

Lead or partner organisation

The Lead Partner for ancient and species-rich hedgerows (a UKBAP Priority Habitat) is [DEFRA](#).



Clawdd, dry stone wall



Upland calcareous grassland

Calcareous Grassland

Calcareous grasslands are developed on shallow lime-rich soils most often derived from chalk and limestone rocks. There are no chalk grasslands in Wales, and limestone grassland is limited to geographically distinct parts of Wales.

They occur in the upland (above the upper limit of agricultural enclosure) and lowland areas of Wales. Upland calcareous grasslands often occur as part of a habitat mosaic, and are used for rough grazing. Lowland calcareous grasslands are often found on topographic features such as escarpments or valley slopes.

Calcareous grasslands contain a high diversity of plant species, particularly those that are mainly restricted to lime-rich soils. A wide range of characteristic species occur in these grasslands, both grasses and flowering plants. Grasses include sheep's fescue (*Festuca ovina*), common bent (*Agrostis capillaris*) and upright brome (*Bromus erecta*); flowering plants include wild thyme (*Thymus praecox*), salad burnet (*Sanguisorba minor*) and common rock-rose (*Helianthemum nummularium*). Calcareous grasslands vary from mostly coastal grasslands (typically with species such as hoary rock-rose (*Helianthemum canum*), through to upland and mountain grasslands.

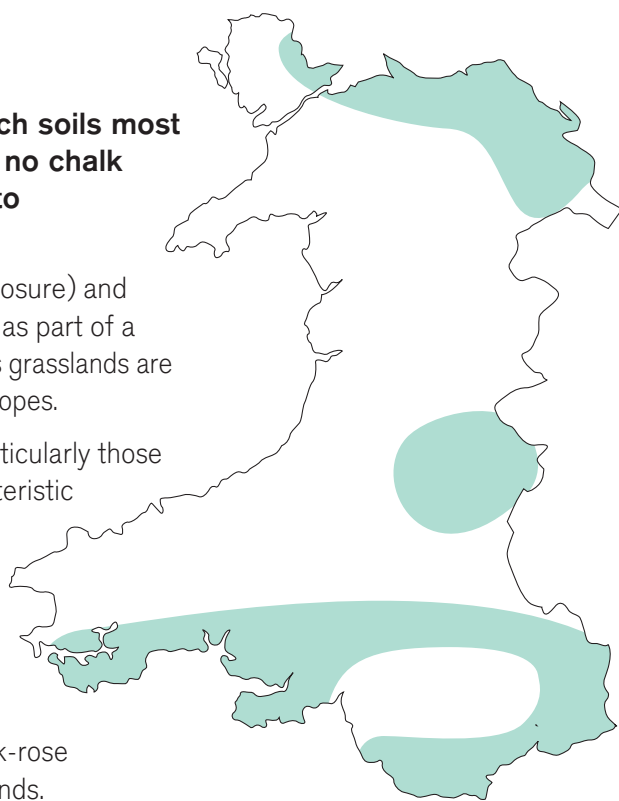
Scrub is a prominent feature of many calcareous grassland areas. In the absence of grazing, scrub can spread to replace grasslands, with a negative effect upon the conservation value of the site. With balanced management, however, species-rich scrub-grassland mosaics can be conserved and, (depending on the situation) restored, leading to increased plant and animal diversity. Both upland and lowland calcareous grassland support a diverse range of animal species, particularly invertebrates, many of which are [UK Priority Species](#).

Current status

Status in the UK and in Wales

Fewer than 1200 hectares of lowland calcareous grassland are considered to be within Wales. Figures for upland calcareous grassland are between 22,000 and 25,000 hectares across the UK, with 650 hectares of these in Wales.

- [Calcareous grassland](#) is a Broad Habitat in the UK Biodiversity Action Plan, and both [upland](#) and [lowland calcareous grassland](#) are Priority Habitats.
- Upland and Lowland Calcareous grassland are included in the list of habitats of principal importance to Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.



Habitat Action Plans

- A high proportion of calcareous grassland occurs within sites designated as Sites of Special Scientific Interest (SSSIs). In Wales, this amounts to 60-70% of all lowland calcareous grassland, and over 60% of all upland calcareous grassland.

Status on the network

Lowland calcareous grasslands on road verges are restricted to areas where roads cut through calcareous outcrops; thus most sites are in North or South Wales (e.g. A55, A477, A40 and M4). This is also true of upland calcareous grasslands, which are likely to be less common within the soft estate.

The M4 crosses limestone areas; and its cuttings support secondary calcareous grassland (i.e. calcareous grassland which has developed from a seed bank where limestone has been exposed on cuttings created during road construction).

Current factors affecting the habitat

Habitat loss or deterioration

The UKBAP has identified fragmentation (including that caused by road-construction, widening and improvement) as a factor in the decline of this habitat. Road maintenance operations are also implicated, through the repair operations themselves, or through inappropriate storage of materials. Activities such as fly-tipping, pollution/spillage or driving/parking on road verges are also likely to degrade this habitat.

Spray drift, both from adjacent agricultural land (herbicides and pesticides) and from the carriageway (from salt applied in poor weather conditions), can also be factors in habitat deterioration.

Good quality calcareous grasslands are nutrient-poor, and any increase in soil nutrient levels (for example, through farming practices on adjacent land) will also be detrimental to grasslands within road verges.

Inappropriate management

Grazing (or mowing) is necessary to ensure that species are able to flower and set seed, and to ensure that the more vigorous grasses and shrubs do not out-compete other species. Thus, both under-grazing and over-grazing will lead to a decrease in species diversity, and eventually a change in the structure of the habitat (on road verges, grazing may need to be replaced by mowing regimes because of stock and traffic safety issues). Agricultural intensification (use of fertilisers and herbicides, or ploughing and reseeded) may lead to damage or even loss.

Alien species and agricultural weeds, a frequent component of road verges, may out-compete calcareous grassland species; similarly, measures taken to control undesirable species may be detrimental to the more valuable species present.

Inappropriate planting schemes may also affect calcareous grasslands detrimentally, including the addition of trees and shrubs, the incorporation of decorative (non-native) species such as daffodils, or the use of non-native or inappropriate seed mixes.

Current Action

- A number of Local Authorities have produced Road Verge Action Plans as part of their LBAP; Gwynedd has produced a Road Verge leaflet, which provides specific management advice.
- WTRMM indicates that verges that are of value should be managed and conserved to enhance this. There is specific advice on herbicide use in relation to alien and invasive species.

Plan objectives and targets

The objectives of this Action plan are to:

- reduce the loss of calcareous grasslands through poor or inappropriate management;
- identify those remaining areas of calcareous grassland to prevent further loss; and
- increase the perceived value of these habitat areas through involving and informing local people, Transport Directorate staff, road users and residents.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review and, if necessary, issue revised guidance with respect to calcareous grassland in WTRMM.

2007

Surveying

Identify and survey areas of the soft estate that are known or likely to contain calcareous grassland: e.g. areas adjacent to significant areas of calcareous grassland (using CCW's current grassland surveys), and record the distribution of the habitat on the network on a database.

2008

Identify areas of calcareous grassland within the soft estate suitable for restoration.

Ongoing

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable calcareous grassland is taken into consideration. Avoid the direct loss of such habitat wherever possible.

As schemes arise

Phase out the use of seed that is not of local or seed source zone provenance.

Ongoing

Where habitat is unavoidably lost, consider the recreation of calcareous grassland on the road verge or, as a last resort, translocation.

As schemes arise

Develop appropriate grass-cutting regimes to maintain species diversity in identified areas.

Ongoing

Aim to create or restore five sites of calcareous grasslands using good management practices in road verges.

By 2010

Future research and monitoring

Set up a system for monitoring known sites (including newly-created sites) to ensure that management is having the desired effect. Modify management when existing techniques are failing.

2012

Habitat Action Plans

Communications and publicity

Increase awareness of Transport Directorate staff, Trunk Road Agents and the general public to the importance of calcareous grassland.

2008

Links with other plans

Lowland and Upland Calcareous Grassland are UKBAP Priority Habitats. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Caerphilly](#); [Carmarthen](#); [Conwy](#); [Pembrokeshire](#); [Powys](#), and [Rhondda Cynon Taff](#).

TREBAP Action Plans that should also be consulted include the HAPs for [Lowland Meadows](#), [Lowland Dry Acid Grassland](#) and the SAPs for [Marsh Fritillary](#); [Barn Owl](#) and [Bats](#).

Lead or partner organisations

The Lead Partner for lowland calcareous grassland is [English Nature](#). The Lead Partner for upland calcareous grassland is the [Countryside Council for Wales](#).



Lowland calcareous grassland



Saltmarsh

Coastal and Estuarine Habitats

Coastal habitats include sand dunes, salt marshes, coastal and flood plain grazing marsh, beaches, maritime heaths and grasslands, maritime cliffs and slopes, and mudflats.

An estuary is best described as the wide lower course of a river where the current is met by incoming tides. The water within estuaries is a mix of saline and freshwater, which contributes to a diverse ecosystem. Coastlines and estuaries are host to a wide array of species, in particular, birds, fish and crustacea.

Current status

Status in the UK and in Wales

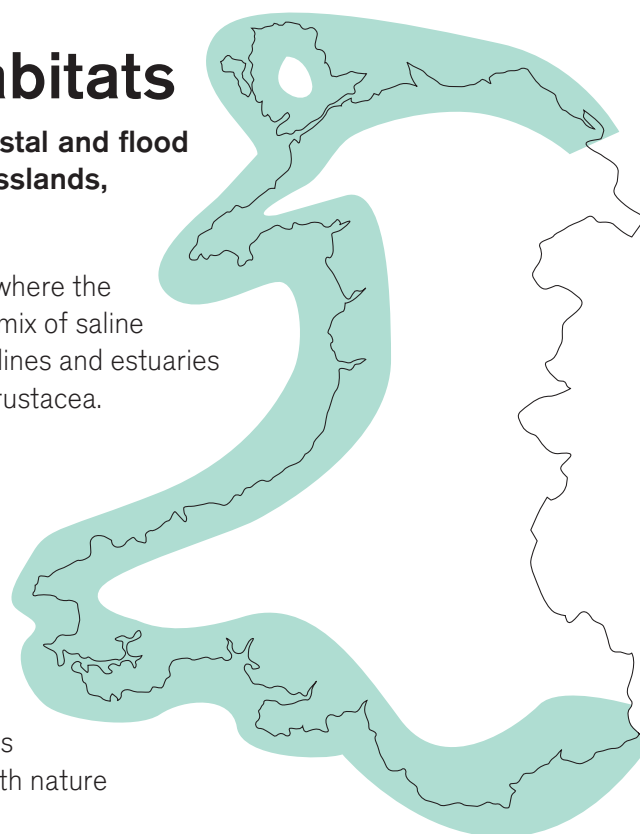
The coastline of Wales is estimated at approximately 1600kms, and a Phase I survey conducted by the Countryside Council for Wales estimates that 0.7% of the land cover in Wales is accounted for by coastal habitats.

A large proportion of the coastal and estuarine habitat in Wales is described as being of national or international importance for both nature conservation and landscape.

- Many coastal habitats are designated as SACs under the EC 'Habitats' Directive 1992.
- Protection is also afforded to coastal sites under the 'Birds' Directive 1979, which provides for the designation of SPAs.
- Coastal and habitat sites may also be protected under the Ramsar Convention.
- A range of coastal and estuarine habitats is included in the list of habitats of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

Status on the network

The trunk road network interacts with coastal and estuarine habitats where the network passes over these habitats. The most well known of these are the two Severn Crossings i.e. the M4 and M48 bridges and the A5/A55 bridges to Anglesey. There are a number of roads that also run, in part, very close to coastal habitats including the M4, the A40 and the A487.



Habitat Action Plans

Current factors affecting the habitat

Habitat disturbance and loss; disturbance to coastal birds

Large developments, including the construction of bridges, can result in substantial disturbance to, and subsequent loss of, coastal habitats and changes to coastal processes (for example, erosion and deposition of material). These developments do, however, tend to be small in terms of the actual area affected.

Road construction can affect the more botanically diverse transitional zones of the coastal environment, and the species that depend upon them, particularly birds.

Pollution

Aquatic and estuarine communities are particularly susceptible to pollution. Pollution caused by roads can come from a number of sources, particularly vehicle exhaust emissions, road runoff, road accidents and spillages.

Alien species

Roads can be a factor in the spread of alien species. The invasion of non-native species into these specialist communities can significantly disrupt the ecological balance. For instance, members of the flowering plant family Aizoaceae, such as the hottentot fig (*Carpobrotus edulis*), can have a devastating impact on indigenous maritime plant communities, although currently there are no reported instances of the trunk road and motorway network being involved in the spread of this plant.

Current actions

- Various European and UK legislation provides protection for coastal and estuarine habitats and species in coastal areas.
- Over 300 of the SSSIs in the UK, designated under the Wildlife and Countryside Act 1981 (as amended) contain some sort of estuarine habitat.

Plan objectives and targets

The objectives of this Action Plan are: to increase awareness of the value and vulnerability of coastal and estuarine habitats; and to establish a greater consideration of the impacts of road construction on these habitats.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review advice provided in the WTRMM on maintenance on, or near, coastal and estuarine habitats. Issue revised guidance where necessary.

2007

Review the need for advice in DMRB with UK Highway National Highway Authorities.

Date to be agreed

Surveying

Identify all areas of the network, and any relevant road drainage systems, that run within 50m of coastal and estuarine habitats.

2008

Road design, construction and maintenance

Ensure that valuable habitats (particularly protected sites and UKBAP habitats) are considered at the design stage of new road and improvement schemes; seek advice from the Environment Agency Wales and CCW to help identify and resolve relevant issues. As schemes arise

Ensure avoidable impacts do not occur to estuarine and coastal habitats during road construction. Ongoing

During operation and maintenance of the road, reduce the impacts of pollution to a minimum by ensuring that drainage systems are kept functional at all times. Ongoing

Communications and publicity

Raise the profile of coastal and estuarine habitats and their nature conservation value with respect to design, construction and maintenance of schemes. Ongoing

Links with other plans

There are a number of UKBAP Habitats that are encompassed within this Coastal and Estuarine Habitats Action Plan. LBAPs which were consulted during the development of the TREBAP were: [Bridgend and Newport](#); [Pembrokeshire](#); [Rhondda Cynon Taff](#); [Snowdonia National Park](#); [Gwent](#); [Carmarthenshire](#); [Gwynedd](#); [Neath Port Talbot](#); [Cardiff](#); [Anglesey](#); [Conwy](#); [Vale of Glamorgan](#), and [Flintshire](#).

TREBAP Action Plans that should also be consulted include [Amphibians](#), [Rivers and Streams](#), and [Aquatic Species](#).

Lead or partner organisation

The Lead Partner for coastal habitats covered by this action plan are identified in the UKBAP as [Countryside Council for Wales](#), [English Nature](#), [Environment Agency](#), and [Scottish Natural Heritage](#).



Coastal and floodplain grazing marsh

Habitat Action Plans



Upland heathland

Heathland

Heathland is characterised by at least 25% cover of dwarf shrubs and is generally associated with thin acidic nutrient-poor soils such as peat or mineral soils.

Often found in a mosaic with other habitat types such as blanket bog, acidic grassland and rock and scree, heathland is an important habitat to a characteristic range of birds, reptiles, invertebrates and lower plant communities. The vascular plants found in this habitat generally include heather (*Calluna vulgaris*), cross-leaved heath (*Erica tetralix*), bell heather (*Erica cinerea*) western gorse (*Ulex gallii*) and bilberry (*Vaccinium myrtillus*).

Lowland heath occurs below the level of agricultural enclosure, usually below 250 - 300m altitudes, and is less extensive than upland heath. Upland heath is less biodiverse, and can occur up to an altitude of 750m and often covers large areas of unenclosed mountainous terrain. However, because of the mild wet conditions in Wales, even upland heath can show lowland characteristics (as seen in, for example, in Glamorgan).

Both upland and lowland heath can be described as being wet or dry depending on the soil moisture present, and each shows characteristic vegetation. Overlapping the definition of lowland and upland can be areas of heathland within mosaics of open land known as “ffridd” which can occur above 250m.

Where the trunk road passes through heathland, the road verge often supports dwarf shrub species (such as heather) which are infrequently cut or grazed, and thus provides a valuable seed-bank from which heathland can spread.

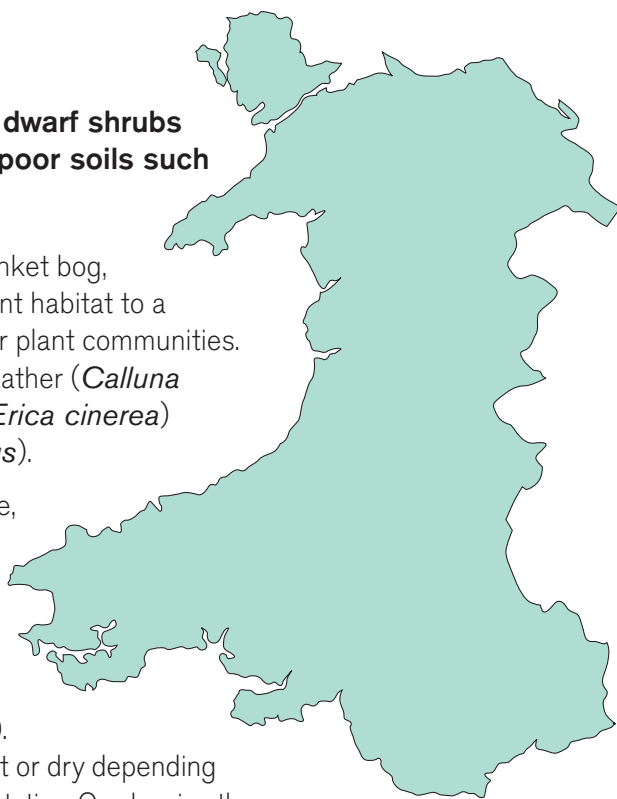
The UKBAP lists many priority species associates with [Lowland](#) and [Upland](#) Heathland, and with the Broad category of [Dwarf Shrub Heath](#).

Current status

Status in the UK and in Wales

Both [lowland heathland](#) and [upland heathland](#) are UKBAP priority habitats associated with the Broad category ‘[Dwarf shrub heath](#)’. The UK holds a significant 20% of the international total of lowland heathland. However, heathland is one of the most threatened habitats in Britain, especially in the lowlands.

In Wales, the habitat is also declining. Between the 1920s and the 1980s, 51% of dry heaths and 95% of wet heaths on the Llŷn Peninsula were destroyed, most of it converted to agricultural grassland and some planted over with conifers. This pattern was repeated across much of Wales. Currently there is c.79,000 ha of upland heath predominantly found in north and central Wales, and c.7,000ha of lowland heath with significant concentrations in the Brecon Beacons, Ceredigion, Pembrokeshire, Swansea and across North Wales. Lowland wet heath is considerably less common than dry heath.



Lowland and Upland Heathland are included in the list of habitats of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

Status on the network

Many trunk roads run through areas of lowland and upland heath. In the mountainous northern and central regions of Wales, there is a likelihood of upland heath occurring on the soft estate in some areas.

Current factors affecting the habitat

Habitat Loss, Fragmentation and Disturbance

Fragmentation and direct loss of heathland may be caused through new developments including road construction, whilst road widening and improvements can also impact areas of both upland and lowland heath. Disturbance, through maintenance or improvements to road verges, which may contain heathland communities, could also reduce the quality and diversity of the heath.

Heathland is very sensitive to nutrient enrichment, which may be caused by atmospheric deposition, acid rain, pollution from vehicle emissions, salt spray and run off from roads, as well as spillages or illegal dumping. Nitrogen deposition is also thought to benefit the heather beetle, (*Lochmaea suturalis*), which has caused extensive defoliation of the heather of the Brecon Beacons.

Inappropriate management

Although heathland requires some grazing to prevent succession to scrub or woodland, overgrazing and trampling by sheep causes significant losses in heathland, encouraging acid grassland species to take over. Grazing is usually impractical on much of the soft estate, so periodic cutting occurs when required.

In addition, unregulated and excessive burning, while preventing succession to scrub and woodland, can cause the long-term damage of large areas of heathland and may impact on road verge communities. Re-planting or seeding of road verges, particularly of non-native species, could dominate the dwarf shrub vegetation and eventually replace it.

Current action

- 34,000ha of upland heath and Wales are protected and managed as SSSIs, NNRs, Local Nature Reserves (also called 'Wildlife Sites') and cSACs, whilst a large proportion of lowland heathland habitat is notified as SSSIs through the Wildlife and Countryside Act 1981 (as amended). These protected sites are likely to include the road verges that run through them, providing they have not been extensively modified or replanted.
- Heath is starting to naturally regenerate on the A470 Cancoed to Minffordd scheme in areas assigned for that purpose following construction.

Plan objectives and targets

The objective of this action plan is to conserve and enhance heathland. In particular, to:

- manage appropriately heathland which is found within the trunk road network; and
- where road construction unavoidably affects heathland habitat, take into account the ecology of the habitat to minimise damage and, where possible, encourage the replacement of heath vegetation within the verges.

Habitat Action Plans

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review and, if necessary, update guidelines for best practice management of the soft estate within the WTRMM with reference to heathland habitats.	2007
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Surveying

In areas where heathland within and outside of the soft estate, encourage coordination of surveys, and subsequent exchange of results by those involved.	Ongoing
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Road design, construction and maintenance

Identify areas of heathland at the route selection stage of road schemes to avoid impacting the habitat where possible.	As schemes arise
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At the design stage for new road and improvement schemes, ensure that valuable heathland is taken into consideration. Avoid the direct loss of heathland habitat wherever possible.	As schemes arise
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Consider opportunities for habitat creation or restoration where practicable, and take forward ten sites by 2014.	10 sites by 2014
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Ensure management of heathland is appropriate to maintain its heathland value.	Ongoing
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Future research and monitoring

Review best practice for the management of heathland with the UK government national highway organisations.	2008
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Communications and publicity

Raise public awareness to help prevent deliberate/accidental fires, fly-tipping, and parking/driving on heathland in the network.	2006
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Links with other plans

LBAPs that were consulted during the development of the TREBAP were: [Anglesey](#); [Blaenau-Gwent](#); [Brecon Beacons](#); [Bridgend](#); [Caerphilly](#); [Conwy](#), and [Snowdonia](#). TREBAP Action Plans that should also be consulted include: [Lowland Dry Acid Grassland](#); [Rock Faces and Scree](#) and [Reptiles](#).

Lead or partner organisations

The Lead Partner for Lowland and Upland Heathland habitat is identified in the UKBAP as [English Nature](#).



Lowland heathland



Lowland dry acid grassland

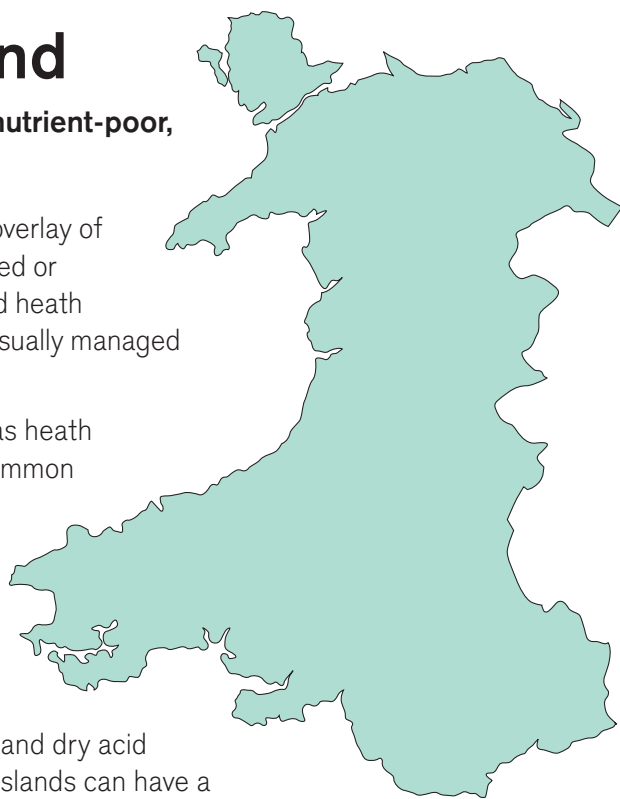
Lowland Dry Acid Grassland

Lowland dry acid grasslands are typically developed on nutrient-poor, free-draining soils with a pH of 4 to 5.5.

Such soils are most often derived from acid rocks or a superficial overlay of sand or gravel. The habitat is defined as all acid grasslands, enclosed or unenclosed, occurring below c.300m. It often occurs within lowland heath landscapes, in parklands, and on coastal cliffs and shingle, and is usually managed as pasture.

Acid grassland is characterised by a range of plant species such as heath bedstraw (*Galium saxatile*), sheep's-fescue (*Festuca ovina*), common bent (*Agrostis capillaris*), sheep's sorrel (*Rumex acetosella*), sand sedge (*Carex arenaria*), wavy hair-grass (*Deschampsia flexuosa*), bristle bent (*Agrostis curtisii*) and tormentil (*Potentilla erecta*). The presence and abundance of each species depends on the community type and its locality.

Dwarf shrubs such as heather (*Calluna vulgaris*) and bilberry (*Vaccinium myrtillus*) can also occur but at low abundance. Lowland dry acid grassland often forms a mosaic with dwarf shrub heath. Acid grasslands can have a high cover of bryophytes, and parched acid grassland can be rich in lichens. Typically, the habitat is species-poor, but supports a significant amount of rare and scarce vascular plants and specialist invertebrate species unique to these grassland communities. Some of the species occurring on [lowland dry acid grasslands](#) are UKBAP-associated species, including tower mustard, (*Arabis glabra*), Deptford pink, (*Dianthus armeria*), field cricket, (*Gryllus campestris*), and nightjar, (*Caprimulgus europaeus*).



Current status

Status in the UK and in Wales

Figures for the extent of lowland dry acid grassland in the UK are poorly known but the best estimate is 40,000ha in Wales. Areas remote from the upland fringe are of particular conservation concern. Important concentrations occur in Gwynedd, Snowdonia National Park and the Welsh border hills of Powys.

- [Acid grassland](#) is a Broad Habitat in the UK Biodiversity Action Plan, [lowland dry acid grassland](#) is a Priority Habitat.
- It is included within the list of habitats of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- In Wales, approximately 700ha of acid grassland occurs in lowland SSSIs; 22 SSSIs qualify independently for their lowland acid grassland interest, with a further 150 where the habitat is a contributory factor to the designation.
- A number of plant, invertebrate and bird species of lowland dry acid grassland are protected under the Schedules of the Wildlife and Countryside Act 1981 (as amended).

Habitat Action Plans

Status on the network

The geology of Wales has an acid bias, although less so in lowland areas. Lowland dry acid grassland is therefore likely to be found on road verges in parts of Wales where roads pass through areas of shale and sandstone.

Current factors affecting the habitat

Habitat loss or deterioration

The UKBAP has identified fragmentation (including that arising from road-construction, widening and improvement) as a factor in reducing the quality and quantity of acid grassland. Fragmentation of the habitat brings increased risk of species extinctions in the small remnant areas. Road maintenance operations can cause damage through the operations themselves, as well as the inappropriate use and/or storage of materials (for example, alkaline materials may influence their surroundings). Activities such as fly-tipping, pollution/spillage or driving/parking on road verges are also likely to degrade this habitat.

Spray drift, both from adjacent agricultural land (herbicides and pesticides) and from the carriageway (from salt applied in poor weather conditions) can also be a factor in habitat deterioration.

Inappropriate management

Management neglect often leads to rank over-growth, bracken and scrub encroachment.

Conversely, over-grazing, or too-frequent mowing, is also a threat to acid grasslands, causing localised sward damage and a decrease in species diversity. Grazing (or mowing) is necessary only to the extent that species are able to flower and set seed, and to ensure that the more vigorous grasses and shrubs do not out-compete other species. Excessive grazing or mowing is likely to lead to a change in the structure of the habitat.

Agricultural intensification (use of fertilisers and herbicides, or ploughing and reseedling) may lead to damage or even local extinctions. Alien species and agricultural weeds may out-compete dry acid grassland species; similarly, measures taken to control undesirable species may be detrimental to the more valuable species present.

Inappropriate planting schemes may also affect grasslands detrimentally, including the addition of trees and shrubs, the incorporation of decorative species such as daffodils, or the use of non-native or inappropriate seed mixes.

Plan objectives and targets

The objectives of this action plan are to:

- identify areas of lowland dry acid grasslands on or immediately adjacent to the soft estate on a rolling programme;
- undertake maintenance operations at the most appropriate time of year, which will include considering protected species and UKBAP priority species which may be present on these sites;
- undertake (or continue to undertake) appropriate management of this habitat;
- identify opportunities for enhancement during design, construction and maintenance;
- target habitat enhancement schemes towards any lowland dry acid grassland priority species found during surveys.

Proposed actions**ACTION****TARGET****Policy Guidance**

Review, and if necessary, issue revised guidance with respect to lowland dry acid grassland in WTRMM.	2007
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Survey

Identify and survey areas of the soft estate that are known or likely to contain lowland dry acid grassland: e.g. areas adjacent to significant areas of lowland dry acid grassland (using CCW's current grassland surveys), and record the distribution of the habitat on the network on a database.	2008
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Identify areas of lowland dry acid grassland within the soft estate suitable for restoration.	Ongoing
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Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable dry acid grasslands are taken into consideration. Avoid the direct loss of such habitats wherever possible, or the potential for changes in the hydrology of such areas.	As schemes arise
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Phase out the use of seed that is not of local or seed source zone provenance.	Ongoing
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Where habitat is unavoidably lost, consider the recreation of lowland dry acid grassland on the road verge or, as a last resort, translocation.	As schemes arise
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Create or enhance five sites of lowland dry acid grassland in road verges.	5 areas by 2014
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Future research and monitoring

Set up a system for monitoring known sites (including newly-created sites) to ensure that the management is having the desired effect. Modify management when existing techniques are failing.	2012
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Communications and publicity

Increase awareness of Transport Directorate staff, Trunk Road Agents and the general public to the importance of lowland dry acid grassland	2006 and 2008
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Links with other plans

Lowland dry acid grassland is a UKBAP priority habitat. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Caerphilly](#); [Carmarthen](#); [Conwy](#); [Pembrokeshire](#); [Powys](#), and [Rhondda Cynon Taff](#).

TREBAP Action Plans that should also be consulted include the [Deptford Pink](#); [Amphibians](#); [Lowland Meadows](#); and [Wood Bitter-Vetch](#).

Lead or partner organisation

The Lead Partner for this habitat is identified in the UKBAP as [English Nature](#).

Habitat Action Plans



Traditional hay meadow with oxeye daisies, buttercups and clover

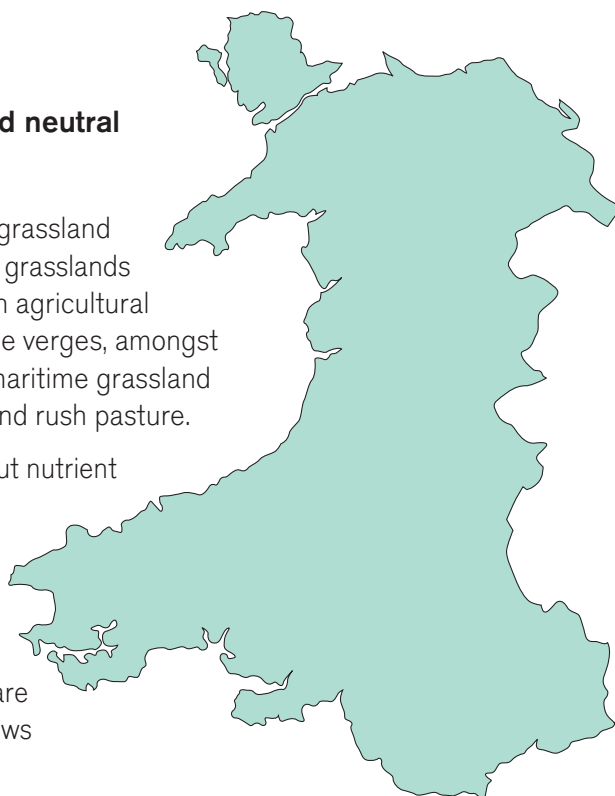
Lowland Meadows

Lowland meadows include most forms of unimproved neutral grassland found within lowland regions.

This includes floodplain meadow and flood pasture and also grassland with differing management strategies i.e. grazing pasture and grasslands cut for hay. Lowland meadows tend to be most frequent in an agricultural setting, though additional examples may be found on roadside verges, amongst others. Grassland communities excluded from this plan are maritime grassland communities, upland hay meadows, and purple moor-grass and rush pasture.

The grassland of the soft estate has the characteristic low-input nutrient regimes associated with lowland meadow, and many of the species characteristic to this habitat type, such as skylark and wood bitter-vetch, are known to occur on or near the soft estate. Within the UK, most lowland meadow communities now occur in highly localised, small, fragmented areas. Seasonally flooded grasslands are less widely distributed, but are not fragmented to the same degree as unimproved hay meadows and pasture.

The soft estate often contains remnants of long-established communities of grassland that have otherwise been lost following agricultural intensification or development. Thus the soft estate could significantly contribute to the total area of this valuable grassland within Wales.



Current status

Status in the UK and in Wales

Unimproved neutral grassland habitat has undergone a marked decline over the past 100 years, mainly due to the intensification of agriculture. It has been estimated that 97% of semi-natural grasslands have been lost over the past 50 years in England and Wales. Estimates now state that less than 19,000ha of lowland meadow communities survive today in the UK, of which 1,700 ha occur in Wales.

- [Lowland meadows](#) are a UKBAP Priority Habitat.
- Lowland meadow is included within the list of habitats of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

Status on the network

The UKBAP classification of different grasslands is not easily applied to the soft estate because of its close relationship with agriculture. Road verges tend to comprise low-diversity swards of improved grassland created by management techniques and seed mixes. The potential of the soft estate to provide good quality grassland through sensitive management is high, and there may be much good quality neutral species-rich grassland on the soft estate.

Current factors affecting the habitat

Habitat fragmentation, loss and degradation

Within the UK, large areas of lowland meadow habitat have been lost to development. Road construction has contributed to this loss, and has also exacerbated the problems of fragmentation and isolation. Although road verges can provide a refuge for the final remnants of these fragile habitats, road widening and improvement schemes further contribute to the loss by damaging these remnants.

The maintenance of the soft estate is often not conducted in a manner conducive with that required by grassland habitats. Further degradation of the soft estate habitats can be caused both by road maintenance staff storing materials, or working on services beneath the road verge, and through motorists by pollution, be it accidental (spillages) or deliberate (fly tipping) and by compaction of the ground when parking on road verges.

Lowland meadow habitats are particularly sensitive to a number of pollutants coming from the road, including those from vehicle emissions and salt spray. Herbicide and insecticide from neighbouring farmland can also cause a substantial decline in grassland diversity. The fragile nature of these communities also relies upon low soil nutrient levels, and the inputs of nutrients either from fertilisers or from vehicle emissions will contribute to the development of less diverse communities.

Inappropriate management

The balance between controlling scrub growth and cutting too frequently is one that is difficult to reach. Without regular cutting, and in some cases removal of the arisings (cut material), traditional lowland meadow species are out-competed by vigorous grasses and shrubs. The spread of highly invasive weeds and aliens such as Ragwort (*Senecio jacobaea*), Indian Balsam (*Impatiens glandulifera*) and Japanese Knotweed (*Fallopia japonica*) also leads to native grassland species being out-competed.

The seeding of road verges with inappropriate seed mixes has been common as, until recently, verges were sown with an amenity grassland mix. This, along with the planting of cultivated trees and shrubs, further detracted from the nature conservation value of areas which could be suitable for the creation of lowland meadows.

The use of herbicides, particularly in areas where cultivated plants have been used, can further damage lowland meadows if they are present in the verge.

Current actions

- Lowland meadows have been identified in a number of Welsh LBAPs and Road verge Action Plans, and management regimes designed for specific verges have been produced to optimise the plant and invertebrate diversity
- The WTRMM has identified grassland verges as valuable habitats, and states that their nature conservation value should be managed and enhanced.
- The DMRB provides advice on the creation of grassland habitats on road verges, either by selecting appropriate seed mixes or by grassland translocation.
- The A55 North Wales Coast Road Ecological Study and Enhancement Programme experimentally showed the effects of different management techniques on various types of grassland.

Habitat Action Plans

Plan objectives and targets

The objective of this Action Plan is to conserve and enhance the conservation of lowland meadow habitat within road verges. Specifically, to:

- protect, maintain and enhance the conservation value of the lowland meadow habitats within the soft estate;
- avoid further losses of lowland meadow habitats in future road construction and road improvement schemes;
- ensure that unavoidable impacts on lowland meadow habitats are fully mitigated either through the creation of alternative habitats, or through the sensitive management of adjacent highway verges;
- raise awareness of those involved in the design, construction and maintenance of roads of the conservation value of these lowland meadow habitats and to provide detailed information on how to promote these habitats; and
- improve suitable areas which do not currently support valuable grassland habitats such as a lowland meadow habitat.

Proposed actions

ACTION

TARGET

Policy, guidance and advice.

Review and, if necessary, issue revised guidance with respect to lowland meadow grassland in WTRMM.

2007

Surveying

Identify and survey areas of the soft estate that are known or likely to contain lowland meadow, for example, areas adjacent to significant areas of lowland meadow (using CCW's current grassland survey information), and record the distribution of the habitat on the network on to a database.

2008

Identify areas of lowland meadows within the soft estate suitable for restoration.

Ongoing

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable lowland meadows are taken into consideration. Avoid the direct loss of lowland meadow habitat wherever possible.

As schemes arise

Phase out the use of seed that is not of local or seed source zone provenance.

Ongoing

Where the loss of lowland meadow habitat is unavoidable, consideration should be given to the creation of a similar meadow habitat on the road verge or, as a last resort, translocation.

As schemes arise

Create or restore six sites of lowland meadow within the highway boundary.

Six sites by 2014

Future research and monitoring

Set up system for monitoring known sites (including newly-created sites) to ensure that the management is having the desired effect. Modify management when existing techniques are failing.	2012
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Communications and publicity

Increase awareness of Transport Directorate staff, Trunk Road Agents and the general public to the importance of lowland dry acid grassland	2008
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Links with other plans

There is a UKBAP Habitat Action Plan for Lowland Meadow. LBAPs which were consulted during the development of the TREBAP were: [Bridgend](#); [Pembrokeshire](#); [Rhondda Cynon Taff](#); [Carmarthenshire](#); [Powys](#); [Torfaen](#), and the [Vale of Glamorgan](#).

TREBAP Action Plans that should also be consulted include Habitat Action Plans for: [Calcareous Grassland](#); [Purple Moor-Grass and Rush Pastures](#); [Lowland Dry Acid Grassland](#), and [Woodlands and Planted Native Trees and Shrubs](#). It should also be considered with the following Species Action Plans: [Marsh Fritillary](#); [Wood Bitter-Vetch](#) and [Barn Owl](#).

Lead or partner organisation

The Lead Partner for this habitat is identified in the UKBAP as [Countryside Council for Wales](#).

Habitat Action Plans



Purple moor-grass and rush pasture

Purple Moor-Grass and Rush Pasture

Purple moor-grass and rush pasture (also known as rhos pasture) is a marshy grassland of poorly drained, generally acidic soils.

The habitat is predominantly found on valley bottoms, hillsides and commons in lowland areas with high rainfall. Characterised by an abundance of purple moor-grass (*Molinia caerulea*) and tall rushes (*Juncus* sp.), many rare and distinctive species (such as marsh fritillary butterflies) are associated with this habitat, making it a significant biodiversity resource.

Current status

Status in the UK and in Wales

The UK supports a substantial proportion of the world's resource of purple moor-grass and rush pasture. The total extent in the UK is currently unknown, but has shown a considerable decline over the last 40 years. Wales holds a significant amount of this resource, estimated to be 35,000ha.

- Listed on Annex I of the EC 'Habitats' Directive 1992 as '*Molinia* meadows on chalk and clay'; the best UK examples are designated as cSACs.
- Purple moor-grass and rush pasture is identified as a [UKBAP](#) habitat
- It is included within the list of habitats of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- In Wales, 93 SSSIs are designated for purple moor-grass and rush pasture, covering some 1,172ha.

Status on the network

Although there is little information on specific sites for this habitat on or adjacent to the network, it is likely to occur in many areas where the trunk road runs through lowland Wales, particularly in the south and west where the habitat is most common.



Current factors affecting the habitat

Habitat loss and fragmentation

Purple moor-grass and rush pasture is vulnerable to both direct habitat loss and to fragmentation and disturbance through new road schemes. Fragmented sites often suffer deterioration through disrupted drainage regimes, fire (particularly in *Molinia*-dominated swards), and cessation of traditional management.

Lack of awareness and information

There is a lack of information on the extent and nature conservation significance of this habitat. In particular, there is the issue of differentiating between the more vulnerable species-rich priority lowland pastures, which are particularly at threat from road schemes and development, and the species-poor upland fringes. This contributes to a lack of awareness of the significance and vulnerability of this habitat amongst decision makers, though the situation is gradually improving.

Current actions

- Species-rich or large areas of purple moor-grass and rush pasture are often designated as local Wildlife Sites (also known as Sites of Nature Conservation Importance).
- CCW has completed a detailed Phase II survey to determine distribution and quality of lowland grassland in Wales, including purple moor-grass and rush pasture.

Plan objectives and targets

The objectives of this Action Plan are: to avoid further loss, fragmentation and deterioration of purple moor-grass and rush pasture; and to increase knowledge of the distribution and management of the habitat on the network.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review and, if necessary, issue revised guidance with respect to purple moor-grass and rush pasture in WTRMM.

2007

Surveying

Survey the soft estate that is adjacent to known areas of purple moor-grass and rush pasture habitat to establish distribution of this habitat on the network.

As schemes arise

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that this habitat is taken into consideration, and avoid its direct loss or fragmentation wherever possible.

As schemes arise

Phase out the use of seed which is not of local or seed source zone provenance.

Ongoing

Where habitat is unavoidably lost, consider the recreation of purple moor grass and rush pasture on the road verge or, as a last resort, translocation.

As schemes arise

Enhance or create six sites by 2014 within the highway boundary.

Six sites by 2014

Habitat Action Plans

Future research and monitoring

Set up a recording system and monitor known sites (particularly those identified as marsh fritillary butterfly habitat) to ensure maintenance of quality and diversity.

Modify management when techniques are failing.

2012

Communications and publicity

Increase awareness of Transport Directorate staff, Trunk Road Agents and the general public to the importance of lowland dry acid grassland.

2008

Links with other plans

Purple moorgrass and rush pasture has a UKBAP. LBAPs which were consulted during the development of the TREBAP were: [Brecon Beacons](#); [Bridgend](#); [Caerphilly](#); [Cardiff](#); [Carmarthenshire](#); [Glamorgan](#); [Gwynedd](#); [Gwent](#); [Merthyr Tydfil](#); [Snowdonia National Park](#); [Pembrokeshire](#); [Swansea](#); [Rhondda Cynon Taff](#), and [Torfaen](#).

TREBAP Action Plans that should also be consulted include: [Marsh Fritillary](#); [Barn Owl](#); [Otter](#); [Water Vole](#); [Amphibians](#) and the Habitat Action Plan for [Water Bodies](#).

Lead or partner organisation

The Lead Partner for this habitat is identified in the UKBAP as [Countryside Council for Wales](#).



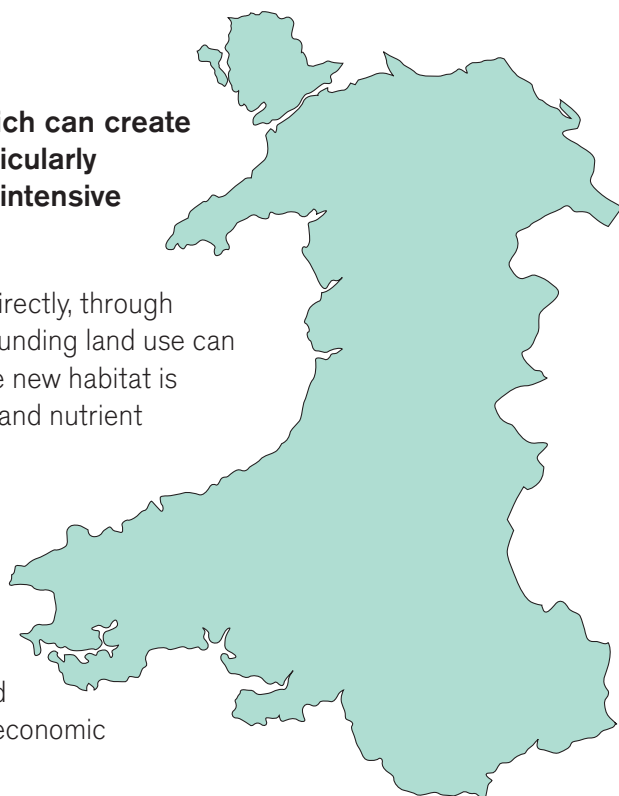
Upland stream and woodland

Rivers and Streams

Rivers and streams represent rich, dynamic systems, which can create new habitat and provide important wildlife corridors, particularly between fragmented habitats and through species-poor intensive agricultural land.

However, few rivers remain unmodified. Rivers may be modified directly, through flood defence schemes or straightening; while alterations in surrounding land use can modify rivers indirectly. Consequently their natural ability to create new habitat is often affected, whilst changes in water flows, sediment transport and nutrient exchange are common.

Rivers and streams encompass a mosaic of habitat features (for example, rock, gravels, silted areas, fast and slow flowing water) that support a diverse assemblage of riparian plants and animals. Species include both protected and priority species, including: mammals (for example, water voles and otters); birds (kingfisher); fish (shad); invertebrates (white-clawed crayfish) and plants. Fishing for recreational purposes may be of considerable economic importance in some catchments.



Current status

Status in the UK and in Wales

There has been a widespread human influence on rivers in the UK, particularly during the 1950s and 1960s when many rivers were extensively deepened and straightened; whilst rivers and streams in industrialised areas throughout much of the 19th and 20th centuries became highly polluted and biologically dead. Many of these habitats are now recovering due to stronger environmental legislation, improvements in water quality and a realisation of the importance of rivers and streams. Wales has over 27,000kms of rivers and streams.

- Some types of rivers and streams are protected by both International and UK legislation, and some types of rivers are a key habitat listed under the EC 'Habitats' Directive 1992.
- Many rivers and streams in Wales are protected as SSSIs, SACs and (non-statutory) Wildlife Sites (also known as Sites of Nature Conservation Importance), either because they run through a wider protected area, or where afforded specific protection (due to, for example, the high diversity or rarity of species they support).
- [Rivers and Streams](#) have priority status in the UKBAP.

Habitat Action Plans

Status on the network

The network crosses and runs adjacent to hundreds of rivers and streams all over Wales. For example, the A487 Llanwnda to south of Llanllyfni Improvement crossed over 40 watercourses of various sizes. Many rivers and streams crossing under or adjacent to the network are protected by some level of designation.

Current factors affecting the habitat

Habitat Loss, Fragmentation and Deterioration

New road schemes frequently cross the courses of rivers and streams of all sizes. Often these areas of the watercourse will be diverted and piped through structures, which can upset the balance of the river or stream, and affect the species that live there.

In addition, this can disrupt the wildlife corridor function of the habitat, and disturb species that may depend on this.

Pollution

This may be direct, i.e. point source, pollution, such as a spillage accident or fly-tipping, or indirect, from diffuse pollutants such as surface run-off or contaminated groundwater. Pollution may occur as a result of the road construction process (for example, silt washed from earthwork excavations); or when the road is subsequently in operation, from runoff containing road salt, spillages from vehicles, or accidents. Where pollution reaches a river or stream, there are implications for the whole aquatic ecosystem.

This includes effects on other species: when invertebrates and fish are depleted, this may impact on a further wide range of species dependent on aquatic prey. The significance of the impacts of pollution depend on the type of pollution involved, and the sensitivity and characteristics of the river or stream involved.

Invasive alien species

Invasive alien species can cause significant loss of biodiversity through crowding out other species over large areas, and affecting the way rivers and stream function. These include giant hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*), and Himalayan balsam (*Impatiens glandulifera*). These species spread quickly along watercourses, and their control through herbicides is restricted to those approved for use near aquatic habitats.

Current actions

- Some rivers and streams are given protection as important habitats through European and UK legislation (for example, SSSI or cSAC designation).
- The Environment Agency formerly produced Local Environment Agency Plans (LEAPs) for all the river catchments in Wales. These provided a summary of the status of the river catchments, and highlighted actions for pollution control, environmental works, etc. The Environment Agency has also supported the development of LBAPs by providing advice on watercourse-related issues.
- The Transport Directorate works with the Environment Agency with respect to drainage requirements, including pollution prevention and flood management measures, within the design, construction and operational stages of a scheme.
- EU LIFE funding is being used to establish a better understanding of the ecology of rivers and their related species in the UK. The project details are available from [English Nature](#).
- Care is taken in schemes and maintenance works to minimise, if not avoid, impacts on rivers and streams, working with advice from the Environment Agency Wales and the Countryside Council for Wales.

- The Design Manual for Roads and Bridges Volume 4 contains guidance on the use of vegetative systems (for example, reed beds) for road runoff purposes.
- Advice on the control of invasive alien species is available from the Environment Agency. The Transport Directorate has worked in partnership with adjacent landowners and local authorities in removing invasive plants on the soft estate next to rivers.
- Other guidance is contained in The New Rivers and Wildlife Handbook, published jointly by the NRA, RSPB and the Wildlife Trusts in 1994 (currently out-of-print).

Plan objectives and targets

The objectives of this Action Plan are:

- to minimise the impacts of the road network on rivers and streams for road development (loss and disturbance through new schemes and through maintenance) and;
- to ensure the quality of rivers and streams, and riparian bank-side habitat, is maintained both as habitat in its own right, and as wildlife corridors.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Consider the results of the EU Life project to advise on management issues.	As available
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Review and, if necessary, update guidelines relating to rivers and streams within the WTRMM, in particular, the way maintenance is carried out (pesticide use, etc.).	2007
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Surveying

Collate the results of any surveys to gain a clearer picture of the extent and quality of river/stream habitats on the network, and liaise with organisations such as the Environment Agency to identify any other relevant issues.	Ongoing
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Road design, construction and maintenance

At the design stage of any scheme, ensure that watercourses, particularly those supporting protected species, are taken into consideration. Liaise with organisations such as the Environment Agency to identify relevant issues, and avoid the direct loss of riverine habitat (e.g. through inappropriate culverting).	As schemes arise
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Before road schemes commence, take into account drainage issues and potential changes in groundwater, and any likely/potential effects on local watercourses.	As schemes arise
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Maintain and develop pollution controls, in line with best practice, to stop untreated road runoff and vehicle pollution seeping into nearby watercourses.	Ongoing
--	---------

Implement watercourse restoration schemes where road construction has unavoidably disturbed a river or stream where land ownership allows. Apply to ten different locations by 2014.	10 sites by 2014
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Habitat Action Plans

Future research and monitoring

Monitor the condition of rivers and streams on and adjacent to the soft estate to ensure maintenance of quality following improvement or major maintenance where there are specific identifiable issues of biodiversity concern. Where significant effects remain after mitigation, considerate whether retro-fitted measures can be applied.

As schemes arise

Communications and publicity

Raise awareness about the importance and vulnerability of water bodies and their associated species within those organisations involved in design, construction and maintenance.

Ongoing

Links with other plans

There is a UKBAP Broad Habitat Action Plan for Rivers and Streams. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Brecon Beacons](#); [Caerphilly](#); [Conwy](#); [Merthyr Tydfil](#); [Neath Port Talbot](#); [Newport](#); [Pembrokeshire](#); [Powys](#); [Rhondda Cynon Taff](#); [Torfaen](#), and [Wrexham](#).

TREBAP Action Plans that should also be consulted include: [Water Bodies](#); [Aquatic Species](#); [Amphibians](#); [Bats](#); [Otter](#); [Water Vole](#) and [Native Black Poplar](#).

Lead or partner organisation

This habitat has a Broad Statement in the UKBAP and no Lead Partner has been identified.



River Wye, Powys



Scree next to the A487

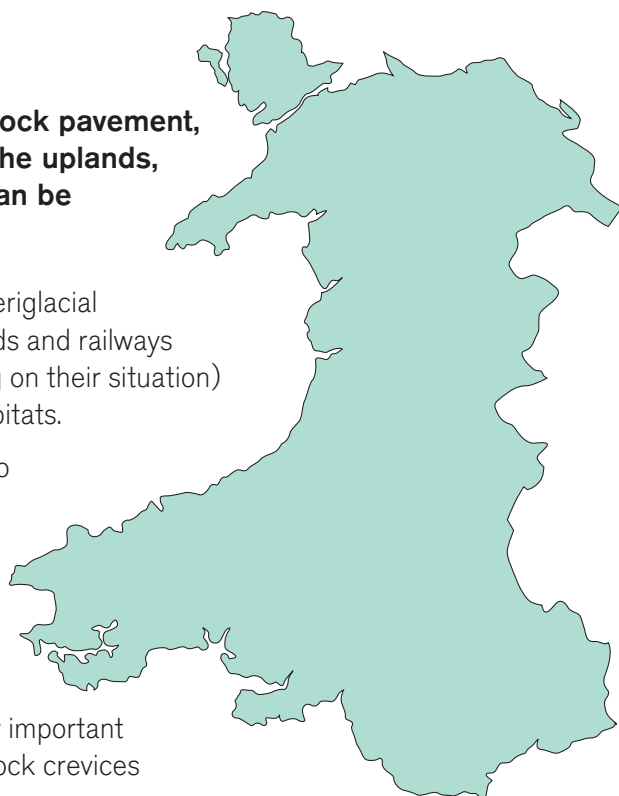
Rock Faces and Scree

Wales plays host to a great diversity of cliff, rock ledge, rock pavement, boulder field and scree habitats, which can be found in the uplands, coastal areas and river valleys. Major rock strata types can be found in these different features.

Most of these features are natural (for example, from glacial or periglacial activity), however, quarrying activities and the construction of roads and railways have all created such habitat features. These habitats (depending on their situation) can represent some of Wales' and the UK's most undisturbed habitats.

While rock surfaces are not heavily vegetated, they do play host to a wide variety of notable organisms. As many of these habitats are not accessible by livestock, cliff faces provide refuge for light-seeking grazing-sensitive species. The vegetation community is a 'colonising community' dominated by ferns, lichens, mosses, liverworts and grasses. The communities that become established depend on ongoing erosion processes, rock face stability, elevation and aspect. These habitats are particularly important for lower plants. Recent research has also confirmed the use of rock crevices by lesser horseshoe bats.

This plan covers rock faces and scree in inland, rather than coastal, areas.



Current status

Status in the UK and in Wales

These habitats occur mainly in the mountains of North and Central Wales, and parts of England and Scotland. There is no national data regarding their distribution.

- [Inland rock](#) is a UKBAP Broad Habitat.
- Seventeen rock habitats and caves are listed under Annex 1 of the EC 'Habitats' Directive 1992. In other words, their conservation is considered to require the designation of SACs. Seven of these occur in the UK (the number of SACs currently designated in Wales for each habitat is given in brackets): acidic scree (2); base-rich scree (1); plants in crevices on acidic rocks (5); plants in crevices in base-rich rocks (3); limestone pavements (0); caves not open to the public (2); and sea caves (5).

Habitat Action Plans



Rock face on the A470

Status on the network

During the construction and improvement of the road network, open rock faces and scree slopes can be created, particularly when the roads are in cutting or on embankment. These habitats are thus particularly likely to occur in areas where the road network crosses mountainous areas. The extent of these habitat types on the network is not known, but work relating to limestone woundwort is starting to indicate the potential importance of this habitat.

Current factors affecting the habitat

Habitat fragmentation and loss

The small size and relative isolation of this habitat and its associated vegetation stands may affect dispersal, reproduction and species-richness of the communities present. Valuable plants may be lost when new cuttings are created.

Inappropriate management

Invasive species such as gorse, buddleia and birch, can colonise rock faces.

Pollution

As these isolated, undisturbed communities become more accessible through the construction of roads, the traffic volume and hence the levels of atmospheric pollution will also increase. This may limit the growth of some species, particularly lichens and bryophytes. This greater accessibility could allow an increase in the use of these areas.

Current actions

- Research has been undertaken to characterise the vegetation composition and variation of rock-face communities, and to establish long-term monitoring quadrats.
- Rock faces and screes are well represented in several NNRs and SSSIs ([Snowdonia National Park](#)).

Plan objectives and targets

The objectives of this Action Plan are to raise the profile of rock faces and screes in terms of the geological and wildlife value of the habitat and to make recommendations on how to manage these habitats to maintain their natural composition. Specifically, to:

- collate records of scree and rock face communities within the soft estate and improve knowledge of their species composition;
- consider the ecological implications of loss or fragmentation of rock face and scree habitats through road construction; and
- when constructing new roads or improving roads in cutting or on embankment, to consider the creation of rock face and scree communities, based upon knowledge gained from current and future survey work.



Rock face on the A470

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review WTRMM advice and best practice generally so to include advice on management of rock face and scree habitats, including the management of invasive species, within the WTRMM.

2007

Review the need for advice in the DMRB with the UK National Highway Authorities.

Date to be agreed

Surveying

As part of all surveys undertaken, ensure the location and value of rock faces and scree are assessed.

Ongoing

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable rock faces and scree, in particular UKBAP habitats and designated sites, are taken into consideration. Avoid the direct loss of rock faces and scree wherever possible.

As schemes arise

Create or restore ten new sites by 2014.

10 new sites
by 2014

Consider creating wet rock faces where road drainage issues allow, and road safety issues are not compromised.

As schemes arise

Communications and publicity

Raise the awareness of the value of rock face and scree communities within the Transport Directorate staff, Trunk Road Agents and the general public.

Ongoing

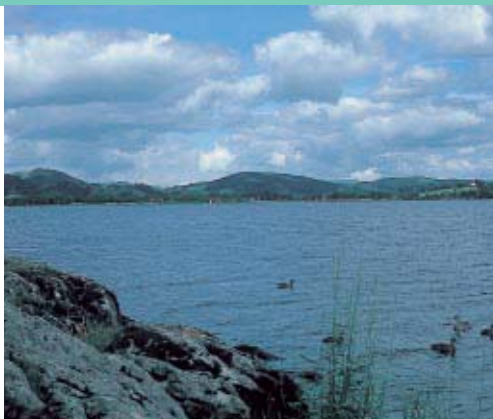
Links with other plans

This Habitat Action Plan should be considered in conjunction with the UKBAP Broad Habitat Statement for [Inland Rock](#). LBAPs which were consulted during the development of the TREBAP were: [Brecon Beacons](#); [Cardiff](#); [Merthyr Tydfil](#); [Pembrokeshire & Pembrokeshire Coast National Park](#); [Rhondda Cynon Taff](#); [Snowdonia](#), and [Torfaen](#).

Lead or partner organisation

This habitat has a Broad Statement in the UKBAP and no Lead Partner has been identified.

Habitat Action Plans



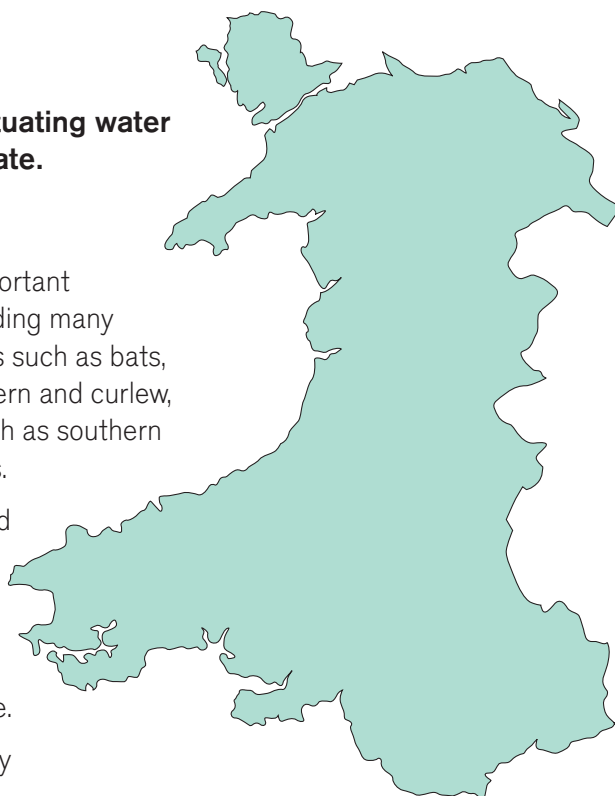
Mesotrophic lake, Llyn Tegid

Water Bodies

This Habitat Action Plan covers all standing and fluctuating water bodies that may occur on or adjacent to the soft estate.

This plan covers two types of water bodies:

- 1) Canals, lakes, ponds and reedbeds, all of which are important habitats to a diverse spectrum of fauna and flora, including many protected and priority species. These include: mammals such as bats, water voles and otters; birds such as marsh harrier, bittern and curlew, amphibians, the rare gwyniad (a fish), invertebrates such as southern damselfly and a host of wetland plants and lower plants.
- 2) Balancing ponds, ditches and settlement lagoons related to the drainage system of the trunk road network, whose primary function is the treatment or storage of road runoff. Though unlikely to be managed for wildlife, these water bodies are often colonised by a range of species that can be of some conservation value.



Estuaries are dealt with separately in the Coastal and Estuary Habitat Action Plan.

Current status

Status in the UK and in Wales

There is thought to be 125km² of still inland water in Wales, of which 40% is estimated to be eutrophic (high in nutrients). 33 sites have been tentatively recognised as mesotrophic (moderately rich in nutrients). Wales supports an estimated 500ha of reedbed with significant concentrations in Anglesey, the Llŷn Peninsula and around the Pembrokeshire, Carmarthenshire and Swansea/Neath Port Talbot/Bridgend coasts. A large number of ponds are found in counties within North Wales. Mawn ponds in Powys (Radnorshire) can support notable species such as Fairy Shrimps (*Chirocephalus diaphanus*) and Pillwort (*Pilularia globulifera*).

- [Standing Open Water and Canals](#) is a UK Broad Habitat.
- Many significant areas of reedbed are SSSIs.
- 300 nationally rare species are associated with water bodies, many of these [UK priority species](#).
- Large wetland areas may be assigned as [Ramsar](#) sites.
- Mesotrophic lakes, eutrophic standing waters and aquifer-fed naturally fluctuating water bodies are included in the list of habitats of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.



Afon Ganol flood storage on the A55

Status on the network

The types of UKBAP water bodies most commonly found on or adjacent to the trunk road network in Wales include reedbeds (e.g. A40 Carmarthen Eastern Bypass and A55 Afon Ganol, near RSPB's Conwy reserve), and eutrophic standing water; along with smaller water bodies constructed for their road runoff treatment functions. The complete extent and distribution of water bodies over the trunk road network, however, is presently unknown.

Current factors affecting the habitat

Habitat Loss and Deterioration

Road construction can impact on important water bodies through direct loss and fragmentation of the habitat and also indirectly, by the alteration of drainage or ground-water levels. Both existing and new roads can pollute nearby water bodies. This may be point-source (direct) or diffuse (indirect) and could occur through the construction process, or from subsequent vehicle use of the road.

Inappropriate management or neglect

Where water bodies in the soft estate are poorly managed, they may be susceptible to flooding, drying out, scrub encroachment and succession to woodland. In considering the management of features whose primary purpose is as part of the system to treat road runoff, their ability to deal with road runoff should remain paramount, while complying with the relevant wildlife legislation.

Current actions

- Many water bodies, particularly when supporting significant populations of priority species are given protection, through statutory designations (SSSI, Ramsar, SPA or SAC), or through non-statutory designation as a 'Wildlife Site' (also known as a Site of Nature Conservation Importance).
- The EA regularly monitor the quality of a proportion of open standing waters to check for signs of pollution and nutrient enrichment.
- Roads are constructed with appropriate pollution control measures that minimise the impacts of surface run-off and road-related pollution, both during construction and the operation of the road.
- The Highways Agency continues with a programme of research into the significance of road runoff/pollution on waterbodies.
- The Design Manual for Roads and Bridges Volume 4 contains guidance on the use of vegetative systems (for example, reedbeds) for road runoff purposes.
- Other guidance is contained in *The New Rivers and Wildlife Handbook*, published jointly by the NRA, RSPB and the Wildlife Trusts in 1994 (currently out-of-print).

Plan objectives and targets

The objectives of this Habitat Action Plan are to protect water bodies on or adjacent to the soft estate, as well as implementing appropriate management plans for them.

Habitat Action Plans

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review and, if necessary, update guidance in WTRMM on the management of water-bodies on the soft estate.

2007

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable water bodies, in particular UKBAP habitats and designated sites, are taken into consideration. Avoid the direct loss of water bodies wherever possible.

As schemes arise

Take into account during design and construction indirect effects of drainage or alterations to ground water on surrounding water bodies.

As schemes arise

Undertake further pond/reedbed creation for biodiversity purposes, at the rate of one pond or reedbed/year.

10 ponds/
reedbeds by 2014

Improve road runoff protection in existing schemes or scheme improvements as opportunities arise and/or where the need arises following assessments of risk, at the rate of one scheme per year.

10 schemes by
2014

Future research and monitoring

Set up a system to collate records of pollution incidents and monitor effects on waterbodies.

2009 and ongoing

Monitor the condition of rivers and streams on and adjacent to the soft estate to ensure maintenance of quality following improvement or major maintenance, or where there are specific identifiable issues of biodiversity concern. Where significant effects remain after mitigation, consider whether retro-fitted measures can be applied.

As schemes arise

Communications and publicity

Raise awareness about the importance and vulnerability of water bodies and their associated species within those organisations involved in design, construction and maintenance.

Ongoing

Links with other plans

This Habitat Action Plan should be considered in conjunction with those for [Rivers and Streams](#); [Purple Moor-grass and rush pasture](#); [Amphibians](#); [Aquatic Species](#); [Bats](#); [Otter](#) and [Water Vole](#).

Specific water bodies are LBAP habitats for the majority of local authorities in Wales.

Lead or partner organisation

This habitat has a Broad Statement in the UKBAP and no Lead Partner has been identified.

*Upland oakwood*

Woodlands and Planted Native Trees and Shrubs

The Transport Directorate is responsible for all trees and shrubs within the trunk road and motorway network and, in addition, is responsible for ensuring the safety of road users, in relation to trees on adjacent land.

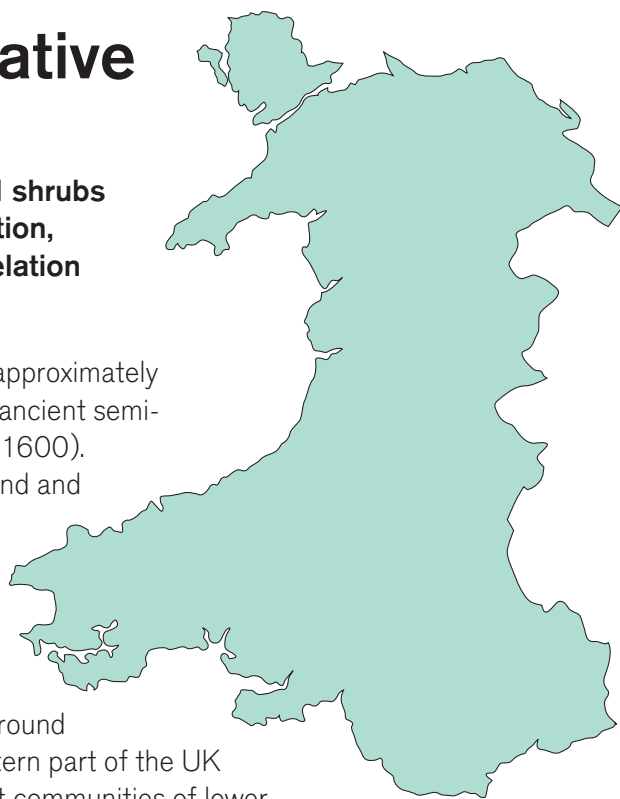
Relative to the rest of Europe, only a small proportion of Britain (approximately 800,000 ha) is wooded, with only about 300,000 ha comprising ancient semi-natural woodland (that is, woodland that has existed since before 1600). The remaining areas largely comprise recent semi-natural woodland and plantation woodland of various types, including both broadleaved and coniferous species. Ancient woodland tends to be more varied in structure and more rich in biodiversity than more recent woodland.

Woodlands are important habitats for a range of wildlife. Broadleaved woodlands are noted for the range of plants in the ground layer such as bluebell. In addition, the moist conditions in the western part of the UK provide ideal conditions for the growth of internationally important communities of lower plants, fungi and deadwood invertebrates. Similarly, mammals, birds and invertebrates thrive in woodlands, including dormice, bats, nightjars and rare butterflies.

Veteran trees are important as habitat and landscape features in their own right, but also as habitat for a wide range of organisms. Examples of these are lichens which are slow growing, invertebrates that depend on decaying heartwood, and animals that rely on cracks and holes to breed or hibernate (such as birds and bats). Age, size, condition, cultural value and ecological status all contribute to determine whether a tree is a veteran or not.

Roadside trees and shrubs are an important part of the roadside environment. Trees and shrubs have been planted to help lessen the road's visual impact and to help integrate the road with the surrounding landscape. They can create a more pleasing environment for the driver by, for example, creating more interesting roadsides and reducing the glare of oncoming lights, and in this way may reduce the monotony and stress of driving.

Wildlife can benefit from new roadside plantings, as these create potential habitats for insects, small mammals and birds. Retaining existing trees within the soft estate brings further benefits to biodiversity: veteran and mature trees provide roost sites for bats, habitats for rare invertebrates and fungi, a home for mammals such as red squirrels and dormice, and nesting areas for many protected birds.



Habitat Action Plans



Roadside managed woodland

Planting can be used by some animals as corridors and links between habitats that may have been severed by the route of the road, or fragmented by local development. This is particularly important with regard to woodland species such as the dormouse, which rarely ventures across open ground.

Current status

Status in the UK and in Wales

- The international importance of broadleaved woodland is recognised through the EC 'Habitats' Directive 1992, with seven woodland types listed under Annex I of the Directive.
- A range of woodland types are included on the list of habitats of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000, including upland oak woodland, lowland beech and yew woodland, upland mixed ash woodland, wet woodland, wood pasture and parkland, lowland mixed deciduous woodland, and upland birch woodland. These are included under the Broad category Broadleaved, mixed and yew woodland.
- Habitat Action Plans have been prepared in the UKBAP for several different types of ancient semi-natural woodland: [Lowland beech and yew woodland](#); [Lowland wood pastures and parkland](#); [Upland mixed ashwoods](#); [Upland oak woodlands](#); and [Wet woodland](#).
- Coniferous woodland / native pine woodlands are also UKBAP Broad/Priority Habitats, but these are not included on the Section 74 List.

Woodlands cover approximately 14% of Wales, and include the following types of UKBAP habitats:

[Broadleaved, mixed and yew woodlands](#) are found throughout Wales. This type, which is a UKBAP Broad habitat, includes all broadleaved and yew stands and mixed broadleaved and coniferous stands that have more than 20% of the cover made up of broadleaved and yew trees. It also includes patches of scrub of above 0.25ha that form a continuous canopy. Areas of recently felled broadleaved woodland are also included in this type, along with other integral features of woodland such as glades and rides.

Lowland mixed deciduous woodland is found on all soil types and covers a wide range of botanical interests. Examples of this type are those dominated by Ash, Field Maple, Dog's Mercury; Oak (*Quercus robur*), Bracken and Bramble; and Oak (*Quercus* sp.) and Birch. It covers about 15% of all native broadleaved woodlands in Wales, and is mainly found in South Wales and along the border with England.

[Wet woodlands](#) occur on poorly drained or seasonally wet soils, and are characterised by an abundance of alder (*Alnus glutinosa*), willow (*Salix* sp.) or birch (*Betula* sp.) trees. Wet woodlands are concentrated on hillsides and plateaus throughout Wales and are particularly susceptible to the effects of drainage and ground water contamination. Wales holds roughly 10% (c.5,000 to 7,000 ha) of the UK resource of this type of woodland.



Lowland beech and yew woodland

Lowland Beech and Yew woodland. Beech is considered to be native in southern England and South Wales. This woodland is typically found on limestone outcrops within the areas formerly known as Gwent and Glamorgan. The estimated area of this resource in Wales is c.3,000 ha.

Upland oakwood are characterised by a predominance of oak (most commonly sessile, but locally pedunculate) and birch in the canopy, with varying amounts of holly, rowan and hazel as the main understorey species. Upland oak woodlands account for approximately half of the semi-natural woodland cover in Wales and are found in north and west Wales. This habitat is found throughout the north and west of the UK; in Wales on acidic soils with high rainfall. There are major concentrations in Gwynedd, Snowdonia National Park, Powys, Ceredigion and northern Carmarthenshire. The best estimates of the extent of this habitat are between 80,000 and 110,00 ha.

Upland mixed ashwoods are abundant in upland Britain, but this habitat can, in fact, be found at low altitudes. The term is used for woods on base-rich soils in the north and west, in most of which ash is a major species, although locally oak, birch, elm, small-leaved lime and even hazel may be the most abundant species.

Yew may form small groves in intimate mosaics with the other major tree species and alder may occur where there are transitions to wet woodland. Despite variations in canopy composition, the ground flora remains broadly similar. They are concentrated in the limestone areas of Wales, including Conwy, Monmouthshire, Swansea and south-eastern Carmarthenshire. The estimated area of this resource in Wales is 17,000 ha, or c.25% of the UK resource.

Status on the network

The majority of the woodlands within the soft estate originate from planting schemes of recent origin. The extent of planted native trees and shrubs on the trunk road and motorway network is not known in detail, but with better information management techniques, this information is becoming more accurate.

Many planted areas consist of varying numbers of exotic conifer trees that were introduced because they grow quickly and provide a year-round screening function. Nevertheless, broadleaved woodland is relatively widespread on the soft estate: it is generally of greater value for biodiversity than woodland that partially or entirely comprises coniferous species. Some broadleaved woodland areas may be remnants of woodland older than the road itself.

Upland oak woodlands can be adjacent to the trunk road network (e.g. in Gwynedd) and in some locations, these woodlands have been incorporated into the verge. In places, trees have grown over the carriageway to form a wildlife corridor for arboreal species (such as dormice). It is likely that trunk roads bisect a number of upland mixed ash woodlands. Wet woodlands may remain adjacent to roads if there are no hydrological changes as a result of construction. Lowland beech woodlands are likely to be encountered along roadside verges in south-east Wales.

Habitat Action Plans



Upland mixed ashwood

Current factors affecting the habitat

Habitat loss and fragmentation

The construction of new roads can lead not only to the loss of woodland habitat, but can also cause the fragmentation and isolation of woodlands. Road-widening schemes or road improvements may also lead to the loss of trees and shrubs, close to, or within the road verge.

Maintenance works, undertaken (for example) to maintain or repair pipe and cable services can also lead to damage of trees and shrubs on the road verge. Care is usually taken to avoid damage to mature trees, but shrubs and young trees can be damaged, and replacements provided where practical.

Inappropriate management

Trees are often perceived to be a threat to road safety, especially where natural regeneration has occurred close to the highway, and they may be felled or undergo tree surgery. Currently, woody material is chipped or removed from site although, where safe, small-diameter wood may be left in rows on the highway verge. Dead wood may need to be removed for reasons of safety, or may be removed for reasons of 'tidiness' where safety is not an issue, reducing the value of that wood to wildlife.

Uncontrolled deer browsing, rabbit grazing, and bark stripping by grey squirrels can damage individual trees, affecting woodland structure and species composition by preventing new tree and shrub growth where protection has not been provided.

Alien species such as Rhododendron (*Rhododendron ponticum*) and Turkey Oak (*Quercus cerris*), if unmanaged, can spread into and along the road verge and threaten the development of a valuable woodland flora and fauna.

Problems affecting mature roadside trees

More than any other habitat of the soft estate, older and mature trees can be the most problematic in terms of management. Where trees cause a hazard to road users, they need to be dealt with through tree surgery or felling. This has obvious implications for the value of trees on road verges, the habitats of which they are a part and the species which inhabit them.

Large upright dead trees are an important habitat for certain dead-wood invertebrates and fungi, but can be a danger when close to roadsides. Dead wood on the ground (fallen or felled) is another important habitat feature. Both types of wood could be left in situ (or elsewhere within the verge), if safety or fire hazards are not an issue: however, due to the perception that dead wood is 'unsightly' or 'untidy', this habitat is often needlessly removed.

Problems affecting native trees and shrubs

Landscape planting, where non-native species have been used, can lead to these species becoming established and dominant over the local native tree and shrub species.

Where trees and shrubs have been planted without considering the ecology of the surrounding habitat (for example, the requirements of local wildlife species), the planting may in fact be detrimental (e.g. planting extensively may reduce available reptile habitat; or tall dense woodland may reduce grassland available for barn owl hunting).

Current action

- The Welsh Assembly Government has produced a strategy for tree and woodland management for the next 50 years '[Woodlands for Wales 2001](#)'. This is the first step towards fully integrating the role of woodlands into a wider environmental and economic policy for Wales. Its objectives are: to conserve and enhance the biodiversity of our woodlands; to conserve and enhance the landscapes of Wales; and to better integrate woodlands with other countryside management.
- The Countryside Council for Wales is currently completing a survey of the extent of existing areas of woodland. This does not include woodland on road verges.
- Many woodlands within Wales are designated under European or UK legislation (for example, cSACs or SSSIs), often for the species that live in them: others have non-statutory local designations, for example, as 'Wildlife Sites'.
- The Forestry Commission Wales has introduced grants specifically targeted to enhance woodland biodiversity.
- Forest Enterprise (FE) is currently surveying all ancient woodlands within FE estates in Wales in order to determine the condition of the ancient semi-natural woodland and replanted woodlands, and to inform the restoration of plantations on ancient woodland sites to native tree species.
- Coed Cadw promotes the sustainable management of Welsh hardwoods, which includes maintaining their value to wildlife.
- All new schemes have areas of trees and shrubs either as retained or new planting within the proposals, where appropriate.
- Much of the roadside tree and shrub maintenance is involved in removing dangerous trees or cutting back vegetation to clear sight lines for road users, provide access and remove fire risks. Advice contained within the WTRMM also covers Tree Preservation Orders, bat roosts, bird nests and trees within areas of conservation interest.
- Advice on the planting and management of woodland and scrub habitat on road verges is being prepared for inclusion in the DMRB Volume 10.
- On the A470, a pilot scheme to collect seed from trees to be removed, is growing replacement plants.

Habitat Action Plans



Wet woodland

Plan objectives and targets

The objectives of this Action Plan are to:

- identify the presence of UKBAP woodland habitats within the network;
- avoid the further loss of woodland habitats along road verges;
- mitigate against the unavoidable loss of woodland habitat;
- maintain and enhance the existing woodland within the soft estate;
- maximise biodiversity within woodlands; and
- conserve existing roadside trees, shrubs and their associated habitat, where this does not conflict with road safety, or other ecological factors such as other biodiversity species requirements, or where there is a statutory requirement to maintain trees in a certain way.

Proposed action

ACTION

TARGET

Policy, guidance and advice

Review the WTRMM and, if necessary, update guidance to provide detailed information on the appropriate management of woodland, veteran trees and roadside plantings within and adjacent to road verges to maximise biodiversity. Include in this the use of landscape planting to create corridors and links between existing habitat types.

2004 & 2007

Surveying

Review existing information on the location of UKBAP woodlands within the network, including CCW's Priority Habitats and Ancient Woodland Inventories and Forest Enterprise's review data.

2008

Ensure all surveys undertaken take fully into account planted/woodland areas and mature/ancient trees in the network.

Ongoing

Road design, construction and maintenance

At the design stage for new road and improvement schemes, ensure that valuable woodlands and trees, in particular UKBAP habitats and designated sites, are taken into consideration. Avoid the direct loss of valuable woodland habitat and individual trees wherever possible.

As schemes arise

Protect existing and retained woodland habitat during construction operations by the use of appropriate fencing, and by not stockpiling construction materials in these areas.

As schemes arise

Where the loss of woodland is unavoidable, consider options for mitigation and enhancement, including the extension of areas of existing woodland, or increasing connections with other woodland areas by the use of native planting.

Translocation should only be considered as a last resort.

As schemes arise

Prior to undertaking management on existing planted areas, identify those areas that may benefit from enhancement measures. See enhancement action below.

Ongoing

Encourage additional tree and shrub planting in existing planted areas in order to enhance species mix and age structure, to extend the areas of existing woodland, or to link valuable woodland habitats.

50 sites by 2010

Use only native species when carrying out planting and, where possible, stock of local or seed source zone provenance, ensuring that the species are used in 'natural' abundance and distributions. If appropriate, consider growing from seeds from particular sites.

Ongoing

Future research and monitoring

Monitor existing mature trees alongside new/improved roads to try to ensure that they remain healthy, and determine whether the road or its construction has adversely affected them.

Ongoing

Assess areas of new planting with respect to their growth/health.

Ongoing

Communications and publicity

Raise awareness within the Transport Directorate staff and Trunk Road Agents of the value of UKBAP woodland habitats on the network, for example through the use of internal training. See Education and Awareness GAP.

Ongoing

Ensure that Transport Directorate staff and Trunk Road Agents involved in road verge management are aware of any updating of the WTRMM with regard to woodland management.

2004/2008

Raise public awareness of the value of native trees and shrubs for wildlife, for example through the use of publications (internal and external).

2006

Links with other plans

There are a number of different UKBAP habitats that relate to woodland. TREBAP Action Plans that should also be consulted include the Habitat Action Plan for [Boundary Features](#); and the Species Action Plans for [Native Black Poplar](#); [Bluebells](#); [Dormouse](#); [Bats](#); and [Welsh Clearwing Moth](#).

[Butterfly Conservation](#)'s National Plan has an Action Plan covering woodlands as a habitat for butterflies.

The majority of the Local Biodiversity Action Plans produced within Wales contain woodland Habitat Action Plans. The specific action plans are listed in the table overleaf:

Habitat Action Plans

LBAP	Upland Oak Woodland	Wet Woodland	Upland Ash Woodland	Lowland Beech & Yew	Broadleaved Mixed & Yew	Semi-Natural Woodlands
Anglesey						✓
Brecon Beacons	✓		✓	✓		
Bridgend	✓	✓	✓		✓	
Caerphilly	✓	✓	✓	✓		
Cardiff						✓
Carmarthenshire	✓	✓	✓			
Ceredigion	✓	✓	✓			
Conwy						✓
Flintshire		✓	✓	✓		
Gwent	✓	✓	✓			
Gwynedd	✓	✓	✓			
Merthyr Tydfil	✓	✓	✓			
Neath Port Talbot	✓	✓	✓			
Newport		✓	✓			
Pembrokeshire	✓	✓				
Powys	✓	✓				
Rhondda Cynon Taff	✓	✓	✓	✓		
Snowdonia	✓	✓				
Torfaen	✓	✓	✓			
Vale of Glamorgan		✓		✓		
Wrexham						✓

Lead or partner organisation

The Lead Partner for this habitat is identified in the UKBAP as the Forestry Commission.

Species Action Plans



Great crested newt, female

Amphibians

Of the six amphibian species that are native to Britain, there are three species of newt (palmate, smooth and great crested), two species of toad (common and natterjack), and the common frog.

Newts are nocturnally active, and predominantly terrestrial. They are generally found within 500 metres from their breeding pond (though their range when dispersing can extend further than this), returning to water bodies to breed in the spring.

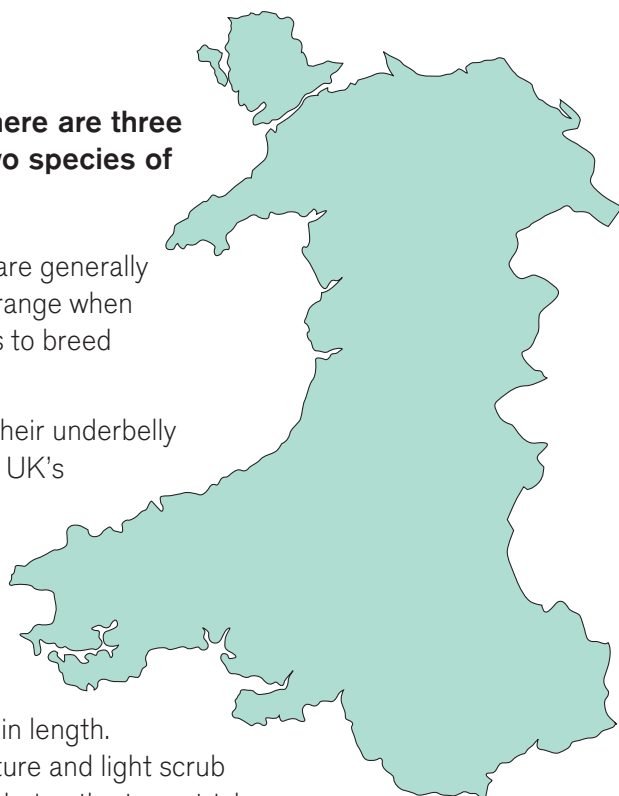
Courtship is elaborate, with male newts displaying the colours of their underbelly to attract females. The palmate newt (*Triturus helveticus*) is the UK's smallest native newt, with a typical length of about 7cms.

They are particularly associated with heathland and habitats of acidic soils. The smooth newt (*Triturus vulgaris*) is the most common British newt, utilising the full range of water bodies (including ditches and linear ponds) for breeding, with breeding males developing distinctive wavy crests. The great crested newt (*Triturus cristatus*) is the largest UK newt, usually around 14cm in length.

Adults are mainly terrestrial, preferring rough grassland, rough pasture and light scrub habitats. Deciduous woodland is also considered to be important during the terrestrial phase. They return to their customary breeding waters for 3-4 months in spring where the breeding males develop high spiky crests. Hibernation takes place over winter in frost-free locations such as rotted tree stumps, root systems, under rubble, in walls or cloddiau, or deep in leaf mould.

The common toad (*Bufo bufo*) is relatively widespread in Britain, breeding in ponds in March-April and using grassland, woodland and hedgerow habitats as terrestrial foraging ground, feeding on small invertebrates. Hibernation sites include dead wood, tree roots and leaf litter. The natterjack toad (*Bufo calamita*) is rare due to its specialised breeding requirements and habitat: sand dunes, heathland and upper saltmarsh.

The common frog (*Rana temporaria*) is largely terrestrial, but utilises water bodies for breeding and hibernating. It is widespread, occurring in most moist habitats.



Current status

Status in the UK and in Wales

The great crested newt is thought to have declined in Britain by 25-30% in the last 25 years, but is still relatively widespread, and in Wales has strongholds in the North East.

The natterjack toad has suffered a substantial decline UK-wide, as well as becoming extinct in Wales where it has now been [reintroduced](#) to one site on the north coast. The remaining native amphibians are relatively common throughout Britain, although the palmate newt tends to be more common in Wales due to its preference for upland habitats.

Species Action Plans

- Common frog, common toad, smooth newt and palmate newt are protected by Section 9(5) of the Wildlife and Countryside Act 1981 (as amended), which protects these species against sale.
- Great crested newt and natterjack toad are fully protected under Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 and Section 5 of the Wildlife and Countryside Act 1981 (as amended) as well as being listed in Annex IV of the EC 'Habitats' Directive 1992. Under Annex IV of this Directive, 30 SAC sites have been designated for great crested newts, of which five are in Wales.
- Natterjack toad and Great crested newt are included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- There are Species Action Plans for [great crested newt](#) and for [natterjack toad](#) within the UKBAP.

Status on the network

Amphibians are likely to occur on all areas of the network, particularly where the road runs through damp grassland habitats and where water bodies are on or adjacent to the soft estate. The natterjack toad is unlikely to be affected by trunk roads currently due to its one coastal location in Wales. New road schemes including A55 Llanfair Pwllgwyngyll to Holyhead Improvement have provided mitigation for great crested newts and other amphibians where the scheme has unavoidably destroyed their habitat.

Current factors affecting the species

Loss, fragmentation or degradation of habitat

Road construction may cause the direct loss of breeding ponds as well as the loss or degradation of terrestrial habitat used by amphibians. Fragmented habitat can prevent dispersal and migration to and from breeding waters. Changes to drainage systems or ground water levels may lead to the drying out of surrounding habitat, which in turn affects amphibians.

Road-related mortality

Amphibians often use the same spawning waters year after year, and traditional migration routes tend to become established. As a result, both new and existing road schemes can severely impact amphibian populations directly through road-kills, particularly where hibernation sites and breeding pools lie on either side of a road.

Pollution

Salt spray and runoff from the road could impact amphibians through pollution of their aquatic habitat. In addition, pollution and debris discharged into water bodies from the actual road construction process may be a problem.



Great crested newt, male

Colonisation by fish

Where balancing ponds are adjacent to water courses, fish may enter the ponds at certain times. Fish act as a limiting factor on existing populations, and may limit the potential for newt colonisation.

Current actions

- An Amphibian Advice Note has been published as part of DMRB Volume 10 (HA 98/01 Nature Conservation Management Advice in Relation to Amphibians).
- Sites that support three species of breeding amphibian or a large population of one species, may be identified as a statutory or non-statutory designated site; similarly, the presence of great crested newts alone is often a qualifying factor.
- Amphibian surveys, assessment and mitigation are regularly carried out for new roads in order to understand the effect of roads on potential amphibian habitat.

Plan objectives and targets

The objectives of this Action Plan are to protect and, where possible, enhance amphibian habitat on the soft estate (including migration routes) as well as providing mitigation for existing [amphibian road-kill](#) black spots.

Proposed actions

ACTION	TARGET
Review existing advice within WTRMM to ensure it incorporates best practice.	2007
Surveying	
Where new road schemes are proposed, survey terrestrial and aquatic habitat in the area to assess local amphibian populations and predict potential migration routes.	As schemes arise
Road design, construction and maintenance	
Where a road will unavoidably destroy or degrade amphibian habitat, consider the creation of new breeding waters, artificial hibernacula and suitable foraging habitat (these may be incorporated into the soft estate depending on the species involved).	As schemes arise
Where existing amphibian road-kill black spots are known, consider building mitigation measures into the road: these may include tunnels, fencing and road signs.	Ongoing
Take into account the possible impacts of alterations to drainage or water levels on the surrounding amphibian populations during construction and maintenance operations	As schemes arise
Replace or amend gully pots that can trap amphibians, with more suitable structures on a rolling programme (as maintenance is undertaken). Aim to replace/amend these on a minimum of three locations/year.	30 schemes by 2014

Species Action Plans



Newt fence on the A55

Consider the provision of habitats suitable for amphibians (both for foraging and hibernating) when managing the soft estate, to enhance the area for the local amphibian population.

Ongoing

Ensure measures are in place to prevent road runoff pollution events in line with best practice in new schemes.

As schemes arise

Future research and monitoring

Set up a system to collate current and future records of amphibian sites on the network, including road-kill black spots and migration routes.

2006

Communications and publicity

Liase with [local amphibian groups](#) in each county that can survey, monitor and help flag up road-kill black spots and migration routes.

2004

Raise awareness of Transport Directorate staff with respect to road-kill black spots, and encourage reporting of such areas.

2006

Raise public awareness of amphibian issues via publicity materials.

2006

Links with other plans

The natterjack toad and great crested newt have their own UKBAPs. LBAPs that were consulted during the development of the TREBAP were:

- [Rhondda Cynon Taff \(Amphibian GAP\)](#) and [Gwynedd \(Newt GAP\)](#);
- Species Action Plans for Great Crested Newts: [Anglesey](#); [Blaenau-Gwent](#); [Bridgend](#); [Cardiff](#); [Conwy](#); [Denbighshire](#); [Flintshire](#); [Merthyr Tydfil](#); [Neath Port Talbot](#); [Newport](#); [Powys](#); [Rhondda Cynon Taff](#); [Snowdonia](#); [Swansea](#); [Torfaen](#), and [Vale of Glamorgan](#);
- Species Action Plans for Natterjack Toads: [Conwy](#); [Denbighshire](#) and [Flintshire](#).

TREBAP Action Plans that should also be consulted include: [Water Bodies](#); [Rivers and Streams](#); [Coastal and Estuarine](#); [Boundary Features](#); [Purple Moor-Grass and Rush Pasture](#); and [Woodlands and Planted Native Trees and Shrubs](#).

Lead or partner organisation

The Lead Partner for the Natterjack toad is identified in the UKBAP as the [Herpetological Conservation Trust](#). The Lead Partners for the Great Crested Newt are identified in the UKBAP as the [British Herpetological Society](#), [Herpetological Conservation Trust](#) and [Frog Life](#).



Pillwort

Aquatic Species

This action plan highlights a number of different species/species groups that use aquatic habitats, notably:

- aquatic plants;
- white-clawed crayfish and other invertebrates;
- salmonids (i.e. salmon, trout, grayling and charr);
- other fish; and
- riverine birds.

However, it is anticipated that many other aquatic species of flora and fauna will benefit from the actions therein. The species selected are highlighted for different reasons: for example, to highlight their inclusion in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000; because of their economic significance; because they are frequently encountered during river/bridge maintenance works; and/or because they would benefit from low-cost enhancement measures.

Otters and water voles have separate Species Action Plans.



Aquatic plants

The following plants have been selected to reflect their inclusion in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000. They are also included as Priority Species in the UK Biodiversity Action Plan:

- Vascular plants: [pillwort](#) (*Pilularia globulifera*); [three-lobed water-crowfoot](#) (*Ranunculus tripartitus*); [floating water-plantain](#) (*Luronium natans*); [grass-wrack pondweed](#) (*Potamogeton compressus*);
- Mosses and liverworts: [multi-fruited river moss](#) (*Cryphaea lamyana*);
- Lichens: [river jelly lichen](#) (*Collema dichotomum*);
- Stoneworts: [lesser bearded stonewort](#) (*Chara curta*); [slender stonewort](#) (*Nitella gracilis*); [dwarf stonewort](#) (*Nitella tenuissima*).

Species Action Plans

Invertebrates

Seven aquatic invertebrates are included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000. A large number of aquatic species are included as Priority Species associated with either the Broad habitat [Standing open water and Canals](#), of which fifteen are invertebrates (including beetles, crustacea, molluscs and worms). Similarly, four invertebrate species (including molluscs, crustacea, and damselfly) are associated with the Broad habitat [Rivers and Streams](#) in the UK Biodiversity Action Plan. White-clawed crayfish and the freshwater pearl mussel have been highlighted in this plan because of their known proximity to the network.

- [White-clawed crayfish](#) (*Austropotamobius pallipes*) are Britain's only native freshwater crayfish species. They occur in clean, calcareous streams, rivers and lakes. These small (12cm) invertebrates are brown bodied with white/pink underside of claws and are at risk from alien crayfish species, particularly through the spread of crayfish plague.
- The [freshwater pearl mussel](#) (*Margaritifera margaritifera*) is a bivalve mollusc that lives in fast-flowing, nutrient-poor rivers with clean, sandy and stony bottoms. These small mussels are long-lived (80-100 years), but many populations, dependent on declining salmon stocks for part of their life cycle, have not produced young for over thirty years.

Fish: salmonids

These species are not UKBAP priority species, nor included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000. However, some species are included within LBAPS (for example: charr is included within Gwynedd's LBAP).

- Salmonids are widely distributed across the UK. Salmon (*Salmo salar*) and sea trout (*Salmo trutta*) have a varied life history spending time both at sea and inland.
- Inland rivers, particularly tributaries, are predominantly used while spawning.
- The condition of these spawning grounds is extremely important, with a strong preference exhibited for clear shallow streams with a loose gravel bottom.
- This group also includes grayling and charr. Grayling (*Thymalus thymalus*) are not native to Welsh rivers, but are included within this group of 'game' fish. Charr (*Salvelinus alpinus*) are rare and confined to a few water bodies in North Wales. In Wales, they are known as 'torgoch'.

Fish: non-salmonids

Allis and twaite shad are included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000. They are also included as Priority Species in the UK Biodiversity Action Plan.

- [Allis shad](#) (*Alosa alosa*) and [twaite shad](#) (*Alosa fallax*) are members of the herring family. Both were widespread throughout the UK but are now uncommon.
- The bullhead (*Cottus gobio*) is widely distributed across Europe and is found in a variety of aquatic environments. A preference is shown for fast flowing, clear, shallow water.

Riverine birds

Riverine birds are included within this Action Plan because they would benefit from low-cost enhancement measures, such as dipper boxes. A large number of bird species use river corridors, notable amongst these are:

- Dippers
- Wagtails
- Kingfishers

Current status

Status in the UK and in Wales

A number of species highlighted are included either in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000 and/or as Priority Species within the UK Biodiversity Action Plan (as listed above). In addition:

As this Action Plan covers a wide range of species, no attempt has been made to describe the varied geographical locations of each. Further information can be obtained via the UK BAP, or from the Environment Agency and/or the Countryside Council for Wales.

- Plants (including non-vascular species) receive general protection under the Wildlife and Countryside Act 1981 (as amended). In addition, three-lobed water-crowfoot is being considered for inclusion within Schedule 8 of that Act.
- Floating water plantain is listed on Annexes II and IV of the EC 'Habitats' Directive 1992 and Appendix I of the Bern Convention. It is protected under Schedule 4 of the Conservation (Natural Habitats, etc.) Regulations 1994 and Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- Multi-fruited river moss and river jelly moss are both included within Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- White-clawed crayfish is listed in Appendix III of the Bern Convention and Annexes II and V of the EC 'Habitats' Directive 1992. It is also protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of taking from the wild and sale.
- The freshwater pearl mussel is listed on Annexes II and IV of the EC 'Habitats' Directive 1992 and Appendix II of the Bern Convention and is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
- Salmonids are protected under the Salmon and Freshwater Fisheries Act 1974, and the Salmon Act 1986, and are also given European protection under the Freshwater Fisheries Directive.
- Bullheads are listed on Annex II of the EC 'Habitats' Directive 1992.
- Shads are listed on Appendix II of the Bern convention, on Annex II and V of the EC 'Habitats' Directive 1992, and are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
- All birds are protected under the Wildlife and Countryside Act 1981 (as amended): some, including kingfisher, are listed on Schedule 1 of that Act, and are therefore afforded a greater level of protection.

Status on the network

Motorways and trunk roads regularly cross watercourses throughout the network in Wales.

However, if not properly managed, the impacts of road development have the potential to be significant. For instance white-clawed crayfish are only found in relation to the Transport Directorate's soft estate where roads cross or run parallel to rivers, so could be negatively affected by the construction or repair of bridges if appropriate surveys and measures are not carried out and applied.

Species Action Plans



White-clawed crayfish

Current factors affecting the species

Pollution

There are a number of potential sources of pollution from roads that may affect these species. Particulates (for example, brake material) that reach road runoff could enter watercourses if not effectively removed. Spillages, and salt-spray may present a direct source of pollution, as can fly-tipping. Groundwater contaminants may be a more diffuse pollutant. Concrete used in bridges and other structures leach lime into the water.

Barriers to migration

Bridges crossing rivers often have supporting pillars standing within the river itself. This can mean that, during construction, substantial excavation of the surrounding river is likely to have occurred, usually causing temporary disruption to aquatic communities. The presence of in-river bridge footings may also have impacts on the hydrology of the river downstream. Pillars created within the river can cause some obstruction to the migration of fish species attempting to reach upstream spawning grounds.

Invasive and alien species

Invasive alien species can cause significant loss of biodiversity through crowding out other species over large areas, and affecting the way rivers and stream work. These include giant hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*), and Himalayan balsam (*Impatiens glandulifera*). These species spread quickly along watercourses, and their control through herbicides is restricted to those approved for use near watercourses.

Current actions

- Advice is contained within the DMRB Volume 4 on the construction of bridges so as to minimise the impacts on downstream hydrology and water quality.
- The Transport Directorate works with the Environment Agency and CCW to ensure that the effects of new construction and maintenance on aquatic species is avoided wherever possible.
- Best practice guidelines for work affecting white-clawed crayfish have been produced by the Environment Agency and English Nature.
- Draft design guidelines for designing fish passes and other measures to ensure fish can travel along rivers under road structures are available from the Scottish Executive / Scottish Natural Heritage.

Plan objectives and targets

The objectives of this Action Plan are to: avoid any detrimental impacts of new road construction, road improvements and road operation on aquatic systems and their species; and to identify opportunities throughout each phase of road construction for enhancement of existing habitats and the provision of effective mitigation.

*Twaite Shad*

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review advice within the WTRMM regarding maintenance operations as they impact upon aquatic systems.

2007

Road design, construction and maintenance

During the design phase of a road scheme, assess the impacts upon aquatic species, particularly at river crossing points, at both desk study and field survey phases.

As schemes arise

During construction, in consultation with Environment Agency Wales and CCW, ensure as little disruption as possible to aquatic species occurs. Maintain water quality, and the ability of species to move along rivers and water bodies, throughout construction. Ensure footings do not significantly encroach on water courses.

As schemes arise

Ensure that, following construction, runoff from roads does not directly enter watercourses.

As schemes arise

During design and maintenance, identify opportunities to enhance the ecological value of streams to aquatic birds by the provision of nesting structures including burrows and platforms. Five sites a year in appropriate locations.

50 sites by 2014

Communications and publicity

Create awareness within the Transport Directorate and the Trunk Road Agents of opportunities for enhancement for aquatic species.

Ongoing and
2008

Links with other plans

This Action Plan should be considered alongside the UKBAP Species Action Plan for white-clawed crayfish. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Brecon Beacons](#); [Bridgend](#); [Caerphilly](#); [Carmarthenshire](#); [Conwy](#); [Denbighshire](#); [Gwynedd](#); [Monmouthshire](#); [Neath Port Talbot](#); [Newport](#); [Pembrokeshire](#); [Powys](#); [Rhondda Cynon Taff](#); [Snowdonia National Park](#); [Swansea](#), and [Torfaen](#).

TREBAP Action Plans that should also be consulted include the [Otter](#) and [Water Vole](#) Species Action Plans. It should also be considered with the [Coastal and Estuarine](#); [Water Bodies](#); and [Rivers and Streams](#) Habitat Action Plans.

Lead or partner organisation

The Lead Partner for these species is identified in the UKBAP as [The Environment Agency](#).

Species Action Plans



Barn owl

Barn Owl (*Tyto alba*)

The barn owl is a nocturnal bird associated with open agricultural land.

This species favours damp pastures and unimproved meadows that hold a high density of small mammal prey. Hunting by flying at low level, it feeds largely on field voles, but also takes mice, shrews, rats and other small vertebrates. It is often found in close proximity to man, making use of a wide variety of buildings such as farms, church towers and derelict buildings as well as hollow trees and cliff ledges, often using the same nest site year after year.

Current status

Status in the UK and in Wales

- The barn owl is listed on Appendix II of the Bern Convention and is protected under the EC 'Birds' Directive 1979, and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- Although it is not a UKBAP Priority Species, it is listed as a Species of Conservation Concern in the UK Biodiversity Steering Group Report and is on the RSPB Amber List of Birds of Conservation Concern.
- The barn owl has undergone a significant decline in population throughout the 20th century, with the most recent estimate in Britain being around 4000 breeding pairs (source: Project Barn Owl).
- By 1950, breeding barn owls were scarce in many Welsh counties. The most recent indication of Welsh numbers from 1982 to 1985, was estimated at 462 breeding pairs. This is a decline of 67% in 50 years. The decline is thought to have slowed since the 1990s, with a relatively stable current population.

Status on the network

Due to its use of small mammal-rich linear features such as road verges and ditches, the barn owl is likely to be present on much of the trunk road network which contains suitable habitat. Although network records are very limited, this is almost certainly due to under-recording and reporting to the Transport Directorate.



Current factors affecting the species

Traffic-related mortality or injury

A combination of increased road construction, traffic volume and traffic speed combined with the barn owl's use of the soft estate as hunting ground, and its tendency to fly low, means that fatal collisions with vehicles are likely to have a direct impact on the population. High numbers of casualties have been recorded on road verges in some locations, and currently it is not always clear what can be done to avoid or reduce this risk.

Habitat Loss or Degradation and Fragmentation

The direct loss of foraging and nesting habitat is a threat from new road developments and improvements, whilst fragmentation of habitat and the loss of linear corridors caused by roads also reduces the small mammal population and therefore impacts on barn owls.

In addition, the change from unimproved grassland of traditional agricultural practices to improved grassland (which supports a lower small mammal population) means that barn owls are using road verges more frequently as foraging habitat, with a consequent increase in road casualties.

Current Action

- The Barn Owl Trust is a national organisation aiming to conserve barn owls and their habitats, and providing a free national information line and guidance for Developers and Planners. They are currently undertaking research into the impacts of major roads on barn owls;
- A number of local groups and individuals, including the British Trust for Ornithology's (BTO) Breeding Bird Survey, contribute to annual monitoring and recording of barn owl populations. The BTO organises an ongoing national bird ringing scheme and nest record scheme, [Project Barn Owl](#). The South Pembrokeshire ringing group operates nestbox schemes and ringing records.
- An Advice Note to the Design Manual for Roads and Bridges Volume 10 is currently being drafted by the Highways Agency with the other UK National Highway Authorities.

Plan Objectives and Targets

The main objectives for this Action Plan are to gather more information about the presence of barn owls on the trunk road network, and to reduce the level and incidence of mortality on roads whilst managing the soft estate for barn owls where it is safe to do so, and the risk of road-related casualties is low.

Species Action Plans

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Work with Highways Agency and other UK National Highway Authorities to produce advice in DMRB.	2004 / 2005
Review Highways Agency and Barn Owl Trust research on the impact of roads on barn owls and any recommendations for soft estate management, and apply in the context of the Welsh trunk road network through the WTRMM.	2006
Surveying	
Set up a system for reporting barn owl casualties to the Transport Directorate.	2004
Identify the extent of the soft estate used by barn owls as current/potential foraging and nesting habitat by collating current information.	2008
Road design, construction and maintenance	
Identify stretches of road where regularly high levels of mortality are recorded.	Ongoing
Where new road developments are planned, ensure prior desk studies and surveys determine any likely impacts on the local barn owl population and options available for the mitigation of these impacts.	As schemes arise
Apply mitigation to areas of high barn owl road mortality.	5 sites by 2014
Communications and publicity	
Investigate the possibility of warning signs in areas known as important barn owl hunting areas.	2006
Encourage the public to report barn owl road traffic accidents or sightings of barn owls on the network.	2006

Links with other plans

LBAPs which were consulted during the development of the TREBAP were: [Bridgend](#); [Caerphilly](#); [Conwy](#); [Flintshire](#); [Gwynedd](#); [Neath Port Talbot](#); [Pembrokeshire](#); [Rhondda Cynon Taff](#) and [Swansea](#).

TREBAP Action Plans that should also be consulted include [Boundary Features](#); [Purple Moorgrass and Rush Pasture](#); [Lowland Meadows](#); [Calcareous Grassland](#); [Lowland Dry Acid Grassland](#); and [Woodlands and Planted Native Trees and Shrubs](#).

Lead or partner organisations

This is not a UKBAP species and there is therefore no Lead Partner.



Lesser horseshoe bat

Bats (*Chiroptera*)

There are sixteen species of bats known to breed in Britain. Currently fifteen of these are known to occur in Wales. They use a wide variety of natural and artificial structures, including buildings, bridges, and trees, and underground structures such as caves and mines.

Bats are colonial, and tend to roost in groups. Mean colony size is around 50 individuals, but they can be found singly, or in groups of any size up to several hundreds depending on the species. Roosts may be used during the year, for breeding, hibernating, or mating. These may be within the same location, or at distances of several kilometres apart.

British bats are insectivorous, and therefore require foraging habitats producing high insect biomass (for example, woodlands, wetlands and some pastures). Bats use echolocation to locate and catch their prey, and to navigate between roosts. Most species are dependent on linear corridors to differing degrees, such as hedgerows, tree lines and watercourses, to navigate between roost sites and foraging habitats that may be some distance apart. Bats may be found in almost any habitat that occurs on the soft estate.

UKBAP Priority Habitats of particular importance to bats are: ancient and/or species-rich hedgerows, all woodlands, and all wetland habitats.



Current status

Status in the UK and in Wales

Of the sixteen species of bats resident in Britain, at least half are rare or endangered. Even those that are relatively common have undergone massive population declines in the last fifty years in the UK and Europe. As a consequence, bats are strictly protected.

- All species of bats, and their roosts, are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994.
- All bats are listed on Appendix 3 of the Bonn Convention.
- All except the common and soprano pipistrelles are included on Appendix II of the Bern Convention.
- Four species (greater horseshoe bat; lesser horseshoe bat; Bechstein's bat; barbastelle) are covered by the provisions of the EC 'Habitats' Directive 1992 (Annex II), which allows the designation of SACs on the basis of their presence. A total of 21 candidate SACs are proposed for one or more of these four species, of which ten sites are wholly or partly in Wales.

Species Action Plans

- Seven species of bat are identified as Priority Species in the UK Biodiversity Action Plan: the greater horseshoe bat; the lesser horseshoe bat; the greater mouse-eared bat; Bechstein's bat; the barbastelle; and the 'pipistrelle' (the term is assumed to include both common and soprano).
- Of these, all but the greater mouse-eared bat are included within the list of species selected by the Assembly Government in the list of species of principal importance under Section 74 of the Countryside and Rights of Way Act 2000.

Common Name	UK Status	Distribution in Wales
Greater horseshoe bat	Endangered	SW and SE Wales
Lesser horseshoe bat	Endangered	Throughout most of Wales
Whiskered bat	Local	Throughout most of Wales
Brandt's bat	Local	Throughout most of Wales
Natterer's bat	Fairly common	Throughout most of Wales
Bechstein's bat	Very rare	Very infrequently recorded in south Wales
Daubenton's bat	Fairly common	Throughout most of Wales
Serotine	Uncommon	Very infrequently recorded in south Wales
Noctule	Fairly common	Throughout most of Wales
Leisler's bat	Scarce	Very scarce in Wales
Common (45kHz) pipistrelle	Common	Throughout most of Wales
Soprano (55kHz) pipistrelle	Common	Throughout most of Wales
Nathusius' pipistrelle	Occasional records	No roosts yet identified in Wales
Barbastelle	Rare	Occasional records in mid- and S Wales
Brown long-eared bat	Common	Throughout Wales
Grey long-eared bat	Very rare	No records in Wales, but distribution appears to be expanding northwards from southern England

Status on the network

Bats are present in all areas of the network. Bats have been identified near a large number of schemes including: the A40 (Carmarthen Eastern Bypass; Fishguard Western By-pass); the A470 (Dolwyddelan to Pont yr Afanc Improvement; Pentrebach to Cefn Coed Improvement); the A487 (Llanwnda to south of Llanllyfni Improvement); and the A477 (Sageston to Redberth Bypass and Nash to Bangeston Improvement).

Current factors affecting the species

Loss of habitat through land-take, pollution or fragmentation

The loss of bat roosts can have a significant effect on bat populations over a wide area since bats can roost in large groups at certain times of year. The loss of even small roosts may be significant for rarer species, or at certain times of the year (for example, in the autumn during mating).

Bats are vulnerable to the effects of road construction or improvement schemes, where direct land-take results in the loss of foraging habitat or the loss or severance of linear corridors. The deterioration of such habitats due to polluted runoff or hydrological changes may result in a depletion of insect biomass.

Road traffic-related mortality

Road-traffic related mortalities are likely to be higher for new schemes and off-line improvements, particularly where these cross a well-established crossing-point. However, because bat corpses are rarely recorded, it is difficult to estimate the significance of this impact.

Road-side lighting

Lit roads can form a barrier to the movement of horseshoe bats, and most of the rarer and endangered species, which tend to feed in enclosed (or 'cluttered') habitats can be adversely affected by road lighting. In addition, whilst some species of bats (such as pipistrelles) utilise the insects attracted to street lights as a valuable and predictable food source, it is not considered advisable to attract bats to road verges (particularly those which fly low) due to the risk of mortality from collisions with vehicles.

Maintenance

There is a risk of destroying roosts, or injuring or killing of bats, through maintenance works particularly those that involve trees, bridges and other structures. Some species frequently roost in bridges (particularly Daubenton's bats) and many will roost in crevices in trees. The presence of bats is not obvious, and they can be easily overlooked if appropriate surveys at the correct time of year are not undertaken before works (such as pressure grouting of bridges, or tree surgery) are started.

Current actions

- A Bat Advice Note has been published as part of DMRB Volume 10 (HA 80/99 The Good Roads Guide Nature Conservation Management in Relation to Bats).
- WTRMM highlights the importance of checking large trees for bats before works on them are carried out.
- The National Bat Monitoring Programme has collected baseline data, and published their first report in 2001. This project is ongoing.
- Monitoring of mitigation measures recently implemented for bats is being undertaken on a number of schemes across Wales.
- A report has recently been published by the Transport Directorate and the Countryside Council for Wales, which has reviewed the relevant literature, assessed a number of recent road schemes in Wales and reviewed the success of bat mitigation techniques.

Plan objectives and targets

The objectives of this Action Plan are to enhance the conservation of bats, during scheme design, construction and maintenance operations. Specifically, to:

- undertake maintenance operations at the most appropriate time of year, after relevant surveys have been completed;
- avoid the loss of roosts, foraging areas and linear corridors during road construction and widening schemes;
- identify opportunities for enhancement of habitats for bats during design, construction and maintenance;
- avoid road mortality to bats.

Species Action Plans

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review, with the Highways Agency and other UK National Highway Authorities, the DMRB Bat Advice Note.

2005

Review the WTRMM, and publish advice for all network operators to ensure maintenance works are undertaken at the correct time of year, and after the appropriate surveys have been carried out.

2004

Road design, construction and maintenance

Include bats at the earliest stages of road design, construction and maintenance in order to ensure the early identification (and appropriate management) of sites valuable as roosts, foraging areas, and linear corridors.

As schemes arise

Avoid the indirect impacts of water-based pollution on valuable feeding areas by using and maintaining appropriate road runoff control and treatment measures.

As schemes arise

Consider options for mitigation and enhancement in all road construction and maintenance operations (e.g. bat tunnels, habitat enhancements and hibernacula).

As schemes arise

Increase opportunities for roosting bats in areas of woodland within the highway boundary (which are otherwise suitable for use by foraging bats) by adding artificial roosts.

As schemes arise

Provide bat boxes which are suitable for the species likely to be present in order to enhance 30 appropriate locations within the highway boundary.

by 2009

Future research and monitoring

Develop a system to collect and maintain information of known roosts which are located on or very near the network.

2006

Develop a system to identify and collate information on well-used crossing points within the network, and any areas of high road mortality of bats.

2006

Communications and publicity

Develop training materials to support the information in the WTRMM and DMRB after their review.

2005

Liaise with CCW and local bat groups who may be able to provide additional information on species distributions.

2004

Ensure maintenance personnel and engineers are aware of issues such as seasonal constraints and licensing requirements, and the consequent need for forward planning.

2005

Links with other plans

UKBAPs have been prepared for the following bat species: Barbastelle, Bechstein's, pipistrelle, greater horseshoe, and lesser horseshoe. This Species Action Plan should be considered in conjunction with the Habitat Action Plans for [Woodlands](#), [Rivers and Streams](#), and [Boundary Features](#).

Bats are LBAP species for a large number of counties in Wales.



Pipistrelle bat

LBAP	Bats (>1 sp.)	Greater horseshoe bat	Lesser horseshoe bat	Natterer's bat	Bechstein's bat	Noctule	One or more Pipistrelle(s)	Barbastelle
Anglesey							✓	
Blaenau-Gwent			✓					
Brecon Beacons		Species statement	✓		Species statement			
Bridgend	✓							
Caerphilly		✓	✓				✓	✓
Cardiff	✓							
Conwy			✓					
Denbighshire			✓				✓	
Flintshire	✓							
Gwynedd			✓	✓		✓	✓	
Neath Port Talbot	✓							
Pembrokeshire		✓	✓				✓	✓
Powys			✓				✓	
Rhondda Cynon Taff	✓						✓	
Snowdonia			✓				✓	
Swansea		✓	✓		✓		✓	✓
Torfaen	✓							
Vale of Glamorgan	✓						✓	
Total number of LBAPs	7	4	10	1	2	1	10	3

Lead or partner organisation

The Lead Partners for the six UKBAP bat species in Wales are as follows:

Greater horseshoe bat	CCW / English Nature
Lesser horseshoe bat	The Bat Conservation Trust
Bechstein's bat	The Bat Conservation Trust
Pipistrelle (common and soprano)	The Bat Conservation Trust
Barbastelle	The Bat Conservation Trust

There is also a UKBAP for the greater mouse-eared bat, until recently thought to be extinct in Britain. However, a single juvenile greater mouse-eared bat was recorded in Sussex in 2002. This species has never been recorded in Wales.

Species Action Plans



Common dormouse

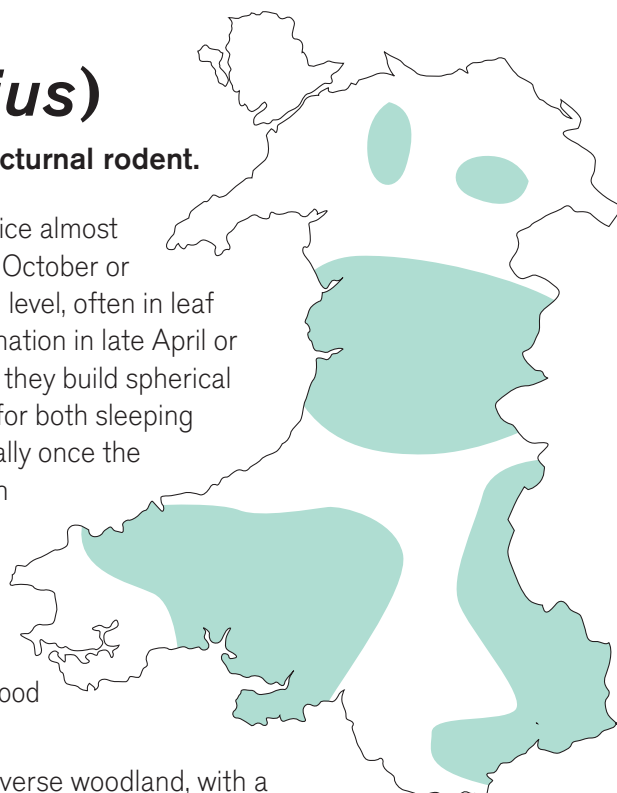
Dormouse (*Muscardinus avellanarius*)

The dormouse is an arboreal (tree-dwelling) small nocturnal rodent.

Body weight varies enormously throughout the year, with dormice almost doubling their summer body weight prior to hibernation. In late October or early November, dormice hibernate and make a nest at ground level, often in leaf litter or at the base of coppice stools. They emerge from hibernation in late April or May, depending on weather conditions. In the summer months, they build spherical nests of barks and grasses in the tree canopy, which are used for both sleeping and breeding. Between one and two litters are produced annually once the dormice has reached sexual maturity, each comprising between three and five young.

The Dormouse is omnivorous, feeding on nuts, flowers, seeds, fruit and insects. They require reliable food sources between May and October, and are therefore more likely to be present where there is sufficient diversity of trees and shrubs to provide food throughout the summer months.

Optimal habitat for dormice is considered to be structurally-diverse woodland, with a dense understorey containing mature hazel coppice and a varied range of shrubs and tree species. Hedgerows also provide an important resource to dormice, both as dispersal corridors facilitating movement between areas of suitable habitat and as sites of permanent habitation. To be of any value to dormice, hedgerows need to be both wide and tall, and to house a high species diversity with considerable amounts of both hazel and bramble, which contribute to the annually diverse range of food plants. Tall, unmanaged, species-rich hedgerows with standard trees without gaps are particularly valuable. In addition, mature landscape planting can also support dormouse populations.



Current status

Status in the UK and in Wales

Dormice are widely dispersed throughout the southern counties of England, however, they have been lost from over 50% of their former range over the last century. The species is virtually absent from the northern areas of UK.

Within Wales, there are scattered populations, generally restricted to the south, although they are found in other areas as well. They have been identified on roadside verges in Radnorshire, Conwy Valley, Dolgellau-Machynlleth and around Corris.

- The dormouse is protected through its inclusion on Schedule 5 of the Wildlife & Countryside Act 1981 (as amended); and Appendix 3 of the Bonn Convention.
- It is included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- Dormouse are included within Annex IVa of the EC 'Habitats' Directive 1992, and Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994.
- [Dormice](#) are a Priority Species in the UKBAP.

Status on the network

There are currently no reports of dormice within the existing trunk road and motorway network; however, dormice are known to be present adjacent to the trunk road and motorway network. There are six known colonies to the north of the M4 and one to the south in the Vale of Glamorgan / Rhondda Cynon Taff area. Although suitable habitat exists on both sides of the road, the M4 is suggested to be a physical barrier to dispersal. It is likely that there are further populations that have not yet been identified.

Current factors affecting the species

Changes in forestry management practices

Forestry management practices such as coppicing have been replaced with clear-felling over the past century. Coppicing creates a much denser understorey, which is important for dormice. Current practices, such as the grazing of woodland by livestock, further prevent this understorey from developing. Management of much of the woodland within the soft estate is not currently conducted in a manner conducive to dormouse conservation, but, if populations were found, consideration would need to be given to how best to manage these areas.

Fragmentation of woodlands leading to isolated populations

Road construction has fragmented woodlands preventing dispersal of dormouse populations and limiting the feeding resources available. For example, woodlands in the Vale of Glamorgan and Rhondda Cynon Taff are physically isolated from one another by the M4. Socially isolated populations may not have sufficient genetic diversity for long-term viability.

Species Action Plans

Hedgerow loss

Hedgerows are now considered to be a very important resource for dormice. The loss and decline of species-rich hedgerows has led to both a loss of habitat resources, and also constitutes a major obstruction to dispersal, as dormice are dependent on such features to migrate between woodlands.

Current actions

- A Dormouse Advice Note has been published as part of DMRB Volume 10 (HA 97/01 The Good Roads Guide Nature Conservation Management in Relation to Dormice).
- Two nationwide monitoring schemes using volunteers have been undertaken: known as the 'Great Nut Hunts'; the information (particularly relating to distribution) has been developed into practical conservation management advice.
- English Nature has published the 'Dormouse Conservation Handbook' (1996).
- The Vincent Wildlife Trust has recently completed a report on the distribution of dormice in Wales (2001).
- Dormice have been reintroduced into Cheshire and have subsequently spread into the Wrexham area.
- Dormice surveys are regularly carried out for new schemes in areas where dormice have been recorded.

Plan objectives and targets

The objectives of this plan are to reduce the adverse impacts of development, particularly road construction, on dormouse populations, and specifically to:

- consider, and where possible avoid, any adverse impacts of road construction on dormice;
- following comprehensive assessment, mitigate against those impacts that are unavoidable;
- promote the profile of the dormouse populations within Wales to contractors, consultants, Trunk Road Agents and the Transport Directorate Staff;
- continue to enhance the knowledge of dormouse distribution within Wales, particularly within the soft estate; and
- should dormouse populations be identified as using the soft estate, maintain and, where possible, enhance the habitat to retain the species.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review the need to incorporate detailed advice into the WTRMM regarding management of the soft estate with regard to dormice.

2007

Surveying

For new schemes, identify dormouse suitable habitats within soft estate, and undertake surveys (using licensed surveyors) wherever these are present.

As schemes arise

Concentrate survey effort on the existing soft estate around areas identified as having local dormouse populations e.g. Wye Valley.

Ongoing

Road design, construction and maintenance

Include dormice at the earliest stages of road design, construction and maintenance, in order to ensure the early identification of dormice-related issues.	Ongoing
Where impacts are unavoidable, make efforts to create alternative habitats and enhance remaining habitat. Consider the provision of 'links' (such as rope bridges) across roads to prevent them acting as barriers to dispersal.	As schemes arise
Promote soft estate management techniques that enhance potentially suitable dormouse habitat. Extend current planting schemes to provide habitats of value to dormice.	Ongoing
Enhance suitable habitat through the provision of dormouse boxes in 30 locations within the highway boundary.	by 2009

Future research and monitoring

Set up a system to monitor suitable dormouse habitats within the soft estate so that the success of the management of the soft estate can be assessed.	2008
Monitor mitigation measures (for example, those to connect woodlands that have been fragmented by roads) to inform future schemes.	As schemes arise

Communications and publicity

Provide Transport Directorate staff and Trunk Road Agents with information on dormice issues.	2008
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Links with other plans

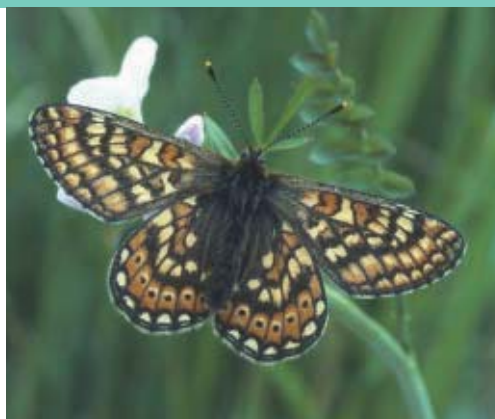
Dormice are included on the HABAP and the UKBAP. LBAPs which were consulted during the development of the TREBAP were: [Brecon Beacons](#); [Bridgend County Borough](#); [Cardiff](#); [Caerphilly County Borough](#); [Carmarthenshire](#); [Conwy](#); [Denbighshire](#); [Flintshire](#); [Gwynedd](#); [Monmouthshire](#); [Neath Port Talbot](#); [Newport](#); [Pembrokeshire](#); [Powys](#); [Rhondda Cynon Taff](#); [Snowdonia National Park](#); [Swansea](#); [Torfaen](#) and [Vale of Glamorgan](#).

TREBAP Action Plans that should also be consulted include [Woodlands and Planted Native Trees and Shrubs](#), and [Boundary Features](#).

Lead or partner organisation

The Lead Partners for this species are identified in the UKBAP as [English Nature](#) and the [Wildlife Trusts](#).

Species Action Plans



Marsh fritillary butterfly

Marsh Fritillary Butterfly (*Eurodryas aurina*)

The marsh fritillary butterfly breeds in open grassland habitats in the UK, particularly damp acidic or dry calcareous grasslands dominated by tussock-forming grasses.

Populations also occur on wet heath, bog margins and woodland clearings. Colonies tend to be limited to small patches of habitat, subject to large fluctuations in local population size, and the majority of individual butterflies do not fly very far (c.100m). However, colonies tend to exist as metapopulations with other colonies and individual butterflies can fly 10 – 15km.

Marsh fritillary adults are on the wing from May to June, and their larvae live communally in a silkweb on devil's-bit scabious plants. These larval colonies can be readily identified in late summer. Its populations are highly volatile, and the species may require extensive habitat networks to ensure its long-term survival.



Current status

Status in the UK and in Wales

The marsh fritillary was once widespread in Britain and Ireland, but has declined severely over the twentieth century, a decline seen throughout Europe. The UK is thought to be a stronghold of this species. Of 432 colonies identified in the UK, 111 were recorded in Wales, in particular in the southern and western parts of Wales.

- The marsh fritillary is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and is listed on Annex II of the Conservation (Natural Habitats, &c.) Regulations 1994. This butterfly is also protected under the Bern Convention.
- It is included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- The [marsh fritillary](#) is a Priority Species in the UK Action Plan.
- The marsh fritillary is covered by the provisions of EC 'Habitats' Directive 1992 (Annex II), which allows the designation of SACs on the basis of its presence. A total of 31 candidate SACs are proposed for this species, of which 13 are in Wales.
- The marsh fritillary is listed by Butterfly Conservation as a 'High Priority Species' in Britain.

Status on the network

Marsh fritillaries have not been identified within the boundaries of the soft estate itself. However, there is a series of sites containing marsh fritillary colonies alongside the M4, between Rhondda Cynon Taff and the Vale of Glamorgan. Marsh fritillaries are known to be present on either side of the A465, and adjacent to the A487 in Gwynedd.

Current factors affecting the species

Fragmentation and loss of habitat through land-take (development)

Marsh fritillaries are particularly susceptible to habitat fragmentation. Adults tend to be sedentary and remain in a series of linked metapopulations, forming numerous temporary sub-populations, which frequently die out and recolonise. Fluctuations in population size are due, in part, to cycles of attack from parasitic wasps, which make habitats unsuitable until the parasite populations drop. Habitat fragmentation prevents recolonisation of suitable sites, and populations are therefore unable to persist without a cluster of sites in close proximity. Road corridors form a significant physical barrier to the recolonisation process and small remnants of sites may be too small to manage appropriately. Habitat fragmentation may be responsible for a 'wave' of local marsh fritillary extinctions, which has spread westwards through South Wales in recent decades.

Changes in land management

Adverse changes include the agricultural improvement of marshy and chalky/limestone grasslands, afforestation, and changes in grazing stock (sheep selectively graze devil's-bit scabious and are therefore detrimental to marsh fritillary populations, except at very low stocking rates). Burning and mowing are also known to have caused the extinction of populations.

Current actions

- A full UK-wide Species Action Plan has been prepared by Butterfly Conservation, and the species is included in their National Action Plan for Wales ('Action for Butterflies').
- A major audit of marsh fritillary habitat/colonies is being undertaken in Rhondda Cynon Taff and the Vale of Glamorgan areas. All sites where marsh fritillaries have been recorded in Pembrokeshire are surveyed annually.
- Countryside Council for Wales have recently completed a full survey of Wales for Marsh Fritillary, and the results are available from CCW in MapInfo. Guidance notes for the definition and mapping of habitat quality for marsh fritillaries are also available from CCW.

Plan objectives and targets

The objectives of this action plan are to:

- identify all areas of potentially suitable marsh fritillary habitat on or immediately adjacent to the soft estate;
- undertake maintenance operations at the most appropriate time of year where habitats are found to be suitable;
- identify opportunities for enhancement during design, construction and maintenance;
- consider managing areas of soft estate to link remnant habitat parcels; and
- to enhance potentially suitable habitat within the network in the vicinity of identified marsh fritillary sites.

Species Action Plans

Proposed actions

ACTION

TARGET

Policy guidance and advice

Review with the UK National Highways Authorities the need for an advice note within the DMRB on marsh fritillaries.	Date to be agreed
Update the WTRMM to include information on management of the soft estate to promote marsh fritillary conservation.	2007

Survey

Identify areas of marshy grassland in relation to existing and proposed road schemes using the CCW Phase I maps and existing information.	Ongoing
Survey these areas of suitable habitat on the soft estate that are adjacent to known populations of marsh fritillary for their suitability and presence of larval webs.	Ongoing

Road design, construction and maintenance

Identify road schemes that might fragment further known metapopulations of marsh fritillary butterflies. Investigate mechanisms of reducing the effects of fragmentation where this is unavoidable.	As schemes arise
Avoid the indirect effects of road runoff pollution on suitable habitat by appropriate hydrological design: during design phase and as pollution events occur.	As schemes arise
Consider options for mitigation and enhancement in road construction and maintenance operations, particularly where small alterations in management (within the soft estate) may result in habitat that might link remnant parcels outside of the soft estate.	As schemes arise
Where marsh fritillaries are found on road verges, consider whether to modify existing management.	Ongoing

Future research and monitoring

Create and maintain a database of all sites within or adjacent to the trunk road and motorway network that are either known breeding grounds or are potentially suitable for the marsh fritillary.	Ongoing
Consider research to determine if major roads do present a barrier to dispersal with the UK National Highway Authorities.	2008

Links with other plans

A UKBAP Species Action Plan has been prepared by Butterfly Conservation. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Brecon Beacons](#); [Bridgend](#); [Caerphilly](#); [Carmarthenshire](#); [Gwynedd](#); [Swansea](#); [Merthyr Tydfil](#); [Monmouthshire](#); [Neath Port Talbot](#); [Powys](#); [Rhondda Cynon Taff](#) and [Snowdonia National Park](#).

TREBAP Action Plans that should also be consulted include [Calcareous Grasslands](#); [Purple Moor-Grass and Rush Pasture](#).

Lead or partner organisation

The Lead Partner for this species is identified in the UKBAP as [Butterfly Conservation](#).



Otter

Otter (*Lutra lutra*)

Otters are semi-aquatic, nocturnal carnivores in the family Mustelidae, and are generally found in rivers, streams, marshes and lakes.

Otters are fairly large animals; adult males can reach up to 1.2m in length, including the tail. Within their home range otters require a varied supply of food and also a range of secluded resting places or holts, which must be relatively undisturbed. Consequently, otter home ranges can encompass as much as 40km of riverine habitat for males, though smaller ranges are used by females. They are highly mobile and usually occur at extremely low densities. Populations are therefore vulnerable across most of the British Isles.

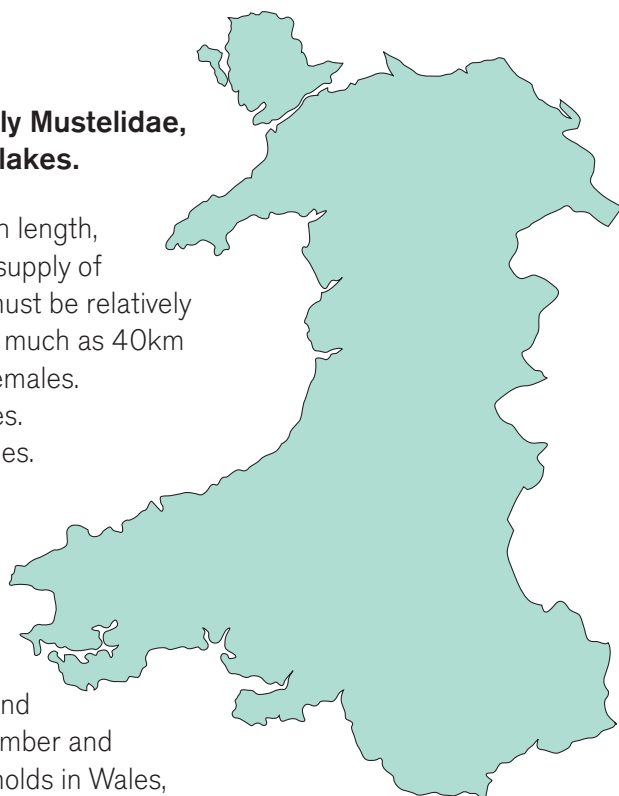
Current status

Status in the UK and in Wales

Formerly widespread throughout the UK, the otter underwent a rapid decline in numbers from the 1950s to 1970s and was effectively lost from midland and south-eastern counties of England and parts of Wales by the 1980s. Otters are now increasing in number and distribution throughout the UK, spreading from traditional strongholds in Wales, Scotland, northern England, East Anglia and southwest England.

Wales has historically provided a stronghold for otter populations in the UK. Although otters can be found on most river systems in Wales, the size and strength of the population is not uniform. The otter is now widespread in Mid and North Wales; however, otters are not found so frequently in the North East and parts of South Wales.

- Otters are listed on Appendix II of the Bern Convention and Annexes II and IV of the EC 'Habitats' Directive 1992. Annex II of this Directive allows the designation of SACs on the basis of their presence. A total of 71 SACs are proposed for otters of which twelve are wholly or partly in Wales. [Welsh cSACs](#) include the Wye, Dee, Gwyrfai, Usk, Tywi, Teifi and Western Cleddau Rivers.
- Otters are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994.
- They are included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.
- [Otters](#) are listed as a Priority Species in the UK Biodiversity Action Plan.



Species Action Plans

Status on the network

Otters are present in most areas around the network, however, they are generally confined to watercourse corridors, and will therefore only encounter the Transport Directorate's soft estate where roads cross or run adjacent to watercourses or marshes, or cross over the boundary between river catchments.

Road casualties have been recorded on the existing network, and mitigation measures are being installed in a number of locations.

Current factors affecting the species

Incidental mortality of otters on the roads

Incidental otter road casualties have increased significantly in Wales. In 2000, approximately 50 otters were killed on roads in Wales, and otter road deaths are considered to be a significant cause of mortality.

They tended to occur at locations where otters were unable to pass through bridges and culverts at times of high flow, where otters had taken 'short-cuts' across roads, and where watersheds were bisected by a road.

Loss and deterioration of habitat and food sources

New road developments and road improvement schemes may lead to the loss of bankside habitat which provide breeding and resting sites, and to the fragmentation of the otter habitat by obstructing access along linear water features. Roads can also cause the pollution of watercourses, leading either to a decline in prey species or to a build up of toxins up the food chain, causing disease and mortality.

Current actions

- Best practice guidelines for work affecting otters and suitable mitigation measures are provided in DMRB Volume 10: HA 81/99 Nature Conservation Advice in Relation to Otters. These guidelines include ensuring that bridges and culverts are designed so that otters can travel through them at times of high water flow by the use of wide-span bridges, ledges or underpasses. In addition, the use of otter-resistant fencing is recommended in order to prevent otters from reaching the road corridor.
- A study of otter road deaths across Wales has been carried out in order to identify accident 'black-spots' (where between two and seven otters have been killed over a period of time), to target specific mitigation methods in order to reduce otter road deaths.
- The Roads and Otters Steering Group – Wales, set up with the Environment Agency Wales and supported by many interested organisations, is working to ensure that records of casualties are quickly assessed and distributed to ecologists and engineers to inform mitigation measures.
- In Wales, Water for Wildlife officers working with Environment Agency Wales compile up-to-date information on local otter distribution.
- Mitigation measures are regularly installed on new roads, and mitigation has been provided at locations on the following existing roads: M4, A465, A40, A44 and A487.

Plan objectives and targets

The objectives of this Species Action Plan are to:

- avoid impacts of new road schemes or improvements on otters;
- mitigate unavoidable impacts on otters and/or their habitats;
- reduce the level of incidental otter mortality on existing roads;
- safeguard and enhance known otter populations close to the road network;
- raise the awareness of Transport Directorate staff, Trunk Road Agents and consultants regarding the significance of otters on the network;
- safeguard and enhance potentially suitable habitat features for otters within the soft estate; and
- to develop a greater knowledge of the distribution of otters across the trunk road network.

Proposed action

ACTION

TARGET

Policy, guidance and advice

With the UK National Highway Authorities, review the current Otter Advice Note.	2004 / 2005
Review the WTRMM on the management of the soft estate for the benefit of otters.	2007

Road design, construction and maintenance

Where impacts of new schemes and road improvements on otter habitat are unavoidable, consider the options for wide-span bridges, otter ledges, road underpasses, otter resting places, other habitat improvements, and artificial holts, and prevent effects on feeding areas through appropriate pollution controls.	Ongoing
Increase the amount of available otter habitat by removing barriers to dispersal (for example, under bridges and through culverts) and by creating suitable habitat wherever possible.	Ongoing
Continue providing mitigation for existing roads at sites identified as 'black spots' across the network. Ten appropriate sites/year.	100 sites by 2014
Undertake regular checks of artificial holts, otter underpasses and fences as part of maintenance activities to check that they are not blocked or in bad condition.	Ongoing

Species Action Plans



Otter ledge

Future research and monitoring

Continue supporting work to identify black spots on existing roads which pose a threat to otters.	Ongoing
Monitor the use and success of otter mitigation already installed across the road network to inform future mitigation.	Ongoing

Communications and publicity

Include information on otter issues for Transport Directorate staff and Trunk Road Agents.	Ongoing
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Links with other plans

There is a UKBAP Species Action Plan for Otters. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Brecon Beacons](#); [Bridgend](#); [Caerphilly](#); [Conwy](#); [Denbighshire](#); [Flintshire](#); [Gwynedd](#); [Merthyr Tydfil](#); [Monmouthshire](#); [Neath Port Talbot](#); [Newport](#); [Pembrokeshire](#); [Powys](#); [Rhondda Cynon Taff](#); [Snowdonia](#); [Torfaen](#) and [Wrexham](#).

TREBAP Action Plans that should also be consulted include [Aquatic Species](#) and [Water Vole](#) Species Action Plans, and the [Rivers and Streams](#) and [Water Bodies](#) Habitat Action Plans.

Lead or partner organisations

The Lead Partners for this species is identified in the UKBAP as the [Environment Agency](#) and the [Wildlife Trusts](#).



Common lizard, female basking on rock

Reptiles (*Reptilia*)

Of the six native reptiles species in Britain, five are found in Wales. Two of these are snakes: the grass snake and adder. Three are lizards: common (or viviparous) lizard; sand lizard; and the slow worm (a legless lizard).

The grass snake (*Natrix natrix*) is the largest snake, and can reach over a metre in length. Often associated with water, its main prey are amphibians and fish.

Grass snakes are egg-laying, and are non-venomous. The adder (*Vipera berus*) is the only poisonous snake, though bites are rarely fatal. This snake prefers open sites, and it can be found in a wide variety of such habitats, including heathland, moorland, bogs, open woodland, field edges and hedgerows, bogs and marshy areas.

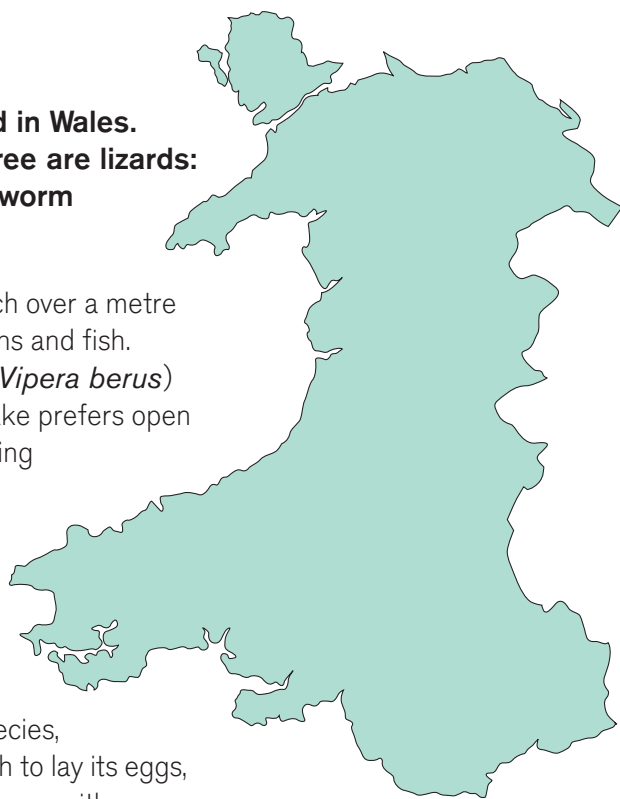
Common lizards (*Lacerta vivipara*) are also found in a wide variety of habitats. They are most frequently seen in drier habitats such as commons, heaths, moorland, dry-stone walls, embankments and cliffs, but can also be found on wet heaths.

Unlike these two lizards, which give birth to live young, the third species, the sand lizard (*Lacerta agilis*), requires a sandy substrate in which to lay its eggs, and is therefore restricted to sandy heathlands and coastal sand dunes with some cover.

The slow worm (*Anguis fragilis*) is the most common lizard species in Britain. It is found throughout Wales in most open and semi-open habitats, including pastures, woodland glades, scrub and heathland.

They are also found in embankments and hedgerows, and are commonly encountered in gardens (particularly in compost heaps). Unlike other lizards, which bask in the open, slow worms absorb heat by sheltering under structures that are exposed to sunshine.

UKBAP habitats which are of particular relevance to reptiles, and which occur within the soft estate, are ancient and/or species-rich hedgerows, lowland heathland, calcareous grassland, inland rock and all woodlands.



Species Action Plans



Adder, male basking on rock

Current status

Status in the UK and in Wales

Adders, grass snakes, slow worms and common lizards are widespread and locally common throughout Wales.

Within the UK, the sand lizard occurs naturally only in a few sites in the south and the north-west of England. However, it is being reintroduced to sites formerly within its range, including sites in North Wales.

- Sand lizards and their habitats are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, &c.) Regulations 1994. Slow worms, adders, grass snakes and common lizards are protected from killing, injuring and sale under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
- [Sand lizards](#) are listed as a Priority Species in the UK Biodiversity Action Plan. It is included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

The UK's sixth native reptile – the smooth snake (*Coronella austrica*) – has a very restricted distribution and does not occur in Wales.

Status on the network

All species are likely to occur within the soft estate, with the likely exception of sand lizard, though comprehensive records are not available. In many cases, the likely presence of particular species may be inferred from the characteristics of the habitats present. 'Derelict' areas, where construction waste and rubble have been left undisturbed, may also provide valuable habitat.

Current factors affecting the species

Habitat loss and fragmentation

The construction of new roads, and the implementation of improvement schemes, are likely to have a significant impact on reptile populations through habitat loss and fragmentation. Roads are likely to form significant barriers to dispersal.

Road mortality

Road mortalities are likely to be under-reported, and the scale and significance of road mortality is unknown. Incidental mortality during road construction and maintenance operations may also be significant.

Inappropriate habitat management

Within the soft estate, the management of road verges may have a significant impact on reptile populations. The species most likely to be affected in Wales are slow worms, adders and common lizards. Management activities which are most likely to adversely affect reptiles are strimming and mowing. The natural succession of vegetation on a site to mature woodland naturally causes habitats to become unsuitable for reptiles over time, therefore the removal of scrub could be beneficial.

Current actions

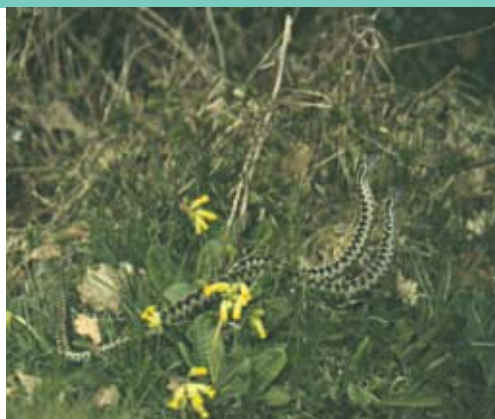
- Research into best practice with a view to formulating new guidance (to form part of the DMRB) is being undertaken by the Highways Agency with the other UK National Highways Authorities.
- The JNCC publication 'Herpetofauna Workers' Manual' and English Nature's 'Species Conservation Handbook' both include information on habitat management for reptiles, as well as advice on survey and mitigation.
- Surveys and mitigation measures such as replacement hibernacula have been, and are being, applied to new schemes, including A40 Carmarthen Eastern Bypass and A470 Dolwyddelan to Pont yr Afanc Improvement.

Plan objectives and targets

The objectives of this Action Plan are to:

- identify areas of habitat that are suitable for reptiles within the soft estate;
- adhere to new best practice advice as it is developed (with respect to road construction and maintenance); and
- identify opportunities for enhancement during road design and construction.

Species Action Plans



Pair of adders in a courtship 'dance'

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review existing advice within WTRMM to ensure it incorporates best practice.

2007

With Highways Agency and other UK National Highway Authorities produce advice for DMRB.

2004

Surveying

Undertake surveys of suitable habitat to build up a more complete picture of soft estate use by reptiles.

As schemes arise

Road design, construction and maintenance

Identify the likely presence of reptiles early, particularly for schemes where there is no alternative to effects on reptiles, and which would require translocation as a last resort.

Ongoing

Create reptile habitats on five new sites/year in appropriate locations.

50 sites by 2014

Communications and publicity

Ensure Trunk Road Agents are aware of current best practice regarding reptiles, particularly new additions to the DMRB and WTRMM.

2005 / 2008

Links with other plans

There is a UKBAP for sand lizards. LBAPs which were consulted during the development of the TREBAP were: [Caerphilly](#); [Conwy](#); [Gwynedd](#); [Rhondda Cynon Taff](#) and [Torfaen](#).

TREBAP Action Plans that should also be consulted include: [Boundary Features](#); [Coastal and Estuarine](#); [Calcareous Grassland](#); [Lowland Dry Acid Grassland](#); [Lowland Meadows](#) and [Purple Moor-Grass and Rush Pasture](#).

Lead or partner organisation

The joint Lead Partners for sand lizards are identified in the UKBAP as [English Nature](#) and [The Herpetological Conservation Trust](#).

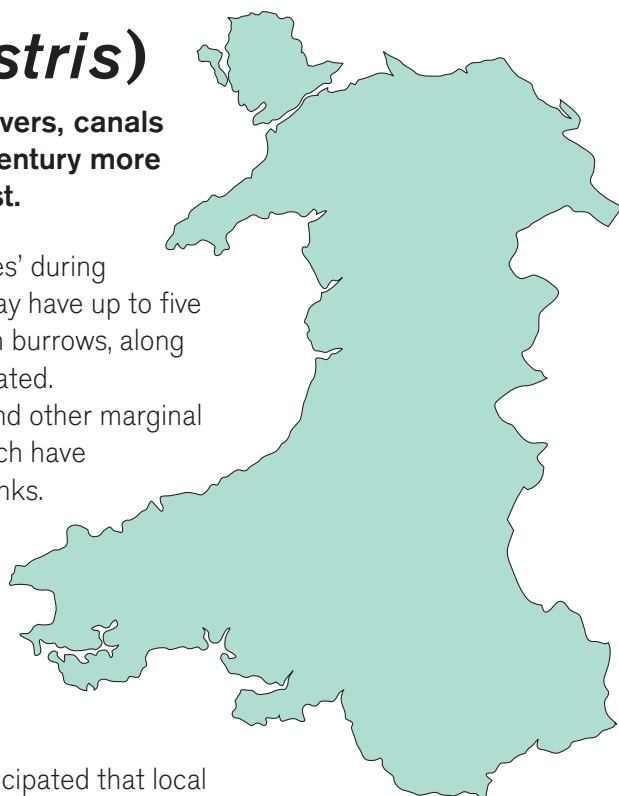


Water vole

Water Vole (*Arvicola terrestris*)

Water voles were once common and widespread along rivers, canals and ponds, but are now in rapid decline. Over the past century more than 95% of the UK's water vole population has been lost.

Water voles are territorial mammals, with established 'home ranges' during the breeding season (between February and November). They may have up to five litters a year of between three and eight young. Water voles live in burrows, along riparian habitat of natural earth banks, which are often well vegetated. They are mainly vegetarian, feeding on grasses, sedges, rushes and other marginal vegetation. Water voles inhabit extensive systems of burrows, which have entrances both above and below the water level, and on top of banks. Burrows are also utilised for food storage, nesting and as boltholes. Although often called 'water rats', they should not be confused with the brown rat.



Current status

Status in the UK and in Wales

While water voles are currently found throughout the UK, it is anticipated that local extinctions will occur within the next ten years if their decline is left unchecked.

Within Wales this decline has been particularly marked: the [Vincent Wildlife Trust](#) recently recorded a decline in occupation of suitable sites of nearly 18% over approximately ten years.

- The water vole is listed under Schedule 5 of the Wildlife and Countryside Act 1981, but currently only in respect of Section 9(4), which protects water vole habitat (i.e. the banks of water features).
- It is included in the list of species of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act.
- The [water vole](#) is a UKBAP Priority Species.

Status on the network

Water voles, while not common in Wales, are not restricted to any particular region. They are likely to be found in many areas where roads run alongside or cross drains, ditches, canals or other water bodies. Water voles are known to occur on the A487 Llanwnda to south of Llanllyfni improvement and on the A55 across Anglesey, where during construction works, special attention was given to the conservation of this species. On the A55, they have colonised a number of balancing ponds.

Species Action Plans

Current factors affecting the species

Decline in habitat area; fragmentation

The construction of new roads can lead to a loss of the bank-side vegetation needed by water voles for feeding and breeding. This loss of suitable habitat, for example, through construction of new roads, can lead to fragmented populations of voles, which may be more susceptible to predation where suitable links to alternative habitats are not maintained.

Decline in habitat quality

Construction of roads can cause river pollution. Research suggests that water pollution is a main factor in the recent rise in disease and mortality of water voles, as voles are sensitive to declines in water quality. Riparian management practices have also contributed to degradation in habitat quality both through the control of riparian vegetation and the loss of riparian boundary strips. The increased prevalence of rodenticide use within the UK has contributed to a decline in water quality for water voles. Surprisingly, water voles have been found in areas of high human activity.

Predation by mink

The decline in vole numbers and changes in habitat has led to an increased vulnerability to local extinction, especially as a result of predation by American mink (*Mustela vison*), which have been spreading and becoming more numerous throughout Britain over the last 50 years. However, any mink control should be carried out as part of an overall co-ordinated approach with other landowners, in combination with the provision or maintenance of good quality habitat.

Current actions

- A recent survey of water vole populations was recently completed by the Vincent Wildlife Trust. The information collated from this survey will allow more informed planning decisions.
- Research is currently underway regarding the relationships between water voles and mink, and on greater understanding of water vole movements and behaviour.
- Detailed mitigation and management guidelines are available in the 'Water Vole Conservation Handbook' (2001).
- Surveys for water voles are regularly carried out for new schemes.

Plan objectives and targets

The objectives of this plan are to avoid any further loss or fragmentation of water vole habitat, to mitigate against any unavoidable impacts; and to reduce the impact of pollution caused by roads on water quality. Specifically, to:

- avoid and reduce all impacts of new road construction or road improvement on water voles unless absolutely necessary;
- improve the quality of surrounding habitat and create new habitats where impacts are unavoidable;
- enhance the habitat in the soft estate where populations of water voles are known to occur on or near new or existing road schemes, and enhance areas potentially suitable for, but not yet occupied by, water voles;
- raise awareness of those involved in planning, construction and maintenance of the network to the significance and fragility of water vole populations; and
- improve the knowledge of the distribution of water voles and the importance of habitat within the soft estate.

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Review with the UK National Highway Authorities the need for an advice note within the DMRB on water voles.	2005
Review and update the WTRMM as necessary to include information on management of the soft estate to promote water vole conservation.	2007
Surveying	
Set up system to monitor water vole populations and suitable habitat in areas of the soft estate known to already have vole populations.	2009
Road design, construction and maintenance	
For all road construction and road improvement schemes, include an initial desk study and water vole survey as identification within the scoping stage of the development may allow impacts to be avoided.	As schemes arise
Offset unavoidable impacts from road development by the provision of new habitats, improvement of existing habitats, positive management actions (for example, provision of fencing, scrub control) and the control of pollution from road runoff.	As schemes arise
Remove the barriers to dispersal of water voles through the provision of purpose-designed drains and water features.	As schemes arise
Provide new water vole habitat, either through habitat creation or changes in management, in suitable locations: two sites/year.	20 sites by 2014
Future research and monitoring	
Monitor water vole populations on or close to the soft estate as part of any mitigation scheme; ascertain the success of any such mitigation measures to inform future actions.	As schemes arise
Communications and publicity	
Provide information on water voles within environmental training provided within the Transport Directorate and by Managing Agents.	2008

Links with other plans

Water voles are included in the UKBAP and the HABAP. LBAPs which were consulted during the development of the TREBAP were: [Anglesey](#); [Brecon Beacons](#); [Bridgend County Borough](#); [Cardiff](#); [Caerphilly County Borough](#); [Carmarthenshire](#); [Conwy](#); [Denbighshire](#); [Flintshire](#); [Gwynedd](#); [Monmouthshire](#); [Neath Port Talbot](#); [Newport](#); [Pembrokeshire](#); [Powys](#); [Rhondda Cynon Taff](#); [Snowdonia National Park](#); [Swansea](#); [Torfaen](#), and [Vale of Glamorgan](#).

TREBAP Action Plans that should also be consulted include: [Rivers and Streams](#) and [Water Bodies](#) Habitat Action Plans; and the Species Action Plans for [Otters](#) and [Aquatic Species](#).

Lead or partner organisation

The Lead Partner organisation for water vole conservation is the [Environment Agency](#).

Species Action Plans



Welsh clearwing moth

Welsh Clearwing Moth (*Synanthedon scoliaeformis*)

This rare species of macro-moth is thought to be restricted to stands of mature birch trees.

This moth lays its eggs in bark crevices or within former emergence holes. Their preferred habitat appears to comprise scattered groups of older birch trees within wet acidic pasture, which are not shaded.

Current status

Status in the UK and in Wales

Assumed extinct in Wales for 100 years, the Welsh clearwing was rediscovered in 1988. Until recently, only three sites were known in Gwynedd (Meirionydd) and Powys (Montgomeryshire). Surveys undertaken in 2002, however, located this species in 37 1-km squares in this area, and it is likely that the species (formerly recorded throughout Wales but now almost certainly restricted to local areas) has been widely overlooked.

It is included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

Status on the network

The Welsh clearwing has recently been recorded in old birch trees alongside the A470 near Dolgellau.

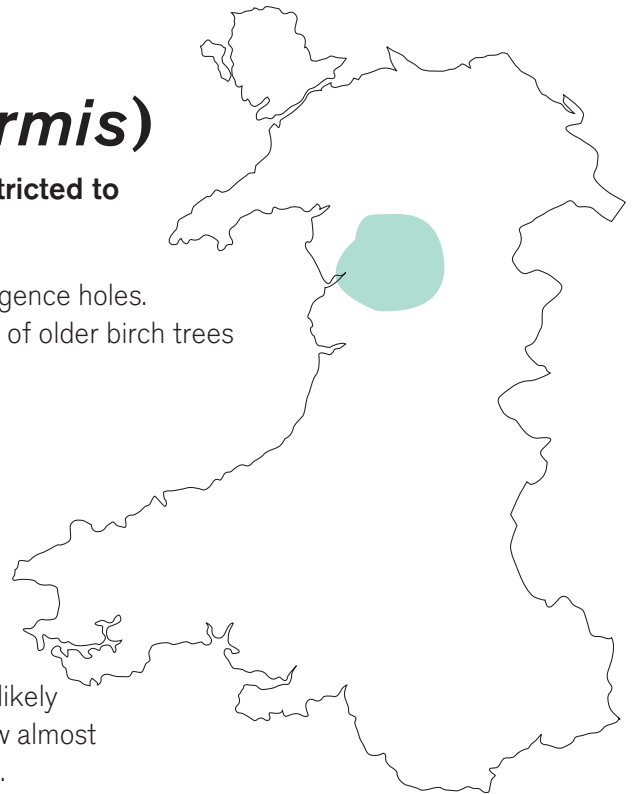
Current factors affecting the species

Loss of habitat

Welsh clearwings rely on birch trees. In some areas, where the stands of trees are all of the same age, this may lead to a loss in the continuity of suitable habitat in future.

Birch trees become mature at 40 years old, and may live until they are 60-80 years old. On the soft estate, older or over-mature trees may be removed for safety reasons.

Over-grazing by sheep may prevent birch regeneration in places: this is less likely to be a problem on the soft estate, where grazing is rarely appropriate.



Current actions

- The three original sites where the moth has been recorded have been subject to regular surveys by the Countryside Council for Wales. A more extensive survey was undertaken in 2002.

Plan objectives and targets

The objective of this Action Plan is to identify suitable stands of mature birch on the soft estate, and ascertain if Welsh clearwing are present.

Proposed actions

ACTION

TARGET

Policy Guidance

Update the WTRMM to include information on management of the soft estate to promote Welsh clearwing conservation in appropriate locations.

2007

Surveying

Identify suitable stands of mature birch on the soft estate, and undertake surveys for Welsh clearwing. Give priority to stands of birch in the locations where Welsh clearwing have been identified in previous surveys.

Ongoing

Road design, construction and maintenance

Ensure the potential presence of Welsh clearwing is considered in advance of birch tree maintenance and construction of new schemes.

Ongoing
As schemes arise

Encourage birch regeneration by using fencing, and plant new birch trees where appropriate.

Ongoing

Links with other plans

The Welsh clearwing is not included within the UKBAP, or within any LBAPs in Wales. It is included within [Butterfly Conservation's National Action Plan for Wales](#) as a High Priority Macro-moth.

TREBAP Action Plans that should also be consulted include [Woodlands](#) and [Planted Native Trees and Shrubs](#).

Lead or partner organisation

This is not a UKBAP species and there is therefore no Lead Partner.

Species Action Plans



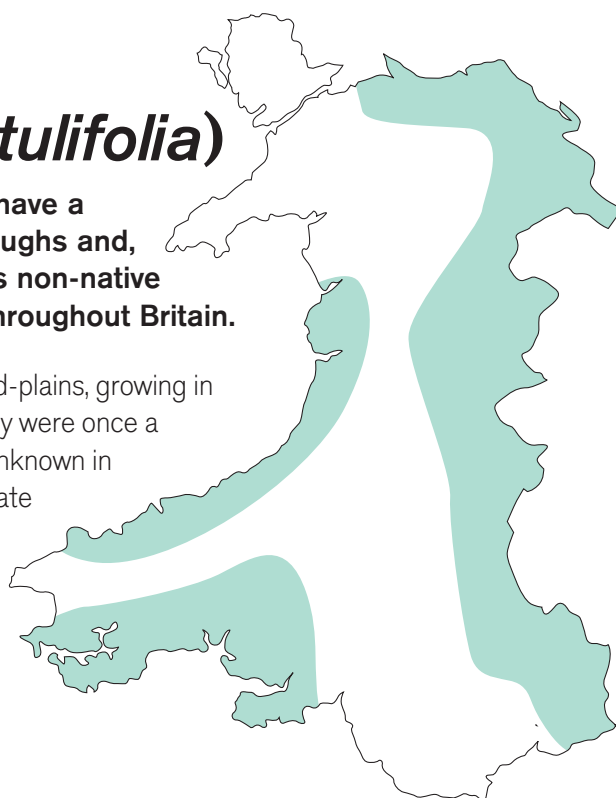
Native black poplar

Native Black Poplar (*Populus nigra* subsp. *betulifolia*)

Mature specimens of this native broad-leaved tree have a broad crown, a burred trunk and large sweeping boughs and, as such, should not be confused with the numerous non-native fast-growing hybrids which are frequently planted throughout Britain.

Native black poplars are largely restricted to lowland river flood-plains, growing in damp soils by watercourses, ponds and within hedgerows. They were once a tree of winter-flooded riverine woods. This habitat is virtually unknown in Britain today, but it is considered to be impossible to differentiate between trees that represent the remnants of this woodland habitat and those that have been planted long ago.

The distinctive appearance of this tree means that it was often planted as a landmark/boundary tree, typically in low-lying, and often flooded, grazing land.



Current status

Status in the UK and in Wales

Native black poplar trees have been recorded within most counties in England and Wales (this species has not been recorded in Scotland). Current population estimates are set between two and three thousand trees (this figure may be higher as this species is often overlooked or wrongly identified as a hybrid black poplar). It is thought that the majority of the surviving specimen trees were propagated as cuttings taken from just six hundred individuals.

In Wales, this tree is more common in the counties on the English border, but it has also been recorded close to the coast in Pembrokeshire, Cardiganshire, Carmarthenshire, Gwynedd and Conwy.

UKBAP Priority Habitats of particular importance to these trees are: ancient and/or species-rich hedgerows, coastal and floodplain grazing marsh, eutrophic standing water and lowland meadows.

Status on the network

Native black-poplar trees are known to occur on the soft estate on the A5 in the Dee Valley.

Current factors affecting the species

Inability to regenerate naturally

In order to regenerate successfully from seedlings, this plant requires the presence of both male and female trees in close proximity, and a suitable damp mud substrate available in June. The majority of trees are male, as many female trees were felled in the past because the white down that surrounds the seeds was considered to be a nuisance. Consequently, drainage of farmland and the rarity of female trees has virtually eliminated it as a naturally regenerating species.

The Forestry Commission and other organisations have taken cuttings from native stock in order to propagate this species, ready for replanting near their known source. This is the most commonly used method of propagation.

Loss of habitat through land-take, pollution or fragmentation

The habitats that native black-poplar trees depend on have been lost through hydrological changes associated with agriculture, development and road schemes.

Current actions

- The Forestry Commission, along with a number of local authorities, are propagating trees of known provenance for use in planting schemes.
- Regional groups have been set up in various localities to preserve, maintain and promote trees in their own region.
- Mature poplars are described in a central database held by the Centre for Ecology and Hydrology at Monkswood in Cambridge.

Plan objectives and targets

The objectives of this Action Plan are to:

- identify the individual trees on the soft estate; and
- maintain these trees in a safe and healthy condition.

Species Action Plans

Proposed actions

ACTION	TARGET
Surveying	
Identify any existing black-poplar trees on the soft-estate.	2007
Monitor the condition of the native black-poplar trees on the soft estate.	Every 5 years/ 2008 and 2013
Road design, construction and maintenance	
Identify new opportunities for including native black-poplar trees in any new planting schemes. Plant in ten sites by 2014.	10 sites by 2014
For all new road schemes and road improvements, avoid any direct impacts on native black-poplar trees, particularly female trees. Where this is unavoidable, plant new trees of local provenance in appropriate locations.	As schemes arise
Undertake any tree surgery necessary to maintain any mature trees in a safe condition so they can be retained.	As necessary
Future research and monitoring	
Consider DNA testing the trees on the soft estate and adjacent land to compare results with similar studies undertaken in the Upper Severn.	—

Links with other plans

Only one LBAP was consulted during the development of the TREBAP ([Flintshire](#)). TREBAP Action Plans that should also be consulted include the Habitat plans for [Woodlands and Planted Native Trees and Shrubs](#), [Rivers and Streams](#), [Water Bodies](#), [Boundary Features](#) and [Lowland Meadows](#), and the Species Action Plan for [Bats](#).

Lead or partner organisation

This is not a UKBAP species and there is therefore no Lead Partner.



Native Bluebell

Bluebell (*Hyacinthoides non-scripta*)

Bluebells are a characteristic visual feature of broadleaved woodlands in the UK in the spring.

In addition to woodland, bluebells also occur on bracken-covered slopes, and along ancient and/or species-rich hedgerows. In Caerphilly, bluebells are also found on colliery spoil, shaded beneath bracken and on heathland. In south-west Wales, these plants are also found in abundance within coastal grassland on cliff tops, road verges and small islands. In some parts of North Wales, areas of bluebells occur on hillsides as “ghosts” of woodlands which have been cleared.

Current status

Status in the UK and in Wales

The moist oceanic climate of the UK provides ideal conditions for bluebells. The UK has between 25-49% of the global bluebell population. The bluebell is found throughout Wales and is locally abundant in deciduous woodlands, and ancient or species-rich hedgerows.

- The bluebell is listed by the UK Biodiversity Steering Group as a Species of Conservation Concern.
- The bluebell is afforded protection under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) in respect of sale only.

Status on the network

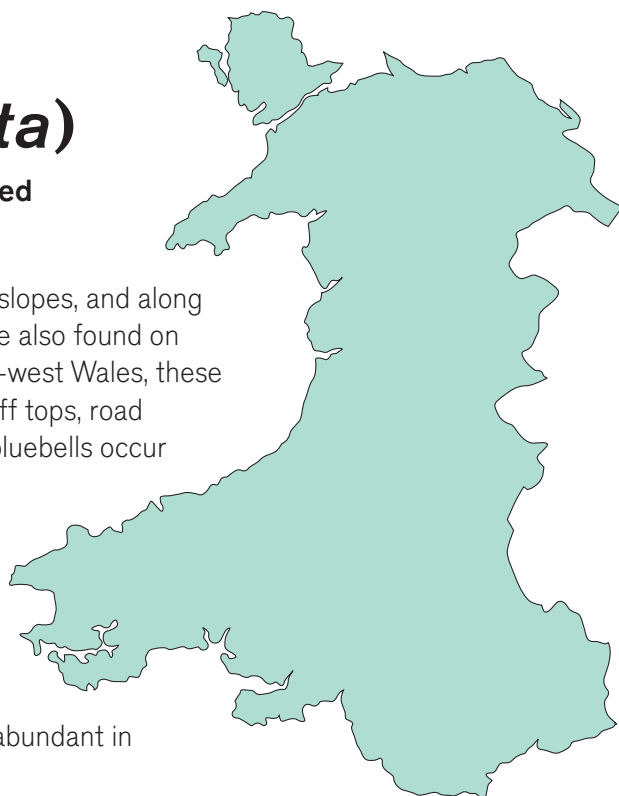
The majority of the woodlands within the soft estate originate from recent planting schemes and are not necessarily suitable for bluebells. However, where the network is next to upland oak or mixed ash woodlands, it is likely that bluebells will be encountered within the soft estate.

Where both lanes of trunk roads have been widened, and ancient and/ or species-rich hedgerows have been removed, bluebells are likely to have been lost. If only one side of the road has had to be removed or changed, bluebells may survive. Bluebells are commonly found on verges on bracken-covered banks.

Current factors affecting the species

Habitat loss

Although apparently abundant in some locations, the bluebell is in decline, due to habitat loss (particularly of woodland and mature hedge-banks). The construction of new roads and improvement schemes can lead to the loss of woodland habitat and mature hedgerows containing bluebells.



Species Action Plans

Management

A decline in traditional management of woodlands can lead to the 'shading out' of bluebells. Other factors include bluebells being removed for sale and the planting of Spanish bluebells, resulting in the cross-pollination and hybridisation of our native species.

Current actions

Many ancient woodland sites which contain bluebells are designated as SSSIs or have non-statutory designations.

Plan objective and targets

The objective of this Action Plan is to conserve and enhance the existing population of bluebells along the soft estate through positive woodland and hedgerow management.

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Review the WTRMM, and provide detailed information on the appropriate management of woodland ground flora and hedgerows containing bluebells.	2007
Review with other UK National Highway Authorities advice for inclusion in the DMRB on the enhancement of existing planted areas, including bulbs.	2004
Road design, construction and maintenance	
At the design stage for new road and improvement schemes, ensure that valuable woodlands and ancient hedgerows with bluebells are taken into consideration. Avoid the direct loss of this habitat wherever possible.	As schemes arise
Sympathetically manage woodland sites and ancient hedgerows, and other locations which contain bluebells that are within the soft estate.	Ongoing
Consider the retention, storage and relocation of bulbs and topsoil, wherever road schemes affect areas of native bluebells.	As schemes arise
Plant forty new bluebell sites within the soft estate by 2014. Ensure that locally native bulbs are used and not non-native species such as Spanish bluebell.	40 sites by 2014
Communications and publicity	
Raise awareness within the Transport Directorate and Trunk Road Agents of the protection and appropriate management of bluebells.	Ongoing
Increase public awareness of the value of bluebells in road verges.	Ongoing & 2006

Links with other plans

Bluebells are also associated with UK BAP Priority Habitats as follows: Upland oak woodland; Lowland wood pasture and parkland; and Ancient and/or species-rich hedgerows. LBAPs which were consulted during the development of the TREBAP were: [Caerphilly](#); [Gwynedd](#) and [Rhondda Cynon Taff](#).

TREBAP Action Plans that should also be consulted include [Boundary Features](#) and [Woodlands and Planted Native Trees and Shrubs](#) Habitat Action Plans.

Lead or partner organisations

This is not a UKBAP species and there is therefore no Lead Partner.



Deptford pink

Deptford Pink (*Dianthus armeria*)

The Deptford pink is a plant associated with dry pastures, disturbed ground, field borders, hedgerows and road verges.

It generally requires light, sandy soil of a relatively high pH, (that is, alkaline) and open conditions, although once established, it may be able to compete with taller vegetation. It has sometimes been found on slightly acidic soils.

Current status

Status in the UK and in Wales

Although Deptford pink is not threatened in Europe, there has been a severe decline in the UK over the last 60 years.

- Deptford pink is listed as a [Priority Species](#) in the UKBAP, and is classified as 'Vulnerable'.
- Deptford pink is protected under Section 8 of the Wildlife and Countryside Act 1981 (as amended).
- Deptford pink included in the list of species of principal importance for Welsh Biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

There are only four post-1970 records in Wales, located in Conwy, Flintshire, Swansea and Neath Port Talbot.

Status on the network

Although Deptford pink is currently present alongside the 'Triangular Pond' (Baglan Reservoir) adjacent to the M4 in Neath Port Talbot, there are no known records for this species in the trunk road soft estate. The Highways Agency has recorded populations on its roads in Herefordshire and Worcestershire.

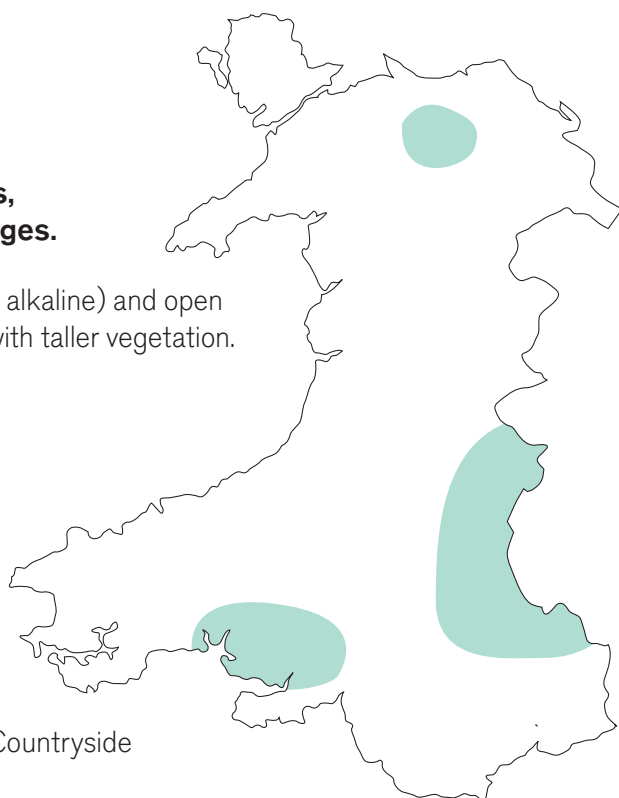
Current factors affecting the species

Habitat loss and fragmentation

Road construction and improvements may impact Deptford pink by direct loss of both the species itself and its habitat, for example through destruction of pasture and hedgerows and the widening of road verges.

Inappropriate management of habitat

Inappropriate cutting regimes, cessation of grazing on common land verges, or general lack of management could be detrimental to this species by allowing successional changes such as the development of a tall dense vegetation structure which is not favourable to the Deptford pink.



Species Action Plans

Current Action

- The site adjacent to the pond in Neath Port Talbot has been protected from development. Contractors working in the area are aware of the location and importance of the species.
- Plantlife are working with the Countryside Council for Wales on a joint initiative to promote the importance of the Deptford pink.

Plan objectives and targets

The objective of this action plan is to survey areas of the network that are close to known colonies of Deptford pink and, where found, to implement appropriate mitigation for new schemes and management to maintain and encourage new populations of the Deptford pink on the network. Specifically to:

- avoid impacts of new road developments or improvements on the Deptford pink and its habitat;
- survey potential Deptford pink sites on the network, particularly before road construction or improvement is to take place;
- where unavoidable impacts on the Deptford pink and its habitat are to take place, ensure adequate mitigation is in place; and
- where found, consider appropriate management to conserve and enhance the colonies.

Proposed actions

ACTION	TARGET
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Policy, guidance and advice

Provide guidance on the management of roadside verges for the benefit of the Deptford pink if populations are found.	2006
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Surveying

Survey areas of the network which may be suitable.	Ongoing
Set up system for reporting of potential areas of suitable habitat.	2008

Road design, construction and maintenance

Where colonies are found on the soft estate, avoid impacting the species through road construction.	As schemes arise
Where impacts on the species cannot be avoided provide appropriate mitigation and consider habitat recreation/translocation.	As schemes arise
Manage network verges to be favourable to Deptford pink in existing and potential areas of colonisation close to known sites.	As necessary

Future research and monitoring

Monitor known existing colonies of Deptford pink on the soft estate.	If relevant
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Links with other plans

LBAPs which were consulted during the development of the TREBAP were: [Carmarthenshire](#); [Flintshire](#); [Monmouthshire](#); [Neath Port Talbot and Rhondda Cynon Taff](#). TREBAP Action Plans that should also be consulted include [Calcareous Grassland](#), [Lowland Dry Acid Grassland](#) and [Boundary Features](#).

The Deptford pink is also a [Highways Agency](#) BAP species.

Lead or partner organisations

The Lead Partner for this species is identified in the UKBAP as [Plantlife](#).



Limestone woundwort

Limestone Woundwort (*Stachys alpina*)

This plant is generally associated with open woodlands, glades, woodland borders and hedgebanks, preferring sunny and sheltered sites on thin calcareous soils.

A perennial herb, growing up to a metre tall, its seeds are adapted to long periods of dormancy, so that plants are known to appear after long absences from historical sites following disturbance or clearance of scrub or woodland.

Current status

Status in the UK and in Wales

Although the species is not threatened in Europe, it is endangered in the UK and recent records indicate that the species only survives in three populations in Gloucestershire and North Wales. In Wales, the natural populations in Denbighshire seem to be in slow decline, though with some recruitment. It is not clear if the Gloucestershire population still survives. There is some debate as to whether the limestone woundwort really is a native plant, or in fact has become naturalised after its introduction as a garden plant.

- Protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- Listed in the British Red Data Book as 'endangered'.

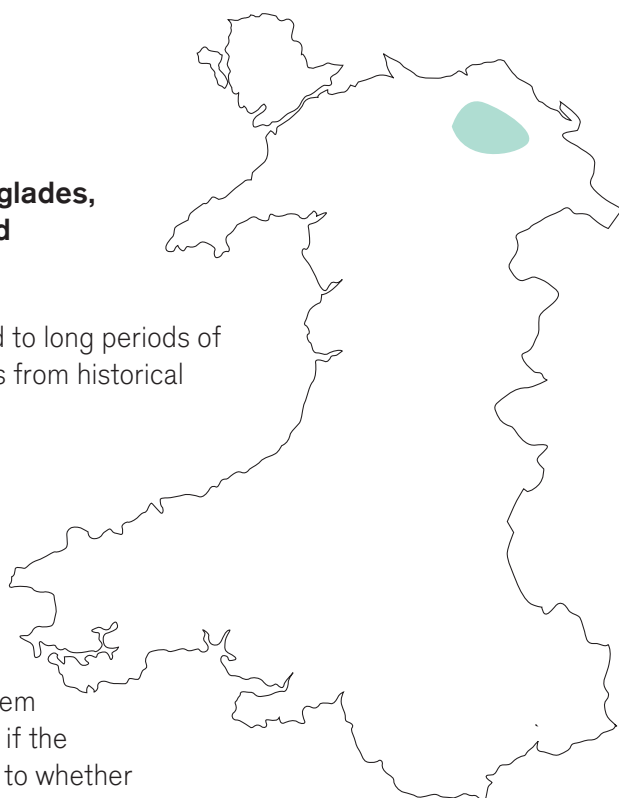
Status on the network

There are a small number of plants alongside the A5 at Glyn Bends. These are the remnants of a reintroduced population.

Current factors affecting the species

Inappropriate management

Existing colonies could be lost through cessation of management, which may allow other species to dominate light and space, or by inadvertent damage through untargeted herbicide, or cutting at the wrong time of year.



Species Action Plans

Habitat loss and fragmentation

Where road construction or improvement may affect open woodland and ancient or species-rich hedgerows, there is a possibility that limestone woundwort will also be affected. Although some disturbance may trigger germination of dormant seeds, it is also possible that existing colonies could be destroyed: for example one of the sites in Denbighshire was thought to have been lost due to road widening.

Current actions

- Ness Botanic Gardens hold a seed bank for limestone woundwort.
- The Transport Directorate, together with Forest Enterprise and Countryside Council for Wales, have surveyed the A5 site, and are investigating potential management and enhancement opportunities.
- An action plan for this species has been prepared by the Countryside Council for Wales.

Plan objectives and targets

The objectives of this Action Plan are to: safeguard limestone woundwort on the network; and explore opportunities for reintroduction onto the soft estate.

Proposed actions

ACTION	TARGET
Road design, construction and maintenance	
In areas close to known populations, survey suitable habitat for limestone woundwort before any road construction or improvement takes place.	As schemes arise
Where conditions are appropriate, consider introduction schemes onto the soft estate.	2004 and as schemes arise
All parties (the Directorate and the North-East Wales Trunk Road Agency/Forest Enterprise) to liaise with current interested parties (CCW; Ness Botanic Gardens; and Gloucestershire Wildlife Trust) to obtain advice on management, propagation and reintroduction. Apply results of liaison to existing population.	Ongoing
Future research and monitoring	
Monitor all existing (and future) colonies on the network.	Biennially

Links with other plans

TREBAP Action Plans that should also be consulted include [Boundary Features](#), [Calcareous Grassland](#) and [Woodlands and Planted Native Trees and Shrubs](#).

Lead or partner organisation

This is not a UKBAP species and there is therefore no Lead Partner.



Bee orchids

Orchids (*Orchidaceae*)

Members of the family Orchidaceae are defined as perennial herbs with rhizomes or tuberous roots with stems that are swollen at the base.

The majority of British species have microrhizal fungal associations. Hybrids within the family frequently occur, particularly within the genus / 'tribe' *Dactylorhiza*: twenty-three different 'tribes' occur in Britain.

Orchids are associated with long-standing habitats such as ancient woodlands and old meadows as well as soils on road-sides and brown-field sites that have recently undergone some degree of disturbance. With the notable exception of purely aquatic habitats, most UKBAP Priority Habitats have the potential to support orchids: those that are most relevant to roads are grassland, heathland and woodland habitats.

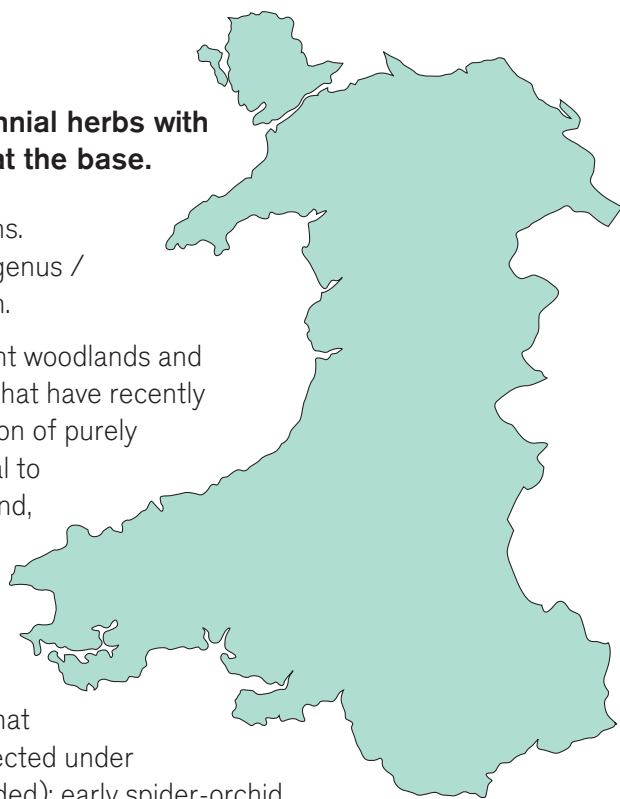
Current status

Status in the UK and in Wales

- This large group of plants includes two extremely rare species that are considered to be endangered and therefore are legally protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended): early spider-orchid (*Ophrys sphegodes*) and fen orchid (*Liparis loeselii*). Only the fen orchid occurs in Wales, but is not known to occur on the network. [Fen orchid](#) is also a UKBAP species, and is listed under Annex II and IV of the EC 'Habitats' Directive 1992, and Schedule 4 of the Conservation (Natural Habitats, etc.) Regulations 1994.
- The group also includes rare species that are considered to be nationally scarce such as dark-red helleborine (*Epipactis atrorubens*).
- A number of other orchid species are listed in LBAPs in Wales: these include green-winged orchid (*Orchis morio*), pyramidal orchid (*Anacamptis pyramidalis*); frog orchid (*Coeloglossum viride*); and heath spotted-orchid (*Dactylorhiza maculata*).

Status on the network

A number of the more common orchid species have been recorded on road-verges and roundabouts on the network including: common spotted-orchid (*Dactylorhiza fuchsii*); southern marsh-orchid (*Dactylorhiza praetermissa*); northern marsh orchid (*Dactylorhiza purpurella*); bee orchid (*Ophrys apifera*); common twayblade (*Listera cordata*); and pyramidal orchid (*Anacamptis pyramidalis*). Routes involved include M4, A4042, A470 and A55.



Species Action Plans



Orchids on the A55 roadside

Current factors affecting the species

Loss of habitat through land-take, pollution or fragmentation

The loss of semi-natural habitats and the general decline in plant species diversity that has occurred in the wider countryside has affected the number and distribution of orchid species, throughout the UK including Wales. Although much of this habitat loss results from changes in farming practices, a small proportion results from development proposals including road scheme.

Spray drift, both from adjacent agricultural land (herbicides and pesticides) and from the carriageway (from salt applied in poor weather conditions), are also a factor in habitat deterioration, leading to the loss of more vulnerable plant species including orchids.

The habitats that are more likely to support large numbers of orchid species tend to be nutrient-poor, and any increase in soil nutrient levels (for example, through farming practices on adjacent land) will also be detrimental to any orchids within road verges.

Inappropriate management

Grazing (or mowing) is necessary to ensure that orchids are able to flower and set seed, and to ensure that the more vigorous grasses and shrubs do not out-compete them. Thus, under-grazing and over-grazing, or an inappropriate cutting regime, will lead to a decrease in species diversity, and eventually a change in the structure of the habitat, leading to the loss of orchids from a grassland.

Alien species and agricultural weeds may out-compete orchids; similarly, measures taken to control these undesirable species may also be detrimental to orchids.

Inappropriate planting schemes can have a detrimental affect on grassland and heathland habitats that have the potential to support orchids. This can include the addition of trees and shrubs, the incorporation of decorative species such as daffodils, or the use of non-native or inappropriate seed mixes.

Current actions

- The fen orchid is known to occur in two National Nature Reserves in Wales, and the Countryside Council for Wales has set up a working group to protect and study this species. It is included in three LBAPs in Wales (Carmarthenshire, Bridgend and Neath Port Talbot). Surveys of current and historical fen orchid sites have been carried out in Carmarthenshire.
- Heath spotted-orchid is included in the Rhondda Cynon Taff LBAP as an indicator species of good quality acid grassland, heath or rhos (rush) pasture.

- The green winged-orchid is also included in the Rhondda Cynon Taff LBAP and it is proposed to undertake hay meadow surveys for this species during the flowering period. They also propose to use a cemetery which supports this species as a seed source for road verges, landscape planting and school nature reserves in the County Borough.
- Management to remove scrub from orchid sites is being undertaken on the A55.

Plan objectives and targets

The objectives of this Action Plan are to:

- avoid the loss of sites that support orchids during road construction and widening schemes;
- undertake management operations at the most appropriate time of year, and to avoid those which conflict with the flowering and seed production periods of the orchid's lifecycle; and
- identify opportunities for habitat enhancement during design, construction and maintenance.

Proposed actions

ACTION

TARGET

Policy, guidance and advice

Review existing recommendations within WTRMM for management of habitats that currently have orchids or could support them.

2007

Surveying

Identify areas that support orchids through a combination of field survey and desk study.

Ongoing

Road design, construction and maintenance

Ensure that any areas of the soft estate that are known to support orchids are managed to benefit these plants; this includes, for example, cutting areas of grassland at appropriate times of year and removing arisings. Avoid the use of herbicides to control alien and invasive weed species.

Ongoing

For all new road schemes and road improvements, seek to avoid any direct impacts on orchid-rich habitats. Ensure ornamental/landscape planting does not encroach onto orchid-rich areas.

As schemes arise

Species Action Plans

Create or restore new orchid-rich areas, either using seed of local provenance in appropriate locations, or through restoration management at ten sites.	10 sites by 2014
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Avoid introducing, as part of maintenance operations, inappropriate species (trees, shrubs and seed mixes) in areas that support or have the potential to support orchids.	Ongoing
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Future research and monitoring

Set up a system to review the success of management of areas to benefit orchids.	2007
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Communications and publicity

Develop training materials on best management practice for orchids.	2008
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Raise public awareness of the conservation value of habitats containing orchids.	2006
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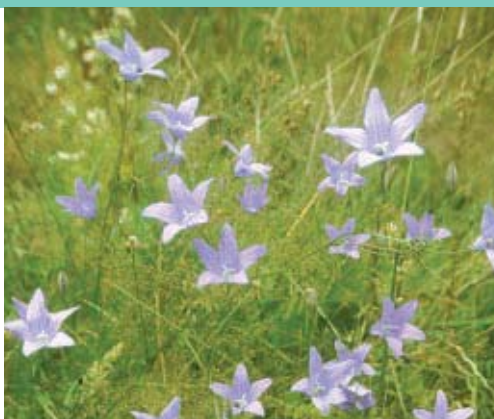
Links with other plans

LBAPs which were consulted during the development of the TREBAP were: [Bridgend, Caerphilly Carmarthenshire, Neath Port Talbot, Pembrokeshire and Rhondda Cynon Taff](#).

TREBAP Action Plans that should also be consulted include: [Heathland](#); [Coastal and Estuarine](#); [Woodlands and Planted Native Trees and Shrubs](#); [Rivers and Streams](#); [Water Bodies](#); [Boundary Features](#); [Calcareous Grassland](#); [Lowland Dry Acid Grassland](#); [Lowland Meadows](#); and [Purple Moor-Grass and Rush Pastures](#).

Lead or partner organisation

The Lead Partners for these species are identified in the UKBAP as [English Nature](#), the [Wildlife Trusts](#), the Cypridium Committee, and the [Royal Botanic Gardens, Kew](#).



Spreading bellflower

Spreading bellflower (*Campanula patula*)

The spreading bellflower is a perennial plant associated with open woodland, woodland edge habitats, field borders, hedgerows and road verges.

It prefers dry, well drained, sunny sites on relatively infertile sandy or gravel-based soils. Its decline is possibly connected with the reduction in disturbance to woodland sites, and the increased use of herbicides on road verges and railways. Its seeds need disturbed soil, but can survive dormant for long periods, so the plant can reappear after a long absence.

Current status

Status in the UK and in Wales

Although spreading bellflower is not threatened in Europe, it has undergone a steady decline in the UK. It is not a protected species under the Wildlife and Countryside Act 1981 (as amended) or included in the UKBAP, but is included in the list of species of principal importance for Welsh biodiversity under Section 74 of the Countryside and Rights of Way Act 2000.

The main populations for this species are Powys (Brecknockshire, Radnorshire and Montgomeryshire) and Monmouthshire in Wales; and in Shropshire, Herefordshire and Worcestershire in England, with smaller populations in Leicestershire and across southern England. A non-native naturalised garden escape of this species is recorded from parts of England and historically in Gwynedd.

Status on the network

There are no known records for this species on the trunk road network, but the species has been found on roadside verges elsewhere in Wales.

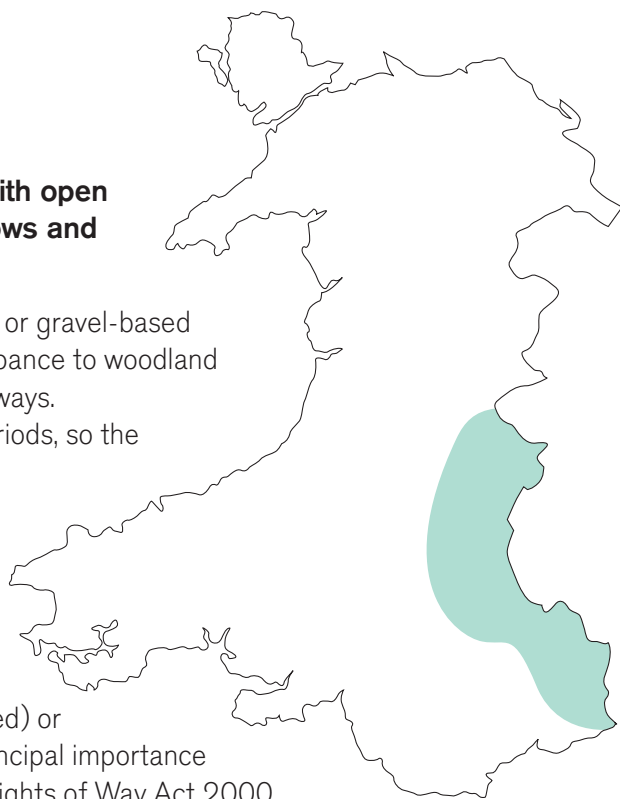
Current factors affecting the species

Habitat loss and fragmentation

Road construction and improvements may impact on the spreading bellflower by direct loss of both the species itself and its habitat, for example, through destruction of woodland and hedgerows and the widening of road verges.

Inappropriate management of habitat

Inappropriate cutting regimes, cessation of grazing on common land verges or general lack of management could be detrimental to this species by allowing successional changes which are not favourable to the spreading bellflower.



Species Action Plans

Current actions

- Plantlife have recently (2003) revisited previously known locations for this species.

Plan objectives and targets

The objective of this action plan is to survey areas of the network that are close to known colonies of spreading bellflower and, if found, to implement appropriate management to maintain and encourage new populations of the spreading bellflower on the network. In addition, to:

- survey potential spreading bellflower sites on the network, particularly before road construction or improvement is to take place;
- avoid impacts of new road developments or improvements on the spreading bellflower and its habitat;
- where unavoidable impacts on the spreading bellflower and its habitat are to take place, ensure adequate mitigation is in place; and
- where present, consider appropriate management to conserve and enhance the species.

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Provide guidance on the management of roadside verges for the benefit of the spreading bellflower, if populations are found.	2006
Surveying	
Survey areas of the network which may be suitable.	2006/2008
Set up system for reporting of potential areas of suitable habitat.	2008
Road design, construction and maintenance	
Where colonies are found on the soft estate, avoid impacting the species through road construction.	As schemes arise
Where impacts on the species cannot be avoided, provide appropriate mitigation and consider habitat recreation/translocation as a last resort.	As schemes arise
Manage network verges to be favourable to spreading bellflower, in existing and potential areas of colonisation close to known sites.	As necessary
Future research and monitoring	
Monitor known existing colonies of spreading bellflower on the soft estate.	If relevant

Links with other plans

No LBAPs had actions for spreading bellflower. TREBAP Action Plans that should also be consulted include [Calcareous Grassland](#), [Lowland Dry Acid Grassland](#) and [Boundary Features](#).

Lead or partner organisations

There is no Lead Organisation for this species, as the species is not a Priority Species in the UKBAP.



Wood bitter-vetch

Wood Bitter-vetch (*Vicia orobus*)

Wood bitter-vetch is a species characteristic of well-drained, species-rich, old grassland in fertile, alkaline soils. Intolerant of grazing and scrub competition, it exists mainly on banks and amongst boulders and thorny bushes, which offer it protection from grazing stock.

It has also become prevalent on the grassy verges of roads and tracks where an absence of grazing and occasional scrub control provides it with ideal conditions. It is primarily an upland species, but is also found at sea level.

Current status

Status in the UK and in Wales

The wood bitter-vetch is considered to be 'not scarce' within the UK, meaning that it has been counted in more than one hundred 10km squares in the UK since the 1970s. It has declined markedly in Britain and Ireland since about 1900, and is considered rare, except in Wales and Western Scotland which are now two of the only remaining strongholds in Europe.

- It is included within the [Lowland Meadows](#) UK Habitat Action Plan.
- Wood bitter-vetch has no special statutory protection at present; however, a substantial number of its known sites have been designated as SSSIs.

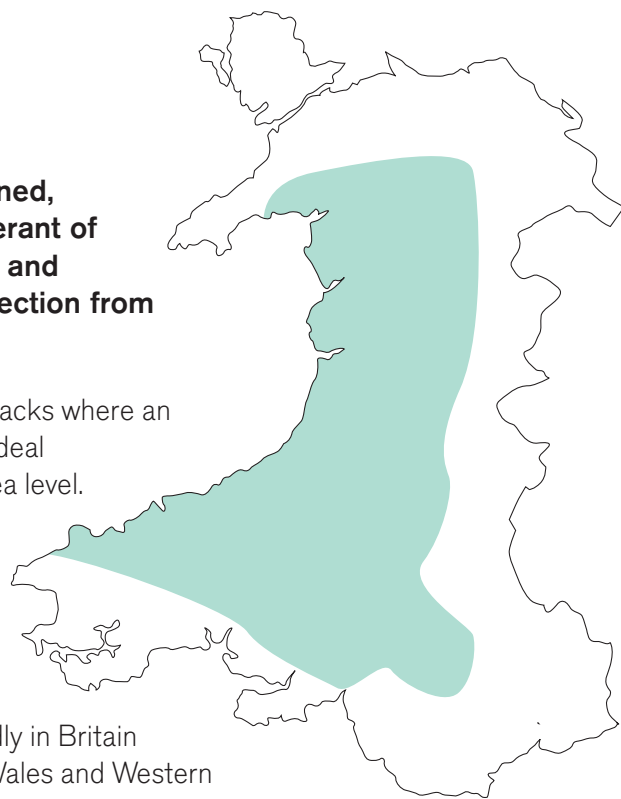
Status on the network

Given the ungrazed, scrub-free nature of road verges, and this species' preference for this type of habitat, it is likely to be found in suitable habitats throughout the soft estate. It is currently known to occur on the A470 and A44.

Current factors affecting the species

Loss of habitat

The ploughing and reseeded of ancient grasslands, and the abandonment of traditional hay meadow management techniques, has led to a loss of suitable habitat.



Species Action Plans

Inappropriate management

The use of herbicides and the inappropriate management of hedgebanks (for example, over-frequent strimming or mowing) in upland areas has led to a decline in the species' former range.

Pollution from roads

Road runoff can render the soil of the soft estate unsuitable for the wood bitter-vetch.

Current actions

- None

Plan objectives and targets

The objectives of this Action Plan are to raise awareness of the wood bitter-vetch, and to ensure that the soft estate is managed in a manner that is conducive to its conservation. Specifically, to:

- survey, monitor and maintain all known populations within the soft estate; and
- in consultation with the Countryside Council for Wales, consider the establishment of populations of seed-grown plants on suitable areas within the soft estate.

Proposed actions

ACTION	TARGET
Policy, guidance and advice	
Publish advice on management of areas on the soft estate known to contain wood bitter-vetch in WTRMM.	By 2007
Road design, construction and maintenance	
If new road construction or road improvements impact areas of grassland containing wood bitter-vetch, ensure that road verges are subsequently planted with a suitable species mix, including wood bitter-vetch. Consider translocation as a last resort.	As schemes arise
Manage of highway verges in a manner that controls scrub development and promotes this species' growth.	Ongoing
Future research and monitoring	
Monitor the success of seeding areas with wood bitter-vetch to ascertain the factors necessary for successful growth on the soft estate.	As schemes arise
Communications and publicity	
Include details on appropriate landscape management for the conservation of wood bitter-vetch within the training of Managing Agents and Transport Directorate staff.	Ongoing

Links with other plans

Wood bitter-vetch is incorporated within the UKBAP Lowland Meadows Habitat Action Plan.

LBAPs which were consulted during the development of the TREBAP were: [Neath Port Talbot and Powys](#).

TREBAP Action Plans that should also be consulted include [Lowland Meadows](#) and [Purple Moor-Grass & Rush Pastures](#).

Lead or partner organisation

This is not a UKBAP species and there is therefore no Lead Partner.

10 Glossary

This Glossary provides an explanation of terms, and roles of some of the organisations referred to in the main text; and also web-based links to organisations mentioned in the text of the action plans where websites are available.

Abbreviation	Glossary entry	Description & Web-link (where appropriate)
	Adobe Acrobat Reader	The computer software programme which can be used to read the Adobe Acrobat versions of the TREBAP. http://www.adobe.co.uk/products/acrobat
	Barn Owl Trust	http://www.barnowltrust.org.uk
BCT	Bat Conservation Trust	http://www.bats.org.uk
	Biodiversity	The variety of life on earth. This includes the abundance and variety of habitats and species, and the processes needed to sustain them.
	British Herpetological Society	http://www.thebhs.org
BTO	British Trust for Ornithology	http://www.bto.org
	British Waterways Board	http://www.britishwaterways.co.uk
	Butterfly Conservation	http://www.butterfly-conservation.org http://www.butterfly-conservation.org/bcuk/wales/
CEH	Centre for Ecology and Hydrology	http://www.ceh.ac.uk
	Coed Cadw	http://www.coed-cadw.org.uk
	Conwy Tunnel Group	http://www.traffic-wales.com http://www.nwales-traffic.co.uk
CCW	Countryside Council for Wales	Statutory advisors on wildlife and landscape issues in Wales. http://www.ccw.gov.uk

Glossary

DEFRA	Department of the Environment, Food & Rural Affairs	In relation to biodiversity, the equivalent of the Countryside Division of the Assembly Government for England. It is also responsible for a number of other issues. http://www.defra.gov.uk
EAP/EMP	Environment Action Plans/ Environment Management Plans	EAPs are prepared for major schemes from the time of a Public Inquiry to record environmental commitments. These plans are taken forward to the construction stage and are updated throughout construction. EMPs are prepared to direct the environmental management of the scheme, after construction and construction-related maintenance has finished. They are developed from the construction version of the EAP.
	Environmental Co-ordinator	A person appointed during new scheme development to co-ordinate the environmental aspects of the design process.
	Environmental Site Co-ordinator or Clerk of Works	A person appointed to oversee the environmental aspects of the construction process.
	Echolocation	A technique based on using sound by some species (e.g. bats) to navigate, catch prey and communicate between themselves.
EN	English Nature	The equivalent organisation to CCW covering wildlife issues in England. http://www.english-nature.org.uk
EA	Environment Agency Wales	The part of the Environment Agency dealing with water-, air- and soil-related issues in Wales. http://www.environment-agency.gov.uk/regions/wales
	European Union Life in UK rivers project	A project funded by the European Union to research the requirements of habitats and species covered by the EC Habitats Directive in the UK. http://www.english-nature.org.uk/LIFEinUKRivers/index.html
FE	Forest Enterprise	http://www.forestry.gov.uk
	Forestry Commission Wales	http://www.forestry.gov.uk
	Fragmentation	An effect of roads, or other development, where habitats are split into smaller areas, and the roads act as a barrier to the species that live in them. Fragmentation may, in some cases, result in habitats not being able to sustain their biodiversity value.

	Froglife	http://www.froglife.org
GAP	Generic Action Plan	An action plan covering subjects not specifically related to a particular habitat or species.
HAP	Habitat Action Plan	An action plan which has information and then a set of action each with a target date for a particular habitat or group of habitats.
	Hawk and Owl Trust	http://www.hawkandowl.org/
HCT	Herpetological Conservation Trust	http://www.hcontrst.f9.co.uk/
HA	Highways Agency	The equivalent of the Transport Directorate of Wales; responsible for the motorway and trunk road network in England. http://www.highways.gov.uk
	Insectivorous	A description of a species which depends entirely, or for part of its diet on insects (e.g. bats)
	Kew Gardens	http://www.rbgekew.org.uk
	Lead Partner	An organisation that is responsible for overseeing and reporting on actions for a particular habitat or species from the UKBAP.
LBAP	Local Biodiversity Action Plan	A plan which usually covers a Local Authority or National Park area prepared by a Partnership of organisations. The Plan provides information about biodiversity in that area, and usually includes action plans for selected habitats and species. http://www.ukbap.org.uk/
LBRC	Local Biological Record Centres	An organisation which collects, holds and processes biodiversity records for a specific area.
	Living Highways Project	A project run by Brecknock Wildlife Trust and Powys County Council to identify and manage road verge nature reserves in Powys.
LNR	Local Nature Reserve	Sites of local wildlife importance designated under the National Parks and Access to the Countryside Act 1949 by Local Authorities.
	Local Provenance	Plants or seeds from a source local to the site where they are to be used.
	Metapopulations	A group of colonies or smaller populations of a species which interact with each other, even though they are separated physically.

	National Assembly for Wales	http://www.wales.gov.uk/index.htm
NNR	National Nature Reserve	Sites of national importance, which are very good examples of that habitat designated under the Wildlife and Countryside Act 1981.
NRA	National Rivers Authority	See Environment Agency
	Natura 2000	A Europe-wide network of protected sites, set up through the Habitats Directive, comprising SACs and SPAs (see below).
	Plantlife	http://www.plantlife.org.uk
	Priority habitat	A habitat for which a costed Action Plan has been produced in the UK BAP. The term can also be used for particularly important plans in any Action Plan.
	Priority species	A species for which a costed Action Plan has been produced in the UK BAP. The term can be used for particularly important plans in any Action Plan.
	Ramsar Site	Wetland sites of international importance, designated by signatories to the 'Ramsar Convention'.
	Road verge	The area of land between the carriageway and the highway boundary fence.
	Roads and Otters Steering Group – Wales	A group, including the Transport Directorate, which is taking forward initiatives to reduce the negative effects of roads on otters, and encourage positive measures for otters.
RSPB	Royal Society for the Protection of Birds	http://www.rspb.org.uk
	Seed Source Zones	Plants or seeds from a source within the same bioregional area (as identified by the Forestry Commission) as the site where they are to be used.
	Scottish Executive	The equivalent of the Welsh Assembly Government in Scotland. http://www.scotland.gov.uk
SINC	Site of Importance for Nature Conservation	See Wildlife Sites.
SNCI	Site of Nature Conservation Importance	See Wildlife Sites.
SSSI	Site of Special Scientific Interest	An area of land designated under the Wildlife and Countryside Act 1981 as being of national nature conservation interest.

	Soft estate	The whole area of road verges on the trunk road and motorway network.
SACs	Special Areas of Conservation	A site of European importance for wildlife other than birds, designated by the UK Government as a requirement of the EC Habitats Directive. See also Natura 2000.
SPAs	Special Protection Areas	A site of European importance for birds, designated by the UK Government as a requirement of the EC Birds Directive. See also Natura 2000.
	Species of Conservation Concern	Species listed in the UK Biodiversity Action Plan as being of UK importance, but without a costed action plan (see also Priority Species).
SAP	Species Action Plan	An action plan which has information and then a set of action each with a target date for a particular species or group of species.
	Transport Directorate	Part of the Welsh Assembly Government responsible for the Motorway and Trunk Road network in Wales. http://www.wales.gov.uk/subitransport/index.htm
VWT	Vincent Wildlife Trust	http://www.vwt.org.uk
	Water for Wildlife	http://www.waterpolicyteam.org
	Welsh Assembly Government	<i>See National Assembly for Wales.</i>
	Wildlife Site	Site for wildlife considered to be of local importance. They have no legal designation. Individual local authorities may use different terminology.
	Wildlife Trusts	http://www.wildlifetrusts.org

11 Bibliography and Useful References

Main Nature Conservation and Highways Legislation

Common abbreviation	Description (including full title); Web-links & ISBN No.
Bern Convention	Convention on the Conservation of European Wildlife and Natural Habitats (opened for signature 1979; came into force 1982). http://www.ecnc.nl/doc/europe/legislat/bernconv.html ISBN 92-871-0020-9
Birds Directive	COUNCIL DIRECTIVE 79/409/EEC of 2 April 1979 on the conservation of wild birds. http://www.ecnc.nl/doc/europe/legislat/birdsdir.html ISBN 0119749424
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals. Documents are available online, or from the UNEP / CMS Secretariat, Martin-Luther-King-Str. 8, D-53175 Bonn, Germany. http://www.wcmc.org.uk/cms/
CRoW Act	Countryside and Rights of Way Act 2000 http://www.hmso.gov.uk/acts/acts2000/20000037.htm ISBN 0-10- 543700-X http://www.wales.gov.uk/subienviroment/content/guidance/species-statement-e.htm
Habitats Directive	COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. http://www.europa.eu.int/comm/environment/nature/habdir.htm
Habitats Regulations	The Conservation (Natural Habitats, &c.) Regulations 1994. This statutory instrument transposes the 'Habitats Directive' into UK legislation. The Regulations are informally known as the 'Habitats Regulations'. http://www.hmso.gov.uk/si/si1994/Uksi_19942716_en_1.htm ISBN 0110457161
Hedgerows Regulations	The Hedgerows Regulations 1997 http://www.hmso.gov.uk/si/si1997/97116001.htm ISBN 0 11 064458 1
Highways Act	The Highways Act, 1980 is the main legislation which provides the powers to the National Assembly to undertake works in relation to the motorway and trunk road network.

WCA (summary)	The Wildlife and Countryside Act 1981 (and subsequent amendments) is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention') and the European Union Directives on the Conservation of Wild Birds (79/409/EEC) and Natural Habitats and Wild Fauna and Flora (92/43/EEC) are implemented in Great Britain.
WCA (informal)	http://www.jncc.gov.uk/species/Legislation/protect/default.htm (summary) http://www.naturenet.net/law/wca.html (informal)
	ISBN 0 10 546981 5

Main Policy and Advice documents

Common abbreviation	Description (including full title); Web-links & ISBN No.
DMRB	Design Manual for Roads and Bridges – The Good Roads Guide, and associated Nature Conservation Advice Notes. Available from The Stationery Office. http://www.official-documents.co.uk/document/deps/ha/dmr/index.htm Various ISBNs.
Sustainable Development Scheme	Learning to live differently – The Sustainable Development Scheme, National Assembly for Wales, 2000 http://www.wales.gov.uk/themessustainabledev/content/newsite/scheme-e.htm
TAN5	Technical Advice Note 5 – Nature Conservation – 1996. Available from The Stationery Office. ISBN 0750421738
TPOs (public leaflet) TPOs (guide to good practice)	Tree Preservation Orders are made by a local planning authority (London Boroughs, district or unitary councils and sometimes county councils) which in general makes it an offence to cut down, top, lop, uproot, wilfully damage or wilfully destroy a tree without the planning authority's permission. http://www.odpm.gov.uk/stellent/groups/odpm_urbanpolicy/documents/page/odpm_urbpol_607978.hcsp (technical)
Transport Framework for Wales	The Transport Framework for Wales http://www.wales.gov.uk/subitransport/content/framework/main.htm ISBN 0750427779
Trunk Road Forward Programme	The Trunk Road Forward Programme http://www.wales.gov.uk/subitransport/content/trunk/forwardprog/newpublication-e.htm#top ISBN 0750428856

Bibliography and Useful References

UKBAP	<p>There are a large number of documents relating to the UK Biodiversity Action Plan, which are detailed on the UKBAP web-site. They are also available from The Stationery Office.</p> <p>http://www.ukbap.org.uk/default.htm</p>
	<p>Biodiversity –The UK Action Plan 1994. Accessible from UKBAP web-site ISBN 0 10 124282-4</p>
	<p>UK Biodiversity Group – Biodiversity Meeting the Challenge – Volume 1 and Volume 2 1995. Accessible from UKBAP web-site. ISBN 0117532185. ISBN 0117532282</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume I: Vertebrates and vascular plants 1998. Accessible from UKBAP web-site. ISBN 1 85716 406 7</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume II: Terrestrial and freshwater habitats 1998. Accessible from UKBAP web-site. ISBN 1 85716 422 9</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume III: Plants and fungi 1998 Accessible from UKBAP web-site. ISBN 1 85716 445 8</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume IV: Invertebrates 1998 Accessible from UKBAP web-site. ISBN 1 85716 448 2</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume V: Maritime species and habitats 1999 Accessible from UKBAP web-site. ISBN 1 85716 467 9</p>
	<p>UK Biodiversity Group Tranche 2 Action Plans – Volume VI: Terrestrial and freshwater species and habitats 1999 Accessible from UKBAP web-site. ISBN 1 85716 467 9</p>
Woodlands for Wales	<p>The Wales Woodlands Strategy is the National Assembly's strategy for Welsh woodlands for the next 50 years. Woodlands for Wales summarises this strategy 2001. http://www.forestry.gov.uk/forestry/inf-d-53vh7e</p>
WTRMM	<p>Welsh Trunk Road Maintenance Manual 1999. Unpublished document; available from the Transport Directorate, Welsh Assembly Government.</p>

Local and Other Biodiversity Action Plans examined for the Audit in August 2002:

Anglesey	Working for the Wealth of Wildlife - Anglesey's Local Biodiversity Action Plan.
Blaenau Gwent	A local Biodiversity Action Plan for Blaenau Gwent.
Brecon Beacons National Park	Our Natural World - a local biodiversity action plan for the Brecon Beacons National Park.
Bridgend	A Local Biodiversity Action Plan for Bridgend County Borough Council.
British Waterways Board	Web-link provided in the Glossary.
Butterfly Conservation National Butterfly and Moth Action Plan for Wales	Web-link provided in the Glossary.
Caerphilly	Caerphilly County Borough LBAP. Summary only on UKBAP site.
Carmarthenshire	Carmarthenshire Local Biodiversity Action Plan. Summary only on UKBAP site.
Cardiff	Wild About Cardiff.
Ceredigion	Ceredigion Biodiversity Action Plan.
Conway	A Local Biodiversity Action Plan for Conwy.
Denbighshire	Denbighshire Biodiversity Action Plan.
Flintshire	Flintshire Local Biodiversity Action Plan (Creating Space for Wildlife).
Gwynedd	Gwynedd Biodiversity Action Plan.
Highways Agency	Web-link provided in the Glossary.
Merthyr Tydfil	Action for Wildlife in Merthyr Tydfil - Merthyr Tydfil Biodiversity Action Plan. Summary only on UKBAP site.
Monmouthshire	Monmouthshire Local Biodiversity Action Plan. Summary only on UKBAP site.
Neath Port Talbot	Local Biodiversity Action Plan for Neath Port Talbot 2001-2006.
Newport	A local Biodiversity Action Plan for Newport. Summary only on UKBAP site.
Pembrokeshire	A Local Biodiversity Plan for Pembrokeshire. Summary only on UKBAP site.
Powys	Powys Local Biodiversity Action Plan. Summary only on UKBAP site.
Rhondda Cynon Taff	Action for Nature: The Local Biodiversity Action Plan for Rhondda Cynon Taff.
Snowdonia	Bioamrywiaeth yn Eryri. Summary only on UKBAP site.
Swansea	A local Biodiversity Action Plan for Swansea. Summary only on UKBAP site.
Torfaen	Torfaen LBAP. Summary only on UKBAP site.
Vale of Glamorgan	Vale of Glamorgan Local Biodiversity Action Plan. Summary only on UKBAP site.
Wrexham	Wrexham Biodiversity Action Plan.

12 Other References

- Arnold H, **Atlas of Amphibians and Reptiles in Britain**, JNCC, 1995
- Asher J et al, **Millennium Atlas of Butterflies in Britain and Ireland**, Oxford University Press, 2001
- Bright P, Morris P and Mitchell-Jones A, **Dormouse Conservation Handbook**, English Nature, 1996
- De Feu C, **Nest Boxes**, British Trust for Ornithology, 1993
- Dewar M and Shawyer C, **Boxes, Platforms and Baskets – Artificial nest sites for owls and other birds of prey**, Hawk and Owl Trust, 1999
- Environment Agency, **Otters and river management**, EA, 1999
- Environment Agency, **Water Vole Conservation Handbook**, EA, 1999
- Gent T and Gibson P, **Herpetofauna Workers handbook**, JNCC, 1998 (revised 2002)
- Highways Agency, **Biodiversity Action Plan**, Highways Agency, 2002
- Jermyn D L et al, **The distribution of the hazel dormouse in Wales**, Vincent Wildlife Trust, 2001
- Jones, P S et al, **Priority Habitats of Wales – a technical guide**, CCW, 2003
- Mitchell-Jones A and McLeish A, **Bat Workers' Manual**, JNCC, 1999
- Preston C et al., **New Atlas of the British and Irish Flora**, Oxford University Press, 2003
- Richardson P, **Distribution atlas of bats in Britain and Ireland**, Bat Conservation Trust, 2000
- RSPB, **List of Birds of Conservation Concern, 2002 – 2007**, RSPB, 2002.
- Stace C, **New Flora of the British Isles**, Cambridge University Press, 1997
- Stebbins and Walsh, **Bat boxes**, Bat Conservation Trust, 1997
- Ward et al, **New Rivers and wildlife handbook**, RSPB, 1994
- Wigginton, **Red data book for vascular plants**, JNCC, 1999

Acknowledgements

The Transport Directorate would like to thank the following for their help and involvement:

The organisations and individuals involved in the TREBAP partnership.

Those who responded to consultations in 2001 and 2003.

The Local Biodiversity Action Plan Groups and other organisations who were able to forward their plans for the Audit work.

Those who have provided information in relation to the trunk road and motorway network.

Cresswell Associates – <http://www.cresswell-associates.com/>

Celf Creative – <http://www.celfcreative.com/>

White Drift Translations Limited – <http://www.whitedrift-translations.com/>

And the following organisations/people for photographs:

Keith Alexander – *Resurfacing works on the A40*

C Duigan – *Mesotrophic lake, Llyn Tegid*

Countryside Council for Wales – *Upland calcareous grassland; ancient or species rich hedgerow.*

Adrian Fowles – *Coastal and floodplain grazing marsh.*

Nick Greensill – *Orchids on the A55; cowslip bank; roadside managed woodland.*

Gwynedd Council/North West Wales Trunk Road Agency – *Scree next to A487; rock faces on the A470.*

Mark Hamblin – *Barn owl; common lizard, female basking; adder, male basking.*

Mike Hamnett – *Otter; marsh fritillary; welsh clearwing moth; bats.*

Pat Hayes, Environment Agency, Wales – *Twaite shad.*

Peter Jones – *Lowland calcareous grassland; lowland heathland.*

Mid Wales Trunk Road Agency/Powys County Council – *Traffic in a mid-Wales village;
A470 and the Wye Valley.*

J Latham – *Upland mixed ashwood; lowland beech and yew woodland; wet woodland.*

Chris Nelson/West Wales Trunk Road Agency – *Otter ledge with dipper box.*

North East Wales Trunk Road Agency – *Aerial view of the A494/A55.*

John Ostley – *Limestone woundwort.*

P Rhind – *Upland heathland; saltmarsh; upland oakwood.*

Acknowledgements

Tim Rich and the Arkive Project (www.arkive.org) – *Pillwort*.

John Robinson – *Common dormouse; pair of adders ‘dancing’*.

S Smith – *Lowland dry acid grassland*.

D Stevens – *Purple moor grass and rush pasture*.

Symonds – *Afon Ganol flood storage on the A55*.

Transport Directorate – *A465 and the Clydach Gorge* (front cover).

Transport Directorate Electrical Section/W S Atkins – *M4 night scene; Second Severn Crossing; computer-based network information*.

Alwyn Williams – *Clawdd*.

Julian Whitehouse – *Great crested newt*.

Ray Woods – *Spreading bellflower*.

David Woodfall – *Native black poplar; upland stream and woodland; River Wye, Powys; bluebell wood; white-clawed crayfish*.

Woodfall Wild Images – *Deptford pink; bee orchids; bluebell; water vole; lowland meadow*

Len Wyatt – *Newt fence on the A55; wood bitter vetch; great burnet; surveying the network; oxeye daisies on the A55; clawdd*.