SOMERSET HIGHWAYS BIODIVERSITY ACTION PLAN

Species Action Plans

April 2006

Somerset Highways – aiming for excellence

Introduction

The Somerset Highways Biodiversity Action Plan details measures and actions to be taken when encountering wildlife species in the highway. The plan gives basic work procedures and mitigation methods to avoid impacts on those species when carrying out works. Further to those listed in the SHBAP specific Species Action Plans (SHSAP) are to be developed as stated in the aims of the plan in Section 1.

Species Action Plans will further develop what is written in the SHBAP and will link into the local and UK Biodiversity Action Plan (BAP) process.

Somerset Environmental Records Centre (SERC) originally wrote local BAPs for District Council areas and the Quantocks Area of Outstanding Natural Beauty (AONB) in Somerset. Exmoor National Park has also produced its own local BAP. However, these LBAPs have been revised in early 2006 and a new overarching Somerset Biodiversity Strategy produced by the Somerset Biodiversity Partnership, a partnership which includes officers from county and district councils, English Nature, Somerset Wildlife Trust, SERC, Exmoor National Park, AONB offices, the National Trust, RSPB, Environment Agency and the Field Studies Council.

The following Species Action Plans form a basis for monitoring the actions of Somerset Highways in relation to Key Performance Indicators (KPI) and also to that, which might be required by the Strategic Environmental Assessment of the Local Transport Plan. Actions resulting from local BAPs are reported nationally to the Biodiversity Action Reporting System (BARS). It is also intended that actions carried out by Somerset Highways with regard to the following SHSAP will also be reported through BARS.

The Species Action Plans also aim to raise the awareness of Somerset Highways staff and their contractors of the requirements of important species and how these requirements need to be incorporated into working practices including meeting legal obligations.

The species chosen for specific action plans are those which it is considered there is most opportunity to make a positive contribution to its benefit. There may also be benefits to road safety resulting from actions taken. The species selected for action plans include:

- Otter (*Lutra lutra*)
- Common Dormouse (*Muscardinus avellanarius*)
- Bats (all species)
- Barn Owl (*Tyto alba*)
- Reptiles
- Amphibians

The plans will be kept under review and amended to include current best practice. In addition, other species may be added if it is considered that positive action can be taken in carrying out highway maintenance and within the design of new infrastructure.

Content

Each Species Action Plan (SAP) is made up of the following sections:

Current Status
This section reviews the status of the species concerned with regard the protection afforded it through legislation, and describes its national and local abundance.

Habitat and Ecology
Gives a brief description of the biology of the species and the habitats in which it is found.

Current Highways Factors Affecting the Species
Sets out the issues caused by highways that affect the abundance of the species.

Working with …
Gives details of surveying, mitigation and enhancement measures that Somerset Highways should employ in designing and implementing schemes.

Current Action
This section details current actions for the species being carried out by Somerset Highways as part of the SHBAP.

Action Plan Objectives and Targets
Sets out the objectives for each species and the actions by which these objectives would be met. These will be recorded in BARS, and contribute to the KPI dashboarding process and Local Transport Plan targets.

The section also lists links to other plans, organisations where action can be taken in partnership and experts consulted in developing the SAP.

References
Lists the sources used in compiling the SAP.

Somerset Highways Species Action Plans

Otter (*Lutra lutra*)

Current Status

National Status

Prior to 1950 the Otter was relatively widespread throughout the UK. Since then it has undergone a rapid decline in numbers with the largest declines being a result of poisoning by organochlorine pesticides. Today the largest concentrations are confined to Wales, Scotland and the South West of England including Somerset. Populations have been making a steady recovery since the early 1980s and other parts of England are beginning to be re-populated.

The UK Otter population is internationally important, as the species has declined across much of western Europe. The Otter is also an important indicator of water quality.

Legal Status

The Otter is afforded protection under European community legislation by Directive 92/43/EEC on the 'Conservation of natural habitats and wild flora and fauna' (the 'Habitats Directive') being listed in both Annexes II and IV; the Wildlife and Countryside Act, 1981 (as amended), listed on Schedules 5 and 6; and the Wild Mammals Act 1995.

The Otter is also the subject of a UK Species Action Plan. It is on the International Union for the Conservation of Nature's Red List of species of conservation concern, classed as 'Vulnerable', and appears on Appendix II of the Bern Convention.

Local Status and Distribution

Otters are found on all watercourses in Somerset.

The Otter is the subject of a Sedgemoor District Council local Biodiversity Action Plan.

Habitat and Ecology

Otter's give birth throughout the year to a litter of between 2 and 3 cubs. After 12 to 13 months cubs become independent and will disperse over many kilometres. A female Otter in Somerset may have a territory of up to 20 kilometres of watercourse (Pers. comm. Karen Coxon) or the length of three riverside parishes (Pers. comm. James Williams)

Although they may live to sixteen most Otters have an average life expectancy of four years. Most Otters die as a result of road kill, through drowning in fishing apparatus or fighting.

Otters are found on all types of watercourse including canals, ponds, lakes and reservoirs. They use tiny ditches and streams including dry watercourses as regular commuting routes. They may also cross overland between watersheds and will shortcut across bends in rivers. The Environment Agency reported a road casualty on the A361 north of Pilton, and also not far from the Wellington Monument.

The presence of Ash or Sycamore trees along river banks is particularly important to Otters as the roots of these species provide the majority of den sites. Other species used include Rhododendron bushes, Oak and Elm trees. Bankside vegetation, such as woodland and scrub, can provide cover for Otters. They also use Reedbeds and islands as rest sites and marshy areas to forage for frogs.

Holts or dens are found in the roots of trees, heaps of sticks or rocks, drains, badger setts, rabbit burrows, etc., where the chance of physical disturbance is low. These are usually within 10 metres of the watercourse but can be up to 50 metres away. Natal holts seem to be located away from main watercourses and from water altogether even being found up to 500 metres away.

The Otter's diet consists mainly of fish, such as eel, perch or pike, but amphibians and crayfish are also caught. Other food includes small mammals, birds and reptiles.

Current Highways Factors affecting the Population

Road Mortality

Road mortality is one of the biggest threats to the Somerset Otter population. This commonly occurs when a stream is in spate and/or there is lack of headroom. In fact if the road runs beside a river, an Otter may run along the road when the water is in spate, as the easier option. Weirs and dams also obstruct the passage of Otters and they are forced to leave the watercourse and cross the highway. Elsewhere it may occur when an Otter is crossing from one watershed to the next and has to traverse a road *en route*.

Pollution

One off pollution events due to spillage of chemicals, etc by road transport incidents can have serious effects on watercourse species wiping out whole populations of fish and thereby indirectly affecting the ability of Otters to use that watercourse.

Loss of Habitat

Construction of new transport infrastructure can incur loss of Otter habitat and lead to Otters crossing roads to access other areas within their territory.

Working with Otters

The following should be undertaken and/or considered when working on schemes that can potentially affect Otters.

Surveys

- Any new work or maintenance operation within potentially suitable habitat for Otters will require a survey carried out by a specialist.

- Where surveys show that Otters are present all effort must be made to avoid the impact on the species.

- If Otter holts or dens are found on the site surveys must be under taken to assess whether they are used for breeding. If Otters are breeding there may be seasonal time constraints on timing of mitigation. All holts are protected by law.

- Where survey methods are invasive a licence will be required.

- Surveys can be undertaken at any time of year. Repeat surveys may be required depending on the outcome of initial surveys, the scale of the impact and type of work. For example repeat surveys would not be required on sites, which are of small scale and would not involve the potential destruction or disturbance of holt or dens. Surveys should not take place after periods of heavy rain.

- If found on site after work has commenced work must stop immediately and an experienced specialist called into to establish the extent to which Otters are using the site (resident, passing through or breeding)

Mitigation

- The Environment Agency must be consulted where works affect a watercourse or where an Otter holt is affected. It is imperative that the destruction of holts is avoided.

- The level of mitigation will also depend on the scale of the scheme.

- Any pollution of watercourse must not be permitted.

- Exclusion fencing may be required to prevent disturbance to Otters. Safe working distances need to be established. If Otters are breeding then work would be delayed until the cubs are no longer dependant on the natal holt. Withdrawal of plant from the immediate riverbank during the hours of darkness permits Otters to pass through the site.

- Special precautions are essential during night working.

- Access to and maintenance of food sources should be maintained during and

after construction.

- Include ledges, underpasses and lead in fencing, maintenance of habitat corridors and artificial holts as appropriate in scheme design. Under passes should be a minimum of 60 centimetre diameter when up to 20 metres long and 90 centimetres between 20 and 50 metres long. Lead-in fencing should be of 3mm weld mesh, 37.5mm square (not chain link) and 1.5 metres high with a 30 centimetre overhang and sunk 30 centimetres into the ground. There may be circumstances where this specification may be reduced.

- Do not 'manicure' or over tidy riverbanks.

- Avoid vertical channels and bottlenecks that increase the velocity of the water.

Potential Enhancement Measures

- Plant bankside vegetation alongside roads that run parallel to watercourses

- Provide underpasses with lead-in fencing, as specified above, where Otter road casualty 'hotspots' occur if appropriate.

- Provide artificial Otter holts

- Provide simple structures of logs, etc for shelter

- Plant bankside trees, especially of Ash and Sycamore

- Use soft banks of gabions and boulders rather than concrete in construction schemes

Current Action

Road Casualty Database

A wildlife road casualty database has been set up as part of the Somerset Highways Biodiversity Action Plan. Any Otter casualties will be recorded to the database. The database for Otters currently includes those listed for Somerset up to 1998. Further data is being sought from the Environment Agency.

Underpass

Following consultation with the Environment Agency, in March 2006 an underpass for Otters was constructed under the A372 east of Othery, either side of the weir at Beer Wall. Another underpass is to be installed on the Taunton to Kingston St Mary road at a road kill 'hotspot'.

Recent alterations have been made to a culvert at Porlock and an otter pass has been installed on the River Pill.

Reflector posts

Reflector posts have been installed on the A361 at East Lyng. However, since installation these have become dislodged by grass cutting operations and are in need of being maintained and/or reinstalled where necessary. The section of verge has since been added to the Somerset Highways' Special Road Verge list to highlight the need for hand strimming of this section. It has been reported that there has been no records of road kill recently along this stretch of the A361 (pers. com. James Williams).

Silk Mills Bridge and Park and Ride Site

Two artificial Otter holts have been constructed as part of the Silk Mills Park and Ride development. Monitoring of Otter activity along the Back Stream has also been carried out to determine if activity has been affected by construction. Somerset Environmental Records Centre is producing a report.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for the Otter is to minimise the number of Otters killed on Somerset roads and maintain passage across the County. The loss of a single Otter is considered to be significant to the Somerset metapopulation.

Actions

1. Road casualty database – continue to record road casualties in order to identify problem locations and prioritise for action. Obtain records from the Environment Agency.

2. Ensure that all dead Otters are handed to the Water UK and the Wildlife Trusts Wessex Otters and Rivers Project, who monitor of the Otter population. These should be delivered to James Williams (Somerset Trust Otter Group), Stoford Manor, West Buckland, Wellington – 01823 461655.

3. Ensure that new schemes have appropriate mitigation incorporated into the scheme design.

4. Installation of ledges in bridges where there are records of Otter casualties. This is dependant on when maintenance operations are carried out on a particular bridge, as consents are likely to be required by the Environment Agency. Maintain a list and ensure that measures are included when bridges are maintained.

5. Form underpasses with associated fencing where ledges are not practical as for 4.

6. Consider planting scrub where watercourses run parallel to watercourses to discourage otters from using the road in times of spate.

7. Maintain existing roadside reflectors. Repair reflectors on A361 if required by

the Somerset Otter Group. Install new reflector posts if required.

8. Consider experiment with acoustic wildlife warning reflector posts used for deer on the A39 in 2005/6.

9. Provide planting on highway land to enhance habitat for otters at appropriate locations.

10. Ensure that surveys are carried out where highways schemes affect suitable cover for Otters along watercourses.

11. Provide artificial holts on highway sites away from busy roads (See Appendix 1)

Work with:

Environment Agency - Francis Farr-Cox, Rivers House, East Quay, Bridgwater, TA6 4YS. Tel: 01278 457333. Email: francis.farr-cox@environmentagency.gov.uk
Somerset Otter Group – James Williams, Stoford Manor, West Buckland, Wellington, TA21 9LS. Tel: 01823 461655
Sedgemoor District Council – Julie Cooper, Bridgwater House, King Square, Bridgwater, TA6 3AR. Email: Julie.Cooper@sedgemoor.gov.uk

Links with other plans

Somerset Biodiversity Strategy
Sedgemoor local Biodiversity Action Plan

Acknowledgements

James Williams - Somerset Otter Group
Karen Coxon

Otter photographs by Darin Smith (this section plus front cover)

References

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Grogan, A., Philcox C. & Macdonald D. (2001): *Nature Conservation and Roads: Advice in Relation to Otters*. Oxford: Wildlife Conservation Research Unit.

Highways Agency (1999): *Design Manual for Roads and Bridges, Vol 10, Section 1, Part 9: Nature Conservation Advice in Relation to Otters*. London: HMSO.

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Pollard, A., Coles, V., Taylor K. & Butcher B. (1998): *Sedgemoor Biodiversity Action Plan*. Somerset Environmental Records Centre

Common Dormouse (*Muscardinus avellanarius*)

Current Status

National Status

The distribution of Common Dormouse in the UK is mainly in the southern part of England although isolated populations occur in Northumberland and Cumbria and in Wales. Introductions have been made elsewhere as part of the Dormouse Species Recovery Programme.

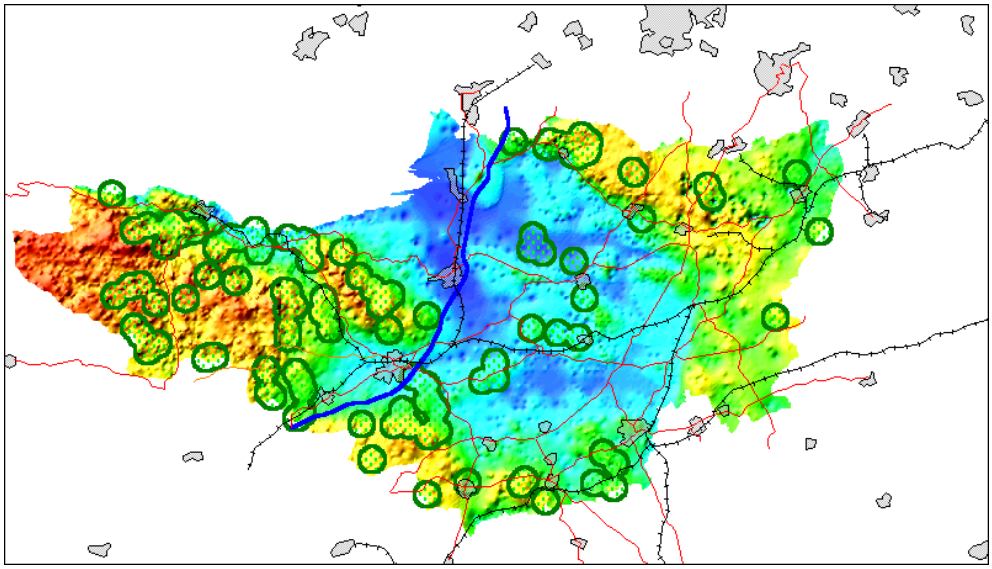
Legal Status

The Common Dormouse is afforded protection under European community legislation by Directive 92/43/EEC on the 'Conservation of natural habitats and wild flora and fauna' (the 'Habitats Directive') being listed in Annex IV; and the Wildlife and Countryside Act, 1981 (as amended), listed on Schedules 5.

The Common Dormouse is also the subject of a UK Species Action Plan. It is on the International Union for the Conservation of Nature's Red List of species of conservation concern, and is classed as 'Vulnerable'.

Local Status and Distribution

The Common Dormouse is found throughout Somerset. Dormice are found in hedgerows in Somerset.



Potential distribution of Common Dormouse in Somerset, 2004[1]

[1] Note: This map is intended only as a guide to where Dormice may be found. Other sites have been recorded since, e.g. Blackworthy Road, Castle Cary.

The Common Dormouse is a ‘County Notable’ species and is the subject of the Taunton Deane District Council and Exmoor National Park Biodiversity Action Plans. English Nature has identified high priority areas for action nationally including areas within Taunton Deane.

Habitat and Ecology

The Common Dormouse is nocturnal. It lives and feeds among the branches of trees and shrubs and rarely descends to ground level except when hibernating. It is found in woodland, scrub and hedgerows. It is important that it can easily move from tree to tree and be able to climb in the understorey and canopy without difficulty and without coming to the ground. A dormouse can live up to six years in the wild but two or three years is more usual.

Dormice may travel up to 70 metres from their nests when feeding. They have been found in habitat patches of little as 1.7 hectares in size along road verges in Somerset (Garland & Woods, 2005) but it is considered that 20 hectares is required for a sustainable population in the long term (Bright *et al*, 1996).

Dormice are found in a range of habitats including both deciduous and coniferous woodland, scrub and hedgerows. Although dormice have been found in managed hedgerows as little as 1 metre wide and 1.5 metes tall they are more likely to occur in large, less frequently cut hedgerows.

Dormice feed on flowers, berries and nuts and insects and require a variety of trees in order to have a succession of flowers. Insects are an important mid summer food source during a period when both flowers and fruit are scarce. Hazel, Oak, Bramble and Honeysuckle are valuable food sources as is Sycamore and Blackthorn.

Male Dormice are territorial in the breeding season between May and September. Females give birth to a litter of four or five from early June through to September but mainly in July and August. The young remain with their mother for two months.

Dormice nests are round, about 15 centimetres in diameter, and woven of Honeysuckle, Clematis and leaves and are grey coloured. They also use hollow tree branches and old birds nests.

Common Dormice hibernate on the ground in a tightly woven nest the size of tennis ball where conditions are damp, with high humidity and temperatures remain cool. This is usually under moss or fallen leaves, occasionally among logs, tree roots or the base of a hedgerow. Hibernation starts when nights become cool, usually at the time of the first frost and animals will remain in hibernation until May the following year. They also go into torpor during cool, windy or wet periods during the rest of the year.

Current Highways Factors affecting the Population

Loss of Habitat

Dormouse habitat can be lost due to the construction of new transport infrastructure or maintenance operations carried out on the highway.

Habitat Fragmentation

New road schemes and loss of trees, hedgerows and shrub in the highway verge due to maintenance operations can potentially result in fragmentation of Dormouse habitat.

Mortality

Removal of trees, hedgerows and shrub in the highway verge due to routine maintenance operations can potentially result in disturbance and fatalities to Dormice.

Installation of Street Lighting

The installation of streetlamps will make any habitat lit up by the artificial lighting untenable to Dormice and thereby reduce the effective area available to support a metapopulation.

Working with the Common Dormouse

The following should be undertaken and/or considered when working on schemes that can potentially affect Common Dormouse.

Surveys

- Any new work or maintenance operation affecting potentially suitable habitat for Dormice will require a survey carried out by a specialist.

- Where surveys show that Dormice are present, all effort must be made to avoid any impact on the species.

- No single survey method is suitable to determine presence. A combination of methods should be used. Survey licences are obtained from English Nature. The following methods can be used:

    - Nut search where Hazel is present - best between September and December. A search for nest sites may also be undertaken. Both these methods are limited.
    - Nest boxes placed at a density of 30 per hectare about 1.5 metres above ground level. Can be used between May and October but requires a licence. Use in woodland.
    - Nest tubes about 15 centimetres long with one end blocked and an

inner wooden section with an overlap of 3 to 4 centimetres are placed and left in situ between May and October. In hedgerows they should be left at about 10 to 20 metre intervals. Requires a licence.

- If Dormice are found on site after work has commenced work must stop immediately and an experienced specialist called in.

Mitigation

- Avoidance should be the first priority. Schemes should be designed to avoid habitat loss or fragmentation.

- Street lighting should not be installed in proximity to existing Dormouse habitat.

- If avoidance is not possible compensatory habitat will need to be established prior to the start of the scheme, ready to take the displaced Dormice. Dormice are required to be maintained at 'Favourable Conservation Status' under the 'Habitats' Directive, i.e. the habitat necessary to support the existing population must be maintained or enhanced. The planting schedule should include Oak, Sycamore, Hazel and Honeysuckle. Hawthorn should not be planted. Plants should be planted closer than normal in order to create arboreal connectivity.

- Nest boxes and green bridges or aerial route ways should be designed into receiving habitat.

- Vegetation clearance is carried out in two stages and should start furtherest away from remaining Dormice habitat

    - October until February – the vegetation is manually cut down to 50 centimetres above ground level under the supervision of a license holder. A search would also be carried out of tree holes; litter; moss; and hedgerow bases for Dormice, which if found are captured and translocated. Work should be carried out using hand tools and carried to the vehicle to be transported away from site
    - May following cutting – Work on site may commence by removing stools left after vegetation clearance.

- Wooden gates should be used rather than metal ones.

- Do not plant shading trees

- Hedgerows and scrub should be trimmed only between January and February in areas where Dormice are potentially present (This would also avoid the bird nesting season)

Potential Enhancement Measures

- Linear planting of native species hedgerows along roadsides to link isolated woodlands. Hawthorn should not form more than 20% of the mixture in planting schedules.

- Piles of logs should be left for shelter and as habitat for insects on which Dormice are reliant for food during mid summer

- Creation of green bridges across existing roads joining up fragmented habitats
- Provision of nest boxes
- Coppicing in small coupes after seeking advice
- Planting areas of new woodland

Current Action

Species Information Sheet

A species information sheet on the Common Dormouse has been produced and issued to Somerset Highways operatives and staff. This contains basic details about the species and procedures to be followed if presence is suspected.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for the Common Dormouse is to protect and enhance existing habitat within highway limits and to extend this to join up fragmented Dormouse habitats.

Actions

1. Identify all roadside verges and areas adjacent to the highway occupied by Dormice in Somerset and designate as Special Road Verges.
2. Ensure that Highway's officers and operatives are aware of sites supporting Dormice and understand the requirements of the species.
3. Ensure that new schemes avoid Dormouse habitat wherever possible and if unavoidable have appropriate mitigation incorporated into the scheme design.
4. Installation of green bridges joining up Dormouse habitat either side of a road at appropriate locations.
5. Consider planting new hedgerows with appropriate species to join/rejoin existing Dormouse habitats.
6. Manage and provide planting on highway land to enhance existing habitat for Dormice at appropriate locations.
7. Provide log piles as shelter at appropriate locations.
8. Ensure that surveys are carried out where highway's schemes affect suitable habitat for Dormice even in areas where there are no records.

9. Erect nest boxes at appropriate locations.

Work with:

Somerset Mammals Group/The Mammal Society – Michael Woods, Overlea House, Crickham, Wedmore, BS28 4JZ. Tel: 01934 712500. Email: michael.woods@michaelwoodsassociates.co.uk
Exmoor National Park – Alison Cox, Exmoor House, Dulverton, TA22 9HL. Email: ACox@exmoor-nationalpark.gov.uk
Taunton Deane Borough Council – Pam Motum/Barbara Collier, The Deane House, Belvedere Road, Taunton, TA1 1HE. Email: p.Motum@tauntondeane.gov.uk b.collier@tauntondeane.gov.uk

Links with other plans

Somerset Biodiversity Strategy
Taunton Deane Biodiversity Action Plan
Exmoor National Park Biodiversity Action Plan

Acknowledgements

Michael Woods, Mammal Society
Map from Somerset Environmental Records Centre

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Bats

Current Status

National Status

Bats are found throughout the UK. During the 20th century bat numbers fell dramatically. This has resulted in six of our seventeen species of bat being identified by the UK Government as requiring special conservation help because of their rarity or because their absolute numbers have declined alarmingly.

Pipistrelle Bat

Legal Status

All bats are afforded protection under European community legislation by Directive 92/43/EEC on the 'Conservation of natural habitats and wild flora and fauna' (the 'Habitats Directive') being listed in Annex IV. In addition four species – Greater and Lesser Horseshoe, Bechstein's and Barbastelle Bats are also listed on Annex II.

All bat species and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended) and are included in Schedule 2 of the Conservation (Natural Habitats, & c.) Regulations 1994.

As a signatory to the Bonn Convention (Agreement on the Conservation of Bats in Europe 1999) the UK is also required to conserve bat habitats, requiring their identification and the protection from damage or disturbance of important feeding areas.

Local Status and Distribution

Sixteen of the seventeen species of UK bat have been found in Somerset. They are potentially present throughout the County where suitable habitat exists.

There are three internationally important roosting sites designated as Special Areas of Conservation in the County. Hestercombe House is listed for its Lesser Horseshoe Bat population; the Mells Valley is listed for its Greater Horseshoe Bat populations; and the Exmoor and Quantock Oakwoods for their populations of Barbastelle and Bechstein's Bats.

All bat species are included in the 'County Notable' species list. Greater Horseshoe Bats are the subject of the Mendip Local Biodiversity Action Plan and Lesser Horseshoe Bats are included in the West Somerset Local Biodiversity Action Plan. In addition, the Somerset Biodiversity Strategy includes a group Species Action Plan for bats.

Habitat and Ecology

All UK bats are relatively small. The largest, the Noctule, has a wingspan of about 40 centimetres and the smallest, the Pipistrelle, has a wingspan of about 20 centimetres.

Bats are social animals that can live up to thirty years. During the summer months female bats form maternity colonies - which may be in a variety of natural or artificial structures, such as houses, trees or bridges depending on the species - to have their young. These tend to be the same site every year. A mature female may produce one offspring every year or so. Maternity roosts disperse in September/October and many bats hibernate in an alternative site, some species using caves, tunnels, bridges or mines.


Greater Horseshoe Bat

Bats are nocturnal and emerge from their roosts at dusk to feed. In the UK all bat species feed on insects. A number of feeding sites are needed throughout the year as insect availability changes. They can forage several kilometres away from their roost site and often rely on hedgerows, woodland edge, tree lines, copses and watercourses to commute.

Current Highways Factors affecting the Population

Loss of Habitat

Habitat, such woodland, hedgerows and ponds, supporting bat populations can be lost due to landtake required for new highways schemes. These effects can be especially significant where a feature runs alongside a road. Impacts may also be caused through hydrological change resulting in loss of wetland or ponds.

The loss of roost sites, such as trees, would also have a significant effect on a bat population. Roost sites have also been lost due to bridge maintenance works.

Habitat Fragmentation

As most bat species are reliant on linear features traditionally used to commute between roost sites and feeding areas. Any severance of these features could cause disruption to flight patterns and threaten the viability of a colony. As bats fly some distance from their roost site severance could affect bats several kilometres from the scheme.

Mortality

Bats are affected by road mortality but it is uncertain as to what degree as remains are difficult to find. It is very difficult to determine the effects on populations, as so

many other factors need to be considered. An important consideration would also be if casualties were already occurring on existing roads not only on new schemes

Lesser Horseshoe and Whiskered Bats often fly 0.5-3 metres above road level where 20-40 metre gaps in hedgerows have been created by a road scheme. Greater Horseshoe Bats are more flexible but have been found to sometimes fly as low as 1 metre above the road surface (Billington, 2005).

Installation of Street Lighting

Bat roost may be disturbed and abandoned following the installation of street lighting.

Artificial lighting can also affect the feeding behaviour of bats. Studies have shown that, although some species of bat swarm around white mercury streetlights, most, such as horseshoe and *Myotis* species, will avoid artificial lighting. Street lighting can therefore cause habitat fragmentation and prevent bats from reaching feeding areas. Continuous lighting along roads creates barriers that bats cannot cross.

Working with Bats

The following should be undertaken and/or considered when working on schemes that can potentially affect bat species. The removal of hedgerows and/or trees may be particularly significant anywhere in the County, as would the installation of street lighting.

Surveys

- An initial walkover survey can be carried out at any time of year. This can be accompanied by a study of the Somerset ECOnet, which will give a list of potentially affected species, and of aerial photographs to identify potential flight routes. It is important to take a wider landscape view, not only considering the immediate land take impacts

- The site and surrounding area would need to be searched for potential bat roosts. Some roosts will be identified from a search of records held by SERC but in some areas there may be no information available. Generally this search should include:
    - All affected trees and trees within 200 metres of scheme – further if rare bats are present in the area, e.g. Barbastelle bats - with potential to host bat roosts. These searches should be carried out when trees are leafless in the autumn and winter.
    - All bridges, buildings and other structures within 50m of the route should be investigated by inspection and activity survey. This would take place between May and September. If considerable disturbance would occur as a result surveys should be carried out up to 100 metres away from site.
    - All underground sites affected and within 100m of scheme, or further if relevant.

- Activity surveys using bat detectors would need to be carried out at night between May and September to identify features used as flyways by bats. A minimum of five (ten for species of conservation concern) visits to the effected area should be made, at, ideally, one per month between May and September.

All surveys would need also to be undertaken when weather conditions are suitable, i.e. above 10 degrees, with no rain or wind.

Mitigation

Mitigation works for bats would need to be in place before any work on site can start and may take months to complete and can run into years.

- Any impacts on bats should be avoided where possible by amending the scheme design avoiding destruction or disturbance of roost sites, feeding areas and commuting routes.

- Street lighting should not be installed where it affects a bat roost or a habitat feature used by bats as a flyway or for feeding.

- Any maintenance work to habitat features, such as hedgerows and trees, should take place between November and March and should not reduce the suitability of the feature as a flyway. Trees should be maintained over the highway as a 'hop over'.

- Where works to structures containing roosts is likely to disturb bats they must be carried out under the appropriate Defra licence. Such roosts may be found in trees, bridges, tunnels, culverts or buildings. The recommended times for disturbance are set out below.

Bat usage of site	**Optimum period for carrying out works (some variation between species)**
Maternity	1st October – 1st May
Summer (not a proven maternity site)	1st September – 1st May
Hibernation	1st May - 1st October
Mating/swarming	1st November – 1st August

Source: '*Bat mitigation guidelines*' published by English Nature

- Trees potentially hosting roost sites should be surveyed before the felling date. Ideally these should be surveyed when bats are active and with enough time to apply to Defra for a licence. Some works on removing dead branches may be possible without a licence as long as bats are not disturbed, for example in the winter months if the tree is a maternity roost. Expert advice should be sought in all cases.

- Where trees hosting roost sites need to be felled these should be done so under the supervision of an appropriately licensed bat worker. This should be done in mid September/October or April (if no birds are present). If trees are felled outside this period they would need to be removed in sections limb by limb, with each slowly lowered to the ground. The limb should then be left for 48 hours to allow any bat to escape. Any fissures should be kept open with wedges. Any roost site would need to be compensated for by the installation of two artificial sites appropriately located.

- Works to roosts, which may be found in bridges, tunnels or culverts, should take place in April, May and October unless birds are also present if maternity or hibernation roost sites. If being used as a maternity roost only then between December and March. If neither maternity nor hibernation roosts then work may take place between December and March or June to August. The roost site should be blocked after emergence times in the evening. Noise should be

avoided as this can drive bats further into roost sites. If bats are to be excluded from the whole structure then temporary roost sites should be constructed to a similar size of the originals as close to those closed down as possible before exclusion takes place. Scaffolding should be erected two weeks before work commences. The appropriate licence is required for all work.

- Crevices should be retained in bridge maintenance operations.

- Where new highway infrastructure bisects existing flyways safe crossing places will need to be constructed in order that traditional routes are preserved. These may be underpasses or bridges and will require lead-in planting and/or fencing from existing flyways. The sizes of underpasses suitable for bat species are given in Appendix 2. These routes should also be unlit. Any street lighting would also have to be adapted to preserve darkness.

- Where habitat is lost as a result of highway operation this should be replaced on a like for like basis at minimum. For example where a length of hedgerow is to be removed this would require replacing with a new one on the same line. The new hedgerow would need establishing and should be complemented by suitable fencing.

- Night working would need to be avoided near bat roosts and feeding areas.

- A monitoring programme should be implemented where works affects bats

Potential Enhancement Measures

- Provision of bat boxes as roost isles in suitable trees within highway limits. It should be noted that once installed they may only be inspected by a licensed bat worker.

- Provision of bat roosts in bridge and other structures

- Maintenance of hedgerows so that they are enhanced as flyways or foraging routes for bats

- Replacement of existing street lamps with low spill lighting to increase areas of darkness adjacent to existing feeding areas, flyways and roost sites.

- Traffic calming measures at points where bats cross the road

Current Action

Survey of road crossing points

Survey and report of bat movements across roads have been undertaken on the A371, west of Cheddar and at Mells with a view to implementing high level overpasses if viable.

GIS Mapping

Bat flight paths, for Greater Horseshoe at Cheddar and Mells and for Lesser Horseshoe at Hestercombe House, recorded in reports produced for English Nature, have been transferred to GIS and are available on the Highway Scheme Proposal Register (HSPR)

Road casualty database

Bats are included in the list of species where road casualties are being recorded.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for bat species is to record, protect and enhance existing flyways within highway limits and to provide artificial roost sites where appropriate.

Actions

1. Add GIS mapping layers of bat flight paths from radio tracking other data to Highway Schemes Proposals register as they become available.

2. Identify and maintain all crossing places on the highway used by bats as flyways.

3. Ensure that Highway's officers and operatives are aware of bat roost sites adjacent to the highway and understand the requirements of species.

4. Ensure that new schemes avoid bat habitat wherever possible and if unavoidable have appropriate mitigation incorporated into the scheme design.

5. Ensure street lighting does not disturb roost sites and/or interferes with flyways.

6. Installation of 'green bridges/overpasses' joining up bat habitat either side of a road at appropriate locations.

7. Consider planting new hedgerows with appropriate species to join/rejoin existing bat flyways.

8. Manage and provide planting on highway land to enhance existing habitat for bats at appropriate locations.

9. Ensure that surveys are carried out where highway's schemes affect suitable roost sites.

10. Ensure that surveys are carried out where highway's schemes affect habitat used by bats as flyways.

11. Erect bat boxes or install bat bricks at appropriate locations.

Work with:

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Mendip District Council – Richard Dixon, Mendip Environment Forum, c/o Council Offices, Cannards Grave Road, Shepton Mallet, BA4 5BT. Email: richard@dixon.org.uk
West Somerset District Council – Mark Westcott, 37 Blenheim Road, Minehead, TA24 5PS. Email: mwestcott@westsomerset.gov.uk

Links with other plans

Somerset Biodiversity Strategy
Mendip Biodiversity Action Plan
West Somerset Biodiversity Action Plan

Acknowledgements

David Cottle, Somerset Bat Group
Edward Wells, Somerset Bat Group
Geoff Billington – 'Bats and Roads' talk given to Somerset Highways in October 2005.

Pipistrelle photograph courtesy of English Nature
Greater Horseshoe photograph courtesy of the BBC Natural History Unit

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Barn Owl (*Tyto alba*)

Current Status

National Status

The Barn Owl was the most common species of owl in Britain in the 18th and early 19th centuries. However, its numbers have been declining from the mid 19th century and between 1952 and 1985 it suffered an estimated population loss of 69%. The proportion attributed to road deaths increased from 6% between 1910-1954 to 50% between 1991 and 1996. It is estimated that there are now only 4000 pairs left in Britain.

Legal Status

The Barn Owl and their roost sites are protected under the Wildlife and Countryside Act 1981 (as amended) and are listed on Schedule 1, which makes it illegal to disturb a Barn Owl at the nest at any time as well as being afforded protection against killing and destruction of its roost site.

The Barn Owl is listed in Appendix II of the Berne Convention, by which member states are required to take special measures to conserve the species. Barn Owls are on the 'amber' list of 'Birds of Conservation Concern' published by the Joint Committee for Nature Conservation.

Local Status and Distribution

Barn Owls are widely but thinly distributed throughout Somerset with the largest population on the Somerset Levels and Moors.

The Barn Owl is the subject of a Mendip local Biodiversity Action Plan.

Habitat and Ecology

Barn Owl roost sites occur in draught free buildings, such as barns, caves and holes in trees. Barn Owls have bred in all months of the year but the majority of eggs are laid in April and May. Between four and seven are laid. Fledged young leave the nest after 14 weeks following hatching. Second and, occasionally, third broods may occur. The young can disperse up to 20 kilometres from the natal roost to seek their own territories in November.

Most Barn Owls have an average life expectancy of three to four years. Most die as a result of road kill.

The Barn Owl's diet consists mainly of Field Vole (*Microtus agrestis*) but other small mammals such as shrews and mice are also caught.

Barn Owls hunt over low-lying open farmland and require extensive areas of rough, un-grazed or lightly grazed grassland found in fields, field margins, parkland, orchard and/or newly planted plantation. Foraging occurs within about 1 kilometre of a nest site in the breeding season. Within this range a breeding pair requires at least 50 hectares or permanent or semi permanent rough grassland to hunt. Where they are dependant on linear grasslands, this requirement translates as strips at least 15 kilometres long if 5 metres wide. In winter the foraging range is extended to about 3 kilometres from the roost site.

Current Highways Factors affecting the Population

Mortality

Collision with vehicles is a major cause of Barn Owl mortality. It has been reported that 72.6% of Barn Owls encountering a major road will be killed and in Devon 49.5% of young Barn Owls are victims of road traffic. Road deaths have more impact on Barn Owls than any other animal.

Barrier

Even though Barn Owls will cross major roads they can act as a partial barrier to dispersal through road mortality.

Disturbance

Major roads will cause the complete absence of breeding Barn Owls within 500 metres of the road, severe depletion of population up to 2.5 kilometres away and with some depletion up to around 8 kilometres distance.

Loss and Fragmentation of Habitat

New road schemes may result in the loss of grassland used by Barn Owls for hunting. New infrastructure may also create a barrier and be the cause of road mortality amongst Barn Owls.

Working with Barn Owls

Surveys

- The site should be viewed with its potential to support Barn Owls, either as hunting habitat or for roost sites. Consultation with the Somerset ECOnet is essential.

Mitigation

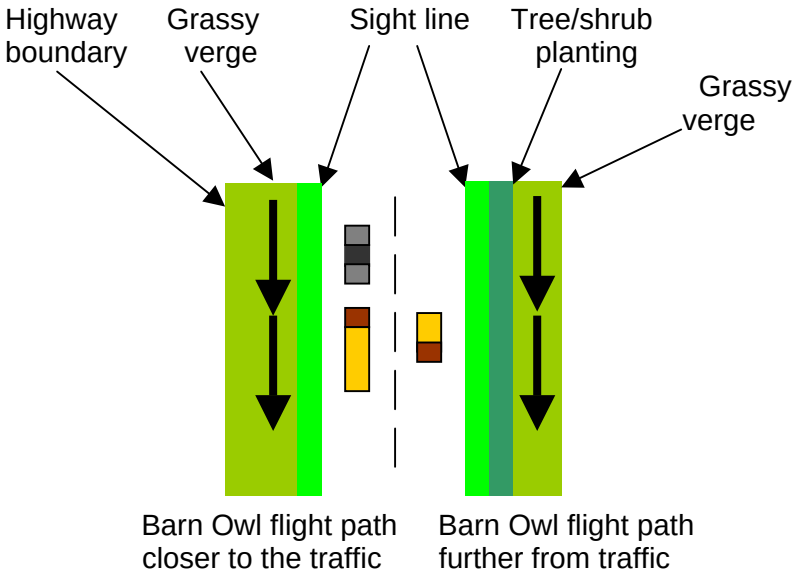
- Record all Barn Owl casualties on Somerset roads

- Where Barn Owl casualties occur consider planting hedgerow, shrubs and trees

to raise the flight height above the level of traffic and to discourage hunting along road verges. If necessary establish hedgerows on top of earth mounds to ensure they are sufficiently high to elevate Barn Owls above high-sided vehicles, which are typically 4 metres in height.

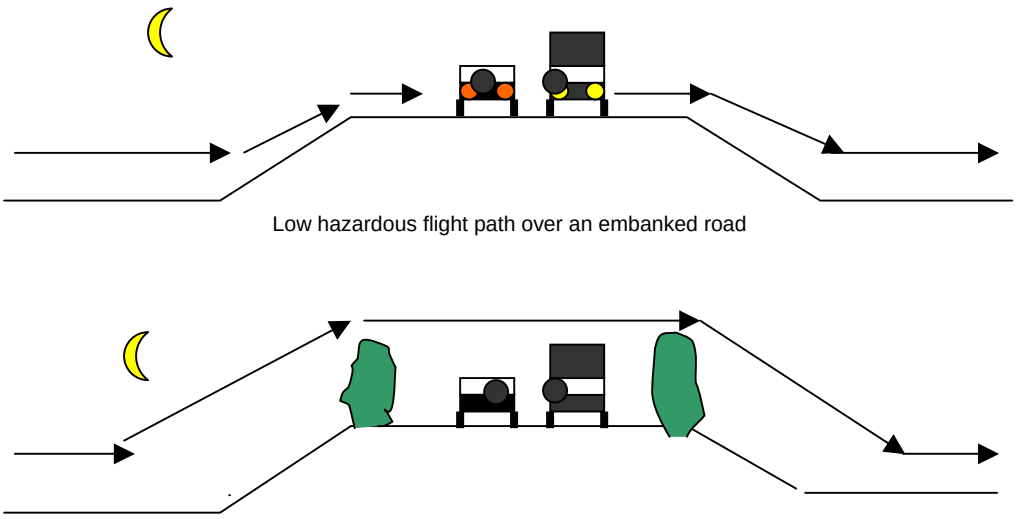
Shrubs/trees should be planted directly adjacent to sight lines where Barn Owls hunt along road verges to establish a protective barrier from traffic reducing the effect of vehicle turbulence (see Figure 1). Vehicle turbulence is believed to knock many Barn Owls to the ground where they die of hypothermia/shock.

Figure 1: Tree/shrub planting adjacent to the sight line as a protective barrier for Barn Owls hunting along grassy road verges (Garland 2002)



- Boundary hedges should be planted on embankments where they do not exist to raise the flight path of Barn Owls over the traffic where necessary.

Figure 2: Barn Owl flight path over embanked roads with and without boundary hedgerows (Garland 2002)



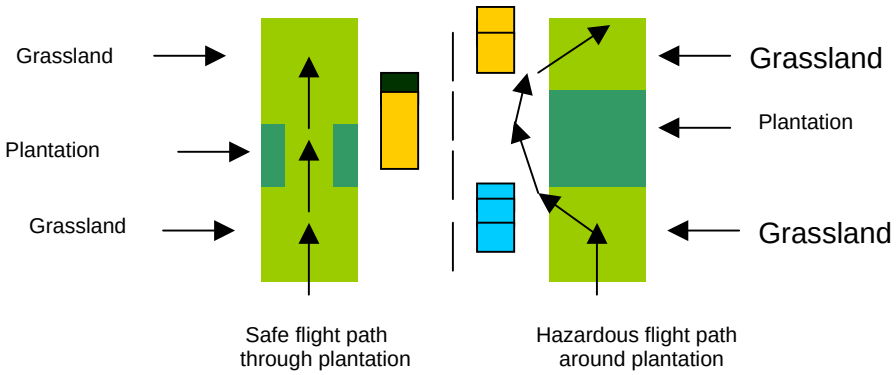
- Fill gaps in existing hedgerows in areas of Barn Owl mortality, as birds passing through hedgerow gaps will be at a lower elevation than those flying over a hedgerow, increasing the risk of collisions with vehicles.

- Alternatively increase grass cutting to make the site unsuitable for Barn Owl prey species

- Maintain the height of existing tall hedgerows along roads within know Barn Owl territories (refer to ECOnet mapping)

- At locations where Barn Owls hunting road verges are forced into the carriageway due to scrub, plantation or woodland seek to establish uninterrupted flight paths. A grassy ride no less than 3 metre wide should be cut through plantation habitat connecting grassland either side in an attempt to discourage Barn Owls from moving off the verge into the road in order to fly out into the road around the plantation (see Figure 3).

Figure 3: Safe and hazardous flight paths of Barn Owls around roadside plantation habitat (Garland 2002)



- Where new infrastructure is planned determine affects of traffic on Barn Owl roosts within 2.5 kilometres. Consider alternative routing, and seek to minimise disturbance and potential road mortality by extensive verge planting.

- Where new infrastructure is planned of the loss of suitable foraging habitat due to new infrastructure and compensate elsewhere through land purchase if necessary

- Liaise with other organizations, such as the Farming and Wildlife Advisory Group to achieve off highway habitat management particularly along wildlife corridors leading to the highway through Environmental Stewardship Schemes.

Potential Enhancement Measures

- At appropriate locations verges can be enhanced by creating habitats of rough grassland for small mammals, which are the prey of the Barn Owls and other raptors. These verges should be wide enough to accommodate a hedge or scrub barrier to prevent Barn Owl casualties.

- Erect Barn Owl nest boxes at appropriate locations. These should never be located on roads with even moderate traffic levels.

Current Action

Road casualty database

Barn Owls are included in the list of species where road casualties are being recorded.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for the Barn Owl is to identify locations where they are the subjects of road mortality and implement measures to mitigate for future losses. The plan also aims to manage its road verges to reduce the risks to Barn Owls from road traffic.

Actions

1. Record Barn Owl road casualties and identify the causes in each case.

2. Implement measures to prevent Barn Owl road mortality through habitat management, including grass cutting and measures set out below

3. Ensure that highways designers, engineers and technicians are aware of Barn Owl roost sites with 2.5 kilometres of the highway and understand the requirements of species.

4. Ensure that new schemes avoid loss or fragmentation of Barn Owl foraging habitat wherever possible and if unavoidable have compensatory habitat incorporated into the scheme design.

5. Ensure that scheme design includes barriers to raise Barn Owl flight paths above the height of high sided vehicles where present

6. Ensure that new hedgerows/ tree lines are planted or existing ones managed at locations where Barn Owls have been killed to prevent potential casualties in the future

7. Create planted barriers along verges that are wide enough to support Barn Owl foraging habitat

8. Consider creating flight paths through areas of scrub or plantation along the highway to avoid Barn Owls having to fly into the path of traffic.

9. Consider erecting Barn Owl boxes at appropriate locations away from trafficked roads

Work with:

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Links with other plans

Somerset Biodiversity Strategy
Mendip local Biodiversity Action Plan

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Chris Sperring MBE, Hawk and Owl Trust ***(awaiting reply)***

Barn Owl photograph courtesy of www.bocn.org
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Reptiles

There are four species of reptile present in Somerset. These are:

- Common (or Viviparous) Lizard (*Lacerta vivipara*)
- Slow Worm (*Anguis fragilis*)
- Adder (*Vipera berus*)
- Grass Snake (*Natrix natrix*)

Current Status

National Status

Although the Grass Snake is widely distributed throughout lowland areas of England and Wales it is undergoing a decline in numbers. The Adder is widespread but rather patchy in distribution being excluded from areas of intensive agriculture, and urban areas. The Slow Worm is found in wide range of sunny habitats through the country including in gardens. The Common Lizard is widespread but patchily distributed.

Adder

An English Nature research report (2004) revealed that Adder populations are in decline and that there have been local extinctions in England over a period of time. The same reported that Slow Worm populations have also been in decline but is now considered to have stabilised.

Legal Status

All species of reptile are protected under the Wildlife and Countryside Act 1981 (as amended) from intentional and reckless killing or injury.

The Grass Snake and the Common Lizard is listed under Appendix III of the Berne Convention, which requires signatories to protect the species. The Slow Worm is also listed under Appendix III of the Bern Convention and is a Species of Conservation Concern under the UK Biodiversity Action Plan, but is not a priority species.

Local Status and Distribution

Somerset Environmental Records Centre (SERC) lists all reptile species as being ‘County Notable’. In addition, the Grass Snake is the subject of a local Biodiversity Action Plan for South Somerset and the Adder is the subject of a local Biodiversity Action Plan in the Quantock Hills Area of Outstanding Natural Beauty (AONB).

Slow Worms and Common Lizard are widespread and likely to occur anywhere within the County, in both rural and urban areas. The Grass Snake is widespread in lowland areas of the County

Habitat and Ecology

Common (or Viviparous) Lizard (*Lacerta vivipara*)

The Common Lizard is found in open habitats such as moors, heathland and natural grassland with sunny aspects and free draining soil. They hibernate from late October to early April in underground burrows or recesses in rocks and logs. They mate in spring and live young are born with a thin membranous egg three months later. Common Lizards are fast moving and feed on invertebrates such as beetles. They frequently bask in sunshine.

Slow Worm (*Anguis fragilis*)

The Slow Worm is found in a wide variety of habitats providing that they offer sunny basking areas. These are typically woodland margins, undisturbed grassland, heathland, road embankments and gardens (where domestic cats are absent). They hibernate between October and April. They mate in late spring and live young are born in early autumn. Their main food is invertebrates, such as slugs and worms, and is probably hunted at night. Slow Worms conceal themselves under ground level debris, woodpiles, rocks, etc

Grass Snake (*Natrix natrix*)

Grass Snakes are an aquatic species found in lowland areas, which have ponds, marshes and fens. Grass Snakes hibernate between October and March/April. Following mating in spring, eggs are laid in a mound of decaying vegetation. The young hatch in July Grass Snakes feed on amphibians and occasionally small fish.

Adder (*Vipera berus*)

The Adder is found on heathland, open woodland, rough and natural grassland, and

in coastal dunes. Adders hibernate between October and March. Following mating in spring the female gives birth to live to about a dozen live young. The adults prefer small mammals as prey, which they use venom to kill following a lunge and bite.

Current Highways Factors affecting Populations

Loss of Habitat

Reptiles would suffer loss of habitat for basking, foraging and hibernating through new highway infrastructure schemes.

Habitat Fragmentation

Similarly existing habitats could be fragmented by new infrastructure especially for species such as Grass Snake and Adders, which may travel several kilometres from hibernating sites to foraging grounds.

Mortality

Reptiles are also susceptible to road mortality, especially where new roads cross migration routes. Reptiles can also be affected by routine maintenance operation in the verge.

Barrier

The installation of kerbs can potentially trap reptiles within the carriageway leading to them becoming road casualties.

Working with Reptiles

Surveys

- Desk study of site to ascertain suitability of habitat for reptiles including consultation with the Somerset ECOnet

- Survey between April and September, particularly during April, May and September when reptiles are most active. These should be carried out between 9 a.m. and 11 a.m. and 4 p.m. to 7 p.m. Earlier in the year reptiles are more likely to be encountered closer to mid day. In hot conditions timing should be earlier in the morning and later in the afternoon. The air temperature should ideally be between 9 and 18 degrees centigrade with little or no wind.

- A walk over survey should be conducted at a slow pace looking 3 to 4 metres ahead. If rustles are heard return to the same spot 10 minutes later. Also look for shed reptile skins. A minimum of ten site visits should be made. Surveys should also be combined with the use of refugia.

- Refuges, of corrugated iron or roofing felt, should be placed at about 10 metres apart on a grid. These should be about 0.5 to 1 metre square. Ideally these

should be placed on site in the previous winter. These should be checked fifteen to twenty times between April and October and any reptiles found recorded.

Mitigation

- In areas where present design schemes to prevent reptiles being trapped by kerbing

- Avoid habitat if possible by altering scheme layout

- On sites where reptiles could be present vegetation clearance in preparation of works will need to be programmed to take place between October and February when reptiles are in hibernation. The area of proposed works would be made sub-optimal for reptiles by cutting all Bramble, other scrub, grass and herbs down to ground level using steel bladed strimmers. Most reptiles would be expected to emerge from hibernation sometime during March.

- At the beginning of April any significant vegetative re-growth will need to be removed and cut down to ground level to retain the area in an unsuitable state for reptiles from all potential habitats. Leave two small islands consisting of vegetative cuttings, each measuring approximately 2 metres in diameter within the area of proposed works. All other arisings from the vegetative clearance would be removed from site. The aim of this is to encourage any reptiles that are still within the area after fencing to move toward these islands where they can be caught beneath strategically placed reptile refuges.

- Following the April vegetative clearance, reptile fencing would be installed around the cleared area. The fence installation would follow any second clearance of vegetation by around five days, which is considered sufficient to allow the majority of any remaining reptiles time to move away from the area of proposed works in search of adjacent cover. A specialist contractor would be employed to install the fencing. Large pieces of rubble and other debris, beneath which reptiles can shelter, would also be picked up by hand and removed to the development boundary in a wheelbarrow. Rubble and debris will not be cleared in winter as hibernating reptiles might be disturbed and their welfare compromised.

- The fence will be checked on a regular basis to ensure that it has not been vandalised and would remain in place until just prior to the commencement of works. Fencing the site ensures that it remains reptile free if the scheme is delayed for any reason.

- Between early April and mid May, any reptiles within the fenced reptile exclusion areas that were not originally displaced by the vegetation clearance will be captured and translocated. Refuges will be installed and regularly checked in suitable survey weather conditions, until five visits have been made during which no reptiles are caught. Translocated reptiles should be moved to suitable receptor sites and the process should include consideration given to habitat crowding. Habitat enhancement suitable for reptiles might be required to accommodate the translocated reptiles.

- Works could begin in mid May given no other wildlife constraints in the areas concerned such as Badgers.

- Those in charge of the development will ensure that clear instructions are given

to the whole workforce to the potential presence of reptiles, the mitigation measures employed and the legal requirements appertaining to their welfare.

- If reptile species were discovered during the course of construction, work would need to be suspended until their habitat is cleared. Vegetation would be cleared and grassy areas cut in appropriate weather conditions – warm, dry and still. Machinery used would be hand held and the vegetation will be cut back in stages, starting with a high cut. A second cut will take place at least 24 hours afterwards to allow the animals to move away. Reptiles generally avoid exposed areas cleared of vegetation and will stay in remaining cover. Sections worked will be cut from the middle outwards. Vegetation will kept low until construction resumes. Any shelter for reptiles, such as piles of stone and rubble will be dismantled by hand.

Potential Enhancement Measures

- Create south facing banks suitable for basking
- Plant mosaics of shrubs and grassed areas
- Create refuges by leaving piles of logs and rocks, including materials obtained through works on site

Current Action

Road casualty database

Grass Snakes and Adders are included in the list of species of road casualties being recorded.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for reptiles is to protect and enhance existing habitat within highway limits.

Actions

- Ensure that Highway's officers and operatives are aware of sites supporting reptiles and understand the requirements of these species.
- Ensure that new schemes avoid reptile habitat wherever possible and if unavoidable have appropriate mitigation incorporated into the scheme design.
- Where impacts are unavoidable ensure that adequate surveys are carried out well in advance of the scheme and that additional habitat to support any translocated reptiles is in place
- Consider creating basking sites on south facing embankments

- Manage and provide planting on highway land to enhance existing habitat for reptiles at appropriate locations.

- Provide log piles and rocks as refugia at appropriate locations.

Work with:

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Links with other plans

Somerset Biodiversity Strategy
South Somerset Biodiversity Action Plan
Quantocks AONB Biodiversity Action Plan

Acknowledgements

Paul Newman, Somerset Reptiles and Amphibian Group ***(awaiting reply)***
Adder photograph courtesy of the Quantocks AONB Service

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Amphibians

There are five species of amphibian present in Somerset. These are:

- Great Crested (or Warty) Newt (*Triturus cristatus*)
- Palmate Newt (*Triturus helveticus*)
- Smooth Newt (*Triturus vulgaris*)
- Common Toad (*Bufo bufo*)
- Common Frog (*Rana temporaria*)

Current Status

National Status

Great Crested Newts is vulnerable to loss of habitat and has undergone a major decline in the UK mainly through changes in agricultural practice and loss of ponds. Populations in Britain of Great Crested Newts are significant in European terms. Both of the other species of newt and the Common Toad are common and widespread in the UK although populations have undergone local declines. The Common Frog is found in a wide range of habitats throughout the UK and, although has undergone a sharp decline, has recovered with the popularity of garden ponds being more adaptable to change than other species.

Great Crested Newt

Legal Status

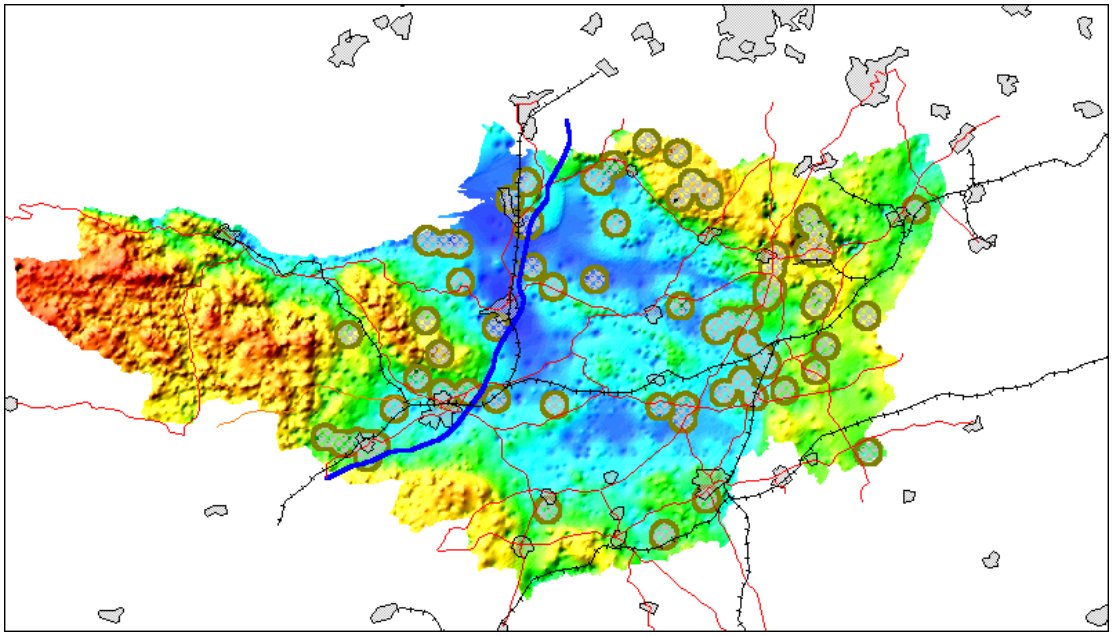
The Great Crested Newt is afforded protection under European community legislation by Directive 92/43/EEC on the 'Conservation of natural habitats and wild flora and fauna' (the 'Habitats Directive') being listed in Annex IV; and the Wildlife and Countryside Act, 1981 (as amended), listed on Schedules 5.

The Great Crested Newt is also the subject of a UK Species Action Plan. It is on the International Union for the Conservation of Nature's Red List of species being 'conservation dependant', and is listed in Appendix II of the Bern Convention.

The Common Toad is classified as a Species of Conservation Concern under the UK Biodiversity Action Plan (UK BAP), but is not a priority species. All other amphibian species are unlisted or unclassified.

Local Status and Distribution

In Somerset the Great Crested Newt occurs frequently locally east of Exmoor although it is widespread. Other amphibian species are found throughout the County.



Potential distribution of Great Crested Newt 2004[2]

Habitat and Ecology

Amphibians congregate between February and June for mating and egg laying following their emergence from winter hibernation. They may be observed in large number migrating between their terrestrial habitat and ponds. Common Toads are known for their mass migrations

Tadpoles develop, grow legs and emerge onto land during the summer and autumn, dispersing back to suitable habitat away from breeding ponds. They return to their place of birth to breed after two or three years.

Amphibians spend most of the year in terrestrial habitat and need damp moist conditions such found in woodland, under hedgerows, scrub and log piles. Frogs are found in rough grassland

Great Crested Newts require larger ponds or a group of ponds that are free from fish. Both other species of newt prefer small pools and ponds and Smooth Newts will use ditches and garden ponds. Common Toads and Common Frogs make use of ponds; lakes and reservoirs to breed and the latter are even known to breed in woodland puddles. Generally amphibians prefer ponds that are not too heavily choked by plants or silt and lack shading by trees

Amphibians diet consists of a variety of invertebrates.

[2] Note: This map is intended only as a guide to where Great Crested Newts may be found. Other sites have been recorded since, e.g. east of Cotford St Luke

Current Highways Factors affecting Populations

Loss of Habitat

Amphibians are reliant on a combination of habitats, terrestrial or land habitats, such as hedgerows, and aquatic habitats, such as ponds, being within migratory distance of each other. If either one is lost the other will be rendered untenable resulting in loss of the local population potentially over a large area.

Habitat Fragmentation

Amphibians are vulnerable to severance of their breeding habitat from terrestrial habitat and will case the population to decline. They will continue to use traditional routes and may incur mortality from road traffic or from exposure to predators whilst crossing the new road or other infrastructure.

Mortality

Amphibians are very susceptible to road mortality, especially where new roads cross migration routes. This is most obvious in March. Amphibians can also be affected by routine maintenance operation in the verge, especially during periods of migration between terrestrial and aquatic habitats.

Barrier

The installation of new kerbs can potentially trap reptiles within the carriageway leading to them becoming road casualties. Road gullies are also death traps to migrating amphibians.

Changes in Hydrology

Changes to hydrology may occur as result of new road infrastructure or from maintenance operations resulting in the raising or lowering of water levels in breeding ponds that may be critical to some amphibian species.

Working with Amphibians

Surveys

- Desk study of site to ascertain suitability of habitat for amphibians including consultation with the Somerset ECOnet for Great Crested Newts.

- Surveys on ponds may be carried out between mid March and mid August, dependant on weather conditions. Adults may be surveyed between mid March and mid June, eggs between April to mid June and tadpoles between mid May and mid August. A minimum of four visits is required. There are several survey methods:

    - Torchlight survey – during breeding season (No licence required if animals are not disturbed)
    - Bottle trapping – particularly between March and April

    - Egg searches
    - Netting – for tadpoles

- Terrestrial habitat surveys for Great Crested Newt and other amphibians can be undertaken within 500 metres of a breeding pond. These are carried out between March and September by using pitfall traps and amphibian fencing. Hot or dry weather is unsuitable survey weather. Refugia may also be set out using carpet tiles, which are then checked for presence. Sixty visits are required.

- A licence is likely to be required when surveying for Great Crested Newts.

Mitigation

It should be noted that mitigation would need to be designed on a case-by-case basis.

- At known migration sites schedule grass cutting to avoid potential injury/ mortality to amphibians through designating as Special Road Verges

- In areas where present, design schemes to prevent amphibians being trapped by kerbing and drainage systems. Sustainable drainage systems should be used

- Avoid habitat loss or fragmentation if possible by altering scheme layout

- If unavoidable mitigation and compensatory measures should be implemented at least one year prior to the scheme being started

- Amphibian fencing may be necessary to prevent animals from using the highway where sufficient habitat to maintain a population is available or has been created on one side of the new infrastructure

- Any vegetation clearance in areas where amphibians are present should be done by hand during the autumn when animals are still active but not breeding. February/ March and late summer should be avoided. Vegetation should be left at a height of 10 centimetres. Any refuges, log piles, rocks, etc should also be done by hand.

- Where amphibian habitat is unavoidably severed the construction of amphibian tunnels with lead in fencing under the road should be implemented.

- Where habitat is lost compensatory habitat will need to be constructed and established prior to work commencing on site. This can mean the creation of ponds and land habitats with dense ground cover. For every pond lost at least two should be created. This may need to be carried years in advance of the scheme.

- Amphibians should only be translocated as a last resort. Amphibians should be translocated and capturing should take place over at least a 30-day period. Where there are large populations this period should be extended to three years. Translocations of the adult Great Crested Newt is not generally successful as they habitually use traditional sites returning always to the site of their nativity. Therefore Great Crested Newt eggs and larvae should be moved to the new site.

- Where destruction of ponds is necessary this should take place between

November and January and drained to minimise risk of injury to any over wintering animals.

Potential Enhancement Measures

- Create ponds or groups of ponds
- Plant mosaics of shrubs and grassed areas
- Create wildlife corridors to create new links into wider countryside
- Create refuges by leaving piles of logs and rocks, including materials obtained through works on site

Current Action

Hawkridge Reservoir

The Hawkridge Reservoir in the Blackdowns hosts one of the largest spawning sites for Common Toad in the County. A number of measures are being implemented to reduce the number of road casualties. The site has seasonal warning signs for drivers, kerbs heights have been adjusted and holes in walls are being enlarged to accommodate the species when mating. Netting has also temporarily been paced over gully tops to prevent animals falling into them during the migration season. It is planned to erect an information board about amphibians using the site.

Silk Mills Park and Ride Site

A number of ponds have been created as a result of flood attenuation measures at Silk Mills. It is hoped that these in time will host amphibian breeding sites.

Toad Crossing Signs

Toads crossing warning signs have been installed recently at West Hatch. Another potential site is being investigated near Courtway in the Quantocks.

Road casualty database

Amphibian species are included in the list of species of road casualties being recorded.

Action Plan Objectives and Targets

Objective

The aim of the Somerset Highways Species Action Plan for amphibians is to protect and enhance existing habitat within highway limits and to limit road mortality resulting from migratory behaviour.

Actions

- Ensure that Highway's officers and operatives are aware of sites supporting amphibians and understand the requirements of these species.

- Ensure that adequate surveys are carried out well in advance of a scheme.

- Ensure that new schemes avoid amphibian habitat wherever possible and if unavoidable have appropriate mitigation incorporated into the scheme design. Awareness should also be made of the periods of time required to carry out mitigation, often well in advance of scheme implementation.

- Ensure that additional habitat created for translocated amphibians is in place and has developed to support the removed population.

- Consider measures on a site-by-site basis where amphibians are known to be crossing the highway, including the erection of warning signs and the scheduling of grass cutting to avoid peak migration periods in the summer.

- Provide log piles and rocks as refugia at appropriate locations.

Work with:

Somerset Reptile and Amphibians Group – Paul Newman, Hill View, Street-on-the-Fosse, Pylle, Shepton Mallet, BA4 6ST. Tel: 01749 830700

Links with other plans

Somerset Biodiversity Strategy

Acknowledgements

Paul Newman, Somerset Reptiles and Amphibian Group ***(awaiting reply)***
Map from Somerset Environmental Records Centre

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Somerset Environmental Records Centre
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Farming and Wildlife Advisory Group
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Royal Society for the Protection of Birds
RSPB Somerset Office, Dewlands Farm, Redhill, Curry Rivel, Langport, Somerset, TA10 0PH. Tel: 01458 252841

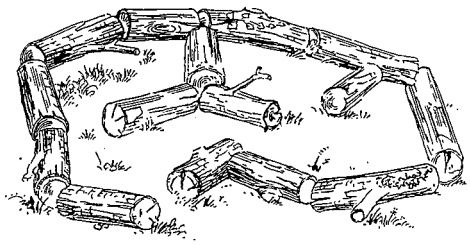
Appendix 1: Otter Holt Construction

Log pile holt design specification (RSNC, undated)

The objective is to provide a number of interconnecting chambers, which are dark and reasonably dry. Construction of the Holt should be in three stages, which are described in text and graphically as follows:

1. Place logs to form chambers of about 1m square. Two to eight chambers can be included. Leave gaps of about 15-20 centimetres round as entrances. One or two entrances should be immediately on the pond's edge, with other entrances onto the land.
2. Use poles across the logs and chambers to form the roof. Small pieces of wood can be used to fill the gaps to make the chambers darker and more water resistant.
3. Pile brashings on top of the structure to completely hide the logs and poles and make the chambers dry and dark. It is best to break or saw branches so that they lie flat and pack down. Lay branches stems inwards, with smaller branches and fronds overlapping logs and poles to form an outer fringe. If the site is liable to flooding, stretch sheep netting over the brashings and stake netting down on both sides of the holt. Wooden stakes can be made on site. Place more brashings on top to hide the wire.

1.



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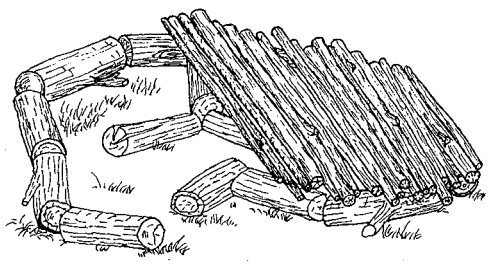

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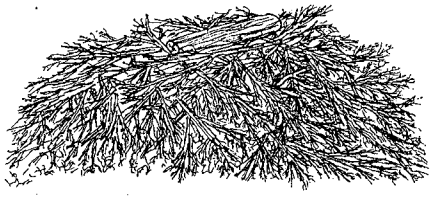

Appendix 2: Bat Underpasses

The following table lists the size of culvert required by various bat species. Lighting should not be used. Linking to guide-in structures is essential. Tunnels can be up to 30 metres long. (Brinkmann, Dr. R., 2003)

Species	Watercourse	Terrestrial
Greater Horseshoe	Size of farm vehicle underpass – little data – probably less*	
Lesser Horseshoe		
Daubenton's	1.5m above Mean Water Level (MWL), 1.5 to 2 metres wide	4.5 m high, 4 to 6 metres wide on land
Brandt's	Largest possible culvert	4.5 m high, 4 to 6 metres wide
Whiskered Natterer's	1.5m above MWL, 3 to 6 metres wide	4.5 m high, 4 to 6 metres wide
Bechstein's Barbastelle	-	4.5 m high, 4 to 6 metres wide
Noctule Serotine Pipistrelle	-	4.5 m high, 4 to 6 metres wide
Brown Long-eared Grey Long-eared	Slightly smaller than 4.5 m high, 4 to 6 metres wide	4.5 m high, 4 to 6 metres wide

* Greater Horseshoe Bats have been recorded using a stream culvert under the road at Bulls Green.