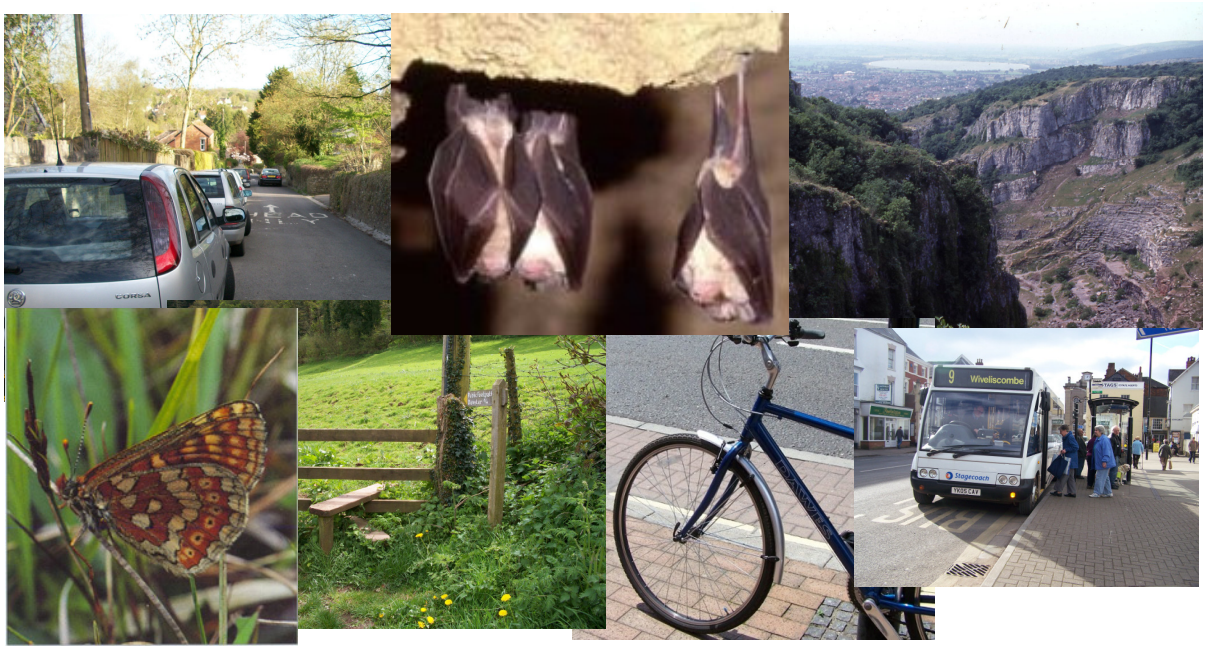
SOMERSET COUNTY COUNCIL

TRANSPORT POLICIES

Schedule of Policies



HABITATS REGULATIONS ASSESSMENT

October 2010

Executive Summary

This report contributes to Somerset County Council's legal obligation under The Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') to carry out a Habitat Regulations Assessment (HRA) on its plans for affects on Natura 2000 sites. In this case it is the draft Transport Policies – Schedule of Policies October 2010 (TPSP) following assessment of the draft Future Transport Plan in June 2010.

Natura 2000 sites consist of Special Areas of Conservation (SAC) designated for habitats and animal species, and Special Protection Areas (SPA) designated for bird species. Ramsar sites designated under the Ramsar Convention on Wetlands 1971 are also included following Government policy.

Before a plan can be adopted the 'competent authority' (Somerset County Council) needs to prove that the plan would have no significant effects on the integrity of Natura 2000 sites. An uncertain result is not acceptable and is treated as adverse until proven otherwise.

A previous HRA report (June 2010) screened policies in the draft Future Transport Plan to determine whether there is any potential for a significant effect on Natura 2000 sites from them, either directly or indirectly, and in combination with other plans and projects. This resulted in the following recommendations to ensure compliance with the Habitat Regulations:

1. Policy 17

   Concerning support for biofuel production and potential impacts on several SACs supporting bat populations.

   Add to policy statement
   '*Supporting the advancement of biofuels*…' after '…*sustainably*…' the following:

   '… *Habitats Regulations (2010) compliant* …'

   Add text
   At the end of paragraph beginning '*As new technologies, such as electric vehicles or alternative fuels*…' add text:

   '*Nonetheless,* b*efore supporting new technologies we also need to ensure that wildlife species and habitats that are sensitive to changes in land use be considered and that the provisions of the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') are complied with*.'

2. Policy 19

   Concerning access to the Public Rights of Way network and its promotion and mapping including on websites and recreational impacts on habitats and species from several Natura 2000 sites.

Add an additional policy

'*Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites and that where this is likely to occur the route is not promoted or mapped including on websites*.'

Add Text
Add to text in Public Rights of Way section to paragraph beginning. '*Our plan for improving Rights of Way…*' after '*…duties that we must perform…*' the words:

'*…the Habitats Regulations…*'

3. Policy 24
Concerning North Petherton Bypass and potential effects on barbastelle bat habitat and behaviour from the Exmoor & Quantocks Oak Woodlands SAC.

Amend Policy
Amend policy, '*Northern Petherton Bypass*' to:

'*North Petherton Eastern Bypass*'

4. Policy 25
Concerning new access and link roads and possibly a park and ride site and potential effects on lesser horseshoe bat habitat and behaviour from the Hestercombe House SAC,

Add to policy statement
Add to '*New access and link roads to facilitate development*' the following wording,

'*…but which are also routed to avoid impacts on Hestercombe House SAC*'

Add Text
Add to text in Bridgwater, Taunton and Wellington Future Transport Strategy after paragraph beginning with, '*Somerset authorities have been planning…*' a new paragraph:

'*However, new access and link roads and any other infrastructure serving development may have impacts on the habitat use and behaviour of lesser horseshoe bats from the Hestercombe House Special Area of Conservation (SAC) in the area north of Taunton from Monkton Heathfield to Staplegrove. Any proposal would have to ensure that there is no adverse effect on the maintenance of the population of lesser horseshoe*

bats in order to comply with the Habitats Regulations.'

This HRA assesses the draft TPSP (October 2010), which updates the Future Transport Plan. The draft Transport Policies – Schedule of Policies contains consolidated, revised and additional policy that now needs to be screened in order that this stage of the plan development is compliant with the Habitat Regulations.

For the sake of completeness descriptions of the Natura 2000 sites potentially affected and description of the effects of transport on wildlife is given again. This is followed by analysis of each policy in the report is carried out which can result in amendments or additions to policies to ensure compliance with the Habitat Regulations.

Following screening of the policies contained in the TPSP the following policy amendments and/or additions are recommended to ensure compliance with the Habitat Regulations before submission.

Policy 7: Cycling

Add to Policy 13 Landscape and Biodiversity

Amend policy text to read:

> **'***Ensure that any walking…'* **and** / **or cycling routes** *'… considered does not lead to increases in habitat…'* **fragmentation**, *'… degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites and that where this is likely to occur the route is not promoted or mapped including on websites.'*

Annex B: Taunton

Add to policy statement

Add to '*New or enhanced Pak and Ride*' the following wording,

> **'…which is located to avoid impacts on Hestercombe House SAC'**

In conclusion, it is the consideration of Somerset County Council that, providing the counter acting measures set out in this report are applied to the Transport Policies – Schedule of Policies, there is unlikely to be a significant effect on the Natura 2000 site network.

Contents

1. Introduction

1.1 This report details the findings of the Habitat Regulations Assessment (HRA) process of the Somerset County Council's draft Transport Policies – Schedule of Policies, October 2010 (TPSP). As the 'competent authority' under the Conservation of Habitats and Species Regulations 2010 (The Habitats Regulations) Somerset County Council is required to assess the TPSP through the HRA process as policies and infrastructure schemes in the plan can potentially affect Natura 2000 sites.

1.2 The TPSP covers the time period from 2011-2026 and replaces Somerset's second Local Transport Plan (LTP2) which finishes in March 2011.

1.3 Natura 2000 sites include European Sites - Special Protection Areas (SPA) classified under the EC Birds Directive 1979 and Special Areas of Conservation (SAC) and candidate Special Areas of Conservation (SAC) designated under the EC Habitats Directive 1992, and, as a matter of Government policy, all Ramsar sites as if they are fully designated European Sites for the purpose of considering development proposals that may affect them.

1.4 The definition of 'Habitat Regulations Assessment' is simply an assessment, which must be appropriate to its purpose under the Habitats Directive and Regulations. According to the Habitats Regulations 2010, regulations 61(1), before authorising a plan that is likely to have a significant effect on a European site, and is not connected to the management of the site, the Council shall assess the implications for the site in view of its conservation objectives.

1.5 The purpose of HRA of land use plans is to ensure that protection of the integrity of European sites (Natura 2000 sites) is a part of the planning process at a regional and local level. The requirement for a HRA of plans or projects is outlined in Article 6(3) and (4) of the European Communities (1992) Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (known as the 'Habitats Directive').

2. The Habitat Regulations Assessment Process

Steps in the Habitat Regulations Assessment Process

2.1 The Department for Communities and Local Government's (DCLG) consultation document '*Planning for the Protection of European Sites: Appropriate Assessment*[1]' (August 2006) gives three main tasks to the HRA process:

- Likely significant effects
- Appropriate assessment and ascertaining the effect on site integrity
- Mitigation and alternative solutions

2.2 The process is further detailed in '*The Appropriate Assessment of Spatial Plans in England*', published by the Royal Society for the Protection of Birds (Dodd *et al*, 2007).

2.3 The RSPB guidance (2007) sets out a 3-step approach to appropriate assessment as follows.

> **Step 1: Screening for likely significant effects.**
> This is the initial evaluation of a plan's effects on a Natura 2000 site. If it cannot conclude there will be no significant effect upon any Natura 2000 site, an 'Appropriate Assessment' is required. In the DCLG guidance this is called evidence gathering.
>
> **Step 2 Appropriate Assessment – scoping and further information gathering**
> Preparation for the AA where the screening has shown there is likely to be significant effects upon a Natura 2000 site.
>
> **Step 3 Appropriate Assessment**
> An evaluation of the evidence gathered on impacts and consideration of whether changes to the plan are needed to ensure that it will have no adverse effect upon any Natura 2000 site. This should be the end of the HRA process and the plan can be adopted.

2.4 This report contains Step 1 of the process and compiles information in order to assess the likely effects of potential policies and proposals contained within the TPSP on Natura 2000 sites alone, or in combination with other plans or projects.

[1] The term 'Appropriate Assessment' is often used to refer to the whole 'Habitat Regulations Assessment' process.

2.5 Natural England and other relevant stakeholders will be consulted on the screening opinion to ensure all elements of the plan are considered which, either alone or in-combination, have the potential for a significant effect on relevant sites. This will help the Council identify potential impacts, likely pathways for those impacts and key indicators to be used for identifying impacts. The screening should therefore look at the significant effects of the plan objectives and of each individual policy.

Precautionary Approach

2.6 When carrying out this screening, it must be viewed as a coarse filter and therefore a 'Precautionary Approach' has been taken in the assessment of significance. The EC Guidance sets out a number of principles as to how to approach decision making during the process. The primary one is the 'Precautionary Principle', which requires that the conservation objectives of Natura 2000 sites should prevail where there is uncertainty. In other words if the answer is 'don't know' an adverse impact is assumed. This is the case throughout the HRA process.

Definitions

2.7 Once potential impacts have been identified, their significance will be considered. A judgement about significance is made in relation to the conservation objectives and targets using the Precautionary Principle.

2.8 "Significant" is interpreted as an effect likely to adversely affect a Natura 2000 site's integrity. A useful definition of what a significant effect is contained in an English Nature guidance note[2] on the subject: "…*any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects.*"

2.9 "Integrity" is described in ODPM Circular 06/2005: Biodiversity and Geological Conservation as '*the site's coherence, ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of species for which it was classified*' (ODPM Circular 06/2005, para. 20).

2.10 Significance will vary from site to site according to conservation sensitivities and magnitude of the potential impact. Assessment is triggered by likelihood not certainty in line with precautionary principle.

[2] English Nature. 1999. *Habitats Regulation Guidance Note 3: The Determination of Likely Significant Effect under The Conservation (Natural Habitats &c) Regulations 1994.*

(European Communities, 2000) Therefore, the assessment considers whether effects are 'likely' and 'significant' and not every conceivable effect or fanciful possibility. The Waddensee tests are used:

- Would the effect undermine the conservation objectives for the site?
- Can significant effects be excluded on the basis of objective information?

2.11 Significant effects are also determined in-combination with other plans or projects and take account of cumulative effects.

Screening Report Methodology

2.12 This screening report contains the following sections:

- Considers the potential impacts on nature conservation interests from transport.
- Includes the following information for the Natura 2000 sites in Somerset or outside the County where there is potentially a significant effect:
- Why the site is important for wildlife, i.e. the features (species and habitats) for which the site was designated;
    - The conservation objectives for the site;
    - The latest assessment of the sites ecological condition; and
    - Any particular problems or sensitivities of the site's features that could be affected by a plan's policies or proposals
- The report also outlines the Ecological Zone of Influence of each Natura 2000 site. Many Natura sites support features, which are dependant on ecological conditions outside the designated area to maintain the integrity of the conservation objectives for which the site is listed.
- The HRA screens each of the policies and infrastructure schemes for potential effects on Natura 2000 sites.
- Counter-acting Measures, where required, are recommended for incorporation into the development of the draft Transport Policies – Schedule of Policies.
- Where counter-acting measures are not sufficient to mitigate for the

effects of the plan on Natura 2000 sites further work is scoped for a Stage 2 Appropriate Assessment.

3. Potential Impacts of the Transport Policy on Ecology

Introduction

3.1 Transport and its infrastructure can potentially cause severe adverse affects on species and habitats, including the nature conservation interests of Natura 2000 sites. These can be loss, fragmentation or degradation of habitat, or indirect such as emissions from the transportation and street lighting.

Potential Effects from Transport and its Infrastructure on Ecological Features

Introduction

3.2 This section considers further the potential ecological impacts of transport and its infrastructure and the distances from them that environmental affects are likely to occur. The distances will be used in considering impacts that may affect a Natura 2000 site and areas supporting ecological functioning arising from transport, and are explained in the following sections.

3.3 The affects considered are:

- Disturbance
- Habitat Loss
- Habitat Fragmentation
- Habitat Isolation
- Barrier Effects
- Air Pollution
- Hydrological Changes
- Soil Changes
- Introduction of New Habitats

Disturbance

3.4 Changes in patterns of human activity and associated disturbance or damage can disturb species and effect ecosystems. Such disturbance includes increased public access to sensitive sites. The presence of vehicles and/or humans can cause visual disturbance to some species, for example to wading birds (Treweek, 1999; Evink, 2002; Seiler, 2002).

3.5 The introduction or increase in human activity in an area can affect sensitive species by reducing the amount of time spent on essential activity such as feeding or rearing young, and can lead to displacement, declines in populations or even local extinction. Where

there is an open aspect, such as on the Somerset Levels and Moors human activity may cause disturbance affecting behaviour of sensitive birds. For example, shorebirds can be disturbed at distances of 400 metres by the presence of humans. (Goss-Custard, 2005).

3.6 Another example is otters. Anecdotal evidence suggests that otters are not seriously affected by disturbance from anglers, walkers and dogs. Otters do not appear to avoid houses, industry, roads and campsites Although individual otters do not appear to be influenced by short periods of disturbance there is a lack of information on how sustained levels of disturbance influences female otters with young. (McCafferty, n/d)

3.7 Traffic noise has been shown to affect the behaviour of species, e.g. bird densities decline where noise is over 50 dbA. Dutch and Swedish research (Reijnen et al, 1995; Helldin & Seiler, 2003) into breeding bird populations has shown an increased shift away from roads according to the amount and speed of traffic.

3.8 Street lighting is known to effect wildlife by altering nocturnal conditions. Street lighting can disturb the diurnal rhythm of species. Many of the species, including otters and bats are sensitive to artificial lighting. Indeed, the introduction of street lighting can have significant effects on their behaviour, cause loss of access to feeding areas and resting areas, and hence affect the viability of populations. (Outen, 2002; Stone, 2009).

Habitat Loss

3.9 Habitat loss is a major threat to species. In some cases it is directly linked to mortality, and in other cases survival depends on the ability of displaced species to locate alternative habitat. Species require minimum habitat to maintain their populations and it is difficult to assess the impacts of any single scheme. Size of habitat left after loss is also important for species diversity, as there is a threshold for many species that makes smaller patches unviable. The spatial placement of habitat is also important (Treweek, 1999; Evink, 2002; Seiler, 2002).

3.10 The effects may be local or on a larger geographic scale. Delayed effects of habitat loss are probably common but rarely analysed in ecological impact assessments. Species are not only threatened by habitat loss but also by reorganisation of land use and by reduction in size of habitat patches. (Treweek, 1999)

Habitat Fragmentation

3.11 Fragmentation is the breaking down of habitat units into smaller units of habitat. It is linked to changes in quality and quantity. These could include increase in edge effects, reduction in size of habitat and changes in species composition. (Treweek, 1999)

3.12 A key issue in a fragmented landscape is the ability of species populations to survive in and move between small isolated habitat patches scattered within an urban and agricultural landscape. Research has shown that habitat size and wildlife corridors are of vital importance to nature conservation, and to a thriving and diverse wildlife (English Nature, 1996; Dufek, 2001; Evink, 2002). The value of a large area of semi natural habitat outweighs its division into smaller areas where alterations, for example to light, hydrology and levels of disturbance can have a radical effect on species survival. Fragmentation into smaller areas can lead to extinction of predators, larger species and habitat specialists as well effecting pollination in flora – for example Bluebells produce less seed in smaller areas. Road construction and widening would increase fragmentation effects (Treweek, 1999; Evink, 2002; Seiler, 2002).

3.13 The reduction in habitat area would be less able to support a level of population prior to the land use change and may result in inbreeding to genetic problems and eventual local extinction. (Treweek, 1999)

Barrier Effects

3.14 Linear development, such as new roads and even cycleways, can form barriers, which prevent the movement of wildlife through the landscape. This is a particular problem for migrating species. Many amphibians use different habitat at different seasons of the year. Barriers can cause traffic casualties or reluctance in a species to cross it. Small mammals will not cross roads of 20 to 25 metres wide. Traffic density also forms part of the ability of species to cross roads. (Treweek, 1999)

3.15 Wild flowers, invertebrates, amphibians, reptiles and small mammals will be affected by the presence of a road. Those species, which are unable or reluctant to cross roads, will become isolated and hence loose genetic diversity. This isolation could also lead to in the long term the local extinction of some species, which in turn may affect others up the food chain. The creation of barriers or other obstacles affecting the movement of animals may be caused by cumulative development, be it roads and/or housing, within a species range. Road casualties are a significant cause of fauna mortality. In Somerset, Otters are increasingly becoming victims of vehicle collision. Road mortality continues for decades after construction (Treweek, 1999; Evink, 2002; Seiler, 2002) and numbers of casualties counted are often under estimated (Slater, 2002).

Habitat Isolation

3.16 Habitat Isolation is the combined effect of habitat loss, fragmentation and isolation. It affects the genetics of a population if it cannot interact with populations elsewhere which can have a long-term effect on viability.

3.17 In general, consequences are:

- Loss of key species (species on which the ecology of other species depend); Reduction or extinction of species at newly formed edges, increased vulnerability to external influences such as disturbance, increased likelihood of invasion by uncharacteristic species;
- Inbreeding;
- Loss of characteristic species; and
- Increased vulnerability to stochastic events, e.g. climate change.

(Treweek, 1999)

3.18 Limitations on genetic exchange and response to climate change may have on effect on the population of the species maintained. This isolation can result in a 'sink' where a population is growing but there is not sufficient to support this increase and there is no route out of the area to enable migration (Hanski, 1999).

Changes in numbers of predators and/or prey

3.19 Direct loss or change of habitat due to road building will affect the numbers and types of prey available. The increased numbers and speed of road traffic will affect airborne invertebrate and small bird populations. Small mammals may eventually increase in the road verge but this would then attract predators, such as Barn Owls, resulting in increased death to these species from traffic collisions (Treweek, 1999; Ramsden, 2004).

3.20 Street lamps can also have an effect on prey availability to bats (Outen, 2002; pers. comm. Emma Stone, University of Bristol). Whereas they do not sustain insect populations *per se* but attract insects from the surrounding natural environment. Therefore, as a consequence of attracting the insects deplete prey availability for light sensitive bats in surrounding zones.

Mortality

3.21 Some animals attempt to cross roads. This can arise out of fragmentation caused by new building. This includes many rare species such as bats, otters and amphibians trying to reach breeding ponds. Mortality affects animals of all sizes from insects up to deer. (English Nature, 1996)

3.22 National statistics suggest that 47,000 badgers (25% of the population) and between thirty and seventy million birds are killed annually on UK roads for example (English Nature, 1996). In Somerset around 25 to 30% of the otter population has been killed on roads in one year (pers. comm., Somerset Otter Group). Apart from numerous wildlife casualties, collisions with wildlife are also a cause of road traffic accidents. In Somerset there are on average 10.9 injury accidents per

annum involving wild species (Somerset Highways, accident data).

Air Pollution

3.23 Road transport is the source of a number of airborne pollutants. The impacts of nitrogen and nitrogen oxides deposition on vegetation growth are of particular concern. Transport produces other pollutants including sulphur dioxide, ozone and particulates. Air pollution has been linked to ill health amongst trees, particularly over mature specimens, and also a failure to regenerate, either from coppice, pollard or seed. In grassland nitrogen loving species will suppress sensitive flora. Lichens and bryophytes are particularly sensitive.

3.24 The Habitat Regulations Assessment of the draft Regional Spatial Strategy for the South West (2006) considered 200 metres as the outer distance from a road where nitrogen deposition is expected to occur. Bignall *et al*, (2004) consider that 150 metres air quality returns to background levels. The greater distance is used, as a precautionary approach is required.

Hydrological changes

3.25 Changes in hard surface runoff may leads to changes in flow patterns in watercourses (storm water surges), and increased nutrient and sediment levels in watercourses. River, rhyne and ditch, and floodplain habitats such as alluvial forests would be especially vulnerable.

3.26 Surface water run-off from development can result in changed conditions in water environments. The amount of new paved surface may significantly affect local hydrology. The amount and quality of water available determines which flora and invertebrates can survive and indeed the type of habitat (Treweek, 1999; Evink, 2002).

Soil changes

3.27 Materials used in construction, road spray, vehicle emissions, dust, and other particulates including that which can be deposited on the land or by precipitation can change soil pH and structure which in turn effects which plants can grow, those invertebrates that can survive and so on up the food chain (Treweek, 1999; Seiler, 2002).

Introduction of New Habitats

3.28 As a result of road building, new habitats may be introduced as part of the landscaping the verges and adjacent landform to the scheme. This may include inappropriate non-native species or an imbalance of local species, which in turn may affect the surrounding ecosystem. Roads are also known to disperse seed from ‘foreign’ sources (Treweek, 1999; White & Ernst, 2003).

4. Identification and Description of the Natura 2000 Sites

Introduction

4.1 This section identifies which Natura 2000 sites are potentially affected.

4.2 Special Areas of Conservation (SAC) are designated due to the presence or providing ecological support to habitats, listed in Annex I, and species, listed in Annex II of the Habitats Directive (92/43/EEC).

4.3 Special Protection Areas (SPA) are designated for bird species listed under Article 4 of the Birds Directive (79/409/EEC).

4.4 Ramsar sites are internationally important wetland sites that have been designated under the Ramsar Convention on Wetlands 1971. Under Government policy, as set out in Planning Policy Statement 9: Biodiversity and Geological Conservation, they are to be treated as Natura 2000 sites.

Identification of Natura 2000 sites

4.5 The following Natura 2000 sites lie wholly or have component sites present within the geographic area administered by Somerset County Council.

- Exmoor and Quantocks Oak Woodlands SAC
- Exmoor Heaths SAC
- Hestercombe House SAC
- Holme Moor and Clean Moor SAC
- Mells Valley SAC
- Mendip Limestone Grasslands SAC
- Mendip Woodlands SAC
- North Somerset and Mendip Bats SAC
- Quants SAC
- Severn Estuary SPA/SAC/Ramsar
- Somerset Levels and Moors SPA/Ramsar

4.6 A further review for other Natura 2000 sites potentially affected in other counties within 10 kilometres of the Somerset border has been carried out in Table 1 through consideration of impacts identified in Chapter 3, such as increased disturbance and air quality. Although the thrust of the Transport Policies – Schedule of Policies is to manage transport demand and reducing pollution in Somerset potential onward effects must be considered.

4.7 The locations of the Natura 2000 sites are shown in Maps 1 to 4.

Table 1: Screening Natura 2000 Sites outside Somerset

Natura 2000 Site	Designated Features	Screening Conclusion
Chew Valley Lake SPA	Shoveler	Not included as access is managed on site and any increases from improved Rights of Way or cycleways is unlikely
Bath and Bradford on Avon Bats SAC	Greater horseshoe, lesser horseshoe and Bechstein's bats	Not included as bat foraging and flight lines are unlikely to cross over the Somerset border
Salisbury Plain SAC	Calcareous grasslands, marsh fritillary butterfly	Not included as SAC is too remote to be influenced by improved walking and cycling access in Somerset
River Avon SAC	Water courses with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, Desmoulin's whorl snail, sea lamprey, brook lamprey, Atlantic salmon, bullhead	Not included as river catchment is outside of Somerset
Rooksmoor SAC	*Molinia* meadows, marsh fritillary butterfly	Not included as SAC is too remote to be influenced by improved walking and cycling access in Somerset and infrastructure such as cycle ways would not effect habitat within marsh fritillary dispersal ranges
Holnest SAC	Great crested newt	Not included as SAC is too remote to be influenced by improved walking and cycling access in Somerset and infrastructure such as cycle ways would not effect habitat within the dispersal range of great crested newts
West Dorset Alder Woods SAC	Alluvial forest, *Molinia* meadows, oak wood, marsh fritillary, great crested newt	Not included as SAC is not linked hydrologically to Somerset and would not be influenced by improved walking and cycling access in Somerset and infrastructure such as cycle ways

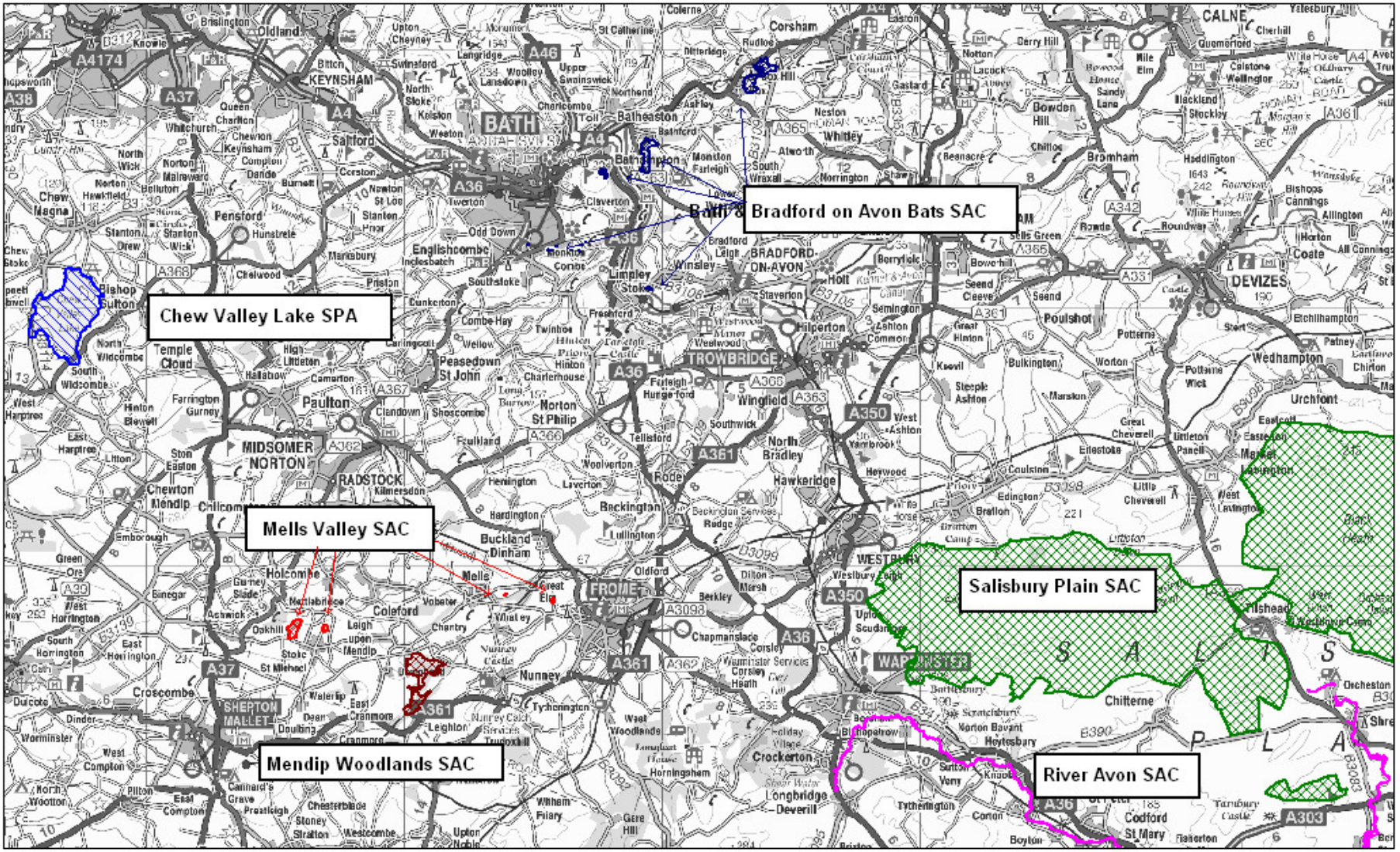
Natura 2000 Site	Designated Features	Screening Conclusion
		would not effect habitat within the dispersal range of marsh fritillaries and great crested newts
Bracket's Coppice SAC	Bechstein's bats, *Molinia* meadows	Not included although Bechstein's bat could be foraging in woodlands located in Somerset there is unlikely to be significant infrastructure that would fragment flight lines and the woodland is not generally accessible.
River Axe SAC	Water courses with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, sea lamprey, brook lamprey, bullhead	Although the County is upstream it is unlikely to be affected by hydrological impacts from road infrastructure in Somerset
Culm Grasslands SAC	*Molinia* meadows, wet heath, marsh fritillary butterfly	Not included as SAC is not linked hydrologically to Somerset, would not be influenced by improved walking and cycling access in Somerset and infrastructure such as cycle ways would not effect habitat within the dispersal range of marsh fritillaries

4.8 Therefore it is considered that there are no sites outside the geographic borders of Somerset that need be included in this assessment

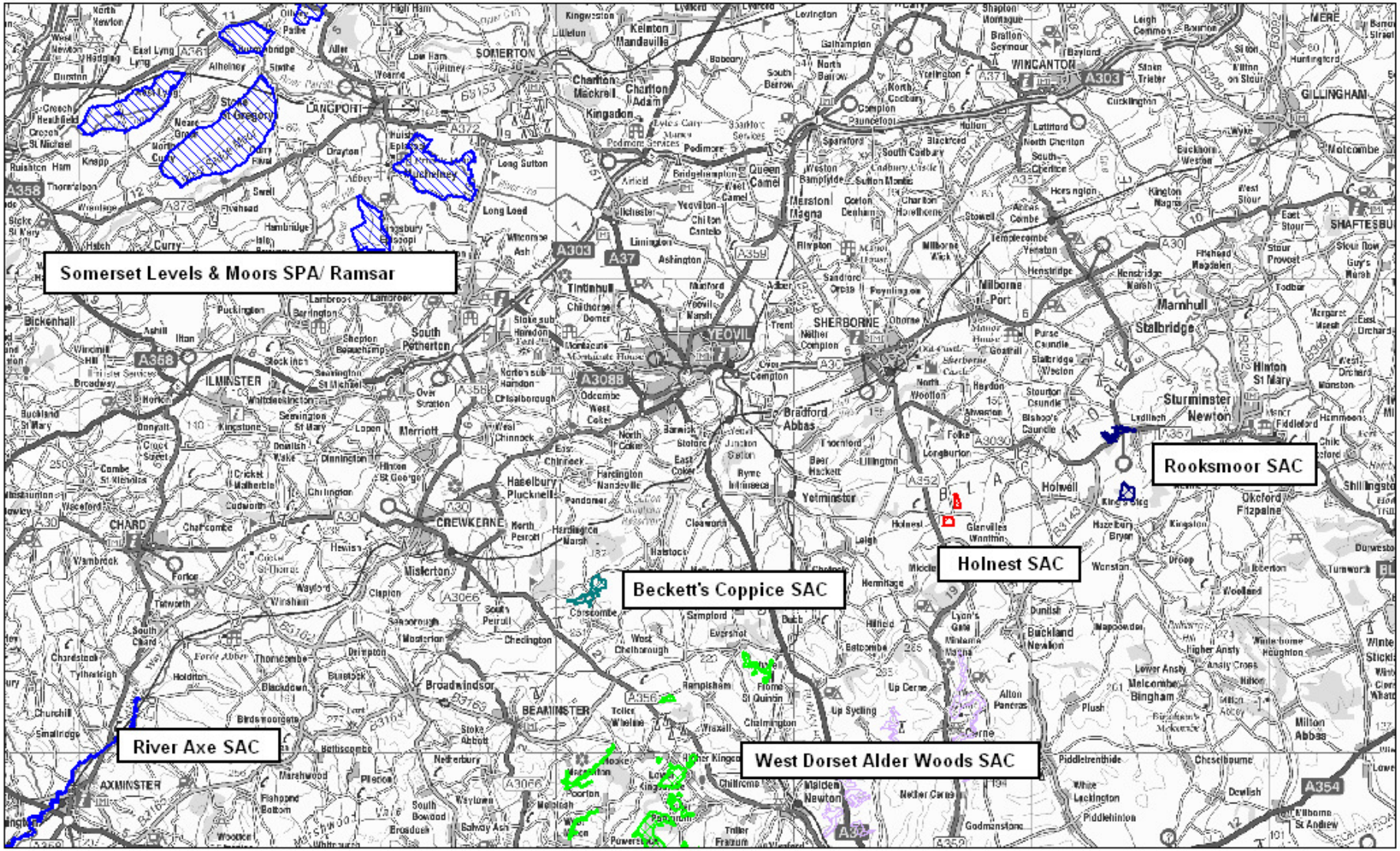
Ecological Zones of Influence

4.9 Natura 2000 sites are designated for both species and habitat features. Conservation objectives and targets relate to maintaining the integrity of these features. This section describes how 'Ecological Zones of Influence' (EZI) are arrived at for each of the Natura 2000 sites potentially affected by the implementation of the Transport Policies – Schedule of Policies. These are areas outside the designated Natura 2000 site, which nonetheless if affected can adversely impact on the integrity of the site's conservation objectives. For example, bat flight lines and

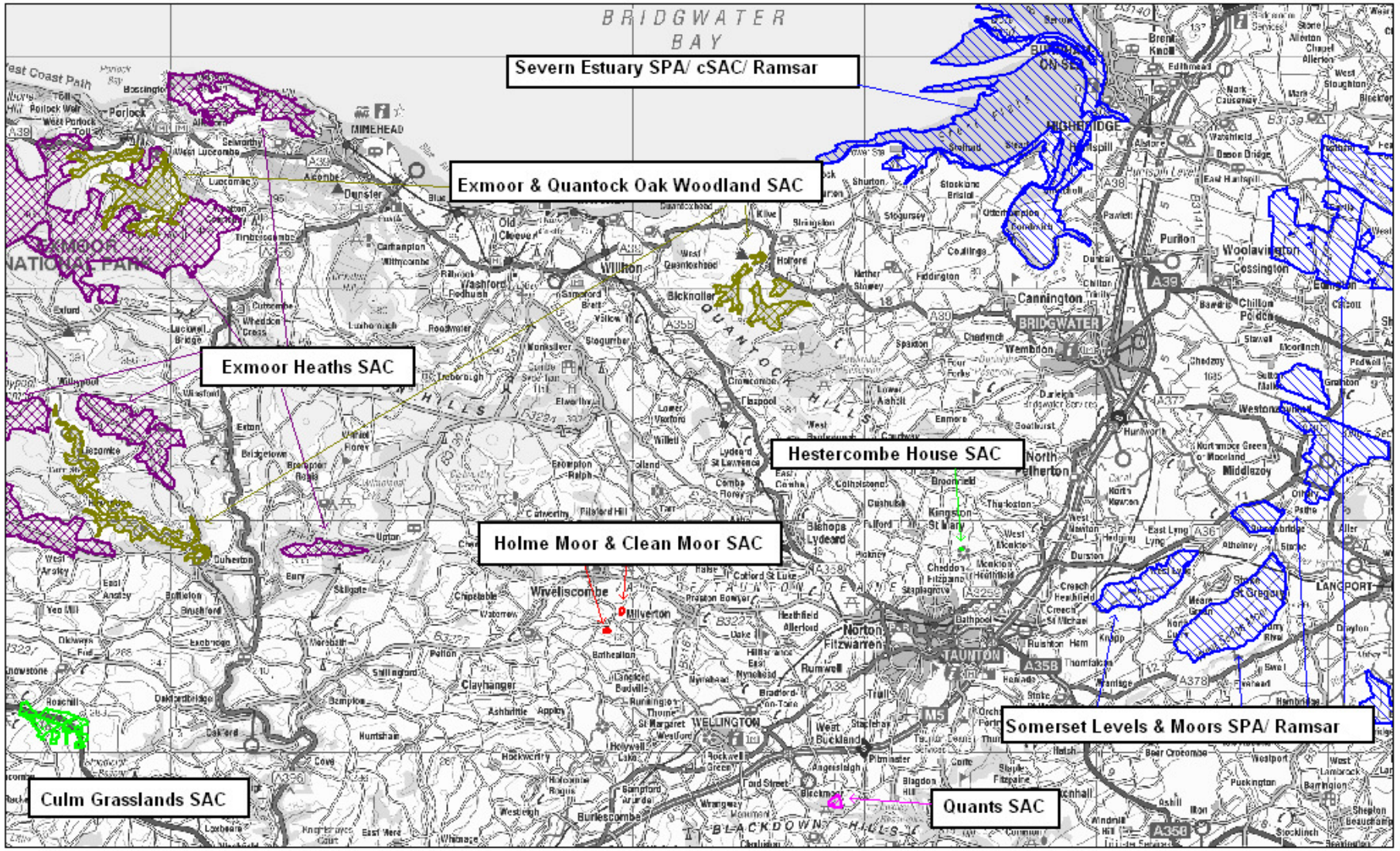
Map1: Location of Natura 2000 sites (east)



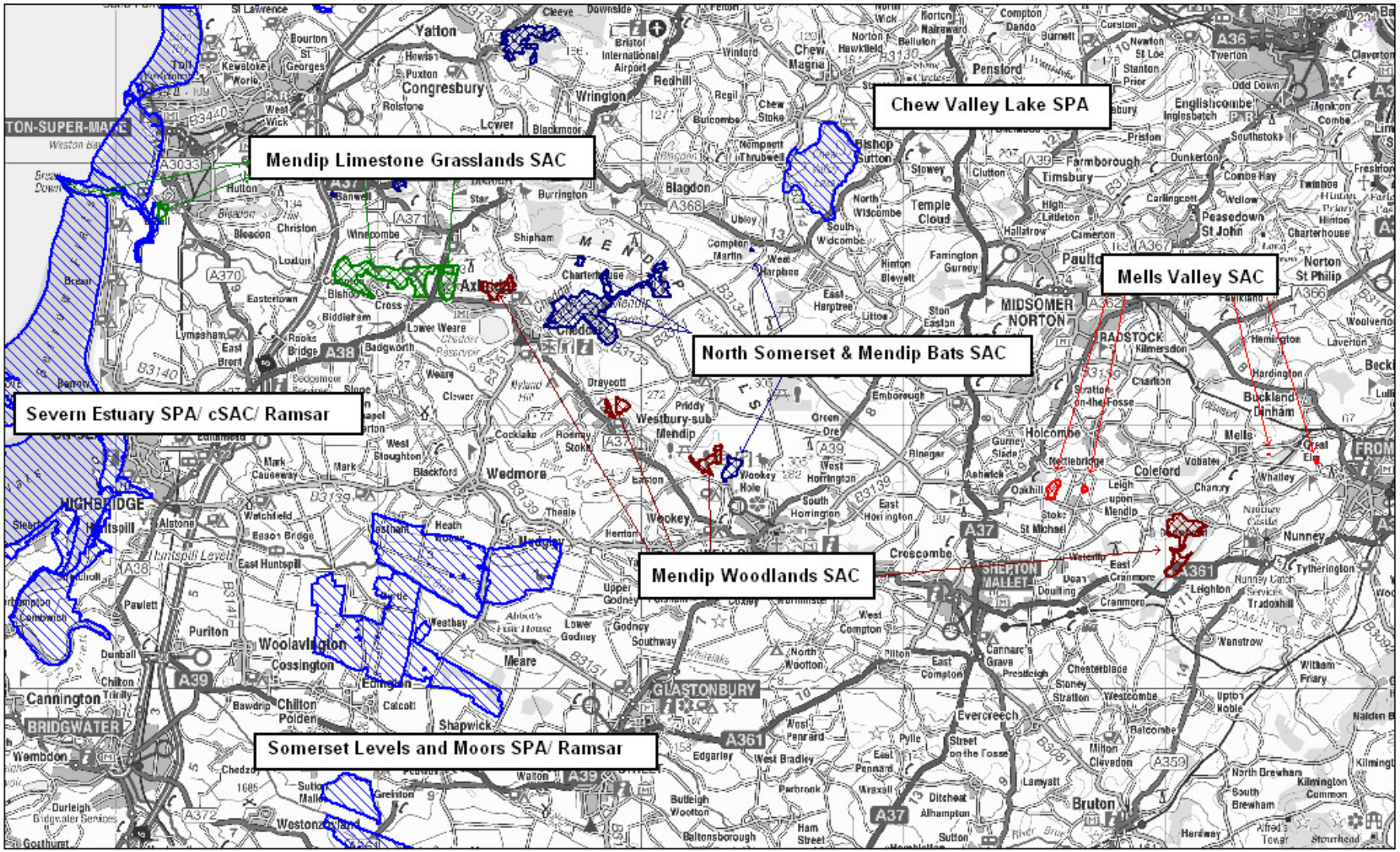
Map 2: Location of Natura 2000 sites (south)



Map 3: Location of Natura 2000 sites (west)



Map 4: Location of Natura 2000 sites (north)



feeding areas supporting a designated roost site if lost may affect the viability of the population.

4.10 Habitats are affected directly from on-site loss due to damage or destruction from land use change. However, they can also be influenced by off site factors such as hydrology. Where there are no significant off site requirements in maintaining a sites habitat the EZI is the same as the Natura 2000 sites boundary. However, sites affected by air pollution will be assessed by distances set out in the Chapter 3. All flora species are affected by airborne pollution, although some, such as lichens and bryophytes are more vulnerable.

4.11 Unlike habitats, species are not limited by the designated site boundary yet its integrity may depend on habitat several kilometres from the site. For each Natura 2000 site, where a qualifying species is listed as a feature, a description is given, the potential impacts, which are likely to affect that species population's integrity in terms of the site's nature conservation objectives, and the methodology of how the EZI is formed.

4.12 Finally all the EZI for each of a site's features, i.e. the site itself, its species and habitats, are combined into one EZI per site. Map 5 at the end of the Descriptions and Characterisation of Natura 2000 Sites section shows the mapped EZI in relation to the road network in Somerset.

Description and Characterisation of Natura 2000 Sites

Exmoor Heaths SAC

Component Sites

4.13 Component SACs sites are:

North Exmoor SSSI
South Exmoor SSSI
Exmoor Coastal Heaths SSSI
West Exmoor Coast and Woods SSSI

Exmoor Coastal Heaths and West Exmoor Coast and Woods SSSIs are in the Devon County Council administrative area.

Site Condition

4.14 Based on the tables for the equivalent Site of Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 2: Exmoor Heaths Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
North Exmoor	41.33	48.01	7.3	3.37	0
South Exmoor	6.53	64.76	28.71	0	0
Exmoor Coastal Heaths (Devon)	49.4	24.46	24.04	2.1	0
West Exmoor Coast & Woods (Devon)	34.14	57.53	8.33	0	0

The condition also includes areas outside of the SAC. The North Exmoor SAC component of the SSSI is 100% favourable.

Determining Reasons for Designation

4.15 North Exmoor SSSI is a southern outpost of typically northern and upland elements of Britain's flora and fauna. The site is nationally important for its south-western lowland heath communities and for transitions from ancient semi-natural woodland through upland heath to blanket mire. The site is also of importance for its breeding bird communities, its large population of the nationally rare heath fritillary butterfly *Mellicta athalia*, an exceptional woodland lichen flora and its palynologicai interest of deep peat on the Chains. The site is in two main blocks: the major one to the North and a smaller one by Simonsbath to the South. The highest point, Dunkery Beacon, is 519 metres above sea level, the lowest heathland is at about 250 metres and the site extends down to 80 metres in woodland.

4.16 Exmoor is representative of upland wet heath in south-west England. Exmoor Heath SAC is designated for the presence of **Northern Atlantic wet heaths with *Erica tetralix*** habitat. M15 *Scirpus cespitosus – Erica tetralix* wet heath predominates on gently-sloping and level ground. It is extremely variable in nature and has in places been modified by management, particularly burning. Typically, heather *Calluna vulgaris* dominates, with scattered plants of purple moor-grass *Molinia caerulea*, cross-leaved heath *Erica tetralix*, bilberry *Vaccinium myrtillus* and deergrass *Trichophorum cespitosum*. In other areas *Molinia* and *Calluna* are more-or-less co-dominant, with the former forming tussocks. There are transitions to H12 *Calluna vulgaris – Vaccinium myrtillus* heath on well-drained, steeper slopes and to M17 *Scirpus cespitosus – Eriophorum vaginatum* blanket mire on deeper peat, where the northern species crowberry *Empetrum nigrum* occurs.

4.17 The conservation objective for the feature is '**To maintain, subject to**

natural change, in favourable condition, the habitats for the Northern Atlantic wet heaths with *Erica tetralix*' (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Extent
- Dwarf-shrub diversity and cover
- Bryophyte abundance
- Age structure
- Graminoid cover
- Grazing impact
- Vegetation mosaic
- Water quality and soil nutrient status
- Hydrology

4.18 Exmoor Heath SAC is also designated for the presence of **European dry heaths.** The site is notable because it contains extensive areas of H4 *Ulex gallii – Agrostis curtisii* heath, a type most often found in the lowlands, and H12 *Calluna vulgaris – Vaccinium myrtillus* heath, a predominantly upland type, together with areas of H8 *Calluna vulgaris – Ulex gallii* heath. In wetter situations or on peat there can be a high frequency of purple moor-grass *Molinia caerulea* and cross-leaved heath *Erica tetralix*, which results in frequent transitions to wet heaths. The associated valley mires support the oceanic species pale butterwort *Pinguicula lusitanica* and ivy-leaved bellflower *Wahlenbergia hederacea*. The Exmoor heaths are also important as the largest stronghold for the heath fritillary butterfly *Mellicta athalia*, associated with sheltered slopes in the transition to woodland. The site holds a small breeding population of merlin *Falco columbarius* that is the most southerly in the western Palearctic.

4.19 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for the European dry heaths**' (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Extent
- Bryophyte / lichen abundance
- Dwarf-shrub diversity and cover
- Grazing impact
- Vegetation structure
- Vegetation mosaic
- Soil structure and nutrient status
- Species characteristic of the site: Heath Fritillary

4.20 **Blanket bogs** are a feature of the Exmoor Heaths SAC. These extensive peatlands have formed in areas where there is a climate of high rainfall and a low level of evapotranspiration, allowing peat to develop not only in wet hollows but over large expanses of undulating ground. The blanketing of the ground with a variable depth of peat gives the habitat type its name and results in the various morphological types according to their topographical position, e.g. saddle mires, watershed mires, valley side mires.

4.21 Blanket bogs show a complex pattern of variation related to climatic factors, particularly illustrated by the variety of patterning of the bog surface in different parts of the UK. Such climatic factors also influence the floristic composition of bog vegetation. An important element in defining variation is the relative proportion of pools on the bog surface. In general, the proportion of surface patterning occupied by permanent pools increases to the north and west, although the precise shape and pattern of pools appears to depend on local topography as well as geographical location. Variety within the bog vegetation mirrors this pattern and is also affected by altitude. Similarly, the number of associated habitats and communities, such as springs, flushes, fens and heath, is greater in the milder, wetter and geologically and topographically more complex north and west.

4.22 'Active' is defined as supporting a significant area of vegetation that is normally peat-forming. Typical species include the important peat-forming species, such as bog-mosses *Sphagnum* spp. and cottongrasses *Eriophorum* spp., or purple moor-grass *Molinia caerulea* in certain circumstances, together with heather *Calluna vulgaris* and other ericaceous species. Thus sites, particularly those at higher altitude, characterised by extensive erosion features, may still be classed as 'active' if they otherwise support extensive areas of typical bog vegetation, and especially if the erosion gullies show signs of recolonisation.

4.23 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for the Blanket bogs**' (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Extent
- Bryophyte abundance
- Dwarf-shrub diversity & cover
- Graminoid cover
- Grazing impact
- Extent of bare ground or ground covered by algal mats
- Hydrology

4.24 **Alkaline fens** form another feature of the Exmoor Heaths SAC. They consist of a complex assemblage of vegetation types characteristic of sites where there is tufa and/or peat formation with a high water table and a calcareous base-rich water supply. The core vegetation is short sedge mire (mire with low-growing sedge vegetation). At most sites there are well-marked transitions to a range of other fen vegetation, predominantly, but not exclusively, to M14 *Schoenus nigricans – Narthecium ossifragum* mire and S24 *Phragmites australis – Peucedanum palustre* tall-herb fen in the lowlands. Alkaline fens may also occur with various types of swamp (such as species-poor stands of great fen-sedge *Cladium mariscus*), wet grasslands (particularly various types of purple moor-grass *Molinia caerulea* grassland) and areas rich in rush *Juncus* species, as well as fen carr and, especially in the uplands, wet heath and acid bogs. There is considerable variation between sites in the associated communities and the transitions that may occur. Such variation can be broadly classified by the geomorphological situation in which the fen occurs, namely: flood plain mire, valley mire, basin mire, hydroseral fen (i.e. as zones around open waterbodies) and spring fen. Another important source of ecological variation is altitude, with significant differences between lowland fens, which are rich in southern and continental species, and upland fens, which are rich in northern species.

4.25 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for the Alkaline fens**' (Natural England conservation objectives). The attributes that measure the condition of the feature are sward structure and composition.

4.26 In conjunction with heaths this site also supports tracts of **old sessile oak woods**. These woods are rich in bryophytes, ferns (including *Dryopteris aemula*) and epiphytic lichens, the latter often associated with old pollards, since parts are former wood-pasture rather than the oak coppice that is more common with this type.

4.27 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for the old sessile oak woods with *Ilex* and *Blechnum* in the British isles**' (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Area
- Natural processes and structural development
- Regeneration potential
- Composition
- Distinctive and desirable elements:

1. Rich Atlantic bryophyte communities.
2. Epiphytic lichens
3. Western oakwood
4. Breeding bird community.
5. River, stream and mires.
6. Transition to open heath with c. 3 km of wood/heath edge & Heath Fritillary colony.
7. Heronry

Table 3: Exmoor Heaths Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Northern Atlantic wet heaths with *Erica tetralix*	Air quality Soil conditions Hydrological conditions Appropriate management Control of inappropriate invasive species
European dry heaths	Appropriate management Soil conditions Control of inappropriate invasive species
Blanket bogs	Appropriate management The control of inappropriate and invasive species. Hydrology, Water quality Air quality
Alkaline fens	Topography Hydrology Drainage Water quality Soil conditions Appropriate management

Qualifying features	Key environmental conditions to support site integrity
Old sessile oak woods with *Ilex* (holly) and *Blechnum* (fern) in the British Isles	Appropriate woodland management Air pollution

Ecological Zone of Influence

4.28 For the purposes of this assessment it is considered that the EZI lies entirely within the site boundary as any impacts would only be from visitor pressure.

Vulnerability

4.29 These heathlands retain significant areas of mature heather stands. This habitat is dependent upon low intensity, traditional agricultural management by grazing and controlled burning. Such management is becoming less economic, except with agri-environment funds. Agri-environment schemes such as the Environmentally Sensitive Area Scheme and more recently the Higher Level Stewardship Scheme have been useful in promoting traditional grazing management, as have other management agreements and conservation body ownership. Illegal and uncontrolled burning is adversely affecting heathland structure in some areas, and localised winterfeeding of cattle and overgrazing has caused some losses to heathland in the past although these have been largely resolved through prescriptions in agri-environment agreements. Incentive payments are currently seen as the only effective means of influencing burning practices. *Rhododendron* has spread in some areas, and work to eliminate it from heathland sites has been funded through National Park Authority grants and conservation plans which form part of Natural England's agri-environment scheme agreements

4.29 This site is also vulnerable to atmospheric deposition and eutrophication.

Exmoor and Quantocks Oak Woodlands SAC

Component Sites

4.30 Component SACs sites are:

- North Exmoor SSSI
- Barle Valley SSSI
- Watersmeet SSSI
- West Exmoor Coast & Woods SSSI
- The Quantocks SSSI

4.31 It is considered that all habitats in the Exmoor SSSIs may be influenced by the TPSP in the area of Somerset outside its boundaries and is therefore considered in this assessment. Species of bats and otters are also considered as they could potentially rely on features outside the National Park area. The Quantocks SSSI component habitats are considered as the site lies within the influence of the TPSP.

Site Condition

4.32 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 4: Exmoor and Quantocks Oak Woodlands Site Condition

S\AC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
The Quantocks	9.21	19.73	65.63	5.43	0
North Exmoor	41.33	48.01	7.3	3.37	0
Barle Valley	32.69	39.16	10.28	17.87	0
Watersmeet	43.71	44.63	4.85	6.81	0
West Exmoor Coast & Woods	34.14	57.53	8.33	0	0

Determining Reasons for Designation

4.33 This site supports extensive tracts of **old sessile oak woods** in conjunction with heath. They are rich in bryophytes, ferns (including *Dryopteris aemula*) and epiphytic lichens, the latter often associated with old pollards, since parts are former wood-pasture rather than the oak coppice that is more common with this type.

4.34 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for the old sessile oak woods with *Ilex* and *Blechnum* in the British isles**' (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Age/size class variation within and between stands; presence of open space and old trees; dead wood lying on the ground; standing dead trees
- Successful establishment of young stems in gaps or on the edge of

a stand

- Cover of native versus non-native species (all layers)
- Death, destruction or replacement of native woodland species through effects of non-native fauna or external unnatural factors
- Ground flora type
- Distinctive and desirable elements:
    1. Rich Atlantic bryophyte communities.
    2. Western oakwood
    3. Breeding bird community.
    4. Streams and mires.
    5. Transitions to alder wood.
    6. Transition to open heath with c. 15km of wood/heath edge
- Air quality measures
- Presence of undesirable indicator species

4.35 **Alluvial forests with *alder and ash*** comprises woods dominated by alder *Alnus glutinosa* and willow *Salix* spp. on flood plains in a range of situations from islands in river channels to low-lying wetlands alongside the channels. The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation.

4.36 Many such woods are dynamic, being part of a successional series of habitats. Their structure and function are best maintained within a larger unit that includes the open communities, mainly fen and swamp, of earlier successional stages. On the drier margins of these areas other tree species, notably ash *Fraxinus excelsior* and elm *Ulmus* spp., may become abundant. In other situations the alder woods occur as a stable component within transitions to surrounding dry-ground forest, sometimes including other Annex I woodland types.

4.37 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, the habitats for Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)** (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- Age/size class variation within and between stands; presence of open space and old trees; dead wood lying on the ground; standing dead trees
- Structures associated with the hydrological regime
- Successful establishment of young stems in gaps or on the edge of a stand
- Cover of native versus non-native species (all layers)
- Death, destruction or replacement of native woodland species through effects of non-native fauna or external unnatural factors

- Ground flora type
- Distinctive and desirable elements:
  1. *Epiphytic lichens* (see Old sessile oak woods)
  2. Transitions to old sessile oak woods
  3. Streams and mires

4.38 There is a maternity colony of **Barbastelle Bat *Barbastella barbastellus*** utilising a range of tree roosts in this area of predominantly oak woodland on the Exmoor site. However, recent survey has indicated barbastelle bats are also roosting within the Quantocks component site. Foraging areas can lie several kilometres from the roost sites and barbastelle bats have been recorded in the Hinkley, Cannington and west Bridgwater areas,

4.39 Barbastelle bats generally forage over old meadows, hedgerows and woodlands, often in valley bottoms during summer, heathland and moorland in high summer and dense old growth deciduous woodland habitats in colder months (Greenway, 2004). On Exmoor barbastelle bats hunt in high overgrown hedgerows, scrub areas, woodland strips, and small copses, stream headwaters in combes, uncut grassland and heather moorland. They have also been recorded in gardens and areas with low lighting, and over saltmarsh. (Billington, 2002). Barbastelles are also sensitive to artificial lighting, which can disrupt or deny habitat use, and avoid street lights (Outen, 2002; BCT/ILE, n/d).

4.40 Barbastelle bats rely on contiguous flight lines, such as overgrown hedgerows, and woodland to reach foraging habitat. Trimmed hedges form very poor flyways. Flight lines should be managed at least 6 kilometres from roosting woodlands. As with hedgerows connectivity along watercourse is beneficial out to 12 kilometres from roost area. They will cross open spaces when dark, i.e. further from the roost site. Most remote feeding area was 18 kilometres away. (Greenway, 2001) The lengths of flight lines vary from a few kilometres up to 20 kilometres (Greenway, 2004). On Exmoor summer foraging ranged up to 9 kilometres from roost locations. About 90% of the foraging occurred outside of the SAC boundaries (English Nature, Conservation Objectives for North Exmoor SSSI)

4.41 Current factors considered to be causing loss or decline in barbastelle include:

- Loss or fragmentation of foraging habitats
- Loss/ disruption of flyway, e.g. woodland edges, mature hedge banks
- Loss, destruction or disturbance of roost sites
- Loss of cover in the vicinity of roost sites

- Disturbance of underground swarming sites

(Bat Conservation Trust/ BMT Cordah Ltd., 2005)

4.42 Bechstein's bat ***Myotis bechsteinii*** has not been recorded in the Quantocks component site. However, as the foraging areas can lie several kilometres from the roost sites the species is considered.

4.43 Bechstein's bat is a woodland species. They prefer semi natural or ancient woodland but will make use of oak and mixed forestry plantations. Most summer roost sites for Bechstein's bats are in woodpecker holes, although sometimes they use loose bark or tree crevices. They change roosts nearly every day and therefore large number of sites required, perhaps as many as 50. (Greenway, 2004) In one colony the actual roost site was hedgerow tree 3.5 kilometres from the main plantation foraging area. Hedgerow trees are not uncommon for colonies foraging in plantations, as frequently they are the only trees available with woodpecker holes (Fitzsimmons *et al*, 2002)

4.44 The standard pattern of foraging within a colony is for suitable canopy areas within woodland to be divided between individuals. About 50 hectares of mature oak with good understorey and small streams seams is ideal. (Greenway, 2004) Other woodland would need to be larger to sustain a colony, for example coniferous woodland home ranges of 100 hectares per individual have been recorded. (Boye & Dietz, 2005; Fitzsimmons *et al*, 2002)

4.45 Bechstein's bats have a small range of movement around summer roost of 1 kilometre. The main foraging areas are usually 500 -1500 metres from roost. Sometimes they will fly up to 3.8 kilometres. Foraging range is smaller in continuous woodlands than those in fragmented forests. (Boye & Dietz, 2005; Fitzsimmons *et al*, 2002)

4.46 Bechstein's bats are also sensitive to artificial lighting, which can disrupt or deny habitat use, and avoid streetlights (Outen, 2002; BCT/ILE, n/d).

4.47 The conservation objective for the features are '**To maintain, subject to natural change, in favourable condition, the Barbastelle and Bechstein's Bats** (Natural England conservation objectives). The attributes that measure the condition of the feature are:

- No loss of ancient semi-natural stands
- Current area of semi-natural woodland to be retained
- At least the current level of structural diversity maintained.
- Canopy cover present over 50-90% of area
- A minimum of 4 trees per ha allowed to die standing

- Signs of seedlings growing through at sufficient density to maintain required canopy cover over a 10-year period
- Current length and extent of woodland/moorland scrub edge to be retained
- No overall loss of open water
- Human access to roost area controlled and limited; no significant increase since previous visit

4.48 **Otter *Lutra lutra*** 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 short cut across bends in rivers. (Chanin, 2003)

4.49 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. Optimal habitat includes stream banks with dense herbaceous vegetation and fringes of trees (e.g. alder) with branches hanging low near the water, lakes, coastlands, rivers and marshes. (Chanin, 2003)

4.50 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. (Chanin, 1993, 2003)

4.51 An otter's territory is approximately 15 to 20 kilometres long or the length of three riverside parishes in Somerset (Pers.Com. James Williams, Somerset Otter Group; Karen Coxon)

4.52 Current factors considered to be causing loss or decline in otters include:

- Road mortality
- Pollution events
- Loss or fragmentation of habitat
- Human disturbance
- Liver fluke (introduced from 'alien' fish species)

4.53 The conservation objective for the feature is '**To maintain, subject to natural change, in favourable condition, Otter'.** The attributes that measure the condition of the feature are water quality, flow rate, site

integrity, fish stocks, disturbance, bankside cover and the presence of otters.

Table 5: Exmoor and Quantocks Oak Woodlands Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Old sessile oak woods with *Ilex* (holly) and *Blechnum* (fern) in the British Isles	Appropriate woodland management Air pollution
Alluvial forests with *Alnus glutinosa* (alder) and *Fraxinus excelsior* (ash)	Appropriate woodland management Hydrology
Barbastelle bat *Barbastella barbastellus*	Undisturbed roosts Woodland management Availability of decaying and veteran trees Maintenance and connectivity of habitats used as flight lines on and off site Feeding areas
Bechstein's bat *Myotis bechsteinii*	
Otter *Lutra lutra*	Maintenance of river water quality and flow Fish stocks Bankside vegetation Levels of disturbance

Ecological Zone of Influence

4.54 The **woodland habitats** are sensitive to changes in hydrology and to changes in air quality. The habitat therefore may be influenced outside the SAC by dust and air pollution resulting from issues set out in Chapter 3. Any watercourse entering and upstream of the site in the catchment is mapped by enclosing within a Minimum Convex Polygon (MCP).

4.55 For components of the SAC where **barbastelle bats** are present a buffer of 6 kilometres around the maternity roost site area is formed. Feeding areas are digitised, particularly unbroken strips of dense woodland connecting down to water that are connected by flyways to the roost area. This process uses aerial photographic interpretation and available habitat data. Starting with maternity roosts, Minimum Convex Polygons (MCP) of feeding areas within home range is formed. There can be more than one MCP if feeding areas are sufficiently separated. Include other roosts within the home in the MCP. The MCP is then modified by either inclusion or

exclusion of whole fields using OS Mastermap. This forms the EZI for barbastelle bats.

4.56 For components of the SAC where **Bechstein's bats** are present a buffer of 3.8 kilometres around the maternity roost site area is formed. Woodland feeding areas are digitised, as any connecting flyways. This process uses aerial photographic interpretation and available habitat data. Starting with maternity roosts, Minimum Convex Polygons (MCP) of feeding areas within home range are formed. There can be more than one MCP if feeding areas are sufficiently separated. Include other roosts within the home range in the MCP. The MCP is then modified by either inclusion or exclusion of whole fields using OS Mastermap. This forms the EZI for Bechstein's bats.

4.57 There are records of **Otters** for every watercourse within the SAC. Digitise the watercourses for 10 kilometres either side of a record and then buffer this by 500 metres. This then forms the Ecological Buffer for otters.

Vulnerability

4.58 Some grazing/browsing is essential to maintain conditions suitable for lower plant assemblages, which are a key feature of the woodlands. However, sheep and/or red deer graze many woods and this can prevent regeneration and change the ground flora. Invasive non-native species are a problem in some woods, particularly *Rhododendron* and Japanese knotweed. Conservation bodies or management agreements are eliminating these species. Dense monocultures of coppiced oak occur, of little structural or species diversity. Although minimum intervention is mostly desirable, opportunities are being taken to diversify age and species composition to restore near-natural conditions where possible.

4.59 Drainage and potential impacts of lowering water table (including abstraction) is potentially an issue. In the review of Agency consents, there are seven Agency consented abstraction and two discharge consents identified as potentially having a significant effect on the site.

4.60 There is potential conflict between forestry and woodland management, and potential impacts from surrounding land use (e.g. agriculture, pheasant rearing affecting bats and otter)

Hestercombe House SAC

Component Sites

4.61 Component SACs sites are:

- Hestercombe House SSSI

Site Condition

4.62 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 6: Hestercombe House Site Condition

SPA component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
	0	0	0	100	0

Determining Reasons for Designation

4.63 Hestercombe \House hosts a large **lesser horseshoe bat *Rhinolophus hipposideros*** maternity site in the vale of Taunton Deane. The bats roost in the roof void in a building at the rear of the main house and also in the stable block. Although only a small proportion of the UK population, this site has been included as representative of the species in South West England.

4.64 The most significant foraging habitat for lesser horseshoe bats is woodland. In Bavaria, where forests covered 60% of the landscape surrounding a maternity roost, and about 90% of foraging time was spent in the habitat type. Hedgerow, tree lines and streams were only exploited only where there was less forest. (Holzhaider *et al*, 2002)

4.65 In Belgium research has shown that the feeding grounds for lesser horseshoe bats were deciduous woodland along with copses or mixed coniferous woodland. Woodland occupied 25% of the area within 1 kilometre of the roost. However, some foraging was observed in hedgerows. Bats selected areas that were undulating countryside with hedgerows, tree lines and woodland in preference to flat open intensively farmed areas. (Motte & Dubois, 2002)

4.66 In the Wye valley in Monmouthshire studies have also revealed that lesser horseshoe bats significantly spend the majority of their time foraging in broadleaved woodland. Pasture and arable areas were least used for foraging (Botadina *et al*, 2002).

4.67 The Ciliau SSSI is designated for its lesser horseshoe bats. The Ciliau SSSI, again on the River Wye. Here lesser horseshoe bats foraged predominately in broadleaved woodland along the banks of the River Wye and its tributary streams. They were also recorded foraging in conifer plantations. (Schofield *et al*, 2002)

4.68 In fragmented habitats linear features, such as hedgerows, provided valuable corridors between roosts and foraging areas. Commuting corridors are important features for lesser horseshoe bats as they avoid crossing open areas and are vulnerable to the loss of these corridors. Where lesser horseshoes foraged along linear features, such as hedgerows, it was always within 10 metres of the feature (Bat Conservation Trust, 2005). In Belgium no bat was recorded more than 1 metre from a feature (Motte & Dubois, 2002).

4.69 They were found over water and in farmyards in Ireland (McAney & Fairley, 1988: in Vaughn *et al*, 1997) and among vegetation on the banks of rivers and lakes in France (Barataud, 1993: in Vaughn *et al*, 1997).

4.70 In a study carried out by Cresswell Associates (2004) on the Sherborne Park Estate in Gloucestershire for the National Trust it was considered that the presence of cattle might be an important factor in foraging by Lesser Horseshoe Bats. It was found that habitats that were most important contained a high proportion of woodland, parkland and grazed pasture woodland, combined with linear features, such as overgrown hedgerows. Through radio tracking it was found that occasionally bat activity was concentrated in fields containing cattle and that the bats foraged directly over cattle. However, the same lesser horseshoes foraged little, if at all, over the same pasture immediately after the cattle were removed.

4.71 At Hestercombe House lesser horseshoe bats were radio tracked in the late summer of 2005 and found to be primarily feeding around tall hedgerows and moving in open pasture, through woodlands, over arable fields, along woodland tracks, field edges, over private allotments, across amenity grasslands (lawns, playing fields, etc.), marshy fields, ditches and lakes. In addition, marshland was being used for foraging. (Billington, 2005)

4.72 Night roosts are particularly important. These are used by lesser horseshoes for resting, grooming, eating or sheltering in bad weather. Importantly some bats, especially pregnant females, can extend their foraging range from the maternity roost by using such roosts. In Bavaria one was located in a large, dense spruce (*Picea abies*) and another in a house (Holzhaider *et al*, 2002). Night roosts can occur in rock fissures (Schofield *et al*, 2002).

4.73 Botadina *et al* (2002) considered that a large colony size increases the foraging range of individuals, and conversely that the average foraging distance in smaller colonies might be even smaller. As afore mentioned, in the Botadina *et al* study (2002) a colony of 300 had a maximum foraging range of 4.2 kilometres. However, at Hestercombe House SAC individual lesser horseshoes were recorded in late July/early August travelling distances of 5 and 6 kilometres to feeding areas (Billington, 2005).

4.74 Current factors considered to be causing loss or decline in lesser horseshoe bats include:

- Loss, destruction or disturbance of roost sites
- Loss, damage or fragmentation of important foraging habitats, such as deciduous woodland, and connecting linear features such as hedgerows and tree lines
- Lack of suitably connected foraging habitats (a mosaic of deciduous woodland, hedgerows and tree lines)

4.75 The conservation objective for the feature is '**to maintain*, in favourable condition, the habitats for the population of: lesser horseshoe bat (*Rhinolophus hipposideros*)'.** The attributes that measures the condition of the feature are the roosts' roof covering, entrances, light levels, the degree of disturbance, the general condition and security of the buildings, the internal condition in roost area, signs of bats and the population size, and flight lines from roost in surrounding habitat and feeding habitat

Table 7: Hestercombe House Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Lesser horseshoe bat	Undisturbed roosts Roost conditions maintained Appropriate management of vegetation at roost entrances Maintenance and connectivity of habitats used as flight lines on and off site Feeding areas

Ecological Zone of Influence

4.76 A buffer of 6 kilometres around the maternity roost site area is formed. Flyways and feeding areas are digitised from radio tracking and field surveys carried out for the Habitats Regulations Assessment of the Taunton Deane Borough Core Strategy and the Somerset County Council

4.77 The EZI was developed from this through methodology used by Somerset Species Occurrence Mapping (Somerset County Council, 2010)

Vulnerability

4.78 Bat numbers are down by more than 25% since notification. The cause is unknown. This could be a number of factors. There has been physical loss of habitat (woodland work/ building work) near to the roost. There has been housing development in the foraging area. Other reasons could be change in agricultural practice in the area south of the Quantocks resulting in degradation of feeding habitat and loss or severance of hedgerows.

Holme Moor and Clean Moor SAC

Component Sites

4.79 Component SACs sites are:

- Clean Moor SSSI
- Holme Moor SSSI

Site Condition

4.80 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 8: Holme Moor and Clean Moor Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
	31.2	0	62.49	6.31	0

Determining Reasons for Designation

4.81 This is a relatively small site but it is important as an outlier of **calcareous fens** in south-west England, where *Cladium* is a local and rare species. The site occupies an unusual ecological situation on the spring line at the foot of a scarp slope. Although not currently managed, management continued until comparatively recently and in part explains the high species-richness of this site. There are important species-rich transitions from *Cladium* fen to mire with black bog-rush *Schoenus nigricans* and blunt-flowered rush *Juncus subnodulosus*, as well as to fen-meadow

vegetation with purple moor-grass *Molinia caerulea* and meadow thistle *Cirsium dissectum*.

4.82 The conservation objective for the feature is **'to maintain, in favourable condition, the Calcareous fens with *Cladium mariscus* and species of the *ariciondavallianae.'*** The attributes that measures the condition of the feature are the NVC communities as appropriate to base status, fertility and degree of succession. (Site specific)

4.83 These sites are situated on the north-facing slope of the upper reaches of a small valley and are fed by a mix of acidic and base-rich springs. The most species-rich example of **alkaline fen** is on Clean Moor, where black bog-rush *Schoenus nigricans* and blunt-flowered rush *Juncus subnodulosus* have many associates including the moss *Scorpidium scorpioides*, small sedges such as *Carex pulicaris*, *C. panicea* and *C. viridula* ssp *brachyrrhyncha*, and other low growing species such as lousewort *Pedicularis palustris* and the orchids *Gymnadenia conopsea*, *Dactylorhiza fuchsii* and *D. praetermissa*. In addition to NVC type M13 *Schoenus nigricans – Juncus subnodulosus* mire around the base-rich seepages there is also species-poor swamp with great fen-sedge *Cladium mariscus* and hemp agrimony *Eupatorium cannabinum*, and fen meadow on Holme Moor. Holme Moor & Clean Moor is important as a south-westerly site for alkaline fen.

4.84 The conservation objective for is **'to maintain, in favourable condition, the Alkaline fens.'** The attributes that measures the condition of the feature are the NVC communities as appropriate to base status, fertility and degree of succession. (Site specific)

4.85 Unimproved marshy grassland habitat, ***Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*),** is also present on the sites. *Molinia* meadows are found mainly on moist, moderately base-rich, peats and peaty gley soils, often with fluctuating water tables. They usually occur as components of wet pastures or fens, and often form mosaics with dry grassland, heath, mire and scrub communities. This habitat type includes the most species-rich *Molinia* grasslands in the UK, in which purple moor-grass *Molinia caerulea* is accompanied by a wide range of associated species, including rushes, sedges and tall-growing herbs.

4.86 The conservation objective for the feature is **'to maintain, in favourable condition, the *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*).'** The attributes that measures the condition of the feature are the extent of the habitat, the sward composition (positive indicator species/ frequency and cover of *Molinia caerulea/*negative indicator species/cover of *Juncus* spp./negative

indicator species/ % cover of *Phragmites australis*/ % cover of *Myrica gale*), sward structure (average height/ litter/ bare ground)

Table 9: Holme Moor and Clean Moor Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Calcareous fens	Hydrological conditions maintained. Water quality is extremely important. Healthy stands of Cladium are required in communities in which short herbs/sedges are a major and characteristic component
Alkaline fens	Appropriate management The control of inappropriate and invasive species. Hydrology, water quality and air quality must be maintained.
Purple moor grass meadows on calcareous, peaty or clayey-silt-laden soils	Appropriate management The control of inappropriate and invasive species. Hydrology, water quality and air quality must be maintained

Ecological Zone of Influence

4.87 The **fen and grassland habitats** are sensitive to changes in hydrology as described in Chapter 3.

Vulnerability

4.88 The fen communities here had been neglected for several decades and as a result had deteriorated a great deal through the invasion of woody species. This situation has now been entirely reversed through management agreements with Natural England. However, it is important to note that neither of the two owner/occupiers has expressed any interest in undertaking or organising essential management themselves and Natural England has had to do this directly with their permission.

4.89 No particular existing trends or pressures were identified in site information, except for one off damage from an off road vehicle and deer browsing within woodland habitats. All habitats are sensitive to recreation pressure particularly the use of off road vehicles.

4.90 The site is however known to be susceptible to drought/dry conditions, which have occurred in recent years, although there is no indication

whether this has yet caused a problem. The Environment Agency's review of consents has assessed existing consents as unlikely to have a significant impact.

Mells Valley SAC

Component Sites

4.91 The component sites for the Mells Valley SAC are:

- Vallis Vale SSSI
- Old Ironstone Works SSSI
- St. Dunstan's Well Catchment SSSI

Site Condition

4.92 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 10: Mells Valley Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
Vallis Vale	100	0	0	0	0
Old Ironstone Works	0	0	100	0	0
St. Dunstan's Well Catchment	81.22	0	0	18.78	0

Determining Reasons for Designation

4.93 Mells Valley in southern England is selected on the basis of the size of its exceptional breeding population of **greater horseshoe bat *Rhinolophus ferrumequinum***. It contains the maternity site associated with a population comprising about 12% of the UK population. A proportion of the population also hibernates at the site, though many disperse through other hibernacula through the Mendips to Cheddar and some as far as Bath, Brockleigh Hall and perhaps Worchester in Gloucestershire. Fairy Cave is one of the main sites in the Mendips (pers. comm. Bob Corns, Natural England).

4.94 Greater horseshoe bats travel away from the roost towards foraging

grounds along distinct flight paths. Up to three main flight paths radiating in different directions can be used by a single colony, with varying proportions of the colony using different ones through a single summer, possibly as different foraging areas become profitable. The majority of flight paths (about 70-%) run along the edges of woods, woodland rides or tall hedges, only rarely crossing open fields. (Ransome, 1996) Greater horseshoes will not cross gaps of greater than15 metres although open fields are crossed after dusk on dark nights (Jones & Billington, 1999; Ransome, 1996). They travel about 1 metre away from vegetation edges. (Ransome, 1996)

4.95 The top five feeding areas include: pasture with cattle as single stock or part of mixed stock (38.6%); ancient semi natural woodland (16.6%); pastures with stock other than cattle (10.3%); meadows grazed by cattle in the autumn (9.4%); and other meadows and broadleaved woodland (4.9%). These habitats are not used according to the fore listed proportions throughout the year but change with the seasons. Woodlands and pasture adjoining wood are used in spring and early summer. As summer progresses, feeding switches to areas further away and tends to be fields used for grazing cattle and other types of stock. Meadows that had been cut and where animals are grazing are also used. (Duvergé & Jones, 1994)

4.96 At Mells a radio tracking study (Billington, 2000) showed the importance of high overgrown hedgerows, next to meadows and grazed pastures, areas of scrub and tree lines or woodland edges often near water as primary foraging habitat. Bats were shown to be commuting, mostly within 3 kilometres of the roost site and up to 3.5 kilometres from the roost site to Kingsdown Wood, Ammerdown. A route that one male traversed from Wadbury to there was 7 kilometres. (Billington, 2000) Adult bats were happy to commute 6 kilometres to feeding areas but the juveniles stayed within 4 kilometres of the roost (Billington, 2004).

4.97 Current factors considered to be causing loss or decline in greater horseshoe bats include:

- Loss, destruction or disturbance of roost sites
- Loss, damage or fragmentation of important foraging habitats and flyways, such as woodland, and connecting linear features such as hedgerows and tree lines and pasture.
- Lack of suitably connected foraging habitats (a mosaic of pasture hedgerows and woodland)
- Loss or disruption of key flyways between different roosts

4.98 The conservation objective for the feature is **‘to maintain, in favourable condition, the habitats for the population of Greater horseshoe bat**

(*Rhinolophus ferrumequinum*)*'.* The attributes that measures the condition of the feature are the buildings containing bat maternity and hibernation roosts' roof covering, entrances, light levels, the degree of disturbance, the general condition and security of building, the internal condition in roost area and signs of bats.

4.99 **Caves not open to the public** are present on the Vallis Vale and St. Dunstan's Well Catchment component sites and are selected as features of the SAC as they provide important hibernation sites for greater horseshoe bats. Fairy Cave (part of the St. Dunstan's Well Catchment component site) is one of the main roost sites in the Mendips.

4.100 The conservation objective for the feature is **'to maintain, in favourable condition, the caves not open to the public*'.*** The attributes that measures the condition of the feature as hibernation roosts are the state of entrance, the security of the entrance, external conditions, lack of disturbance and use by bats

4.101 St. Dunstan's Well Catchment component site also hosts an area of **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia).** *Festuco-Brometalia* grasslands are found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and Wales, extending locally into upland areas in northern England, Scotland and Northern Ireland. Most of these calcareous grasslands are maintained by grazing. Where grazing levels are reduced, such as at this site, *Festuco-Brometalia* swards typically become dominated by coarse grasses (in particular, downy oat-grass *Avenula pubescens*, tor-grass *Brachypodium pinnatum* and upright brome *Bromus erectus*), and plants of smaller stature become correspondingly scarcer. CG3 *Bromus* grassland, CG4 *Brachypodium* grassland and CG5 *Bromus – Brachypodium* grassland are present.

4.102 The conservation objective for the feature is **'to maintain, in favourable condition, the semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)*'.*** The attributes that measure the condition of the feature are the extent of the habitat, the sward composition and the sward structure.

Table 11: Mells Valley Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Greater horseshoe bat	Undisturbed roosts Roost conditions maintained Appropriate management of vegetation at roost entrances Maintenance and connectivity of habitats used as flight lines on and off site Feeding areas
Caves not open to the public	Pressure from human activity above and below ground Management of overlying land and catchment
Semi-natural dry grasslands and scrubland facies on calcareous substrates	Appropriate management Soil conditions Sward structure and composition Absence of negative indicator species

Ecological Zone of Influence

4.103 For greater horseshoe bats a buffer of 6 kilometres around the maternity roost site areas are formed. Flyways and feeding areas are digitised based on radio tracking data produced in 2000 for the Mells Valley SAC (Billington, 2000). This process is further analysed using aerial photographic interpretation and available habitat data. Starting with maternity roosts, Minimum Convex Polygons (MCP) of feeding areas within home range are formed. There is more than one MCP as feeding areas are sufficiently separated. Include other roosts with in the home range in the MCP. The MCP is then modified by either inclusion or exclusion of whole fields using OS Mastermap. This forms the EZI for greater horseshoe bats.

4.104 The **unimproved calcareous grasslands** are sensitive to changes in air quality. The habitat therefore may be influenced outside the SAC by dust and air pollution resulting from issues set out in Chapter 3. Air pollution from traffic may have eutrophication effects, which would impact on species composition in the sward. 200 metres is the distance from a road where nitrogen deposition is expected to occur in the Habitat Regulations Assessment of the draft Regional Spatial Strategy for the South West (2006). Bignall *et al*, (2004) consider that 150 metres air quality returns to background levels. The greater distance is used, as a precautionary approach is required.

Vulnerability

4.105 The bat population in the Mells Valley uses a range of natural caves and man-made tunnels in which to breed and hibernate. None of the sites are currently managed directly for bats. The population is vulnerable to disturbance from human access. Public access and disturbance is having a negative impact on the site. Natural England is discussing access provisions with the owner.

4.106 For the unimproved grassland cutting or grazing, including control of scrub encroachment maintains the sward. The presence of negative indicator species may indicate problems such as eutrophication, scrub invasion (insufficient control) or over grazing (e.g. by rabbits). A suitable grazing regime is required.

Mendip Limestone Grasslands SAC

Component Sites

4.107 The component sites for the Mendip Limestone Grasslands SAC are:

- Crook Peak to Shute Shelve Hill SSSI
- Uphill Cliff SSSI
- Brean Down SSSI

4.108 Uphill Cliff SSSI lies within the geographic area administered by North Somerset Council.

Site Condition

4.109 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 12: Mendip Limestone Grasslands Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
Crook Peak to Shute Shelve Hill	6.08	83.63	0	10.29	0
Uphill Cliff	31.98	68.02	0	0	0
Brean Down	100	0	0	0	0

Determining Reasons for Designation

4.110 The primary reason for the sites designation is **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*).** This site comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. The coastal headland and inland hills support the largest area of CG1 *Festuca ovina – Carlina vulgaris* grassland in England, including two sub-types (CG1a *Carex humilis* and CG1c *Trinia glauca* sub-communities) known from no other site in the UK. Areas of short-turf CG2 *Festuca ovina – Avenula pratensis* grassland also occur inland. The site is exceptional in that it supports a number of rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora. These include white rock-rose *Helianthemum apenninum*, Somerset hair-grass *Koeleria vallesiana* and honewort *Trinia glauca*. Transitions to limestone heath (European dry heaths) situated on flatter terrain also occur.

4.111 The conservation objective for the feature is **'to maintain, in favourable condition, the semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)*'.*** The attributes that measure the condition of the feature are the extent of the habitat, the sward composition and the sward structure.

4.112 Transitions to **European dry heaths** occur on flatter terrain. European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex* spp., bilberry *Vaccinium* spp. or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally. Most dry heaths are managed as extensive grazing for livestock

4.113 The conservation objective for the feature is **'to maintain, in favourable condition, European dry heaths*'.*** The attributes that measure the condition of the feature are the extent of the habitat, the amount of bare ground, the vegetative structure and composition, the presence of negative indicators and the sward composition and structure.

4.114 ***Tilio-Acerion* forests of slopes, screes and ravines** occur in the Crook Peak to Shute Shelve Hill component site of the SAC. *Tilio-Acerion* ravine forests are woods of ash *Fraxinus excelsior*, wych elm *Ulmus glabra* and lime (mainly small-leaved lime *Tilia cordata* but more rarely large-leaved lime *T. platyphyllos.* The habitat type typically occurs on nutrient-rich soils that often accumulate in the shady micro-climates towards the bases of slopes and ravines. Therefore it is found on calcareous substrates associated with coarse scree, cliffs, steep rocky slopes and ravines, where inaccessibility has reduced human impact. This habitat type is ecologically variable, particularly with respect to the dominant tree species.

4.115 The conservation objective for the feature is **'to maintain, in favourable condition, *Tilio-Acerion* forests of slopes, screes and ravines.** The attributes that measure the condition of the feature are maintenance of the area of the habitat, natural processes and structural development, the regeneration potential, composition and that species, habitats, structures characteristic of the site are present.

4.116 **Caves not open to the public** are present on the Crook Peak to Shute Shelve Hill component sites and are selected as features of the SAC as they provide important hibernation sites for **greater and lesser horseshoe bats**. Greater horseshoe bats are also a feature of the SAC.

4.117 Greater horseshoe bats forage in the winter when temperatures are over 5°C. Eight species of prey is consumed. *Ophion* wasps provide a large amount of the prey consumed through the winter period, which occur in dense swarms in deciduous woodland. They are also dependent on the dung of grazing animals, especially cattle, for *Geotrupes* beetle, the *Aphodius* beetle and the *Scathophaga stercoraria* dung fly. (Ransome, 2002)

4.118 Lesser horseshoe bats also feed throughout the winter, depending on temperature (Williams 2001: in Bat Conservation Trust/BMT Cordah, 2005). In England radio-tracking of bats revealed that they foraged on average to a maximum distance of 1.2 kilometres from the hibernation site. One bat travelled to an absolute maximum distance of 2.1 kilometres. The winter foraging range appears to be approximately half the area covered in the summer months. (Bat Conservation Trust/BMT Cordah, 2005)

4.119 The conservation objective for the feature is **'to maintain, in favourable condition, the caves not open to the public*'.*** The attributes that measure the condition of the feature as hibernation roosts are the state of entrance, the security of the entrance, external conditions, lack of disturbance and use by bats in winter. In addition it is a conservation objective '**to maintain, in favourable condition, the habitats for the population of Greater horseshoe bat (*Rhinolophus ferrumequinum)* and Lesser horseshoe bat (*Rhinolophus hipposideros*)'**

Table 13: Mendip Limestone Grasslands Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Semi-natural dry grasslands and scrubland facies on calcareous substrates	Sward structure and composition Absence of negative indicator species

Qualifying features	Key environmental conditions to support site integrity
European dry heaths	Appropriate management Control of inappropriate or invasive species
Tilio-acerion (lime-maple) forests on slopes, screes and ravines	Appropriate management
Caves not open to the public	Pressure from human activity above and below ground Management of overlying land and catchment
Greater horseshoe bat	Undisturbed roosts Roost conditions maintained Appropriate management of vegetation at roost entrances Maintenance and connectivity of habitats used as flight lines on and off site Feeding areas

Ecological Zone of Influence

4.120 The **unimproved calcareous grasslands, dry heath and *Tilio-Acerion* forests** are sensitive to changes in air quality. The habitat therefore may be influenced outside the SAC by dust and air pollution resulting from issues set out in Chapter 3. Air pollution from traffic may have eutrophication effects, which would impact on species composition in the sward. 200 metres is the distance from a road where nitrogen deposition is expected to occur in the Habitat Regulations Assessment of the draft Regional Spatial Strategy for the South West (2006). Bignall *et al*, (2004) consider that 150 metres air quality returns to background levels. The greater distance is used, as a precautionary approach is required.

4.121 For **horseshoe bats** a buffer of 2.1 kilometres around the hibernation roost site area is formed. Flyways and feeding areas are digitised based aerial photographic interpretation and available habitat data. Minimum Convex Polygons (MCP) of feeding areas within home range are formed. There is more than one MCP as feeding areas are sufficiently separated. Include other roosts with in the home range in the MCP. The MCP is then modified by either inclusion or exclusion of whole fields using OS Mastermap. This forms the EZI for horseshoe bats for this SAC.

Vulnerability

4.122 These sites are all open-access and are heavily used for informal recreation. Recreational pressure is becoming a problem with increased levels of trampling and erosion leading to localised loss of habitat (Natural England). There is also the illegal setting of fires.

4.123 Maintaining appropriate grazing levels, currently under grazing is a problem on some of the grassland and heath, and inappropriate / overgrazing is a problem in some of the woodland. The balance of habitats is heavily dependent upon adequate grazing, which is not always available. Cutting or grazing may be used to maintain these habitats, including control of scrub encroachment (including Cotoneaster), though some scrub can be ecologically beneficial. Bracken is also invasive. The commoning system on which the management of the Crook Peak part of the site depends has broken down and the National Trust, who manages the site, supported by Natural England, has established a grazing system, using an absentee grazer.

4.124 Caves are sensitive systems, which often suffer significant pressure from human activities, both above and below ground. It is important to manage the overlying land and catchment in a manner, which takes account of potential consequences on the caves.

4.125 Light pollution is also becoming a problem, especially affecting the behaviour of bats. (prof. judgment: Land Use Consultants, 2006)

Mendip Woodlands SAC

Component Sites

4.126 The component sites for the Mendip Woodlands SAC are:

- Asham Wood SSSI
- Ebbor Gorge SSSI
- Rodney Stoke SSSI
- Cheddar Wood SSSI

Site Condition

4.127 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 14: Mendip Woodlands Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
Asham Wood	100	0	0	0	0
Ebbor Gorge	80.22	19.78	0	0	0
Rodney Stoke	73.59	10.87	0	15.54	0
Cheddar Wood	6.7	90.09	0	3.21	0

Determining Reasons for Designation

4.128 Mendip Woodlands in south-west England is a relatively extensive example of ***Tilio-Acerion* forests** on limestone. It is a cluster of three ash-dominated woods on Carboniferous limestone. A rich variety of other trees and shrubs are present, including elm *Ulmus* spp. and, locally, small-leaved lime *Tilia cordata*. At Ebbor Gorge elm rather than lime is mixed with ash *Fraxinus excelsior* in a steep-sided gorge; at both Rodney Stoke and Cheddar Wood lime and ash are found on rocky slopes with patches of deeper soil between the outcrops. Ferns characteristic of this woodland type, such as hart's-tongue *Phyllitis scolopendrium* and shield-ferns *Polystichum* spp., are common. The site is in the centre of the range of common dormouse *Muscardinus avellanarius* and holds a large population of this species.

4.129 Asham Wood is the largest and most diverse of the ancient semi-natural woods in the Mendips. Despite recent partial destruction due to quarrying it remains one of the most important. Unlike other Mendip ancient woods the soils include a full range from excessively drained skeletal soils on the limestone outcrops to permanently wet conditions along the streamside. Several woodland types occur within the wood. On the heavy acid soils of the northern valley slopes one finds acid Pedunculate Oak-Hazel-Ash woodland. Along the valley bottom the alder *Alnus glutinosa* is mostly on neutral-alkaline mineral soils, but in parts of the southern valley alder wood was more extensive and wet. On the limestone plateau and slopes the woodland is a mixture of dry Ash-Maple woodland and Maple-Ash-Lime woodland, the latter being more abundant south of Tunscombe Bottom. Both these types are particularly characteristic of Mendip woodlands and indeed are better developed here than elsewhere in Britain. Finally, on the steep slopes of Tunscombe Bottom and Leighton Hanging wych elm *Ulmus glabra* is present and generates a further type, calcareous Ash-Wych Elm woodland. This is found both on the flushed lower slopes and on rock outcrops, where yew *Taxus baccata* is abundant. This range of woodland types is greater than in other Mendip ancient woods.

4.130 The conservation objective for the feature is **'to maintain, in favourable condition, *Tilio-Acerion* forests of slopes, screes and ravines'.** The attributes that measure the condition of the feature are the maintenance of the area, the natural processes and structural development, the wood's regeneration potential, its composition and the presence of species, habitats, and structures characteristic of the site.

Table 15: Mendip Woodlands Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Tilio-Acerion forests on slopes, screes and ravines	Appropriate management Deer, rabbit and livestock management Exclusion of off road vehicles

Ecological Zone of Influence

4.131 ***Tilio-Acerion* forests of slopes, screes and ravines** are sensitive to changes in air quality. The habitat therefore may be influenced outside the SAC by dust and air pollution resulting from issues set out in Chapter 3

Vulnerability

4.132 Two parts of the SAC, Ebbor Gorge and Rodney Stoke, are National Nature Reserves, with the exception of a small area at Rodney Stoke. These are not currently under any threat. Cheddar Wood is a Somerset Wildlife Trust nature reserve but is owned by the quarrying company, Associated Aggregates. The woodland is currently protected by local planning policies as a notified SSSI. No threat from quarrying is at present anticipated. The Asham Wood extension has been badly affected by quarrying in the past with up to 20% lost. This has now ceased and no major threats are apparent. However, acidic loving bryophytes have decreased significantly at Asham Wood over recent years, which may be a result of dust settlement from quarrying (pers, comm. Bob Corns, Natural England). Asham Wood is subject to illegal off road activities causing erosion.

4.133 Woodland areas require active management and the Invasion of inappropriate species into habitats requires control. Heavy browsing by deer can be a problem in some of the woodland.

North Somerset and Mendip Bats SAC

Component Sites

4.134 The component sites for the North Somerset & Mendip Bats SAC are:

- Compton Martin Ochre Mine SSSI
- Banwell Caves SSSI
- Banwell Ochre Mine SSSI
- Brockley Hall Stables SSSI
- King's Wood and Urchin Wood SSSI
- The Cheddar Complex SSSI
- Wookey Hole SSSI

4.135 Compton Martin Ochre Mine, Banwell Caves, Banwell Ochre Mine, Brockley Hall Stables and King's Wood and Urchin Wood SSSIs are all located in the geographic area administered by North Somerset Council. Compton Martin Ochre Mine is within 300 metres of the Somerset border. Banwell Caves is within 2 kilometres and Banwell Ochre Mine just over 2 kilometres.

Site Condition

4.136 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 16: North Somerset and Mendips Bat Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
Banwell Caves	100	0	0	0	0
Banwell Ochre Mine	100	0	0	0	0
Brockley Hall Stables	100	0	0	0	0
Cheddar Complex	40.66	54.27	5.07	0	0
Combe Martin Ochre Mine	0	0	0	100	0
Kings Wood and Urchin Wood	36.36	54.09	4.92	4.62	0
Wookey Hole	72.26	27.74	0	0	0

Determining Reasons for Designation

4.137 This site in south-west England was selected on the basis of the size of population represented (3% of the UK **greater horseshoe bat *Rhinolophus ferrumequinum*** population) and its good conservation of structure and function, having both maternity and hibernation sites. This site contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills.

4.138 The ecology of greater horseshoe bats have been described previously in sections on the Mells Valley and Mendip Limestone Grassland SACs.

4.139 The limestone caves of the Mendips provide a range of important hibernation sites for **lesser horseshoe bat *Rhinolophus hipposideros***. The Cheddar Complex component site supports a number of possible bat hibernacula and a single maternity roost. The maternity roost is located in the show caves. At Wookey Hole the roost site is located off the show caves.

4.140 Lesser horseshoe bats hibernate between September/October and April/May although they remain active and will forage when temperatures are above 5°C. Many lesser horseshoes hibernate in an alternative site to their summer roost sites, using caves, tunnels, mines or cellars where temperatures are below 11°C and with high humidity. Hibernation sites often contain few in number. (Bat Conservation Trust, 2003)

4.141 Lesser Horseshoe Bats forage in winter during warmer weather. They use similar habitats to those used in the summer months - that of woodland and particularly over pasture. (Boye & Dietz, 2005) In England radio tracking of bats revealed that they foraged on average to a maximum distance of 1.2 kilometres from the hibernation site. One bat travelled to an absolute maximum distance of 2.1 kilometres. The winter foraging range appears to be approximately half the area covered in the summer months. (Bat Conservation Trust/BMT Cordah, 2005)

4.142 Current factors considered to be causing loss or decline in lesser horseshoe bats include:

- Loss, destruction or disturbance of hibernation sites through change of use, leisure use or safety purposes
- Loss, damage or fragmentation of important foraging habitats, such as deciduous woodland, and connecting linear features such as hedgerows and tree lines
- Lack of suitably connected foraging habitats (a mosaic of deciduous woodland, hedgerows and tree lines)

4.143 The conservation objective for the feature is '**to maintain, in favourable condition, the habitats for the population of Greater horseshoe bat (*Rhinolophus ferrumequinum*) and Lesser horseshoe bat (*Rhinolophus hipposideros*)***'*. The attributes that measures the condition of the feature are the buildings containing bat roosts' roof covering, entrances, light levels, the degree of disturbance, the general condition and security of building, the internal condition in roost area and signs of bats. The attributes that measures the condition of the feature as hibernation roosts are the state of entrance, the security of the entrance, external conditions, lack of disturbance and use by bats

4.144 The Cheddar complex and Wookey Hole areas support a wide range of semi-natural habitats including **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)**. The principal community present is CG2 *Festuca ovina – Avenula pratensis* grassland that occurs on rock ledges and on steep slopes with shallow limestone soil, especially in the dry valleys and gorges and on the south-facing scarp of the Mendips. The site is also important for the large number of rare plants, which are associated with Carboniferous limestone habitats. These include dwarf mouse-ear *Cerastium pumilum*, Cheddar pink *Dianthus gratianopolitanus* and rock stonecrop *Sedum forsterianum*, which occur on rocks, screes, cliffs and in open grassland. Transitions to and mosaics with limestone heath, calcareous screes, scrub and *Tilio-Acerion* forests are a particular feature of the Cheddar complex part of the site.

4.145 The conservation objective for the feature is **'to maintain, in favourable condition, the semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)*'*.** The attributes that measure the condition of the feature are the extent of the habitat, the sward composition and the sward structure.

4.146 The main block of ***Tilio-Acerion* forest**, listed on the SAC citation**,** is at King's and Urchin's Woods located in North Somerset.

4.147 **Caves not open to the public** are selected as features of the SAC as they provide important hibernation sites for **greater and lesser horseshoe bats**.

4.148 The conservation objective for the feature is **'to maintain, in favourable condition, the caves not open to the public*'*.** The attributes that measure the condition of the feature as hibernation roosts are the state of entrance, the security of the entrance, external conditions, lack of disturbance and use by bats in winter.

Table 17: North Somerset and Mendip Bats Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Horseshoe bats	Undisturbed roosts Roost conditions maintained Appropriate management of vegetation at roost entrances Maintenance and connectivity of habitats used as flight lines on and off site Feeding areas
Semi-natural dry grasslands and scrubland facies on calcareous substrates	Sward structure and composition Absence of negative indictor species
Caves not open to the public	Pressure from human activity above and below ground Management of overlying land and catchment

Ecological Zone of Influence

4.149 For **greater horseshoe bats** a buffer of 6 kilometres around the maternity roost site areas are formed. Flyways and feeding areas are digitised based on radio tracking data produced in 2000 for the Cheddar Complex component of the SAC (Jones & Billington, 1999). This process is further analysed using aerial photographic interpretation and available habitat data.

4.150 Starting with maternity roosts, Minimum Convex Polygons (MCP) of feeding areas within home range are formed. There is more than one MCP as feeding areas are sufficiently separated. Include other roosts with in the home range in the MCP. The MCP is then modified by either inclusion or exclusion of whole fields using OS Mastermap. Similarly **lesser horseshoe bat** roosts are mapped using data on roost size to determine the distance buffered. Hibernation roosts are buffered by 2.1 kilometres. This forms the EZI for horseshoe bats with roosts located in the SAC.

4.151 The **unimproved calcareous grasslands** are sensitive to changes in air quality. The habitat therefore may be influenced outside the SAC by dust and air pollution resulting from issues set out in Chapter 3. Air pollution from traffic may have eutrophication effects, which would impact on species composition in the sward. 200 metres is the distance from a road

where nitrogen deposition is expected to occur in the Habitat Regulations Assessment of the draft Regional Spatial Strategy for the South West (2006). Bignall *et al*, (2004) consider that 150 metres air quality returns to background levels. The greater distance is used, as a precautionary approach is required.

Vulnerability

4.152 There is concern regarding loss of bat foraging areas. (Natural England). Problems are known to exist with recreational cavers in some of the caves used as hibernacula by bats. Natural England is working with the owners of these caves in order to minimise disturbance at critical times of the year. Further breeding roosts are believed to occur in the Cheddar area and steps are being taken to identify these. The bat population will potentially be at risk until these are discovered.

4.153 There are significant management problems associated with both the grassland and woodland elements of the SAC. Maintaining appropriate grazing levels is a problem. Currently under grazing is a problem on some of the grassland. Low levels of grazing are resulting in scrub invasion and the development of secondary woodland. There is also a problem with invasive and inappropriate species, such as gorse and bracken in the grassland.

Quants SAC

Component Sites

4.154 Component SACs sites are:

- Quants SSSI

Site Condition

4.155 Based on the tables for the equivalent Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 18: Quants Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
	45.02	17.56	37.42	0	0

Determining Reasons for Designation

4.156 This damp and sheltered site supports a medium-sized but strong **marsh fritillary *Euphydryas aurinia*** population in a neutral grassland/fen mosaic. It is strategically placed close to other smaller sub-populations, with which it forms a metapopulation, and may exchange individuals with the large population at Southey Moor (outside the SAC series).

4.157 The marsh fritillary is found on damp grasslands, which tend to be level or on gentle slopes in valley bottoms in Somerset. The adult emerges in late May or early July. The most important food plant for the species is devil's-bit scabious *Succisa pratensis*. Caterpillars will occasionally feed on small scabious *Scabiosa columbaria* or field scabious *Knautia arvensis*. However, generally, devil's-bit scabious needs to be abundant: in breeding sites. In addition, if the grassland sward is too tall and coarse, or too low and uneven adults may abandon its existing sites.

4.158 The marsh fritillary is essentially highly colonial with limited and sporadic dispersal. Colonies may occupy areas of less than 0.5 hectares up to over 20 hectares in size. 70 hectares of suitable habitat is required to sustain populations in the long term. It has been known to colonise between 5 and 20 kilometres away from its core sites However, the species is reluctant to fly over hedges and is restricted by open water, arable land, woodland and even beds of sedges.

4.159 The major threats to the marsh fritillary are the wholesale loss of its habitat caused by development and agricultural intensification and the inappropriate management of sites including abandonment of grazing resulting in increasing fragmentation and isolation of its habitats. (Hobson *et al*, 2002; Schtickzelle *et al*, 2005)

4.160 The conservation objective for the feature is **'to maintain, in favourable condition, the habitats for the population of Marsh fritillary (*Euphydryas aurinia*)'.** The attributes that measure the condition of the feature are *Succisa pratensis* density, the sward height, and floral richness, lack of scrub invasion, and the presence of larval webs

Table 19: Quants Key Environmental Conditions

Qualifying features	Key environmental conditions to support site integrity
Marsh fritillary butterfly	Appropriate management to maintain a mosaic of grassland and scrub habitats. Significant population of devil's bit scabious

Ecological Zone of Influence

4.161 Within Quants SAC suitable habitat is digitised using aerial photographic interpretation and available layers of habitat mapping. A buffer zone of 2 kilometres is created around the habitat (Fowles, A. P. 2003, amended 2004). Any marsh fritillary sites within this zone are also analysed by means of aerial photography and habitat data. This cluster of sites is then buffered by 2 kilometres to create the EZI for the marsh fritillary.

Vulnerability

4.162 The marsh fritillary population here is restricted to a comparatively small area (c. 2 ha) and is kept high by a considerable level of management directed at producing 'ideal' habitat in this area. If the highly interventionist nature of management is disrupted or discontinued the population may drop.

Severn Estuary

Component Sites

4.163 The Severn Estuary SPA comprises the following component SSSIs:

Bridgwater Bay
Flat Holm
Severn Estuary
Steep Holm
Sully Island
Upper Severn Estuary
Penarth Coast

4.164 The Ramsar site comprises all or parts of Bridgwater Bay SSSI, Flat Holm SSSI, Severn Estuary SSSI, Steep Holm SSSI, Sully Island SSSI and Upper Severn Estuary SSSI. Bridgwater Bay, covering 2,703 ha, was designated as a Ramsar site on 5 January 1976.

4.165 The Severn Estuary SAC contains habitat types and/or species which are rare or threatened within a European context. The SSSI describes the special interests for which the site was notified in the British context. The area is considered to have a high density of habitats/Species of European interest.

4.166 It is considered that only significant effects arising from the Transport Policies – Schedule of Policies potentially affect the **Bridgwater Bay SSSI**.

Site Condition

4.167 Based on the tables for the Bridgwater Bay Site of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 20: Bridgwater Bay Site Condition

SAC component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
	90.56	7.97	0.90	0.57	0

Determining Reasons for Designation

4.168 The Severn Estuary has a classic funnel shape, unique in the U.K., which helps give it the second highest tidal range in the world at more than 12 metres. This results in a range of terrestrial and aquatic habitats composed of plants and animals typical of extreme conditions of strong flows, mobile sediments, changing salinity and turbid waters.

4.169 The Severn Estuary has extensive intertidal mudflats and sand flats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh and freshwater ditches and occasional brackish ditches. The tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide swept sand and rock. The species poor invertebrate community includes high densities of ragworms, lugworms and other invertebrates forming an important food source for passage and wintering waders.

4.170 The site is important in the spring and autumn migration periods for waders moving up the coast of west Britain, as well as in winter for large numbers of waterbirds, especially swans, ducks and waders.

4.171 The area is also important for migratory fish and as a nursery for juvenile fish of many species.

Special Protection Area

4.172 The Severn Estuary supports populations of European importance of over wintering Bewick's Swan *Cygnus columbianus bewickii.* However, this species is not present in the Bridgwater Bay component site. Bridgwater Bay supports populations of European importance of migratory Ringed Plover *Charadrius hiaticula* on passage (particularly around the Axe Estaury, Berrow and Brue Estuary) and over wintering populations of

Curlew *Numenius arquata*, Dunlin *Calidris alpina alpina*, Pintail *Anas acuta*, Redshank *Tringa totanus* and Shelduck *Tadoma tadoma*.

4.173 Over winter the Severn Estuary regularly supports 72,000 individual waterfowl. In the Bridgwater Bay component site there are important populations of Shelduck *Tadoma tadoma*, Dunlin *Calidris alpina alpina*, Curlew *Numenius arquata*, Redshank *Tringa totanus*, Wigeon *Anas penelope* and Teal *Anas crecca.*

4.174 **Shelduck** are present in Bridgwater Bay all year. They are present in the Parrett estuary in significant numbers year round (500 - 3000 in 2003; 350 – 3595 in 2006). However, the number of breeding birds is extremely low (Somerset Ornithological Society).

4.175 Shelduck are found on sheltered coast and estuaries where there are sandbars and mud flats. They also visit farmland near the coast. (Holden & Cleeves, 2002) Typically they range up to 1 or 2 kilometres out to sea and a little further inland. (Cramp, 1977) Shelduck nest in burrows, often a rabbit hole, amongst dense vegetation, or other crevices and gaps including under buildings. Eggs are laid in April or May. (Holden & Cleeves, 2002) Shelduck moult in late summer, rendering them flightless for about a month. This makes them particularly sensitive to disturbance during this period. They are likely to seek the shelter out at sea riding the tide out. Also at this time youngsters form crèches. (Holden & Cleeves, 2002; pers. comm. Bob Corns, Natural England)

4.176 The reclamation of intertidal feeding grounds is a threat to Shelduck populations in the U.K. (Duncan *et al*, 1999)

4.177 **Wigeon** are a winter visitor to Somerset and can be found on coastal estuaries and marshes of Bridgwater Bay in the over winter period between September and March/April. (Somerset Ornithological Society) Wigeon winter along shallow coastlines, in sheltered waters with extensive tracts of mudflat or salt marsh (Cramp, 1977). They graze on land or find food in water. It eats mainly vegetation such as grasses, buttercups, algae, pondweed and especially eelgrass, which is found in estuaries. (Holden & Cleeves, 2002)

4.178 Space and visibility are essential for wigeon and they are sensitive to human disturbance such as from recreational activity. (Cramp, 1977; Holden & Cleeves, 2002)

4.179 **Teal** are present over the winter period from August/September to March/April on the Parrett/Brue estuary. (Somerset Ornithological Society)Teal are found on tidal coasts, in large estuaries, salt marshes and lagoons on passage in winter. They have long established wintering areas.

Outside of the breeding season they rest by day in tight packed groups on open water or on the edge of mud flats. As dusk progresses they move progressively towards dense vegetation. In the Carmargue they make flights of up to 15 kilometres between roost sites and feeding areas. (Cramp, 1977)

4.180 Teal find food mostly in shallow water and feeds mainly on the seeds of grasses, rushes and other plants such as pondweed, dock, birch and buttercup. In the summer it also feeds on invertebrates. (Holden & Cleeves, 2002)

4.181 **Dunlin** are a winter visitor and passage migrant in Somerset and are present in Bridgwater Bay in high numbers (2,000 to 21,000 in 2003; 818 to 24,500 in 2006) between August and March but can be seen in small numbers outside this period. However, 520/583 dunlins were still present in April/ May 2006 (Somerset Ornithological Society)

4.182 Outside the breeding season, dunlins are strongly attracted to broad coastal beeches, especially mudflats but also occur on lagoons and in estuaries, tidal rivers and on lake margins and freshwater bodies. Roosting tends to follow the tidal rises. At high tide they roost in salt marshes extending along the waterline 3 to 9 times as wide as their depth. There may be as many as 20 birds per square metre. (Cramp, 1983) Food is taken from the surface by probing mud or wading in water and consists of invertebrates such as beetles, molluscs, microscopic crustacea and worms. (Holden & Cleeves, 2002) When as breeding adults dunlin may feed up to 3 kilometres away from their broods (Bright *et al*, 2006).

4.183 Conservation of estuaries is essential for wintering populations and for – passage migrants. Recreational activity on coast can disturb roosting sites. (Holden & Cleeves, 2002)

4.184 The **black–tailed godwit** is mainly a passage migrant or winter visitor to Somerset with most numbers (c.300) being present from September to December in 2003. However, in 2006 numbers for the estuary in the same period numbered from 1 to 23. (Somerset Ornithological Society)

4.185 Outside the breeding season black-tailed godwits are found on muddy estuaries where it feeds on invertebrates. Black-tailed godwits are highly gregarious and use communal roost sites outside the chick-rearing season. They prefer shallow water, such as fens and flooded fields. They can make roosting flights of up to 11 kilometres. (Cramp, 1983; Holden & Cleeves, 2002)

4.186 **Whimbrel** are found on the coast, mainly in estuaries, coastal grassland and saltmarsh habitats. In Bridgwater Bay they were recorded visiting on

migration in April and May and were present in small number from June to September. (Somerset Ornithological Society)

4.187 **Curlew** have been recorded on the east Parrett estuary in all months apart from April and May. 641 Curlew were present in January 2003 falling to 48 in July. In 2006 1276 were present in January falling to 35 in May. (Somerset Ornithological Society)

4.188 Curlews can breed in coastal marshes or even agricultural land in lowland areas. In winter they are found mostly around the coast and especially in estuaries. Curlews form flocks outside the breeding season, and shift to coastal habitats such as mudflats and sands, which are extensive at low tide. Feeding birds spread out but congregate at high tide and usually roost on nearby fields or salt marsh. The principal features of roost sites are shallow water, some vegetative clear ground and clear views. They may travel up to 20 kilometres to roost. Roost site fidelity is strong even outside the breeding season. (Cramp, 1983; Holden & Cleeves, 2002) Curlews prefer open fields that have little activity about them, with low intensity agricultural fields and existing meadows away from frequent human disturbance providing ideal living conditions (Cramp, 1983).

4.189 In 2003 **redshank** numbering from 100 to 800 were using the east Parrett estuary in Bridgwater Bay, with the highest number recorded in August and being absent only in May and June. In 2006 they were absent during May and June whilst the rest of the year ranged from 1 in April to 790 in February. (Somerset Ornithological Society)

4.190 Outside the breeding season redshanks are mainly found in coastal areas, feeding in saltmarsh habitats, and un-vegetated mud in estuaries. Its food consists of shrimps, small crabs, ragworms and other marine worms. When they remain inland redshanks are found with ample food supplies, such as around sewage works and watersides. (Cramp, 1983; Holden & Cleeves, 2002) On an estuary in Scotland wintering redshank fed for 24 hours, using nearby fields to do so at high tide (Cramp, 1983).

4.191 Threats to redshanks include the disappearance of coastal marshes due to sea levels rising. (Holden & Cleeves, 2002)

4.192 The conservation objectives for a site relate to the important wintering populations of birds listed in Annex I of the Bird's Directive, populations of passage birds and populations of waterfowl, '**to maintain at, or restore to, favourable conservation status, the natural habitats and/or the populations of birds for which the site has been selected**'. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing.

Special Area of Conservation

4.193 The Severn Estuary is one of the best areas in the UK for mudflats, sand flats and Atlantic salt meadows. The estuary is also an important area for migratory fish and as a nursery for juvenile fish of many species.

4.194 The area is considered one of the best in the U.K. for **Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).** This habitat encompasses saltmarsh vegetation containing perennial flowering plants that are regularly inundated by the sea. The species vary according to the duration and frequency of flooding with seawater, geographical location and grazing intensity. Salt-tolerant species, such as common saltmarsh grass *Puccinellietalia maritimae,* sea aster *Aster tripolium* and sea arrowgrass *Trigochin maritime, are particularly characteristic of this habitat.*

4.195 Nationally scarce flora occurs including bulbous foxtail (*Alopecurus bulbosus*) in Bridgwater Bay and the River Parrett. Slender hare's-ear *Bupleurum tenuissimum* is also frequently found in Bridgwater Bay and Rivers Parrett and Brue. *Hordeum marinum*, sea barley, is found in a particularly dense population in Bridgwater Bay.

4.196 **Estuaries** are semi-enclosed bodies of water, which have free connection with the open sea and within which seawater is measurably diluted by freshwater from surrounding land. They are usually large features containing a complex range of habitats that reflect the variations in tidal influence and substrate type.

4.197 The area is considered one of the best in the U.K. for **mudflats and sandflats not covered by seawater at low tide.** These are mud and sand sediments on the shore that are exposed at low tide but submerged at high tide. Many sites are important feeding areas for waders and wildfowl.

4.198 **Reefs** are biological concretions formed from various invertebrate species. Reefs occur in the sub-tidal zone, but may extend onto the shore. They form the habitat for a variety of biological communities, such as those characterised by encrusting animals and seaweed.

4.199 Isolated reefs of agglomerated *Sabellaria* worms are found in Bridgwater Bay, which is highly mobile, nearly liquid mud with some areas of sand waves and an intertidal area of firm sandy mud. Dense aggregations of *Sabellaria alveolata* worms have been recorded (density exceeding 1000 worms per m^2) off Hinkley Point. Intertidal *Sabellaria* reef is present to the north east of Steart Point outside the Parrett Estuary.

4.200 **Sandbanks which are slightly covered by sea water all the time** are covered by seawater up to depths of 20 metres below low water can include muddy sands, clean sands, gravely sands, eelgrass *Zostera marina* beds, and maerl beds (carpets of small, unattached, calcareous seaweed). An area of this habitat lies off the coast directly west of Burnham on Sea

4.201 **Twaite Shad *Alosa fallax*** is a fish that occurs in western European coastal waters. It enters the lower reaches of rivers to spawn. Twaite shad is a member of the herring family. It returns from the sea to spawn in spring, usually between April and June, hence the alternative name of 'May fish'. The habitat requirements of twaite shad are not fully understood. On the River Usk and the River Wye, twaite shad are known to spawn at night in a shallow area near deeper pools, in which the fish congregate. The eggs are released into the water column, sinking into the interstices between coarse gravel/cobble substrates. The majority of adults die after spawning, though UK populations appear to have an unusually high proportion of repeat spawners – up to 25%. After hatching the fry develop and slowly drift downstream. Recruitment seems to be highest in warm years, and high flows between May and August may result in fry being washed prematurely out to sea.

4.202 Population declines in many parts of Europe have been attributed to pollution, overfishing and migratory route obstructions.
http://www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1103

4.203 **River lamprey *Lampetra fluviatilis*** is a primitive jawless fish resembling an eel. Confined to Western Europe, it migrates from the sea to spawn in silt beds of many rivers in the U.K. It is found in coastal waters, estuaries and accessible rivers. The species is normally anadromous (i.e. spawning in freshwater but completing part of its life cycle in the sea), and pollution or artificial obstacles such as weirs or dams impede migration, it migrates from the sea to spawn in silt beds of many rivers in the U.K.
http://www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1099

4.204 **Sea lamprey *Petromyzon marinus*** is also a primitive jawless fish resembling an eel. It is the largest of the lampreys found in the U.K. It inhabits North Atlantic coastal waters and migrates to spawn in rivers.

4.205 It occurs in estuaries and easily accessible rivers, and is an anadromous species (i.e. spawning in freshwater but completing its life cycle in the sea). Like the other species of lamprey, sea lampreys need clean gravel for spawning, and marginal silt or sand for the burrowing juvenile

ammocoetes. Sea lampreys have a preference for warm waters in which to spawn. Features such as weirs and dams, as well as polluted sections of river, may impede migration to spawning grounds. In comparison to river lamprey, sea lampreys seem to be relatively poor at ascending obstacles to migration, and are frequently restricted to the lower reaches of rivers.
http://www.jncc.gov.uk/ProtectedSites/SACselection/species.asp?FeatureIntCode=S1095

4.206 Currently there are no conservation objectives for the SAC.

Ramsar

4.207 The Ramsar site is a Wetland of International Importance because the site qualifies under several criteria for determining qualification. Under **Criterion 1** it qualifies because it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region. It has an immense tidal range exceeded only by that occurring in the Bay of Fundy, Canada. This tidal regime affects both the physical environment and the biological communities present in the estuary.

4.208 Under **Criterion 3** it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region. It supports unusual estuarine communities, reduced species diversity and high productivity. The high tidal range leads to strong tidal streams and high turbidity, producing communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock.

4.209 The site qualifies under **Criterion 4** because it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions. It is particularly important for migratory birds during passage periods in spring and autumn. The rich food resources available in the tidal flats and nearby freshwater wetlands support these large bird populations. The bird species are synonymous with those listed under the SPA designation above.

4.210 The site qualifies under **Criterion 5** because it regularly supports 20,000 or more waterbirds and in the non-breeding season, the area regularly supports 68,026 individual waterbirds (5 year peak mean 1988/89 – 1992/93). The site qualifies under **Criterion 6** (previously Criterion 3c) because it regularly supports 1% of the individuals in the populations of species or subspecies of water bird in any season. The bird species are synonymous with those listed under the SPA designation above.

4.211 The site qualifies under **Criterion 8** because it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend. It is particularly important for the run of migratory fish between the sea and rivers via the estuary. Species using the estuary include **Atlantic Salmon *Salmo salar***, Sea Trout *S. trutta*, Sea Lamprey *Petromyzon marinus*, River Lamprey *Lampetra fluviatilis*, Allis Shad *Alosa alosa*, Twaite Shad *A. fallax* and **Eel *Anguilla anguilla***. The population of the Sea Lamprey and the Twaite Shad are now considered to be larger than in any other UK estuary. The rare and endangered Allis Shad is now only an occasional visitor although formerly a substantial spawning population was present.

4.212 **Atlantic salmon** is an anadromous species (i.e. adults migrate from the sea to breed in freshwater). Spawning takes place in shallow excavations called redds, found in shallow gravelly areas in clean rivers and streams where the water flows swiftly. The young that emerge spread out into other parts of the river. After a period of 1-6 years the young salmon migrate downstream to the sea as 'smolts'. Salmon have a homing instinct that draws them back to spawn in the river of their birth after 1-3 years in the sea. Salmon use the Estuary to migrate to spawn in rivers draining into it including the River Tone in the River Parrett catchment through Bridgwater Bay. The Estuary also acts as a nursery for the species.

4.213 Adult **common eel** are most abundant in estuaries and low salinity pools but are also found around the coast in permanent tide pools, on the lower shore and shallow sublittoral. Being nocturnal it is inactive during the day concealed under rocks or weed or in soft sediments. It has a complex life history that is poorly understood. It involves migration of mature adults from European rivers and estuaries to the Sargasso Sea in the western Atlantic for spawning, and the subsequent return of juveniles. They metamorphose twice, part of the life cycle spent in fresh water and part in estuarine or full seawater. It is present in the River Parrett catchment flowing into Bridgwater Bay.

Table 21: Severn Estuary Key Environmental Conditions

Site	Qualifying features	Key environmental conditions to support site integrity
Severn Estuary SPA	Migratory species – ringed plover, curlew, dunlin, pintail, redshank, Shelduck	Bird usage of the site varies seasonally, with different areas being favoured over others at certain times of year. Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and manv

Site	Qualifying features	Key environmental conditions to support site integrity
Severn Estuary Ramsar	Ramsar Criterion 1 Immense tidal range	The estuary has an extreme type of hydrodynamic and sedimentary regime and these determine the type of habitat and species present. Management must ensure that these factors are not unduly influenced by anthropomorphic activities. Dynamic habitats need to be taken account of when managing the site. Habitats highly sensitive to inorganic fertilisers and pesticides Grazing management of saltmarsh Management of creek density Human disturbance kept within acceptable levels
	Ramsar criterion 3 Unusual estuarine communities	
	Ramsar criterion 4 Migratory species	As per criterion 8 below
	Ramsar criterion 5 Species with peak counts in winter: 70919 waterfowl	Bird usage of the site varies seasonally, with different areas being favoured over others at certain times of year. Bird communities are highly mobile and exhibit patterns of activity related to tidal water movements and many other factors. The most important factors are: • Current extent and distribution of suitable feeding and roosting habitat. • Sufficient prey availability . • Levels of disturbance are maintained within necessary levels. • Water quality and quantity
	Ramsar criterion 6 Species with peak counts in winter: • Shelduck • Gadwall • Dunlin • Redshank	

Site	Qualifying features	Key environmental conditions to support site integrity
	Ramsar criterion 8 Very high fish species diversity for Britain with over 110 species.	Natural structure and form of rivers maintained to support natural flow regime Avoidance of creating artificial barriers to the passage of migratory fish. Exploitation of fish populations or other native animals or plants at a sustainable level Water quality
Severn Estuary SAC	Estuaries	Maintenance of includes levels of nutrients, oxygen, turbidity, temperature and salinity
	Mudflats and sandflats not covered by sea water at low tide	See Ramsar Criterion 1 Avoidance of disturbance of human activities
	Atlantic salt meadows	Grazing management of saltmarsh Management of creek density Human disturbance kept within acceptable levels
	Sandbanks which are slightly covered by sea water all the time	See Ramsar Criterion 1
	Reefs	Abundance of suitable coarse sediments The availability of suitable substrates Supply of *Sabellaria* larvae (within the water column) Abundance of food
	Sea lamprey	Natural structure and form of rivers maintained to support natural flow regime Avoidance of creating artificial barriers to the passage of migratory fish. Exploitation of fish populations or other native animals or plants at a sustainable level Water quality
	River lamprey	
	Twaite shad	

Ecological Zone of Influence

4.214 **Habitats** in the estuary are sensitive to changes to water quality in outfalls and watercourses entering Bridgwater Bay as described in Chapter 3.

4.215 Records for each **bird species** are analysed outside of the SPA and any supporting habitat that supports a bird species is digitised. In flight records are ignored, as are those over 10 years old. Birds can be disturbed by human activity or development (Stillman *et al*, 2007). Populations of curlew, redshank and dunlin are significantly reduced through sustained disturbance, such as construction work or road traffic on adjacent land to mudflats (Burton *et al*, 2002a; Burton *et al*, 2002b). Where people were showing against the skyline shorebirds were disturbed at distances of 400 metres compared with 200 metres when not exposed on the skyline but moving at a steady pace. (Goss-Custard, 2005)

4.216 Examples of the distances at which birds take flight from being disturbed are shown in Table 22. There would also be a distance from which birds are distracted from feeding and are alert, which is not given.

Table 22: Disturbance from Human Proximity

Species	Flight Distance (FD)
Shelduck	102-124 metres
Wigeon	89 -250 metres
Teal	No data
Dunlin	97– 175 metres
Black-tailed Godwit	45-73 metres
Whimbrel	84 metres
Curlew	90-339 metres
Redshank	70 –95 metres

(from Bright *et al*; Goss-Custard, 2005; Mathers *et al*, 2000)

4.217 The largest FD is 339metres. Therefore, a distance of 400 metres is used for buffering the Natura 2000 site and any additional digitised habitat. This allows for a period of alertness before taking flight and also the possibility that development is on the skyline.

4.218 Records outside of the SPA/Ramsar sites are examined and where it is considered that the habitat potentially supports the ecological requirements of the bird species listed for the designation this is digitised and buffered. A list of the sites is given in Appendix 1.

4.219 Flight paths also need considering as many species listed fly in the lower air space and can be disturbed by land use change along these corridors. These are digitised by forming MCPs around the records per species for the site, linking the habitat outside the site with that on the Natura 2000

site.

4.220 Birds are also dependent on prey species, which are in turn partly dependent on the maintenance of water quality entering the estuary. Therefore, watercourses entering the Ramsar sites supporting these species should also be digitized.

4.221 The riverine records for the **fish species** listed were examined and the Environment Agency consulted. None of the species for which the SAC site is designated have been recorded for some time in the rivers entering Bridgwater Bay. (SERC have records for River Lamprey dating from 1905 for the River Tone) However, Atlantic salmon and common eel frequent to Parrett catchment and would be dependent on conditions in these watercourses to migrate and breed. Fish are also dependent on the maintenance of water quality entering the estuary. Therefore, watercourses entering the SAC site supporting these species should be digitized as part of the EZI.

Vulnerability

4.222 The conservation of the site features is dependent on the tidal regime. The tidal range in the Severn Estuary is the second-highest in the world and the scouring of the seabed and strong tidal streams result in natural erosion of the habitats and the presence of high sediment loads. Natural processes cause the width and depth of the estuary to change over time and the location and extent of salt marshes and mudflats may change provided there is capacity to accommodate readjustment.

4.223 However, where this process is constrained by human intervention, the capacity of habitats to accommodate readjustment may be adversely affected. The estuary's tidal regime makes it vulnerable to large-scale interference, including human actions such as:

- Land-claim leading to salt marsh loss and reduction in suitable habitats for resident and migrating birds species.
- Aggregate extraction/ dredging. Scouring of the seabed and strong tidal streams result in natural erosion.
- Physical developments, such as potential Severn barrage construction and resultant change in tidal and sediment regimes
- Coastal squeeze due to sea level rise and existing or new flood defences (for protection of new development), leading to saltmarsh loss and changes to coastal erosion and deposition processes.
- Pollution (industrial, oil spillage) and resultant declining water quality.

• Nutrient enrichment, especially due to agricultural runoff or increased sewage treatment work discharges associated with development.
• Tourism based activities or population increase / urban growth and resulting potential for increased disturbance, especially to inter-tidal bird habitats, and feeding and roosting wildfowl.
• Development pressure for wind farms and associated land take, construction disturbance and impact on bird migration routes.
• Inappropriate grazing regimes e.g. of saltmarsh (under-grazing or over-grazing).
• Low summer water levels affecting coastal swamp /marsh.

4.224 There are several management mechanisms that seek to secure sustainable management of the Severn Estuary and its wildlife interest. A management scheme under Regulation 34 of the Habitats Regulations was established in 2004 in relation to the international bird interest that underpins designation as a Special Protection Area.

Somerset Levels and Moors

Component Sites

4.225 The Somerset Levels and Moors SPA comprises the following component SSSIs:

- Catcott Edington and Chilton Moors SSSI
- Curry and Hay Moors SSSI
- King's Sedgemoor SSSI
- Moorlinch SSSI
- Shapwick Heath SSSI
- Southlake Moor SSSI
- Tealham and Tadham Moors SSSI
- West Moor SSSI
- West Sedge Moor SSSI
- Westhay Heath SSSI
- Westhay Moor SSSI
- Wet Moor SSSI

4.226 The Ramsar site comprises the same SSSI suite as the SPA.

Site Condition

4.227 Based on the tables for the Sites of Special Scientific Interest the condition of the affected components, by % of site, is as follows:

Table 23: Somerset Levels and Moors Site Condition

SPA/ Ramsar component site	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
Catcott, Edington and Chilton Moors	5.37	0	94.63	0	0
Curry and Hay Moor	1.74	0	95.3	2.96	0
King's Sedgemoor	26.51	0	73.9	0	0
Moorlinch	2.44	67.76	29.8	0	0
Shapwick Heath	70.45	23.91	5.64	0	0
Southlake Moor	0	19.94	80.06	0	0
Tealham and Tadham Moors	13.31	5.48	81.21	0	0
West Sedgemoor	44.87	12.02	33.29	0	9.82
Westhay Heath	100	0	0	0	0
Westhay Moor	24.15	0	73.26	2.59	0
Wet Moor	53.27	27.5	19.23	0	0

Determining Reasons for Designation

4.228 The Somerset Levels and Moors SPA and Ramsar status was classified on 26 June 1997. The Levels and Moors is one of the largest and richest areas of traditionally managed wet grassland and fen habitats in lowland UK. The SPA is within this area and totals 6388.49 hectares. The majority of the site is only a few metres above mean sea level and drains through a network of ditches, rhynes, drains and rivers. Flooding may affect large areas in winter depending on rainfall and tidal conditions. Parts of the site in the Brue valley include areas of former raised peat bog that have now been substantially modified by agricultural intensification and peat extraction. This has created areas of open water, fen and reed bed. The site attracts important numbers of water birds in winter. The network of rhynes and ditches support an outstanding assemblage of aquatic invertebrates, particularly beetles.

4.229 The majority of the site is dominated by open wet grassland and ditches with a range of plant communities: Species-poor grassland including the semi-improved grassland communities with perennial rye grass and naturally-occurring species-poor floodplain or inundation grassland communities (National Vegetation Classification communities (NVC)

include MG13, MG6, MG7, MG10). Species-rich fen meadows and flood pastures where agricultural improvement has been less intense with MG8 *Cynosurus cristatus- Caltha palustris* grassland with *Cirsium dissectum* and *Caltha palustris* and mire communities such as M23, M24 and M25 with more *Juncus* and *Carex* species. Smaller areas of drier species-rich hay meadows (MG5) with *Centaurea nigra, Orchis morio* and *Briza media* are present.

4.230 In the rivers, rhynes and ditches the floristic diversity is largely dependent upon sympathetic cleaning practices. The field ditches support the greatest floristic diversity including the species; *Wolffia arrhiza, Hottonia palustris* and *Hydrocharis morsus-ranae*.

4.231 Other habitats include withy beds, orchards and pollarded willows.

4.232 The remaining habitats are largely restricted to the SSSIs within the Brue Valley where areas of former raised bog have been modified by peat extraction and agricultural improvement. Small areas of tall herb fen (S24) with *Lathyrus palustris, Peucedanum palustre* and *Thelypteris palustris* and small remnants of raised bogs which are very degraded and support vegetation more akin to wet heath with *Erica tetralix* and *Molinia caerulea*.

4.233 Open water, reed swamp and reedbed with a range of species from submerged plants to tall stands of *Phragmites australis* and *Typha latifolia* are found in the flooded peat workings. Wet woodland is also found where peat has been cut many years ago and dominated by *Salix* spp., *Betula* spp. and *Alnus glutinosa*.

Special Protection Area

4.234 In Somerset, **Bewick's Swan *Cygnus columbianus bewickii*** winter gathering on low-lying wet pasture, flooded grasslands, and salt marshes, which are free from persecution, using lakes, pools, reservoirs and rivers accompanied by suitable grazing areas, especially flood pastures. It occasionally visits arable fields with spring wheat. On migration it pauses on suitable lakes, pools and rivers. (Cramp, 1977; Holden & Cleeves, 2002) They eat almost entirely leaves, shoots, roots, rhizomes and tubers found in water less than 1 metre deep. However, they frequently graze and dig for roots in flooded pastures. (Cramp, 1977)

4.235 They are present from about December to March on Curry & Hay Moors; Southlake Moor; West Sedgemoor; and Wet Moor sites. They have also been recorded at Westhay Moor, Tealham Moor, Catcott Lows, Greylake, Moorlinch Moor, and Mulcheney Level. (Somerset Ornithological Society)

4.236 **Wigeon *Anas penelope*** are a winter visitor to Somerset and can be

found on marshes, although in recent times they have also used inland lakes and reservoirs. (Holden & Cleeves, 2002) Wigeon were present on most SPA sites in the Levels and Moors. (Somerset Ornithological Society) This species is further described under the Severn Estuary SPA/Ramsar above where it is also present.

4.237 **Gadwall *Anas strepera*** are present all year on the Levels and Moors, which is the third most important site in the UK for the species. They are fairly common as a winter visitor and passage migrant but are an uncommon breeder. They have been recorded on Westhay Moor; Ham Wall/Walton Heath; Shapwick Heath/Meare Heath; Westhay Heath; Catcott Lows; and West Sedgemoor, and also at Cheddar Reservoir. They bred at Ham Wall and Shapwick Heath in 2003. (Somerset Ornithological Society)

4.238 Gadwalls breed on lowland lakes or slow flowing rivers with vegetated edges and islands. They do not nest in colonies but females will occasionally nest within 5 metres of each other. They use open water, often following other feeding water birds such as coots and mute swans. In winter they form small loose flocks. (Holden & Cleeves, 2002) In winter they tend towards concentrations in suitable sheltered parts of large wetlands. They are reluctant to shift further than is essential from their regular habitats. During winter gadwalls communally roost, probably both during diurnal and nocturnal periods. (Cramp, 1977) During the breeding season gadwall have a home range of between 14 – 35 hectares (av. 27ha), which expands to several hundred acres dependant on the distance between nest sites and suitable activity centres. Gadwall breed both in the open and under thorny bushes. They readily forage and nest some way from water on natural grassland or heath, pasture or crop fields. (Cramp, 1977)

4.239 **Teal *Anas crecca*** winter in wetland areas where it may be found on ponds and reservoirs. (Holden & Cleeves, 2002) The Levels and Moors constitute the most important site nationally for the species in Great Britain, and the area is important internationally for teal.

4.240 In the summer one pair have bred on the Catcott Lows over successive years and others were present on the Avalon Marshes, Greylake, Shapwick Heath and West Sedgemoor during the breeding season. (Somerset Ornithological Society) Over wintering teal are present from August to April and are present on Westhay Moor, Ham Wall/Walton Heath, Shapwick/Meare Heath, Catcott Lows, Greylake/King's Sedge Moor and Wet Moor. (Somerset Ornithological Society) This species is further described under the Severn Estuary SPA/Ramsar above where it is also present.

4.241 **Pintail *Anas acuta*** is a fairly common winter visitor to Somerset being present from in numbers from October to March. West Sedgemoor hosts the largest counts of pintails, which is of international importance for the species, but they are also found on Wet Moor; King's Sedgemoor; Catcott Lows; and Shapwick/Meare Heath. They also visit Cheddar and Sutton Bingham Reservoirs. However, January numbers have been declining on West Sedgemoor from 2003 when 1001 were present until 2006 when there were only 161 recorded. (Somerset Ornithological Society)

4.242 They are highly gregarious and prefer shallow aquatic habitats, most often eutrophic and at least moderately biologically productive. They avoid overgrown areas with dense aquatic vegetation. They can use bare ground some distance from water, although they normally nest nearer. In winter they also feed on farmland, including stubble. (Cramp, 1977) Pintails visit estuaries and large inland wetlands in winter, which have flooded grassland and reservoirs with shallow edges. (Holden & Cleeves, 2002) Pintail eat a wide variety of plant and animal material in depths of 10 – 31 cm of water.

4.243 **Shoveler *Anas clypetea*** is a fairly common winter visitor to Somerset but has been known to breed. Most are present through the winter at Ham Wall/Walton Heath; Westhay Moor and Meare/ Shapwick Heaths, Catcott Lows and particularly West Sedgemoor. There were 2 breeding pairs at Westhay Moor in 2006. (Somerset Ornithological Society)

4.244 In winter shovelers are found on inland marshes, small lakes and pools, and around the fringes of reservoirs. (Holden & Cleeves, 2002) Outside the breeding season they form flocks of 20-30 birds (Cramp, 1977). Shovelers are omnivorous and fly below 100 metres. (Cramp, 1977) Shovelers from Chew Valley Lake SPA are known to use Cheddar Reservoir SSSI and there may possibly some interaction between them and the Levels and Moors populations.

4.245 **Golden Plover *Pluvialis apricaria*** is present over winter in Somerset. In winter they gather on lowland grassland and arable fields and can roost in ploughed fields. Some flocks visit coastal marshes and estuaries, away from mud flats and sand preferring open ground above the foreshore, commonly sharing with lapwings. It prefers low vegetation that does not block its view.

4.246 They are present from September to April on Catcott, Edington & Chilcott Moors; Curry & Hay Moors; Southlake; West Sedgemoor; and Wet Moor SPA/Ramsar sites. They have been recorded elsewhere on the Levels, e.g. Aller Moor, and in the Parrett estuary. Numbers have been fairly consistent. (Somerset Ornithological Society)

4.247 **Lapwing *Vanellus vanellus*** are present in the area throughout the year, either over wintering or breeding. In 2004/5 the Levels and Moors were the most important international site in the UK for lapwings. 2006 figures are almost the same, which may maintain this status. In the UK numbers are up generally but down in Northern Ireland which may indicate an eastward shift of range. (Somerset Ornithological Society)

4.248 Lapwings breed mainly in farmland which has been cultivated in spring and where there is bare ground and short grass, especially among crops, but take their young to feed in neighbouring pasture. They are also found on wet grasslands, bogs, marshes and brownfield sites with damp areas. Nesting begins in March. (Holden & Cleeves, 2002) They avoid fields of less than 5 hectares (Cramp, 1983). Lapwings require unenclosed terrain affording an unbroken view all around. They avoid fields enclosed by hedgerows or walls or parkland with many mature trees or savannah type grasslands (Cramp, 1983) but select open habitats distant from boundary features (Sheldon *et al*, 2004). Roads negatively affect lapwings to a distance of 500-600 metres in grassland habitat (Kaseloo & Tyson, 2004).

4.249 In winter they are found on lowland farmland except in cold weather when they visit coastal areas.

4.250 Lapwings form communal roosts from early May through to January. They roost in fields of greater than 16 hectares (Mason & Macdonald, 1999). Many feed en route at staging posts. At full moon they may feed all night. Night roosts are in open ground. Whilst on the nest the female will roost on the nest site with the male some 10 to 20 metres distant. (Cramp, 1983)

4.251 Key breeding sites are on the Upper Axe, in the Shapwick area, King's Sedge Moor, Catcott Lows, Greylake and West Sedge Moor. From 1995 there has been a trend for decreasing numbers of breeding lapwings in Somerset. (Somerset Ornithological Society) Lapwings nest in groups of 3 to 10pairs who space their nest sites about 10 to 150 metres apart. Territorial area ranges from 0.36 hectares (Severn) to 0.9 hectares (Lancashire). (Cramp, 1983)

4.252 The SPA/Ramsar is also important for supporting large numbers of over wintering lapwing on Tealham Moor, Meare Heath, Shapwick Heath, Catcott Lows, Greylake, West Sedge Moor, King's Sedge Moor and other sites on the Levels. (Somerset Ornithological Society)

4.253 **Snipe *Gallinago gallinago*** are found in summer on fenland and low-lying marshes and in winter its habitat use becomes more widespread, using both coastal and inland marshes. (Holden & Cleeves, 2002) Any tall or dense vegetation needs to be separated by more open ground with low

tussocks or clumps of sedge *Carex*, rushes *Juncus o*r coarse grasses. They require soft accessible organic soil rich in food organisms just below the surface with frequent clumps or patches of herbage or shrub affording good visibility of approaching danger. (Cramp, 1983)

4.254 When nesting there are an average of 3 to 9 pairs per 100 hectares (average 17.2 hectares per pair) on peatland (Cramp, 1983).

4.255 Snipe show considerable winter site fidelity. In winter they feed at night and roost by day. (Cramp, 1983)

4.256 In 2003 snipe were mainly found on West Sedgemoor SPA, which hosted half the wintering population, but were also present on other sites across the Levels in all months apart from July. In 2006 a total of 64 pairs bred on Levels and Moors, of which West Sedgemoor is an important site. (Somerset Ornithological Society)

4.257 The conservation objectives for a site relate to the important wintering populations of birds listed in Annex I of the Bird's Directive, populations of 'regularly occurring migrant birds' and populations of waterfowl. Therefore, the conservation objective for the Somerset Levels and Moors SPA is '**to maintain at, or restore to, favourable conservation status, the natural habitats and/or the populations of birds for which the site has been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing**.'

Ramsar

4.258 The Ramsar site is a Wetland of International Importance because the site qualifies under several criteria for determining qualification. Under **Criterion 2a** the ditches and rhymes support an assemblage of rare, vulnerable or endangered species of sub species (specifically rare invertebrates, particularly beetles). Nationally important invertebrate species occurring on the sites are:

- Lesser silver water beetle *Hydrochara caraboides*
- A water beetle *Hydaticus transversalis*
- A water beetle *Dytiscus dimidiatus*
- Greater silver water beetle *Hydrophilus piceus*
- A water beetle *Laccornis oblongus*
- A small water beetle, *Limnebius aluta*
- A soldier beetle *Cantharis fusca*
- A rove beetle *Paederus caligatus*
- A leaf beetle *Oulema erichsoni*
- A weevil *Bagous nodulosus*

- A soldier fly *Odontomyia angulata*
- A soldier fly *Odontomyia ornate*
- A marsh fly *Pteromicra leucopeza*
- A hoverfly *Lejops vittata*
- Large marsh grasshopper *Stethophyma grossum* (Now considered extinct on the Levels and Moors)
- Large-mouthed valve snail *Valvata macrostoma*

4.259 **Water beetles** may be either predatory, scavengers or herbivores. They swim well and store oxygen under the elytra, a modified forewing, or hairs on their underside. When their oxygen is used up they return to the surface. A few species can get their oxygen from the water. Most are active throughout the year but may remain dormant in colder weather. Many species fly well. (Chinery, 2005)

4.260 As an example, the **lesser silver water beetle** is found in drainage ditches with diverse emergent vegetation, overlying peat in somewhat base-rich water. Eggs are often laid on frog-bit. The larvae are totally carnivorous preying on aquatic water snails. The adults are omnivorous feeding on snails, aquatic worms, insects and flora such as water violet and frog-bit. (Boyce, 2004) The adult lesser silver water beetle can be found throughout the year but peaks between March and June. Breeding probably occurs during this period and eggs are hatched by early June. They are capable swimmers for *Hydrophilidae,* swimming being used as a means to escape. Lesser silver water beetles, like most water beetles, fly readily. (Boyce, 2004; Chinery, 2007) There is a strong correlation between distribution of egg cocoons and low levels of duckweed (*Lemna* spp.). The growth of duckweed is linked to nutrient levels in the water and eutrophication. (Boyce, 2004)

4.261 **Soldier beetles** are so called because of their bright colours. They are predators hunting on flowers of grassland, hedgerows and woodland margins. They fly well in sunshine. (Chinery, 2007)

4.262 **Rove beetles** have short elytra and leave much of the abdomen exposed. They are small and fly well. They are mostly predatory or omnivorous scavengers. (Chinery, 2005) **Leaf beetles** are leaf eaters. **Weevils** are vegetarian throughout their life cycle and many are flightless. (Chinery, 2007)

4.263 **Soldier flies** are named after their bright and metallic colours. Their flight is often week and they visit flowers to gather nectar. (Chinery, 2007)

4.264 **Hover flies** have a hovering darting type flight. Most are nectar feeders, especially from umbellifers. Many mimic wasps or bees. (Chinery, 2007)

4.265 The **large mouthed valve snail** is restricted to still or slow flowing water in well-vegetated lowland habitats with high species diversity, primarily drainage ditches in marshland levels. Large mouthed valve snail colonies are sharply defined and limited to short lengths of ditch. (Bratton, 1991)

4.266 Under **Criterion 3a** the Ramsar site regularly supports at least 20,000 waterfowl (specifically 73014 waterfowl) and under **Criterion 3c** – Regularly supports at least 1% of all individuals in a waterfowl population (specifically Bewick's swan, teal and lapwing [see SPA criteria])

Table 24: Somerset Levels and Moors Key Environemtal Conditions

Site	Qualifying features	Key environmental conditions to support site integrity
Somerset Levels and Moors SPA	Over wintering - Bewick's swan, golden plover	Active management to maintain the ground and surface water levels of the site. Management of the habitats present is required to maintain the diverse structure and composition of vegetation. This would include hay cutting, light grazing and ditch drainage. Control of inappropriate or invasive species Maintenance of view lines Birdlife found on the site is vulnerable to disturbance.
	Migratory species – shoveler, teal, wigeon	
	Waterfowl	
Somerset Levels and Moors Ramsar	Rare invertebrates, particularly beetles	Appropriate maintenance of rhynes and ditches Ground and surface water levels Water quality
	Waterfowl	Ground and surface water levels. Management of habitats Control of inappropriate or invasive species Maintenance of view lines Birdlife found on the site is vulnerable to disturbance.
	Teal, lapwing and Bewick's swan	

Ecological Zone of Influence

4.267 Records for each of the **bird** species are analysed outside of the SPA and any supporting habitat that supports a bird species is digitised. i.e. Some

ducks and waders will switch habitats between day and night time periods (Guillemain *et al*, 2001; Cramp, 1979; 1983) In flight records are ignored, as are those over 10 years old.

4.268 Examples of the distances at which birds take flight from being disturbed are shown in Table 25. There would also be a distance from which birds are distracted from feeding and are alert, which is not given.

Table 25: Disturbance from Human Proximity

Species	Flight Distance (FD)
Bewick's Swan	No data
Wigeon	89-250 metres
Gadwall	No data
Teal	No data
Pintail	No data
Shoveler	No data
Golden Plover	42-70 metres
Lapwing	No data
Whimbrel	84 metres

(from Goss-Custard, 2005; Mathers *et al*, 2000)

4.269 The largest FD is 250 metres. Therefore, a distance of 300 metres is used for buffering the Natura 2000 site and any additional digitised habitat. This allows for a period of disturbance where birds are alert before taking flight.

4.270 Records outside of the SPA/Ramsar site are examined and where it is considered that the habitat potentially supports the ecological requirements of the bird species listed for the designation this is digitised and buffered. A list of the sites is given in Appendix 1.

4.271 Flight paths also need considering as many species listed fly in the lower air space and can be disturbed by land use change along these corridors between areas of use. These are digitised by forming MCPs around the records per species for the site, linking the habitat outside the site with that on the Natura 2000 site.

4.272 These then form the EZI for the bird species of the Somerset Levels and Moors SPA/Ramsar.

4.273 Records of **beetle** species listed are compared to the Ramsar site boundary. It is considered that the longest ranging of the invertebrates species listed above would be beetles, which fly readily, or hoverfly. Beetles are known to disperse over several kilometres (Lundkvist *et al*, 2002). A rove beetle *Aleochara bilineata* in Ontario, Canada was recorded as being capable of flying at least 5 kilometres (Tomlin *et al*, 1992). Records of listed beetles and **hover flies** (*Lejops vittata*) are considered to

be included if within 5 kilometres of the Ramsar site lacking further evidence. The fields around any water, rove or soldier beetle or *Lejops vittata* records, inside and outside of the site, are digitised. Flight corridors also need considering as species can be disturbed by land use change along these paths between areas of use. These are digitised by forming MCPs around the records per species for the site, linking the habitat outside the site with that on the Ramsar site.

4.274 It is considered that other species of invertebrates have limited dispersal capability and are confined to the Ramsar site. No buffer is formed in relation to these records.

4.275 Water beetles and large mouthed valve snails are also dependent on the maintenance of water quality (Foster & Eyre, 1992)[3]. Therefore, watercourses entering the Ramsar sites supporting these species should also be mapped.

4.276 This forms part of the EZI to take account of potential impacts on invertebrates for the Somerset Levels and Moors Ramsar.

Vulnerabilities

4.277 The site lies within the flood plains of a number of large rivers and drains with many areas below high tide levels. Peat extraction occurs over part of the site. This is not currently thought to pose a risk (May 2006), and forward controls would be subject to the Habitats Regulations.

4.278 Management of the habitats present on the site is required to maintain the diverse structure and composition of vegetation. This would include hay cutting, light grazing and ditch drainage. Control of inappropriate or invasive species, an open landscape free of scrub is required for breeding waders. The majority of land is farmed and under private ownership. Most farms have beef and dairy herds. Trends in agriculture and support schemes have a critical influence as improvement with conversion of grassland to arable, land drainage, increased applications of inorganic fertilisers and cutting of silage are major threats to vulnerable peat soils and the nature conservation value of the site. Less intensive practices are encouraged through the ESA scheme, WES and Section 15 agreements.

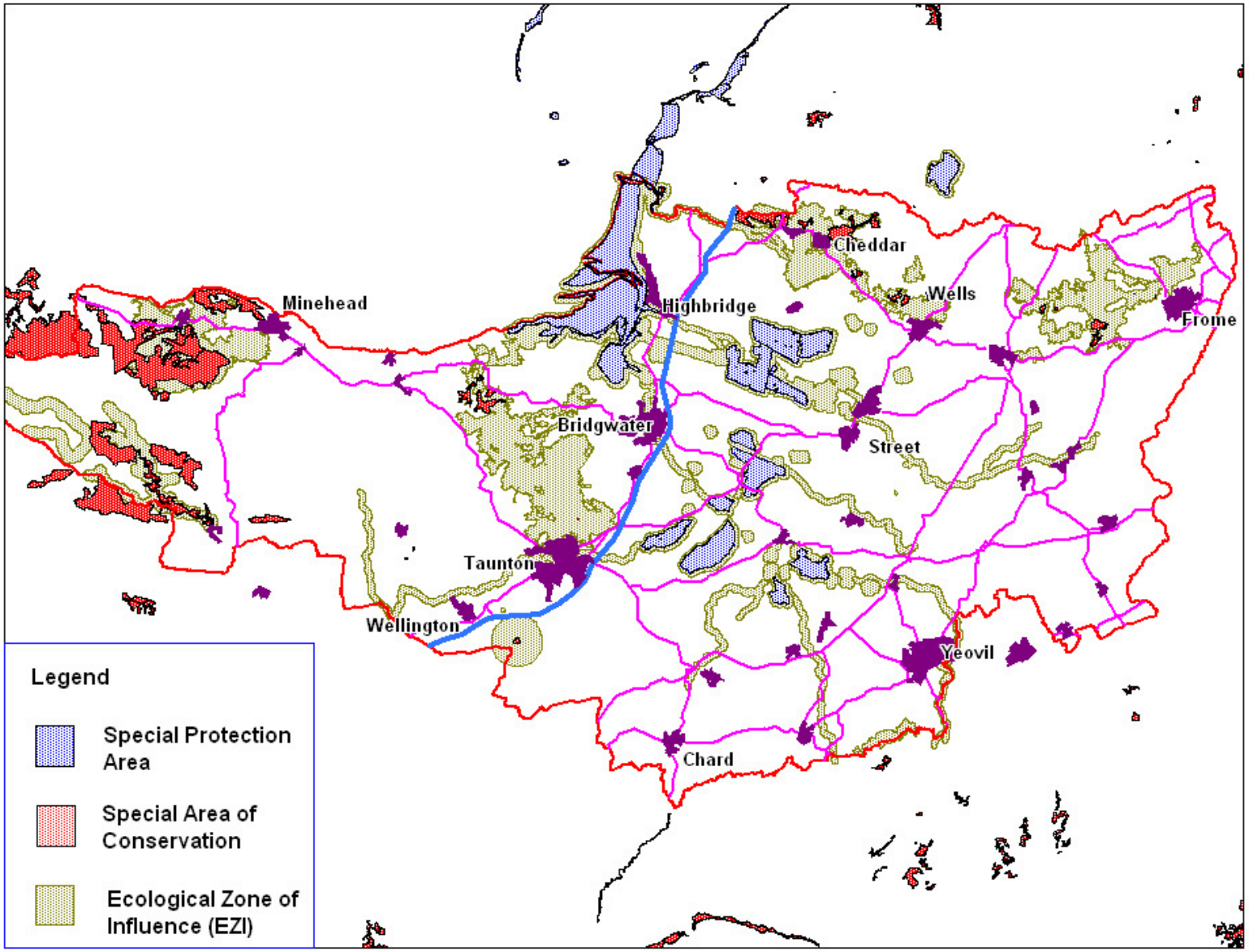
4.279 The majority of the site is only a few metres above mean sea level and drains through a large network of ditches, rhynes, drains and rivers. Water Level Management is critical and is being addressed through Water level Management Plans process and the development of Raised Water Level Areas and Environmentally Sensitive Areas (ESA). Inappropriate water level management issues due to development on flood plain may occur.

[3] Also see http://www.environment-agency.gov.uk/yourenv/eff/1190084/wildlife/970605/?version=1&lang=_e

4.280 There is nutrient enrichment due to sewage treatment facilities in to watercourses (70%) and also water pollution from agricultural run off (30%). This would particularly affect the vegetative composition of ditches and rhynes and hence the aquatic invertebrates they support. Invasive freshwater species are also occurring.

4.281 Birds on the site would be vulnerable to disturbance from access, shooting and other recreational activities.

Map 5: Ecological Zones of Influence



5. Other Relevant Plans or Projects

5.1 Article 6(3) of the Habitats Directive requires a HRA of *'…any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect there on, either individually or in combination with other plan or projects'.* Therefore it is necessary to identify plans and projects that may have 'in-combination' affecting the Nature 2000 sites, which are the focus of this assessment.

5.2 The assessment of significant effects for Transport Policies – Schedule of Policies (TPSP) policies and consultation areas needs to take account of the impact in combination with other plans and projects. For Natura 2000 sites where it is unlikely that the TPSP on its own will require a stage 2 Appropriate Assessment in relation to that site, it has been necessary to consider whether 'in-combination' effects are likely to result in an Appropriate Assessment being required.

5.3 The guidance states that only those that are considered most relevant should be collected for 'in combination' testing - an exhaustive list could render the assessment exercise unworkable. The following plans or strategies are considered to have potential effects and therefore have been included within the assessment.

Table 26: Assessment of Plans and Projects for In-Combination Effects

Plan or Project	Implications for TPSP
The Draft Revised Regional Spatial Strategy for the South West Incorporating the Secretary of States Proposed Changes	The Strategy proposes new houses for Somerset which could have in-combination effects from increased traffic generated by development particularly on major roads close to Natura 2000 sites There are potential recreational effects on Natura 200 sites from new housing development. Water abstraction from new housing and other development may affect groundwater. Waste management may lead to increased traffic movements.
Somerset Local Authorities' Development Plan Documents	New housing resulting from policy in Core Strategies is likely to generate increased traffic from development which may lead to new road infrastructure, improvement schemes, including increased highways lighting, and new cycle and foot ways. The expected increase in traffic is likely to result in a decline in air quality.

Plan or Project	Implications for TPSP
	There is also likely to be an increase recreational activity along access routes, such as Rights of Way, crossing or adjacent to Natura 2000 sites.
Somerset Rights of Way Improvement Plan 2006	There is likely to be any in-combination impacts arising from the interaction of these plans where the aim is to increase and improve access by foot and cycle to the countryside.
Somerset Minerals Core Strategy	There are potentially in combination effects from the use of transport from quarries and peat factories and their routing through the County.
Somerset Waste Core Strategy	There is unlikely to be in combination effects as Somerset waste strategy is likely to focus growth on existing facilities.
Somerset Community Strategy	Any new development should consider the objectives set out in the Community Strategy. As such, there are unlikely to be any in-combination impacts.

6. Analysis of Transport Policy in the Schedule of Policies

Introduction

6.1 The Transport Policy – Schedule of Policies report (TPSP) sets out Somerset County Council's strategy for the long-term planning of transport across the County. It covers the time period from 2011-2026 and replaces Somerset's second Local Transport Plan (LTP2), which finishes in March 2011.

6.2 The TPSP will set the framework and context for future investment in transport, and is supported by 3-year Implementation Plans which detail how we intend to deliver our plan. The first of these Implementation Plans covers the period 2011-14 and is published within the TPSP consultation document that is the subject of this assessment.

6.3 Policies are outlined in Table 4 below, together with a broad assessment of impacts.

6.4 Every policy has then been assessed against each of the qualifying features for the Natura 2000 site. Table 5 below sets out the key policy options in terms of feature and gives an assessment. Many policies will have a neutral effect on each site feature and are therefore not detailed any further within this report as they would not have any significant effect on a Natura 2000 site.

6.4 "Significant" is interpreted as an effect likely to adversely affect a Natura 2000 site's integrity. "Integrity" is described in ODPM Circular 06/2005: Biodiversity and Geological Conservation as '*the site's coherence, ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of species for which it was classified*' (ODPM Circular 06/2005, para. 20).

6.5 Significance will vary from site to site according to conservation sensitivities and magnitude of the potential impact. Assessment is triggered by likelihood not certainty in line with precautionary principle (European Communities, 2000). Therefore, the assessment considers whether effects are 'likely' and 'significant' and not every conceivable effect or fanciful possibility. The Waddensee tests are used:

- Would the effect undermine the conservation objectives for the site?
- Can significant effects be excluded on the basis of objective information?

6.6 Significant effects are also determined in-combination with other plans or projects and take account of cumulative effects.

Management for Nature Conservation Purposes

6.7 The Transport Policies – Schedule of Policies does not introduce any management measures for conservation purposes at this stage.

Analysis of Policies

6.8 Table 27 analyses the policies in the TPSP and gives an assessment of its potential impact on Natura 2000 sites. Table 28 similarly analyses initiatives listed in the TPSP. Those policies that have a potential significant effect are underlined in the 'Description' column and highlighted in Orange in the 'Comment' column.

Table 27: Plan Analysis

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
1 Community and Partnership Involvement	We will help our communities to help themselves. We will help make improvements to transport, allow them to shape our work and deliver improvements in partnership with other organisation. To do this we will: Engage in local community in discussions about the type of things we could do in their area; Look at ways to help communities help themselves by encouraging volunteering, providing advice and support for groups to bring about; Build on our existing partnerships and develop new ones to help meet our goals and challenges; Seek funding opportunities through public and private sources: Work with our neighbouring authorities, our cross-boundary issues	None likely	None	The policy is for consultation and engagement with the community and other partners only. However, awareness of potential constraints due to the ecological requirements of Natura 2000 site will need to be raised during consultations where appropriate.

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
2 Climate Change	We\will work to reduce our carbon emissions whilst planning for the effect of climate change will have on our transport. We will publish an annual action plan explaining how we will lead Somerset's response to climate change. Transport will have an important part to play in this. To do this we will: Provide strong strategic leadership to prepare the County for the effects of climate change on the service we deliver and reducing emissions from our own activities. To make sure we are successful we will engage with local communities, businesses, government agencies and other key stakeholders. Work to achieve a reduction in carbon emissions from local authority operations of 30% by 2015 relative to baseline emissions of 2008. Support the whole County to achieve a similar reduction in carbon emissions per capita. Publish an annual Climate Change Action Plan detailing action by all service areas with simple, measurable, achievable and realistic targets to deal with the causes and effects of climate change.	None likely	None	The policy is to provide leadership only and could contribute to improving conditions on Natura 2000 sites if successful

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
3 Bus and Community Transport Services	We will help to develop, promote and improve existing community transport services and explore the potential for developing new ones. To do this we could: Maintain and, where possible, improve services provided by existing community transport organisations Deliver an effective strategy to promote bus and community-based accessible transport. Offer business advice and travel surveying to help community organisations who provide transport services Work with the community voluntary sector so more of the local bus services they provide can carry the general public Develop and expand district SLINKY services Assess potential for more Somerset Accessible Transport community transport schemes Develop more community car schemes. Improve the efficiency of community transport through partnerships and better co-operation. To do this we will: • Work with partners to reduce the need to travel by providing more services locally • Ensure Local Development Frameworks tackle accessibility issues • Carry out accessibility study partnership with the relevant district each year • Work with South West Community Transport Benchmarking Group to raise skills and the quality of community transport providers and the quality of their services	None likely	None	The policy is to provide bus and community transport and for partnership working only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
4 Integrating Passenger Transport	We will improve the way our passenger transport network works together. We will help improve facilities, timetables, the reliability of buses and introduce smartcard ticketing. To do this we will: Improve the integration of rail and bus services at railway stations, through the actual facilities available and the way timetables fit together. Audit walking routes to railway stations and principal bus interchanges, major taxi ranks and car parks with a view to making them accessible for all and prioritising improvements; Continue our programme of high quality interchange improvements; Implement improvements to two rural interchanges, with our partners, every year (for the period of the strategy); Continue to implement the proposed programme of Quality Bus Partnership routes; Implement a 'limited stop' Quality Bus Partnership route between Taunton and Yeovil and investigate the feasibility of implementing others across the county; Consider measures such as bus priority and changes to parking charges to support the introduction of the new park and ride services; and Work with operators to develop smartcard ticketing across the County, beginning by: Using smartcard technology for concessionary travel (for people who are disabled or aged over 60) and 'scholars' tickets' in partnership with other south-west authorities; and Introducing a smartcard 'County Ticket' in parallel with the 'scholars' tickets' discussed above.	None likely	None	The policy is for improving bus interchange and timetable integration, bus priority and ticketing only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
5 Bus and Community Transport Information	We will improve the information available about bus and community transport by creating a single point of contact online and by phone. We will explore how other new technologies could help improve the way we provide this information. To do this we could: Deliver a 'single point of contact' call centre for all bus and community transport needs in Somerset. This will include public transport, social needs transport, school transport and non-emergency health transport and offer an out of hours service; Create a website that provides electronic timetable and community transport information and is user friendly and easy to navigate; Produce all bus services booklets in the same format, making production quicker and the booklet cheaper to produce; Improve the use of SMS text messaging and audio technology for information provision; Introduction of 'smart points' that provide interactive real time information at key transport interchanges; and Compile an accurate list of all bus stops, poles, flags, bus shelters and low floor curbs in Somerset. We will consider entering their position onto a mapping system to help identification, monitoring and maintenance.	None likely	None	The policy for information provision only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
6 Smarter Travel Choices	We will help people make smarter travel choices. We will provide a One Stop Shop' for high quality transport information and encourage organisations to develop 'Travel Plans' To do this we could: Create a comprehensive 'One Stop Shop' for transport information and advice across all modes of travel. Integrating signage, network plans and paper and digital maps into a single wayfinding system; Developing our online profile by expanding and improving our website to cover all modes and integration between modes; Providing information in a range of traditional and innovative formats; Support people directly, with things like training and providing advice over the telephone. This includes improved cycle training for schools through schemes such as 'Bikeability'; Provide better public transport information; and Investigate the information people with disabilities need. Carry out promotion. This could include: • Targeted campaigns • Helping people to choose sustainable travel when breaking habits Ensuring new and existing infrastructure and services are suitably marketed; and Comparing the performance of our campaigns against other authorities and best practice examples to drive improvements. • Improve our communications. This could include: • Ensuring messages remain relevant; • Supporting policies on ICT and emerging technologies by extending our • communications platforms to make more use of modern technology and communications methods; • Better integration with other internal and external operations; and • Reviewing our brand and creating a business-facing brand. • Giving people informed choice, including about the true costs of travel modes; • Engage in initiatives such as personal travel planning, travel plans (and associated transport/travel	None likely	None	The policy is concerned with providing information and marketing only. However, awareness of effects on Natura 2000 sites will need to be taken into account when providing information, and marketing.

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
7 Cycling	We will encourage people to cycle more by helping them to make smarter travel choices, helping them get better cycling skills and providing appropriate and well connected facilities. To do this we will: Examine gaps and barriers in our cycling network and use this knowledge to plan improvements. This will include the continuation and completion of the market town studies looking at barriers to cycling. Work with schools and businesses to encourage cycling through travel planning, and using the planning framework to ensure developments provide access onto the existing network and upgrades to routes as appropriate. This supports our Sustainable development' and 'School travel' policies; and Influence the design and implementation of infrastructure. To do this we will: • Review the cycle and safety audit processes to ensure they provide proactive support for problem solving rather than being a barrier to innovation; • Progress schemes identified in current plans (such as the Taunton area and Yeovil transport studies and the market town studies); and • Explore options for future countywide strategic routes	Potential to incur habitat loss and/or fragmentation affecting flight lines sued by lesser horseshoe bats north of Taunton	Hestercombe House SAC	A proposed circular cycle route north of Taunton may cause fragmentation of flight lines and perhaps habitat loss resulting from construction. It is assumed that no lighting will be implemented with such a scheme. A policy to explore future countywide strategic routes will need to take account potential effects on other Natura 2000 sites.

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
8 Walking	We will help people make more trips by foot. We will improve the quality, attractiveness and comprehensiveness of Somerset's pedestrian routes and help people to see walking as a smarter and healthier way to travel. To do this we will: Raise the level of priority given to pedestrians and reinforce pedestrian rights in the urban environment. We will use traffic management measures which, reallocate road space to the pedestrian and encourage a reduction in the number of vehicles using the road (without creating unacceptable congestion); Improve perceptions of walking by reducing the fear of crime, through good design and by improving existing facilities on pedestrian routes. This includes working to improve the way pedestrians and cyclists share paths and other spaces; Identify, improve and upgrade crossing facilities at locations with the potential for high levels of continuous footfall; Look at how pedestrian routes can be identified and mapped to achieve our long-term aspiration for a continuous network of accessible pedestrian routes. Supported by attractive signage where necessary, these routes will link residential areas, employment, community facilities and public transport interchanges; Support our parking policy, which aims to discourage footway parking; Ensure the needs of all pedestrians, including those with reduced mobility and sensory impairments, are taken into account when designing pedestrian networks and facilities.	None likely	None	Policy is concerned with existing walking routes within settlements

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
9 Rights of Way	We will improve the quality and accessibility of our Rights of Way network. We will work to connect more places with our Rights of Way and improve the information available to help people use them. To do this would need to do a number of things, we have divided these into three groups: Our High Priority Actions are: Inform our maintenance program and ensure that improvements to the public rights of way network are secured through development where appropriate; Maintain the 'ease of use' assessment and produce an updated Definitive Map & Statement; Link key destinations by identifying PRoW on the urban fringes that link to nearby communities, schools, services, public open space etc, that could be upgraded or improved to become restricted byways or bridleways and serve as multi-use routes; Create a list of routes currently available to people with reduced mobility and identify routes that could be improved; Develop an interactive mapping website for PRoW; and Continue to develop the Community Paths Partnership.	Potential to increase habitat deterioration to sensitive habitats, and disturbance to sensitive species from increased access to countryside	Exmoor and Quantock Oak Woodlands, Exmoor Heaths, North Somerset and Mendip Bats and Mendip Limestone Grasslands SACs. Severn Estuary SPA/ Ramsar/ SAC, Somerset Levels and Moors SPA / Ramsar. There is also potential for disturbance of sensitive bat roost within the Exmoor & Quantocks Oak Woodlands SAC, which hosts sites for barbastelle and Bechstein's bats. Otters are not present in the Quantocks component and would be unaffected. Otherwise bat roosts within the SACs are inaccessible.	Improvements to accessibility in combination with Increases in population resulting from policy in district and borough council Core Strategies plus encouragement of tourism could place pressure on sites from increased recreational use and visitor pressure. Habitat deterioration and loss is possible due to increased leisure use from walkers, dogs, cyclists, and horse riders and possibly off road vehicles arising from increased population due to proposed Core Strategy policies and improved access[4].

[4] Penny Anderson Associates. 2009. *Countryside and Rights of Way Act 2000 Part1: Access to the Countryside*. Peterborough: Natural England; Footprint Ecology. 2009. *Access and Nature Conservation reconciliation: Supplementary Guidance for England*. Peterborough: Natural England.

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
	Our Medium Priority Actions are: Ensure that PRoW connectivity is integrated into the emerging Local Development Frameworks; Ensure that the RoWIP and any identified priority routes are taken into account when negotiating High Level Stewardship applications; Ensure that network improvements are secured prior to the sale of any County Farms and improve the PRoW on the retained estate farms as and when appropriate; Enhanced signage and waymarking (such as destination and distance signing) will be considered on national, regional & local promoted routes; Continue to collate permissive and other route information and engage with key stakeholders and landowners to collate and map the wider access opportunities; and Support and develop health initiatives that involve the maintenance and/or use of ProW Our Low Priority Actions are: Work with the Countryside Team to ensure that access improvements are included in the development of County Wildlife Sites and community woodlands. Wherever possible these will be multi-use routes; and Work in partnership transport providers to develop publications and services to promoted trails and popular, accessible, routes. Ensure that these services are as accessible as possible for visually and mobility impaired people and for cyclists.	Potential to increase habitat deterioration to sensitive habitats, and disturbance to sensitive species from increased access to countryside	Exmoor and Quantock Oak Woodlands, Exmoor Heaths, North Somerset and Mendip Bats and Mendip Limestone Grasslands SACs. North Somerset and Mendip Bats SAC,Severn Estuary SPA/ Ramsar/ SAC, Somerset Levels and Moors SPA / Ramsar. There is also potential for disturbance of sensitive bat roost within the Exmoor & Quantocks Oak Woodlands SAC, which hosts sites for barbastelle and Bechstein's bats. Otters are not present in the Quantocks component and would be unaffected. Otherwise bat roosts within the SACs are inaccessible.	Improvements to accessibility in combination with Increases in population resulting from policy in district and borough council Core Strategies plus encouragement of tourism could place pressure on sites from increased recreational use and visitor pressure. Habitat deterioration and loss is possible due to increased leisure use from walkers, dogs, cyclists, horse riders and possibly off road vehicles arising from increased population due to proposed Core Strategy policies and improved access[5].

[5] Penny Anderson Associates. 2009. *Countryside and Rights of Way Act 2000 Part1: Access to the Countryside*. Peterborough: Natural England; Footprint Ecology. 2009. *Access and Nature Conservation reconciliation: Supplementary Guidance for England*. Peterborough: Natural England.

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
10 Rail	We will work in partnership with the rail industry and other stakeholders to encourage more people to travel by train. We will support better services, facilities, integration and improvements in the way people see train travel. To do this we could: Support our policy of promoting integration by improving the consistency of station facilities; Work with the rail industry (and other stakeholders) to improve our stations and support rail partnerships; Support the partnerships that market our rail lines; Research the need for new services and how people perceive rail travel; Engage in the development of timetables and use evidence from our research to lobby for improvements; and Engage in policy being developed by the rail industry.	None likely	None	The policy is for engagement, promoting, research and working with rail industry only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
11 Emerging Technologies	We will support electric vehicles, responsibly sourced biofuels and other new technologies that could help us meet our goals and challenges. To do this we will: Support the provision of electric vehicle charging points at locations which may help to increase the range with which an electric car, motorcycle or bicycle could travel; Encourage developers to provide parking spaces within new developments to be designed to provide opportunities for charging electric or plug-in hybrid vehicles, include cabling for charging infrastructure and provide charging infrastructure; Investigate options for providing electric vehicle battery swapping facilities, where empty batteries are exchanged for charged ones; Support wider initiatives looking at safe and environmentally sound vehicle battery disposal and decarbonising the national grid to provide carbon-free transport; Explore ways of mitigating the potential negative effects of electric vehicles. For example their quieter engines can make them harder to hear coming and there is potential for conflict when certain types of electric vehicle are allowed to use walking or cycling routes; Support biofuels which are produced in a sustainable and Habitats Regulations (2010) compliant fashion, without replacing the production of food crops or destroying forests; Support the development and implementation of new technologies that could help us meet our goals and challenges.	None likely	None	The policy has been updated to include the recommendation from the HRA of the FTP (June 2010)
12 Noise	We will manage the effect noise has on our communities at problem locations. We will assess sites according to the Department for Environment, Food and Rural Affairs' guidance and prioritise possible solutions based on how well they fit with our goals and challenges.	None likely	None	The policy is for noise reduction but effects households only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
13 Landscapes and Biodiversity	We will protect Somerset's landscapes and biodiversity by raising awareness, developing plans to tackle specific issues and making sure our own work does not damage them. To do this we will: Continue to raise awareness and understanding of the importance of biodiversity among our contractors, our partners and the general public; Provide specific habitat and species action plans that are relevant to our work and that support local, regional and national habitat legislation and objectives; Ensure our work does not damage Somerset's landscapes or biodiversity; Consider landscape character in the preparation of schemes and maintenance in order to minimise degradation and integrate new measures into the local surroundings; Consider the impacts of our work on the local urban environment and minimise or mitigate the impacts accordingly; Recognise and promote the importance of landscape and biodiversity to human health and wellbeing; Ensure that our work does not create an additional risk of flooding and, where possible, measures can be implemented to help reduce the risk of flooding in the future; and Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).	None likely	None	The policy includes policy for protecting Natura 2000 sites and those areas ecologically supporting their conservation objectives from the effects of walking
14 Cars and Taxi	We will tackle the most congested parts of the road network to make journeys quicker and more reliable. We will work to manage the road network better and improve the most congested junctions and stretches of road. We will make sure new developments don't make conditions worse for existing drivers.	None likely	None	The policy is for management of the network only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
15 Sustainable Development	We will work to make sure new developments are set out so that people do not have to travel so far to access goods and services, and to make it easier for them to use sustainable modes of transport that are appropriate for their location. To do this there are a number things we could do or will need to make sure happen: Ensure most new developments are located in the main urban areas, where they are most accessible and can help to increase the use of non-car modes; Promote attractive environments which are accessible and linked with the wider transport network. Encourage developers of residential estates to follow the guidelines on planning inclusive "walkable neighbourhoods", as set out in the Manual for Streets; Take account of climate change in the layout of developments; Manage the demand for travel, reduce air pollution and enhance road safety; Ensure developments support the use of ICT to reduce the need to travel. Support the development of networks of bus priority measures through the planning process; Support, promote and deliver the travel improvements identified in the future transport plan; Require all applications for development which are likely to have significant transport implications to be accompanied by a Transport Assessment, an Air Quality Assessment, and a Travel Plan; Support the development, implementation and monitoring of workplace travel plans (according to the Supplementary Planning Document 'Enabling Smarter Travel through Travel Planning in Somerset'); Ensure the emerging Local Development Frameworks give walking a high priority and that patterns of development minimise the need to travel and avoid severance	None likely	None	Policy is for planning locally only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
16 Information & Communication Technology	We will promote the use of ICT to reduce the need to travel and increase people's ability to access goods and services. We will improve Somerset residents' ability to access and use ICT. To do this we could: Work with private and public sector partners in the South West, nationally and internationally to improve the availability and use of ICT in the county; Look at ways to extend Broadband coverage across Somerset; Support ICT skills-raising programmes provided by both the public and private sectors, particularly where it helps to reduce the need to travel; and Work with partners to encourage communities and individuals to use ICT to access public services.	None likely	None	The policy is for ICT development only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
17 Parking	We will encourage people to use the right sort of car park for their trip and help provide parking facilities for more sustainable means of travel. We will manage the negative effects of parking and help plan new developments appropriately. To do this we will work towards introducing civil parking enforcement (CPE) across all five of the Districts in Somerset. We will also consider the following actions: Prioritise town centre parking spaces for use by shoppers and visitors; Provide all day parking for commuters and visitors in Taunton at Park and Ride sites; Consider the provision of Park and Ride sites in Yeovil and Bridgwater and extending existing sites in Taunton; Manage on street parking restrictions in residential areas; Discourage footway parking through enforcement, publicity and future parking policy; Enforce parking and stopping restrictions to ensure that inappropriate parking does not hinder access for people with restricted mobility or cause congestion; Provide well located, well designed parking facilities for disabled people, cyclists and motorcyclists; Improving actual and perceived safety and security in public car parks; and Ensure the design and provision of parking in new developments supports our goals and challenges. To do this we will: Set standards to ensure that developments provide appropriate levels of parking, either within the site's boundaries or through pooled parking facilities; Set standards to ensure that developments cater for motorcycle and disabled parking requirements; Ensure that developments encourage active travel through the provision of cycle parking; Provide appropriate parking for freight transport; Encourage the use of best practice in the design of parking facilities; Allow developers flexibility in choosing the best mix of allocated and shared parking spaces; Allow a flexible approach to the levels of parking supplied, provided that departures from the standards are covered by stringent travel plans and supported by robust evidence and monitoring; and Ensure that parking facilities provided by new developments are managed effectively in future	None likely	None	The policy is for parking management only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
18 Freight	We will help hauliers choose the most appropriate routes and work to improve the relationships between communities and the hauliers that serve them. To do this we could: Manage freight by developing and promoting a package of interactive routing resources and free downloads for existing SatNav units; Helping residents, communities and businesses by formalising the processes used for establishing dialogues between stakeholders, providing information on the benefits of freight, workshops for different groups of road users and 'up our street' delivery packs; Working with other stakeholders to improve commercially available routing resources and integration with other policies, land use planning and the travel planning process; and Developing a dataset detailing Traffic Regulation Orders to underpin the routing resources mentioned above and a programme of studies to inform the development of future policy (and responses to local issues).	Potential for increased HGV traffic along routes within 200 metres[6] of a Natura 2000 site resulting in a decrease in air quality effecting sensitive species forming Natura 2000 habitat features. Disturbance	Exmoor and Quantocks Oak Woodlands SAC Mendip Limestone Grasslands SAC Somerset Levels and Moors SPA/ Ramsar	Nitrogen and other deposits from transport may affect sensitive sites at Exmoor and Quantocks Oakwoods SAC and Mendip Limestone Grasslands SAC due to the potential presence of sensitive flora including lichens and bryophytes. The Exmoor Heaths SAC is not included as it is unlikely that freight traffic will be deliberately routed through the National Park. The limestone grassland feature of the North Somerset and Mendip Bat SAC is not included, as the Cheddar Gorge road does not permit HGV traffic. Birds may be displaced through increased levels of traffic along certain routes through the SPA.[7]

[6] Bignall, K., Ashmore, M. & Power, S. 2004. *The ecological effects of diffuse air pollution from road transport. English Nature Research Report No. 580*. Peterborough: English Nature.

[7] Reijnen, M. J. S. M., Veenbaas, G. & Foppen, R. P. B. 1995. *Predicting the Effects of Motorway Traffic on Breeding Bird Populations*. Delft: Road and Hydraulic Engineering Division and DLO-Institute for Forestry and Nature research; Reijnen, R., Foppen, R. & Meeuwsen, H. 1996. The effects of traffic on the density of breeding birds in Dutch agricultural grasslands: in *Biological Conservation 75 (1996) 255-260;* Waterman, E., Tulp, I., Reijnen, R., Krijgsveld, K. & ter Braak, C. n/d. Noise disturbance of meadow birds by railway noise: in *The 33rd International Congress and Exposition on Noise Control Engineering.*

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
19 Maintenance	We will maintain our network in a way that targets our work to bring the most benefits, minimises long term costs and reduces the risks we face. To do this we could: Target our work so that it provides the best possible value. To do this we will: Regularly monitor condition of our assets and ensure that the best available techniques are employed to improve the standard of the transport asset. Prioritise our maintenance work based on our community objectives and ensure that funding delivers the best value. Monitor and update the value of our transport assets to ensure appropriate decisions can be made on their maintenance. Ensure that all maintenance-related risks are recorded and monitored according to the risk they present. Risk exposure and action plans will be periodically reviewed to monitor changes in risks and to ensure our control measures are still suitable. Consider the long term impacts of our work. To do this we will: Produce and update lifecycle plans for the assets set out in the TAMP. This will ensure the maintenance we undertake has the lowest possible whole life cost and our maintenance funding is used appropriately. Seek designs and materials that are effective in use, efficient to construct and minimise the longer term costs and implications of maintaining and managing our transport assets. Ensure that disruption caused by work to the highways, for maintenance purposes or by a statutory undertaker, cause the minimum delay to users of the network.	None likely	None	The policy is for maintenance only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
20 School Travel	We will help improve travel to Somerset's schools with training, promotion, safety initiatives and better walking and cycling routes. We will make the school transport services we provide more efficient. To do this we could: Work with the schools with the most children living within a reasonable walking distance of their school but are currently driven to school; Work with schools to help them implement School Travel Plans and address gaps in the provision of safe walking routes to schools; Encouraging schools to develop, update and implement their travel plans to provide healthy, sustainable options for school travel; Integrate the long-term road safety strategy into schools; Working more closely with communities to deliver schemes that can be delivered in partnership; Increase the efficiency of the transport we provide to help get children to school. To do this we will: Improve integration of school travel planning and the provision of school transport through the annual sustainable modes of travel to school strategy; Seeking efficiency savings from school transport services, including using a smaller number of single contractors; Selling spare seats on school transport vehicles to pupils and students not eligible for free transport; and Working with local schools and colleges to ensure that appropriate transport services are in place to minimise exclusion of pupils from after school learning and activities.	None likely	None	The policy is for school travel only
21 Road Safety	We will make our roads safer by working with drivers and riders to educate them and improve their skills. To do this we will: Finalise a new Road Safety Strategy for the period up to 2021. Review the financial viability of establishing a driver skills centre, which is currently on-hold due to the financial climate, with a view to implementing this at an appropriate time.	None likely	None	Policy is for road safety only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
22 Motorcycling	We will promote safe and responsible motorcycling through safety schemes and by working to improve parking provision. To do this we could: Ensure highway designers and planning professionals 'Think Bike' Promote the use of improved anti-skid service covers by utility companies Prioritise locations for using the WYLIWYG ('Where-you-look-is-where-you-go') concept in safety schemes on bends and incorporate it in new scheme design. Identify sites for motorcycle safety barriers. Ensure that motorcycles receive adequate attention in the creation and review of planning guidance and other related documents, such as motorcycle parking standards; and Engage with the District Councils, the Motorcycle Forum members and other motorcycle users to assess and improve existing public parking provision for motorcycles across the county.	None likely	None	Policy is for regard of motorcycling only
23 Active Travel	We will help people be more active by giving them more opportunities to travel in a healthy way.	None likely	None	Policy is for aiding travel in healthy ways only
24 Access to Health	We will improve people's ability to access healthcare services by sharing our plans with the people who provide them and helping to develop 'out of hours' transport to healthcare services. To do this we could: Work with health service to ensure we share information about the planning and delivery of existing and future services; and Develop 'out of hours' transport for patients, employees and visitors.	None likely	None	The policy is concerned with health access only

Policy	Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
25 Air Quality	We will make sure any changes to the transport system do not increase pollution. We will work with Somerset's district and borough authorities to improve air quality in Somerset by encouraging partnership and sharing best practice with our neighbours. To do this we could: Encourage District and Borough Councils to continue their existing Air Quality reporting duties; Promote the sharing of information and expertise across the County, encouraging greater consistency in the air quality management process; Foster collaboration between environmental health and protection professionals from Somerset County Council and the five district and borough authorities. This will improve the approach to air quality monitoring, hot-spot identification, pollution sources and other relevant air quality issues in Somerset; Ensure local air quality maintains a high profile, through the appropriate communication of information across the County	None likely	None	The policy is for improving air quality only and may benefit sensitive Natura 2000 sites

Table 28: Analysis of Taunton Area and Yeovil Transport Initiatives (Annex B)

Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
Our Area Wide Initiatives will include: Air quality monitoring stations Management of traffic to make better use of the road network Promotion of electric vehicles Ensure HGV deliveries take place outside main shopping and commuting hours Improve Community Transport Work with schools and businesses to promote walking, cycling and public transport use and provide information to help make informed choices, using Travel Plans where necessary Ensure the design of new schemes considers safety for all without compromising ease of use for more vulnerable users. Park and bus sites to be accredited to safe parking standard More control over retail parking on edges of town centre	None likely	None	Initiative is for monitoring, promotion. Working with others, design and accreditation only

Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
Our Initiatives for Bridgwater will include: • Pedestrian and cycle links between the schools and key destinations • Celebration Mile - Improved pedestrian and cycle links between the College, railway station and town centre • More public transport on rural routes and more evening and Sunday services. • Improvements at Bridgwater railway station to address access issues • Enhanced bus service linking Wellington, Taunton and Bridgwater along the A38 corridor • 20 mph zones, traffic calming, pedestrian priority, shared spaces etc in town centre • Linked cycle network • More integrated transport: better coordination of bus and rail services. • New shared cycle and pedestrian routes in Bridgwater linking outskirts to town centre • Improved junctions considering needs of non-car users • Reduce severance caused by roads carrying high volumes of traffic. • North Petherton bypass • New Park and Bus sites to the south and north of Bridgwater, enhanced bus services, new or improved bus priority, improvement of the principal arterials into the town, improvements for pedestrians in the town centre • New road between Bristol Road and Taunton Road running adjacent to the M5. Improved links from A39 Quantock Road to Spaxton Road and using Little Sydenham link to relieve Bath Road.	None likely	None	The initiative now includes recommendation from the HRA of the FTP (June 2010) with regard to the location of the North Petherton Bypass and thus impacts on barbastelle from the Exmoor and Quantock Oak Woodlands SAC

Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
Our Initiatives for Taunton will include: • High quality, secure multi-storey car parks • Completion of a bypass for Norton Fitzwarren • Traffic management Variable Message Signing • Quality Bus Partnerships / enhanced bus services • 20mph zones, on-street parking permit-controlled, public transport has priority • Additional pedestrian crossing facilities around town centre area • Real Time Information on buses • Increase pedestrianisation of Taunton town centre to include increased cycle access • Shared walk/cycle routes in Taunton • Increased parking charges • Comprehensive and integrated cycle network • Improved facilities at Taunton bus station • Improved interchange facilities and better integration of bus and rail services at Taunton railway station • Henlade by-pass, traffic calming, improved junctions (303/A358 improvement package) • New or expanded Park & Ride • Bus priority routes to town centre • Improved junctions between Norton Fitzwarren / Monkton Heathfield / M5 and Taunton town centre • New access and link roads to facilitate development but which are also routed to avoid impacts on Hestercombe House SAC	Potential loss of lesser horseshoe bat foraging and commuting habitat, and increased light levels from introduced street lighting, fragmentation of flight lines and severance from feeding habitats[8]	Hestercombe House SAC	Location of new park and ride site is not defined. This could potentially be north of the A3259 and land take could affect feeding areas and flight lines of lesser horseshoe bats.

[8] Somerset County Council. 2009. *Appropriate Assessment of Hestercombe House SAC: Taunton Deane Borough Council Local Development Framework and Somerset County Council. Taunton Transport Strategy Review 2*. Taunton: Somerset County Council.

Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
Initiatives for Wellington will include: • New road between Taunton Road and B3187 to serve new developments at Longforth Farm and Tonedale • Possible reopened railway station at Wellington • New park and bus facilities at Chelston roundabout (250 spaces) and at Rockwell Green (25 spaces) • Shared walk/cycle routes in Wellington • Reduce heavy traffic flows in town; consider pedestrianisation, removal of on-street parking, 20mph limits in zones across all of Rockwell and Wellington, traffic calming and HGV restrictions. • Junction improvements at Chelston Roundabout, A38 Hockholler Junction and the Nynehead/Wellington Junction. • Town bus route	None likely	None	Policy is for developments that are remote from likely impacts on Natura 2000 sites and the EZI

Description	Potential Impact on Natura 2000 Sites	Natura 2000 sites Potentially Affected	Comment
Non- highways improvements in Yeovil include: • Car parking review to cover charging regime, approach to employment sites, public off and on road provision; • Comprehensive walking and cycling network improvements, including radial routes to the town centre • Pedestrian priority areas within the town centre • Public information and education programme for behavioural change • Cycle parking provision at residential and employment developments • Cycling improvements at Yeovil Hospital • Cycle link provided on A37 between Ilchester and Yeovilton • School, workplace, residential and personalised travel planning • Quality Bus Partnerships covering core services • Bus Station improvements • Real time passenger information (RTPI) and on-bus electronic information • Dedicated bus routes and other priority measures	None likely	None	Policy is for localised non-highways improvements in Yeovil only
Highways improvements set out in the Yeovil Eastern and Western Corridor Studies include: • A30 Reckleford/Market Street • Reckleford Gyratory Provision • A30 Sherborne Road/Lyde Road • Coombe Street Lane/Mudford Road • Thorne Lane/Western Avenue • Copse Road/Western Avenue • Western Way/Preston Road • Asda Access • Westland's (Cartgate Link/Bunford Lane) • Lysander Road/Watercombe Lane • Horsey (Police Station) Roundabout • Hospital Roundabout • Fiveways Roundabouts	None likely	None	Policy is for localised road improvements in Yeovil only

Policies and Initiatives Requiring Further Screening

6.9 The policies and initiatives that are considered for further assessment, highlighted in orange in Tables 27 and 28, are listed in the following table showing the features of the Natura 2000 site concerned. This assessment is carried out in Chapter 7 following.

Table 29: Policies Requiring Further Assessment

Policy	Issue	Natura 2000 Sites Potentially Affected	Features Potentially Affected
7 Cycling Progress schemes identified in current plans (such as the Taunton area and Yeovil transport studies and the market town studies)	Habitat fragmentation	Hestercombe House SAC	Lesser horseshoe bat maternity colony
9 Rights of Way Maintain the 'ease of use' assessment and produce an updated Definitive Map & Statement Create a list of routes currently available to people with reduced mobility and identify routes that could be improved Develop an interactive mapping website for PRoW Ensure that network improvements are secured prior to the sale of any County Farms and improve the PRoW on the retained estate farms as and when appropriate Enhanced signage and waymarking (such as destination and distance signing) will be considered on national, regional & local promoted routes Continue to collate permissive and other route	Recreational disturbance	Exmoor Heaths	European dry heaths
			Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
		Exmoor and Quantock Oak Woodlands	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
			Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*
			Barbastelle and Bechstein's bats
		Mendip Limestone Grasslands	Semi-natural dry grasslands and scrubland facies on calcareous substrates
			European dry heaths
			Tilio-Acerion forest of slopes, screes and ravines
		Mendip Woodlands SAC	*Tilio-Acerion* forest of slopes, screes and ravines

Policy	Issue	Natura 2000 Sites Potentially Affected	Features Potentially Affected
information and engage with key stakeholders and landowners to collate and map the wider access opportunities Work in partnership transport providers to develop publications and services to promoted trails and popular, accessible, routes. Ensure that these services are as accessible as possible for visually and mobility impaired people and for cyclists		North Somerset and Mendip Bats	Semi-natural dry grasslands and scrubland facies on calcareous substrates
		Severn Estuary SPA/ Ramsar/ SAC	Migratory bird species – ringed plover, curlew, dunlin, pintail, redshank, shelduck
			Waterfowl
		Somerset Levels and Moors SPA / Ramsar	Over wintering - Bewick's swan, golden plover
			Migratory species – shoveler, teal, wigeon
			Waterfowl
18 Freight Manage freight by developing and promoting a package of interactive routing resources and free downloads for existing SatNav units	Air quality	Exmoor and Quantocks Oak Woodlands SAC	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
		Mendip Limestone Grasslands SAC	Semi-natural dry grasslands and scrubland facies on calcareous substrates
			European dry heaths
	Disturbance	Somerset Levels and Moors	Waterfowl
Annex B: Taunton New or expanded Park & Ride	Loss of habitat, severance of flight lines and artificial lighting	Hestercombe House SAC	Lesser horseshoe bat

7. Analysis of Effects on Natura 2000 Sites

Introduction

7.1 This section looks at the likely direct, indirect or secondary impacts of policy options, identified as potentially having a significant effect in Chapter 6, on the integrity of designated sites, alone or in-combination with other relevant plans.

7.2 The determination of 'favourable condition'[9] of a site is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan being implemented and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan may have an adverse effect upon integrity even though the site remains in favourable condition.

7.3 In addition, and in order to secure the long term presence and stability of Natura 2000 sites and the network, climate change should be a key consideration in the application of Habitat Regulations Assessment (HRA). Consideration should be given as to whether the plan inhibits in any way the potential of species to adapt to climate change.

7.4 The following tables further analyse potential impacts on Natura 2000 sites. The Precautionary Principle is used so that where an affect is uncertain it is assumed to be adverse.

7.5 Note: The assessment does not take into account mitigation or counter-acting measures, including avoidance, cancellation and /or reduction measures, at this stage. Where the 'Overall likely significant effect conclusion' column is highlighted in orange counter-acting measures is considered in the following section.

7.6 The table form is based on Table A3.2 in Appendix 3 of the RSPB guidance (Dodd *et al*, 2007).

9 'Favourable condition' means that the Natura 2000 site's features are being adequately conserved and is meeting the site is meeting its 'conservation objectives', however, there is scope for the enhancement of these sites

Assessment of Policies

Table 30	Policy 7: Cycling							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Hestercombe House SAC	Lesser horseshoe bat *Rhinolophus hipposideros*	Maintenance and connectivity of habitats	Maintenance of populations	Loss of habitat, severance of flight lines Lesser horseshoe bats are susceptible to loss of linear features, such as mature hedgerows, which act as commuting routes between roost sites and foraging areas and indeed to other roost sites. (Billington, 2005). Severance of commuting routes may isolate lesser horseshoe bats from areas of suitable feeding habitat, rendering them particularly susceptible (Highways Agency, 2008; Motte & Libois, 2002; Schofield *et al*, 2002; Wray *et al*, 2005). .	Yes – A circular cycle route to the north of Taunton is planned, for example in the Taunton Deane Borough Council Green Infrastructure Strategy	No – the proposals are local to Taunton only	None	Potential significant effect from severance of flight lines. It is assumed that the route would be unlit.

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Exmoor Heaths SAC	European dry heaths	Extent Bryophyte/ lichen abundance Dwarf shrub cover and diversity Grazing impact Vegetation structure Vegetation mosaic Soil structure Heath Fritillary	No loss Frequency 25% cover and two dwarf shrub species minimum 5% maximum All age classes present % cover, scrub presence, recreational disturbance Status Abundance of food plant	<u>Recreational pressure</u> Habitat deterioration and loss due to a combination of increased leisure use and tourist visits walking or cycling. Habitat deterioration and loss from trampling, (dwarf shrubs reduced by 50% cover with less than 200 – 400 passages/year; dry heath plants are more vulnerable when older or wet; nitrogen enrichment from dog fouling can change heath to grassland [Penny Anderson Associates, 2009]	Uncertain – the policy promotes use of the PRoW network and access A survey produced by the National Park on the recreational use of Exmoor's Moorlands reported the moors were underused with the exception of Dunkery Beacon, which was 'being hammered'	West Somerset, Taunton Deane and Sedgemoor District Council LDF Core Strategies Somerset County Council Rights of Way Management Plan	Uncertain – Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
	Old sessile oak woods with Ilex and Blechnum in the British Isles	Natural processes and structural development Regeneration potential Composition Species, habitats, structures characteristic of the site	Current level of structural diversity maintained Ground flora present Signs of seedlings Current level of site-native species maintained Distinctive elements, patches and transitions maintained	<u>Recreational pressure</u> Habitat deterioration and loss due to a combination of increased leisure use and tourist visits walking or cycling. Habitat deterioration and loss from trampling (passages as low as 40 -50/year can eliminate species - species of low productivity, especially ancient woodland flora; lichens and some mosses) [Penny Anderson Associates, 2009]; nitrogen enrichment from dog fouling [Footprint Ecology, 2009]	Uncertain – the policy promotes use of the PRoW network and access	West Somerset, Taunton Deane and Sedgemoor District Council LDF Core Strategies Somerset County Council Rights of Way Management Plan	Uncertain – Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

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Exmoor and Quantock Oakwoods SAC	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	Natural processes and structural development Regeneration potential Composition Species, habitats, structures characteristic of the site	Current level of structural diversity maintained Ground flora present Signs of seedlings Current level of site-native species maintained Distinctive elements, patches and transitions maintained	<u>Recreational pressure</u> Habitat deterioration and loss due to increased leisure use from walkers, dogs, cyclists, horse riders and possibly off road vehicles arising from increased population due to proposed development. Habitat deterioration and loss from trampling (passages as low as 40 -50/year can eliminate species - species of low productivity, especially ancient woodland flora; lichens and some mosses) [Penny Anderson Associates, 2009]; nitrogen enrichment from dog fouling [Footprint Ecology, 2009] There is some erosion and fragmentation of habitats, almost entirely on PRoW - there is very little vehicle intrusion into the oak woods (pers. comm. Chris Edwards, Quantocks AONB manager).	Uncertain – the policies support and provide information for access to the PRoW network indiscriminately	West Somerset, Taunton Deane and Sedgemoor District Council LDF Core Strategies Somerset County Council Rights of Way Management Plan	Uncertain – there is likely to be increased demand due to increased population as a result of housing development proposals on PRoW including those routed through or adjacent to Natura 2000 sites. The aim of the Rights of Way Management Plan is to maintain and therefore increase access to the RoW network.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	Natural processes and structural development Regeneration potential Composition Species, habitats, structures characteristic of the site	Current level of structural diversity maintained Ground flora present Signs of seedlings Current level of site-native species maintained Distinctive elements, patches and transitions maintained					
	Barbastelle Bat *Barbastella barbastellus* Bechstein's Bat *Myotis bechsteinii*	Disturbance	Degree of human activity around roost areas	<u>Recreational pressure</u> Disturbance from human activity including increased noise levels. Barbastelle bats are sensitive to disturbance at roosts (Zeale, 2009).	No – the Exmoor sites are more remote from urban centres and therefore less likely to be accessed. Recent records from the Quantocks and elsewhere indicate the presence of barbastelle roosts in that component site. Although currently unknown it is likely that they are also undisturbed and remote, although there may be small amount of local access.	Taunton Deane, Sedgemoor, West Somerset and other DPD from outside of Somerset geographic area (see Exmoor visitor surveys) Rights of Way Management Plan	No – Core Strategies have to accommodate increased housing numbers, which could result in increased recreational use of the SAC. However, pressure is unlikely to be significant	No significant effect likely

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Mendip Limestone Grasslands SAC	Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)	Extent Composition Structure	No reduction Presence and ratio of characteristic species Height and % area	<u>Recreational pressure</u> Habitat deterioration and loss due to increased leisure use from walkers, dogs, cyclists, horse riders and possibly off road vehicles arising from increased population due to proposed development. Habitat deterioration and loss from trampling (common pasture herbs are more resilient; impacts greater on steep slopes; sensitive species disappear on and besides paths and extend up to 50 metres either side, 400 passages/year could result in 50% loss) nitrogen enrichment from dog fouling. [Penny Anderson Associates, 2009] The habitat itself is also under threat from its lack of management, therefore, increasing the significance of small losses. Habitat deterioration and loss from trampling, (dwarf shrubs reduced by 50% cover with less than 200 – 400 passages/year; dry heath plants are more vulnerable when older or wet; nitrogen enrichment from dog fouling can change heath to grassland [Penny Anderson Associates, 2009]	Uncertain – the policies support and provide information for access to the PRoW network indiscriminately There is a need to review visitor data held by Mendips AONB. There is a bridleway - The West Mendip Way - running along the north edge of the site and footpaths through the site. Site is open access and heavily used for informal recreation. This has been identified by Natural England as an issue on the site	Taunton Deane, Sedgemoor, Mendip and other DPD from outside of Somerset geographic area Rights of Way Management Plan	Uncertain – Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).
	European dry heaths	Extent Bare ground Vegetation structure Vegetation composition Negative indicators Sward structure	Maintain existing area % area Presence of species Species frequency % presence % cover of degenerate bushes/ woody steams		See assessment for Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*). Footpaths run through areas of dry heath and have degraded the habitat either side.			

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
	Tilio-Acerion forest of slopes, screes and ravines	Area Natural processes Regeneration Composition Characteristic species, habitats, structures	No loss Structural diversity Signs of seedlings Native species maintained Ground flora and elements, patches and transitions maintained	<u>Recreational pressure</u> Habitat deterioration and loss from trampling (passages as low as 40 -50/year can eliminate species - species of low productivity, especially ancient woodland flora; lichens and some mosses) [Penny Anderson Associates, 2009]; nitrogen enrichment from dog fouling [Footprint Ecology, 2009]				

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Mendip Woodlands SAC	*Tilio-Acerion* forest of slopes, screes and ravines	Area Natural processes Regeneration Composition Characteristic species, habitats, structures	No loss Structural diversity Signs of seedlings Native species maintained Ground flora and elements, patches and transitions maintained	<u>Recreational pressure</u> Habitat deterioration and loss from trampling (passages as low as 40 -50/year can eliminate species - species of low productivity, especially ancient woodland flora; lichens and some mosses) [Penny Anderson Associates, 2009]; nitrogen enrichment from dog fouling [Footprint Ecology, 2009]	Uncertain-The policies support and provide information for access to the PRoW network indiscriminately Research suggests that people will travel up to 18.1 kilometres to visit woodland[10]. **Asham Wood** has two public rights of way entering the site from the south near Merehead Quarry and one across the north west of the site. However, damage from picnicking activity is occurring at the entrance to Asham tunnel. There is also considerable damage to part of the site from illegal access by off road vehicles **Ebbor Gorge** component site is a National Nature Reserve and is managed. The **Rodney Stoke** component is not generally accessible. The **Cheddar Wood** component site is located to the west of Shipham Hill. There are two footpaths running north south on the eastern side of the SAC, neither of which are nationally marked routes, which may be used by residents the use of which is unlikely to increase significantly due to increased leisure use. The site is managed by Somerset Wildlife Trust	Sedgemoor, Mendip and other DPD from outside of Somerset geographic area Rights of Way Management Plan	Uncertain – Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

[10] http://naturalengland.communisis.com/naturalenglandshop/docs/NE13.pdf

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
North Somerset and Mendip Bats SAC	Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)	Extent Composition Structure	No reduction Presence and ratio of characteristic species Height and % area	<u>Recreational pressure</u> Habitat deterioration and loss due to increased leisure use from walkers, dogs, cyclists, horse riders and possibly off road vehicles arising from increased population due to proposed development. Habitat deterioration and loss from trampling (common pasture herbs are more resilient; impacts greater on steep slopes; sensitive species disappear on and besides paths and extend up to 50 metres either side, 400 passages/year could result in 50% loss) nitrogen enrichment from dog fouling. [Penny Anderson Associates, 2009] Possible increased use of rights of way may lead to 'nibbling' at edges of habitat. Also nibbling from provision of car parking and use of unofficial car parking spaces in Cheddar Gorge	Uncertain – The policies support and provide information for access to the PRoW network indiscriminately. A public right of way runs along the length of the Velvet Bottom and along the West Mendip Way and other footpaths run along the south of the Gorge in the Cheddar Complex components and is heavily used for informal recreation. Promotion could exacerbate the problem.	Sedegmoor, Mendip and other DPD from outside of Somerset geographic area particularly neighbouring North Somerset Rights of Way Management Plan	Uncertain – Core Strategies concerned also have to accommodate increased housing numbers, which could result in increased recreational use of the SAC.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Severn Estuary SPA/ Ramsar	Migratory bird species Waterfowl	Bird usage	Levels of disturbance are maintained within necessary levels.	<u>Recreational pressure</u> Human disturbance is a major influence on wildfowl and other birds. Nature viewing has a great potential impact. The highest impacts occur in the breeding season. Dogs can cause great disturbance to wildlife. (Dale & Naylor, 2006) Waders and wildfowl are particularly sensitive. Migrants are more sensitive to disturbance than resident birds. (Bennett & Zeulke, 1999, Dale & Naylor, 2006)Generally disturbance only affects the behaviour and movement of birds temporarily and locally, probably redistributing birds among other water bodies within a region. (Bennett & Zeulke, 1999, Dale & Naylor, 2006) Even at relatively low levels, disturbance with costs increases mortality rates more than permanent habitat removal (West *et al*, 2002). Shorebirds often show strong avoidance of humans and studies have shown that bird numbers are lower in disturbed than undisturbed sites. (Gill *et al*, 2001) Gill *et al*, 2001 found that human presence reduced the number of Black-tailed Godwits that were supported by coastal sites at a range of spatial scales	Uncertain-The policies support and provide information for access to the PRoW network indiscriminately. Brue Estuary – boat club at Highbridge and Apex Park has large numbers of visitors. From here Clyce Bridge acts as a PRoW access to estuary with dog walking along the top of the sea wall. The mouth of River Brue is a major roost for redshank, dunlin, etc that are vulnerable to disturbance. Already disturbed on the north side except when bad weather. There are few birds from the boat club eastward. Mouth of Brue is a winter roost occupied from late autumn. (pers. comm.. Natural England) Huntspill is well visited from Sloway Bridge. There is disturbance at the mouth of river; even in freezing conditions there are dog walkers. Teal, wigeon, little egret, avocet, etc are present. It is not a problem at the moment. The NNR report guesses 5000 visitors. More concern is people going north along the coast opposite Steart. (pers. comm.. Natural England)	Sedgemoor District Council Core Strategy Rights of Way Management Plan	Uncertain – Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC particularly from proposed housing in Highbridge.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).

Table 31	Policy 9 Public Rights of Way							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Somerset Levels and Moors SPA/ Ramsar	Over wintering and migratory bird species Waterfowl	Bird usage	Levels of disturbance are maintained within necessary levels.	<u>Recreational pressure</u> See description for Severn Estuary SPA/ Ramsar above	Uncertain-The policies support and provide information for access to the PRoW network indiscriminately. Shapwick Heath has visitor data – NE estimates 75000 visitors per annum. The car park at Ashcott Corner serves both Shapwick Heath and the RSPB reserve at Ham Wall. There is a visitor management plan at Shapwick. There is a problem with people viewing starlings Elsewhere recreational disturbance problems are considered to be low level issues. All reserves are in various visitor handbooks. Apart from low level visitors go where there are car parks.	Somerset District and Borough Council Core Strategies and other DPD from outside of Somerset geographic area Rights of Way Management Plan	Uncertain - Core Strategies concerned have to accommodate increased housing numbers, which could result in increased recreational use of the SAC particularly from proposed housing in Highbridge. Visitor surveys show that people access the Levels and Moors car parks from many kilometres away.	No significant effect – Policy 13 states, 'Ensure that any walking route considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).
			Management of the habitats present is required to maintain the diverse structure and composition of vegetation.	<u>Recreational pressure</u> Habitat deterioration and loss due to increased leisure use from walkers, dogs, cyclists, horse riders and possibly off road vehicles arising from increased population due to proposed development.				

Table 32	Policy 18. Freight							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Exmoor and Quantocks Oak Woodlands SAC	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	Natural processes and structural development Regeneration potential Composition Species, habitats, structures characteristic of the site	Current level of structural diversity maintained Ground flora present Signs of seedlings Current level of site-native species maintained Distinctive elements, patches and transitions maintained	<u>Air Pollution</u> The A39 runs along the north side of the SAC and is currently shown as a County Freight Route. The site supports extensive tracts of old sessile oak woods in conjunction with heath. They are rich in bryophytes, ferns (including *Dryopteris aemula*) and epiphytic lichens. Bryophytes and epiphytic lichens are vulnerable to nitrogen and acid deposition. Ozone also damages other plants in the site's plant communities. Nitrogen deposition for the SAC is currently 2.74, which is above critical levels. Acid and ozone are also above critical levels. Sessile oak woodlands would be under threat from predicted climatic changes resulting in eventual replacement by pedunculate oak	Unlikely – Air quality impacts would arise directly from HGV directed to using the route. Traffic along the A39 may increase nitrogen deposition and particulates within 200[11] metres of the road. However, sensitive species are further than 200 metres away from the road and are therefore unlikely to be affected by air pollution.	Somerset District and Borough Council Core Strategies and other DPD from outside of Somerset geographic area	Core Strategies include provision for employment development, which may generate freight traffic. However, see comment under 'Likely significant effect alone'.	No significant effect likely

[11] 200 metres is the distance from a road where nitrogen deposition is expected to occur in the Habitat Regulations Assessment of the draft Regional Spatial Strategy for the South West (2006). Bignall *et al*, (2004) consider that 150 metres air quality returns to background levels. The greater distance is used, as a precautionary approach is required.

Table 32	Policy 18. Freight							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Mendip Limestone Grasslands SAC	Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)	Extent Composition Structure	No reduction Presence and ratio of characteristic species Height and % area	<u>Air pollution</u> The A38 adjacent to the SAC is likely to be included as a freight route for HGVs. Currently it is a Regional Freight Route Component 6 of the SSSI lies next to the A38. Reference to the Air Pollution Information System[12] indicates that nitrogen deposition is at critical loading. NOx is well below critical level at Shute Shelve. However, over time continued exceedence of nitrogen deposition would in time cause nitrogen oxides to exceed critical loads as well in areas within 200 metres of main roads.	No - It is considered that nitrogen oxide and particulate emissions from HGV traffic along the A38, as a result of routing, is unlikely to significantly contribute to increased nitrogen and particulate deposition. The component sites of the Mendip Limestone Grasslands are lime-maple woodland ones which do not support any significant lichen communities; the grassland habitat is more than 200 metres from the road.	Somerset District and Borough Council Core Strategies and other DPD from outside of Somerset geographic area Minerals Core Strategy	Core Strategies include provision for employment development, which may generate freight traffic. However, see comment under 'Likely significant effect alone'. Sites at Shute Shelve are close to Bristol Airport and the A38. Increased flights from the expanded Bristol airport and increased traffic from the south may result in increased air pollution along the A38 to access the airport and Bristol. However, the A38 at Shute Shelve is likely to have had much higher traffic levels in the past before the opening of the M5	No significant effect likely
	European dry heaths	Extent Bare ground Vegetation structure Vegetation composition Negative indicators Sward structure	Maintain existing area % area Presence of species Species frequency % presence % cover of degenerate bushes/ woody steams					

[12] http://www.apis.ac.uk/query_location.html

Table 32	Policy 18. Freight							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Somerset Levels and Moors	Waterfowl	Bird usage	Levels of disturbance are maintained within necessary levels.	<u>Disturbance causing displacement</u> Two roads run through the SPA/ Ramsar. These are the A361, and the A372, both of which runs through the Kings Sedgemoor component site. Only the A372 is listed as a County freight route in the current strategy. Dutch research shows that the noise effects from traffic on grassland birds would be displaced by 72 metres on the A361 and 105 metres on the A372 given current usage (Reijnen *et al*, 1995). Further increase in traffic as a result of HGV routing could displace breeding birds further from the roads and reduce the area available resulting in smaller populations. The Taunton to Westbury railway line runs through the northern end of the West Sedgemoor component site. Railway '…*noise emission, however had a significantly negative effect on the density of garganey, black-tailed godwit and skylark, as well as on all meadow birds together and all waders together'* For example, garganey are affected at 49dB(A) (Waterman *et al*, n/d)	No – it is considered that routing HGV traffic on the A361 and A372 would not significantly increase HGV usage of either road. However, these are likely to be located on existing urban edges and close to the trunk road system. Therefore there is unlikely to be a significant increase on either the A361 or the A372 The Taunton to Westbury line does not support high volumes of freight traffic (less than 0.9 million tonnes per annum) and an increase in traffic of less than 5 extra trains a day was possible in 2007 (Network Rail, 2007).	Somerset District and Borough Council Core Strategies and other DPD from outside of Somerset geographic area	Core Strategies include provision for employment development, which may generate freight traffic.	No significant effect likely

Table 33	Annex B: Taunton - New or expanded park and ride							
European site name	**Qualifying feature**	**Attribute**	**Target**	**Possible impacts**	**Likely significant effect alone?**	**Other plans or projects in-combination**	**Likely significant effect in-combination?**	**Overall likely significant effect conclusion**
Hestercombe House SAC	Lesser horseshoe bat *Rhinolophus hipposideros*	Maintenance and connectivity of habitats Feeding areas	Maintenance of populations	<u>Loss of habitat, severance of flight lines and artificial lighting</u> Lesser horseshoe bats are susceptible to loss of linear features, such as mature hedgerows, which act as commuting routes between roost sites and foraging areas and indeed to other roost sites. (Billington, 2005). Severance of commuting routes may isolate lesser horseshoe bats from areas of suitable feeding habitat, rendering them particularly susceptible (Highways Agency, 2008; Motte & Libois, 2002; Schofield *et al*, 2002; Wray *et al*, 2005). A PhD study (Stone, 2009) carried out at the University of Bristol has shown that lesser horseshoe bats are disrupted from flying along hedgerows by artificial light levels above 0.5 Lux. It was also found that continued disruption increased the effect, i.e. lesser horseshoe bats do not become habituated to the presence of artificial lighting and would therefore permanently disrupt their behaviour.	Yes - The location of a park and ride site has not been identified and therefore there is potential for this to be located north of the A3259 at Monkton Heathfield.	No – the proposals are local to Taunton only	None	Potential significant effect if new Park and Ride Site is located to the north of the A3259 at Monkton Heathfield.

Counter-acting Measures and Conclusions

7.7 This section analyses those policies where a significant effect has been potentially identified in the detailed screening tables above. The table below lists each policy, the potential impact arising from implementation of the policy and recommend counter-acting measures to negate the potential significant effect.

7.8 Policies where counter-acting measures, at this stage, do not negate the potential for a significant effect need to be re-considered before bringing forward the final stage of the TPSP development. These policies may require a Stage 2 'Appropriate Assessment' if significant effects cannot be negated at this stage.

Table 34: Counter-acting Measures and Conclusions

Policy	Natura 2000	Feature	Potential Issue	Counter-acting Measure	Conclusion
7 Cycling	Hestercombe House SAC	Lesser horseshoe bats	Severance of flight lines north of Taunton	**Add to Policy 13** Insert into policy the following words: '*Ensure that any walking…*' **and** / **or cycling routes** '… *considered does not lead to increases in habitat degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites. Where this is likely to occur the route is not promoted or mapped (including on websites).*'	No significant effect if policy text added
Annex B New and enahanced Park & Ride	Hestercombe House SAC	Lesser horseshoe bats	Loss of habitat, severance of flight lines and artificial lighting north of Taunton	**Add to Annex B** Add to '*New and enhanced park and ride'* the following wording, '…*which is located to avoid impacts on Hestercombe House SAC*'	No significant effect if policy text added

Summary of Required Additions and Amendments to the TPSP

7.9 The following is a list of the Policies in the TPSP that require either additions and/or amendments in order to ensure compliance with the Habitats Regulations.

Policy 7: Cycling

7.10 Add to Policy 13 Landscape and Biodiversity

Amend policy text to read:

> '*Ensure that any walking…'* **and** / **or cycling routes** *'… considered does not lead to increases in habitat…'* **fragmentation**, *'… degradation or loss, or species disturbance on or in areas ecologically supporting Natura 2000 sites and that where this is likely to occur the route is not promoted or mapped including on websites.'*

Annex B: Taunton

7.11 Add to policy statement

Add to '*New or enhanced Pak and Ride*' the following wording,

> **'…which is located to avoid impacts on Hestercombe House SAC'**

Conclusion

7.12 No further assessment (Stage 2 – Appropriate Assessment) would be required if the above additions and amendments are made to the draft Transport Policies – Schedule of Policies.

7.13 In conclusion, it is the consideration of Somerset County Council that, providing the counter acting measures set out in this report are applied to the Transport Policies – Schedule of Policies, there is unlikely to be a significant effect on the Natura 2000 site network.

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Appendix 1: Areas Included Outside of SPA/Ramsar Designations

The following tables list sites outside of the designated areas that nonetheless are considered to function ecologically for species for which the site is designated, and hence, could potentially affect the integrity of the site's conservation objectives. A precautionary approach is used.

If a site is used by more than one species only the first listed species use is mentioned in the tables.

Severn Estuary SPA/Ramsar	
Shelduck	Knighton
Wigeon	Axe Estuary
	Huntspil River
	Berrow Dunes
	Brick Yard Farm
	Hinkley Wind Farm site
	Combwich Brick Pit
Teal	Pawlett Field Drove
Curlew	Fields west of Car Auction Centre, Dunball
	Middle Field Lane, Huntspil
River Lamprey	River Tone to Clover Close Copse

Somerset Levels and Moors SPA/Ramsar	
Bewick's Swan	Higher Salt Moor
	Horlake Moor
	Weston Level
	Earlake Moor
	Butleigh Moor
	King's Sedgemoor (o/s SPA designation)
	South Moor
	Drayton Level

Somerset Levels and Moors SPA/Ramsar	
	Huish Level
	Mulchelney Level
	Hay Moor
	King's Moor
	Meare Heath
	Queen’s Sedgemoor
Wigeon	Langport Level
	Thorney Moor
	Long Load (east of village)
	King's Moor
	Gold Corner
	Ham Wall
	West Waste
	East Waste
Gadwall	Westhay Heath
	Walton Heath
	Cradlebridge
	West Backwear
	Cheddar Reservoir
Teal	Whitcombe Bottom
	Knowle Moor Fields
Shoveler	Sharpham
	Smart’s Ground, Meare Heath NNR
Lapwing	Between River Yeo and Bearley Brook
	Wick Moor
	Greylake
	Waterleaze
	Upper Axe Valley

Somerset Levels and Moors SPA/Ramsar	
Whimbrel	Sharpham Plot
Hydaticus transversalis	Morlands Ditches and Pools, Northover