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M4 Corridor around Newport

We want your views on our draft Plan which aims to address transport related problems on the M4 around Newport



Llywodraeth Cymru
Welsh Government

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**M4 Corridor
around Newport
draft Plan**

**Consultation
Document**

Equality Impact Assessment

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Appendix A

EqIA Scoping Responses

Large print versions of this document are made available on request. Please contact Allan Pitt via:

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Glossary

The following terms are referred to in this Equality Impact Assessment (EqIA) Consultation Document:

AQMAs	Air Quality Management Areas. Since 1997 local authorities in the UK have been carrying out a review and assessment of air quality in their area. The aim of the review is to assist authorities in carrying out their statutory duty to work towards meeting the national air quality objectives. If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area there.
DfT	Department for Transport. It works to support the UK transport network and plans and invests in transport infrastructure.
Do Minimum	This is a scenario (sequence of future events) where intervention includes doing nothing above what is already planned or committed. In this case, it includes all recent network modifications (such as the Junction 24 improvement and the Variable Speed Limit system) and any committed schemes (such as the Junction 28/Bassaleg Roundabout/Pont Ebbw Roundabout improvement and the Steelworks Access Road)
Draft Plan	This is the Welsh Government's preferred strategy to solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the draft Plan would lead to a new motorway (Black Route) being built to the south of Newport, alongside some complementary highway management, walking and cycling initiatives. Assessments of the draft Plan compare it to reasonable alternatives, as well as the Do Minimum scenario.
EqIA	Equality Impact Assessment. A way of examining and analysing services, policies and strategies that identify existing and potential impacts on certain groups of people, and sometimes individuals.
LGB	Lesbian, gay and bisexual
M4 CEM	M4 Corridor Enhancement Measures. A Welsh Government initiative set up to explore and resolve issues of capacity, safety and resilience along the M4 corridor in South East Wales.

NAPPAs	Noise Action Planning Priority Areas. Noise maps and associated plans are managed by the Welsh Government and local authorities to find where noise levels are high and help create noise action plans to address the issue.
Reasonable Alternatives	These are reasonable alternatives to the draft Plan, being other options that the Welsh Government consider could solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the reasonable alternatives would lead to either a new dual carriageway (Red Route) being built to the south of Newport, or a motorway solution along a similar alignment (Purple Route) alongside some complementary highway management, walking and cycling initiatives.
SAC	Special Area of Conservation. Strictly protected sites with listed habitat types and species that are considered to be most in need of conservation at a European level (excluding birds).
Scheme / Project	For individual schemes or projects, the appropriate level of appraisal is more detailed, quantitative and evidence-based ¹
SEA	Strategic Environmental Assessment. A process that provides for the high level protection of the environment, by ensuring the integration of environmental considerations into the preparation of plans and programmes and to contribute to the promotion of sustainable development and environmental protection.
SDR	Southern Distributor Road. In this case, the A48 Southern Distributor Road, Newport.
Strategy, Plan or Programme	A strategy, plan or programme sets out broad objectives, identifies measures to achieve these and proposes a typically broad package of interventions to achieve the objectives. The appropriate level of appraisal is also broad, and at a strategy level, it may only be possible to undertake appraisal qualitatively ¹ .
SWATS	South Wales Area Traffic Survey
TEN-T	Trans-European Transport Network
TPOs	Transport Planning Objectives
TR111	Once a preferred route of a transport scheme is announced, the Welsh Government serves a statutory TR111 notice on the local planning authorities requiring the line to be protected from development
UNCRC	United Nations Convention on the Rights of the Child
WelTAG	Welsh Transport Planning and Appraisal Guidance is a transport appraisal tool applicable to transport projects, plans and programmes in Wales. The Welsh Government requires that major transport initiatives seeking government funding are appraised with this guidance.

¹ Source: Welsh Transport Planning and Appraisal Guidance (WelTAG), June 2008

1 Introduction

Please read this document alongside the overarching M4 Corridor around Newport draft Plan Consultation Document².

The draft Plan has been developed taking into account the extensive work undertaken as part of the M4 Corridor Enhancement Measures (CEM) Programme. The M4 CEM Programme was set up to explore and resolve issues of capacity, safety and resilience along the M4 Corridor around Newport, in South East Wales. It was based upon the ability to deliver and identify measures in phases to improve affordability.

As a result of on-going discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4. On 26 June 2013, Edwina Hart AM CStJ MBE, Minister for Economy, Science and Transport, published the following written statement:

“Addressing the capacity and resilience issues on the M4 around Newport is the top transport challenge that we face in ensuring that Wales has an effective economic infrastructure which improves our competitiveness and access to jobs and services.

As a result of ongoing discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4.

Building on the extensive development and consultation work undertaken on M4 Corridor Enhancement Measures (CEM), we will be consulting formally over the summer with Natural Resources Wales in order to go out to public consultation this September with a finalised draft Plan and Strategic Environmental Assessment (SEA) Report.

If implemented, the draft plan would lead to a motorway being built south of Newport.”

The main element of the draft Plan is the provision of a section of three lane motorway between Junctions 23 and 29 on the south side of Newport. It is shown as the Black Route on page 19. The draft Plan would also include the following Complementary Measures:

Table 1 draft Plan Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.

² The Consultation Document is available online at www.m4newport.com or in paper copy (see page 52)

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

The consultation document also provides information on two “Reasonable Alternatives” to the draft Plan and a “Do Minimum” which considers consequences of doing nothing above what is already planned.

The main elements of the two reasonable alternatives are also shown on page 19. They are the Red Route which is a dual carriageway and the Purple Route which is a three lane motorway. Both routes would also have complementary measures.

The draft Plan does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. The report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

The Welsh Government is seeking your views on the draft Plan, which aims to address transport related problems on the M4 Corridor around Newport. We also want your views on two reasonable alternatives to the draft Plan, the Do Minimum scenario and the associated assessments which are:

- Equality Impact Assessment (EqIA);
- Strategic Environmental Assessment (SEA);
- Habitats Regulations Assessment (HRA); and
- Health Impact Assessment (HIA).

These assessments consider the potential environmental, health and equality impacts of the draft Plan, its reasonable alternatives and the Do Minimum scenario. These are separate documents but are included in the draft Plan Consultation.

Using the feedback received from the consultation, the Welsh Government will decide whether to adopt the draft Plan, with or without amendments, taking into account the responses to the associated assessments.

1.1 Purpose

This document provides the Equality Impact Assessment (EqIA) which is included in the draft Plan Consultation.

In accordance with the Equality Act 2010, as a strategy or programme, the Welsh Government considers that an Equality Impact Assessment (EqIA) of the M4 Corridor around Newport draft Plan is required. This EqIA assesses to what extent the draft Plan, its

reasonable alternatives and the Do Minimum scenario affect different social and demographic groups. The assessment has been undertaken in accordance with guidance provided by the Welsh Assembly Government's Equality and Human Rights Division³ and prepared with due regard to the guidance provided in Welsh Transport Planning and Appraisal Guidance (WelTAG)⁴, the National Transport Plan Equality Impact Assessment (February 2010)⁵, the Wales Transport Strategy Equality Impact Assessment (2008)⁶ and Working for Equality in Wales (May 2010)⁷. The assessment also reflects the Welsh Governments objectives outlined in its Strategic Equality Plan⁸.

1.2 Background

The M4 in South Wales forms part of the Trans-European Transport Network (TEN-T), which provides connections throughout Europe by road, rail, sea and air. The M4 plays a key strategic role in connecting South Wales with the rest of Europe, providing links to Ireland via the ports in South West Wales and England and mainland Europe to the east. It is a key east-west route being the main gateway into South Wales and also one of the most heavily used roads in Wales.

Providing a facility for transporting goods, linking people to jobs and employment sites as well as serving the Welsh tourism industry, the M4 is critical to the Welsh economy. Cardiff, and Newport and Swansea have ambitious regeneration strategies and Monmouthshire County Council is developing areas around Junction 23A of the M4. Rhondda Cynon Taff has important gateways onto the motorway at Junctions 32 and 34. Bridgend is served by M4 Junctions 35 and 36. Neath Port Talbot straddles the motorway and gets important access from Junctions 38 to 43. Congestion on the M4 causing unreliable journey times and reduced service levels will therefore hinder economic development in South Wales.

The M4 between Junctions 28 and 24 was originally designed as the 'Newport Bypass' with further design amendments in the 1960s to include the first motorway tunnels to be built in the UK. The M4 Motorway between Magor and Castleton does not meet modern motorway design standards. This section of the M4 has many lane drops and lane gains, resulting in some two-lane sections, an intermittent hard shoulder and frequent junctions. It is often congested, especially during weekday peak periods resulting in slow and unreliable journey times and stop-start conditions with incidents frequently causing delays.

This is why problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years. The motorway and surrounding highway network does not cope with sudden changes in demand or operation, for example as a result of accidents or extreme weather events for example. These issues are worse at times of peak travel (rush hour) and have worsened as the number of users on the network has increased.

The M4 Corridor around Newport is shown in Figure 1.

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³ Welsh Government – Working for Equality in Wales, November 2008

⁴ Welsh Transport Planning and Appraisal Guidance, June 2008, Welsh Assembly Government. WelTAG is a transport appraisal tool for Wales. It is applicable to transport projects, plans and programmes.

⁵ National Transport Plan Equality Impact Assessment and Equality Action Plan, February 2010

⁶ Wales Transport Strategy Equality Impact Assessment, 2008

⁷ Working for Equality in Wales. Inclusive Policy Making. Second Edition Guidance, May 2010, Welsh Assembly Government

⁸ Welsh Government: Strategic Equality Plan & Objectives, 2012-2016

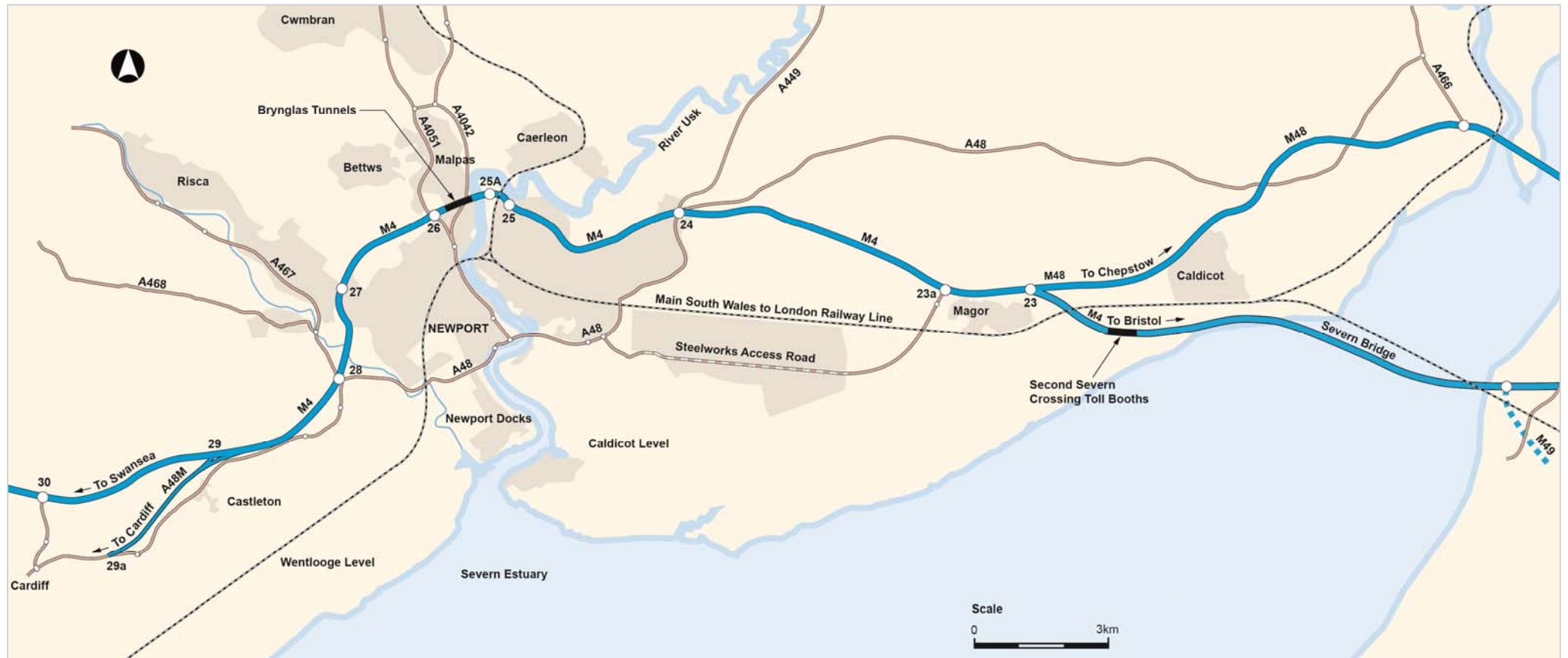


Figure 1 Location of the M4 around Newport

2 Problems, Aims and Goals

2.1 Relationship to M4 CEM Programme

The problems, goals and aims of the M4 CEM Programme were subject to dialogue during the early stages of the engagement process, with public and stakeholders.

17 problems were identified; which encompassed issues of capacity, (network) resilience, safety and sustainable development. It is considered that the problems have not changed since 2012.

15 goals were identified and each one aimed to address one or more of the problems. As the problems have not changed there was no need to revisit the goals.

2.2 Problems on the M4 Corridor around Newport

The 17 identified transport related problems are listed below.

As part of the M4 CEM Consultation, respondents were asked to prioritise up to four problems out of the full list.

Problems 1,5,7 and 9 shown in bold italics were selected the most times by those who responded to the M4 CEM Consultation.

Capacity

1. ***A greater volume of traffic uses the M4 around Newport than it was designed to accommodate, resulting in regular congestion at peak times over extended periods.***
2. The M4 around Newport is used as a convenient cross town connection for local traffic, with insufficient local road capacity.
3. HGVs do not operate efficiently on the motorway around Newport.
4. There is insufficient capacity through some of the Junctions (e.g. 3 lane capacity drops to 2 lane capacity).
5. ***The 2-lane Brynglas tunnels are a major capacity constraint.***
6. The M4 cannot cope with increased traffic from new developments.

Resilience

7. ***Difficulties maintaining adequate traffic flows on the M4 and alternative highway routes at times of temporary disruption; alternative routes are not able to cope with M4 traffic.***
8. The road and rail transport system in and around the M4 Corridor is at increasing risk of disruption due to extreme weather events.
9. ***When there are problems on the M4, there is severe disruption and congestion on the local and regional highway network.***
10. The M4 requires essential major maintenance within the next 5-10 years; this will involve prolonged lane and speed restrictions, thus increasing congestion problems.
11. There is insufficient advance information to inform travel decisions when there is a problem on the M4.

Safety

12. The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorways⁹.
13. The existing M4 is an inadequate standard compared to modern design standards.
14. Some people's driving behaviour leads to increased accidents (e.g. speeding, lane hogging, unlicensed drivers).

Sustainable Development

15. There is a lack of adequate sustainable integrated transport alternatives for existing road users.
16. Traffic noise from the motorway and air quality is a problem for local residents in certain areas.
17. The existing transport network acts as a constraint to economic growth and adversely impacts the current economy.

2.3 Aims for the M4 Corridor around Newport

The aims of the Welsh Government for the M4 Corridor around Newport are to:

1. Make it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road.
2. Deliver a more efficient and sustainable transport network supporting and encouraging long-term prosperity in the region, across Wales, and enabling access to international markets.
3. To produce positive effects overall on people and the environment, making a positive contribution to the overarching Welsh Government goals to reduce greenhouse gas emissions and to making Wales more resilient to the effects of climate change.

The draft Plan aims to help to achieve or facilitate these aims as part of a wider transport strategy for South East Wales, as outlined within the Prioritised National Transport Plan¹⁰.

2.4 Goals of the M4 Corridor around Newport

The Welsh Government with the help of the others, identified 15 goals for the M4 CEM Programme. These goals aim to address the identified transport related problems listed in section 2.2. For clarity goals are referred to as "Transport Planning Objectives" (TPOs) in WelTAG (see Glossary).

The 15 goals (listed below) provide a framework in which to appraise the relative performance at a strategic level of the draft Plan, the reasonable alternatives and the Do Minimum scenario.

As part of the M4 CEM Consultation respondents were asked to prioritise up to 4 goals out of the full 15. Goals 1,4,5 and 7 shown in bold italics were selected the most.

⁹ The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. The first year of operation has shown a reduction in accidents.

¹⁰ National Transport Plan (2010) & Prioritised National Transport Plan (2011) Welsh Government

- 1. *Safer, easier and more reliable travel east-west in South Wales.***
2. Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.
3. More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport.
- 4. *Best possible use of the existing M4, local road network and other transport networks.***
- 5. *More reliable journey times along the M4 Corridor.***
6. Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives.
- 7. *Improved safety on the M4 Corridor between Magor and Castleton.***
8. Improved air quality in areas next to the M4 around Newport.
9. Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor.
10. Reduced greenhouse gas emissions per vehicle and/or person kilometre.
11. Improved travel experience into South Wales along the M4 Corridor.
12. An M4 attractive for strategic journeys that discourages local traffic use.
13. Improved traffic management in and around Newport on the M4 Corridor.
14. Easier access to local key services and residential and commercial centres.
15. A cultural shift in travel behaviour towards more sustainable choices.

2.5 Consequences of Doing Nothing

Analysis shows that in 2012 during peak periods (also known as ‘rush hour’), traffic flows approach 100% of capacity along sections of the M4 around Newport¹¹. Once flows exceed 80% of capacity, traffic can expect operational problems (frequent traffic jams). The more congested road conditions become, the greater the risk of incidents and accidents occurring. In the future, the situation is expected to deteriorate further.

Forecasts of future traffic volumes show that in the Do Minimum situation, traffic congestion will be severe on most links by 2020 and by 2035 the motorway around Newport will be heavily congested, with all sections between J23A and J29 experiencing flows above 100% of capacity during weekday peak periods¹².

Congestion on the M4, particularly around Cardiff and Newport, is cited by the business community in South Wales as a barrier to economic growth. Where congestion increases, the cost of transport for businesses, commuters, consumers and economic performance can be affected. Increased congestion will also result in longer journey times for commuters, reducing the effective travel to work area.

In terms of the environment, local authorities in the UK work towards meeting the national air quality objectives and if a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area. Out of Newport’s seven Air Quality Management Areas (AQMAs), four are associated with the M4. Higher traffic volumes along the M4 are likely to contribute not only to poor air quality, but also

¹¹ Source: Arup analysis 2012

¹² Source: Arup analysis 2012

noise pollution, compromising the amenity of neighbouring residential communities. Assuming no improvements to vehicle emissions technology, the increased flows and stop start conditions will give rise to more vehicle emissions along these routes. It is important to note that stop-start congested traffic can result in higher CO₂ emissions than free-flowing traffic. Alongside the motorway at Newport, there are also Noise Action Planning Priority Areas (NAPPAs), which investigate where noise levels are high and help create noise action plans to address the issue.

The AQMAs in Newport are available to view on the Newport City Council website¹³, whilst recently published Wales Noise Maps are being used to help the Welsh Government to develop and implement a noise action plan for Wales, which is due to be published later in 2013. These are also available on the Welsh Government website¹⁴.

¹³ See

http://www.newport.gov.uk/_dc/index.cfm?fuseaction=environmentalhealth.homepage&contentid=cont446709

¹⁴ See <http://data.wales.gov.uk/apps/noise/>

3 Previous Work

Since 1991, much assessment and consultation has been undertaken to develop a preferred solution to the problems on the motorway around Newport. A summary of previous work is provided below and a more detailed history is documented in the M4 Corridor around Newport WelTAG Appraisal Report Stage 1 (Strategy Level)¹⁵.

For many years, concerns have been raised regarding the potential for delays on the motorway and trunk road network in South Wales.

In March 1989, the then Secretary of State for Wales commissioned the South Wales Area Traffic Survey (SWATS) to review traffic patterns over part of the trunk road network in South Wales in order to identify problem areas and propose possible solutions. The SWATS Report (1990) identified the need for substantial improvement to the M4 to address a growing capacity issue on the motorway, in particular the section between Magor and Castleton.

As a consequence, a proposal for a relief road to the south of Newport (which became known as the 'M4 Relief Road', and later, the 'New M4 Project' as a new dual 3-lane motorway) was included in the Welsh Trunk Road Forward Programme in 1991. An M4 Relief Road Preferred Route was published in 1995 and amended in 1997.

In 2004, the then Minister for Economic Development and Transport reported on the outcome of his review of transport programmes, which were undertaken to ensure a strategic fit with: 'Wales: A Better Country' and the Wales Spatial Plan. One of the conclusions of the review was that additional capacity was still required on the M4 motorway in South East Wales, in order to reduce congestion, improve resilience and remove an obstacle to greater prosperity along the whole corridor through to Swansea and West Wales. In addition to widening the motorway north of Cardiff, the Minister announced proposals to develop a New M4 south of Newport between Magor and Castleton.

Following Ministerial Review in 2004, the New M4 Project was the subject of a thorough re-examination in order to ensure fit with policies at that time and to take account of physical and legislative changes. Three key activities were undertaken:

1. A re-examination of route corridors considering, in particular, the implications and consequences of legislative changes and physical developments within the original project study area;
2. A comprehensive review of the previously published M4 Relief Road Preferred Route; and
3. A Junction Strategy Review.

The conclusion of these studies confirmed the route to the south of Newport as the optimal solution to tackling the problems of congestion on the M4 corridor around Newport. Following the Preferred Route and Junction Strategy Review, a TR111¹⁶ notice (April 2006) was published to protect a revised route corridor. A series of public exhibitions were held in April and May 2006 to explain the changes to the public and other stakeholders with an interest in transport in South Wales.

¹⁵ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013

¹⁶ Once a preferred route is announced, Welsh Government serves a statutory notice (TR111) on the local planning authorities requiring the line to be protected from development. This is enacted under Article 19 of the Town & Country Planning (Development Management Procedure) (Wales) Order 2012.

3.1.1 M4 Corridor Enhancement Measures (M4 CEM) Programme

A written statement in July 2009, by the then Deputy First Minister Ieuan Wyn Jones, announced that the New M4 was not affordable. The statement, however, accepted “*the need to urgently address safety and capacity issues on the existing route*” through the introduction of “*a range of measures*”.

The M4 Corridor Enhancement Measures (CEM) Programme¹⁷ was therefore initiated by the Welsh Government and this aimed to create a package of measures to deal with resilience, safety and reliability issues within the M4 corridor between Magor and Castleton.

Under the M4 CEM Programme, a long list of possible solutions was explored. Packages that combined public transport, highway and other travel solutions were identified for appraisal. These included widening of the M4 between Junctions 24 and 29 as well as improvement to the existing road network to the south of Newport city centre and a new dual carriageway all-purpose road to the south of Newport.

As part of the M4 CEM Programme, a comprehensive engagement process was launched in September 2010 culminating in a public consultation held between March and July 2012. During the engagement process, the Welsh Government and its project team engaged with both internal and external specialists and expert stakeholders. This process encompassed a diverse range of views and interests relating to transport in South Wales, as well as with people likely to be interested in and affected by any transport measures potentially adopted and implemented by Welsh Government. The consultation resulted in public support for the provision of an additional high quality road to the south of Newport¹⁸, supported by additional measures to address travel related problems within the M4 Corridor. These were referred to as Common Measures. They comprised a mix of network improvements, network management, demand management, alternative modes and smarter sustainable choices. The M4 CEM WelTAG Stage 1 (Strategy Level) Appraisal¹⁹ concluded that the following measures were worthy of further consideration:

- A new dual carriageway route to the south of Newport (Red Route alternative to the draft Plan);
- Public transport enhancement; and
- Common measures.

3.1.2 M4 Corridor around Newport draft Plan

Recent initiatives, including discussions between the Welsh Government and HM Treasury/Department for Transport, as well as the work of the Silk Commission²⁰, have created future potential funding opportunities for Welsh Government infrastructure projects. As a consequence, the decision was taken by the Welsh Government to further reconsider solutions to resolve transport related problems on the M4 around Newport.

¹⁷ Further details of the M4 CEM Programme and its evolution are available at www.m4cem.com.

¹⁸ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013

¹⁹ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, March 2013

²⁰ The ‘Silk’ Commission on Devolution in Wales, which is reviewing the case for the devolution of fiscal powers and reviewing the powers of the National Assembly for Wales, due to report in Spring 2014.

Thus, in order to inform the strategy for the M4 Corridor around Newport, a further M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal²¹ has been undertaken of options that include M4 CEM measures, provision of new motorway capacity routed to the south of Newport and complementary measures. The options considered within the WelTAG Appraisal were as follows:

1. A new section of 3-lane motorway to the south of Newport following the protected (TR111) route (Black Route);
2. A new dual 2-lane all-purpose road to the south of Newport following an alignment that would allow it to be constructed in phases (Red Route);
3. A new section of 3-lane motorway to the south of Newport along a similar alignment to the all-purpose road (Purple Route);
4. Public transport measures; and
5. Complementary measures.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal concluded that a new section of 3-lane motorway to the south of Newport following a protected (TR111) route, in addition to complementary measures, would best achieve the goals and address the problems of the M4 Corridor around Newport, and should be progressed for further appraisal.

These options have subsequently formed the basis for the development of the draft Plan, which is described further in Section 4.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal also acknowledged that public transport enhancement will contribute to some of the goals of the M4 Corridor around Newport. The draft Plan does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. That report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

²¹ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013.

4 The draft Plan

In recognising the range of the goals for the M4 Corridor around Newport, the draft Plan combines both highway infrastructure and other demand management solutions in identifying a preferred strategy.

The draft Plan for the M4 Corridor around Newport (the preferred strategy) consists of:

- **A new section of 3-lane motorway between Magor and Castleton to the south of Newport along the TR111 protected corridor of the Black Route; and**
- **Complementary Measures (see table 2 overleaf).**

The reasonable alternatives to the draft Plan include:

- **A dual 2-lane all-purpose road (Red Route); or**
- **A motorway solution along a similar alignment (Purple Route); in addition to**
- **Complementary Measures.**

The draft Plan and the reasonable alternatives have been assessed against the ‘Do Minimum’ scenario. The Do Minimum scenario means doing nothing above what is already planned or committed.

The preferred strategy and reasonable alternatives are described in more detail below and illustrated in Figure 2 on page 19.

4.1 The draft Plan (Preferred Strategy)

4.1.1 Motorway following TR111 Protected Route – The Black Route and Complementary Measures

This preferred strategy comprises the construction of a new 3-lane motorway mainly following the protected TR111 ‘Black Route’, between Junctions 23 and 29, including a new crossing of the River Usk south of Newport. The River Usk is designated as a Special Area of Conservation (SAC).

The TR111 route to the south of Newport has remained protected for planning purposes since April 2006. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation and analysis. The aim is to minimise the impact on the environment, whilst fully meeting current motorway design and safety standards. Minor changes to the alignment of the TR111 protected route could still be made, subject to further investigation, if this option is taken forward. This motorway solution would be delivered as one scheme.

If this draft Plan is adopted a junction strategy would be investigated as part of scheme’s development.

The alignment of the Black Route is shown in the context of local constraints in Figure 2 on page 19.

In addition to the new highway infrastructure, there are additional complementary measures that could assist in alleviating travel related problems within the M4 Corridor around Newport. The draft Plan’s complementary measures are as follows:

Table 2 draft Plan Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.2 Reasonable Alternatives to the draft Plan

4.2.1 Dual 2-lane All-Purpose Road – The Red Route and Complementary Measures

This option involves the construction of an additional high quality road to the south of Newport, as a dual carriageway solution. The route aims to minimise negative impacts on local communities and the environment. As a dual carriageway on this corridor alignment, the road could be delivered in phases by tying into the existing road network in Newport. Delivery could thus be phased with availability of funding. However, the main benefits would only be realised when the route is complete.

This road would require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Red Route is further north compared to that of the Black Route and the impact on the Port of Newport operations may be less. However, the alignment would pass through and have significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Duffryn. There are also on-going and potential further development sites along this route.

The alignment of the Red Route is shown in the context of local constraints on Figure 2 on page 19.

In addition, the following complementary measures could assist the Red Route in alleviating travel related problems within the M4 Corridor around Newport:

Table 3 Red Route Complementary Measures

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.2.2 Motorway along Alternative Alignment to the South of Newport – The Purple Route and Complementary Measures

In order to fully represent the highway options to the south of Newport, this option comprises a 3-lane motorway along a similar route to that which is proposed for the Red Route (dual 2-lane all-purpose road). A difference between the two routes being the purple route has a more northerly alignment to cross the northern end of the North Dock at the Port of Newport.

This new motorway would require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Purple Route is such that the impact on the Port of Newport is minimised. However, there could be significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Dyffryn. There are also on-going and potential further development sites along this route.

The alignment of the Purple Route is shown in the context of local constraints on Figure 2 on page 19.

In addition, the following complementary measures could assist the Purple Route in alleviating travel related problems within the M4 Corridor around Newport:

Table 4 Purple Route Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.3 Do Minimum Scenario

The Welsh Government is committed to continuing to improve transport in South Wales. Practical measures to make travel safer and easier on the M4 motorway around Newport have included replacing sections of steel central barriers with concrete barriers, the introduction of Variable Speed Limit systems and improvements to the roundabout at Junction 24 at Coldra.

The Do Minimum scenario means doing nothing above what is already planned or committed. This scenario therefore comprises minimum intervention but in this case does include a number of highway schemes, which are currently committed to be completed between 2020 and 2035 as follows:

Welsh Government Schemes:

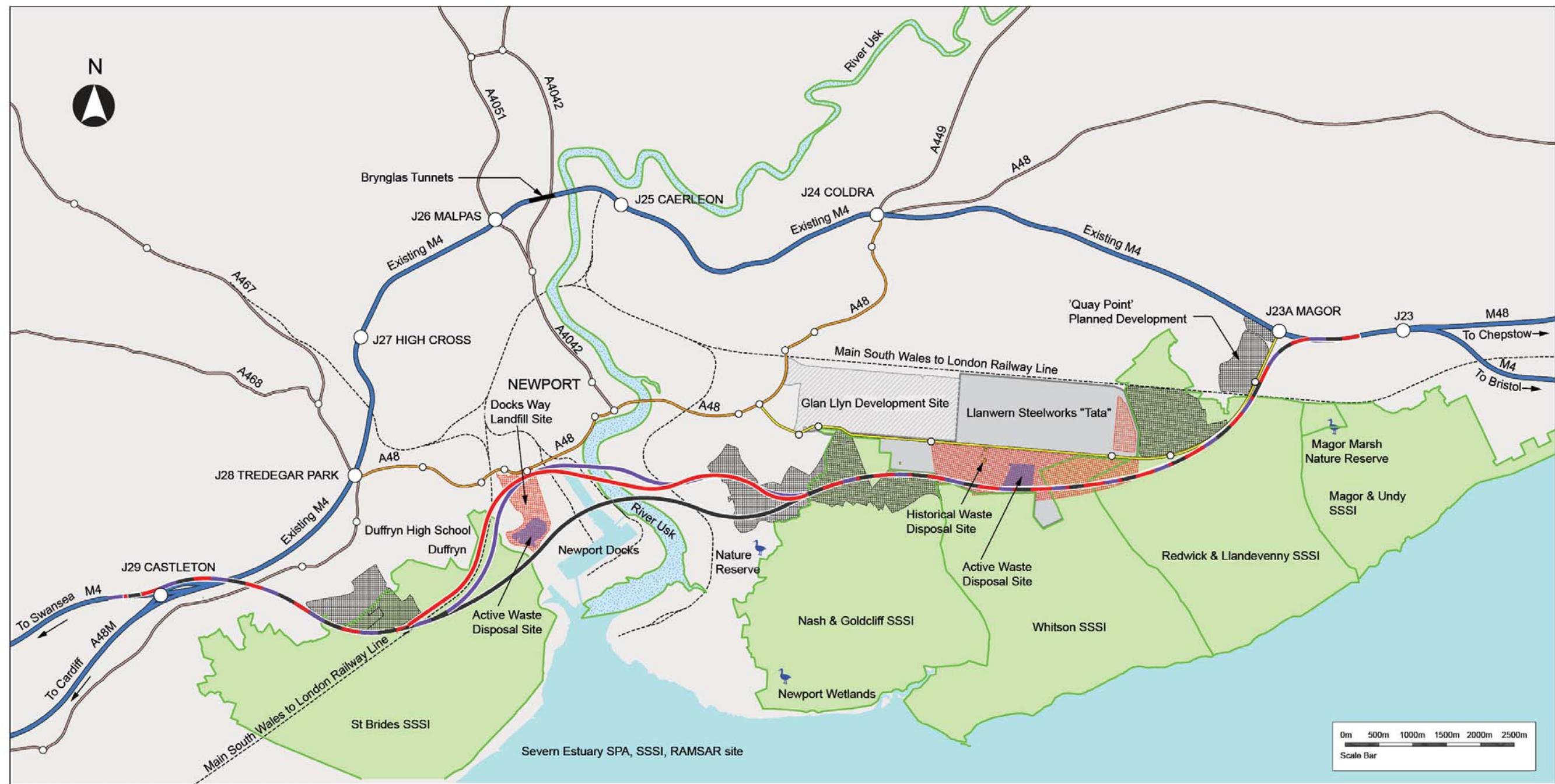
- The recently opened Newport Steelworks Access Road Phases 1 and 2 (the former Llanwern Steelworks access road);
- Junction 28 roundabout, enlarged signalled gyratory scheme including associated improvements to the A467 Bassaleg roundabout and A48 Pont Ebbw; and
- A465 Heads of the Valleys dualling (Gilwern to Hirwaun).

Newport City Council Scheme:

- Link through Newport Eastern Expansion Areas between Steelworks Access Road and A48 SDR (Cot Hill junction, signalised with full movements).

Alongside these schemes, the Do Minimum scenario also consists of a number of development proposals throughout South East Wales, which are committed through the planning process and are due to be completed at various stages to 2035.

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Legend

- Black Route (the main element of the draft Plan)
- Red Route (the main element to the 'reasonable alternative' to the draft Plan)
- Purple Route (the main element to the 'reasonable alternative' to the draft Plan)
- Employment Land Allocation from Newport Unitary Development Plan
- Newport Southern Distributor Road
- Steelworks Access Road
- Existing Railway Lines
- Sites of Special Scientific Interest (SSSI)
- River Usk SAC and SSSI

Figure 2 Black, Purple and Red Route shown within the local study area and main constraints around Newport

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5 Equality Impact Assessment

5.1 Introduction

The Welsh Government is committed to improving the lives of the people in Wales and to achieving best practice in equality and human rights. The goal of the Wales Transport Strategy²², One Wales: Connecting the Nation is to “*promote sustainable transport networks that safeguard the environment while strengthening the country’s economic and social life.*” It is important, therefore, that transport encompasses those social, economic and environmental interactions.²³ The Wales Transport Strategy sets the framework for the National Transport Plan and its strategic priorities.

Paragraphs 8.7.1 to 8.7.3 of WelTAG provide the context for the transport appraisal of equality, diversity and human rights. It states that the Welsh Government will ensure that all demographic groups, particularly under-represented groups, can take advantage of transport services. Therefore, all transport proposals seeking public funding and/or the approval of the Welsh Government must take account of differing needs and their equality impacts. All equality impact groups should be considered including age, sexual orientation, religion or belief and human rights generally.

Problems with transport contribute to social exclusion by preventing people from participating in work or learning, or accessing healthcare, food shopping and other local activities. As highlighted by the UK Social Exclusion Unit²⁴, the problems are understood to largely affect access to:

- **Work:** Two out of five jobseekers say lack of transport is a barrier to getting a job;
- **Learning:** Nearly half of 16–18-year-old students say they find their transport costs hard to meet;
- **Health:** Over a 12-month period, 1.4 million people miss, turn down or choose not to seek medical help because of transport problems;
- **Food:** 16% of people without cars find access to supermarkets hard, compared with 6% of people with cars; and
- **Social activities:** 18% of non-car owners find seeing friends and family difficult because of transport problems, compared with 8% of people with access to a car.

The links between transport and social exclusion are expansive and varied as outlined by research undertaken by the Fédération Internationale de l'Automobile (FIA) Foundation²⁵. In summary, the issues are understood to be:

- Access to a car, particularly outside of major cities, seems to be essential to full participation in economic and social life in modern industrialised societies;
- Lack of access to a car is the main transport factor in the social exclusion of low-income households and other marginalised groups;
- Even for families without cars, the share of public transport trips is lower than the share of trips by car;

²² One Wales Connecting the Nation. The Wales Transport Strategy, 2008

²³ National Transport Plan Equality Impact Assessment and Equality Action Plan, February 2010

²⁴ Social Exclusion Unit – Making the Connections: Report on Transport and Social Exclusion, 2003

²⁵ FIA Foundation – Transport & Social Exclusion, Evaluating the Contribution of Transport Projects to Welfare to Work – An International Study, 2006

- Improving public transport in isolation is no longer an adequate solution to the poor accessibility experienced by low-income and marginalised groups; and
- Dispersed land uses, changing work and lifestyle patterns and the closure of local amenities, increasing car dependence, has exacerbated the problems of poor access for non-car owning households.

5.2 What is an Equality Impact Assessment?

The National Transport Plan EqIA describes an Equality Impact Assessment as a way of examining and analysing services, policies and strategies that identifies existing and potential impacts on certain groups of people, and sometimes individuals. It allows decision makers to make informed decisions that can be evidenced and published. An EqIA can also identify improvements and better ways of delivering goals.

The Welsh Government has specific and general duties in relation to equality and human rights²⁶. The legislative framework for equality and human rights comprises:

1. The Government of Wales Act 2006. Section 77(1) states that: *“The Welsh Ministers must make appropriate arrangements with a view to ensuring that their functions are exercised with due regard to the principle that there should be equality of opportunity for all people.”*
2. The Equality Act 2010 came into force in April 2011. This brings together all the legal requirements on equality that organisations in the private, public and voluntary sectors are required to meet. The Act replaces existing equality law including the Equal Pay Act 1970, the Race Relations Act 1976, the Sex Discrimination Act 1975 and the Disability Discrimination Act 1995²⁷.
3. The Human Rights Act 1998.

The statutory equality duties of the Welsh Government are summarised in Table 8.3 of WelTAG and the National Transport Plan EqIA. These are listed as follows:

Race

- To promote equality of opportunity;
- To eliminate race discrimination;
- To promote good race relations.

Disability

- To promote equality of opportunity between disabled people and other people;
- To eliminate discrimination that is unlawful;
- To eliminate harassment of disabled people that is related to their disability;
- To promote positive attitudes towards disabled people;
- To encourage participation by disabled people in public life;
- To take steps to meet disabled people’s needs, even if that requires more favourable treatment.

²⁶ Working for Equality in Wales, Inclusive Policy Making Second Edition Guidance, May 2010

²⁷ <http://wales.gov.uk/topics/equality/equalityactatwork/equalityact10/?lang=en>

Gender

- To eliminate discrimination and harassment; and
- To promote equality of opportunity between men and women.

WelTAG is an iterative process and as such, the EqIA may need to be updated following completion of WelTAG Stage 1 at a scheme level. Furthermore, for any options that are progressed as part of a draft Plan, it is likely that depending on their scale and location, they will require further Equality Impact Assessment at a scheme level, to avoid, reduce and, if possible, remedy any significant adverse impacts on people.

6 EqIA Appraisal

An assessment of the draft Plan, its reasonable alternatives and the Do Minimum scenario has been undertaken to appraise the significance of the following protected characteristics groups, as outlined in Annex B of the Welsh Government's guidance on Equality Impact Assessments²⁸:

- Age;
- Disability;
- Gender reassignment;
- Marriage and civil partnership;
- Pregnancy and maternity;
- Race;
- Religion and belief;
- Sex (gender); and
- Sexual orientation.

In addition, the following appraisal criteria will also be subject to assessment as outlined in WelTAG:

- Welsh language; and
- Other: Lone parent, economic inactivity, social and multiple deprivation.

6.1 Scoping

A scoping report was prepared in relation to this EqIA and was made available to the Welsh Government's Equality Support Unit within the department of the Economy, Transport and Science, as well as the Welsh Government's wider Equality and Diversity Department (Fairer Futures) for comment, for a five week period commencing 9 July 2013. This outlined the Welsh Government's proposed approach to undertaking EqIA.

Specifically, the scoping consultation posed the following questions:

1. Other than that available at the Welsh Government Equality and Diversity website, is there any additional guidance that should be taken into account as part of this assessment?
2. Are there any additional organisations or parties that we should consider contacting as part of this EqIA?
3. In addition to those identified within the scoping paper, are there any particular issues that should be addressed in detail as part of this assessment?

The responses received as part of the scoping exercise have been incorporated into this assessment of the draft Plan. Relevant EqIA scoping responses are provided at Appendix A.

²⁸ Welsh Government, Working for Equality in Wales – Equality Impact Assessment Guidance (November 2012)

6.2 Consultation

A series of public exhibitions were held in April and May 2006 to engage with the public and other stakeholders on the New M4 Project (at a scheme level). Furthermore, recognising the potential level of public interest in transport related issues within the M4 Corridor around Newport and beyond, and the numbers of people potentially affected by any new plans resulting from possible options, the Welsh Government undertook wide-ranging and focussed engagement with stakeholders and local people from September 2010 as part of the M4 CEM Programme (at a strategy level).

During the engagement process, the Welsh Government and its project team conducted dialogue and deliberative sessions both with internal and external specialists and expert stakeholders, encompassing local authorities, community groups and other organisations with an interest in the likely social and equality impacts of transport measures on the M4 Corridor around Newport. This input has helped to shape the development of a draft Plan and its associated assessments, which remain at a strategy level. Should the draft Plan be adopted by the Welsh Government, with or without amendments, any options taken forward for further appraisal would be progressed as a project and therefore assessed at a scheme level of detail.

The Equality and Human Rights Division of the Welsh Government was consulted on the proposed scope of the EqIA and it has been prepared with due regard to the guidance provided in WelTAG, the National Transport Plan Equality Impact Assessment (February 2010)²⁹, the Wales Transport Strategy Equality Impact Assessment (2008)³⁰ and Working for Equality in Wales (May 2010)³¹.

A public consultation on the draft Plan and its associated assessments, including this EqIA, will commence in September 2013.

6.3 Appraisal

The impact of the draft Plan on equality has been considered with reference to relevant WelTAG criteria. An evidence base has been prepared as part of the WelTAG appraisal of the options. It provides a summary of baseline conditions as well as an appraisal of social, economic and environmental criteria.

As recommended by WelTAG, an EqIA appraisal summary table has been prepared for the draft Plan to qualitatively assess the potential effects on equality. In order to make the appraisal information easier to understand, each measure has been assessed using a 7 scale colour coding system technique that is adopted in WelTAG:

Large Positive Impact	(+++)
Moderate Positive Impact	(++)
Slight Positive Impact	(+)
No (or Minimal) Impact	(0)
Slight Negative Impact	(-)
Moderate Negative Impact	(--)
Large Negative Impact	(---)

²⁹ National Transport Plan Equality Impact Assessment and Equality Action Plan, February 2010

³⁰ Wales Transport Strategy Equality Impact Assessment, 2008

³¹ Working for Equality in Wales. Inclusive Policy Making. Second Edition Guidance, May 2010, Welsh Assembly Government

A summary of each of the options is provided in the following sections and is accompanied by a high level qualitative assessment of potential impacts on equality in an appraisal summary table.

EqIA is an iterative process. This document forms an initial assessment and in order to assist with the EqIA of the draft Plan, information about respondents to the draft Plan Consultation is being sought via the single Response Form (see Section 9). This form is seeking information on the age, sex and nationality of respondents, should they wish to provide this information as part of their response, to help the Welsh Government's analysis of the responses to the consultation, relevant to equality, diversity and social inclusion. If the evidence collected highlights the fact that all groups of people (and certain protected groups)³² are not sufficiently represented, the Welsh Government would consider exploring the potential impacts of the draft Plan, engaging with the Equality Support Unit of the Welsh Government Department for Economy, Science and Transport as necessary.

In order to attract comments from all groups of people, publicity that promotes the draft Plan consultation will be wide ranging. A comprehensive approach to publicity has been prepared with the aim of targeting representative groups across South Wales. Details of publicity and consultation events are summarised within the associated M4 Corridor around Newport draft Plan Consultation Document³³ and outlined at www.m4newport.com.

Following the draft Plan Consultation, this data and any relevant comments will then be incorporated into a finalised EqIA Report, with a statement of results. Should the draft Plan be adopted, this will then be published.

Furthermore, for any options that may be progressed as part of the draft Plan, should it be adopted, it is likely that depending on their scale and location, they will require further EqIA at a project (scheme) level, to avoid, reduce and, if possible, remedy any significant adverse impacts. As such, further liaison with stakeholders will be considered by the Welsh Government in the future. At this stage of further assessment the EqIA would also further consider each of the character groups in more detail (e.g. the assessment would consider the different types of disability, rather than disability in general).

An appraisal summary table is provided in Section 7 to provide a comparison of the preliminary EqIA results. These will be updated to take into consideration any comments received during the draft Plan Consultation, as outlined above.

The following assessment focusses on the character groups identified above, assessing the likely effect of the draft Plan on the equality of those who use the M4, those who dwell in communities alongside the proposed routes and those who dwell in the communities alongside the existing M4. Where it is felt that an option would not necessarily improve equality for a specific group, but would also not worsen their situation, a neutral (0) score has been selected.

³² These are described as protected characteristics for the purposes of the Equality Act 2010.

³³ Available online at www.m4newport.com or in paper copy – see Section 9.

Age

Levels of car ownership are closely linked with age.³⁴ The younger population under 17 are unable to drive. In addition, the elderly are more likely to have to give up their car due to declining health and finances.³⁵ When young people reach the late teens (16 years and over) their mobility needs expand to encompass travel to work, training, further education, leisure and other services. Their needs become more complex, they are likely to travel further distances, and to travel at night as well as during the day. By their late teens, the range of travel modes increases to include driving, which is seen predominantly as the optimum form of travel.³⁶ In addition, the time taken to travel makes part-time evening jobs unviable for many young people.³⁷ As people age, they become less likely to travel by private transport, and there is a particular decline in levels of car driving. Travel as a car passenger, by bus and by taxi increases with age.³⁸

The United Nations Convention on the Rights of the Child (UNCRC) is an international agreement that protects the human rights of children under the age of 18. It was ratified by the UN General Assembly in 1989. In 1991 the United Kingdom formally agreed to ensure that every child in the UK has all the rights listed in the convention. The Welsh Government adopted the Convention as the basis for policy making for children and young people in Wales in 2004. There are 54 articles in the Convention. Articles 43-45 are about how adults and governments should work together to make sure all children are entitled to their rights.

Table 5 considers how the draft Plan, its reasonable alternatives and the do minimum scenario would impact on people of all ages.

Table 5 EqIA Appraisal – Age

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would lead to a reduction in traffic congestion, improved resilience and journey time reliability. This would bring benefits to people of all ages who have access to a car, improving local trips and access to the wider region and offering the resilience required to accommodate predicted future growth. The Black Route would therefore improve access to services and facilities (e.g. education and healthcare) as well as employment opportunities for those in work. The Black Route would also improve safety for those driving, reducing the number of accidents. The Black Route and its complementary measures would be unlikely to benefit those without access to a car, unless public transport services operate along the new road.</p> <p>The complementary measures could bring increased walking and cycling facilities, implemented to modern safety and design standards. These could provide benefits to</p>	People of all ages.	(++)

³⁴ Bevan Foundation – Accessibility for all – public transport and social inclusion in Wales

³⁵ DfT – Older people: Their transport needs and requirements

³⁶ DfT – Evidence Base Review on Mobility: Choices & Barriers for Different Social Groups

³⁷ DfT – Young people and transport: Their needs and requirements

³⁸ DfT – Evidence Base Review on Mobility: Choices & Barriers for Different Social Groups

Topic	Assessment	Distribution	Significance
	<p>people of all ages who do not have access to a car through improve connections to undertake local trips or access public transport facilities. Complementary measures could also bring health benefits to people of all ages through promoting walking and cycling locally.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>		
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring some benefit in terms of reduced congestion, improved resilience and journey time reliability; however, benefits would not be as great as the Black or Purple routes due to the capacity and distance of the dual carriageway. The phased nature of the Red Route could bring local benefits in the short term with wider, regional benefits emerging on scheme completion. Benefits would include access to education, employment, services and facilities for all those with access to a car. However, the route would not offer as much resilience to accommodate future growth when compared with the Black and Purple routes and therefore may require upgrading in the long term.</p> <p>The Red Route and its complementary measures would be unlikely to benefit those without access to a car.</p> <p>The complementary measures, through improved walking and cycling facilities could provide a positive benefit to all those who may not have access to a car and therefore depend on alternative transport modes. This could include younger people to access education, those of working age to access employment and the older population to access services / facilities.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	People of all ages.	(+)
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would lead to a reduction in traffic congestion, improved resilience and journey time reliability. This would bring benefits to people of all ages who have access to a car, improving local trips and access to the wider region and offering the resilience required to accommodate predicted future growth. The Purple Route would therefore improve access to services and facilities (e.g. education for young and healthcare for the older population) as well as employment opportunities for those in work. The Purple Route would also improve safety for those driving, reducing</p>	People of all ages.	(++)

Topic	Assessment	Distribution	Significance
	<p>the number of accidents.</p> <p>The Purple Route and its complementary measures would be unlikely to benefit those without access to a car, unless public transport services operate along the new road.</p> <p>The complementary measures could bring increased walking and cycling facilities, implemented to modern safety and design standards. These could provide benefits to people of all ages who do not have access to a car through improve connections to undertake local trips or access public transport facilities. Complementary measures could also bring health benefits to people of all ages through promoting walking and cycling locally.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>		
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would impact on people of all ages with access to a car or who rely on a car to access education, employment and services / facilities.</p> <p>The Do Minimum scenario would also impact on people of all ages who do not have access to a car but rely on public transport, particularly during peak periods where traffic would divert to local roads, exacerbating local accessibility issues.</p>	People of all ages.	(-)

Disability

Disabled people have fewer transport options and often lack access to cars.³⁹ However, people with mobility difficulties or health problems tend to use cars because they are convenient compared to public transport or walking.⁴⁰

Research shows that inaccessible transport has an extensive impact on the lives of many disabled people⁴¹.

Table 6 EqIA Appraisal – Disability

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would lead to a reduction in traffic congestion, improved resilience and journey time reliability. This would bring benefits to those with a disability who have access to a car, making both local and regional trips more accessible. This would improve access to key support services, facilities and employment opportunities. The Black Route would be unlikely to benefit those without access to a car, unless public transport services operate along the new road.</p> <p>The complementary measures could bring benefits to those with a disability, without access to a car if walking and cycling links are built with ‘access for all’ in mind. The measures could also improve links to public transport facilities, therefore improving accessibility for non –car users to facilities, services and employment.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	Disabled persons	(+)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures will offer improvements to traffic congestion, improved resilience and journey time reliability. However, this will be to a lesser extent than the Black and Purple routes due to the capacity and distance of the dual carriageway with reduced resilience to accommodate growth in the long term.</p> <p>The Red Route could bring local accessibility benefits in the short term and regional benefits on completion, assisting those with a disability to access support services, facilities and employment opportunities. This reasonable alternative is unlikely to benefit those without access to a car, unless public transport services operate along the new road.</p> <p>The complementary measures could bring benefits to those with a disability if</p>	Disabled persons	(+)

³⁹ National Transport Plan Equalities Impact Assessment (February 2010)

⁴⁰ DfT – The Travel Choices and Needs of Low Income Households: the Role of the Car

⁴¹ Leonard Cheshire – Mind the Gap

Topic	Assessment	Distribution	Significance
	designed with 'access for all' in mind. This could improve access to local services, facilities and employment and more generally to public transport options. Issues around safety and personal security will be considered at the detailed design stage.		
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would lead to a reduction in traffic congestion, improved resilience and journey time reliability. This would bring benefits to those with a disability who have access to a car, making both local and regional trips more accessible. This would improve access to key support services, facilities and employment opportunities. The Purple Route would be unlikely to benefit those without access to a car, unless public transport services operate along the new road.</p> <p>The complementary measures could bring benefits to those with a disability without access to a car if walking and cycling links are built with 'access for all' in mind. The measures could also improve links to public transport facilities, therefore improving accessibility for non-car users to facilities, services and employment.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	Disabled persons	(+)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would impact negatively on those with a disability (with access to a car), reducing access to services, facilities and employment opportunities.</p> <p>The Do Minimum scenario would also impact on disabled people who do not have access to a car but rely on public transport, particularly during peak periods where traffic would divert to local roads, exacerbating local accessibility issues.</p> <p>Compounding accessibility issues would be likely to lead to a lower quality of life for those with a disability.</p>	Disabled persons	(-)

Gender Reassignment

There is growing recognition of the discrimination, inequalities and social exclusion that trans people face by policy makers and the public. This includes bullying and discriminatory treatment in schools, harassment and physical/sexual assault and rejection from families, work colleagues and friends.⁴²

Table 7 EqIA Appraisal - Gender Reassignment

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would bring benefit to all with access to a car in terms of access to support services, facilities and employment opportunities.</p> <p>The Black Route itself would be unlikely to benefit those without access to a car, however, the complementary measures could bring benefits in relation to local accessibility to services and facilities as well as improved access to public transport facilities, enabling wider accessibility. In relation to issues of discrimination and personal safety, the complementary measures would improve the standard and safety of walking and cycling routes.</p> <p>Issues around safety and personal security would be considered at the detailed design stage.</p>	Those proposing to undergo, who are undergoing or have undergone a process for the purpose of reassigning gender.	(0)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced congestion, improved resilience and journey time reliability, although to a lesser extent than the Black and Purple routes due to the capacity and distance of the dual carriageway. The phased nature of the scheme could bring local accessibility benefits to all in the short term with wider regional benefits in the longer term in relation to access to support services, facilities and employment opportunities.</p> <p>The Red Route itself would be unlikely to benefit those without access to a car, however, the complementary measures could bring benefits in relation to local accessibility to services and facilities as well as improved access to public transport facilities, enabling wider accessibility.</p> <p>In relation to issues of discrimination and personal safety, the complementary measures would improve the standard and safety of walking and cycling routes, however, issues around safety and personal security would be considered at the detailed design stage.</p>	Those proposing to undergo, who are undergoing or have undergone a process for the purpose of reassigning gender.	(0)

⁴² Trans Research Review, National Centre for Social Research (2009) - http://www.equalityhumanrights.com/uploaded_files/research/trans_research_review_rep27.doc

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would bring benefit to all with access to a car in terms of access to support services, facilities and employment opportunities.</p> <p>The Purple Route itself would be unlikely to benefit those without access to a car, however, the complementary measures could bring benefits in relation to local accessibility to services and facilities as well as improved access to public transport facilities, enabling wider accessibility.</p> <p>In relation to issues of discrimination and personal safety, the complementary measures would improve the standard and safety of walking and cycling routes.</p> <p>Issues around safety and personal security would be considered at the detailed design stage.</p>	Those proposing to undergo, who are undergoing or have undergone a process for the purpose of reassigning gender.	(0)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would impact negatively on those wishing to access support services, facilities and employment opportunities by car.</p> <p>The Do Minimum scenario would also impact on those reliant on alternative transport modes, particularly during peak periods where traffic would divert to local roads, exacerbating local accessibility issues. Safety concerns on existing walking and cycling links and on public transport would also remain.</p>	Those proposing to undergo, who are undergoing or have undergone a process for the purpose of reassigning gender.	(-)

Marriage and Civil Partnership

Car ownership is closely related to the number of households and the number of people in the household. Generally, car owning households tend to have more than one person (most non-car owning households are single person households) and recent growth in car ownership has largely been through increases in the number of households with two or more cars.⁴³

In line with these trends, those who are married or in a civil partnership are more likely to have access to a car or more than one car.

Table 8 EqIA Appraisal - Marriage and Civil Partnership

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would bring direct benefit to married couples and those in a civil partnership with access to a car, improving accessibility to employment opportunities, services and facilities.</p> <p>For those couples that rely on other transport modes, the complementary measures could bring improved walking and cycling links to the local area and public transport facilities. The complementary measures therefore offer potential to improve local non-car accessibility while also offering health benefits through improved walking and cycling facilities.</p>	Married couples or those in a civil partnership.	(+)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, although to a lesser extent than the Black and Purple Routes due to the capacity and distance of the dual carriageway. This would bring direct benefit to married couples and those in a civil partnership with access to a car, improving accessibility to employment opportunities, services and facilities, however, due to the phased nature of this reasonable alternative, benefits could be local in the short term, broadening to the region on completion of the scheme.</p> <p>For those couples that rely on other transport modes, the complementary measures could bring improved walking and cycling links to the local area and public transport facilities. The complementary measures therefore offer potential to improve local non-car accessibility while also offering health benefits through improved facilities.</p>	Married couples or those in a civil partnership.	(+)

⁴³ Royal Automobile Club Foundation for Motoring – Car Ownership in Great Britain (2008)

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would bring direct benefit to married couples and those in a civil partnership with access to a car, improving accessibility to employment opportunities, services and facilities.</p> <p>For those couples that rely on other transport modes, the complementary measures could bring improved walking and cycling links to the local area and public transport facilities. The complementary measures therefore offer potential to improve local non-car accessibility while also offering health benefits through improved walking and cycling facilities.</p>	Married couples or those in a civil partnership.	(+)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would impact negatively on those who are married / in a civil partnership wishing to access services, facilities and employment opportunities by car.</p> <p>The Do Minimum scenario would also impact on those reliant on alternative transport modes, particularly during peak periods where traffic would divert to local roads, exacerbating local accessibility issues.</p>	Married couples or those in a civil partnership.	(-)

Pregnancy and Maternity

Pregnant women or those that have recently given birth are more reliant on services and facilities such as GP's, hospitals and community facilities.

Research shows that women are generally more dependent than men on public transport⁴⁴.

Alongside accessibility needs, research suggests that exposure to air pollution during early and late pregnancy may curb the normal growth of the developing fetus⁴⁵.

Table 9 EqIA Appraisal – Pregnancy and Maternity

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, benefitting those with access to a car, improving accessibility to key facilities and services (e.g. healthcare / support groups).</p> <p>The Black Route is aligned furthest from the main areas of residential properties, particularly around the area of Duffryn. This option also takes a significant proportion of traffic off the existing M4 which passes through a number of residential areas to the north of Newport. This could reduce the exposure of pregnant women to air pollution associated with traffic.</p> <p>The potential for improved walking and cycling infrastructure as part of complementary measures could improve accessibility, particularly to public transport facilities, improving access to services and facilities relied upon during pregnancy and maternity.</p>	Pregnant women or new parents.	(+)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, although to a lesser extent than the Black and Purple Routes due to the capacity and distance of the dual carriageway. Although this would bring benefit to those with access to a car by improving accessibility to key facilities and services (e.g. healthcare and support), the phased nature of this alternative means benefits could be felt locally in the short-term with more widespread benefits only felt on scheme completion.</p> <p>The Red Route runs closer to areas of population than the Black, particularly around Duffryn to the south of Newport. The route would also remove less traffic from the existing M4 corridor, bringing</p>	Pregnant women or new parents.	(+)

⁴⁴ Welsh Consumer Council – People without cars

⁴⁵ Journal of Epidemiology and Community Health – Ambient Air Pollutant Concentrations During Pregnancy and the Risk of Fetal Growth Restriction (2009)

Topic	Assessment	Distribution	Significance
	<p>less benefit in terms of air quality improvements for residential areas to the north of Newport.</p> <p>The potential for improved walking and cycling infrastructure as part of complementary measures could improve accessibility, particularly to public transport facilities, improving access to services and facilities relied upon during pregnancy and maternity.</p>		
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, benefitting those with access to a car, improving accessibility to key facilities and services (e.g. healthcare / support groups).</p> <p>While the Purple Route would remove similar levels of traffic from the existing M4 as the Black Route, bringing air quality benefits to residential areas to the north of Newport, it does run closer to residential areas to the south of Newport, potentially impacting on air quality and pregnant women.</p> <p>The potential for improved walking and cycling infrastructure as part of complementary measures could improve accessibility, particularly to public transport facilities, improving access to services and facilities relied upon during pregnancy and maternity.</p>	Pregnant women or new parents.	(+)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would impact negatively on pregnant women or new parents wishing to access healthcare and support services whether by car or by alternative transport modes.</p> <p>This scenario would also lead to increasing transport levels on the existing M4 which could bring decreasing air quality around the residential areas to the north of Newport.</p>	Pregnant women or new parents	(-)

Race

Research by the Department for Transport (DfT) has shown that people in households of black origin are least likely to have access to a car or to travel to work by car. Slightly more households of Indian origin reported having a car than those from White British or White Irish households, while persons of white origin are generally more likely to travel to work by car than those from Indian, Pakistani or Bangladeshi origins. Adults from black and minority ethnic groups share with adults on low income the problems of accessing employment opportunities without a private vehicle.⁴⁶

Research also shows how minority ethnic and faith communities are often concerned about racist attacks and all aspects of personal safety on the transport network, including when walking or cycling. The fear can be a barrier to using the transport network to access key facilities and employment opportunities⁴⁷.

Table 10 EqIA Appraisal – Race

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability for those with access to a car. This would improve access to facilities, services and employment opportunities. Unless public transport services operate along the new road, it is unlikely to benefit those without access to a car.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and opportunities for public transport along the reclassified road. Issues of safety and personal security would be considered at the detailed design stage.</p>	Minority ethnic and faith communities	(+)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, although to a lesser extent than the Black and Purple Routes due to the capacity and distance of the dual carriageway. This could bring local accessibility benefits in the short term with regional benefits felt on scheme completion. The Route would therefore improve access to facilities, services and employment opportunities for those with access to a car.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and improved links to public transport. Issues of safety and personal security would be considered at the detailed design stage.</p>	Minority ethnic and faith communities	(+)

⁴⁶ DfT – Focus on Personal Travel (2005 edition).

⁴⁷ DfT – Public Transport Needs of Minority, Ethnic and Faith Communities Guidance Pack

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability for those with access to a car. This would improve access to facilities, services and employment opportunities. Unless public transport services operate along the new road, it is unlikely to benefit those without access to a car.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and opportunities for public transport along the reclassified road. Issues of safety and personal security would be considered at the detailed design stage.</p>	Minority ethnic and faith communities	(+)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would bring negative impacts to those reliant on the car to access facilities, services and employment opportunities, as well as those utilising public transport for this purpose, with traffic diverting to local roads during peak periods.</p>	Minority ethnic and faith communities	(-)

Religion and Belief

People who are of a particular religion or belief have very specific access requirements to facilities such as religious establishments, community facilities and or other services.

Research has shown that faith communities are often concerned about racist attacks and all aspects of personal safety on the transport network, including when walking or cycling. The fear can be a barrier to using the transport network to access key facilities and employment opportunities⁴⁸.

Table 11 EqIA Appraisal – Religion and Belief

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability for those with access to a car. This would improve access to facilities (including religious establishments), although it is not considered the draft Plan would necessarily improve the situation for those of a particular religion or belief.</p> <p>Unless public transport services operate along the new road, it is unlikely to benefit those without access to a car.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and opportunities for public transport along the reclassified road.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	Those of a particular religion or belief.	(0)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion; improved resilience and journey time reliability, although to a lesser extent than the Black and Purple Routes due to the capacity and distance of the dual carriageway. This could bring local accessibility benefits in the short term with regional benefits felt on scheme completion. The Route would therefore improve access to facilities (including religious establishments), although it is not considered the alternative would necessarily improve the situation for those of a particular religion or belief.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and improved links to public transport.</p>	Those of a particular religion or belief.	(0)

⁴⁸ DfT – Public Transport Needs of Minority, Ethnic and Faith Communities Guidance Pack

Topic	Assessment	Distribution	Significance
	Issues of safety and personal security would be considered at the detailed design stage.		
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability for those with access to a car. This would improve access to facilities (including religious buildings), although it is not considered the alternative would necessarily improve the situation for those of a particular religion or belief.</p> <p>Unless public transport services operate along the new road, it would be unlikely to benefit those without access to a car.</p> <p>Complementary measures could improve access to facilities, services and employment through improved walking and cycling networks and opportunities for public transport along the reclassified road.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	Those of a particular religion or belief.	(0)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would bring negative impacts to those reliant on the car to access facilities, services and employment opportunities, as well as those utilising public transport for this purpose, with traffic diverting to local roads during peak periods.</p> <p>Despite this it is not considered the Do Minimum scenario would specifically worsen the situation for those of a particular religion or belief.</p>	Those of a particular religion or belief.	(0)

Sex (Gender)

A higher proportion of adult men than adult women have full car driving licences in all age groups.⁴⁹ 83% of male respondents use a car or van to travel to work compared with only 76% of female respondents.⁵⁰ Men are more likely to travel for work purposes than women, while women are more likely to take social and personal business journeys (including escorting children to school). Women are less likely to have access to a car, and more likely to travel by bus, foot or taxi than are men, arguably reflecting men's use of the car to travel to work. Women are more likely than men to be responsible for childcare. As such they face specific difficulties associated co-ordinating these responsibilities with work⁵¹.

Women make fewer and shorter trips as a car driver compared to their male counterparts.⁵² Over all age groups and all modes, men tend to travel 40% further than women.⁵³ Women are more dependent than men on public transport⁵⁴.

Table 12 EqIA Appraisal – Sex (Gender)

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would benefit both male and female drivers, improving access to employment as well as facilities and services (e.g. childcare / education).</p> <p>The potential for improved walking and cycling infrastructure as part of complementary measures may improve accessibility, particularly to public transport facilities. While this could provide a positive benefit for women who are more dependent on public transport services than men, issues of safety and personal security would be considered at the detailed design stage.</p> <p>Complementary measures would also improve the overall provision of walking and cycling facilities, promoting a healthier lifestyle and potentially bringing health benefits.</p>	Women and men	(+)

⁴⁹ Equal Opportunities Commission – Promoting gender equality in transport

⁵⁰ Welsh Government (2008). Public Transport Use in Wales, 2005-2006. Statistical Bulletin 29/2008

⁵¹ DfT – Evidence Base Review on Mobility: Choices & Barriers for Different Social Groups

⁵² DfT – In car safety and the personal security needs of female drivers and passengers

⁵³ DfT – Public transport gender audit evidence base

⁵⁴ Welsh Consumer Council – People without cars

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability, although to a lesser extent than the Black or Purple Routes due to the capacity and distance of the dual carriageway. This reasonable alternative could offer short-term benefits through phasing, with longer term strategic benefits emerging over a longer period of time, improving access to employment, services and facilities.</p> <p>As part of complementary measures, the potential for improved walking and cycling infrastructure may improve accessibility to employment, services and facilities for those without access to a car. Complementary measures would also improve the overall provision of walking and cycling facilities, promoting a healthier lifestyle and potentially bringing health benefits to all genders.</p>	Women and men	(+)
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability. This would benefit both male and female drivers, improving access to employment as well as facilities and services (e.g. childcare / education).</p> <p>The potential for improved walking and cycling infrastructure as part of complementary measures may improve accessibility, particularly to public transport facilities. While this could provide a positive benefit for women who are more dependent on public transport services than men, issues of safety and personal security would be considered at the detailed design stage.</p> <p>Complementary measures would also improve the overall provision of walking and cycling facilities, promoting a healthier lifestyle and potentially bringing health benefits to all genders.</p>	Women and men	(+)
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would continue to impact on both males and females who are reliant on the car for accessing employment, services and facilities.</p> <p>This would also continue to impact on those reliant on public transport for accessing employment, services and facilities with traffic re-routing to local roads during peak hours, compounding congestion locally.</p>	Women and Men	(-)

Sexual Orientation

Sexual orientation means a person's sexual orientation towards a) persons of the same sex, b) persons of the opposite sex, or c) persons of either sex.

Research has shown that many lesbian, gay, or bisexual (LGB) people living in rural or suburban districts can only access appropriate social activities, support groups, or help and advocacy services by public transport⁵⁵. Those most seriously affected by this are LGB with limited mobility, the elderly, the poor and the young, reflecting trends described in other character groups in relation to access to a car.

However, a key barrier for LGB communities accessing transport include personal security – 11% of the LGB community reported that they avoided public transport due to safety concerns⁵⁶.

Table 13 EqIA Appraisal – Sexual Orientation

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would not directly impact on LGB groups any differently to non-LGB peers, as described above.</p> <p>The complementary measures could provide additional and / or improved walking and cycling facilities, bringing a positive benefit for LGB groups without a car and improving access to public transport interchanges.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	LGB groups	(0)
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would not directly impact on LGB groups any differently to non-LGB peers, as described above.</p> <p>The complementary measures could provide additional and / or improved walking and cycling facilities, bringing a positive benefit for LGB groups without a car and improving access to public transport interchanges.</p> <p>Issues of safety and personal security would be considered at the detailed design stage.</p>	LGB groups	(0)

⁵⁵ The Intercom Trust – The Extended Neighbourhood

⁵⁶ Diversity Matters Hastings/ Hastings Rainbow Alliance – Report into Homophobic and Transphobic Hate Crimes in Hastings

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Purple Route and Complementary Measures	The Purple Route and its complementary measures would not directly impact on LGB groups any differently to non-LGB peers, as described above. The complementary measures could provide additional and / or improved walking and cycling facilities which could bring a positive benefit for LGB groups without a car and improve access to public transport interchanges. Issues of safety and personal security would be considered at the detailed design stage.	LGB groups	(0)
Do Minimum	The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. There would be limited improvements to infrastructure which would negatively impact on many LGB groups who rely on transport modes other than the car to access activities and services.	LGB groups	(-)

Welsh Language

Support by the population in Wales for Welsh-language service provision is well evidenced. Over nine out of ten Welsh speakers (with a range of fluency levels) take the view that Welsh-language service provision is important to keep the language alive⁵⁷.

Table 14 EqIA Appraisal – Welsh Language

Topic	Assessment	Distribution	Significance
Draft Plan	The provision of bi-lingual information at road junctions and along walking and cycling facilities would be considered at the detailed design stage.	Welsh speakers	(0)
Reasonable Alternative: Red Route and Complementary Measures	The provision of bi-lingual information at road junctions and along walking and cycling facilities would be considered at the detailed design stage.	Welsh speakers	(0)
Reasonable Alternative: Purple Route and Complementary Measures	The provision of bi-lingual information at road junctions and along walking and cycling facilities would be considered at the detailed design stage.	Welsh speakers	(0)
Do Minimum	Current road signs are bi-lingual and any additional signs implemented as part of the do minimum improvements would be bi-lingual.	Welsh speakers	(0)

⁵⁷ <http://wales.gov.uk/depc/publications/welshlanguage/wlstrategy2012/wlstrategy2012?lang=en> A Living Language. A Language for Living, Welsh Language Strategy 2012–17

Other: Lone Parent, Economic Inactivity, Social and Multiple Deprivation

Half of households in the bottom income bracket do not own a car, compared to a national average of 25%. This figure is even higher for individuals on benefits: nearly two-thirds of people claiming income support or jobseeker's allowance do not have access to a car⁵⁸. 13% of respondents of working-age said they had decided not to apply for a particular job in the last 12 months because of transport problems⁵⁹.

The South Wales business community have previously raised concerns about the impact of current congestion and delays on production costs and the overall competitiveness of transport reliant business in Wales. Concerns have also been expressed in relation to the impact of problems on the M4 corridor around Newport in relation to the perception of South Wales from potential investors.

Table 15 EqIA Appraisal – Other

Topic	Assessment	Distribution	Significance
Draft Plan	<p>The Black Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability which would benefit all users with access to a car accessing facilities, services and employment opportunities. This could improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle.</p> <p>The implementation of the draft Plan would support regional economic development, through enhanced accessibility to employment centres and improving the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to economic activity.</p> <p>Some property demolition may be needed to accommodate the Black Route. This would be considered at the detailed design stage.</p> <p>The Black Route would improve traffic conditions and pollution levels along the route of the existing motorway, which would positively impact on properties in the urban area north of Newport.</p> <p>The complementary measures, through delivering additional and/or improved walking and cycling facilities, could lead to an increased level of choice and easier access to key local services and commercial centres while also offering opportunities for health benefits.</p>	Income related groups	(++)

⁵⁸ Campaign for Better Transport - Transport, social equality and welfare to work

⁵⁹ DfT – Evidence Base Review on Mobility: Choices & Barriers for Different Social Groups

Topic	Assessment	Distribution	Significance
Reasonable Alternative: Red Route and Complementary Measures	<p>The Red Route and its complementary measures would bring reduced traffic congestion; improved resilience and journey time reliability, although to a lesser extent than the Black and Purple Routes due to the capacity and distance of the dual carriageway. The Route would benefit all users with access to a car accessing facilities, services and employment opportunities.</p> <p>This could improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle and could be felt over a longer period than the Black and Purple Routes given the phased nature of the Red Route.</p> <p>The implementation of the Red Route would support regional economic development, although anticipated impacts will be lower than the Black and Purple Routes, felt locally in the short term, with wider regional benefits potentially being realised on scheme completion.</p> <p>Some property demolition may be needed to accommodate the Red Route. This will be considered at the detailed design stage.</p> <p>The Red Route would improve traffic conditions and pollution levels along the route of the existing motorway, although to a lesser extent than the Black and Purple Routes given scale and the phased nature of the Red Route. The Red Route also runs closer to the residential area of Duffryn to the south of Newport when compared with the Black.</p> <p>The complementary measures, through delivering additional and/or improved walking and cycling facilities, could lead to an increased level of choice and easier access to key local services and commercial centres while also offering opportunities for health benefits.</p>	Income related groups	(+)
Reasonable Alternative: Purple Route and Complementary Measures	<p>The Purple Route and its complementary measures would bring reduced traffic congestion, improved resilience and journey time reliability which would benefit all users with access to a car accessing facilities, services and employment opportunities.</p> <p>This could improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle.</p>	Income related groups	(++)

Topic	Assessment	Distribution	Significance
	<p>The implementation of the Purple Route would support regional economic development, through enhanced accessibility to employment centres and improving the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to economic activity.</p> <p>Some property demolition may be needed to accommodate the Purple Route. This would be considered at the detailed design stage.</p> <p>The Purple Route would improve traffic conditions and pollution levels along the route of the existing motorway, which will positively impact on properties in the urban area north of Newport. However, the Route alignment is closer to the area of Duffryn when compared to the Black Route, potentially bringing air quality and noise impacts in this area.</p> <p>The complementary measures, through delivering additional and/or improved walking and cycling facilities, could lead to an increased level of choice and easier access to key local services and commercial centres while also offering opportunities for health benefits.</p>		
Do Minimum	<p>The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would impact those reliant on the car to access services, facilities and employment opportunities.</p> <p>This continuation of reported problems would also continue to hamper economic growth potential of the region, restricting the movement of people and freight, particularly at peak periods.</p> <p>Air quality and noise issues would also continue along the current alignment, impacting on residential areas to the north of Newport.</p>	Income related groups	(--)

7 EqlA Appraisal Summary

Table 16 provides a comparative summary of the initial EqlA appraisal of the draft Plan, the reasonable alternatives, and the Do Minimum scenario.

Table 16 EqlA Appraisal Comparative Summary

Equalities and WeTAG Criteria	Appraisal of draft Plan & Reasonable Alternatives			
	Preferred Strategy : Black Route and Complementary Measures	Reasonable Alternative: Red Route and Complementary Measures	Reasonable Alternative: Purple Route and Complementary Measures	Do Minimum
Age	(++)	(+)	(++)	(-)
Disability: physical, sensory or mental	(+)	(+)	(+)	(-)
Gender Reassignment	(0)	(0)	(0)	(-)
Marriage and Civil Partnership	(+)	(+)	(+)	(-)
Pregnancy and maternity	(+)	(+)	(+)	(-)
Race	(+)	(+)	(+)	(-)
Religion and Belief	(0)	(0)	(0)	(0)
Sex	(+)	(+)	(+)	(-)
Sexual orientation	(0)	(0)	(0)	(-)
Welsh language	(0)	(0)	(0)	(0)
Other: Lone parent, economic inactivity, social and multiple deprivation	(++)	(+)	(++)	(--)

The above summary highlights that there are no significant adverse effects arising for any character group through the draft Plan or either of the reasonable alternatives. What is clear from the assessment is that all options other than the Do Minimum scenario would bring benefits to all character groups with access to a car, with the draft Plan (Black Route) and the Purple Route reasonable alternative bringing the greatest benefit in terms of reduced traffic congestion, improved resilience and journey time reliability.

All Routes have the potential to benefit each of the character groups in terms of improved accessibility with varying degrees of benefit dependent upon need (e.g. improved access to healthcare for pregnant women and new parents).

Alongside those with access to the car, the Black and Purple Routes also bring benefit to those reliant on public transport to access services, facilities and employment. These options reduce the amount of traffic on local roads during peak periods that currently divert in order to avoid congestion on the M4 corridor. While the Red Route would offer some benefit, the phased nature of this option means benefits would be felt to a lesser extent until the full scheme is complete.

The complementary measures that support their respective highway options would bring a variety of benefits, with improvements to walking and cycling infrastructure, offering improved access to local services, facilities and employment, as well as improved access to public transport facilities for those reliant on public transport for local and regional travel.

The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would adversely impact on access to services, facilities and employment opportunities for all those with access to a car, and who rely on public transport due to continued problems associated with motorway traffic diverting onto local roads to avoid peak congestion. The continuing problems would further hamper economic growth and prosperity in the region, restricting the movement of freight and people, particularly at peak periods.

8 Action Plan

Table 17 provides an overview of potential actions that the Welsh Government may consider as part of progressing any options within the draft Plan, should it be adopted, with or without amendments. The actions suggested below aim to enhance the possible beneficial impacts and/or mitigate against any potential adverse impacts on equality areas.

Following the draft Plan Consultation, this Action Plan would be updated to take into account any relevant comments received. This would then be published within a final M4 Corridor around Newport EqIA Report with a statement of results. Furthermore, this Action Plan would help to inform further EqIA, if necessary, at a project (scheme) level, for any options that are progressed as part of the draft Plan, should it be adopted by the Welsh Government.

Most of the actions are relevant to a project (scheme) level of appraisal and monitoring would be undertaken by the Welsh Government, although this is also likely to be more appropriate at a project (scheme) level.

Table 17 Action Plan

Actions to be considered	Rationale	Who will benefit
Ensure ergonomically designed access to public transport facilities that facilitate use for all.	The design of access to public transport services should cater for all needs and mobility issues.	Women with children Older people Disabled people
Plan appropriate pedestrian routes and conveniently located interchanges to public transport services, discussed in partnership with community groups and operators. Design-out crime at public transport interchanges.	To improve personal security and encourage use of public transport.	Younger people Older people Ethnic groups LGB/T
Ensure clear and appropriate signage and information services are displayed at public transport interchanges and along road routes.	Effective signage and information supports access to transport services and aids mobility.	Younger people Older people Ethnic groups
Ensure inclusive design principles are incorporated into the design of new junctions to accommodate non-motorised users.	To ensure inclusive access to those not travelling by car.	Older people Disabled people
Offer appropriate compensation for properties requiring demolition, including replacement of any community facilities.	To ensure certain community groups are not disproportionately affected by demolition and/or construction works.	Lower socio-economic groups Older people Ethnic groups

9 How to respond to this consultation document

Please respond to this Consultation by using the Consultation Response Form that accompanies this document. This can be completed and sent to the address shown below:

‘FREEPOST M4 CONSULTATION’.

Alternatively, you can respond electronically via the following website links:

- www.wales.gov.uk/consultations under Transport; or
- www.m4newport.com.

At www.m4newport.com you can also find further information about the draft Plan and its development.

This Consultation runs for 12 weeks, commencing on 23 September 2013 and closes on 16 December 2013.

The draft Plan Consultation Document, all draft Plan assessments, and the Response Form are available to download online at www.m4newport.com and are available to view or to take away as paper copies at the following deposit points, during the consultation period:

- Caldicot One Stop Shop, NP26 5DB;
- Castleton Village Hall, CF3 2UW;
- Liswerry Post Office, NP19 0JX;
- Magor Post Office, NP26 3EP;
- Newport Central Library, NP20 1PA;
- Newport Information Station, Newport, NP20 4AX; and
- Welsh Government, Cathays Park, Cardiff, CF10 3NQ.

Documents are also available at public drop-in exhibitions (see the draft Plan Consultation Document or www.m4newport.com for details).

Sufficient quantities of the consultation documents will be made available at each of the public drop-in exhibitions, where additional copies may also be requested for delivery.

Large print versions of this document are made available on request.

For further information please contact Allan Pitt (Communications Manager) via:

- ***Email: m4newport@arup.com;***
- ***Telephone: 029 20473727; or***
- ***Mail: Allan Pitt, Arup, 4 Pierhead Street, Cardiff CF10 4QP.***

Appendix A

EqIA Scoping Responses

A1 Welsh Government Department for Economy, Science and Transport Equality Support Unit

EST Equality Support Unit (ESU) have reviewed the scoping document and would make the following comments which we hope you will find useful and provide answers to the three questions raised in Section 4 of the Report directed to ESU and Fairer Futures. Sorry for the long email hopefully its not as bad as it looks. As agreed with [redacted], I have copied her in to this response for information and to allow her to add or comment on the points raised.

As I said to [redacted] previously it's great to see that the EqIA is a part of the Transport Planning process and that it is a standard consideration in projects like this. The scoping document contains loads of good ideas and an excellent initial scoping document. For example its good to see that following changes to earlier project proposals the EqIA is going to be re-assessed and that information and evidence gathered previously will be used (page 18 & 20). Its also very good to see in this high level scoping document that should any adverse impacts be identified further project level EqIA's would be considered (page 22). Its also clear that consultation is an integral part of your process.

Here are our thoughts on this scoping document as presented.

- The main observation is in relation to the EqIA consultation process which I discussed with Mark recently. The consultation process is mentioned in a several places throughout the Scoping Report (for example page 4 Paragraph 3, page 5 paragraph 1, page 9 para 4, page 20 paragraph 4 & Page 20 paragraph 6). Statements within the report are along the lines of “there is a comprehensive engagement process”, “public consultation”, “encompassing a diverse range of views”, “extensive stakeholder and community engagement and consultation”. The question is around how that process will involve people in the 9 protected characteristics identified in the Equality Act 2010 and how you will evidence their involvement. From reading the scope report questions arise like who will be involved? how will they be invited? who actually attends and crucially how will we know that the people involved have represented the protected groups.
- Consultation is clearly going to be an integral part of this process which is great and page 9 refers to the regulations being used to frame that consultation process. What would make it excellent and fit with the requirements of the Equality Act 2010 that also contains a specific duty to consult, is evidence of the demographics of the people contributing to the consultation process. This evidence if collected, would allow you to present a clear and strong statement in the EqIA that we people from the 9 protected characteristic groups have been represented in the consultation process. Alternatively, if the evidence collected highlights the fact that protected groups were not sufficiently represented, we could then consider alternative methods of consultation or to widen the exercise in some way. It would be good to try think about this up front to try to ensure the consultation processes encourage and facilitate participation of those people from the protected groups. Things like who we invite, where we advertise, the process itself and targeting the information to

relevant representative groups is going to be important. I discussed possible options with Mark when we met and of course we would be happy to discuss this further if required. Hopefully this addresses Question 2 in section 4 which asks us to consider if there are any additional organisations or parties that you should consider contacting. I don't think we can be more specific until we see the list of the stakeholder groups you intend to involve. Please let us know if you need any advice or assistance on any of this.

Other more general points;

- We note the reference on page 18 to the EqIA being undertaken according to Welsh Government's Fairer Futures guidance available on the WG intranet. As per my discussion with Mark and Allan Pitt of Arup this guidance and template is there to help you through the process and gives you a clear steer on what should be covered by your Equality Impact Assessment. We also acknowledge that as long as all the points are covered, you may build into your assessments issues or formats from other guidance or policies and not follow the WG (Fairer Futures) process exactly.
- Page 19 outlines where work will be undertaken including the core Equality considerations and some additional considerations like Welsh Language. It's important to mention that the UN Rights of the Child legislation has been adopted by the Welsh Government and Ministers are required to consider the Rights of the Child in all their policy decisions. We can offer some advice in this area and there is a specific Rights of the Child team headed by and a specific intranet page and training.
- Page 19 of the report lists the 9 protected characteristics identified in the Equality Act 2010. I have attached below a copy of a summary sheet entitled "Copy of Duties and protected Characteristics." Please note that for Marriage and Civil Partnership only the first General Duty applies. Happy to explain the implications of this if you wish.
- Page 20 paragraph 5 – could you change the wording slightly as we are the EST Equality Support Unit not Welsh Government's.
- Page 20 (paragraphs 5 & 6) - Paragraph 5 refers to an engagement process of Welsh Government with the Equality Support Unit. Two things in relation to this statement which might just be our interpretation of wording used but thought worth mentioning. Our role in ESU is to provide advice and assistance to colleagues and teams within our own department. Crucially the real engagements on equality related issues should be with people in the 9 protected groups identified in the Equality Act 2010 not with ESU. The next paragraph (6) on page 20 states that "other stakeholders, organisations and individuals, including the general public will be consulted in the EqIA report. It would make the document stronger if here it made it clear that we will be specifically consulting people in the protected groups as opposed to more general group titles like stakeholders, or general public. I'm sure this is understood but thought it a point worth making in conjunction with the main issue on consultation above.
- Page 21 of the Scoping Report contains a list of reading and source information you have identified. Where teams undertake an EqIA we normally recommend that they undertake an official research request via the Welsh Government Library. That is a very thorough process and helps ensure that

any existing evidence and research is collected and considered. That research is meant to form the starting point for the reading and evidence for EqIA. I understand that in this case your team have employed an external consultancy firm to undertake the work including the research and evidence gathering and they have come up with this list. I have attached below the link to the Welsh Government Search request which you still might wish to consider undertaking to enhance the research sources and if you do so we will be happy to advise on this process. To assist I have also attached other links to internal web pages and documents that we normally send to teams undertaking EqIA's, some of which I discussed with . This includes the WG Strategic Equality Plan and links to guidance and training on the UN Rights of the Child legislation adopted by the Welsh Government. I have also attached the WG link to the guidance on the Welsh Language Measure which we were pleased to see was another consideration already built into your process.

- Page 22 Paragraph 3, there is a reference to “remedy significant adverse health impacts”. It would be good if you could explain how you are making the connection between health and the protected characteristics set out in the Equality Act 2010.

Link to Welsh Governments Library Research Request Form (under “Other Library Services – Literature Search Request”

<http://intranet/English/Services/KnowledgeAnalyticalServices/prodserv/servreqfor.ms/Pages/Welcome.aspx>

<<Copy of Duties and Protected Characteristics.xls>>

Link to Welsh Government Equality Impact Assessment Guidance, Template and link to existing examples of EqIA's

<http://intranet/English/PolicyDelivery/AppraisingPolicy/EqualityDiversity/Pages/EqualityImpactAssessments.aspx>

Link to Welsh Government Strategic Equality Plan

<http://wales.gov.uk/topics/equality/equalityactatwork/?skip=1&lang=en>

Link to Welsh Governments Rights of the Child online Training

<http://intranet/English/People/Learning/ProgrammeLearning/OtherLearning/Pages/UNCRC.aspx>

Link to the Welsh Government Rights of the Child FAQ's & Guidance

[http://intranet/English/AboutUs/OurStructure/LGC/Departments/CTP/Pages/RightsOfChildrenandYoungPerson's\(Wales\)FAQ's.aspx](http://intranet/English/AboutUs/OurStructure/LGC/Departments/CTP/Pages/RightsOfChildrenandYoungPerson's(Wales)FAQ's.aspx)

Link to Welsh Government Welsh Language Measure Guidance

<http://intranet/English/AboutUs/OurStructure/Business/StratDGOT/DGOT/EqualityDiv/Pages/Welshguidance.aspx>

As you will be aware all documentation including things like this email will form evidence of the departments work on Equality. We recommend that all teams in EST have their own area of I-Share where they save all Equality work undertaken including emails, documents and consultation feedback.

You will probably have questions from these comments and we would be happy to discuss anything in person if it would help.

Regards/Cofion

A2 Welsh Government Fairer Futures Division

Good morning ,

Really I would just wish to support points expressed and really re-iterate the points he has made, especially regarding consultation and engagement. The consultation must be undertaken with people with protected characteristics throughout the entire process, and they must be included in all engagement processes, whether it is engagement events, written consultation etc. The need to engage with protected groups, does mean accessibility issues must be considered, to ensure that all protected groups are being given the opportunity to respond and participate. (e.g. written consultations may not be accessible for everyone). Perhaps on page 20 if you were able to change the doc, you may want to reflect this through amending the first line of Para 6 to read >> 'Other stakeholders, organisations and individuals, including the general public, will be consulted on the EqIA Report, with a commitment to engaging with protected groups'

In the consultation process, not only should protected groups be involved, but it may also be worth considering how you gain views on equality impacts through questioning etc. Is there potential for actual questions to be asked surrounding what people perceive impacts or equality issues might be on the protected characteristics within the other consultation questions? This will allow you not only to get individuals current personal experiences to be captured, but may allow you to obtain what each planned policy would mean for people if it was fully implemented etc. If respondents were to say they could not foresee any equality issues arising, you would still have evidence of individual protected groups through your engagement with them.

I think it is also important that you really make clear that the equality impacts you want considered are for all outcomes and for everyone's position. What I mean here is that you need to be able to consider the equality impact on: those who use the M4; those who dwell in communities alongside the new proposed routes; those who dwell in communities on the current route and the impact of the shift on them etc. As such, there may be conflicting impacts on the same protected groups. I know you will have already thought of this, but I just wanted to add that if you were going to ask questions on the equality impacts, within the actual policy questions of the consultation, it needs to be clear that you want impacts considered for each of these groups and not just the impact of the improved road service etc.

With regards the Welsh Governments EIA template and guidance, as mentioned, the template is just a suggestion. You may well find it easier to report and undertake your EIA in a different format, which is completely acceptable. But it is good the provided template has been looked at in the first instance, as it does provide a good breakdown of who you need to consider when thinking of people with protected groups. For example, it asks for impacts on the different types of disability for which impacts will be quite different, rather than disability in general. As such, it should hopefully provide you with a good starting point of thinking how you report.

As I mentioned above, if you are going to change the wording of this doc, I would also consider amending pg 18 para 4 to the WELSH Government's Fairer Future Division (also in para 3 of page 22)

Another possible source that may be of use is the Understanding the Travel Needs of London's Diverse Community report 2012. Whilst it does have a heavy focus on public transport, it does provide some information on barriers faced for protected groups that may be of use etc.

You may also wish to consider reporting on socio-economic impacts within the assessment or separately (apologies if this is already in hand). Whilst socio-economic impacts are different to equality impacts, in many cases, people belonging to certain protected groups often belong to specific socio-economic groups, and it can be worthwhile considering this.

I hope this is of help. We are happy to provide further contact details and work with you on this as you go through the process.

Many thanks and kindest regards,

A3 Natural Resources Wales

Mr Martin Bates
Project Director, Infrastructure Projects
Unit
Department for Economy, Science and
Transport
Welsh Government
Cathays Park
Cardiff
CF10 3NQ

Ein cyf / Our ref: C.33.04.01/JP
Eich cyf / Your ref: 13/0663

20 August 2013

By email: martin.bates@wales.gsi.gov.uk

Dear Martin

**M4 CORRIDOR AROUND NEWPORT – RESPONSE FROM NATURAL
RESOURCES WALES ON HEALTH IMPACTS ASSESSMENT AND EQUALITY
IMPACTS ASSESSMENT**

Thank you for consulting Cyfoeth Naturiol Cymru / Natural Resources Wales about the above, which we received on 9 July 2013. This response is in relation to the Health Impacts Assessment and Equality Impacts Assessment only. Our comments with respect to the scoping report for a Strategic Environmental Assessment have been made in a separate response from our functionally separate unit the Strategic Assessment Team.

Natural Resources Wales brings together the work of the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales, as well as some functions of Welsh Government. Our purpose is to ensure that the natural resources of Wales are sustainably maintained, used and enhanced, now and in the future.

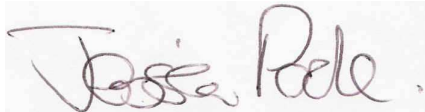
Health Impacts Assessment Scoping Report

Considerations of health in this context are not within the remit of Natural Resources Wales and we therefore have no comments to make on the scoping report for the Health Impact Assessment.

Equality Impacts Assessment Scoping Report

Similarly, Natural Resources Wales will not be providing comment on the Equality Impacts Assessment scoping report.

Yours sincerely



Jessica Poole
Team Leader
Cardiff and Newport District Team

cc Simon Power, ARUP (simon-j.power@arup.com)

Number: WG19741

M4 Corridor around Newport

We want your views on our draft Plan which aims to address transport related problems on the M4 around Newport



Llywodraeth Cymru
Welsh Government

www.cymru.gov.uk

**M4 Corridor
around Newport
draft Plan**

**Consultation
Document**

Health Impact Assessment

Date of issue: 23 September 2013

Responses by: 16 December 2013



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Appendices

Appendix A

HIA Scoping Responses

Large print versions of this document are made available on request. Please contact Allan Pitt via:

- Email: m4newport@arup.com;
- Telephone: 029 20473727; or
- Mail: Allan Pitt, Arup, 4 Pierhead Street, Cardiff CF10 4QP.

Glossary

The following terms are referred to in this Health Impact Assessment (HIA) Consultation Document.

AQMAs	Air Quality Management Areas. Since 1997 local authorities in the UK have been carrying out a review and assessment of air quality in their area. The aim of the review is to assist authorities in carrying out their statutory duty to work towards meeting the national air quality objectives. If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area there
Do Minimum	This is a scenario (sequence of future events) where intervention includes doing nothing above what is already planned or committed. In this case, it includes all recent network modifications (such as the Junction 24 improvement and the Variable Speed Limit system) and any committed schemes (such as the Junction 28/Bassaleg Roundabout/Pont Ebbw Roundabout improvement and the Steelworks Access Road)
Draft Plan	This is the Welsh Government's preferred strategy to solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the draft Plan would lead to a new motorway (Black Route) being built to the south of Newport, alongside some complementary highway management, walking and cycling initiatives. Assessments of the draft Plan compare it to reasonable alternatives, as well as the Do Minimum scenario.
EqIA	Equality Impact Assessment. A way of examining and analysing services, policies and strategies that identify existing and potential impacts on certain groups of people, and sometimes individuals
GDP	Gross Domestic Product
HIA	Health Impact Assessment. A process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan or a change to the organisation or delivery of a particular public service
HRA	Habitats Regulations Assessment. A process that considers the potential effects of plans and programmes on European Sites (protected habitats)

M4 CEM	M4 Corridor Enhancement Measures. A Welsh Government initiative set up to explore and resolve issues of capacity, safety and resilience along the M4 corridor in South East Wales
NAPPAs	Noise Action Planning Priority Areas. Noise maps and associated plans are managed by the Welsh Government and local authorities to find where noise levels are high and help create noise action plans to address the issue
PHW	Public Health Wales aims to give people power to protect and improve health and wellbeing and reduce inequalities by informing, advising and speaking up for them. PHW provides an expert public health resource as part of the NHS in Wales.
Reasonable Alternatives	These are reasonable alternatives to the draft Plan, being other options that the Welsh Government consider could solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the reasonable alternatives would lead to either a new dual carriageway (Red Route) being built to the south of Newport, or a motorway solution along a similar alignment (Purple Route) alongside some complementary highway management, walking and cycling initiatives.
SAC	Special Area of Conservation. Strictly protected sites with listed habitat types and species that are considered to be most in need of conservation at a European level (excluding birds)
Scheme / Project	For individual schemes or projects, the appropriate level of appraisal is more detailed, quantitative and evidence-based ¹
SEA	Strategic Environmental Assessment. A process that provides for the high level protection of the environment, by ensuring the integration of environmental considerations into the preparation of plans and programmes and to contribute to the promotion of sustainable development and environmental protection
SDR	Southern Distributor Road. In this case, the A48 Southern Distributor Road, Newport
SSSI	Sites of Special Scientific Interest. Legally protected sites for wildlife and geology conservation.
Strategy, Plan or Programme	A strategy, plan or programme sets out broad objectives, identifies measures to achieve these and proposes a typically broad package of interventions to achieve the objectives. The appropriate level of appraisal is also broad, and at a strategy level, it may only be possible to undertake appraisal qualitatively ¹
SWATS	South Wales Area Traffic Survey
TEN-T	Trans-European Transport Network
TPOs	Transport Planning Objectives
TR111 Notice	Once a preferred route of a transport scheme is announced, the Welsh Government serves a statutory TR111 notice on the local planning authorities requiring the line to be protected from development

¹ Source: Welsh Transport Planning and Appraisal Guidance (WelTAG), June 2008

WelTAG	Welsh Transport Planning and Appraisal Guidance is a transport appraisal tool applicable to transport projects, plans and programmes in Wales. The Welsh Government requires that major transport initiatives seeking government funding are appraised with this guidance
WHIASU	Wales Health Impact Assessment Support Unit
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation

1 Introduction

Please read this document alongside the overarching M4 Corridor around Newport draft Plan Consultation Document².

The draft Plan has been developed taking into account the extensive work undertaken as part of the M4 Corridor Enhancement Measures (CEM) Programme. The M4 CEM Programme was set up to explore and resolve issues of capacity, safety and resilience along the M4 Corridor around Newport, in South East Wales. It was based upon the ability to deliver and identify measures in phases to improve affordability.

As a result of on-going discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4. On 26 June 2013, Edwina Hart AM CStJ MBE, Minister for Economy, Science and Transport, published the following written statement:

“Addressing the capacity and resilience issues on the M4 around Newport is the top transport challenge that we face in ensuring that Wales has an effective economic infrastructure which improves our competitiveness and access to jobs and services.

As a result of ongoing discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4.

Building on the extensive development and consultation work undertaken on M4 Corridor Enhancement Measures (CEM), we will be consulting formally over the summer with Natural Resources Wales in order to go out to public consultation this September with a finalised draft Plan and Strategic Environmental Assessment (SEA) Report.

If implemented, the draft plan would lead to a motorway being built south of Newport.”

The main element of the draft Plan is the provision of a section of three lane motorway between Junctions 23 and 29 on the south side of Newport. It is shown as the Black Route on page 23. The draft Plan would also include the following Complementary Measures:

Table 1 draft Plan (Black Route) Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.

² The Consultation Document is available online at www.m4newport.com or in paper copy (see page 51)

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

The consultation document also provides information on two “Reasonable Alternatives” to the draft Plan and a “Do Minimum” which considers consequences of doing nothing above what is already planned.

The main elements of the two reasonable alternatives are also shown on page 23. They are the Red Route which is a dual carriageway and the Purple Route which is a three lane motorway. Both routes would also have complementary measures.

The draft Plan does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. The report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

The Welsh Government is seeking your views on the draft Plan whose aim is to address transport related problems on the M4 Corridor around Newport. We also want your views on two reasonable alternatives to the draft Plan, the Do Minimum scenario, and the associated assessments which are:

- Health Impact Assessment (HIA);
- Equality Impact Assessment (EqIA);
- Strategic Environmental Assessment (SEA); and
- Habitats Regulations Assessment (HRA).

These assessments consider the potential environmental, health and equality impacts of the draft Plan, its reasonable alternatives and the Do Minimum scenario. These are separate documents but are included in the draft Plan Consultation.

Using the feedback received from the consultation, the Welsh Government will decide whether to adopt the draft Plan, with or without amendments, taking into account the responses to the associated assessments.

1.1 Purpose

This document provides the Health Impact Assessment (HIA) Report which is included in the draft Plan Consultation.

As a strategy or programme, the Welsh Government considers that an HIA of the M4 Corridor around Newport draft Plan is required. This report provides the Health Impact Assessment (HIA) for the transport measures that form a draft Plan for the M4 Corridor

around Newport. The completion of an HIA is a mandatory requirement of WelTAG. This report has been prepared in accordance with new guidance on the HIA process that has been prepared by WHIASU in conjunction with Public Health Wales and Cardiff University entitled, “Health Impact Assessment: A Practical Guide³.”

The Wales Health Impact Assessment Support Unit (WHIASU) was consulted on the proposed scope of the HIA and provided comments and advice on the preparation of the HIA. Public Health Wales also provided a scoping response and all relevant scoping responses to HIA are provided in Appendix A. The responses received as part of the scoping exercise have been incorporated into this assessment of the draft Plan, which will be subject to public consultation from September 2013 for a period of 12 weeks. Following the draft Plan Consultation, any relevant comments will then be incorporated into a finalised HIA Report, with a statement of results. Should the draft Plan be adopted, this would then be published.

1.2 Background

The M4 in South Wales forms part of the Trans-European Transport Network (TEN-T), which provides connections throughout Europe by road, rail, sea and air. The M4 plays a key strategic role in connecting South Wales with the rest of Europe, providing links to Ireland via the ports in South West Wales and England and mainland Europe to the east. It is a key east-west route being the main gateway into South Wales and also one of the most heavily used roads in Wales.

Providing a facility for transporting goods, linking people to jobs and employment sites as well as serving the Welsh tourism industry, the M4 is critical to the Welsh economy. Cardiff, and Newport and Swansea have ambitious regeneration strategies and Monmouthshire County Council is developing areas around Junction 23A of the M4. Rhondda Cynon Taff has important gateways onto the motorway at Junctions 32 and 34. Bridgend is served by M4 Junctions 35 and 36. Neath Port Talbot straddles the motorway and gets important access from Junctions 38 to 43. Congestion on the M4 causing unreliable journey times and reduced service levels will therefore hinder economic development in South Wales.

The M4 between Junctions 28 and 24 was originally designed as the ‘Newport Bypass’ with further design amendments in the 1960s to include the first motorway tunnels to be built in the UK. The M4 Motorway between Magor and Castleton does not meet modern motorway design standards. This section of the M4 has many lane drops and lane gains, resulting in some two-lane sections, an intermittent hard shoulder and frequent junctions. It is often congested, especially during weekday peak periods resulting in slow and unreliable journey times and stop-start conditions with incidents frequently causing delays.

This is why problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years. The motorway and surrounding highway network does not cope with sudden changes in demand or operation, for example as a result of accidents or extreme weather events for example. These issues are worse at times of peak travel (rush hour) and have worsened as the number of users on the network has increased.

The M4 Corridor around Newport is shown in Figure 1.

³ Source: Health Impact Assessment. A Practical Guide, WHIASU (2012).

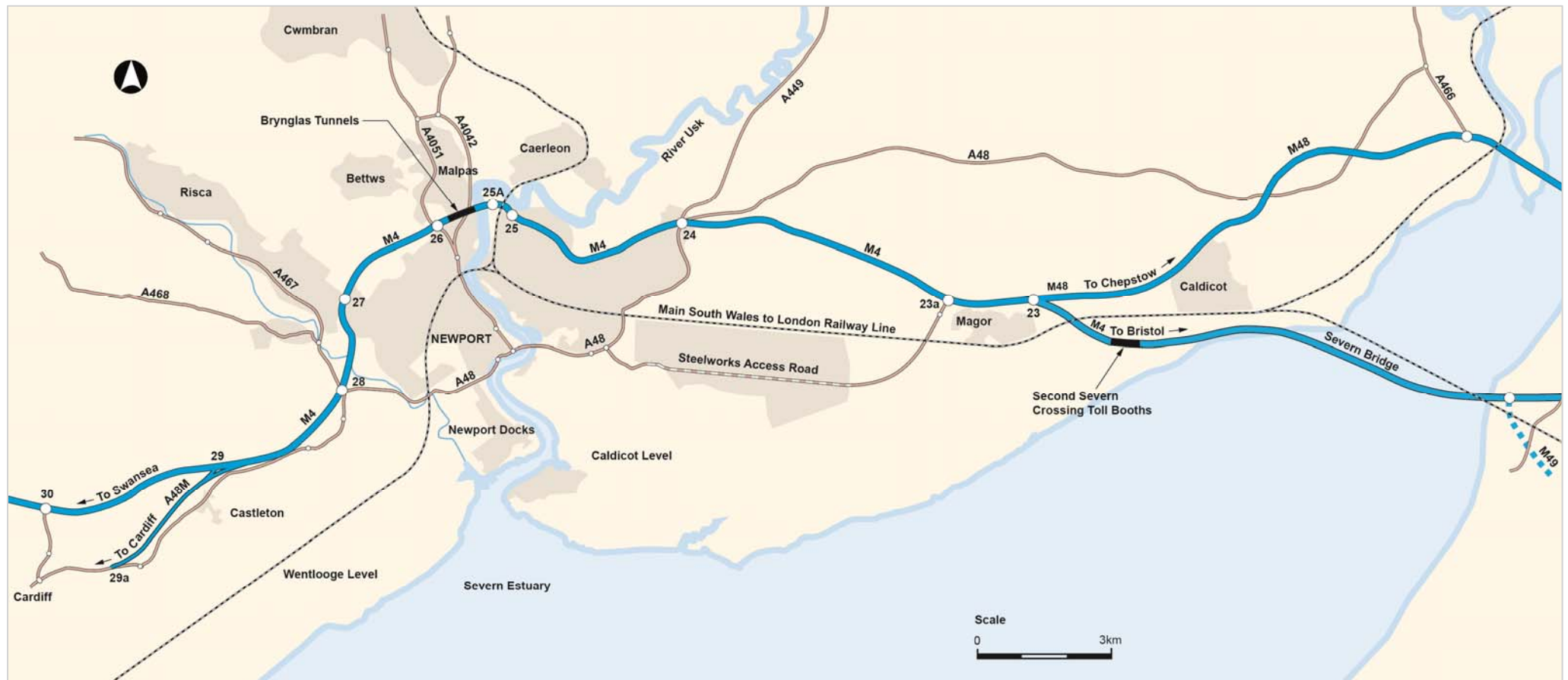


Figure 1 The Location of the M4 around Newport

2 Problems, Aims and Goals

2.1 Relationship to M4 CEM Programme

The problems, goals and aims of the M4 CEM Programme were subject to dialogue during the early stages of the engagement process, with public and stakeholders.

17 problems were identified; which encompassed issues of capacity, (network) resilience, safety and sustainable development. It is considered that the problems have not changed since 2012.

15 goals were identified and each one aimed to address one or more of the problems. As the problems have not changed there was no need to revisit the goals.

2.2 Problems on the M4 Corridor around Newport

The 17 identified transport related problems are listed below:

As part of the M4 CEM Consultation, respondents were asked to prioritise up to four problems out of the full list. Problems 1, 5, 7 and 9 shown in bold italics were selected the most times by those who responded to the M4 CEM Consultation.

Capacity

- 1. A greater volume of traffic uses the M4 around Newport than it was designed to accommodate, resulting in regular congestion at peak times over extended periods.***
2. The M4 around Newport is used as a convenient cross town connection for local traffic, with insufficient local road capacity.
3. HGVs do not operate efficiently on the motorway around Newport.
4. There is insufficient capacity through some of the Junctions (e.g. 3 lane capacity drops to 2 lane capacity).
- 5. The 2-lane Brynglas tunnels are a major capacity constraint.***
6. The M4 cannot cope with increased traffic from new developments.

Resilience

- 7. Difficulties maintaining adequate traffic flows on the M4 and alternative highway routes at times of temporary disruption; alternative routes are not able to cope with M4 traffic.***
8. The road and rail transport system in and around the M4 Corridor is at increasing risk of disruption due to extreme weather events.
- 9. When there are problems on the M4, there is severe disruption and congestion on the local and regional highway network.***
10. The M4 requires essential major maintenance within the next 5-10 years; this will involve prolonged lane and speed restrictions, thus increasing congestion problems.

11. There is insufficient advance information to inform travel decisions when there is a problem on the M4.

Safety

12. The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorways⁴.
13. The existing M4 is an inadequate standard compared to modern design standards.
14. Some people's driving behaviour leads to increased accidents (e.g. speeding, lane hogging, unlicensed drivers).

Sustainable Development

15. There is a lack of adequate sustainable integrated transport alternatives for existing road users.
16. Traffic noise from the motorway and air quality is a problem for local residents in certain areas.
17. The existing transport network acts as a constraint to economic growth and adversely impacts the current economy.

2.3 Aims for the M4 Corridor around Newport

The aims of the Welsh Government for the M4 Corridor around Newport are to:

1. Make it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road.
2. Deliver a more efficient and sustainable transport network supporting and encouraging long-term prosperity in the region, across Wales, and enabling access to international markets.
3. To produce positive effects overall on people and the environment, making a positive contribution to the overarching Welsh Government goals to reduce greenhouse gas emissions and to making Wales more resilient to the effects of climate change.

The draft Plan aims to help to achieve or facilitate these aims as part of a wider transport strategy for South East Wales, as outlined within the Prioritised National Transport Plan⁵.

2.4 Goals of the M4 Corridor around Newport

The Welsh Government with the help of the others, identified 15 goals for the M4 CEM Programme. These goals aim to address the identified transport related problems listed in section 2.2. For clarity goals are referred to as "Transport Planning Objectives" (TPOs) in WelTAG (see Glossary).

⁴ The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. The first year of operation has shown a reduction in accidents.

⁵ National Transport Plan (2010) & Prioritised National Transport Plan (2011) Welsh Government

The 15 goals (listed below) provide a framework in which to appraise the relative performance at a strategic level of the draft Plan, the reasonable alternatives and the Do Minimum scenario.

As part of the M4 CEM Consultation respondents were asked to prioritise up to 4 goals out of the full 15. Goals 1,4,5 and 7 shown in bold italics were selected the most.

If the draft Plan (or any reasonable alternative to the draft Plan) is successful, its success will be measured by how well it achieves the following goals:

- 1. Safer, easier and more reliable travel east-west in South Wales.***
2. Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.
3. More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport.
- 4. Best possible use of the existing M4, local road network and other transport networks.***
- 5. More reliable journey times along the M4 Corridor.***
6. Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives.
- 7. Improved safety on the M4 Corridor between Magor and Castleton.***
8. Improved air quality in areas next to the M4 around Newport.
9. Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor.
10. Reduced greenhouse gas emissions per vehicle and/or person kilometre.
11. Improved travel experience into South Wales along the M4 Corridor.
12. An M4 attractive for strategic journeys that discourages local traffic use.
13. Improved traffic management in and around Newport on the M4 Corridor.
14. Easier access to local key services and residential and commercial centres.
15. A cultural shift in travel behaviour towards more sustainable choices.”

2.5 Consequences of Doing Nothing

Analysis shows that in 2012 during peak periods (also known as ‘rush hour’), traffic flows approach 100% of capacity along sections of the M4 around Newport⁶. Once flows exceed 80% of capacity, traffic can expect operational problems (frequent traffic jams). The more congested road conditions become, the greater the risk of incidents and accidents occurring. In the future, the situation is expected to deteriorate further.

Forecasts of future traffic volumes show that in the Do Minimum situation, traffic congestion will be severe on most links by 2020 and by 2035 the motorway around Newport will be

⁶Source: Arup analysis 2012

heavily congested, with all sections between J23A and J29 experiencing flows above 100% of capacity during weekday peak periods⁷.

Congestion on the M4, particularly around Cardiff and Newport, is cited by the business community in South Wales as a barrier to economic growth. Where congestion increases, the cost of transport for businesses, commuters, consumers and economic performance can be affected. Increased congestion will also result in longer journey times for commuters, reducing the effective travel to work area.

In terms of the environment, local authorities in the UK work towards meeting the national air quality objectives and if a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area. Out of Newport's seven Air Quality Management Areas (AQMAs), four are associated with the M4. Higher traffic volumes along the M4 are likely to contribute not only to poor air quality, but also noise pollution, compromising the amenity of neighbouring residential communities.

Assuming no improvements to vehicle emissions technology, the increased flows and stop start conditions will give rise to more vehicle emissions along these routes. It is important to note that stop-start congested traffic can result in higher CO₂ emissions than free-flowing traffic. Alongside the motorway at Newport, there are also Noise Action Planning Priority Areas (NAPPAs), which investigate where noise levels are high and help create noise action plans to address the issue.

The AQMAs in Newport are available to view on the Newport City Council website⁸, whilst recently published Wales Noise Maps are being used to help the Welsh Government to develop and implement a noise action plan for Wales, which is due to be published later in 2013. These are also available on the Welsh Government website⁹.

⁷ Source: Arup analysis 2012

⁸ See

http://www.newport.gov.uk/_dc/index.cfm?fuseaction=environmentalhealth.homepage&contentid=cont446709

⁹ See <http://data.wales.gov.uk/apps/noise/>

3 Previous Work

Since 1991, much assessment and consultation has been undertaken to develop a preferred solution to the problems on the motorway around Newport. A summary of previous work is provided below and a more detailed history is documented in the M4 Corridor around Newport WelTAG Appraisal Report Stage 1 (Strategy Level)¹⁰.

For many years, concerns have been raised regarding the potential for delays on the motorway and trunk road network in South Wales.

In March 1989, the then Secretary of State for Wales commissioned the South Wales Area Traffic Survey (SWATS) to review traffic patterns over part of the trunk road network in South Wales in order to identify problem areas and propose possible solutions. The SWATS Report (1990) identified the need for substantial improvement to the M4 to address a growing capacity issue on the motorway, in particular the section between Magor and Castleton.

As a consequence, a proposal for a relief road to the south of Newport (which became known as the 'M4 Relief Road', and later, the 'New M4 Project' as a new dual 3-lane motorway) was included in the Welsh Trunk Road Forward Programme in 1991. An M4 Relief Road Preferred Route was published in 1995 and amended in 1997.

In 2004, the then Minister for Economic Development and Transport reported on the outcome of his review of transport programmes, which were undertaken to ensure a strategic fit with: 'Wales: A Better Country' and the Wales Spatial Plan. One of the conclusions of the review was that additional capacity was still required on the M4 motorway in South East Wales, in order to reduce congestion, improve resilience and remove an obstacle to greater prosperity along the whole corridor through to Swansea and West Wales. In addition to widening the motorway north of Cardiff, the Minister announced proposals to develop a New M4 south of Newport between Magor and Castleton.

Following Ministerial Review in 2004, the New M4 Project was the subject of a thorough re-examination in order to ensure fit with policies at that time and to take account of physical and legislative changes. Three key activities were undertaken:

1. A re-examination of route corridors considering, in particular, the implications and consequences of legislative changes and physical developments within the original project study area;
2. A comprehensive review of the previously published M4 Relief Road Preferred Route; and
3. A Junction Strategy Review.

The conclusion of these studies confirmed the route to the south of Newport as the optimal solution to tackling the problems of congestion on the M4 corridor around Newport. Following the Preferred Route and Junction Strategy Review, a TR111¹¹ notice (April 2006) was published to protect a revised route corridor. A series of public exhibitions were held in

¹⁰ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013

¹¹ Once a preferred route is announced, Welsh Government serves a statutory notice (TR111) on the local planning authorities requiring the line to be protected from development. This is enacted under Article 19 of the Town & Country Planning (Development Management Procedure) (Wales) Order 2012.

April and May 2006 to explain the changes to the public and other stakeholders with an interest in transport in South Wales.

3.1 M4 Corridor Enhancement Measures (M4 CEM) Programme

A written statement in July 2009, by the then Deputy First Minister Ieuan Wyn Jones, announced that the New M4 was not affordable. The statement, however, accepted “*the need to urgently address safety and capacity issues on the existing route*” through the introduction of “*a range of measures*”.

The M4 Corridor Enhancement Measures (CEM) Programme¹² was therefore initiated by the Welsh Government and this aimed to create a package of measures to deal with resilience, safety and reliability issues within the M4 corridor between Magor and Castleton.

Under the M4 CEM Programme, a long list of possible solutions was explored. Packages that combined public transport, highway and other travel solutions were identified for appraisal. These included widening of the M4 between Junctions 24 and 29 as well as improvement to the existing road network to the south of Newport city centre and a new dual carriageway all-purpose road to the south of Newport.

As part of the M4 CEM Programme, a comprehensive engagement process was launched in September 2010 culminating in a public consultation held between March and July 2012. During the engagement process, the Welsh Government and its project team engaged with both internal and external specialists and expert stakeholders. This process encompassed a diverse range of views and interests relating to transport in South Wales, as well as with people likely to be interested in and affected by any transport measures potentially adopted and implemented by Welsh Government. The consultation resulted in public support for the provision of an additional high quality road to the south of Newport¹³, supported by additional measures to address travel related problems within the M4 Corridor. These were referred to as Common Measures. They comprised a mix of network improvements, network management, demand management, alternative modes and smarter sustainable choices. The M4 CEM WelTAG Stage 1 (Strategy Level) Appraisal¹⁴ concluded that the following measures were worthy of further consideration:

- A new dual carriageway route to the south of Newport (Red Route alternative to the draft Plan);
- Public transport enhancement; and
- Common measures.

¹² Further details of the M4 CEM Programme and its evolution are available at www.m4cem.com.

¹³ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013

¹⁴ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, March 2013

3.2 M4 Corridor around Newport draft Plan

Recent initiatives, including discussions between the Welsh Government and HM Treasury/Department for Transport, as well as the work of the Silk Commission¹⁵, have created future potential funding opportunities for Welsh Government infrastructure projects. As a consequence, the decision was taken by the Welsh Government to further reconsider solutions to resolve transport related problems on the M4 around Newport.

Thus, in order to inform the strategy for the M4 Corridor around Newport, a further M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal¹⁶ has been undertaken of options that include M4 CEM measures, provision of new motorway capacity routed to the south of Newport and complementary measures. The options considered within the WelTAG Appraisal were as follows:

1. A new section of 3-lane motorway to the south of Newport following the protected (TR111) route (Black Route);
2. A new dual 2-lane all-purpose road to the south of Newport following an alignment that would allow it to be constructed in phases (Red Route);
3. A new section of 3-lane motorway to the south of Newport along a similar alignment to the all-purpose road (Purple Route);
4. Public transport measures; and
5. Complementary measures.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal concluded that a new section of 3-lane motorway to the south of Newport following a protected (TR111) route, in addition to complementary measures, would best achieve the goals and address the problems of the M4 Corridor around Newport, and should be progressed for further appraisal.

These options have subsequently formed the basis for the development of the draft Plan, which is described further in Section 4.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal also acknowledged that public transport enhancement will contribute to some of the goals of the M4 Corridor around Newport. This draft Plan does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. That report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

3.3 Previous HIA

Recognising the potential level of public interest in transport related issues within the M4 Corridor around Newport and beyond, and the numbers of people potentially affected by any new plans resulting from possible options, the Welsh Government undertook wide-ranging and focussed engagement with stakeholders and local people from September 2010 as part of the M4 CEM Programme, which aimed to address transport related problems on the M4

¹⁵ The 'Silk' Commission on Devolution in Wales, which is reviewing the case for the devolution of fiscal powers and reviewing the powers of the National Assembly for Wales, due to report in Spring 2014.

¹⁶ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013.

Corridor around Newport through a package of public transport, highway infrastructure and complementary measures ‘referred to as Common Measures’ that included demand management, alternative modes and smarter sustainable choices.

During the engagement process, the Welsh Government and its project team conducted dialogue and deliberative sessions both with internal and external specialists and expert stakeholders, encompassing local health boards, local authorities and other organisations with an interest in the likely health and community impacts of transport measures on the M4 Corridor around Newport. This input has helped and influenced the development of a draft Plan.

The Welsh Government consulted with the Wales Health Impact Assessment Support Unit (WHIASU) on its approach to assessment and reporting. A scoping report for the HIA was issued to WHIASU for comment on M4 CEM options, including an additional high quality road to the south of Newport, in September 2012. WHIASU provided comments on the proposed scope for the HIA in October 2012. Following WHIASU advice and guidance, telephone interviews on the potential health effects of the M4 CEM measures were undertaken with health professionals and other local stakeholders. Stakeholders were identified with the assistance of WHIASU. The consultees contacted for interview are shown in Table 2.

Table 2 M4 CEM HIA Consultees

Organisation
Aneurin Bevan Health Board
Countryside Council for Wales
House of Commons
National Assembly for Wales
Newport City Council
Newport Local Public Health Team
Newport, Gwent Association of Voluntary Organisations (GAVO)
Public Health Wales (PHW)
Wales Health Impact Assessment Support Unit (WHIASU)

A number of the identified stakeholders (above) declined to take part or were unavailable for the telephone interviews as part of the M4 CEM options HIA. In total three telephone interviews were undertaken, including:

- Health and Wellbeing representative from the Countryside Council for Wales;
- MP for Newport West; and
- Public health consultant representing both Public Health Wales and the Aneurin Bevan Health Board.

For the M4 CEM options, stakeholders were asked:

1. What do you consider to be the potential health impacts and will the impact be positive or negative?
2. Is the likelihood of the impact of the proposal definite, probable or speculative?

3. What do you consider to be the scale of the impact and what proportion of the population is likely to be affected?
4. What do you consider to be the timing of these impacts and will the impact be in weeks, months or years?
5. What will the distribution of the effects be and will the proposal affect different groups of people in different ways?
6. Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?

A summary of responses received as part of the M4 CEM HIA process is provided in Table 3.

Table 3 Summary of M4 CEM HIA Consultation Responses

Topic	Summary of Responses
Public Transport Measures	<p>They would create positive health impacts, encouraging physical activity, a potential reduction in emissions and social connectivity. Getting people to use public transport is challenging. Changing people's behaviour is vital, which may take a long time and so there may need to be some sort of intervention to make people use public transport. Benefits would likely be long term but the impact limited and mainly to those without access to a car. Systematic promotion of public transport to increase awareness would increase the benefits.</p> <p>Clean technology for buses would also help to reduce pollution.</p>
Additional high quality road to the south of Newport (being progressed as a reasonable alternative (Red Route) as part of this draft Plan Consultation).	<p>It would be the favoured option. It would only impact on a small population, so it would be the least polluting option. It directs traffic away from the most populated areas of Newport; the winds blow from west to east and the pollution from this option would spread over the channel and not the local population. A sizable population (the Duffryn area) would experience positive benefits; the negative impacts would be experienced by the least number of people in comparison to the other options. There is the potential that it could bring congestion and pollution to new areas.</p> <p>There may be negative impacts during construction (noise, air quality, visual impact).</p> <p>Although the frequency of accidents may be reduced the increased road space may mean that accidents are more serious.</p> <p>It may widen the gap in health inequality between the north and south of Newport. The impact would be limited but long term. The most affected would be people with vehicles and people who occupy the new housing at the steelworks. In the long term it could affect a larger proportion if flood mitigation measures are not implemented.</p> <p>This option has been designed in a positive way, it avoids nature reservations etc. but the damage to the landscape would have to be managed; there is a lot that can be done to minimise the damage.</p>

Topic	Summary of Responses
Complementary Measures	<p>Complementary measures are supported.</p> <p>Positive impacts could be realised from noise pollution reduction measures and improved incident management and event management.</p> <p>In particular, walking and cycling infrastructure would potentially have a positive effect on physical activity levels, and alternative route promotion could be beneficial with regards to access to services. There is also potential for a reduction in noise and an improvement in local air quality.</p> <p>Complementary measures would affect the general population and benefits would be realised over the long term. The measures might exclude young and elderly people as it may be more challenging for them to utilise public transport, walking and cycling options.</p> <p>A well planned and tested series of interventions to encourage the use of alternative methods of transport would be needed. Changes should take into account local consultation to ensure limited disruption and maximum benefit of any measures that could be progressed further.</p>

These comments have informed the development of, and HIA of, the draft Plan.

4 The draft Plan

In recognising the range of the goals for the M4 Corridor around Newport, the draft Plan combines both highway infrastructure and other demand management solutions in identifying a preferred strategy.

The draft Plan for the M4 Corridor around Newport (the preferred strategy) consists of:

- **A new section of 3-lane motorway between Magor and Castleton to the south of Newport along the TR111 protected corridor of the Black Route; and**
- **Complementary Measures (see table 4, overleaf).**

The reasonable alternatives to the draft Plan include:

- **A dual 2-lane all-purpose road (Red Route); or**
- **A motorway solution along a similar alignment (Purple Route); in addition to**
- **Complementary Measures.**

The draft Plan and the reasonable alternatives have been assessed against the ‘Do Minimum’ scenario. The Do Minimum scenario means doing nothing above what is already planned or committed.

The preferred strategy and reasonable alternatives are described in more detail below and illustrated in Figure 2 on page 23.

4.1 The draft Plan (Preferred Strategy)

4.1.1 Motorway following TR111 Protected Route – The Black Route and Complementary Measures

This preferred strategy comprises the construction of a new 3-lane motorway mainly following the protected TR111 ‘Black Route’, between Junctions 23 and 29, including a new crossing of the River Usk south of Newport. The River Usk is designated as a Special Area of Conservation (SAC).

The TR111 route to the south of Newport has remained protected for planning purposes since April 2006. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation and analysis. The aim is to minimise the impact on the environment, whilst fully meeting current motorway design and safety standards. Minor changes to the alignment of the TR111 protected route could still be made, subject to further investigation, if this option is taken forward. This motorway solution would be delivered as one scheme.

If this draft Plan is adopted a junction strategy would be investigated as part of scheme’s development.

The alignment of the Black Route is shown in the context of local constraints in Figure 2.

In addition to the new highway infrastructure, there are additional complementary measures that could assist in alleviating travel related problems within the M4 Corridor around Newport. The draft Plan's complementary measures are as follows:

Table 4 draft Plan (Black Route) Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.2 Reasonable Alternatives to the draft Plan

4.2.1 Dual 2-lane All-Purpose Road – The Red Route and Complementary Measures

This option involves the construction of an additional high quality road to the south of Newport, as a dual carriageway solution. The route aims to minimise negative impacts on local communities and the environment. As a dual carriageway on this corridor alignment, the road could be delivered in phases by tying into the existing road network in Newport. Delivery could thus be phased with availability of funding. However, the main benefits would only be realised when the route is complete.

This road would require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Red Route is further north compared to that of the Black Route and the impact on the Port of Newport operations may be less. However, the alignment would pass through and have significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Dyffryn. There are also on-going and potential further development sites along this route.

The alignment of the Red Route is shown in the context of local constraints on Figure 2, page 23.

In addition, the following complementary measures could assist the Red Route in alleviating travel related problems within the M4 Corridor around Newport:

Table 5 Red Route Complementary Measures

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.2.2 Motorway along Alternative Alignment to the South of Newport – The Purple Route and Complementary Measures

In order to fully represent the highway options to the south of Newport, this option comprises a 3-lane motorway along a similar route to that which is proposed for the Red Route (dual 2-lane all-purpose road). A difference between the two routes being the purple route has a more northerly alignment to cross the northern end of the North Dock at the Port of Newport.

This new motorway would require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Purple Route is such that the impact on the Port of Newport is minimised. However, there could be significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Dyffryn. There are also on-going and potential further development sites along this route.

The alignment of the Purple Route is shown in the context of local constraints on Figure 2 on page 23.

In addition, the following complementary measures could assist the Purple Route in alleviating travel related problems within the M4 Corridor around Newport:

Table 6 Purple Route Complementary Measures

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

4.3 Do Minimum Scenario

The Welsh Government is committed to continuing to improve transport in South Wales. Practical measures to make travel safer and easier on the M4 motorway around Newport have included replacing sections of steel central barriers with concrete barriers, the introduction of Variable Speed Limit systems and improvements to the roundabout at Junction 24 at Coldra.

The Do Minimum scenario means doing nothing above what is already planned or committed. This scenario therefore comprises minimum intervention but in this case does include a number of highway schemes, which are currently committed to be completed between 2020 and 2035 as follows:

Welsh Government Schemes:

- The recently opened Newport Steelworks Access Road Phases 1 and 2 (the former Llanwern Steelworks access road);
- Junction 28 roundabout, enlarged signalled gyratory scheme including associated improvements to the A467 Bassaleg roundabout and A48 Pont Ebbw; and
- A465 Heads of the Valleys dualling (Gilwern to Hirwaun).

Newport City Council Scheme:

- Link through Newport Eastern Expansion Areas between Steelworks Access Road and A48 SDR (Cot Hill junction, signalised with full movements).

Alongside these schemes, the Do Minimum scenario also consists of a number of development proposals throughout South East Wales, which are committed through the planning process and are due to be completed at various stages to 2035.

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Legend

- Black Route (the main element of the draft Plan)
- Red Route (the main element to the 'reasonable alternative' to the draft Plan)
- Purple Route (the main element to the 'reasonable alternative' to the draft Plan)
- Employment Land Allocation from Newport Unitary Development Plan
- Newport Southern Distributor Road
- Steelworks Access Road
- Existing Railway Lines
- Sites of Special Scientific Interest (SSSI)
- River Usk SAC and SSSI

Figure 2 Black, Purple and Red Route shown within the local study area and main constraints around Newport

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5 What is Health Impact Assessment?

5.1 Introduction

The WHIASU guidance refers to HIA as a process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan or a change to the organisation or delivery of a particular public service. The guidance states that,

“Within HIA, health is understood as a positive concept which encompasses mental, physical and social well-being. It is difficult to understand the concept of health as something distinct from the ways in which we live and the society of which we are a part. This implies two things - firstly, that health means different things to different people living in particular times and places and secondly, that health outcomes, however we may understand and/or measure them, are shaped by wider social and economic processes.”

The best known definition of the social model of health is one that was produced by the World Health Organisation (WHO) in 1948 which stated that:

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1948).

The WHIASU guidance notes that health is shaped by wider social processes; and policies, programmes and projects are likely to be important opportunities or threats to the health of individuals, groups, communities and whole populations. Whilst the availability and quality of health services are likely to be important, the quality and distribution of social and economic resources are likely to be more important to the health of a population. Figure 3 below¹⁷ provides an illustration of how a proposal may impact different groups of people in different ways.

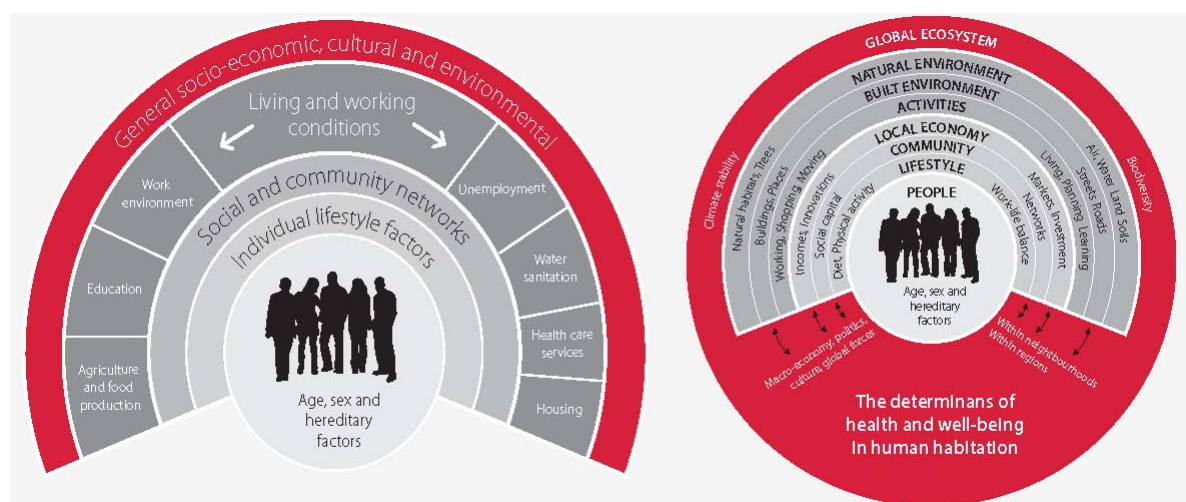


Figure 3 WHIASU guidance: how a proposal may impact on different groups of people

¹⁷ Source: Health Impact Assessment. A Practical Guide, WHIASU. Page 3. Figures: Dahlgren and Whitehead (1991) & Barton and Grant (1998)

WHIASU advise that some impacts on health determinants may be direct, obvious and/or international, whilst others may be indirect, difficult to identify and unintentional. HIA tries to anticipate and mitigate for these effects.

5.2 Definitions of HIA

The European Centre for Health Policy (1999) Gothenburg Consensus is the most widely accepted definition of HIA. This defines HIA as:

“A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population”.

An alternative definition, which is referenced in the WHIASU guidance, is¹⁸:

‘...a process through which evidence (of different kinds), interests, values and meanings are brought into dialogue between relevant stakeholders (politicians, professionals and citizens) in order imaginatively to understand and anticipate the effects of change on health and health inequalities in a given population’.

The consideration of health impacts is becoming an increasingly important aspect of any new proposal, programme or project in the UK. The purpose of carrying out a HIA is to assess the potential impacts to human health from a policy, programme or project and then to use this information to influence the decision making process. This should help to maximise the positive health outcomes and minimise the negative health outcomes of a proposal. However, WHIASU note that HIA is a tool to support decision making, but is not, in itself, the means of making a decision on whether a policy, proposal or programme should proceed.

5.3 Determinants of Health and Vulnerable Groups

WHIASU advise that HIA is a systematic, objective, flexible and practical way of assessing both the potential positive and negative impacts of a proposal on health and well-being. It can suggest ways in which opportunities for health gain can be maximized and risks to health minimised. HIA looks at health in its broadest sense, using the wider determinants of health as a framework. The health and well-being determinants checklist provided in Appendix 1 of the WHIASU guidance is reproduced in Table 7.

¹⁸ Elliott E, Harrop E, and Williams GH (2010) Contesting the science: public health knowledge and action in controversial land-use developments, in P. Bennett, K Calman, S Curtis and D Fischbacher-Smith (eds) Risk Communication and Public Health (second edition), Oxford: Oxford University Press.

Table 7 Health and Well-Being Determinants and Checklist

1. Lifestyles	
Diet	Sexual activity
Physical activity	Other risk-taking activity
Use of alcohol, cigarettes, non-prescribed drugs	
2. Social and community influences on health	
Family organisation and roles	Social isolation
Citizen power and influence	Peer pressure
Social support and social networks	Community identity
Neighbourliness	Cultural and spiritual ethos
Sense of belonging	Racism
Local pride	Other social exclusion
Divisions in the community	
3. Living/environmental conditions affecting health	
Built environment	Green space
Neighbourhood design	Community safety
Housing	Smell/odour
Indoor environment	Waste disposal
Noise	Road hazards
Air and water quality	Injury hazards
Attractiveness of area	Quality and safety of play areas
4. Economic conditions affecting health	
Unemployment	Type of employment
Income	Workplace conditions
Economic activity	
5. Access and quality of services	
Medical services	Public amenities
Other caring services	Transport including parking
Careers advice	Education and training
Shops and commercial services	Information technology
6. Macro-economic, environmental and sustainability factors	
Government policies	Biological diversity
Gross Domestic Product	Climate
Economic development	

WelTAG considers the interaction between factors that determine health and WelTAG criteria. These are listed in Table 8. Although the health determinants listed in WelTAG and the WHIASU guidelines are not identical, they are broadly similar. As the HIA for the M4 Newport draft Plan is being prepared in accordance with WelTAG requirements, the criteria listed in WelTAG have been used for the appraisal summary tables for the HIA.

Paragraph 9.2.6 of WelTAG states that the interactions between health determinants and the WelTAG criteria show how WelTAG performs the HIA, thus negating the need to generate new analysis.

Table 8 Interaction between WelTAG Criteria and Health

Factors that determine health	WelTAG appraisal criteria
Individuals lifestyle/capacities affecting health Smoking, nutrition and healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education	Physical Fitness
Social and community influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos.	Social Inclusion Heritage
Living conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces.	Noise Local Air Quality Landscape and Townscape Water Environment Transport Safety Personal Safety
Working conditions Employment, workplace conditions, occupation, income.	Economic Activity and Location Impacts (EALI)
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Permeability Transport Economic Efficiency (TEE)
Socio-economic, cultural and environmental Sustainability factors Biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate. Macro-economic factors: political climate, GDP, economic development, policy climate.	Biodiversity Greenhouse Gas Emissions

HIA highlights the uneven way in which health impacts may be distributed across a population and seeks to address existing health inequalities as well as avoiding the creation of new ones. This HIA aims to determine how and to what extent the M4 Corridor around Newport draft Plan, its reasonable alternatives and the Do Minimum scenario, affects different social and demographic groups and associated potential health implications at a strategy level. The assessment aims to determine the most appropriate actions necessary to address any inequalities and remove adverse effects. HIA can also identify any gaps in the options and highlight any positive impacts that may come from them. These could then be maximised.

In addition to the general adult population, the guideline target groups for HIA listed by WHIASU are:

Age related groups:

- Children and young people; and
- Older people.

Income related groups:

- People on low income;
- Economically inactive;
- Unemployed/workless; and
- People who are unable to work due to ill health.

Groups who suffer discrimination or other social disadvantage:

- People with physical or learning disabilities/difficulties;
- Refugee groups;
- People seeking asylum;
- Travellers;
- Single parent families;
- Lesbian and gay and transgender people;
- Black and minority ethnic groups; and
- Religious groups.

Geographical groups:

- People living in areas known to exhibit poor economic and/or health indicators;
- People living in isolated/over-populated areas; and
- People unable to access services and facilities.

6 Health and Well-Being Context

Newport City Council and the Aneurin Bevan Local Health Board have prepared a health, social care and well-being strategy for Newport for the period 2011-2014¹⁹. One Newport has also prepared a community strategy for the period 2010-2020²⁰, which is a single integrated plan to bring together Newport's Community Strategy; Health, Social Care and Wellbeing Strategy; Children and Young People's Plan; Community Safety Plan; and Prosperous Newport Plan. The population and health status of Newport are considered in these strategies and the latest data is summarised below.

6.1 Population

In 2011, the population of Newport was 145,736 which is a 6.4% rise from the 2001 figure²¹. The population of Newport in 2011 was 51% female and 49% male with 89.9% of people from a white background and 10.1% of people from a non-white background. Newport has the second largest number of people from a non-white background in Wales, second to Cardiff only. This equates to Newport having a higher proportion of people from a non-white background than for Wales as a whole (Newport 10.1%, Wales 4.3% in 2011²²).

The proportion of the Newport population aged over 65 in 2011 was 16.1% which is slightly lower than the proportion for Wales as a whole, which was 18.3%. The proportion of children aged 0-15 years old in Newport was 20.2%, which is a higher proportion than at a Wales level (16.1% in 2011)²³. For Newport this represents a 2.3% fall in the proportion of the population aged 0-15 years old from 2001 figures²⁴.

Most recent figures indicate that 78.5% of Newport residents considered their health to be either 'very good' or 'good' which is higher than the average for Wales (77.7%). A total of 20.8% of the Newport population are living with a long-term activity-limiting illness, which is slightly lower than the Wales average of 22.7%. Moreover, 11.4% of the Newport population are unpaid carers; this is slightly lower than the Wales average of 12.1%.²⁵

6.2 Wealth and Deprivation

In Newport, neighbourhoods with some of the country's highest levels of social deprivation sit next to some of those with the greatest affluence. The Wales Index of Multiple Deprivation (WIMD) is the official measure of deprivation of small areas in Wales.

The WIMD 2011 is made up of eight separate kinds of deprivation: income, employment, health, education, housing, access to services, environment and community safety. For

¹⁹ Health, Social Care and Wellbeing Strategy 2011-2014. Newport's Healthy Future, Newport City Council Aneurin Bevan Local Health Board, One Newport, Healthy Newport.

²⁰ Newport's Community Strategy 2010-2020. Feeling Good about Newport. One Newport

²¹ Office of National Statistics, Census 2001 & Census 2011

²² Office of National Statistics, Census 2011

²³ Office of National Statistics, Census 2011

²⁴ Office of National Statistics, Census 2001

²⁵ Office of National Statistics, Census 2011

Newport, 16% of the Lower Super Output Areas (LSOA) fall within the 10% most deprived LSOAs in Wales, and 44% of LSOAs fall within the 50% most deprived LSOAs in Wales.²⁶

According to Newport's Community Strategy, Newport has a labour catchment population of 479,000 people living within 30 minutes' drive; and 1.6 million people, over a third of the population of Wales, live within one hour of the city. In 2008, 31,400 people commuted to work in the city, making Newport the second biggest destination for commuters in Wales after Cardiff.

For the period January-December 2012, 23.3% of the residents of Newport aged 16-64 were economically inactive, compared to 26.5% for Wales²⁷. However, in terms of claimants, the proportion of job seekers allowance claimants was 5.6% in Newport for April 2013, which was slightly higher than the average of 4.0% for Wales.²⁸

6.3 Health

Poor air quality can impact on people's health. The main source of air pollution within Newport is from traffic emissions, and primarily from the M4 motorway that crosses the City area from east to west. The motorway cuts through several residential areas, notably St Julian's, Brynglas, Crindau, Glasllwch and High Cross.

Newport has a total of nine Air Quality Management Areas (AQMAs), which were declared because assessments of air quality predicted that the annual mean objective for nitrogen dioxide (NO₂) was not likely to be met. Four of the AQMAs have been declared as a result of emissions from traffic on the M4 motorway (Shaftesbury/Crindau, St Julians, Royal Oak Hill, and Glasllwch). The major contributor to the pollution in these areas was found to be road traffic.

The overall health status of the people in Newport is generally comparable to that in the rest of Wales. Currently in Newport, the prevalence of obesity, coronary heart disease, strokes and respiratory disease are marginally lower than the Welsh average, but are still high compared to the rest of the UK. The number of deaths from cancer is following the national trend and reducing slightly.

Newport lies within the area of the Aneurin Bevan Health Board, which covers the local authority areas of Caerphilly, Blaenau Gwent, Torfaen, Monmouthshire and Newport. The Aneurin Bevan Health Board provides an overview of the local health context among the population in this area. The overview provided in the latest demography profile (2009) includes the following key points in relation to health of the local population²⁹:

- The under 75 age standardised mortality rate has decreased by 16% between 1998 and 2007. However it remains slightly higher than the average Wales rate;

²⁶ Stats Wales, Wales Index of Multiple Deprivation 2011

²⁷ Office for National Statistics, Annual Population Survey

²⁸ Office for National Statistics, Claimant Count

²⁹ Aneurin Bevan – Local Health Board – Demography Profile (2009) available online at: <http://www.wales.nhs.uk/sitesplus/922/page/49938>

- The greatest causes of death in people under 75 are cancer, circulatory disease and respiratory disease, accounting for 39%, 28% and 9% of approximately 2,200 deaths respectively during 2007³⁰;
- Within the area covered by Aneurin Bevan Health Board there are areas of deprivation, particularly the valley areas of Caerphilly, Blaenau Gwent and Torfaen;
- 88 of the 369 Lower Super Output Areas in the area (24%) are among the most deprived in Wales, with 72 (20%) in the least deprived fifth. However, within the less deprived areas there are often pockets of hidden deprivation;
- Current projections see a rise in the older population (75 years and over) of Aneurin Bevan residents from 45,000 (8% of the total population) to 82,000 (13% of the total population) in 2031;
- The increase in the number of older people may cause a rise in chronic conditions such as circulatory and respiratory diseases, and cancer; and
- The relative (and absolute) increase in economically dependent and in some cases care-dependent populations will pose particular challenges to local communities.

³⁰ Office for National Statistics, Annual District Deaths Extract (Cited in Aneurin Bevan – Local Health Board Demography Profile 2009).

7 Approach to HIA Appraisal

7.1 Screening and Scope of the HIA

WelTAG states that HIA is a mandatory requirement of transport appraisal. As a result, the Welsh Government acknowledges that HIA is required for the M4 Corridor around Newport draft Plan.

The HIA has been developed to be proportionate to the strategic level of the draft Plan. As such, the appropriate level of appraisal is broad and at a strategy level. It may only be possible to undertake appraisal qualitatively.

HIA is an iterative process. This document forms an initial appraisal of the draft Plan, its reasonable alternatives and the Do Minimum scenario, in order to assist with the development of an HIA of the draft Plan. Following the draft Plan Consultation, any relevant comments will then be incorporated into a finalised HIA Report, with a statement of results. Should the draft Plan be adopted, this would then be published.

Furthermore, for any options that may be progressed it is likely that, depending on their scale and location, they would require further HIA at a project (scheme) level, to avoid, reduce and, if possible, remedy significant adverse impacts. As such, further liaison with stakeholders would then be considered by the Welsh Government.

The geographical extent of the HIA specifically refers to the M4 Corridor around Newport.

At this strategy level of appraisal; short, medium and long term timescales have been considered in terms of the potential impacts of the options on the population.

The impact of possible measures on health and well-being has been considered with reference to relevant WelTAG criteria. An evidence base has been prepared as part of the WelTAG appraisal of the options. It provides a summary of baseline conditions as well as an appraisal of social, economic and environmental criteria. This evidence base has informed the preparation of this HIA.

As recommended by WelTAG, an HIA appraisal summary table has been prepared for the draft Plan to qualitatively assess the potential effects on health and well-being. Each measure has been assessed using a 7 scale colour coding system technique that is adopted in WelTAG (Table 9).

Table 9 WelTAG Appraisal Guidance

Large Positive Impact	(+++)
Moderate Positive Impact	(++)
Slight Positive Impact	(+)
No (or Minimal) Impact	(0)
Slight Negative Impact	(-)
Moderate Negative Impact	(--)
Large Negative Impact	(---)

7.2 Scoping

A scoping report was prepared in relation to this HIA and was made available to the Wales Health Impact Assessment Support Unit for comment, for a five week period commencing 9 July 2013. This outlined the Welsh Government's proposed approach to undertaken HIA. Specifically, the scoping consultation posed the following questions:

1. Other than that available at the WHIASU website, is there any additional guidance that should be taken into account as part of this assessment?
2. Are there any additional organisations or parties that we should consider contacting as part of this HIA?
3. In addition to those identified within this scoping paper, are there any particular issues that should be addressed in detail as part of this assessment?

The responses received as part of the scoping exercise have been incorporated into this assessment of the draft Plan, which will be subject to public consultation from September 2013 for a period of 12 weeks.

Further to WHIASU's advice, the following issues have been explored as part of the assessment:

- What positive effect(s) is the option likely to have for people's health and well-being, and for which groups within the population?
- What negative effect(s) is the option likely to have for people's health and well-being, and for which groups within the population?
- If negative impacts were identified for one or more group within the population, are there ways in which these can be removed or mitigated?
- Is further investigation, information and evidence collection needed to find potential solutions?
- Are there opportunities to build in more actions to improve people's health as a part of the option? Are there sources of information or experience elsewhere that may help explore this question more fully?

8 HIA Appraisal

A high level qualitative assessment of potential impacts on health is provided in the following sections in appraisal summary tables 10 to 13.

As set out in Section 5, HIA is an iterative process. This document forms an initial HIA as part of the draft Plan consultation.

Whilst this HIA of the draft Plan is subject to public consultation, during the duration of the draft Plan Consultation a separate HIA participatory stakeholder workshop will take place to further appraise the options. As recommended by WHIASU, the following stakeholders would be specifically invited to participate:

- Aneurin Bevan Health Board;
- Natural Resources Wales;
- National Assembly for Wales;
- Public Health Wales (PHW);
- Welsh Government Transport representative;
- Newport Local Public Health Team;
- Local Authority Health, Social Care and Wellbeing Strategy Manager or other nominated person with responsibility for this i.e. Partnerships Manager or Co-ordinator;
- Local Authority Transport, Sustainability and Planning Officers or representatives;
- Local Authority Community Partnerships Manager/Community Cohesion Officer;
- Newport, Gwent Association of Voluntary Organisations (GAVO);
- Local elected members or community councillor(s) for the relevant potentially affected wards; and
- Appropriate others that these stakeholders may recommend or suggest.

Following the draft Plan Consultation, any relevant comments will then be incorporated into a finalised HIA Report, with a statement of results. Further HIA at a project (scheme) level may be required to avoid, reduce and, if possible, remedy any significant adverse impacts of any options that may be progressed as part of the draft Plan, should it be adopted.

An appraisal summary table is provided in Section 9 in order to provide a comparison of the preliminary HIA results. These will be updated to take into consideration any comments received during the draft Plan Consultation, as outlined above.

The assessment has focussed on the target groups identified in section 5.3, assessing the likely change to these groups through the various options.

8.1 Draft Plan

Table 10 HIA Appraisal of the draft Plan

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education.	The draft Plan would improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle. Complementary measures could bring improved access to facilities for those who rely on other transport modes through improved walking and cycling infrastructure and linkages to public transport interchanges. This would be likely to encourage local trips to be made by such modes and as such benefit health and well-being.	General population with access to a car	(+)
Social and community: influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos.	A new motorway would improve journey times and journey time reliability to benefit access to regional support services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially create severance between communities located to the north and south of the new road, although there are few properties south of the Black Route. Provision of additional cycling and walking infrastructure would help encourage healthy lifestyle choices, particularly for local trips, as well as supporting social interaction and assisting in scene setting and place making. The Gwent levels are defined as a landscape of Outstanding Historical Interest. There are limited means by which the effects of construction of the new road on the Historic Built Environment could be mitigated.	General population, Geographical groups	(+)
Living conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces.	The Black Route would help to reduce noise and air pollution along the route of the existing M4, where there are four AQMAs and higher than average noise levels. However, noise and air quality would be expected to deteriorate in the area around the new road – although the surrounding area is less populated than the urban areas of Newport and thus the impact on human health would be less. The impacts of air, noise and dust pollution during construction are likely to affect those who live in close proximity to the Black Route. Modern construction methods would aim to limit any impacts	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton, and the new road)	(+)

Assessment Criteria	Assessment	Distribution	Significance
	<p>during this period.</p> <p>Provision of additional cycling and walking infrastructure would aim to be of a high quality and increase perceived safety for users.</p> <p>The Black Route would cross the River Usk SAC and SSSI and the Gwent Levels and would be likely to impact adversely on the landscape.</p> <p>The Black Route would improve safety by reducing traffic congestion and associated impacts on accidents and incidents. On completion, it is forecast that the total number of accidents on major roads in Newport would fall.</p> <p>There may also be a psychological impact from construction activities and possible impact on property values and perceived quality of life. This may be positive or negative depending on proximity to the route and stage of the project (during construction or operation).</p>		
Working conditions Employment, workplace conditions, occupation, income.	<p>Ill health is often associated with economic deprivation.</p> <p>The construction of the Black Route and its complementary measures would aim to support regional economic development, through enhanced accessibility to employment centres and improvements in the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.</p>	General population, Income related groups	(+)
Services (access to and quality) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	<p>A new motorway would improve journey times and journey time reliability to benefit access to services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially sever communities located to the north and south of the new road, although there are few properties south of the Black Route.</p> <p>The construction of the Black Route and implementation of its complementary measures is unlikely to reduce access to any property, facilities or services during or post construction works. Any required route diversions would aim to maintain effective access and connections.</p> <p>Although there is no direct link between journey time saving and health, a new motorway would improve the driver experience and reduce driver stress.</p>	General population, Geographical groups	(++)

Assessment Criteria	Assessment	Distribution	Significance
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate. Macro-economic factors: political climate, GDP, economic development, policy climate.	<p>The draft Plan would deliver significant travel time savings and reliability benefits for businesses and commuters, leading to lower production costs and contributing to the competitiveness of transport dependent business in Wales. Improved accessibility within South Wales and to areas of England would lead to significant agglomeration benefits and higher productivity and/or employment in some sectors.</p> <p>The Black Route would cross the River Usk SAC, SSSI and the Gwent Levels SSSI and thus care would be required during construction. The route potentially traverses former and current industrial areas, encountering contaminated soils and waters, which may pose potential risks to health and the environment. Mitigation/enhancement measures could help ensure that adverse impacts are compensated for.</p> <p>The Black Route would help to reduce congestion, which should have some benefit in reducing vehicle emissions. However it is not clear whether the additional road capacity would lead to an overall increase in emissions in the long term.</p>	General population, Geographical groups, Income related groups	(++)

8.2 Reasonable Alternative: Red Route and Complementary Measures

Table 11 HIA Appraisal of Red Route and Complementary Measures

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education.	<p>The Red Route and its complementary measures could improve accessibility to health, care, training and education facilities and services, although this would be to a lesser extent than the Black and Purple Routes due to capacity and distance of the dual carriageway.</p> <p>Such benefit would also favour those with access to a private vehicle.</p> <p>Complementary measures could bring improved access to facilities for those who rely on other transport modes through improved walking and cycling infrastructure and linkages to public transport interchanges. This would be likely to encourage local trips to be made by such modes and as such benefit health and well-being.</p>	General population with access to a car	(+)

Assessment Criteria	Assessment	Distribution	Significance
Social and community influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos.	<p>The Red Route and its complementary measures could improve access to local support services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially sever communities located to the north and south of the new road.</p> <p>There are also on-going and potential further development sites along this route. There could also be some impact upon the Duffryn residential area, in terms of the need for property demolition to accommodate the road, which would need to be explored further at a project level.</p> <p>Provision of additional cycling and walking infrastructure would help encourage healthy lifestyle choices, particularly for local trips, as well as supporting social interaction and assisting in scene setting and place making.</p> <p>The Gwent levels are defined by Cadw as a landscape of Outstanding Historical Interest. There are limited means by which the effects of construction of the new road on the Historic Built Environment could be mitigated.</p>	General population, Geographical groups	(0)
Living conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces.	<p>The Red Route would help to reduce noise and air pollution along the route of the existing M4, where there are four AQMAs and higher than average noise levels, although to a lesser extent than Black and Purple motorway options due to capacity. However, noise and air quality would be expected to deteriorate in the area around the new road, which is in closer proximity to the Duffryn area compared to the Black Route. The impacts of air, noise and dust pollution during construction are likely to affect those who live in close proximity to the Red Route. Modern construction methods would aim to limit any impacts during this period.</p> <p>Provision of additional cycling and walking infrastructure would aim to be of a high quality and increase perceived safety for users.</p> <p>The Red Route would cross the River Usk SAC and SSSI and the Gwent Levels and would be likely to impact adversely on the landscape.</p> <p>The Red Route would improve safety by reducing traffic congestion and associated impacts on accidents and incidents. On</p>	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton, and the new road)	(0)

Assessment Criteria	Assessment	Distribution	Significance
	<p>completion, it is forecast that the total number of accidents on major roads in Newport would fall, although to a lesser extent than the Black and Purple motorway options.</p> <p>There may also be a psychological impact from construction activities and possible impact on property values and perceived quality of life. This may be positive or negative depending on proximity to the route and stage of the project (during construction or operation).</p>		
Working conditions Employment, workplace conditions, occupation, income.	<p>Ill health is often associated with economic deprivation.</p> <p>The construction of a new dual carriageway to the south of Newport would aim to support regional economic development, through enhanced accessibility to employment centres and improving the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.</p>	General population, Income related groups	(+)
Services (access to and quality) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	<p>A new dual carriageway would improve journey times and journey time reliability to benefit access to services and community facilities, although to a lesser extent than the motorway options. Whilst east-west transport connections would be enhanced, this measure may potentially sever communities located to the north and south of the new road, although there are few properties south of the Red Route.</p> <p>The construction of the Red Route and implementation of its complementary measures is unlikely to reduce access to any property, facilities or services during or post construction works. Any required route diversions would aim to maintain effective access and connections.</p> <p>Although there is no direct link between journey time saving and health, a new road would improve the driver experience and reduce driver stress.</p>	General population, Geographical groups	(+)

Assessment Criteria	Assessment	Distribution	Significance
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate. Macro-economic factors: political climate, GDP, economic development, policy climate.	<p>The construction of a dual carriageway to the south of Newport would aim to support regional economic development, through enhancing accessibility to employment centres and improving the movement of people and freight. However, future accessibility could be limited by capacity of the road.</p> <p>The new road would cross the River Usk SAC, SSSI and the Gwent Levels SSSI and thus care will be required during construction. The route potentially traverses former and current industrial areas, encountering contaminated soils and waters, which may pose potential risks to health and the environment. Mitigation/enhancement measures could help ensure that adverse impacts are compensated for.</p> <p>The new road would help to reduce congestion, which should have some benefit in reducing vehicle emissions. However it is not clear whether the additional road capacity would lead to an overall increase in emissions in the long term.</p>	General population, Geographical groups, Income related groups	(+)

8.3 Reasonable Alternative: Purple Route and Complementary Measures

Table 12 HIA Appraisal of Purple Route and Complementary Measures

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education.	<p>The Purple Route and its complementary measures would improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle.</p> <p>Complementary measures could bring improved access to facilities for those who rely on other transport modes through improved walking and cycling infrastructure and linkages to public transport interchanges. This would be likely to encourage local trips to be made by such modes and as such benefit health and well-being.</p>	General population with access to a car	(+)
Social and community influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos.	<p>A new motorway would improve journey times and journey time reliability to benefit access to regional support services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially sever communities located to the north and south of the new road, although there are few properties south of the Purple Route.</p> <p>Provision of additional cycling and walking infrastructure would help encourage healthy lifestyle choices, particularly for local trips, as well as supporting social interaction and assisting in scene setting and place making.</p> <p>The Gwent levels are defined as a landscape of Outstanding Historical Interest. There are limited means by which the effects of construction of the new road on the Historic Built Environment could be mitigated.</p>	General population, Geographical groups	(+)

Assessment Criteria	Assessment	Distribution	Significance
Living conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces.	<p>The Purple Route would help to reduce noise and air pollution along the route of the existing M4, where there are four AQMAs and higher than average noise levels. However, noise and air quality would be expected to deteriorate in the area around the new road, which is in closer proximity to the Duffryn area compared to the Black Route. The impacts of air, noise and dust pollution during construction are likely to affect those who live in close proximity to the Purple Route. Modern construction methods would aim to limit any impacts during this period.</p> <p>Provision of additional cycling and walking infrastructure would aim to be of a high quality and increase perceived safety for users.</p> <p>The Purple Route would cross the River Usk SAC and SSSI and the Gwent Levels and is likely to impact adversely on the landscape.</p> <p>The Purple Route would improve safety by reducing traffic congestion and associated impacts on accidents and incidents. On completion, it is forecast that the total number of accidents on major roads in Newport would fall.</p> <p>There may also be a psychological impact from construction activities and possible impact on property values and perceived quality of life. This may be positive or negative depending on proximity to the route and stage of the project (during construction or operation).</p>	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton, and the new road)	(0)
Working conditions Employment, workplace conditions, occupation, income.	<p>Ill health is often associated with economic deprivation.</p> <p>The construction of the Red Route and its complementary measures would aim to support regional economic development, through enhanced accessibility to employment centres and improvements in the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.</p>	General population, Income related groups	(+)

Assessment Criteria	Assessment	Distribution	Significance
Services (access to and quality) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	<p>A new motorway would improve journey times and journey time reliability to benefit access to services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially sever communities located to the north and south of the new road, although there are few properties south of the Purple Route.</p> <p>The construction of the Purple Route and implementation of its complementary measures is unlikely to reduce access to any property, facilities or services during or post construction works. Any required route diversions would aim to maintain effective access and connections.</p> <p>Although there is no direct link between journey time saving and health, a new motorway would improve the driver experience and reduce driver stress.</p>	General population, Geographical groups	(++)
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate.	<p>The Purple Route and its complementary measures would deliver significant travel time savings and reliability benefits for businesses and commuters, leading to lower production costs and contributing to the competitiveness of transport dependent business in Wales. Improved accessibility within South Wales and to areas of England would lead to significant agglomeration benefits and higher productivity and/or employment in some sectors.</p> <p>The Purple Route would cross the River Usk SAC, SSSI and the Gwent Levels SSSI and thus care would be required during construction. The route potentially traverses former and current industrial areas, encountering contaminated soils and waters, which may pose potential risks to health and the environment. Mitigation/enhancement measures could help ensure that adverse impacts are compensated for.</p> <p>The Purple Route will help to reduce congestion, which should have some benefit in reducing vehicle emissions. However it is not clear whether the additional road capacity would lead to an overall increase in emissions in the long term.</p>	General population, Geographical groups, Income related groups	(++)

8.4 Do Minimum

Table 13 HIA Appraisal of the Do Minimum Scenario

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education.	No impact is likely to arise from the Do Minimum scenario.	General population with access to a car	(0)
Social and Community Influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos.	Travel conditions on the M4 are forecast to worsen over time, reducing accessibility on the transport network. Increased congestion on the M4 could lead to severe disruption and congestion on the local and regional highway network, with significant delays and adverse effects on local roads being used as diversions. This would impact on local social networks, issues of severance and reduced accessibility.	General population, Geographical groups	(-)
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces.	Traffic conditions are expected to deteriorate and stop/start driving conditions would create an adverse travel experience, leading to higher levels of driver stress. Increased congestion would also exacerbate the risk of incidents and accidents occurring. A Do Minimum scenario would be detrimental to the environment as it would not, for example, achieve any improvement in air quality or noise, meaning that the Welsh Government and Newport City Council would not be able to fulfil their statutory duties for managing local air quality under Part IV of the Environment Act 1995, to meet the EU limit values for pollutants for the four Air Quality Management Areas which were declared as a result of emissions from traffic on the M4 motorway.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton, and the new road)	(-)

Assessment Criteria	Assessment	Distribution	Significance
Working Conditions Employment, workplace conditions, occupation, income.	<p>Ill health is often associated with economic deprivation.</p> <p>Congestion on the M4 between junctions 24 and 29 is already thought to be impacting on business performance and the level of congestion is expected to increase. Cardiff and Newport have ambitious regeneration strategies and Monmouthshire is developing areas around Junction 23A of the M4. Traffic congestion on the M4 could hamper these plans and impact negatively on regional economic development.</p> <p>Congestion on the M4, particularly around Cardiff and Newport, is sighted by the business community in South Wales as a barrier to economic growth. Where congestion increases, the cost of transport for businesses, commuters and consumers and economic performance can be affected.</p> <p>Increased congestion would adversely impact on the movement of commuters. The M4 is heavily used by commuters and there are already significant movements of commuters between Wales and England over the Severn Crossings. Increased congestion would result in higher journey times for commuters, reducing the effective travel to work area.</p>	General population, Income related groups	(-)
Services (access to and quality) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	<p>Travel conditions on the M4 are forecast to worsen over time, reducing accessibility and journey time reliability on the transport network, to all services.</p> <p>Increased congestion on the M4 may lead to severe disruption and congestion on the local and regional highway network, with significant delays and adverse effects on local roads being used as diversions.</p> <p>This would impact on local social networks, issues of severance and reduced accessibility.</p>	General population, Geographical groups	(-)

Assessment Criteria	Assessment	Distribution	Significance
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	<p>Increased traffic congestion on the M4 would impact negatively on regional economic development.</p> <p>Where congestion increases, the cost of transport for businesses, commuters and consumers; and economic performance could be affected.</p> <p>Increased congestion would result in higher journey times for commuters, reducing the effective travel to work area.</p> <p>A Do Minimum scenario would be detrimental to the environment as it would not, for example, achieve any improvement in air quality or noise, meaning that conditions would worsen in areas surrounding the existing M4.</p> <p>Furthermore, traffic conditions are expected to deteriorate and slow-moving, stop/start driving conditions could lead to higher CO₂ emissions than free-flowing traffic.</p>	General population, Geographical groups, Income related groups	(--)

9 HIA Appraisal Summary

Table 14 provides a comparative summary of the HIA appraisal of the public transport measures, highway infrastructure schemes and the complementary measures based on the existing WelTAG evidence.

Table 14 HIA Appraisal Comparative Summary

WelTAG Criteria	Appraisal of Measures			
	Draft Plan: Black Route and Complementary Measures	Reasonable Alternative: Red Route and Complementary Measures	Reasonable Alternative: Purple Route and Complementary Measures	Do Minimum Scenario
Lifestyle/capacity affecting health	(+)	(+)	(+)	(0)
Social and Community Influences affecting health	(+)	(0)	(+)	(-)
Living Conditions	(+)	(0)	(0)	(-)
Working Conditions	(+)	(+)	(+)	(-)
Services (access to and quality of)	(++)	(+)	(++)	(-)
Socio-economic, cultural and environmental	(++)	(+)	(++)	(--)

The draft Plan performs best against HIA criteria for all groups, although all highway options and their complementary measures bring positive benefits to health in the M4 Corridor around Newport. The Do Minimum scenario would lead to either minor or moderate adverse impacts on the majority of HIA criteria, affecting the majority of groups within the population.

10 Action Plan

Table 15 provides an overview of potential actions that the Welsh Government may consider as part of progressing any of the options within the draft Plan, should it be adopted, with or without amendments. The actions suggested below aim to enhance the possible beneficial impacts and/or mitigate against any potential adverse impacts on health.

Following the draft Plan Consultation, this Action Plan would be updated to take into account any relevant comments received. This would then be published within a final M4 Corridor around Newport HIA Report with a statement of results. Furthermore, this Action Plan would help to inform further HIA, if necessary, at a project (scheme) level, for any options that are progressed as part of the draft Plan, should it be adopted by the Welsh Government.

Most of the actions are relevant to a project (scheme) level of appraisal and monitoring would be undertaken by the Welsh Government, although this is also likely to be more appropriate at a project (scheme) level.

Table 15 Action Plan

Actions to be considered	Rationale	Relevant HIA Criteria
Use modern construction methods and appropriate management and mitigation of potential noise, air and dust pollution impacts during construction	Reduce possible adverse impacts of construction on the population.	Living Conditions
Ensure safe working practices during construction	Ensure the safety of workers and the community during construction.	Living Conditions
Consider measures to enhance the safety of users as part of any option	Improve the safety of road users and pedestrians.	Living Conditions
Appropriate diversions to any highway or pedestrian route should be made, if required, during construction works that might obstruct an existing route	To maintain access to properties, facilities and services during construction.	Services (access to and quality)
Work with the local community to explore appropriate pedestrian and cycling infrastructure improvements and new connections	To ensure that the benefits of the complementary measures are maximised. To improve local accessibility To encourage modal shift for local trips. To maximise health and wellbeing benefits.	Services (access to and quality) Lifestyle/capacity affecting health
Ensure appropriate mitigation measures are identified to offset any adverse impacts of an option on cultural and historical identity	Offset any adverse impacts of development on the landscape and cultural heritage.	Social and community influences affecting health

Actions to be considered	Rationale	Relevant HIA Criteria
Ensure the procurement process associated with any option targets local recruitment and training (during construction and maintenance activities)	Improve local opportunities and access to employment and training.	Working conditions Lifestyle/capacity affecting health
Seek sustainable sourcing of materials and minimise site waste (during construction and maintenance activities)	To support local suppliers and businesses. To limit carbon production and promote sustainability.	Socio-economic, cultural and environmental

11 How to respond and Further Information

Please respond to this Consultation by using the Consultation Response Form that accompanies this document. This can be completed and sent to the address shown below:

‘FREEPOST M4 CONSULTATION’

Alternatively, you can respond electronically via the following website links:

- www.wales.gov.uk/consultations under Transport; or
- www.m4newport.com

At www.m4newport.com you can also find further information about the draft Plan and its development.

This Consultation runs for 12 weeks, commencing on 23 September 2013 and closes on 16 December 2013.

The draft Plan Consultation Document, all draft Plan assessments, and the Response Form are available to download online at www.m4newport.com and are available to view or to take away as paper copies at the following deposit points, during the consultation period:

- Caldicot One Stop Shop, NP26 5DB;
- Castleton Village Hall, CF3 2UW;
- Liswerry Post Office, NP19 0JX;
- Magor Post Office, NP26 3EP;
- Newport Central Library, NP20 1PA;
- Newport Information Station, Newport, NP20 4AX; and
- Welsh Government, Cathays Park, Cardiff, CF10 3NQ.

Documents are also available at public drop-in exhibitions (see the draft Plan Consultation Document or www.m4newport.com for details).

Sufficient quantities of the consultation documents will be made available at each of the public drop-in exhibitions, where additional copies may also be requested for delivery.

Large print versions of this document are made available on request.

For further information please contact Allan Pitt (Communications Manager) via:

- ***Email: m4newport@arup.com;***
- ***Telephone: 029 20473727; or***
- ***Mail: Allan Pitt, Arup, 4 Pierhead Street, Cardiff CF10 4QP.***

Appendix A

HIA Scoping Responses

A1 Wales Health Impact Assessment Support Unit (WHIASU)



Comments on the M4 Corridor around Newport HIA, EqIA and SEA Scoping Documents

Having read all the Consultation documents, I understand that this is a large piece of work and that the consultation taken place so far has highlighted a number of issues to be addressed with regard to the current situation on the M4. The different enhancement measures including the Corridor around Newport are a response to this.

Overall, the Scoping Reports are good but I do have several comments and some amendments:

HIA Scoping Report

Approach to Reporting Section

Page 18: Second paragraph - Health Impact Assessment is defined as: This needs an academic reference to The Gothenburg Consensus.

Page 18: Should read 'Wales Health Impact Assessment Unit' not Welsh

Page 18: The determinants of health considered within the HIA should be much broader than those that are listed as interacting with the WeITAG criteria and TPOs. They should include those listed in Table 2.1 of this report. This mirrors those defined in Table 9.2 (page 171) of the WeITAG Guidance (the template for a HIA screening or appraisal tool).

Page 21 : Second paragraph - I agree with the statement about the HIA identifying vulnerable groups that will be affected and any potential adverse effects but a HIA can also identify any gaps in the options and highlight any positive impacts that may come from them. These could then be maximised. I am pleased that inequalities will be considered.

Page 21: Third paragraph - explain 'proportionate'? This is a significant transport study and therefore more than a desk based assessment of the evidence gathered already should take place.

Scoping section:

Page 22: I agree with the large amount of information and evidence that is being used to inform the HIA. I would like to see a short demographic and community health profile for the affected area(s) in the final HIA Report and for any impacts on the population to be reflected in the HIA.

Page 23: Third Paragraph. We strongly advocate that a separate HIA participatory stakeholder workshop take place to appraise the options. We can advise on this and provide examples of previous transport related HIA's (see below).

Page 23: Third paragraph - Should read 'Wales Health Impact Assessment Unit' not Welsh

The stakeholders listed are good but I would suggest that you may additionally want to invite and involve the following within any rapid participatory stakeholder workshop appraisal of the M4 Road around Newport or the HIA:

- Local Authority Health, Social Care and Wellbeing Strategy Manager or other nominated person with responsibility for this ie Partnerships Manager or Co-ordinator
- Local Authority Transport, Sustainability and Planning Officers/representatives
- Local Authority Community Partnerships Manager/Community Cohesion Officer
- Welsh Government Transport representative - perhaps the project lead?
- Local elected member or community councillor(s) for the affected wards
- Local residents and/or representatives - particularly those who live near the M4 and will be directly affected by the works
- Appropriate key others that these local stakeholders may recommend or suggest.

Page 24: First and second paragraph - that is very good.

Page 24: The WHIASU Short Guide to HIA has been replaced by 'HIA: A Practical Guide'. However, we are happy with the questions listed.

HIA Consultation and Liaison Section

With regard to the specific questions:

Page 25: Bullet point 1: No. The Welsh Practical Guide is listed but it would be helpful to read the following reports of completed HIA's following the introduction of WeITAG which demonstrate the process to be followed:

- Stage 1 and Stage 2 HIA reports on the A483/489 Road Transportation Study, Newtown, Powys
- Wrexham Industrial Estate Road Access Scheme (WIERA) HIA.

These are available on the WHIASU website (www.whiasu.wales.nhs.uk).

Bullet point 2: The main stakeholders are identified. However, you may want support from WHIASU, the LPHT of PHW and the LA's to identify other key stakeholders for any participatory workshops or the appraisal. PHW

Environmental Health Protection Directorate and colleagues may want to comment or participate as part of the HIA.

Bullet point 3: Yes. The main impacts will become apparent within the HIA process (and will probably reflect the findings to date of the consultation evidence).

However, the appraisal should not just consider the environmental/measurable impacts but also consider local stakeholder knowledge and qualitative evidence. The HIA should also assess the potential impacts of not only any operation of the road options but the impacts that may occur during the construction phase(s).

Page 25: We are pleased to see outlined what will happen with the information gathered for the HIA, the next steps and how the HIA will inform the decision making process.

SEA and EqIA Scoping Documents

No comments on either.

Overall

We suggest that the Scoping Report include some more detail with regard to the HIA and how it will be undertaken and specifically with regard to any participatory aspects. It is still very open in some respects. We would like to see it include the following:

- Defined timescales and geographical parameters for the assessment.
- Whilst aspects of the consultation are outlined these (ie events, letters sent out etc) we strongly advise that there is more direct involvement/engagement with those residents closest to the M4 Corridor as part of the HIA, particularly those likely to be affected by the works (as stated above). If this is done, then we would like who and how to be specified in any HIA report and/or the relevant documents cross referenced.

WHIASU

7th August 2013

A2 Public Health Wales



GIG
CYMRU
NHS
WALES

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Cymru
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13th August 2013

Dear Allan

M4 Corridor - Strategic Environmental Assessment Scoping Consultation.

We have consulted our technical advisors within Public Health Wales as well as PHE CRCE – Wales, and our comments are based on the information contained within the scoping report documentation. The scoping report relates to the Strategic Environmental Assessment (SEA) for proposed changes to the current M4 motorway configuration around Newport. Specifically the report outlines assessment in respect of changes between junctions 23 and 29 and provision of an alternative route between Magor and Castleton.

Overall we feel that the scope of the proposed SEA is appropriate in respect of public health assessment of the proposed revisions to the M4, detailing considerations for short, medium and long-term impact at local, regional and national levels and identifying the need for adequate contemporaneous baseline data.

The document identifies all relevant aspects with public health implications including air quality, noise, soil and water resources, as well as amenity and socio-economic factors. The report outlines current issues in relation to air quality (4 of the 7 air quality management areas for Newport currently lie along the area of the M4 under review), noise and traffic related activities.

Initial environmental impact assessment of the scheme, based upon expert judgement and data from earlier (2009) studies identifies potential negative impacts in respect of soil and water resources, and possible positive benefits concerning air quality and noise. In the case of air

quality and noise it is established that these are likely to improve along the current M4 corridor by increasing modal shift. However this will introduce potential for impact along the proposed new route. Furthermore it is noted that prevailing winds tend to be in a north easterly direction, which could encourage traffic emissions and noise to travel towards residential areas of Newport.

In light of the above we would stress the need for accurate contemporaneous data in respect of air quality and noise assessments and modelling for the proposed route to ensure that potential impacts will be suitably quantified and suggest close liaison is with relevant departments within the local authority.

Additionally, the proposed route under consideration potentially traverses former and current industrial areas, most notably Llanwern steelworks but also areas within Newport docks. As such we recommend that the assessment gives due regard to the potential for encountering contaminated soils and waters and that potential risks to health and the environment are evaluated and incorporated into the assessment including impact from potentially hazardous wastes for disposal and/or re-siting. Again we feel this will require the need to obtain accurate data on existing ground conditions along the route and the need to establish close liaison with the local authority.

Impact on water resources is identified and as such it is proposed that the assessment considers any private water supplies that may lie along the proposed route and also future waste water management both with regard to the construction phase and ongoing use of the road.

The health impact assessment section of the SEA has been reviewed in detail by WHIASU and their comments provided separately. We support the comments of WHIASU and would re-iterate the importance of establishing up-to-date baseline information and also the need to identify potentially sensitive receptors, such as areas where the young, elderly and infirm may be located close to the proposed route. We would also highlight the potential need to assess psychological impact of the scheme from construction activities and possible impact on property values and perceived quality of life.

Finally in respect of the 6 specific questions set within the consultation document we would provide the following answers:

1. Are there any specific policies, plans and programmes that will affect or influence environmental aspects of the draft Plan that we should address in our detailed review?

No Comment

2. Do you agree that the approach to reviewing and updating the baseline data summarised for inclusion in the Environmental Report is appropriate, i.e. is it at the right level and coverage across social and environmental issues? Do we propose to cover the correct geographic area and issues?

Obtaining updated baseline data is critical to the assessment and we agree with the current approach and scope within the SEA document

3. Do you know of any additional relevant baseline data which is pertinent to the draft Plan SEA? Do you collect any information that could be used to enhance the completeness of baseline information?

Local authority data / records on aspects such as contaminated land and planning applications along the proposed route will be important as will records of any permitted activities past and present, as held by Natural Resources Wales. Information on existing issues / complaints concerning noise and air quality along the proposed route may be helpful.

4. Do you agree that the identified SEA objectives are appropriate?

Yes

5. Is the SEA process set out transparent and appropriate?

Yes

6. Are any specific organisations who should be contacted as part of the SEA Environmental Report consultation process?

Consultation with the Met Office, in respect of longer-term climate predictions for the area may be useful, particularly in respect of flooding in view of the topographical setting of the land along parts of the proposed route.

Should you have any queries, please do not hesitate to contact me.

Yours sincerely



Huw Brunt

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A3 Natural Resources Wales

Mr Martin Bates
Project Director, Infrastructure Projects
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Ein cyf / Our ref: C.33.04.01/JP
Eich cyf / Your ref: 13/0663

20 August 2013

By email: martin.bates@wales.gsi.gov.uk

Dear Martin

**M4 CORRIDOR AROUND NEWPORT – RESPONSE FROM NATURAL
RESOURCES WALES ON HEALTH IMPACTS ASSESSMENT AND EQUALITY
IMPACTS ASSESSMENT**

Thank you for consulting Cyfoeth Naturiol Cymru / Natural Resources Wales about the above, which we received on 9 July 2013. This response is in relation to the Health Impacts Assessment and Equality Impacts Assessment only. Our comments with respect to the scoping report for a Strategic Environmental Assessment have been made in a separate response from our functionally separate unit the Strategic Assessment Team.

Natural Resources Wales brings together the work of the Countryside Council for Wales, Environment Agency Wales and Forestry Commission Wales, as well as some functions of Welsh Government. Our purpose is to ensure that the natural resources of Wales are sustainably maintained, used and enhanced, now and in the future.

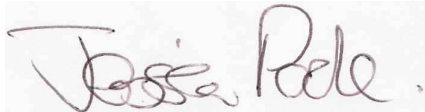
Health Impacts Assessment Scoping Report

Considerations of health in this context are not within the remit of Natural Resources Wales and we therefore have no comments to make on the scoping report for the Health Impact Assessment.

Equality Impacts Assessment Scoping Report

Similarly, Natural Resources Wales will not be providing comment on the Equality Impacts Assessment scoping report.

Yours sincerely



Jessica Poole
Team Leader
Cardiff and Newport District Team

cc Simon Power, ARUP (simon-j.power@arup.com)

Number: WG19741

M4 Corridor around Newport

We want your views on our draft Plan which aims to address transport related problems on the M4 around Newport



Llywodraeth Cymru
Welsh Government

www.cymru.gov.uk

**M4 Corridor
around Newport
draft Plan**

**Consultation
Document**

Consideration of the options in relation to the requirements of the Habitats Regulations

Date of issue: 23 September 2013

Responses by: 16 December 2013



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Table 7: Potential for significant effects on European Sites

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Figure 1: The Location of the M4 around Newport

Figure 2: Black, Red and Purple Route shown within the local study area and main constraints around Newport

Figure 3: Flow diagram detailing the AIES process

Appendices

Appendix A

Conservation Objectives

Appendix B

Appropriate Mitigation Measures

Appendix C

Matrix of Potential Effect on Qualifying Features

Appendix D

Figure showing European Designated Sites

Appendix E

Results

Large print versions of this document are made available on request. Please contact Allan Pitt via:

- Email: m4newport@arup.com;
- Telephone: 029 20473727; or
- Mail: Allan Pitt, Arup, 4 Pierhead Street, Cardiff CF10 4QP.

Glossary

The following terms are referred to in this Habitats Regulations Assessment (HRA) Consultation Document:

Table (i): Glossary of Terms

AIES	Assessment of Implications on European Sites. A process for the assessment of the implications of highway construction or improvement projects on protected sites, at the European level, where such sites are designated for their nature conservation interests
AQMAs	Air Quality Management Areas. Since 1997 local authorities in the UK have been carrying out a review and assessment of air quality in their area. The aim of the review is to assist authorities in carrying out their statutory duty to work towards meeting the national air quality objectives. If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area there
DMRB	Design Manual for Road and Bridges
Do Minimum	This is a scenario (sequence of future events) where intervention includes doing nothing above what is already planned or committed. In this case, it includes all recent network modifications (such as the Junction 24 improvement and the Variable Speed Limit system) and any committed schemes (such as the Junction 28/Bassaleg Roundabout/Pont Ebbw Roundabout improvement and the Steelworks Access Road)
draft Plan	This is the Welsh Government's preferred strategy to solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the draft Plan would lead to a new motorway (Black Route) being built to the south of Newport, alongside some complementary highway management, walking and cycling initiatives. Assessments of the draft Plan compare it to reasonable alternatives, as well as the Do Minimum scenario

EMS	The term 'European Marine Sites' collectively describes Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that are covered by tidal waters and protect some of our most important marine and coastal habitats and species of European importance.
EqIA	Equality Impact Assessment. A way of examining and analysing services, policies and strategies that identify existing and potential impacts on certain groups of people, and sometimes individuals
HIA	Health Impact Assessment. A process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan or a change to the organisation or delivery of a particular public service
HRA	Habitats Regulations Assessment. A process that considers the potential effects of plans and programmes on European Sites (protected habitats)
LDP	Local Development Plan. The required statutory development plan for each local planning authority area in Wales. This includes a vision, strategy, area wide policies for development types, land allocations, and where necessary policies and proposals for key areas of change and protection
LNR	Local Nature Reserves. A local site of importance for wildlife, geology, education or public enjoyment
M4 CEM	M4 Corridor Enhancement Measures. A Welsh Government initiative set up to explore and resolve issues of capacity, safety and resilience along the M4 corridor in South East Wales
NAPPAs	Noise Action Planning Priority Areas. Noise maps and associated plans are managed by the Welsh Government and local authorities to find where noise levels are high and help create noise action plans to address the issue
Newport Unlimited	The Urban Regeneration Company for Newport, working with public and private sectors to deliver physical change and support the economy of Newport.
NRW	Natural Resources Wales. From 1 April 2013, Natural Resources Wales took over the functions formally carried out by the Countryside Council for Wales and Forestry Commission Wales, along with the devolved functions of Environment Agency Wales and some functions that are currently carried out within the Welsh Government.

Reasonable Alternatives	These are reasonable alternatives to the draft Plan, being other options that the Welsh Government considers could solve transport related problems affecting the M4 Corridor around Newport in South Wales. If implemented, the reasonable alternatives would lead to either a new dual carriageway (Red Route) being built to the south of Newport, or a motorway solution along a similar alignment (Purple Route) alongside some complementary highway management, walking and cycling initiatives.
Ramsar Site	A Ramsar site is an internationally important wetland designated under the Ramsar Convention 1971. Under Government policy Ramsar sites receive the same level of protection as European sites (SAC and SPA).
SAC	Special Area of Conservation. Strictly protected sites with listed habitat types and species that are considered to be most in need of conservation at a European level (excluding birds). cSACs are candidate Special Areas of Conservation where the features are internationally important and the site has been registered for adoption with the European Commission.
Scheme / Project	For individual schemes or projects, the appropriate level of appraisal is more detailed, quantitative and evidence-based ¹
SEA	Strategic Environmental Assessment. A process that provides for the high level protection of the environment, by ensuring the integration of environmental considerations into the preparation of plans and programmes and to contribute to the promotion of sustainable development and environmental protection
SEWTA	The South East Wales Transport Alliance is a consortium of 10 local authorities which prepares and co-ordinates regional transport policies, plans and programmes on behalf of its constituent councils
SDR	Southern Distributor Road. In this case, the A48 Southern Distributor Road, Newport
SPA	Special Protection Area. Strictly protected sites at a European level, classified for rare and vulnerable birds and for regularly occurring migratory species. pSPAs are potential Special Protection Areas where the features are internationally important and the site has been registered for adoption with the European Commission.
SSSI	Sites of Special Scientific Interest. Legally protected sites for wildlife and geology conservation
Strategy, Plan or Programme	A strategy, plan or programme sets out broad objectives, identifies measures to achieve these and proposes a typically broad package of interventions to achieve the objectives. The appropriate level of appraisal is also broad, and at a strategy level, it may only be possible to undertake appraisal qualitatively ¹

¹ Source: Welsh Transport Planning and Appraisal Guidance (WelTAG), June 2008

SWATS	South Wales Area Traffic Study
TEN-T	Trans-European Transport Network
TPOs	Transport Planning Objectives
TR111 Notice	Once a preferred route of a transport scheme is announced, the Welsh Government serves a statutory TR111 notice on the local planning authorities requiring the line to be protected from development
UDP	Unitary Development Plan. It sets out a range of policies and proposals relating to future development, and deals with the use and conservation of land and buildings within local planning authorities. All UDPs are to be replaced by a Local Development Plan (LDP)
WelTAG	Welsh Transport Planning and Appraisal Guidance is a transport appraisal tool applicable to transport projects, plans and programmes in Wales. The Welsh Government requires that major transport initiatives seeking government funding are appraised with this guidance.

1 Introduction

Please read this document alongside the overarching M4 Corridor around Newport draft Plan Consultation Document².

A draft Plan has been developed taking into account the extensive work undertaken as part of the M4 Corridor Enhancement Measures (CEM) Programme. The M4 CEM Programme was set up to explore and resolve issues of capacity, safety and resilience along the M4 Corridor around Newport, in South East Wales. It was based upon the ability to deliver and identify measures in phases to improve affordability.

As a result of on-going discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4. On 26 June 2013, Edwina Hart AM CStJ MBE, Minister for Economy, Science and Transport, published the following written statement:

“Addressing the capacity and resilience issues on the M4 around Newport is the top transport challenge that we face in ensuring that Wales has an effective economic infrastructure which improves our competitiveness and access to jobs and services.

As a result of ongoing discussions with the UK Government there has been a significant change in the assessment of the affordability of a major enhancement of the M4.

Building on the extensive development and consultation work undertaken on M4 Corridor Enhancement Measures (CEM), we will be consulting formally over the summer with Natural Resources Wales in order to go out to public consultation this September with a finalised draft Plan and Strategic Environmental Assessment (SEA) Report.

If implemented, the draft Plan would lead to a motorway being built south of Newport.”

The main element of the draft Plan is the provision of a section of three lane motorway between Junctions 23 and 29 on the south side of Newport. It is described on page 18 and shown as the Black Route in Figure 2 on page 23. The draft Plan would also include the following Complementary Measures:

² The draft Plan Consultation Document is available online at www.m4newport.com or in paper copy (see Chapter 11)

Table 1: Complementary Measures of the M4 Corridor around Newport

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

The consultation document also provides information on two “reasonable alternatives” to the draft Plan and a “Do Minimum” which considers the consequences of doing nothing above what is already planned.

The main elements of the two reasonable alternatives are described on pages 19 to 21 and shown in Figure 2. They are the Red Route which is a dual carriageway and the Purple Route which is a three lane motorway. Both routes would also have complementary measures.

The draft Plan does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. That report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

The Welsh Government is seeking your views on the draft Plan and its reasonable alternatives, which aims to address transport related problems on the M4 Corridor around Newport, taking into account the responses to various assessments. We also want your views on the Do Minimum scenario and the associated assessments which are:

- Habitats Regulations Assessment (HRA);
- Strategic Environmental Assessment (SEA);
- Health Impact Assessment (HIA); and
- Equality Impact Assessment (EqIA).

These assessments consider the potential environmental, health and equality impacts of the draft Plan, its reasonable alternatives and the Do Minimum scenario. These are separate documents but are referred to in this draft Plan Consultation. As such, they will be reviewed and finalised to take into account and address any comments arising from the consultation.

Using the feedback received from the consultation, the Welsh Government will decide whether to adopt the draft Plan, with or without amendments, taking into account the responses to the associated assessments.

1.1 Purpose

This document considers the four options (draft Plan Black Route, reasonable alternative Red Route, reasonable alternative Purple Route, and the Do Minimum scenario) in relation to the requirements of the Conservation of Habitats and Species Regulations 2010 (as amended), known as and referred to in this report as the Habitats Regulations. This document will be subject to public consultation alongside the draft Plan Consultation Document and associated assessments. The responses to the consultation will then be used to review and finalise a Habitats Regulations Assessment (HRA) Screening Report and a Statement to inform an Appropriate Assessment.

1.2 Requirements of the Habitats Regulations

Before deciding to undertake or give authorisation for a plan or project the Welsh Government as a determining body and competent authority, must consider under the requirements of Regulation 61 whether the plan or project —

(a) is likely to have a significant effect on a European site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

and in such cases they must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

A plan or project should only be undertaken or authorised if it can be shown that it will not result in an adverse effect on the integrity of European sites except in situations of imperative reasons of overriding public interest where compensation measures have been included.

The assessment primarily assesses the consideration of the likely significant effects of the draft Plan, its reasonable alternatives and the Do Minimum scenario on the European designated sites. In the case of any likely significant effects arising, consideration of effects in relation to the conservation objectives will be assessed.

1.3 Aims for this document

Therefore, the aims of this document are to provide information on the:

- Identification of which European sites are in the vicinity of the measures contained within the draft Plan;
- Identification of which measures have the potential, subject to further work, to give rise to effects on European sites;
- Identification of the relevant qualifying interests/interest features of each European site being considered;
- Identification of the relevant conservation objectives of these European sites;
- Identification and characterisation of the potential impacts of a particular option before mitigation;
- Identification of plans or projects which may cause significant effects on the European sites;
- Characterisation of the significance of the potential in combination effects with other plans and projects;
- Consideration of effects in relation to conservation objectives; and
- Identification of additional mitigation measures.

2 Background

The M4 in South Wales forms part of the Trans-European Transport Network (TEN-T), which provides connections throughout Europe by road, rail, sea and air. The M4 plays a key strategic role in connecting South Wales with the rest of Europe, providing links to Ireland via the ports in South West Wales and England and mainland Europe to the east. It is a key east-west route being the main gateway into South Wales and also one of the most heavily used roads in Wales.

Providing a facility for transporting goods, linking people to jobs and employment sites as well as serving the Welsh tourism industry, the M4 is critical to the Welsh economy. Cardiff, Newport and Swansea have ambitious regeneration strategies and Monmouthshire County Council is developing areas around Junction 23A of the M4. Rhondda Cynon Taff has important gateways onto the motorway at Junctions 32 and 34. Bridgend is served by M4 Junctions 35 and 36. Neath Port Talbot straddles the motorway and gets important access from Junctions 38 to 43. Congestion on the M4 causing unreliable journey times and reduced service levels will therefore hinder economic development in South Wales.

The M4 between Junctions 28 and 24 was originally designed as the 'Newport Bypass' with further design amendments in the 1960s to include the first motorway tunnels to be built in the UK. The M4 Motorway between Magor and Castleton does not meet modern motorway design standards. This section of the M4 has many lane drops and lane gains, resulting in some two-lane sections, an intermittent hard shoulder and frequent junctions. It is congested during weekday peak periods resulting in slow and unreliable journey times and stop-start conditions with incidents frequently causing delays.

This is why problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years. The motorway and surrounding highway network does not cope with sudden changes in demand or operation, for example as a result of accidents or extreme weather events. These issues are worse at times of peak travel (rush hour) and, as the number of users on the network increase, they are set to worsen.

The M4 Corridor around Newport is shown in Figure 1.

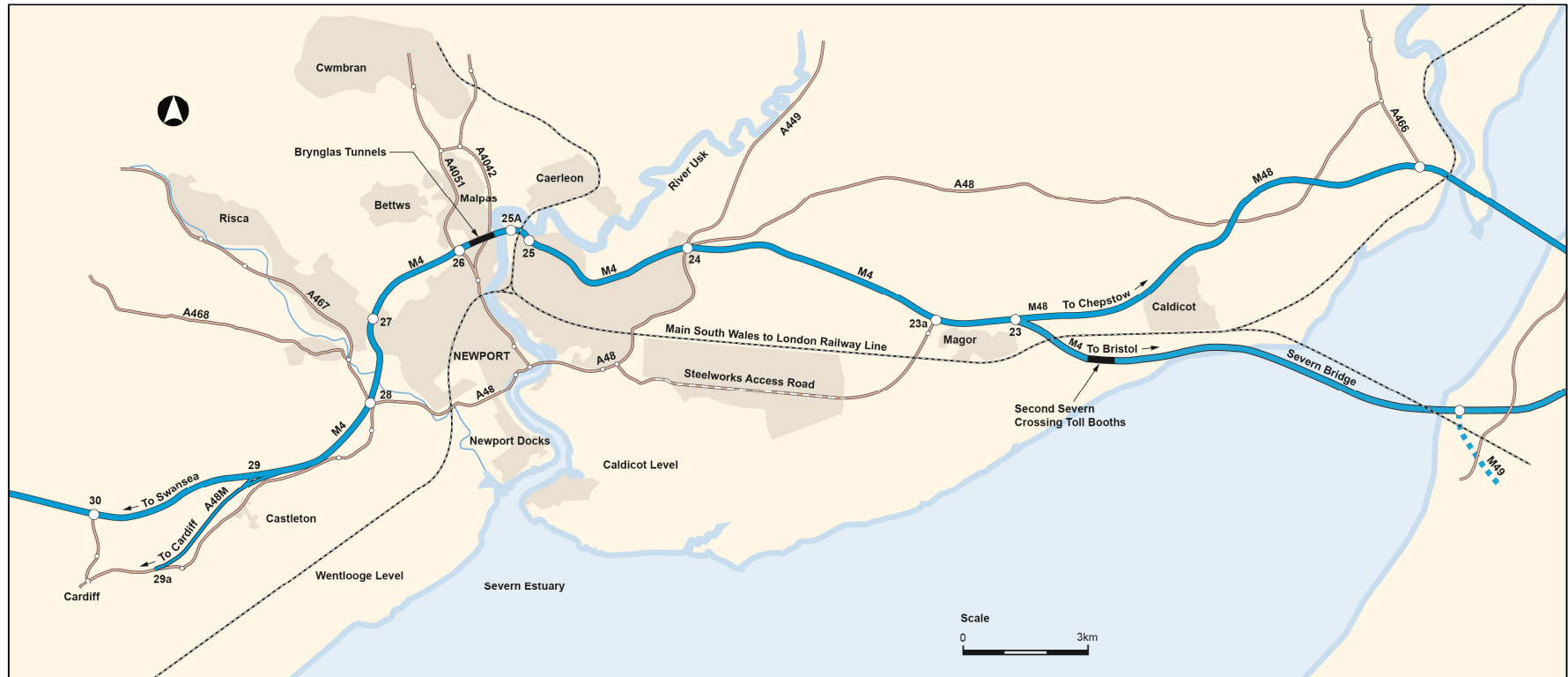


Figure 1: The Location of the M4 around Newport

3 Problems, Aims and Goals

3.1 Relationship to M4 CEM Programme

The problems, goals and aims of the M4 CEM Programme were subject to dialogue during the early stages of the engagement process, with public and stakeholders.

17 problems were identified; which encompassed issues of capacity, (network) resilience, safety and sustainable development. It is considered that the problems have not changed since 2012.

15 goals were identified and each one aimed to address one or more of the problems. As the problems have not changed there was no need to revisit the goals.

3.2 Problems on the M4 Corridor around Newport

The 17 identified transport related problems are listed below³.

As part of the M4 CEM Consultation, respondents were asked to prioritise up to four problems out of the full list. Problems 1, 5, 7 and 9 shown in bold italics were selected the most times by those who responded to the M4 CEM Consultation.

Capacity

1. ***A greater volume of traffic uses the M4 around Newport than it was designed to accommodate, resulting in regular congestion at peak times over extended periods.***
2. The M4 around Newport is used as a convenient cross town connection for local traffic, with insufficient local road capacity.
3. HGVs do not operate efficiently on the motorway around Newport.
4. There is insufficient capacity through some of the Junctions (e.g. 3 lane capacity drops to 2 lane capacity).
5. ***The 2-lane Brynglas tunnels are a major capacity constraint.***
6. The M4 cannot cope with increased traffic from new developments.

Resilience

7. ***Difficulties maintaining adequate traffic flows on the M4 and alternative highway routes at times of temporary disruption; alternative routes are not able to cope with M4 traffic.***
8. The road and rail transport system in and around the M4 Corridor is at increasing risk of disruption due to extreme weather events.
9. ***When there are problems on the M4, there is severe disruption and congestion on the local and regional highway network.***
10. The M4 requires essential major maintenance within the next 5-10 years; this will involve prolonged lane and speed restrictions, thus increasing congestion problems.
11. There is insufficient advance information to inform travel decisions when there is a problem on the M4.

³ Problems shown in bold were most frequently identified by M4 CEM respondents. See Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013.

Safety

12. The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorways⁴.
13. The existing M4 is an inadequate standard compared to modern design standards.
14. Some people's driving behaviour leads to increased accidents (e.g. speeding, lane hogging, unlicensed drivers).

Sustainable Development

15. There is a lack of adequate sustainable integrated transport alternatives for existing road users.
16. Traffic noise from the motorway and air quality is a problem for local residents in certain areas.
17. The existing transport network acts as a constraint to economic growth and adversely impacts the current economy.

3.3 Aims for the M4 Corridor around Newport

The aims of the Welsh Government for the M4 Corridor around Newport are to:

1. Make it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road.
2. Deliver a more efficient and sustainable transport network supporting and encouraging long-term prosperity in the region, across Wales, and enabling access to international markets.
3. To produce positive effects overall on people and the environment, making a positive contribution to the overarching Welsh Government goals to reduce greenhouse gas emissions and to making Wales more resilient to the effects of climate change.

The draft Plan aims to help to achieve or facilitate these aims as part of a wider transport strategy for South East Wales, as outlined within the Prioritised National Transport Plan⁵.

3.4 Goals of the M4 Corridor around Newport

The Welsh Government, with the help of others, identified 15 goals⁶ for the M4 CEM Programme. These goals aim to address the identified transport related problems listed in section 3.2. For clarity goals are referred to as "Transport Planning Objectives" (TPOs) in WelTAG (see Glossary).

The 15 goals (listed below) provide a framework in which to appraise the relative performance at a strategic level of the draft Plan, the reasonable alternatives and the Do Minimum scenario.

As part of the M4 CEM Consultation respondents were asked to prioritise up to 4 goals out of the full 15. Goals 1, 4, 5 and 7 shown in bold italics were selected the most.

⁴ The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. The first year of operation has shown a reduction in accidents, and it is to be hoped that records in subsequent years will confirm this trend.

⁵ National Transport Plan (2010) & Prioritised National Transport Plan (2011) Welsh Government

⁶ Goals shown in bold were most frequently identified by M4 CEM respondents. See Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013.

If the draft Plan (or any reasonable alternative to the draft Plan) is successful, its success will be measured by how well it achieves the following goals:

- 1. *Safer, easier and more reliable travel east-west in South Wales.***
2. Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.
3. More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport.
- 4. *Best possible use of the existing M4, local road network and other transport networks.***
- 5. *More reliable journey times along the M4 Corridor.***
6. Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives.
- 7. *Improved safety on the M4 Corridor between Magor and Castleton.***
8. Improved air quality in areas next to the M4 around Newport.
9. Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor.
10. Reduced greenhouse gas emissions per vehicle and/or person kilometre.
11. Improved travel experience into South Wales along the M4 Corridor.
12. An M4 attractive for strategic journeys that discourages local traffic use.
13. Improved traffic management in and around Newport on the M4 Corridor.
14. Easier access to local key services and residential and commercial centres.
15. A cultural shift in travel behaviour towards more sustainable choices.

3.5 Consequences of Doing Nothing

Analysis shows that in 2012 during week day peak periods (also known as ‘rush hour’), traffic flows approach 100% of capacity along sections of the M4 around Newport⁷. Once flows exceed 80% of capacity, traffic can expect operational problems (frequent traffic jams). The more congested road conditions become, the greater the risk of incidents and accidents occurring. In the future, the situation is expected to deteriorate further.

Forecasts of future traffic volumes show that in the Do Minimum situation, traffic congestion will be severe on most links by 2020 and by 2035 the motorway around Newport will be heavily congested, with all sections between J23A and J29 experiencing flows above 100% of capacity during weekday peak periods⁸.

Congestion on the M4, particularly around Cardiff and Newport, is cited by the business community in South Wales as a barrier to economic growth. Where congestion increases, the cost of transport for businesses, commuters, consumers and economic performance can be affected. Increased congestion will also result in longer journey times for commuters, reducing the effective travel to work area.

In terms of the environment, local authorities in the UK work towards meeting the national air quality objectives and if a local authority finds any places where the objectives are not

⁷ Source: Arup analysis 2012

⁸ Source: Arup analysis 2012

likely to be achieved, it must declare an Air Quality Management Area. Out of Newport's seven Air Quality Management Areas (AQMAs), four are associated with the M4. Higher traffic volumes along the M4 are likely to contribute not only to poor air quality, but also noise pollution, compromising the amenity of neighbouring residential communities. Assuming no improvements to vehicle emissions technology, the increased flows and stop start conditions will give rise to more vehicle emissions along these routes. It is important to note that stop-start congested traffic can result in higher CO₂ emissions than free-flowing traffic. Alongside the motorway at Newport, there are also Noise Action Planning Priority Areas (NAPPAs), which investigate where noise levels are high and help create noise action plans to address the issue.

The AQMAs in Newport are available to view on the Newport City Council website⁹, whilst recently published Wales Noise Maps are being used to help the Welsh Government to develop and implement a noise action plan for Wales, which is due to be published later in 2013. These are also available on the Welsh Government website¹⁰.

⁹ See

http://www.newport.gov.uk/_dc/index.cfm?fuseaction=environmentalhealth.homepage&contentid=cont446709

¹⁰ See <http://data.wales.gov.uk/apps/noise/>

4 Previous Work

Since 1991, much assessment and consultation has been undertaken to develop a preferred solution to the problems on the motorway around Newport. A summary of previous work is provided below and a more detailed history is documented in the M4 Corridor around Newport WelTAG Appraisal Report Stage 1 (Strategy Level)¹¹.

For many years, concerns have been raised regarding the potential for delays on the motorway and trunk road network in South Wales.

In March 1989, the Secretary of State for Wales commissioned the South Wales Area Traffic Study (SWATS) to review traffic patterns over part of the trunk road network in South Wales in order to identify problem areas and propose possible solutions. The SWATS Report (1990) identified the need for substantial improvement to the M4 to address a growing capacity issue on the motorway, in particular the section between Magor and Castleton.

As a consequence, a proposal for a relief road to the south of Newport (which became known as the 'M4 Relief Road', and later, the 'New M4 Project' as a new dual 3-lane motorway) was included in the Welsh Trunk Road Forward Programme in 1991. An M4 Relief Road Preferred Route was published in 1995 and amended in 1997.

In 2004, the then Minister for Economic Development and Transport reported on the outcome of his review of transport programmes, which were undertaken to ensure a strategic fit with: 'Wales: A Better Country' and the Wales Spatial Plan. One of the conclusions of the review was that additional capacity was still required on the M4 motorway in South East Wales, in order to reduce congestion, improve resilience and remove an obstacle to greater prosperity along the whole corridor through to Swansea and West Wales. In addition to widening the motorway north of Cardiff, the Minister announced proposals to develop a New M4 south of Newport between Magor and Castleton.

Following Ministerial Review in 2004, the New M4 Project was the subject of a thorough re-examination in order to ensure fit with policies at that time and to take account of physical and legislative changes. Three key activities were undertaken:

1. A re-examination of route corridors considering, in particular, the implications and consequences of legislative changes and physical developments within the original project study area;
2. A comprehensive review of the previously published M4 Relief Road Preferred Route; and
3. A Junction Strategy Review.

The conclusion of these studies confirmed the route to the south of Newport as the optimal solution to tackling the problems of congestion on the M4 corridor around Newport. Following the Preferred Route and Junction Strategy Review, a TR111¹² notice (April 2006) was published to protect a revised route corridor. A series of public exhibitions were held in April and May 2006 to explain the changes to the public and other stakeholders with an interest in transport in South Wales.

¹¹ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013

¹² Once a preferred route is announced, Welsh Government serves a statutory notice (TR 111) on the local planning authorities requiring the line to be protected from development. The statutory blight rules come into play. This is enacted under Article 19 of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012. .

4.1.1 M4 Corridor Enhancement Measures (M4 CEM) Programme

A written statement in July 2009, by the then Deputy First Minister Ieuan Wyn Jones, announced that the New M4 was not affordable. The statement, however, accepted “*the need to urgently address safety and capacity issues on the existing route*” through the introduction of “*a range of measures*”.

The M4 Corridor Enhancement Measures (CEM) Programme¹³ was therefore initiated by the Welsh Government and this aimed to create a package of measures to deal with resilience, safety and reliability issues within the M4 corridor between Magor and Castleton.

Under the M4 CEM Programme, a long list of possible solutions was explored. Packages that combined public transport, highway and other travel solutions were identified for appraisal. These included widening of the M4 between Junctions 24 and 29 as well as improvement to the existing road network to the south of Newport city centre and a new dual carriageway all-purpose road to the south of Newport.

As part of the M4 CEM Programme, a comprehensive engagement process was launched in September 2010 culminating in a public consultation held between March and July 2012. During the engagement process, the Welsh Government and its project team engaged with both internal and external specialists and expert stakeholders. This process encompassed a diverse range of views and interests relating to transport in South Wales, as well as with people likely to be interested in and affected by any transport measures potentially adopted and implemented by Welsh Government. The consultation resulted in public support for the provision of an additional high quality road to the south of Newport¹⁴, supported by additional measures to address travel related problems within the M4 Corridor. These were referred to as Common Measures. They comprised a mix of network improvements, network management, demand management, alternative modes and smarter sustainable choices. The M4 CEM WelTAG Stage 1 (Strategy Level) Appraisal¹⁵ concluded that the following measures were worthy of further consideration:

- A new dual carriageway route to the south of Newport (Red Route alternative to the draft Plan);
- Public transport enhancement; and
- Common measures.

¹³ Further details of the M4 CEM Programme and its evolution are available at www.m4cem.com.

¹⁴ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013

¹⁵ Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, March 2013

4.1.2 M4 Corridor around Newport draft Plan

Recent initiatives, including discussions between the Welsh Government and HM Treasury/Department for Transport, as well as the work of the Silk Commission¹⁶, have created future potential funding opportunities for Welsh Government infrastructure projects. As a consequence, the decision was taken by the Welsh Government to further reconsider solutions to resolve transport related problems on the M4 around Newport.

Thus, in order to inform the strategy for the M4 Corridor around Newport, a further M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal¹⁷ has been undertaken of options that include M4 CEM measures, provision of new motorway capacity routed to the south of Newport and complementary measures. The options considered within the WelTAG Appraisal were as follows:

1. A new section of 3-lane motorway to the south of Newport following a protected (TR111) route (Black Route);
2. A new dual 2-lane all-purpose road to the south of Newport following an alignment that would allow it to be constructed in phases (Red Route);
3. A new section of 3-lane motorway to the south of Newport along a similar alignment to the all-purpose road (Purple Route);
4. Public transport measures; and
5. Complementary network management and/or network improvement measures.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal concluded that a new section of 3-lane motorway to the south of Newport following a protected (TR111) route, in addition to complementary network management and/or network improvement measures, would best achieve the goals and address the problems of the M4 Corridor around Newport, and should be progressed for further appraisal.

These options have subsequently formed the basis for the development of the draft Plan, which is described further in Section 5.

The M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal also acknowledged that public transport enhancement will contribute to some of the goals of the M4 Corridor around Newport. This draft Plan however does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. The report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales.

¹⁶ The 'Silk' Commission on Devolution in Wales, which is reviewing the case for the devolution of fiscal powers and reviewing the powers of the National Assembly for Wales, due to report in Spring 2014.

¹⁷ Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, June 2013.

5 The draft Plan

In recognising the range of the goals for the M4 Corridor around Newport, the draft Plan combines both highway infrastructure and other demand management solutions in identifying a preferred strategy.

The draft Plan for the M4 Corridor around Newport (the preferred strategy) consists of:

- A new section of 3-lane motorway between Magor and Castleton to the south of Newport along the TR111 protected corridor of the Black Route; and
- Complementary Measures (see table 2, overleaf).

The reasonable alternatives to the draft Plan include:

- A dual 2-lane all-purpose road (Red Route); or
- A motorway solution along a similar alignment (Purple Route); in addition to
- Complementary Measures.

The draft Plan and the reasonable alternatives have been assessed against the ‘Do Minimum’ scenario. The Do Minimum scenario means doing nothing above what is already planned or committed.

The draft Plan and reasonable alternatives are described in more detail below and illustrated in Figure 2.

5.1 The draft Plan (Preferred Strategy)

5.1.1 Motorway following TR111 Protected Route – The Black Route and Complementary Measures

This draft Plan comprises the construction of a new 3-lane motorway mainly following the protected TR111 ‘Black Route’, between Junctions 23 and 29, including a new crossing of the River Usk south of Newport. The River Usk is designated as a Special Area of Conservation (SAC).

The TR111 route to the south of Newport has remained protected for planning purposes since April 2006. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation and analysis. The aim is to minimise the impact on the environment, whilst fully meeting current motorway design and safety standards. Minor changes to the alignment of the TR111 protected route could still be made, subject to further investigation, if this option is taken forward. This motorway solution would be delivered as one scheme.

If this draft Plan is adopted a junction strategy would be investigated as part of scheme’s development.

The alignment of the Black Route is shown in the context of local constraints in Figure 2 on page 23.

In addition to the new highway infrastructure, there are additional complementary measures that could assist in alleviating travel related problems within the M4 Corridor around Newport. The draft Plan’s complementary measures are as follows:

Table 2: Complementary Measures for the Black Route (Preferred Strategy)

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

5.2 Reasonable Alternatives to the draft Plan

5.2.1 Dual 2-lane All-Purpose Road – The Red Route and Complementary Measures

This option involves the construction of an additional high quality road to the south of Newport, as a dual carriageway solution. The route aims to minimise negative impacts on local communities and the environment. As a dual carriageway on this corridor alignment, the road could be delivered in phases by tying into the existing road network in Newport. Delivery could thus be phased with availability of funding. However, the main benefits would only be realised when the route is complete.

This road will require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Red Route is further north compared to that of the Black Route and the impact on the Port of Newport operations may be less. However, the alignment would pass through and have significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Duffryn. There are also on-going and potential further development sites along this route.

The alignment of the Red Route is shown in the context of local constraints on Figure 2 on page 23.

In addition, the following complementary measures could assist the Red Route in alleviating travel related problems within the M4 Corridor around Newport:

Table 3: Complementary Measures for the Red Route (Reasonable Alternative)

Complementary Measure	Description
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

5.2.2 Motorway along Alternative Alignment to the South of Newport – The Purple Route and Complementary Measures

In order to fully represent the highway options to the south of Newport, this option comprises a 3-lane motorway along a similar route to that which is proposed for the Red Route (dual 2-lane all-purpose road). A difference between the two routes being the purple route has a more northerly alignment to cross the northern end of the North Dock at the Port of Newport.

This new motorway will require a new crossing of the River Usk, which is designated as a Special Area of Conservation (SAC).

The alignment of the Purple Route is such that the impact on the Port of Newport is minimised. However, there could be significant impact upon the Newport City Council's Docks Way landfill site. The route runs close to the residential area, Duffryn. There are also on-going and potential further development sites along this route.

The alignment of the Purple Route is shown in the context of local constraints on Figure 2 on page 23.

In addition, the following complementary measures could assist the Purple Route in alleviating travel related problems within the M4 Corridor around Newport.

Table 4: Complementary Measures for the Purple Route (Reasonable Alternative)

Complementary Measure	Description
Re-classify existing M4 between Magor and Castleton	Re-classify the existing motorway as a trunk road, which could enable traffic management, safety and revised access measures. These could include modifications to interchanges at Magor and Castleton. Only certain classes of motorised vehicles can use motorways and they should have no traffic signals, intersections or property access. They are free of any ground level crossings with other roads, railways, or pedestrian paths, which are instead carried by overpasses and underpasses across the highway.
M48 – B4245 Link	New single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23A and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

Complementary Measure	Description
Provide walking friendly infrastructure	Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

5.3 Do Minimum Scenario

The Welsh Government is committed to continuing to improve transport in South Wales. Practical measures to make travel safer and easier on the M4 motorway around Newport have included replacing sections of steel central barriers with concrete barriers, the introduction of Variable Speed Limit systems and improvements to the roundabout at Junction 24 at Coldra.

The Do Minimum scenario means doing nothing above what is already planned or committed. This scenario therefore comprises minimum intervention but in this case does include a number of highway schemes, which are currently committed to be completed between 2020 and 2035 as follows:

Welsh Government Schemes:

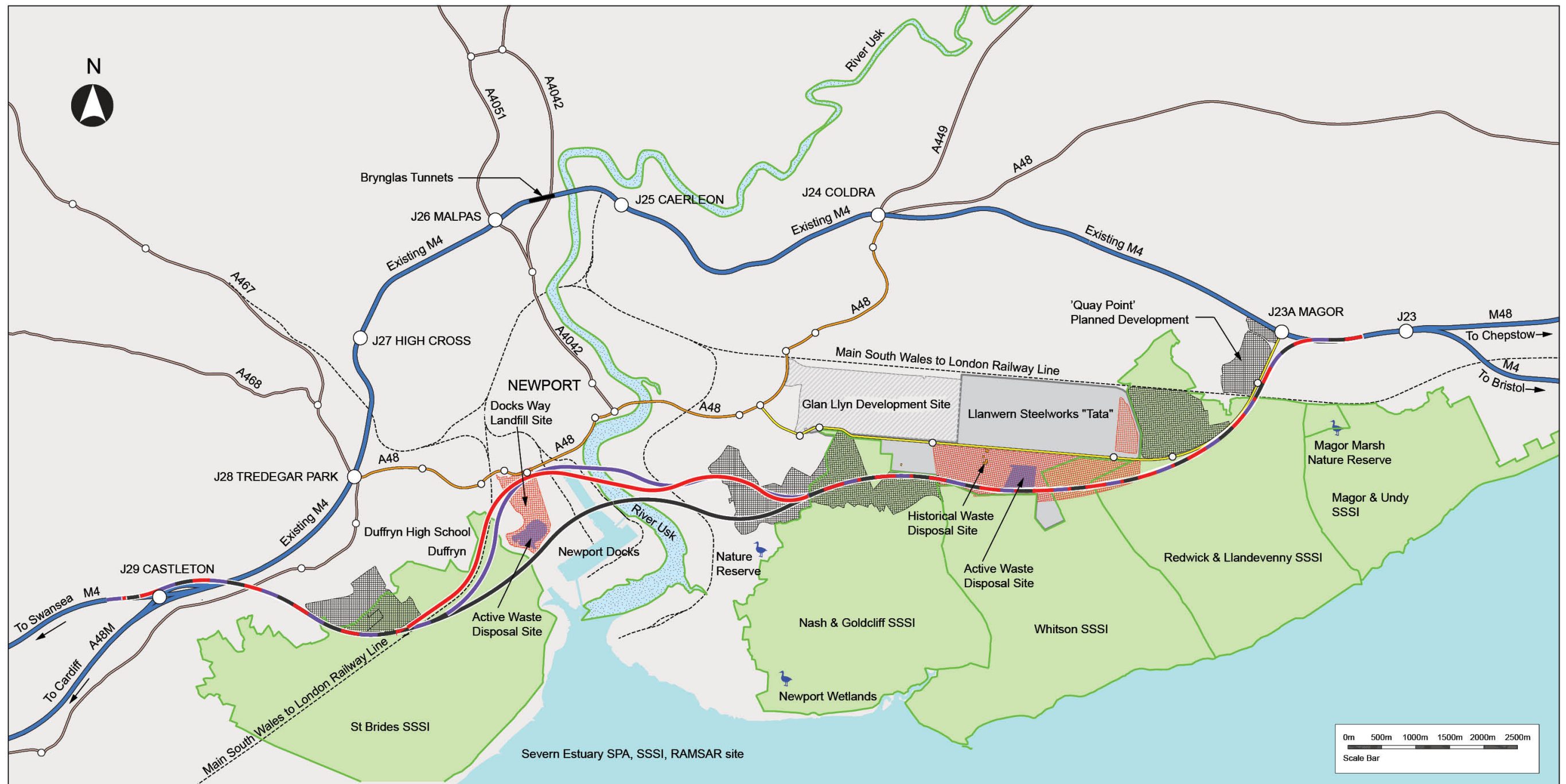
- The recently opened Newport Steelworks Access Road Phases 1 and 2 (the former Llanwern Steelworks access road);
- Junction 28 roundabout, enlarged signalled gyratory scheme including associated improvements to the A467 Bassaleg roundabout and A48 Pont Ebbw; and
- A465 Heads of the Valleys Dualling (Gilwern to Hirwaun).

Newport City Council Scheme:

- Link through Newport Eastern Expansion Areas between Steelworks Access Road and A48 SDR (Cot Hill junction, signalised with full movements).

Alongside these schemes, the Do Minimum scenario also consists of a number of development proposals throughout South East Wales, which are committed through the planning process and are due to be completed at various stages to 2035.

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Legend

- Black Route (the main element of the draft Plan)
- Red Route (the main element to the 'reasonable alternative' to the draft Plan)
- Purple Route (the main element to the 'reasonable alternative' to the draft Plan)
- Employment Land Allocation from Newport Unitary Development Plan
- Newport Southern Distributor Road
- Steelworks Access Road
- - - - - Existing Railway Lines
- Sites of Special Scientific Interest (SSSI)
- River Usk SAC and SSSI

Figure 2: Black, Red and Purple Route shown within the local study area and main constraints around Newport

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6 Methodology

All plans and projects should identify any possible impacts on European Sites early in the plan-making process and then either alter the plan to avoid them or introduce mitigation measures to the point where no adverse impacts remain. The ‘Competent Authority’ shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of a European site or sites in accordance with the requirements of the Habitats Regulations (Regulation 61(5)). Regulation 61(3) requires the Competent Authority to consult with the Statutory Nature Conservation Body (Natural Resources Wales) and if appropriate having obtained the opinion of the general public.

European Sites include Special Areas of Conservation (SACs), Marine SACs and Special Protection Areas (SPAs). However it is Government Policy in England and Wales to also include Wetlands of International Importance (Ramsar sites), potential SPAs (pSPA), candidate SACs (cSAC), and possible Ramsar sites as European Sites.

For highways schemes the consideration of schemes under the requirements of the Habitats Regulations is known as the Assessment of Implications on European Sites (AIES) but is equivalent to the consideration of other projects or plans, comprising a screening stage (i.e. consideration of likely significant effects) and an Appropriate Assessment stage (consideration of effects in relation to the conservation objectives). Figure 3 overleaf shows an overview of the AIES process as provided within the Design Manual for Roads and Bridges Vol. 11, Section 4 HD44/09: Assessment of Implications (of Highways and/or Roads Projects) on European Sites (including Appropriate Assessment).

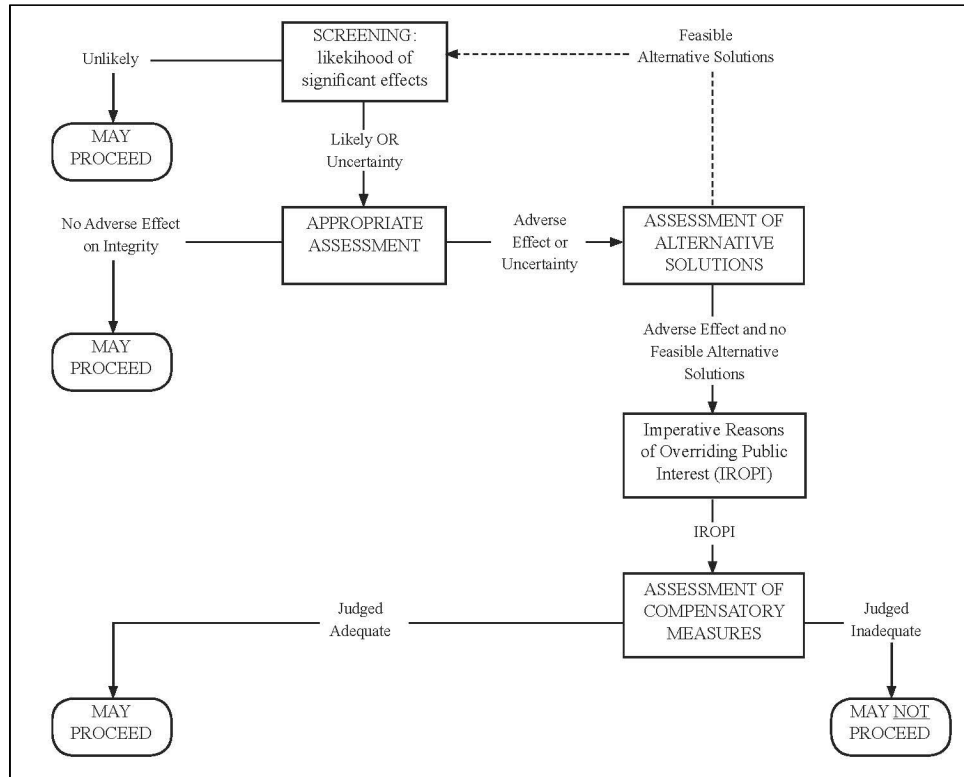


Figure 3: Flow diagram detailing the AIES process

6.1 Previous Consultation

The Welsh Government undertook wide-ranging and focussed engagement with stakeholders and local people from September 2010 as part of the M4 CEM Programme (at a strategy level). During the engagement process, the Welsh Government and its project team conducted dialogue and deliberative sessions both with internal and external specialists and expert stakeholders, encompassing local authorities, community groups and other organisations with an interest in the likely impacts on European designated sites from transport measures on the M4 Corridor around Newport. This input has helped to shape the development of a draft Plan and its associated assessments, which remain at a strategy level. Should the draft Plan be adopted by the Welsh Government, with or without amendments, any options progressed for further appraisal would be so as a project and therefore assessed at a scheme level of detail.

A consultation exercise was undertaken during November 2012, as part of preparatory work on the likely impacts of the M4 CEM Programme options on designated sites, as part of the HRA process.

A public consultation on the draft Plan and its associated assessments, including this assessment, will commence in September 2013.

6.2 Guidance and Policy

The Consideration of the options in relation to the Habitats Regulations has been informed by a range of guidance and policy documents including:

- Technical Advice Note (TAN) 5: Nature Conservation and Planning (WG, 2009) – Annex 6 The Assessment of Development Plans in Wales under the Provisions of the Habitat Regulations;
- Design Manual for Road and Bridges (DMRB) HD 44/09. Assessment of implications (of Highways and/or Roads Projects) on European Sites (including Appropriate Assessment) (HA, 2009);
- Draft Guidance for Plan Making Authorities in Wales: The Appraisal of Plans under the Habitats Regulations (Tyldesley D. , 2012); and
- The Severn Estuary / Môr Hafren European Marine Site - Natural England & the Countryside Council for Wales' advice given under Regulation 33(2)(a) of the Conservation (Natural Habitats &c.) Regulations 1994, as amended. (CCW, 2009).

6.3 Evidence Base

In addition to the guidance noted above, the following websites were used to gather information on the European protected sites:

- Joint Nature Conservation Committee (JNCC)¹⁸;
- Natural England¹⁹;
- Countryside Council for Wales²⁰ (CCW)²¹; and
- Natural Resources Wales (NRW)²².

CCW Core Site Management Plans were also used to gather information on European protected sites. These documents provide the main elements of NRW's management plan for protected sites and sets out what needs to be achieved on the sites, the results of monitoring and advice on the actions required. The Geographical Information Systems (GIS) datasets for European sites used were downloaded from the CCW and Natural England websites in July 2013 to ensure all relevant European sites and their updated boundaries were taken into consideration.

6.4 Assessment Methodology

This section provides the applicable methodologies and assumptions for the consideration of new road route options and the do minimum scenario with regard to the requirements of the Habitats Regulation.

¹⁸ www.jncc.gov.uk

¹⁹ www.naturalengland.org.uk

²⁰ CCW was amalgamated with the Environment Agency and Forestry Commission in April 2013 to form Natural Resources Wales

²¹ www.ccw.gov.uk

²² www.naturalresourceswales.gov.uk

The assessment process was based on Annex 6 of Technical Advice Note 5 'Nature Conservation and Planning' (TAN 5). Given that the draft Plan contains proposals for specific transport interventions (e.g. highway and other interventions) the approach also drew upon guidance produced as part of the Design Manual for Road and Bridges (DMRB). The methodology carried out for the assessment was in line with the National Transport Plan SHRA. The consideration of the options was undertaken in the following step by step process.

6.4.1 Identifying sites

The first step of the process was to identify all the European sites within the programme area. Certain species which are part of the designated features of some European sites are not restricted to the defined boundaries of the site but can be highly mobile with ranges well outside the defined area of the sites. Therefore, a 30km buffer was selected around the options taken forward in the process, see section 3.2.3. The 30km buffer was selected to take account of the range for certain bat species and other mobile species such as birds. This is the distance that is defined in the HD44/09 guidance (HA, 2009). The sites which need to be considered for assessment in terms of air quality effects are those for which the designated features are sensitive to air pollution, indirectly or directly, on vegetation within 30km of the European sites.

6.4.2 Understanding European Site features and conservation objectives

Conservation objectives of each interest feature of each European Site potentially affected were acquired and examined. In Wales, conservation objectives (shown in Appendix A) are considered to consist of the vision and performance indicators stated in the relevant Core Management Plan available from the Countryside Council for Wales's website. For each of the sites the relevant qualifying interests were also collated and examined.

For European Sites situated in England, conservation objectives are developed from the relevant Site of Special Scientific Interest (SSSI) objectives which are within the relevant site area.

6.4.3 Identification of plans or projects considered for in-combination effects

It is a requirement of the Habitat Regulations to examine the potential for a plan or project to have a significant effect either alone or in combination with other plans and projects. It is therefore necessary to identify those other plans and projects which may give rise to in-combination effects with the options being considered between the draft Plan and the alternative options.

To inform this process, plans and projects which have a spatial context and contain plans or proposals most likely to have in-combination effects, were identified from the following locations:

- Welsh Government – strategies, plans and guidance;
- Local Authority/National Plan Authorities – LDP/UDP;

- Statutory Environment Bodies – Management Plans and major projects;
- Regional Authorities – Regional Transport Plans (RTP); and
- Other government strategies, plans and guidance.

In addition to the in-combination effects of other plans and projects, other elements considered with this assessment include:

- Developments and other projects which are currently under construction; and
- Proposed developments which are currently under consideration with the local planning authority or other determining bodies.

When considering in-combination effects in the assessments for each site, the potential impact of the measure on the feature is the key consideration. A plan or project could have an effect on water quality which can alter the nutrient balance on a site/feature without causing any potential effects to air quality, but such an effect could still be significant when considered in-combination with air quality impacts resulting from another plan or project.

6.4.4 Identification of the potential impacts of the options

The following list of potential impacts that could arise from the four options was informed by those impacts identified in the Statement to Inform an Appropriate Assessment for the National Transport Plan:

- Habitat loss and/or fragmentation (including areas on foraging areas);
- Loss of breeding and resting places, swarming areas and roosting sites;
- Damage to flight lines between roosting and foraging areas or restrictions to species movements;
- Air quality changes;
- Changes in water quality and flow;
- Changes in hydrological conditions;
- Changes to structure/composition of the habitat;
- Disturbance to species caused by increased use of the site;
- Noise and vibration disturbance to species;
- Visual and lighting disturbance to species; and
- Wildlife vehicle collisions leading to casualties.

This list has formed the basis for considering the potential for effects on the European Sites on the basis of identifying the sources or impacts and the pathways that could link those sources to the features of the site (receptors). See Appendix C, for list of potential impacts.

The consideration of the potential for impacts has also been informed by the conservation objectives for the features of the European sites identified. In particular details of the vulnerability of features to particular potentially

influencing factors were used to identify the likelihood of impacts affecting features of the sites.

Three of the four options have considerable overlap including a range of common measures (such as cycling and walking infrastructure) and overlaps in the route corridor being considered. The draft Plan black TR111 route, and the red and purple routes are all identical with the exception of the location of the crossing of the River Usk SAC and the areas immediately either side of the Usk Crossing. The consideration of the potential effects has therefore assumed that the impacts would be similar for all three options. The basis for the consideration in terms of the Habitats Regulations is therefore a comparison between the impacts of a route to the south of Newport and the do minimum scenario as set out in the SEA Report.

Cycle friendly and walking infrastructure are not considered further in this document as at present there are no definitive proposals and in terms of comparison between the different options, these measures are largely generic and common between all three options.

6.4.5 Consideration of the significance of the potential effects

The significance of the potential effects was assessed in the absence of mitigation measures other than those which are standard construction practices, such as pollution control.

In the assessment of the significance of effects, professional judgement was applied using the following criteria, as often insufficient information about the elements and interests is available:

- The vulnerability/sensitivity of the receiving environment/features of interest;
- When the risk of effects are likely to occur (e.g. construction and/or operation);
- The likely geographical extent of the effects; and
- Likelihood of significant effects (e.g. those above negligible in magnitude) occurring based on previous experience with similar elements, where available.

The assessment of potential significant effects has been made of the options on their own and in-combination with other plans and projects. The assessment included consideration of likely mitigation measures that would be included within any option taken forward in line with the findings or the Dilly Lane case (see below).

A high-profile court case, the ‘Dilly Lane’ case, in England was about whether a housing development accompanied by Suitable Accessible Natural Green Space as mitigation for its recreational impacts on ground-nesting birds could be said at the screening stage to not have a significant impact on the Thames Basin Heaths

SPA²³. The judge ruled that avoidance or mitigation measures forming part of a plan or project can be considered at the screening stage.

6.4.6 Summary of Mitigation included within the Considerations

Mitigation measures considered in this assessment were limited to those which are plainly established and uncontroversial, in line with guidance in the Design Manual for Roads and Bridges, HD44/09 and other volumes such as the provision of underpasses for bats on existing flight lines.

Construction would be carried out in accordance with guidance outlined within CIRIA best practice guidance and the Environment Agency (EA) Pollution Prevention Guidelines (PPGs).

Undertaking an assessment at a strategic level means that it is not possible to consider mitigation at a level of detail specific to each project. Instead, consideration has been given to plainly established and uncontroversial mitigation measures that would be appropriate, given the potential effects that have been predicted to result from each site/element relationship. Examples of these mitigation measures are presented in Appendix B, although application does depend on the qualifying feature involved and the context in which the measure is applied.

It should be noted that some of the mitigation measures in Appendix B cover both construction and operational effects, but are applied during the construction period (e.g. design of lighting columns, provision of underpasses).

6.4.7 Consideration of effects in relation to conservation objectives

Where potentially significant effects have been identified or there is uncertainty over the significance of effects, further consideration has been given to the potential for those effects to be of sufficient scale and magnitude to prevent the features of the European site from meeting its conservation objectives. An effect that would prevent or limit a feature from achieving its objectives would be considered to be an 'adverse effect on the integrity of the European Site'.

²³ Hart District Council v. Secretary of State for Communities and Local Government, Luckmore Limited and Barratt Homes Limited, [2008] EWHC 1204, Available at: http://www.epr.uk.com/eprnews/Dilly_Lane_files/Dilly%20Lane%20Judgement.pdf. [Accessed on 29/10/2012]

6.4.8 Consideration of whether any adverse effects can be avoided by changes to the draft Plan

Where the potential for significant effects was identified or there was a sufficient level of uncertainty over the potential for significant, consideration was given to whether, in the light of the information collected and the results of the assessment, there was sufficient information to allow a formal conclusion as to the whether the individual elements of the programme could be amended, or whether an alternative policy or proposal could be added to the programme which would achieve the required result that adverse effects on the integrity of the sites caused by the options in its entirety would be avoided, while achieving its aims and objectives.

6.5 The Use of Professional Judgement

Professional judgement was used in the carrying out of this work where professional guidance was not available, and in the interpretation of results. Where there was not enough information about the risk of qualifying interest being present, or of the risk of impacts, the assessment used the precautionary principle to inform the judgement. The precautionary principle has been applied to ensure that any assessment errs on the side of caution, without being overly cautious. This principle means that the conservation objectives should prevail where there is uncertainty or that harmful effects will be assumed in the absence of evidence to the contrary.

7 Identification of European Sites with the Zone of Influence

Fifteen European Sites were identified as including areas within the 30km zone of influence of the different options being considered. Table 5 details the qualifying features for each of the European Sites under consideration in this document. The locations of the sites are shown in Appendix D.

The fifteen European Sites within 30km zone of potential influence include:

- 12 Special Areas of Conservation (SACs);
- 2 Special Protection Areas (SPAs); and
- 1 Ramsar site.

Table 5: Qualifying Features of European Sites

European Site	Qualifying Features	Distance at closest point
River Usk SAC	<ol style="list-style-type: none"> 1. Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation 2. Sea lamprey (<i>Petromyzon marinus</i>) 3. Brook lamprey (<i>Lampetra planeri</i>) 4. River lamprey (<i>Lampetra fluviatilis</i>) 5. Twaite shad (<i>Alosa fallax</i>) 6. Atlantic salmon (<i>Salmo salar</i>) 7. Bullhead (<i>Cottus gobio</i>) 8. Otter (<i>Lutra lutra</i>) 9. Allis shad (<i>Alosa alosa</i>) 	Crossed by the scheme
Severn Estuary SAC	<ol style="list-style-type: none"> 1. Estuaries 2. Mudflats and sandflats not covered by seawater at low tide 3. Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) 4. Sandbanks which are slightly covered by sea water all the time 5. Reefs 6. Sea lamprey 7. River lamprey 8. Twaite shad 	6km (Usk Crossing)
Severn Estuary SPA	<ol style="list-style-type: none"> 1. Bewick's swan (passage) (<i>Cygnus columbianus bewickii</i>) <p>Wintering:</p> <ol style="list-style-type: none"> 2. European white-fronted goose (<i>Anser albifrons albifrons</i>) 3. Dunlin (<i>Calidris alpina alpina</i>) 4. Redshank (<i>Tringa totanus</i>) 5. Shelduck (<i>Tadorna tadorna</i>) 	6km

European Site	Qualifying Features	Distance at closest point
	6. Gadwall (<i>Anas strepera</i>) 7. Curlew (<i>Numenius arquata</i>) 8. Pintail (<i>Anas acuta</i>) 9. Ringed plover (<i>Charadrius hiaticula</i>) 10. Assemblage of nationally important populations of waterfowl	
Severn Estuary Ramsar	1. Sandbanks which are slightly covered by sea water all the time 2. Estuaries 3. Mudflats and sandflats not covered by seawater at low tide 4. Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) Migratory fish: 5. Salmon 6. Sea trout (<i>Salmo trutta</i>) 7. Sea lamprey 8. River lamprey 9. Allis shad 10. Twaite shad 11. European eel (<i>Anguilla anguilla</i>) Bird assemblages of international importance Species with peak counts in winter: 12. Bewick's swan 13. European white-fronted goose 14. Shelduck 15. Gadwall 16. Dunlin 17. Redshank Species regularly supported during the breeding season: 18. Lesser black-backed gull (<i>Larus fuscus graellsii</i>) Species with peak counts in spring/autumn: 19. Ringed plover Species with peak counts in winter: 20. Eurasian teal (<i>Anas crecca</i>) 21. Pintail	6km
Wye Valley and Forest of Dean Bats	1. Lesser horseshoe bat 2. Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>)	8.5km

European Site	Qualifying Features	Distance at closest point
SAC		
Cardiff Beech Woods SAC	<ol style="list-style-type: none"> 1. <i>Asperulo-fagetum</i> beech forest (EU Habitat Code 9130) 2. <i>Tilio-acerion</i> forest of slopes, screes and ravines (EU Habitat Code 9180) 	10.3km
Wye Valley Woodlands SAC	<ol style="list-style-type: none"> 1. <i>Asperulo-Fagetum</i> beech forests 2. <i>Tilio-Acerion</i> forests of slopes, screes and ravines 3. <i>Taxus baccata</i> woods of the British Isles 4. Lesser horseshoe bat 	12.5km
Aberbargoed Grasslands SAC	<ol style="list-style-type: none"> 1. Marsh fritillary butterfly (<i>Euphydryasaurinia</i>) 2. <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) 	17km
Avon Gorge Woodlands SAC	<ol style="list-style-type: none"> 1. <i>Tilio-Acerion</i> forests of slopes, screes and ravines 2. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (<i>Festuco-Brometalia</i>) 	17.1km
North Somerset and Mendip Bats SAC	<ol style="list-style-type: none"> 1. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (<i>Festuco-Brometalia</i>) 2. <i>Tilio-Acerion</i> forests of slopes, screes and ravines 3. Caves not open to the public 4. Lesser horseshoe bat 5. Greater horseshoe bat 	21.3km
Usk Bat SAC	<ol style="list-style-type: none"> 1. European dry heaths 2. Degraded raised bogs still capable of natural regeneration 3. Blanket bogs 4. Calcareous rocky slopes with chasmophytic vegetation 5. Caves not open to the public 6. <i>Tilio-Acerion</i> forests of slopes, screes and ravines 7. Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) 	26.1km
Cwm Clydach	<ol style="list-style-type: none"> 1. <i>Asperulo – Fagetum</i> beech forests 2. Atlantic acidophilous beech forests with <i>Ilex</i> 	27.7km

European Site	Qualifying Features	Distance at closest point
Woodlands SAC	and sometimes also <i>Taxus</i> in the shrublayer (<i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i>)	
Mendip Limestone Grasslands SAC	<ol style="list-style-type: none"> 1. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (<i>Festuco-Brometalia</i>) 2. European dry heaths 3. Caves not open to the public 4. <i>Tilio-Acerion</i> forests of slopes, screes and ravines 5. Greater horseshoe bat 	28.7km
River Wye SAC	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ol style="list-style-type: none"> 1. Water courses of plain to montane levels with the <i>Ranunculum fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ol style="list-style-type: none"> 1. Transition mires and quaking bogs <p>Annex II species that are a primary reason for selection of this site</p> <ol style="list-style-type: none"> 1. White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> 2. Sea lamprey 3. Brook lamprey 4. River lamprey 5. Twait shad 6. Atlantic salmon 7. Bullhead 8. Otter <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ol style="list-style-type: none"> 1. Allis shad <i>Alosa alosa</i> 	29.2km
Chew Valley Lake SPA	<ol style="list-style-type: none"> 1. Northern shoveler (Non-breeding) (<i>Anas clypeata</i>) 	29.4km

8 Identification of In-Combination Plans and Projects

The plans and projects identified as being most likely to have in combination effects with the options, and therefore which have been considered in the assessment are:

- Wales Transport Strategy (2008);
- Wales Spatial Plan Update Habitats Regulations Assessment & Appropriate Assessment(June 2008);
- South East Wales Regional Transport Plan, SEA, Environmental Report (July 2008);
- Habitats Regulations Assessment Screening Report of Newport City Council LDP 2011 – 2026 Revised Deposit Plan (May 2013);
- Habitats Regulations Assessment of the Blaenau Gwent Local Development Plan – Pre-Deposit Proposals: Screening assessment (November 2008);
- Caerphilly Deposit LDP up to 2021: Habitats Regulations Assessment (incorporating Appropriate Assessment) (October 2008);
- Cardiff County Council Habitats Regulations Assessment; Screening Report (September 2007);
- Habitats Regulations Assessment of Monmouthshire Local Development Plan –Deposit Local Plan, 2012;
- Newport Local Development Plan, Revised Deposit Plan Habitats Regulations Assessment Screening Report (June 2013);
- Powys Unitary Development Plan Habitats Regulations Assessment (June 2009);
- Torfaen County Borough Council Local Development Plan Preferred Strategy 2006 – 2021: Habitats Regulations Assessment - Screening Report (January 2008);
- Habitats Regulation Assessment of the Vale of Glamorgan Local Development Plan Draft Preferred Strategy - Screening Report: Non-technical summary (December 2007);
- Habitats Regulations Assessment Screening Report - Brecon Beacons National Park Authority Local Development Plan: Preferred Strategy (December 2008);
- Newport City Council – Habitat Regulations Assessment River Usk Strategy (2009);
- Wye and Usk Catchment Flood Management Plan(January 2010);
- Eastern Valleys Catchment Flood Management Plan (January 2010);
- Taff and Ely Catchment Flood Management Plan (January 2010);
- Draft Shoreline Management Plan for the Severn Estuary (SMP2)(December 2010);

- Countryside Council for Wales – Habitats Regulation Assessment of a proposal for a continuous coastal path between Cardiff and Chepstow (May 2011); and
- Dwr Cymru – Final Water Resources Management Plan (September 2012).

Table 6 provides further details of these plans and the potential impacts from these that could work in-combination with impacts of the options being considered to give rise to effects on European Sites.

Table 6: In-combination Plans

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
Transport Plans		
Wales Transport Strategy, 2008		
<p>The WTS provides the detailed blueprint for the development of a transport system in Wales which supports WG objectives. The goal of "One Wales: Connecting the nation" is to promote sustainable transport networks that safeguard the environment while strengthening our country's economic and social life. The WTS identifies a series of high-level outcomes and sets out the steps to their delivery.</p> <p>The strategic priorities of the WTS are:</p> <ul style="list-style-type: none"> • Reducing greenhouse gas emissions and other environmental impacts from transport; • Integrating local transport; • Improving access between key settlements and sites; • Enhancing international connectivity; and • Increasing safety and security. 	<p>Improving the efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p>	<p>Reduction in greenhouse gas emissions.</p>
Wales Spatial Plan Update (WSPU) Habitats Regulations Assessment & Appropriate Assessment, June 2008		
<p>The WSPU sets out cross-cutting national spatial priorities. It encompasses the elements required to deliver sustainable development: services, land use and investment and provides a framework for developing national and regional perspectives, reflecting the distinctive needs of the various communities of Wales.</p> <p>The WSPU comprises a series of national frameworks based on the core themes of:</p>	<p>The provision of transport infrastructure includes the effects of port and marine developments as well as road and rail that potentially may give rise to adverse effects due to direct disturbance or indirect effects such as hydrological impacts. The provision of water supplies and sewage treatment may also have a bearing upon the conservation objectives of European sites based on river systems and groundwater flows. Provision of both low carbon conventional and renewable energy sources may give rise to effects primarily due to direct land take, but also as a result of the provision of water, thermal</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts.</p>

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
<ul style="list-style-type: none"> • Building Sustainable Communities • Promoting a Sustainable Economy • Valuing our Environment • Achieving Sustainable Accessibility • Respecting Distinctiveness <p>The WSPU is a strategic document which provides a framework for other spatial planning activities in Wales and as such contains limited detail relating to the scale and location of new development.</p>	<p>effluent and transmission lines.</p> <p>Flood risk management may alter the hydrological regime potentially affecting European sites. This applies to both coastal as well as fluvial systems since in the case of the former, coastal defences may alter the movement of marine sediment and erosive forces.</p> <p>There are 94 Special Areas of Conservation (SAC), including 5 European Marine Sites, 20 Special Protection Areas (SPA) and 10 Ramsar sites in Wales. The Appropriate Assessment has identified that 84 European and Ramsar sites could potentially be affected by the delivery of the WSPU either directly or in combination with other plans and projects both in Wales and in England.</p> <p>Particular attention should be paid to the following areas:</p> <ul style="list-style-type: none"> • River Wye; and • Severn Estuary. <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are:</p> <ul style="list-style-type: none"> • Urban and economic development activities; • Water abstraction and water pollution; • Recreation and tourist pressures; and • Provision of energy and transport infrastructure. 	
South East Wales Regional Transport Plan, SEA, Environmental Report, July 2008		
The vision for the RTP is to provide a modern, integrated and sustainable transport system for South East Wales that increases opportunity,	<p>1. To reduce the contribution of transport to air pollution and other harmful pollutant emissions</p> <p>It is expected that the provisions outlined in the SE</p>	Reduction in air pollution emissions.

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
<p>promotes prosperity and protects the environment; where public transport, walking, cycling and sustainable freight provide travel alternatives.</p> <p>The priorities of the SE Wales RTP are to:</p> <ul style="list-style-type: none"> • To improve access to services, facilities and employment, particularly by public transport, walking and cycling. • To provide a transport system that increases the use of sustainable modes of travel. • To reduce the demand for travel. • To develop an efficient and reliable transport system with reduced levels of congestion and improved transport links within the Sewta region and to the rest of Wales, the UK and Europe. • To provide a transport system that encourages healthy and active lifestyles, is safer and supports local communities. • To reduce significantly the emission of greenhouse gases and air pollution from transport. • To ensure that land use development in SE Wales is supported by sustainable transport measures. • To make better use of the existing transport system. • To play a full role in regenerating SE Wales. 	<p>Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales, although there is no certainty that improvements will be universal. Measures outlined in the SE Wales RTP support the reduction in the use of cars in favour of public transport, which would improve the general level of air quality across some locations in SE Wales, should a significant number of people switch to using public transport rather than using cars. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p> <p>Additional measures in the SE Wales RTP which could be of benefit to improving local air quality across SE Wales include the promotion of walking and cycling schemes to encourage people to leave their cars when undertaking short journeys. This would assist with reducing emissions of nitrogen dioxide and particulate matter from the transport network, and subsequently the formation of low lying ozone, which is damaging to the health of both flora and fauna.</p> <p>2. To reduce the negative impacts of transport on biodiversity and to increase its positive impacts</p> <p>It should be noted that there is a significant risk that the cumulative impact of individual transport projects could have a significantly adverse effect on biodiversity, by reducing the extent of habitats and incrementally increasing the emission or release of harmful pollutants. Generally however, it is expected that the provisions in</p>	

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
	<p>the SE Wales RTP will indirectly benefit the protection of biodiversity across SE Wales. Reducing the use of private vehicles in favour of home working, public transport or cycling and walking, would assist with reducing air quality emissions, and noise impacts, which would be to the benefit of biodiversity across SE Wales.</p> <p>3. To avoid transport related damage to designated wildlife sites and protected species</p> <p>It is likely that the proposals in the SE Wales RTP could affect any designated wildlife sites across SE such as bridging points across the River Usk Wales, as specific road infrastructure projects are aimed at upgrading existing transport routes rather than building new roads through previously undeveloped sites. However, there may be some loss of roadside verges, which are valuable wildlife habitats for a range of animals.</p> <p>4. To limit transport related pollution of water resources</p> <p>The future impact of the transport network on water pollution is likely to be small overall, especially in comparison to air and noise pollution. The number of recorded water pollution events where transport is the primary cause is not expected to significantly change given the proposals outlined in the SE Wales RTP, which are supportive of improving road drainage and incorporating water quality treatment measures across the transport network. Thus there is likely to be some pollution of water resources due to the movement of particles arising from tyre or brake wear or spilt oil being washed into waterways during a surface runoff</p>	

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	event.	
Local Development Plans/Regional Spatial Strategies		
South West Regional Spatial Strategy (SWESS): Habitats Regulations Assessment of the Draft Regional Spatial Strategy for the South West (February 2007)		
<p>The overall aim of the Draft RSS is to work towards a regional future where:</p> <ul style="list-style-type: none"> • All communities enjoy the benefits of further development and where housing needs are satisfied • The economy continues to prosper • Rural parts of the region fulfil their economic potential with vibrant market towns at their core • Bristol becomes a major European city • Plymouth continues its renaissance and becomes the economic hub of the far South West • Swindon, Exeter, Cheltenham/Gloucester, Bournemouth/Poole, Weston-super-Mare and Taunton develop as important focal points for economic growth • Regeneration of the Cornwall towns, Forest of Dean and Torbay and other priority areas continues to have effect • Growth is supported by necessary infrastructure in step with development <p>A significant amount of development is proposed in the Draft RSS (approximately 23,000 additional dwellings per annum).</p> <ul style="list-style-type: none"> • 4,600 hectares of greenfield land will be needed for housing development, and a further 4,600 hectares of greenfield land 	<p>Following on from the Screening exercise, the Appropriate Assessment showed that there are a number of impacts potentially resulting from the Draft RSS, in-combination with other plans and projects, which mean that adverse impacts could not be ruled out, without additional safeguards. The main issues that were identified were as follows: water abstraction, water quality, tourism, recreation and related pressures (including urban effects), air quality, physical habitat loss or damage from development. Other issues that were identified that also could lead to potentially adverse effects, but due to a lack of spatial specificity in the Draft RSS, it was not possible to be precise about which sites might be affected, were: renewable energy, mineral extraction, and woodland management.</p> <p>The Appropriate Assessment stage recognised that many of the potential effects of the Draft RSS on Natura 2000 sites are not easy to quantify or predict their extent and scale of impact. In addition, a number of avoidance and mitigation measures may be outside the remit of the Draft RSS. There will also be a need for much joint working between SWRA, and local authorities, relevant stakeholders such as the Environment Agency, Natural England, Wildlife Trusts, Biological Records Centres to co-ordinate efforts to monitor the scale, location and standards of development and understand whether adverse effects are occurring, or if mitigation measures are successful.</p> <p>Given that the Appropriate Assessment has been unable to conclude that there will not be adverse effects on</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts</p>

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<p>for associated development, giving a total of 9,200 hectares (i.e. 92 square kilometres) of greenfield development.</p>	<p>some Natura 2000 sites on the basis of the policies and text currently contained within the Draft RSS, the question remains as to what changes should be made and safeguards incorporated to the final version of the RSS to ensure that no adverse effects occur in implementation.</p> <p>For the following sites where potential adverse effects have been identified, and generic policy safeguards are not considered to provide sufficient mitigation, it is recommended that the specific Natura 2000 sites are named in the sub-regional supporting text, including a description of the potential pressures, the need to protect the site’s integrity from adverse effects, and the likely need for HRAs further “down the line” (e.g. for Local Development Plans and project level proposals, such as planning applications or applications for licenses to the EA.):</p> <ul style="list-style-type: none"> • River Avon SAC and Avon Valley SPA and Ramsar (South East Dorset and Trowbridge). • Chesil & The Fleet SAC, Chesil Beach & The Fleet SPA, Ramsar (South East Dorset, Dorchester and Weymouth). • Somerset Levels & Moors SPA and Ramsar (Taunton and Yeovil). • Hestercombe House SAC (Taunton). • Mells Valley SAC (Trowbridge). • Mendip Limestone Grassland SAC (Weston-super-Mare). • North Somerset & Mendip Bats SAC (Bristol). • South Hams SAC (Newton Abbott and Torbay). • Wye Valley & Forest of Dean Bat Sites SAC and Wye Valley Woodlands SAC (Forest of Dean Towns). 	

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	<p>There are some proposals in the draft RSS where the pressures arising from development have given rise to particular concerns over potential damage or loss to Natura 2000 sites. In these instances, the Draft RSS should include specific safeguards to ensure that no such adverse effects on site integrity occur. These sites are:</p> <ul style="list-style-type: none"> • Dorset Heaths SAC and Dorset Heathlands SPA, Ramsar. • Dorset Heaths (Purbeck & Wareham) & Studland Dunes SAC. • Severn Estuary pSAC, SPA and Ramsar. • Somerset Levels & Moors SPA and Ramsar. <p>Specifically in relation to bats, the following sites should be specifically identified in the relevant sub-regional components of the RSS to ensure that damage or loss not only to the sites, but also foraging and associated habitats is avoided or if necessary mitigated:</p> <ul style="list-style-type: none"> • Bath and Bradford on Avon Bats SAC. • Hestercombe House SAC. • Mells Valley SAC. • Mendip Limestone Grasslands SAC. • North Somerset & Mendip Bats SAC • South Hams SAC • Wye Valley & Forest of Dean Bat Sites SAC. • Wye Valley Woodlands SAC. <p>Finally, there are four SPA/Ramsar sites where bird strike might occur associated with increased flights or changed flight paths due to airport expansion proposed in the Draft RSS. The following sites should be specifically identified in the relevant subregional component of the RSS to ensure that HRA of LDPs and specific project proposals avoid bird strike:</p>	

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	<ul style="list-style-type: none"> • Chew Valley Lake SPA – flight paths from Bristol Airport. • Plymouth Sound & Estuaries SAC and Tamar Estuaries Complex SPA – flight paths from Plymouth Airport. • Avon Valley SPA and Ramsar – flight paths from Bournemouth Airport. • Severn Estuary pSAC, SPA and Ramsar – flight paths from Bristol Airport. 	
Cardiff Local Development Plan Habitats Regulations Assessment, Screening Report, September 2007		
<p>The LDP objectives are to:</p> <ul style="list-style-type: none"> • Support the development of Cardiff as the heart of a sustainable, competitive and integrated city region; • Support the regeneration of deprived communities; • Promote the regeneration of district and local centres as providers of accessible local services, facilities and employment; • Maintain and enhance the vitality, attractiveness and viability of the city centre as the principal and most accessible commercial, administrative and visitor focus of the city region; • Progress the regeneration of Cardiff Bay to provide new and accessible housing, employment and leisure opportunities and visitor attractions • Provide for a range and mix of new housing to address demand and need in the county; • Ensure a range and choice of employment land is provided to maintain and improve the economic competitiveness of the city; 	<p>The most likely mechanism for the draft Plan to have a significant effect is through airborne pollution. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at these sites. Critical loads for the deposition of Nitrogen, Acid and Ozone are already exceeded at Blackmill Woodlands SAC. Acid deposition at Aberbargoed Grasslands SAC already exceeds the critical load by a factor of 22.</p> <p>There are two International Sites within Cardiff – the Cardiff Beech Woods SAC and the Severn Estuary SPA/pSAC/Ramsar Site. Within a 10km radius of Cardiff there is the River Usk SAC. Within 15km there are the Aberbargoed Grassland SAC and Blackmill Woodlands SAC.</p>	Increases in airborne pollution and deposition

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<ul style="list-style-type: none"> • Support the development of an integrated transport system that enables sustainable and active travel options, ensures the safe and efficient movement of people and goods throughout the city, addresses social inclusion and facilitates commuting, national and international business travel by a choice of means of transport; • Maintain and enhance a network of green spaces and corridors throughout the urban area, including the river corridors, which link to the surrounding countryside and coastline, provide opportunities for healthy recreation and travel, and support wildlife; • Promote high quality, locally distinctive and sustainable design that addresses social inclusion and the need for efficient use of natural resources. <p>Provision will be made for between 22,750 and 24,750 new dwellings in Cardiff over the plan period (2006-21).</p> <p>The HRA Screening for Cardiff's Preferred Strategy has identified potential effects on five European sites: Cardiff Beechwoods SAC, Severn Estuary SAC/SPA/Ramsar, Aberbargoed Grasslands SAC, River Usk SAC and Blackmill Woodlands SAC.</p> <p>The main routes through which likely significant effects are anticipated are via increased air emissions and recreational pressures.</p>		

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Recommendations include changes to the LDP wording and potentially further appropriate assessment work.		
Habitats Regulation Assessment of the Vale of Glamorgan Local Development Plan Draft Preferred Strategy - Screening Report, December 2007: Non-technical summary		
<p>The Draft Preferred Strategy for the LDP sets out the spatial direction of the Plan between 2011 and 2026 and seeks to “Concentrate development opportunities in Barry and the South East Zone. The St Athan area to be a key development opportunity. Other sustainable settlements to accommodate further housing and associated developments.”</p>	<p>The following five European Sites within and adjacent to the borders of the county were identified to be of relevance for the LDP:</p> <ul style="list-style-type: none"> • Dunraven Bay SAC (water quality and quantity, soil loss, habitat fragmentation, air pollution, increased recreational pressure); • Severn Estuary / Mor Hafren SPA, SAC, and RAMSAR (possible impacts include land-take, disturbance through noise and vibration, pollution through ground and surface water run-off, and interruption of flight-lines by wind turbines); • Kenfig / Cynffig SAC (water quality and quantity, soil loss, habitat fragmentation, air pollution, increased recreational pressure); • Blackmill Woodlands SAC (the site is already subject to high levels of air pollution, and any further development should seek to have positive impact on the site); • Cardiff Beech Woods SAC (the site is already subject to high levels of air pollution, and any further development should seek to have positive impact on the site). <p>Overall detrimental impacts of the LDP alone on SACs are considered unlikely; however in-combination effects cannot be disregarded. Therefore a precautionary approach needs to be undertaken in respect of all five sites and further investigations will be needed.</p>	<p>Airborne pollution impacts, potential land-take and disturbance impacts</p> <p>Noise, vibration and impacts on hydrology</p>

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<p>Habitats Regulations Assessment of the Blaenau Gwent Local Development Plan – Pre-Deposit Proposals: Screening assessment, November 2008</p> <p>The Blaenau Gwent Draft Preferred Strategy vision is to create a network of sustainable vibrant communities where people have the opportunity through the improvement of skills and opportunities to achieve a better quality of life. The communities are to be safe, healthy and thriving, with access to a range of good quality affordable homes and thriving town centres. Its unique environment, cultural and historic identity will be protected and enhanced to create a place where people want to live, work and visit. The Strategy is for growth and regeneration based around developing Ebbw Vale as the main hub and creating a network of secondary hubs to serve the other three areas of Tredegar, Ebbw Fach Upper and Ebbw Fach Lower. The aim is to ensure that the regeneration benefits to be delivered at the Ebbw Vale Steelworks site are spread across the Borough. The strategy is anticipated to accommodate between 2,250-3,000 dwellings and up to 50-80ha of employment land.</p>		
	<p>There are no European sites within the Local Planning Authority of Blaenau Gwent.</p> <p>Taking into account the potential for transboundary impacts the screening has identified 9 European Sites that lie within a 15km search area around BGCBC's Planning Authority boundary.</p> <p>The potential impacts arising as a result of the screened in policies are:</p> <ul style="list-style-type: none"> • Airborne pollution as a result of increased traffic, new housing development and employment; • Increased water extraction; • Increased dumping of domestic and commercial waste; and • Recreational pressure. <p>Screening Conclusion Based on the information gathered for the screening process and considering the Habitats Regulations requirements for a precautionary approach, it is determined that further Appropriate Assessment work is required for:</p> <p>Cwm Clydach Woodlands It is considered that increased development in Blaenau Gwent may lead to dumping. Therefore a precautionary approach is proposed and further assessment is undertaken.</p>	<p>Pollution impacts and recreational disturbance.</p>

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	<p>Usk Bats Site</p> <p>CCW Management Plans identify that lesser horseshoe bats are very sensitive to disturbance, such as light and noise pollution and even the presence of a single person in close proximity can cause problems. A potential increase in recreation levels at the site could therefore have significant adverse effects.</p>	Impacts on flight lines and foraging areas.
Caerphilly Deposit LDP up to 2021: Habitats Regulations Assessment (incorporating Appropriate Assessment), October 2008		
<p>“The Development Strategy for the Local Development Plan will capitalise on the strategic location of Caerphilly County Borough at the centre of the Capital Network Region. It will ensure that the needs of all the County Borough's residents and visitors are met and that the regeneration of our towns, villages and employment centres and the surrounding countryside is delivered in a well-balanced and sustainable manner that reflects the specific role and function of individual settlements.” The Deposit LDP is underpinned by eight components which set a framework for the approach to - and the nature of - land use development. They are:</p> <ul style="list-style-type: none"> • Target development to reflect the roles and functions of individual settlements • Allow for development opportunities in the Heads of the Valleys Regeneration Area • Promote a balanced approach to managing future growth • Exploit brownfield opportunities where appropriate • Promote resource efficient settlement patterns • Ensure development contributes towards 	<p>The potential effects arising from these policies are:</p> <ul style="list-style-type: none"> • Urbanisation Impacts & Recreational – resulting from an expanding population within and around Bargoed/Aberbargoed, issues include fly tipping, dog fouling, cat predation, potential vandalism, trampling, introduction of invasive/ non-native species, pollution (water, air, noise, light); • Land take – from proximal and adjacent development to European sites, including impacts on surrounding “buffer” habitats/ green space areas not designated for European interest but part of wider habitats connectivity supporting site integrity (important for the designated species at Aberbargoed Grasslands SAC); • Water Resources and Water Quality – resulting from increased demand for water consumption and discharge requirements arising from new/ expanded housing and commercial developments and the potential for increased point source pollution, changes to surface water/ run-off which may have implications for water dependant sites; and • Atmospheric Pollution - arising from a growth in traffic and transport and general development (emissions from construction/ building stock) which has the potential to affect sites sensitive to 	There is no potential for land take from the M4 within Caerphilly Borough.

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<p>necessary infrastructure improvements</p> <ul style="list-style-type: none"> • Ensure development provides necessary community facilities • Reduce the impact of development upon the countryside. • The plan makes provision for 8,625 new dwellings during the plan period, provisions for employment land, infrastructure improvements as well as allocations for open space and improvement to recreational and wider community facilities. <p>LDP policies screened into the HRA were:</p> <ul style="list-style-type: none"> • Strategy Policies: • SP1 Development Strategy – Development in the Heads of the Valleys Regeneration Area • SP2 Development Strategy – Development in the Northern Connections Corridor • SP4 Settlement Strategy • SP16 Total Housing Requirement • Area Specific Policies: Heads of the Valleys Regeneration Area(HOVRA) • HG1 Allocated Housing Sites • EM2 Employment Site Protection • CF1 Community Facilities • TR7 New Roads to Facilitate Development • TR8 Regeneration Led Highways Improvements 	<p>changes in air quality.</p> <p>There is one European site within the CCBC boundary, the Aberbargoed Grasslands SAC, and several adjacent sites:</p> <p>Brecon Beacons SAC Cardiff Beech Woods SAC Cwm Cadlan SAC Cwm Clydach Woodlands SAC Llangorse Lake SAC River Usk SAC Severn Estuary SAC Severn Estuary SPA Severn Estuary Ramsar Usk Valley Bat Sites SAC</p>	

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<p>The HRA looked at the Aberbargoed SAC only. The HRA identified a number of policies in the Plan that had the potential to lead to likely significant effects on the Aberbargoed SAC. However, a Stage 2 - Appropriate Assessment was carried out and it was found that the Plan alone and in combination would not lead to adverse effects on the integrity of this European site.</p>		
Torfaen County Borough Council Local Development Plan Preferred Strategy 2006 – 2021: Habitats Regulations Assessment - Screening Report, January 2008		
<p>The Strategy of the LDP is one of achieving a Network of Integrated Communities in Torfaen. The principal elements of this spatially will be to ensure that the two key settlements of Cwmbran and Pontypool function as service hubs for surrounding settlements. This strategy will rely on realising regeneration benefits of key sites namely the British site in Talywain alongside Cwmbran Town Centre. The strategy is anticipated to accommodate mid to high housing provision of 6600-7000 dwellings.</p> <p>Taking a precautionary approach, the HRA of the LDP has identified the potential for effects on five European sites: Aberbargoed Grasslands SAC, Usk Valley Bat Sites SAC, Cwm Clydach Woodlands SAC, the River Usk SAC and the Severn Estuary SAC/SPA/Ramsar.</p> <p>The Council intends to appoint independent consultants to carry out Stage 2 of the HRA to ensure that it satisfies the requirements of the Habitats Regulations. It will also allow for an independent appraisal to be carried out of the implications for European sites.</p>	<p>There are no European sites within the County Borough Boundaries. Following sites have been identified in close proximity to the boundaries of the county:</p> <ul style="list-style-type: none"> • Aberbargoed Grasslands SAC - Caerphilly (potential for air pollution from new developments); • Coed Y Cerrig SAC – Monmouthshire (proximity to A465 – air pollution); • Cwm Clydach Woodlands SAC - Blaenau Gwent (proximity to A465 – air pollution); • River Usk SAC - Newport, Monmouthshire, Powys (potential for air pollution from new developments); • River Wye SAC – Monmouthshire; • Severn Estuary SAC and SPA - Newport, Monmouthshire, Powys (potential for air pollution from new developments); • Sugar Loaf Woodlands SAC – Monmouthshire; • Usk Bat Sites SAC - Monmouthshire, Powys; • Wye Valley Woodlands SAC – Monmouthshire; and • Wye Valley and the Forest of Dean Bat Sites 	<p>Pollution impacts and recreational disturbance.</p>

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	<p>SAC – Monmouthshire.</p> <p>Although the LDP will be unlikely to have significant effects on the sites named here alone, a precautionary approach will be adopted so that the potential impacts will be reassessed when the detail of the policies and allocations in the Deposit LDP emerge. The most likely mechanism for significant effects is considered to be "in-combination" with other developments.</p>	
Habitats Regulations Assessment Screening Report - Brecon Beacons National Park Authority Local Development Plan: Preferred Strategy, December 2008		
<p>The key implications of the plan are likely to be:</p> <ul style="list-style-type: none"> Continued support for, protection and enhancement of the landscape, cultural and environmental heritage of the Park. A growth in the provision and use of sustainable energy sources, focused on small scale generation as part of new developments at source. Promotion of development on previously developed land. Development of housing and employment focused on key settlements with mixed allocations. Small scale allocations of housing at non-strategic sites where it supports regeneration & identified need in rural communities, including through the provision of affordable housing. <p>Overall the LDP's strategy reflects the wider criteria and aims of National Park designation in only allowing for:</p> <ul style="list-style-type: none"> Moderate housing development: 1,500 – 1,650 new houses over the period of the 	<p>Four of the twelve European sites likely to be affected by the LDP were identified in the HRA screening process as potentially affected primarily by the housing and employment allocations proposed within the National Park:</p> <ul style="list-style-type: none"> Llangorse Lake, River Usk SAC, River Wye SAC, and Usk Bat Sites. <p>For all four sites further, lower tier HRA Screening of the site allocations documents is recommended as a more appropriate level to identify likely impacts of developments (population increases) on the sites.</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts</p>

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<p>plan and;</p> <ul style="list-style-type: none"> One strategic employment site at the Key Settlement of Brecon, for "knowledge based" educational and commercial uses. 		
Powys Unitary Development Plan Habitats Regulations Assessment, June 2009		
<p>The Powys UDP sets the broad strategic context for future development across Powys (Excluding the Brecon Beacons National Park) for a period up to 2016. Planning Policy Wales advises that in rural areas, development should be located in those settlements which have relatively good accessibility by non-car modes. The UDP is therefore shaped by the location of existing settlements, some of which are located in close proximity to European sites.</p>	<p>The European Sites within or close to the borders of the county:</p> <p>Special Areas of Conservation (SAC):</p> <ul style="list-style-type: none"> Berwyn a Mynyddoedd De Clwyd/ Berwyn and South Clwyd Mountains Coedydd Llwr-y-glyn Coetiroedd Cwm Elan/ Elan Valley Woodlands Drostre Bank Elenydd Granllyn Montgomery Canal Mynydd Epynt Pen Llyn a'r Sarnau/ Llyn Peninsula and the Sarnau Rhos Goch River Usk/ Afon Wysg River Wye/ Afon Gwy Tanat and Vyrnwy Bat Sites/ Safleoedd Ystlumod Tanat ac Efyrynwy <p>Special Protection Areas (SPA)</p> <ul style="list-style-type: none"> Berwyn Elenydd – Mallaen 	<p>No impacts on European sites identified</p>

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	<p>Ramsar site</p> <ul style="list-style-type: none"> Cors Fochno and Dyfi <p>It is considered that the policies and proposals contained in the Powys UDP are not likely to give rise to any significant effects on any European site in Powys.</p>	
Habitats Regulations Assessment of Monmouthshire Deposit Local Development Plan, October 2012		
<p>The Preferred Strategy Proposals of the Local Development Plan (LDP) set out the strategy for guiding development in the County. This includes setting the level of growth the LDP must provide for over the plan period, and the spatial distribution of this growth around the County.</p> <p>The HRA Screening of the Plan identified the potential for significant effects on several European sites in Monmouthshire County including the River Usk SAC and River Wye SAC through water pollution and reduced flow due to water abstraction.</p> <p>Recommendations include changes to the LDP wording and potentially further appropriate assessment work.</p>	<p>A number of European Sites have been identified within and close to the boundaries of the county. The LDP has the potential to adversely affect some of these sites:</p> <p>Inside the Monmouthshire LDP area:</p> <ul style="list-style-type: none"> River Usk – SAC (part is also in Brecon Beacons National Park) (increased pressure on natural resources, particularly water, recreational resources, green space, and air quality). River Wye/ Afon Gwy – SAC (increased pressure on natural resources, particularly water, recreational resources, green space, and air quality). Severn Estuary – SAC, Ramsar and SPA (potential for the developments to affect green space, water run-off and water quality/quantity). Wye Valley and Forest of Dean Bat Sites – SAC (increased pressure on recreational resources, water and air; increased light and noise pollution; reuse of buildings can affect bat roosting places; connectivity of habitats may be affected). Wye Valley Woodlands – SAC (increased pressure on recreational resources, water and air). 	<p>Direct disturbance from development;</p> <p>Human disturbance from recreation;</p> <p>Water quality and quantity;</p> <p>Air quality;</p> <p>Changes in surrounding supporting habitats;</p> <p>Coastal processes.</p>

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	<p>Brecon Beacons National Park LDP area:</p> <ul style="list-style-type: none"> • Coed y Cerrig – SAC (potential for the developments to increase pressure on natural resources, particularly water and air; air pollution from increased traffic; biodiversity (forests)). • Cwm Clydach Woodlands – SAC (impacts from developments on water quality/water table and air quality, particularly from increased traffic). • Sugar Loaf Woodlands – SAC (increased pressure on recreational resources, water and air). • Usk Bat Sites – SAC (increased air, light and noise pollution; reuse of buildings can affect bat roosting places; connectivity of habitats may be affected). <p>Outside the County boundaries:</p> <ul style="list-style-type: none"> • Llangorse Lake / Llyn Syfaddan- SAC • Aberbargoed Grassland – SAC 	
Newport Local Development Plan 2011 - 2026, Revised Deposit Plans, Habitats Regulation Assessment, May 2013		
<p>The purpose of the LDP is to guide the development of Newport over the next 15 years. There are nine objectives within the Plan. These are:</p> <ul style="list-style-type: none"> • Objective 1 - Sustainable Use of Land; • Objective 2 - Climate Change; • Objective 3 - Economic Growth; • Objective 4 – Housing; • Objective 5 - Conservation and the Environment; • Objective 6 - Conservation and the 	<p>The findings of the assessment indicate that the Revised Newport City Council Deposit LDP in implementation will not have a likely significant effect on the European sites considered as part of the HRA screening alone or in combination and will not require full AA under the Habitats Regulations.</p> <p>The HRA considered seven European Sites within the influence of the Newport City Council Revised Deposit LDP including:</p> <ul style="list-style-type: none"> • River Usk SAC; • Severn Estuary SAC/SPA/Ramsar site; 	<p>No significant effects predicted from the plan</p>

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<p>Environment;</p> <ul style="list-style-type: none"> Objective 7 - Community Facilities and Infrastructure; Objective 8 - Culture and Accessibility; and, Objective 9 - Health and Wellbeing, Objective 10-Waste <p>The HRA considered seven European Sites within the influence of the Newport City Council Revised Deposit LDP including:</p> <ul style="list-style-type: none"> River Usk SAC; Severn Estuary SAC/SPA/Ramsar site; River Wye SAC; Cardiff Beechwoods SAC, Wye Valley Woodland SAC, Wye Valley and Forest of Dean Bat SAC; and, Aberbargoed Grasslands SAC. 	<ul style="list-style-type: none"> River Wye SAC; Cardiff Beechwoods SAC, Wye Valley Woodland SAC, Wye Valley and Forest of Dean Bat SAC; and, Aberbargoed Grasslands SAC. 	
Flood Management Plans		
Wye and Usk Catchment Flood Management Plan (January 2010)		
<p>The Catchment Flood Management Plan (CFMP) sets out the scale and extent of the River Wye and River Usk flooding at present and in the future. The CFMP outlines policies for managing flood risk within the catchment.</p> <p>The Wye and Usk CFMP should be used to inform planning and decision making by key partners. CFMP aim to promote more sustainable approaches to managing flood risk.</p>	<p>There are four internationally designated environmental sites which lie fully or partially within the 1% Annual Exceedance Probability (AEP) flood outline. These include the River Wye SAC and the River Usk SAC and the Severn Estuary SAC, SPA and Ramsar site.</p> <p>The greatest risks to property and infrastructure for the 1% AEP flood event are located in the Lower Usk and Lower Wye catchments and include the urban areas of Newport, Cwmbran and Caerleon. Parts of Hay-on-Wye, Brecon, Caerleon and Usk are classed as the most socially vulnerable to flooding in the 1% AEP flood</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts</p>

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
	<p>event therefore the consequences of a flood event in these areas will be greater than in the rest of the CFMP area.</p> <p>There are currently approximately 8,900 properties across the CFMP at risk from flooding. In the Wye and Usk catchments, climate change will have the greatest impact on flood risk, with urban growth and more intensive farming practices also predicted to have some impact.</p> <p>Cwmbran and M4 Corridor - Approximately 450 properties are currently at risk from the 1% AEP flood event, rising to around 810 properties in the future. Important infrastructure is at flood risk. In the future increased tide levels will result in a significant rise in tidally influenced flooding. The likelihood of defences overtopping will increase.</p> <p>The Gwent Levels - Internationally and nationally important conservation sites are at risk from the 1% AEP flood event. These sites depend on active water level management and the land drainage networks. The Caldicot and Wentlooge Levels IDB play an important role in this area. Any significant change in the water environment will impact on the valuable natural habitats and species.</p> <p>Lower Usk - Approximately 250 properties are currently at risk from the 1% AEP flood event, rising to around 570 properties in the future. People, properties and infrastructure in the towns and villages are at flood risk.</p> <p>Lower Wye - Approximately 780 properties are currently at risk from the 1% AEP flood event, rising to</p>	

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
	<p>around 1,100 properties in the future. Overtopping of defences, now or in the future, by extreme flood events could have very serious consequences. This is an important agricultural area with a large proportion of good quality land at flood risk. The Lower Wye also has a large number of environmental designations.</p> <p>Newport - The area has a high population density and is a centre for employment and urban growth. Flood risk is associated with tidally influenced flooding from the River Usk and tributaries running through Newport. There is also risk of surface water and localised sewer flooding. Approximately 6,900 properties are currently at risk from the 1% AEP river and 0.5% tidal flood event, rising to around 13,100 properties in the future. Flood risk is dominated by the tidal influence. In the future, sea level rise and additional development will considerably increase the flood risks unless these are managed.</p>	
Eastern Valleys Catchment Flood Management Plan (January 2010)		
<p>The Catchment Flood Management Plan (CFMP) sets out the scale and extent of the Rhymney, Ebbw and Sirhowy rivers flooding at present and in the future. The CFMP outlines policies and actions for managing flood risk within the catchment.</p> <p>The Eastern Valleys CFMP should be used to inform planning and decision making by key partners.</p> <p>CFMP aim to promote more sustainable approaches to managing flood risk.</p>	<p>The Rhymney flows into the Severn Estuary, the Ebbw flows into the Usk Estuary, and the Sirhowy is a major tributary of the Ebbw.</p> <p>The coastal and estuarine environments in the Eastern Valleys contain a number of important and diverse habitats and species, including three internationally designated conservation areas. The Severn Estuary is an important Ramsar site, Special Protection Area and Special Area of Conservation.</p> <p>The locations at greatest risk of flooding in the future are parts of Cardiff, Risca and Ystrad Mynach.</p> <p>Cardiff - Flood risk is primarily from river flooding</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts</p>

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
	<p>with tidal risk affecting lower parts of the River Rhymney and Roath Brook. Localised surface and sewer flooding are also an issue. Approximately 310 properties are currently at risk from the 1% AEP river flood event and 0.5% tidal flood event. This rises to around 2,600 properties in the future. The majority of the increased flood risk comes from the lower reaches of Roath Brook.</p> <p>Wentlooge Levels - There are no main rivers in this area with flood risk coming from the reens and drains. There is also a tidally influenced flood risk from the River Ebbw.</p> <p>There are currently no properties at risk from the 1% AEP river flood event; however, there are approximately 10 properties at risk from the 0.5% AEP tidal flood event. This figure does not increase for the future 1% AEP river flood event, but rises to around 230 properties in the future for the 0.5% AEP tidal flood event.</p>	
Taff and Ely Catchment Flood Management Plan (January 2010)		
<p>The Catchment Flood Management Plan (CFMP) sets out the scale and extent of the Taff and Ely rivers flooding at present and in the future. The CFMP outlines policies and actions for managing flood risk within the catchment.</p> <p>The Taff and Ely CFMP should be used to inform planning and decision making by key partners.</p> <p>CFMP aim to promote more sustainable approaches to managing flood risk.</p>	<p>A limited number of environmentally designated sites are directly impacted by flooding. There are no internationally designated sites at risk from the 1% AEP flood event.</p> <p>The highest numbers of properties at risk from the 1% AEP flood event are located in Pontyclun, Ynysddu, Treforest, Glyntaff, Pontypridd, Porth and Trehafod. Over 30 properties are also at risk in the 10% AEP flood event in Porth, Trehafod, Pontyclun and Ynysddu. The areas of Merthyr Tydfil, Aberdare, Gelli and Treorchy are the most socially vulnerable to flooding in the 1% AEP flood event.</p>	<p>Insufficient information on actual activities or locations to allow identification of impacts</p>

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
	<p>The most significant increase in risk is in Cardiff, although there are potentially significant local increases at Pontypridd, Porth and Trehafod, Gelli and Treforest. Flood risk to environmental, landscape and heritage features is expected to increase but is likely to be small scale in extent.</p> <p>Cardiff - Flood risk is mainly from river flooding in the lower parts of the Rivers Taff and Ely, both of which discharge into Cardiff Bay. Approximately 90 properties are currently at risk from the 1% AEP flood event, rising to around 2,800 properties in the future. Currently the main area of flood risk is local to Whitchurch. Flood risk is expected to increase significantly in the future unless it is managed.</p>	
Draft Shoreline Management Plan for the Severn Estuary (SMP2) (December 2010)		
<p>The Shoreline Management Plan for the Severn Estuary includes:</p> <ul style="list-style-type: none"> • An assessment of the way that the coast will change over time – identifying the natural forces shaping the shoreline and predicting, as far as possible, how the shoreline will change over time with erosion, sea level rise and climate change (in 20, 50 and 100 years); • Identifying the risks to people, property, the natural and historic environment as the coast changes; and • Policies for the different stretches of shoreline (Policy Units) to manage the risks in a sustainable way. <p>The SMP2 will help planners and regulators to plan for and manage the way that the shoreline will change over time. The SMP2 provides</p>	<p>Population and human health - The SMP2 will result in significant benefit to populations, human health, material assets and critical infrastructure by ensuring a strategic approach is taken to protect centres of population, businesses and critical infrastructure from increased flood and erosion risk, in the face of a changing climate.</p> <p>Biodiversity flora and fauna - The assessment of likely significant effect undertaken for the SMP2 concluded that the only European sites potentially affected by the implementation of the SMP2 are the Severn SPA, SAC and Ramsar sites and the Somerset Levels and Moors SPA/Ramsar.</p> <p>Historic environment - Overall all the SMP2 will have a major beneficial impact on the historic environment, largely protecting features and historic landscapes behind existing defences where a Hold the Line policy is being proposed.</p>	<p>The SEA for the Severn SMP2 was unable to demonstrate no adverse effects on Severn SPA, SAC and Ramsar sites and the Somerset Levels and Moors SPA/Ramsar.</p> <p>There will inevitably be impacts on the Severn Estuary European site, largely where a policy of Hold the Line in combination with sea level rise will result in loss of intertidal habitat. The HRA will quantify predicted habitat loss across the estuary.</p>

Aim of the document	Elements of the plan that could cause 'in-combination' effects	Summary of Effect
<p>greater certainty for landowners, residents and businesses on how the shoreline will be managed by regulators during the next 100 years, so that they can plan ahead and make decisions about investments, homes, development and the management of their resources.</p> <p>The SMP2 supports and influences a whole range of regional, national and international policies, frameworks and strategies, not just those connected with managing the shoreline.</p>	<p>Water environment - The SMP2 will have a major positive effect on water resources and water quality, protecting key features such as sewage treatment works, existing abstractions and source protection zones from future flood and erosion risk.</p> <p>Air and climate - Where a no active intervention policy or managed realignment is to be applied, the natural evolution of the coast will adapt to accommodate the impacts of climate change, delivering a minor beneficial impact.</p> <p>Landscape - Overall the SMP2 has been considered to have a neutral impact on the landscape of the Severn estuary. Uncertainty remains over specific impacts and mitigation measures that will need to be addressed either by the FRMS or at project level.</p>	
Welsh Water – Draft Water Resources Management Plan (WRMP) (August 2012)		
<p>To ensure that water is available to our customers when it is needed and in the quantity required. The WRMP forecasts over a 25 year period the supply and demand balance across our water supply area.</p> <p>This document included the results of a HRA completed of the WRMP. This concluded that it will be possible to provide a supply of water to the Welsh Water supply area (including Newport and most of Wales) for the lifetime of the WRMP (25 years) without having any significant adverse effects on any European sites alone or in combination (with certain mitigation measures in place).</p>	No likely significant effects identified.	No likely significant effects identified.

Habitats Regulation Assessment of Newport City Council's River Usk Strategy (2009)		
<p>The HRA of this strategy identified key impacts from reduced flow, disturbance to fish and otters and pollution from numerous developments planned along the River Usk SAC.</p> <p>Numerous avoidance methods were recommended including the introduction of new byelaws by Newport Harbour Commissioners to assist the control and regulation of the river and good practice guidelines.</p> <p>When implemented these were deemed sufficient to avoid likely significant effects on any of the interest features, presuming NCC are able to enforce such methods, along with organisations such as the Environment Agency.</p>	No likely significant effects identified.	No likely significant effects identified.
Countryside Council for Wales HRA of a Proposal for a continuous coastal path between Cardiff and Chepstow (May 2011)		
<p>A HRA was carried out for the All Wales Coastal Path.</p> <p>The conclusion of the HRA was that the <i>“Project will not have an adverse effect on the integrity of the Natura 2000 sites (Severn Estuary Ramsar, SPA and SAC) and that effect can be reduced to de minimis, provided all proposed mitigation measure are fully implemented.”</i></p>	No likely significant effects identified.	No likely significant effects identified.

9 Consideration of the Significance of Potential Effects

The following section and tables sets out the likely significance of effects occurring as a result of the implementation of the options being considered. As described in Section 2.4.4 above the potential impacts of the three new road options to the south of Newport have been assessed as one option due to the high degree of overlap and minimal separation of the different crossing points of the River Usk.

Table 7 documents the results of the screening stage of the consideration of the options in terms of identifying those sites where there is the potential for significant effects to occur.

Table 7: Potential for significant effects on European Sites

European Site	Do Minimum	New Road Options	Comments
River Usk SAC	✓	✓	Crossed by both existing corridor and new road options
River Wye SAC	✗	✗	Sufficient separation distance
Severn Estuary SAC	✗	✓	New road options closer to estuary
Usk Bat SAC	✗	✗	Sufficient separation distance
Cardiff Beech Woods SAC	✗	✗	Sufficient separation distance and prevailing winds would take air pollution away from this site
Wye Valley and Forest of Dean Bats SAC	✗	✓	Lesser horseshoe have been recorded at eastern end of scheme during previous studies
Wye Valley Woodlands SAC	✓	✗	Sufficient separation distance
Cwm Clydach Woodlands SAC	✗	✗	Sufficient separation distance
Chew Valley Lake SPA	✗	✗	Sufficient separation distance

European Site	Do Minimum	New Road Options	Comments
Aberbargoed Grasslands SAC	✗	✗	Sufficient separation distance
Avon Gorge Woodlands SAC	✗	✗	Sufficient separation distance
Mendip Limestone Grasslands SAC	✗	✗	Sufficient separation distance
North Somerset and Mendip Bats SAC	✗	✗	Sufficient separation distance
Severn Estuary SPA	✗	✓	New road options closer to estuary
Severn Estuary Ramsar	✗	✓	New road options closer to estuary

9.1 Proposed New Road Options

Figure 8 overleaf provides information on the potential pathways that could link impacts to the features of European Sites and sets out the likely significance of any effects that could occur from the proposed new road options south of Newport.

Table 8: Identification of pathways and potential for significant effects from the Route to the South of Newport Alone

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
River Usk SAC	Sea lamprey	Barrier to migration caused by piers within river channel	As a result of barrier to migration	Diffusion of pollution from the two Usk crossing would reduce concentrations to minimal levels in the upper catchment	Barrier to migration caused by piers within river channel	No pathway	Certain species are sensitive to noise and vibration such that migration could be inhibited	No pathway	No pathway	Yes
	River lamprey									
	Twaite shad									
	Allis shad									
	Atlantic salmon									
	Bullhead	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No
	Brook lamprey									

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
	European otter	Temporary restriction in movement during construction	If present in area of construction	No pathway	No pathway	No pathway	Deterring movement of otters through construction zone	Deterring movement of otters through construction zone	Assume no pathway as underpasses and fencing would be installed on a new road in line with DMRB	Yes
	Water courses	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway – feature only present in upstream areas	No pathway	No
Severn Estuary SAC	Sea lamprey	Barrier to migration caused by piers within river channel	As a result of barrier to migration	Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment	Barrier to migration caused by piers within river channel	No pathway	Certain species are sensitive to noise and vibration such that migration could be inhibited	No pathway	No pathway	Yes
	Twaite shad									
	River lamprey									

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
	Reefs	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Sandbanks which are slightly covered by sea water all times	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Estuaries	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Mudflats and sandflats not covered by seawater at low tide	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Atlantic salt meadows	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
Severn Estuary SPA	Bewick's swan	No pathway – species does not currently use the levels and habitats are largely unsuitable	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	Potential for effect if bird behaviour changes to include regular flights across the	No
	Wintering European white-fronted goose									
	Dunlin									

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
	Redshank								road	
	Gadwell									
	Shelduck									
	Assemblage of nationally important populations of waterfowl	Some species within the assemblage may use some areas on the levels	Potential for roost sites in close proximity to road to be affected	No pathway	No pathway	No pathway	Potential for disturbance during construction	No pathway	Potential for effect if bird behaviour changes to include regular flights across the road	Yes
Severn Estuary Ramsar	Bewick's swan	No pathway – species does not currently use the levels	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	Potential for effect if bird behaviour changes to include regular flights across the road	No
	Wintering European white-fronted goose									
	Dunlin									
	Redshank									

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
	Gadwell									
	Shelduck									
	Assemblage of nationally important populations of waterfowl	Some species within the assemblage may use some areas on the levels	Potential for roost sites in close proximity to road to be affected	No pathway	No pathway	No pathway	Potential for disturbance during construction	No pathway	Potential for effect if bird behaviour changes to include regular flights across the road	Yes
	Estuaries	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Atlantic Salt Meadows	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
	Assemblage of migratory fish	Barrier to migration caused by piers within river channel	As a result of barrier to migration	Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment	Barrier to migration caused by piers within river channel	No pathway	Certain species are sensitive to noise and vibration such that migration could be inhibited	No pathway	No pathway	Yes

European Site	Qualifying Features	Potential Effects								Potential for significant effects
		Habitat loss fragmentation	Loss of breeding areas and roosts	Air quality changes	Water quality and flow change	Changes to habitat structure	Noise and vibration disturbance to species	Lighting disturbance to species	Wildlife collision	
	Mudflats and sandflats not covered by seawater at low tide	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No
Wye Valley and Forest of Dean Bats SAC	Lesser horseshoe bat	Potential for severing flight lines	Severing of flight lines could prevent movement of animals between roost sites	No pathway	No pathway	Introduction of road would affect flight lines	No pathway	Potential to restrict bat movement	Potential for collisions if flight routes not identified or mitigation measures not used	Yes
	Greater horseshoe bat	No pathway – no established link between roost at Ruperra and Wye Valley	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No pathway	No

Of the in-combination plans identified, the majority of the impacts that were predicted centred on the issues of air pollution and disturbance to the Severn Estuary features. However, while some strategies have acknowledged that there could be increases in the amounts of greenhouse gases and other airborne pollutants produced, the proposed new road options could deliver improvement in air quality by reducing congestion. It is therefore considered that there are not likely to be any significant effects in terms of air pollution as a result of the road options in combination with other plans.

The effects of disturbance on features of the Severn Estuary have been identified as potentially significant alone, and the potential increase in additional recreational disturbance could add to this.

9.2 Do Minimum Scenario

This option has been identified as having the potential to affect the Wye Valley Woodland SAC through potential increase in levels of air pollution, and therefore potential deposition, which could occur as a result of increased congestion on the existing M4 corridor. However, it is not considered to be significant due to the dispersal of the air borne pollution over the 12.5km between the existing M4 corridor and the SAC designated areas.

10 Consideration of Likely Effects in Relation to the Conservation Objectives

10.1 River Usk SAC

Consideration of the potential for likely significant effects highlighted the potential for effects on migratory fish populations and otters within the lower section of the River Usk SAC. These effects relate to the potential for the construction and presence of a new crossing to inhibit the movement of migratory fish through Newport and the potential for disturbance during construction to inhibit the movement of otters through the area of the proposed Usk crossings.

10.1.1 Migratory Fish Populations

The Conservation Objectives for the features of the River Usk SAC are provided in Appendix A. Of the objectives for the migratory fish species, the following objective is the one which is most likely to be affected by the potential impacts:

‘The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future’.

Clearly the introduction of a barrier to migration, either adult fish upstream or juvenile fish moving out to sea, would have a considerable effect on the range of the species and could prevent spawning. If the barrier persisted for several years it could prevent spawning and result in the absence of fish including juvenile age classes from the Usk catchment.

Extensive studies undertaken of river crossing options included modelling of the potential changes in flows caused by the creation of a bridge pier within the river channel and measurements to understand the potential extent of noise propagation through the water during any piling activities. These studies concluded that, provided the piling works were undertaken with sensitive methods (drilled rather than percussive piling) and avoided certain tidal stages during key migration periods, the creation of piers within the river channel was unlikely to pose a barrier to fish movement either up or down stream.

It is therefore concluded that the creation of a new road crossing would be unlikely to affect the range or movement of fish within the River Usk and that any effects that might occur could be mitigated through measures that could be incorporated into the design of a scheme or could be secured during the process of deciding construct such a scheme under the Highways Act 1990 (as amended).

10.1.2 Otter Population

The conservation objectives for the otter feature focus around maintaining the size of the population, maintaining the range and areas of habitat for otter and ensuring the safe movement and dispersal of otters.

The safe movement of otter would be ensured through the inclusion of adequate mitigation in line with the requirements of DMRB as described above. However during construction there is the potential that otters could be deterred from moving along the Usk within the zone of construction around the Usk Crossing. In particular if activities are required to take place at night, for example to make efficient use of tidal cycles for the works, task lighting has the potential to affect otter movement. However mitigation for such an impact could be devised to ensure only one bank is lit and shielding the wider river corridor from the light using baffles and screens.

10.1.3 Conclusion

It is considered on the basis of professional judgement that the impacts that could reasonably be expected to give rise to effects on the features of the River Usk SAC could be mitigated during the implementation of a project to build a new road to the south of Newport. It is therefore considered that in terms of any assessment under the Habitats Regulations of the decision to take forward the draft plan, red or purple alternative routes, these could be considered as not giving rise to any adverse effects on the integrity of the European Site.

10.2 Severn Estuary SAC, SPA and Ramsar Site

The previous section of this report identified the potential for significant effects on the populations of migratory fish and the assemblage of wintering birds for which the Severn Estuary European Marine Site (EMS) is designated.

10.2.1 Migratory Fish Populations

The effects on migratory fish have been considered above in relation to the River Usk SAC, which adjoins the Severn Estuary EMS at the mouth of the River Usk where it flows into the Severn Estuary. The conservation objectives for these features of the Severn Estuary (provided in Appendix A) focus on ensuring there are no barriers to fish movement within the Estuary and that the population of fish within the Estuary is maintained.

Although there is the potential for barrier effects from a potential new road crossing these are located outside of the Severn Estuary EMS and would therefore not affect the ability of the Severn Estuary EMS features to achieve favourable conservation status.

As discussed above the potential effects of the proposed new road options on the numbers of fish using the River Usk and therefore the potential for there to be a reduction in the number of fish present within the Severn Estuary EMS can be mitigated and are considered unlikely to give rise to adverse effects on the integrity of the Severn Estuary EMS.

10.2.2 Wintering Bird Assemblage.

At present there is not a large scale use of the Gwent Levels by bird species from the Severn Estuary EMS. The majority of the Gwent Levels is not suitable for wading birds due to being enclosed with well-established hedgerows. As a result the conservation objectives for the bird assemblage relate to the population size and the extent of supporting habitat and food sources within the SPA boundary.

The potential for habitat fragmentation or loss and disturbance is therefore relatively low at the current time. However it is known that in some areas aggregations of species have been found on the levels. There is the potential that the use of the levels could increase however this would be likely to only occur if there were significant changes in land use such as the conversion to arable farming. The majority of the proposed new road options are located within areas designated as Sites of Special Scientific Interest and it is therefore unlikely that changes in farming practices would occur.

In the event that birds from the SPA population were found to be using areas on or in close proximity to areas required for the construction of a new road, it would be possible to avoid impacts by commencing work in those areas during the summer months avoiding disturbance to the bird species which form the assemblage.

It is therefore considered that the construction of a new road to the south of Newport is not likely to give rise to an adverse effect on the integrity of the Severn Estuary EMS.

10.2.3 Conclusions

The construction and operation of a new road route to the south of Newport is not considered likely to give rise to any adverse effects on the features of the Severn Estuary European Marine Site. Where impacts that could give rise to effects have been predicted, it is considered that suitable avoidance and mitigation measures could be employed during the construction of the scheme to ensure adverse effects do not occur.

10.3 Wye Valley and Forest of Dean Bats SAC

Although standard DMRB mitigation measures are likely to ameliorate issues of collision of bats with vehicles, there is also the potential for lighting to affect bat activity and behaviour and for the movement of bats through the landscape to be affected by the construction and operation of a new road route.

The following conservation objectives have been set by NRW for the lesser horseshoe bat feature of this site:

- The site will support a sustainable population of lesser horseshoe bats in the Wye Valley area.
- The population will be viable in the long term, acknowledging the population fluctuations of the species.
- Buildings, structures and habitats on the site will be in optimal condition to support the populations.

- Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, mortality from predation or vehicle collision, and changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range.
- Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, or any decline in the extent or quality of breeding, foraging or hibernating habitat.
- There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines – there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management.
- All factors affecting the achievement of the foregoing conditions are under control.

Whilst there is the potential for a new road to affect bat flight lines, it is envisaged that through appropriate survey and design of mitigation these effects could be minimised. It should also be noted that the distance between the SAC designation, containing the main roost sites, and the closest parts of the proposed new road routes is 8.5km. Lesser horseshoe bats tend to have a core foraging area around their maternity roosts of approximately 4km depending on habitat availability (Catherine Bickmore Associates, 2003). They have however been recorded travelling up to 11km between summer and winter roosts (Catherine Bickmore Associates, 2003).

At present there are no known links between roosts in the Wye Valley and Forest of Dean and the area around Newport. A small roost was identified on the Gwent Levels during previous studies for the New M4 Project in 2007, and there are records of horseshoe bats at the disused military base at Caerwent.

10.3.1 Conclusion

It is considered on the basis of professional judgement that any areas of habitat that are suitable for lesser horseshoe bats that are likely to be affected by a new road route would be of very low significance to the lesser horseshoe bat population within the Wye Valley and Forest of Dean Bat SAC. Therefore with the implementation of appropriate surveys and mitigation design during the project level assessment of any new road route, it is concluded that such a route is not likely to result in an adverse effect on the integrity of the Wye Valley and Forest of Dean Bat SAC.

11 Summary of Findings and Next Steps

The consideration of the draft Plan, its reasonable alternatives and the Do Minimum scenario has shown that it is considered unlikely that any of the four options would result in adverse effects on the integrity of European Sites. There is the potential for effects on European Sites from the new road route options and mitigation is likely to be required to ensure that adverse effects do not occur. This mitigation would be developed and secured during the design and consenting of a new road by Welsh Government at scheme level, should the draft Plan or either of its reasonable alternatives be adopted (with or without amendment). At the scheme level, the details of the proposal and any mitigation requirements would need to be further assessed under the Habitats Regulations to confirm that there would be no effect on the integrity of European Sites.

This document will be subject to public consultation alongside the draft Plan Consultation Document and associated assessments. The responses to the consultation will then be used to review and finalise a Habitats Regulations Assessment (HRA) Screening Report and a Statement to inform an Appropriate Assessment.

12 How to respond and further information

Please respond to this Consultation by using the Consultation Response Form that accompanies this document. This can be completed and sent to the address shown below:

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Alternatively, you can respond electronically via the following website links:

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Appendix A

Conservation Objectives

A1 Conservation Objectives

Conservation Objectives for European Sites

The ecological status of the water course is a major determinant of FCS for all features. The required conservation objective for the water course is defined below.

4.1 Conservation Objective for the water course

- 4.1.1 The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary.
- 4.1.2 The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3.
- 4.1.3 Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC.
- 4.1.4 All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change.
- 4.1.5 Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed.
- 4.1.6 The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.
- 4.1.7 River habitat SSSI features should be in favourable condition. In the case of the Usk Tributaries SSSI, the SAC habitat is not underpinned by a river habitat SSSI feature. In this case, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone.
- 4.1.8 Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. weirs, bridge sills, acoustic barriers.
- 4.1.9 Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified.
- 4.1.10 Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.
- 4.1.11 Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed between EA and CCW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document.
- 4.1.12 Levels of nutrients, in particular phosphate, will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document.
- 4.1.13 Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the

standards used by the Review of Consents process given in Annex 3 of this document.

- 4.1.14 Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects.
- 4.1.15 Levels of suspended solids will be agreed between EA and CCW for each Water Framework Directive water body in the Usk SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.

4.2 Conservation Objective for Features 1-5:

- Sea lamprey *Petromyzon marinus* (EU Species Code: **1095**) ;
 - Brook lamprey *Lampetra planeri* (EU Species Code : **1096**) ;
 - River lamprey *Lampetra fluviatilis* (EU Species Code : **1099**) ;
 - Twaite shad *Alosa fallax* (EU Species Code : **1103**) ;
 - Allis shad *Alosa alosa* (EU Species Code : **1102**) ;
 - Atlantic salmon *Salmo salar* (EU Species Code : **1106**) ;
 - Bullhead *Cottus gobio* (EU Species Code : **1163**)
-

Vision for features 1-5

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

FCS component	Supporting information / current knowledge
4.2.1 The conservation objective for the water course as defined in 4.1 above must be met	
4.2.2 The population of the feature in the SAC is stable or increasing over the long term.	<p>Refer to sections 5.1 to 5.5 for current assessments of feature populations</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates.</p> <p>Fish stocking can adversely affect population dynamics through competition, predation, and alteration of population genetics and introduction of disease.</p>
4.2.3 The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions eg. food supply (as described in sections 2.2	<p>Some reaches of the Usk SAC are more suitable for some features than others e.g. the Senni has important populations of brook/river lamprey and salmon but is not used by shad due to its small size and distance from the estuary. These differences influence the management priorities for individual reaches and are used to define the site units described in section 3.2. Further details of feature habitat suitability are given in section 5. In general, management for one feature is likely to be sympathetic for the other features present in the river, provided that the components of favourable conservation status for the water course given in section 4.1 are secured.</p> <p>The characteristic channel morphology provides the diversity of water depths, current velocities and</p>

<p>and 5). Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of 4.2.4</p>	<p>substrate types necessary to fulfil the habitat requirements of the features. The close proximity of different habitats facilitates movement of fish to new preferred habitats with age. The presence of hard bank revetments in a number of active alluvial reaches e.g. through Brecon and upstream of Abergavenny, adversely affects the processes that maintain suitable habitat for the SAC features.</p> <p>Hydrological processes in the Usk are currently affected by large abstractions, especially at Prioress Mill and Brecon Weir. However, there are many smaller abstractions not considered to cause a problem at present.</p> <p>Shad and salmon migration can be affected by acoustic barriers and by high sediment loads, which can originate from a number of sources including construction works.</p>
<p>4.2.4 There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.</p>	<p>Allis and twaite shad are affected by range contraction due to artificial barriers to migration in the Usk. It is likely that this loss of habitat affects their maintenance in the SAC on a long-term basis.</p>

Performance indicators for features 1-5

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Sea lamprey <i>Petromyzon marinus</i> : <i>Performance indicators for feature condition</i>			
<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Distribution within catchment	Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon ammocoetes</i> .	This attribute provides evidence of successful spawning and distribution trends. Spawning sites known to have been used within the previous 10 years and historical sites considered still to have suitable habitat, are shown in Annex 4. Spawning locations may move within and between sites due to natural processes or new sites may be discovered over time. Silt beds downstream of all sites identified in Annex 4 will be sampled for presence or absence of ammocoetes. Where apparently suitable habitat at any site is unoccupied feature condition will be considered unfavourable.	1-5

b) Ammocoete density	Ammocoetes should be present in at least four sampling sites each not less than 5km apart.	This standard CSM attribute establishes a minimum occupied spawning range, within any sampling period, of 15km. In the Usk, spawning sites within units 2 to 5 will be assessed against this attribute.	2-5
	Overall catchment mean $>0.1\text{m}^{-2}$ (Harvey & Cowx 2003) ¹	Although this attribute is not used in CSM for sea lamprey, baseline monitoring in the Usk gave an overall catchment mean of 2.27 ammocoetes m^{-2} in suitable habitat ² , therefore 0.1m^{-2} is a conservative threshold value for unfavourable condition.	

Brook lamprey *Lampetra planeri* and River lamprey *Lampetra fluviatilis* :
Performance indicators for feature condition

Attribute	Specified limits	Comments	Relevant unit(s)
a) Age/size structure of ammocoete population	Samples < 50 ammocoetes ~ 2 size classes Samples > 50 ammocoetes ~ at least 3 size classes	This gives an indication of recruitment to the population over the several years preceding the survey. Failure of one or more years recruitment may be due to either short or long term impacts or natural factors such as natural flow variability, therefore would trigger further investigation of the cause rather than leading automatically to an unfavourable condition assessment.	2-10
b) Distribution of ammocoetes within catchment	Present at not less than 2/3 of sites surveyed within natural range No reduction in distribution of ammocoetes	The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit ie. all except unit 1 Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment. Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit or sub-unit/tributary, and will lead to an unfavourable condition assessment.	2-10
c) Ammocoete density	Optimal habitat: $>10\text{m}^{-2}$ Overall catchment mean: $>5\text{m}^{-2}$	Optimal habitat comprises beds of stable fine sediment or sand $\geq 15\text{cm}$ deep, low water velocity and the presence of organic detritus, as well as, in the Usk, shallower sediment, often patchy and interspersed among coarser substrate.	2-10

Twaite shad *Alosa fallax* and Allis shad *Alosa alosa* :
Performance indicators for feature condition

Attribute	Specified limits	Comments	Relevant unit(s)
a) Spawning distribution	No decline in spawning distribution	Spawning distribution is assessed by kick sampling for eggs and/or observations of spawning adults. A representative sample of	1-5

		sites within units 2 to 5 will be monitored at 3 yearly intervals. Absence from any site in 2 consecutive surveys will result in an unfavourable condition assessment.	
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Performance indicators for factors affecting the feature

a) Flow	Targets are set in relation to river/reach type(s)	Targets equate to those levels agreed and used in the Review of Consents (see Annex 1). Shad are particularly sensitive to flow. The ideal regime is one of relatively high flows in March-May, to stimulate migration and allow maximum penetration of adults upstream, followed by rather low flows in June-September, which ensures that the juveniles are not washed prematurely into saline waters and grow rapidly under warmer conditions. The release of freshets to encourage salmonid migration should therefore be discouraged on shad rivers during this period.	1-5
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Atlantic salmon *Salmo salar* :

Performance indicators for feature condition

<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Adult run size	Conservation Limit complied with at least four years in five (see 5.4)	CSM guidance states: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component. As there is no fish counter in the Usk, adult run size is calculated using rod catch data. Further details can be found in the EA Usk Salmon Action Plan.	All
b) Juvenile densities	Expected densities for each sample site using HABSCORE	CSM guidance states: These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality. Assessed using electrofishing data.	6-10

Performance indicators for factors affecting the feature

Water quality

a) Biological quality	Biological GQA class A	This is the class required in the CSM guidance for Atlantic salmon, the most sensitive feature.	6-10
b) Chemical quality	RE1	It has been agreed through the Review of Consents process that RE1 will be used throughout the SAC (see Annex 3)	All

Hydromorphology

a) Flow	Targets are set in relation to river/reach type(s)	Targets equate to those levels agreed and used in the Review of Consents (see Annex 1)	All
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Bullhead <i>Cottus gobio</i> : Performance indicators for feature condition			
Attribute	Specified limits	Comments	Relevant unit(s)
a) Adult densities	No less than 0.2 m ⁻² in sampled reaches	CSM guidance states that densities should be no less than 0.2 m ⁻² in upland rivers (source altitude >100m) and 0.5 m ⁻² in lowland rivers (source altitude ≤100m). A significant reduction in densities may also lead to an unfavourable condition assessment.	2-10
b) Distribution	Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current	Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an unfavourable condition assessment.	2-10
c) Reproduction / age structure	Young-of-year fish should occur at densities at least equal to adults	This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.	2-10

4.3 Conservation Objective for Feature 6:

- European otter *Lutra lutra* (EU Species Code: 1355)

Vision for feature 6

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

FCS component	Supporting information / current knowledge
4.3.1 The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.	Refer to section 5.9 for current assessment of feature population
4.3.2 The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Usk SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may	Survey information shows that otters are widely distributed in the Usk catchment. While the breeding population in the Usk is not currently considered to be limited by the availability of suitable breeding sites, there is some uncertainty over the number of breeding territories which the SAC is capable of supporting given near-natural levels of prey abundance. The decline in eel populations may be having an adverse effect on the population of otters in the Usk.

vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.

4.3.3	The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.	Restrictions on the movement of otters around the SAC, and between adjoining sites are currently a particular concern in the reach through Newport as a result of a continued decrease in undisturbed suitable riparian habitat.
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Performance indicators for feature 6

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>			
<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Distribution	Otter signs present at 90% of Otter Survey of Wales sites	Ref: CCW Environmental Monitoring Report No 19 (2005) ³	All
b) Breeding activity	2 reports of cub/family sightings at least 1 year in 6	Ref: CCW Environmental Monitoring Report No 19 (2005) ³	All
c) Actual and potential breeding sites	No decline in number and quality of mapped breeding sites in sub-catchments (see Ref)	Ref: CCW Environmental Monitoring Report No 19 (2005) ³ In the Usk catchment, 77 actual or potential breeding sites have been identified, distributed throughout the catchment on the main river and tributaries.	All

4.4 Conservation Objective for Feature 7:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation

Vision for feature 7

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

FCS component	Supporting information / current knowledge
4.4.1 The conservation objective for the water course as defined in 4.1 above must be met	
4.4.2 The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term. Suitable habitat and associated plant communities may vary from reach to reach. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions eg. nutrient levels, shade (as described in section 2.4). Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.	More information is required on the natural range and distribution of this feature in the Usk. Important examples of the feature may be present outside currently known locations. Sympathetic management will be promoted wherever the feature is present. Species indicative of unfavourable condition for this feature eg. filamentous algae associated with eutrophication, invasive non-native species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status, within the SAC.
4.4.3 The area covered by the feature within its natural range in the SAC should be stable or increasing.	Important stands of the feature are known to occur within site management unit nos. 2, 3 & 10. Management to maintain or increase the feature within these units will be a priority. Adverse factors may include elevated nutrient levels, shading or altered flow and/or sediment transport regimes.
4.4.4 The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species	More information on the typical species expected to be found with each management unit in the SAC is required.

may be defined as appropriate.

Performance indicators for feature 7

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition			
Attribute	Specified limits	Comments	Relevant unit(s)
a) Distribution within catchment	Distribution within site units 2,3 & 10	<i>Ranunculus</i> spp. will be present with an MTR species cover score of at least 5 in: Any three representative sample 100m stretches of suitable habitat between Usk Town bridge and the bridge at Newbridge-on-Usk: AND In one representative sample 100m stretch of suitable habitat along the Senni	2,3,10
b) Typical species	Species list for reference vegetation type	Should conform to appropriate JNCC type or other list for site unit as appropriate. Details to be confirmed	2,3,10
Performance indicators for factors affecting the feature			
Negative indicators			
a) Native species	Cover of indicators of eutrophication maintained below threshold over the medium to long term	CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals. For the Usk SAC: Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. and <i>Vaucheria</i> spp.) should not have an MTR cover value of greater than 5 (ie.10%) in 3 consecutive years in: Any three representative sample 100m stretches of suitable habitat between Usk Town bridge and the bridge at Newbridge-on-Usk: AND In one representative sample 100m stretch of suitable habitat along the Senni	2,3,10
b) Alien / introduced species	No impact on native biota from alien or introduced species	In the CSM guidance, the SERCON scoring system for naturalness of aquatic and marginal macrophytes and naturalness of banks and riparian zone, are used to assess this attribute. SERCON protocols have not been applied in the Usk SAC, therefore assessment of this attribute relies on locally defined thresholds and expert judgement. Details to be confirmed	

4. Conservation Objectives and Favourable Condition Tables For the European Marine Site

Severn Estuary SAC, SPA and Ramsar

4.1 Conservation objectives for the Severn Estuary / Môr Hafren SAC

The protection and management of the SAC in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

4.1.1 SAC interest feature 1: Estuaries

The conservation objective for the “estuaries” feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met

- i. the total extent of the estuary² is maintained;
- ii. the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the estuary is maintained;
- iii. the characteristic range and relative proportions of sediment sizes and sediment budget³ within the site is maintained;
- iv. the extent, variety and spatial distribution⁴ of estuarine habitat communities⁵ within the site is maintained⁶;
- v. the extent, variety, spatial distribution⁴ and community composition of hard substrate habitats and their notable communities^{5(v)} is maintained;
- vi. the abundance of the notable estuarine species assemblages⁷ is maintained or increased;
- vii. the physico-chemical characteristics⁸ of the water column⁹ support the ecological objectives described above;
- viii. Toxic contaminants in water column⁹ and sediment are below levels which would pose a risk to the ecological objectives described above.
- ix. Airborne nutrient and contaminant loads are below levels which would pose a risk to the ecological objectives described above

The meaning of terms ¹⁻⁹ above is explained in **section 4.1.1.1**

Appendix 2 shows the extent of the “estuaries” feature within the Severn Estuary SAC European Marine Site.

4.1.1.1 Explanatory information for the “estuaries” conservation objective

¹ Natural processes in respect of the SAC

Each feature may be subject to both natural processes and human influence. Human influence on the interest features is acceptable provided that it is proved to be / can be established to be compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions, which is entirely a result of natural process will not constitute unfavourable condition, but may trigger a review of the definition of favourable condition.

Dynamic physical process within estuaries can stem from variable weather conditions including one off storm events, and result in changes in wave exposure, riverine floods or tidal surges. These events can move large quantities of sediments and alter channel morphology, which affect current patterns and sediment transport within the estuary.

Where these processes occur without significant anthropogenic influence they fall under the umbrella of 'natural change'. Because estuaries are dynamic systems we can expect the amount and gross distribution of habitats to change in the future. In general estuarine communities and their supporting habitats are intrinsically more dynamic over short timescales when compared to other marine and terrestrial habitats. Some estuarine communities occur in cycles dependent upon the prevailing physical conditions. Features should not necessarily be considered in unfavourable condition caused by the short term disappearance of a particular community due to natural processes.

An important example of natural processes occurring over a longer timescale is that estuaries have a natural tendency to accumulate sediment, thereby changing their form from their original glacial morphology to a state where tidal energy is dissipated by sediment banks and other features such as saltmarsh. This, with other forces of natural change, will therefore cause the width and depth of the estuary to change over time, moving towards a state of dynamic equilibrium or 'most probable state'. As part of this process, the location and extent of saltmarshes and mudflats may change, provided there is capacity to accommodate readjustment. Future developments should aim to avoid impact on the future evolution of the system as where this process is constrained by human influence, the capacity of habitats to accommodate readjustment may be affected.

² Extent of the estuary

The landward limit of the estuary feature is the limit of highest astronomical tide or the site boundary where it is below highest astronomical tide, except where the landward limit is defined as straight lines across the mouths of rivers entering the estuary. The seaward limit is as shown in the map in Appendix 2. Where other Habitats Directive Annex I habitat types occur within the estuary, they also form part of the estuary feature. In addition, there are areas of the estuary which do not form part of other Annex I habitat types.

³ Sediment budget

The sediment budget refers to the total amount of sediment within the Severn Estuary taking into account the balance of sediment inputs and outputs.

⁴ Spatial distribution

Spatial distribution of estuarine communities refers to the macro spatial pattern in which communities are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

⁵ Estuarine habitat communities

***Note:** sections i – iv below list the habitat types which are also features of the Severn Estuary SAC in their own right as well as being 'sub-features' of the estuary feature. The detailed definitions of favourable conservation status for these features are provided under their respective conservation objectives.*

- i. Subtidal sandbanks (*see section 4.1.2 for the conservation objective for this feature*)
 - Sublittoral Sands and Muddy Sands
 - Sublittoral cohesive mud and sandy mud communities
- ii. Intertidal mudflats and sandflats (*see section 4.1.3 for the conservation objective for this feature*)
 - Intertidal gravel and clean sands
 - Intertidal muddy sands
 - Intertidal muds

- iii. Atlantic saltmeadows (*see section 4.1.4 for the conservation objective for this feature*)
 - Low – mid marsh communities
 - Mid – upper marsh communities
 - Transitional high marsh communities
 - Pioneer marsh communities
- iv. Reefs of *Sabellaria alveolata* (*see section 4.1.5 for the conservation objective for this feature*)
 - *Sabellaria alveolata* on variable salinity sublittoral mixed sediment (subtidal)
 - *Sabellaria alveolata* reefs on sand-abraded eulittoral rock (contiguous subtidal and intertidal)
- v. Hard substrate habitat notable communities
 - *Sabellaria alveolata* reefs on sand-abraded eulittoral rock (MLR.Sab.Salv)
 - *Hydroids, ephemeral seaweeds and Littorina littorea* in shallow eulittoral mixed substrata pools. (LR.RkpH)
 - *Balanus crenatus* and *Tubularia indivisa* on extremely tide-swept circalittoral rock. (ECR.BS.BalTub)
 - *Fucus serratus* and piddocks on lower eulittoral soft rock (MLR.Fser.Pid)
 - *Mytilus edulis* and piddocks on eulittoral firm clay (MLR.MytPid)
 - *Balanus crenatus*, *Halichondria panacea* and *Alcyonidium diaphanum* on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan)
 - *Sertularia cupressina* and *Hydrallmania falcate* on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd).
 - *Corrallina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.Rkp.Cor)
 - Eel grass (*Zostera*) beds
 - Peat and clay exposures
 - Any other notable hard substrata communities that may be identified.

⁶Maintained

Since the late 1990s Natural England's condition assessment has identified that parts of the saltmarsh within the Severn Estuary appear to be exhibiting the effects of coastal squeeze. For this reason NE and CCW do not consider it sufficient simply to seek to maintain the existing saltmarsh resource, rather it is our advice that measures will be required which seek to recreate the approximate extent of saltmarsh habitat present within the estuary in 1995 (the year the Severn Estuary was first identified as a proposed SAC); whilst at all times working within the framework of seeking a sustainable estuary form. N.B. This is based upon a site specific consideration of the state of habitats within the Severn Estuary, and should not be extended to other sites on the basis of this advice.

⁷Notable estuarine species assemblages

- i. Assemblage of fish species:
 - Migratory species
 - River and Sea Lamprey and Twait shad (Annex 1 species) and Allis shad
 - Sea trout, salmon, eel,
 - Estuarine species
 - Species typically occurring and breeding in estuaries (Bird, 2008)
 - Marine species occurring in large numbers in estuaries (Bird, 2008)
 - Marine species
 - Predominantly marine species occurring infrequently in the Severn (Bird, 2008)
 - Freshwater species
 - Species typically occurring and breeding in freshwater and recorded within the Severn cSAC (Bird, 2008)

- ii Assemblage of waterfowl species (refer also sections 4.2 and 4.3 on the SPA and Ramsar Site):
 - Regularly occurring Annex 1 species - Bewicks' swan
 - Regularly occurring migratory species - European white-fronted goose, dunlin, redshank, shelduck, gadwall
 - Nationally important bird populations - wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew, whimbrel and spotted redshank
- iii. Assemblage of vascular plant species:
 - Salt marsh species (refer to notes 5 and 6 in section 4.1.4.1 - explanatory information on the conservation objective for the Atlantic salt meadows feature)
 - Eel grass (*Zostera*) species.

⁸ Physico-chemical characteristics

These include nutrients, oxygen, turbidity, pH, temperature and salinity.

⁹ Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.2 SAC interest feature 2: Subtidal sandbanks which are covered by sea water all the time (subtidal sandbanks)

The conservation objective for the “subtidal sandbanks” feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the total extent of the subtidal sandbanks² within the site is maintained;
- ii. the extent and distribution³ of the individual subtidal sandbank communities⁴ within the site is maintained;
- iii. the community composition⁵ of the subtidal sandbank feature within the site is maintained;
- iv. the variety and distribution³ of sediment types across the subtidal sandbank feature is maintained;
- v. the gross morphology (depth, distribution and profile) of the subtidal sandbank feature within the site is maintained.

The meaning of terms ¹⁻⁵ above is explained in **section 4.1.2.1**

Appendix 3 shows the extent of the “subtidal sandbanks” feature within the Severn Estuary SAC European Marine Site.

4.1.2.1 Explanatory information for the “subtidal sandbanks” conservation objective

¹ Natural processes in respect of the SAC

The meaning of ‘natural processes’ is explained in **section 4.1.1.1**

² Extent of subtidal sandbanks

The subtidal sandbanks in the Severn Estuary change their shape over time and many are ephemeral in nature, although some are relatively stable and long established. The extent of the Annex 1 habitat is considered to include both the actual sandbanks and their associated sediments. Areas of associated sediments have been defined by using the sediment environments of the Bristol Channel Marine Aggregates Resources and Constraints project, commissioned by the National Assembly for Wales (Posford Duvivier and ABP, 2000) Associated sediments have been defined as any area of of subtidal sand-sized sediment within the same sediment environment as a subtidal sandbank. Mobile sediments that form temporary sandbanks are considered to be associated sediments that should be retained in the system, but their location may change. Areas of holocene valley infill (relict sediment) are not mobile under present day estuarine conditions. Therefore, where Holocene infill is exposed, it is not considered to form part of the associated sediments. However, any mobile sand deposited over the infill does contribute to the associated sediments.

³ Distribution

Distribution of sandbank communities and sediments refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities or sediments e.g. the exact mapped positions of specific communities or sediments to be maintained.

The sand banks of the Middle and Welsh Grounds are relatively permanent sandbank features in the Severn Estuary, along with other long established sandbank features at Cardiff Grounds and in Bridgwater Bay. The tops of these banks are intertidal, and the permanently submerged parts of the banks are considered to contribute to the subtidal sandbanks habitat.

There are other areas of subtidal sandbank habitat within the Estuary, again sometimes the top of the bank may be exposed at low tide, with the submerged sections contributing to the subtidal sandbanks habitat. These banks are more ephemeral in nature, but are still considered part of the feature, and reflect the dynamic nature of the Severn Estuary. The areas where ephemeral subtidal sandbanks are known to occur include areas offshore from Avonmouth and at English Grounds (near Clevedon).

The macro-scale distribution of the subtidal sandbanks should be maintained, and there should be continued presence of ephemeral subtidal sandbanks in the Estuary.

⁴ Subtidal sandbank communities

There are two groups of communities comprising the ‘sub-features’ of the subtidal sandbanks feature:

- Sublittoral Sands and Muddy Sands:
 - i. Infralittoral mobile sand in variable salinity (estuaries)
 - ii. Infralittoral mobile clean sand with sparse fauna
 - iii. *Nephtys cirrosa* and *Macoma balthica* in variable salinity infralittoral mobile sand
 - iv. *Neomysis integer* and *Gammarus* spp. in fluctuating low salinity infralittoral mobile sand
- Sublittoral cohesive mud and sandy mud communities:
 - i. *Capitella capitata* in enriched sublittoral muddy sediments
 - ii. *Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud
 - iii. *Capitella capitata* and *Tubificoides* spp. in reduced salinity infralittoral muddy sediment*
 - iv. *Nephtys hombergii* and *Macoma balthica* in infralittoral sandy mud*

(* these records have a lower degree of confidence than the other communities listed, i.e. the biotope assessor was uncertain regarding precisely which biotope should be recorded).

⁵ Community composition

Species typical of the subtidal sandbank communities:

Aricidea minuta
Capitella capitata
Diastylis rathkei typica
Eurydice pulchra
Gammarus salinus
Harpinia pectinata
Mediomastus fragilis
Nephtys cirrosa
Nephtys hombergii
Oligochaeta
Pygospio elegans
Pontocrates arenarius
Pseudocuma longicornis
Retusa obtusa
Tubificoides amplivasatus

4.1.3 SAC interest feature 3 : Mudflats and sandflats not covered by seawater at low tide (mudflats and sandflats)

The conservation objective for “mudflats and sandflats” feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. The total extent of the mudflats and sandflats feature² is maintained;
- ii. the variety and extent of individual mudflats and sandflats communities³ within the site is maintained;
- iii. the distribution⁴ of individual mudflats and sandflats communities³ within the site is maintained;
- iv. the community composition⁵ of the mudflats and sandflats feature within the site is maintained;
- v. the topography of the intertidal flats and the morphology (dynamic processes of sediment movement and channel migration across the flats) are maintained.

The meaning of terms ¹⁻⁵ above is explained in **section 4.1.3.1**.

Appendix 4 shows the extent of the “mudflats and sandflats” feature within the Severn Estuary SAC European Marine Site.

4.1.3.1 Explanatory information for the “mudflats and sandflats” conservation objective

¹ Natural processes in respect of the SAC

The meaning of ‘natural processes’ is explained in **section 4.1.1.1**.

²Extent of the intertidal mudflats and sandflats

The extent of the feature is defined using intertidal Phase 1 survey information, which gives the seaward limit of the feature as the low water mark of spring tides (MLWS) because that is in practice the lower limit to which Phase 1 survey is possible. The feature does not include other intertidal habitats which are not mudflats and sandflats, such as intertidal reefs and rocky shores. This is the basis on which the feature is shown in the map in Figure 4, the total extent being 20,271 ha. However in addition there will be some areas of intertidal mudflat and sandflat seaward of MLWS and down to Lowest Astronomical Tide, which is the absolute seaward limit of this habitat type.

³Mudflat and sandflat communities

There are three groups of communities comprising the “sub-features” of the “Mudflats and sandflats not covered by seawater at low tide” feature:

- Intertidal gravel and clean sand communities

- i. Barren coarse sand shores; **LGS.S.BarSnd**
- ii. Burrowing amphipods and *Eurydice pulchra* in well drained clean sand shores; **LGS.S.AEur**
- iii. Burrowing amphipods and polychaetes in clean sand shores. **LGS.S.AP**
- iv. Talitrid amphipods in decomposing seaweed on the strandline **LGS.S.Tal**
- v. Dense *Lanice conchilega* in tide-swept lower shore sand **LGS.S.Lan**
- vi. Barren shingle or gravel shores **LGS.Sh.BarSh**

- Intertidal muddy sand communities :

- Polychaetes and *Cerastoderma edule* in fine sand or muddy sand shores **LMS.MS.PCer**
- Bathyporeia pilosa* and *Corophium spp.* in upper shore slightly muddy fine sand shores **LMS.MS.BatCor**
- Macoma balthica* and *Arenicola marina* in muddy sand shores. **LMS.MS.MacAre**

- Intertidal mud communities:

- Hediste diversicolor* and *Macoma balthica* in sandy mud shores: **LMU.SMu.HedMac**
- Hediste diversicolor*, *Macoma balthica* and *Arenicola marina* in muddy sand or sandy mud shores **LMU.SMu.HedMacAre**
- Hediste diversicolor* and *Scrobicularia plana* in reduced salinity mud shores **LMU.Mu.HedScr**
- Hediste diversicolor* and oligochaetes in low salinity mud shores **LMU.Mu.HedOl**
- Hediste diversicolor* and *Streblospio shrubsolii* in sandy mud or soft mud shores **LMU.Mu Hed Str**

Appendix 4a shows the extent of the “mudflats and sandflats” subfeatures within the Severn Estuary SAC European Marine Site.

⁴ Distribution

The distribution of mudflats and sandflats communities refers to the macro spatial pattern in which these communities are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

⁵ Community composition

Species typical of the mudflat and sandflat communities:

Aphelocheata marioni
Arenicola marina
Bathyporeia pelagica
Corophium volutator
Enchytraeidae
Eurydice pulchra
Hediste diversicolor
Hydrobia ulvae
Macoma balthica
Nephtys cirrosa
Nephtys hombergii
Oligochaeta indet.
Pygospio elegans
Scoloplos armiger
Scrobicularia plana
Streblospio shrubsolii
Tubificoides benedii

4.1.4 SAC interest feature 4: Atlantic salt meadow

The conservation objective for the “Atlantic salt meadow” feature of the Severn Estuary SAC is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the total extent of Atlantic salt meadow and associated transitional vegetation communities² within the site is maintained³;
- ii. the extent and distribution⁴ of the individual Atlantic salt meadow and associated transitional vegetation communities² within the site is maintained;
- iii. the zonation of Atlantic salt meadow vegetation communities and their associated transitions² to other estuary habitats is maintained;
- iv. the relative abundance of the typical species⁵ of the Atlantic salt meadow and associated transitional vegetation communities² is maintained;
- v. the abundance of the notable species⁶ of the Atlantic salt meadow and associated transitional vegetation communities² is maintained.
- vi. the structural variation of the salt marsh sward (resulting from grazing) is maintained within limits sufficient to satisfy the requirements of conditions iv and v above and the requirements of the Ramsar and SPA features⁷
- vii. the characteristic stepped morphology of the salt marshes and associated creeks, pills, drainage ditches and pans, and the estuarine processes that enable their development, is maintained.
- viii. Any areas of *Spartina anglica* salt marsh (SM6) are capable of developing naturally into other saltmarsh communities.⁸

The meaning of terms ¹⁻⁸ above is explained in **section 4.1.4.1**.

Appendix 5 shows the extent of Atlantic salt meadow and its associated transitional vegetation communities within the Severn Estuary SAC European Marine Site.

4.1.4.1 Explanatory information for the “Atlantic salt meadow” conservation objective

¹ Natural processes in respect of the SAC

The meaning of ‘natural processes’ is explained in **section 4.1.1.1**.

² Atlantic salt meadow and associated transitional vegetation communities

The vegetation communities comprising the Atlantic Salt Meadow feature can be grouped into four ‘sub-features’, namely:

- (a) low to mid marsh communities
- (b) mid to upper marsh communities
- (c) transitional high marsh communities
- (d) pioneer saltmarsh communities

The communities in each of these sub-features are listed below.

Sub-features (a) and (b) contain the National Vegetation Classification (NVC) communities which fall within the definition of Atlantic Salt Meadow in the EU Interpretation Manual. The extent of these two sub-features within the SAC is currently estimated at 656 ha. The communities in (c) and (d) do not fall within the Atlantic Salt Meadow definition, but are considered to be important components of this feature as they represent its landward and seaward transitions to other habitat types, namely non-saline vegetation and pioneer salt marsh respectively. Atlantic salt meadow is a naturally dynamic habitat and these transitional communities are considered to be an integral part of the Atlantic Salt Meadow feature and essential elements of its structure and function. The total extent of all four of the above sub-features in the SAC is estimated to be 1400 ha, distributed in the SAC as shown in Appendix 5a.

(a) Low to mid marsh communities:

- i. Transitional low saltmarsh with *Puccinellia maritima*, annual *Salicornia* sp. and *Suaeda maritima* SM10
- ii. *Aster tripolium* (rayed) saltmarsh SM12
- iii. *Puccinellia maritima* saltmarsh SM13
 - o *Puccinellia maritima* sub-community SM13a
 - o *Glaux maritima* sub-community SM13b
 - o *Limonium vulgare* - *Armeria maritima* sub-community SM13c
 - o *Plantago maritima* - *Armeria maritima* sub-community SM13d
 - o *Plantago maritima*-*Triglochin maritima* sub-community SM13x (provisional)
 - o *Spartina anglica* sub-community SM13y (provisional)
- iv. *Atriplex portulacoides* saltmarsh SM14
 - o *Atriplex portulacoides* sub-community SM14a
- v. *Juncus maritimus* - *Triglochin maritima* saltmarsh SM15

(b) Mid to upper marsh communities:

- i. *Festuca rubra* salt-marsh SM16
 - o *Puccinellia maritima* sub-community SM16a
 - o *Juncus gerardii* sub-community SM16b
 - o *Glaux maritima* sub-community SM16c
 - o *Festuca rubra* sub-community SM16d
 - o *Leontodon autumnalis* sub-community SM16e
 - o *Aster tripolium* sub-community SM16x (provisional)
- ii. *Artemisia maritima* saltmarsh SM17
- iii. *Juncus maritimus* salt-marsh SM18
 - o *Festuca arundinacea* sub-community SM18c

(c) Transitional high marsh communities:

- i. *Spergularia marina* - *Puccinellia distans* saltmarsh SM23
 - ii. *Elytrigia atherica* saltmarsh SM24
 - iii. *Elytrigia repens* saltmarsh SM28
 - iv. *Festuca rubra* - *Agrostis stolonifera* - *Potentilla anserina* inundation grassland MG11
 - v. *Festuca arundinacea* coarse grassland MG12
 - vi. *Agrostis stolonifera* - *Alopecurus geniculatus* inundation grassland MG13
 - vii. *Phragmites australis* reedbed S4
 - o *Phragmites australis* sub-community S4a
 - xiii. *Bolboschoenus maritimus* swamp S21
 - o *B. maritimus* sub-community S21a
- Agrostis stolonifera* sub-community S21c

(d) Pioneer saltmarsh communities:

- i. *Spartina anglica* saltmarsh SM6
- ii. Annual *Salicornia* saltmarsh SM8
- iii. *Suaeda maritima* saltmarsh SM9

³Maintained

Since the late 1990s Natural England's condition assessment has identified that parts of the saltmarsh within the Severn Estuary appear to be exhibiting the effects of coastal squeeze. For this reason NE and CCW do not consider it sufficient simply to seek to maintain the existing saltmarsh resource, rather it is our advice that measures will be required which seek to recreate the approximate extent of saltmarsh habitat present within the estuary in 1995 (the year the Severn Estuary was first identified as a proposed SAC); whilst at all times working within the framework of seeking a sustainable estuary form. N.B. This is based upon a site specific consideration of the state of habitats within the Severn Estuary, and should not be extended to other sites on the basis of this advice.

⁴Distribution

The distribution Atlantic salt meadow communities refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities e.g. the exact mapped positions of specific communities to be maintained.

⁵Typical species of the Atlantic salt meadow

Festuca arundinacea
Festuca rubra
Juncus gerardii
Triglochin maritimum
Carex extensa
Agrostis stolonifera
Juncus maritimus
Oenanthe lachenalii
Puccinellia maritima,
Salicornia spp.
Suaeda maritima
Aster tripolium
Glaux maritima
Plantago maritima
Armeria maritima
Elytrigia atherica
Atriplex prostrata
Phragmites australis
Spartina anglica
Spergularia media
Puccinellia distans
Cochlearia anglica
Cochlearia officinalis
Limonium vulgare
Atriplex portulacoides
Seriphidium maritimum
Plantago coronopus
Beta vulgaris maritima

⁶Notable Atlantic salt meadow vegetation species

Alopecurus bulbosus
Althaea officinalis
Bupleurum tenuissimum
Hordeum marinum
Puccinellia rupestris
Trifolium squamosum
Lepidium latifolium

Allium oleraceum

Petroselinum segetum

⁷ **Severn Estuary SPA and Severn Estuary Ramsar Site Conservation Objectives**

Refer to sections 4.2 and 4.3 of this document

⁸ ***Spartina anglica* SM6**

Spartina in the Severn is considered to be an invasive species and these conservation objectives do not seek the maintenance of the extent or condition of this habitat type. However, SM6 is considered to be a transitional salt marsh community and the conservation objectives seek to protect the ability of areas of *Spartina* to develop into other Atlantic Salt Meadow or transitional communities.

4.1.5 SAC interest feature 5 : Reefs

The conservation objective for the “reefs” feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the total extent and distribution² of *Sabellaria* reef³ is maintained;
- ii. the community composition⁴ of the *Sabellaria* reef is maintained;
- iii. the full range of different age structures of *Sabellaria* reef are present;
- iv. the physical⁵ and ecological processes⁶ necessary to support *Sabellaria* reef are maintained.

The meaning of terms ¹⁻⁶ above is explained in section 4.1.5.1 below.

Appendix 6 shows the extent of the “reef” feature within the Severn Estuary SAC European Marine Site.

4.1.5.1 Explanatory information for the “reefs” conservation objective

¹ Natural processes in respect of the SAC

The meaning of ‘natural processes’ is explained in section 4.1.1.1

² Distribution

The distribution of reefs refers to the macro spatial pattern in which the reefs are distributed around the estuary. This statement does not require micro-distribution of the reefs e.g. the exact mapped positions of specific reefs to be maintained.

³ *Sabellaria* reef

Little is known about the nature of the *Sabellaria alveolata* reef in the Severn Estuary, especially in the subtidal. However, at other sites *S. alveolata* is known to have a very variable recruitment and the cover in any one area may vary greatly over a number of years. *S. alveolata* reefs also cycle through different phases, from newly settled worms through vigorous fast growing reef to older hummocks. It is likely that subtidal *S. alveolata* reef in the Severn Estuary will exhibit reduced growth forms (lower elevation) in comparison to the intertidal reef habitat. The easiest of these phases to identify is the fast growing reef and for the purposes of these conservation objectives this is defined as a dense aggregation of worms (over 1000 per m², as a rough guide), generally forming a thick (2 cm or more) crust of tubes. The area covered by the habitat would generally exceed 25 m² although there could be patchiness within this area. The other phases of growth are also important and are encompassed in point iii of the objective.

The *S. alveolata* reef biotopes recorded in the Severn Estuary are SS.SBR.PoR.SalvMx *Sabellaria alveolata* on variable salinity sublittoral mixed sediment and LS.LBR.Sab.Salv *Sabellaria alveolata* reefs on sand-abraded eulittoral rock.

⁴ Community composition

Species associated with dense aggregations of *Sabellaria alveolata* in the Severn estuary:

Subtidal

Sabellaria alveolata
Eulalia tripunctata

Mediomastus fragilis
Typosyllis armillaris
Ampharete grubei
Harpinia pectinata
Melinna cristata
Pygospio elegans
Scoloplos armiger
Nemertea
Nucula nitidosa
Nucula nucleus
Tubificoides amplivasatus
Golfingia vulgaris vulgaris
Gammarus salinus
Tubificoides
Arenicola marina
Sphenia binghami
Eumida sanguinea
Nephtys hombergii
Autolytus prolifera
Harmothoe impar
Nematoda
Polycirrus
Dodecaceria concharum
Harmothoe
Syllidae
Enchytraeidae

Intertidal

Sabellaria alveolata,
Actinia equina
Cancer pagurus
Elminius modestus
Littorina saxatilis
L.littorea
L.obtusata
Pholas dactylus
Pomatocerus lamarcki
Porcellana platycheles
Semibalanus balanoides
Halichondrea sp
Corallina officinalis
Enteromorpha sp.
Fucus serratus
Fucus vesiculosus
Pelvetia canaliculata
Porphyra sp
Ulva sp

⁵Physical processes

- abundance of suitable coarse sediments to support reef growth (tube building)
- the availability of suitable substrates where *Sabellaria* has been known to occur in the past

⁶Ecological Processes

- supply of *Sabellaria* larvae (within the water column)
- abundance of food (suspended detritus material) within the water column to support feeding

4.1.6 SAC interest feature 6 : River lamprey *Lampetra fluviatilis*

The conservation objective for the river lamprey *Lampetra fluviatilis* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile river lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the river lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- iii. the abundance of prey species² forming the river lamprey's food resource within the estuary, is maintained.
- iv. Toxic contaminants in the water column³ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻³ above is explained in **section 4.1.6.1**.

Note : The river lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary river lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC river lamprey feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.6.1 Explanatory information for the river lamprey *Lampetra fluviatilis* conservation objective

¹ Natural processes in respect of the SAC fish features

River lamprey population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats

The general meaning of 'natural processes' with respect to the supporting habitats of river lamprey within the estuary is explained in **section 4.1.1.1**

² Prey species

Sea trout *Salmo trutta*, shad *Alosa fallax/Alosa alosa*, herring *Clupea harengus*, sprat *Sprattus sprattus*, flounder *Platichthys flesus* and small gadoids such as whiting *Merlangius merlangus* and pout *Trisopterus luscus* are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008).

³Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.7 SAC interest feature 7: The conservation objective for sea lamprey *Petromyzon marinus*

The conservation objective for the sea lamprey *Petromyzon marinus* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile sea lamprey through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the sea lamprey population in the Severn Estuary and the rivers which drain into it, is at least maintained as is at a level that is sustainable in the long term;
- iii. the abundance of prey species² forming the sea lamprey's food resource within the estuary, is maintained.
- vi. Toxic contaminants in the water column³ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻³ above is explained in **section 4.1.7.1**.

Note : The sea lamprey population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary sea lamprey feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC sea lamprey shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.7.1 Explanatory information for the sea lamprey *Petromyzon marinus* conservation objective

¹ Natural processes in respect of the SAC fish features

Sea lamprey population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats:

The general meaning of 'natural processes' with respect to the supporting habitats of sea lamprey within the estuary is explained in **section 4.1.1.1**.

²Prey species

Eel *Anguilla anguilla*, cod *Gadus morhua*, and haddock *Melanogrammus aeglefinus* are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008)

³Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.8 SAC interest feature 8: The conservation objective for twaite shad *Alosa fallax*

The conservation objective for the twaite Shad *Alosa fallax* feature of the Severn Estuary SAC is to maintain the feature in a favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes¹, each of the following conditions are met:

- i. the migratory passage of both adult and juvenile twaite shad through the Severn Estuary between the Bristol Channel and their spawning rivers is not obstructed or impeded by physical barriers, changes in flows or poor water quality;
- ii. the size of the twaite shad population within the Severn Estuary and the rivers draining into it is at least maintained and is at a level that is sustainable in the long term.
- iii. the abundance of prey species² forming the twaite shad's food resource within the estuary, in particular at the salt wedge³, is maintained.
- iv. Toxic contaminants in the water column⁴ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms¹⁻⁴ above is explained in **section 4.1.8.1**.

Note : The twaite shad population of the Severn depends on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species' lifecycle and therefore the Severn Estuary twaite shad feature can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC twaite shad feature are also met in full and there is a continued recorded presence of this species in the River Severn.

4.1.8.1 Explanatory information for the Twaite shad *Alosa fallax* conservation objective

¹ Natural processes in respect of the SAC fish features

Twaite shad population:

The size of the population is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats:

The general meaning of 'natural processes' with respect to the supporting habitats of twaite shad within the estuary is explained in **section 4.1.1.1**.

² Prey species

Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).

³ Salt wedge

This is the area within the estuary where fresh and saline water meet and where the abundance of prey species is particularly important to the twaite shad population. The actual position varies according to the state of the tide and volume of freshwater input to the estuary.

⁴Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.1.9 Favourable Condition Tables for the SAC interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in Section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the SAC. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the first reporting cycle in order to characterise the site and establish the baseline. Where relevant, abbreviations of National Vegetation Classification (NVC) codes are used for simplicity (Rodwell, 2000).

Comprising :

Table 8 – Favourable condition table for the “estuaries” feature of the Severn Estuary SAC and (in part) for the Ramsar Site (refer to section 4.3.1)

Table 9 – Favourable condition table for the “subtidal sandbanks” feature of the Severn Estuary SAC

Table 10 – Favourable condition table for the “intertidal mudflats and sandflats” feature of the Severn Estuary SAC

Table 11 – Favourable condition table for the “Atlantic salt meadows” feature of the Severn Estuary SAC

Table 12 – Favourable condition table for the “reefs” feature of the Severn Estuary SAC

Table 13 – Favourable condition table for the “river lamprey” and “sea lamprey” features of the Severn Estuary SAC

Table 14 – Favourable condition table for the “twait shad” feature of the Severn Estuary SAC

Table 8 – Favourable condition table for the “estuaries” feature of the Severn Estuary SAC and (in part) for the Ramsar Site (refer to section 4.3.1)

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A1	SAC interest feature 1: Estuaries		Extent <i>(Total extent of the estuaries feature - section 4.1.1.i of the conservation objectives)</i>	Total area (ha) of estuary feature	No decrease in extent due to man induced changes from the established baseline <i>The baseline is the extent of all areas subject to tidal influence within the boundary of the designation of the pSAC in 2000 - see also map in Appendix 2</i>	Extent is an attribute on which reporting is required by the Habitats Directive.
A2		All sub-features	Morphology <i>(Characteristic physical form and flow - section 4.1.1.ii of the conservation objectives)</i>	Intra and inter-estuarine Tidal Prism/Cross Section ratio (TP/CS ratio) measured during the reporting cycle using remote sensing (frequency to be determined).	The intra- and inter- estuarine TP/CS relationship should not deviate significantly from an established baseline subject to natural processes (* includes recognition of fixed hard geology formations) <i>Baseline to be established :- Data to be used is Hydrological Office bathymetry data (intertidal and subtidal) and Environment Agency LIDAR survey</i>	TP = Tidal Prism = total volume of water crossing a given cross section during the flood tide (m ³). CS = Area of a given cross section at high water springs (m ²). The relationship between TP & CS provides a measure of the way the estuary has adjusted to tidal energy. Substantial departures from this characteristic relationship (determined on a regional basis) may indicate the influence of anthropogenic factors and this would trigger more detailed evaluation of potential problems. The identification of a suitable baseline for TP/CS relationship will need to take account of the highly dynamic nature of the Severn and potential impacts of natural processes (including sea level rise) in altering the profile of the estuary – with a view to maintaining or promoting the movement of the estuary towards “dynamic equilibrium”. *The hard geology formations (headlands, cliffs and rock platforms) have a major role in influencing the characteristic physical form and flow of the estuary (many are protected in their own right as geological SSSI).

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A3	SAC interest feature 1: Estuaries		Tidal regime and flows (saline water and freshwater contributions) <i>(characteristic physical form and flow - section 4.1.1.ii of the conservation objectives)</i>	Tidal range, measured from tide gauges at specified locations, and flows measured from current estuary and river meters . Locations and frequency to be determined	No decrease in tidal range subject to natural processes. Tidal currents should not deviate significantly from an established baseline subject to natural processes Riverine flows (Rivers Wye, Usk and Severn) and estuarine flows must be sufficient to ensure Water Framework Directive target of Good Ecological Status (GES) is met. <i>Baseline to be established :- Data to be used is existing tide gauge and current meter data from EA ca 2000, and agreed WFD monitoring measures.</i>	

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A4			Sediment budget <i>(characteristic range and relative proportions of sediment sizes and sediment budget - section 4.1.1.iii of the conservation objectives)</i>	Evaluation of the sediment fluxes, sources and sinks, using a variety of measures including bathymetry, suspended sediment concentrations, fluvial and marine influx/efflux, man-made changes (e.g. navigational dredging/marine minerals extraction), cliff erosion etc)	No decrease in sediment budget from the established baseline <i>Baseline to be established :- Data to be used is Severn Estuary Coastal Habitat Management Plan (CHaMP) Part F- Sediment Budget Analysis</i>	<p>A sediment budget is a balance of the sediment volume entering and exiting a particular section of the coast or an estuary. Sediment budget analysis consists of the evaluation of sediment fluxes, sources and sinks from different processes that give rise to additions and subtractions within a control volume (e.g. a section of coast or an estuary) in order to gain a better understanding of the estuary system.</p> <p>An estuary provides a readily defined control volume, where point sources and sinks exist in the form of rivers, other terrestrial outfalls and the open sea. Line sources and sinks may be defined in terms of erosion from cliffs and transfers to or from saltmarshes, wetlands or other intertidal areas. The subtidal beds also needs consideration as an important source/sink as does material stored in suspension within the volume of water that moves back and forth under tidal action within the estuary.</p> <p>Identification and quantification of all the mechanisms giving rise to sediment transfers can be difficult, and for the most part are approximate estimates of sediment exchange between sources and sinks.</p> <p>Reference ; ABPmer and HR Wallingford (2007).</p>
A5	SAC interest feature 1: Estuaries		Sediment size, range and distribution <i>(characteristic range and proportions of sediment sizes and sediment budget - section 4.1.1.iii of the conservation objectives)</i>	Sediment size distribution characterised and measured by particle size analysis (PSA) at a series of locations across the estuary during the reporting cycle (locations and frequency to be determined)	Sediment size distribution should not deviate from an established baseline. <i>Baseline to be established :- Data to be used is BGS seabed sediment data and other relevant datasets ?</i>	PSA measures parameters including percentage sand/silt/gravel, mean and median grain size and sorting co-efficient, used to characterise sediment type. Sediment character is key to the structure of the features and reflects the physical processes acting on it – it may vary across the estuary and can be used to indicate the spatial distribution of sediment types reflecting the stability of the features and the processes supporting it..
A6		Subtidal sandbanks	Extent, variety and spatial distribution of estuarine habitat communities <i>(section 4.1.1.iv of the conservation objectives)</i>	<i>For information on the attributes of the subtidal sandbank communities sub-feature see the sections of this table which relate to the subtidal sandbanks which are covered by seawater all the time feature, see Table 9</i>		

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A7		Intertidal mudflat and sandflat communities	Extent, variety and spatial distribution of estuarine habitat communities (section 4.1.1.iv of the conservation objectives)			<i>For information on the attributes of the intertidal mudflat & sandflat communities sub-feature see the sections of this table which relate to the intertidal mudflats and sandflats not covered by seawater at low tide feature, see Table 10</i>
A8		Atlantic salt meadow (and associated transition habitats)	Extent, variety and spatial distribution of estuarine habitat communities (section 4.1.1.iv of the conservation objectives)			<i>For information on the attributes of the Atlantic salt meadow communities sub-feature see the sections of this table which relate to Atlantic salt meadow feature, see Table 11</i>
A9		Reefs of <i>Sabellaria alveolata</i>	Extent, variety and spatial distribution of estuarine habitat communities (section 4.1.1.iv of the conservation objectives)			<i>For information on the attributes of the Reef sub-feature see the sections of this table which relate to the Reef feature, see Table 12</i>

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A10	SAC interest feature 1: Estuaries	Hard substrate habitats and their notable communities	Extent & variety <i>(extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities - section 4.1.1.v of the conservation objectives)</i>	Area (ha) and range of types of hard substrate habitats and their notable communities, measured periodically during the reporting cycle along sampling transects or grids (frequency to be determined).	No decrease in extent or range of types of hard substrate habitats and their notable communities from the established baseline subject to natural processes. <i>Baseline is the CCW and English Nature Intertidal Biotope Surveys 2006.</i>	Loss of hard substrate habitats and their notable communities is likely to be detrimental to the structure of the interest feature, e.g. associated with a change in estuary processes and may indicate long term changes in the physical conditions of the estuaries interest feature. Notable communities of the Severn Estuary comprise the following <ul style="list-style-type: none"> • <i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock (MLR.Sab.Salv) • <i>Hydroids, ephemeral seaweeds and Littorina littorea</i> in shallow eulittoral mixed substrata pools. (LR.RkpH) • <i>Balanus crenatus</i> and <i>Tubularia indivisa</i> on extremely tide-swept circalittoral rock.(ECR.BS.BalTub) • <i>Fucus serratus</i> and piddocks on lower eulittoral soft rock (MLR.Fser.Pid) • <i>Mytilus edulis</i> and piddocks on eulittoral firm clay (MLR.MytPid) • <i>Balanus crenatus</i>, <i>Halichondrea panicea</i> and <i>Alcyonidium diaphanum</i> on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan) • <i>Sertularia cupressina</i> and <i>Hydrallmania falcate</i> on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd). • <i>Corralina officinalis</i> and coralline crusts in shallow eulittoral rockpools (LR.rkp.Cor) • Eel grass (<i>Zostera</i>) beds • Any other notable hard substrata communities that may be identified.
A11			Spatial distribution <i>(extent, variety, spatial distribution and community composition of notable communities - section 4.1.1.v of the conservation objectives)</i>	Spatial distribution of notable communities measured periodically during the reporting cycle using a combination of remote sensing and ground truthing using GPS (frequency to be determined).	Macroscale distribution of notable communities should not deviate significantly from the established baselines, subject to natural processes. <i>Baseline is the CCW and English Nature Intertidal Biotope Surveys 2006.</i>	Changes in the variety or distribution of notable estuarine communities may indicate long term changes in the physical conditions of the estuary interest feature or individual subfeatures.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A12	SAC interest feature 1: Estuaries	Hard substrate habitats and their notable communities	Community composition <i>(extent, variety, spatial distribution and community composition of notable communities - section 4.1.1.v of the conservation objectives)</i>	Assessment of community quality through survey of species composition (presence of typical species) within the notable communities measured periodically	No decline in community quality due to changes in species composition or loss of typical species from an established baseline <i>Baseline to be established : Data to be used : CCW and English Nature Intertidal Biotope Surveys 2006 and future surveys</i>	Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type may indicate long-term changes in physical conditions at the site. Typical species of the notable communities to be determined.
A13		Notable estuarine species assemblages : Assemblage of fish species	Abundance <i>(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives)</i>	Numbers of species and population estimates	No significant reduction in overall diversity of species or in individual populations against an established baseline <i>Baseline to be established : Data to be used : Environment Agency and relevant Sea Fisheries Committee data</i>	Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures. Assemblage of fish species: (Refer to section 4.1.1 note 7) • Migratory species (see also section of this table which relates to the river lamprey, sea lamprey and twaite shad features) • Estuarine species • Marine species • Freshwater species Refer also to section 4.3.2 in relation to the assemblage of migratory fish species of the Ramsar Site.
A14		Notable estuarine species assemblages : Assemblage of waterfowl species	Abundance <i>(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives)</i>	Numbers of species and individual population sizes	No significant reduction in overall diversity of species or in individual populations against an established baseline <i>Baselines are identified in the SPA section of this advice – see section 4.2</i>	Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures. Refer also to section 4.2.7 in relation to the Internationally important assemblage of waterfowl of the Severn Estuary SPA and section 4.3.9 in relation to the Internationally important assemblage of waterfowl of the Severn Estuary Ramsar Site
A15		Notable estuarine species assemblages : Assemblage of vascular plant species	Abundance of saltmarsh species <i>(abundance of notable estuarine species assemblages - section 4.1.1.vi of the conservation objectives)</i>	Number of species and population sizes	No significant reduction in overall diversity of species or in individual populations against an established baseline <i>Baselines to be established: Data to be used is 1998 NVC Scarce plant survey, county botanical records and CCW/NE site records</i>	Loss of notable communities may indicate long term changes in the physical conditions of the estuaries interest feature or individual subfeatures. Assemblage of vascular plant species includes: • Salt marsh species Note : maintaining the conditions necessary for these species are covered by the Atlantic salt meadows table attributes Table 11

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A16	SAC interest feature 1: Estuaries	Notable estuarine species assemblages : Assemblage of vascular plant species	Abundance of Eel grass	Extent and density of Eel grass species	No significant reduction in overall extent and density against as established baseline <i>Baseline is CCW and English Nature Intertidal Biotope Surveys 2006 plus Severn Second Crossing monitoring data 1989-95/6</i>	Assemblage of vascular plant species includes: • Eel grass (<i>Zostera</i>) species.
A17		All sub-features	Water quality – physico-chemical parameters (Including temperature, salinity, oxygen, nutrients, pH and turbidity etc) <i>(physico chemical characteristics of the water column - section 4.1.1.vii of the conservation objectives)</i>	Physico-chemical parameters measured periodically throughout the reporting cycle (frequency to be determined).	Physico-chemical parameters should not pose a risk to the ecology* of the habitats and species of the SAC, SPA or Ramsar Site. Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive.	Changes in any of the physico-chemical parameters in the water column can impact on the quality of the estuary habitat and hence could lead to changes in the presence and distribution of species (along with recruitment processes and spawning behaviour) and those at the edge of their geographic ranges and non-natives. *ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary.
A18			Phytoplankton <i>(physico chemical characteristics of the water column - section 4.1.1.vii of the conservation objectives)</i>	Average phytoplankton biomass and characteristic species in summer, measured periodically during the reporting cycle.	Growth of phytoplankton does not cause an undesirable disturbance to the estuary habitats and species Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive.	
A19			Macroalgae	Average macroalgal cover and density in summer, measured periodically during the reporting cycle.	Average macroalgal cover and density should not compromise the ecology * of the estuary habitats and species Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive.	*ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
A20	SAC interest feature 1: Estuaries		Toxic contaminants <i>(toxic contaminants in water column and sediment - section 4.1.1.viii of the conservation objectives)</i>	Toxic contaminants measured periodically throughout the reporting cycle (frequency to be determined).	Toxic contaminants in water column and sediment should be below levels which would pose a risk to the ecology* of the estuary habitats and species Levels should comply with targets established under the EA Review of Consents and the Water Framework Directive	Elevated concentrations of toxic contaminants in the water column and sediment have the potential to cause lethal or sub-lethal harm to any features and sub-features. *ie does not compromise the quality, extent, distribution or species composition of habitats or their ability to support species features (eg feeding, breeding, resting) – the outcome sought is the healthy functioning of the estuary.
A21			Airborne nutrient and contaminants <i>(airborne contaminants - section 4.1.1.ix of the conservation objectives)</i>	Airborne contaminants measured periodically throughout the reporting cycle (frequency to be determined)	No exceedence of critical loads for: Sulphur dioxide - 20µg/m³ Nitrous Oxides - 30µg/m³ Ozone - 3000 ppb Ammonia - 3µg/m³ Nutrient Nitrogen - 30-40 kg/ha/yr.	Critical loads have been defined where possible (www.apis.ac.uk) for the conservation features of the European site. Where the critical load is exceeded features are at risk. As more in depth studies are undertaken critical loads will be altered to reflect best available scientific knowledge. The impacts of air pollution on the vegetation need further investigation. If particularly damaging, point sources (or groups of point sources) can be identified, then emissions should be regulated to reduce the impacts. It will also be very important for wider measures to be taken, at Government and international levels, to reduce air pollution. There is currently insufficient knowledge to make a judgment of the impacts on specific species. Decisions should be made at a site specific level."

Table 9 – Favourable condition table for the “subtidal sandbanks” feature of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
B1	SAC interest feature 2: Subtidal Sandbanks	All sub-features	Extent of feature <i>(total extent of subtidal sandbanks - section 4.1.2.i of the conservation objectives)</i>	Total extent assessed periodically against baseline map (using bathymetry data, and other geophysical techniques (e.g. sidescan sonar), and sediment grain-size data)	No decrease in extent of subtidal sandbanks features from an established baseline, subject to natural processes. <i>Baseline is taken from 1994 admiralty charts, BGS seabed sediment data and sediment environments defined in the Bristol Channel Marine Aggregates Study (Posford Duvivier and ABP Research Consultancy, 2000).</i> <i>Refer also to Map in Appendix 3</i>	Extent is an attribute on which reporting is required by the Habitats Directive. Within the Severn the subtidal sandbanks feature includes both relatively permanent and stable banks (shown in Appendix XX as subtidal sandbanks) and more ephemeral banks which contribute sediment to the sandbanks (shown in Appendix XX as associated sediments) and which are therefore considered to be an integral part of the feature In the long term loss of subtidal sandbank feature communities is likely to be detrimental to the structure of this interest feature and the intertidal mudflats and sandflats features, e.g. associated with a change in sediment budget or geomorphological regime, and may indicate long term changes in the physical conditions of the estuaries interest feature.
B2		All sub-features	Extent of the subtidal sandbank communities <i>(extent of subtidal sandbank communities -section 4.1.2.ii of the conservation objectives)</i>	Extent of subtidal sandbank communities within the site assessed periodically (method and frequency to be determined).	No decrease in extent of the communities from an established baseline subject to natural processes. <i>Baseline is data held on Marine Recorder</i>	The subtidal sandbanks feature comprises two sub-features Sublittoral sands and muddy sand : This sub-feature comprises the following four communities: <ul style="list-style-type: none">• Infralittoral mobile sand in variable salinity• Infralittoral mobile clean sands with sparse fauna• Nephtys cirrosa and Macoma balthica in variable salinity infralittoral mobile sand• Neomysis integer and Gammarus spp in fluctuating low salinity infralittoral mobile sand Sublittoral cohesive mud and sandy mud communities This sub-feature comprises the following four communities: <ul style="list-style-type: none">• Capitella capitata in enriched sublittoral muddy sediments• Nephtys hombergii and Tubificiodes spp. In variable salinity infralittoral soft mud• Capitella capitata and Tubificiodes spp. In reduced salinity infralittoral muddy sediment• Nephtys hombergii and Macoma balthica in infralittoral sandy mud

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
B3	SAC interest feature 2: Subtidal Sandbanks		Distribution of subtidal sandbank communities <i>(extent of subtidal sandbank communities -section 4.1.2.ii of the conservation objectives)</i>	Spatial distribution of subtidal sandbank communities measured periodically (frequency to be determined).	No significant change in the macro scale distribution of the communities from an established baseline subject to natural processes <i>Baseline is data held on Marine Recorder</i>	Some biotopes occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of such ephemeral biotopes
B4			Community composition <i>(community composition of the subtidal sandbank communities -section 4.1.2.iii of the conservation objectives)</i>	Assessment of community quality through survey of species composition within the subtidal sandbank feature measured periodically	No decline in community quality due to changes in species composition or loss of typical species from an established baseline subject to natural processes <i>Baseline is data held on Marine Recorder and EA WFD benthic sampling data</i>	Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type of sediment may indicate long-term changes in physical conditions at the site. Typical species of the subtidal sandbanks communities include: <i>Aricidea minuta</i> , <i>Capitella capitata</i> , <i>Diastylis rathkei</i> typical, <i>Eurydice pulchra</i> , <i>Gammarus salinus</i> , <i>Harpinia pectinata</i> , <i>Mediomastus fragilis</i> , <i>Nephtys cirrosa</i> , <i>Nephtys hombergii</i> , <i>Oligochaeta</i> , <i>Pygospio elegans</i> , <i>Pontocrates arenarius</i> , <i>Pseudocuma longicornis</i> , <i>Retusa obtuse</i> , <i>Tubificoides amplivasatus</i>
B5		All sub-features	Sediment character <i>(variety & distribution of sediment types - section 4.1.2.iv of the conservation objectives)</i>	Distribution of sediment types/grain sizes assessed across the site	No major change in composition of sediment type across the feature against an established baseline subject to natural processes <i>Baseline to be established Data to be used is BGS seabed sediment data and other relevant datasets</i>	

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
B6	SAC interest feature 2: Subtidal Sandbanks	All sub-features	Topography <i>(gross morphology – depth distribution and profile of subtidal sandbank feature - section 4.1.2.v of the conservation objectives)</i>	Depth distribution/profile of the sandbank feature measured across the site	No major alteration of topography of the subtidal sandbank feature against an established baseline <i>Baseline to be established Data to be used is Hydrographic Office bathymetric data and other relevant bathymetric datasets</i>	

Table 10 – Favourable condition table for the “intertidal mudflats and sandflats” feature of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
C1	SAC interest feature 3: Mudflats and sandflats	All sub-features	Extent of the feature <i>(total extent of the mudflats and sandflats feature - section 4.1.3.i of the conservation objectives)</i>	Total area (ha) of the intertidal mudflat and sandflat feature measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined).	No decrease in extent of intertidal mudflats and sandflats from an established baseline, subject to natural processes. <i>Baseline is aerial photography dated 1999 and CCW/English Nature Intertidal Biotope Surveys 2006. (Note air photo coverage from 1988 gives data for assessing trends in change of this attribute.) Refer also to maps in Appendix 4</i>	Extent is an attribute on which reporting is required by the Habitats Directive. In the long term loss of intertidal mudflat / sandflat communities is likely to be detrimental to the structure of the interest feature, e.g. associated with a change in sediment budget or geomorphological regime, and may indicate long term changes in the physical conditions of the estuaries interest feature. Some fluctuations in extent may occur which are directly attributable to natural coastal processes. These include reduced extent following storms or due to a change to another feature habitat such as saltmarsh. Such types of change in extent would form under the umbrella of ‘natural change’
C2		All sub-features	Extent and variety of the mudflats and sandflats communities comprising each sub-feature <i>(variety and extent of the mudflat and sandflats communities – section 4.1.3.ii of the conservation objectives)</i>	Extent and range of types of intertidal mudflat and sandflat communities assessed along a sampling transect or grid and rapid phase 1 survey techniques using GPS (frequency to be determined).	No decrease in the extent or range of types of intertidal mudflat and sandflat communities from an established baseline, subject to natural processes <i>Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.</i>	Intertidal mudflat and sand flat feature comprises three sub-features: Intertidal gravel and clean sand communities <ul style="list-style-type: none"> • Barren coarse sand shores; • Burrowing amphipods and <i>Eurydice pulchra</i> in well drained clean sand shores; • Burrowing amphipods and polychaetes in clean sand shores. • Talitrid amphipods in decomposing seaweed on the strandline • Dense <i>Janice conchilega</i> in tide-swept lower shore sand • Barren shingle or gravel shores Intertidal muddy sand communities <ul style="list-style-type: none"> • Polychaetes and <i>Cerastoderma edule</i> in fine sand or muddy sand shores • <i>Bathyporeia pilosa</i> and <i>Corophium</i> spp. in upper shore slightly muddy fine sand shores • <i>Macoma balthica</i> and <i>Arenicola marina</i> in muddy sand shores. • <i>Arenicola marina</i>, <i>Macoma balthica</i> and <i>Mya arenaria</i> in muddy sand shores. • <i>Echinocardium cordatum</i> and <i>Ensis</i> sp. in lower shore or shallow sublittoral muddy fine sand Intertidal mud communities <ul style="list-style-type: none"> • <i>Hediste diversicolor</i> and <i>Macoma balthica</i> in sandy mud shores • <i>Hediste diversicolor</i>, <i>Macoma balthica</i> and <i>Arenicola marina</i> in muddy sand or sandy mud shores • <i>Hediste diversicolor</i>, <i>Macoma balthica</i> and <i>Mya arenaria</i> in sandy mud shores • <i>Hediste diversicolor</i> and <i>Scrobicularia plana</i> in reduced salinity mud shores • <i>Hediste diversicolor</i> and oligochaetes in low salinity mud shores

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
C3	SAC interest feature 3: Mudflats and sandflats	All subfeatures	Distribution of mudflats and sandflats communities (distribution of communities - section 4.1.3.iii of the conservation objectives)	Spatial distribution of mudflat and sandflat communities assessed along a sampling transect or grid and rapid phase 1 survey techniques using GPS (frequency to be determined).	Macro scale distribution of communities should not deviate significantly from an established baseline, subject to natural processes. <i>Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.</i>	Changes in the spatial distribution of biotopes within an area of a particular type of sediment may provide the first indications of long-term changes in physical conditions at the site. Some biotopes occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of such ephemeral biotopes.
C4		All subfeatures	Community composition (community composition of the feature - section 4.1.3.iv of the conservation objectives)	Assessment of community quality through survey of species composition (presence of typical species) within the intertidal mudflats and sandflats feature measured periodically	No decline in community quality due to changes in species composition or loss of typical species from an established baseline, subject to natural processes. <i>Baseline is CCW/English Nature Intertidal Biotope Surveys 2006.</i>	Different associations of plants, animals and their habitat are an important structural and functional aspect of the feature. Changes in the communities present within an area of a particular type of sediment may indicate long-term changes in physical conditions at the site. Typical species of the intertidal mudflats and sandflats communities include: <i>Aphelocheata marioni</i> , <i>Arenicola marina</i> , <i>Bathyporeia pelagica</i> , <i>Corophium volutator</i> , <i>Enchytraeidae</i> , <i>Eurydice pulchra</i> , <i>Hediste diversicolor</i> , <i>Hydrobia ulvae</i> , <i>Macoma balthica</i> , <i>Nephtys cirrosa</i> , <i>Nephtys hombergii</i> , <i>Oligochaeta indet</i> , <i>Pygospio elegans</i> , <i>Scoloplos armiger</i> , <i>Scrobicularia plana</i> , <i>Streblospio shrubsolii</i> , <i>Tubificoides benedii</i>
C5			Topography (Topography and morphology of the intertidal flats -section 4.1.3v of the conservation objectives)	Tidal elevation and intertidal slope, measured along a series of transects across the estuary periodically during the reporting cycle using remote sensing or traditional surveying techniques (transect locations and survey frequency to be determined).	Intertidal profile should not deviate significantly from an established baseline, subject to natural processes. <i>Baseline to be established: Data to be used is Environment Agency LIDAR survey</i>	In the intertidal zone topography reflects the energy conditions and stability of the sediment, which is key to the structure of the interest feature. Topography is a major influence on the distribution of communities throughout the intertidal flats. Assessing topography also provides information on the position of channels through the interest feature.
C6			Sediment character	Particle size analysis (PSA). measured at a series of locations across the estuary. Locations and frequency to be determined	Average PSA parameters should not deviate significantly from an established baseline. <i>Baseline to be established Data to be used CCW/English Nature Intertidal Biotope Surveys 2006, BGS seabed sediment data and other relevant data sources</i>	Parameters include percentage sand / silt / gravel, mean and median grain size, and sorting coefficient, used to characterise sediment type Sediment character defined by particle size analysis is key to the structure of the feature, and reflects all of the physical processes acting on it. Particle size composition varies across the feature and can be used to indicate spatial distribution of sediment types thus reflecting the stability of the feature and the processes supporting it.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
C7	SAC interest feature 3: Mudflats and sandflats			Sediment penetrability (degree of sinking) measured at a series of locations across the estuary (methodology, locations and frequency to be determined).	Average measure should not deviate significantly from an established baseline. <i>Baseline to be established by future survey</i>	Penetrability is an indicator of sediment stability and degree of compaction; it indicates the shear strength of the sediment and thus the susceptibility of that sediment type to erosion. Compaction of the sediment influences the biological community within the sediment. Penetrability of the sediment is determined by a combination of grain size and water content, which may provide a surrogate index of the penetrability of the sediments.
C8				Sediment organic content (% carbon) measured at a series of locations across the estuary (sampling locations and frequency to be determined).	Average organic carbon content should not deviate significantly from an established baseline. <i>Baseline to be established by future survey</i>	Organic content critically influences the infaunal community and can cause deoxygenation of the feature, which can be detrimental to the biota. However, a balance needs to be struck as organic content provides a measure of the material available to detritivores. A reduction in organic content could lead to a reduction in detritivores, with subsequent knock on effects throughout the food chain.
C9				Oxidation - reduction potential (depth of black anoxic layer) measured at a series of locations across the estuary (sampling locations and frequency to be determined).	Average black layer depth should not deviate significantly from an established baseline. <i>Baseline to be established by future survey</i>	Degree of oxidation / reduction, reflecting oxygen availability within the sediment, critically influences the infaunal community and the mobility of chemical compounds. It is an indicator of the structure of the feature.

Table 11 – Favourable condition table for the “Atlantic salt meadows” feature of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
D1	SAC interest feature 4: Atlantic salt meadows	All sub-features	Extent of Atlantic salt meadow (and transitional habitats) feature <i>(extent of Atlantic salt meadow (and transitional habitats) feature - section 4.1.4.i of the conservation objectives)</i>	Total area (ha) of the Atlantic salt meadow feature (and associated transitional habitats) within the site measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined).	No decrease in total extent of Atlantic salt meadow and associated transitional habitats from the established baseline. <i>Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i> <i>Refer also to maps in Appendix 5</i>	Extent is an attribute on which reporting is required by the Habitats Directive. Monitoring will need to take account of the dynamic nature of these habitats and seasonal and periodic random variations in vegetation types. Coastal squeeze may result in the replacement of Atlantic salt meadows with pioneer saltmarsh. A reduction in extent could be further evaluated by a ground survey to assess for signs of erosion such as toppled vegetation blocks, signs of roots in intertidal mud, signs of stress/damage to plants. Extent needs to be measured at low tide.
D2		All sub-features	Extent of the Atlantic salt meadow communities and associated transitional vegetation communities <i>(extent and distribution of atlantic salt meadow and associated transitional vegetation communities - section 4.1.4.ii of the conservation objectives)</i>	Area (ha) of Atlantic salt meadow and associated transitional vegetation communities within the site measured periodically during the reporting cycle using a combination of remote sensing and ground truthing of boundaries between communities using GPS (frequency to be determined).	No decrease in extent of Atlantic salt meadow and associated transitional vegetation communities from the established baseline subject to natural processes <i>Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i>	Assessment against this target will take account of the effects of the natural process of cyclical development and breakdown of saltmarshes within the Severn which results in the natural succession of saltmarsh communities over time ie the continued presence of all types in proportions reflecting the natural processes operating. Some individual salt marsh communities occur in a natural cycle linked to the dynamism of the prevailing conditions, and these may naturally appear and disappear over time. The feature should not be considered in unfavourable condition due to the short-term disappearance of transient communities. The outcome sought is the maintenance of the general character of the saltmarshes of the Severn in terms of the continued presence, abundance and variation of communities with local differences reflected – it is not to seek the retention of saltmarsh types in situ but to allow them to shift and evolve in line with natural processes The Atlantic salt meadow feature comprises four sub-features: Low to mid marsh communities NVC communities: SM10, SM12, SM13a, SM13b, SM13c, SM13d, SM13x, SM13y, SM14a, SM15. Mid to upper marsh communities NVC communities: SM16a, SM16b, SM16c, SM16d, SM16e, SM16x, SM17, SM18c. Transitional high marsh communities NVC communities: SM23, SM24, SM28, MG11, MG12, MG13, S4a, S21a, S21c. Pioneer saltmarsh communities NVC communities: SM6, SM8, SM9

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
D3	SAC interest feature 4: Atlantic salt meadows	All sub-features	Distribution of the Atlantic salt meadow communities and associated transitional vegetation communities <i>(extent and distribution of atlantic salt meadow and associated transitional vegetation communities - section 4.1.4.ii of the conservation objectives)</i>	Spatial distribution of Atlantic saltmeadow and associated transitional vegetation communities measured along a series of fixed transects (or other suitable method to be agreed) periodically during the reporting cycle using GPS (transect locations and frequency of survey to be determined).	<p>The macro scale distribution of communities should not deviate significantly from an established baseline subject to natural processes.</p> <p><i>Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i></p>	<p>The distribution of the Atlantic salt meadow communities refers to the macro spatial pattern in which these are distributed around the estuary. This statement does not require micro-distribution of communities (i.e. the exact mapped positions of specific communities to be maintained) but does require the distribution of some saltmarsh types which reflect the differences in estuary structure and function (eg in outer versus inner parts of the estuary, or the influence of freshwater inputs from the rivers) be taken into account.</p> <p>Consideration of this attribute needs to take account of the wider scale and long-term changes and development of saltmarshes in the Severn Estuary which shows a pattern of episodic erosion and accretion evident in a series of saltmarsh terraces. This attribute is also linked with attributes covering zonation and morphology below.</p>
D4		All sub-features	Extent of <i>Spartina anglica</i> <i>(areas of <i>Spartina anglica</i> - section 4.1.4.viii of the conservation objectives)</i>	Total extent of <i>Spartina anglica</i> measured along a series of transects (or other suitable method to be agreed) around the estuary, periodically during the reporting cycle, using a combination of remote sensing and ground survey (transect locations and frequency of survey to be determined).	<p>No increase in total extent of more than 10% over monitoring period;</p> <p><i>Baseline is the CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i></p>	<p><i>Spartina anglica</i> acts as a pioneer species in the Severn and can undergo succession to other saltmarsh habitats over time. As a consequence, although it may be colonising new areas in one part of the estuary, in others it may be developing into more mixed saltmarsh communities. There will be differences in the density, height and cover of the vegetation depending on where it is in the succession. These changes will need to be monitored to establish a baseline and rates of any gross change. An increase in <i>Spartina</i> at the expense of other saltmarsh could indicate changes in the sediment regime and/or tidal levels both in response to natural or anthropogenic processes. Monitoring will only focus on areas of gross expansion of <i>Spartina</i> into intertidal mudflat and saltmarsh communities.</p>
D5		All sub-features	Zonation of vegetation <i>(zonation of Atlantic salt meadow communities - section 4.1.4.iii of the conservation objectives)</i>	Width of pioneer, low-mid marsh, mid-upper marsh, and transitional high marsh saltmarsh zones, measured along a series of transects (or other suitable method to be agreed) around the estuary, periodically during the reporting cycle, using a combination of remote sensing and ground survey (transect locations and frequency of survey to be determined).	<p>The range of variation of zonation of saltmarsh communities around the estuary should not deviate significantly from an established baseline, subject to natural processes.</p> <p><i>Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998 (and English Nature condition assessment data collected in 2002 for Gloucestershire section of the estuary).</i></p>	<p>Assessment against this target will take account of the effects of the natural process of cyclical development and breakdown of saltmarshes within the Severn which results in the natural succession of saltmarsh communities and changes to the zonation over time . ie the continued presence of all zones in proportions reflecting the natural processes operating.</p> <p>The outcome sought is the maintenance of the general character of the saltmarshes of the Severn in terms of the continued presence and variation of the saltmarsh zones with local differences reflected – it is not to seek the retention of zones in situ but to allow them to shift and evolve in line with natural processes</p>

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
D6	SAC interest feature 4: Atlantic salt meadows	Low to mid marsh communities	Species composition <i>(abundance of typical species - section 4.1.4.iv of the conservation objectives)</i>	Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle	Frequency of typical species of characteristic low to mid marsh communities should not deviate significantly from an established baseline. <i>Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i>	The typical species for these communities include: <i>Puccinellia maritima, Salicornia spp., Suaeda maritima, Aster tripolium, Spergularia marginata, Glaux maritima, Plantago maritima, Atriplex glabriuscula, Atriplex prostrata, Triglochin maritima, Limonium vulgare, Armeria maritima and Juncus maritimus</i> *This target should not however prevent the enhancement of the diversity of swards where possible eg through the encouragement of a wider range of herbs through relaxation of grazing pressure in heavily grazed areas.
D7		Mid to upper marsh communities	Species composition <i>(abundance of typical species - section 4.1.4.iv of the conservation objectives)</i>	Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle	Frequency of typical species of characteristic mid to upper marsh communities should not deviate significantly from an established baseline. <i>Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i>	The typical species for these communities include : <i>Puccinellia maritima, Aster tripolium, Glaux maritima, Plantago maritima, Festuca rubra, Juncus gerardii, Triglochin maritima, , Agrostis stolonifera, Juncus maritimus, , Spergularia marginata, Parapholis strigosa, Elymus pycnanthus,, Hordeum secalinum, Trifolium fragiferum and Atriplex glabriuscula,</i> *(see note above)
D8		Transitional high marsh communities	Species composition <i>(abundance of typical species - section 4.1.4.iv of the conservation objectives)</i>	Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle	Frequency of typical species of characteristic high marsh communities should not deviate significantly from an established baseline. <i>Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i>	The typical species for these communities include: <i>Puccinellia distans, Puccinellia maritima, Puccinellia rupestris, Plantago coronopus, Parapholis strigosa, Atriplex glabriuscula, Spergularia marina, Festuca rubra, Agrostis stolonifera, Aster tripolium, Hordeum secalinum, Elymus pycnanthus, Elymus repens, Potentilla anserina, Lolium perenne, Alopecurus geniculatus, Phragmites australis, Bolboschoenus maritimus, Festuca arundinacea,</i> *(see note above)
D9		Pioneer saltmarsh communities	Species composition <i>(abundance of typical species - section 4.1.4.iv of the conservation objectives)</i>	Frequency of typical species to be measured using methodology to be agreed (e.g. transects, plots etc) once during reporting cycle	Frequency of typical species of characteristic pioneer marsh communities should not deviate significantly from an established baseline. <i>Baseline is CCW/English Nature Saltmarsh NVC survey by Dargie 1998</i>	The typical species for these communities include : <i>Spartina anglica, Salicornia sp, Suaeda maritima</i>

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
D10	SAC interest feature 4: Atlantic salt meadows		Abundance of locally occurring scarce and notable plant species <i>(abundance of notable species - section 4.1.4v of the conservation objectives)</i>	Number of discrete locations within the estuary where scarce and notable species are found and their abundance at each location.	No decrease in abundance of scarce and notable species from an established baseline. <i>Baseline : CCW/English Nature saltmarsh rare/scarce plant survey by Dargie 1998</i> <i>Individual county based records from plant recorders/record centres</i>	Nationally scarce and notable species within the Atlantic salt meadow and associated transitional vegetation communities comprise: Nationally scarce species: <i>Alopecurus bulbosus, Althaea officinalis, Bupleurum tenuissimum, Hordeum marinum, Trifolium squamosum, Puccinellia rupestris, Polygonum raii.</i> Other notable species occurring: <i>Allium oleraceum, Lepidium latifolium, Petroselinum segetum</i> Note that some of the nationally scarce and notable plants require levels of ground disturbance (resulting in openings in the sward) to establish. Localised tight grazing and /or poaching may provide sward openings for such species as well as the wider range of herbs and unless widespread and persistent should not necessarily regarded as a problem.
D11		All sub-features	Sward structure <i>(structural variation of the salt marsh sward - section 4.1.4 vi of the conservation objectives)</i>	Sward height of Atlantic salt meadow communities measured periodically during the reporting cycle in late summer using a combination of remote sensing and field visits.	The extent and distribution of vegetation communities exhibiting different sward heights should not deviate significantly from an established set of limits. The limits will be defined to ensure that the requirements of the typical and notable plants species and birds species designated within the Severn Estuary SPA and Ramsar, can be met <i>Baselines are to be established from Nature Conservancy Council SSSI owner/occupier consent records dating from 1988 Severn Estuary SSSI notification (and subsequent consent reviews)</i> <i>CCW and EN/NE site monitoring records</i>	Vegetation structure is largely affected by the impact of grazing (of wild or domesticated herbivores) interacting with different vegetation communities and ground hydrological conditions. Not all Atlantic salt meadow within the Severn Estuary is grazed, but it is a widespread and long established practice and stocking levels need to be appropriate to the interest of the site. Over grazing can lead to a loss of structural diversity of rare plant species and affect bird use of these habitats while under grazing can lead to a loss of plant diversity by competitive exclusion. Introduction of grazing to previously ungrazed sites can result in deleterious changes to plant community composition and its value for wider conservation interests such as invertebrates. Note that some of the nationally scarce and notable plants require levels of ground disturbance (resulting in openings in the sward) to establish. Localised tight grazing and /or poaching may provide sward openings for such species as well as the wider range of herbs and unless widespread and persistent should not necessarily regarded as a problem. Disturbance is also provided in areas where natural tidal debris accumulates scattered across the salt marsh and in driftlines (often at the base and on the seaward slope of the floodbank). As well as providing seed establishment points for scarce plants the debris also plays a role in creating variation in sward structure particularly in the mid/upper and transition high marsh zones and in supporting important populations of invertebrates (notable deadwood beetles). The continued presence of tidal debris and driftlines in some locations is therefore a desirable aspect of the saltmarsh management which delivers this attribute . They may also be of value for the bird populations which roost and feed on saltmarshes of the SPA and Ramsar Site. (see sections 4.2 and 4.3)

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
D12	SAC interest feature 4: Atlantic salt meadows		Morphology <i>(characteristic stepped morphology and associated structural features - section 4.1.4.vii of the conservation objectives)</i>	Location and extent of established morphological features (saltmarsh terracing, creeks, pills, drainage ditches and pans) measured during the reporting cycle using remote sensing and field survey	No anthropogenic alteration of established morphological features from an established baseline. <i>Baselines is taken from 1999 air photos , CCW/English Nature Saltmarsh NVC survey by Dargie 1998 and English Nature condition assessment data collected in 2002 for Gloucestershire section of the estuary.</i>	This target relates to features which have developed naturally as a result of the evolution of the saltmarshes or the presence of freshwater drainage systems entering the estuary and which have established conservation value (eg pill sides of value botanically, pills used for shelter, feeding and roosting by birds). The baseline dataset will establish the location and extent of these features and identify man made features which do not need to meet this target.

Table 12 – Favourable condition table for the “reefs” feature of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
E1	SAC interest feature 4: Reefs		(Total) Extent and distribution <i>(total extent and distribution of reef - section 4.1.5.i of the conservation objectives)</i>	<p>Measurement of the extent and distribution of the purely subtidal part of this feature in the Severn Estuary is challenging. Remote sensing methods (such as side scan sonar) and drop down video are unreliable in these conditions. Therefore limited grab sampling may be required.</p> <p>Measurement of the subtidal component at the subtidal/intertidal interface may be possible by direct observation at very low tides.</p> <p>Extent and distribution of the intertidal <i>Sabellaria</i> reef measured using Phase 1 mapping survey techniques</p>	<p>No reduction in the extent and distribution of the reef from an established baseline</p> <p><i>Baseline is comprised of grab sampling surveys by Mettam 1988 supplemented by Environment Agency data 1999 and data from Warwick et al.2001 which provide subtidal reef records.</i></p> <p><i>CCW/English Nature Intertidal Biotope Surveys 2006 identify the distribution of intertidal Sabellaria alveolata and indication of locations for further survey for subtidal Sabellaria contiguous with these intertidal areas.</i></p>	<p>Known occurrences of subtidal and subtidal contiguous with intertidal reefs are largely limited to the outer parts of the estuary (area seaward of a line drawn between Portishead and Newport). See appendix 6. Samples show that reef formation is not continuous within this area and is in varying stages of growth. Further work is required to establish the distribution of this feature particularly with respect to the subtidal and the intertidal/subtidal interface.</p> <p>A further upstream zone of intertidal <i>Sabellaria</i> populations is recorded up to the old Severn Bridge (Beachley to Aust). While not part of the reef feature the extent of solely intertidal <i>Sabellaria</i> is relevant as these areas will also contribute larvae to the estuary wide populations of this species.</p> <p>The populations of <i>Sabellaria</i> within the Severn (subtidal, and intertidal) should be regarded as a metapopulation.</p> <p>New technologies that may allow the measurement of <i>Sabellaria</i> reef in a non destructive way should be investigated if they present themselves.</p>
E2			Community composition <i>(community composition - section 4.1.5.ii of the conservation objectives)-</i>	<p>Measurement of the community composition of this feature in the Severn Estuary is challenging. Remote sensing methods (such as side scan sonar) and drop down video are difficult. Therefore limited grab sampling may be required.</p>	<p>New samples of reef show no significant decline in community composition from baseline records</p> <p><i>Baseline is survey by Mettam 1988 supplemented by Environment Agency data 1999 and data from Warwick et al.2001</i></p>	<p>The reefs feature comprise two communities :</p> <p><i>Sabellaria alveolata</i> on variable salinity sublittoral mixed sediment SS.SBR.PoR.SalvMx</p> <p><i>Sabellaria alveolata</i> reefs on sand-abraded eulittoral rock. LS.LBR.Sab.Salv</p> <p>The typical species associated with subtidal and intertidal reefs in the Severn Estuary, derived from known samples, are listed in section 4.15.1 note 4</p>

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
E3	SAC interest feature 4: Reefs		Age structure <i>(full range of age structures - section 4.1.5.iii of the conservation objectives)</i>	Measurement of the community composition of this feature in the Severn Estuary is challenging. Remote sensing methods (such as drop down video) are difficult. Therefore limited grab sampling may be required.	Different phases from newly settled worms through vigorous fast growing reef to older hummocks are present <i>Baseline yet to be established.</i>	<i>Sabellaria alveolata</i> reefs cycle through different phases from newly settled worms through vigorous fast-growing reef to older hummocks. In a stable or increasing population all age phases are likely to be present . The presence of areas of variable stages of growth is important in ensuring larval supply and also enhances the species diversity of the reef
E4			Physical & ecological processes <i>(physical and ecological processes - section 4.1.5.iv of the conservation objectives)</i>	Abundance of coarse sediments Presence of suitable sediment grades in subtidal and intertidal sediments within the defined reefs zone (see comment on extent and distribution above) measured periodically.	No change in the abundance of suitable sediment grades within the defined reefs zone against an established baseline <i>Baseline yet to be established.</i>	An abundance of suitable coarse sediments (0.5-1mm sand) are required to support reef growth (tube building)
E5				Availability of suitable substrates Extent of available suitable (hard or long-term consolidated) substrates within the defined reef zone measured periodically	No change in overall extent of available suitable substrates within the defined reefs zone against an established baseline <i>Baseline yet to be established – data from the BGS and the CCW/English Nature intertidal biotope survey 2006 may assist</i>	Within the Severn reefs have been recorded both on solid geology and on smaller rocks and cobbles.
E6				Supply of larvae Abundance of <i>Sabellaria</i> larvae within the water column measured through plankton sampling	No decrease in the abundance of <i>Sabellaria</i> larvae against an established baseline <i>Baseline yet to be established – data may be available from existing plankton sampling surveys</i>	Area of sampling for this attribute should include both the reef zone and areas where intertidal populations are known as all areas supporting <i>Sabellaria alveolata</i> formations will be supplying larvae to the water column and hence may seed the reef feature. Recruitment is likely to be variable between years.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
E7				Abundance of food in water column Methods to be determined .	No decrease in the abundance of suspended detritus within the water column of the defined reef zone against an established baseline <i>Baseline yet to be established</i>	Area of sampling of the water column should include both the reef zone and intertidal populations (the estuary-wide metapopulation of <i>Sabellaria alveolata</i>)

Table 13 – Favourable condition table for the “river lamprey” and “sea lamprey” features of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
F1	SAC interest feature 5: River lamprey <i>Lampetra fluviatilis</i> and SAC interest feature 6: Sea lamprey <i>Petromyzon marinus</i>		Migratory access (Barriers to migration) (migratory passage not impeded - sections 4.1.6.i and 4.1.7.i of the conservation objectives)	Water quality measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn. (see also Table 8, lines A17-20 relating to general water quality requirements for the estuary feature (and dependant sub features))	Water quality is sufficient to support migratory passage. Levels (for temperature, salinity, turbidity, pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive. Baseline is water quality sampling data collected by the Environment Agency	Significant variation in these physico-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes as well as pheromone triggers from the juveniles during periods of high water flow. Peak migration usually coincides with river temperatures that remain above 10°C and continues until temperatures reach 18°C. Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the re-suspension of organic rich sediments. Toxic contaminants may act as a barrier to migration. Environmental Quality Standards (EQSs) are set for dangerous substances as defined under the Dangerous Substances Directive or Government Policy for freshwater and marine environments
F2				Water flows measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn (see also Table 8 line A3 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features))	Flows from the river into the estuary must be sufficient to allow migration. Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined	
F3				Physical barriers Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle.	No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream. Baseline is the Environment Agency data on structures and flood defences	Dams, navigation and other weirs may prevent lamprey from reaching their spawning grounds. In particular, sea lamprey is known to be poor at ascending obstacles.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
F4	SAC interest feature 5: River lamprey <i>Lampetra fluviatilis</i> and SAC interest feature 6: Sea lamprey <i>Petromyzon marinus</i>		Population size (returning adults) <i>(size of populations - sections 4.1.6.ii and 4.1.7.ii of the conservation objectives)</i>	Number of returning adults measured using fish counters on the feeding rivers (Wye, Usk and Severn) during the migratory period.	No decline in number of returning adults from established baseline. <i>Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.</i>	(Note that this attribute will not be able to be measured until the technological solutions are developed.) Fish counter technology is being developed to monitor adult lampreys but is not yet installed on the feeding rivers of the Severn Estuary. Fish counter technology should be further developed to monitor migrating adult river and sea lamprey.
F5			Ammocoete population in tributary rivers <i>(size of populations - sections 4.1.6.ii and 4.1.7.ii of the conservation objectives)</i>	Electrofishing surveys in 1m ² quadrats at a series of locations in the Rivers Usk, Wye (and Severn)	River population targets for the Usk and Wye must be met <i>Baseline is the survey of ammocoete abundance and distribution in the Rivers Usk and Wye commissioned by CCW in 2005 (Harvey et al. 2007).</i>	(Note that this attribute will not be able to be measured until the technological solutions are developed.) During the electrofishing survey all ammocoetes should be identified as <i>Lampetra</i> or <i>Petromyzon</i> and measured (mm). Surveys should be undertaken at the earliest in July but preferably between August and October. The rivers fauna CSM state three targets which must be met for the population attribute. These are; 1. Ammocoete population age structure For samples of 50 ammocoetes or less, at least 2 distinct size classes should normally be present. If more than 50 ammocoetes are collected, at least 3 size classes should be present. 2. Ammocoete distribution within catchment Lampreys should be present at not less than 2/3 of sites surveyed. 3. Ammocoete density; a. For <i>lampetra</i> ; Optimal habitat >10m ⁻² Overall catchment mean >5m ⁻² b. For sea lamprey - Ammocoetes should be present in at least sampling sites each not less than 5km apart

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
F6			Prey species <i>(abundance of prey species - sections 4.1.6.iii and 4.1.7.iii of the conservation objectives))</i>	The abundance of key prey species measured periodically	No significant reduction in abundance of key prey species against an established baseline <i>Baseline is yet to be established Data to be used is EA monitoring of river and fish populations and future surveys</i>	River and sea lamprey require a variety of other fish species to act as hosts throughout their lifecycle. Their principal host species are part of the estuarine fish assemblage which has measures and targets included within the “estuaries” feature – Table 8

Table 14 – Favourable condition table for the “twait shad” feature of the Severn Estuary SAC

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
G1	SAC interest feature 7: Twait shad (<i>Alosa fallax</i>)		Migratory access (Barriers to migration) (migratory passage not impeded - section 4.1.8.i of the conservation objectives)	Water quality measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn. (see also Table 8 line A 17-20 relating to general water quality requirements for the estuary feature (and dependant sub features))	Water quality is sufficient to support migratory passage. Levels (for temperature, salinity, turbidity, pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive. <i>Baseline is water quality sampling data collected by the Environment Agency</i>	Significant variation in these physico-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes . Peak migration usually coincides with river temperatures that remain above 10°C and continues until temperatures reach 18°C. Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the resuspension of organic rich sediments. Toxic contaminants may act as a barrier to migration. Environmental Quality Standards (EQSs) are set for dangerous substances as defined under the Dangerous Substances Directive or Government Policy for freshwater and marine environments.
G2				Water flows measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn (see also Table 8 line A3 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features))	Flows from the river into the estuary must be sufficient to allow migration <i>Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined</i>	
G3				Physical barriers Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle.	No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream. <i>Baseline is Environment Agency data on structures and flood defences</i>	Dams, navigation and other weirs may prevent shad reaching their spawning grounds. In particular, shad are known to be poor at ascending obstacles.

Ref	SAC Interest Feature	Sub-feature	Attribute	Measure	Target	Comments
G4	SAC interest feature 7: Twaite shad (<i>Alosa fallax</i>)		Population size (returning adults) <i>(size of populations - section 4.1.8.ii of the conservation objectives)</i>	Number of returning adults measured using fish counters on the Usk and Wye rivers during the migratory period.	No drop in the annual run size greater than would be expected from variations in natural mortality alone. <i>Baseline is yet to be established - fish counter data may be able to provide a baseline in future years. Noble et al. (2007) provides historical information on returning adults for the River Wye.</i>	(Note that this attribute will not be able to be measured until the technological solutions are developed.) Fish counter technology is being developed to monitor adult shad but is not yet installed on the feeding rivers of the Severn Estuary. Fish counter technology should be further developed to monitor migrating adult shad.
G5			River population <i>(size of populations - section 4.1.8.ii of the conservation objectives)</i>	Seine netting for juveniles in the lower rivers and upper estuaries and monitoring of shad eggs by kick sampling	River population targets for the Usk and Wye must be met <i>Baseline yet to be established. Noble et al. (2007) provides some information on juvenile densities.</i>	(Note that this attribute will not be able to be measured until the technological solutions are developed.) Seine netting should occur in lower rivers and upper estuaries. Netting should be carried out in late summer early autumn (July-October). For each river, juvenile densities should exceed a specified minimum target at least two years in six. The extent of spawning should be monitored by kick sampling for eggs at a proportion of known spawning sites. A reduction in the spawning distribution of more than 50 % compared with the baseline will indicate an adverse change. Kick sampling should occur during May and June.
G6			Prey species <i>(abundance of prey species – section 4.1.8.iii of the conservation objectives))</i>	The abundance of key prey species measured by EA in their routine monitoring of the rivers and estuary	No significant reduction in abundance of key prey species against an established baseline <i>Baseline is yet to be established through fish surveys in estuary and rivers</i>	Twaite shad require a variety of invertebrates including crustacean, mysids and copepods, small fish and fish eggs particularly in that section of the estuary where saline and freshwaters meet.

4.2 Conservation objectives for SPA European Marine Site interest features

The protection and management of the SPA in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

Note : The conservation objectives for areas of the SPA which lie outside the European Marine Site boundary are provided in separate documents by CCW and Natural England which are currently in preparation and will soon be available on request.

4.2.1 SPA Interest feature 1: Internationally important population of regularly occurring Annex 1 species : Bewick's swan

The conservation objective is to maintain the Bewick's swan population and its supporting habitats¹ in **favourable condition**, as defined below

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the Bewick's swan population is no less than 289 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;
- (iv) the extent of vegetation with an effective field size of >6 ha and with unrestricted bird sightlines > 500m at feeding, roosting and refuge sites (Appendix III) are maintained;
- (v) greater than 25% cover of suitable soft leaved herbs and grasses³ in winter season throughout the transitional saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (vi) aggregations of Bewick's swan at feeding, roosting and refuge sites are not subject to significant disturbance.

4.2.1.1 Explanatory information for the Bewick's swan conservation objective

¹ Key supporting habitats for the Annex I species

- Intertidal mudflats and sandflats
- Saltmarsh

² Natural processes in respect of the SPA

Each interest feature is subject to both natural processes and human influences. Human influence on the interest features is acceptable provided that it is compatible with the achievement of the conditions set out under the definition of favourable condition for each interest feature. A failure to meet these conditions which is entirely a result of natural processes will not constitute unfavourable condition, but will trigger a review of the definition of favourable condition. This qualification is necessary because:

- (a) the bird populations themselves are subject to natural factors, many of which arise outside the SPA, such as breeding success and winter temperatures;

(b) the supporting habitats of the birds are influenced by the evolution of the estuary. Natural adjustments within estuaries can take many forms. One important example is the tendency of estuaries to accumulate sediment, thereby changing their form from their original Holocene morphology to a state where tidal energy is dissipated by subtidal and intertidal sediment banks or features. This, with other natural processes, will therefore cause the width and depth of the estuary to change over time, moving towards a state of dynamic equilibrium or 'most probable state'. As part of this process, the location and extent of saltmarshes and mudflats may change, provided there is capacity to accommodate readjustment. However, where this process is constrained, the capacity of habitats to accommodate readjustment may be affected.

³Key food plants of Bewick's swan

eg *Agrostis stolonifera*, *Alopecurus geniculatus*, *Glyceria geniculatus*. (This list contains examples and is not exhaustive)

4.2.2 SPA interest feature 2: Internationally important population of regularly occurring migratory species: wintering European white-fronted goose

The conservation objective is to maintain the European white-fronted goose population and its supporting habitats¹ in **favourable condition**, as defined below.

The interest feature European white-fronted goose will be considered to be in favourable condition² when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering European white fronted goose population is no less than 3,002 individuals (ie the 5 year peak mean between 1988/9-1992/3);
- (ii) the extent of saltmarsh at the Dumbles (Appendix 8: Map 1) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix 8: Map 1) is maintained;
- (iv) greater than 25% cover of suitable soft-leaved herbs and grasses³ is maintained during the winter on saltmarsh areas (Appendix 8: Map 1);
- (v) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (vi) aggregations of European white-fronted goose at feeding or roosting sites are not subject to significant disturbance.

4.2.2.1 Explanatory information for the wintering European white-fronted goose objective

¹Key supporting habitats for the migratory bird species

- Intertidal mudflats and sandflats
- Saltmarsh

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key food plants of European white-fronted goose

eg *Alopecurus bulbosus*, *Festuca rubra*, *Hordeum marinum*, *Lolium perenne*; *Puccinellia maritima*.
(This list contains examples and is not exhaustive)

4.2.3 SPA interest feature 3: Internationally important population of regularly occurring migratory species: wintering dunlin

The conservation objective is to maintain the dunlin population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature dunlin will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering dunlin population is no less than 41,683 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) the extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh (Appendix 8);
- (vi) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macro-distribution of suitable invertebrates³ in hard substrate habitats (Appendix 8) is maintained;
- (viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (ix) aggregations of dunlin at feeding or roosting sites are not subject to significant disturbance.

4.2.3.1 Explanatory information for the wintering dunlin objective

¹Key supporting habitats for the migratory bird species

- Intertidal mudflats and sandflats
- Saltmarsh
- Hard substrate habitats (rocky shores)

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of dunlin

eg *Carcinus*, *Crangon*, *Hydrobia*, *Macoma*, *Hediste*, and *Talitrus* spp.
(This list contains examples and is not exhaustive)

4.2.4 SPA interest feature 4: Internationally important population of regularly occurring migratory species: wintering redshank

The conservation objective is to maintain the redshank population and its supporting habitats¹ in **favourable condition**, as defined below

The interest feature redshank will be considered to be in favourable condition when, subject to natural processes² each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering redshank population is no less than 2,013 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix IV) is maintained;
- (v) the extent of vegetation with a sward height of <10cm throughout the saltmarsh (Appendix 8) is maintained;
- (vi) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macro-distribution of suitable invertebrates³ in hard substrate habitats (Appendix 8) is maintained;
- (viii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (ix) aggregations of redshank at feeding or roosting sites are not subject to significant disturbance.

4.2.4.1 Explanatory information for the wintering redshank objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of redshank

eg *Carcinus*, *Crangon*, *Hydrobia*, *Macoma*, *Hediste*, and *Talitrus* spp.
(This list contains examples and is not exhaustive)

4.2.5 SPA interest feature 5: Internationally important population of regularly occurring migratory species: wintering shelduck

The conservation objective is to maintain the shelduck population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature shelduck will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering shelduck population is no less than 2,892 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) the abundance and macro-distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vi) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (vii) aggregations of shelduck at feeding or roosting sites are not subject to significant disturbance.

4.2.5.1 Explanatory information for the wintering shelduck objective

¹Key supporting habitats for the migratory bird species

- Intertidal mudflats and sandflats
- Saltmarsh
- Hard substrate habitats (rocky shores)

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.2.1.1**.

³Key intertidal invertebrate prey species of shelduck

eg *Carcinus*, *Corophium*, *Hydrobia*, *Macoma*, *Mytilus*, and *Hediste* spp
(This list contains examples and is not exhaustive)

4.2.6 SPA interest feature 6: Internationally important population of regularly occurring migratory species: wintering gadwall

The conservation objective is to maintain the gadwall population and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature gadwall will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the wintering gadwall population is no less than 330 (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iii) unrestricted bird sightlines of >200m at feeding and roosting sites are maintained;
- (iv) aggregations of gadwall at feeding or roosting sites are not subject to significant disturbance.

4.2.6.1 Explanatory information for the wintering gadwall objective

¹Key supporting habitats for the migratory bird species

- **Intertidal mudflats and sandflats**

Note : It is currently unclear what use this species is making of the estuary – they are clearly present in intertidal areas particularly around areas freshwater streams and pills enter the estuary. Although primarily freshwater plant feeders they do also take animal material including insects, molluscs, annelids and even small fish and small amphibians – it is possible that they are feeding on such matter in the freshwater influenced mud and sands. Recent evidence indicates this species is changing its general habits as it extends its range westwards. As a result the conservation objective for this species does not include a condition in respect of the key food sources as for other species at this time.

²Natural processes in respect of the SPA

The meaning of ‘natural processes’ is explained in **section 4.2.1.1**.

4.2.7 SPA interest feature 7: Internationally important assemblage of waterfowl

The conservation objective is to maintain the waterfowl assemblage and its supporting habitats¹ in **favourable condition**, as defined below:

The interest feature waterfowl assemblage will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- (i) the 5 year peak mean population size for the waterfowl assemblage is no less than 68,026 individuals (ie the 5 year peak mean between 1988/9 - 1992/3);
- (ii) the extent of saltmarsh (Appendix 8) and their associated strandlines is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix 8) is maintained;
- (iv) the extent of hard substrate habitats (Appendix 8) is maintained;
- (v) extent of vegetation of <10cm throughout the saltmarsh (Appendix 8) is maintained;
- (vi) the abundance and macroscale distribution of suitable invertebrates³ in intertidal mudflats and sandflats (Appendix 8) is maintained;
- (vii) the abundance and macroscale distribution of suitable invertebrates³ in hard substrate habitats (Appendix IV) is maintained;
- (viii) greater than 25% cover of suitable soft leaved herbs and grasses⁴ during the winter on saltmarsh areas (Appendix 8) is maintained;
- (ix) unrestricted bird sightlines of >500m at feeding and roosting sites are maintained;
- (x) waterfowl aggregations at feeding or roosting sites are not subject to significant disturbance.

4.2.7.1 Explanatory information for the internationally important assemblage of waterfowl

¹Key supporting habitats for the waterfowl assemblage¹

- **Intertidal mudflats and sandflats**
- **Saltmarsh**
- **Hard substrate habitats (rocky shores)**

²Natural processes in respect of the SPA

The meaning of 'natural processes' is explained in **section 4.1.1**.

³Key intertidal invertebrate prey species of the waterfowl assemblage

eg *Arenicola*, *Carcinus*, *Corophium*, *Crangon*, *Gammarus*, *Hydrobia*, *Macoma*, *Hediste*, *Notomastus* and *Talitrus* spp. - these lists are examples and are not exhaustive

⁴Key saltmarsh food plants

eg *Puccinellia maritima*, *Salicornia* spp., *Agrostis stolonifera*, *Atriplex* spp., *Hordeum marinum*, *Festuca rubra*, *Alopecurus bulbosus*, *Lolium perenne* - these lists are examples and are not exhaustive

4.2.8 Favourable Condition Tables for SPA interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the SPA. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the initial monitoring events in order to characterise the site and establish the baselines. Extreme events (such as storms reducing or increasing salinities, exceptionally cold winters or warm summers) also need to be recorded as they may be critical in influencing ecological issues in the Severn Estuary and may well be missed by routine monitoring.

Comprising :

Table 15 – Favourable condition table for the supporting habitats of the bird interest features in the Severn Estuary SPA

Table 16 – Favourable condition table for the qualifying bird features of the Severn Estuary SPA

Reference should also be made to Tables 8,10 and 11 - Favourable Condition Tables for the SAC habitat features relevant to the supporting habitats (intertidal mudflats and sandflats, saltmarsh and hard substrate habitats (rocky shores)) .

Table 15 Favourable Condition Table for the supporting habitats of the bird interest features in the Severn Estuary SPA European Marine Site (information on the populations of bird species using these habitats are given in Table 4)

SPA interest feature	Supporting Habitat	Attribute	Measure	Target	Comments
<i>SPA interest feature 1:</i> Internationally important Annex 1 species: Bewick's swan	Saltmarsh	Habitat extent	Area (ha) measured once per reporting cycle.	At The Dumbles, no decrease in extent from 76 ha.	Saltmarsh provides an important feeding and roosting habitat for Bewick's swans on The Dumbles - saltmarsh/transition wet grassland in front of sea defences.
		Vegetation characteristics	Abundance of suitable soft leaved herbs and grasses - % cover (frequency to be determined)	Greater than 25% cover during the winter season.	Bewick's swans graze on soft wet meadow grasses such as <i>Agrostis stolonifera</i> , <i>Glyceria fluitans</i> and <i>Alopecurus geniculatus</i> which are found in the transition of saltmarsh to grassland.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines. Areas of vegetation with an effective field size of >6ha	Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting.
	Intertidal mudflats and sandflats	Habitat extent	Area (ha), measured once per reporting cycle.	At Frampton Sands, Waveridge Sands and the Noose, no decrease in extent from 980 ha.	The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Bewick's swan require unrestricted views >500m to allow early detection of predators when feeding and roosting.

Table 15 - continued

SPA interest feature	Supporting Habitat	Attribute	Measure	Target	Comments
<p><i>SPA interest features 2 - 6:</i> Internationally important populations of regularly occurring migratory species</p> <p>and</p> <p><i>SPA interest feature 7:</i> Internationally important assemblage of waterfowl</p>	Saltmarsh	Habitat extent	Area (ha), measured once per reporting cycle.	<p>No decrease in extent from 1,400 ha.</p> <p>At The Dumbles, no decrease in extent from 76 ha.</p>	Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas.
		Food availability	Presence and abundance of suitable saltmarsh food plants measured periodically (frequency to be determined).	Presence and abundance of suitable saltmarsh food plants should not deviate significantly from an established baseline ¹	European white-fronted geese graze on a range of saltmarsh grasses and herbs. Wigeon feed on well-grazed saltmarsh with <i>Puccinella maritiae</i> , <i>Salicornia</i> and <i>Agrostis</i> . Teal and pintail feed on seeds from <i>Salicornia</i> and <i>Atriplex</i> .
		Vegetation characteristics	Range of vegetation heights measured periodically (frequency to be determined).	Sward height and density throughout areas used for roosting should not deviate significantly from an established baseline ¹ .	Vegetation of <10 cm is required throughout areas used by roosting waders. This is managed by grazing.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.

Table 15 - continued

SPA interest feature	Supporting Habitat	Attribute	Measure	Target	Comments
SPA interest features 2 - 6: Internationally important populations of regularly occurring migratory species and SPA interest feature 7: Internationally important assemblage of waterfowl	Intertidal mudflats and sandflats	Habitat extent	Area (ha), measured once per reporting cycle.	No decrease in extent from 15,000 ha. At Frampton Sands, Waveridge Sands and The Noose no decrease in extent from 980 ha.	Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas.
		Food availability	Presence and abundance of suitable prey species measured periodically (frequency to be determined).	Presence and abundance of suitable prey species should not deviate significantly from an established baseline. ¹	Most of the waders and waterfowl within the assemblage including the internationally important regularly occurring migratory birds feed on invertebrates within and on the sediments. Diet includes <i>Arenicola</i> , <i>Crangon</i> , <i>Hydrobia</i> , <i>Hediste</i> , <i>Corophium</i> , <i>Macoma</i> , <i>Gammarus</i> , small molluscs and strandline plankton and seeds.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.
	Shingle and rocky shores	Habitat extent	Area (ha), measured once per reporting cycle.	No decrease in extent from 1,500 ha.	This habitat is used for feeding and roosting, particularly by waders.
		Food availability	Presence and abundance of suitable intertidal invertebrates, measured periodically (frequency to be determined).	Presence and abundance of suitable food species should not deviate significantly from an established baseline ¹	Waders feed on worms, crustaceans and molluscs.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.

¹ Baselines to be established

Table 16 Favourable Condition Table for the qualifying bird features in the Severn Estuary European Marine Site

SPA interest feature	Supporting Habitat	Attribute	Measure	Target	Comments
<i>SPA interest feature 1:</i> Internationally important Annex 1 species: Bewick's swan		Population size	5 year peak mean number of individuals	No less than 289 individuals [ie the 5 year peak mean between 1988/9 - 1992/3]	Mainly found in the Upper Severn Estuary at Slimbridge
		Proportion of biogeographic population	% of NW European population	1 % of NW European population	WeBS counts provide this information
		Distribution	Number and location of sectors occupied at low tide	No decrease in use of the number of sectors and their distribution established as baseline ¹	WeBS low tide counts display distribution information by sector (not annual counts) Birds use certain sectors to a greater or lesser degree from year to year
		Disturbance in feeding and roosting areas	Reduction or displacement of wintering birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline ¹	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.
<i>SPA interest features 2 - 6:</i> Internationally important populations of regularly occurring migratory species and <i>SPA interest feature 7:</i> Internationally important assemblage of waterfowl		Population size	5 year peak mean number of individuals	No less than 68,026 individuals in the assemblage [ie the 5 year peak mean between 1988/9 - 1992/3] For individual species - no less than the 5 year peak mean between 1988/9 - 1992/3 detailed in Table 4	Figures derived from WeBS counts. The 5 year peak means for this period for each of the internationally important populations and species with nationally important populations which make up the internationally important assemblage are detailed in Table 4
		Distribution	Number and location of sectors occupied at low tide	No decrease in use of the number of sectors and their distribution established as baseline ¹	In some years birds use certain sectors to a greater or lesser degree. WeBS low tide counts display distribution information by sector (not annual counts).

SPA interest feature	Supporting Habitat	Attribute	Measure	Target	Comments
		Disturbance in feeding and roosting areas.	Reduction or displacement of wintering birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline ¹ .	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.

¹ Baselines to be established

4.3 Conservation objectives for the Severn Estuary / Môr Hafren Ramsar Site

The protection and management of the Ramsar in accordance with Article 6 of the Habitats Directive, including in particular the consideration of plans and projects under Article 6(3) and 6(4), should be carried out in view of the conservation objectives in this section.

4.3.1 Ramsar interest feature 1: Estuaries

The conservation objective for the “estuaries” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SAC “estuaries” feature” (refer to section 4.1.1 and Table 8 of this document), in so far as these objectives are applicable to the area designated as Ramsar Site and as defined below.

4.3.1.1 Explanatory information for the Ramsar Site “estuaries” conservation objective

The area of the estuarine ecosystem designated as Ramsar Site is smaller than that of the SAC as it is restricted to the terrestrial and intertidal areas and excludes all subtidal areas. There are therefore aspects of the SAC “estuaries” conservation objective that are not applicable to the Ramsar Site “estuaries” feature. The following Table 17 identifies the limits and restrictions, if any, that apply in respect of the Ramsar Site. The table layout follows the numbering of the SAC “estuaries” objective conditions given in section 4.1.1.

Table 17 - Limits of the Ramsar “estuaries” feature

SAC “estuaries” objective conditions to be met	Limits, if any, of the Ramsar
i. the total extent of the estuary is maintained;	Limited to the lesser area of the Ramsar Site – excludes all subtidal areas - refer also to Appendix 2
ii. the characteristic physical form (tidal prism/cross sectional area) and flow (tidal regime) of the estuary is maintained;	These requirements are related to the estuary regime, structure and function at a whole ecosystem level
iii. the characteristic range and relative proportions of sediment sizes and sediment budget ³ within the site is maintained;	
iv. the extent, variety and spatial distribution of estuarine habitat communities within the site is maintained;	Within the Ramsar Site this is limited to the habitats listed as Ramsar “estuarine habitats communities” ¹ below
v. the extent, variety, spatial distribution and community composition of hard substrate habitats and their notable communities is maintained;	Within the Ramsar Site this is limited to the habitats listed as Ramsar “hard substrate communities” ² below
vi. the abundance of the notable estuarine species assemblages is maintained or increased;	Within the Ramsar Site this is limited to the species listed as Ramsar “notable estuarine species assemblages” ³ below
vii. the physico-chemical characteristics of the water column support the ecological objectives described above;	These requirements apply estuary wide at a whole ecosystem level
viii. Toxic contaminants in water column and sediment are below levels which would pose a risk to the ecological objectives described above.	

¹Ramsar “estuarine habitat communities”

- a. Intertidal mudflats and sandflats (refer also to maps in Appendices 4 and 4a)
 - Intertidal gravel and clean sands
 - Intertidal muddy sands
 - Intertidal muds

- b. Saltmarshes (equivalent to the Atlantic saltmeadows feature of the SAC) (refer also to maps in Appendices 5 and 5a)
- Low – mid marsh communities
 - Mid – upper marsh communities
 - Transitional high marsh communities
 - Pioneer marsh communities

²Ramsar “hard substrate communities”

These include all hard substrate (rocky shore) communities within the Ramsar Site boundary shown in the map in Appendix 7 which includes the following notable communities:

- *Sabellaria alveolata* reefs on sand-abraded eulittoral rock (MLR.Sab Salv) *
- *Hydroids, ephemeral seaweeds and Littorina littorea* in shallow eulittoral mixed substrata pools. (LR.RkpH)
- *Balanus crenatus* and *Tubularia indivisa* on extremely tide-swept circalittoral rock ECR.BS.BalTub)
- *Fucus serratus* and piddocks on lower eulittoral soft rock (MLR.Fser.Pid)
- *Mytilus edulis* and piddocks on eulittoral firm clay (MLR.MytPid)
- *Balanus crenatus*, *Halichondrea panicea* and *Alcyonidium diaphanum* on extremely tide-swept sheltered circalittoral rock (ECR.BalHpan) .
- *Sertularia cupressina* and *Hydrallmania falcate* on tide-swept sublittoral cobbles or pebbles in coarse sand (IGS.ScupHyd).
- *Corralina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.Rkp.Cor)
- Eel grass (*Zostera*) beds
- Any other notable hard substrata communities that may be identified.

*Note : where this community is contiguous with the occurrence of subtidal *Sabellaria alveolata* reefs it forms part of the SAC reefs feature. Within the Ramsar it is regarded as a component of the hard substrates subfeature of the Ramsar estuaries feature .

³Ramsar “notable estuarine species assemblages”

- i. Assemblage of fish species:
- Migratory species
 - River and Sea Lamprey and Twaité shad and Allis shad
 - Sea trout, salmon, eel,
 - Estuarine species
 - Species typically occurring and breeding in estuaries (Bird, 2008)
 - Marine species occurring in large numbers in estuaries (Bird, 2008)
 - Marine species
 - Predominantly marine species occurring infrequently in the Severn (Bird, 2008)
 - Freshwater species
 - Species typically occurring and breeding in freshwater and recorded within the Severn (Bird, 2008)

- ii Assemblage of waterfowl species (refer also to section 4.3.9)

Internationally important populations of waterfowl comprising :

- Regularly occurring Annex 1 species - Bewick's swan
- Regularly occurring migratory species - European white-fronted goose, dunlin, redshank, shelduck, and gadwall

Internationally important assemblage of waterfowl comprising above species plus the following :

- Nationally important bird populations - wigeon, teal, pintail, pochard, tufted duck, ringed plover, grey plover, curlew, whimbrel and spotted redshank, lesser black-backed gull

- iii. Assemblage of vascular plant species:

- Salt marsh species (refer to notes 5 and 6 in section 4.1.4.1 - explanatory information on the conservation objective for the Atlantic salt meadows feature)
- Eel grass (*Zostera*) species.

4.3.2 Ramsar interest feature 2: Assemblage of migratory fish species¹

The conservation objective for the “assemblage of migratory fish species” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined below:

The feature will be considered to be in favourable condition when, subject to natural processes², each of the following conditions are met:

- i. the migratory passage of both adults and juveniles of the assemblage of migratory fish species through the Severn Estuary between the Bristol Channel and any of their spawning rivers is not obstructed or impeded by physical barriers, changes in flows, or poor water quality;
- ii. the size of the populations of the assemblage species in the Severn Estuary and the rivers which drain into it, is at least maintained and is at a level that is sustainable in the long term;
- iii. the abundance of prey species³ forming the principle food resources for the assemblage species within the estuary, is maintained.
- iv. Toxic contaminants in the water column⁴ and sediment are below levels which would pose a risk to the ecological objectives described above.

The meaning of terms ¹⁻⁴ above is explained in **section 4.3.2.1**

Note : The populations of three of the assemblage species (river lamprey, sea lamprey and twaite shad) are designated as features of the SAC for which separate specific objectives have been written (refer to sections 4.1.6 to 4.1.8 of this document). The populations of these species depend on habitat in the adjacent River Usk SAC, River Wye SAC and River Severn. The habitats in these rivers, including spawning and nursery areas, are essential for the fulfilment of the species’ lifecycle and therefore these features can only be in favourable condition if the conservation objectives pertaining to the River Usk SAC and River Wye SAC are also met in full and there is a continued recorded presence of these species in the River Severn.

4.3.2.1 Explanatory information for the assemblage of migratory fish species conservation objective

¹ Assemblage of migratory fish species

Species which are designated features of the SAC and for which individual conservation objectives have been written (refer to sections 4.1.6, 4.1.7 and 4.1.8)

Sea lamprey *Petromyzon marinus*
River lamprey *Lampetra fluviatilis*
Twaite shad *Alosa fallax*

Other migratory species in the assemblage

Allis shad *Alosa alosa*
Salmon *Salmo salar*
Sea trout *S. trutta*
Eel *Anguilla anguilla*.

²Natural processes in respect of the Ramsar fish features

Assemblage populations :

The size of the populations is subject to non anthropogenic factors relating to natural fluctuations of external factors such as food / host availability in the Bristol Channel and more widely and breeding success in the River Severn and other rivers draining into the Severn Estuary.

Supporting habitats

The general meaning of ‘natural processes’ with respect to the supporting habitats of the migratory fish assemblage within the estuary is explained in **section 4.1.1.1**.

³Prey species

Assemblage Species	Key prey species
Sea lamprey	Eel <i>Anguilla anguilla</i> , cod <i>Gadus morhua</i> , and haddock <i>Melanogrammus aeglefinus</i> are all potential prey species for the sea lamprey found within the Severn Estuary (Bird 2008)
River lamprey	Sea trout <i>Salmo trutta</i> , shad <i>Alosa fallax/Alosa alosa</i> , herring <i>Clupea harengus</i> , sprat <i>Sprattus sprattus</i> , flounder <i>Platichthys flesus</i> and small gadoids such as whiting <i>Merlangius merlangus</i> and pout <i>Trisopterus luscus</i> are all potential prey species for the river lamprey found within the Severn Estuary (Bird 2008).
Twaite shad	Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).
Allis shad	Small crustaceans, especially mysids and copepods, small fish, especially sprats and anchovies, and fish eggs (Maitland, P.S. & Hatton-Ellis 2003).
Salmon	While at sea, salmon feed on a variety of fish (e.g. herring, sprat, sand eel, mackerel, and various gadoids) and crustaceans (e.g. euphausiid shrimps, prawns, gammarid amphipods and various crabs). (Bird, 2008)
Sea trout	The diet of this species at sea has not been much studied but is believed to include a range of fish species including sprat, young herring and sand eels as well as crustaceans such as amphipods (e.g. Corophium), gammarids, decapods such as Crangon and mysid shrimps. Many of these prey items also occur in estuaries where sea trout are known to feed extensively. (Bird, 2008)
Eel	A range of benthic organisms that include crustaceans and small fish. (Bird, 2008)

⁴Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.3.3 Ramsar interest feature 3: Internationally important populations of waterfowl : Bewick's swan

The conservation objective for the “Bewick's swan” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “Bewick's swan ” feature (refer to section 4.2.1)

4.3.4 Ramsar interest feature 4 : Internationally important populations of waterfowl : European white-fronted goose

The conservation objective for the “European white-fronted goose” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering European white-fronted goose” feature (refer to section 4.2.2)

4.3.5 Ramsar interest feature 5: Internationally important populations of waterfowl : dunlin

The conservation objective for the “dunlin” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering dunlin ” feature (refer to section 4.2.3)

4.3.6 Ramsar interest feature 6: Internationally important populations of waterfowl : redshank

The conservation objective for the “redshank” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering redshank” feature (refer to section sections 4.2.4)

4.3.7 Ramsar interest feature 7: Internationally important populations of waterfowl :shelduck

The conservation objective for the “shelduck” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering shelduck” feature (refer to section 4.2.5)

4.3.8 Ramsar interest feature 8: Internationally important populations of waterfowl : gadwall

The conservation objective for the “gadwall” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “wintering gadwall” feature (refer to section sections 4.2.6)

4.3.9 Ramsar interest feature 9: Internationally important assemblage of waterfowl

The conservation objective for the “internationally important assemblage of waterfowl” feature of the Severn Estuary Ramsar Site is to maintain the feature in favourable condition, as defined by the conservation objective for the SPA “internationally important assemblage of waterfowl” feature (refer to section sections 4.2.7) – with special reference to the individual species listed and their population figures given in Table 6

Note : This Ramsar Site feature incorporates both wintering and passage populations of some birds and hence some species are included more than once in lists given in Table 6

4.3.10 Favourable Condition Tables for the Ramsar Site interest features of the Severn Estuary European Marine Site

Background information on the role of favourable condition tables and the information provided in each column is provided in section 1.8 of this document, and a concise glossary of terms used is provided in Section 7.

The favourable condition table is intended to supplement the conservation objectives, including with respect to the management of established and ongoing activities, future requirements of monitoring and reporting on the condition of the features of the site and, together with the conservation objectives, informs the scope and nature of any appropriate assessment that may be needed. The table **does not by itself** provide a comprehensive basis on which to assess plans and projects as required under the Habitats Regulations. It should be noted that appropriate assessments are a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

These tables set out all the attributes that **may** be used to monitor the condition of the features of the Ramsar Site. Where possible we will seek available information from others which can inform our assessment process.

It will be possible to monitor many of the attributes at the same time or during the same survey. The frequency of sampling for many attributes may need to be greater during the initial monitoring events in order to characterise the site and establish the baselines. Extreme events (such as storms reducing or increasing salinities, exceptionally cold winters or warm summers) also need to be recorded as they may be critical in influencing ecological issues in the Severn Estuary and may well be missed by routine monitoring.

Comprising :

Table 18 – Favourable condition table for the “estuaries” feature of the Severn Estuary Ramsar Site

Table 19 – Favourable condition table for the migratory fish assemblage of the Severn Estuary Ramsar Site

Table 20 – Favourable condition table for the supporting habitats of the bird interest features (Ramsar features 3 to 9) in the Severn Estuary Ramsar Site

Table 21 – Favourable condition table for the qualifying bird interest features in the Severn Estuary Ramsar Site

Favourable condition table for the “estuaries” feature of the Severn Estuary Ramsar Site

Reference should also be made to Tables 8,10 and 11 - Favourable Condition Tables for the SAC habitat features relevant to the supporting habitats (intertidal mudflats and sandflats, saltmarsh and hard substrate habitats (rocky shores)) .

Table 18 Favourable Condition Table for the “estuaries” feature of the Severn Estuary Ramsar Site

Ramsar interest feature	Comments
<i>Ramsar Interest feature 1: Estuaries</i>	<p>The Favourable Condition Table for the “estuaries” feature of the Severn Estuary Ramsar Site is largely the same as that for the Severn Estuary SAC “estuaries” feature (see section 4.1 : Table 8).</p> <p>However the area of the estuarine ecosystem designated as Ramsar Site is smaller than that of the SAC as it is restricted to the terrestrial and intertidal areas and excludes all subtidal areas. Table 17 identifies the limits and restrictions that apply in respect of the Ramsar Site Conservation Objective.</p> <p>There are therefore aspects of the SAC “estuaries” Favourable Condition Table that are not applicable to the Ramsar Site “estuaries” feature as follows :</p> <ul style="list-style-type: none"> • All attributes other than those referred to below - apply only in respect of the area within the Ramsar Boundary (as shown in Appendix 2) • Line A6 - which relates to the subtidal sandbanks subfeature of the estuaries feature - this does not apply as these habitats lie outside the boundary of the Ramsar Site • Line A9 - which relates to the reefs subfeature of the estuaries feature - this only applies in respect of areas where intertidal <i>Sabellaria alveolata</i> occurs contiguously with the subtidal reefs (yet to be fully defined).

Table 19 Favourable Condition Table for the Migratory fish assemblage feature of the Severn Estuary Ramsar Site

Ramsar interest feature	Sub-feature	Attribute	Measure	Target	Comments
Ramsar Interest feature 2 : Migratory fish assemblage		Migratory access (Barriers to migration) (migratory passage not impeded - sections 4.6.i and 4.7.i of the conservation objectives)	Water quality measured regularly throughout the reporting cycle in the Bristol Channel, Severn Estuary, River Wye SAC, River Usk SAC and River Severn. (see also lines A17- A20 of Table 8 relating to general water quality requirements for the estuary feature (and dependant sub features)	Water quality is sufficient to support migratory passage. Levels (for temperature, salinity, turbidity and pH, and dissolved oxygen) should comply with targets established under the EA Review of Consents and the Water Framework Directive. Baseline is water quality sampling data collected by the Environment Agency	Significant variation in these physio-chemical parameters may act as barriers to migration. For example, the timing, duration and consistency of their upstream migration are believed to be closely related to temperature changes as well as pheromone triggers from the juveniles during periods of high water flow. Peak migration usually coincides with river temperatures that remain above 10°C and continues until temperatures reach 18°C. Dissolved oxygen can also be significantly reduced in stretches receiving significant BOD inputs, or through the re-suspension of organic rich sediments. Toxic contaminants may act as a barrier to migration.
			Water flows measured regularly throughout the reporting cycle (frequency to be determined) in the River Wye SAC, River Usk SAC and River Severn (see also line A3 of Table 8 relating to general tidal and water flow requirements for the estuary feature (and dependant sub features)	Flows from the rivers into the estuary must be sufficient to allow migration Baseline is water flow sampling data collected by the Environment Agency provides a baseline. Severe low flow conditions that affect these species yet to be defined	
			Physical barriers Mapping and quantification of potential obstructions in relation to height, type and water depth below obstruction once during the reporting cycle.	No artificial barriers significantly impairing, adults from reaching existing and historical spawning grounds, or juveniles from moving downstream. Baseline is the Environment Agency data on structures and flood defences	Dams, navigation and other weirs may prevent fish from reaching their spawning grounds. In particular, sea lamprey is known to be poor at ascending obstacles.

Ramsar interest feature	Sub-feature	Attribute	Measure	Target	Comments
		Population sizes (returning adults) <i>(size of populations - sections 4.6.ii and 4.7.ii of the conservation objectives)</i>	Number of returning adults measured using fish counters on the feeding rivers (Wye, Usk and Severn) during the migratory period.	No decline in number of returning adults from established baseline. <i>Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.</i>	(Note that this attribute will not be able to be measured until the technological solutions for monitoring some species (notably lampreys and shad) are developed.)
		River populations <i>(size of populations - sections 4.6.ii and 4.7.ii of the conservation objectives)</i>	Survey through various methods (Electrofishing, seine netting, line fishing records, licencing returns) at a series of locations in the Rivers Wye, Usk and Severn	No decline in populations of the Rivers Wye and Usk <i>Baseline is yet to be established - fish counter data may be able to provide a baseline in future years.</i>	Details of methods for river and sea lamprey are outlined in section 4.1.9, Table 13 and for Twaite shad in Table 14 - the individual FCT for these species within the SAC section of this document
		Prey species <i>(abundance of prey species - sections 4.6.iii and 4.7.iii of the conservation objectives)</i>	The abundance of key prey species measured by EA in their routine monitoring of the rivers and estuary	No significant reduction in abundance of key prey species against an established baseline <i>Baseline is yet to be established through fish surveys in estuary and rivers</i>	<p>River and sea lamprey require a variety of other fish species to act as hosts throughout their lifecycle. Their principal host species are part of the estuarine fish assemblage which has measures and targets included within Table 8.</p> <p>Twaite shad require a variety of invertebrates including crustacean, mysids and copepods, small fish and fish eggs particularly in that section of the estuary where saline and freshwaters meet.</p> <p>While at sea, salmon feed on a variety of fish (e.g. herring, sprat, sand eel, mackerel, and various gadoids) and crustaceans (e.g. euphausiid shrimps, prawns, gammarid amphipods and various crabs). (Bird, 2008)</p> <p>The diet of sea trout at sea is believed to include a range of fish species including sprat, young herring and sand eels as well as crustaceans such as amphipods (e.g. Corophium), gammarids, decapods such as Crangon and mysid shrimps.</p> <p>Eels feed on a range of benthic organisms that include crustaceans and small fish. (Bird, 2008)</p>

Table 20 Favourable Condition Table for the supporting habitats of the bird interest features (Ramsar interest features 3 to 9) in the Severn Estuary Ramsar Site (Numbers of bird species using these habitats are given in Table 6)

Ramsar interest features	Supporting Habitat	Attribute	Measure	Target	Comments
Ramsar Interest features 3-8 : Internationally important populations of waterfowl and Ramsar Interest feature 9 : Internationally important assemblage of waterfowl	Saltmarsh	Habitat extent	Area (ha) measured once per reporting cycle.	No decrease in extent from 1,400 ha. At The Dumbles, no decrease in extent from 76 ha.	Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas.
		Food availability	Presence and abundance of suitable saltmarsh food plants measured periodically (frequency to be determined).	Presence and abundance of suitable saltmarsh food plants should not deviate significantly from an established baseline ¹ .	European white-fronted geese graze on a range of saltmarsh grasses and herbs. Wigeon feed on well-grazed saltmarsh with <i>Puccinella maritiae</i> , <i>Salicornia</i> and <i>Agrostis</i> . Teal and pintail feed on seeds from <i>Salicornia</i> and <i>Atriplex</i> .
		Vegetation characteristics	Abundance of suitable soft leaved herbs and grasses - % cover (frequency to be determined)	Greater than 25% cover during the winter season.	Bewick's swans graze on soft wet meadow grasses such as <i>Agrostis stolonifera</i> , <i>Glyceria fluitans</i> and <i>Alopecurus geniculatus</i> which are found in the transition of saltmarsh to grassland.
		Vegetation characteristics	Range of vegetation heights measured periodically (frequency to be determined).	Sward height and density throughout areas used for roosting should not deviate significantly from an established baseline ¹ .	Vegetation of <10 cm is required throughout areas used by roosting waders. This is managed by grazing.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines. Areas of vegetation with an effective field size of >6ha at the Dumbles (Bewicks swan)	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.

Table 20 continued

Ramsar interest features	Supporting Habitat	Attribute	Measure	Target	Comments
<p><i>Ramsar Interest features 3-8 : Internationally important populations of waterfowl</i></p> <p>and</p> <p><i>Ramsar Interest feature 9 : Internationally important assemblage of waterfowl</i></p>	Intertidal mudflats and sandflats	Habitat extent	Area (ha), measured once per reporting cycle.	<p>No decrease in extent from 15,000 ha.</p> <p>At Frampton Sands, Waveridge Sands and The Noose no decrease in extent from 980 ha.</p>	<p>Intertidal mudflats and sandflats and their communities are important habitats as they provide both roosting and feeding areas.</p> <p>The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition.</p>
		Food availability	Presence and abundance of suitable prey species measured periodically (frequency to be determined).	Presence and abundance of suitable prey species should not deviate significantly from an established baseline ¹ .	Most of the waders and waterfowl within the assemblage including the internationally important population of waterfowl feed on invertebrates within and on the sediments. Diet includes <i>Arenicola</i> , <i>Crangon</i> , <i>Hydrobia</i> , <i>Hediste</i> , <i>Corophium</i> , <i>Macoma</i> , <i>Gammarus</i> , small molluscs and strandline plankton and seeds.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.
	Shingle and rocky shores	Habitat extent	Area (ha), measured once per reporting cycle.	No decrease in extent from 1,500 ha.	This habitat is used for feeding and roosting, particularly by waders.
		Food availability	Presence and abundance of suitable intertidal invertebrates, measured periodically (frequency to be determined).	Presence and abundance of suitable food species should not deviate significantly from an established baseline ¹ .	Waders feed on worms, crustaceans and molluscs.
		Unimpeded sightlines at feeding and roosting sites	Openness of terrain unrestricted by obstructions	No increase in obstructions to existing bird sightlines.	Waterfowl require unrestricted views >500m to allow early detection of predators when feeding and roosting.

¹ Baselines to be established

Table 21 Favourable Condition Table for the qualifying bird features in the Severn Estuary Ramsar Site

Ramsar interest features	Supporting Habitat	Attribute	Measure	Target	Comments
<p><i>Ramsar Interest features 3-8 :</i> Internationally important populations of waterfowl</p> <p>and</p> <p><i>Ramsar Interest feature 9 :</i> Internationally important assemblage of waterfowl</p>		Population size	5 year peak mean number of individuals	<p>No less than 68,026 individuals in the assemblage [ie the 5 year peak mean between 1988/9 - 1992/3]</p> <p>For individual species - no less than the 5 year peak mean between 1988/9 - 1992/3 detailed in Table 6</p>	<p>Figures derived from WeBS counts.</p> <p>The 5 year peak means for this period for each of the internationally important populations and species with nationally important populations which make up the internationally important assemblage are detailed in Table 6</p>
		Distribution	Number and location of sectors occupied at low tide	No decrease in use of the number of sectors and their distribution established as baseline ¹ .	<p>WeBS low tide counts display distribution information by sector (not annual counts)</p> <p>Birds use certain sectors to a greater or lesser degree from year to year</p>
		Disturbance in feeding and roosting areas.	Reduction or displacement of wintering birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline ¹ .	<p>Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.</p>

¹ Baselines to be established

4.1 Conservation Objective for Feature 1: Greater Horseshoe Bat *Rhinolophus ferrumequinum* (EU Species Code: 1304)

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The site will support a sustainable population of greater horseshoe bats in the Wye Valley area.
- The population will viable in the long term, acknowledging the population fluctuations of the species.
- Buildings, structures and habitats on the site will be in optimal condition to support the populations.
- Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, and mortality from predation or vehicle collision, changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range
- Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat.
- There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines - there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management
- All factors affecting the achievement of the foregoing conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

The performance indicators for maintenance of **favourable condition** of the greater horseshoe bats (*Rhinolophus ferrumequinum*) on the Welsh side of the Wye Valley and Forest of Dean Bat Sites SAC.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Population of Greater Horseshoe Bats	<p>Justification for limits in document 'Draft Performance Indicators for Greater', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>An adult bat is defined as any greater horseshoe bat recorded leaving the roost between 7th – 21st July.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> During at least one surveillance visit between 7th – 21st July of every year, there will be 80 or more adult bats present.</p>

A2. Recruitment to bat population/productivity	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> During at least one surveillance visit between 7th –28th July of every year, the productivity should be 0.3 or more (i.e. number of births is 30% or more of the total number of adult bats).</p>
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Site security	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Access to the site under the control of the owner/occupier or site secured against unauthorised access.</p>
F2. External condition of the building	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Fabric of building sufficient to maintain roost conditions internally with:</p> <ul style="list-style-type: none"> • Weatherproof roof. • No holes allowing excessive heat loss or high light levels in the roost area. • Walls sound, rainwater goods in adequate condition. • Solar heating sufficient to maintain adequate roost temperature, with no significant shading of the roost. • The building is structurally stable.

F3. Roost access	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> The roost access is in a suitable condition to allow emergence by bats with:</p> <ul style="list-style-type: none"> • A greater horseshoe bat entrance a minimum of 400mm x 300mm. • An entrance that is unobstructed and allows the bats to fly through unimpeded. • No artificial lights shining on access or associated flight paths.
F4. Disturbance	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required</p> <p><i>Lower limits:</i> Disturbance levels acceptable to bats with:</p> <ul style="list-style-type: none"> • No increase since previous visit. • Human access to roost controlled and limited.
F5. Internal condition of building	<p>Justification for limits in document 'Draft Performance Indicators for Greater's', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> The internal fabric of the building is sufficient to maintain the roost location with:</p> <ul style="list-style-type: none"> • No significant water penetration. • Low light levels with no through draught. • No toxic substances present which would adversely affect the health of the bats.
F6. Temperature of roost area	Site specific requirements based on site monitoring	To be determined

<p>F7. Flight Lines</p>	<p>Justification for limits in document 'Draft Performance Indicators for Greater', K. Wilkinson, 2005/ 'Monitoring Greater Horseshoe Bats in the Wye Valley through radio tracking and field survey to assess habitat use and condition', G. Billington, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>Broadleaf woodland edge is defined as an area where 90% of the trees are broadleaf.</p> <p>A woodland ride is defined as woodland track >10m wide and greater than 100m in length.</p> <p>Tree lined is defined as a line of trees with <20% gaps over the length and with no individual gaps that are greater than 10m.</p> <p>Type 2A hedgerow is defined as partially managed/unmanaged hedgerow >2m wide and >2m high, not gappy.</p> <p>Type 2B hedgerow is defined as 2A but with gaps.</p> <p>Type 3A hedgerow is defined as hedgerow with trees (overall >30% trees) or tree lined, non gappy.</p> <p>Gappy/gaps is defined as a hedge where there is 20% gaps over the length of the hedge or with single gaps greater than 10m.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Refer to Figure 2 (Collins <i>et al</i>, 2005) for locations of these Areas.</p> <p>70% of Area A (Hayes coppice up to horizontal line) is maintained as woodland AND Within Area A there are a minimum of two woodland rides AND Area B is maintained as a broadleaf woodland edge AND Within 500m of the roost:</p> <ul style="list-style-type: none"> • Mally Brook is maintained as a tree-lined stream. • There are at least 400m of hedgerow that are described as type 2 or better, of which no more than 50% will be type 2B. • Type 2 or better hedgerows will be present (at least 50m) both north and south of Mally Brook. <p>AND District staff should comment on felling licences applications within 2km of the roost.</p> <p>Note: Refer to Collins <i>et al</i>, 2005 for development of these habitat definitions and figures.</p>
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<p>F8. Feeding habitats</p>	<p>Justification for limits in document 'Draft Performance Indicators for Greater', K. Wilkinson, 2005/ 'Monitoring Greater Horseshoe Bats in the Wye Valley through radio tracking and field survey to assess habitat use and condition', G. Billington, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site specific requirements.</p> <p>Type 2A hedgerow is defined as partially managed/unmanaged hedgerow >2m wide and >2m high, not gappy.</p> <p>Type 2B hedgerow is defined as 2A but with gaps.</p> <p>The River Wye has also been shown to be an important flight line/feeding habitat for greater horseshoe bats.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i></p> <ul style="list-style-type: none"> • Within Area G (see Figure 3, Collins <i>et al</i>, 2005) 40% of the length of field boundaries will be type 2 or better. • Within Area I (see Figure 4) 50% of the length of field boundaries will be of type 2 hedge or better. • An ideal level of cattle grazing for the area has yet to be determined. <p><i>Other conditions:</i></p> <ul style="list-style-type: none"> • District staff should comment on any Tir Gofal applications within the 7km survey boundary. Management should look to increase the amount of cattle grazing, conversion of improved pasture to semi-improved and improve the structure of hedgerows (to make them taller and bushier). • The requirements of these bats should be considered when considering riparian management along the stretch of the River Wye that lies within the 7km survey boundary.
<p>F9. Roosts</p>	<p>Justification for limits in document 'Draft Performance Indicators for Greater', K. Wilkinson, 2005 / 'Monitoring Greater Horseshoe Bats in the Wye Valley through radio tracking and field survey to assess habitat use and condition', G. Billington, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i></p> <ul style="list-style-type: none"> • The roost at Osbaston will be maintained according to the criteria outlined in the Common Standards Monitoring for Mammals version: August 2004.

<p>F10. Condition of the habitat within the SSSI boundary</p>	<p>Justification for limits in documents ‘Draft Performance Indicators for Greater’s, K. Wilkinson, 2005 / ‘Monitoring Greater Horseshoe Bats in the Wye Valley through radio tracking and field survey to assess habitat use and condition’ G. Billington, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site specific requirements.</p> <p>Woodland is defined as an area dominated by broadleaf or conifer trees with no clear felled areas >0.1ha</p> <p>Livox Wood and Harper’s Grove Lord’s Grove are within close proximity to Newton Court and it is likely that they are used at certain times of the year (one radio-tagged bat was recorded sheltering in Harper’s Grove during the 2004 study).</p>	<p><i>Upper limit:</i> The roof of the roost will not be shaded by trees.</p> <p><i>Lower limit:</i></p> <ul style="list-style-type: none"> • The wall (refer to Figure 1 in report ‘Draft Performance Indicators for Greater’s K. Wilkinson, 2005) is structurally intact <p>AND</p> <ul style="list-style-type: none"> • 70% of the SSSI is referable to broadleaf woodland <p>AND</p> <ul style="list-style-type: none"> • Livox Wood and Harper’s Grove Lord’s Grove form part of the Wye Valley Woods SAC and therefore CCW has some degree of management control of them. The requirements of these bats should be considered when developing management plans for both these sites.
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The feeding habitat and flight line limits represent more of a long-term aim and in some respects represent the ideal landscape. However here we have attempted, using information from radio-tracking and general knowledge of greater horseshoe bat ecology, to identify key areas that will aid the maintenance of FCS of this colony of greater horseshoe bats. This is not a complete list and it is likely that as more information becomes available other areas of habitat will be identified as being of importance.

4.2 Conservation Objective for Feature 2: Lesser Horseshoe Bat *Rhinolophus hipposideros* (EU Species Code: 1303)

Vision for feature 2

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The site will support a sustainable population of lesser horseshoe bats in the Wye Valley area.
- The population will viable in the long term, acknowledging the population fluctuations of the species.
- Buildings, structures and habitats on the site will be in optimal condition to support the populations.
- Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, and mortality from predation or vehicle collision, changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range.

- Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat.
- There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines – there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management.
- All factors affecting the achievement of the foregoing conditions are under control.

Performance indicators for Feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

The performance indicators for maintenance of **favourable condition** of the lesser horseshoe bats (*Rhinolophus hipposideros*) on the Welsh side of the Wye Valley and Forest of Dean Bat Sites SAC.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Distribution and population of Lesser Horseshoe Bats	<p>Justification for limits in document ‘Draft Performance Indicators for Lessers’, K. Wilkinson, 2005 / ‘Monitoring the Welsh Colonies of Lesser Horseshoe Bats in the Wye Valley’, P. Morgan 2006.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>Mwyngloddfa Mynydd-Bach limits based on Common Standards Monitoring for hibernating populations of lesser or greater horseshoe bats.</p> <p>The performance indicators only relate to adult bats; lesser horseshoe bats are sensitive to disturbance and access to the roost to count juvenile bats is considered too disturbing.</p>	<p><i>Upper limits:</i> None required</p> <p><i>Lower limits:</i> For the Welsh side of this SAC to be favourable each of the individual roosts must meet the criteria outlined below. During at least one surveillance visit between 29th May and 17th June of <u>every year</u>, there will be a minimum of adults:</p> <p>Penallt Old Church</p> <ul style="list-style-type: none"> • 250 LHS bats <p>Itton Court Stud</p> <ul style="list-style-type: none"> • 120 LHS bats <p>The Priory</p> <ul style="list-style-type: none"> • 325 LHS bats <p>Tregeiriog and Llangovan Church</p> <ul style="list-style-type: none"> • A combined minimum of 180 LHS bats, with a minimum of 40 LHS bats at each roost <p><u>And</u> during at least one surveillance visit during January of <u>every year</u>, there will be a minimum of:</p> <p>Mwyngloddfa Mynydd-Bach 60 LHS bats</p>
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>

F1. Condition of structures and buildings	<p>Justification for limits in document ‘Draft Performance Indicators for Lessers’, K. Wilkinson, 2005</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Fabric of each building sufficient to maintain roost conditions internally with:</p> <ul style="list-style-type: none"> • Weatherproof roof. • No holes allowing excessive heat loss or high light levels in the roost area. • Walls sound, rainwater goods in adequate condition. • Solar heating sufficient to maintain adequate roost temperature, with no significant shading of the roost. • The building is structurally stable.
F2. Roost access	<p>Justification for limits in document ‘Draft Performance Indicators for Lessers’, K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>Horseshoe bats prefer to fly through an entrance.</p>	<p>Where:</p> <p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Each roost access is in a suitable condition to allow emergence by bats with:</p> <ul style="list-style-type: none"> • A lesser horseshoe bat entrance a minimum of 300mm x 200mm. • An entrance that is unobstructed and allows the bats to fly through unimpeded. • No artificial lights shining on access or associated flight paths.

F3. Hibernaculum access	<p>Justification for limits in document 'Draft Performance Indicators for Lessers', K. Wilkinson, 2005</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>These limits cover only the Mwyngloddfa Mynydd-Bach SSSI.</p> <p>Horseshoe bats prefer to fly through an entrance.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> The site entrance is in suitable condition to allow continued use by bats with:</p> <ul style="list-style-type: none"> • Existing access unobstructed. • No unplanned new access causing a change to the ventilation. • No change in the size sufficient to affect the airflow and internal temperature. • The access used by the bats is stable. • No recent falls or signs of geological instability. • Vegetation present close to the access but not obstructing it. • No artificial lights shining on access or associated flight paths.
F4. Disturbance	<p>Justification for limits in document 'Draft Performance Indicators for Lessers', K. Wilkinson, 2005</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Disturbance levels acceptable to bats with:</p> <ul style="list-style-type: none"> • No increase since previous visit. • Human access to roost controlled and limited.
F5. Temperature of roost area	Site specific requirements based on site monitoring	To be determined
F6. Internal Condition of building	<p>Justification for limits in document 'Draft Performance Indicators for Lessers', K. Wilkinson, 2005</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> The internal fabric of each building is sufficient to maintain the roost location with:</p> <ul style="list-style-type: none"> • No significant water penetration. • Low light levels with no through draught. • No toxic substances present which would adversely affect the health of the bats.

F7. Site Security	<p>Justification for limits in document 'Draft Performance Indicators for Lessers', K. Wilkinson, 2005.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p>	Access to each site is under the control of the owner/occupier and the site is secured against unauthorised access.
F8. Condition of the habitat within the SAC boundary	<p>Justification for limits in document 'Draft Performance Indicators for Lessers', K. Wilkinson, 2005 / 'Monitoring the Welsh Colonies of Lesser Horseshoe Bats in the Wye Valley', P. Morgan 2006.</p> <p>Based on Common Standards Monitoring for this feature. Modified according to site-specific requirements.</p> <p>Mwyngloddfa Mynydd-Bach limits based on Common Standards Monitoring for hibernating populations of lesser or greater horseshoe bats.</p> <p>The performance indicators only relate to adult bats, Lesser horseshoe bats are sensitive to disturbance and access to the roost to count juvenile bats is considered too disturbing.</p>	<p><i>Upper limits:</i> None required.</p> <p><i>Lower limits:</i> Penallt Old Church The line of trees leading from the church porch to the entrance should be maintained AND Mwyngloddfa Mynydd-Bach The extent of the woodland/scrub is as mapped in 2006.</p>

Other factors considered include –

Owner/occupier objectives - the owners/occupiers of the land typically have an interest from the land. This factor will be controlled through management agreements and the SSSI legislation. An operational limit is not required.

Weather conditions - Weather conditions have an effect on the breeding success of the lesser horseshoe bats. In particular, poor weather conditions during the adult breeding season will reduce opportunities for foraging and therefore affect adult condition and reproductive outputs. This factor is outside the influence of the site manager and an operational limit is not required.

5. ASSESSMENT OF CONSERVATION STATUS AND MANAGEMENT REQUIREMENTS

This part of the document provides:

- A summary of the assessment of the conservation status of each feature.
- A summary of the management issues that need to be addressed to maintain or restore each feature.

5.1 Conservation Status and Management Requirements of Feature 1: Greater Horseshoe Bat *Rhinolophus ferrumequinum* (EU Species Code: 1304)

Conservation Status of Feature 1

The greater horseshoe bat numbers of Newton Court Stable Block SSSI are monitored annually in June. The assessment found the SSSI to be in **Favourable condition**. But FCS is **Unfavourable declining**

Newton Court Stable Block SSSI *Current assessments are:*

MU1 Unfavourable declining

Management Requirements of Feature 1

The current status of the feature overall is unfavourable. The following outlines which attributes are considered favourable/unfavourable at each site. The site-specific monitoring report provides more detail on the condition of the site.

Building condition

The external condition of Newton Court is currently in a poor state. While the roof is largely intact and provides a waterproof environment for the roost, holes in the fabric of the roof allow heat loss and too much light into the roost. The current roof is tin causing large fluctuations in diurnal temperature making the roost too hot during the day and too cool at night. However, this appears to have no effect on the bat population. The building is currently structurally stable due to recent remedial work, but this is unlikely to be enough to maintain it in the long term.

Habitat management

The habitat surrounding Newton Court is of paramount importance to maintaining the population. The loss of flight lines in the form of walls, hedges or woodland rides within 1km around the roost should be prevented, as this is where juvenile bats learn to forage and navigate. There should be a similar aim to maintain or improve the quality of woodland and grazed pasture around and between areas identified as being used by the bats. Management of river habitats in the area is also critical due to the diversity of insect life that sustains the bats.

The overall aim for the landscape surrounding Newton Court is to improve the feeding opportunities for the greater horseshoe bats and the flight links between these feeding areas and the roosts (nursery, hibernation and transitory). Increases in the amount of land that is cattle grazed, development of 'less managed' bushier hedgerows and conversion of improved grassland to semi-improved grassland, particularly close to the notified nursery roost, would improve the extent and quality of available greater horseshoe bat feeding habitat.

5.2 Conservation Status and Management Requirements of Feature 2: Lesser Horseshoe Bat *Rhinolophus hipposideros* (EU Species Code: 1303)

Conservation Status of Feature 2

The lesser horseshoe bat numbers for all component SSSIs are annually monitored. The assessment of all 3 component SSSIs showed lesser horseshoe bats to be favourable in two of the three areas. As all of the three SSSI units have to be in good condition for the LHB overall to be favourable the feature is in **unfavourable condition**, and in this case we can give condition information at the unit level.

Llangovan Church SSSI *Current assessments are:*

MU1 Favourable maintained

Mwyngloddfa Mynydd Bach SSSI *Current assessments are:*

MU1 Favourable maintained

Wye Valley Lesser Horseshoe Bats SSSI *Current assessments are:*

MU1 Favourable maintained

MU2 Unfavourable declining

MU3 Unfavourable maintained

MU4 Unfavourable declining

Management Requirements of Feature 2

The current status of the feature overall is unfavourable. The following section outlines which attributes are considered favourable/unfavourable at each site. The site-specific monitoring report provides more detail on the condition of the site.

Structure Condition

At **Mwyngloddfa Mynydd-Bach** structural integrity of the rock forming the adit may require management to prevent further collapse. Rockfall deep within the adit should not affect the viability of the mine as a habitat, but rockfall closer to the entrance may block access and could result in the complete loss of this site as a hibernaculum roost. Given the current unsupported state of the rock, collapse should be considered imminent.

Habitat management

The habitat surrounding these sites is of paramount importance to maintaining the population. The loss of flight lines in the form of walls, hedges or woodland rides within 1km around the roost should be prevented, as this is where juvenile bats learn to forage and navigate. There should be a similar aim to maintain or improve the quality of woodland and grazed pasture around and between areas identified as being used by the bats. Management of river habitats in the area is also critical due to the diversity of insect life that sustains the bats.

The overall aim for the landscape surrounding the management units is to improve the feeding opportunities for the lesser horseshoe bats and the flight links between these feeding areas and the roosts (nursery, hibernation and transitory). Increases in the amount of land that is cattle grazed, development of 'less managed' bushier hedgerows and conversion of improved grassland to semi-improved grassland, particularly close to the notified nursery roost, would improve the extent and quality of available lesser horseshoe bat feeding habitat.

Llangovan Church – no issues except surrounding habitat.

Mwyngloddfa Mynydd Bach – no issues except surrounding habitat.

Wye Valley Lesser Horseshoe Bats SSSI

MU1 – no issues, but important to continue liaison with owner/occupiers and monitor the progress of planned extension.

MU2 – issue with declining numbers needs to be investigated, possibly another unknown roost in the area.

MU3 – no issues, but important to continue liaison with owner/occupiers.

MU4 – issue with declining numbers, requires investigation into possible reasons including building condition.

Surrounding habitat management important for all units.

4.1 Conservation Objective for Feature 1: *Asperulo-Fagetum* beech forest (EU Habitat Code 9130)

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The existing *Asperulo-fagetum* beech forest will be maintained.
- At least 95% of canopy forming trees will be locally native species such as beech, ash and oak, with some areas dominated by beech.
- The tree canopy will not be completely closed; approximately 10% of the canopy will include a dynamic shifting pattern of gaps encouraging natural regeneration of tree species of all ages.
- Dead wood, standing and fallen, will be maintained where possible to provide habitat for invertebrates, fungi and other woodland species.
- There are pockets of ground flora across the site, comprising species typical of lime-rich beech wood, including indicators of ancient woodland such as wood anemone, ramsons and sanicle.
- There is little evidence of browsing or squirrel damage to trees.
- Recreational use of the site will continue to be managed so it does not damage the wildlife interest of the site.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent	<p>For a habitat feature to be considered to be at favourable conservation status, the area of the habitat must be stable in the long-term or increasing.</p> <p>Upper limit – restricted by the limits set in the conservation objective for the <i>Tilio-acerion</i> feature.</p> <p>Lower limit - based on current extent.</p>	<p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> As mapped (Garth Wood and Fforestganol a Chwm Nofydd in 1997 and Castell Coch Woodlands and Road Section in 1990)</p>
A2. Quality	<p>For a habitat feature to be considered to be at favourable conservation status, its quality (including in terms of ecological structure and function) must be maintained.</p> <p><u>Good condition <i>Asperulo-fagetum</i> woodland of Garth Wood definition:</u> Within a 25m radius of a sample point* all of the following criteria must be met:</p>	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> The following are met:</p> <p>In Unit 1 of Garth Wood, 70% of the woodland habitat is referable to 'good condition <i>Asperulo-fagetum</i> woodland of Garth Wood' and there are at least 4 patches of advanced beech regeneration.</p>

	<ul style="list-style-type: none"> ○ At least 95% of the canopy forming trees are native to the site with at least 50% of the canopy forming trees being <i>Fagus sylvatica</i> <p>AND</p> <ul style="list-style-type: none"> ○ There are at least 5 mature trees present <p>AND</p> <ul style="list-style-type: none"> ○ There are at least 5 sapling present <p>AND</p> <ul style="list-style-type: none"> ○ There are at least 3 relevant ground flora species present and there is no evidence of grazing <p>AND</p> <ul style="list-style-type: none"> ○ Dead wood is present in at least 2 forms <p><u>Good condition <i>Asperulo-fagetum</i> woodland of Castell Coch definition:</u> As above except the definition requires the criteria to be met in a 12.5m radius of a sample point* (NOT 25m radius) and only requires 3 mature trees to be present</p> <p><u><i>Asperulo-fagetum</i> forest definition:</u> The canopy is generally dominated by <i>Fagus sylvestris</i> however in some areas <i>Fraxinus excelsior</i> shares dominance. The shrub layer is sparse with scattered <i>Corylus avellana</i> and <i>Fagus</i> saplings and occasional <i>Ilex aquifolium</i>. The field layer is also characterised by its sparseness, largely due to the presence of deep leaf litter, low light levels and thin soils. Patches of bare ground are frequent. However in some areas <i>Rubus fruticosus</i> or <i>Hedera helix</i> can form dense patches. Other associated ground flora species include <i>Mercurialis perennis</i>, <i>Hyacinthoides non-scripta</i> and <i>Luzula sylvatica</i> and <i>Dryopteris filis-mas</i></p>	<p>In Units 3 and 4 of Castell Coch Woodlands, 60% of the woodland habitat is referable to ‘good condition <i>Asperulo-fagetum</i> woodland of Castell Coch’ and there are at least 4 patches of advanced beech regeneration.</p> <p>In Unit 1 of Fforestganol a Chwm Nofydd, <i>Fagus sylvatica</i> is present within a 25m radius of a sample point*.</p> <p>In Units 2 and 3 of Fforestganol a Chwm Nofydd, habitat present within a 25m radius of a sample point* meets the definition of ‘<i>Asperulo-fagetum</i> forest’.</p>
A3. Canopy cover	Woodland structure to include a shifting dynamic of canopy gaps to encourage natural regeneration	<p><i>Upper limit:</i> No more than 85% canopy cover</p> <p><i>Lower limit:</i> As existing</p>
A4. Viable saplings	Native species sapling of > 1.5m	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> 5 no. of successive cohorts in 25m x 25m sample plot* of understorey</p>
A5. Advanced regeneration	Areas of regeneration >10m x 10m with 50+ beech saplings/seedlings. Each area	<i>Upper limit:</i> Not required

	of advance regeneration needs to be separated by a minimum of 10m	<i>Lower limit:</i> 4 areas of regeneration in each of Garth Wood, Castell Coch Woodlands and Fforestganol a Chwm Nofydd noted every 6 years
A6. Species composition	Any species native to the area, including <i>Acer pseudoplatanus</i>	<i>Upper limit:</i> At least 95% of the canopy forming trees are native to the site with at least 50% of the canopy forming trees being <i>Fagus sylvatica</i> <i>Lower limit:</i> As existing
A7. Age structure	All age classes represented including mature and veteran trees. Mature tree: canopy forming tree with a girth of >150cm at chest height	<i>Upper limit:</i> None set <i>Lower limit:</i> At least 5 mature trees present within a 25m radius of a sample point*
A8. Ground flora species	Three of the following: <i>Mercurialis perennis</i> , <i>Hyacinthoides non-scripta</i> , <i>Hedera helix</i> , <i>Allium ursinum</i> , <i>Anemone nemorosa</i> , <i>Circaea lutetiana</i> , <i>Arum maculatum</i> , <i>Sanicula europaea</i> , <i>Geum urbanum</i> or <i>Melica uniflora</i>	<i>Upper limit:</i> Not required <i>Lower limit:</i> At least 3 ground flora species present within a 25m radius of a sample point* and no evidence of browsing
A9. Dead wood	Fallen trees, fallen branches, dead branches on living trees or standing dead trees (all > 20cm in diameter) All dead wood (standing or fallen) left in situ	<i>Upper limit:</i> None set <i>Lower limit:</i> Dead wood present in at least 2 forms within a 25m radius of a sample point*
A10. Evidence of browsing	Signs of browsing particularly on saplings (where tops have been taken off) or ferns (where fronds/pinnae have been removed)	No limits set
A11. Evidence of bark stripping by squirrels	Signs of bark stripping by squirrels	No limits set
* Sampling points as defined in Wilkinson, K. (17 March 2004) Cardiff Beech Woods cSAC, Annex 1 Habitat (9130) <i>Asperulo-Fagetum</i> beech forests SAC Monitoring Report (draft)		
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Recreational Use	The woodlands, especially Castell Coch and Fforestganol a Chwm Nofydd, experience heavy recreational pressure and certain areas are managed for this purpose. Health and safety considerations (discussed below) are relevant here.	No limits set. Pending a fuller understanding of current situation and impact on habitat. Access issues need to be kept under review.
F2. Health & safety	In addition to general health and safety issues arising from woodland	No limits set.

	management for conservation purposes, site-specific safety issues need to be addressed by management. Such issues may arise from the presence of old quarry workings, and ‘unsafe’ trees in vicinity of public footpaths, access routes and car parks etc.	
F3. Atmospheric pollution	The location of the woodland in industrialised South Wales, together with the presence of nearby quarrying and associated activities, means that there is the potential for localised atmospheric pollution.	No limits set. There is no evidence to date that this has had an adverse impact on the features but this may need to be addressed in more detail in the future.
F4. Development	Its location in the populated South Wales area means that there is considerable development pressure in the vicinity including associated infrastructure on land adjacent to the site. There is the potential for a range of impacts arising from increasing urbanisation.	No limits set. May need to be considered in the future.
F5. Commercial forestry	Commercial forestry in the vicinity of Castell Coch may have implications for surface water supply and quality, and this needs to be kept under review.	No limits set. Pending a fuller understanding of current situation and impact on habitat.
F6. Mineral extraction	There are a number of active and disused limestone quarries in the area. Garth Wood surrounds Taff’s Well Quarry but there are other, smaller quarries in and around all component SSSIs. Quarrying can lead to direct loss of the feature together with indirect impacts from issues such as access. There are also a number of impacts arising from restoration at the end of a quarry’s working life. (For aerial impacts see atmospheric pollution above.)	No limits set. Pending a fuller understanding of current situation and impact on habitat. Quarry restoration may need to be considered in the future.
F7. Cultural heritage	There is considerable cultural heritage interest in the area, including Castell Coch and industrial workings. The associated health and safety issues are addressed above. The management of these sites needs to be balanced with the requirements of the conservation objectives.	No limits set.

4.2 Conservation Objective for Feature 2:

Tilio-Acerion forest of slopes, screes and ravines (EU Habitat Code 9180)

Vision for feature 2

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The existing *Tilio-acerion* forest will be maintained.
- At least 95% of canopy forming trees will be locally native species (sycamore included).
- The tree canopy will not be completely closed; approximately 10% of the canopy will include a dynamic shifting pattern of gaps encouraging natural regeneration of tree species of all ages.
- Dead wood, standing and fallen, will be maintained where possible to provide habitat for invertebrates, fungi and other woodland species.
- There are pockets of ground flora across the site, comprising species typical of lime-rich beech wood, including indicators of ancient woodland such as wood anemone, ramsons and sanicle.
- There is little evidence of browsing or squirrel damage to trees.
- Recreational use of the site will continue to be managed so it does not damage the wildlife interest of the site.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent	<p>For a habitat feature to be considered to be at favourable conservation status, the area of the habitat must be stable in the long-term or increasing.</p> <p>Upper Limit – restricted by the limits set in the conservation objective for the <i>Asperulo-fagetum</i> feature.</p> <p>Lower limit - based on current extent.</p> <p><u><i>Tilio-acerion</i> forest definition:</u> Woodland on steep, rocky limestone slopes or sloping, ‘undulating’ ground. <i>Fraxinus excelsior</i> is at least present in the canopy and is generally associated with a wide variety of other canopy forming species e.g. <i>Fagus sylvatica</i> and <i>Acer pseudoplatanus</i>. <i>Phyllitis scolopendrium</i> is at least present in the ground flora within a 10m radius of a sample point*. In addition <i>Dryopteris</i> species are often present.</p>	<p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> <i>Tilio-acerion</i> is present in at least four locations in Unit 1 of Garth Wood, two locations in Unit 1 of Fforestganol a Chym Nofydd, and as mapped in Units 3 and 4 of Fforestganol a Chym Nofydd (see Map 1 below)</p>

A2. Quality	<p>For a habitat feature to be considered to be at favourable conservation status, its quality (including in terms of ecological structure and function) must be maintained.</p> <p><u>‘Good condition’ semi-natural broadleaf woodland definition:</u> Woodland where within a 25m radius of a sample point* all of the following are met:</p> <ul style="list-style-type: none"> ○ At least 95% of the canopy forming trees are native to the site AND ○ At least 5 mature trees are present AND ○ There are 5 viable saplings present AND ○ There are at least 3 relevant ground flora species present and there is no evidence of browsing AND ○ Dead wood is present in at least two forms AND ○ There are no tracks present other than those highlighted on Map 2 below 	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> The following are met:</p> <p>In Units 3 and 4 of Fforestganol a Chym Nofydd (Area Z of Map 1 below) the <i>Tilio-acerion</i> is referable to ‘good condition’ semi-natural broadleaf woodland.</p>
A3. Canopy Cover	Woodland structure to include a shifting dynamic of canopy gaps to encourage natural regeneration	<p><i>Upper limit:</i> No more than 85% canopy cover</p> <p><i>Lower limit:</i> As existing</p>
A4. Viable saplings	Native species sapling of > 1.5m	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> 5 no. of successive cohorts in 25m x 25m sample plot* of understorey</p>
A5. Species composition	Any species native to the area, including <i>Acer pseudoplatanus</i>	<p><i>Upper limit:</i> At least 95% of the canopy forming trees are native to the site</p> <p><i>Lower limit:</i> As existing</p>
A6. Age structure	<p>All age classes represented including mature and veteran trees.</p> <p>Mature tree: canopy forming tree with a girth of >150cm at chest height</p>	<p><i>Upper limit:</i> None set</p> <p><i>Lower limit:</i> At least 5 mature trees present within a 25m radius of a sample point*</p>
A7. Ground flora species	Three of the following: <i>Mercurialis perennis</i> , <i>Hyacinthoides non-scripta</i> , <i>Hedera helix</i> , <i>Allium ursinum</i> , <i>Anemone nemorosa</i> , <i>Circaea lutetiana</i> , <i>Arum maculatum</i> , <i>Sanicula europaea</i> , <i>Geum</i>	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> At least 3 ground flora species present within a 25 m radius of a sample point* and no evidence</p>

	<i>urbanum</i> or <i>Melica uniflora</i>	of browsing
A8. Dead wood	Fallen trees, fallen branches, dead branches on living trees or standing dead trees (all > 20cm in diameter) All dead wood (standing or fallen) left in situ	<i>Upper limit:</i> None set <i>Lower limit:</i> Dead wood present in at least 2 forms within a 25m radius of a sample point*
A9. Evidence of browsing	Signs of browsing particularly on saplings (where tops have been taken off) or ferns (where fronds/pinnae have been removed)	No limits set
A10. Evidence of bark stripping by squirrels	Signs of bark stripping by squirrels	No limits set
* Sampling points as defined in Wilkinson, K. (17 February 2004) Cardiff Beech Woods cSAC, Annex 1 Habitat (9180) <i>Tilio-Acerion</i> forests of slopes, screes and ravines, SAC Monitoring Report (draft)		
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Recreational Use	The woodlands, especially Castell Coch and Fforestganol a Chwm Nofydd, experience heavy recreational pressure and certain areas are managed for this purpose. Health and safety considerations (discussed below) are relevant here.	No limits set. Pending a fuller understanding of current situation and impact on habitat. Access issues need to be kept under review.
F2. Health & safety	In addition to general health and safety issues arising from woodland management for conservation purposes, site-specific safety issues need to be addressed by management. Such issues may arise from the presence of old quarry workings, and 'unsafe' trees in vicinity of public footpaths, access routes and car parks etc.	No limits set.
F3. Atmospheric pollution	The location of the woodland in industrialised South Wales, together with the presence of nearby quarrying and associated activities, means that there is the potential for localised atmospheric pollution.	No limits set. There is no evidence to date that this has had an adverse impact on the features but this may need to be addressed in more detail in the future.
F4. Development	Its location in the populated South Wales area means that there is considerable development pressure in the vicinity including associated infrastructure on land adjacent to the site. There is the potential for a range of impacts arising from increasing urbanisation.	No limits set. May need to be considered in the future.
F5. Commercial forestry	Commercial forestry in the vicinity of Castell Coch may have implications for	No limits set. Pending a fuller understanding of current situation

	surface water supply and quality, and this needs to be kept under review.	and impact on habitat.
F6. Mineral extraction	There are a number of active and disused limestone quarries in the area. Garth Wood surrounds Taff's Well Quarry but there are other, smaller quarries in and around all the component SSSIs. Quarrying can lead to direct loss of the feature together with indirect impacts from issues such as access. There are also a number of impacts arising from restoration at the end of a quarry's working life. (For aerial impacts see atmospheric pollution above.)	No limits set. Pending a fuller understanding of current situation and impact on habitat. Quarry restoration may need to be considered in the future.
F7. Cultural heritage	There is considerable cultural heritage interest in the area, including Castell Coch and industrial workings. The associated health and safety issues are addressed above. The management of these sites needs to be balanced with the requirements of the conservation objectives.	No limits set.

4.1 Conservation Objective for Feature 1: *Tilio–Acerion* forests of slopes, screes and ravines (EU Habitat Code: 9180)

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- *Tilio–Acerion* woodland is found in all eight of the Welsh SSSIs that contribute to the Wye Valley Woodlands SAC.
- The woodland area covers the entire site.
- The woodland is maintained as far as possible by natural processes.
- The location of open glades varies over time.
- Trees and shrubs are mainly locally native broadleaved species.
- The abundance and density of individual native species varies across the site.
- Trees and shrubs of a wide range of ages and sizes are present.
- Tree seedlings are plentiful throughout the site.
- Tree seedlings develop into saplings in the open glades.
- There are abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches.
- Some dead and dying trees will be partially or completely hollow.
- Fallen dead wood is dense enough to obstruct progress by foot across the entire site, except on established maintained paths.
- Dead wood dependent species of moss, liverwort, fungi and specialised invertebrates are present, in spatially and temporally variable abundance, throughout the site.
- Field and ground layers are well developed with a patchwork of vegetation communities characteristic of local soil and humidity conditions.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of <i>Tilio–Acerion</i> woodland	<p>Monitoring is likely to be a map-based exercise. The area of <i>Tilio–Acerion</i> woodland will be mapped as a baseline extent and the total area measured. Repeat monitoring will either re-map the site or review the baseline map in the field.</p> <p><i>Tilio–Acerion</i> woodland is defined as Woodland occurring on steep, rocky or sloping ground with rocky outcrops. In which <i>Fraxinus excelsior</i> and/or <i>Tilia cordata</i> are dominant/co-dominant in the canopy. Other species that may occur in the canopy include <i>Ulmus glabra</i>, <i>Quercus</i> spp., <i>Fagus sylvatica</i>, <i>Salix</i> spp.,</p>	<p><i>Lower Limit:</i> No loss of extent of feature (mapped as NVC community W8d-g). Refer to Ecotech survey 1996 <u>and</u> The extent of the feature under high forest management, coppice with standards and minimum intervention is as outlined on Map X.</p> <p>Loss = 0.5 ha or 0.5% of the stand area, whichever is the smaller (i.e. loss of extent through felling).</p>

	<i>Prunus avium</i> and in some instances <i>Acer pseudoplatanus</i> . <i>Corylus avellana</i> is constant in the shrub layer along with occasional <i>Acer campestre</i> and <i>Taxus baccata</i> . <i>Phyllitis scolopendrium</i> is at least present in the field layer within 10m of any point.	
A2. Condition of the <i>Tilio-Acerion</i> woodland	Based on the Standard CSM attribute for this feature. Modified according to site-specific requirements.	<p><i>Tilio-Acerion</i> woodland continues to be present within all eight of the woodlands that contribute to the Welsh side of this SAC</p> <p>Blackcliff Wyndcliff –29,30,31 Cleddon Shoots Woodland -32 Fiddler’s Elbow –35,36 Graig Wood – 37,38 Harper’s Grove-Lord’s Grove 39,40 Livox Wood -43 Lower Hael -44 Pierce, Alcove and Piercefield –45,46</p> <p><i>Upper limit:</i> Not required <i>Lower limit:</i> 100% of the <i>Tilio-Acerion</i> woodland meets the following conditions within a given 25 m radius sample point</p> <ul style="list-style-type: none"> • ≥ 20 ash (<i>Fraxinus excelsior</i>) saplings • ≥ 5 native canopy forming trees with girth >1.5 m • $\leq 5\%$ of the canopy forming trees are non-native species • ≥ 2 dead trees, standing or fallen, of >20 cm diameter. • $<20\%$ of the canopy forming trees are sycamore (<i>Acer pseudoplatanus</i>)
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Livestock grazing		<p><i>Upper limit:</i> Light browsing <i>Lower limit:</i> Not applicable Deer browsing definitions: Heavy: Absence of shrub layer, topiary effect on shrubs and young trees, browse line on mature trees, ground vegetation <10cm mostly grasses and mosses. Abundant dung, paths. Moderate: Patchy understorey with some evidence of browse line. Ground vegetation >30cm with mixture of</p>

		<p>species, locally some close cropped area. Tree saplings projecting above ground vegetation but may show some evidence of browsing</p> <p>Light: Well-developed understorey with no obvious browse line, lush ground vegetation with sensitive species such as bramble, honeysuckle and ivy. Tree seedlings and saplings common.</p>
F2. Adjacent land use	One of the component SSSIs lies close to opencast quarry. This may have indirect effects on the extent and quality of the woodland	No limits set. May need to be considered in the future.

4.2 Conservation Objective for Feature 2: *Asperulo–Fagetum* beech forests (EU Habitat Code:9130)

Vision for feature 2

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- *Asperulo–Fagetum* woodland continues to be present in Fiddler’s Elbow, Harper’s Grove-Lord’s Grove, Lower Hael, Cleddon Shoots and Blackcliff Wyndcliff, woods that contribute to the Wye Valley Woodlands SAC.
- The woodland area covers the entire site.
- The woodland is maintained as far as possible by natural processes.
- One quarter of the woodland canopy is open at any time.
- The location of open glades varies over time.
- Trees and shrubs are mainly locally native broadleaved species.
- The abundance and density of individual native species varies across the site.
- Trees and shrubs of a wide range of ages and sizes are present.
- Tree seedlings are plentiful throughout the site.
- Tree seedlings develop into saplings in the open glades.
- There are abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches.
- Some dead and dying trees will be partially or completely hollow.
- Fallen dead wood is dense enough to obstruct progress by foot across the entire site, except on established maintained paths.
- Field and ground layers are a patchwork of vegetation communities characteristic of local soil and humidity conditions.
- The woodland supports populations of birds (including pied flycatchers, redstarts, wood warblers) and mammals (including several bat species, otters and badgers).
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of <i>Asperulo–Fagetum</i> beech forests	<p>Monitoring is likely to be a map-based exercise. The area of <i>Asperulo–Fagetum</i> beech forests will be mapped as a baseline extent and the total area measured. Repeat monitoring will either re-map the site or review the baseline map in the field.</p> <p><i>Asperulo–Fagetum</i> woodland is defined as having a canopy generally dominated (>50%) by <i>Fagus sylvestris</i>, however in some areas <i>Tilia cordata</i>, <i>Ulmus</i> spp., <i>Quercus</i> spp. or <i>Fraxinus excelsior</i> share dominance. The shrub layer is sparse with</p>	<p><i>Lower Limit:</i> No loss of extent of feature (mapped as NVC community W12). Refer to Ecotech survey 1996. <u>and</u></p> <p>The extent of the feature under high forest management, coppice with standards management and minimum intervention management is as outlined on Map X.</p> <p>Loss = 0.5 ha or 0.5% of the stand area, whichever is the smaller</p>

	scattered <i>Corylus avellana</i> and <i>Fagus</i> saplings and occasional <i>Ilex aquifolium</i> . The field layer is also characterised by its sparse-ness, largely due to the presence of deep leaf litter, low light levels and thin soils. Patches of bare ground are frequent. However in some areas <i>Rubus fruticosus</i> or <i>Hedera helix</i> can form dense patches. Other associated ground flora species include <i>Mercurialis perennis</i> , <i>Hyacinthoides non-scripta</i> and <i>Luzula sylvatica</i> and <i>Dryopteris filis-mas</i>	
A2. Condition of the <i>Asperulo–Fagetum</i> beech forests	Based on the Standard CSM attribute for this feature. Modified according to site - specific requirements.	<p><i>Asperulo–Fagetum</i> woodland continues to be present within the following woodlands, in the units specified:</p> <p>Blackcliff-Wyndcliff – 29,30,31 Cleddon Shoots – 32,33,34 Fiddler’s Elbow SSSI (both Garth Wood and Lady Grove) –35,36 Harper’s Grove-Lord’s Grove – 39,40 Lower Hael -44</p> <p><i>Upper limit:</i> Not required <i>Lower limit:</i> 100% of the <i>Asperulo–Fagetum</i> woodland is in good condition, characterised by: Within a 25 m radius sample point</p> <ul style="list-style-type: none"> • ≤50% of the canopy forming trees are beech • ≥ 3 beech (<i>Fagus sylvatica</i>) saplings • ≥ 5 native canopy forming trees with girth >1.5 m • ≥ 2 dead trees, standing or fallen, of >20 cm diameter. • No more than 5% or less? of the canopy forming trees are non-native species • <20% of the canopy forming trees are sycamore (<i>Acer pseudoplatanus</i>) • <5% of the shrub layer is non-native
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Livestock grazing	Refer to Feature 1	Refer to Feature 1
F2. Adjacent land use	Refer to Feature 1	Refer to Feature 1

4.3 Conservation Objective for Feature 3: *Taxus Baccata* woods of the British Isles (EU Habitat Code:91JO)

Vision for feature 3

- *Taxus Baccata* woodland continues to be present in Blackcliff Wyndcliff Woods that contribute to the Wye Valley Woodlands SAC.
- The woodland area covers the entire site.
- The woodland is maintained as far as possible by natural processes.
- The location of open glades varies over time.
- Trees and shrubs are mainly locally native broadleaved species.
- The abundance and density of individual native species varies across the site.
- Trees and shrubs of a wide range of ages and sizes are present.
- Tree seedlings are plentiful throughout the site.
- Tree seedlings develop into saplings in the open glades.
- There are abundant dead and dying trees with holes and hollows, rot columns, torn off limbs and rotten branches.
- Some dead and dying trees will be partially or completely hollow.
- Fallen dead wood is dense enough to obstruct progress by foot across the entire site, except on established maintained paths.
- Dead wood dependent species of moss, liverwort, fungi and specialised invertebrates are present, in spatially and temporally variable abundance, throughout the site.
- Field and ground layers are a patchwork of vegetation communities characteristic of local soil and humidity conditions.
- The woodland supports populations of birds (including pied flycatchers, redstarts, wood warblers) and mammals (including several bat species, otters and badgers).
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 3

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition		
Attribute	Attribute rationale and other comments	Specified limits
A1. Extent of <i>Taxus baccata</i> woodland	Monitoring is likely to be a map-based exercise. The area of <i>Taxus baccata</i> woodland will be mapped as a baseline extent and the total area measured. Repeat monitoring will either re-map the site or review the baseline map in the field. <i>Taxus baccata</i> woodland is defined as where <i>Taxus baccata</i> (yew) achieves dominance or co-dominance in the canopy	Blackcliff Wyndcliff <i>Upper limit:</i> As limited by other habitat types <i>Lower limit:</i> As mapped in 1996 by Ecotech
A2. Condition of the <i>Taxus baccata</i> woodland	Based on the Standard CSM attribute for this feature. Modified according to site-specific requirements.	Where <i>Taxus baccata</i> woodland is the Key Habitat in the Management Units, Blackcliff –Wyndcliff - 30 <i>Upper limit:</i> Not required

		<p><i>Lower limit:</i></p> <p>The woodland canopy in managed sections of the wood is comprised of:</p> <p>>40% of trees are <i>Taxus baccata</i></p> <p>Tree - Any woody plant >2m tall</p>
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Livestock grazing	Refer to Feature 1	Refer to Feature 1

4.4 Conservation Objective for Feature 4: Lesser horseshoe bat *Rhinolophus hipposideros* (EU Species Code: 1303)

Vision for feature 4

- The woodlands continue to support populations of lesser horseshoe bat.
- Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, mortality from predation or vehicle collision, and changes in habitat management that would reduce the available food source are not at levels, which could cause any decline in population size.
- Management of the woodland SAC is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat, for example due to over-intensive woodland management.
- There will be no loss or decline in quality of linear features (such as hedgerows and tree lines), which the bats use as flight lines.
- Disturbance to roost sites both within the site and in the surrounding area, especially from human physical presence, noise and lighting, is minimized.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 4

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Population of Lesser Horse shoe bat	<p>Lesser horseshoe bat is a qualifying feature but is not a primary reason for the selection of this SAC site.</p> <p>A number of lesser horseshoe bat maternity and hibernation roosts are located within the English side of the Wye Valley Woods SAC. Natural England will consider the condition of these and provide the assessment of this feature. However lesser horseshoe bats do use caves within the Welsh side of this SAC as hibernation roosts. Also, a number of large maternity roosts are located close to this SAC and the woodland are highly likely to be important feeding areas for this species of bat. A number of these roosts are included in the Wye Valley and Forest of Dean Bat Sites SAC.</p> <p>The lesser horseshoe bat is a feature of this SAC. However, the roosts lie on the English side of the SAC. Assessment of</p>	

	this feature shall be based on data collected by Natural England.	
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Condition of the <i>Tilio–Acerion</i> , <i>Asperulo–Fagetum</i> , <i>Taxus Baccata</i> and non SAC semi natural broadleaved woodland	The conditions stipulated in the conservation objective/performance indicators for Feature 1,2, 3, 5 will ensure that the necessary requirements for flightlines and foraging for lesser horse shoe bat are met	Refer to Feature 1,2,3,5 - Attributes 1 & 2.

4.5 Conservation Objective for Feature 5: Non SAC semi natural broadleaved woodland (EU habitat Code: 9160)

Vision for feature 5

As Feature 1,2 and 3

Performance indicators for Feature 5

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of non-SAC semi natural broadleaved woodland	Monitoring is likely to be a map-based exercise. The areas of non- SAC semi natural broadleaved woodland will be reviewed in the field against The Ecotech survey 1996 Definition of non-SAC semi natural broadleaved woodland: semi-natural woodland types not selected as SAC habitat features at this site including Sun-Atlantic and medio European oak and/or old sessile oak woods, alder woodland, conifer plantations and non-wooded areas.	No loss of extent in any of the eight woodlands
A2. Condition of the <i>non-SAC</i> semi natural broadleaved woodland	Based on the Standard CSM attribute for this feature. Modified according to site-specific requirements. See individual SSSI management plans for full details on site specific performance indicators.	It has been possible to deduce the SSSI feature condition from the SAC monitoring except in Fiddler's Elbow and Harper's Grove – Lord's Grove where additional monitoring work to assess the condition of the SSSI feature was undertaken
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
As feature 1		

Aberbargoed Grasslands SAC

4.1 Conservation Objective for Feature 1: Marsh fritillary Butterfly *Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia* (EU Species Code: 1065)

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The site will support a sustainable metapopulation of the marsh fritillary in the Aberbargoed area. This will require at least 50ha of suitable habitat, although not all of this will be within the SAC
- The population will be viable in the long term, acknowledging the extreme population fluctuations of the species.
- Habitats on the site will be in optimal condition to support the metapopulation.
- At least 25ha of the total site area will be marshy grassland suitable for supporting marsh fritillary, with *Succisa pratensis* present and only a low cover of scrub.
- At least 6.25ha will be good marsh fritillary breeding habitat, dominated by purple moor-grass *Molinia caerulea*, with *S. pratensis* present throughout and a vegetation height of 10-20cm over the winter period.
- All factors affecting the achievement of the foregoing conditions are under control.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Density of larval webs Marsh fritillary butterfly <i>Euphydryas</i> (<i>Eurodryas</i> , <i>Hypodryas</i>) <i>aurinia</i>	We have limited web count surveillance information therefore we are unable to set site-specific targets therefore the targets set are based on those outlined in the generic guidance (Fowles, 2004)	<i>Upper limit:</i> Not required <i>Lower limit:</i> In one year in six the number of larval webs is estimated to be: 200 per hectare of good condition habitat.
A2. Extent of Marsh fritillary butterfly (<i>Eurodryas</i> , <i>Hypodryas</i>) <i>aurinia</i> Habitat	<p>There is limited habitat available in the landscape surrounding Aberbargoed Grasslands, therefore it is vital that management of the SAC needs to ensure that as much habitat as possible within the SAC is available to Marsh Fritillaries, to ensure their long term survival.</p> <p>Approximately 50ha of habitat is required to maintain the population in the long term, with at least 10ha in good condition. Not all is expected to be within the SAC. The specified limits reflect the minimum contribution of the Aberbargoed Grasslands SAC towards the favourable conservation status of the species in the Caerphilly area.</p> <p>Good condition habitat is defined as:</p> <p>Grassland, with <i>Molinia</i> abundant</p>	<i>Upper limit:</i> Not required <i>Lower limit:</i> 25ha of available habitat including 6.25ha of good condition habitat.

	<p>where, for at least 80% of sampling points, the vegetation height is within the range of 10 to 20 cm and <i>Succisa pratensis</i> is present within a 1 m radius. Scrub (>0.5 metres tall) covers no more than 10% of area.</p> <p>Suitable condition habitat is defined as:</p> <p>Stands of grassland where <i>Succisa pratensis</i> is present at lower frequencies but still widely distributed (>5% of sampling points) throughout the habitat patch and in which scrub (>0.5 metre tall) covers no more than 25% of area. Alternatively, <i>Succisa</i> may be present at high density in close-cropped swards. [note: Available habitat is the total of Good Condition and Suitable habitat]</p> <p>An assessment of Rhos Pasture habitat in Caerphilly CBC, in respect of its suitability and condition for the priority butterfly species, marsh fritillary <i>Euphydryas aurinia</i> was carried out in February 2005 by Richard Smith. This highlights areas around Aberbargoed Grassland that could support metapopulations of marsh fritillary.</p>	
A3. Condition of Marsh fritillary butterfly (<i>Eurodryas</i> , <i>Hypodryas</i>) <i>aurinia</i> Habitat	Refer to feature 2.	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> See feature 2.</p>
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Livestock grazing	The <i>eu-Molinion</i> marshy grassland needs to be maintained through traditional farming practices. Without an appropriate grazing regime, the grassland will continue to become rank and eventually turn to scrub and woodland. Light grazing by cattle and ponies between April and November each year is essential in maintaining the marshy grassland communities.	<p><i>Upper limit:</i> to be agreed</p> <p><i>Lower limit:</i> See feature 2</p>
F2. Anti-social behaviours	In previous years anti-social behaviour such as off-roading and burning have occurred at Aberbargoed grasslands.	<p>See feature 2</p> <p><i>Upper limit:</i> None</p>

	This issues need to be addressed to prevent the <i>eu-Molinion habitat</i> from being damaged.	<i>Lower Limit:</i> None tolerated
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4.2 Conservation Objective for Feature 2: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinia caerulea*) (EU Habitat Code: 6410)

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- *eu-Molinia* marshy grassland will occupy at least 70% of the total site area.
- The remainder of the site will be other semi-natural habitat or areas of permanent pasture.
- The following plants will be common in the *eu-Molinia* marshy grassland: purple moor-grass *Molinia caerulea*; meadow thistle *Cirsium dissectum*; devil's bit scabious *Succisa pratensis*; carnation sedge *Carex panicea*; saw wort *Serratula tinctoria*; and lousewort *Pedicularis sylvestris*.
- Cross-leaved heath *Erica tetralix* and common heather *Calluna vulgaris* will also be common in some areas.
- Rushes and species indicative of agricultural modification, such as perennial rye grass *Lolium perenne* and white clover *Trifolium repens* will be largely absent from the *eu-Molinia* marshy grassland.
- Scrub species such as willow *Salix* and birch *Betula* will also be largely absent from the *eu-Molinia* marshy grassland.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition		
Attribute	Attribute rationale and other comments	Specified limits
A1. Extent of <i>Eu Molinion</i> grassland	Lower limit is based on current extent. The draft mapping guidance developed by Adrian Fowles was used to map the habitat at Aberbargoed and is in itself a condition mapping exercise that has provided information on the quality of the habitat.	<i>Upper limit:</i> As limited by other habitats. <i>Lower limit:</i> Current extent (As shown in SAC monitoring report by Karen Wilkinson 2002)
A2. Condition of <i>Eu Molinion</i> grassland	Habitat quality required within each of the four areas reflects that detailed in the generic guidance. In addition however sampling in good condition habitat at Aberbargoed indicated that <i>Succisa</i> is present at a density of 5% or more. This has therefore been incorporated into the sites based performance indicators.	<i>Upper limit:</i> Not required <i>Lower limit:</i> Within fields H,L,M and W (on phase II map) 50% of the vegetation meets the following criteria: Within a 50cm radius: <i>Molinia</i> is present AND The cover of <i>Succisa</i> is 5% or greater AND The vegetation height is between 10-20cm when measured using a

		Boorman's disc. AND Scrub (including seedlings of any tree species and bramble) is absent.
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Livestock grazing	The <i>eu-Molinion</i> marshy grassland needs to be maintained through traditional farming practices. Without an appropriate grazing regime, the grassland will continue to become rank and eventually turn to scrub and woodland. Light grazing by cattle and ponies between April and November each year is essential in maintaining the marshy grassland communities.	<i>Upper limit:</i> to be agreed <i>Lower limit:</i> as grazing is has only been happening for two years it will need constant review to make sure we get it right. The <i>eu Molinion</i> grasslands have been grazed hard for the first couple of year to get through the litter build up. Now light grazing by cattle is required.
F2. Burning/off-road vehicles	In previous years anti-social behaviour such as off-roading and burning have occurred at Aberbargoed grasslands. This issues need to be addressed to prevent the <i>eu-Molinion habitat</i> from being damaged.	<i>Upper limit:</i> None <i>Lower Limit:</i> No burning No off-road vehicles

4.3 Conservation Objective for Feature 3 & 4:

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Non SAC features-Marshy Grassland, Dry Neutral Grassland	See features 1 & 2	<i>Upper limit:</i> See features 1 &2 <i>Lower limit:</i>
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Livestock grazing	See features 1 &2	<i>Upper limit:</i> See features 1 &2 <i>Lower limit:</i>
F2. Anti-social behaviours	See features 1 &2	<i>Upper limit:</i> See features 1 &2 <i>Lower Limit:</i>

Feature 3 and 4 to be completed

European Site Conservation Objectives for Avon Gorge Woodlands Special Area of Conservation Site code: UK0012734

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes*

* denotes a priority natural habitat or species (supporting explanatory text on following page)

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England's website. This list is far from exhaustive.

European Site Conservation Objectives for North Somerset and Mendip Bats Special Area of Conservation Site code: UK0030052

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H8310. Caves not open to the public

H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes*

S1303. *Rhinolophus hipposideros*; Lesser horseshoe bat

S1304. *Rhinolophus ferrumequinum*; Greater horseshoe bat

* denotes a priority natural habitat or species (supporting explanatory text on following page)

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England's website. This list is far from exhaustive.

4.1 Conservation Objective for Feature 1:**Lesser Horseshoe Bat *Rhinolophus hipposideros* (EU species code:1304)****Vision for Feature 1**

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The site will support a sustainable population of lesser horseshoe bats in the River Usk area.
- The population will viable in the long term, acknowledging the population fluctuations of the species.
- Buildings, structures and habitats on the site will be in optimal condition to support the populations.
- Sufficient foraging habitat is available, in which factors such as disturbance, interruption to flight lines, and mortality from predation or vehicle collision, changes in habitat management that would reduce the available food source are not at levels which could cause any decline in population size or range
- Management of the surrounding habitats is of the appropriate type and sufficiently secure to ensure there is likely to be no reduction in population size or range, nor any decline in the extent or quality of breeding, foraging or hibernating habitat.
- There will be no loss or decline in quality of linear features (such as hedgerows and tree lines) which the bats use as flight lines - there will be no loss of foraging habitat use by the bats or decline in its quality, such as due to over-intensive woodland management
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A.1 Pre-parturition population in the maternity roost	The is the target for the number of adult bats required each year during early summer, when females gather to give birth and numbers are likely to be at their highest. The figure of 320 bats is based on the lowest number of bats at Buckland between 2000 and 2006.	On at least one occasion between 29 th May and 17 th June of every year, there will be: <ul style="list-style-type: none"> • 320 or more bats at Buckland Coach House and 600 bats to be recorded at Buckland Coach House in at least one year during the six year monitoring cycle
A.2 Population in hibernation roost	There are a large number of hibernation sites within the SAC, and also a number outside the SAC, which all contribute towards maintaining the SAC population of lesser horseshoe bats. For the performance indicators for the SAC, counts will therefore be undertaken at five key sites. Buckland Ice House, closely associated with the maternity roost, is the easiest	During at least one surveillance visit between 1 st January and 28 th February of every year, there will be: <ul style="list-style-type: none"> • 270 or more lesser horseshoe bats at Agen Allwedd cave, and 500 (this figure may need revising as 500 is close to the maximum recorded, although current trends show an increasing

	<p>site to count. The numbers in the performance indicators are based on maximum counts between 2000 and 2006, and have been devised using the same rationale as for the maternity site. However, there are some difficulties in timing of counts at Buckland Ice House. The site is used by large numbers of bats during relatively mild winters. In cold weather the ice house becomes unsuitable, and the bats relocate to another site not within the SAC, (Ogof Cynnes). For this reason counts for this hibernaculum will be accepted between 1st November and 28th February.</p> <p>Counts at cave sites are technically very difficult. Bats are often difficult to see and also frequently move hibernation site, within the cave and between caves. They may use parts of the cave inaccessible to humans.</p> <p>There are also specific problems at the Usk Bat Sites hibernation sites. Agen Allwedd is a large cave system with a number of passages. One section particularly favoured by bats is known as Angel's Roost. However, it is occasionally impossible to survey this section, because bats are hibernating in the passage to it, and it cannot be reached without disturbing these bats. The Clydach Gorge sites consist of more than 10 caves, not all of which are continually used, but which collectively support a significant part of the wintering bat population. Foxwood is a drift cave with holes in the cave roof. This allows warm air in the cave to escape during the winter. As a result, bats frequently leave this site when it becomes too cold. The internal temperature when the site is surveyed is therefore critical to gaining an accurate picture of the importance of this site for lesser horseshoe bats.</p> <p>The numbers of bats expected at each site have been calculated using the same rationale as that used for the maternity site. An alternative lower number is provided for situations in which the Angel's Roost section of Agen Allwedd cannot be accessed. This count should</p>	<p>population) or more present at least once during the six year monitoring cycle OR 220 or more lesser horseshoe bats at Agen Allwedd Cave excluding the Angel's roost section (see rationale below), AND</p> <ul style="list-style-type: none"> • A total of 18 or more lesser horseshoe bats at the Clydach Gorge cave sites, and 47 to be recorded at least once during the six year monitoring cycle, AND <p>During at least one surveillance visit between 1st November and 28th February of each year,</p> <ul style="list-style-type: none"> • 280 or more lesser horseshoe bats at Buckland Ice House and 470 to be recorded at least once during the six year monitoring cycle AND <p>During at least one surveillance visit between 1st November and 28th February of each year, when the internal temperature of the cave is 6°C or above there will be:</p> <ul style="list-style-type: none"> • 60 lesser horseshoe bats at Foxwood cave AND <p>There is continued use by lesser horseshoe bats at Siambre Ddu (data collected from this site requires further examination in order to devise population limits).</p>
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	<p>not be used in years when Angel's Roost is accessible.</p> <p>Siambre Ddu is another large roost. Data recently collected from this site requires further examination in order to devise population limits. It is expected that the lower limit would be in the region of several 10s of bats. The performance indicator for this site at present requires only that bats be present. Droppings will not be used to make assumptions about bats using the site.</p> <p>Once more data is collected, it is possible that a moving (6yearly) average could be calculated, such that a fall in numbers of say 10% could flag up a potential decline in health of the population.</p>	
Performance indicators for factors affecting the feature		
Buckland House Maternity Roost (may also apply to other non-SAC maternity roosts)		
Factor	Factor rationale and other comments	Operational Limits
F.1 Site security	Derived from Common standards Monitoring advice.	Access to the site under the control of the owner/occupier or site secured against unauthorised access. Doors, gates or security fences in sound condition and able to resist unauthorised access attempts
F.2 External condition of building	As above.	<p>Fabric of building sufficient to maintain roost conditions internally with:</p> <ul style="list-style-type: none"> • Weatherproof roof. The roof covering materials (slates, tiles etc.) in weatherproof condition with no significant gaps, slippage or damage. • No holes large enough to allow soaking of roof timbers, excessive heat loss or high light levels in the roost area • Walls sound, rainwater goods in adequate condition. <p>The building is structurally stable. No significant deterioration in overall condition of the building</p>
F.3 Roost entrance – buildings and underground	As above.	<ul style="list-style-type: none"> • Unobstructed roost entrance large enough for bats to fly through unimpeded. Normal minima: 300 x 200 mm

sites		No artificial lights shining on access or associated flight paths
F.4 External Disturbance	As above.	Disturbance levels acceptable to bats with: <ul style="list-style-type: none"> No increase since previous visit Human access to roost controlled and limited
F.5 Internal condition of building/ underground site in roost area	As above.	<ul style="list-style-type: none"> Low light levels with no through draught. No toxic substances present, which would adversely affect the health of the bats (e.g. chemical timber treatment within inappropriate substances).
F.6 Temperature of roost area	As above.	<ul style="list-style-type: none"> Range of temperatures available to bats with mean temperature in July greater than 20°C
F.7 Internal disturbance	As above.	<ul style="list-style-type: none"> Human access to roost area controlled and limited Disturbance is kept to a minimum
<i>Hibernation Sites</i>		
F.8 Site entrance	As above.	<ul style="list-style-type: none"> Existing entrances unobstructed. No human-influenced new entrances causing a change to ventilation. No change in size sufficient to affect airflow and internal temperature.
F.9 External conditions of site	As above.	<ul style="list-style-type: none"> Vegetation present close to entrance (s) but not obstructing it (them). No artificial lights shining on entrance(s).
F.10 Internal conditions	As above.	<ul style="list-style-type: none"> The temperature should remain constantly cool (8-12°C) and dark, once beyond the entrance zone No significant man-induced changes to ventilation or temperature regime. No toxic substances present (dumping of oil or other substances).
F.11 Internal disturbance	As above.	<ul style="list-style-type: none"> Human access to roost area controlled and limited (at Agen Allwedd the number of visitors is already controlled) Disturbance is kept to a minimum.

<i>Foraging areas and links to roosts</i>		
F.12 Habitat Quality	The bats mainly feed along the edges of woodland, large hedges and tree-lined rivers within and around the SAC areas and land situated between the SSSIs in the Usk valley area between Llangorse and Abergavenny.	There should be no nett loss of suitable woodland, scrub and hedgerows within the SAC or adjoining areas used by the bats.
F.13 Connectivity	<p>The bats appear to prefer not to like crossing large areas of open ground and therefore retaining or providing new cover would be beneficial. Links between foraging areas, maternity roosts and hibernacula, are provided by hedgerows, woodland, scrub and lines of trees.</p> <p>There are quite a few maternity roosts in buildings in the Usk valley area that are not within in the SAC, so connectivity is important here too.</p>	Major gaps in the continuity of these habitats should not be created. See also F12 above.
The extent of these habitats shown on aerial photographs taken in 2006 forms a baseline to measure habitat cover.		

4.2 Conservation Objective for Feature 2: Blanket bog

Vision for Feature 2

- The extent, quality and species richness of the blanket bog vegetation is maintained and, where possible, degraded bog is restored to good condition so that this habitat occupies its full potential range within the site.
- The bog vegetation is largely a mixture of dwarf shrubs, hare's-tail cottongrass and mosses, including bog-mosses.
- Extensive areas of purple moor-grass or hare's-tail cottongrass show signs of recovery towards a more mixed dwarf shrub sward.
- The natural hydrological regime is maintained and there is continued peat formation and thus carbon storage.
- Areas of bare peat are not extensive and most areas show signs of recovery.
- Peat profiles containing important pollen records are maintained.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>

A1. Extent	There have been past losses and degradation, so it is essential to maintain the current (2003) extent of the habitat and to restore degraded areas where possible.	<i>Upper limit:</i> 280 ha, constrained by site topography and hydrology. <i>Lower limits:</i> 150 ha (c 90% of extent as measured in 2003).
A2. Quality of the Blanket bog	<p>The key attributes are presence and frequency of positive (listed below) and negative indicator species and the lack of significant grazing damage to the dwarf shrubs (where present).</p> <p>These conditions should be met in 90% of the blanket bog.</p>	<p><i>Upper Limits:</i> No more than 75% cover of purple moor-grass, hare's-tail cottongrass, deergrass or common haircap moss (<i>Polytrichum commune</i>). AND: Less than 1/3 of shoots of all dwarf shrub species collectively showing signs of browsing. AND: <i>Lower limits:</i> 6 positive indicator species present. AND: 50% of vegetation cover comprising 3 or more of the positive indicators. AND: flat-topped bog-moss (<i>Sphagnum fallax</i>) should not be the only bog-moss present. Ideally <i>S. capillifolium</i> and other true 'bog' species would be present. (further work required to elucidate the species present or likely to be present at this locality).</p>
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Peat Erosion	<p>There is a natural cycle of peat erosion and deposition but the balance can be upset by burning, heavy grazing, pollution and vehicle damage.</p> <p>The process is best measured across the whole plan area using aerial photography, backed by ground checks, where necessary.</p>	<p><i>Upper limit:</i> The total extent of active erosion over a 5-year period should not exceed the total extent of areas showing signs of peat accumulation and re-vegetation. <i>Lower limit:</i> There are always some areas of bare peat present as a result of natural erosive processes.</p>
F2. Burning	Blanket bog is adversely affected by burning, which leads to surface drying and the replacement of bog-mosses by purple moor-grass and common haircap.	<p><i>Upper limit:</i> No evidence of significant burning (patches larger than 1ha) in any areas of blanket bog. <i>Lower limit:</i> N/A.</p>
F3. Drainage	Significant new drains within the bog areas could cause surface drying and peat erosion. Most old drains are now blocked with peat.	<p><i>Upper Limit:</i> No evidence of new drains or major clearance of old drains or deepening of bog outlet streams. <i>Lower limit:</i> N/A.</p>

F4. Air Quality	<p>High levels of air pollution are believed to be damaging and there may be combined effects. Increased cover of hare's-tail cottongrass and flat-topped bog-moss may be symptoms, as could increased levels of peat erosion. The Environment Agency has set critical levels for these pollutants in relation to various types of vegetation (Refer to the APIS database at www.airquality.co.uk).</p> <p>Monitoring stations located at grid location: 319097.79 214637.88</p>	<p><i>Upper limits:</i> No exceedence of critical loads for Sulphur dioxide – 20µg/m³ Nitrous Oxides – 30µg/m³ Ozone – 3000 ppb ammonia – 1µg/m³ N – 5-10 kg/ha/yr acid – 0.35keq/ha/yr</p> <p><i>Lower limits:</i> None.</p>
<p>Positive indicators for blanket bog quality: Bog rosemary (<i>Andromeda polifolia</i>); heather (<i>Calluna vulgaris</i>); round-leaved sundew (<i>Drosera rotundifolia</i>); cross-leaved heath (<i>Erica tetralix</i>); crowberry (<i>Empetrum nigrum</i>); common cottongrass (<i>Eriophorum angustifolium</i>); hare's-tail cottongrass (<i>E. vaginatum</i>); bog asphodel (<i>Narthecium ossifragrum</i>); non-crust-forming lichens (count together); other mosses (count together as one); bog-mosses (<i>Sphagnum spp.</i> – count each species*); deergrass (<i>Trichophorum cespitosum</i>); bilberry (<i>Vaccinium myrtillus</i>); cowberry (<i>V. vitis-idaea</i>).</p> <p>* flat-topped bog-moss only counts if at least other species (further survey required) of bog-moss is present.</p>		
<p>Definition of blanket bog vegetation: Generally occurs where the peat is deeper than half a metre and conforms with National Vegetation Classification types M17, M19 & M20b.</p>		

4.3 Conservation Objective for Feature 3: Tilio-Acerion forests of slopes, screes and ravines

Vision for Feature 3

The vision for this feature is for it to be in favourable conservation status within the site, as a functioning and regenerating ash woodland, where all of the following conditions are satisfied:

- There are extensive patches of semi-natural woodland on the cliffs of the Llangatwg escarpment and hillsides in the Clydach gorge.
- The woodland canopy is dominated by locally native species, including lime ash *Fraxinus excelsior*, *Tilia* spp., pedunculate oak *Quercus robur*, hazel *Corylus avellana*, birch *Betula* spp., whitebeams *Sorbus* spp. and, in the Clydach gorge, beech *Fagus sylvatica*. Rare whitebeams are a significant component of the canopy.
- Saplings of locally native species dominate the tree regeneration and there is evidence of sufficient regeneration to maintain the canopy in the long term.
- There is an accumulation of standing and fallen deadwood as the woodland develops.
- The woodland ground flora is composed of a range of typical native plants including enchanters-nightshade *Circaea lutetiana*, dog's-mercury *Mercurialis perennis*, wood-sorrel *Oxalis acetosella*, hart's-tongue *Phyllitis scolopendrium* and wood sage *Teucrium scorodonia*.
- The populations of rare whitebeams are stable or increasing.

- Young sycamore *Acer pseudoplatanus* trees are rare, as are beech *Fagus sylvatica* in areas away from the Clydach gorge.
- Plants indicating disturbance and nutrient enrichment, such as nettles, cleavers and weeds, are not dominant in the ground flora of the woodland.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 3

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent of and distribution	<p>To be assessed using aerial photography and ground checking. The total area of broadleaved semi-natural woodland, screes and ravines has been mapped as a baseline but extent of ash dominated types has been estimated as they can be intermixed with other types.</p> <p>Tilio-Acerion forests of slopes, screes and ravines is defined as: any area where there is a more-or-less continuous cover of shrubs over 3 metres tall, with or without woodland canopy trees such as ash. In the long-term, when a better woodland community has developed, then these objectives will need to be revisited.</p>	<p><i>Lower limit:</i> 13.5 ha, of which units 1 & 2 support at least 10 ha and unit 5 supports at least 3.5 ha. Small areas are also present in units 12 & 13.</p> <p><i>Upper limit:</i> N/A</p>
A2. Canopy cover	<p>The woodland is scattered over the lower slopes of Craig y Cilau and extends onto the cliff areas. The latter is secure from the effects of grazing and is probably more or less self-sustaining. The remaining woodland on the grazed slopes has been developing for sometime, and at present it is assumed that this development will continue, provided that the grazing is at a level to permit gradual regeneration. In the long-term (at least 50 years hence), when a better woodland community has developed, then these objectives will need to be revisited.</p>	<p><i>Upper limits:</i> 90% canopy cover OR: 60% on the south-west facing slopes of unit 1 <i>Lower limits:</i> 75% canopy cover OR: 30% on the south-west facing slopes of unit 1</p>
Attributes A3 –A7 below apply to the main woodland stands in units 1, 2 & 5 (see maps in Annex 1).		
A3. Regeneration	In the Clydach gorge on the southern slopes of Mynydd Llangatwg there are	<p><i>Upper limit:</i> N/A <i>Lower limit:</i> Canopy forming</p>

	<p>stands of ungrazed woodland, which are unlikely to ever be grazed. Therefore the same performance indicators can be applied to all areas.</p> <p>Regeneration to be met in at least 50% of significant gaps in canopy. Such gaps should be recorded at each monitoring visit.</p>	<p>shrubs, trees or coppice re-growth at least 1.5m high present (should be evident in at least one location within each woodland block).</p>
A4. Woodland structure	<p>A functioning woodland system will have trees of all ages present.</p> <p>Veteran trees provide particularly important habitat for birds and invertebrates.</p> <p>75% of the woodland should meet the criteria for an understorey.</p>	<p><i>Upper limit:</i> N/A</p> <p><i>Lower limits:</i> An understorey at a height of 2–5m over at least 20% of the stand, composed of locally native species, such as yew, wych elm, whitebeams, hawthorn, limes, rowan, hazel and ash.</p> <p>AND:</p> <p>In grazed areas there should be evidence of an understorey developing.</p>
A5. Canopy composition	<p>In some areas non-native trees, such as sycamore, will be tolerated, as long as they are not freely re-generating to form large saplings in the understorey, which would likely change the canopy composition over time. Consequently, only 70% of the woodland need comply with the limits set.</p>	<p><i>Upper limit:</i> None</p> <p><i>Lower limit:</i> 95% of tree cover is composed of locally native species, such as ash, whitebeams, wych elm, rowan, field maple, hazel, or beech.</p>
A6. Ground flora	<p>The ground flora is naturally quite sparse in the rocky areas of units 1 and 2, but a few typical ash woodland plants should be evident in all areas.</p> <p>Brambles and ivy can be locally abundant in ungrazed ash woodland but other indicators of disturbance and nutrient enrichment should not be.</p> <p>Limits should be met for 80% of the woodland.</p>	<p><i>Upper limit:</i></p> <p>The cover of nettles should not exceed 10%.</p> <p><i>Lower limit:</i> Typical ground flora species (see list below) should be evident throughout the woodland.</p>
A7. Deadwood	<p>Deadwood will be retained.</p> <p>The limits given here should be met in at least 50% of existing woodland.</p>	<p><i>Upper limit:</i> None</p> <p><i>Lower limit:</i> Presence of standing and/or fallen deadwood.</p>
<p>Typical ash woodland plants: Dog's-mercury; Bramble; Violets; Lesser celandine; Barren strawberry; Ivy; Herb-Robert; Hart's-tongue fern; Chalk comb-moss <i>Ctenidium molluscum</i>; Wild garlic; Wood false-brome; Wood sage; Wood Melick; Shield ferns; Enchanter's-nightshade; Wood avens; Lords-and-ladies and Male fern.</p>		
<i>Performance indicators for factors affecting the feature</i>		

<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Grazing	<p>The present structure and species composition of the northern escarpment woodland, excluding the cliff ledges, is a result of natural regeneration. The cliff ledges are inaccessible to stock, have developed naturally and are not actively managed.</p> <p>The greatest influence on the woodland, and its continued regeneration, is grazing. In units 1 & 2, the woodland has developed on common land and parts are subject to high grazing levels by sheep. The woodland in units 5, 12 & 13 is now largely un-grazed and the ground flora is noticeably more luxuriant in these areas.</p>	<p><i>Upper limit:</i> Sufficient to allow regeneration in the long term, as defined by the regeneration attribute above.</p> <p><i>Lower limit:</i> None required.</p>
F2. Non-native species	<p>Beech is at the edge of its range in this part of Wales. In units 5, 12 and 13 the beech wood appears to be natural, but the spread of beech over much of Units 1 & 2 may not be desirable, as it would replace the ash woodland.</p> <p>Limits should be met in 70% of the woodland.</p>	<p><i>Upper limits:</i> 5% cover of non-native trees in the canopy.</p> <p>AND:</p> <p>No cotoneaster (or other invasive non-native shrubs) in the understorey or shrub layer.</p> <p><i>Lower limit:</i> None.</p>
F.3 Woodland Management	<p>Natural ecological processes should be allowed to operate as far as possible. In many areas, these are gradually creating greater structural diversity.</p> <p>Most of the woodland on the site is not actively managed (indeed much occurs on cliffs and will never have been managed).</p>	<p>There should be no evidence of tree felling or coppicing within the past five years. (Tree surgery for safety reasons excluded).</p>

4.4 Conservation Objective for Feature 4: Calcareous rocky slopes with chasmophytic vegetation

Vision for Feature 4

- Sufficient vegetation within crevices remains free from disturbance to support typical plants, including mosses, ferns and rare hawkweeds (*Hieracium* spp.) and allow them to sustain their populations into the future.
- Areas accessible to grazing animals should free from being smothered by ivy or heavily shaded by trees.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 4

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent and Distribution	<p>The distribution of calcareous rocks (including old quarries) as been mapped as a baseline. However, it has not been possible to accurately map or measure the extent of the chasmophytic vegetation itself.</p> <p>Calcareous rocky slopes with chasmophytic vegetation is defined as: plant species capable of colonising cracks and fissures of rock faces, and the type of plant community depends on the base-status of the rock face.</p>	<p><i>Lower limit:</i> 11ha of suitably open cliffs and scree and old quarry faces, mainly located in units 1 & 2, with outliers in unit 13.</p>
A2. Condition	<p>Many of the cliff areas are inaccessible to grazing stock, and therefore it is reasonably certain that the communities are self-sustaining, assuming that they are not at risk from ivy growing up from below.</p> <p>The species composition is beyond the influence of management, so all that is required is to assume the habitat is not threatened by land use of changes in management.</p> <p>Condition attributes should apply to the key areas of open rocky ground in units 1 & 2, as shown on the maps in Annex 1 of this plan.</p>	<p><i>Upper limits:</i> Alien species should be absent, especially cotoneasters.</p> <p>AND: Brambles, nettles, bracken, ivy and shrubs should remain scattered and subdued by grazing, where accessible to livestock.</p> <p><i>Lower limits:</i> Chasmophytic and ledge vegetation should be diverse and abundant in available crevices and ledges.</p> <p>AND: Crevices support a mixture of mosses and higher plants.</p>

<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Grazing	Low grazing levels are important in controlling the growth of ground-smothering species such as ivy, which have the potential to smother boulders and cliff faces that are important for their lower plant communities. Tree growth at the base of the cliffs may shade out important calcareous chasmophytic habitat, so should be controlled within limits outside the areas of agreed woodland. Surveillance of grazing levels and type should be maintained so that changes that may influence the features on the site are identified and recorded.	<i>Upper limit:</i> To be set in relation to the requirements of the limestone grassland. <i>Lower limits:</i> Sufficient to prevent the development of scrub or spread of ivy and tall vegetation. NB. Limits apply to the key areas in units 1 & 2.
F2. Quarrying	Any quarrying in the key areas would lead to habitat loss.	No quarrying in the key areas as shown on the maps in Annex 1.
F3. Rock Climbing	Intensive use can dislodge plants and disturb breeding birds. These impacts may be avoided if climbing is subject to specific agreements, which include a code of conduct.	No rock climbing in the key areas of units 1 & 2 without agreement.

4.5 Conservation Objective for Feature 5: Caves not open to the public

Vision for Feature 5

- The cave system provides a winter hibernation site for large numbers of lesser horseshoe bats and other bat species, including Brandt's, whiskered, Daubenton's, Natterer's, brown long-eared and, occasionally, greater horseshoe bats.
- Numbers of roosting bats are stable or increasing in the system as a whole.
- All factors affecting the achievement of the above conditions are under control.

Also see the vision for lesser horseshoe bats.

As outlined in the JNCC description of this feature, the cavernicolous fauna is considered to be impoverished throughout the UK and this feature is not a primary reason for selection of any SAC in the UK (www.jncc.gov.uk).

There is however significant bat interest associated with many of the caves within this SAC, particularly Lesser Horseshoe Bat. Great Horseshoe Bat has also been recorded in very small numbers. Several other bat species are recorded, particularly from the genus *Myotis*, but their habit of hibernating deep within crevices in the caves (rather than hanging freely from the cave roof, like horseshoe species) makes them extremely difficult to record.

Performance indicators for Feature 5

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent and Distribution of the habitat	Within Mynydd Llangatwg SSSI, many of the same cave passages used by lesser horseshoe bats are also used by other hibernating bat species.	No loss of suitable bat hibernating areas in units 1, 2, 5, 12, 13 and 19.
A2. Species of bat using the caves	Records of other bats using the caves in total at least seven species. These have included Lesser Horseshoe, Greater Horseshoe, Brandt's, Whiskered, Natterer's, Daubentons and Brown Long-eared.	<i>Upper Limit:</i> N/A <i>Lower limit:</i> At least 6 of the species listed are recorded as using the caves as hibernation site in Unit 1. AND: At least 3 of the species listed are recorded as using the caves as hibernation site in Unit 2.

<i>Performance indicators for factors affecting the feature</i>		
F1. Condition of the habitat	It is assumed that the condition of the hibernating areas should be much the same for all bat species, although most of the myotid species require less open space as the hibernate in small crevices.	See factors F1-F13 for lesser horseshoe bats in 4.1 above.

4.6 Conservation Objective for Feature 6: **Degraded raised bogs still capable of natural regeneration**

Vision for Feature 6

- The extent, quality and diversity of raised bog vegetation is maintained and, where possible, restored to good condition, with active moss and peat growth across the raised bog surface.
- The vegetation consists of a mixture of dwarf shrubs, hare's-tail cottongrass, deergrass and bog mosses, grading at the edges into acid and alkaline flushes influenced by acidic water draining from the bog and springs rising in the limestone catchment.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 6

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent	Monitoring is likely to be a map-based exercise. The area of degraded raised bog will be mapped as a baseline extent and the total area measured. Repeat monitoring will either re-map the site or review the baseline map in the field.	<i>Upper Limit:</i> None, constrained by governed by site topography. <i>Lower limit:</i> 3.4 ha
A2. Condition	<p>The important attributes for degraded raised bog on this site are considered to be:</p> <ul style="list-style-type: none"> • Ericaceous shrub cover • Species compliment • Height of vegetation • Cover of bog-mosses, grass cover and bare ground • Indicators of grazing pressure <p>The invasion of trees and scrub is not an issue on the site. Consequently, no performance indicator is required for this element. If this becomes a problem in the future then this can be addressed by adding additional performance indicators.</p> <p>At least 80% of the feature must fall within the limits.</p>	<p><i>Upper Limit:</i> The total cover of grasses is less than 50% AND: Dwarf shrub cover is less than 70% AND: Cover of bare peat is less than 10%</p> <p><i>Lower limits:</i> Cover of hummock forming bog-mosses is at least 10% AND: Vegetation must support at least 5 of the following plants: Heather, sundews, cross-leaved heath, common cotton-grass, hare's-tail cottongrass, bog asphodel, non-crustose lichens, bog-mosses, deer-grass and bilberry. AND: Vegetation is at least 10cm high.</p>

<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Grazing	This area of bog has been damaged by heavy grazing in the past and current (2008) grazing levels are still to high to enable the re-generation of the bog habitats. Most of the bog is on commonland and therefore it is difficult to control grazing without agreement and fencing.	<i>Upper limits:</i> Overall grazing pressure of 0.05 livestock units/ha/year on the bog area. AND: Minimal winter grazing. AND: no stock feeding <i>Lower limit:</i> Sufficient to prevent the establishment of trees and shrubs in the long term
F2. Burning	Burning will damage the feature and could encourage dominance by purple-moor grass if grazing is significantly reduced and result in a decline in the cover of bog mosses. At present there is generally insufficient vegetation to be burnt here.	There should be no evidence of recent burning.
F3. Drainage	See blanket bog 4.2 above.	See 4.2 above.

F4. Air Quality	See 4.2 above.	See 4.2 above.
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4.7 Conservation Objective for Feature 7: European dry heaths

Vision for Feature 7

- The extent, quality and diversity of heath vegetation within the constituent sites is maintained and, where possible, degraded heath is restored to good condition.
- The main heathland areas have a varied age structure with a mosaic of young heath, mature heath and degenerate heath.
- All factors affecting the achievement of these conditions are under control.

Performance indicators for Feature 7

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent and Distribution	The area of European dry heaths has been mapped as a baseline extent and the total area measured (based on the latest habitat survey information from 2003). Repeat monitoring will either re-map the site or review the baseline map in the field. There should be no discernable decline in extent from those areas defined above.	<i>Upper limit:</i> N/A, constrained by site topography and hydrology. <i>Lower limits:</i> 385 ha, largely confined to the drier areas of unit 2 and the top of the escarpment in unit 1.
A2. Quality of the habitat	<p>Based on the presence and cover of typical heathland plants and ‘negative indicator’ species.</p> <p>At least 90% of the dry heath within unit 2 should fall within the specified limits. Unit 1 should be managed primarily to suit its other habitats. Recently burnt areas should be avoided when sampling but see also F1 below.</p> <p>The invasion of trees and scrub is not an issue on the site. Consequently, no performance indicator is required for this element. If this becomes a problem in the future then this can be addressed.</p>	<p><i>Upper Limits:</i> Cover of Western gorse <i>Ulex gallii</i> no more than 50 %. AND: Cover of non-native plants and/or agricultural weeds is less than 1%. AND: cover of Bracken is less than 10%. AND: Less than 1/3 of shoots of all mature dwarf shrub plants collectively showing signs of browsing. OR: Less than 2/3 of young pioneer plants collectively showing signs of browsing. <i>Lower limits:</i> At least 50% of vegetation cover made up of at least 2 dwarf shrub species and the height of the shrub canopy is at least 15cm. AND:</p>

		1 species of moss, liverwort or non-crustose lichen present (excluding hair-cap mosses and <i>Campylopus</i> mosses - associated with burning).
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Burning	Areas burnt may be measured by aerial photography.	<i>Upper limits:</i> In areas subject to any burning plan, only a maximum of up to 15% of the total heathland area should be burnt in any one year. <i>Lower limit:</i> N/A.
F2. Erosion/Bare Ground	Is generally caused by uncontrolled fires (see above) or heavy trampling. Assessments should not be made in areas that have been recently been subject to planned burning.	<i>Upper Limit:</i> 10% bare ground <i>Lower limit:</i> N/A.
F3. Air Quality	Increased cover of grasses and degenerate heather may be symptomatic of air pollution, as there is evidence that pollution makes heather plants more susceptible to damage by frost and heather beetles. The Environment Agency has set critical levels for these pollutants in relation to various types of vegetation. Monitoring station located at grid location: 319097.79 214637.88	<i>Upper limits:</i> No critical loads are exceeded. Sulphur dioxide – 20µg/m ³ Nitrous Oxides – 30µg/m ³ Ozone – 3000 ppb ammonia – 1µg/m ³ N – 10-20 kg/ha/yr acid – 0.35keq/ha/yr <i>Lower limits:</i> None required.
Dwarf shrub species are: Heather (<i>Calluna vulgaris</i>); crowberry (<i>Empetrum nigrum</i>); bilberry (<i>Vaccinium myrtillus</i>); cowberry (<i>V. vitis-idaea</i>);		
Definition of dry heath vegetation: Generally occurs over thin peat on hilltops or mineral soils and conforms with National Vegetation Classification types H8, H10, H12& H18. Can occur intermixed with dense bracken stands, rock and scree but these areas should be avoided when sampling for vegetation condition.		

4.1 Conservation Objective for Feature 1:

Asperulo – Fagetum beech forests (EU Habitat code 9130)

Vision for feature 1

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- At least 50% of the canopy-forming trees are beech.
- The canopy cover is at least 80% (excluding areas of crag) and composed of locally native trees.
- The woodland has trees of all age classes with a scattering of standing and fallen dead wood.
- Regeneration of trees is sufficient to maintain the woodland cover in the long term.
- The shrub layer and ground flora can be quite sparse, but where present consist of locally native plants such as yew, hawthorn, wych elm, ash, hazel, field maple and elder, bramble, dog's mercury, enchanter's-nightshade, lords-and-ladies, woodruff, male fern, sanicle, wood melick, ivy, false brome, violets, herb robert, wood avens, and tufted hair-grass.
- Scarcer plants, such as soft-leaved sedge and bird's-nest orchid are locally frequent and, more rarely, yellow bird's-nest orchid can be found.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 1

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent and distribution	Extent is based on ground surveys and 2006 aerial photographs. Upper limit set to maintain areas of non-wooded habitat.	<i>Upper limit:</i> 25 ha <i>Lower limit:</i> 21 ha Located in units 1 & 5.
A2. Canopy cover	75% of the woodland should meet the criteria for canopy cover.	<i>Upper limit:</i> 90% <i>Lower limit:</i> 80%
Attributes A3–A6 below are based on the Standard Common Standards Monitoring guidance, modified according to site-specific requirements. They apply to the main calcareous beech woodland stands in units 1 & 5 (see maps in Annex 1).		
A3. Canopy composition	In some areas non-native trees, such as sycamore, will be tolerated, so long as they are not freely re-generating in the understorey. 75% of the woodland needs to comply with the limits set.	<i>Upper limit:</i> N/A <i>Lower limit:</i> 50% of the canopy forming trees are beech (except in those areas where whitebeam dominates) AND: 95% of tree cover is composed of locally native trees (see definition below).

A4. Regeneration	<p>To be met in at least 50% of significant gaps in canopy. Such gaps should be recorded at each monitoring visit.</p> <p>A gap is defined as an open area with a diameter of at least one average tree height.</p> <p>Beech will also regenerate under the canopy and some recording should also occur here.</p>	<p><i>Upper limit:</i> N/A <i>Lower limit:</i> Canopy forming trees, shrubs or coppice re-growth at least 1.5m high present (there should be enough present to maintain the canopy in the long term).</p>
A5. Ground flora	<p>The ground flora can be naturally quite sparse under the beech canopy, but a few typical calcareous beech woodland plants should be evident in all areas.</p> <p>Brambles and ivy can be locally quite abundant but other indicators of disturbance and nutrient enrichment should not be.</p> <p>Limits should be met for 75% of the woodland.</p>	<p><i>Upper limit:</i> The cover of nettles should not exceed 10%. <i>Lower limit:</i> Typical ground flora species (see list below) should be evident throughout the woodland.</p>
A6. Dead Wood	<p>It is difficult to set meaningful limits for dead wood but, in the short term. Much of the woodland is on steep ground and so removal of deadwood is unlikely. However, any fallen timber will tend to accumulate at the foot of the slopes.</p> <p>The limits given here should be met in at least 75% of existing woodland.</p>	<p><i>Upper limit:</i> None <i>Lower limit:</i> Presence of standing and/or fallen deadwood greater than 20 cm diameter.</p>
<p>Locally native Trees and shrubs: Beech; Ash; Oak; Birch; Rowan; Field maple; Yew; Hawthorn; Hazel; Elder and Holly.</p>		
<p>Typical plants of calcareous beech woodland: Dog's mercury; Bramble; Enchanter's-nightshade; Lords-and-Ladies; Woodruff; Male fern; Sanicle; Wood melick; Ivy; False brome; Violets; Rough-stalked feather moss <i>Brachythecium rutabulum</i>; Common feather-moss <i>Eurhynchium praelongum</i> and Herb Robert. List likely to be refined following further survey and monitoring.</p>		
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
F1. Livestock grazing	<p>There is a long-history of the woodland being open to casual grazing by sheep. This has probably skewed the species make up of the wood towards beech because sheep preferentially graze other species.</p> <p>This is not thought to be a major issue,</p>	<p><i>Upper limit:</i> Sufficiently low to allow regeneration in the long term, as defined by the regeneration attribute above. <i>Lower limit:</i> None required.</p>

	but needs to be kept under review.	
F2. Non-native and invasive species	Along the river corridor there is Japanese knotweed, which may pose a threat to the woodland habitat.	<i>Upper limit:</i> No spread of Japanese knotweed into woodland. <i>Lower limit:</i> None required.

4.2 Conservation Objective for Feature 2:

Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion* (EU Habitat code 9120))

Vision for feature 2

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

At least 75% of the woodland vegetation meets the criteria for intact acid beech wood, where:

- At least 10% of the canopy forming trees are beech.
- The canopy cover is at least 80% and composed of locally native species.
- The woodland has trees of all age classes with a scattering of standing and fallen dead wood.
- Regeneration of trees is sufficient to maintain the woodland cover in the long term.
- The shrub layer and ground flora can be quite sparse, but where present consist of locally native plants.
- All factors affecting the achievement of the above conditions are under control.

Performance indicators for Feature 2

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition		
Attribute	Attribute rationale and other comments	Specified limits
A1. Extent and distribution	Extent is based on ground surveys and 2006 aerial photographs. Upper limit set to maintain areas of non-wooded habitat.	<i>Upper limit:</i> 3.5 ha <i>Lower limit:</i> 4.3 ha Located mainly on the upper slopes at the western end of unit 1.
A2. Canopy cover	75% of the woodland should meet the criteria for canopy cover.	<i>Upper limit:</i> 90% <i>Lower limit:</i> 80%
Attributes A3–A6 below are based on the Standard Common Standards Monitoring guidance, modified according to site-specific requirements. They apply to the main acid beech woodland stands in unit 1 (see maps in Annex 1).		
A3. Canopy composition	In some areas non-native trees, such as sycamore, will be tolerated, so long as they are not freely re-generating in the understorey. 75% of the woodland needs to comply with the limits set.	<i>Upper limit:</i> N/A <i>Lower limit:</i> 10% of the canopy forming trees are beech AND: 95% of tree cover is composed of locally native trees (see definition below).

A4. Regeneration	To be met in at least 50% of significant gaps in canopy. Such gaps should be recorded at each monitoring visit. A gap is defined as an open area with a diameter of at least one average tree height.	<i>Upper limit:</i> N/A <i>Lower limit:</i> Canopy forming trees, shrubs or coppice re-growth at least 1.5m high present (should be enough present to maintain the canopy in the long term).
A5. Ground flora	The ground flora can be naturally quite sparse under the beech canopy, but a few typical acid beech woodland plants should be evident. Bracken can be locally quite abundant but should not dominate large areas of the woodland floor. Limits should be met for 75% of the woodland.	<i>Upper limit:</i> N/A <i>Lower limit:</i> Typical ground flora species (see list below) should be evident throughout the woodland.
A6. Dead Wood	It is difficult to set meaningful limits for dead wood but, in the short term. Much of the woodland is on steep ground and so removal of deadwood is unlikely. However, any fallen timber will tend to accumulate at the foot of the slopes. The limits given here should be met in at least 75% of existing woodland.	<i>Upper limit:</i> None <i>Lower limit:</i> Presence of standing and/or fallen deadwood greater than 20 cm diameter.
Locally native Trees and shrubs: Beech; Ash; Oak; Birch; Rowan; Yew; Hawthorn; Hazel and Holly.		
Typical plants of acid beech woodland: Bilberry; Heather; Wavy hair-grass; Common bent; Wood sorrel and moss carpets, of species such as swan's-neck thyme-moss <i>Mnium hornum</i> , bank hair-cap <i>Polytricum formosum</i> , large white-moss <i>Leucobryum glaucum</i> and common tamarisk-moss <i>Thuidium tamariscinum</i> .		
Performance indicators for factors affecting the feature		
Factor	Factor rationale and other comments	Operational Limits
F1. Livestock grazing	There is a long-history of the woodland being open to casual grazing by sheep. This has probably skewed the species make up of the wood towards beech because sheep preferentially graze other species. This is not thought to be a major issue, but needs to be kept under review.	<i>Upper limit:</i> Sufficiently low to allow regeneration in the long term, as defined by the regeneration attribute above. <i>Lower limit:</i> None required.
F2. Non-native and invasive species	There are localised problems with bracken on the upper slopes in the western part of the site, but this is mainly confined to more open areas at	<i>Upper limit:</i> No increase in the area of woodland floor that is dominated by invasive species. <i>Lower limit:</i> None required.

	the edges of the woodland. Once a canopy has established, shading usually limits the growth of bracken.	
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5. ASSESSMENT OF CONSERVATION STATUS AND MANAGEMENT REQUIREMENTS

This part of the document provides:

- A summary of the assessment of the conservation status of each feature.
- A summary of the management issues that need to be addressed to maintain or restore each feature.

5.1 Conservation Status and Management Requirements of Feature 1: Asperulo – Fagetum beech forest (EU Habitat code 9130)

Conservation Status of Feature 1

The conservation status of this feature within the site is considered to be **Favourable** (2006).

Assessment carried out in August 2002 indicated that feature condition was: **Favourable, maintained**. All the factors affecting the features appear to be under control.

Management Requirements of Feature 1

Woodland management

Most of the woodland at the site is mature and appears to require little active management. Many of the beech trees, however, are old and of a rather even age and in recent years a significant number of these have fallen. In some areas there is good regeneration of beech, and in time, these should grow and fill gaps. Most management, apart from the removal of a small area of larch, would likely be aimed at aiding the spread and growth of beech, possibly by actively moving saplings into gaps where there is little or no natural regeneration and also by selectively thinning species such as ash or sycamore, which might become dominant and displace beech. Dead and fallen trees should in general be left in situ to provide habitat for species such as birds, insects and fungi.

Scrub management

Some areas with the woodland should be retained as permanent open glades to benefit butterflies and other invertebrates and scrub encroachment should be controlled in these areas. Tree branches overhanging parts of the railway track with important grassland habitat will need cutting back from time-to-time to enable more light to reach the ground.

Grazing

Past grazing has influenced the structure of the woodland, such as the dominance of beech in the canopy. It is therefore likely that occasional light grazing would be beneficial for the woodland habitat, although any increase in grazing pressure could prevent all tree and shrub regeneration and suppress the woodland ground flora. Some land within the site, mainly in the Llanelly quarry and Llam-march dingle areas, is common land. Small numbers of sheep graze the area and also graze adjoining open land along the old railway trackbed and adjacent vegetated spoil heaps.

Dumping

European Site Conservation Objectives for Mendip Limestone Grasslands Special Area of Conservation Site code: UK0030203

With regard to the natural habitats and/or species for which the site has been designated ('the Qualifying Features' listed below);

Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.

Subject to natural change, to maintain or restore:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- The populations of qualifying species;
- The distribution of qualifying species within the site.

Qualifying Features:

H4030. European dry heaths

H6210. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone

H8310. Caves not open to the public

H9180. *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes*

S1304. *Rhinolophus ferrumequinum*; Greater horseshoe bat

* denotes a priority natural habitat or species (supporting explanatory text on following page)

*** Priority natural habitats or species**

Some of the natural habitats and species listed in the Habitats Directive and for which SACs have been selected are considered to be particular priorities for conservation at a European scale and are subject to special provisions in the Directive and the Habitats Regulations. These priority natural habitats and species are denoted by an asterisk (*) in Annex I and II of the Directive. The term 'priority' is also used in other contexts, for example with reference to particular habitats or species that are prioritised in UK Biodiversity Action Plans. It is important to note however that these are not necessarily the priority natural habitats or species within the meaning of the Habitats Directive or the Habitats Regulations.

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each habitat or species of a [Special Area of Conservation \(SAC\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving favourable conservation status for those features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England's website. This list is far from exhaustive.

The ecological status of the watercourse is a major determinant of FCS for all features. The required conservation objective for the watercourse is defined below.

4.1 Conservation Objective for the watercourse

- 4.1.1 The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary.
- 4.1.2 The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards used by the Review of Consents process given in Annexes 1-3.
- 4.1.3 Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC.
- 4.1.4 All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change.
- 4.1.5 Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed.
- 4.1.6 The river planform and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.
- 4.1.7 River habitat SSSI features should be in favourable condition. Where the SAC habitat is not underpinned by a river habitat SSSI feature, the target is to maintain the characteristic physical features of the river channel, banks and riparian zone.
- 4.1.8 Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, eg. weirs, bridge sills, acoustic barriers.
- 4.1.9 Natural factors such as waterfalls, which may limit, wholly or partially, the natural range of a species feature or dispersal between naturally isolated populations, should not be modified.
- 4.1.10 Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.
- 4.1.11 Flow objectives for assessment points in the Wye Catchment Abstraction Management Strategy will be agreed between EA and CCW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 1 of this document.
- 4.1.12 Levels of nutrients, in particular phosphate, will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards used by the Review of Consents process given in Annex 2 of this document.
- 4.1.13 Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC, and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the

standards used by the Review of Consents process given in Annex 3 of this document.

- 4.1.14 Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, will be considered in assessing plans and projects.
- 4.1.15 Levels of suspended solids will be agreed between EA and CCW for each Water Framework Directive water body in the Wye SAC. Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels.

4.2 Conservation Objective for Features 1-5:

- Sea lamprey *Petromyzon marinus* (EU Species Code: 1095) ;
 - Brook lamprey *Lampetra planeri* (EU Species Code : 1096) ;
 - River lamprey *Lampetra fluviatilis* (EU Species Code : 1099) ;
 - Twaite shad *Alosa fallax* (EU Species Code : 1103) ;
 - Allis shad *Alosa alosa* (EU Species Code : 1102) ;
 - Atlantic salmon *Salmo salar* (EU Species Code : 1106) ;
 - Bullhead *Cottus gobio* (EU Species Code : 1163)
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Vision for features 1-5

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

<i>FCS component</i>	<i>Supporting information / current knowledge</i>
4.2.1 <i>The conservation objective for the water course as defined in 4.1 above must be met</i>	
4.2.2 <i>The population of the feature in the SAC is stable or increasing over the long term.</i>	<p><i>Refer to sections 5.1 to 5.5 for current assessments of feature populations</i></p> <p><i>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates.</i></p> <p><i>Fish stocking can adversely affect population dynamics through competition, predation, introduction of disease and alteration of population genetics.</i></p>
4.2.3 <i>The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions eg. food supply (as described in sections 2.2 and 5).</i>	<p><i>Some reaches of the Wye SAC are more suitable for some features than others eg. the Edw has important populations of salmon but is not used by shad due to its small size. These differences influence the management priorities for individual reaches and are used to define the site units described in section 3.2. Further details of feature habitat suitability are given in section 5. In general, management for one feature is likely to be sympathetic for the other features present in the river, provided that the components of favourable conservation status for the watercourse given in section 4.1 are secured.</i></p> <p><i>The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the habitat</i></p>

Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of 4.2.4

requirements of the features. The close proximity of different habitats facilitates movement of fish to new preferred habitats with age.

Hydrological processes in the Wye are affected by abstraction and regulation releases from the Elan Valley reservoirs. While these effects cannot practicably be removed any adverse effects on the integrity of the SAC should be minimised as far as possible.

Extensive coniferous forestry plantations in the upper catchment, including the Irfon catchment, adversely affect the run-off and sediment characteristics and water quality of the river. Measures should be taken to restore the hydrological characteristics of headwater areas including wetland functions.

Shad and salmon migration can be affected by acoustic barriers and by high sediment loads, which can originate from a number of sources including construction works.

4.2.4 *There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.*

Performance indicators for features 1-5

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Sea lamprey *Petromyzon marinus* :

Performance indicators for feature condition

<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Distribution within catchment	Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon ammocoetes</i> .	This attribute provides evidence of successful spawning and distribution trends. Spawning sites known to have been used within the previous 10 years and historical sites considered still to have suitable habitat are shown in Annex 4. Spawning locations may move within and between sites due to natural processes and new sites may be discovered over time. Silt beds downstream of all sites identified in Annex 4 will be sampled for presence or absence of ammocoetes. Where apparently suitable habitat at any site is unoccupied feature condition will be considered unfavourable.	1A-D, 2A, 2B, 6, 7

b) Ammocoete density	Ammocoetes should be present in at least four sampling sites each not less than 5km apart.	This standard CSM attribute establishes a minimum occupied spawning range, within any sampling period, of 15km.	1A-D, 2A, 2B, 6, 7
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Brook lamprey *Lampetra planeri* and River lamprey *Lampetra fluviatilis* :

Performance indicators for feature condition

<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Age/size structure of ammocoete population	Samples < 50 ammocoetes ~ 2 size classes Samples > 50 ammocoetes ~ at least 3 size classes	This gives an indication of recruitment to the population over the several years preceding the survey. Failure of one or more years recruitment may be due to either short or long term impacts or natural factors such as natural flow variability, therefore would trigger further investigation of the cause rather than leading automatically to an unfavourable condition assessment.	All
b) Distribution of ammocoetes within catchment	Present at not less than 2/3 of sites surveyed within natural range No reduction in distribution of ammocoetes	The combined natural range of these two species in terms of ammocoete distribution includes all units above the tidal limit. Presence at less than 2/3 of sample sites will lead to an unfavourable condition assessment. Reduction in distribution will be defined as absence of ammocoetes from all samples within a single unit or sub-unit/tributary, and will lead to an unfavourable condition assessment.	All
c) Ammocoete density	Optimal habitat: >10m ⁻² Overall catchment mean: >5m ⁻²	Optimal habitat comprises beds of stable fine sediment or sand ≥15cm deep, low water velocity and the presence of organic detritus, as well as, in the Wye, shallower sediment, often patchy and interspersed among coarser substrate.	All

Twaite shad *Alosa fallax* and Allis shad *Alosa alosa* :

Performance indicators for feature condition

<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Spawning distribution	No decline in spawning distribution	Spawning distribution is assessed by kick sampling for eggs and/or observations of spawning adults. A representative sample of sites within units 1C and 2A will be monitored at 3 yearly intervals. Absence from any site in 2 consecutive surveys will result in an unfavourable condition assessment.	1A-D, 2A

Performance indicators for factors affecting the feature

a) Flow	Targets are set	Targets equate to those levels agreed and used in	1A-D,
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	in relation to river/reach type(s)	the Review of Consents (see Annex 1). Shad are particularly sensitive to flow. The ideal regime is one of relatively high flows in March-May, to stimulate migration and allow maximum penetration of adults upstream, followed by rather low flows in June-September, which ensures that the juveniles are not washed prematurely into saline waters and grow rapidly under warmer conditions. The release of freshets to encourage salmonid migration should therefore be discouraged on shad rivers during this period.	2A
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Atlantic salmon *Salmo salar* :

Performance indicators for feature condition

Attribute	Specified limits	Comments	Relevant unit(s)
a) Adult run size	Conservation Limit complied with at least four years in five (see 5.4)	CSM guidance states: Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component. As fish counter data in the Wye is considered unreliable (EA pers. comm.), adult run size is calculated using rod catch data. Further details can be found in the EA Wye Salmon Action Plan.	All
b) Juvenile densities	Expected densities for each sample site using HABSCORE	CSM guidance states: These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality. Assessed using electrofishing data.	All except 1A-D, 2A

Performance indicators for factors affecting the feature

Water quality

a) Biological quality	Biological GQA class A	This is the class required in the CSM guidance for Atlantic salmon, the most sensitive feature.	All
b) Chemical quality	RE1	It has been agreed through the Review of Consents process that RE1 will be used throughout the SAC (see Annex 3)	All

Hydromorphology

a) Flow	Targets are set in relation to river/reach type(s)	Targets equate to those levels agreed and used in the Review of Consents (see Annex 1)	All
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Bullhead *Cottus gobio* :

Performance indicators for feature condition

Attribute	Specified limits	Comments	Relevant unit(s)
a) Population densities	No less than 0.2 m ⁻² in	CSM guidance states that densities should be no less than 0.2 m ⁻² in upland rivers (source altitude	All except

	sampled reaches	>100m) and 0.5 m ⁻² in lowland rivers (source altitude ≤100m). A significant reduction in densities may also lead to an unfavourable condition assessment.	1A, 1B
b) Distribution	Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current	Suitable reaches will be mapped using fluvial audit information validated using the results of population monitoring. Absence of bullheads from any of these reaches, or from any previously occupied reach, revealed by on-going monitoring will result in an unfavourable condition assessment.	All except 1A, 1B
c) Reproduction / age structure	Young-of-year fish should occur at densities at least equal to adults	This gives an indication of successful recruitment and a healthy population structure. Failure of this attribute on its own would not lead to an unfavourable condition assessment.	All except 1A, 1B

4.3 Conservation Objective for Feature 6:

- European otter *Lutra lutra* (EU Species Code: 1355)

Vision for feature 6

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

<i>FCS component</i>	<i>Supporting information / current knowledge</i>
4.3.1 <i>The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.</i>	<i>Refer to section 5.9 for current assessment of feature population</i>
4.3.2 <i>The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Wye SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient they should be created through habitat enhancement and where necessary the</i>	<i>Survey information shows that otters are widely distributed in the Wye catchment. However, an assessment of otter breeding habitat has indicated that there may be a shortage of suitable habitat around the middle reaches of the river, which may affect the long-term viability of the population. This should be addressed by habitat enhancement including stock exclusion from suitable woodlands near to the river but outside the floodplain. The decline in eel populations may be having an adverse effect on the population of otters in the Wye.</i>

provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.

- 4.3.3** *The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.*
- Road and bridge improvement schemes within the catchment should take appropriate measures towards achievement of this objective.*

Performance indicators for feature 6

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

<i>Performance indicators for feature condition</i>			
<i>Attribute</i>	<i>Specified limits</i>	<i>Comments</i>	<i>Relevant unit(s)</i>
a) Distribution	Otter signs present at 82-90% of Otter Survey of Wales sites in sub-catchments	Ref: CCW Environmental Monitoring Report No 30 (2006) ⁵	All
b) Breeding activity	Reports of cub/family sightings (no specified limit)	Ref: CCW Environmental Monitoring Report No 30 (2006) ⁵	All
c) Actual and potential breeding sites	No decline in number and quality of mapped breeding sites in sub-catchments. Increase from 5 to 9 sites in Middle Wye sub-catchment (see Ref)	Ref: CCW Environmental Monitoring Report No 30 (2006) ⁵ In the Wye catchment within Wales, 32 actual or potential breeding sites have been identified (19 within the Wye SAC), distributed throughout the catchment on the main river and tributaries. It is recommended that this should increase to at least 40 (23 within Wye SAC) ⁵ . Note: breeding territories typically contain more than one breeding site.	All

4.4 Conservation Objective for Feature 7:

- Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation (EU Habitat Code: 3260)

Vision for feature 7

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

<i>FCS component</i>	<i>Supporting information / current knowledge</i>
4.4.1 <i>The conservation objective for the water course as defined in 4.1 above must be met</i>	
4.4.2 <i>The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term. Suitable habitat and associated plant communities may vary from reach to reach. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions eg. nutrient levels, shade (as described in section 2.2). Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.</i>	<i>Stands of this feature are known to be widespread in the Wye SAC including many of the tributaries. However, further information on its natural range, distribution and variation is desirable. Sympathetic management will be promoted wherever the feature is present.</i> <i>Species indicative of unfavourable condition for this feature eg. filamentous algae associated with eutrophication, invasive non-native species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status within the SAC.</i>
4.4.3 <i>The area covered by the feature within its natural range in the SAC should be stable or increasing.</i>	<i>Adverse factors may include elevated nutrient levels, shading or altered flow and/or sediment regimes.</i> <i>It is possible that reaches with slightly elevated nutrient levels and/or regulated flows may have a higher cover of the feature than under natural conditions, though species composition may also be affected (see 4.4.4)</i>
4.4.4 <i>The conservation status of the feature's typical species should be favourable. The typical species are defined with reference to the species composition of the appropriate JNCC river vegetation type for the particular river reach, unless differing from this type due to natural variability when other typical species may be defined as appropriate.</i>	<i>More information on the typical species expected within each management unit in the SAC is required.</i> <i>The effects of artificial factors such as flow regulation on species composition should be examined eg. river jelly lichen may prefer greater flow variability.</i>

Performance indicators for feature 7

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition			
Attribute	Specified limits	Comments	Relevant unit(s)
a) Distribution within catchment	Distribution within site units	<i>Ranunculus</i> spp. will be present with a cover of at least 10% in any three representative sample 100m stretches of suitable habitat in: [reaches to be confirmed]	All
b) Typical species	Species list for reference vegetation type	Should conform to appropriate JNCC type or other list for site unit as appropriate. Details to be confirmed	All
Performance indicators for factors affecting the feature			
Negative indicators			
a) Native species	Cover of indicators of eutrophication maintained below threshold over the medium to long term	CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals. For the Wye SAC: Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. and <i>Vaucheria</i> spp.) should not have a cover value of greater than 10% in 3 consecutive years in: [reaches to be confirmed]	All
b) Alien / introduced species	No impact on native biota from alien or introduced species	In the CSM guidance, the SERCON scoring system for naturalness of aquatic and marginal macrophytes and naturalness of banks and riparian zone, are used to assess this attribute. SERCON protocols have not been applied in the Wye SAC, therefore assessment of this attribute relies on locally defined thresholds and expert judgement. Details to be confirmed	All

4.2 Conservation Objective for Feature 8:

- White-clawed crayfish *Austropotamobius pallipes* (EU Species Code: 1092)

Vision for feature 8

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

FCS component	Supporting information / current knowledge
4.2.5 <i>The conservation objective for the water course as defined in 4.1 above must be met</i>	

4.2.6 <i>The population of the feature in the SAC is stable or increasing over the long term.</i>	<p><i>Refer to section 5.8 for current assessment of feature population</i></p> <p><i>Presence of non-native crayfish adversely affects population dynamics through competition, predation and introduction of disease (crayfish plague). This is thought to invariably lead to local extinction of white-clawed crayfish. American signal crayfish are present in the Bachawy and Lugg and Arrow sub-catchments (outside the SAC) and have been reported in the Edw.</i></p> <p><i>The release of highly toxic sheep dips into streams has caused mass mortality and local extinction in the SAC from which populations may be very slow to recover.</i></p>
4.2.7 <i>The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms eg. substrate type, water hardness and temperature, and ecosystem structure and functions eg. food supply, absence of invasive non-native competitors (as described in sections 2.2 and 5). Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity will be assessed in view of 4.2.4</i>	<p><i>Some reaches of the Wye SAC are more suitable for some features than others eg. the natural range of white-clawed crayfish may be limited by water hardness and temperature (which may possibly also mediate competition with non-native crayfish to some extent). These differences influence the management priorities for individual reaches and are used to define the site units described in section 3.2. Further details of feature habitat suitability are given in section 5.</i></p> <p><i>Eradication of American signal crayfish, or control of its spread in the Wye catchment is considered essential to the long-term suitability of the SAC for white-clawed crayfish. At present there are no known effective methods for eradication or long-term control of signal crayfish.</i></p> <p><i>Prevention of release of toxic sheep dips and other harmful diffuse pollution into water courses is essential.</i></p>
4.2.8 <i>There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.</i>	<p><i>Invasion of American signal crayfish is likely to make existing habitat in the Wye SAC unsuitable for white-clawed crayfish in the long term. There may be a need to translocate white-clawed crayfish to suitable habitat outside its present (and historic) range.</i></p>

Performance indicators for feature 6

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

White-clawed crayfish <i>Austropotamobius pallipes</i> : Performance indicators for feature condition			
Attribute	Specified limits	Comments	Relevant unit(s)
a) Adult/juvenile densities	Abundance in habitat patches above threshold	Average number of crayfish in each habitat patch surveyed by stone turning and trapping combined should be greater than 1 ⁹ .	3, 4, 5, 6
b) Distribution	Distribution in suitable reaches (monitoring units)	Suitable reaches within the relevant management units will be mapped using fluvial audit information validated with historic data and the results of population monitoring. Absence of white-clawed crayfish from any of these reaches revealed by on-going monitoring will result in an unfavourable condition assessment.	3, 4, 5, 6
Performance indicators for factors affecting the feature			
Negative indicators			
a) Invasive non-native crayfish	Absence of non-native crayfish from the SAC	Collation of <i>ad hoc</i> records of non-native crayfish in the Wye catchment and adjacent areas and monitoring in conjunction with control programmes using trapping.	All
b) Porcelain disease in white-clawed crayfish	Incidence <10%	Incidence to be recorded during population monitoring.	3, 4, 5, 6

4.4 Conservation Objective for Feature 9: - Quaking bogs and transition mires (EU Habitat Code: 7410)

Vision for feature 9

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

FCS component	Supporting information / current knowledge
4.4.5 <i>The conservation objective for the water course as defined in 4.1 above must be met</i>	
4.4.6 <i>The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where near-natural hydrological and geomorphological processes and landforms favour the development of this habitat. The feature need not be present in all suitable locations in the SAC but where present must be secured for the foreseeable future.</i>	<i>This feature is represented within the SAC at Colwyn Brook Marshes SSSI. Other locations with similar habitat within and adjacent to the SAC are not considered to qualify as examples of this feature e.g. Waen Rhyd SSSI, but may have similar management requirements.</i> <i>Species indicative of unfavourable condition for this feature eg. invasive native trees and shrubs and non-native species, should be maintained or restored below an acceptable threshold level, indicative of high ecological status within the SAC.</i>
4.4.7 <i>The area covered by the feature within its natural range in the SAC should be stable or increasing.</i>	<i>Adverse factors may include elevated nutrient levels or altered hydrological processes through drainage or groundwater abstraction.</i>
4.4.8 <i>The conservation status of the feature's typical species should be</i>	<i>More information on the typical species expected within each management unit is required. Details</i>

favourable. The typical species are defined with reference to the species composition of the appropriate NVC type(s), unless differing from this type due to natural variability/local distinctiveness when other typical/indicator species may be defined as appropriate.

to be confirmed

Performance indicators for feature 9

The performance indicators are part of the conservation objective, not a substitute for it. Assessment of plans and projects must be based on the entire conservation objective, not just the performance indicators.

Performance indicators for feature condition			
Attribute	Specified limits	Comments	Relevant unit(s)
a) Habitat extent	No reduction in total extent	This would be indicative of drying out due to a change in hydrological processes/wetland structure & function.	9
b) Habitat composition	No significant increase in woodland/scrub	This would be indicative of drying out due to a change in hydrological processes/wetland structure function and/or vegetation succession due to a change in grazing pressure.	9
c) Habitat structure	Cover of exposed substrate/litter	May indicate either over- or under-grazing.	9
d) Vegetation composition	Indicator species presence/frequency for reference vegetation type(s). No significant reduction in key type(s)	Should conform to appropriate NVC type(s) and/or locally defined vegetation composition criteria as appropriate. Shifts in vegetation composition may indicate change in hydrology, nutrient status and/or grazing pressure. Details to be confirmed	9
Performance indicators for factors affecting the feature			
Negative indicators			
a) Native species	Cover of indicators of under-grazing, drainage, eutrophication or disturbance maintained below threshold	May include graminoids such as <i>Phragmites australis</i> , <i>Phalaris arundinacea</i> , <i>Glyceria maxima</i> , <i>Typha latifolia</i> , <i>Juncus</i> spp., <i>Molinia caerulea</i> ; tall herbs such as <i>Epilobium hirsutum</i> , <i>Urtica dioica</i> , <i>Pteridium aquilinum</i> , <i>Rubus fruticosus</i> ; bryophytes such as <i>Brachythecium rutabulum</i> , <i>Eurhynchium praelongum</i> , <i>Sphagnum recurvum</i> ; tree and shrub spp. (CSM Lowland fens guidance)	9
b) Invasive non-native species	No impact on native biota from invasive non-native or introduced species	Possible invasive non-natives include New Zealand swamp-stonecrop <i>Crassula helmsii</i> : although not recorded at the site, any records should be verified and followed up with control measures.	9

European Site Conservation Objectives for Chew Valley Lake Special Protection Area Site Code: UK9010041

With regard to the individual species and/or assemblage of species for which the site has been classified ('the Qualifying Features' listed below);

Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive.

Subject to natural change, to maintain or restore:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The populations of the qualifying features;
- The distribution of the qualifying features within the site.

Qualifying Features:

A056 *Anas clypeata*; Northern shoveler (Non-breeding)

Explanatory Notes: European Site Conservation Objectives

European Site Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”) and Article 6(3) of the Habitats Directive 1992. They are for use when either the appropriate nature conservation body or competent authority is required to make an Appropriate Assessment under the relevant parts of the respective legislation.

These conservation objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Birds Directive for those features. On the first page of this document there may be a list of ‘Additional Qualifying Features identified by the 2001 UK SPA Review’. These are additional features identified by the UK SPA Review published in 2001 and, although not yet legally classified, are as a matter of Government policy treated in the same way as classified features.

This document is also intended for those who are preparing information to be used for an appropriate assessment by either the appropriate nature conservation body or a competent authority. As such this document cannot be definitive in how the impacts of a project can be determined. Links to selected sources of information, data and guidance which may be helpful can be found on Natural England’s website. This list is far from exhaustive.

Appendix B

Appropriate Mitigation Measures

B1 **Appropriate Mitigation Measures**

Appropriate Mitigation Measures

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
Habitat loss and/or fragmentation	<p>Wherever possible, return topsoil, subsoil and mulched vegetation to approximately the same area from which it was removed maintaining the soil profile.</p> <p>The erection of all protective fencing will be undertaken prior to the commencement of any site works for vegetation which will not be removed.</p> <p>The number of trees to be removed will be minimised and all trees to be retained will be afforded protection.</p> <p>Clearance of vegetation along the proposed route will take place outside of the breeding bird season (1st March to 31st August) in accordance with the Wildlife and Countryside Act (1981). To compensate for the loss of habitat for bird species, landscaping proposals will primarily entail the use of native trees and shrubs.</p>	<p>The landscape design will use primarily native species and aim to recreate mixed species hedgerows and grasslands to compensate for the loss of the habitat.</p> <p>Provision of a purpose-built structure as alternative roosts for bats/birds.</p> <p>Provision of alternative feeding sites (e.g. lakes, ponds, woodland). There may be a requirement to manage the surrounding habitat to provide mitigation for losses in feeding areas. All plants used in this measure should be of local stock and native species should be employed wherever possible.</p> <p>Large culverts may have a dual function in maintaining wildlife corridors for otters and badgers.</p>
Loss of breeding and resting places, swarming areas and roosts	<p>Prior to the removal of any trees that have potential to support roosting bats a bat box scheme will be erected in close proximity to those trees scheduled for removal. These works will be done a minimum of 6 months in advance of planned tree felling/demolition to allow bats to become accustomed to new roosting opportunities in the area.</p> <p>The felling of all trees, which have been identified as potential bat roosts shall be supervised by a bat specialist holding a bat handling licence.</p>	<p>Enhancement areas will be replanted with native species to re-create habitats lost as a result of the road development.</p> <p>Provision of a purpose-built structure as alternative roosts for bats/birds.</p> <p>Provision of alternative feeding sites (e.g. lakes, ponds, woodland). There may be a requirement to manage the surrounding habitat to provide mitigation for losses in feeding areas. All plants used in this</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
		measure should be of local stock and native species should be employed wherever possible.
Damage to flightlines between roosting and foraging	Bright lighting creates a barrier to commuting bats so lighting will be minimised and designed appropriately along the proposed route during construction.	<p>Provision of a 'green bridge' or underpass with associated planting. A green bridge with specific modifications crossing over the new road may allow bats to continue to cross close to well-established commuting points.</p> <p>Provide hedgerows/linear features on either side of road that form a closed canopy to provide a community route.</p> <p>Bright lighting creates a barrier to commuting bats so lighting will be minimised and designed appropriately along the proposed route during operation.</p> <p>Use of close planting of tall vegetation to encourage a higher flight line.</p> <p>The incorporation of a carefully designed underpass will also allow bats to gain access to either side of the road. This may range in size from a 1.5m concrete pipe or box culvert up to a 4m wide structure.</p>
Air quality changes	<ul style="list-style-type: none"> • A dust minimisation plan created for construction; • Erect effective barriers around dusty activities or the site boundary; • Plan site layout machinery and dust causing activities should be located away from sensitive receptors; • Wash or clean all vehicles effectively before leaving the site 	No mitigation measures will be required for air quality in the operational phase of the scheme.

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
	<p>if close to sensitive receptors;</p> <ul style="list-style-type: none"> • Minimise dust generating activities; • Use water as dust suppressant where applicable; • Sweep or remove sediment from paved or sealed areas regularly; • Avoid blasting or earthworks on windy days 	
<p>Changes in water quality and flow</p>	<p>Protect and maintain site erosion control measures to prevent/reduce changes to hydrological conditions, such as:</p> <ul style="list-style-type: none"> • replacing temporary cut-off drains at the end of the day's work; • minimise exposed soil and slopes; • avoid damage to erosion control measures; • replace damaged erosion control measures, including silt fences; • a continuous bund will be built 10m from rivers/stream to control suspended soils laden runoff from construction; • road runoff is to go through a stilling process to allow suspended solids to settle out (this may be in open ditches, ponds, hydrodynamic separators, etc.); • work near surface water features will be carried out during drier months where possible; • should the need for borrow pits arise, move the borrow pit to >500m from a private water supply and >200m from a stream / river to mitigate impact by avoidance; • If excavations and borrow pits are being backfilled, ensure that the backfill is of "natural" ground origin, is of local origin and is inert in relation to leaching and mixing with underlying groundwater; 	<p>Water quality monitoring throughout the operational lifetime of scheme.</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
	<ul style="list-style-type: none"> Oil interceptors will be provided in order to prevent runoff of pollutants to rivers. <p>Other ways to prevent pollutants leaking into the water environment:</p> <ul style="list-style-type: none"> sand trap fencing; brush layering/mulching; spray on stabilisers (e.g. hydromulch); walkways and boardwalks; matting or mesh laid over traffic areas; sand bagging/gabions. 	
<p>Changes in hydrological conditions</p>	<p>Protect and maintain site erosion control measures to prevent/reduce changes to hydrological conditions, such as:</p> <ul style="list-style-type: none"> replacing temporary cut-off drains at the end of the days' work minimise exposed soil and slopes; avoid damage to erosion control measures; replace damaged erosion control measures, including silt fences; temporary bunds and straw bales; ensure the works drain to the erosion/sedimentation control structures; road runoff is to go through a stilling process to allow suspended solids to settle out (this may be in open ditches, ponds, hydrodynamic separators, etc.); If excavations and borrow pits are being backfilled, ensure 	<p>The road design layout proposed has been selected to ensure it does not cause flooding either upstream or downstream of the road crossing.</p> <p>A programme of inspection, auditing and maintenance of the road scheme drainage and water quality pollution control system will be undertaken for the scheme.</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
	<p>that the backfill is of “natural” ground origin, is of local origin and is inert in relation to leaching and mixing with underlying groundwater;</p> <ul style="list-style-type: none"> • should the need for borrow pits arise, move the borrow pit to >500m from a private water supply and >200m from a stream / river to mitigate impact by avoidance; <p>Other ways to prevent pollutants leaking into the water environment:</p> <ul style="list-style-type: none"> • sand trap fencing; • brush layering/mulching; • spray on stabilisers (e.g. hydromulch); • walkways and boardwalks; • matting or mesh laid over traffic areas; • sand bagging/gabions. 	
Disturbance of species caused by humans and vehicles	<p>Ensure site staff trained to understand disturbance and take measures to avoid it.</p> <p>Control of the movement of construction plant within the site, to ensure that the minimum area of ground would be disturbed outside the footprint of the works.</p> <p>Screening of sensitive areas during construction.</p>	<p>There are a wide variety of wildlife underpasses and overpasses that offer safe crossing opportunities for wildlife. Examples of underpasses include culverts and open span bridges where animals cross under the road. Overpasses may consist of road tunnels dug into the earth or human-made, naturalistic bridges where animals cross over the road.</p> <p>Specialised fencing which can be used to protect animals such as deer and badgers either by preventing access to roads or by channelling animals towards safe crossing points such as tunnels.</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
		<p>Wildlife fencing in combination with wildlife overpasses or underpasses may reduce wildlife-vehicle collisions for large species.</p> <p>Screening of sensitive areas during operation.</p>
Noise and vibration disturbance to species	<p>Noise and vibration mitigation measures which could be implemented during construction are the following:</p> <ul style="list-style-type: none"> • select the quietest available equipment and maintain noise reducing equipment (e.g. mufflers); • no machine which uses the dropping of heavy weights for the purpose of demolition shall be permitted; • locate stationary noise sources distant from sensitive areas; • select delivery and off-site haul routes to reduce impact on sensitive receptors; • plan low impact blasts; • monitor noise and vibrations in sensitive areas; • use of noise barriers such as an earth berm along the side of the motorway consisting of a masonry wall or earthwork, or a combination thereof; • work not carried out while species present; • no use of rock blasting techniques; • monitoring of noise levels during construction maybe required; • ground vibration from additional traffic due to the development under consideration would be expected to be orders of magnitude less than that required to cause 	<p>Noise levels are not to be expected to exceed threshold values therefore no further remedial measures are required.</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
	disturbance to species.	
Visual and lighting disturbance to species	<ul style="list-style-type: none"> No night time working; All staff and subcontractors will be made aware of the issue of lighting associated with construction works; The amount of lighting will be kept to the minimum necessary for construction; Light will be screened/hooded to the extent possible so they are restricted to the immediate work area. 	No mitigation measures will be required for visual and lighting disturbance to species in the operational phase of the scheme.
Physical restrictions to species movements	<p>Avoidance of times when species moving through are, for instance no night time working when nocturnal species are commuting.</p> <p>Design of the construction area to allow species to pass through to avoid physical restriction to species movements.</p> <p>Provision of specially designed fencing around construction works to avoid species being trapped on site</p>	There are a wide variety of wildlife underpasses and overpasses that offer safe crossing opportunities for wildlife. Examples of underpasses include culverts and open span bridges where animals cross under the road. Overpasses may consist of road tunnels dug into the earth or human-made, naturalistic bridges where animals cross over the road.
Wildlife vehicle collisions leading to casualties	Provision of wire-mesh fencing around construction works.	<p>There are a wide variety of wildlife underpasses and overpasses that offer safe crossing opportunities for wildlife. Examples of underpasses include culverts and open span bridges where animals cross under the road. Overpasses may consist of road tunnels dug into the earth or human-made, naturalistic bridges where animals cross over the road.</p> <p>Specialised fencing which can be used to protect animals such as deer and badgers either by preventing access to roads or by channelling animals towards safe crossing points such as tunnels.</p>

Potential Effect	Appropriate mitigation measures during construction	Appropriate mitigation measures during operation
		Wildlife fencing in combination with wildlife overpasses or underpasses may reduce wildlife-vehicle collisions for large species.

Appendix C

Matrix of Potential Effect on Qualifying Features

C1 Matrix of Potential Effect on Qualifying Features

Matrix of Potential Effect on Qualifying Features

Effect	Habitats	Non-mobile species (e.g. plants)	Mobile species (excluding birds/bats)	Bats	Birds	Comments
Habitat loss fragmentation, including effects on foraging areas (construction)	Direct loss of area, loss of integrity and/or function of habitat, or changes in quality or connectivity within area	Not assessed separately from habitat loss as species dependent on presence of habitat	Not assessed separately from habitat loss as species dependent on habitat being present	Not assessed separately from habitat loss as species dependent on habitat being present	Not assessed separately from habitat loss as species dependent on habitat being present	For species effects see also assessment under loss of breeding areas, hibernacula etc; and changes to flight lines between roosting/feeding areas, which link into use of habitat areas
Loss of breeding areas, hibernacula etc. (construction)	N/A	N/A	Loss of habitat suitable for breeding	Loss of features used for roosting, breeding, hibernacula and swarming	Loss of breeding areas	
Damage to flight lines between roosting/feeding areas etc. (construction)	N/A	N/A	Changes to flight lines which affects ability to access roosts, breeding and feeding areas	Changes to flight lines which affects ability to access roosts, breeding and feeding areas and hibernacula	Changes to flight lines which affects ability to access roosts, breeding and feeding areas	Change relates to changes in physical environment caused by construction. See also physical restrictions to species movements; and noise and vibration disturbance; and visual and lighting disturbance

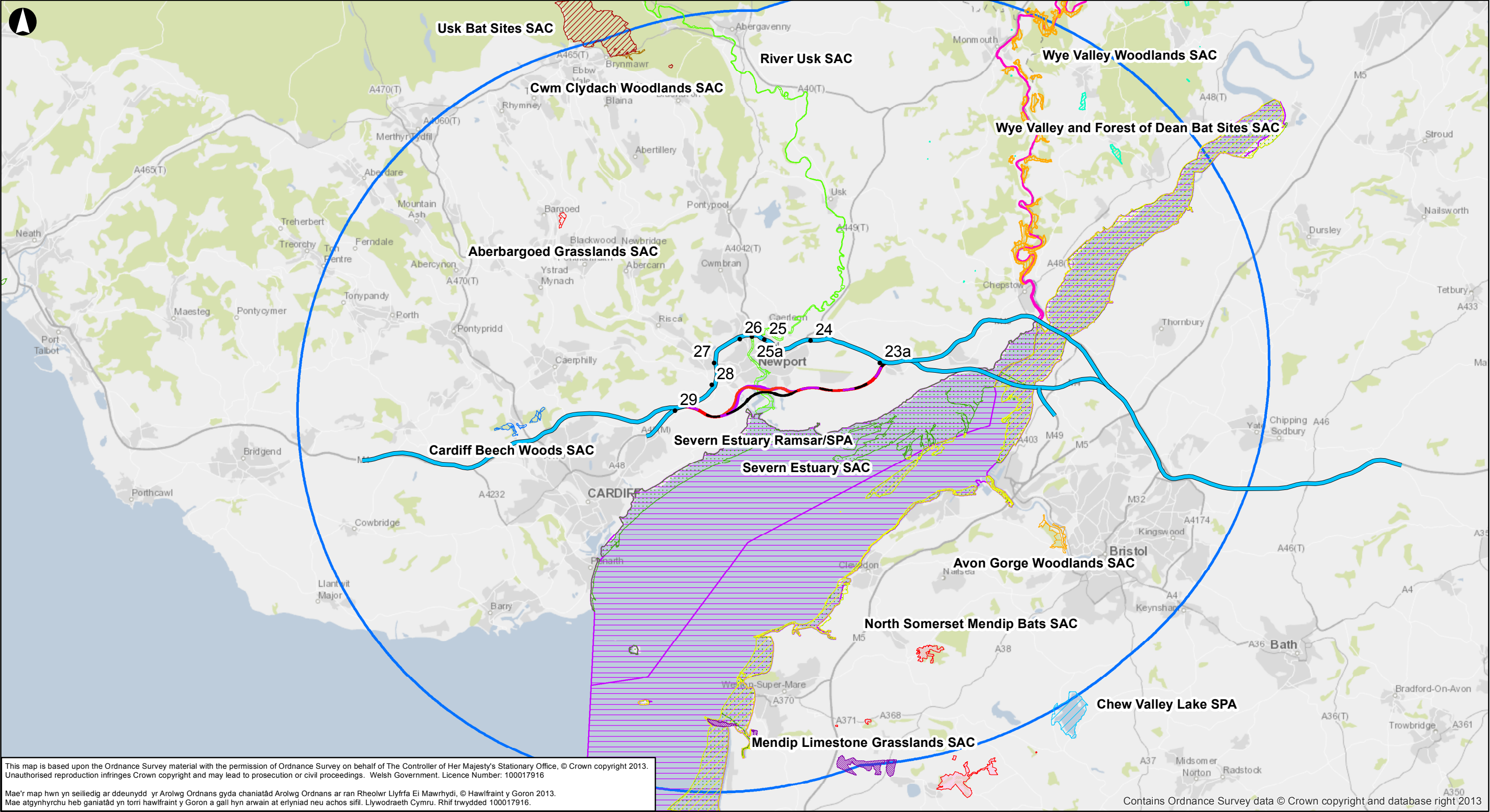
Air quality changes (construction and operation)	Risk of increase in deposition of nitrogen; or acidification	Not assessed separately from habitat loss	Risk of changes to habitats used due to relevant types of air pollution	Risk of changes to habitats used due to relevant types of air pollution	Risk of changes to habitats due to relevant types of air pollution	Changes in deposition usually found in close proximity to site
Water quality/flow changes (construction and operation)	Risk of change in habitat in sites due to relevant types of water pollution; or reduction or increase in water flows	Not assessed separately from changes to habitats	Risk of changes to habitats used due to relevant types of water pollution; or reduction or increase in water flow	Risk of changes to habitats used due to relevant types of water pollution; or reduction or increase in water flow	Risk of changes to habitats used due to relevant types of water pollution; or reduction or increase in water flow	Changes usually found in close proximity to site
Changes in hydrology (construction and operation)	Change to water levels on sites which support particular habitats	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	
Changes to habitat structure (construction)	Change to structure of habitat in site caused by physical intervention such as vegetation removal during construction	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	Not assessed separately from changes to habitat	
Disturbance to species (construction)	N/A	Not assessed separately from habitat loss and changes to habitat structure	Direct effects on resting/roosting species, including risk of causing death	Direct effects on resting/roosting species, including risk of causing death	Direct effects on resting/roosting species, including risk of causing death	Changes usually found in close proximity to site
Noise and vibration disturbance (construction and operation)	N/A	N/A	Disturbance likely to cause change in behaviour or use of habitats	Disturbance likely to cause change in behaviour or use of habitats	Disturbance likely to cause change in behaviour or use of habitats	Behaviour includes that carried out by species through their lifecycles. Changes usually found in close proximity to the element

Visual and lighting disturbance (construction and operation)	N/A	N/A	Disturbance likely to cause change in behaviour or use of habitats	Disturbance likely to cause change in behaviour or use of habitats	Disturbance likely to cause change in behaviour or use of habitats	Changes usually found in close proximity to the element
Physical restrictions to species movements (construction and operation)	N/A	N/A	Risk of movement of species (e.g. fish or otter) blocked with no alternative	N/A	N/A	Changes usually found in close proximity to the element
Wildlife vehicle collisions (operation)	N/A	N/A	Risk of vehicle collisions if behaviour, including territorial and breeding behaviour, is known to bring the species into potential conflict	Risk of vehicle collisions if behaviour is known to bring the species into potential conflict	Risk of vehicle collisions if behaviour is known to bring the species into potential conflict	

Appendix D

Figure showing European
Designated Sites

D1 Figure showing European Designated Sites



Legend

- M4
- Black Option
- Purple Option
- Red Option
- 30km Buffer
- Severn Estuary Ramsar
- Chew Valley Lake SPA
- Severn Estuary SPA
- Aberbargoed Grasslands SAC
- Cardiff Beech Woods SAC
- Cwm Clydach Woodlands / Coedydd Cwm Clydach SAC
- River Usk / Afon Wysg SAC
- River Wye / Afon Gwy
- Severn Estuary

- Usk Bat Sites / Safleoedd Ystlumod Wysg SAC
- Wye Valley Woodlands / Coetiroedd Dyffryn Gwy
- Wye Valley and Forest of Dean Bat Sites / Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena
- Avon Gorge Woodlands SAC
- Mendip Limestone Grasslands SAC
- North Somerset & Mendip Bats SAC

P1	2013-08-05	JE	TM	HP
Issue	Date	By	Chkd	Appd

Client



Llywodraeth Cymru
Welsh Government

Transport
Local Government and Communities
Welsh Government
Cathays Park
Cardiff
CF10 3NQ

Trafnidiaeth
Llywodraeth Leol a Chymunedau
Llywodraeth Cymru
Parc Cathays
Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport

Drawing Title

European Designated Sites

ARUP

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Metres
0 2,625 5,250 10,500
Scale at A3
1:300,000

Job No
117300-00
Drawing Status
Preliminary

Drawing No
HRA 01
Issue
P1

Appendix E

Results

E1 Results

Results

Glossary

CCW	Countryside Council for Wales
EA	Environmental Agency
HRA	Habitats Regulation Assessment
LDP	Local Development Plan
NP	National Park
RTP	Regional Transport Plan
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SPA	Special Protection Area
SWRSS	South West Regional Spatial Strategy
VoG	Vale of Glamorgan
WSPU	Wales Spatial Plan Update
WTS	Wales Transport Strategy

Welsh Special Area of Conservation sites within 30km of options

Site Name: Aberbargoed Grasslands SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	Marsh Fritillary Molinia Meadows on calcareous, peaty or clayey-silt laden soils
3 Conservation Objectives	Marsh Fritillary Density of larval webs Extent of habitat Condition of habitat Molinia Meadows Extent of grassland Condition of grassland
4 List of relevant options	No options associated with this site. The site is situated north west approximately 27km from the options.
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Caerphilly LDP, Cardiff LDP, Torfaen LDP, SE Wales RTP
10 List of effects noted in other plans and projects considered as relevant for site	WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy. The key actions associated with the WSPU and in combination with other plans that may affect European sites are:

Site Name: Aberbargoed Grasslands SAC	
	<p>Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The HRA of the Caerphilly LDP identified potential air quality issues resulting from an expanding population within and around Bargoed/ Aberbargoed. Atmospheric pollution arising from a growth in traffic and transport and general development (emissions from construction/ building stock) which has the potential to affect this site.</p> <p>The HRA of the Cardiff LDP identified potential for air quality effects. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at this site.</p> <p>The HRA of the Torfaen LDP identified potential for air pollution from new developments on the SAC.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality - nitrogen deposition and acidification Water abstraction and water pollution Urban and economic development activities Recreation and tourist pressures Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: Cardiff Beech Woods SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site:</p> <p>Asperulo-fagetum beech forest (EU Habitat Code 9130)</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>1. Tilio-acerion forest of slopes, screes and ravines (EU Habitat Code 9180)</p>
3 Conservation Objectives	<p>Asperulo-fagetum beech forest</p> <p>A1: Extent</p> <p>A2: Quality</p> <p>A3: Canopy Cover</p> <p>A4: Viable Saplings</p> <p>A5: Advanced regeneration</p> <p>A6: Species composition</p> <p>A7: Age Structure</p> <p>A8: Ground Flora Species</p> <p>A9: Dead Wood</p> <p>A10: Evidence of browsing</p> <p>A11: Evidence of bark stripping by squirrels</p> <p>Tilio-acerion forest of slopes, screes and ravines</p> <p>A1: Extent</p> <p>A2: Quality</p> <p>A3: Canopy Cover</p> <p>A4: Viable Saplings</p> <p>A5: Advanced regeneration</p> <p>A6: Species composition</p> <p>A7: Age structure</p> <p>A8: Ground flora species</p> <p>A9: Dead wood</p> <p>A10: Evidence of browsing</p> <p>A11: Evidence of bark stripping by squirrels</p>
4 List of relevant options	No options associated with this site. Nearest draft Plan option, Junction 29 of Red, Black and Purple route is approximately 12km east of the site.
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<p>It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways</p> <p>Changes to air quality</p>
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	<p>The nearest draft Plan option is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are</p>

Site Name: Cardiff Beech Woods SAC	
	outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Caerphilly LDP, Cardiff LDP, VoG LDP, SE Wales RTP,
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are:</p> <p>Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The HRA of the Caerphilly LDP identified potential air quality issues resulting from an expanding population within and around Bargoed/ Aberbargoed. Atmospheric pollution arising from a growth in traffic and transport and general development (emissions from construction/ building stock) which has the potential to affect this site.</p> <p>The HRA of the Cardiff LDP identified potential for air quality effects. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at this site.</p> <p>The HRA of the VoG LDP identifies the site is already subject to high levels of air pollution, and any further development should seek to have positive impact on the site.</p>
11 List of potential effects of element (s) in combination with other plans and projects	Air quality Water abstraction and water pollution Urban and economic development activities Recreation and tourist pressures Provision of energy and transport infrastructure
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after	No likelihood of significant effects

Site Name: Cardiff Beech Woods SAC	
mitigation	

Site Name: Cwm Clydach Woodlands SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site: Asperulo – Fagetum beech forests</p> <p>Annex I habitats that are a primary reason for selection of this site: 1. Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)</p>
Conservation Objectives	<p>Asperulo – Fagetum beech forests</p> <p>A1. Extent and distribution A2. Canopy cover A3. Canopy composition A4. Regeneration A5. Ground flora A6. Dead Wood</p> <p>Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)</p> <p>A1. Extent and distribution A2. Canopy cover A3. Canopy composition A4. Regeneration A5. Ground flora A6. Dead Wood</p>
4 List of relevant draft Plan elements	No options associated with this site. The site is situated north west approximately 25km from the Red, Purple and Black routes.
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A

8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Site Name: Cwm Clydach Woodlands SAC	
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Blaenau Gwent LDP, Monmouthshire LDP, Caerphilly LDP, Torfaen LDP, SE Wales RTP
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are: Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The HRA of the Blaenau Gwent LDP identified the following potential impacts arising as a result of the screened in policies:</p> <p>Airborne pollution as a result of increased traffic, new housing development and employment; Increased water extraction; Increased dumping of domestic and commercial waste; and Recreational pressure.</p> <p>The HRA of Monmouthshire LDP identified potential impacts from developments on air quality, particularly from increased traffic.</p> <p>The HRA of the Caerphilly LDP identified potential air quality issues resulting from an expanding population within and around Bargoed/ Aberbargoed. Atmospheric pollution arising from a growth in traffic and transport and general development (emissions from construction/ building stock) which has the potential to affect this site.</p> <p>The HRA of the Torfaen LDP identified potential air pollution impacts on the SAC as a result of its proximity to the A465.</p> <p>The SEA of the SE Wales RTP expects that</p>

	the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future
Site Name: Cwm Clydach Woodlands SAC	
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality – nitrogen disposition and acidification</p> <p>Water abstraction and water pollution</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: River Usk SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachium</i> vegetation</p> <p>Annex II species that are a primary reason for selection of this site: Sea lamprey Brook lamprey River lamprey Twaite shad Atlantic salmon Bullhead Otter</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection: Allis shad</p>
3 Conservation Objectives	Ecological status of the watercourse, including waterflows, river morphology, habitat quality and distribution
4 List of relevant options	<p>The site is situated approximately 0km of the Red, Purple and Black routes. However there could be downstream effects from the following options;</p> <p>Draft Plan: Black Route Reasonable Alternative: Red Route Reasonable Alternative: Purple Route No effects associated with complementary measure M48 – B4245 Link as approximately 10km from site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<ul style="list-style-type: none"> -Habitat loss fragmentation -Loss of breeding areas, hibernacula etc. -Air quality changes -Water quality and flow changes barrier to migration from piers within river channel -Changes to habitat structure -Noise and vibration disturbance -Visual and lighting disturbance -Wildlife vehicle collisions
6 Likelihood of significant effects (from the M4 CEMs) on conservation objectives – before mitigation	<p><u>Sea lamprey, River Lamprey, Twaite shad, Atlantic salmon, Allis shad:</u></p> <p>-Habitat loss fragmentation barrier due to</p>

Site Name: River Usk SAC

migration from caused by piers within river channel– likely of significant effect during construction

- Loss of breeding areas, hibernacula etc.as a result of barrier to migration – likely of significant during construction
- Air quality changes - Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment
- Water quality and flow changes barrier to migration from piers within river channel – likely of significant effect during construction and operation
- Changes to habitat structure – no pathway
- Noise and vibration disturbance- certain species are sensitive to noise and vibration such that migration could be inhibited – likely of significant effect during construction
- Visual and lighting disturbance – no pathway
- Wildlife vehicle collisions – no pathway

Bullhead and Brook lamprey:

- Habitat loss fragmentation barrier due to migration- No pathway – feature only present in upstream areas
- Loss of breeding areas, hibernacula etc. no pathway – feature only present in upstream
- Air quality - Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment
- Water quality and flow changes - no pathway – feature only present in upstream areas
- Changes to habitat structure – no pathway – feature only present in upstream areas
- Noise and vibration disturbance- no pathway – feature only present in upstream areas
- Visual and lighting disturbance – no pathway – feature only present in upstream areas
- Wildlife vehicle collisions – no pathway – feature only present in upstream areas

European otters:

- Habitat loss fragmentation - Temporary restriction in movement during construction
- Loss of breeding areas, hibernacula etc.- If present in area of construction may be significant during construction
- Air quality changes - No pathway
- Water quality and flow changes – No pathway

Site Name: River Usk SAC	
	<p>-Changes to habitat structure – No pathway</p> <p>- Noise and vibration disturbance – Deterring movement of otters through construction zone</p> <p>-Visual and lighting disturbance – Deterring movement of otters through construction zone.</p> <p>-Wildlife vehicle collisions – Assume no pathway as underpasses and fencing would be installed on a new road in line with DMRB</p> <p><u>Watercourses</u></p> <p>-Habitat loss fragmentation - No pathway – feature only present in upstream areas</p> <p>-Loss of breeding areas, hibernacula etc.- No pathway – feature only present in upstream areas</p> <p>-Air quality changes - Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment</p> <p>-Water quality and flow changes – No pathway – feature only present in upstream areas</p> <p>-Changes to habitat structure – No pathway – feature only present in upstream areas</p> <p>- Noise and vibration disturbance – No pathway – feature only present in upstream areas</p> <p>-Visual and lighting disturbance – No pathway – feature only present in upstream areas.</p> <p>-Wildlife vehicle collisions – No pathway</p>
Avoidance and mitigation measures	<p><i>Fish Species:</i></p> <ul style="list-style-type: none"> •Habitat loss fragmentation – avoid areas which are important to the species. If necessary use natural forces to move habitats. • Loss of breeding areas, hibernacula etc. – as Habitat loss above. • Water quality and flow changes – water quality and flow control and monitoring to EA standards • Changes to habitat structure – see habitat loss above. • Disturbance to species – method of construction and timing of works, barrier around important areas. • Noise and vibration disturbance – as disturbance above. • Visual and lighting disturbance – no night time working and location/design of lights

Site Name: River Usk SAC	
	<p><i>Otters :</i></p> <ul style="list-style-type: none"> •Wildlife vehicle collisions (otters only) – fencing and underpasses •Loss of breeding areas - avoid areas which are important to the species. If necessary use natural forces to move habitats
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	<p>There would be a likely impact on fish species and water courses of plain to plain to montane levels with the Ranunculus fluitans and Callitriche-Batrachion vegetation.</p> <p>There is a likelihood of significant effects. Carry forward to Appropriate Assessment</p>
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, , Newport LDP, Monmouthshire LDP, Brecon Beacons NPMP and LDP, Torfaen LDP, Caerphilly LDP, SE Wales RTP
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are: Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The findings of the HRA of Revised Newport LDP indicate that the Revised Newport City Council Deposit LDP in implementation will not have a likely significant effect on the European sites considered as part of the HRA screening alone or in combination and will not require full AA under the Habitats Regulations.</p> <p>The HRA of the Monmouthshire LDP has</p>

Site Name: River Usk SAC	
	<p>identified the plan could adversely affects this SAC through increased pressure on natural resources, particularly water, recreational resources, green space, and air quality.</p> <p>The HRA of the Caerphilly LDP recognised that the plan could have potential effects on this SAC as a result of policies that could lead to urbanisation impacts and recreation, land take, water resources and water quality and atmospheric pollution.</p> <p>The HRA of the Torfaen LDP identified potential for air pollution effects on this SAC from new developments.</p> <p>The HRA of the Brecon Beacons NP LDP recognised that this SAC could be affected by the housing and employment allocations proposed in the Park. Potential effects include recreational pressure on the land, atmospheric pollution, water quality and water resources.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Water quality</p> <p>Air quality</p> <p>Habitat loss</p> <p>Disturbance</p> <p>Water abstraction and water pollution</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects considered not significant
13 Mitigation measures in draft Plan s and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects
15 Review of description of elements	<p>Draft Plan:</p> <p>Black Route - a new 3-lane motorway mainly following the protected TR 111 'Black Route', between Junctions 23 and 29, including a new crossing of the River Usk south of Newport.</p> <p>Reasonable Alternative:</p> <p>Red Route – Dual 2-lane all-purpose road to</p>

Site Name: River Usk SAC	
	<p>the south of Newport</p> <p>Reasonable Alternative:</p> <p>Purple Route – a 3-lane motorway route along alternative alignment to the South of Newport</p> <p>Complementary Measure (addition to Red, Black and Purple Route):</p> <p>M48 – B4245 Link is a new single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23a and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.</p>
16 Review of site based information	<p>The River Usk SAC rises in the Black Mountain range in the west of the Brecon Beacons National Park and flows east and then south, to enter the Severn Estuary at Newport.</p> <p>The underlying geology consists predominantly of Devonian Old Red Sandstone with a moderate base status, resulting in waters that are generally well buffered against acidity. This geology also produces a generally low to moderate nutrient status, and a moderate base-flow index, intermediate between base-flow dominated rivers and more flashy rivers on less permeable geology.</p> <p>Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers.</p> <p>Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats.</p> <p>Habitat connectivity is an important property of river ecosystem structure and function.</p>

Site Name: River Usk SAC	
	<p>Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream.</p> <p>External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.</p>
17 Review of baseline information	<p>Brook lamprey - The Usk in south Wales supports a healthy population of brook lamprey and is considered to provide exceptionally good quality habitat likely to ensure the continued survival of the species in this part of the UK.</p> <p>Sea lamprey - Survey of juveniles and observation of spawning adults indicates that this species is mainly restricted to the lower reaches of the catchment.</p> <p>Twaite shad and Allis Shad- The Usk is one of only four sites in the UK where a known breeding population of twaite shad occurs (the Rivers Wye and Tywi are other SAC sites). Water quality and quantity are considered favourable for this species. The main channel is largely unmodified and a variety of aquatic habitats are present, including good quality spawning gravels and deep pools used for cover by adults and fry. However, Trostrey and Rhadyr Weirs may be a barrier to shad migration under low flow conditions.</p> <p>Bullhead - The Usk represents bullhead <i>Cottus gobio</i> in the southern part of its range in Wales. It is considered to have exceptionally high-quality habitat with good water quality, abundant cover and a variety of aquatic habitats. Bullhead are widespread throughout the Usk system.</p> <p>European Otter - They are believed to be using most parts of the main river, from Newport upstream, and in recent years signs of otters have increased. In 1991 an expansion upstream of known otter ranges was recorded on several tributaries, including the Honddu, Senni and Crai. The upper Usk</p>

Site Name: River Usk SAC	
	may have acted as a 'refuge' during the decline of the 1950s, and had subsequently acted as a 'source' population for recolonisation of south-east Wales.
18 Review of potential impacts	No change from information provided
19 Review of "in combination" projects or plans information	The screening stage identified no likelihood of significant "in combination" effects from projects or plans.
20 Assessment findings for site	<p><u>Sea lamprey, River lamprey, Twaite shad, Atlantic salmon, Allis shad:</u></p> <p>The effects of road construction during the construction stages may indirectly and directly affect the habitat quality of the fish species. Suitable habitat for fish species in terms of near-natural hydrological and geomorphological processes and forms.</p> <p>Habitat loss fragmentation and loss of breeding areas as a result of barrier to migration from caused by piers within river channel.</p> <p>Certain species are sensitive to noise and vibration such that migration could be inhibited.</p> <p>Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment.</p> <p><u>Bullhead and Brook lamprey:</u></p> <p>Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment.</p> <p><u>European otters:</u></p> <p>Temporary restriction in movement during construction.</p> <p>Noise, vibration and lighting disturbance to species - deterring movement of otters through construction zone</p> <p><u>Water courses:</u></p> <p>Diffusion of pollution from the two Usk crossings would reduce concentrations to</p>

Site Name: River Usk SAC	
	minimal levels in the upper catchment
21 Avoidance/mitigation measures not previously included in Row 7 above	<p><i>Otters:</i></p> <p>Loss of breeding areas –</p> <p>Other mitigation could consist of creating/managing habitat which is suitable to support otters (using the SAC performance criteria). The habitat should be located in an area which links to and supports existing suitable habitat patches within the SAC or outside the SAC. The habitat should be managed long-term (through appropriate grazing and scrub control) to ensure the habitats are maintained in good condition for otters.</p> <p>Vehicle collisions -</p> <p>Use of over-bridges or under-passes combined with appropriate land-forming or planting to guide the otters to and through the crossing points</p> <p>For fish species there are no additional mitigation measures.</p>
22 Assessment findings after additional mitigation	Appropriate mitigations have been identified that should adequately remove/reduce potential adverse impacts on the integrity of River Usk SAC.
23 Conclusion– no adverse effect on the integrity of the site/ adverse effect on the integrity of the site?	The decision on whether the proposed Black, Red and Purple Routes would have an adverse impact on the fish species and otters of the River Usk SAC, cannot be made until more detailed survey and project design information is available. However, appropriate mitigations have been identified that should adequately remove/reduce these adverse impacts.

Site Name: River Wye SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site: Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachium</i> vegetation</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Transition mires and quaking bogs</p> <p>Annex II species that are a primary reason for selection of this site White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> Sea lamprey <i>Petromyzon marinus</i> Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i> Twaite shad <i>Alosa fallax</i> Atlantic salmon <i>Salmo salar</i> Bullhead <i>Cottus gobio</i> Otter <i>Lutra lutra</i></p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection: Allis shad <i>Alosa alosa</i></p>
3 Conservation Objectives	<p>Sea lamprey, brook lamprey, river lamprey, Twaite shad and Allis shad, Atlantic salmon, European otter and bullhead - The population in SAC is stable or increasing over the long term, there is and will probably continue to be a sufficiently large habitat to maintain the feature's population in the SAC on long-term basis, and the natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future</p> <p>Sea lamprey - Distribution within catchment and Ammocoete density Brook lamprey and river lamprey - Distribution within catchment</p>
4 List of relevant options	No options associated with this site. The site is situated approximately 10km from the Purple, Red and Black Route,
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and

Site Name: River Wye SAC	
	HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Powys UDP, Monmouthshire LDP, Torfaen LDP
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The HRA of the WSPU recognised that this SAC could be affected by actions within the plan. The key actions associated with the WSPU and in combination with other plans that may affect this SAC, include urban and economic activities, water pollution and abstraction, recreation and tourism pressures and provision of energy and transport infrastructure.</p> <p>The HRA of the Powys UDP identified that the policies and proposals contained in the Powys UDP are not likely to give rise to any significant effects on any European site in Powys.</p> <p>The HRA of the Monmouthshire LDP has identified the plan could adversely affects this SAC through increased pressure on natural resources, particularly water, recreational resources, green space, and air quality.</p> <p>The HRA of the Torfaen LDP identified potential for air pollution effects on this SAC from new developments.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Water quality</p> <p>Water quantity</p> <p>Recreational pressures</p> <p>Disturbance</p> <p>Habitat damage</p>

Site Name: River Wye SAC	
	Water abstraction and water pollution Urban and economic development activities Recreation and tourist pressures Provision of energy and transport infrastructure
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in options and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: Severn Estuary SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site:</p> <p>Estuaries</p> <p>Mudflats and sandflats not covered by seawater at low tide</p> <p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>)</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>Sandbanks which are slightly covered by sea water all the time</p> <p>Reefs</p> <p>Annex II species that are a primary reason for selection of this site:</p> <p>Sea lamprey <i>Petromyzon marinus</i></p> <p>River lamprey <i>Lampetra fluviatilis</i></p> <p>Twaite shad <i>Alosa fallax</i></p>
3 Conservation Objectives	<p>Sandbanks which are slightly covered by sea water at all times - Natural process in respect to the SAC, the extent and distribution of subtidal sandbanks, subtidal sandbank communities and community composition</p> <p>Atlantic salt meadows - Extent, variety and spatial distribution of Atlantic salt meadows and associated transitional vegetation communities</p> <p>Estuaries – Extent, variety and spatial distribution of estuarine habitat</p> <p>Mudflats and sandflats not covered by seawater at low tide – extent, variety and</p>

Site Name: Severn Estuary SAC	
	<p>spatial distribution of mudflat and sandflat communities</p> <p>Reefs - The total extent and distribution, community composition of the reef, and the full range of different age structures of reef present, the physical and ecological processes necessary to support reef</p> <p>Sea lamprey, river lamprey, twaite shad – Natural processes in respect of the SAC fish features; supporting habitats of fish species, fish species population, prey species and water column</p>
4 List of relevant options	<p>The site is situated approximately 2.8km south of the Black route, approximately 3.4km south of the Purple route and approximately 3km south of the Red route. . However there could be downstream effects from the following options;</p> <p>Draft Plan: Black Route</p> <p>Reasonable Alternative: Red Route</p> <p>Reasonable Alternative: Purple Route</p> <p>No effects associated with complementary measure M48 – B4245 Link as approximately 10km from site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<p>None of the construction activities would take place within the designated site, and no land take would be required from within the SAC. However there could be downstream effects.</p> <p><u>Sea lamprey, Twaite shad, River lamprey:</u></p> <ul style="list-style-type: none"> -Habitat loss fragmentation - Barrier to migration from caused by piers within river channel - Loss of breeding areas and roosts - As a result of barrier to migration - Air quality - Deposition of airborne pollution in upper catchment would be diluted - Water quality and flow change - Barrier to migration from caused by piers within river channel -Changes to habitat structure - No pathway -Noise and vibration disturbance to species - Certain species are sensitive to noise and vibration such that migration could be inhibited - Lighting disturbance to species – No pathway - Wildlife collision – No pathway <p><u>Reefs:</u></p> <ul style="list-style-type: none"> - Habitat loss fragmentation – No pathway - Loss of breeding areas and roosts – No

Site Name: Severn Estuary SAC

pathway
 - Air quality – No pathway
 - Water quality and flow change – No pathway
 -Changes to habitat structure - No pathway
 -Noise and vibration disturbance to species
 No pathway
 - Lighting disturbance to species – No pathway
 - Wildlife collision – No pathway
Sandbanks which are slightly covered by sea water all times:
 Habitat loss fragmentation – No pathway
 - Loss of breeding areas and roosts – No pathway
 - Air quality – No pathway
 - Water quality and flow change – No pathway
 -Changes to habitat structure - No pathway
 -Noise and vibration disturbance to species
 No pathway
 - Lighting disturbance to species – No pathway
 - Wildlife collision – No pathway
Estuaries:
 -Habitat loss fragmentation – No pathway
 - Loss of breeding areas and roosts – No pathway
 - Air quality – No pathway
 - Water quality and flow change – No pathway
 -Changes to habitat structure - No pathway
 -Noise and vibration disturbance to species
 No pathway
 - Lighting disturbance to species – No pathway
 - Wildlife collision – No pathway
Mudflats and sandflats not covered by sweater at low tide:
 -Habitat loss fragmentation – No pathway
 - Loss of breeding areas and roosts – No pathway
 - Air quality – No pathway
 - Water quality and flow change – No pathway
 -Changes to habitat structure - No pathway
 -Noise and vibration disturbance to species
 No pathway
 - Lighting disturbance to species – No pathway
 - Wildlife collision – No pathway
Atlantic salt meadows –

Site Name: Severn Estuary SAC	
	<ul style="list-style-type: none"> -Habitat loss fragmentation – No pathway - Loss of breeding areas and roosts – No pathway - Air quality – No pathway - Water quality and flow change – No pathway -Changes to habitat structure - No pathway -Noise and vibration disturbance to species No pathway - Lighting disturbance to species – No pathway - Wildlife collision – No pathway
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	<p><i>Fish species</i> - Water quality and flow changes – likely to be significant during construction and operation</p> <p><i>Estuaries</i> - the Project could affect the water quality in within the Severn Estuary during construction or operation</p> <p><i>Sandbanks</i> and Reefs- Reduction in habitat quality from pollution/sediment run-off during construction</p> <p><i>Atlantic salt meadows</i> - Smothering of salt meadow vegetation – likely to be significant during construction and operation</p>
7 Avoidance and mitigation measures	<p><i>Fish Species:</i> Water quality and flow changes – water quality and flow control and monitoring to EA standards</p> <p><i>Sandbanks, Atlantic Salt Meadows, Estuaries, Reefs:</i> Air quality changes – as species above Water quality and flow changes – as species above</p>
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	There is a likelihood of significant effects. Carry forward to Appropriate Assessment
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Newport LDP, Cardiff LDP, VoG LDP, Monmouthshire LDP, Caerphilly LDP, SE Wales RTP, SWRSS.
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The HRA of the WSPU recognised that this SAC could be affected by actions within the</p>

Site Name: Severn Estuary SAC	
	<p>plan. The key actions associated with the WSPU and in-combination with other plans that may affect this SAC, include urban and economic activities, water pollution and abstraction, recreation and tourism pressures and provision of energy and transport infrastructure.</p> <p>The Newport LDP includes reference to the construction of an airport with runways on land that would be reclaimed from the Severn Estuary. This could have an adverse effect on this SAC.</p> <p>The HRA of the Caerphilly LDP recognised that the plan could have potential effects on this SAC as a result of policies that could lead to atmospheric pollution.</p> <p>The HRA of VoG LDP identified that the plan could have potential effects on this site as a result of land-take, disturbance through noise and vibration, pollution through ground and surface water run-off, and interruption of flight-lines by wind turbines.</p> <p>The HRA of Monmouthshire LDP identified that the plan could have potential effects on this site as a result of potential for the developments to affect green space, water run-off and water quality/quantity</p> <p>The HRA of the Cardiff LDP identified potential for air quality effects. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at this site.</p> <p>The HRA of the SWRSS identified some proposals in the draft strategy where the pressures arising from development have given rise to particular concerns over potential damage or loss to N2K sites, including this SAC.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality - nitrogen deposition and acidification.</p> <p>Water run-off and quality</p>

Site Name: Severn Estuary SAC	
	<p>Water pollution and abstraction</p> <p>Disturbance through noise and vibration</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects
15 Review of description of elements	<p>Draft Plan:</p> <p>Black Route - a new 3-lane motorway mainly following the protected TR 111 'Black Route', between Junctions 23 and 29, including a new crossing of the River Usk south of Newport.</p> <p>Reasonable Alternative:</p> <p>Red Route – Dual 2-lane all-purpose road to the south of Newport</p> <p>Reasonable Alternative:</p> <p>Purple Route – a 3-lane motorway route along alternative alignment to the South of Newport</p> <p>Complementary Measure (addition to Red, Black and Purple Route):</p> <p>M48 – B4245 Link is a new single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23a and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.</p>
16 Review of site based information	<p>The Severn Estuary is the largest example of a coastal plain estuary in the UK, and one of the largest estuaries in Europe. It contributes approximately 30% of the UK Natura 2000 resource for estuaries, by area. The extent of the Estuary feature is 73678 ha. The Severn Estuary SAC includes subtidal and intertidal areas landward to the line of high ground and flood defences (banks and walls) that provide the limit of tidal inundation. The Severn Estuary is important for its immense tidal range, which affects both the physical environment and the diversity and productivity of the biological communities.</p> <p>The tidal range is the second largest in the world, reaching in excess of 13m at</p>

Site Name: Severn Estuary SAC	
	<p>Avonmouth. This macrotidal environment is partly due to the estuary's funnel shape which concentrates the tidal wave as it moves up the Bristol Channel. There are several major rivers, including the Taff, Usk, Wye, Severn, Avon and Parrett which feed into the estuary, and influence the salinity regime.</p> <p>Severn Estuary SAC includes an overarching "estuaries" feature within which subtidal sandbanks, intertidal mudflats and sandflats, Atlantic salt meadows and reefs (of <i>Sabellaria alveolata</i>) and three species of migratory fish are defined as both features in their own right and as sub-features of the estuary feature.</p>
17 Review of baseline information	<p>Sea lamprey – Species occurrence not yet accountable</p> <p>River lamprey – Species occurrence not yet accountable</p> <p>Twaite shad – Species occurrence not yet accountable</p> <p>Reef – The Severn Estuary has areas of biogenic reefs, formed by the tube-dwelling polychaete worm <i>Sabellaria alveolata</i>. <i>Sabellaria alveolata</i> reefs in the UK are predominantly an intertidal habitat but the Severn Estuary is one of the few places where <i>Sabellaria alveolata</i> reefs occur extensively in the subtidal, as well as the intertidal. <i>Sabellaria alveolata</i> is a species of small worm which constructs tubes using sand particles, to build honeycomb-like structures. <i>Sabellaria alveolata</i> reefs are often also known as honeycomb worm reefs.</p> <p>These biogenic reefs tend to increase habitat diversity for other species (Holt et al 1998), sometimes leading to higher species diversity within <i>Sabellaria</i> reefs compared to the surrounding sediment or rock habitats (Dubois et al 2002). <i>Sabellaria alveolata</i> reefs cycle through different phases, from newly settled worms through vigorous fast. In the Severn Estuary (both subtidal and intertidal) the presence of <i>Sabellaria alveolata</i> reefs generally increases species diversity, relative to the surrounding rock or sediment, although the diversity of <i>Sabellaria alveolata</i> reefs in the Severn is still thought to be comparatively low compared to other areas of the UK.</p> <p>Mudflats and sandflats not covered by sea</p>

Site Name: Severn Estuary SAC	
	<p>water at low tide –</p> <p>The Intertidal mudflats and sandflats feature in the Severn Estuary covers an area of approximately 20,300ha. The Intertidal mudflats and sandflats feature is distributed throughout the Severn Estuary with extensive mudflats fronting the Welsh shore and Bridgwater Bay, and large banks of clean sands in the more central parts of the estuary at Middle and Welsh Grounds. The high biomass of invertebrates in the mudflats of the Severn provide an important food source for a diverse range and large number of fish and benthic predators. These intertidal areas are therefore important in supporting the fish assemblage subfeature of the SAC and Ramsar site. Mudflats also provide a valuable feeding, roosting and resting area for a wide range of species of wading birds and waterfowl and are therefore important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site.</p> <p>Intertidal mudflats and sandflats support a variety of different wildlife communities. These are predominantly infaunal communities of a variety of different animal species such as worms, molluscs and crustaceans living within the sediment habitat. The type of sediment, its stability and the salinity of the water have a large influence on the wildlife species present.</p> <p>Atlantic sea meadows – The Severn Estuary holds the largest aggregation of saltmarsh in the south and south-west of the UK. It covers approximately 1,400 ha, representing about 4% of the total area of saltmarsh in the UK (Dargie, 2000). The huge tidal range in the Severn Estuary has led to extensive saltmarsh community development with an expanded zonation.</p> <p>The saltmarshes of the Severn Estuary have four principal zones corresponding to the four main sub-features that have been identified for this feature. Two of these zones (the lower to mid marsh communities and the mid to upper marsh communities) contain the principle saltmarsh types which are defined as Atlantic salt meadow as per the Annex 1 habitat description.</p> <p>Saltmarshes and mudflats have an important role to play in estuarine processes, both through the recycling of nutrients within the estuary and through their role as soft sea defences, dissipating wave energy.</p>

Site Name: Severn Estuary SAC	
	<p>Saltmarshes also provide a valuable feeding and roosting and resting areas (particularly at high tide) for a wide range of species of waterfowl and are therefore very important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site.</p> <p>The Severn Estuary saltmarshes are generally grazed by sheep and/or cattle. Grazing is a significant factor in determining the plant communities found within them and their value for dependant species such as birds and rare plants.</p> <p>Sandbanks which are slightly covered by sea water –</p> <p>The Severn Estuary subtidal sandbanks can be considered to contribute to the gravelly and clean sand sandbank resource. The Severn Estuary contributes approximately 3% of the UK Natura 2000 resource for subtidal sandbanks, by area¹. These subtidal areas play an important role in holding and supplying sediment for other habitats notably the intertidal mud and sandflats, saltmarshes and reef features and it is likely that subtidal invertebrate communities play a role as a food resource for some species of the fish assemblage feature of the SAC and Ramsar Site.</p> <p>The typical species of these communities include a range of worms, shrimps, snails and bivalves. The species diversity of these habitats is often low but overall biomass can be high. Subtidal sandbanks are dynamic features with their size, shape, aspect and orientation, as well as the macro- and micro-topography and sediment characteristics largely determined by the sediment supply and the influence of the hydrodynamic processes affecting each bank.</p>
18 Review of potential impacts	No change from information provided at screening stage
19 Review of “in combination” projects or plans information	The screening stage identified no likelihood of significant “in combination” effects from projects or plans.
20 Assessment findings for site	<p><u><i>Sea lamprey, River lamprey, Twaite shad:</i></u></p> <p>The effects of road widening, additional road</p>

¹ Based on Natura 2000 Standard data forms for all UK Natura 2000 sites which have estuaries as a feature- source: JNCC website <http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H1130>

Site Name: Severn Estuary SAC	
	<p>infrastructure and grade junction improvements could affect the water quality of the water column. Toxic contaminants in the water column and sediment are below levels which would pose a risk to the ecological conservation objectives for fish species.</p> <p>During the construction and operation period, barrier to migration caused by piers within river channel. Fish species could be disturbed by noise and vibration such that migration could be inhibited.</p> <p>Possible diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment.</p> <p><u>Estuaries:</u></p> <p>No effect due to no pathway</p> <p><u>Sandbanks, Reefs, Mudflats and sandflats not covered by sea water at low tide:</u></p> <p>No effect due to no pathway</p> <p><u>Atlantic salt meadows:</u></p> <p>No effect due to no pathway</p>
21 Avoidance/mitigation measures not previously included in the Estuary assessment at Row 7 above	No other additional mitigation measures
22 Assessment findings after additional mitigation	Appropriate mitigation has been appropriately identified that should adequately remove/reduce these adverse impacts on the integrity of the Severn Estuary SAC.
23 Conclusion– no adverse effect on the integrity of the site/ adverse effect on the integrity of the site?	The decision on whether the proposed Black, Purple and Red Routes would have an adverse impact on the integrity of the Severn Estuary SAC cannot be made until more detailed survey and project design information is available.

Site Name: Usk Bat Sites SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>European dry heaths Degraded raised bogs still capable of natural regeneration Blanket bogs * Priority feature Calcareous rocky slopes with chasmophytic vegetation Caves not open to the public Tilio-Acerion forests of slopes, screes and ravines * Priority feature</p> <p>Annex II species that are a primary reason for selection of this site:</p> <p>Lesser horseshoe bat <i>Rhinolophus hipposideros</i></p>
3 Conservation Objectives	<p>Bats - Sustainable population of bat, supported by optimum conditions in breeding and hibernation roosts and condition of surrounding foraging habitats</p> <p>Blanket Bog , <i>Tilio-acerion</i> forest of slopes, screes and ravines, European dry heaths, calcareous rocky slopes with chasmophytic vegetation, Degraded raised bogs still capable of natural regeneration - Extent and condition of habitat</p> <p>Caves not open to public - Extent and condition of habitat and bat species using the cave</p>
4 List of relevant options	No options affecting site. Options are approximately 28km from the site
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the site.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	No likelihood of significant effects
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and	WTS, WSPU, Blaenau Gwent LDP,

projects considered as relevant for site	Monmouthshire LDP, Torfaen LDP, Powys LDP, Brecon Beacons NP LDP, SE Wales RTP.
Site Name: Usk Bat Sites SAC	
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are: Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The HRA of the Blaenau Gwent LDP assessed that the LDP may have a significant effect at this site as result of potential disturbance to bats from recreation.</p> <p>The HRA of the Monmouthshire LDP identified potential effects on this SAC through increased air, light and noise pollution; reuse of buildings which can affect bat roosting places and impacting on habitat connectivity.</p> <p>The HRA of the Torfaen LDP recognised potential disturbance effects on this SAC.</p> <p>The HRA of the Brecon Beacons NP LDP identified potential effects on this SAC due primarily to the housing and employment allocations. Development in rural areas and of rural/ disused buildings: Disused/ rural building can provide valuable habitats for protected species- in particular bats, which also use established paths for foraging. Landuse changes and new developments can have significant negative effects in relation to feeding and migration patterns.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p>
11 List of potential effects of element (s) in combination with other plans and projects	Air quality Loss of breeding sites Disturbance and noise pollution Light pollution

	Damage to flightlines Urban and economic development activities Recreation and tourist pressures Provision of energy and transport infrastructure
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects are considered not significant
13 Mitigation measures in draft Plan and other plans/projects	Same as above
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

English Special Area of Conservation within 30km of options

Site Name: Avon Gorge Woodlands SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site: Tilio-Acerion forests of slopes, screes and ravines</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)</p>
3 Conservation Objectives	<p>Tilio-Acerion: Structure and natural processes Composition Indicators of local distinctiveness Regeneration potential</p> <p>Festuco-Brometalia: Sward structure: localised bare ground Sward structure: litter Sward structure: average height Sward composition: cover of lichens Sward composition: positive indicator species Sward composition: grass herb ratio</p>
4 List of relevant options	<p>No options associated with this site. Junction 23a is situated approximately 27km south west from the site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites

Site Name: Avon Gorge Woodlands SAC	
	which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	HRA of South West Regional Spatial Strategy
10 List of effects noted in other plans and projects considered as relevant for site	HRA of SWRSS identified the following potential effects from the policies in the strategy - water abstraction, water quality, tourism, recreation and related pressures (including urban effects), air quality, physical habitat loss or damage from development.
11 List of potential effects of element (s) in combination with other plans and projects	Water abstraction water quality tourism, recreation and related pressures (including urban effects) air quality physical habitat loss or damage from development.
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects considered not significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: Mendip Limestone Grasslands SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site: Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: European dry heaths Caves not open to the public Tilio-Acerion forests of slopes, screes and ravines Priority feature</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection: Greater horseshoe bat <i>Rhinolophus ferrumequinum</i></p>
3 Conservation Objectives	<p>Semi-natural dry grasslands and scrubland facies: on calcareous substrates: Extent Sward composition: cover of lichens. Sward composition: positive indicator species Sward composition: negative indicator species Sward composition: negative indicator species Sward composition: negative indicator species Sward structure: average height Sward structure: litter</p> <p>European dry heaths: Extent Bare ground Vegetation Structure Vegetation Composition Negative indicators Sward composition Sward structure</p>

Site Name: Mendip Limestone Grasslands SAC	
	<p>Caves not open to the public</p> <p>Tilio-Acerion forests of slopes, screes and ravines:</p> <ol style="list-style-type: none"> 1. Area 2. Natural processes and structural development 3. Regeneration potential 4. Composition 5. Species, habitats, structures characteristic of the site. <p>Rhinolophus ferrumequinum</p> <p>Use of entrance to roosts</p> <p>Entrance security</p> <p>External conditions</p> <p>Disturbance</p> <p>Internal conditions</p> <p>Use by bats</p>
4 List of relevant options	<p>No options associated with this site.</p> <p>Junction 23a is situated approximately 27km north west from the site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	HRA of South West Regional Spatial Strategy
10 List of effects noted in other plans and projects considered as relevant for site	HRA of SWRSS identified the following potential effects from the policies in the strategy - water abstraction, water quality, tourism, recreation and related pressures (including urban effects), air quality, physical habitat loss or damage from development.
11 List of potential effects of element (s) in combination with other plans and projects	<p>Water abstraction</p> <p>water quality</p> <p>tourism, recreation and related pressures (including urban effects)</p> <p>air quality</p> <p>physical habitat loss or damage from development</p>

Site Name: Mendip Limestone Grasslands SAC	
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects are considered not significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: North Somerset and Mendip Bats SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site:</p> <p>Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia)</p> <p>Tilio-Acerion forests of slopes, screes and ravines *</p> <p>Priority feature</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <p>Caves not open to the public</p> <p>Annex II species that are a primary reason for selection of this site:</p> <p>Lesser horseshoe bat <i>Rhinolophus hipposideros</i></p> <p>Greater horseshoe bat <i>Rhinolophus ferrumequinum</i></p>
3 Conservation Objectives	<p>Greater horseshoe bat:</p> <p>A1. Population of Greater Horseshoe Bats</p> <p>A2. Recruitment to bat population/productivity</p> <p>Lesser horseshoe bat:</p> <p>A1. Distribution and population of Lesser Horseshoe Bats</p>
4 List of relevant options	<p>No options associated with this site.</p> <p>Junction 23a is situated approximately 25km north from the site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these

Site Name: North Somerset and Mendip Bats SAC	
	elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	HRA of South West Regional Spatial Strategy
10 List of effects noted in other plans and projects considered as relevant for site	HRA of SWRSS identified the following potential effects from the policies in the strategy - water abstraction, water quality, tourism, recreation and related pressures (including urban effects), air quality, physical habitat loss or damage from development.
11 List of potential effects of element (s) in combination with other plans and projects	Water abstraction water quality tourism, recreation and related pressures (including urban effects) air quality physical habitat loss or damage from development
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects are considered not significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

England/Wales Border Special Area of Conservation within 30km of options

Site Name: Wye Valley Woodlands SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	Annex II species that are a primary reason for selection of this site: Lesser horseshoe bat <i>Rhinolophus hipposideros</i> Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>
3 Conservation Objectives	Tilio-Acerion forests of slopes, screes and ravines/ Asperulo-Fagetum beech forests/ <i>Taxus Baccata</i> woods of the British Isles - Extent of woodland/forests, condition of the woodland/forests and livestock grazing and adjacent land use Lesser horseshoe bat - Population of Lesser horseshoe population and condition of the <i>Tilio-Acerion</i> , <i>Asperulo-Fagetum</i> , <i>Taxus Baccata</i> and non-SAC semi natural broadleaved woodland Non-SAC semi natural broadleaved woodland – Extent and condition of the non-SAC semi natural broadleaved woodland, and livestock grazing and adjacent land use
4 List of relevant options	No options associated with this site. Nearest element is Junction 23a approximately 10km west of the site.
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the sites due to distance and potential lack of pathways. No effects on bats. Changes to air quality.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	As the Project is a considerable distance from the roost sites which are known to support the SAC population of lesser horseshoe bats no significant impacts are anticipated. The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites

Site Name: Wye Valley Woodlands SAC	
	<p>which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.</p> <p>It should be noted that the 10km distance is at the limit of where potential effects should be considered therefore depending on the scale of intervention when known there may be the need for more detailed consideration of potential impacts on the Wye Valley Woodlands SAC lesser and greater horseshoe bat features.</p>
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Monmouthshire LDP, SE Wales RTP, SWRSS
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are:</p> <p>Urban and economic development activities; Water abstraction and water pollution; Recreation and tourist pressures; and Provision of energy and transport infrastructure.</p> <p>The HRA of the Monmouthshire LDP noted potential effects on this SAC including pressure on recreational resources, water and air.</p> <p>The HRA of the SWRSS recognises potential effects on this SAC and the need for their protection, in addition to the protection of associated foraging habitats.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination)	In-combination effects not considered significant

Site Name: Wye Valley Woodlands SAC	
on conservation objectives – before mitigation	
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects

Site Name: Wye Valley and Forest of Dean Bat SAC	
Background information	
1 European Site/Designation	SAC
2 Qualifying features/interests	<p>Annex I habitats that are a primary reason for selection of this site:</p> <p>Asperulo-Fagetum beech forests</p> <p>Tilio-Acerion forests of slopes, screes and ravines * Priority feature</p> <p>Taxus baccata woods of the British Isles * Priority feature</p> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <p>Lesser horseshoe bat <i>Rhinolophus hipposideros</i></p>
3 Conservation Objectives	<p>Greater horseshoe bat:</p> <p>A1. Population of Greater Horseshoe Bats</p> <p>A2. Recruitment to bat population/productivity</p> <p>Lesser horseshoe bat:</p> <p>A1. Distribution and population of Lesser Horseshoe Bats</p>
4 List of relevant options	<p>Junction 23a is situated approximately 25km south from the site.</p> <p>Draft Plan: Black Route</p> <p>Reasonable Alternative: Red Route</p> <p>Reasonable Alternative: Purple Route</p> <p>M48 – B4245 Link.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<p>Habitat loss fragmentation</p> <p>Loss of breeding areas and roosts</p> <p>Changes to habitat structure</p> <p>Lighting disturbance to species</p> <p>Wildlife collision</p>
6 Likelihood of significant effects (from the draft Plan option) on conservation objectives – before mitigation	<p><u>Greater horseshoe bat:</u></p> <p>Habitat loss fragmentation - No pathway – no established link between roost at Rupera and Wye</p>

Site Name: Wye Valley and Forest of Dean Bat SAC	
	<p>Valley</p> <p><u>Lesser horseshoe bat:</u></p> <p>Habitat loss fragmentation - Potential for severing flight lines</p> <p>Loss of breeding areas and roosts – Severing of flight lines could prevent movement of animals between roost sites</p> <p>Changes to habitat structure– Introduction of road would affect flight lines</p> <p>Lighting disturbance to species – Potential to restrict bat movement</p> <p>Wildlife collision - Potential for collisions if flight routes not identified or mitigation measures not use</p>
7 Avoidance and mitigation measures	Surveys and design mitigation measures it is envisaged that through appropriate survey and design of mitigation these effects could be minimised
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	<p>There would be a likely impact on bat species and habitats.</p> <p>There is a likelihood of significant effects. Carry forward to Appropriate Assessment</p>
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Monmouthshire LDP, SE Wales RTP, SWRSS
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The key actions associated with the WSPU and in combination with other plans that may affect European sites are:</p> <p>Urban and economic development activities;</p> <p>Water abstraction and water pollution;</p> <p>Recreation and tourist pressures; and</p> <p>Provision of energy and transport infrastructure.</p> <p>The HRA of the Monmouthshire LDP identifies potential effects on this SAC resulting from increased pressure on recreational resources, water and air; increased light and noise pollution; reuse of buildings which can affect bat roosting places and impacts on habitat connectivity.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase</p>

Site Name: Wye Valley and Forest of Dean Bat SAC	
	<p>in population across SE Wales precipitate an increase in car use in the near future.</p> <p>The HRA of the SWRSS recognises potential effects on this SAC and the need for their protection, in addition to the protection of associated foraging habitats.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Water quality</p> <p>Air quality</p> <p>Light and noise pollution</p> <p>Damage to flightlines and roosting places</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects considered not significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likely significant effect
15 Review of description of elements	<p>Draft Plan:</p> <p>Black Route - a new 3-lane motorway mainly following the protected TR 111 'Black Route', between Junctions 23 and 29, including a new crossing of the River Usk south of Newport.</p> <p>Reasonable Alternative:</p> <p>Red Route – Dual 2-lane all-purpose road to the south of Newport</p> <p>Reasonable Alternative:</p> <p>Purple Route – a 3-lane motorway route along alternative alignment to the South of Newport</p> <p>Complementary Measure (addition to Red, Black and Purple Route):</p> <p>M48 – B4245 Link is a new single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23a and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.</p>
16 Review of site based information	<p>The Wye Valley and Forest of Dean Bats SAC straddles the Wales-England border and is made up of several sites. The sites in Wales include various buildings and a cave site which is used by lesser and greater horseshoe bats for breeding and hibernating. Other bat species found at this site include brown long-eared and Natterer's bats.</p>
17 Review of baseline information	<p>This complex of sites on the border between England and Wales contains by far the greatest concentration of lesser horseshoe bat <i>Rhinolophus hipposideros</i> in the UK, totalling about 26% of the national population. It has been selected on the grounds of the exceptional breeding population, and the majority of sites within</p>

Site Name: Wye Valley and Forest of Dean Bat SAC	
	<p>the complex are maternity roosts. The bats are believed to hibernate in the many disused mines in the area.</p> <p>This complex of sites on the border between England and Wales represents greater horseshoe bat <i>Rhinolophus ferrumequinum</i> in the northern part of its range, with about 6% of the UK population. The site contains the main maternity roost for bats in this area, which are believed to hibernate in the many disused mines in the Forest.</p>
18 Review of potential impacts	No change from information provided at screening stage
19 Review of “in combination” projects or plans information	The screening stage identified no likelihood of significant “in combination” effects from projects or plans.
20 Assessment findings for site	<p><u>Greater horseshoe bat:</u></p> <p>Habitat loss fragmentation - No pathway – no established link between roost at Rupera and Wye Valley</p> <p><u>Lesser horseshoe bat:</u></p> <p>Habitat loss fragmentation - Potential for severing flight lines</p> <p>Loss of breeding areas and roosts – Severing of flight lines could prevent movement of animals between roost sites</p> <p>Changes to habitat structure– Introduction of road would affect flight lines</p> <p>Lighting disturbance to species – Potential to restrict bat movement</p> <p>Wildlife collision - Potential for collisions if flight routes not identified or mitigation measures not use</p>
21 Avoidance/mitigation measures not previously included in the assessment at Row 7 above	No additional mitigation measures
22 Assessment findings after additional mitigation	Appropriate mitigation has been appropriately identified that should adequately remove/reduce these adverse impacts on the integrity of Wye Valley and Forest of Dean Bats SAC.
23 Conclusion– no adverse effect on the integrity of the site/ adverse effect on the integrity of the site?	The decision on whether the proposed Black, Red and Purple Routes and M48-B4245 Link would have an adverse impact on the integrity of the Wye Valley and Forest of Dean Bats SAC cannot be made until more detailed survey and project design information is available.

Welsh Special Protection Area sites within 30km of options

Site Name: Severn Estuary SPA	
Background information	
1 European Site/Designation	SPA
2 Qualifying features/interests	<p>Internationally important populations of migratory bird species: Bewick's swan</p> <p>Internationally important populations of wintering bird species: Wintering European white-fronted goose Dunlin Redshank Shelduck Gadwall Curlew Pintail Ringed plover</p> <p>Assemblage of nationally important populations of waterfowl</p>
3 Conservation Objectives	Key supporting habitats for birds, natural processes in respect of the SPA and key food plants/invertebrate prey of birds
4 List of relevant options	<p>The site is situated approximately 2.8km south of the Black route, approximately 3.4km south of the Purple route and approximately 3km south of the Red route. . However there could be downstream effects from the following options;</p> <p>Draft Plan: Black Route Reasonable Alternative: Red Route Reasonable Alternative: Purple Route No effects associated with complementary measure M48 – B4245 Link as approximately 10km from site.</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<p>None of the construction activities would take place within the designated site, and no land take would be required from within the SPA. However there could be downstream effects on:</p> <ul style="list-style-type: none"> -Habitat loss fragmentation -Loss of breeding areas, hibernacula etc. -Air quality changes -Water quality and flow changes barrier to migration from piers within river channel -Changes to habitat structure -Noise and vibration disturbance -Visual and lighting disturbance -Wildlife vehicle collisions
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	<u>Bewick's swan, Wintering European white-fronted goose, Dunlin, Redshank, Gadwall, Shelduck -</u>

Site Name: Severn Estuary SPA	
	<p>- Habitat loss fragmentation – No pathway – species does not currently use the levels and habitats are largely unsuitable</p> <p>-Loss of breeding areas, hibernacula etc. – No pathway</p> <p>-Air quality changes – No pathway</p> <p>-Water quality and flow changes barrier to migration from piers within river channel – No pathway</p> <p>-Changes to habitat structure – No pathway</p> <p>-Noise and vibration disturbance – No pathway</p> <p>-Visual and lighting disturbance – No pathway</p> <p>-Wildlife vehicle collisions – Potential for effect if bird behaviour changes to include regular flights across the road</p> <p><u>Assemblage of nationally important populations of waterfowl -</u></p> <p>- Habitat loss fragmentation - Some species within the assemblage may use some areas on the levels</p> <p>-Loss of breeding areas, hibernacula etc. - Potential for roost sites in close proximity to road to be affected</p> <p>-Air quality changes – No pathway</p> <p>-Water quality and flow changes barrier to migration from piers within river channel – No pathway</p> <p>-Changes to habitat structure – No pathway</p> <p>-Noise and vibration disturbance – No pathway</p> <p>-Visual and lighting disturbance – No pathway</p> <p>-Wildlife vehicle collisions – No pathway</p>
7 Avoidance and mitigation measures	<p>Water quality and flow control and monitoring to EA standards</p> <p>Construction mitigation measures</p>
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	<p>There is a likelihood of significant effects related to reduction in habitat quality for bird species.</p> <p>Carry forward to Appropriate Assessment</p>
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	<p>WTS, WSPU, Newport LDP, Cardiff LDP, VoG LDP, Monmouthshire LDP, Caerphilly LDP, SE Wales RTP, SWRSS.</p>
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The HRA of the WSPU recognised that this SPA could be affected by actions within the plan. The key actions associated with the WSPU and in-combination with other plans that may affect this SPA, include urban and economic activities, water pollution and abstraction, recreation and tourism pressures and provision of energy and transport infrastructure.</p> <p>The Newport LDP includes reference to the</p>

Site Name: Severn Estuary SPA	
	<p>construction of an airport with runways on land that would be reclaimed from the Severn Estuary. This could have an adverse effect on this SPA.</p> <p>The HRA of the Caerphilly LDP recognised that the plan could have potential effects on this SPA as a result of policies that could lead to atmospheric pollution.</p> <p>The HRA of VoG LDP identified that the plan could have potential effects on this site as a result of land-take, disturbance through noise and vibration, pollution through ground and surface water run-off, and interruption of flight-lines by wind turbines.</p> <p>The HRA of Monmouthshire LDP identified that the plan could have potential effects on this site as a result of potential for the developments to affect green space, water run-off and water quality/quantity</p> <p>The HRA of the Cardiff LDP identified potential for air quality effects. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at this site.</p> <p>The HRA of the SWRSS identified some proposals in the draft strategy where the pressures arising from development have given rise to particular concerns over potential damage or loss to N2K sites, including this SAC.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase in population across SE Wales precipitate an increase in car use in the near future.</p>
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality - nitrogen deposition and acidification.</p> <p>Water run-off and quality</p> <p>Water pollution and abstraction</p> <p>Disturbance through noise and vibration</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects
15 Review of description of elements	Draft Plan:

Site Name: Severn Estuary SPA	
	<p>Black Route - a new 3-lane motorway mainly following the protected TR 111 'Black Route', between Junctions 23 and 29, including a new crossing of the River Usk south of Newport.</p> <p>Reasonable Alternative:</p> <p>Red Route – Dual 2-lane all-purpose road to the south of Newport</p> <p>Reasonable Alternative:</p> <p>Purple Route – a 3-lane motorway route along alternative alignment to the South of Newport</p> <p>Complementary Measure (addition to Red, Black and Purple Route):</p> <p>M48 – B4245 Link is a new single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23a and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.</p>
16 Review of site based information	<p>The Severn Estuary is the largest example of a coastal plain estuary in the UK, and one of the largest estuaries in Europe. It contributes approximately 30% of the UK Natura 2000 resource for estuaries, by area. The extent of the Estuary feature is 73678 ha. The Severn Estuary SAC includes subtidal and intertidal areas landward to the line of high ground and flood defences (banks and walls) that provide the limit of tidal inundation. The Severn Estuary is important for its immense tidal range, which affects both the physical environment and the diversity and productivity of the biological communities.</p> <p>The tidal range is the second largest in the world, reaching in excess of 13m at Avonmouth. This macrotidal environment is partly due to the estuary's funnel shape which concentrates the tidal wave as it moves up the Bristol Channel. There are several major rivers, including the Taff, Usk, Wye, Severn, Avon and Parrett which feed into the estuary, and influence the salinity regime.</p> <p>The key features of European importance of the Severn Estuary SAC include internationally important populations of regularly occurring Annex 1 species, internationally important populations of regularly occurring migratory bird species and internationally important assemblage of waterfowl.</p> <p>The Severn Estuary SPA within the European Marine Site boundary includes saltmarshes and the adjacent extensive areas of intertidal mud, sand and rocky shores. All these habitats provide essential food and resting places for the wide range of wintering and migratory waterfowl and are therefore identified as key "supporting habitats" for the conservation of these species. Supporting habitats include intertidal mudflats and sandflats, saltmarshes and hard substrate habitats.</p>
17 Review of baseline information	<u>Birds:</u>

Site Name: Severn Estuary SPA	
	<p><i>Bewick's swan</i> - Mainly found in the Upper Severn Estuary at Slimbridge. Peak bird count for Bewick's swan during 2006/07 for Severn Estuary SPA is 196²</p> <p><i>European white-fronted goose</i> – Peak bird count for European white-fronted goose during 2006/07 for Severn Estuary SPA is 120³</p> <p><i>Dunlin</i> – Peak bird count for Dunlin during 2006/07 for Severn Estuary SPA is 16,625⁴</p> <p><i>Redshank</i> – Peak bird count for Redshank during 2006/07 for Severn Estuary SPA is 2,362⁵</p> <p><i>Shelduck</i> - Peak bird count for Shelduck during 2006/07 for Severn Estuary SPA is 3,711⁶</p> <p><i>Gadwall</i> - Peak bird count for Gadwall during 2006/07 for Severn Estuary SPA is 241⁷</p> <p><i>Curlew</i> – Peak bird count for Curlew during 2006/07 for Severn Estuary SPA is 3,230⁸</p> <p><i>Pintail</i> – Peak bird count for Pintail during 2006/07 for Severn Estuary SPA is 1,161⁹</p> <p><i>Ringed plover</i> – Peak bird count for Ringed plover during 2006/07 for Severn Estuary SPA is 1,453¹⁰.</p> <p><u>Supporting habitats:</u></p> <p>Mudflats and sandflats - The extensive mudflats and sandflats of the Severn Estuary provide undisturbed refuge and a rich resource of intertidal invertebrates as food for many species of migratory birds. The Severn supports massive populations of birds, many of which are highly mobile, feeding and roosting in different areas, depending on food availability and the state of the tide. The European white-fronted geese roost at night on estuarine sandbanks and usually fly less than 10km to the daytime feeding grounds. Shelduck exploit the rich resources of invertebrates found in the intertidal mudflats where they forage for molluscs and other invertebrates such as the mudsnail. Redshank and dunlin are distributed widely and feed throughout</p>

² Appendix 11 of the Severn Estuary SAC, SPA and Ramsar Site: Regulation 33 Advice from CCW and Natural England, June 2009

³ Ibid

⁴ Ibid

⁵ Ibid

⁶ Ibid

⁷ Ibid

⁸ Ibid

⁹ Ibid

¹⁰ Ibid

Site Name: Severn Estuary SPA	
	<p>the estuary on marine polychaete worms, crustaceans and molluscs such as the Baltic tellin <i>Macoma balthica</i>. Dunlin and redshank mainly feed on invertebrates in the muddier finer sediments. Dunlin are found mostly on the mid shore whereas redshank are more thinly distributed and are often found in smaller groups in the creeks and sub-estuaries. Gadwall are predominantly a freshwater species preferring the wetland habitats that occur within the SPA behind the flood defences and therefore outside the European Marine Site- most notably the freshwater wetlands at Slimbridge and Bridgwater bay. However, they do make use of the estuary but this is largely restricted to areas where freshwater flows come into the estuary.</p> <p>The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition.</p> <p>Saltmarsh – Saltmarsh and their communities are important habitats as they provide both roosting and feeding areas for internationally important populations of regularly occurring migratory species and internationally important assemblage of waterfowl. Most of the waders and waterfowl within the assemblage including the internationally important regularly occurring migratory birds feed on invertebrates within and on the sediments. Diet includes Arenicola, Crangon, Hydrobia, Hediste, Corophium, Macoma, Gammarus, small molluscs and strandline plankton and seeds.</p> <p>Saltmarsh provides an important feeding and roosting habitat for Bewick's swans on The Dumbles – saltmarsh/transition wet grassland in front of sea defences.</p> <p>Hard substrate habitats (rocky shores) – This habitat is used for feeding and roosting, for internationally important populations of regularly occurring migratory species and internationally important assemblage of waterfowl, particularly by waders. Waders feed on worms, crustaceans and molluscs.</p> <p>Freshwater coastal grazing marsh, improved grassland and open standing waters - these supporting habitats lie outside the European Marine Site boundary but within the SPA. They provide key areas for feeding and roosting for all the migratory species particularly at high tide, and mainly on the English side of the Estuary.</p>
18 Review of potential impacts	No change from information provided at screening stage
19 Review of “in combination” projects or plans	The screening stage identified no likelihood of

Site Name: Severn Estuary SPA	
information	significant “in combination” effects from projects or plans.
20 Assessment findings for site	<p><i>Bewick’s swan, Wintering European white-fronted goose, Dunlin, Redshank, Gadwell, Shelduck -</i></p> <p>-Wildlife vehicle collisions – Potential for effect if bird behaviour changes to include regular flights across the road</p> <p><i>Assemblage of nationally important populations of waterfowl -</i></p> <p>- Habitat loss fragmentation - Some species within the assemblage may use some areas on the levels</p> <p>-Loss of breeding areas, hibernacula etc. - Potential for roost sites in close proximity to road to be affected</p>
21 Avoidance/mitigation measures not previously included in the assessment at Row 7 above	No additional mitigation measures
22 Assessment findings after additional mitigation	Appropriate mitigation has been appropriately identified that should adequately remove/reduce these adverse impacts on the integrity of Severn Estuary SPA.
23 Conclusion– no adverse effect on the integrity of the site/ adverse effect on the integrity of the site?	The decision on whether the proposed Black, Red and Purple Routes would have an adverse impact on the integrity of the Severn Estuary SPA cannot be made until more detailed survey and project design information is available.

English Special Protection Area within 30km of options

Site Name: Chew Valley Lake SPA	
Background information	
1 European Site/Designation	SPA
2 Qualifying features/interests	<p>This site qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:</p> <p>Northern shoveler (Non-breeding)</p>
3 Conservation Objectives	Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive
4 List of relevant options	No options associated with this site. The site is situated approximately 30km from the options.
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	It is unlikely that the elements will have an effect on the site due to distance and potential lack of pathways.
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	The nearest element is distant from the site. HA207/07 provides advice on the assessment of air quality for a road project for EIA and HRA, in the absence of other more appropriate advice it has been applied to these elements. HA207/07 asks for an assessment of sites which are sensitive to air pollutants and their effects, either directly or indirectly, for sites within 200m of a project (element). Elements are outside the 200m therefore no further assessment has been carried out.
7 Avoidance and mitigation measures	N/A
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	No likely significant effects
Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	HRA of South West Regional Spatial Strategy
10 List of effects noted in other plans and projects considered as relevant for site	The HRA of SWRSS identified the following potential effects arising from the Strategy – water abstraction, water quality, tourism, recreation and related pressures (including urban effects), air quality, physical habitat loss or damage from development.
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood if significant effects

Welsh Ramsar sites within 30km of options

Site Name: Severn Estuary Ramsar	
Background information	
1 European Site/Designation	Ramsar
2 Qualifying features/interests	<p>Estuaries</p> <p>Mudflats and sandflats not covered by seawater at low tide</p> <p>Atlantic salt meadows</p> <p>Migratory fish: Salmon Sea trout Sea lamprey, River lamprey Allis shad Twaite shad Eel</p> <p>Internationally important populations of waterfowl: Bewick's swan European white-fronted goose Dunlin Redshank Shelduck Gadwall</p>
3 Conservation Objectives	<p>Estuaries – Ramsar “estuarine habitat communities” (intertidal mudflats and sandflats, and saltmarshes), Ramsar “hard substrate communities” and Ramsar “notable estuarine species assemblages”</p> <p>Assemblage of migratory fish species – Assemblage of migratory fish species, other migratory species in the assemblage, natural processes in respect of the Ramsar fish features (assemblage populations and supporting habitats)</p> <p>Bewick's swan, European white-fronted goose, Dunlin, Redshank, Selduck, Gadwall – Key supporting habitats for birds swan, natural processes in respect of the Ramsar and key food plants of birds</p> <p>Internationally important assemblage of waterfowl – Key supporting habitats for the waterfowl assemblage natural processes in respect of the SPA, key intertidal invertebrate prey species of the waterfowl assemblage and key saltmarsh food plants</p>
4 List of relevant options	<p>The site is situated approximately 2.8km south of the Black route, approximately 3.4km south of the Purple route and approximately 3km south of the Red route. . However there could be downstream effects from the following options;</p> <p>Draft Plan: Black Route</p> <p>Reasonable Alternative: Red Route</p>

Site Name: Severn Estuary Ramsar	
	<p>Reasonable Alternative: Purple Route</p> <p>No effects associated with complementary measure M48 – B4245 Link as approximately 10km from site.</p> <p>–red Route</p>
Assessment of effects of element(s) on site	
5 List of potential effects of elements on site	<p>The Project lies 3km to the north of the Severn Estuary Ramsar site. None of the construction activities would take place within the designated site, and no land take would be required from within the Ramsar site. However there could be potential downstream effects on:</p> <ul style="list-style-type: none"> -Habitat loss fragmentation -Loss of breeding areas, hibernacula etc. -Air quality changes -Water quality and flow changes barrier to migration from piers within river channel -Changes to habitat structure -Noise and vibration disturbance -Visual and lighting disturbance -Wildlife vehicle collisions
6 Likelihood of significant effects (from the options) on conservation objectives – before mitigation	<p>The likelihood of any noise or vibration disturbance which could affect fish during construction and operation of the Project is negligible, due to the distance between the proposals and the site. Noise and vibration is anticipated to be very low level and unlikely to transmit to the estuary.</p> <p><u><i>Bewick's swan, Wintering European white-fronted goose, Dunlin, Redshank, Gadwall, Shelduck –</i></u></p> <ul style="list-style-type: none"> -Habitat loss fragmentation - No pathway – species does not currently use the levels -Loss of breeding areas, hibernacula etc. – No pathway -Air quality changes – No pathway -Water quality and flow changes barrier to migration from piers within river channel – No pathway -Changes to habitat structure – No pathway -Noise and vibration disturbance – No pathway -Visual and lighting disturbance – No pathway -Wildlife vehicle collisions - Potential for effect if bird behaviour changes to include regular flights across the road <p><u><i>Assemblage of nationally important populations of waterfowl -</i></u></p> <ul style="list-style-type: none"> - Habitat loss fragmentation - Some species within the assemblage may use some areas on the levels -Loss of breeding areas, hibernacula etc. - Potential for roost sites in close proximity to road to be affected -Air quality changes – No pathway -Water quality and flow changes barrier to migration

Site Name: Severn Estuary Ramsar

from piers within river channel – No pathway
 -Changes to habitat structure – No pathway
 -Noise and vibration disturbance - Potential for disturbance during construction
 -Visual and lighting disturbance – No pathway
 -Wildlife vehicle collisions – Potential for effect if bird behaviour changes to include regular flights across the road

Estuaries:

- Habitat loss fragmentation – No pathway
 -Loss of breeding areas, hibernacula etc. – No pathway
 -Air quality changes – No pathway
 -Water quality and flow changes barrier to migration from piers within river channel – No pathway
 -Changes to habitat structure – No pathway
 -Noise and vibration disturbance – No pathway
 -Visual and lighting disturbance – No pathway
 -Wildlife vehicle collisions – No pathway

Atlantic Salt Meadows :

- Habitat loss fragmentation – No pathway
 -Loss of breeding areas, hibernacula etc. – No pathway
 -Air quality changes – No pathway
 -Water quality and flow changes barrier to migration from piers within river channel – No pathway
 -Changes to habitat structure – No pathway
 -Noise and vibration disturbance –No pathway
 -Visual and lighting disturbance – No pathway
 -Wildlife vehicle collisions – No pathway

Assemblage of migratory fish –

- Habitat loss fragmentation - Barrier to migration from caused by piers within river channel
 -Loss of breeding areas, hibernacula etc. - As a result of barrier to migration
 -Air quality changes – Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment
 -Water quality and flow changes barrier to migration from piers within river channel – Barrier to migration from caused by piers within river channel
 -Changes to habitat structure – No pathway
 -Noise and vibration disturbance - Certain species are sensitive to noise and vibration such that migration

Site Name: Severn Estuary Ramsar	
	<p>could be inhibited</p> <ul style="list-style-type: none"> -Visual and lighting disturbance – No pathway -Wildlife vehicle collisions – No pathway <p><u>Mudflats and snadflats not covered by seawater at low tide -</u></p> <ul style="list-style-type: none"> - Habitat loss fragmentation – No pathway -Loss of breeding areas, hibernacula etc. – No pathway -Air quality changes – No pathway -Water quality and flow changes barrier to migration from piers within river channel – No pathway -Changes to habitat structure – No pathway -Noise and vibration disturbance – No pathway -Visual and lighting disturbance – No pathway -Wildlife vehicle collisions – No pathway
7 Avoidance and mitigation measures	<p><i>Birds:</i></p> <p>Water quality and flow control and monitoring to EA standards</p> <p>Construction mitigation measures</p> <p><i>Fish Species:</i></p> <p>Habitat loss fragmentation – avoid areas which are important to the species. If necessary use natural forces to move habitats.</p> <p>Loss of breeding areas, hibernacula etc. – as Habitat loss above.</p> <p>Water quality and flow changes – water quality and flow control and monitoring to EA standards</p> <p>Changes to habitat structure – see habitat loss above.</p> <p>Physical restrictions to species movement – ensure pathways for species left open in method of construction and timing of works.</p> <p><i>Estuaries:</i></p> <p>Habitat loss fragmentation – avoid important areas</p> <p>Air quality changes – as species above</p> <p>Water quality and flow changes – as species above</p> <p>Changes to habitat structure – avoid important area</p>
8 Likelihood of significant effects (from the options) on conservation objectives – after mitigation	<p>There is a likelihood of significant effects related to reduction in habitat quality for bird species, estuaries and fish species.</p> <p>There is a likelihood of significant effects. Carry forward to Appropriate Assessment</p>

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Assessment of effects of element(s) on site in combination	
9 List of effects noted in other plans and projects considered as relevant for site	WTS, WSPU, Newport LDP, Cardiff LDP, VoG LDP, Monmouthshire LDP, Caerphilly LDP, SE Wales RTP, SWRSS.
10 List of effects noted in other plans and projects considered as relevant for site	<p>WTS will help to deliver an efficient, reliable and sustainable movement of people and freight as well as reducing the contribution of transport to greenhouse gas emissions will help to mitigate or offset any increase in diffuse air pollution as a result of this Strategy.</p> <p>The HRA of the WSPU recognised that this Ramsar could be affected by actions within the plan. The key actions associated with the WSPU and in-combination with other plans that may affect this Ramsar, include urban and economic activities, water pollution and abstraction, recreation and tourism pressures and provision of energy and transport infrastructure.</p> <p>The Newport LDP includes reference to the construction of an airport with runways on land that would be reclaimed from the Severn Estuary. This could have an adverse effect on this Ramsar.</p> <p>The HRA of the Caerphilly LDP recognised that the plan could have potential effects on this Ramsar as a result of policies that could lead to atmospheric pollution.</p> <p>The HRA of VoG LDP identified that the plan could have potential effects on this site as a result of land-take, disturbance through noise and vibration, pollution through ground and surface water run-off, and interruption of flight-lines by wind turbines.</p> <p>The HRA of Monmouthshire LDP identified that the plan could have potential effects on this site as a result of potential for the developments to affect green space, water run-off and water quality/quantity</p> <p>The HRA of the Cardiff LDP identified potential for air quality effects. Opportunities for housing, employment and the enhanced status of Cardiff as a regional hub for industry, commerce and recreation as identified in the preferred Strategy have the potential to affect levels of airborne pollution, and hence deposition of pollutants at this site.</p> <p>The HRA of the SWRSS identified some proposals in the draft strategy where the pressures arising from development have given rise to particular concerns over potential damage or loss to N2K sites, including this Ramsar.</p> <p>The SEA of the SE Wales RTP expects that the provisions outlined in the SE Wales RTP will support the improvement in air quality across aspects of the transport network in SE Wales. However, particular parts of the road network could suffer from deteriorating air quality should the expected increase</p>

Site Name: Severn Estuary Ramsar	
	in population across SE Wales precipitate an increase in car use in the near future.
11 List of potential effects of element (s) in combination with other plans and projects	<p>Air quality – nitrogen deposition and acidification.</p> <p>Water run-off and quality</p> <p>Water pollution and abstraction</p> <p>Disturbance through noise and vibration</p> <p>Urban and economic development activities</p> <p>Recreation and tourist pressures</p> <p>Provision of energy and transport infrastructure</p>
12 Likelihood of significant effects (in-combination) on conservation objectives – before mitigation	In-combination effects not considered significant
13 Mitigation measures in draft Plan and other plans/projects	N/A
14 Likelihood of significance of effects (in combination) on conservation objectives – after mitigation	No likelihood of significant effects
15 Review of description of elements	<p>Draft Plan:</p> <p>Black Route - a new 3-lane motorway mainly following the protected TR 111 'Black Route', between Junctions 23 and 29, including a new crossing of the River Usk south of Newport.</p> <p>Reasonable Alternative:</p> <p>Red Route – Dual 2-lane all-purpose road to the south of Newport</p> <p>Reasonable Alternative:</p> <p>Purple Route – a 3-lane motorway route along alternative alignment to the South of Newport</p> <p>Complementary Measure (addition to Red, Black and Purple Route):</p> <p>M48 – B4245 Link is a new single carriageway link between the M48 and B4245. This would potentially provide relief to Junction 23a and to the local road network. It may also facilitate the introduction of a park and ride facility at Severn Tunnel Junction in the future.</p>
16 Review of site based information	<p>The Severn Estuary is the largest example of a coastal plain estuary in the UK, and one of the largest estuaries in Europe. It contributes approximately 30% of the UK Natura 2000 resource for estuaries, by area. The extent of the Estuary feature is 73678 ha. The Severn Estuary Ramsar includes subtidal and intertidal areas landward to the line of high ground and flood defences (banks and walls) that provide the limit of tidal inundation. The Severn Estuary is important for its immense tidal range, which affects both the physical environment and the diversity and productivity of the biological communities.</p> <p>The tidal range is the second largest in the world, reaching in excess of 13m at Avonmouth. This macrotidal environment is partly due to the estuary's funnel shape which concentrates the tidal wave as it</p>

Site Name: Severn Estuary Ramsar	
	<p>moves up the Bristol Channel. There are several major rivers, including the Taff, Usk, Wye, Severn, Avon and Parrett which feed into the estuary, and influence the salinity regime.</p> <p>The key features of European importance within the Severn Estuary Ramsar site include internationally important populations of waterfowl, migratory fish, estuaries, Atlantic sea meadows and mudflats and sandflats.</p>
17 Review of baseline information	<p>Estuaries - The extreme hydrodynamic and sedimentary conditions essentially determine the type of habitats and species present and result in characteristic animal and plant communities.</p> <p>The predominant unconsolidated sediments are muds and sands which form the basis of the structure of the estuarine habitats which include saltmarshes, intertidal mud and sand flats and subtidal sand banks, mixed mud and sand, rock outcrops, boulder and shingle shores as well as biogenic (worm built) reefs. There are also sandy beaches on the southern shores in the outer part of the estuary, backed by sand dunes.</p> <p>The intertidal zone of mudflats, sandbanks, rocky platforms and saltmarsh is one of the largest and most important in Britain and this range of habitats provide an ecosystem of great importance for a wide range of fish and bird species – for feeding, breeding, resting and migration.</p> <p>Atlantic sea meadows – The Severn Estuary holds the largest aggregation of saltmarsh in the south and south-west of the UK. It covers approximately 1,400 ha, representing about 4% of the total area of saltmarsh in the UK (Dargie, 2000). The huge tidal range in the Severn Estuary has led to extensive saltmarsh community development with an expanded zonation.</p> <p>The saltmarshes of the Severn Estuary have four principal zones corresponding to the four main sub-features that have been identified for this feature. Two of these zones (the lower to mid marsh communities and the mid to upper marsh communities) contain the principle saltmarsh types.</p> <p>Saltmarshes and mudflats have an important role to play in estuarine processes, both through the recycling of nutrients within the estuary and through their role as soft sea defences, dissipating wave energy.</p> <p>Saltmarshes also provide a valuable feeding and roosting and resting areas (particularly at high tide) for a wide range of species of waterfowl and are therefore very important supporting habitats for the wintering and passage bird features of the SPA and Ramsar Site.</p>

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	<p>The Severn Estuary saltmarshes are generally grazed by sheep and/or cattle. Grazing is a significant factor in determining the plant communities found within them and their value for dependant species such as birds and rare plants.</p> <p>Mudflats and sandflats not covered by seawater at low tide - The extensive mudflats and sandflats of the Severn Estuary provide undisturbed refuge and a rich resource of intertidal invertebrates as food for many species of migratory birds. The Severn supports massive populations of birds, many of which are highly mobile, feeding and roosting in different areas, depending on food availability and the state of the tide. The European white-fronted geese roost at night on estuarine sandbanks and usually fly less than 10km to the daytime feeding grounds. Shelduck exploit the rich resources of invertebrates found in the intertidal mudflats where they forage for molluscs and other invertebrates such as the mudsnail. Redshank and dunlin are distributed widely and feed throughout the estuary on marine polychaete worms, crustaceans and molluscs such as the Baltic tellin <i>Macoma balthica</i>. Dunlin and redshank mainly feed on invertebrates in the muddier finer sediments. Dunlin are found mostly on the mid shore whereas redshank are more thinly distributed and are often found in smaller groups in the creeks and sub-estuaries. Gadwall are predominantly a freshwater species preferring the wetland habitats that occur within the SPA behind the flood defences and therefore outside the European Marine Site- most notably the freshwater wetlands at Slimbridge and Bridgwater bay. However, they do make use of the estuary but this is largely restricted to areas where freshwater flows come into the estuary.</p> <p>The intertidal mudflats and sandflats at The Noose, Frampton Sand and Waveridge Sand are used as disturbance refuge for Bewick's swan. The extent and distribution of this sub-feature are important to maintain the population in favourable condition.</p> <p>Internationally important populations of waterfowl: <i>Bewick's swan</i> - Mainly found in the Upper Severn Estuary at Slimbridge. Peak bird count for Bewick's swan during 2006/07 for Severn Estuary SPA is 196¹¹</p> <p><i>European white-fronted goose</i> – Peak bird count for European white-fronted goose during 2006/07 for Severn Estuary SPA is 120¹²</p> <p><i>Dunlin</i> – Peak bird count for Dunlin during 2006/07 for Severn Estuary SPA is 16,625¹³</p>

¹¹ Appendix 11 of the Severn Estuary SAC, SPA and Ramsar Site: Regulation 33 Advice from CCW and Natural England, June 2009

¹² Ibid

¹³ Ibid

Site Name: Severn Estuary Ramsar	
	<p><i>Redshank</i> – Peak bird count for Redshank during 2006/07 for Severn Estuary SPA is 2,362¹⁴</p> <p><i>Shelduck</i> - Peak bird count for Shelduck during 2006/07 for Severn Estuary SPA is 3,711¹⁵</p> <p><i>Gadwall</i> - Peak bird count for Gadwall during 2006/07 for Severn Estuary SPA is 241¹⁶</p> <p>Assemblage of migratory fish species: Species occurrence not yet accountable</p>
18 Review of potential impacts	No change from information provided at screening stage
19 Review of “in combination” projects or plans information	The screening stage identified no likelihood of significant “in combination” effects from projects or plans.
20 Assessment findings for site	<p><u><i>Bewick’s swan, Wintering European white-fronted goose, Dunlin, Redshank, Gadwall, Shelduck –</i></u> - Wildlife vehicle collisions - Potential for effect if bird behaviour changes to include regular flights across the road</p> <p><u><i>Assemblage of nationally important populations of waterfowl -</i></u></p> <p>- Habitat loss fragmentation - Some species within the assemblage may use some areas on the levels - Loss of breeding areas, hibernacula etc. - Potential for roost sites in close proximity to road to be affected - Noise and vibration disturbance - Potential for disturbance during construction - Wildlife vehicle collisions – Potential for effect if bird behaviour changes to include regular flights across the road</p> <p><u><i>Assemblage of migratory fish –</i></u></p> <p>- Habitat loss fragmentation - Barrier to migration from caused by piers within river channel - Loss of breeding areas, hibernacula etc. - As a result of barrier to migration - Air quality changes – Diffusion of pollution from the two Usk crossings would reduce concentrations to minimal levels in the upper catchment - Water quality and flow changes barrier to migration from piers within river channel – Barrier to migration from caused by piers within river channel</p>

¹⁴ Ibid

¹⁵ Ibid

¹⁶ Ibid

Site Name: Severn Estuary Ramsar	
	-Noise and vibration disturbance - Certain species are sensitive to noise and vibration such that migration could be inhibited
21 Avoidance/mitigation measures not previously included in the Estuary assessment at Row 7 above	No additional mitigation measures
22 Assessment findings after additional mitigation	Appropriate mitigation has been appropriately identified that should adequately remove/reduce these adverse impacts on the integrity of Severn Estuary Ramsar.
23 Conclusion – no adverse effect on the integrity of the site/ adverse effect on the integrity of the site?	The decision on whether the proposed Black, Red and Purple Routes would have an adverse impact on the integrity of the Severn Estuary Ramsar cannot be made until more detailed survey and project design information is available.

