

Newport City Council Local Development Plan

Habitat Regulations Assessment

Initial Screening Report

January 2010

Plan Design Enable

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Record of Assessment of Likely Significant Effect on a European Site Required by Regulation 48 of the Conservation (Natural Habitats & c.) Regulations 1994 (as amended)

January 2010

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1. Introduction and Background

1.1 Background to this Assessment

This report is a record of the Habitat Regulations Assessment (HRA) screening stage carried out by Atkins Limited (Atkins) on behalf of Newport City Council (the Competent Authority) to allow them to make an informed decision on whether there are likely to be significant effects on European sites as a result of the Newport City Local Development Plan (LDP).

The LDP is a high-level strategic document which aims to identify the key proposed development trends within the authority boundary in the years between 2011 and 2026. The LDP is still in development and currently consists of a Preferred Strategy document and a register of candidate development sites (Candidate Site Register) within Newport City. Each site within the Candidate Site Register currently has a defined boundary (see Appendix A).

This screening report represents part of an iterative process undertaken by Newport City Council (NCC) and aims to highlight those policies and options within the Preferred Strategy and more specifically any sites within the Candidate Site Register which would potentially result in likely significant effects on European sites either alone or in-combination with other plans and projects.

1.2 Background to Habitat Regulations Assessment

Newport City Council has identified the potential need for an assessment of the potential effects of the LDP on a number of European protected sites both within Newport City and within close proximity to the authority boundary.

The Habitats Directive 92/43/EEC, requires the assessment of the potential effects of a development plan on European Sites. In the UK, the Habitats Directive has been transposed into national legislation in the Conservation (Natural Habitats &c) Regulations 1994 (the Habitat Regulations – as amended). Regulation 48 implements the requirements of Article 6.3 of the Directive for Habitats Regulations Assessment (HRA) of a project or plan. Such an assessment is required where a plan or project under consideration is likely to have a significant effect on a Special Area of Conservation (SAC) or Special Protection Area (SPA). In such assessments, TAN 5: Nature Conservation and Planning (Welsh Assembly Government, January 2006) states that consideration should also be given to Wetlands of International Importance (Ramsar sites), potential SPAs (pSPAs), and candidate SACs (cSACs). Hereafter, these sites are collectively referred to as 'European sites'

Draft guidance issued by the Welsh Assembly Government (contained within TAN 5: Nature Conservation and Planning, January 2006 and Annex 6 to TAN 5: The Assessment of Development Plans in Wales under the provisions of the Habitats Regulations, October 2006) recommends HRA comprises the following stages:

- **Stage 1 – Screening:** To test whether a plan or project either alone or in combination with other plans and projects is likely to have a significant effect on a European site;
- **Stage 2 – Appropriate Assessment:** To determine whether, in view of a European site's conservation objectives, the plan (either alone or in combination with other projects and plans) would have an adverse effect (or risk of this) on the integrity of the site with respect to the site structure, function and conservation objectives. If adverse impacts are anticipated, potential mitigation measures to alleviate impacts should be proposed and assessed;

- **Stage 3 – Assessment of alternative solutions:** Where a plan is assessed as having an adverse impact (or risk of this) on the integrity of a European site, there should be an examination of alternatives (e.g. alternative locations and designs of development); and
- **Stage 4 – Assessment where no alternative solutions remain and where adverse impacts remain:** In exceptional circumstance (e.g. where there are imperative reasons of overriding public interest), compensatory measures to be put in place to offset negative impacts.

This report is a record of the screening assessment undertaken at Stage 1 of the HRA process.

1.3 Consultation

An inception meeting was held on 8th January 2009 between Newport City Council (including Newport City Council's biodiversity officer), Atkins, the Countryside Council for Wales (CCW) and the Environment Agency. Representatives of the organisations present were able to identify key vulnerabilities of European sites and to identify sites included within the Candidate Site Register of particular concern to European sites. A general approach to the screening assessment was agreed at the meeting.

Discussion was held with Kerry Rogers of CCW following the meeting to further agree the approach to the screening assessment.

1.4 Outline of this Report

Following this introduction:

- Section 2 outlines the methodology used for this HRA screening;
- Section 3 contains tables describing the European sites in the NCC boundary and within 15km of the NCC boundary and highlights their key vulnerabilities;
- Section 4 summarises the details of the LDP;
- Section 5 describes the other plans and projects relevant for the 'in combination' assessment;
- Section 6 describes the findings of the HRA screening;
- Section 7 contains recommendations to be considered for the draft LDP document;
- Section 8 presents the conclusions of the HRA screening.

2. Methodology

Determination of the European Sites included in the HRA Screening

An initial review of the LDP in light of the Habitats Regulations has been undertaken by Atkins as part of the HRA process. This initial review looked at the geographic extent or zone of influence of potential impacts which could arise as a result of the LDP and considered which European sites should be included within the assessment.

As a starting point all sites within Newport City and up to 15 km from the district boundary were identified¹. This distance was agreed with CCW at the initial inception meeting on 8th January 2009. This distance is understood to be sufficient to establish the potential impact range of air emissions, and whilst it is known that studies show that people will travel up to 17.3km to visit areas for recreation, given the transport corridors within the local region, 15km in this case was considered sufficient.

It is recognised that the impacts of the airport will be significant within greater range than 15km, but for the purpose of this report it is accepted that the airport is not NCC's responsibility and not supported by the UK Government. If it was to go ahead, a separate HRA would be required for this site in order to assess impacts of air emissions, bird strike and land take amongst many other potential impacts.

Process of the Screening assessment

- Step 1. Identification of European Sites.

European Sites within Newport City and up to 15 km from the district boundary were identified using the CCW website, and Newport City Council's GIS department.

- Step 2. Site Information.

Information was obtained for each European site from CCW and Joint Nature Conservation Committee. This included a list of all qualifying features, their current condition and conservation objectives and any particular sensitivity of vulnerability of the European site².

- Step 3. Sites review.

A review was undertaken of the Candidate Site Register within the LDP to identify those considered likely to impact upon the European Sites identified at Step 1.

- Step 4. Assessment of 'in-combination' effects.

Other plans and projects that may, in combination with the Newport City LDP, have the potential to adversely impact European Sites were considered. HRAs of nearby local authority's Local Development Plans, as well as other management plans and development plans which may affect those European and Ramsar sites identified were reviewed. Other information used included

¹ The Environment Agency Integrated Pollution Control (IPC) and Pollution Prevention and Control (PPC) guidance notes that a proposal to construct a coal or oil fired power station should consider impacts on European sites up to 15 km away (Page 4 of the *Habitats Directive – Work Instruction: Appendix 7 Technical and Procedural Issues Specific to IPC and PPC* produced by the Environment Agency in July 2004).

² Countryside Council for Wales 2008 Core Management Plans, including Conservation Objectives for each European and Ramsar site identified.

Pollution Prevention and Control data and United Nations Economic Commission for Europe data of Critical Loads for Nitrogen in vulnerable habitats.

- Step 5. Assessment of likely significant effects.

This step involved an initial assessment of the likely effects of the LDP alone and/or in combination with other plans and projects on the European Sites, and whether these impacts would be likely to be significant. Of key consideration for assessment were the distance of the proposed development to a European and Ramsar site and the proposed land use in relation to each European and Ramsar site's vulnerabilities. Vectors such as wind direction or river flow were also considered when making the assessment.

3. European Sites

This section includes information about the six European sites within 15km of the Newport City Council's boundary including their designation status, the location of the sites, a brief description of the sites and site's key vulnerabilities.³ A map with the locations of the site can be found in Appendix A

Table 3.1 Summary of European sites and key vulnerabilities

³ Countryside Council for Wales 2008 Core Management Plans, including Conservation Objectives for each European and Ramsar site identified.

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
River Usk SAC (1007.71ha) UK0013007	<p>The site lies within the Newport City boundary</p>	<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. The river therefore runs through the Newport's Unitary Authority boundary itself.</p>	<p>The River Usk is one of the largest rivers in south Wales, and it supports six species of European protected fish species:</p> <ul style="list-style-type: none"> • Sea lamprey • brook lamprey • River lamprey • Twaite shad • Atlantic salmon • Bullhead • Otter 	<p>Barriers to Migration - Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of certain fish species. There are no known barriers within Newport.</p> <p>Reduced Flow - Flow targets have been set which are considered likely to significantly reduce or remove the impacts on SAC features. There are also requirements for screening of intakes to reduce or remove the impact of impingement and entrainment on juvenile fish migrating downstream.</p> <p>Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates.</p> <p>Development Pressures - development pressure in the lower catchment can cause temporary physical, acoustic, chemical and sediment barrier effects.</p> <p>The Usk SAC provides a key movement corridor for otters passing between the relatively high densities in mid Wales and the south-east Wales coastal strip (Severn Estuary and Gwent Levels). The function of this aspect of the site should be protected through the maintenance of suitable resting sites (in terms of size, quality and levels of disturbance) through the major urban centre of Newport.</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
				<p>Diffuse Pollution - the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution.</p> <p>Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century.</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
Severn Estuary SAC (73715.4 ha) UK0013030 SPA (24662.98ha) UK9015022 Ramsar (24662.98ha) UK11081	Adjacent to Newport City southern boundary	The Estuary is located in the south west of the UK	SAC <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time Estuaries Reefs Atlantic salt meadows Sea lamprey River lamprey Twaite shad SPA <ul style="list-style-type: none"> Gadwall White-fronted Goose Dunlin Shelduck Redshank Bewick Swan Ramsar <ul style="list-style-type: none"> Sandbanks which are slightly covered by sea water all the time Estuaries Reefs Atlantic salt meadows 	<p>The estuary as a whole is vulnerable to large scale interference, mainly as a result of human actions. These include land-claim, aggregate extraction, physical developments such as barrage construction and other commercial construction activities, flood defences, industrial pollution, oil spillage and tourism-based activities and disturbance.</p> <p>Physical loss through removal - activities or developments resulting in physical loss of the intertidal supporting habitats are likely to reduce the availability of bird feeding and roosting habitat and thus be detrimental to the favourable condition of the SPA interest features including the Annex 1 species, Bewick's swan. The intertidal mudflats and sand flats and the salt marsh are highly sensitive to removal by land reclamation and barrage construction. Large areas of the European marine site are not currently under threat.</p> <p>Disturbance - Overwintering birds are disturbed by sudden movements and sudden noises. This can displace the birds from their feeding grounds. Disturbance can prevent the birds from feeding and in response they either a) decrease their energy intake at their present (disturbed) feeding site through displacement activity, or b) move to an alternative less favoured feeding site.</p> <p>Toxic contamination - Waterfowl are subject</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
			<ul style="list-style-type: none"> • Salmon • Sea trout • Sea lamprey • River lamprey • Allis shad • Twaite shad • Eel • Gadwall • White-fronted Goose 	<p>to the accumulation of toxins through the food chain or through direct contact with toxic substances when roosting or feeding. Their ability to feed can also be affected by the abundance or change in palatability of their prey caused by toxic contamination. At the moment there is no evidence to show that this is the case on the Severn Estuary, but the estuary is vulnerable to oil spills and there is a continuous discharge of toxins into the estuary, some of which bind to the sediments.</p> <p>Changes in nutrient and/or organic loading</p> <p>- Changes in organic or nutrient loading can change the species composition of the plants on the salt marsh and thus the structure of the sward. Increases in nutrients can also cause excessive algal growth on the mudflats, denying the birds' access to their invertebrate prey and changing the invertebrate species composition in the sediment. At present the intertidal mudflats and sand flats are moderately vulnerable to changes in nutrient and/or organic loading.</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
River Wye SAC (2234.89ha) UK9015022	The River Wye SAC is located 10km to the east and north east of the Newport City boundary	The River Wye SAC rises on Plynlimon in the Cambrian Mountains and flows in a generally south-easterly direction to enter the Severn Estuary at Chepstow	<ul style="list-style-type: none"> • Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation • Transition mires and quaking bogs • Sea lamprey • Brook lamprey • River lamprey • Twaite shad • Allis shad • Atlantic salmon • Bullhead • Otter 	<p>Barriers to Migration - Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of certain fish species.</p> <p>Reduced Flow - Extraction of water from the river can result in changes and loss to important fluvial habitats, consequently affecting the animal species for which the site is designated. Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates.</p> <p>Development Pressures - development pressure in the lower catchment can cause temporary physical, acoustic, chemical and sediment barrier effects. The Wye SAC provides a key movement corridor for otters passing between the relatively high densities in mid Wales and the south-east Wales coastal strip (Severn Estuary and Gwent Levels). The function of this aspect of the site should be protected through the maintenance of suitable resting sites (in terms of size, quality and levels of disturbance) through urban centres.</p> <p>Diffuse Pollution - the most significant sources of diffuse pollution and siltation are from agriculture, including fertiliser run-off, livestock manure, silage effluent and soil erosion from ploughed land. Discharges from sewage treatment works, urban drainage,</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
				<p>engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution. Pollution of rivers with toxic chemicals, such as PCBs, was one of the major factors identified in the widespread decline of otters during the last century.</p> <p>Invasive Species - Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. A further adverse factor is the over-abundance of invasive non-native species of bank side plant communities, which are included within the feature definition. Japanese knotweed and Himalayan balsam are widespread in the catchment, including the Lfon sub-catchment.</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
Wye Valley Woodlands SAC (916.24ha) UK0012727	The Wye Valley Woodlands is located 9km to the east of the Newport City boundary	The Wye Valley Woodland SAC is a cross border site and comprises sixteen SSSIs. Nine of these are in Wales. Blackcliff-Wyndcliff SSSI is located approximately 9km to the east of the Newport City boundary.	<ul style="list-style-type: none"> • <i>Asperulo-Fagetum</i> beech forests • <i>Tilio-Acerion</i> forests of slopes, screes and ravines • <i>Taxus baccata</i> woods of the British Isles • Lesser horseshoe bat 	<p>Inappropriate grazing - regeneration is frequently recorded as unfavourable, largely because of the extensive deer grazing throughout the Wye Valley.</p> <p>Off-site pollution - the effects of the releases of quarry dust into the atmosphere from the works adjacent to the Blackcliff -Wyndcliff SSSI are not known; these emissions are subject to the authorisation of other competent authorities, particularly the Environment Agency.</p>
Cardiff Beechwoods SAC (115.62ha) UK0030109	The Cardiff Beechwoods SAC is located 8km to the west of the Newport City boundary	Cardiff Beechwoods SAC is located to the north west of Cardiff, at the base of the Rhondda Valley.	<ul style="list-style-type: none"> • <i>Asperulo-Fagetum</i> beech forests 	<p>Recreational Pressure - All component SSSIs are used to a greater or lesser extent for recreation purposes. Castell Coch Woodlands and Fforestganol a Chwm Nofydd experience the most recreational pressure, and are popular for walking, climbing and mountain biking. There is pressure to open up additional areas for access, with potential adverse implications for the ground flora and, depending on the scale of the proposals, the trees themselves.</p> <p>Aerial 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.</p> <p>Quarrying - There are a number of active and disused limestone quarries in the area. Garth</p>

Site Details	Distance from Newport unitary authority boundary	Location of European Site	Reasons for designation	Key vulnerabilities of the European Site
				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. .
Aberbargoed Grasslands SAC (39.78ha) UK0030071	The Aberbargoed Grasslands SAC is located approximately 12km to the north west of the Newport City boundary	Aberbargoed Grasslands SAC covers an area of 42.5ha and lies on a southwest facing hillside in the Rhymney Valley, 1km east of Bargoed. The site occupies an urban fringe position, between 200m and 290m above sea level.	<ul style="list-style-type: none"> • <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils • marsh fritillary butterflies 	<p>Inappropriate Management - 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.</p> <p>Anti-social behaviours - in previous years anti-social behaviour such as off-roading and burning have occurred at Aberbargoed grasslands.</p> <p>Aerial Pollution - poor air quality represents a conservation threat to grassland habitats such as this SAC. However, there is no current evidence to show that aerial pollutants are having an adverse impact on the <i>eu-Molinion</i> marshy grasslands.</p>

4. Plan Details

4.1 Brief Description of Plan

The Newport City Council (NCC) Unitary Development Plan (UDP) was adopted in May 2006. The adopted UDP contains detailed policies that will be used in the assessment of all planning applications that come before the council, and will guide the new development that is likely to take place until 2011. NCC has now started the preparation of the LDP, which will replace the UDP upon adoption. The LDP will set out the Council's objectives and priorities for the development and use of land within the City for the period 2011-2026. At present, the plan takes the form of the Preferred Strategy along with a list of Candidate Sites. The Preferred Strategy includes a vision for the city over the next 15 years and includes 8 more detailed objectives, which are outlined below. The Preferred Strategy also includes a number of policies which detail how the objectives are going to be implemented; these are included in Appendix C

The Vision

“As a gateway to Wales, Newport will be a centre of regeneration that celebrates its culture and heritage, while being a focus for diverse economic growth that will strengthen its contribution to the region. It will be a place that people recognise as a lively, dynamic, growing city, with communities living in harmony in a unique natural environment.”

This vision is proposed as the core purpose of the LDP. It will drive forward the intended changes for Newport from 2011. The vision addresses the main priorities for taking Newport forward in land use terms, as discussed at the three consultation events, and taking into account the Community Strategy and the Wales Spatial Plan. Importantly, it is also distinctive to Newport.

Sustainable use of land

Objective 1

To ensure that all development makes the most efficient use of natural resources by seeking to locate development in the most sustainable locations, minimises the impact on the environment and makes a positive contribution to Local communities.

A key way in which the plan will seek to meet this objective is by focusing development on previously used, brownfield sites. Newport has a good supply of this type of land. Some of the sites are of a sufficient size that they have the potential to create new communities in their own right, with a mix of different land uses, and with appropriate landscaping making for a pleasant environment.

Climate change

Objective 2

To ensure that development and land uses in Newport make a positive contribution to helping to minimise the causes of climate change and to mitigating the impacts, by incorporating the principles of sustainable design, reducing the need to travel, providing safe and active travel routes, and managing the risks and consequences of flooding.

Transport is a major source of greenhouse gases, so the plan seeks to minimise the need to travel and to enable journeys that do need to be made to be done so in as sustainable a way as possible. Because Newport has a relatively compact urban form, and has radial routes running

into the city centre, this has enabled bus services to be provided that allow many journeys within the city to be made by public transport.

The concentration of major growth in the Eastern Expansion Area should provide a sufficient nucleus of development that will enable public transport services to be provided, including the proposed railway station. A scatter of relatively small scale peripheral extensions would tend to need to rely on the private car.

Although the city sits astride a river with a large tidal range, the risks and consequences of flooding are well understood. Recent developments, especially on the east bank of the Usk, have contributed to improving the flood defences to existing development by being built at higher ground levels than previous uses on the sites.

Economic Growth

Objective 3

To enable a diverse economy that meets the needs of the people of Newport and those of the wider South East Wales economic region.

The Strategy seeks to maintain Newport's role as a major economic hub in the region, providing employment and adding value. Significant development has been occurring on peripheral sites, and construction is ongoing. There will, however, also be a focus on inner urban sites, which can be more accessible by a choice of means of transport. The employment value of other uses also needs to be recognised, for example from health, other public services and construction, including housing.

Housing

Objective 4

To ensure that there is an adequate supply of land for housing in the most sustainable locations, and to ensure that the quantity, quality and variety of housing provision meets the needs of the population. Also to foster the creation of places which contribute to local distinctiveness and thriving communities.

A level of house building is proposed that will meet current trends in household formation and so enable everyone to have potential access to decent housing. The reuse of brownfield sites will help to ensure sustainability, both in avoiding excessive use of greenfield sites and also in helping to maintain existing communities by providing new housing opportunities nearby. Detailed policies on design will also help to maximise the eco-standards of new development.

A number of housing estates in the city are likely to come to a point of needing significant regeneration works during the plan period, such as at Malpas and Ringland. It is proposed that a comprehensive approach should be taken to this, as is being done at Alway.

Conservation and the Environment

Objective 5

To ensure that all development or use of land does not adversely affect, and seeks to preserve or enhance, the quality of the built environment.

The quality of the built environment is a contributor to the quality of life. Newport has a variety of interesting buildings and structures, including in the city centre where many fine Victorian buildings remain, having escaped the redevelopment that many towns and cities saw in the 1960s and 70s. The Strategy therefore seeks to preserve historical quality and to ensure that new development of all sorts is of carefully thought through design.

Objective 6

To protect and enhance the quality of the natural environment, including protected and non-protected species and habitats, regardless of greenfield or brownfield status, and also including the protection of controlled waters.

Newport has an important natural heritage not only in its countryside, but also within its urban area. Numerous designations apply to sites and species within the county borough, and the Strategy seeks to maintain and enhance its biodiversity.

Community Facilities and Infrastructure

Objective 7

To ensure the provision of appropriate new, and/or enhanced existing, community facilities.

New development will be required to make contributions to the provision of infrastructure necessary for the development. This will be through obligations negotiated under section 106 of the Planning Act 1990 (as amended) and also potentially through the Community Infrastructure Levy brought in by the 2008 Planning Act.

Culture and Accessibility

Objective 8

To ensure that development proposals and uses are socially and physically accessible to all, taking account of the needs of all individuals.

The Strategy seeks to facilitate development that is accessible by a choice of means of transport. This will assist in serving the interests of sustainability, both in ensuring that there are alternatives to travel by private car, and also in helping to ensure that developments are accessible to all, so that all people can potentially achieve the same outcome.

Themes

Through the Preferred Strategy's 8 objectives and various policies numerous themes can be identified. Those relevant to this HRA have been outlined below. Much of the wording has been taken directly from the Preferred Strategy and other NCC documents:

Housing

New sites are likely to gain planning permission in the intervening period under the policies of the currently adopted plan, thereby replenishing the supply. So a potential build rate of about 640 dwellings per year could be feasible on currently available sites, if densities remained the same overall, which would mean 9,600 new dwellings over the plan period.

Key brownfield regeneration sites for housing have been identified at Llanwern Steelworks, the former Whiteheads Steelworks, Monmouthshire Bank Sidings and along the River Usk including sites at the Old Town Dock and Crindau. Greenfield sites have been identified to provide up to 1,500 dwellings including key locations at Llanwern Village and Tredegar Park Golf Course.

Employment

The creation of job opportunities is likely to be an ongoing priority, and issues may revolve around the amount of employment land required, the location of it, and the provision of jobs on land not specifically allocated for employment purposes. The council's Economic Development Strategy is currently being reviewed to cover the period to 2011 to coincide with the end of the adopted UDP period and the start of the LDP period, much of the original UDP remains valid and the main thrust of the new strategy will be to help deliver the employment growth targets set out in the UDP. An assessment of industrial and commercial land and property is recommended to inform the LDP.

New industrial and business development will be located mainly at West Newport at Coed Kernew; South East Newport within the Eastern Expansion Area and within the general urban area, River Usk Corridor and docks.

Flood Risk and Water Resources

There is a requirement to address the issue of flood risk and flood resilience of developments. Development will be directed away from flood risk areas, and layouts and buildings will be expected to incorporate Sustainable Drainage Systems (SUDs) and water management techniques. Another key issue for the LDP is that of climate change and sea level rise, whilst the need for continued and improved flood risk management schemes remains. The development of coastal strategies (Shoreline Management Plan) and catchment focused strategies (Catchment Flood Management Plans for River Usk and Eastern Valleys) deal with a range of flooding issues and a consistent approach towards such a complex issue is required.

The preferred strategy states that development proposals should reduce water consumption and result in no net increase in surface water run-off through the sustainable management of water resources through the use of Sustainable Drainage Systems; the reuse of water and reduction of surface water run-off through high quality designed developments and the careful consideration of the impact upon finite water resources, particularly in terms of increased pressures on abstraction and the impact of climate change.

Transport

The Welsh Assembly has produced a draft National Transport Plan (2010-2015) 'A Modern, Sustainable System for Wales' which aims to ensure a system of transport fit for the 21st Century and is based on three key principles: to meet the demand for enhanced mobility which will enable economic growth and improve the quality of life we seek; to put transport onto a more sustainable and less carbon-intensive path and to use transport funding more effectively in light of increased pressures on public finances.

The ten local authorities covering South East Wales have worked together to produce the SEWTA Regional Transport Plan. The aim of the plan is to develop a transport system across South East Wales which is fit for the 21st Century.

This objective will be achieved by implementing a range of competing objectives, providing a transport system which enables greater environmental protection, enhanced accessibility and which supports greater productivity and economic growth, within an overall priority of making better use of the area's existing transport infrastructure to deliver sustainable transport.

In terms of development, land will be safeguarded for the following strategic highway schemes: M4 Motorway Junction 28 Tredegar Park Interchange Improvement; Eastern Extension of the Southern Distributor Road along Queensway through the Glan Llyn Regeneration and Corus Steelworks sites and the Western Extension of the Southern Distributor Road as the Duffryn Link road between Maesglas and Coedkernew.

Conservation of the Natural Environment

Nature conservation sites designated, or proposed to be designated, under European or international legislation are subject to highest level of protection and therefore require rigorous examination. Newport has a number of European protected sites including: the River Usk SAC, the Severn Estuary SAC, SPA and Ramsar site.

In addition to National Policy designation the plan would seek to protect and enhance sites of local importance. Proposals affecting sites will be required to consider the impact on such a finite and distinctive local resource.

Celtic Manor

The Celtic Manor Resort is now a significant employer in Newport, with an international profile. Development of the facility has been incremental, and issues relate to how any further proposals should be handled.

Airport

A submission has been received proposing the construction of an airport with runways on land that would be reclaimed from the Severn Estuary to the south-east of Redwick, and terminals and related development on land to the north of the operational part of Llanwern Steelworks and south-east of Underwood in the Bishton and Wilcrick area. This airport would not be a small facility as this would not justify the significant building costs, including land reclamation and surface transport links. A major facility would be likely to have significant economic effects.

International airport development is not an issue over which the LDP has jurisdiction, national government has that responsibility. There would, however, be major implications for the local area, and many related developments would be subject to local planning control. There is therefore an important procedural issue as to how the LDP should handle the proposal. Local planning authorities normally only have powers down to the low water mark, and the runways would extend beyond that boundary. A key consideration is that there is a clear lack of Government support for the project.

There are also environmental concerns at a number of levels. At a strategic level, the issue of carbon emissions from air travel would be a consideration, and the appropriate amount of airport capacity to be provided nationally. At the site specific level, there would need to be imperative reasons of overriding public interest to allow airport development as this would be likely to have a significant impact on the Severn Estuary SPA, Ramsar site and SAC.

Candidate Site Register

A Candidate Site Register has currently been prepared including areas of land out forward by private individuals to the council for inclusion in the LDP. The Council is required to invite such proposals, and must then assess them as to their suitability for inclusion.

The inclusion of an area of land within the Candidate Site Register should not be interpreted as a commitment from Newport City Council that such sites will be taken forward into the LDP.

At this stage, although the proposed boundaries of each candidate site are known, specific details of the usage of the candidate sites are not known. However, assumptions of potential general usage (e.g. housing, industrial, commercial) have been made by Newport City Council for each candidate site.

4.2 Provisions within the Plan that protect the Environment

The Preferred Strategy contains wording and policies which commit to the protection and enhancement of the natural environment in and around Newport (namely SP1, SP4, and SP7). There is no referral to the protection of European and Ramsar sites within the policies, although it is recognised that guidance discourages LDPs repeating national policy, in this case with reference to internationally designated wildlife sites⁴.

⁴ Welsh Assembly Government 2006 – Planning Policy Wales Companion Guide

5. Other Projects and Plans

The table below outlines the documents reviewed for the purpose of the 'in combination' element of the HRA.

Table 5.1: Documents reviewed for 'in combination' effects

Statutory Body/Organisation	Report Reference	Findings of HRA/Potential sources of impacts on European Sites
Caerphilly County Borough Council	N/A	8,625 new homes, extensive new employment land, provisions for mineral extraction and waste facilities. No HRA available to assess potential impacts on any European Sites. Located close to Aberbargoed Grasslands SAC.
Cardiff City Council	Habitats Regulations Assessment of the County Council of the City and County of Cardiff Local Development Plan Preferred Strategy (2007)	24,750 new homes, extensive new employment land, provisions for mineral extraction and waste facilities. 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. The main routes through which likely significant effects are anticipated are via increased air emissions and recreational pressures. Recommendations include changes to the LDP wording and potentially further appropriate assessment work.
Monmouthshire County Council	Habitats Regulations Assessment of Monmouthshire Local Development Plan – Pre-deposit proposals (2009)	5,250 new homes, new employment land. The HRA Screening for the Monmouthshire LDP emerging Preferred Strategy has identified the potential for negative impacts on several European sites in Monmouthshire County. Identified impacts on the River Usk SAC and River Wye SAC through water pollution and reduced flow due to water abstraction. Recommendations include changes to the LDP wording and potentially further appropriate assessment work.
Torfaen County Borough Council	Torfaen County Borough Council Local Development Plan 2006 – 2021 Habitats Regulations Assessment (2008)	6,600-7,000 new homes, new employment land. Taking a precautionary approach the HRA Assessment for the LDP has identified the potential for effects on four European sites: Aberbargoed Grasslands SAC, Usk Valley Bat Sites SAC, Cwm Clydach Woodlands SAC, the River Usk SAC and the Severn Estuary cSAC/SPA/Ramsar. 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.
Rhondda Cynon	Appropriate	14,850 new homes, extensive new employment land.

Statutory Body/Organisation	Report Reference	Findings of HRA/Potential sources of impacts on European Sites
Taf County Borough Council	Assessment of the Rhondda Cynon Taf County Borough Council's Local Development Plan (2006-2021) (2007)	The HRA Screening for Rhondda Cynon Taf's LDP has identified potential significant effects on the Blaen Cynon SAC. Recommendations include changes to the LDP wording and potentially further appropriate assessment work.
Newport City Council	Habitats Regulation Assessment Newport City Council River Usk Strategy (2009)	Identified key impacts from reduced flow, disturbance to fish and otters and pollution from numerous developments planned along the River Usk. 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 which, if implemented 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.
Severn Estuary Coastal Group	Severn Estuary Shoreline Management Plan (2000)	Provides basis for sustainable coastal defence policies within the Severn Estuary and to set objectives for the future management of the shoreline. The preferred coastal defence policy for the River Usk and Severn Estuary in the short term (30 years) is to maintain the defence line, meaning that in the short term, there are no significant impacts.

- **Note that the impacts of climate change are also considered as a factor within the in combination assessment, with particular importance on the River Usk SAC, River Wye SAC and Severn Estuary SAC/SPA/Ramsar sites.**

6. HRA Results

River Usk SAC

The River Usk runs through the centre of Newport, and is consequently particularly vulnerable to any new proposed development within the LDP. It is considered the features for which the site is designated are particularly vulnerable to development pressures, reduced flows, diffuse pollution and barriers to movement within its lower reaches. This applies to both the fish species using the river and otters using the adjacent terrestrial habitats.

Barriers to migration

At the current stage of the plan, and assessing the Candidate Sites, it is not anticipated that there will be anything within the LDP which will result in any development which will create a barrier to fish migrations.

Reduced Flow

The River Usk is a key water resource for Newport City. It is considered that with the increased development of housing, commercial and industrial facilities that the levels of abstraction from this river will increase. At present, it cannot be ascertained whether this level of development can be sustained without reducing flow to potentially damaging levels as work by the Environment Agency on this matter is ongoing. Policy SP3 recognises the need for careful consideration of the impact of development upon finite water resources. However, at this stage it must be raised as a potential for likely significant effect, both from the LDP itself and in combination with neighbouring authority's LDPs, as well as the future impacts of climate change.

Development Pressures

Those candidate sites located within approximately 1km of the SAC have potential to negatively impact on the SAC's interest features through disturbance. The qualifying fish species are particularly vulnerable to vibration, noise and lighting within the water course via floodlighting, piling and heavy industrial activity. Otters are reliant on quiet, dark habitat corridors through the city, which connect the lower reaches of the Usk with other well used habitats such as the Gwent Levels and the Severn Estuary.

Within the LDP Preferred Strategy objectives and policies, there is specific referral to economic and housing development alongside the River Usk. There are consequently numerous candidate sites which are located within close proximity of the River USK SAC. Most are located within existing built up areas, which are not anticipated to result in significant additional noise, lighting or habitat loss, though they may cause disturbance during construction phases. However, of particular concern are the Uskmouth and the Celtic Manor Candidate Sites, both of which propose extensive future development which could result in a loss of terrestrial habitat being used by otters and an increase in disturbance both of the fluvial and terrestrial habitats.

From the Newport City Council River Usk Strategy it is understood that there is also to be extensive development within the River Usk corridor, adjacent to and within the SAC boundary, in particular at Crindau, where there is a proposed marina development. If this development goes ahead it will result in the dredging of the river and major construction along the river bank which would involve piling. The development will also result in increases in recreational boating activity which could result in disturbance of the fish species and otters, and would significantly contribute to the in combination effects of the NCC LDP.

The Preferred Strategy also seeks to encourage a growth of tourism based on the range of landscapes within and around Newport. Whilst recognising the importance of Newport's natural

landscapes by the Council can have positive effects on the habitats and species within such areas from a conservation perspective, increased in visitor numbers to sensitive areas could have a negative effect on certain habitats and species. For example, within the River Usk SAC, otters may be particularly sensitive to disturbance from increased human activity such as dog walking.

The provision for 9,600 new dwellings within the plan period and encouragement of visitors to the local natural landscapes will inevitably lead to increased numbers of people using the habitats and footpaths along the River Usk SAC for recreational purposes, such as dog walking. Dog walking is particularly disturbing to otters which are scared of humans and dogs. At present, otters are using the River Usk for commuting, feeding and resting meaning that increases in dog walkers could adversely impact on otters using these habitats.

It is therefore considered that there is potential for likely significant effect on the River Usk SAC through loss of terrestrial habitat and disturbance of species for which this site is designated.

Diffuse Pollution

Such large scale developments may also result in diffuse pollutants entering the River Usk and associated tributaries, which could also adversely impact on the fish species and otters for which the SAC is designated. Whilst it is recognised that such outfalls would be strictly regulated by the Environment Agency, such regulation cannot be used to presume no likely significant effects on the SAC.

Likely significant effect?

It is therefore considered that the current candidate sites combined with the wider plans for extensive development along the River Usk SAC may lead to likely significant effects on the European site. Particular focus for any further work should concentrate on:

- The potential impacts of disturbance on fish and otters, and how this disturbance can be managed;
- The potential for the SAC designation features to be impacted by diffuse pollution from developments proposed within the LDP and how these could be managed to minimise impacts;
- Water resources (i.e. the level of abstraction that can be sustained from the River Usk without significantly affecting the qualifying interest features of the SAC).
- The potential for loss of terrestrial habitat used by otters

Severn Estuary

The Severn Estuary SAC/SPA/Ramsar is located adjacent to the south of the Newport City boundary. The SAC is designated for the estuarine habitats and wetland bird assemblages those habitats support. The mudflats and salt marshes provide feeding habitat for the waders and waterfowl features of the site, whilst terrestrial habitats outside of the SAC, itself are important in providing high tide roost, breeding and grazing habitats, namely within the Gwent Levels, for the birds which are qualifying interest features of the SPA and Ramsar site. The European sites are particularly vulnerable to physical loss through removal, disturbance and toxic contamination.

Physical loss through removal

The features for which the site is designated are particularly vulnerable to physical habitat loss. It is considered that due to the proximity of the SAC/SPA/Ramsar to Newport City and the linkage of the estuary to the River Usk, which runs through the city itself in to the estuary, that there is potential for developments within Newport to cause impacts through all of the identified pathways.

Within the Candidate Sites Register, of particular concern is the airport, which sits within the estuary itself, covering an area of 1090ha, with associated proposed development through the Gwent Levels. Whilst it is acknowledged that this proposal is not supported by the City Council

and the UK Government it should be recognised that such a development will have a significant effect on the SAC primarily through physical loss but also through disturbance and pollution.

Changes in habitat composition and direct loss of habitats may occur as a result of climate change and future sea level rise. The effects of these changes, in combination with proposed developments within the LDP may lead to a likely significant effect on the interest features of this site.

Disturbance

Outside of the SAC boundary itself, there is potential for disturbance of habitats important to the birds for which the SAC is designated. Greenfield and brown field sites are referred to in the Preferred Strategy as having capacity for housing and employment developments. Those Candidate Sites adjacent to the Gwent Levels, namely at Uskmouth, Solutia, and Llanwern, and to a lesser extent developments at Duffryn and Marshfield may cause disturbance to birds (qualifying interest features of the SPA and Ramsar sites) which use the wetland and agricultural habitats as high tide roost and grazing habitats. At present the use of the various fields and habitats across the levels by feeding and roosting birds is not fully understood, and is thought to be locally variable, and particularly concentrated at the Newport Wetlands National Nature Reserve⁵. It is also recognised that within the Preferred Strategy, the Gwent Levels are specifically referred to as being of national importance, and that within policy SP4, development will only be allowed if it is not to the detriment to the character of surrounding countryside. However, using the precautionary principle, however, it is considered that there is potential for likely significant effects through disturbance.

The majority of the Gwent Levels land is privately owned agricultural land and is therefore considered to be at low risk to recreational pressures. Popular walking and bird watching areas can be found around the Newport Wetlands reserve and along the flood defences. The proposed housing developments may lead to increases in recreational walking in such areas, which may result in disturbance of birds, especially whilst using high tide roost and grazing habitats.

The Preferred Strategy also seeks to encourage a growth of tourism based on the range of landscapes within and around Newport. Whilst recognising the importance of Newport's natural landscapes by the Council can have positive effects on the habitats and species within such areas from a conservation perspective, increased in visitor numbers to sensitive areas could have a negative effect on certain habitats and species. For example, within the Severn Estuary SAC/SPA/Ramsar, roosting birds may be particularly sensitive to disturbance from increased human activity such as dog walking and bird watching.

Toxic contamination and changes in nutrient and/or organic loading

The wider development of Newport increases the risk of influxes of pollutants and of organic loading in the estuary, especially those developments in the Docks and Uskmouth as highlighted in SP15. This may have an adverse effect on the estuary by directly harming invertebrates upon which the wading bird species feed. Such contamination may also change the composition of the habitats for which the SAC is designated. Whilst it is recognised that any individual developments will be subject to stringent pollution controls, there is potential for likely significant effects from in-combination effects of the wider LDP and from neighbouring authority's LDPs.

Likely significant effect?

It is therefore considered that the current candidate sites combined with the wider plans for extensive development within Newport and within neighbouring local authorities are likely to lead to significant effects on the European site. Particular focus for any further work should be on:

⁵ Gwent Wildlife Trust - Gwent Levels – a summary of ecological information

- Disturbance of high tide roost/feeding habitats, by identifying high tide roost and feeding sites, and assessing their vulnerability to disturbance to any proposed developments. Bird surveys may be required.

River Wye SAC

The River Wye SAC is located 10km to the east and north east of the Newport City boundary. The site is designated for the fish and native crayfish species it supports. It is particularly vulnerable to barriers to migration, reduced flow, diffuse pollution, disturbance through development pressures and invasive species.

It is not considered that the Newport LDP contains any development which alone could adversely affect the River Wye SAC in terms of pollution, disturbance or invasive species. The SAC is located sufficiently far away from Newport that any development will not result in barriers to fish migrations or result in the spread of invasive species. It is also considered highly unlikely that water-borne pollutants will reach the river as Newport City is located downstream of the designated site.

Reduced Flow

The River Wye is a key water resource for Newport. It is considered that with the increased development of housing, commercial and industrial facilities within Newport and in Monmouthshire, as outlined within their LDP, that the levels of abstraction from this river may also increase. At present, it cannot be ascertained whether this level of development can be sustained without reducing flow to potentially damaging levels as work by the Environment Agency on this matter is ongoing. Policy SP3 recognises the need for careful consideration of the impact of development upon finite water resources. However, at this stage it must be raised as a potential for likely significant effect, from the LDP itself in combination with neighbouring authority's LDPs, as well as the future impacts of climate change.

Likely significant effects?

It is therefore considered that the wider plans for extensive development within Newport City and surrounding local authorities using the River Wye as a water resource are likely to have a significant effect on the European site. Particular focus for any further work should be on:

- Water resources (i.e. the level of abstraction that can be sustained from the River Wye without significantly affecting the qualifying interest features of the SAC).

Wye Valley Woodlands SAC

The Wye Valley Woodlands SAC is located 11km to the east of the Newport City boundary. The designated woodland habitats are particularly vulnerable to poor management and uncontrolled grazing by deer. It is not considered that the developments proposed within the Newport LDP will affect the woodland management or deer grazing within the SAC.

It is currently not understood whether aerial pollution is adversely affecting the woodland, but is considered that poor air quality is a general conservation issue for woodlands within the UK. It is hard to predict the potential impacts of aerial pollutants on the SAC from any development in Newport as the current vulnerability of the woodland habitats to poor air quality is not understood. However, due to the fact that the SAC is located 10km to the east of Newport City boundary, and the general prevailing wind direction from Newport is to the south west, it is currently considered that the potential for significant air quality impacts from proposed developments in Newport is low.

Likely significant effects?

It is considered that there is no potential for likely significant effects of the NCC's LDP on this SAC.

Comment [MT1]:

Cardiff Beechwoods

The Cardiff Beechwoods SAC is located 8km to the west of the Newport City boundary and is designated for the woodland habitat and geological features it supports. It is understood that it is particularly vulnerable to recreational pressures and expansion of the limestone quarries currently situated in and around the woodlands. It is currently not understood whether aerial pollution is adversely affecting the woodland, but is considered that poor air quality is a general conservation issue for woodlands within the UK.

Recreational Pressure

The allocation of up to 9,600 new dwellings within Newport, coupled with the proposals for significant increases of housing in neighbouring authorities, such as Cardiff, means there is going to be an inevitable increase in visitors to the woodlands that are designated within the SAC. This could result in damages to the geological structures and woodland ground flora, and potentially to the trees themselves. Whilst there is management of people visiting the site, through the provision of footpaths and mountain bike trails it is considered that such increases in visitors will apply added pressure to the designated features.

The large numbers of housing developments, as outlined within the Preferred Strategy, including: Celtic Manor, Langstone, Allt Yr Yn, Glan Llyn and the Eastern Expansion Area, may lead to a rise of recreational visitors to the Cardiff Beechwoods SAC. Along with the wider development and growth of housing in the South East Wales region, it is considered that there may be a likely significant effect of the proposals within the Newport LDP on this European site despite current visitor management.

Air Pollution

It is difficult to assess the potential impacts that the proposed industrial development and increased in car traffic associated with housing developments within Newport will have on the air quality around the Cardiff Beechwoods SAC. It is understood that the current nitrogen deposition levels within the Cardiff Beechwoods SAC exceed UNECE Critical Loads for Nitrogen for this habitat type⁶ (see Appendix B). The Cardiff Beechwoods SAC is located to the west and south west of the Newport City boundary means that aerial pollutants are more likely to be carried toward the woodland due to the local south westerly prevailing wind direction.

Combined with the wider economic development in Newport, Cardiff and Rhondda Cynon Taff, it is considered that the large industrial developments such as the NCC Candidate Sites at Uskmouth and Llanwern and increases in car traffic on the M4 as well as car traffic and air traffic as a consequence of an airport development would result in an increase in deposition of air borne pollutants at the Cardiff Beechwoods SAC. This could result in damage to the features for which the woodlands are designated, thereby having a likely significant effect.

Likely significant effects?

It is therefore considered that the wider plans for extensive development within Newport and surrounding local authorities along the will lead to a potential like significant effect on the European site. Particular focus for any further work should be on:

- Assessing the likely in combination impacts of recreational pressures on the SAC, and how such pressures could be managed in the long term to minimise impacts;
- The potential impacts of in combination aerial pollution from developments both in Newport and neighbouring local authorities.

⁶ UNECE. Empirical Critical Loads for Nitrogen - Expert Workshop, Berne 2002

Aberbargoed Grasslands SAC

The Aberbargoed Grasslands SAC is located approximately 12km to the north west of the Newport City boundary. The SAC is designated for the butterfly species and grassland habitats it supports. It is vulnerable to poor management and to a lesser extent, antisocial behaviour in the form of uncontrolled burning. It is currently not understood whether aerial pollution is adversely affecting the woodland, but is considered that poor air quality is a general conservation issue for grasslands within the UK. Discussions with CCW highlighted the issue of aerial pollution as being a key consideration for this SAC

It is considered that the antisocial behaviour resulting in the uncontrolled burning of the SAC grasslands is a localised issue and should not be affected by the development of housing within Newport, which lies over 12km to the south. It is also considered that the management of the grassland in the form of grazing is not linked to development proposed within the Newport LDP.

Air Pollution

It is currently not understood what the potential impacts of poor air quality could be on the grassland habitats. However, there are large industrial developments within the Candidate Sites Register which could lead to aerial pollutants, such as at Uskmouth, Llanwern, Solutia and the airport. There is also a trend for wider scale employment development within the nearby authorities of Rhondda Cynon Taff and Caerphilly as well as Cardiff. It is therefore assumed that this development could lead to deposition of aerial pollutants within the SAC such as nitrogen which could have an adverse effect on the habitats and thus butterfly populations for which this site is designated. There is also potential that housing developments within Newport could lead to increases in traffic along major road corridors, such as the M4, located 15km to the south of the SAC.

Likely significant effects?

Due to the local south westerly prevailing wind, and distance from the NCC boundary it is considered that the risk of development within Newport contributing to aerial pollutants around Aberbargoed Grasslands SAC is low.

However, applying the precautionary principal, it is concluded that due to the unknowns about the potential impacts of proposed industrial Candidate Sites within NCC, namely the airport and developments at Usk Mouth and Llanwern, on the grassland habitats within the SAC that using the precautionary principal potential likely significant effects could arise from the LDP. In particular, any further work should focus on:

- Aerial pollution

Table 6.1 – Summary of policies and candidate sites which have potential to cause likely significant effects on the European sites identified during this study

Site Name	Barriers to Migration	Reduced Flow	Development Pressures	Diffuse Pollution	Physical loss through removal	Disturbance	Toxic contamination	Changes in nutrient and/or organic loading	Inappropriate management	Off-site pollution	Recreational Pressure	Aerial Pollution	Anti-social behaviours
River Usk SAC	N/A	Celtic Manor, SP8, SP14, SP15, SP16 and in-combination	SP8, SP14, SP15, SP16 Crindau, Uskmouth, Celtic Manor, LDP as a whole and in-combination	SP8, SP14, SP13, SP15, SP16 Celtic Manor, Uskmouth	N/A	SP13, SP8 Crindau, Uskmouth, Celtic Manor	N/A	N/A	N/A	N/A	SP8, SP14, SP15, SP16 Crindau, Uskmouth, Celtic Manor, LDP as a whole and in-combination	N/A	N/A
Severn Estuary SAC /SPA/Ramsar	N/A	N/A	N/A	N/A	SP8, SP14, SP15, SP16 Airport	SP8, SP14, SP15, SP16 Airport, Llanwern, Duffryn, Marshfield East, Marshfield West, Solutia, Uskmouth	SP8, SP14, SP15, SP16 Airport, Uskmouth LDP as a whole and in-combination	airport	N/A	N/A	N/A	N/A	N/A
River Wye SAC	N/A	LDP as a whole and in-combination	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wye Valley Woodlands SAC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cardiff Beechwoods SAC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	SP8, Celtic Manor, Langstone North, Langstone South Eastern Expansion Area, Allt Yr Yn, Caerleon North Tredegar Glan Llyn,	SP8, Airport, Llanwern, Uskmouth, LDP as a whole and in-combination	N/A

											LDP as a whole and in-combination		
Aberbargoed Grasslands SAC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Airport, Llanwern, Uskmouth, LDP as a whole and in-combination	N/A

7. Recommendations for the Final Draft of the Local Development Plan

Policy wording

It is recognised that guidance discourages LDPs repeating national policy with respect to the protection and enhancement of internationally and nationally designated sites.

However, it is recommended additional wording is included in policy SP7 of the LDP which specifically commits to delivering the plan without causing significant adverse effects to the five European and Ramsar sites identified during this study. Such policy wording should not be considered in isolation from the other policies within the LDP. It must be ensured that the delivery of policy SP7 can still be achieved considering the potential cumulative effects of all other policies within the plan, such as employment, housing and water resources.

Removal of particularly harmful candidate sites from plan

Where possible it is recommended that sites with high potential for causing likely significant effects on European sites are removed from the LDP. It is recognised that in many cases this may not be possible if Newport are to deliver requirements from the Wales Spatial Strategy and other plans.

If such candidate sites are removed, it would modify the LDP in order for it to develop in such a way as to minimise significant effects on five of the six European and Ramsar sites identified during this study.

Those Candidate sites which are considered to potentially result in likely significant effects are:

- Llanwern (mixed-use employment led development)
- Celtic Manor (mixed use development)
- The airport
- Uskmouth (industrial including waste for energy)
- Solutia (industrial)
- Glan Llyn (residential)

If such sites are to be retained, it is recommended that NCC are able to enforce methods such as implementing no development buffer strips around the most sensitive areas of sites (such as otter resting areas along River Usk) as well as areas of visual disturbance for birds. Methods such as planting screening to prevent access and visual disturbance may also be used.

Provisions for recreational management

The potential for increases in visitors and recreational pressures on the European and Ramsar sites identified in this study is heightened with the development of housing both in Newport and in the South East Wales region. Such increases in numbers may cause likely significant effects from increased recreation pressure on the Cardiff Beechwoods SAC, River Usk SAC and Severn Estuary SAC/SPA/Ramsar.

It is recognised that there are provisions within the LDP for developers to contribute to recreational facilities within Newport within policy SP9. It is recommended that the Supplementary Planning Guidance referred to within this policy has wording to ensure the reduction of recreational pressures the various European sites identified in this study, especially the River Usk SAC ,

Cardiff Beechwoods SAC and the River Severn SAC/SPA/Ramsar. It is obviously appreciated that such recreational facilities may not attract specialist visitors, such as bird watchers or mountain bikers; however, it could attract casual use such as dog walking, which in particular is disturbing to birds and otters.

Recommendations for further work

It is considered that further investigation may be required with regards to in combination effects of aerial pollution on Cardiff Beechwoods SAC, Aberbargoed Grasslands SAC and the Wye Valley Woodlands SAC as well as the impacts of water usage on the River Usk SAC and River Wye SAC, such further investigations may require consultation with neighbouring authorities, CCW, the Environment Agency and utilities companies.

Bird surveys, or a strategic level assessment of potentially suitable high tide roost and foraging habitat for SPA/Ramsar bird species could be carried out to assess the potential for disturbance and habitat loss outside of the Severn Estuary SPA/Ramsar boundary.

8. Conclusions

Is Newport City Council's LDP likely to have a significant effect 'alone or in combination' on any of the six European and Ramsar sites within 15km of the unitary authority boundary?

HRA is required by Regulation 48 of the Conservation (Natural Habitats & c.) Regulations 1994 (as amended) (the Habitat Regulations) for all plans and projects which may have adverse effects on European sites. Six European sites are considered in this HRA; River Usk SAC, Severn Estuary SAC/SPA/Ramsar, River Wye SAC, Wye Valley Woodlands SAC, Cardiff Beechwoods SAC and Aberbargoed Grasslands SAC. This HRA screening exercise has assessed whether the objectives and policies within the LDP as well as the current sites included within the Candidate Sites Register are likely to lead to significant effects on these six European sites and what these likely impacts are.

This HRA has identified multiple pathways which may have a significant effect alone or in combination on the European sites. These include:

- **physical loss through removal:** leading to loss of the European site and interest features themselves;
- **increased recreation:** leading to habitat damage and disturbance of interest features;
- **a potential change in air quality:** leading to an increase in nitrogen deposition and acid deposition on grassland and woodland habitats;
- **a potential decrease in water quality:** leading to damage to river and estuary habitats and thus the interest features using these habitats;
- **a potential reduction of river flow:** leading to impacts on the habitats and species for which the SACs are designated.

As the LDP is still in draft a number of recommendations have been made to ensure that the final draft of the LDP avoids and/or minimises impacts on the European sites identified during this study. It is anticipated, however that further appropriate assessment work will be required to assess the in-combination effects of aerial pollution on the Cardiff Beechwoods SAC, Aberbargoed Grasslands SAC and water usage on the River Usk SAC and River Wye SAC,

including changes to the LDP policy wording, further investigations to aid future assessments and ways of managing and mitigating specific impacts.

Name of assessor/originator:	M Tooby, Ecologist, Atkins	Date: 12/10/09
Name of checker:	K Stanhope, Principal Ecologist, Atkins	Date: 12/10/09
CCW comment on assessment:	TBC	
Name of CCW Officer:	TBC	Date: TBC

Appendix A - Drawings

Figure A.1 - Map showing the European and Ramsar sites within 15km of the Newport Unitary Authority Boundary

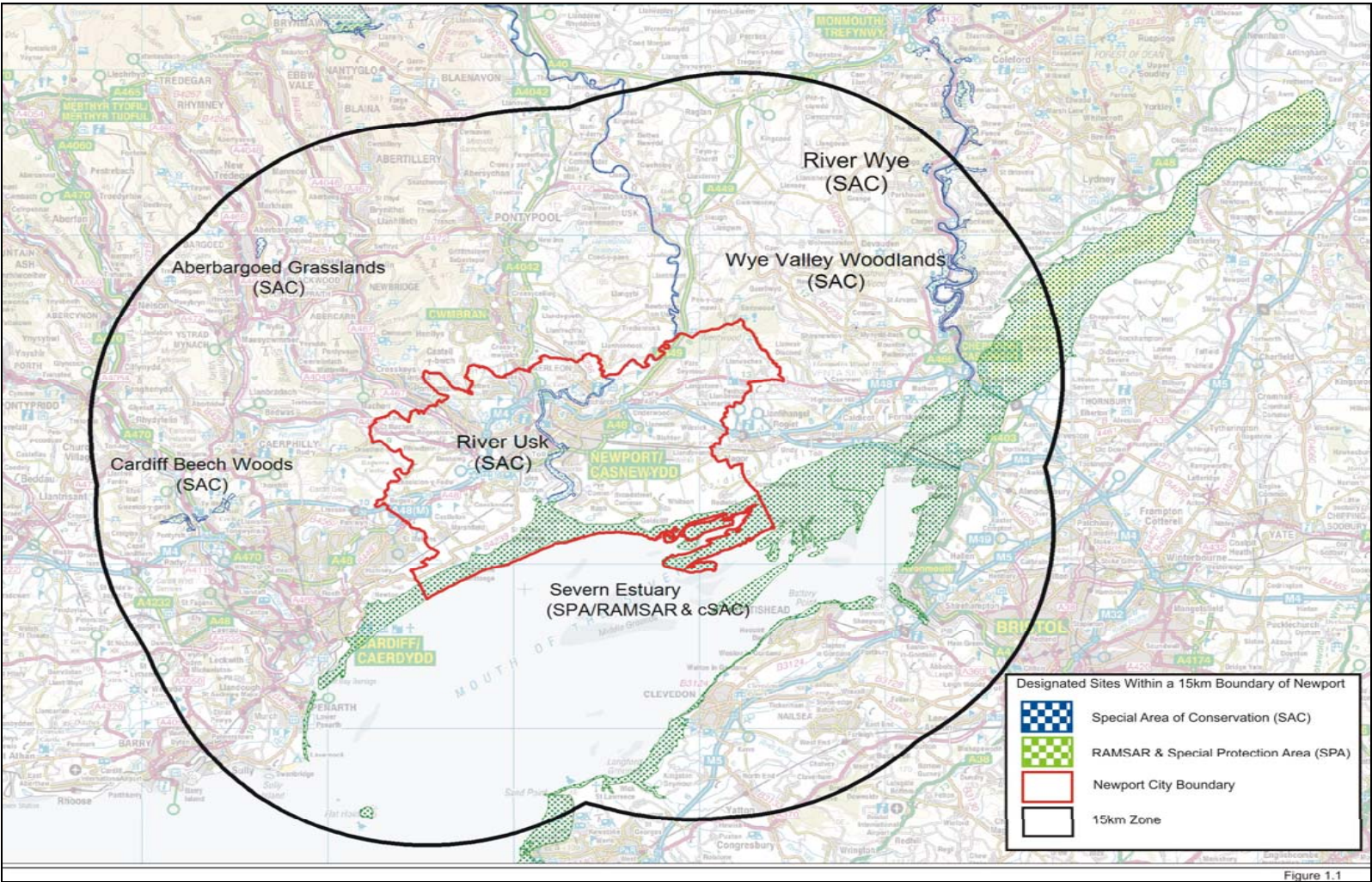
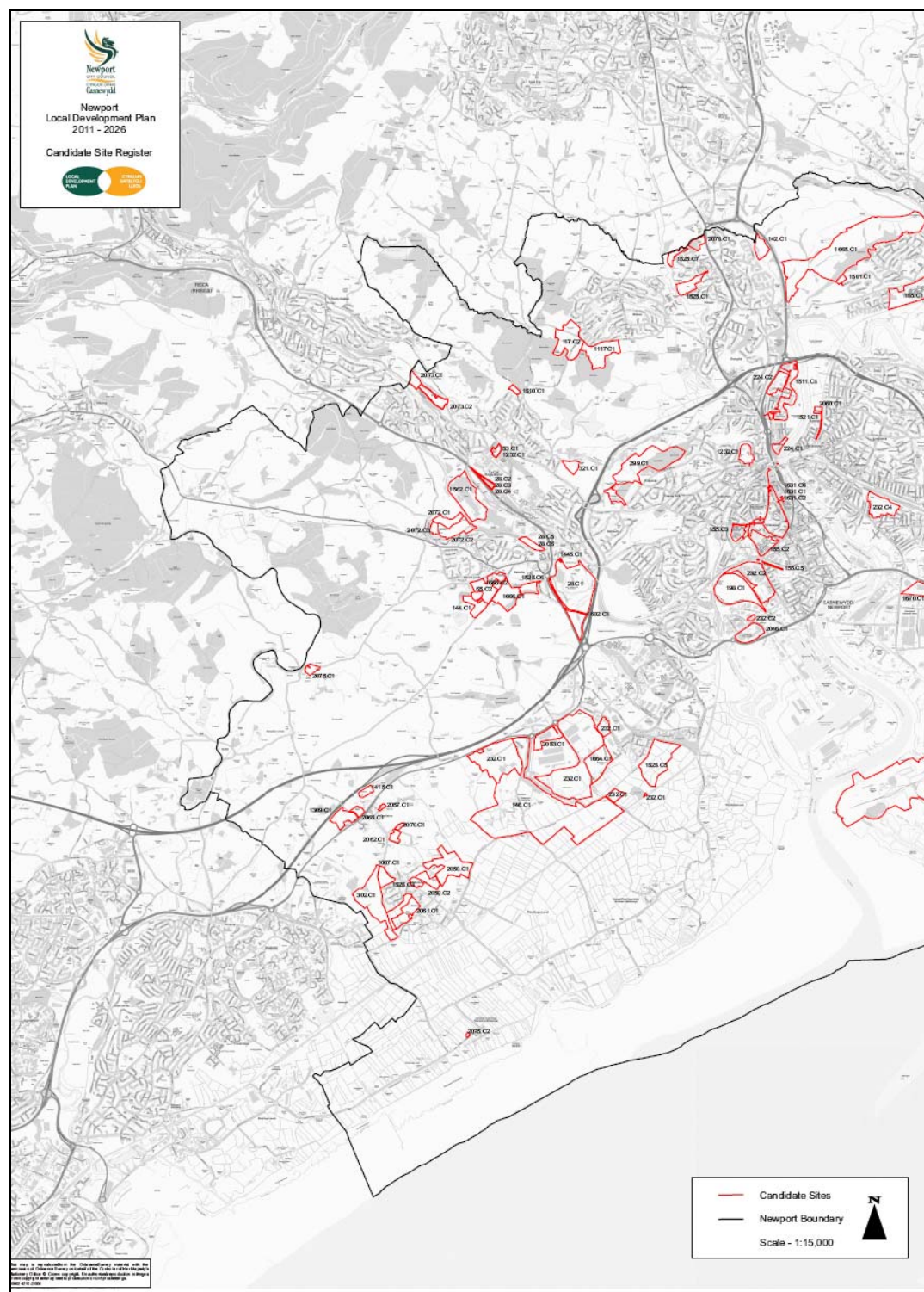


Figure A.3 - Candidate Site Register Map – West





Appendix B

Air Quality Figures

Table B.1 UNECE Critical Loads for Nitrogen at selected European sites

Site Name	Ecosystem type	Critical load (kg N ha ⁻¹ y ⁻¹)	Indication of effects of exceedence
Wye Valley Woodlands SAC Cardiff Beechwoods SAC	Temperate and boreal forests	10-20	Changes in soil processes, ground vegetation, mycorrhiza, increased risk of nutrient imbalances and susceptibility to parasites
Aberbargoed Grasslands SAC	Moist and wet oligotrophic grasslands <ul style="list-style-type: none"> • <i>Molinia caerulea</i> meadows • Heath (<i>Juncus</i>) meadows and humid (<i>Nardus stricta</i>) swards 	15-25 10-20	Increase in tall graminoids, decreased diversity, decrease of bryophytes Increase in tall graminoids, decreased diversity, decrease of bryophytes
Severn Estuary SAC/SPA/Ramsar	Pioneer and low-mid salt marshes	30-40	Increased late-successional species, increase productivity

Appendix C

Preferred Strategy Policies

The following has been taken directly from NCC's Preferred Strategy Document

SP1 Sustainability

Proposals will be required to make a positive contribution to sustainable development. They will be assessed as to their potential contribution to;

- Reusing previously developed land;
- Providing integrated transportation systems, as well as encouraging the co-location of housing and services, which together will minimise the overall need to travel, reduce car usage and encourage a modal shift to more sustainable modes of transport;
- Reducing energy consumption, increasing energy efficiency and encouraging the use of low and zero carbon energy sources;
- The minimisation, re-use and recycling of waste;
- Minimising the risk of and from flood risk, sea level rise and the impact of climate change;
- Improving facilities, services and overall social and environmental equality of existing and future communities;
- Encouraging economic diversification and in particular improving the vitality and viability of the city centre;
- Protecting and enhancing the built and natural environment;
- Conserving and ensuring the efficient use of resources such as water and minerals.

Flood Risk and Water Resources

SP2 Flood Risk

The plan will seek to direct development away from areas of flood risk. Where flood risk is identified as a constraint, development will only be permitted where a detailed technical assessment in accordance with national guidance is provided to ensure that the development is designed to cope with the threat and consequences of flooding over its lifetime.

SP3 Water Resources

Development proposals should reduce water consumption and result in no net increase in surface water run-off through the sustainable management of water resources by:

- the use of Sustainable Drainage Systems;
- the reuse of water and reduction of surface water run-off through high quality designed developments; and,
- careful consideration of the impact upon finite water resources, particularly in terms of increased pressures on abstraction and the impact of climate change.

SP4 Countryside

Development in the countryside (that is, that area of land lying beyond the settlement boundaries shown on the proposals map) will only be permitted where the use is appropriate in the countryside, respects the character of the surrounding area and is appropriate in scale and design.

SP5 Green Belt

The existing green belt is maintained along the Newport – Cardiff boundary and extended northwards to the M4 motorway.

SP6 Special Landscape Areas

Special landscape areas are designated as follows within which proposals will be required to contribute positively to the area through high quality design and management schemes that demonstrate a clear appreciation of their special features:

- North of Bettws
- West of Rhiwderin
- Wentlooge Levels
- River Usk
- Caldicot Levels
- Wentwood
- Tredegar Park

SP7 Conservation of the Natural and Built Environment

In addition to National Policy designation the plan would seek to protect and enhance sites of local importance. Proposals affecting sites will be required to consider the impact on such a finite and distinctive local resource.

SP8 House Building Requirement

Sufficient land will be made available to provide for additional dwellings as follows:

2011 – 2016: 3,200

2016 – 2021 3,200

2021 – 2026 3,200

Each period is to be regarded as self-contained, with excesses or deficits of house building not being carried over into the next period. The land will be provided primarily on previously developed land in the following ways:

- Sites with planning permission, including sites under construction;
- New allocations set out in policy h1; and
- Infill and windfall sites.
- Further major housing development outside existing settlement boundaries will not be permitted.

SP9 Community Facilities and Requirements

Within settlement boundaries and in locations that are close to public transport links, the development of community facilities will be encouraged including:

- Places of worship and church halls, community centres, health centres, day nurseries, clinics and consulting rooms;
- museums, public halls, libraries, art galleries, exhibition halls, education and training centres;
- cinemas, music and concert halls, dance and sport halls, swimming baths, skating rinks, gymnasiums;
- outdoor and indoor sport and leisure uses including allotments and community/ city gardens.

SP10 Community Infrastructure Levy

The council will work in partnership with stakeholders to ensure that developers contribute towards the cost of infrastructure and environmental improvements, and will bring forward supplementary planning guidance to secure this provision.

Transportation

SP11 Transport Proposals

- Transport proposals will be supported where they:
- Provide for traffic free walking and cycling facilities and expansion of the network;
- Encourage the use of public transport and other modes which reduce energy consumption and pollution;
- Improve road safety;
- Improve the quality of life of residents;
- Assist the local economy;
- Assist urban regeneration;
- Provide access to new development areas which incorporate sustainable transport modes;

- Relieve traffic congestion in the long term;
- Result in other environmental improvements, including to air quality, noise reduction, sustainable drainage and enhanced biodiversity.

SP12 Integrated Transport

Integrated transport will be implemented through the Council's adoption of the SEWTA Regional Transport Plan, including:

- A co-ordinated pedestrian network, including schemes such as "safe routes in communities";
- Implementation of the cycling strategy;
- Innovative forms of public transport such as bus priority, safeguarding and enhancement of rail routes and identification of new stations;
- Designation of transport interchanges for park and ride, and road to rail freight centres;
- A central area parking strategy co-ordinated with and in co-operation with local authorities in the SEWTA region;
- Appropriate provision for public transport operation at the planning stage of new developments;
- Urban villages and neighbourhoods in the built-up area supported by sustainable transport and traffic management measures;
- Facilities for public transport, walking and cycling in major new development;
- Interchange between bus, bicycle and car to enable sustainable use of the countryside.

SP13 Major Road Schemes

Land will be safeguarded for the following strategic highway schemes:

- M4 Motorway Junction 28 Tredegar Park Interchange Improvement;
- Eastern Extension of the Southern Distributor Road Along Queensway through the Glan Llyn Regeneration And Corus Steelworks sites;
- Western Extension of the Southern Distributor Road as the Duffryn Link road between Maesglas and Coedkernew.

Economic Development and Urban Regeneration

SP14 Employment Land

Provision will be made for approximately 150 hectares of Employment Land for the period 2011-2026

SP15 Employment Sites

New industrial and Business Development will be located Mainly in the following areas within the urban boundary:

- West Newport at Coedkernew;
- South East Newport within the Eastern Expansion Area;
- Urban Area, River Usk Corridor, and Docks.

SP16 Urban Regeneration

Proposals will be favoured which assist the regeneration of the Urban area, particularly where they contribute to:

- The vitality, viability and quality of the environment of the City Centre;
- The provision of residential and business opportunities within the urban area;
- Reuse of vacant, underused or derelict land.

Waste

SP17 Waste Disposal

Land will be safeguarded for waste disposal purposes at:

- Docksway Waste Disposal Site;
- Tatton Road, Queensway Meadows.

SP18 Waste Management

The sustainable management of waste arisingS in Newport will be facilitated by:

- promoting and supporting additional treatment facilities, measures and strategies that represent the best practicable environmental option, having regard to the waste hierarchy and the proximity principle;
- encouraging the provision of in-building treatment facilities on existing and allocated areas of general industry;
- the provision of new facilities for re-use, recycling and composting; and,
- supporting the provision and maintenance of sustainable waste management storage and collection arrangements in all appropriate new developments.

SP19 Minerals

The plan will fulfil its contribution to the regional demand by:

- Safeguarding localised potential sand and gravel resource blocks;
- Protecting existing and potential wharves and existing rail infrastructure at Newport Docks to ensure the continued sustainable transportation of aggregate;
- Encouraging the use of secondary and recycled aggregates where appropriate; and,

- Considering proposals for the winning and working of minerals in the regional context, whilst having clear regard to local factors

Appendix D

Conservation Objectives

Conservation Objectives for the Severn Estuary SAC

4. Conservation objectives for the Severn Estuary / Môr Hafren candidate SAC

The protection and management of the cSAC 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.

All the conservation objectives are subject to review by Natural England and the Countryside Council of Wales.

4.1 Interest feature 1: Estuaries

The conservation objective for the “estuaries” feature of the Severn Estuary cSAC 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 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.

The meaning of terms ¹⁻⁹ above is explained in **section 4.1.1**.

Figure 2 shows the extent of the “estuaries” feature within the Severn Estuary cSAC European Marine Site.

4.1.1 Explanatory information for the “estuaries” conservation objective

¹ Natural processes

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 dependant upon the prevailing physical conditions. Features should not necessarily be considered in unfavourable condition caused by to 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, 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 Figure 1. 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 cSAC 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 4.2 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 4.3 for the conservation objective for this feature*)
 - Intertidal gravel and clean sands
 - Intertidal muddy sands
 - Intertidal muds
- iii. Atlantic saltmeadows (*see section 4.4 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 4.5 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. 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).
 - Peat and clay exposures
 - *Corralina officinalis* and coralline crusts in shallow eulittoral rockpools (LR.Cor)
 - Eel grass (*Zostera*) beds
 - 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 Twaite 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 to the Regulation 33 advice for the Severn Estuary SPA):
 - Regularly occurring Annex 1 species - Bewicks' swan
 - Regularly occurring migratory species - dunlin, redshank, shelduck, European white-fronted goose
 - 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 4.4.1 - explanatory information on the conservation objective for the Atlantic salt meadows feature)
 - Eel grass (*Zostera*) species.

⁸Physical and chemical characteristics

These include nutrients, oxygen, turbidity, temperature and salinity.

⁹Water column

Water column should be read to include contributory water flows into the estuary including surface flows over mudflats and saltmarsh.

4.2 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 cSAC 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 sub tidal 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 4.2.1**.

Figure 3 shows the extent of the “subtidal sandbanks” feature within the Severn Estuary cSAC European Marine Site.

4.2.1 Explanatory information for the “subtidal sandbanks” conservation objective

¹ Natural processes

The meaning of ‘natural processes’ is explained in **section 4.1.1**.

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

4.3 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 cSAC 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 4.3.1**.

Figure 4 shows the extent of the “mudflats and sandflats” feature within the Severn Estuary cSAC European Marine Site.

4.3.1 Explanatory information for the “mudflats and sandflats” conservation objective

¹ Natural processes

The meaning of ‘natural processes’ is explained in **section 4.1.1**.

² Extent 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.

³ Mudflat 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;
 - ii. Burrowing amphipods and *Eurydice pulchra* in well drained clean sand shores;
 - iii. Burrowing amphipods and polychaetes in clean sand shores.
 - iv. Talitrid amphipods in decomposing seaweed on the strandline
 - v. Dense *Lanice conchilega* in tide-swept lower shore sand
 - vi. Barren shingle or gravel shores
- Intertidal muddy sand communities :
 - i. Polychaetes and *Cerastoderma edule* in fine sand or muddy sand shores
 - ii. *Bathyporeia pilosa* and *Corophium spp.* in upper shore slightly muddy fine sand shores
 - iii. *Macoma balthica* and *Arenicola marina* in muddy sand shores.
 - iv. *Arenicola marina*, *Macoma balthica* and *Mya arenaria* in muddy sand shores.
 - v. *Echinocardium cordatum* and *Ensis sp.* in lower shore or shallow sublittoral muddy fine sand
 - Intertidal mud communities:
 - i. *Hediste diversicolor* and *Macoma balthica* in sandy mud shores:
 - ii. *Hediste diversicolor*, *Macoma balthica* and *Arenicola marina* in muddy sand or sandy mud shores
 - iii. *Hediste diversicolor*, *Macoma balthica* and *Mya arenaria* in sandy mud shores.
 - iv. *Hediste diversicolor* and *Scrobicularia plana* in reduced salinity mud shores
 - v. *Hediste diversicolor* and oligochaetes in low salinity mud shores

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

4.4 Interest feature 4: Atlantic salt meadow

The conservation objective for the “Atlantic salt meadow” feature of the Severn Estuary cSAC 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 4.4.1**.

Figure 5 shows the extent of Atlantic salt meadow and its associated transitional vegetation communities within the Severn Estuary cSAC European Marine Site.

4.4.1 Explanatory information for the “Atlantic salt meadow” conservation objective

¹ Natural processes

The meaning of ‘natural processes’ is explained in **section 4.1.1**.

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 cSAC 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 cSAC is estimated to be 1400 ha, distributed in the cSAC as shown in Figure 5.

(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
 - *Phragmites australis* sub-community S4a
- xiii. *Bolboschoenus maritimus* swamp S21
 - *B. maritimus* sub-community S21a
 - Agrostis stolonifera* sub-community S21c

(d) Pioneer saltmarsh communities:

- i. Annual *Salicornia* saltmarsh SM8
- ii. *Suaeda maritima* saltmarsh SM9

³ Maintained

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.

⁴ Distribution

The distribution 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.

⁵ Typical 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

⁶ Notable 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 Conservation Objectives

For the requirements of the bird species of the Severn Estuary SPA refer to the English Nature (now Natural England) and Countryside Council for Wales advice given under Regulation 33 (2) of the Conservation (Natural Habitats &c.) Regulations 1994 issued in 2004

(<http://naturalengland.communisis.com/NaturalEnglandShop/product.aspx?ProductID=4ea1651b-a908-4432-aa81-cdf24d68e6e2>)

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.

4.5 Interest feature 5: Reefs

The conservation objective for the “reefs” feature of the Severn Estuary cSAC 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 4.5.1** below.

Figure 6 shows the extent of the “reef” feature within the Severn Estuary cSAC European Marine Site.

4.5.1 Explanatory information for the “reefs” conservation objective

¹ Natural processes

The meaning of ‘natural processes’ is explained in section **4.1.1**

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

⁵**Physical 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

⁶**Ecological Processes**

- supply of *Sabellaria* larvae (within the water column)
- abundance of food (suspended detritus material) within the water column to support feeding

4.6 Interest feature 6 : River lamprey *Lampetra fluviatilis*

The conservation objective for the river lamprey *Lampetra fluviatilis* feature of the Severn Estuary cSAC 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.
- 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 4.6.1**.

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.

4.6.1 Explanatory information for the river lamprey *Lampetra fluviatilis* conservation objective

¹Natural processes

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**.

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.

4.7 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 cSAC 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 4.7.1**.

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.

4.7.1 Explanatory information for the sea lamprey *Petromyzon marinus* conservation objective

¹ Natural processes

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**.

² Prey 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.



4.8 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 cSAC 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 4.8.1**.

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.

4.8.1 Explanatory information for the Twaite shad *Alosa fallax* conservation objective

¹ Natural processes

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**.

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 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.

Conservation Objectives for the Severn Estuary SPA

4. Conservation objectives for SPA European marine site interest features

Under Regulation 33(2)(a) of the Conservation (Natural Habitats &c.) Regulations 1994, English Nature and the Countryside Council for Wales have a duty to advise other relevant authorities as to the conservation objectives for the European marine site. The conservation objectives for the Severn Estuary SPA interest features are provided below and should be read in the context of other advice given in this package, particularly:

- the attached maps showing the extent of the supporting habitats;
- summary information on the interest of each of the features; and
- the favourable condition table, providing information on how to recognise favourable condition for the interest feature and which will act as a basis for the development of a monitoring programme.

All the conservation objectives provided below are subject to review by English Nature and the Countryside Council for Wales.

4.1 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 habitats in **favourable condition**, as defined below¹³.

This conservation objective is subject to review.

The interest feature Bewick's swan will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 III) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix III) 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 grasses (Box 2) in winter season throughout the transitional saltmarsh at the Dumbles (Appendix III) is maintained;
- (vi) aggregations of Bewick's swan at feeding, roosting and refuge sites (Appendix III) are not subject to significant disturbance.

¹³ Tables 3a (pg. 36) and 3b (pg. 39) set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

4.2 Interest feature 2: Internationally important population of regularly occurring migratory species: wintering dunlin

The conservation objective is to maintain the dunlin population and its supporting habitats in **favourable condition**, as defined below¹⁴.

This conservation objective is subject to review.

The interest feature dunlin will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 IV) is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix IV) is maintained;
- (iv) the extent of shingle and rocky shore (Appendix IV) is maintained;
- (v) the extent of vegetation with a sward height of <10cm is maintained throughout the saltmarsh (Appendix IV);
- (vi) the distribution and abundance of suitable invertebrates (Box 3) in intertidal mudflats and sandflats (Appendix IV) is maintained;
- (vii) the distribution and abundance of suitable invertebrates (Box 3) in shingle and rocky shore (Appendix IV) is maintained;
- (viii) the extent of strandlines is maintained;
- (ix) unrestricted bird sightlines of >200m at feeding and roosting sites (Appendix IV) are maintained;
- (x) aggregations of dunlin at feeding or roosting sites (Appendix IV) are not subject to significant disturbance.

¹⁴ Tables 3a and 3b set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

4.3 Interest feature 3: 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 habitats in **favourable condition**, as defined below¹⁵.

This conservation objective is subject to review.

The interest feature European white-fronted goose will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 III) is maintained;
- (iii) the extent of intertidal mudflats and sandflats at Frampton Sands, Waveridge Sands and the Noose (Appendix III) is maintained;
- (iv) greater than 25% cover of suitable soft-leaved herbs and grasses (Box 4) is maintained during the winter on saltmarsh areas (Appendix III);
- (v) unrestricted bird sightlines of >200m at feeding and roosting sites (Appendix III) are maintained;
- (vi) aggregations of European white-fronted goose at feeding or roosting sites (Appendix III) are not subject to significant disturbance.

4.4 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 habitats in **favourable condition**, as defined below¹⁶.

This conservation objective is subject to review.

The interest feature redshank will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 IV) is maintained;

¹⁵ Tables 3a and 3b set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

¹⁶ Tables 3a and 3b set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

- (iii) the extent of intertidal mudflats and sandflats (Appendix IV) is maintained;
- (iv) the extent of shingle and rocky shore (Appendix IV) is maintained;
- (v) the extent of vegetation with a sward height of <10cm throughout the saltmarsh (Appendix IV) is maintained;
- (vi) the distribution and abundance of suitable invertebrates (Box 3) in intertidal mudflats and sandflats (Appendix IV) is maintained;
- (vii) the distribution and abundance of suitable invertebrates (Box 3) in shingle and rocky shore (Appendix IV) is maintained;
- (viii) strandlines are not subject to significant disturbance;
- (ix) unrestricted bird sightlines of >200m at feeding and roosting sites (Appendix IV) are maintained;
- (x) aggregations of redshank at feeding or roosting sites (Appendix IV) are not subject to significant disturbance.

4.5 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 habitats in **favourable condition**, as defined below:¹⁷

This conservation objective is subject to review.

The interest feature shelduck will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 IV) is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix IV) is maintained;
- (iv) the extent of shingle and rocky shore (Appendix IV) is maintained;
- (v) the distribution and abundance of suitable invertebrates (Box 5) in intertidal mudflats and sandflats (Appendix IV) is maintained;

¹⁷ Tables 3a and 3b set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

- (vi) unrestricted bird sightlines of >200m at feeding and roosting sites (Appendix IV) are maintained;
- (vii) aggregations of shelduck at feeding or roosting sites (Appendix IV) are not subject to significant disturbance.

4.6 Interest feature 6: Internationally important assemblage of waterfowl

The conservation objective is to maintain the waterfowl assemblage and its supporting habitats in **favourable condition**, as defined below:¹⁸

This conservation objective is subject to review.

The interest feature waterfowl assemblage will be considered to be in favourable condition when, subject to natural processes (Box 1), 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 IV) is maintained;
- (iii) the extent of intertidal mudflats and sandflats (Appendix IV) is maintained;
- (iv) the extent of shingle and rocky shore (Appendix IV) is maintained;
- (v) extent of vegetation of <10cm throughout the saltmarsh (Appendix IV) is maintained;
- (vi) the distribution and abundance of suitable invertebrates (Box 6) in intertidal mudflats and sandflats (Appendix IV) is maintained;
- (vii) the distribution and abundance of suitable invertebrates (Box 6) in shingle and rocky shore (Appendix IV) is maintained;
- (viii) greater than 25% cover of suitable soft leaved herbs and grasses (Box 7) during the winter on saltmarsh areas (Appendix IV) is maintained;
- (ix) strandlines are not subject to significant disturbance;
- (x) unrestricted bird sightlines of >500m at feeding and roosting sites (Appendix IV) are maintained;
- (xi) waterfowl aggregations at feeding or roosting sites (Appendix IV) are not subject to significant disturbance.

¹⁸ Tables 3a and 3b set out the type of information that will be used to support judgements on whether or not this conservation objective is being met.

4.7 Internationally important population of regularly occurring migratory species: gadwall

Gadwall is also a qualifying interest feature of the Severn Estuary SPA but does not occur within the European marine site. It is found within the SPA, but only above the highest astronomical tide (HAT) and the European marine site for which this Reg 33 advice is written, only extends up to HAT. Consequently, there are no specific conservation objectives within this document for this species. Objectives to maintain this features in favourable condition are identified within English Nature and the Countryside Council for Wales' conservation objectives for the relevant SSSIs within each European site boundary, and will be dealt with through procedures outlined in the Conservation (Natural Habitat &c.) Regulations 1994. However, relevant authorities need to have regard to such adjacent interests as they may be affected by activities taking place within, or adjacent to the European marine site.

Box 1: Natural processes

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.

Box 2: Key food plants of Bewick's swan

eg *Agrostis stolonifera*, *Alopecurus geniculatus*, *Glyceria geniculatus* **

Box 3: Key intertidal invertebrate prey species of dunlin and redshank

eg *Carcinus*, *Crangon*, *Hydrobia*, *Macoma*, *Hediste*, and *Talitrus* spp. **

Box 4: Key food plants of European white-fronted goose

eg *Alopecurus bulbosus*, *Festuca rubra*, *Hordeum marinum*, *Lolium perenne*; *Puccinellia maritima* **

Box 5: Key intertidal invertebrate prey species of shelduck

eg *Carcinus*, *Corophium*, *Hydrobia*, *Macoma*, *Mytilus*, and *Hediste* spp.**

Box 6: Key intertidal invertebrate prey species of the waterfowl assemblage

eg *Arenicola*, *Carcinus*, *Corophium*, *Crangon*, *Gammarus*, *Hydrobia*, *Macoma*, *Hediste*, *Notomastus* and *Talitrus* spp. **

Box 7: Key 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

Conservation Objectives for the River Usk SAC

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive

“The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.”

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the ‘Habitats’ Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses ‘performance indicators’ within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW’s current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Web link: <http://www.jncc.gov.uk/page-2199>

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.	
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

Atlantic salmon <i>Salmo salar</i> :			
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 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

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	<p><i>Ranunculus</i> spp. will be present with an MTR species cover score of at least 5 in:</p> <p>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</p>	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	<p>CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals.</p> <p>For the Usk SAC:</p> <p>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:</p> <p>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</p>	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	

Conservation Objectives for the Wye Valley Woodlands SAC

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive

“The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.”

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

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Article 6(3) of the ‘Habitats’ Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses ‘performance indicators’ within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW’s current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

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Each conservation objective consists of the following two elements:

- 1 Vision for the feature
- 2 Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Web link: <http://www.jncc.gov.uk/page-2199>

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	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. <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	<i>Lower Limit:</i> No loss of extent of feature (mapped as NVC community W12). Refer to Ecotech survey 1996. <u>and</u> The extent of the feature under high forest management, coppice with standards management and minimum intervention management is as outlined on Map X. Loss = 0.5 ha or 0.5% of the stand area, whichever is the smaller

	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		

Conservation Objectives for the River Wye SAC

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation as defined in Articles 1(e) and 1(i) of the Habitats Directive

"The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the ‘Habitats’ Directive requires appropriate assessment of proposed plans and projects against a site’s conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses ‘performance indicators’ within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW’s current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Web link: <http://www.jncc.gov.uk/page-2199>

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)
-

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>	

<p>4.2.6 <i>The population of the feature in the SAC is stable or increasing over the long term.</i></p>	<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>
<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>	<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>
<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>	<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

Conservation Objectives for the Aberbargoed Grasslands SAC

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive

“The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.”

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the ‘Habitats’ Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses ‘performance indicators’ within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW’s current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Web link: <http://www.jncc.gov.uk/page-2199>

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

Conservation Objectives for the Cardiff Beech Wood SAC

4. CONSERVATION OBJECTIVES

Background to Conservation Objectives:

a. Outline of the legal context and purpose of conservation objectives.

Conservation objectives are required by the 1992 'Habitats' Directive (92/43/EEC). The aim of the Habitats Directives is the maintenance, or where appropriate the restoration of the 'favourable conservation status' of habitats and species features for which SACs and SPAs are designated (see Box 1).

In the broadest terms, 'favourable conservation status' means a feature is in satisfactory condition and all the things needed to keep it that way are in place for the foreseeable future. CCW considers that the concept of favourable conservation status provides a practical and legally robust basis for conservation objectives for Natura 2000 and Ramsar sites.

Box 1

Favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive

"The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."

Achieving these objectives requires appropriate management and the control of factors that may cause deterioration of habitats or significant disturbance to species.

As well as the overall function of communication, Conservation objectives have a number of specific roles:

- Conservation planning and management.

The conservation objectives guide management of sites, to maintain or restore the habitats and species in favourable condition.

- Assessing plans and projects.

Article 6(3) of the 'Habitats' Directive requires appropriate assessment of proposed plans and projects against a site's conservation objectives. Subject to certain exceptions, plans or projects may not proceed unless it is established that they will not adversely affect the integrity of sites. This role for testing plans and projects also applies to the review of existing decisions and consents.

- Monitoring and reporting.

The conservation objectives provide the basis for assessing the condition of a feature and the status of factors that affect it. CCW uses 'performance indicators' within the conservation objectives, as the basis for monitoring and reporting. Performance indicators are selected to provide useful information about the condition of a feature and the factors that affect it.

The conservation objectives in this document reflect CCW's current information and understanding of the site and its features and their importance in an international context. The conservation objectives are subject to review by CCW in light of new knowledge.

b. Format of the conservation objectives

There is one conservation objective for each feature listed in part 3. Each conservation objective is a composite statement representing a site-specific description of what is considered to be the favourable conservation status of the feature. These statements apply to a whole feature as it occurs within the whole plan area, although section 3.2 sets out their relevance to individual management units.

Each conservation objective consists of the following two elements:

1. Vision for the feature
2. Performance indicators

As a result of the general practice developed and agreed within the UK Conservation Agencies, conservation objectives include performance indicators, the selection of which should be informed by JNCC guidance on Common Standards Monitoring¹.

There is a critical need for clarity over the role of performance indicators within the conservation objectives. **A conservation objective, because it includes the vision for the feature, has meaning and substance independently of the performance indicators, and is more than the sum of the performance indicators.** The performance indicators are simply what make the conservation objectives measurable, and are thus part of, not a substitute for, the conservation objectives. Any feature attribute identified in the performance indicators should be represented in the vision for the feature, but not all elements of the vision for the feature will necessarily have corresponding performance indicators.

As well as describing the aspirations for the condition of the feature, the Vision section of each conservation objective contains a statement that the factors necessary to maintain those desired conditions are under control. Subject to technical, practical and resource constraints, factors which have an important influence on the condition of the feature are identified in the performance indicators.

¹ Available through www.jncc.gov.uk and follow links to Protected Sites and Common Standards Monitoring.

4.1 Conservation Objective for Feature 1: *Aperulo-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:

- At least 85% of the site will continue to be covered by semi-natural broadleaved woodland.
- The range of woodland communities within the site will be maintained - including both of the woodland ~~types considered~~ to be of international importance – *Asperulo-Fagetum* and *Tilio Acerion*.
- At least 95% of canopy forming trees will be locally native species such as beech, ash and oak.
- 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.
- The ground flora will comprise 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.
- 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.

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Deleted: <#>Ground flora shows the woodlands are centuries old and the soils are lime-rich. I'm not sure what this means – could you make some ref to species here. Probably better to say something like “The ground flora will comprise species typical of lime-rich beech wood, including indicators of ancient woodland, such as (e.g.) wood anemone, ramsons and sanicle” Need to check records for suitable species.¶

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	<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>Upper limit: None set</p> <p>Lower limit: 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></p>	<p>Upper limit: Not required</p> <p>Lower limit: 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</p>

	<p>Within a 25m radius all of the following criteria must be met:</p> <ul style="list-style-type: none"> o 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"> o There are at least 5 mature trees present <p>AND</p> <ul style="list-style-type: none"> o There are at least 5 sapling present <p>AND</p> <ul style="list-style-type: none"> o 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"> o 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 25m diameter 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>are at least 4 patches of advanced beech regeneration.</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.</p> <p>In Units 2 and 3 of Fforestganol a Chwm Nofydd, habitat present within a 50m x 50m sample plot is referable to '<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> no. of successive cohorts in 25m x 25m sample plot of understorey to be determined</p>
A5. Advanced	Areas of regeneration >10m x 10m with	<i>Upper limit:</i> Not required

regeneration	50+ beech saplings/seedlings. Each area of advance regeneration needs to be separated by a minimum of 10m	<i>Lower limit:</i> at present this performance indicator needs to be refined, because the amount of regeneration needed is unclear. In future, it will take the form “ X areas of regeneration noted every X 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 25m radius
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 25m radius 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 25m radius
A10. Evidence of browsing	Signs of browsing particularly on saplings (where tops have been taken off) or ferns (where fronds/pinnae have been removed) Bark stripping by squirrels is only likely to be a problem if large numbers of saplings are damaged.	At present no specified limit has been set, beyond noting any obvious areas of damage. Deer are not thought to be a problem at this site.
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 &	In addition to general health and safety	No limits set.

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.	
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. <u>Quarry dust deposition is an issue that occasionally comes up – the only monitoring of this that I'm aware of is in the Wye Valley, it may be worth finding out more.</u>	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:

- At least 85% of the site will continue to be covered by semi-natural broadleaved woodland.
- The range of woodland communities within the site will be maintained, as for feature 1
- 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.
- The ground flora will comprise 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.
- 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.

Deleted: Ground flora shows the woodlands are centuries old and the soils are lime-rich. Ditto as feature 1

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.

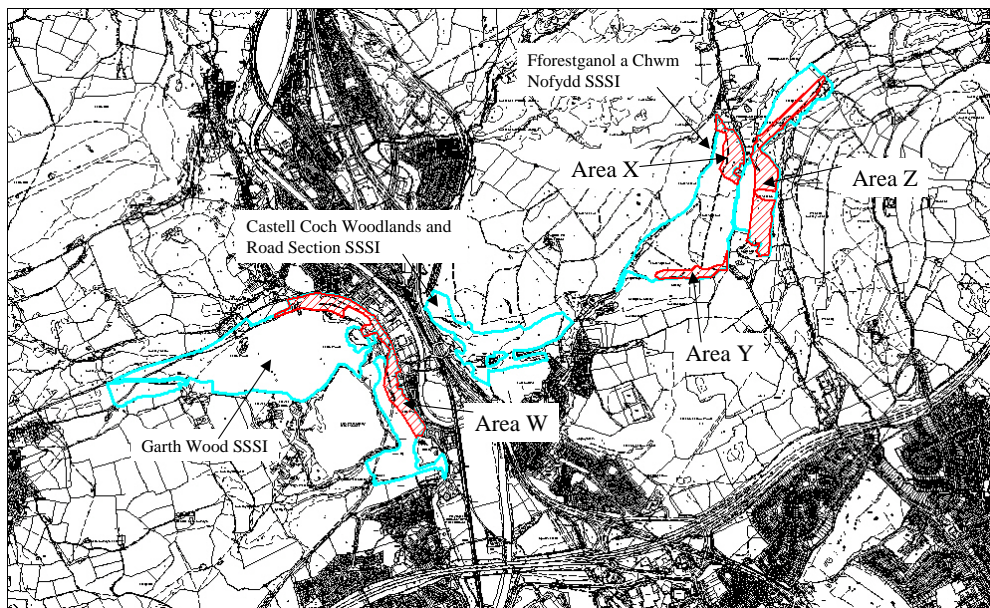
<i>Performance indicators for feature condition</i>		
<i>Attribute</i>	<i>Attribute rationale and other comments</i>	<i>Specified limits</i>
A1. Extent	<p>For a habitat feature to be considered to be at favourable conservation status, the area of the habitat must be stable in the long-term or increasing.</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. In addition <i>Dryopteris</i> species are often</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>

	present.	
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 50x50m area 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> this limit needs to be refined, but will take the form ' X number 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 50m x 50m plot</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</i>	<p><i>Upper limit:</i> Not required</p> <p><i>Lower limit:</i> At least 3 ground flora species present within 50m x 50m</p>

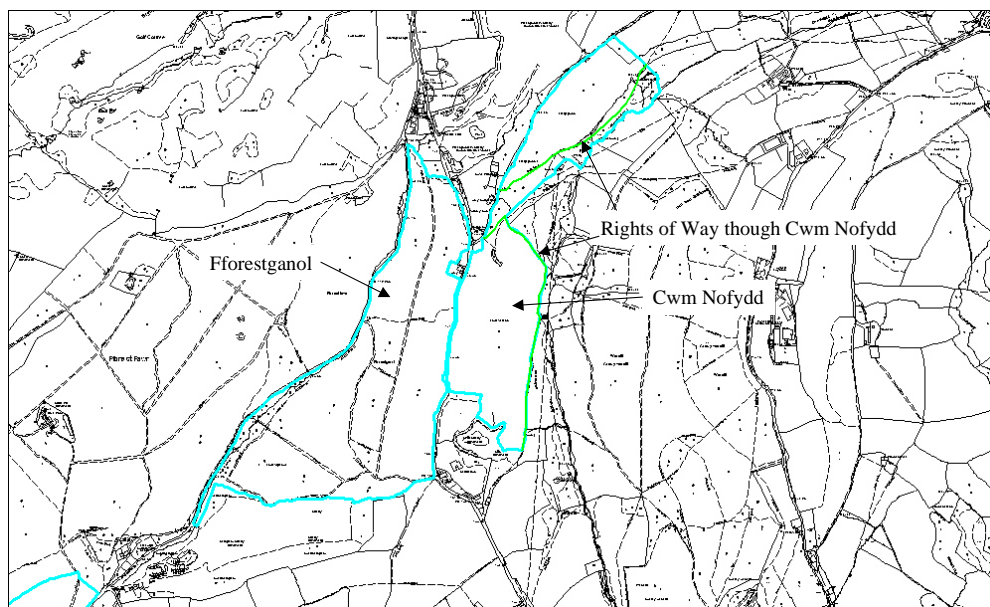
	<i>maculatum</i> , <i>Sanicula europaea</i> , <i>Geum urbanum</i> or <i>Melica uniflora</i>	plot and no evidence of browsing
A8. Dead wood	Fallen trees, fallen branches, dead branches on living trees or standing dead trees (all > 20cm in diameter) All dead wood (standing or fallen) left in situ	<i>Upper limit:</i> None set <i>Lower limit:</i> Dead wood present in at least 2 forms within 50m x 50m plot
A9. Evidence of browsing	Signs of browsing particularly on saplings (where tops have been taken off) or ferns (where fronds/pinnae have been removed) Bark stripping by squirrels is only likely to be a problem if large numbers of saplings are damaged.	At present no specified limit has been set, beyond noting any obvious areas of damage. Deer are not thought to be a problem at this site.
<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 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 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 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.

Map 1:
Location of *Tilio-Acerion* Habitat (Areas W, X, Y and Z) at Cardiff Beech Woods SAC



Map 2:
Rights of Way through Cwm Nofydd



**4.3 Conservation Objective for Feature 3:
Semi-natural Broadleaved Woodland**

Vision for feature 3

As for features 1 and 2.

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	As per features 1 and 2	As per features 1 and 2
A2. Quality	As per features 1 and 2	As per features 1 and 2
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
As features 1 and 2		

**4.4 Conservation Objective for Feature 4:
Porrhoma rosenhaueri (cave dwelling spider)**

Vision for feature 4

- The population of the nationally rare cave spider *Porrhoma rosenhaueri* will be maintained at its current level and distribution throughout the cave systems of Lesser Garth Cave.
- General conditions favourable to the cave invertebrate fauna of Lesser Garth Cave will be maintained.
- 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. Extent	To be completed	
A2. Quality		
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
Natural Woodland Processes		
Recreational Use		

4.5 Conservation Objective for Feature 5: Geological Exposures

Vision for feature 5

- The rock layers are sufficiently free from soil, vegetation or other covering for them to be seen and to see how each layer relates to the layers above and below in the sequence.
- The rocks are clean and accessible in key areas within the site and this is sustainable in the long term.
- All factors affecting the achievement of these conditions are under control.

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	To be completed	
A2. Quality		
<i>Performance indicators for factors affecting the feature</i>		
<i>Factor</i>	<i>Factor rationale and other comments</i>	<i>Operational Limits</i>
Natural Woodland Processes		
Natural Erosion and Deposition Processes		
Recreational Use		



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