



**Cyfoeth
Naturiol
Cymru**
**Natural
Resources
Wales**

CORE MANAGEMENT PLAN INCLUDING CONSERVATION OBJECTIVES

FOR

Afon Wysg / River Usk SAC



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Naturiol
Cymru**
**Natural
Resources
Wales**



Version	Date	Summary of changes made	Approved by
Version 3	09/2022	Revision of water quality targets for river features, updated formatting, clarification of the relationship between Conservation Objectives and Performance Indicators.	Jon Goldsworthy
Version 2	9/2014	Conservation objectives, feature condition, management requirements and Action plan revised and updated. Management units aligned with WFD water bodies.	
Version 1			

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Preface

This document provides the main elements of Natural Resources Wales's management plan for the site(s) named. It sets out what needs to be achieved on the site(s), and advice on the action required. This document is made available through Natural Resources Wales's web site and may be revised in response to changing circumstances or new information. This is a technical document that supplements summary information on the Natural Resources Wales's web site.

One of the key functions of this document is to provide Natural Resources Wales's statement of the Conservation Objectives for the relevant Special Area of Conservation (SAC) and Special Protection Area (SPA) site(s). This is required to implement the changes through the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 in addition to the existing Conservation of Habitats and Species Regulations 2017. As a matter of Welsh Government Policy, the provisions of those regulations are also to be applied to Ramsar sites in Wales.

Vision for the site

This is a descriptive overview of what needs to be achieved for conservation on the site. It brings together and summarises the Conservation Objectives (part 4) into a single, integrated statement about the site.

The purpose of the designation of SAC and SPA sites is to help secure the maintenance or restoration of habitats and species to favourable conservation status for the foreseeable future. Given that we foresee a changing climate, despite the uncertainty of the nature, degree and timing of those changes, we must address the need to ensure the resilience of each site to that changing environment. This will be achieved in the first instance by ensuring favourable condition of the important features, since a healthy feature is likely to be more resilient to the effects of climate change than one which is already stressed. Secondly, consideration must be given to those structures, functions and processes which maintain or boost the resilience of ecosystems to climate stress, including the avoidance, reduction or mitigation of other stress factors such as invasive species, nutrient enrichment, habitat and population fragmentation.

This site forms part of a wider network and is ecologically connected with its surroundings and with other designated sites in the region. Although the focus of this document is on the individual site, the conservation objectives and management requirements need to be considered in the wider context. A connected network of sites is more robust than sites in isolation, and more resilient to pressures such as climate change.

Our vision for the River Usk SAC is to maintain, or where necessary restore the river, so that all of its special features are able to sustain themselves in the long-term as part of a naturally functioning ecosystem. Allowing the natural processes of erosion and deposition to operate without undue interference and maintaining or restoring connectivity maintains the physical river habitat, which forms the foundation for this ecosystem. The quality and quantity of water, including natural flow variability, and the quality of adjacent habitats, are maintained or restored to a level necessary to maintain the features in favourable condition for the foreseeable future. In places, in particular urban environments where natural

processes are likely to cause significant damage to the public interest, artificial control measures are likely to be required but if so these will be justified in terms of over-riding public interest.

The aquatic plant communities that characterise parts of the river are not only attractive but also give a good indication of the overall quality of the environment. They contain the variety and abundance of species expected for this type of river, in conditions of suitably clean water and bed substrate combined with a relatively stable flow regime. Locally, there are patches of white-flowered water-crowfoots. In the more shaded reaches, aquatic plants may be scarce, consisting mainly of mosses and liverworts.

The special fish species found in the river, both residents such as the bullhead and brook lamprey, and migratory species such as the Atlantic salmon, sea lamprey and shad, which swim upriver to spawn and go through their juvenile stages in the river, are present in numbers that reflect a healthy and sustainable population supported by well-distributed good quality habitat. The migratory fish are able to complete their migrations and life cycles largely unhindered by artificial barriers such as weirs, pollution, or depleted flows.

The abundance of prey and widespread availability of undisturbed resting and breeding sites, allows a large otter population to thrive. They are found along the entire length of the river and its main tributaries and are linked to populations on the coast and in neighbouring catchments.

Native trees, scrub and woodlands are retained and expanded in riparian areas, on floodplains and in the wider catchment for the benefit of the site features, to help restore hydrological processes and promote resilience to the effects of climate change. A moderate to high level of shading of the channel is maintained. Fallen trees and woody debris are retained in the river channel wherever possible.

The presence of the River Usk SAC and its special wildlife enhances the economic and social values of the area, by providing a high-quality environment for ecotourism, outdoor activities and peaceful enjoyment by local people and visitors. The river catchment's functions of controlling flooding and supplying clean water are recognised and promoted through appropriate land management. The river is a focus for education to promote increased understanding of its biodiversity and the essential life support functions of its ecosystems.

Site description

Area and designations covered by this plan

Grid reference: SO126219

Unitary authorities: Powys County Council, Monmouthshire County Council, Newport County Borough Council

Area (hectares): 1008.26

Designations covered:

- River Usk (Upper Usk) SSSI
- River Usk (Lower Usk) SSSI
- River Usk (Tributaries) SSSI
- Penllwyn-yr-hendy SSSI
- Coed Dyrysiog SSSI
- Coed Nant Menascin SSSI
- Coed Ynysfaen SSSI

Maps showing the management units referred to in this plan can be viewed on Welsh Government's interactive website [Map Data Cymru](#).

Summary maps showing the coverage of this document are shown below.

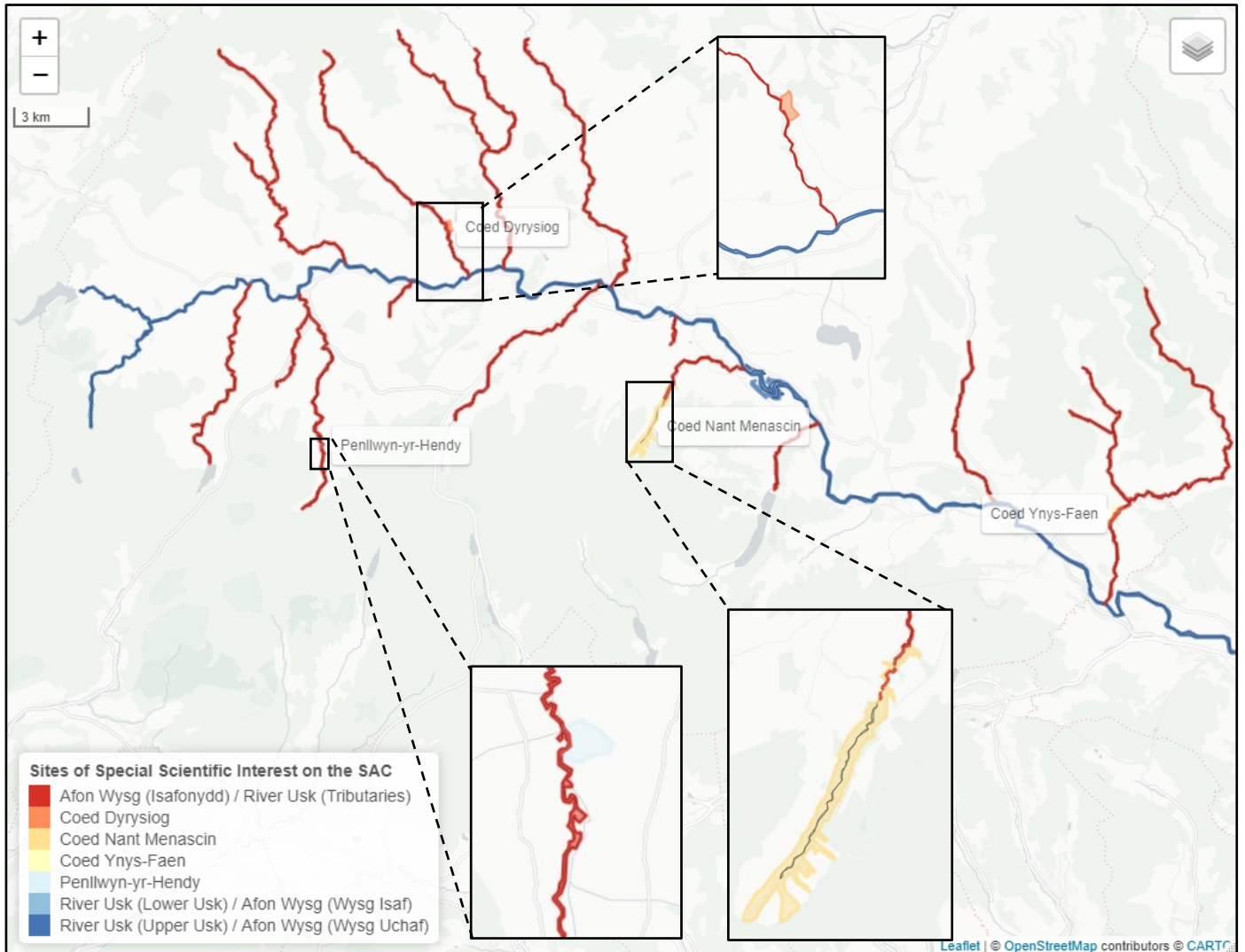


Fig. 1a: Map of Sites of Special Scientific Interest on the SAC (northern section; maps divided by convenience not formal designation). The SAC contains all of the Tributaries, Lower Usk, and Upper Usk SSSIs. The smaller woodland SSSIs (“Coed ...”) and Penllwyn-yr-Hendy SSSI are partly riverine, indicated in zoomed-in insets. © Natural Resources Wales. All rights reserved.

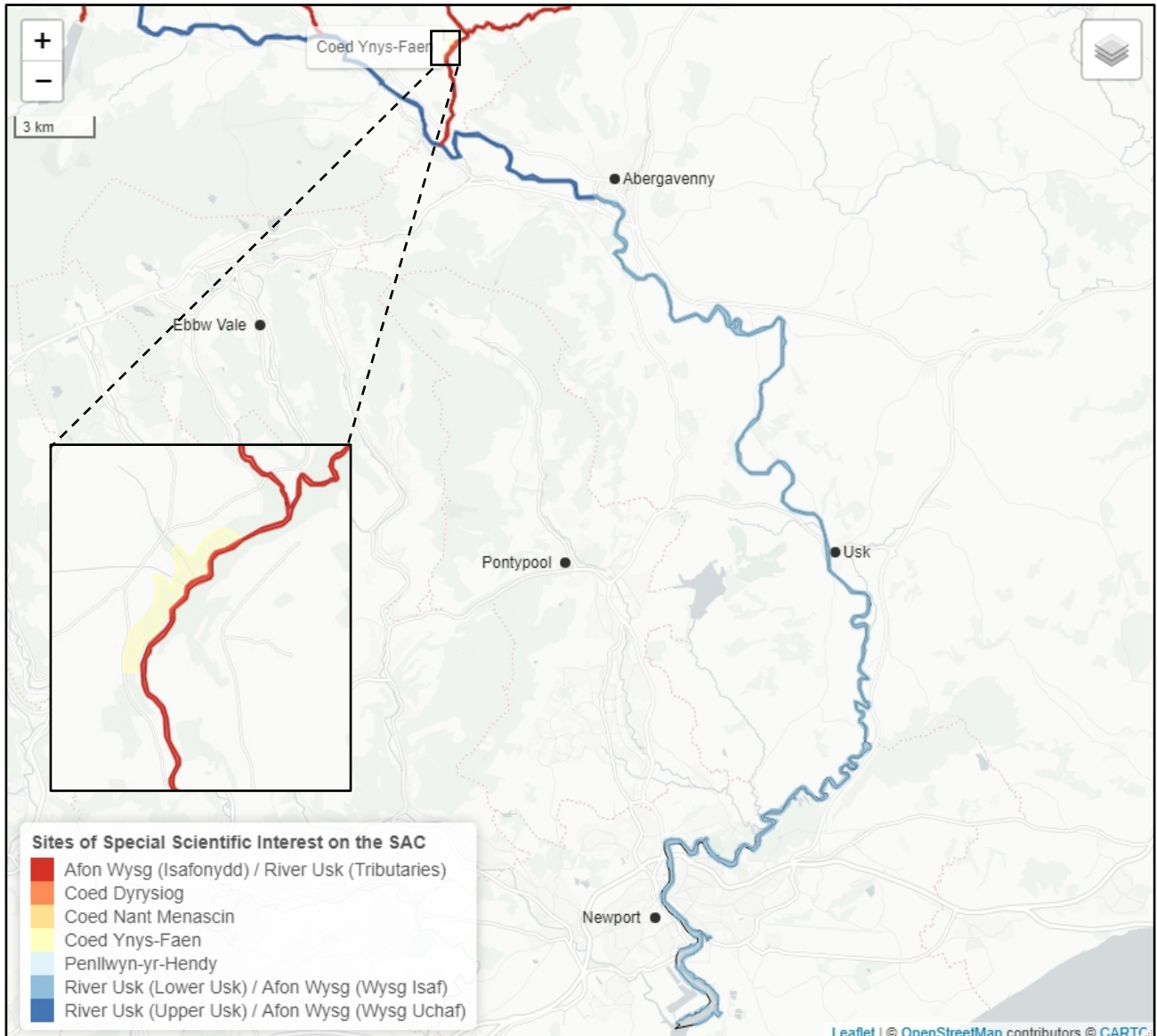


Fig. 1b: Map of Sites of Special Scientific Interest on the SAC (southern section; maps divided by convenience not formal designation). The SAC contains all of the Tributaries, Lower Usk, and Upper Usk SSSIs. The smaller woodland SSSIs (“Coed ...”) and Penllwyn-yr-Hendy SSSI are partly riverine, indicated in zoomed-in insets. © Natural Resources Wales. All rights reserved.

Outline description

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 overall form of the catchment is long and narrow, with short, generally steep tributaries flowing north from the Black Mountain, Fforest Fawr and Brecon Beacons, and south from Mynydd Epynt and the Black Mountains. The underlying geology consists predominantly of Devonian Old Red Sandstone with a moderate base status, resulting in waters that are generally well buffered against acidity. This geology also produces a generally low to moderate nutrient status, and a moderate base-flow index, intermediate between base-flow dominated rivers and more flashy rivers on less permeable geology. The run-off

characteristics and nutrient status are significantly modified by land use in the catchment, which is predominantly pastoral with some woodland and commercial forestry in the headwaters and arable in the lower catchment. The Usk catchment is entirely within Wales.

The ecological structure and functions of the site are dependent on hydrological and geomorphological processes (often referred to as hydromorphological processes), as well as the quality of riparian habitats and connectivity of habitats. Animals that move around and sometimes leave the site, such as migratory fish and otters, may also be affected by factors operating outside the site.

Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. Maintenance of both high 'spate' flows and base-flows is essential. Reduction in flows may reduce the ability of the adults of migratory fish to reach spawning sites. Water-crowfoot vegetation thrives in relatively stable, moderate flows and clean water. The flow regime should be characteristic of the river in order to support the functioning of the river ecosystem.

Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream. In addition, the freshly deposited and eroded surfaces, such as shingle banks and earth cliffs, enable processes of ecological succession to begin again, providing an essential habitat for specialist, early-successional species. Processes at the wider catchment scale generally govern processes of erosion and deposition occurring at the reach scale, although locally, factors such as the effect of grazing levels on riparian vegetation structure may contribute to enhanced erosion rates. In general, management that interferes with natural geomorphological processes, for example preventing bank erosion through the use of hard revetments or removing large amounts of gravel, are likely to be damaging to the coherence of the ecosystem structure and functions.

Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high-quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-stream consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features. Woody debris is very important as it provides refuge areas from predators, traps sediment to create spawning and juvenile habitat and forms the base of an important aquatic food chain. Otters require sufficient undisturbed riparian habitats as breeding and resting sites. It is important that appropriate amounts of tree cover, in general at least 50% high canopy cover, tall vegetation and other semi-natural habitats are maintained on the riverbanks and in adjacent areas, and that they are properly managed to support the SAC features. This may be achieved, for example, through managing grazing levels, selective coppicing of riparian

trees and restoring adjacent wetlands. In the urban sections the focus may be on maintaining the river as a communication corridor, but this will still require that sufficient riparian habitat is present and managed to enable the river corridor to function effectively.

Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. For resident species, dispersal to new areas, or the prevention of dispersal causing isolated populations to become genetically distinct, may be important factors. Naturally isolated feature populations that are identified as having important genetic distinctiveness should be maintained. Artificial obstructions including weirs and bridge sills can reduce connectivity for some species. In addition, reaches subject to depleted flow levels, pollution, or disturbance due to noise, vibration or light, can all inhibit the movement of sensitive species. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions; therefore, these must be designed to allow safe passage. The continuity of riparian habitats enables a wide range of terrestrial species, for example lesser horseshoe bats, to migrate and disperse through the landscape. Connectivity should be maintained or restored where necessary as a means to ensure access for the features to sufficient habitat within the SAC.

External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds. Otters may be affected by developments that affect resting and breeding sites outside the SAC boundary.

Outline of past and current management

The Usk is predominantly a rural catchment with livestock farming dominating the upper catchment but with significant arable areas occurring lower down the catchment. Some commercial forestry occurs in the headwater areas and there is patchy cover of native broadleaved woodland. The river passes through several small towns before the entering the urban area of Newport at the estuary.

Water is taken from the river for public supply at Brecon and Prioress Mill (Rhadyr, near Usk town) and there are four large reservoirs on designated tributaries of the Usk SAC, namely, Usk, Crai, Talybont and Grwyne Fawr reservoirs, the first three of which export water from the catchment to the south Wales valleys. The Brecon and Monmouthshire Canal is also a significant user of water from the River Usk. Options to change the abstraction practices of Dŵr Cymru Welsh Water and the Canals and Rivers Trust have been investigated in recent years with the aim of reducing the impact on river flows where these are deemed to be damaging to the ecology of the river.

Tourism and recreation, centred on the Brecon Beacons National Park through which the Usk flows, is an important part of the local economy. Recreational use of the Usk has traditionally centred on angling, and the Atlantic salmon and brown trout remain the focus for much of the management activity carried out on the Usk, principally by the angling and environmental charity The Wye and Usk Foundation through various funded projects. Some works are also carried out directly by farmers through the Welsh Government agri-environment scheme Glastir. The agricultural land is a source of diffuse pollution and

siltation and a commonly used measure to address this is the establishment of fenced buffer zones on the tributaries within intensively managed pasture or, less often, in arable land. Riparian tree management, especially coppicing and pollarding to increase light levels to the channel and improve casting for anglers is also often carried out, though the focus in recent years has shifted more towards the promotion of shade to mitigate climate change impacts, and this may involve tree planting. The potential for tree planting to attenuate catchment run-off is a growing area of interest. Other work carried out by a partnership of organisations has included the control of invasive non-native weeds on the riverbanks (especially giant hogweed), removal of weirs and construction of fish passes to ease artificial barriers to salmon migration, and the buying out of net fisheries for salmon in the estuary to reduce exploitation pressure and improve angling upstream.

Pollution by sheep dips was formerly a serious problem but has become less so in recent years since the suspension of some synthetic pyrethroid products from sale. Sheep dipping as a practice is also becoming less commonplace (being frequently replaced by pour-on treatments). The overall reduction in sheep numbers since the peak in the 1980s and '90s may also have made the incidence of pest and disease outbreaks requiring treatment less frequent. Other pesticides occur in quantities exceeding water quality standards and are subject to investigation to find suitable control measures.

Physical river habitats have been adversely affected in places by attempts to control bank erosion, typically (in the context of agricultural land) using rubble and other construction wastes. These impacts may need to be reduced through removal of tipped waste in order to restore the river habitat to a favourable condition. No tipping is permitted in the SAC.

Discharges from urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can be significant causes of pollution and must be managed appropriately. Point source pollution from large sewage treatment works has been progressively reduced and no longer causes routine failures of water quality standards, although issues remain locally with combined sewer overflows and sewer misconnections. In some smaller tributaries, private sewage treatment works including poorly maintained septic tanks may also cause problems for water quality which would not be detected by routine monitoring. Owners of such systems must register them with Natural Resources Wales and ensure they are functioning correctly. New private STWs discharging into the SAC require an Environmental Permit.

Management units

The area covered by this plan has been divided into management units to enable practical communication about features, objectives, and management. This will also allow us to differentiate between the different designations where necessary. In this plan the management unit boundaries have been aligned to coincide with water bodies as far as possible. All SAC units have been reunited to match with WFD river water bodies, excepting units 7439 (river surrounds) and 7632 (unit with tidal influence) which are not associated with WFD water bodies.

Maps showing the management units referred to in this plan are shown below, and can also be viewed on Welsh Government's interactive website [Map Data Cymru](#).

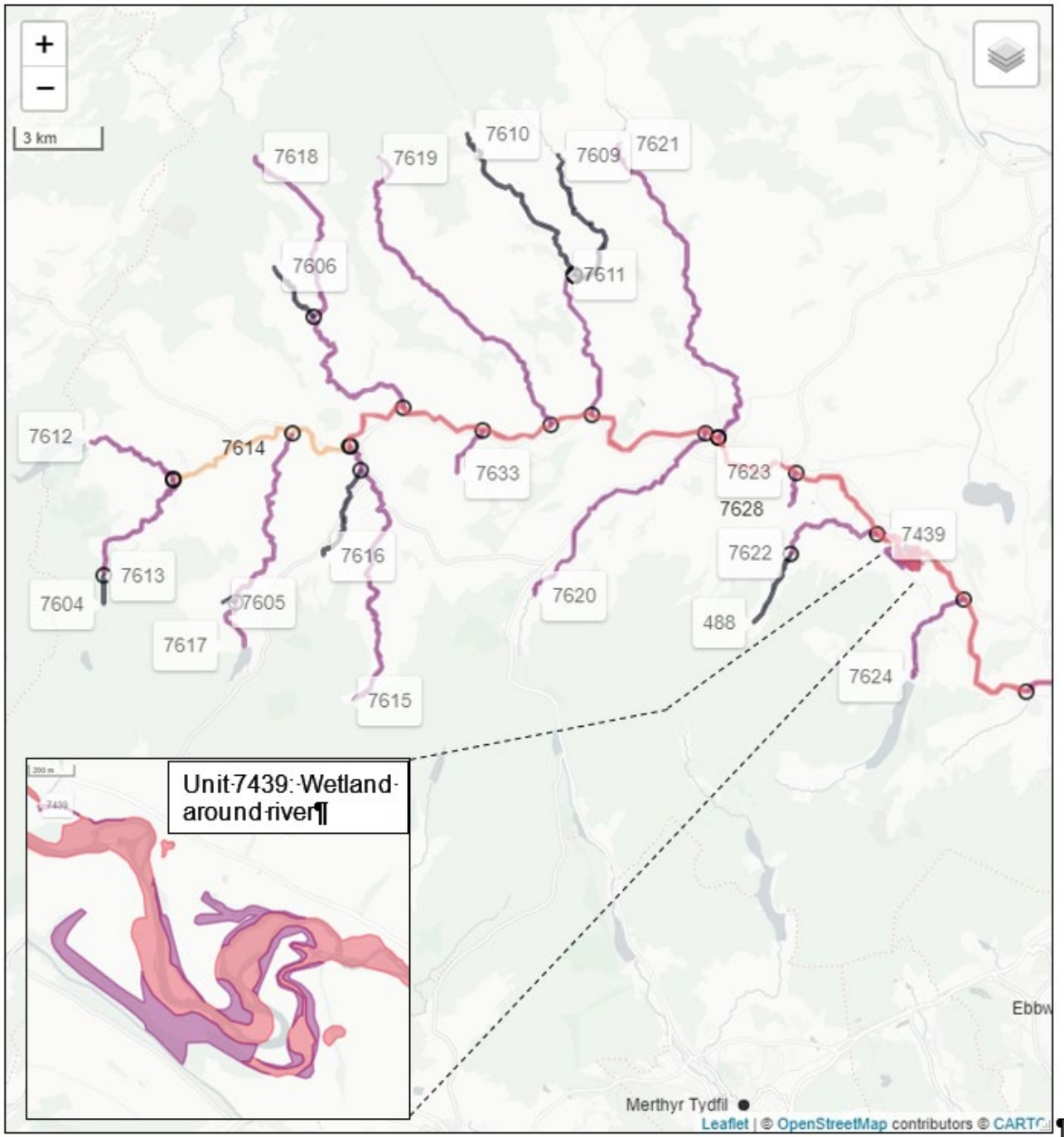


Fig. 2a: Map of SAC management units (upper section; maps divided by convenience not formal designation). Long main stem management units are labelled without label boxes to disambiguate them from shorter/tributary units (labelled with boxes). Points where units join are indicated by circles. Colour is used as a visual aid alongside the circles to aid telling management units apart. © Natural Resources Wales. All rights reserved.

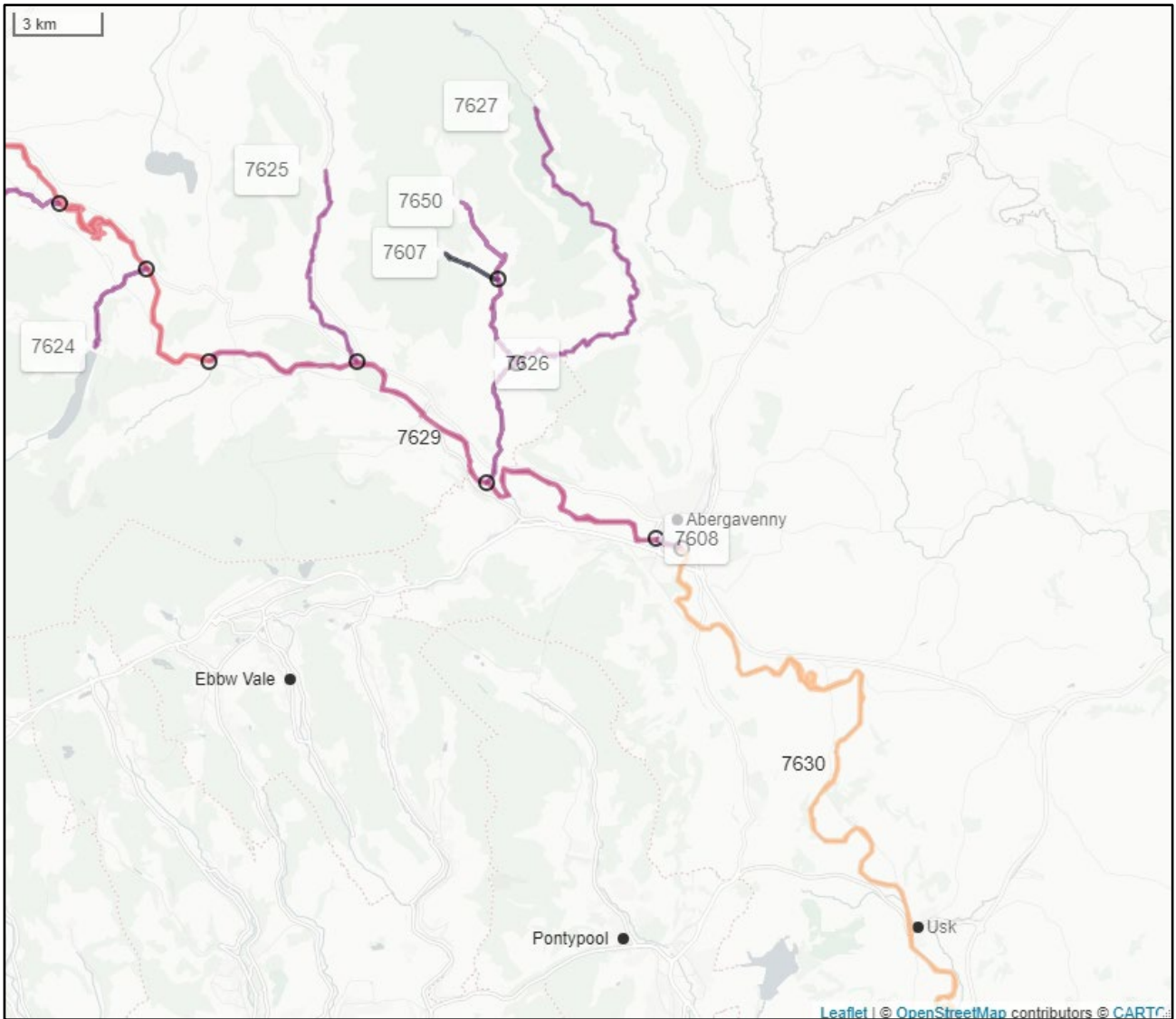


Fig. 2b: Map of SAC management units (middle section; maps divided by convenience not formal designation). Long main stem management units are labelled without label boxes to disambiguate them from shorter/tributary units (labelled with boxes). Points where units join are indicated by circles. Colour is used as a visual aid alongside the circles to aid telling management units apart. © Natural Resources Wales. All rights reserved.

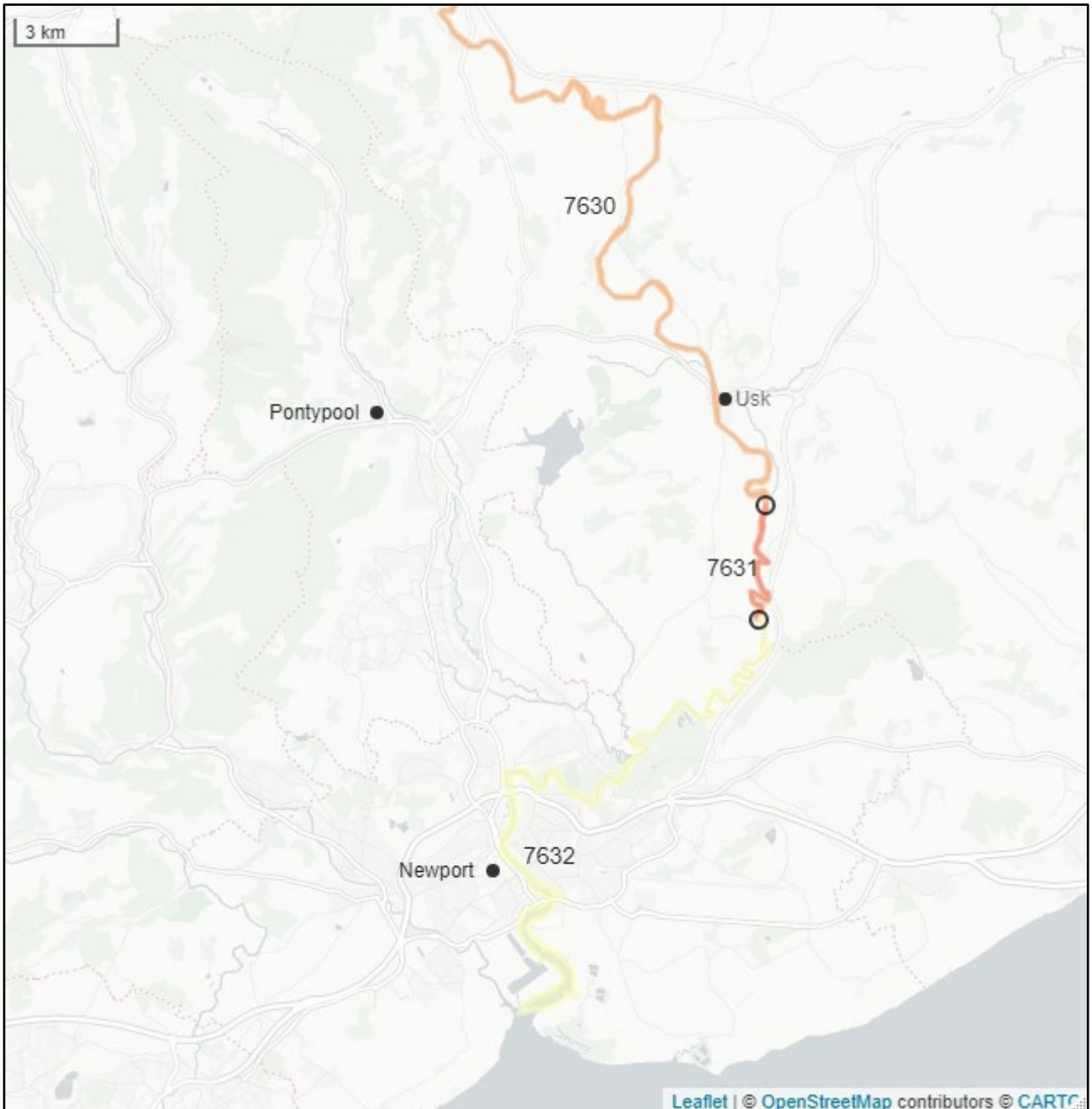


Fig. 2c: Map of SAC management units (lower section; maps divided by convenience not formal designation). Long main stem management units are labelled without label boxes to disambiguate them from shorter/tributary units (labelled with boxes). Points where units join are indicated by circles. Colour is used as a visual aid alongside the circles to aid telling management units apart. © Natural Resources Wales. All rights reserved.

The following table confirms the relationships between the SAC management units and the designations covered. No units on the Usk are owned or managed by NRW; all are SSSI in addition to SAC.

Unique unit no	Site unit ref	SSSI	Water body IDs within unit
xxxx	7605	Afon Wysg (Isafonydd) / River Usk (Tributaries) Rhyddnant	GB109056033080
yyyy	7606	Afon Wysg (Isafonydd) / River Usk (Tributaries) Nant Eithrim source to conf Cilieni	GB109056040030
zzzz	7607	Afon Wysg (Isafonydd) / River Usk (Tributaries) Banw to conf Grwyne Fechan	GB109056039960
bbbb	7609	Afon Wysg (Isafonydd) / River Usk (Tributaries) Yscir Fawr	GB109056040070
cccc	7610	Afon Wysg (Isafonydd) / River Usk (Tributaries) Ysgir Fechan	GB109056040050
dddd	7611	Afon Wysg (Isafonydd) / River Usk (Tributaries) conf Yscir Fechan to conf R Usk	GB109056040020
hhhh	7615	Afon Wysg (Isafonydd) / River Usk (Tributaries) Senni - source to conf River Usk	GB109056033050
iiii	7616	Afon Wysg (Isafonydd) / River Usk (Tributaries) Cwm Treweryn - source to River Senni	GB109056033040
jjjj	7617	Afon Wysg (Isafonydd) / River Usk (Tributaries) Afon Crai	GB109056033080,
kkkk	7618	Afon Wysg (Isafonydd) / River Usk (Tributaries) Cilieni - source to conf R Usk	GB109056040030
llll	7619	Afon Wysg (Isafonydd) / River Usk (Tributaries) Nant Bran - source to conf R Usk	GB109056040040
mmmm	7620	Afon Wysg (Isafonydd) / River Usk (Tributaries) Afon Tarell - source to conf R Usk	GB109056033070
nnnn	7621	Afon Wysg (Isafonydd) / River Usk (Tributaries)	GB109056040060

Unique unit no	Site unit ref	SSSI	Water body IDs within unit
		Honddu - source to conf R Usk	
oooo	7622	Afon Wysg (Isafonydd) / River Usk (Tributaries) Lower Nant Menasgin - to conf R Usk	GB109056033010
pppp	7623	Afon Wysg (Isafonydd) / River Usk (Tributaries) Afon Cynrig - source to conf R Usk	GB109056033020
qqqq	7624	Afon Wysg (Isafonydd) / River Usk (Tributaries) Caerfanell - source to conf R Usk	GB109056033000
rrrr	7625	Afon Wysg (Isafonydd) / River Usk (Tributaries) Rhiangoll - source to conf R Usk	GB109056039990
ssss	7626	Afon Wysg (Isafonydd) / River Usk (Tributaries) Grwyne Fawr - conf Grwyne-Fechan to conf R Usk	GB109056032980
tttt	7627	Afon Wysg (Isafonydd) / River Usk (Tributaries) Grwyne Fawr - source to conf Grwyne-Fechan	GB109056040000
aadd	7633	Afon Wysg (Isafonydd) / River Usk (Tributaries) Camlais to conf River Usk	GB109056040081 (NB no waterbody showing on GIS)
aeee	7650	Afon Wysg (Isafonydd) / River Usk (Tributaries) Grwyne-Fechan - source to conf Grwyne Fawr	GB109056039960
11	488	Coed Nant Menascin Upper Nant Menasgin	GB109056033010
aaaa	7608	River Usk (Lower Usk) / Afon Wysg (Wysg Isaf) Llanfoist bridge to Gavenny confluence	GB109056040082
www	7630	River Usk (Lower Usk) / Afon Wysg (Wysg Isaf) Gavenny conf to Olway conf	GB109056040083
aabb	7631	River Usk (Lower Usk) / Afon Wysg (Wysg Isaf)	GB109056026890

Unique unit no	Site unit ref	SSSI	Water body IDs within unit
		Olway conf to tidal limit	
aacc	7632	River Usk (Lower Usk) / Afon Wysg (Wysg Isaf) Usk transitional Newport	NA
5a	7439	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Pencelli wetland	NA
1822	7604	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Afon Hydfer headwaters	GB109056033030
eeee	7612	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Upstream Hydfer conf	GB109056039970
ffff	7613	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Hydfer conf River Usk	GB109056033030,
gggg	7614	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Hydfer conf to Senni Conf	GB109056039980
uuuu	7628	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Conf Afon Senni to conf Afon Crawnnon	GB109056040081
vvvv	7629	River Usk (Upper Usk) / Afon Wysg (Wysg Uchaf) Crawnnon conf to Llanfoist Bridge	GB109056040082

Position within an ecological network

The River Usk and River Wye SACs flow into the Severn Estuary SAC, which has some features in common with the river sites, i.e., river and sea lampreys and twaite shad. The Usk and Wye SACs and the undesignated River Severn together form an important breeding habitat for migratory fish including Atlantic salmon, lampreys, shad and eels. Returning adults of these species show varying degrees of site faithfulness, with salmon generally regarded as the most site faithful, responding to cues in the water chemistry of their home streams, while sea lamprey and shad may use the available spawning habitat more opportunistically, varying their site use from year to year. Shad and lampreys are generally coastal species when not in the river, while salmon travel further out to sea to feed and grow, where they may be subject to a different range of pressures resulting from changes in sea temperatures and prey species abundance.

The migration of fish between the estuary and the rivers is influenced by pulses of freshwater flow and seasonal temperature changes. The timing of these events varies naturally from year to year, though they may also be influenced by the artificial management of flows, in particular by reservoir releases and abstractions for public water

supply. Large abstractions occur from the lower Usk at Prioress Mill and Llantrisant which are controlled through abstraction licence conditions with the aim of minimising the potential impacts on fish migration and spawning.

The otter population is distributed across the designated and non-designated parts of the river system and the estuary and adjacent coastal areas, which must be managed as a whole in order to ensure that the population is stable or increasing. This depends largely on the extent and connectivity to the river of semi-natural habitats including woodland, scrub and marshy grassland. These connected terrestrial habitats are also priorities for conservation and are subject to requirements to maintain and restore their extent where necessary to secure their favourable conservation status.

The features

Confirmation of features

SAC features have dedicated conservation objectives. The below table lists all of them for the Usk SAC.

SAC feature (Annex I habitats and Annex II species)	Primary reason for site selection?	Relationships, nomenclature etc	Conservation Objective
Sea lamprey <i>Petromyzon marinus</i>	Yes	EU Species Code: 1095	1
Brook lamprey <i>Lampetra planeri</i>	Yes	EU Species Code: 1096	2
River lamprey <i>Lampetra fluviatilis</i>	Yes	EU Species Code: 1099	3
Twaite shad <i>Alosa fallax</i>	Yes	EU Species Code: 1103	4
Allis shad <i>Alosa alosa</i>	No	EU Species Code: 1102	5
Atlantic salmon <i>Salmo salar</i>	Yes	EU Species Code: 1106	6
Bullhead <i>Cottus gobio</i>	Yes	EU Species Code: 1163	7
European otter <i>Lutra lutra</i>	Yes	EU Species Code: 1355	8
Watercourses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	No	EU Habitat Code: 3260	9

SSSI features are listed in the table below.

SSSI feature	Relationships, nomenclature etc
Assemblage of RDB and/or Nationally Scarce and/or Atlantic-Western British bryophytes	
<i>Atriplex longipes</i>	
<i>Bryum gemmiparum</i>	
<i>Endocarpon adscendens</i>	
<i>Lampetra fluviatilis</i>	Managed as SAC feature
<i>Lampetra planeri</i>	Managed as SAC feature
<i>Lepidium latifolium</i>	
<i>Orthotrichum sprucei</i>	
River margin invertebrate assemblage	
Running water -Group B rivers-	
Running water -Group C rivers-	
Semi-natural woodland	

Features and SAC management units

This section sets out the relationship between the designated features and each management unit. This is intended to provide a clear statement about what each unit should be managed for, taking into account the varied needs of the different special features. All features are allocated to one of seven classes in each management unit. These classes are:

Key features

KH - a 'Key Habitat' in the management unit, i.e., the habitat that is the main driver of management and focus of monitoring effort, perhaps because of the dependence of a key species (see KS below). There will usually only be one Key Habitat in a unit but there can be more, especially with large units.

KS – a 'Key Species' in the management unit, often driving both the selection and management of a Key Habitat.

Geo – an earth science feature that is the main driver of management and focus of monitoring effort in a unit.

Other features

Sym - habitats, species and earth science features that are of importance in a unit but are not the main drivers of management or focus of monitoring. These features will benefit from management for the key feature(s) identified in the unit. These may be classed as 'Sym' (sympathetic) features because:

- (a) they are present in the unit but may be of less conservation importance than the key feature; and/or
- (b) they are present in the unit but in small areas/numbers, with the bulk of the feature in other units of the site; and/or

(c) their requirements are broader than and compatible with the management needs of the key feature(s), e.g., a mobile species that uses large parts of the site and surrounding areas: and/or

(d) key features (KH, KS) are closely associated with these features, and the conservation of key features depends on them being managed appropriately.

Nm - an infrequently used category where features are at risk of decline within a unit as a result of meeting the management needs of the key feature(s), i.e., under Negative Management. These cases will usually be compensated for by management elsewhere in the plan and can be used where minor occurrences of a feature would otherwise lead to apparent conflict with another key feature in a unit.

Mn - Management units that are essential for the management of features elsewhere on a site e.g., livestock over-wintering area included within designation boundaries, buffer zones around water bodies, etc.

x – Features not known to be present in the management unit.

The tables below set out the relationship between the features and management units identified in this plan:

SAC Management Unit	488	7604	7605	7606	7607	7608	7609	7610	7611	7612	7613	7614	7615	7616
NRW Internal Reference	11	1822	xxxx	yyyy	zzzz	aaaa	bbbb	cccc	dddd	eeee	ffff	gggg	hhhh	iiii
SAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SAC features														
<i>Alosa alosa</i>	X	X	X	X	X	KS	X	X	X	X	X	X	X	X
<i>Alosa fallax</i>	X	X	X	X	X	KS	X	X	X	X	X	X	X	X
<i>Cottus gobio</i>	KS	KS	KS	KS	KS	Sym	Sym	KS	KS	KS	KS	KS	Sym	Sym
<i>Lampetra fluviatilis</i>	Sym	Sym	Sym	Sym	Sym	KS	Sym	Sym	Sym	Sym	Sym	Sym	KS	KS
<i>Lampetra planeri</i>	KS	KS	KS	KS	KS	Sym	Sym	KS	KS	KS	KS	KS	KS	KS
<i>Lutra lutra</i>	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS
<i>Petromyzon marinus</i>	X	X	X	X	X	KS	X	X	X	X	X	X	X	X
<i>Salmo salar</i>	KS	KS	KS	KS	KS	Sym	KS	KS	KS	KS	KS	KS	KS	KS
Watercourses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Sym	Sym	Sym	Sym	Sym	Sym	X	Sym	Sym	Sym	Sym	Sym	X	X
SSSI features														
Assemblage of RDB and/or Nationally Scarce and/or Atlantic-Western British bryophytes	X	KS	X	X	X	X	X	X	X	KS	KS	X	X	X
<i>Atriplex longipes</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Bryum gemmiparum</i>	X	X	X	X	X	X	X	X	X	X	KS	X	X	X
<i>Endocarpon adscendens</i>	X	X	X	X	X	X	X	X	X	X	KS	X	X	X
<i>Lampetra fluviatilis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Lampetra planeri</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SAC Management Unit	7617	7618	7619	7620	7621	7622	7623	7624	7625	7626	7627	7628	7629	7630	7631
NRW Internal Reference	jjjj	kkkk	llll	mmmm	nnnn	oooo	pppp	qqqq	rrrr	ssss	tttt	uuuu	vvvv	wwww	aabb
SAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SAC features															
<i>Alosa alosa</i>	X	X	X	X	X	X	X	X	X	X	X	Sym	Sym	KS	Sym
<i>Alosa fallax</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	KS	KS
<i>Cottus gobio</i>	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym
<i>Lampetra fluviatilis</i>	KS	KS	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	KS	Sym
<i>Lampetra planeri</i>	KS	KS	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym
<i>Lutra lutra</i>	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS
<i>Petromyzon marinus</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	KS	KS
<i>Salmo salar</i>	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	KS	X	Sym	Sym	Sym
Watercourses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	Sym	X	X	KH	KH
SSSI features															
Assemblage of RDB and/or Nationally Scarce and/or Atlantic-Western British bryophytes	X	X	X	X	X	X	X	X	X	X	X	KS	Sym	X	X
<i>Atriplex longipes</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Bryum gemmiparum</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	X	X
<i>Endocarpon adscendens</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	X	X
<i>Lampetra fluviatilis</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	Sym	X
<i>Lampetra planeri</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	Sym	X

SAC Management Unit	7632	7633	7650
NRW Internal Reference	aacc	aadd	aaee
SAC	Yes	Yes	Yes
SSSI	Yes	Yes	Yes
SAC features			
<i>Alosa alosa</i>	KS	X	X
<i>Alosa fallax</i>	KS	X	X
<i>Cottus gobio</i>	X	Sym	Sym
<i>Lampetra fluviatilis</i>	KS	Sym	Sym
<i>Lampetra planeri</i>	X	Sym	Sym
<i>Lutra lutra</i>	KS	KS	KS
<i>Petromyzon marinus</i>	KS	X	X
<i>Salmo salar</i>	Sym	KS	KS
Watercourses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Sym	Sym	Sym
SSSI features			
Assemblage of RDB and/or Nationally Scarce and/or Atlantic-Western British bryophytes	X	X	X
<i>Atriplex longipes</i>	KS	X	X
<i>Bryum gemmiparum</i>	X	X	X
<i>Endocarpon adscendens</i>	X	X	X
<i>Lampetra fluviatilis</i>	X	X	X
<i>Lampetra planeri</i>	X	X	X

SAC management unit	488	7604	7605	7606	7607	7608	7609	7610	7611	7612	7613	7614	7615	7616
NRW Internal reference	11	1822	xxxx	yyyy	zzzz	aaaa	bbbb	cccc	dddd	eeee	ffff	gggg	hhhh	iiii
SAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI features														
<i>Lepidium latifolium</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Orthotrichum sprucei</i>	X	X	X	X	X	X	X	X	X	X	KS	X	X	X
River margin invertebrate assemblage	X	X	X	X	X	KS	X	X	X	X	X	X	X	X
Running water -Group B rivers-	X	X	X	X	X	KH	X	X	X	X	Sym	X	X	X
Running water -Group C rivers-	X	KH	X	X	X	X	X	X	X	KH	KH	X	X	X
Semi-natural woodland	X	Sym	X	X	X	X	X	X	X	Sym	Sym	X	X	X

SAC management unit	7617	7618	7619	7620	7621	7622	7623	7624	7625	7626	7627	7628	7629	7630	7631
NRW Internal reference	jjjj	kkkk	llll	mmmm	nnnn	oooo	pppp	qqqq	rrrr	ssss	tttt	uuuu	vvvv	wwww	aabb
SAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSSI features															
<i>Lepidium latifolium</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	X	X
<i>Orthotrichum sprucei</i>	X	X	X	X	X	X	X	X	X	X	X	KS	KS	KS	KS
River margin invertebrate assemblage	X	X	X	X	X	X	X	X	X	X	X	X	KH	KH	KH
Running water -Group B rivers-	X	X	X	X	X	X	X	X	X	X	X	KH	X	X	X
Running water -Group C rivers-	X	X	X	X	X	X	X	X	X	X	X	X	KH	X	X
Semi-natural woodland	X	X	X	X	X	X	X	X	X	X	X	KS	KS	X	X

SAC management unit	7632	7633	7650
NRW Internal reference	aacc	aadd	aaee
SAC	Yes	Yes	Yes
SSSI	Yes	Yes	Yes
SSSI features			
<i>Lepidium latifolium</i>	KS	X	X
<i>Orthotrichum sprucei</i>	X	X	X
River margin invertebrate assemblage	KS	X	X
Running water -Group B rivers-	X	X	X
Running water -Group C rivers-	X	X	X
Semi-natural woodland	X	X	X

Twaite shad distribution is constrained by the barrier created by Crickhowell Bridge footings. Sea lamprey may also be affected to an extent by Crickhowell Bridge, and also by Brecon weir although this is less well understood. The status of Allis shad and 'Rivers with floating vegetation often dominated by water-crowfoot' is uncertain in the River Usk (Upper Usk) SSSI. Allis shad is assumed to be present in the same units as twaite shad.

Management for Atlantic salmon, twaite shad and sea lamprey is expected to be sympathetic for river/brook lamprey (spawning habitat) and bullhead.

Specific management measures for otter relating to adjacent habitats and disturbance require its selection as a key feature in all units.

Conservation Objectives

Background to conservation objectives

Outline of the legal context and purpose of conservation objectives

Conservation objectives for individual SACs and SPAs are required by the 1992 'Habitats' Directive (92/43/EEC) as implemented through the Conservation of Habitat and Species Regulations 2017 (As amended). The aim of the Habitats Directive is the maintenance, or where appropriate the restoration, of the 'favourable conservation status' (FCS) of habitats and species listed in the Annexes to the Directive (see below). Therefore, FCS provides the overarching framework for defining the conservation objectives for individual SACs.

Although neither the Birds Directive nor the Ramsar Convention refer to FCS, Natural Resources Wales considers that the overall aim of both those legal instruments is sufficiently similar to FCS to make it practical and proportionate to use the same guiding principle when establishing the conservation objectives for SPAs and Ramsar sites, as well as SACs. Therefore, the Habitats Directive definition of FCS is considered to provide the overarching framework for conservation objectives for all SACs, SPAs and Ramsar sites in Wales.

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.”*

The achievement of FCS is not an objective that applies at the level of the individual sites. Rather it is a wider objective to which each individual site contributes. Therefore, the conservation objectives for an individual site are intended to express what is considered to be that site’s appropriate contribution to achieving FCS. Since SACs are the most important mechanism in the Habitats Directive for achieving FCS, and the sites represent the most important areas for conservation of the Annex I habitat types and Annex II species, the objectives for each individual SAC should seek to ensure that the site makes a substantial contribution which properly reflects its importance in a local, national and European context and the particular reasons why the site was selected for inclusion in the UK National Sites Network of SACs. A similar approach is taken to setting conservation objectives for SPAs and Ramsar sites.

Achieving the conservation objectives of individual sites requires appropriate management and the control of factors which are influencing or may influence the features.

Aspects of conservation objectives

The conservation objectives have a number of specific roles:

- **Communication**

The conservation objectives should help convey to stakeholders what are the reasons for the designation and what it is intended to achieve.

- **Site planning and management**

The conservation objectives guide management of sites, to maintain or restore the designated habitats and species. They provide the basis for identifying what management is required both within the site boundary, and outside it, where achieving the objectives requires action to be taken outside the site.

- **River Basin Management Planning (RBMP)**

Conservation Objectives for aquatic and water dependent SAC and SPA features are also used as the “standards and objectives” referred to in Article 4 (1c) of the Water Framework Directive (WFD) (2000/60/EC). In 2009, Welsh Ministers decided

that where SAC and SPA conservation objectives are more stringent than ‘Good Ecological Status’ (GES) as defined in the WFD, they (and the standards they contain) are the objectives referred to in Article 4(1c) of the WFD.

- **Assessing plans and projects**

Article 6(3) of the ‘Habitats’ Directive requires the assessment of proposed plans and projects in view of 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. There are similar requirements for the review of existing decisions and consents. Note that the assessment of plans and projects should be made in view of the entirety of the conservation objectives for the site, including the performance indicators.

- **Monitoring and reporting**

In addition to foregoing purposes, conservation objectives provide the basis for defining the evidence that will be used for assessing the condition of a feature and the status of factors that affect it. That evidence is contained in a sub-set of conservation objectives called ‘performance indicators’. The performance indicators are those conservation objectives which are quantifiable and measurable, and which provide the basis for monitoring and reporting. The performance indicators are set out in an Appendix to this document.

The conservation objectives in this document reflect Natural Resources Wales’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 Natural Resources Wales in the light of new knowledge.

Format of the conservation objectives

Each conservation objective is a composite statement defining a site-specific aspiration for each designated feature. This composite statement contains clauses that correspond to all the elements of FCS, namely:

For habitat features:

- Extent should be stable in the long term, or where appropriate increasing;
- Quality (including in terms of ecological structure and function) should be being maintained, or where appropriate improving;
- Populations of the habitat’s typical species must be being maintained or where appropriate increasing;
- Factors affecting the extent and quality of the habitat and its typical species (and thus affecting the habitat’s future prospects) should be under appropriate control.
-

For species features:

- The size of the population should be stable or increasing, allowing for natural variability, and sustainable in the long term;
- The distribution of the population should be being maintained;
- There should be sufficient habitat, of sufficient quality, to support the population in the long term;
- Factors affecting the population or its habitat should be under appropriate control.

The elements above constitute a generic checklist or guide to the elements that should normally be included in the conservation objectives, in order to ensure that the site makes an effective and appropriate contribution to achieving favourable conservation status for the habitats and species for which it is designated.

There is one conservation objective for each designated feature listed in part 3. In some cases, where there are distinct areas or forms of a designated habitat or separate populations of a designated species within a site, the conservation objective is sub-divided into different sections to enable different aspirations to be expressed for different occurrences of the features within the site.

As well as describing the aspirations for the condition of the feature, each conservation objective contains a statement that the factors which significantly affect the feature are under appropriate control.

Conservation Objective for the watercourse

The ecological status of the watercourse is a major determinant of Favourable Conservation Status for all features. The required conservation objective for the watercourse is defined below.

- The capacity for 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.
- 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.
- 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.

- 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.
- 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.
- 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 riverbanks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.
- River 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.
- 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, e.g., weirs, bridge sills, acoustic barriers.
- 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.
- Flows during the normal migration periods of sea and river lamprey will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered.
- Flow objectives for assessment points in the Usk Catchment Abstraction Management Strategy will be agreed by NRW as necessary. It is anticipated that these limits will concur with the standards used by the Review of Consents process
- Water Quality targets follow those in the revised Common Standards Monitoring Guidance for Rivers (JNCC 2016). These are detailed in [Appendix 2](#) with targets for organic pollution (DO, BOD and ammonia), phosphate, trophic diatom index and acidification.
- Potential sources of pollution not addressed in the review of consents, such as contaminated land, will be considered in assessing plans and projects.

Conservation Objective for Features 1-7 (fishes)

The 7 fishes designated under the EU Habitats Directive in the Usk (and their corresponding EU code) are sea lamprey *Petromyzon marinus* (1095); Brook lamprey *Lampetra planeri* (1096); River lamprey *Lampetra fluviatilis* (1099); Twaite shad *Alosa fallax* (1103); Allis shad *Alosa alosa* (1102); Atlantic salmon *Salmo salar* (1106); and bullhead *Cottus gobio* (1163).

Vision for features 1-7

The vision for these features is for them to be in a favourable conservation status, where all of the following conditions are satisfied:

Favourable Conservation Status component	Supporting information / current knowledge
The Conservation Objective for the watercourse must be met	
The population of the feature in the SAC is stable or increasing over the long term	Refer to Assessment section for current assessments of feature populations. Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Fish stocking can adversely affect population dynamics through competition, predation, and alteration of population genetics and introduction of disease.
<p>The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.</p> <p>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 e.g. suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions e.g. food supply (as described in the Outline description and Assessment sections). 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</p>	<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. Further details of feature habitat suitability are given in the Assessment section. 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 are secured. The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the habitat requirements of the features. The close proximity of different habitats facilitates movement of</p>

Favourable Conservation Status component	Supporting information / current knowledge
<p>influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed in view of Conservation Objectives for the watercourse.</p>	<p>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. Hydrological processes in the Usk are currently affected by a large abstraction at Brecon Weir. However, the abstraction site at Prioress Mill has been rebuilt as part of a large investment scheme by Dŵr Cymru/Welsh Water to reduce impacts to SAC features and there are also many smaller abstractions not considered to cause a problem at present. 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>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>

Conservation Objective for Feature 8: European otter *Lutra lutra* (EU Species Code: 1355)

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:

Favourable Conservation Status component	Supporting information / current knowledge
<p>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.</p>	<p>Refer to Assessment section for current assessment of feature population</p>
<p>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.</p> <p>The whole area of the Usk SAC is considered to form potentially suitable breeding habitat for otters.</p> <p>The size of breeding territories may vary depending on prey abundance.</p> <p>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.</p> <p>Where necessary, potentially harmful levels of disturbance must be managed.</p>	<p>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.</p> <p>The decline in eel populations may be having an adverse effect on the population of otters in the Usk.</p>

Favourable Conservation Status component	Supporting information / current knowledge
<p>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.</p>	<p>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.</p>

Conservation Objective for Feature 9: Watercourses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

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:

Favourable Conservation Status component	Supporting information / current knowledge
<p>The Conservation Objective for the watercourse must be met</p>	
<p>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.</p> <p>Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms e.g. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions e.g. nutrient levels, shade (as described in the Site description section). 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.</p>	<p>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.</p> <p>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.</p>

Favourable Conservation Status component	Supporting information / current knowledge
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 the site (see Table of features in Features section). 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.
More information on the typical species expected to be found with each management unit in the SAC is required.	

Assessment of status and management requirements

This section provides a summary of the assessment of the status of each feature, and a summary of the management issues that need to be addressed to maintain or restore each feature.

Status and Management Requirements of Feature 1: *Petromyzon marinus*

Status of Feature: Unfavourable (2012)

Performance indicators state that sea lamprey ammocoetes should be present in at least four sampling sites each not less than 5 km apart. Monitoring results in 2012 failed on this criterion with low confidence (Garrett, 2013). The recorded overall catchment mean density of ammocoetes was 0.2 per m² which exceeds the threshold of 0.1 per m², so the feature passes on this criterion. Modified sampling methods are being trialled for sea lampreys as the standard methods for lampreys are likely to underestimate sea lamprey ammocoete abundance.

Factors which failed in the relevant site units in 2012 were suspended solids, soluble reactive phosphorus and flow. Spawning activity and river morphology were not assessed, however the presence of probable partial barriers to migration (notably Crickhowell Bridge) is relevant to sea lamprey.

Climate change is not seen as a particular risk factor for this feature, though associated changes in flow regime could affect migration patterns and the survival of eggs and young.

There could also be indirect effects through changes to populations of other fish in the estuary which the adult lampreys parasitize.

Management Requirements

Flow depletion in the Usk below established standards has resulted from a small number of major abstractions including Brecon canal and Prioress Mill public water supply. The latter in particular has been shown to have effects both on a seasonal timescale by reducing spate flows during the migration period and on a diurnal timescale by substantially depleting flows during the nighttime to the extent that sea lamprey nests and nursery habitats are likely to have been exposed above the water level. These impacts are expected to be substantially mitigated or removed by abstraction regime changes resulting from the Review of Consents. Licence changes are due to take effect in 2015 with a further period allowed to achieve compliance. Changes have also been made to the screening of abstraction in-takes to minimise impacts on fish.

The effect of the Brecon canal abstraction has been shown to comprise a substantial depletion of flows, at least locally, during low flow periods with a resulting reduction in river depth and wetted perimeter downstream of the off-take weir. Investigations into the extent and impacts of this effect and options for mitigation are ongoing by the Canals and Rivers Trust at the time of writing. This abstraction will be brought within the licensing regime in due course.

Llanfoist and Crickhowell bridges are considered to be the most significant artificial barriers to fish migration in the Usk. Management to reduce or remove the effect of these barriers is therefore a high priority.

The impact of acoustic (i.e., noise/vibration) and sediment/chemical barriers arising from plans or projects should be assessed through the Habitats Regulations Assessment process. Where adverse effects may arise from construction or other development related activities it may be necessary to restrict the timing of such activities.

Status and Management Requirements of Features 2 & 3: Brook lamprey *Lampetra planeri* and River lamprey *Lampetra fluviatilis*

Status of Feature: Unfavourable (2012)

In 2012 the density of brook/river lamprey ammocoetes marginally failed the criterion for density in optimal habitat (9 per m² compared to threshold of 10 per m²) with low confidence. The overall catchment density at 6 per m² exceeded the threshold of 5 per m².

Factors which failed in the relevant site units in 2012 were biological General Quality Assessment for Biology, soluble reactive phosphorus, suspended solids and flow.

It is not possible to distinguish between brook and river lamprey ammocoetes. More information on the relative abundance of these two species in different parts of the Usk SAC is desirable. Records of spawning adult lampreys would be particularly useful.

Climate change is not seen as a particular risk factor for this feature, though associated changes in flow regime could affect migration patterns and the survival of eggs and young. There could also be indirect effects through changes to populations of other fish in the estuary which the adult lampreys parasitize.

Management Requirements

In the previous reporting cycle (2001-2006) the condition of brook/river lamprey in the Usk SAC was reported as Favourable with densities recorded exceeding the thresholds by 3 or 4 times. The marginal failure to achieve favourable condition in the current cycle is unlikely to be due to a substantial reduction in abundance; instead, it is more likely to be the result of sampling error due to sampling in different conditions using different methodologies, in particular prevailing higher flows in 2012 may have dispersed the suitable habitat and lamprey ammocoetes more widely through the river, though it may also be possible that poorer recruitment may have resulted. Monitoring of a smaller sample on an annual basis has been instigated to attempt to gain a better understanding of interannual variations in abundance.

There are no particular management actions identified for this feature except the achievement of the [Conservation Objectives for the watercourse](#).

Status and Management Requirements of Features 4 & 5: Twaite shad *Alosa fallax* and Allis shad *Alosa alosa*

Management for Allis shad and management for Twaite shad are effectively the same.

Status of Feature: Unfavourable (2012)

In the 2nd monitoring cycle (2007-2012) twaite shad failed to meet the target for spawning distribution. Spawning distribution is assessed by kick sampling for eggs in suitable habitat. The absence of eggs from some samples upstream of Llanfoist in surveys between 2010 and 2013 is considered likely to be due to the partial barrier formed by Llanfoist bridge. Eggs have never been found upstream of Crickhowell bridge which is considered a complete barrier to shad. Adult run size and juvenile density were not assessed due to practical difficulties with these methods which are under review at the time of writing.

Factors which failed in the relevant site units in 2012 were flow and suspended solids.

Climate change is not seen as a particular risk factor for this feature, though associated changes in flow regime could affect migration patterns and the survival of eggs and young. Migration could occur earlier as a result of warmer spring temperatures.

Management Requirements

Artificial physical barriers are probably the single most important factor in the decline of shad in Europe. Impassable obstacles between suitable spawning areas and the sea can eliminate breeding populations of shad. Both species (but particularly Allis shad) can make migrations of hundreds of kilometres from the estuary to spawning grounds in the absence

of artificial barriers. Existing fish passes designed for salmon are often not effective for shad. Any new provisions need to take their requirements into account.

Llanfoist and Crickhowell bridges are considered to be the most significant artificial barriers to fish migration in the Usk. Management to reduce or remove the effect of these barriers is therefore a priority. Trostrey Weir may also be a significant partial barrier, however as there is substantial evidence from egg surveys to show that shad can pass Trostrey in large numbers it is a lower priority for modification and will be subject to ongoing monitoring.

Flow depletion in the Usk below established standards has resulted from a small number of major abstractions including Brecon canal and Prioress Mill public water supply. The latter in particular has been shown to have effects both on a seasonal timescale by reducing spate flows during the migration period and on a diurnal timescale by substantially depleting flows during the night-time when shad prefer to migrate and spawn. These impacts are expected to be substantially mitigated or removed by abstraction regime changes resulting from the Review of Consents. Licence changes are due to take effect in 2015 with a further period allowed to achieve compliance. Changes have also been made to the screening of abstraction in-takes to minimise impacts on fish.

Development pressure in the lower catchment around Newport has the potential to cause temporary physical, acoustic, chemical and sediment barrier effects that need to be addressed in the assessment of specific plans and projects. Noise/vibration e.g., due to impact piling or drilling within or in close proximity to the river can create a barrier to shad migration. Land on both sides of the river in Newport is potentially highly contaminated. Contamination of the river can arise when this is disturbed e.g., as a result of development. Contamination can also arise from pollution events (which could be shipping or industry related). Barriers resulting from vibration, chemicals, low dissolved oxygen and artificially high sediment levels must be prevented at key times (generally March to June). The possible barrier effects that might be caused by the installation of an acoustic salmonid fish counter should also be evaluated.

Anglers occasionally fish for shad, and they are sometimes taken in quite large numbers. Further research is necessary to define sustainable levels of angling. If this shows there is cause for concern, a temporary cessation of fishing activity in the vicinity of known spawning grounds during the spawning period should be considered, particularly where shad are known to be taken regularly. Exploitation of twaite shad is currently unregulated; whereas allis shad is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) making it an offence to fish for this species.

Commercial fishermen also take shad as a by-catch, with whitebait and shrimp fishing being of particular concern. Changes in fishing methods need to be promoted to minimize captures, whilst both anglers and trawler men should be encouraged to return alive any individuals caught.

Status and management requirements of Feature 6: Atlantic salmon *Salmo salar*

Status of Feature: Unfavourable (2012)

The adult run size target was assessed as failed in the second reporting cycle (2007-2012) based on the Environment Agency's assessment that the river is 'probably at risk' of failing its stock assessment.

Total run size - the long-term trend in total rod catch on the Usk is one of decline from the peak in 1960s to 1980s followed by some recovery. Mean catch over the second monitoring cycle (data only available for 2007-2010) was higher than that during the first monitoring cycle (2001-2006) at 843 and 740 fish respectively.

Catch per unit effort - no overall trend can be discerned. Catch per unit effort (CPUE, as catch per thousand days fishing) has similarly remained variable, but without an overall trend.

Egg Deposition and Conservation Limit Compliance - the Egg Deposition Limit is 10.11M eggs. Egg deposition has remained above this limit for most of the period since 1997. For the current assessment period the mean deposition of 13.6M eggs represents 135% of the CL. However, egg deposition in 2010 (10M) represents 99%. This represents a slight decrease since the previous assessment period where mean deposition represented 165% of the CL. The stock is currently classified as Probably at Risk.

The juvenile population density target was assessed as passed in the second reporting cycle (2007-12). HABSCORE data available for 48 sites within the SAC from 2007 (47 sites) and 2011 (1 site) provided good spatial coverage of most site management units. Populations were considered to pass the target as the status of salmon at all sites could not be distinguished from reference conditions. At two sites the observed density was also statistically above the predicted density (i.e., the lower confidence limit is above 1).

National Fisheries Classification Scheme data were available for 69 sites within the Usk SAC covering the period 2007 to 2011. Overall grades ranged from A to F with the greatest densities recorded in the upper reaches of the SAC (ref). Comparison of the most recent data with that presented in Henderson et al. (2007) for the previous assessment period indicates an improvement in the densities recorded in the upper catchment with fewer sites recording F grades. Densities in the lower catchment remained comparably low.

Factors which failed in the relevant site units in 2012 were suspended solids, biological General Quality Assessment, soluble reactive phosphorus, physical habitat and flow.

Climate change may be a significant risk factor for salmon populations resulting from warming of river and sea temperatures affecting dissolved oxygen levels and hence juvenile and adult survival and prey availability at sea.

Management requirements

Diffuse pollution and siltation in spawning habitat are considered a significant factor in the decline of salmon populations. In the Usk catchment, 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. The most intensively used areas such as heavily trampled gateways and tracks can be especially significant as sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing of land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter. Advice to farmers under the banner of Catchment Sensitive Farming is helping to achieve positive change; other measures under consideration include the introduction of General Binding Rules as a regulatory mechanism to encourage more widespread implementation of pollution prevention and control measures.

Llanfoist and Crickhowell bridges are considered to be the most significant artificial barriers to fish migration in the Usk. Management to reduce or remove the effect of these barriers is therefore a priority.

Flow depletion in the Usk below established standards has resulted from a small number of major abstractions including Brecon canal and Prioress Mill public water supply. The latter in particular has been shown to have effects both on a seasonal timescale by reducing spate flows during the migration periods and on a diurnal timescale by substantially depleting flows during the night-time. These impacts are expected to be substantially mitigated or removed by abstraction regime changes resulting from the Review of Consents. Licence changes are due to take effect in 2015 with a further period allowed to achieve compliance. To promote salmon migration there may also be an element of releases from the reservoirs timed to compensate for their effects on natural spate flows. Changes have also been made to the screening of abstraction in-takes to minimise impacts on fish and meet statutory requirements under the Salmon & Freshwater Fisheries Act 1975.

There is currently no stocking of salmon into the Usk. The objective for SAC salmon populations is to attain naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. Therefore, there is a presumption against salmon stocking in the Usk SAC.

Stocking of brown trout occasionally takes place into the Usk under a S30 consent from NRW. The presence of artificially high densities of other fish can create unacceptably high levels of predatory and competitive pressure on juvenile salmon and other fish and the aim should be to minimise these risks in considering any proposals for stocking. Stocking of all species should be phased out in the SAC.

Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries. Net Limitation Orders are used to control the estuarine fishery.

Exploitation of salmon by rod fisheries is regulated by NRW licensing and byelaws controlling the fishing season and allowable methods.

Status and management requirements of Feature 7: Bullhead *Cottus gobio*

Status of Feature: Unfavourable (2012)

In a survey in 2007, bullhead were absent from two of the 15 sites sampled, resulting in a failure of the distribution criterion. The other sites passed the density threshold of 0.2 individuals per m². Available data suggest that bullhead are absent from the headwaters of a number of tributaries.

Factors which failed in the relevant site units in 2012 were suspended solids, biological General Quality Assessment, soluble reactive phosphorus and flow.

Management requirements

In general, management for other SAC features is expected to result in favourable habitat for bullhead, through improvements in water quality and flow regime and maintenance of suitable physical habitat, including the retention of woody debris.

American signal crayfish are likely to be present in the SAC at Abergavenny and probably elsewhere. Bullhead densities have been found to be negatively correlated with densities of non-native crayfish, suggesting competitive and/or predator-prey interactions. It is illegal to release non-native crayfish into any water body or to possess live crayfish in certain circumstances. Non-native crayfish should ideally be absent from the SAC; however, this is an unrealistic aim at present and will perhaps never be achievable. The implications for attainment of favourable conservation status need to be considered.

The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult bullhead. Stocking of all species should be phased out in the SAC.

Bullheads are relatively sedentary and interactions between populations in different parts of the catchment and in different catchments are likely to be limited, suggesting the existence of genetically discrete populations. Since they are of no angling interest, deliberate transfers between sites are unlikely to have been undertaken in the past, such that the genetic integrity of populations is likely to be intact. There should be no stocking/transfers of bullhead unless agreed to be in the best interests of the population.

Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult bullheads. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes and will also lead to constraints on genetic interactions that may have adverse consequences. New in-stream structures e.g., ford crossings will be avoided, whilst the impact of existing artificial structures needs to be evaluated.

Status and management requirements of Feature 8: European otter *Lutra lutra*

Status of Feature: Favourable

The conservation status of otters in the Usk SAC is determined by monitoring their distribution, breeding success, and the condition of potential breeding and feeding habitat outlined in the Performance Indicators. Their current condition can be considered favourable, but with scope for further improvement, if habitat and other natural factors can be maintained and enhanced.

Management requirements

The catchment should be capable of supporting at least 18 breeding females, based on one breeding female per 20km stretch of river. It is possible that if all the breeding sites achieve optimal habitat conditions and fish and amphibian stocks are secured that the catchment may then support further breeding animals. However, the amount of compression of home ranges that otters will accept cannot as yet be determined.

Management should aim to ensure that there is sufficient undisturbed breeding habitat to support an otter population of a size determined by natural prey availability and associated territorial behaviour. The involvement of river users and land managers will be important in improving potential breeding habitat near to the river. Agri-environment schemes and the Better Woodlands for Wales scheme provide possible mechanisms for maintaining suitable sites, such as lightly grazed woodlands, areas of dense scrub, and tussocky fens with purple moor-grass.

Food availability is an important factor. Fish biomass should stay within expected natural fluctuations. A potential problem appears to be the decline in eel populations, and similar concerns are apparent with respect to amphibian numbers.

Measures to ensure the safe movement of otters around the catchment will be promoted, in particular the provision of ledges, tunnels and fencing on new road bridge schemes. Where bridges are being repaired or replaced, or at especially bad locations for otter road deaths, such features may be retrofitted.

Certain areas of the SAC are critical to the movement of otters both within the system and to adjacent sites. 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 (Seven 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.

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. There should be no increase in pollutants potentially toxic to otters.

Status and Management Requirements of Feature 9: Watercourses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

Status of Feature: Unfavourable (2012)

This feature is not identified as one of the primary reasons for designation of the River Usk SAC; its distribution being apparently limited by the availability of suitable hydromorphological conditions. Important stands have been identified in the lower reaches of the main river below Abergavenny down to the tidal limit, and in the upper reaches of a headwater stream, the Afon Senni. These reaches may represent a sub-type of the feature where large submerged and floating leaved flowering plants, in particular *Ranunculus*, are dominant. Habitat suitability studies suggest that the natural range of the feature may be more widespread within the SAC. More widespread sub-types may consist of communities dominated by aquatic bryophytes. Where necessary, examples of these sub-types may be identified as priorities for management, for example through the management of riparian vegetation to preserve shade and humidity. Further understanding of the distribution and status of this feature and its natural range within the River Usk SAC is required.

The present unfavourable status of the feature results from the over-abundance of invasive non-native species of bankside plant communities, which are included within the feature definition. These are predominantly giant hogweed and Himalayan balsam in the lower reaches of the main river.

Management requirements

Factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, producing unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient status, epiphytic algae may suppress the growth of aquatic flowering plants. Favourable management for this feature is therefore largely dependent on ensuring that sufficient depth, velocity and duration of flow and sufficiently low phosphate levels are maintained within the natural range of the vegetation.

A favourable flow regime can be defined with reference to naturalised flows (removing the influence of artificial abstractions and discharges from flow records). While more sophisticated analysis of depth and velocity has been carried out locally for the Review of Consents process, a flow level criterion is generally applied to regulate abstractions. Based on current available information, the recent level of flow depletion downstream of major abstractions in the River Usk SAC is not considered to be damaging to this feature, either through limiting its range or adversely affecting its community composition.

The conservation objectives require that the area covered by the feature is stable or increasing within its natural range, which is likely to require catchment-wide measures to control diffuse pollution from agriculture, as the principal source of phosphate. Measures should be targeted initially at those reaches identified as holding important stands of this vegetation, in particular the Afon Senni.

Invasive non-native plants are a detrimental impact on this feature. Giant hogweed, Himalayan balsam and Japanese knotweed should be actively managed to control their spread and hopefully reduce their extent in the SAC.

Action plan

This section takes the management requirements outlined in the previous section a stage further, assessing the specific management interventions required on each management unit.

Actions in Natural Resources Wales's actions database

Unique Unit No	Site unit ref	Unit Name	Summary of Conservation Management Issues	Action needed
467	1	Tidal reach	Development pressures in Newport leading to increased disturbance and pollution risk.	Yes
468	2	Prioress Mill to tidal limit	Dŵr Cymru Prioress Mill abstraction causing flow depletion and fish entrainment. Invasive weeds affect riverbank areas.	Yes
469	3	Llanfoist Bridge to Prioress Mill	Trostrey Weir forms a partial barrier to migration of shad. Invasive weeds affect river bank areas.	Yes
470	4	Crickhowell Bridge to Llanfoist Bridge	Trostrey Weir and Llanfoist Bridge form a partial barrier to migration of shad. Tipped waste affects a significant length of riverbank at Llanfoist. Invasive weeds affect riverbank areas.	Yes
471	5	Brecon Weir to Crickhowell Bridge	Crickhowell Bridge forms a near-total barrier to migration of shad. Canal abstraction at Brecon Weir causes localised significant flow depletion at low flows. Himalayan balsam is invasive over large areas of riverbank.	Yes
472	6	Usk Reservoir to Brecon Weir & Afon Hydfer	Brecon Weir forms a partial barrier to fish migration. The main River Usk is partially regulated by Usk Reservoir. Forestry affects the upper part of Afon Hydfer. Agriculture and forestry affect run-off regime and water quality.	Yes

Unique Unit No	Site unit ref	Unit Name	Summary of Conservation Management Issues	Action needed
473	7	Usk Tributaries, Brecon downstream	Partial barriers to fish migration at several locations. Caerfanell is regulated by Talybont Reservoir. Grwyne Fawr is regulated by Grwyne Fawr Reservoir. Agricultural land management affects run-off regime and water quality.	Yes
474	8	Camlais, Bran & Ysgir	Agricultural land management affects run-off regime and water quality.	Yes
475	9	Crai & Cilieni	Crai is regulated by Cray Reservoir. Agricultural land management affects run-off regime and water quality.	Yes
476	10	Afon Senni	Agricultural land management affects run-off regime and water quality.	Yes
488	11	Upper Nant Menascin	No known significant issues.	No

Glossary

This glossary defines some of the terms used in this Core Management Plan. Some of the definitions are based on definitions contained in other documents, including legislation and other publications of Natural Resources Wales and the UK nature conservation agencies.

Action: A recognisable and individually described act, undertaking or project of any kind, specified as being required for protecting, managing or enhancing one or more of the features for which a site is designated.

Attribute: A quantifiable and monitorable characteristic of a feature that, in combination with other such attributes, describes its condition.

Common standards: See JNCC common standards.

Condition: A description of the state of a feature in terms of qualities or attributes that are relevant in a nature conservation context. For example, the condition of a habitat usually includes its extent and species composition and might also include aspects of its ecological functioning, spatial distribution and so on. The condition of a species population usually includes its total size and might also include its age structure, productivity, relationship to other populations and spatial distribution. Aspects of the habitat(s) on which a species population depends may also be considered as attributes of its condition. Condition is considered favourable when all the conservation objectives are being met.

Conservation management: Acts or undertaking of all kinds, including but not necessarily limited to actions, taken with the aim of achieving the conservation objectives of a site. Conservation management includes the taking of statutory and non-statutory measures, it can include the acts of any party and it may take place outside site boundaries as well as within sites. Conservation management may also be embedded within other frameworks for land/sea management carried out for purposes other than achieving the conservation objectives.

Conservation objective: The expression of the desired state of a feature, expressed as a composite statement defining the condition that we wish the feature to be in. Each feature has one conservation objective.

Core Management Plan: A Natural Resources Wales document containing the conservation objectives for a site and a summary of other information contained in a full site Management Plan.

Factor: Anything that has influenced, is influencing or may influence the condition of a feature. Factors can be natural processes, human activities or effects arising from natural process or human activities. They can be positive or negative in terms of their influence on features, and they can arise within a site or from outside the site. Physical, socio-economic or legal constraints on management of the site can also be considered as factors.

Favourable condition: See condition.

Favourable conservation status: The Habitats Directive definition of Favourable Conservation Status (FCS) is given in full in the [Conservation Objectives](#) section.

Feature: The species population, habitat type or other entity for which a site is designated. The ecological or geological interest which justifies the designation of a site and which is the focus of conservation management.

Integrity: See Site integrity.

JNCC common standards: A set of principles developed jointly by the UK nature conservation agencies to help ensure a consistent approach to monitoring and reporting on the features of sites designated for nature conservation, supported by guidance on identification of attributes and monitoring methodologies.

Key Feature: The habitat or species population within a management unit that is the primary focus of management and monitoring in that unit.

Management Plan: The full expression of a designated site's legal status, vision, features, conservation objectives, performance indicators and management requirements. A complete management plan may not reside in a single document but may be contained in a number of documents (including in particular the Core Management Plan) and sets of electronically stored information.

Management Unit: An area within a site, defined according to one or more of a range of criteria, such as topography, location of features, tenure, patterns of land/sea use. The key characteristic of management units is to reflect the spatial scale at which site management and monitoring can be most effectively organised. They are used as the primary basis for differentiating priorities for conservation management and monitoring in different parts of a site, and for facilitating communication with those responsible for management of different parts of a site.

Monitoring: An intermittent (regular or irregular) series of observations in time, carried out to show the extent of compliance with a formulated standard or degree of deviation from an expected norm. In monitoring of sites designated for habitat and species conservation, the formulated standard is the quantified expression of favourable condition based on attributes.

Operational limits: The levels or values within which a factor is considered to be acceptable in terms of its influence on a feature. A factor may have both upper and lower operational limits, or only an upper limit or lower limit. For some factors an upper limit may be zero.

Performance indicators: A subset of the conservation objectives that are quantifiable and measurable. They consist of **attributes** and factors together with their associated target values (or ranges of values) which provide the standard against which information from **monitoring** and other sources is used to determine the degree to which the **conservation objectives** for a **feature** are being met.

Plan or project

- **Project:** Any form of construction work, installation, development or other intervention in the environment, the carrying out or continuance of which is subject to a decision by any public body or statutory undertaker.

- **Plan:** a document prepared or adopted by a public body or statutory undertaker, intended to influence decisions on the carrying out of projects. Decisions on plans and projects which affect SAC, SPA and Ramsar sites are subject to specific legal and policy procedures.

Site integrity: This is defined in Welsh Government policy as the coherence of a site's ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it is designated.

Site Management Statement (SMS): The document containing Natural Resources Wales's views about the management of a site issued as part of the legal notification of an SSSI under section 28(4) of the Wildlife and Countryside Act 1981, as substituted.

Special Feature: See feature.

Specified limits: The levels or values for an attribute which define the degree to which the attribute can fluctuate without creating cause for concern about the condition of the feature. The range within the limits corresponds to favourable, the range outside the limits corresponds to unfavourable. Attributes may have lower specified limits, upper specified limits, or both.

Unit: See management unit.

Vision Statement: The statement conveying an impression of the whole site in the state that is intended to be the product of its conservation management. A 'pen portrait' outlining the conditions that should prevail when all the conservation objectives are met. A description of the site as it would be when all the features are in favourable condition.

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Appendix 1: Performance indicators

These performance indicators are a sub-set of the conservation objectives and describe the evidence, including in particular evidence to be obtained from monitoring of sites and features, that will be used to inform judgements about whether or not the conservation objectives ([Conservation Objectives](#)) are being met.

The assessment of plans and projects should be made in view of the entirety of the conservation objectives, including the performance indicators.

Feature 1 Sea lamprey *Petromyzon marinus*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
a) Distribution within catchment	Suitable habitat adjacent to or downstream of known spawning sites should contain <i>Petromyzon</i> ammocoetes.	This attribute provides evidence of successful spawning and distribution trends. Spawning locations may move within and between sites due to natural processes or new sites may be discovered over time. Silt beds in relevant units will be sampled for presence or absence of ammocoetes. Where apparently suitable habitat at any site is unoccupied feature condition will be considered unfavourable.
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 relevant units will be assessed against this attribute.
	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 0.1 m^{-2} is a conservative threshold value for unfavourable condition.

Features 2 & 3 Brook lamprey *Lampetra planeri* and river lamprey *Lampetra fluviatilis*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
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.
b) Distribution of ammocoetes within catchment	Present at not less than 2/3 of sites surveyed within natural range	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.
	No reduction in distribution of ammocoetes	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.
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 Usk, shallower sediment, often patchy and interspersed among coarser substrate.

Features 4 & 5 Twaite shad *Alosa fallax* and Allis shad *Alosa alosa*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
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 relevant units 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:

Attribute	Specified limits	Comments
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. 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.

Feature 6 Atlantic salmon *Salmo salar*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
a) Adult run size	Conservation Limit complied with at least four years in five	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.
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.

Performance indicators for factors affecting the feature:

Attribute	Specified limits	Comments	Category
a) Water quality	See Appendix 2	Standards follow either CSM Guidance for Rivers (JNCC, 2016) or WFD thresholds for high/good.	Water quality
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	Hydromorphology

Feature 7 Bullhead *Cottus gobio*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
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.
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.
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.

Feature 8 European otter *Lutra lutra*

Performance indicators for feature condition:

Attribute	Specified limits	Comments
a) Distribution	Otter signs present at 90% of Otter Survey of Wales sites	Ref: CCW Environmental Monitoring Report No 19 (2005)
b) Breeding activity	2 reports of cub/family sightings at least 1 year in 6	Ref: CCW Environmental Monitoring Report No 19 (2005)
c) Actual and potential breeding sites	No decline in number and quality of mapped breeding sites in sub-catchments	Ref: CCW Environmental Monitoring Report No 19 (2005) In the Usk catchment, 77 actual or potential breeding sites have been identified, distributed throughout the catchment on the main river and tributaries.

Feature 9 Watercourses of plain to montane levels with the *Ranuncion fluitantis* and *Callitricho-Batrachion* vegetation

Performance indicators for feature condition:

Attribute	Specified limits	Comments
a) Distribution within catchment	Distribution within relevant site units (see Features and units)	<i>Ranunculus</i> spp. will be present with an MTR species cover score of at least 5 in: Any three representative sample 100m stretches of suitable habitat between Usk Town bridge and the bridge at Newbridge-on-Usk: AND In one representative sample 100m stretch of suitable habitat along the Senni
b) Typical species	Species list for reference Vegetation type	Should conform to appropriate JNCC type or other list for site unit as appropriate.

Performance indicators for factors affecting the feature:

Attribute	Specified limits	Comments
a) Native species	Cover of indicators of eutrophication maintained below threshold over the medium to long term	CSM guidance states: Care should be taken with the setting of these targets as thresholds may vary considerably by site and conservation goals. For the Usk SAC: Algae indicative of eutrophication (<i>Enteromorpha</i> spp., <i>Cladophora</i> spp. And <i>Vaucheria</i> spp.) should not have an MTR cover value of greater than 5 (ie.10%) in 3 consecutive years in: Any three representative sample 100m stretches of suitable habitat between Usk Town bridge and the bridge at Newbridge-on-Usk: AND In one representative sample 100m stretch of suitable habitat along the Senni
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.

Appendix 2: Water Quality Targets

(as revised in Common Standards Monitoring guidance for Rivers, JNCC 2016)

River SACs designated under the Habitats Regulations 2017 (UK Gov, 2017) overlap river water bodies designated under Water Framework Directive Regulations (NRW, 2015; UK Gov, 2015). The water quality standards that apply come from the source legislation – i.e., for the water body the WFD Regulations standards and for a SAC the Habitats Regulations standards. Note that the words ‘targets’ and ‘standards’ are used under the various documents that sit under these two Regulations. We have interpreted these to mean the same thing and for this document we will use the term standard unless directly quoting from a specific document. Water quality standards for Special Area of Conservation (SAC) rivers are set via agreement at a UK level and presented in the JNCC Common Standards Monitoring (CSM) guidance (JNCC 2015, 2016).

However, having two sets of standards for the same area of river can lead to confusion both internally and externally as to which apply in a given situation. This Appendix sets out the standards for water quality attributes for water bodies in the River Usk SAC. Where they are more stringent, WFD Regulation 2017 standards are adopted as the CSM standards.

Organic pollution

The following table (Table 1a) provides the values for the physio-chemical attributes to be applied across all river types. Standards apply throughout the Water Body, not just at sparsely distributed monitoring sites.

The standards for DO, BOD and un-ionised ammonia are the same for all river water bodies whereas the standard for total ammonia varies according to river type and previous WFD Regulations classification for ammonia (Table 1a). For the 90%ile total ammonia the CSM standard is 0.25mg/l. However, if High Status under WFD is being reached for a water body for certain river types then the more stringent WFD standard at 0.2mg/l is applied. This is due to the no deterioration principle. Total ammonia standards for each water body are given in Table 1b.

Table 1a. Organic pollution standards for SAC rivers.

Organic pollution attribute	Unit	Test Statistic	Standard
Dissolved Oxygen (DO)	% saturation	10%ile	≥85
Biochemical Oxygen Demand (BOD)	mg l ⁻¹	Mean calculated over a 3-year period	≤1.5
Total Ammonia	mg l ⁻¹	90%ile	Varies by water body. See Table 1b.
95%ile un-ionised ammonia	mg l ⁻¹	95%ile	≤0.025

Table 1b. Organic pollution standards for water bodies in the River Usk SAC.

* Reason for total ammonia standard: some water bodies that meet WFD high status for ammonia have the WFD high standard of 0.2 mg l⁻¹, all other water bodies have the CSM standard of 0.25 mg l⁻¹.

Water Body ID	Water Body Name	Total Ammonia (90%ile, mg l ⁻¹)	Reason for total ammonia standard*
GB109056033080	Afon Crai - source to conf R Usk	0.2	WFD (high)
GB109056033020	Afon Cynrig - source to conf R Usk	0.2	WFD (high)
GB109056033030	Afon Hydfer - source to conf R Usk	0.2	WFD (high)
GB109056033070	Afon Tarell - source to conf R Usk	0.2	WFD (high)
GB109056040020	Afon Yscir - conf Yscir Fechan to conf R Usk	0.2	WFD (high)
GB109056040070	Afon Yscir - source to conf Yscir Fechan	0.2	WFD (high)
GB109056033000	Caerfanell - source to conf R Usk	0.2	WFD (high)
GB109056040030	Cilieni - source to conf R Usk	0.2	WFD (high)
GB109056033040	Cwm Treweryn - source to River Senni	0.2	WFD (high)
GB109056032980	Grwyne Fawr - conf Grwyne-Fechan to conf R Usk	0.25	CSM
GB109056040000	Grwyne Fawr - source to conf Grwyne-Fechan	0.25	CSM
GB109056039960	Grwyne-Fechan - source to conf Grwyne Fawr	0.25	CSM
GB109056040060	Honddu - source to conf R Usk	0.2	WFD (high)
GB109056040040	Nant Bran - source to conf R Usk	0.2	WFD (high)
GB109056033010	Nant Menasgin - source to conf R Usk	0.2	WFD (high)
GB109056039990	Rhiangoll - source to conf R Usk	0.25	CSM
GB109056033050	Senni - source to conf River Usk	0.2	WFD (high)
GB109056039980	Usk - conf Afon Hydfer to conf Afon Senni	0.2	WFD (high)
GB109056040081	Usk - conf Afon Senni to conf Afon Crawnon	0.2	WFD (high)
GB109056026890	Usk - conf Olway Bk to New Br	0.25	CSM

GB109056040083	Usk - conf R Gavenny to conf Olway Bk	0.25	CSM
GB109056039970	Usk - source to conf Afon Hydfer	0.2	WFD (high)
GB109056040082	Usk conf Afon Crawnnon to conf Gavenny R	0.25	CSM
GB109056040050	Yscir Fechan - source to conf Afon Yscir	0.2	WFD (high)

Reactive phosphorus

Phosphorous standards are set according to altitude, alkalinity, and river size, with the tightest targets in low alkalinity, high altitude headwater areas, reflecting natural variation (JNCC 2016). River Habitat Survey (EA, 2003) river flow categories are used to determine river size.

The process also includes an alignment procedure to ensure that standards are never less stringent than the Water Framework Directive (WFD) phosphorus standard for the same water body. If the WFD standard is more stringent than the CSM standard, then the WFD standard applies.

Individual phosphorus standards for all waterbodies in the River Wye SAC are given in Table 2. As explained previously, the WFD phosphate standard for good ecological status has been applied where it is more stringent than CSM standards.

Table 2. Phosphorus standards and typology for all waterbodies in the River Usk SAC. * Phosphorus standard to be applied to annual and growing season means. Standards calculated from annual mean expressed in $\mu\text{g L}^{-1}$ SRP. ** Reason for phosphorus standard: CSM (near natural/max allowable) are derived from the CSM guidance for Rivers and WFD (good/high) from the relevant Water Framework Directive standard.

Water Body ID	Water Body Name	SAC Management Unit(s)	Phosphorus standard* ($\mu\text{g L}^{-1}$)	Reason for phosphorus standard**	CSM_ Alt type	CSM_ Alk type	River size
GB109056033080	Afon Crai - source to conf R Usk	7605 7617	10	CSM (max allowable)	high Alt >80m	low Alk <50mg/l	headwater
GB109056033020	Afon Cynrig - source to conf R Usk	7623	15	CSM (max allowable)	high Alt >80m	high Alk >50mg/l	headwater

Water Body ID	Water Body Name	SAC Management Unit(s)	Phosphorus standard* ($\mu\text{g l}^{-1}$)	Reason for phosphorus standard**	CSM_Alt type	CSM_Alk type	River size
GB109056 033030	Afon Hydfer - source to conf R Usk	7604 7613	10	CSM (near natural)	high Alt >80m	low Alk <50mg/l	river
GB109056 033070	Afon Tarell - source to conf R Usk	7620	20	WFD (high)	high Alt >80m	high Alk >50mg/l	river
GB109056 040020	Afon Yscir - conf Yscir Fechan to conf R Usk	7611	18	WFD (high)	high Alt >80m	high Alk >50mg/l	river
GB109056 040070	Afon Yscir - source to conf Yscir Fechan	7609	18	WFD (high)	high Alt >80m	high Alk >50mg/l	river
GB109056 033000	Caerfanell - source to conf R Usk	7624	10	CSM (near natural)	high Alt >80m	low Alk <50mg/l	river
GB109056 040030	Cilieni - source to conf R Usk	7606 7618	15	WFD (high)	high Alt >80m	high Alk >50mg/l	river
GB109056 033040	Cwm Treweryn - source to River Senni	7616	25	CSM (max allowable)	high Alt >80m	high Alk >50mg/l	river
GB109056 032980	Grwyne Fawr - conf Grwyne-Fechan to conf R Usk	7626	28	WFD (high)	low Alt <80m	high Alk >50mg/l	river
GB109056 040000	Grwyne Fawr - source to conf Grwyne-Fechan	7627	7	CSM (near natural)	high Alt >80m	high Alk >50mg/l	headwater
GB109056 039960	Grwyne-Fechan - source to conf Grwyne Fawr	7650 7607	15	CSM (near natural)	high Alt >80m	high Alk >50mg/l	river
GB109056 040060	Honddu - source to conf R Usk	7621	25	CSM (max allowable)	high Alt >80m	high Alk >50mg/l	river
GB109056 040040	Nant Bran - source to conf R Usk	7619	15	CSM (near natural)	high Alt >80m	high Alk >50mg/l	river
GB109056 033010	Nant Menasgin - source to conf R Usk	7622 488	15	CSM (near natural)	high Alt >80m	high Alk >50mg/l	river

Water Body ID	Water Body Name	SAC Management Unit(s)	Phosphorus standard* ($\mu\text{g l}^{-1}$)	Reason for phosphorus standard**	CSM_Alt type	CSM_Alk type	River size
GB109056 039990	Rhiangoll - source to conf R Usk	7625	30	CSM (near natural)	low Alt <80m	high Alk >50mg/l	river
GB109056 033050	Senni - source to conf River Usk	7615	25	CSM (max allowable)	high Alt >80m	high Alk >50mg/l	river
GB109056 039980	Usk - conf Afon Hydfer to conf Afon Senni	7614	10	CSM (near natural)	high Alt >80m	low Alk <50mg/l	river
GB109056 040081	Usk - conf Afon Senni to conf Afon Crawnon	7628	25	CSM (max allowable)	high Alt >80m	high Alk >50mg/l	river
GB109056 026890	Usk - conf Olway Bk to New Br	7631	50	CSM (max allowable)	low Alt <80m	high Alk >50mg/l	river
GB109056 040083	Usk - conf R Gavenny to conf Olway Bk	7630	50	CSM (max allowable)	low Alt <80m	high Alk >50mg/l	river
GB109056 039970	Usk - source to conf Afon Hydfer	7612	15	CSM (near natural)	high Alt >80m	high Alk >50mg/l	river
GB109056 040082	Usk conf Afon Crawnon to conf Gavenny R	7629 7608	50	CSM (max allowable)	low Alt <80m	high Alk >50mg/l	river
GB109056 040050	Yscir Fechan - source to conf Afon Yscir	7610	18	WFD (high)	high Alt >80m	high Alk >50mg/l	river

Trophic diatom index

The standard should be equivalent to WFD high ecological status using the current version of the diatom classification tool (via light microscopy). This is a tool developed to measure increases in nutrient concentrations through assessing degree of change in floristic composition in benthic diatoms (algae) in streams and rivers.

Acidification

This standard only applies to assessment units whose water body type is classified as siliceous or peat. Other types have good buffering ability and so will not be affected by acidification. See tables 4a and 4b for standards for all water bodies in the River Usk SAC.

Only two out of the 24 water bodies in the Usk SAC are classed as being at risk of acidification (Hankin *et al.* 2014). However, to comply with CSM guidance, acid standards have been applied for all relevant water bodies in the catchment.

Note that monitoring and reporting against these acidification standards will only be carried out for water bodies classified as either 'at risk' or 'probably at risk'. If ANC data is available, + then water bodies should be assessed against the ANC standard but if ANC data is not available then pH should be used.

Table 4a. Acidification standards for SAC rivers. *Acid Neutralising Capacity; ** Dissolved Organic Carbon

Standards for acidification	Method of assessment
ANC*: Mean ANC for all waters > 80 pH (Clear waters with DOC**<10 mg L-1): mean > 6.54 pH (Humic waters with DOC>10 mg L-1): mean > 5.1	Analysis of water chemistry data from environment agencies. At least 36 samples (3 years of data) are required, which must include winter samples.

Table 4b. Acidification standards for all relevant waterbodies in the River Usk SAC.

*Acidification risk categories taken from Hankin *et al.* 2014

Water Body ID	Water Body Name	Acidification risk*	Acid Neutralising Capacity (ANC)	pH
GB109056033000	Caerfanell - source to conf R Usk	Probably not at risk	>80	>6.54
GB109056033030	Afon Hydfer - source to conf R Usk	Not at risk	>80	>6.54
GB109056033080	Afon Crai - source to conf R Usk	Probably not at risk	>80	>6.54
GB109056039980	Usk - conf Afon Hydfer to conf Afon Senni	Probably not at risk	>80	>6.54
GB109056040000	Grwyne Fawr - source to conf Grwyne-Fechan	Probably not at risk	>80	NA
GB109056033050	Senni - source to conf River Usk	Probably at risk	NA	NA
GB109056040050	Yscir Fechan - source to conf Afon Yscir	Probably at risk	NA	NA

Published by:
Natural Resources Wales
Cambria House
29 Newport Road
Cardiff
CF24 0TP

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