



UK Terrestrial & Freshwater Habitat Types: Freshwater Habitat descriptions

The material provided in this document was previously available as a series of webpages, published and updated between 2012 and 2015. These pages can be accessed through The National Archives website:

<https://webarchive.nationalarchives.gov.uk/20190301141028/http://jncc.defra.gov.uk/page-4532>.

The descriptions include information on a habitat's characteristics, extent & distribution, pressures & threats, condition, protection, and management. Although much of the information remains of value and interest, it is historic and therefore does not necessarily reflect the most up-to-date state of knowledge of the habitat.

Please note that, given the age of the material, some of the links (particularly to external websites) may no longer work.

UK Freshwater Habitats

The UK supports a diverse range of freshwater habitats. These are divided into running waters (rivers and streams), and standing waters (lakes and ponds):

Running waters vary from torrential mountain streams to meandering lowland rivers. They are highly dynamic features, being heavily influenced by erosion, sedimentation and water flows. Their make-up is strongly influenced by topography, the chemical composition of the water, and the soils and land-use found in the surrounding catchment. They provide a wide range of specialized micro-habitats, and support many types of aquatic plants and animals. Marginal and bankside vegetation contribute to the biodiversity associated with watercourses. Rivers and streams link fragmented habitats in intensively farmed areas.

Standing waters also show great variation. They range from larger lakes and reservoirs to small ponds, and from clear upland lakes to nutrient-rich lowland water bodies. There are specialized standing waters with brackish-water, and turloughs and temporary meres and ponds that are only filled with water for part of the year. As with running waters, their make-up is also strongly influenced by their nutrient status and surrounding catchment. They can change in composition due to natural factors or man-made pollution. Standing waters support a rich array of aquatic life, including various species of amphibians, dragonflies and fish.

Freshwater habitats are a priority for nature conservation. They are home to an enormous variety of highly specialised plants and animals, and include some of the most natural, appealing and threatened habitat types in the UK. Accordingly, there are six freshwater priority habitats under the UK Biodiversity Action Plan and eight freshwater habitat types listed under Annex I of the EU Habitats Directive.

1 UK Freshwater Habitat Types & Characteristics

1.1 Rivers

River habitats encompass all natural and near-natural running waters in the UK (i.e. with features and processes that resemble those in 'natural' systems). Numerous factors influence their ecological characteristics. These include:

- catchment features (geology, soil, vegetation)
- topography
- gradient and flow rate
- altitude
- channel profile
- climate
- land use and other human activities

There are many different types of river, for example:

- slow-flowing meandering rivers in the lowlands (see right)
- fast-flowing headwater streams associated with the uplands (see right)
- chalk and limestone rivers
- rivers with strongly acidic, nutrient-poor waters

Rivers change greatly in character from their source, through their headwaters, and downstream to the sea or a lake. Specialized habitat features associated with rivers include rapids and riffles, in-stream rocky substrates, exposed shingle banks, scour pools, and gravel beds.

Rivers are home to many species of wildlife. These includes plants, such as water-crowfoot, water-starwort, water-cress and water-milfoil. Many species of fish use river habitats, including Atlantic salmon, brook lamprey, brown trout, bullhead, eel, perch and pike. Other well-known species include otter, water vole, and birds like dipper and kingfisher. A great number of invertebrate species are found in riverine habitats, including aquatic beetles, caddisflies, damselflies, dragonflies, mayflies and stoneflies.

1.2 Lake habitats



1.2.1 Eutrophic lakes

Eutrophic lakes are highly productive because plant nutrients are plentiful. They may be naturally eutrophic or result from artificial enrichment, e.g. Lough Neagh has been enriched moving it from a mesotrophic to a eutrophic state. This habitat is most typical of hard water areas in the lowlands of southern and eastern Britain, but they also occur in the north and west of the UK, especially near the coast.

These water bodies are characterised by having dense, long-term populations of algae in mid-summer, often making the water green. Their beds are covered by dark anaerobic mud, rich in organic matter. They are most typical of hard water areas of the lowlands of southern and eastern Britain, but also occur in the north and west, especially near the coast.

In their natural state, such waters have high biodiversity. Planktonic algae and zooplankton are abundant in the water column. Submerged vegetation is diverse, and numerous species of invertebrate and fish are present. Plant assemblages vary, but fennel-leaved pondweed (*Potamogeton pectinatus*) and spiked water-milfoil (*Myriophyllum spicatum*) are characteristic throughout the UK. Common floating-leaved plants include yellow water lily (*Nuphar lutea*), and there is often a marginal fringe of reedswamp.

Bottom-dwelling invertebrates, such as snails, dragonflies and water beetles are abundant. Calcareous sites may support large populations of the native freshwater crayfish *Austropotamobius pallipes*. Coarse fish, such as roach (*Rutilus rutilus*), tench (*Tinca tinca*) and pike (*Esox lucius*) are typical. And salmonids also occur naturally in some places. Amphibians, including great crested newt (*Triturus cristatus*), are often present. The abundance of food can also support internationally important bird populations.

1.2.2 Mesotrophic lakes

Mesotrophic lakes have a moderate nutrient status. They are characterised by a narrow range of nutrients, which are virtually all locked-up in algae during the growing season. Such lakes are relatively infrequent and largely confined to the margins of upland areas in the north and west.

Mesotrophic lakes have the highest potential macrophyte diversity of any lake type. Furthermore, they contain a higher proportion of nationally scarce and rare aquatic plants. Macro-invertebrates are well represented, particularly dragonflies, water beetles, stoneflies and mayflies. Rare fish, of which only three species are found in UK lakes, are well represented. The vendace (*Coregonus albula*) is only found in two sites in Britain, one of which is Bassenthwaite Water in Cumbria. Another whitefish, *Coregonus lavaretus*, known

as the schelly (or gwyniad, or powan), is found in a mesotrophic tarn in Cumbria. The schelly is also found in oligotrophic lakes in Cumbria, Wales and Scotland and there is uncertainty as to whether it is abnormally stressed in a mesotrophic environment. In general, fish communities in mesotrophic lakes are a mix of coarse and salmonid species, but today there are few truly natural assemblages due to introduced species.

1.2.3 Oligotrophic and dystrophic lakes



Oligotrophic and dystrophic lakes are characterised by low nutrient levels and low productivity. They occur on hard, acid rocks, most often in the uplands of the north and west, and vary greatly in size and depth. They include some of the deepest water bodies and least disturbed aquatic assemblages in the UK. While oligotrophic lakes usually have very clear water, dystrophic examples have dark, peat-stained waters.

Characteristic plankton, zoobenthos, macrophyte and fish communities occur. Fish communities, generally dominated by salmonids, may include charr (*Salvelinus alpinus*) and *Coregonus* spp. A number of benthic and planktonic invertebrates, found only in oligotrophic lakes, are possibly glacial relicts. Macrophytes are typically sparse, with species such as shoreweed (*Littorella uniflora*) and quillwort *Isoetes* spp. Shores are typically stony, and emergent vegetation is generally restricted to sheltered bays, where species such as bottle sedge (*Carex rostrata*) and bulrush (*Scirpus lacustris*) may be found.

1.3 Ponds

Ponds form small water bodies that can be permanently or seasonally (temporarily) filled with water. They are very widespread, occurring in both rural and urban settings.

High-quality examples are highly localised, especially in the lowlands. Areas important for high quality ponds include, for example:

- the Cheshire Plain, the New Forest, and the Lizard Peninsular
- the pingos of East Anglia
- the mid-Wales mawn pools and the NE Wales pond landscape
- the forest and moorland pools of Speyside
- ponds and pools associated with coastal dune slacks
- the machair pools in the Western Isles



Ponds support an array of freshwater life:

- plant species range from those in deeper water, to those in marginal areas and the draw-down zone
- ponds are particularly important for aquatic invertebrates, including damselflies, dragonflies, beetles, caddisflies, snails, water boatman and water scorpions
- amphibious newts, frogs and toads use them for breeding
- grass snakes, water voles and certain bat species use them as feeding areas
- waterbirds, such as moorhen, teal, redshank and snipe, use ponds for feeding, nesting and/or refuge

1.4 Aquifer-fed naturally fluctuating water bodies

This habitat is associated with very large fluctuations in water-level. This includes a period when sites are completely, or almost completely, dry. There is no inflow or outflow stream at the surface, except at times of very high water level, when temporary outflows may occur. Instead, these water bodies are directly filled by an underlying aquifer (through the groundwater system), which is periodically emptied and recharged. All have hard water because the underlying rock is calcareous.

Aquifer-fed water bodies are a very rare habitat type, both in the UK and internationally. They occur in two forms:

- *Turloughs* – these are found over Carboniferous limestone in Northern Ireland and Wales; and are distinguished by winter flooding and a more-or-less dry floor in summer. Three intact turloughs have so far been found in county Fermanagh, Northern Ireland, together with a single example (Pant-y-llyn) in South Wales.
- *Fluctuating meres* – six fluctuating meres have been identified over chalk bedrock in the Norfolk Breckland; these have a complex pattern of emptying and refilling, sometimes with a stretch of several years during which the mere may remain dry, followed by a prolonged period when water is constantly present.

The vegetation of this habitat usually has a distinct zonation determined by water depth and frequency and duration of filling. When in their dry phase, their basins are normally partly or completely occupied by grassland, often with silverweed (*Potentilla anserina*) abundant. Turloughs in Northern Ireland retain some permanent swampy pools. A common element is the prevalence of aquatic and semi-aquatic mosses, such as *Fontinalis antipyretica* and *Cinclidotus fontinaloides*, which are more resistant to desiccation.

Fish are generally absent, but a range of amphibians can be found, including the great crested newt (*Triturus cristatus*) in the Breckland. Invertebrates include many insect species, such as dragonflies, water boatmen and diving beetles. Typically there is also a rich assemblage of micro-crustaceans, such as water fleas, which have resting stages that can remain viable in the soil during dry phases.

2 Correspondences between UK Freshwater Habitat Types

The table below shows how freshwater habitat types recognised by different mainstream habitat classifications in the UK relate to each other. The types included are those recognised under the UK Biodiversity Action Plan (UK BAP), the EU Habitats Directive, the JNCC classifications of British Lake Vegetation Communities and British River Vegetation Communities.

The table shows only how the types broadly fit together – some examples of the types shown may fit into other vegetation/habitat types.

Table 2.1. Correspondences between UK freshwater habitat types (created 2015).

UK BAP priority habitats	EU Habitats Directive Annex I habitats	JNCC British Lakes or Rivers classification types*
Aquifer-fed naturally fluctuating water bodies	<p>H3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation</p> <p>H3180 Turloughs</p>	<p>Group D: Widespread, often large, mid-altitude circumneutral lakes</p> <p>Group E: Northern, often large, low altitude and coastal, above-neutral lakes with high diversity of plant species</p> <p>Group G: Central and eastern, above neutral, lowland lakes</p> <p>Group I: Widespread, mostly moderately large, base-rich lowland lakes</p>
Eutrophic standing waters	<p>H3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation</p>	<p>Group D: Widespread, often large, mid-altitude circumneutral lakes</p> <p>Group E: Northern, often large, low altitude and coastal, above-neutral lakes with high diversity of plant species</p> <p>Group G: Central and eastern, above neutral, lowland lakes</p> <p>Group I: Widespread, mostly moderately large, base-rich lowland lakes</p>
Mesotrophic lakes	<p>H3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></p> <p>H3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.</p>	<p>Group B: Widespread, usually low-lying acid moorland or heathland pools and small lakes</p> <p>Group C1: Northern, usually small to medium-sized, acid, largely mountain lakes</p> <p>Group C2: North western, predominately large, slightly acid, upland lakes</p> <p>Group D: Widespread, often large, mid-altitude circumneutral lakes</p> <p>Group E: Northern, often large, low altitude and coastal, above-neutral lakes with high diversity of plant species</p> <p>Group F: Widespread, usually medium-sized, lowland, above neutral lakes</p> <p>Group G: Central and eastern, above neutral, lowland lakes</p> <p>Group I: Widespread, mostly moderately large, base-rich lowland lakes</p>

UK BAP priority habitats	EU Habitats Directive Annex I habitats	JNCC British Lakes or Rivers classification types*
Oligotrophic and Dystrophic lakes	<p>H3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflora</i>)</p> <p>H3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></p> <p>H3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> species</p> <p>H3160 Natural dystrophic lakes and ponds</p>	<p>Group A: Small, predominantly northern dystrophic peat or heathland pools</p> <p>Group B: Widespread, usually low-lying acid moorland or heathland pools and small lakes</p> <p>Group C1: Northern, usually small to medium-sized, acid, largely mountain lakes</p> <p>Group C2: North western, predominately large, slightly acid, upland lakes</p>
Ponds	<p>H3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflora</i>)</p> <p>H3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i></p> <p>H3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.</p> <p>H3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i>-type vegetation</p> <p>H3160 Natural dystrophic lakes and ponds</p> <p>H3170 Mediterranean temporary ponds</p>	<p>Group A: Small, predominantly northern dystrophic peat or heathland pools</p> <p>Group B: Widespread, usually low-lying acid moorland or heathland pools and small lakes</p> <p>Group C1: Northern, usually small to medium-sized, acid, largely mountain lakes</p> <p>Group C2: North western, predominately large, slightly acid, upland lakes</p> <p>Group D: Widespread, often large, mid-altitude circumneutral lakes</p> <p>Group E: Northern, often large, low altitude and coastal, above-neutral lakes with high diversity of plant species</p> <p>Group G: Central and eastern, above neutral, lowland lakes</p> <p>Group H: Northern, small, circumneutral, lowland lakes, with low species diversity</p> <p>Group I: Widespread, mostly moderately large, base-rich lowland lakes</p>
Rivers	<p>H3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</p>	<p>River types: I-X</p>

* note that the names of the lake types have been shortened
[created Nov 2015]

3 Extent & Distribution of UK Freshwater Habitats

The tables below give information on the extent and distribution of freshwater habitats around the UK. This shows that:

- Many UK lakes fall into the eutrophic category, having a relatively high nutrient status, and including around 80% of lakes in England, 40% in Wales, 15% in Scotland. Northern Ireland alone accounts for around half of all UK eutrophic lake area, including Lough Neagh, which is by far the largest area of freshwater in the British Isles covering 386 km², and the Upper and Lower Lough Erne which covers 144 km².
- Mesotrophic lakes are relatively infrequent in the UK and largely confined to the margins of upland areas in the north and west – several of the largest and most important lakes, including Lough Neagh and Lower Lough Erne, were once mesotrophic but are now classified as eutrophic.
- Comprehensive information on the extent of nutrient poor, oligotrophic and dystrophic lakes is not available – these are, nevertheless, numerous, occurring most often in the uplands of the north and west, which makes them difficult to access and quantify.
- Aquifer-fed naturally fluctuating water bodies is a very rare habitat – there are a few known turloughs in country Fermanagh (Northern Ireland) and at Pant-y-llyn (South Wales), which combine with a small number of fluctuating meres in the Norfolk Brecklands.
- Ponds represent a numerous, generally widespread, and familiar type of freshwater habitat – it has been estimated that around 20% of the c. 400,000 ponds outside curtilage in the UK might meet with the UK BAP Ponds priority habitat definition.

3.1 UK BAP habitats

The table below shows the estimated extent of the freshwater priority habitat types recognised by the UK Biodiversity Action Plan. The values are mainly based on information extracted from the [Biodiversity Action Reporting System \(BARS\)](#). Note that detailed information on the extent of river habitats is mostly unavailable.

Table 3.1. Estimated extent (in 2008) of the four freshwater priority habitats recognised by the UK Biodiversity Action Plan.

UK BAP priority habitats	England	Scotland	Wales	Northern Ireland	UK
Eutrophic standing waters	3,916 lakes	1,012 lakes	150 lakes	650 lakes	5,734 lakes
Mesotrophic lakes	644 lakes	1,749 lakes	50 lakes	111 lakes	2,554 lakes
Aquifer-fed naturally fluctuating water bodies	16.5 ha	–	1 ha	6.5 ha	24 ha
Ponds	unknown	unknown	unknown	unknown	80,000 ponds

3.2 EU Habitats Directive Annex I types

The table below shows the estimated extent of UK freshwater habitats listed under Annex I of the EU Habitats Directive.

Table 3.2. Estimated extent (in 2013) of the freshwater habitat types listed under Annex 1 of the EU Habitats Directive (derived from the 2013 UK Report on Implementation of the Habitats Directive).

EU Habitats Directive Annex I types	England (ha)	Scotland (ha)	Wales (ha)	Northern Ireland (ha)	UK (ha)
H3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> -type vegetation	17,880	unknown	689	14,800	unknown
H3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	10,050	unknown	1,900	2,359	unknown
H3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)	980	unknown	–	–	unknown
H3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.	670	unknown	97	166	unknown
H3160 Natural dystrophic lakes and ponds	180	unknown	35	80	unknown
H3170 Mediterranean temporary ponds	10	–	–	–	10
H3180 Turloughs	–	–	0.66	3.96	4.62
H3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	unknown	unknown	2,000	unknown	unknown

4 Threats to UK Freshwater Habitats

UK freshwater habitats and their associated species are threatened by a range of factors. The table below provides a summary of the major threats – details are given below. These are based on information in the 3rd UK Report on Implementation of the Habitats Directive and the UK Biodiversity Habitat Action Plans.

Table 4.1. Summary of major pressures and threats to freshwater habitats.

	Eutrophic standing waters	Mesotrophic lakes	Oligotrophic and dystrophic lakes	Aquifer-fed naturally fluctuating water bodies	Ponds	Rivers
Pollution	*	*	*	*	*	*
Abstraction and flow regime	*	*	*	*	*	*
Invasive alien species	*	*	*		*	*
Recreation	*	*	*			
Fisheries management	*	*		*	*	
Climate change	*			*		*
Grazing/control of scrub & trees				*	*	
Morphological alterations					*	*

4.1 Pollution

A well-known problem affecting the freshwater environment is pollution. This can threaten the quality of all categories of freshwater habitats. Pollution can come from:

- *point sources*, for example pipes discharging effluents from industrial sites, wastewater treatment plants or mines, sewage tanks, and fish farms;
- *non-point sources*, i.e. *widespread diffuse pollution*, for example land-use activities such as farming, forestry and urban areas; this type of pollution generally exceeds that from point sources.

Individual pollutants include pesticides, poisonous metals and other chemicals, and spillages of slurry or milk. Agricultural fertilisers, including animal manures, can cause eutrophication (nutrient enrichment), which can result in excessive algae and weed growth.

Increased levels of eroded silt can have polluting effects. Silt erosion can be produced by ploughing of grassland, drainage associated with upland afforestation, and peat-cutting on moorland catchments. Eroded silt increases sediment and nutrient loads. This can inhibit the growth of rooted aquatic plants, promote algal growth, and smother the bottom of rivers and lakes, damaging fish spawning beds.

Water acidification is also a factor in catchments where the underlying soil/bedrock offers limited buffering capacity. Although there has been a general decline in the acidifying effects of sulphurous air pollution, nitrogen oxide deposition remains an issue as a cause of acidification and eutrophication.

4.2 Abstraction and flow regulation

Water is abstracted from freshwater habitats to supply drinking water, for agricultural irrigation, and for industrial usage. It can be taken directly from a water body or indirectly via the ground water or from underground aquifers. In some places, dams have been constructed to allow for water abstraction. These modify river flows and can causing environmental problems downstream. Abstraction and flow regulation can exacerbate pollution by concentrating pollutant levels and limiting subsequent flushing.

Although some seasonal variation in water availability is normal, abstraction can significantly reduce water levels. In extreme cases, it can cause a lake, pond or river to dry up. This can have devastating impacts on wildlife, although in some aquatic habitats (turloughs and temporary mere and ponds) it is a natural phenomenon in summertime.

4.3 Invasive alien species

Alien species are non-native plants or animals. Some of these have become invasive in native freshwater ecosystems. As a result, they have displaced resident wildlife and, in some cases, had serious economic impacts.

Examples include Australian swamp stonecrop (*Crassula helmsii*) and parrot's feather (*Myriophyllum spicatum*). Both have rapidly colonised and changed the ecology of small standing water habitats. Lowland oligotrophic lakes are particularly vulnerable to invasions by *Crassula*. This now occurs in over 10,000 sites in England and is spreading in Scotland and Wales. At present, there is no effective means of controlling it.

The invasive signal crayfish (*Pacifastacus leniusculus*) is native to North America. It has spread across 25 European countries, including the UK, having been introduced in 1976.

Not only has it eaten large amounts of aquatic vegetation, but eliminated many populations of native crayfish by spreading crayfish plague.

Complete eradication of invasive species is costly and difficult. Preventing them establishing in the first place is by far the most cost-effective approach.

4.4 Morphological alterations

Freshwater life has evolved to occupy a range of micro-habitats. This includes the edges and deeper water in lakes and ponds. On rivers this includes the bankside vegetation, pools and riffles, and areas of exposed sand and shingle. Changes to the physical structure of a freshwater body, notably river canalisation or dredging of lakes and ponds, can alter the availability of such habitats and result in substantial damage. Weirs, dams and barrages can alter water and sediment movements, and may impede passage of migratory fish such as salmon.

4.5 Recreation

There are a number of recreational activities that can damage freshwater habitats. Boats can damage vegetation directly or through wave erosion. This can also increase turbidity by stirring up sediment, contributing to enrichment and encouraging the growth of algae.

Recreational and sporting use of lakes can create disturbance affecting bird and mammal populations. Marginal vegetation can suffer from trampling. The construction of marinas and other leisure facilities may destroy valuable habitat and can lead to increased pollution. Angling and associated fisheries management (see below) is a widespread problem for many lowland lakes and ponds.

4.6 Fisheries management

Introduction of fish and manipulation of existing stocks can damage freshwater wildlife interests in various ways. It can reduce resident fish and many other animal and plant populations. By altering the structure of the food web, it can increase predation of small invertebrates that graze algae. Fish threaten amphibian populations by eating their tadpoles. Heavy stocking of bottom-feeding fish, especially carp, results in increased disturbance of sediments. This increases turbidity and mobilises nutrients, which encourages algal blooms and cause other fundamental changes.

4.7 Climate change

Climate change is likely to have significant impacts on freshwater habitats. Changes in the amount, timing and distribution of rainfall and run-off are bound to affect the character and ecology of lakes, ponds and rivers. Higher intensity rainfall could increase sewer overflow rates, lead to more severe flooding and increased erosion. Summer droughts would reduce river flows and increase abstraction demands. A rise in water temperature would have wide-ranging effects, causing changes to food-web structure and a general increase in fish and algal and other phytoplankton growth.

4.8 Grazing/control of scrub & trees

An appropriate level of grazing is important to maintain the open character of turloughs and temporary meres and ponds. For many lowland ponds, some periodic cutting of marginal scrub and trees is required to control shading; this should normally be undertaken piecemeal basis.

5 Condition of UK Freshwater Habitats

The condition of UK freshwater habitats has been assessed using Common Standards Monitoring Guidance for Freshwater Habitats. This involves making an assessment of individual sites using a series of habitat characteristics or attributes and standardised condition categories. Sites are judged to be in favourable condition when the objectives for the habitat are being met. Sites with habitat that is in an unsatisfactory state are classed as in unfavourable condition. Where this is the case, a judgement is made as to whether the habitat is: (i) recovering – moving towards the desired state; (ii) declining – moving away from the desired state; or (iii) no-change – neither improving nor declining. Sites are classed as destroyed (partially or completely) when the habitat is no longer present and there is no prospect of being able to restore it.

5.1 Condition on designated sites

The tables below summarise information on the condition of freshwater habitats at a UK-level as reported in 2006-07. In general, the condition of standing waters (lakes and ponds) was better than rivers. Note that, since this time, the condition of some habitats has improved (e.g. see [The State of the Natural Environment 2008](#)).

Tables of condition of UK freshwater habitats: The tables are based on data from the Common Standards Monitoring for Designated Sites: First Six Year Report (2006) and the 2nd UK Report on Implementation of the Habitats Directive (2007)

Table 5.1. Condition of sites designated as SSSI/ASSIs (data from 2006).

	Favourable	Unfavourable recovering	Unfavourable not recovering	Destroyed or part destroyed
Standing water	49%	12%	38%	1%
Rivers	32%	11%	56%	1%

Table 5.2. Condition of sites designated as Special Areas of Conservation (SAC) (data from 2007).

	Favourable	Unfavourable recovering	Unfavourable not recovering	Destroyed or part destroyed
Standing water	68%	11%	21%	0%
Rivers	8%	0%	92%	0%

Table 5.3. Sites designated as Special Areas of Conservation (SAC) – broken down into EU Habitats Directive Annex I types (data from 2007).

Annex I habitat type	Favourable	Unfavourable recovering	Unfavourable not recovering
H3170 Mediterranean temporary ponds	100%	0%	0%
H3160 Natural dystrophic lakes and ponds	99%	<1%	1%
H3130 Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	80%	6%	14%
H3150 Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> -type vegetation	61%	9%	30%
H3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')	38%	4%	58%
H3110 Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)	22%	78%	0%
H3260 Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	3%	0%	97%
H3180 Turloughs	0%	0%	100%

6 Protective Measures for UK Freshwater Habitats

6.1 Conventions and legislation

A number of International Conventions, European Directives and pieces of National Legislation apply to UK coastal habitats. Amongst the most important are:

- [The Convention on Biological Diversity](#)
- [The Convention on the Conservation of European Wildlife and Natural Habitats \(Bern Convention\)](#)
- [The European Commission Habitats Directive](#)
- [The European Commission Birds Directive](#)
- [The EU Water Framework Directive](#)
- [The Wildlife and Countryside Act](#) (plus amendments & supplements)

These have been instrumental in the design of the following biodiversity strategies, priority habitat lists, and site-based designations.

6.2 Biodiversity Strategies

The UK Post-2010 Biodiversity Framework sets out priorities for biodiversity conservation activities at a UK-level. Additional priorities are set out in the Country Biodiversity Strategies for England, Northern Ireland, Scotland and Wales. The main objectives of these strategies are to:

- halt and reverse previous biodiversity loss through targeted actions
- increase awareness, understanding, enjoyment and engagement with biodiversity conservation
- restore and enhance biodiversity through better planning, design and practice

- ensure biodiversity is taken into account in wider decision-making
- ensure knowledge on biodiversity is available to policy makers and practitioners

These high-level strategies largely succeeded the [UK Biodiversity Action Plan](#) (UK BAP), which operated from 1992 until 2012.

6.3 Priority habitats

Statutory lists of habitats of priority or principal importance for biodiversity conservation exist for [England](#), [Scotland](#), [Wales](#) and [Northern Ireland](#). These are largely based on the list of [UK BAP priority habitats](#). This includes six freshwater habitats:

- Aquifer-fed naturally fluctuating water bodies
- Eutrophic standing waters
- Mesotrophic lakes
- Oligotrophic and Dystrophic Lakes
- Ponds
- Rivers

6.4 Site-based designations

Special Areas of Conservation: Special Areas of Conservation (SACs) are strictly protected sites designated under the EU Habitats Directive. They contribute to the [Natura 2000 Network](#), which consists of a series of high-quality nature reserves spread across the European Union. A total of about 177 SACs, covering an area of around 37,250 ha, have been designated to represent eight UK freshwater habitat types listed under Annex I of the EU Habitats Directive.

Sites/Areas of Special Scientific Interest: SSSI/ASSIs are the fundamental statutory mechanism for protecting sites of ecological and geological interest in the UK. Sites of Special Scientific Interest (SSSIs) apply in England, Scotland and Wales, whilst Areas of Special Scientific Interest (ASSIs) apply in Northern Ireland. Legal responsibility for notifying and protecting such sites lies with the relevant statutory nature conservation agency in each country. The SSSI/ASSI series is intended to form a representative network covering the full range of wild flora and fauna, and especially those types and individual sites that are of greatest value to nature conservation. Detailed [Guidelines for the selection of biological SSSIs](#) are available specifically for freshwater habitats.

The table below shows the extent of notified river habitat in SSSIs in England only. Comparable data was not available for other UK countries.

Table 6.1. SSSIs in England.

	Amount of habitat with SSSIs	Total area of habitat	% of habitat within SSSIs
Standing waters	20,458 ha	>50,000 ha	<41%
Rivers and streams	2,500 km	136,000 km	6%
Canals	154 km	2,624 km	2%

(created from data in [The State of the Natural Environment \(2008\)](#) report)

7 Management of UK Freshwater Habitats

Given the threats that freshwater habitats face, it is often necessary to undertake some form of management to improve or maintain their condition. There are a number of sources of information to guide such action, examples of which are outlined below.

7.1 River Restoration Centre (RCC)

[The River Restoration Centre](#) is the national expert advice centre for best practice river restoration, habitat enhancement and catchment management. The RCC is part of a wider European network called the [European Centre for River Restoration \(ECRR\)](#), which aims to encourage and support ecological river restoration throughout greater Europe.

7.2 River basin management planning

To help implement the Water Framework Directive, the UK environment agencies have published river basin management plans – these set objectives for each water body in the UK, and programmes of measures to meet those objectives:

- [River basin management plans for England](#)
- [River basin management plans in Wales](#)
- [River basin management plans for Scotland](#)
- [River basin management plans for Northern Ireland](#)

7.3 SNH advice on managing freshwater

The [SNH 'Managing Freshwater'](#) webpage includes information on flooding, freshwater fisheries, freshwater aquaculture, river engineering, water pollution, catchment management, and aquatic non-natives.

7.4 Annex I Management Models

The European Commission has published [Management Models for Annex I Habitats](#), including one for Mediterranean temporary ponds.

7.5 Pond Creation Toolkit

The Freshwater Habitats Trust provides a [Pond Creation Toolkit](#) – in a set of factsheets with information on best practice principles of pond creation, such as location, design, project planning and implementation.

7.6 UKTAG

The [UKTAG](#) partnership provides coordinated advice on the science and technical aspects of the EU Water Framework Directive (WFD).

8 Resources for UK Freshwater Habitats

This page lists additional sources of information on freshwater issues, partnerships and initiatives.

8.1 Statutory Agencies

- [Environment Agency](#)

- [Natural England](#)
- [Natural Resources Wales](#)
- [Northern Ireland Environment Agency](#)
- [Scottish Environment Protection Agency](#)
- [Scottish Natural Heritage](#)

8.2 Partnerships

- [Angling Trust](#)
- [Freshwater Habitats Trust](#)
- [Invasive Species Ireland](#)
- [Royal Society for the Protection of Birds \(RSPB\)](#)
- [Salmon and Trout Conservation](#)
- [The Atlantic Salmon Trust](#)
- [The Rivers Trust](#)
- [The Wild Trout Trust](#)
- [The Wildlife Trusts](#)
- [UK Rivers Network](#)

8.3 Information Portals

- [Biofresh](#)
- [Freshwater Information Platform](#)
- [National Biodiversity Network Atlas](#)