UK Terrestrial & Freshwater Habitat Types: Lowland Wetland 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 Lowland Wetland Habitats

UK lowland wetland habitats include raised bog and fen. Lowland raised bog is a specialised habitat of elevated deposits of raised peat. It is both very acidic and nutrient-poor, being fed by rainwater rather than groundwater. Raised bogs are typically found in topographical depressions or at the head of estuaries or along river flood-plains. They are a particular feature of cool, rather humid regions, such as the north-west lowlands of England, the central and north-east lowlands of Scotland, Wales and Northern Ireland. Remnants also occur elsewhere, for example the Somerset Levels, South Yorkshire and Fens of East Anglia. Lowland fen is found across the whole of the British Isles, from sea level up into the hills, and grows on peat, peaty or mineral soils, which may be permanently, seasonally or periodically waterlogged. Fens are fed by groundwater and surface run-off and consequently support lush vegetation.

Lowland wetland habitats are a priority for nature conservation. They support a myriad of highly specialised plants and animals and have undergone a dramatic decline in area during the last century – consequently they are amongst the rarest and most threatened habitats in the UK. Both lowland raised bogs and lowland fen are included as priority habitats within the UK Biodiversity Action Plan, and there are six separate lowland wetland habitat types listed under Annex I of the EU Habitats Directive.

1 UK Lowland Wetland Habitat Types & Characteristics

1.1 Lowland Raised Bog

Raised bogs in the lowlands of Britain occur on elevated deposits of peat and receive mineral nutrients principally from precipitation. They are referred to as ombrotrophic (rain-fed) mires.

This habitat is very acidic and nutrient-poor. It is also poorly drained and water-logged. Because of these conditions the decomposition of plant material is strongly inhibited. This results in an accumulation of peat, which, over thousands of years, can become many metres thick. The building peat raises the bog surface upwards to form a gently-curving dome from which the term 'raised' bog is derived. This dome can grow to 10m in height or so and separates the bog from the underlying water-table, minimising the inflow of ground-water. Bogs in which peat is being accumulated are referred to as ‘Active’, whereas those in which peat formation is at a temporary standstill (normally because of drainage) are referred to as ‘Degraded’.

The vegetation of lowland bogs is very distinctive. It includes a range of specialised wetland plants and varies depending on the pattern of surface pools, hummocks and lawns. Usually various colourful *Sphagnum* mosses predominate (e.g. *Sphagnum auriculatum*, *S. cuspidatum*, *S. magellanicum*, *S. papillosum*, *S. recurvum*). These are highly absorbent and produce a characteristically 'spongy-feel' to the bog surface. Other typical plants include bog asphodel (*Narthecium ossifragum*), bogbean (*Menyanthes trifoliata*), bog-myrtle (*Myrica gale*) cotton grasses (*Eriophorum angustifoium* and *E*. *vaginatum*) cross-leaved heath (*Erica tetralix*) deer-grass (*Scirpus cespitosus*) heather (*Calluna vulgaris*), purple moor-grass (*Molinia caerulea*), round-leaved sundew (*Drosera rotundifolia*) and the white beak-sedge (*Rhynchospora alba*).

Raised bogs are home to numerous scarce lowland plant species, such as the bog mosses *Sphagnum pulchrum* and *S. imbricatum*, uncommon bog rosemary *Andromeda polifolia*, cranberry (*Vaccinium oxycoccos*) and the great and oblong leaved sundews (*Drosera anglica*, *D. intermedia*) The vegetation is greatly affected by peat-cutting and drainage, which tend to dry out the bog, encouraging purple moor-grass and heather and allowing birch and pine trees to invade.

Lowland raised bogs form an important refuge for many wetland species. These include various breeding waders, wildfowl and birds of prey, such as curlew, snipe, hen harrier, hobby and merlin. Many species of invertebrates occur, including beetles, butterflies, caddis flies, damselflies, dragonflies, mites, moths, spiders and springtails. Some of these are highly localised in the lowlands, including the large heath butterfly (*Coenonympha tullia* subspecies *davus*) the bog bush cricket (*Metrioptera brachyptera*) the mire pill beetle (*Curimopsis nigrita*) the white-faced darter (*Leucorrhinia dubia*), and Britain's rarest caddis fly *Hagenella clathrata*.

1.2 Lowland Fen

Lowland fens are minerotrophic peatlands (i.e. their nutrients come from ground water as well as rain water), that are at least periodically waterlogged. Although they are underlain by peat, decomposition tends to be relatively high and so the peat depth is shallow and there is no peat dome (as with raised bogs). Fens are complex and dynamic systems; they frequently form complex mosaics with a number of associated habitat types, including wet woodland (fen carr), reedbed, lowland heathland and lowland meadow.

Two broad types of fen can be distinguished. In topogenous fens water movement is generally vertical – these include basin fens and floodplain fens. In soligenous fens water movement is predominantly lateral – these include valley mires, springs and flushes in the lowlands; mires associated with springs, rills and flushes in the uplands; trackways and ladder fens in blanket bogs; and laggs of raised bogs. In addition, fens are also described as poor-fens or rich-fens (see below).

Poor-fens:

Poor-fens have low to moderate fertility and are fed by acid water (pH <5) derived from base-poor rocks or glacial till, such as sandstones, granites or sand and gravel. They occur mainly in the uplands or in association with lowland heaths. Their vegetation is characteristically species-poor, with a moderate to high cover of *Sphagnum* bog mosses (mainly *Sphagnum cuspidatum*, *S. palustre*, *S. recurvum*, *S. squarrosum*) and sedges (especially Bottle sedge *Carex rostrata*), with a scattered and an impoverished layer of herbs including, for example, common cotton-grass *Eriophorum angustifolium*, devil's-bit scabious *Succisa pratensis* and marsh cinquefoil *Potentilla palustris*. In some instances *Sphagnum* can be scarce and various *Carex* sedges dominate in a more herb-rich sward with species like bogbean (*Menyanthes trifoliate*) and marsh bedstraw (*Galium palustre*) present.

Rich-fens

Rich-fens are fed by alkaline, mineral-enriched, calcareous waters (pH >5). They are mainly confined to the lowlands, but also occur in the uplands where there are localised pockets of base-rich rocks. The vegetation is normally relatively species-rich. It includes mire vegetation dominated by a range of *Carex* sedges, growing over a variable carpet of mosses and mixed in with various vascular plants (such as bogbean, common butterwort (*Pinguicula vulgaris*) common cotton-grass, lesser spearwort (*Ranunculus flammula*) marsh cinquefoil marsh bedstraw, marsh lousewort (*Pedicularis palustris*) marsh marigold (*Caltha palustris*) marsh thistle (*Cirsium palustre*) and ragged robin (*Lychnis flos-cuculi*)). Other rich-fen mire communities are dominated by black bog-rush (*Schoenus nigricans*) growing mixed with blunt-flowered rush (*Juncus subnodulosus*) and purple moor-grass (*Molinia caerulea*), cross-leaved heath (*Erica tetralix*), bog asphodel (*Narthecium ossifragum*) and a mixed cover of mosses with *Sphagnum* as a consistent feature.

Rich-fens also support mixed tall-herb fen communities in which Common reed *Phragmites australis* is predominant. These usually include a range of tall herbs, such as hemp agrimony *Eupatorium cannabinum*, marsh bedstraw *Galium palustre*, meadowsweet *Filipendula ulmaria*, milk parsley *Peucedanum palustre*, purple loosestrife *Lythrum salicaria*, and yellow loosestrife *Lysimachia vulgaris*. Much less common is tall, saw-sedge *Cladium mariscus* dominated, species-poor, swamp vegetation. Some rich-fens in the south-east of England support a kind of species-rich fen-meadow, which is dominated by purple moor-grass with an admix of carnation sedge *Carex panicea*, devil's-bit scabious, marsh bird's-foot trefoil *Lotus uliginosus*, marsh thistle and tormentil *Potentilla erecta*.

1.3 Fen animals

Fens provide an invaluable habitat for a large number of wetland animals. The invertebrate and bird fauna are particularly rich. Numerous species of aquatic beetle, damselfly, dragonfly, fly, moth, snail and spider are associated with fens. Rare invertebrates associated with fens include Desmoulin's whorl snail *Vertigo moulinsiana*, the fen raft spider *Dolomedes plantarius*, the lesser water measurer *Hydrometra gracilenta*, the Norfolk Hawker dragonfly (*Aeshna isosceles*), the Pashford pot beetle (*Cryptocephalus exiguus*) the reed leopard moth (*Phragmataecia castaneae*) and the swallowtail butterfly (*Papilio machaon*). The bird fauna includes species such as bearded-tit, bittern, Ceti's warbler, little egret, marsh harrier, marsh warbler, spotted crake and water rail. All of Britain's amphibian species occur in lowland fens.

2 Correspondences between UK Lowland Wetland Habitat Types

The table below shows how the different lowland wetland habitat types recognised by the 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, and the British National Vegetation Classification (NVC).

The table shows only how the types broadly fit together – some examples of the types shown may fit into other vegetation/habitat types. For more detailed information see the habitat correspondences interactive spreadsheet.

Table 2.1. Correspondences between UK lowland wetland habitat types (created 2010).

UK BAP priority habitat	**EU Habitats Directive Annex I habitat**	**National Vegetation Classification type**
Lowland raised bog	***H7110*** Active raised bogs	M1 *Sphagnum auriculatum* bog pool community
		M2 *Sphagnum cuspidatum/ recurvum* bog pool community
		M18 *Erica tetralix-Sphagnum papillosum*raised and blanket mire
		M19 *Calluna vulgaris-Eriophorum vaginatum* blanket mire
	H7120 Degraded raised bogs capable of natural regeneration	M3 *Eriophorum angustifolium* bog pool community
		M15 *Scirpus cespitosus-Erica tetralix* wet heath
		M16 *Erica tetralix-Sphagnum compactum* wet heath
		M17 *Scirpus cespitosus-Eriophorum vaginatum* blanket mire
		M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire
		M19 *Calluna vulgaris-Eriophorum vaginatum* blanket mire
		M20 *Eriophorum vaginatum* blanket and raised mire
		M25 *Molinia caerulea-Potentilla erecta* mire

UK BAP priority habitat	EU Habitats Directive Annex I habitat	National Vegetation Classification type
Lowland raised bog / lowland fen	***H7150*** Depressions on peat substrates of the *Rhynchosporin*	M1 *Sphagnum auriculatum* bog pool community
		M2 *Sphagnum cuspidatum/recurvum* bog pool community
		M14 *Schoenus nigricans-Narthecium ossifragum* mire
		M15 *Scirpus cespitosus-Erica tetralix* wet heath
		M16 *Erica tetralix-Sphagnum compactum* wet heath
		M17 *Scirpus cespitosus-Eriophorum vaginatum* blanket mire
		M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire
		M21 *Narthecium ossifragum-Sphagnum papillosum* valley mire
		M29 *Hypericum elodes-Potamogeton polygonifolius* soakway
Lowland fen	***H7210*** Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	M9 *Carex rostrata-Calliergon cuspidatum/giganteum* mire
		M13 *Schoenus nigricans-Juncus subnodulosus* mire
		M14 *Schoenus nigricans-Narthecium ossifragum* mire
		M24 *Molinia caerulea-Cirsium dissectum* fen-meadow
		S2 *Cladium mariscus* swamp and sedge-beds
		S24 *Phragmites australis-Peucedanum palustris* tall-herb
		S25 *Phragmites australis-Eupatorium cannabinum* tall-herb fen
		SD14 *Salix repens-Campylium stellatum* dune slack community
		SD15 *Salix repens-Calliergon cuspidatum* dune slack community
	H7230 Alkaline fens	M9 *Carex rostrata-Calliergon cuspidatum/giganteum* mire
		M10 *Carex dioica-Pinguicula vulgaris* mire
		M13 *Schoenus nigricans-Juncus subnodulosus* mire
	H7140 Transition mires and quaking bogs	M4 *Carex rostrata-Sphagnum recurvum* mire
		M5 *Carex rostrata-Sphagnum squarrosum* mire
		M8 *Carex rostrata-Sphagnum warnstorfii* mire
		M9 *Carex rostrata-Calliergon cuspidatum/giganteum* mire
		S27 *Carex rostrata-Potentilla palustris* tall-herb fen

3 Extent & Distribution of UK Lowland Wetland Habitats

The tables below give information on the extent (area covered) and distribution of lowland wetland habitats around the UK. Most extensive are lowland raised bogs, which are mainly spread across Northern Ireland, England and Scotland. A large part of this habitat is degraded bog capable of regeneration rather than active raised bog. Lowland fen mainly occurs in Wales, England and Northern Ireland. Knowledge of the extent of the various Lowland fen types recognised under the EU Habitats Directive Annex I types is limited.

3.1 UK BAP habitats

The table below shows the estimated extent the two lowland wetland priority habitat types recognised by the UK Biodiversity Action Plan. Values given are the overall total extent and percentage in each country, based on information extracted from the Biodiversity Action Reporting System (BARS).

Table 3.1. Estimated extent (in 2008) of the two lowland wetland priority habitats recognised by the UK Biodiversity Action Plan.

UK BAP priority habitats	England (ha)	Northern Ireland (ha)	Wales (ha)	Scotland (ha)	United Kingdom (ha)
Lowland raised bog	17,411	21,106	1,830	13,000	53,347
Lowland fen	8,000	3,000	6,200	8,585	25,785

3.2 EU Habitats Directive Annex I types

The table below shows the estimated extent of lowland wetland habitat types on Annex I of the EU Habitats Directive.

Table 3.2. Estimated extent (in 2013) of the lowland wetland habitat types listed under Annex 1 of the EU Habitats Directive (derived from the 2013 UK Report on Implementation of the Habitats Directive. Note that for habitats that occur in both the lowlands and uplands, the area given is the total for both locations.

EU Habitats Directive Annex I types)	England (ha)	Scotland (ha)	Northern Ireland (ha)	Wales (ha)	UK (ha)
Lowland raised bog					
H7120 Degraded raised bogs capable of natural regeneration	13,684	1,490	4,400	751	20,325
H7110 Active raised bogs	3,727	5,600	4,462	1,427	12,941
Lowland fen					
H7140 Transition mires and quaking bogs [most of this habitat occurs in upland areas]	[2,850]	[>1,420]	[336]	[50]	[>4,656]*
H7230 Alkaline fens [most of this habitat occurs in upland areas]	[2,800]	[370]	[120]	[40]	[3,330]
H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	315	–	1	63	379

EU Habitats Directive Annex I types)	England (ha)	Scotland (ha)	Northern Ireland (ha)	Wales (ha)	UK (ha)
Lowland raised bog/fen					
H7150 Depressions on peat substrates of the Rhynchosporin [most of this habitat occurs in upland areas]	[>428]*	[>781]*	[17]	[unknown]	[>1,226]*

*minimum value based on the area of the habitat with SACs

4 Threats to UK Lowland Wetland Habitats

UK lowland wetland habitats and their associated species are threatened by a range of factors. The text below lists the major pressures and threats to UK lowland raised bogs and lowland fen – and provides a summary of each. This is based on information in the 3rd UK Report on Implementation of the Habitats Directive, the UK Biodiversity Habitat Action Plans, and Common Standards Monitoring for Designated Sites: First Six Year Report.

4.1 Drainage, water abstraction and water pollution

One of the main causes of loss and poor condition on surviving lowland raised bogs and lowland fens is water management.

Both are waterlogged systems, so any major loss of water will damage them. Water abstraction, insertion of drainage ditches and peat cuttings within or around raised bogs and fens can cause them to degenerate. The importance of protecting the hydrological zone around raised bog margins is often not appreciated. Similar effects can be caused by excessive water abstraction from underlying aquifers, as this can inhibit spring-line flows, generally lower water tables, and affect the natural balance between the differing water qualities of ground water and surface water that fen vegetation is highly dependent upon. As raised bogs dry out, the central 'raised' dome collapses and normal bog vegetation is replaced by species associated with drier habitats, notably bracken and birch. Drying fens are readily invaded by alder-ash-willow-birch scrub/woodland.

Given that natural lowland raised bogs receive water inputs from precipitation alone, they are particularly sensitive to any inputs of surface or ground water, even more so if these are polluted or enriched. Alkaline fens in valley settings are particularly susceptible to pollution from agricultural run-off, and the status of surface and groundwater is crucial in providing the conditions associated with each type of fen vegetation. In both types of habitat, water pollution can have severe adverse effects on the resident vegetation.

4.2 Peat extraction & conversion

Many lowland raised bogs have suffered, and continue to suffer, from peat extraction. Where extraction has been wholesale and the bog has been converted to agriculture, forestry or urban development, this has effectively destroyed the site potential. However, at sites like Fenns & Whixall Mosses and Thorne Moors, where areas of bog/peat have survived extraction/conversion, major restoration projects have been undertaken to re-flood sites and re-establish bog vegetation and the peat-forming process. Although peat extraction has not been such a major issues for lowland fens, given that peat depth is usually much shallower, loss of fen sites through conversion to agriculture has been very widespread.

4.3 Air pollution

Air pollution can result in the deposition of unwanted nutrients onto lowland raised bogs and fens, which can critically alter the pH and overall nutrient status of sites. Dry deposition of ammonia is still very high in most parts of England, Wales and Northern Ireland, and critical loads of sulphur are exceeded on some sites. Bisulphite is known to have an inhibitory effect on some *Sphagnum* moss species and deposition of nitrogen encourages rank competitors, such as the purple moor-grass. For further info: UK Air Pollution Information System (APIS).

4.4 Inappropriate site management

A further major cause of unfavourable condition on lowland raised bogs and fens is inappropriate site management. Damage to bog surfaces, by machinery or other means, directly affects the vegetation and hydrological regime and ultimately encourages sites to dry out. Over-grazing by livestock can lead to poaching, compaction, surface contamination, and loss of grazing-sensitive plants. At the other extreme, a lack of grazing coupled with drier conditions on raised bogs usually favours widespread expansion of bracken, tall heather, birch and pine.

Comparable vegetation changes occur on lowland fens and here the open vegetation is generally less stable and tends to be more dependent on moderate amounts of grazing and cutting, without which coarse vegetation, scrub and woodland readily develop. Burning was once a management tool used to ‘open’ bog vegetation and create a diverse surface structure: it is now not encouraged as it leads to loss of bog vegetation.

4.5 Fragmentation

A growing concern is the degree to which surviving lowland raised bog and fen sites are fragmented. Most surviving sites are small in size and/or isolated from another comparable patch of wetland habitat. This means that opportunities for species to disperse between sites and re-colonisation sites under-going restoration are inevitably limited.

5 Condition of UK Lowland Wetland Habitats

The condition of UK lowland wetland habitats has been assessed using Common Standards Monitoring Guidance for Lowland Wetland Habitats. This involves making an assessment of habitat condition from a nature conservation perspective. It is based on 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 lowland wetland habitats at a UK-level as reported in 2006-07.

On sites designated as SSSI/ASSIs, the condition of the majority of the two lowland wetland habitat types was either favourable or unfavourable recovering. Nevertheless, a sizeable

percentage of each was unfavourable and did not show signs of recovery. Less of these habitats was in favourable condition on SACs, but more of the lowland raised bog in unfavourable condition was recovering.

Information from SACs on lowland wetland habitats recognised under the EU Habitats Directive showed that the condition of these types varied greatly. Although in some cases most of the habitat was in favourable or unfavourable recovering condition, for others a large part was unfavourable with no signs of recovery.

Since 2006-07 the condition of some lowland wetland habitats has improved (e.g. see The State of the Natural Environment 2008).

Tables of condition of UK lowland grassland 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**
Lowland fen	41%	21%	37%	1%
Lowland raised bog	22%	35%	41%	2%

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

	Favourable	**Unfavourable recovering**	**Unfavourable not recovering**	**Destroyed or part destroyed**
Lowland fen	18%	39%	43%	-
Lowland raised bog	19%	52%	29%	-

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

	Favourable	**Unfavourable recovering**	**Unfavourable not recovering**
Lowland raised bog			
H7110 Active raised bogs	13%	65%	22%
H7120 Degraded raised bogs capable of natural regeneration	1%	88%	11%
Lowland raised bog/Lowland fen			
H7150 Depressions on peat substrates of the *Rhynchosporin* [most of this habitat occurs in upland areas]	[43%]	[26%]	[31%]
Lowland fen			
H7140 Transition mires and quaking bogs [most of this habitat occurs in upland areas]	[58%]	[1%]	[41%]
H7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	20%	12%	68%
H7230 Alkaline fens (most of this habitat occurs in upland areas)	[5%]	[30%]	[65%]

6 Protective Measures for UK Lowland Wetland Habitats

6.1 Conventions and legislation

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

- The Convention on Biological Diversity
- The Convention on the Conservation of European Wildlife and Natural Habitats
- The EU Habitats Directive
- The EU 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 1992–2012.

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 UK BAP priority habitats list. This includes two lowland wetland priority habitats: Lowland fen and Lowland raised bog

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 146 SACs, covering an area of around 17,000 ha, has been designated to represent the six UK lowland wetland habitat types listed under Annex I of the EU Habitats Directive. Information on individual UK SACs can be found in the UK SAC information spreadsheet. These were selected according to various SAC selection criteria and principles.

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 for lowland wetland habitats are available for Fens and Bogs.

The tables below shows the extent of lowland wetland habitats in SSSIs in England and Wales only. Comparable data were not available for Northern Ireland or Scotland.

Table 6.1. SSSI in England

	Area of habitat within SSSIs (ha)	**Total area of habitat (ha)**	**% of habitat within SSSIs**
Lowland raised bogs	8,270	9,690	85%
Lowland fen, marsh and swamp	13,281	22,323	59%

(created Dec 2015 from data in Biodiversity 2020 England Indicators December 2014 Report)

Table 6.2. SSSIs in Wales

	Area of habitat within SSSIs (ha)	**Total area of habitat (ha)**	**% of habitat within SSSIs**
Lowland raised bogs	1,683	1,800	94%
Lowland fen, marsh, swamp, flush and spring	1,960	6,600	30%

(created from: (i) SSSI area data from CCW Features Database April 2010; (ii) total habitat area data from Blackstock, T.H. et al. (2010) Habitats of Wales: A Comprehensive Field Survey 1979-1997, University of Wales Press)

7 Management of UK Lowland Wetland Habitats

Given the threats to lowland wetland habitats, 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 Fen Management Handbook

The Fen Management Handbook is a major publication that highlights practical techniques and provides the background science that underpins different fen management techniques. It is aimed at anyone involved in fen management, creation or restoration in the UK from a practical, policy or planning perspective.

7.2 Wetland Habitat Management for Invertebrates

Buglife has produced guidance for the management of UK BAP Priority Habitats for invertebrates, including on Lowland Raised Bogs and Fens.

7.3 Habitat Management Search Engine

JNCC has developed a customised search engine, Habitat Management on the Web, which is designed to direct users to information about how to manage UK terrestrial and freshwater habitats for biodiversity conservation.

7.4 Annex I Management Models

The European Commission has published Management Models for Annex I Habitats, including some lowland wetland examples. Each document includes information on the distribution, ecological requirements of the habitat, main trends and threats. Relevant

management actions and prescriptions are described in detail. Main constraints, risks and modifiers of the proposed management have also been included. Finally, relevant parameters for cost estimates, cost estimate examples and potential sources of EU financing are illustrated.

8 Resources for UK Lowland Wetland Habitats

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

8.1 Statutory Agencies

- Natural Resources Wales (formerly Countryside Council for Wales)
- Environment Agency
- Natural England
- Northern Ireland Environment Agency
- Scottish Natural Heritage
- Scottish Environment Protection Agency

8.2 Datasets

- National Biodiversity Network Gateway
- Atlas of the British and Irish flora
- Nature on the Map
- Natural England GIS Digital Boundary Datasets
- Countryside Survey
- JNCC NVC distribution maps
- CCW Phase 1 habitat survey

8.3 Portals

- European Commission LIFE Programme

8.4 Partnership projects

- Beckingham Marshes - Wetland Restoration
- England Wetland Vision
- Great Fen Project
- Humberhead Levels Partnership
- Little Ouse Headwaters Project
- New Forest LIFE Wetlands Project
- River Till Wetland Restoration Project
- The Broads Authority
- Wicken Fen Vision