



Fen and Marsh Habitat Action Plan

1. Introduction

Fen and marsh vegetation is groundwater-fed permanently, seasonally or periodically waterlogged peat, peaty or mineral soils where grasses do not predominate. It also includes emergent vegetation or frequently inundated vegetation occurring over peat or mineral soils. It does not include areas of carr that are greater than 0.25ha nor wet grassland (with the exception of purple moor grass, reed, or sweet-grass dominated vegetation), which is included in the Coastal and floodplain grazing marsh habitat type (UKBAP) and Lowland wet grassland (County BAP).

UKBAP Priority habitats relating to this HAP are Fens, Coastal and floodplain grazing marsh, Saltmarsh, and Purple moor grass and rush pastures.

The UK is thought to host a large proportion of fen surviving in the EU. As in other parts of Europe, fen vegetation has declined dramatically in the past century. Peatland habitats have been identified as major contributors to carbon storage and their degradation leads to the release of thousands of tonnes of CO₂ into the atmosphere every year.

Within the county fen and marsh, as with other wetland habitats, have undergone a serious decline in extent and quality. Sites are fragmented, generally small in size and under threat from a range of factors (see below). They were common throughout the county and would have been found on low-lying river floodplains particularly on the Severn and Avon in conjunction with wet grasslands. These habitats still support some of Worcestershire's rarest species in sedge or tall herb dominated mire and swamp communities.

2. Current Status

2.1 Description of Habitat

Fens are peatlands that receive water and nutrients from the soil, rock and ground water as well as from rainfall: they are minerotrophic. Two types of fen can broadly be distinguished: topogenous and soligenous. Topogenous fens are those where water movements in the peat or soil are generally vertical. They include basin fens and floodplain fen. Soligenous fens, where water movements are predominantly lateral, include mires associated with springs, rills and flushes in the uplands, valley mires, springs and flushes in the lowlands, trackways and ladder fens in blanket bogs and laggs of raised bogs.

Fens can also be described as `poor-fens` or `rich-fens`. Poor-fens, where the water is derived from base-poor rock such as sandstones and granites occur mainly in the uplands, or are associated with lowland heaths. They are characterised by short vegetation with a high proportion of *Sphagnum* spp. bog mosses and acid water (pH of 5 or less). Rich-fens are fed by mineral-enriched calcareous waters (pH 5 or more) and are mainly confined to the lowlands and where there are localised occurrences of base-rich rocks such as limestone in the uplands. Fen habitats support a diversity of plant and animal communities. Some can contain up to 550 species of higher plants, a third of our native plant species,

up to and occasionally more than half the UK's species of dragonflies, several thousand other insect species, as well as being an important habitat for a range of aquatic beetles.

Marsh is found on mineral soils and is defined as periodically inundated pasture or meadow with ditches, which help to maintain water levels, containing standing brackish or freshwater. The ditches are especially rich in plants and invertebrates. Mostly grazed, some are also cut for hay or silage. Sites may contain permanent ponds, seasonally wet hollows and areas of emergent swamp although not tall fen species like reeds. Areas of marsh are important for breeding waders especially *Vanellus vanellus* lapwing, *Numenius arquata* curlew and *Gallinago gallinago* snipe. However, only a very small proportion of marsh is semi-natural and capable of supporting a high diversity of plant species.

Swamp and tall herb fen habitats are characterised by the fact that the water table is at or above the soil surface for most of the year. They tend to be botanically species-poor (e.g. reedbeds) relative to other wetland habitats.

Fen and marsh habitats are often found in association with other wetlands such as open water, ditches, lowland wet grassland and wet woodland.

2.2 Distribution and extent

A county wetlands survey in 1998 by Liley (1999) indicates that remaining fen and marsh communities total only 53ha in area. Although this is a minimum estimate (some small sites may not have been surveyed likewise riparian fen habitats e.g. along rivers or ditches) it is felt that this is still an accurate representation of extent (Liley, pers. comm. 2007).

Table 1. Description of NVC communities containing fen, marsh and swamp vegetation within Worcestershire as surveyed by Liley (1999).

NVC Code	Community Description
S3	<i>Carex paniculata</i> sedge swamp (0.16ha) Dominated by tussocks of greater tussock sedge with open water or silt and a sparse flora between, sometimes with young willows or alders.
S5	<i>Glyceria maxima</i> swamp (2.09ha) Dominated by dense stands of reed sweet-grass, which may form large collapsed mats with little else other vegetation.
S6	<i>Carex riparia</i> swamp (4.79ha) A dense canopy of greater pond sedge up to 1 metre high, usually with a poor associated flora.
S7	<i>Carex acutiformis</i> swamp (7.13ha) Similar to S6, but dominated by the lesser pond sedge. Sometimes a sparse tall herb component.
S8	<i>Scirpus lacustris</i> swamp (0.16ha) This community, dominated by common bulrush, is more often found along rivers in Worcestershire but sometimes occurs around pools and very wet marshes.
S9	<i>Carex rostrata</i> swamp (0.3ha) Bladder sedge dominates this species poor swamp, which tends to occur in fairly shallow water in pools or in swamps.
	<i>Carex vesicaria</i> swamp (0.36ha)

S11	Although bottle sedge often dominates this community in shallow water there can be other species such as soft rush, sometimes in reasonable amounts.
S12	<i>Typha latifolia</i> swamp (4.18ha) Common reedmace is always dominant, frequently with no other species present.
S13	<i>Typha angustifolium</i> swamp (0.56ha) This is dominated by lesser reedmace, which prefers more basic water around pools with silty substrate.
S14	<i>Sparganium erectum</i> swamp (1.33ha) This typical sub-community is normally species poor with the branched bur-reed overwhelmingly dominant.
S18	<i>Carex otrubae</i> swamp (0.06ha) False fox sedge swamp normally forms narrow and usually fragmented stands between other communities.
S19	<i>Eleocharis palustris</i> swamp (0.27ha) Common spike rush forms narrow strips around pools, often in such small amounts to not be measurable.
S20	<i>Scirpus lacustris</i> ssp <i>tabernaemontanii</i> swamp (3.36ha) Glaucous clubrush is always dominant, sometimes with other species but often alone.
S22	<i>Glyceria fluitans</i> water margin (2.0ha) This is dominated by a low floating mat of floating sweet-grass, normally around the edges of pools. Sometimes other species are present in shallow water.
S23	Mixed water margin vegetation (0.49ha) This is a ditch/river/pond margin habitat, normally narrow and with a wide range of plants such as <i>Myosotis scorpioides</i> water forget-me-not, <i>Mentha aquatica</i> water mint, <i>Apium nodiflorum</i> foals watercress and <i>Berula erecta</i> lesser water parsnip.
S28	<i>Phalaris arundinacea</i> tall herb fen (3.36ha) This is always a species poor community dominated by reed canary grass.
SM23	<i>Spergularia marina</i> - <i>Puccinella distans</i> salt marsh (0.26ha) Sea spurrey and salt marsh grass dominate a sparse turf where salt excludes most species
SM28	<i>Elymus repens</i> salt marsh (0.7ha) This community is dominated by dense stands of salt tolerant couch grass within which few other plants grow.
M22	<i>Juncus subnodulosus</i> - <i>Cirsium palustre</i> fen-meadow (8.42ha) Dominated by dense blunt flowered rush with other rushes and sedges. Marsh thistle often common. Mainly on base rich soils and peat.
M23	<i>Juncus effusus</i> / <i>acutiflorus</i> - <i>Galium palustre</i> rush-pasture (3.4ha) Either soft or sharp flowered rushes dominate often within a species rich sward, marsh bedstraw common.
M25	<i>Molinia caerulea</i> - <i>Potentilla erecta</i> mire (0.51ha) Purple moor grass dominates this habitat with other acid wet ground species such as cottongrass, tormentil and some rushes.
M27	<i>Filipendula ulmaria</i> - <i>Angelica sylvestris</i> mire (7.61ha) Meadowsweet is normally very dominant with angelica being one of a

	number of minor tall herbs. Usually on rich soils protected from grazing.
WE27	<i>Epilobium hirsutum</i> weed community (1.36ha) Greater willowherb dominates this tall herb community on damp ground normally along riverbanks and in areas of ungrazed marsh.
Unknown	Dominants <i>Scirpus sylvaticus</i> - <i>Carex pseudocyperus</i> (0.76ha) On several sites, areas of swamp dominated by wood clubrush and cyperus sedge occur.

Total = 53.62ha

The wetland survey looked at the 88 most important wetlands in the county. Obviously, there are other wetland communities to be found outside of these 88 sites but these are expected to be small and found in conjunction with other habitats, e.g. riparian zones and field corners. Sedge and tall herb fen communities are considered to be most under-represented perhaps adding another 100ha in total.

2.3 Legislation and site designation

There are 18 SSSIs designated at least in part for their fen, marsh and swamp interest. Of these the largest are Wilden Marsh, Stourvale Marsh, Puxton Marsh, Upton warren and Feckenham Wylde Moor.

2.4 Summary of important sites

Historically, the largest wetland complex in the county was Longdon Marsh and this would have supported large areas of fen, marsh and swamp. However, the marsh was drained in the late nineteenth century and little semi-natural habitat now remains.

At Upton Warren near Droitwich the second most important British inland saltmarsh has developed around a series of saline pools created through subsidence as a result of brine extraction.

In the east of the county a series of fens occur notably Ipsley Alders and Feckenham Wylde Moor SSSIs. Both are examples of "rich" fens. Examples of acid marsh or fens are rare in the county but small tracts can be found at Castlemorton and Ashmoor commons.

3. Current factors affecting the habitat

- Groundwater abstraction and/or field drainage has lowered water tables in some areas so that many important fen and marsh sites are now drying out leading to changes in vegetation communities. This results in a loss of quality and extent of target habitat.
- Reduction in ground water levels has resulted in the oxidation and erosion of organic soils and the loss of dependent flora and fauna. Where organic soils are lost from wetland sites future restoration becomes difficult or even impossible.
- Geographical and ecological isolation of sites has increased as abstraction and drainage have been carried out. Genetic exchange

between these sites is therefore decreasing and individual sites are becoming more vulnerable to environmental change.

- Engineering works for flood alleviation (including river channel re-sectioning and creation of flood defences) has reduced water supply to floodplain sites e.g Wilden Marsh SSSI. This results in a loss of quality and extent of target habitat.
- Water quality in many rivers has become increasingly eutrophic as a result of agricultural and urban pollution. Floodplain sites inundated with this water will become enriched with plant nutrients which in turn will result in changes to plant communities
- Increasing encroachment of alien species, for example *Impatiens glandulifera* Himalayan balsam and *Fallopia japonica* Japanese knotweed.
- Climate change may affect rainfall patterns resulting in changes to water supply to sites (e.g. total amount, seasonality etc).
- Inappropriate management of sites, in particular those within urban fringe areas. There may also be problems with anti-social behaviour (fly-tipping, arson etc).
- Housing and industrial development can lead to additional abstraction from aquifers and further lowering of the water table.
- Ineffective dissemination of advice and information from nature conservation organisations to site managers/owners.
- Limited funding available through Natural England's Environmental Stewardship Scheme to protect existing sites or to fund restoration/creation programmes.
- Poor economic incentive for landowners to manage fen and marsh habitats appropriately. More advice and resources are required to encourage activities such as local branding schemes to "add value" to these habitats and encourage sympathetic management.

4. Current Action

4.1 Local protection

SSSI designations are used to protect some of the most valuable sites within the county. Special Wildlife Sites (SWS) are non-statutory but help identify valuable sites for protection through the development control process.

4.2 Habitat management and programmes of action

- Nature Reserves managed by Worcestershire Wildlife Trust.
- SSSI sites managed by Natural England, Worcestershire Wildlife Trust and private landowners.

- Natural England, Environment Agency and Worcestershire Wildlife Trust are undertaking a feasibility study into the restoration of Wilden Marsh SSSI to favourable condition.
- Many of the county's most important fen and marsh sites are managed under agri-environment agreements (CSS and ES) overseen by Natural England.
- Worcestershire Wildlife Trust provides advice to owners/managers of sites on management/creation and restoration opportunities.

4.3 Survey, research and monitoring

- The Worcestershire Habitat Inventory project being undertaken by Worcestershire County Council will result in a land use and habitat inventory on a field-by-field basis of the whole county.
- Botanical and hydrological monitoring being carried out at Wilden Marsh SSSI.
- Worcestershire Wildlife Trust Wetlands Survey includes all fen and marsh totalling 88 sites.
- Lakes Survey carried out by Worcestershire Wildlife Trust includes some riparian information that covers areas of fen and marsh.
- It is intended that the SWS review being undertaken by Worcestershire Wildlife Trust on behalf of the Worcestershire Special Wildlife Site Partnership will identify the current status of fen and marsh SWS and where action is needed to conserve and enhance the resource.

5. Associated plans

Reedbeds, Lowland Wet Grassland, Wet Woodland, Ponds and Lakes, Rivers and Streams, Canals, Otter, Water Vole, Great Crested Newt.

6. Vision statement

To conserve and enhance the quality and extent of all current fen and marsh sites and create and restore additional sites in order to enhance ecological resilience in the light of climate change and other environmental pressures.

7. Targets

Target Type	Target Text	Baseline value	Target Value	Target Timescale
Maintain Extent	Use the County Habitat Inventory to produce an audit of all the fen and marsh sites in the county	0 ha of county surveyed and analysed	173,529ha	2009
Restore	Prioritise 20 sites for action on the basis of greatest ability to assist with adaptation to climate change	0	20	2010

8. Actions

Action Code	Action Category	Action Text	Location	Complete Action By	Lead Organisation	Supporting Organisations
WRC FAM CA 01	2.1	Use existing sites to demonstrate and encourage good management practice.	Feckenham Wylde Moor	2017	WWT	NE
WRC FAM CA 02	2.11	Maintain communication links with owners of SSSI's. Ensure up to date guidance is provided for SSSI owners.	Worcestershire	2017	NE	
WRC FAM CA 03	2.11	Maintain communication links with owners of Special Wildlife Sites. Ensure up to date guidance is provided for Special Wildlife Site owners.	Worcestershire	2017	WWT	SWS Partnership
WRC FAM CA 04	2.11	Collate existing information into an advice pack on management of fen and marsh habitats and distribute as appropriate to landowners and conservation agencies.	Forest of Feckenham	2010	WWT	SAVWP
WRC FAM CA 05	2.15	Provide 5 training opportunities for landowners for management of fen and marsh sites.	Worcestershire	2017	FWAG	WWT
WRC FAM HS 01	6.15	Identify SSSI sites where current grazing is detrimental to management objectives. Identify remedial measures required to achieve favourable management on SSSI sites.	Worcestershire	2010	NE	WWT

WRC FAM HS 02	6.15	Identify SWS sites where current grazing is detrimental to management objectives. Identify remedial measures required to achieve favourable management on SWS's.	Forest of Feckenham	2010	WWT	
WRC FAM FR 01	4.11	Establish resources required to implement suitable grazing management on SSSI's.	Worcestershire	2010	NE	
WRC FAM FR 02	4.11	Establish resources required to implement suitable grazing management on SWS's.	Forest of Feckenham	2010	WWT	
WRC FAM HS 03	6.4	Discuss and implement management regime with landowner and ensure objectives are understood on SSSI's.	Worcestershire	2010	NE	
WRC FAM HS 04	6.4	Discuss and implement management regime with landowner and ensure objectives are understood on SWS's.	Forest of Feckenham	2010	WWT	
WRC FAM HS 05	6.12	Where appropriate ensure that fen and marsh habitat is included within high quality, nature conservation-focused restoration plans for the after-use of minerals sites.	Worcestershire	2017	WCC	NE, WWT
WRC FAM HS 06	6.12	Ensure that there are no adverse impacts on adjacent wetland sites resulting from extraction permissions granted.	Worcestershire	2017	WCC	NE, WWT
WRC FAM CP 01	3.7	Provide a range of media, including interpretation boards, websites and leaflets and organise events to the promote health, educational and economic benefits of sites.	Worcestershire	2017	SAVWP	WWT, NE

WWT – Worcestershire Wildlife Trust **NE** – Natural England **SAVWP** – Severn and Avon Vales Wetlands Partnership
FWAG – Farming and Wildlife Advisory Group **WCC** – Worcestershire County Council

SAVWP – Severn and Avon Vales Wetlands Partnership consists of the following organisations: Environment Agency, Natural England, The Wildlife Trusts, Farming and Wildlife Advisory Group, Defra, National Farmers Union, Association of Drainage Authorities, County and Local Councils, Royal Society for the Protection of Birds, Wildfowl and Wetlands Trust, Severn Trent Water.

The **SWS Partnership** consists of the following organisations: Bromsgrove District Council, Country Landowners Association, Environment Agency, Farming and Wildlife Advisory Group, Malvern Hills District Council, National Farmers Union, Natural England, Redditch Borough Council, Worcester City Council, Worcestershire County Council, Worcestershire Wildlife Trust, Wychavon District Council, Wyre Forest District Council.

References and further information

Liley, M (1999). *Worcestershire's Wetlands: report of 1998 botanical survey*. Worcestershire Wildlife Trust.

<http://www.naturalengland.org.uk/press/releases2007/161107.htm>