

## **Priority Habitat Definition Statement Fens v1.3**

### **1. Introduction**

#### **1.1 General description**

1.1 Fens occur on soils that are at least periodically waterlogged. They range from small to extensive (Insh Marshes, Broadland), but are generally circumscribed and limited in extent by agricultural or forestry activity. Its decline in the past century is described as 'dramatic' (UK Fen HAP). The category encompasses a range of water supply mechanisms. Variety also arises from differences in the constituents of the water, its levels fluctuation and its movement.

#### **1.2 Summary of existing information**

Divisions between fen and other habitats, particularly bogs, are reviewed by Wheeler & Proctor (2000). Water supply mechanisms, as a means of delimiting fens and understanding their function, is developed by Wheeler & Shaw (2000). UK countries have their own databases, most using FenBASE (Wheeler, 1998). These datasets do not delineate site or habitat boundaries. Statutory nature conservation bodies (at least, EN) have digitised site boundaries, but the edges of component habitats are not digitised.

#### **1.3 Key issues with mapping and discriminating from other habitats**

Key issues relate to boundaries with wet woodland (actually fen carr), wet heath, wet grassland, brackish waters and bog; the precision of division is arbitrary. Concerning minimum size, it must be remembered that some spring fens are very small, but important, e.g. petrifying springs.

- Please refer to Section 9 for instructions on dealing with relationships with other habitats, and Section 11 for size of mappable units.
- Areas of semi-natural or artificial habitat totally within an area of this priority habitat should be included in the polygon for this priority habitat polygon, if <0.25ha.

### **2. Physio-graphical description**

#### **2.1 Structural/physical components**

Fens are fed by rainwater, groundwater and/or surface water. The water source provides few mappable features and differences are more apparent in the physiognomy of the vegetation. Fens with a short sward, often those which are spring-fed and/or nutrient poor, may have surface patterning caused by the retention and flow characteristics of the water – ridges, pools, lawns and hummocks. The extent of these may be used to delimit the fen. Patterning is not evident in fens with a tall sward, usually fed predominantly by overbank flooding with nutrient rich water, as any ground features are obscured. The edge of particular stands of a tall plant species, or mix of species, may be clear-cut, but it important to realise that the extent of a vegetation type is highly dynamic and may not be coincident with the extent of the fen.

## **2.1 Applicability of aerial photos and other remote sensing technologies.**

May be useful in determining the extent of surface patterns and of fen vegetation where this contrasts with surrounding crops, short grassland or bare ground. Soil patterning may also indicate an earlier extent of the fen, such as through the presence of a dark peaty soil. Also tone differences responding to degrees of hydration.

## **3. Altitudinal limits**

Fens extend into the uplands, though with a reduced variety of types. Spring and seepage fens and terrestrialising lake margins are particularly common in the uplands, and some components of blanket mire are also fen.

## 4. Habitat classification

CLASSIFICATION and version date	CODE	DESCRIPTION	RELATIONSHIP*	COMMENTS
<b>BAP priority habitat (1995)</b>		Fens		
<b>BAP broad habitat (1998)</b>		Fen, marsh and swamp	>	
<b>Phase 1 (1990)</b>	E2 E3 F1	Flush and Spring Fen Swamp		These codes may also include areas of other wetland habitat.
<b>NVC (1991)</b>		NVC: All the 'M' series, with the <u>exception</u> of M15, M16, M17, M22, and M23 are associated with some kind of fen; all the 'S' series is similarly associated. It is not helpful at this point to make distinctions based on perceived conservation values of different fen types. Some eutrophic fens, for example, may be very valuable for invertebrates. S4 needs to be separated because it forms a subset - reedbed. Lack of clarity extends to M15-17, as these are heathlands, and M22-24, which are grasslands. The difference between there being a fen or a grassland can rest with the management regime.		Flushes, pools and soakaways (eg M29 onwards) are excluded. S26 <i>Phragmites australis</i> – <i>Urtica dioica</i> fen has also been excluded as it is a species-poor community resulting from eutrophication, and consequently is not priority habitat.
<b>EUNIS</b>	D2.2 D4	Poor fens Base-rich fens	< <	
<b>Palaeartic</b>	54.2 54.4	Rich fens Acidic fens	< <	
<b>CORINE (1991)</b>	4.1.1	Inland marshes	>	

<b>Habitats Directive Annex 1 (1997)</b>	7210 7230	Transition mire, alkaline fen, calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> , some depressions on peat substrates ( <i>Rhynchosporion</i> ), petrifying springs with tufa formation and alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i> ;	< <	
<b>Habitats Directive Annex 1 (later version)</b>				
<b>IHS (2001)</b>	EM/P/31	Fens [lowland]	=	

\* relationship of classification type to priority habitat:  
= equal, < narrower, > wider, # overlap, ? not determined

## 5. Species composition

### 5.1 Flora

Fens have a variety of wetland species, which can survive seasonal inundation. Several of the communities are characterised by, but not dominated by, large calcicolous monocots, including *Cladium mariscus*, *Schoenus nigricans* and *Phragmites*. Accompanying these taller species are other wet meadow dicotyledons such as *Filipendula ulmaria*, *Iris pseudacorus*, *Valeriana officinalis* and *Rumex acetosa*.

### 5.2 Fauna

Fen is also an important habitat for biodiversity species. A list of priority species associated with this habitat is included as **Appendix 2** (from Biodiversity - Making the Links, English Nature Biodiversity series).

## 6. Geographical restrictions

### 6.1 Geographical coverage and restrictions in the UK

Fens extend throughout the UK, but there are regional preferences. For example, rivers and their floodplains determine the distribution and extent of M27 and some others. Plotting NVC communities in FenBASE would assist here.

The dependence on a wet climate is ameliorated by the role of land surface and aquicludes in collecting and channelling the water in its passage from the point of contact to the lowest point in the land, or to the sea. Fen develops where this provides sufficiently wet conditions.

### 6.2 Climate requirements

None known.

## **7. Geology and soils**

Fens are usually found on peat. However, NVC communities M13 and M14 may be found on either mineral or peat soils, and M27 and M28 tend to be found on mineral soils. S25 is found in eutrophic situations, and the remainder in mesotrophic or oligotrophic sites.

## **8. Hydrology**

Fen is sustained where atmospheric water has made contact with a substrate from which it picks up additional constituents, that in turn go a long way towards determining the nature of the vegetation. Thus, the chemistry of rocks and soils is important, as are the land-uses within the catchment, and that may contribute via the atmosphere. The typology of fens is largely determined by hydro-geology and topography. The rate of passage of water (aeration), its absolute level relative to the surface, and its fluctuations are all important factors.

## 9. Relationship with other habitats

	<b>Fens</b>
<b>Ancient and/or species rich hedgerows</b>	Allowable overlap. Hedges will be mapped as linear features and should not artificially sub-divide contiguous areas of fen.
<b>Blanket bog</b>	Small areas of other habitats, including fen will be mapped as part of blanket bog and noted where considered significant in the " <i>additional habitat features</i> " field.
<b>Coastal and floodplain grazing marsh</b>	Fen is not usually grazed and is unlikely to be intersected by drainage channels. Small areas of Fen may occur within CFPGM habitat. If these areas are > than MMS (0.25ha?) then they should be recorded as Fen and NOT as CFPGM. In general grazing marshes will have a dominant grassland component.
<b>Lowland heathland</b>	Separate based on broad habitat distinction. Heath must be 25% or more Erica or small Ulex cover.
<b>Lowland meadows</b>	Separate based on NVC communities.
<b>Lowland raised bogs</b>	Where lowland raised bogs have a fringe of fen type vegetation (acting as the lagg) then they will be mapped as part of the lowland raised bog and attributed in the " <i>additional habitat features</i> " field, unless the area of fen is easily separated and of sufficient area (0.25 ha) to be mapped as a separate polygon.
<b>Maritime cliffs and slopes</b>	Allowable overlap.
<b>Mesotrophic and Eutrophic standing waters</b>	Fen fringes to water bodies are mapped as part of the water body if less than 5 metres in width (see broad habitat definition). Use standard polygon and MMU rules.
<b>Purple moor grass and rush pasture</b>	Caution must be exercised when assigning Priority habitat solely on the basis of NVC. M25 type vegetation may be found on modified lowland raised bog, purple moor grass and rush pastures such as the Culm grasslands of the SW and the fen fringe of bog sites. An understanding of the situation it occurs in is required before assigning it to a Priority habitat type.
<b>Reedbeds</b>	Reed bed will be treated as a subset of fen. Where an area is considered to in general exceed 60 % Phragmites cover then it will be mapped in both the reed bed inventory and the fen inventory. This will allow the reed bed constituent of the fen inventory to be separated out in a GIS for reporting purposes but reflects reedbeds ecological relationship with fen.
<b>Sand dunes</b>	Allowable overlap.
<b>Upland heathland</b>	Separate based on broad habitat distinction. Heath must be 25% or more Erica or small Ulex cover. Altitude also applies.
<b>Wet woodland</b>	Separate by broad habitat guidance, and specifically 20% or greater canopy cover. Carr woodland has a very close relationship with fen and may prove difficult to separate when mapping. If it is impossible to accurately assess whether tree cover is greater than 20% then areas may be mapped as fen but in the with " <i>probably the habitat</i> " recorded in the Pridet field and a justification given in the Pridet comment field.

## **10. Management**

Some fen communities are grazed, and this often determines which community emerges in a particular instance. A little more care is required to determine which these are, look at the NVC accounts.

## **11. Size of mappable units**

**Minimum mappable unit (MMU): 0.25 ha**

Some spring fens are very small, but important, e.g. petrifying springs.

## **12. Regional differences**

## **Appendix 1**

### **Information Sources**

NCC (1990). Handbook for Phase 1 habitat survey: a technique for environmental audit field manual NCC, Peterborough

English Nature (1999) Biodiversity : making the links. English Nature

EUNIS website [[www.mrw.wallonie.be/dgrne/sibw/EUNIS/](http://www.mrw.wallonie.be/dgrne/sibw/EUNIS/)]

Fojt, W.J. (1989). Quick reference to fen vegetation communities.

Jackson, D.L. (2000). Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): Definitions and the relationship with other habitat classifications. JNCC Report, No. 307.

Rodwell, J. S.(ed) (1995). British Plant Communities Vol. 4 Aquatic communities, swamps and tall-herb fens. Cambridge University Press.

Rodwell, J. S. (ed.) (1991). British Plant Communities Vol. 2. Mires and Heaths. Cambridge University Press.

SERC (2001) The Integrated Habitat System.

Anon. (1998). UK Biodiversity group: Tranche 2 Action Plans. Volume II – terrestrial and freshwater habitats.

## Appendix 2

### BAP priority species associated with Fens

(From "Biodiversity - Making the Links" - 28 June 2000 version)

Scientific name	Common name	Taxon	Priority list	Importance of habitat to the species *
<i>Armillaria ectypa</i>	an agaric	Fungi	SAP	P
<i>Clubiona rosserae</i>	a spider	Spider	SAP	P
<i>Cryptocephalus exiguus</i>	a leaf beetle	Beetle	SAP	P
<i>Dolomedes plantarius</i>	Fen raft spider	Spider	SAP	P
<i>Donacia aquatica</i>	a reed beetle	Beetle	SAP	P
<i>Donacia bicolora</i>	a reed beetle	Beetle	SAP	P
<i>Dromius sigma</i>	a ground beetle	Beetle	SS	P
<i>Eurodryas aurinia</i>	Marsh fritillary	Butterfly	SAP	P
<i>Hamatocaulis vernicosus</i>	Slender green feather-moss	Moss	SAP	P
<i>Hemaris tityus</i>	Narrow-bordered hawk-moth	Moth	SAP	P
<i>Hydrometra gracilenta</i>	Lesser water measurer	True bug	SS	P
<i>Laccophilus ponticus/poecilus</i>	a diving beetle	Beetle	SAP	P
<i>Liparis loeselii</i>	Fen orchid	Vascular plant	SAP	P
<i>Lycaena dispar</i>	Large copper	Butterfly	SAP	P
<i>Nitella tenuissima</i>	Dwarf stonewort	Stonewort	SAP	P
<i>Oberea oculata</i>	a longhorn beetle	Beetle	SAP	P
<i>Odontoymia hydroleon</i>	a soldierfly	Fly	SAP	P
<i>Pterostichus aterrimus</i>	a ground beetle	Beetle	SAP	P
<i>Saxifraga hirculus</i>	Yellow marsh saxifrage	Vascular plant	SAP	P
<i>Schrankia taenialis</i>	White-line snout	Moth	SS	P
<i>Sium latifolium</i>	Greater water-parsnip	Vascular plant	SAP	P
<i>Stethophyma grossum</i>	Large marsh grasshopper	Cricket	SAP	P
<i>Vertigo moulinsiana</i>	Desmoulin's whorl snail	Mollusc	SAP	P
<i>Acrocephalus paludicola</i>	Aquatic warbler	Bird	SAP	S
<i>Athetis pallustris</i>	Marsh moth	Moth	SAP	S
<i>Badister peltatus</i>	a ground beetle	Beetle	SS	S
<i>Botaurus stellaris</i>	Bittern	Bird	SAP	S
<i>Emberiza schoeniclus</i>	Reed bunting	Bird	SAP	S
<i>Hirudo medicinalis</i>	Medicinal leech	Worm	SAP	S
<i>Melanapion minimum</i>	a weevil	Beetle	SAP	S
<i>Rana lessonae</i>	Pool frog	Amphibian	SAP	S
<i>Triturus cristatus</i>	Great crested newt	Amphibian	SAP	S
<i>Vertigo angustior</i>	Narrow-mouthed whorl snail	Mollusc	SAP	S
<i>Vertigo geyeri</i>	a whorl snail	Mollusc	SAP	S
<i>Arvicola terrestris</i>	Water vole	Mammal	SAP	X
<i>Calamagrostis scotica</i>	Scottish small-reed	Vascular plant	SAP	X
<i>Chara curta</i>	Lesser bearded stonewort	Stonewort	SAP	X
<i>Chrysis fulgida</i>	a ruby-tailed wasp	Wasp	SAP	X
<i>Hydroporus rufifrons</i>	a diving beetle	Beetle	SAP	X
<i>Jamesoniella undulifolia</i>	Marsh earwort	Liverwort	SAP	X
<i>Laphozia rutheana</i>	Norfolk flapwort	Liverwort	SAP	X
<i>Lutra lutra</i>	Otter	Mammal	SAP	X
<i>Panagaeus cruxmajor</i>	a ground beetle	Beetle	SAP	X

Pilularia globulifera	Pillwort	Vascular plant	SAP	X
Pipistrellus pipistrellus	Pipistrelle bat	Mammal	SAP	X
Tolypella prolifera	Great tassel stonewort	Stonewort	SAP	X
Bidessus unistriatus	a diving beetle	Beetle	SAP	?

\* (P) primary, (S) secondary or (x) less