

LOWLAND FENS IN OXFORDSHIRE

1. INTRODUCTION

A fen is a type of mire which receives at least part of its water and nutrients from soil, rock or groundwater, as well as rainfall. Fens contrast with bogs which mainly receive water and nutrients from rainfall alone (Fojt, 1994). Fens are commonly divided into 'rich-fen', which is fed by calcium rich water, and 'poor-fen' which is typically acid and has low fertility.

Topogenous fens are those where water movements in the peat or soil are generally vertical. They include basin fens and floodplain fen. Soligenous fens are where water movements are predominantly lateral and include mires associated with springs, valley mires, springs and flushes in the lowlands.

Swamps are seasonally inundated wetlands often found at the margins of ponds, lakes and rivers, in ditches and in some riverside fields. These areas are often dominated by large sedges (greater and lesser pond sedges and greater tussock sedge) and other reeds (reed sweet-grass and reed canary grass).

Flushes are small mires (acid, neutral or alkaline), which typically develop as waterlogged areas where spring water spreads over the ground.

UK Biodiversity Group - Priority Species associated with fens and flushes:

Water vole
Reed bunting
Southern damselfly
Desmoulin's whorl snail

UK Biodiversity Group - Species of Conservation Concern

Reed warbler
Sedge warbler
Soldierfly, *Oxycera terminata*
Soldierfly, *Oxycera analis*
Soldierfly, *Odontomyia argentata*
Soldierfly, *Stratiomys chamaeleon*
Fen violet
Marsh helleborine
Marsh valerian

Associated Habitats

Grazing marsh
Lowland Meadows

2. CURRENT STATUS

2.1 Current status in the UK

2.1.1 Habitat extent

Fen is a nationally rare and threatened habitat. Most fens are small (less than 10ha) and isolated. In Britain, the largest areas of fen occur in Broadland and in the Insh Marshes on Speyside in Scotland. Other important sites are more scattered. At present, no data are available on the total area of fen habitat in Britain.

Flushes occur in many areas of Britain, but there have been no national estimates of their number or extent.

2.1.2 Biological status

High quality fens are typically diverse habitats, rich in wetland plant and invertebrate species, including many rarities. The National Vegetation Classification recognises 68 plant communities with a fen component. These support over 650 plant species, many of which are more-or-less specific to fens (Wheeler,



Marsh helleborine
Epipactis palustris

1993). Fen invertebrate communities can also be rich, and can include a range of species, from peatland generalists to fen specialists (Kirby, 1992). Fen sites are often richest for invertebrates where they incorporate a range of habitats and successional stages from pools to fen carr. Extensive areas of fens also support important bird populations (e.g. marsh harrier, Cetti's warbler, snipe) (Fuller, 1982).

Flushes often have a long hydrological continuity which can allow rich and mature floral and faunal communities to develop over time. Particularly high quality flushes are often associated with spring lines where flushes are abundant (Lott, 1999). Unfortunately, the biodiversity value of these small wetlands is typically poorly documented, and their potential is little recognised even amongst conservation bodies. However, flushes can support elements of both rich- and poor-fen plant communities, and are recognised as an important habitat for groups such as soldier flies, crane flies and water beetles.

2.2 Current status in Oxfordshire

2.2.1 Habitat extent and physico-chemical status

Oxfordshire, particularly the Midvale Ridge Natural Area, supports the largest concentration of calcareous fen in southern England (English Nature, 1997a). In total there are about 20 major fen sites in Oxfordshire varying from relatively intact, nationally outstanding, sites such as Cothill Fen and Parsonage Moor, as well as other sites such as Barrow Farm Fen and Weston Fen. Cothill Fen is of particular value because it includes one of the few remnants of calcareous valley fen in central England.

Fen sites are widely distributed throughout the county but the main concentration is centered on two tributaries of the River Ock draining the Corallian sandstone: the Sandford Brook and the Marcham Brook. Approximately 25% of the rich fens recognised in the county by English Nature are found in this area.

Apart from the sites in the Cothill and Frilford area, most fens in Oxfordshire are small in area. There are also a smaller number of others in and around Oxford, including the acidic fens in Shotover.

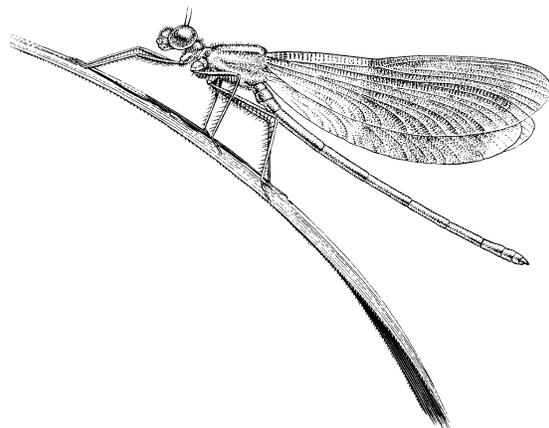
There has not been a comprehensive survey of springs and flushes in the county but a survey in the Midvale Ridge Natural Area located over 180 sites. In practice, springs and flushes probably occur in all areas of the county where permeable rocks (e.g. chalk, Greensand, Corallian sandstone) meet impermeable horizons of silt or clay.

2.2.2 Biological status

Oxfordshire fens are particularly important for three main mire vegetation types: M13 *Schoenus nigricans*-*Juncus subnodulosus* fen meadow, M22 *Juncus subnodulosus*-*Cirsium palustre* fen-meadow and M24 *Molinia caerulea*-*Cirsium dissectum* fen meadow. These communities include a number of regionally and nationally uncommon plant species (cf 2.3).

For invertebrates, Oxfordshire fens provide an important habitat type for a range of wetland and aquatic species. Some sites are exceptionally rich in rare species including Desmoulin's whorl snail, southern damselfly and the soldierfly *Stratiomys chamaeleon*. *S.chamaeleon*, along with other specialist species such as *Oxycera analis*, are strongly associated with Tufa depositing flushes.

Fens in Oxfordshire also support small populations of reed bunting and reed warbler and may contribute areas of high quality habitat for otter and water vole. Individual fen sites, such as Cothill, provide valuable habitats for water shrew and harvest mouse (M. Reid, pers. comm.).



Southern Damselfly *Coenagrion mercuriale*

2.3 Priority species

Only one Oxfordshire Priority BAP plant species is a fen plant (Norfolk flapwort, which now appears to be extinct in the county). However, fen assemblages in Oxfordshire support a range of regionally uncommon plants including marsh helleborine, blunt-flowered rush and black bog-rush. The Cothill district supports the only population in central southern England of fen pondweed.

Fens are an important habitat for a range of wetland invertebrates and some sites are exceptionally rich in rare species. BAP invertebrate species occurring in fens in Oxfordshire are Desmoulin's whorl snail and southern damselfly. The soldierfly *Stratiomys chamaeleon*, a species of conservation concern, is also found in the county but only at Cothill Fen.

Oxfordshire fens support small populations of BAP bird and mammal species (e.g. reed bunting, reed warbler, water vole); the importance of these populations is difficult to gauge as there is too little survey information to assess the current position.

Species associated with flushes have been poorly recorded in the county. However, flushes on Shotover and in the Lye Valley have long been known as important for wetland Diptera. Moreover, English Nature Malaise trapping on Oxfordshire fens in the late eighties to mid nineties show that all surveyed fens were important for BAP wetland Diptera.

3. CONSERVATION

It is evident that fens and flushes are diverse habitats supporting a large number of species, several of which are listed as Priority BAP species. It can also be seen that Oxfordshire is regionally important, supporting the largest concentration of calcareous fen in southern England. Locally fens and flushes are highly vulnerable to impacts such as dehydration, nutrient pollution and changes in management. It is therefore essential that sites are protected to prevent further decline in extent and quality and that the existing resource is managed sympathetically and sustainably to enhance its wildlife potential.

7. REFERENCES

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