

Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields (SFM)

Habitat Action Plan

Doncaster Local Biodiversity Action Plan
January 2007



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1. Description

1.1 Many of the springs and stream headwaters in the Doncaster Borough emerge from the edge of the Magnesian Limestone where the porous and extensively fissured limestone meets underlying impervious clays and silts. The upper reaches of our limestone streams can be rocky or pebbly; however, with the exception of the Don Gorge, nowhere in the Doncaster Borough are gradients particularly steep. The gentle slopes create shallow valleys where sediments in the streams quickly gather to smother the underlying rocky substrate. Small stretches of relatively swift-flowing streams, fed by flushes and seepages can also be found on the sandy areas in the east of Doncaster, where the rainwater percolates through the overlying sand and meets pockets of impervious clay. Flushes typically have a ground layer dominated by mosses, rushes and sedges. Due to the low-lying and flat nature of the majority of northern and eastern Doncaster, natural meandering watercourses would once have been associated with extensive areas of fen, marsh and swamp.

1.2 Doncaster's lowland streams support a number of National Vegetation Classification (NVC) plant communities¹. These communities largely comprise single-species stands such as A2 *Lemna minor* (duckweed), A9 *Potamogeton natans* (broadleaved pondweed), A12 *Potamogeton pectinatus* (fennel-leaved pondweed - a species tolerant of high levels of nutrient enrichment), A15 *Elodea canadensis* (the introduced but widely naturalised Canadian pondweed) and A16 *Callitriche stagnalis* (water starwort). Emergent vegetation on stream edges includes S4 *Phragmites australis* (common reed), S5 *Glyceria maxima* (reed sweet-grass), S6 *Carex riparia* (greater pond sedge), S8 *Scirpus lacustris* (common clubrush), S12 *Typha latifolia* (bulrush), S14 *Sparganium erectum* (branched bur-reed), S20 *Scirpus lacustris* spp. *tabernaemontani* (grey clubrush) and S28 *Phalaris arundinacea* (reed canary-grass).

¹ Rodwell, J.S. (1995), British Plant Communities (Volume 4) Aquatic Communities, Swamps and Tall-herb Fens. Cambridge

1.3 Streams are important for a variety of fauna including **water vole** (*Arvicola terrestris*), **water shrew** (*Neomys fodiens*), **yellow wagtail** (*Motacilla flava*) and Odonata.

1.4 Fens are peatland habitats that receive water and nutrients from the soil, from rock, from groundwater and from rainfall. The water of 'poor' fens is derived from base-poor rock, whereas that in 'rich' fens is from mineral-enriched sources such as calcareous streams and springs. Fen habitats in lowland areas include valley mires, springs and flushes. Fens contain a rich diversity of plant species and accommodate more than half of the UK species of dragonfly. They are important for several thousand other insect species.

1.5 In valley mires there is an obvious direction of water flow, whereas with basin and floodplain mires, the fen is produced by impeded drainage. A valley mire develops along the lower slopes and floor of a small valley and receives its water from springs and seepages on the valley sides. Sedges and sphagnum mosses often dominate them. Examples of this type of fen occur in Doncaster. Basin mires develop in a waterlogged basin and contain very little open water. The water table within the basin is level but small seepages may occur around the edges to produce a limited through-flow of water. This type of mire is dominated by Sphagnum mosses and sedges or by tall swamp plants such as common reed (*Phragmites australis*), bulrush (*Typha latifolia*) or **great fen sedge** (*Cladium mariscus*). Flood plain mires form on a river or stream flood plain, which is waterlogged and periodically inundated. The substrate may be peat or mineral and can also support sphagnum, sedge or tall swamp vegetation.

1.6 Doncaster's fen habitats support a limited diversity of NVC communities including S25 *Phragmites australis*- *Eupatorium cannabinum* tall herb fen, S26 *Phragmites australis* – *urtica dioica* tall herb fen, S28 *Phalaris arundinacea* tall herb fen and M27 *Filipendula ulmaria* – *Angelica sylvestris*. Small stands of S4 *Phragmites australis*, S5 *Glyceria maxima*, S6 *Carex riparia*, S8 *Scirpus lacustris*, S10 *Equisetum fluviatile*, S12 *Typha latifolia*, S13 *Typha angustifolia* (lesser bulrush), S14 *Sparganium erectum* and S20 *Scirpus lacustris* spp. *tabernaemontani* also occur in fen situations. Doncaster's few remaining fen habitats are notable for the presence of greater tussock sedge (*Carex paniculata*), abundance of greater pond sedge (*Carex riparia*), **tufted sedge** (*Carex elata*), **great fen sedge** (*Cladium mariscus*), hemp agrimony (*Eupatorium cannabinum*), meadowsweet (*Filipendula ulmaria*), blunt-flowered rush (*Juncus subnodulosus*), yellow loosestrife (*Lysimachia vulgaris*), purple loosestrife (*Lythrum salicaria*), common skullcap (*Scutellaria galericulata*), sneezewort (*Achillea ptarmica*), marsh marigold (*Caltha palustris*) and **purple smallreed** (*Calamagrostis canescens*).

1.7 'Fenny fields' are a peculiarity of the northern Doncaster, Went Valley floodplain where the waterlogged soil conditions support marshy grasslands in which the proportion of broadleaved herbs, such as great burnet (*Sanguisorba officinalis*), meadow sweet (*Filipendula ulmaria*), meadow rue (*Thalictrum flavum*), sneezewort (*Achillea ptarmica*) is greater than that of the grasses. These fields have affinities to the M27 *Filipendula ulmaria* – *Angelica sylvestris* mire community which is typically found where moist, reasonably-rich neutral soils occur in situations which are protected from grazing, as at the Went Ings Meadows SSSI (Site of Special Scientific Interest) where such fields have traditionally been managed as hay meadows. MG4 grassland is also recorded at the Went Ings SSSI site. In such situations meadowsweet can become dominant.

1.8 Fenny fields are ideal for feeding waders such as **snipe** (*Gallinago gallinago*), **redshank** (*Tringa tetanus*), **Curlew** (*Numenius arquata*), **corncrake** (*Crex crex*) and **black-tailed godwit** (*Limosa limosa*).

2. National status

2.1 Few river and stream systems in the UK have been unmodified by man and those that have not been modified are a valuable resource. The mosaic of features found in stream systems supports a diverse range of plants and animals, e.g. riffles and pools support aquatic species whilst exposed sediments, shingle beds and sand bars are important for a range of invertebrates, ground beetles, spiders and craneflies. Marginal and bank side vegetation supports a range of plants and animals, and streams often provide a wildlife corridor link between fragmented habitats in intensively farmed areas.

2.2 The UK is believed to support a large proportion of the fens surviving within the European Union area but fens are now rare in the intensively farmed lowland areas such as Doncaster, where they do occur they are usually small in size and isolated. The characteristic fenny fields of the Doncaster Borough are similar to those found in the Lower Derwent or the Broads.

3. Local status

3.1 Numerous small streams flow off the Magnesian Limestone and across the Levels to join either the Trent (in the southern areas of the Borough) or the Don, in the north. Historically, the floodplains were associated with numerous smaller wetlands and marshes, boggy pools and fens.

3.2 Short sections of stream join the River Went, including the springs that arise at Bradley's Well at Norton and Fleet drain near Fenwick. The majority of the smaller watercourses and streams in and around the Sykehouse and Fishlake area have been modified for land drainage and historic flood defence purposes and have been further modified by the construction of the New Junction Canal.

3.3 Within the Ea Beck catchment there are several smaller feeder streams and watercourses. The Skell arises near Upton, just outside the Doncaster Borough and flows through Skelbrooke Park (SSI 6.17)² and osier beds at The Skell SSI and is impounded at Skellow Mill Pond (SSI 7.5). The Skell then flows through Skellow before joining the Hampole Dike to form the Ea Beck near Humberhead Bridge on the Great North Road (the A1). **Brown Trout** (*Salmo trutta*) are known to be spawning in a stretch of watercourse in Skellow, thought to be one of the only suitable spawning areas on a minor watercourse.

3.4 Springs arise in and around Burghwallis (Squirrel) Wood (SSI 7.10). The water from the springs flows into Abbes Dike and joins Stream Dike (which arises at Campsmount Park (SSI 7.7) and Campsall Country Park (SSI 7.8) to drain towards the Askern and Shirley Pool area. Sulphur springs in Askern led to the growth of Askern as a health Spa, which once rivalled Harrogate and Buxton in popularity. The natural drainage patterns of the area have been significantly altered by the intervention of land drainage and the flat land between Askern, Moss, Kirk Bramwith and Thorpe in Balne area drained by a complex series of drains including Mill Dike, Haywood and Trumfleet and Drain, and Engine Dike. The ancient river channel and the iron-age fort/enclosure at Sutton Common has been the subject of recent archaeological investigation. Some of the drains in this area, such as Wrancarr Drain (SSI 7.29), and Engine Dike (part of Old Ings and Chequer Lane (SSI 8.1a+b)), and Ruskholme (SSI 8.1c) are clear and fast flowing and support an excellent diversity of wetland and aquatic plants. The drainage from this area now discharges via pumps into the Don at Kirk Bramwith.

² DMBC, Re-survey of Sites of Scientific Interest in the Doncaster Metropolitan Borough 1996/97, Volumes 1-9

3.5 Hampole Dike (only part of which is an SSI 6.19) has several tributary streams, which arise in the Coal Measures and Magnesian Limestone at the northwestern corner of the borough. Howell Beck arises in Howell Wood (SSI 6.1) and LNR. This Beck forms the northern boundary of the Borough between Doncaster and Wakefield. Howell Springs arises near Challenger Wood (with Spring Wood) (SSI 6.2) and joins Howell Beck and other spring-fed streams arising south of the village of Clayton, and west of Brodsworth and Hooton Pagnell, to form Frickley Beck. This Beck flows into Hampole Dike near South Elmsall. Hampole Hall Pasture (SSI 6.13) is a tributary spring that joins the Hampole Dike just upstream of the village of Hampole.

3.6 Smaller streams that feed into the Don include Langthwaite Dike and the streams arising near Cusworth Hall (SSI 3.10). Langthwaite Dike arises from the eastern side of the Magnesian Limestone near Brodsworth but has been much modified and culverted in the vicinity of Brodsworth Colliery. It re-emerges at Hanging Wood and Highfields Lake (SSI 3.6), where it flows through an area of fen and wet woodland into the lake before passing under the Old North Road. It is joined by feeder springs arising near Scawthorpe and flows past the ancient Castle Hills, Scawthorpe (SSI 3.17) and Radcliffe Moat, joins Bentley Mill Dike and eventually reaches the Don near Bentley Ings (SSI 3.30).

3.7 A small area of mire habitat is also found on the West Moor Dike (a stream which arises in Bella Wood, near Hickleton), where a long-abandoned old mill dam has impounded the natural stream flows. The woodland rides in the surrounding woodland also support pockets of tall fen vegetation and abundant hemp agrimony. Thunderhole (candidate SSI 6.67), Ludwell Spring and springs near St Helen's Chapel and High Melton arise from the Magnesian Limestone escarpment north of Barnburgh and flow into the old River Dearne at Denaby Ings SSSI. These spring's feed small areas flush and fen and valley mires.

3.8 South of the Don, the west-facing limestone escarpment of Micklebring, Clifton and Crookhill drains north westwards through Conisbrough Parks and flow past Conisbrough Castle to the Don at Burcroft. The Magnesian limestone ridge and the sandy glacial ridge stretching from Balby to Hatfield form the watershed between the Don and Torne catchments.

3.9 Tributary streams at the head of the Torne drain the edge of the Magnesian Limestone between Braithwell, Styrrup, Sandbeck and Bagley. The tributary streams of Ruddell Dike arise near Braithwell on the northern edge of Maltby and flow through Braithwell Ruddell Mill Holt, Dike and Dam (SSI 4.6), a site of valley grasslands, woodland and a derelict former water-powered steel mill. Its route has been modified by the large limestone quarries at Stainton and is joined by Denaby Wife Dike to form Paper Mill Dike, which flows past the old Friary at Tickhill. This Dike is impounded in the Mill Dam beside Tickhill Castle (SSI 4.18), before flowing into the 'River Goole Dike' or River Torne.

3.10 Springs in the Wilsic and Dadsley areas drain eastwards to join the Torne at Stancil where the place-names such as 'Reedy Holmes' and 'Carr Doles' and the dark fen peat soils indicate a former extensive area of carr and fen and valley mire.

3.11 Streams arising in the Edlington, Warmsworth, Stainton and Braithwell areas generally drain eastwards, with the exception of Howbecks Dike which arises south of Edlington and passes north through Edlington Brick Pond (SSI 2.7), before joining Warmsworth Beck to flow east into the Loversall Carrs area. This low-lying area also takes drainage from Wadworth in Salter Sike, and forms St Catherine's Well Stream, which flows into the Torne near Rossington Colliery.

3.12 Drainage from the glacial sand ridge on which central Doncaster and Balby sit, flows southwards to the Doncaster Carrs area and onwards into the Mother Drain, Division Drain, through Potteric Carr and into the River Torne.

3.13 Shorter streams flow from the sandy lands around the Finningley, Hayfields area and over clayey deposits at Hurst Plantation, Savage Brooks and Marr Flatts Wood (SSI 4.32) and Gelster Lane Holt (SSI 2.50a). Springs and flushes emerge from the edge of Hurst Plantation, Savage Brooks and Marr Flatts Wood (SSI 4.32), to create a swift-flowing stream that enters the Torne near Hayfield Lakes, Rossington Bridge.

3.14 Between the River Don and Hatfield moors is an unusual, almost perfectly round, geomorphological feature, an alas, created by the slow melting of a residual ice lens at the end of the last ice age. The dark peaty, low-lying soils of the West Moor area (between Dunsville, Edenthorpe and Armthorpe) formed from the decaying remains of the fen plants which colonised the waterlogged hollow left where the ice once sat. Many deep drains have been dug to drain this area eastwards into the Woodhouse Sewer creating an ideal **water vole** (*Arvicola terrestris*) habitat.

3.15 The flatlands around the western edge of the Thorne Moors are criss-crossed by a network of straight land drains, which form part of an extensive pumped drainage scheme that stretches all around the Moors. The natural meandering drainage channels are now only evident as crop and soil marks.

3.16 The clayey and heavy alluvial soils of Sykehouse, and Fishlake produce the herb-rich 'fenny fields' which characterise this area. An excellent example is found at the Went Meadows SSSI where the sward is rich in tall herbs indicative of damper soil conditions, typically, an abundance of meadowsweet. They are managed by annual hay cuts and most are in a favourable management condition. Several other fields now owned and managed by the Carstairs Countryside Trust and the Burnet Trust are also wonderful examples of this type of floodplain habitat.

3.17 Outside the areas covered by Hatfield Moors and Thorne Moors, large expanses of fens and mires vegetation are now rare. Shirley Pool SSSI is possibly an example of as base-rich basin mire that supports great fen sedge growing around an open water body.

3.18 Within the Ea Beck catchment are several small areas of fen at Size Ings (SSI 3.3), Duck Holt (SSI 3.14a), Wellsyke Drain (SSI 3.13), Campsall Country Park (SSI 7.8), and Adwick-le-Street Sewage Works (SSI 3.16). Moat Hill, Bentley (SSI 3.26), also supports small patches of fen in the damper soils in the old moat and pockets of fen are to be found around the drains and borrow-pits of the Thorpe Marsh Area (SSI 7.25b). Fen Carr (SSI 9.7) is a small fenny field in Sykehouse managed by the Yorkshire Wildlife Trust as a Nature Reserve.

3.19 A relatively extensive area of former floodplain mire occurs near the River Don at Hexthorpe Ings (SSI 2.16), but this has become separated from the seasonal inundation by embankment of the river. Areas of fen are also to be found at Denaby Ings SSSI on the River Dearne.

3.20 South of the River Don there are fen areas associated with large subsidence water bodies and wet woodlands such as at Potteric Carr SSSI, Holmes Carr Great Wood and Holmes Carr Little Wood SSI (2.53a+b), Hurst Plantation, Savage Brooks and Marr Flatts Wood (SSI 4.32) and at Mother Drain (SSI 2.49a) at Rossington Bridge, in the Torne Valley. Pot Hill (SSI 2.36a) includes an area known as 'The Fen' next to Sandall Beat Wood SSSI. This area of tall reed fen is associated with a water-filled drain network and the former mine water pumping station for Markham Main Colliery. Fen and mire vegetation is also found in Gravel Hill Plantation, Lake and Gypsy Plantation (SSI 2.54) near Rossington Hall and in wetter areas around Bawtry Forest (SSI 4.54) and White Mires Wood (SSI 2.60).

4. Legal status

4.1 Sites identified as SSSIs and SSIs have a presumption against developments that would have an adverse effect on their conservation value.

4.2 Modification to main rivers or en-mained streams requires consent from the Environment Agency. Discharges and abstractions require Environment Agency consent.

4.3 The Defra Environmental Impact Assessment Regulations apply to the conversion of uncultivated land or semi-natural areas for intensive agricultural purposes and therefore apply to fens, mires and fenny field habitats.

5. Links to associated habitats & species

5.1 The Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields Habitat Action Plan is linked to the following Habitat Action Plans:

- Rivers, Canals, Oxbows, Major Streams and Subsidence Flushes (RCF)
- Neutral and Wet Grassland (NWG)
- Marshes and Swamps, Lakes and Ponds, Ditches and Drains (MLD)
- Reedbeds (RB)
- Wet Woodland (WW)

5.2 **'A Species Audit of Doncaster Borough'** has been produced as part of the Doncaster Local Biodiversity Action Plan. Species highlighted in bold within the Habitat Action Plans are identified within Doncaster's Species Audit and are conservation priorities. The Audit identifies **64** species associated with Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields.

6. Current factors causing loss or decline

6.1 Some fen sites and stream networks are under threat from direct drainage, water abstraction or lowering of the local water tables. A major re-wetting scheme was implemented at Shirley Pool in the late 1990s but this process can be costly.

6.2 Land drainage can impact localised water levels affecting fen areas.

6.3 A lack of stream or ditch management can also lead to blockages and localised rising of fen water levels leading to conversion to swamp or marsh, however these can be valuable habitats in their own right.

6.4 Urban development around fen and mire sites can lead to coverage of large areas of the local catchment with impermeable surfacing or buildings and diversion of rainwater into watercourses. This leads to reduced percolation of rainwater into the ground and reduced groundwater flows into a fen or mire habitats. This can lead to desiccation and detrimental changes in species composition, often favouring dominance by ranker grasses and invasive species that are then difficult to eradicate.

6.5 The use of semi-permeable or permeable surfacing on car parks roadways and hard standing near to fens or streams may reduce the adverse effects on rainwater infiltration, but the use of rock salt to grit these areas could lead to saline contamination of freshwater systems.

6.6 Urban development continues to take place in streamside sites and future development is likely to affect further sites. Small-scale flood prevention measures can often lead to canalisation of the stream and artificial re-enforcement of one or both banks. There are often pressures to culvert watercourses where there are fears of pollution risk or there are concerns for 'health and safety' near dwellings or hygiene near food processing/storage areas. Where watercourses are left open, those near to housing tend to become hotspots for littering and general dumping of unwanted household goods.

6.7 Springs and the headwaters of the Magnesian Limestone streams have often been impounded to create mill ponds or ornamental lakes as at Campsmount Park (SSI 7.7) and Campsall Country Park (SSI 7.8), Burghwallis Grange Bank (SSI 7.4), Skellow Mill Pond (SSI 7.5), Hanging Wood and Highfields Lake (SSI 3.6), Bella Wood, Cusworth Hall (SSI 3.10), Barnburgh Hall, Crookhill Park and Plantation (SSI 4.2) and The Old Friary fishponds and mill dam at Tickhill. These waterbodies are often stocked with fish and attract waterfowl, leading to enrichment of the water and poor oxygenation of out flowing water. Impoundment can significantly alter the composition of aquatic invertebrate populations found downstream.

6.8 The installation of agricultural land drainage pipes in place of more open channels, and the lack of management for any existing traditional low lying water collection points, such as field ponds and wet flushes/seepages has removed this additional habitat source from agricultural land.

6.9 Pollution, both point source and diffuse, has a significant effect on water quality. The spraying of adjacent agricultural land with pesticides and fertilisers can lead to contamination of streams. Fertiliser application and excessive manure application of fields around basin mires and other fen habitats can also cause nutrient enrichment. Nutrient enrichment can lead to changes in species composition and promote the growth of invasive species.

6.10 Mine-water discharges may also become more important as groundwater levels rise. Water quality of stream systems can be adversely affected by some industrial operations or road drainage and may be a factor in the reduction in species diversity. Although major improvement to Waste Water Treatment Works are improving water quality in discharges, many smaller sewage works discharge to relatively small streams and therefore any pollution incidents or storm-water discharges can have a significant impact.

6.11 Maintaining the riffle-flow regime on the Skell near Skellow is vital in order to provide the gravel bed habitats suitable for spawning brown trout (*Salmo trutta*). This is thought to be one of the few suitable spawning areas with clear bed and gravel bars. There is a threat to this habitat from poor maintenance and road drainage causing water pollution and sedimentation. Responsibility for local highway runoff rests with DMBC Highways, who have a historic right to drain runoff into public drains. Individual farmers may also need contacting regarding agricultural drainage. Other improvements such as silt traps along the watercourse and re-introduction of channel meanders are required.

6.12 The upper reaches of many of Doncaster's streams could potentially support native crayfish but no systematic survey has been undertaken. The presence of native crayfish and the introduced American or Signal Crayfish and the potential for spread of crayfish plague requires monitoring. The upper stretches of the lime-rich streams may also support specialist aquatic invertebrates. Investigations by specialist entomologists are required.

6.13 Release of alien fish species into small fishing ponds and impounded streams can result in their escape into the wider catchment.

6.14 Native plant diversity has been reduced due to invasion by introduced plants. Alien plant species associated with river habitats include Himalayan balsam, Japanese knotweed, and giant hogweed.

6.15 Spread of disease is also a significant threat to riparian trees – *Phytophthora*, a waterborne fungal infection kills riverside alder trees.

6.16 The small total area of fen habitat means that critically small population sizes of key species are dependent on this habitat.

6.17 Lack of management and, particularly, a lack of scrub control can result in reversion of fens to scrub and carr. Such problems have affected some SSSI fen sites.

6.18 Traditional mowing or grazing management in some fenny fields has been difficult to maintain, due to difficulties in generating interest amongst graziers, in low intensity grazing of small meadows. Expertise and machinery able to cope with the mowing of small meadows, with their narrow turning spaces and restricted access (often narrow hedge-lined green lanes) means that maintaining the traditional hay cropping management in isolated meadows sites is economically impractical. A lack of proper management leads to reversion to rank grassland (MG1) and scrub.

6.19 The Fen at Sandall Beat Wood SSSI has suffered from drying out and periodic fire lighting. The Local Authority has attempted to introduce rotational reed cutting but this is funding-dependent and has not proved to be a guaranteed management activity.

7. Current local action

Research & Monitoring

7.1 Natural England (formerly English Nature) has compiled an inventory of the larger grassland sites in South Yorkshire, including wet grasslands and fenny fields such as Went Ings.

7.2 Funding from the Big Lottery's Transforming Your Space initiative has enabled the further development of the Biological Records Centre at Doncaster Museum. The biological data collected as part of the project, particularly botanical information for local sites, species and habitats has enhanced the modern dataset. Historical biological information has also been transferred to the database.

7.3 The borough has a diverse series of Sites of Scientific Interest (SSIs), illustrating the variety of species and habitats that are represented on sites throughout Doncaster. All SSIs were surveyed in 1996/1997 and again in 2004/2005, when additional candidate sites were also identified. Several stream sections, springs and fens have been identified as SSIs or as candidate SSIs.

7.4 The Doncaster Naturalists' Society holds regular field meetings and has carried out detailed surveys of stream and fen habitats. The Society routinely submits biological records to the Local Record Centre at Doncaster Museum.

Safeguarding & Management

7.5 Funding from the Big Lottery's Transforming Your Space initiative has enabled the development of a range of biodiversity initiatives, including the resurvey of the Borough's SSI's, research projects, production of site management plans and the provision of resources (equipment, educational, activity and promotional materials) to help raise awareness and encourage participation in the management and enhancement of local biodiversity. A number of management plans have also been produced.

7.6 Sites such as Shirley Pool, Denaby Ings, and Went Ings Meadows, Potteric Carr are SSSIs. Management plans have been prepared and implemented for these SSSIs. Sandall Beat Wood LNR, Howell Wood, Campsall Country Park and several other; stream, spring, fen and mire sites are SSIs managed by DMBC. Fen Carr and former British Waterways fields in the Sykehouse area are owned or leased and managed by environmental Trusts such as the YWT, Carstairs Countryside Trust and the Burnet Trust.

7.7 Yorkshire Wildlife Trust sites with wetland habitats are favourably managed.

Funding & Resources

7.8 The new Environmental Stewardship Scheme provides funding for maintenance of field boundary features such as hedges (stock-proof boundaries may enable reinstatement of traditional management). The higher-level scheme also targets the creation of new habitat on land adjacent to, buffering, or linking SSSIs or UK BAP habitats. It also targets the maintenance and restoration of habitats in Sites of Importance for Nature Conservation, known locally as SSIs.

Advisory

7.9 DMBC has introduced a programme of continuous professional development based on planning related issues, including 'Protected species' and 'Trees and Hedgerows'. The Environmental Planning Team has produced a suite of Supplementary Planning Documents, providing guidance on: Planning for Trees and Hedgerows, Nature, Sustainable Construction and Landscape Planning on Development Sites in Doncaster

Policy & Legislation

7.10 The Shire Group of Internal Drainage Boards have updated and are enacting their Environmental Policies in light of current biodiversity obligations, introduced by the Natural Environment & Communities Act 2006. The policies also set out the Board's commitment to the principals of conservation and outline its strategy for monitoring and recording its environmental impact and biodiversity improvements.

Communications & Publicity

7.11 The Yorkshire & Humber Biodiversity Forum has produced a leaflet on wetland and water management; outlining current issues, local action and conservation priorities. This and further information is available from www.yhbf.org. The leaflet was launched at a 'Planning for a wetter future' Conference, organised in partnership with the Yorkshire & Humber Assembly.

8. Objectives, targets & proposed actions

Please refer also to the Generic Actions in the LBAP Introduction & Overview document

Objective	Target	Ref	Action	Lead Partners	Costs	Category
1) To ensure the protection and maintenance of existing streams, fens and fenny field habitats.	Continuous.	1.1	<p>Prevent depletion of streams, fens and fenny field habitats resulting from development and/ or the delivery of statutory functions by:</p> <p>1) Having regard to the protection and enhancement of habitats when considering the allocation of sites, in line with the approach set out in PPS9 and the priorities set out in the LBAP.</p> <p>2) Having regard to the assessment, retention and enhancement of habitat types when formulating and making Development Control Policies and decisions, in line with the approach set out in PPS9 and the priorities set out in the LBAP.</p>	DMBC, Natural England (NE), Environment Agency (EA), Internal Drainage Boards (IDBs)	Staff costs	Advisory/ Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
			<p>3) Providing advice to Development Control and Developers on appropriate types of survey i.e. ecological and/or hydrological, the interpretation of survey results and methods of incorporating habitat retention and enhancement into development proposals (for both designated sites and non-designated features of biodiversity value, as identified in the LBAP.</p> <p>4) Having regard to the priorities set out in the BAP in the interpretation of UDP/LDF policies (and any supporting SPGs/SPDs).</p> <p>5) Providing technical advice on the severity, implications and nature of suspected breaches in planning control (either conditions or unauthorised development).</p>			

Objective	Target	Ref	Action	Lead Partners	Costs	Category
			<p>6) Awarding appropriate site protection through designation, based upon routine environmental monitoring and assessment.</p> <p>7) Ensuring that all Partners and relevant landowners, service providers and operational contractors are informed of the existence and importance of stream, fen and fenny field habitats (both designated and non-designated).</p>			
	Continuous.	1.2	Continue to collect and maintain up-to-date, standardised, biological data using the Museum's Local Record Centre. Promote and initiate appropriate management, monitoring and the exchange of environmental data, to ensure the maximum level of site protection is awarded and habitat condition is maintained.	DMBC, NE, Doncaster Naturalists' Society (DNS), Yorkshire Wildlife Trust (YWT), EA, IDBs, British Waterways (BW)	Staff costs and volunteer time. Other costs to be evaluated	Future Research & Monitoring
	By 2008.	1.3	Expand DMBC's Environmental Planning protected species protocol to include LBAP habitats and species.	DMBC	Staff costs	Advisory

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	By 2009.	1.4	Initiate a watercourse survey project for crayfish (native and American) on the River Skell, particularly around Skelbrooke Hall. (Survey to include aquatic invertebrates).	EA, IDBs, DMBC, NE	To be evaluated	Future Research & Monitoring
	Continuous.	1.5	Promote the use of permeable surfaces and soak-aways in new development close to streams, fens and fenny field habitats, where good water quality can be guaranteed.	DMBC, EA, BW	Staff costs	Advisory/ Safeguarding & Management
	All new road schemes to include SUDS.	1.6	Ensure better regulation and pollution control of highway discharges into open watercourses and wetlands, to reduce contamination by road debris, oil, silt and saline run-off.	DMBC	Staff costs	Safeguarding & Management
	No net loss in biodiversity assets as a result of new drainage schemes approved by the EA or Natural England under EIA Regulations.	1.7	Assess the impacts of new drainage schemes on fens and mires, to protect their biodiversity value, as required under the Environment Act. Request ecological and hydrological surveys where necessary.	EA, IDB, NE	Staff costs	Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	No net loss in biodiversity assets as a result of drain management by IDBs. 5 sites with management improvements for biodiversity by 2009.	1.8	Drainage management and alterations to drainage schemes to reflect the requirement for sustaining and improving stream, spring, fen, flush, mire and fenny field habitats within a catchment. Where agricultural drainage requirements result in biodiversity harm alternative solutions to be sought and promoted. Encourage and implement sympathetic management regimes. Prioritise such work in the Fishlake and Sykehouse area.	IDBs	Negligible – part of regular work	Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
2) To restore degraded sites and ensure appropriate management of streams, fens and fenny field habitats.	2 sites with active habitat management by 2008 and a further 2 sites by 2010.	2.1	<p>1) Identify riparian landowners of existing SSI sites with streams, fen, mires and fenny fields.</p> <p>2) Promote the benefits of the Higher Level ESS scheme to landowners, to encourage uptake on farmland adjacent to streams and around fens/mires and springs and flushes, particularly as a means of buffering wetland and reducing diffuse pollution through nutrient run-off and soil erosion.</p> <p>3) Provide advice on appropriate management techniques. (Management that benefits fen habitats can be prioritised in ESS, as it is national BAP habitat.</p> <p>4) Monitor the uptake of HLS by SSI landowners.</p>	DMBC biodiversity team, NE, Farming & Wildlife Advisory Group (FWAG), Linking Farming And Environment (LEAF), Private landowners	Staff costs and volunteer time	Safeguarding & Management/ Advisory

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	By 2009.	2.2	Research historic locations of fen in the areas surrounding Thorne and Hatfield Moors, with a view to identifying potential locations for habitat restoration projects.	DMBC, DNS, YWT, Thorne & Hatfield Moors Conservation Forum (THMCF)	To be evaluated	Future Research & Monitoring
	Continuous.	2.3	Investigate the acquisition (where necessary, and feasible) of wetland sites of local significance, in order to ensure their future management for the benefit of biodiversity.	YWT, DMBC, local Trusts	£5,000 per ha	Safeguarding & Management
	Develop plans for key sites by 2009.	2.4	Develop and implement management plans for protecting and enhancing important fish spawning areas.	DMBC, EA, IDB, British Waterways (BW)	To be evaluated	Safeguarding & Management/ Species Protection & Management
	Re-instate wet conditions on a local authority owned fen site by 2009.	2.5	Investigate the feasibility of schemes to re-wet desiccated fen sites such as The Fen at Sandall Beat. Manage feeder or outlet streams to maintain appropriate water levels on local authority owned fen sites to avoid desiccation or, conversely prevent excessive water logging.	EA, IDB, NE, DMBC, Private landowners	To be evaluated	Habitat Creation & Restoration/ Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	5 sites by 2010.	2.6	Identify all wetland sites where Priority Species are present and implement appropriate specialist management schemes to benefit these species.	DMBC, NE, IDBs, EA, BW, FWAG, Private landowners	To be evaluated	Species Management & Protection
3) To create 1ha of fen and fenny field habitats linked to existing river and stream systems.	1 ha of fenny field habitat creation by 2009.	3.1	Create fen and fenny field habitats in close proximity to existing sites to safeguard and enhance the populations of associated key species.	DMBC, Private Landowners/ developers, EA, BW, IDB, Coal Authority, YWT, DBAP, DNS and THMCF	To be evaluated	Safeguarding and Management/ Habitat Creation & Restoration/ Species Protection & Management
	By 2010.	3.2	Identify, research and design a project for the re-meandering of a culverted/canalised stream site. Identify potential funding sources for the project to then be carried forward.	DMBC, EA, IDB, YWT	Staff costs	Future Research & Monitoring
4) Raise public awareness of the importance and special characteristics of	1 workshop by 2010.	4.1	Run a streams, springs, fens and flushes species survey and identification workshop open to the general public.	DNS	£256	Communications & publicity

Objective	Target	Ref	Action	Lead Partners	Costs	Category
streams, fens and fenny field habitats.	By 2008.	4.2	Provide an interpretive leaflet to explain the special value of Doncaster's river, canal and streams network and important open water sites. Include a map showing routes linking accessible riparian wetland sites and the more accessible fen, mire and fenny field habitats. Ensure the information is also available on the web.	DBMC, EA, IDB, YWT and other Trusts, NE, Don Gorge Strategic Partnership (DGSP)	£3780	Communications & publicity
	1 Green Flag site by 2010.	4.3	Pursue Green Flag status for one wetland nature conservation site e.g. Hanging Wood and Highfields Lake, or Holmes Carr Great Wood.	DMBC	To be evaluated	Safeguarding & Management/ Communications & Publicity
	1 demonstration led by YWT by 2009.	4.4	Promote good management practice for fen, flush, fenny field and mire habitats through the use of a workshop held at a demonstration site.	EA, FWAG, LEAF, NE YWT, BTCV	£2640	Advisory/ Communications & Publicity

9. Indicative Habitat distribution & Opportunities map (Map 1)

The distribution of Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields (Map 1) has been indicated by mapping species considered to be local indicators for these habitats, as selected by local experts. Certain species that may be considered to be typical indicators of the habitats have not been used, due to them being abundant throughout the Borough, or unrepresentative of a local habitat peculiarity.

The indicator species for this habitat are:

Achillea ptarmica, *Angelica sylvestris*, *Calamagrostis canescens*, *Carex elata*, *Carex paniculata*, *Cladium mariscus*, *Eupatorium cannabinum*

The species records have been compiled based on 1km grid squares of the Borough. The resulting score is based on how many of the different species are found within a particular square, reflecting a degree of match to the species assemblage, and not the number of records of a specific species.

To indicate how good a match each grid square is to the habitats a graduated colour has been applied, based on how many species are recorded in that square as a percentage of the highest number of matches. The higher percentage shows a better species match and therefore is a better indicator that the species assemblage exists, or could exist in that area. The percentages are split down as follows:

- 0% No matches in a grid square – these are left blank
- 1-25%  1 Species
- 26-50%  2 Species
- 51-75%  3 Species
- 76-100%  4-5 Species

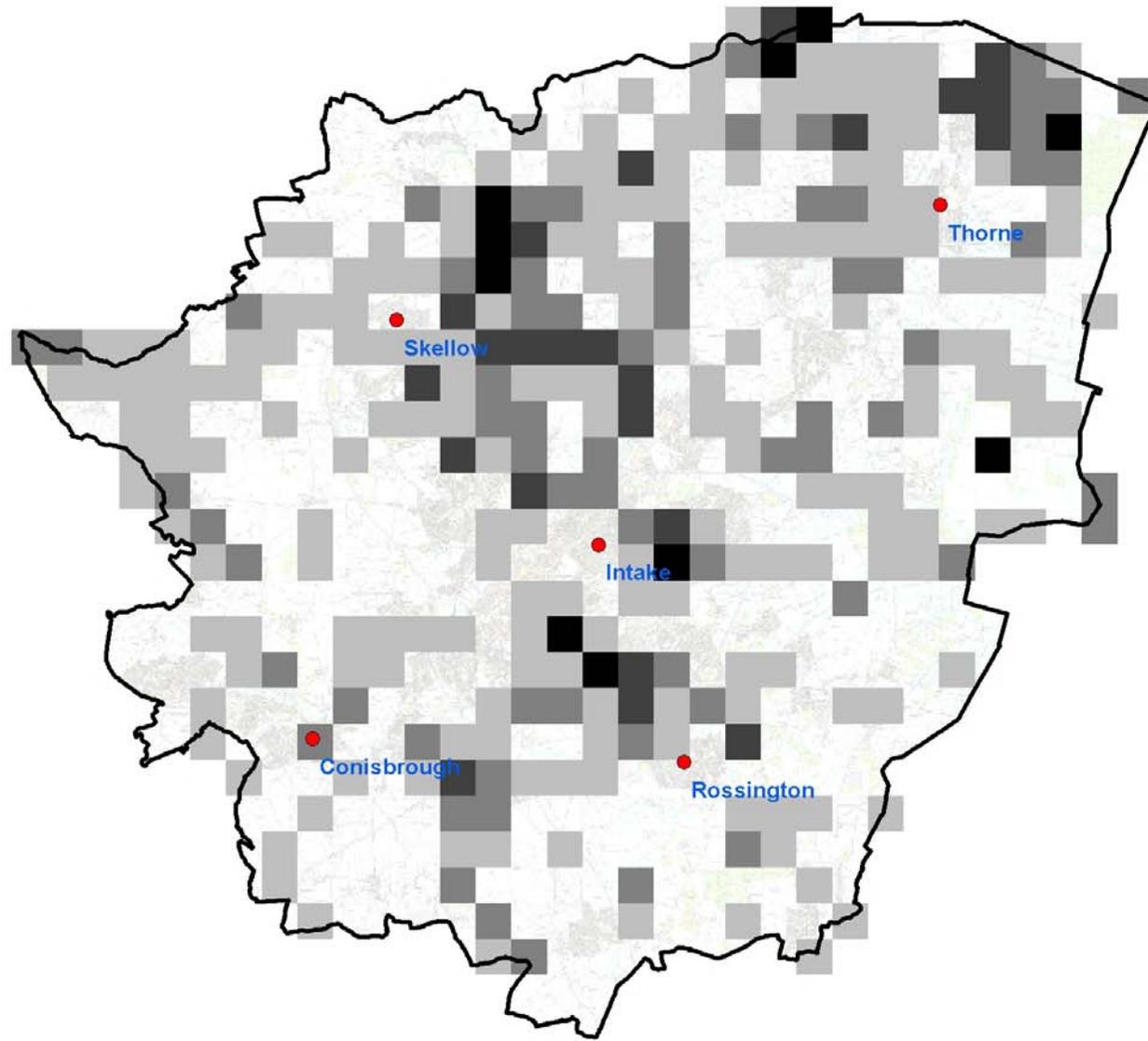
Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields

DATE: January 2007
 SCALE: 1:160,000
 DRAWING NO: HAP/1/SFM1



LEGEND

- Doncaster Borough Boundary
- Village
- 1-25%
- 26-50%
- 51-75%
- 76-100%



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9. Indicative Habitat distribution & Opportunities map (Map 2)

The map for Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields (Map 2) shows the locations of Streams and Springs within the Borough. In order to show how these link with other watercourses in the Borough, the Rivers and Canals are also shown.

— Streams / Springs

— Rivers / Canals

Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields

DATE: January 2007
 SCALE: 1:160,000
 DRAWING NO: HAP/1/SFM2

LEGEND

-  Doncaster Borough Boundary
-  Village
-  Stream/Spring
-  River/Canal

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