

Marshes and Swamps, Lakes and Ponds, Ditches and Drains (MLD)

Habitat Action Plan

Doncaster Local Biodiversity Action Plan
January 2007

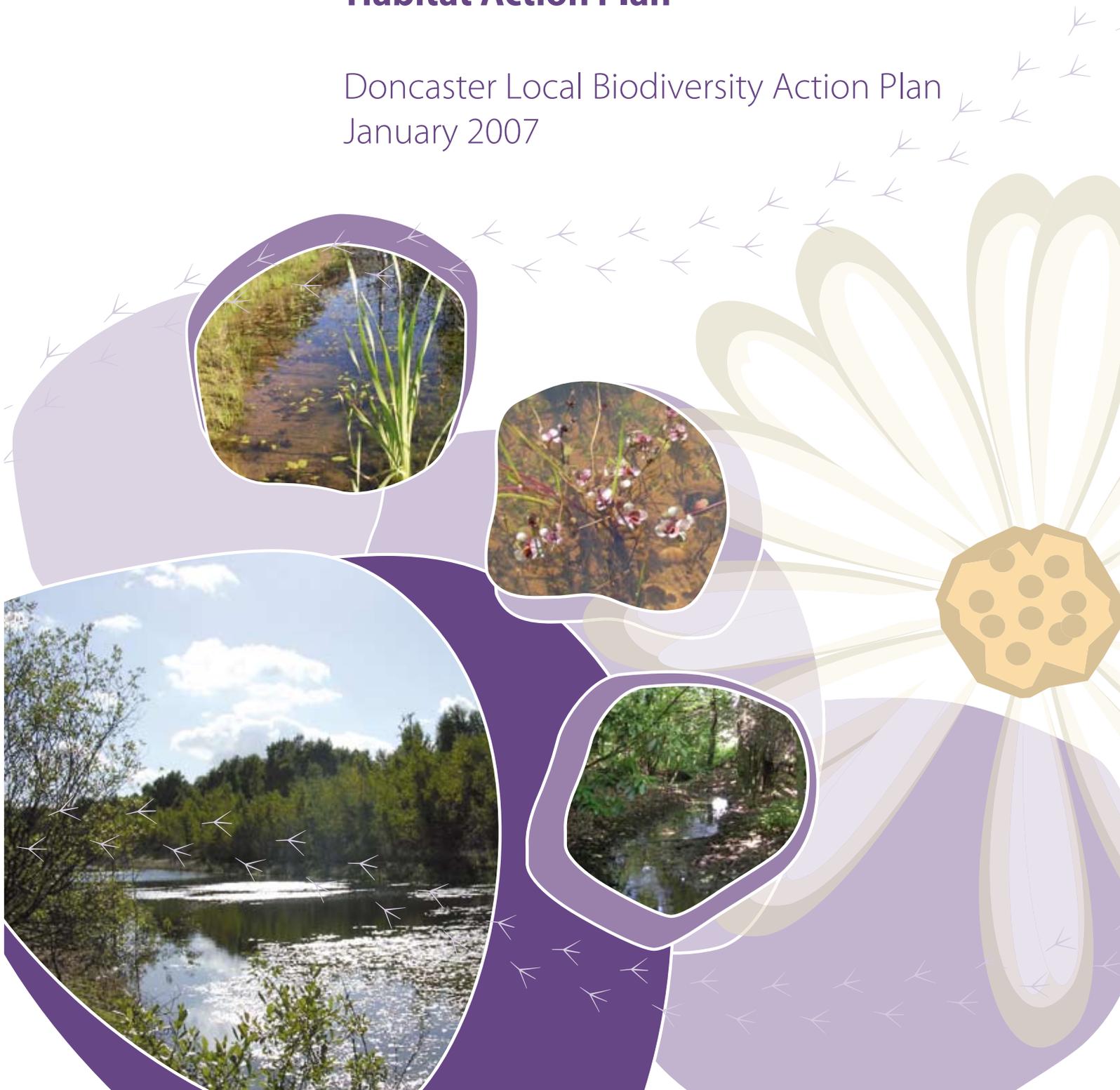


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1. Description

1.1 Marsh or marshy grasslands refers to vegetation occurring on mineral soils that have a water table close to the surface for most of the year. This type of habitat often occurs on almost level ground around ponds or on the edges of drains. Extensive areas may occur on river valley floodplains where winter water levels are at or near the surface of the ground. The marshes tend to be dominated by reed grasses, such as reed canary grass (*Phalaris arundinacea*), **tufted hairgrass** (*Deschampsia caespitose*) with rushes, tall herbs and large sedges such as greater pond sedge (*Carex riparia*).

1.2 Swamp habitat occurs where there are waterlogged conditions, where the water levels are above the level of the soil for most of the year. Swamps are often associated with fluctuating water bodies or watercourses and are frequently inundated on a seasonal cycle. Swamps are species poor in comparison to fen habitats, often being dominated by single species, such as branched bur-reed (*Sparganium erectum*), reed sweet-grass (*Glyceria maxima*), reedmace (*Typha latifolia*) or sedges. Narrow bands of 'marginal' vegetation including sweet-grasses (*Glyceria* sp), **Great water parsnip** (*Sium latifolium*), water cress (*Rorippa nasturtium-aquaticum*), fool's-water cress (*Apium nodiflorum*), brooklime (*Veronica beccabunga*), scattered rush), yellow iris (*Iris pseudacorus*) and branched bur-reed (*Sparganium erectum*) are found on the narrow and often steep margins of lowland watercourses such as drains and ditches, and around the perimeter of steep-sided water bodies.

1.3 Swamp and marsh habitats support a number of National Vegetation Classification (NVC)¹ plant communities. These communities largely comprise single-species stands such as S4 *Phragmites australis* (common reed), S5a *Glyceria maxima* (reed sweet-grass), S5b *Glyceria maxima* - *Alisma plantago-aquatica* – *Sparganium erectum* sub community, S6 *Carex riparia* (greater pond sedge), S8 *Scirpus lacustris* (common clubrush), S10 *Equisetum fluviatile* (water horsetail), S12

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

Typha latifolia (reedmace), S14 *Typha angustifolia* (lesser bulrush), S16 *Sagittaria sagittifolia* (arrowhead), S18 *Carex otrubae* (false fox-sedge), S20 *Scirpus lacustris* spp. *Tabernaemontani* (grey clubrush), S22 *Glyceria fluitans* water-margin vegetation and S28 *Phalaris arundinacea* (reed canary-grass). The edges of marshes and swamps can also support a narrow strip of fen communities such S25 *Phragmites australis* – *Eupatorium cannabinum* tall herb- fen S26 *Phragmites australis* – *Urtica dioica*, S28 *Phalaris arundinacea*, and communities with affinities to (M23 *Juncus effusus/acutiflorus* – *Galium palustre* rush pasture and M27 *Filipendula ulmaria* – *Angelica sylvestris* mire).

1.4 Lake and ponds are the standing open water habitats that lie beyond the limits of swamp or emergent vegetation. They can contain submerged, free-floating or floating-leaved plants. Submerged species include certain pondweeds (*Potamogeton* spp.) and stoneworts, floating plants including duckweed and **water soldier** (*Stratiodes aloides*), and floating-leaved plants such as species of water lily, water crowfoots and broad-leaved pondweed (*Potamogeton natans*). Most of Doncaster's open water habitats are naturally rich in plant nutrients. These water bodies support large amounts of vegetation and a wide variety of animals. Some of the ponds and lakes created as a result of sand extraction in the eastern parts of the borough are perhaps the least enriched. Their clear waters and sandy substrates support some important populations of rarer pondweeds, such as **lesser pondweed** (*Potamogeton pusillus*), water milfoils (*Myriophyllum* spp.), **needle spike-rush** (*Eleocharis acicularis*) and bristle clubrush (*Isolepis setacea*), as well as a variety of stoneworts including *Chara* and *Nitella* sp.

1.5 Ditches and drains which hold water most of the year are considered to be open water habitats since there is often no, or only a very slight, flow of water. Many of Doncaster's drain and ditch systems are part of pumped drainage schemes and they support a range of plants similar to that found in ponds. Where dredging or maintenance is infrequent, some ditches and drains can become linear swamp habitats, supporting relict assemblages of a once more-widespread wetland habitat.

1.6 Open water and the open water of ditches and drains support a number of National Vegetation Classification (NVC) plant communities. These communities largely comprise single-species stands. Floating plant communities include A1 *Lemna gibba* (Fat duckweed), A2 *Lemna minor* (Common duckweed), very rarely A3 *spirodela polyrhiza* – *Hydrdocharis morsus-ranae* (greater duckweed and frogbit), A4 *Hydrdocharis morsus-ranae-Stratioides aloides* (frogbit and water soldier) communities (but lacking frogbit). Aquatic submerged communities include A5 *Ceratophylletum demersi community* (rigid hornwort) and aquatic species which have some floating leaves such as A7 *Nymphaea alba* (white water lily), A8 (*Nuphar lutea*) yellow water lily, A9 *Potamogeton natans* (broad-leaved pondweed and (A10 *Polygonum amphibium*) amphibious bistort). Entirely submerged plant communities can form dense and quite extensive beds of vegetation under the water, communities such as A11 *Potamogeton pectinatus-Myriophyllum spicatum* (spiked water milfoil), A12 *Potmaogeton pectinatus* (fennel pondweed), A13 *Potamogeton perfoliatus-Myriophyllum alterniflorum* (perfoliate pondweed, alternate water milfoil), A15 *Elodea canadensis* (Canadian waterweed), A15 *Elodeae nuttallii* (Nuttall's waterweed). A common community of shallow water margins and many ditches and drains is A16 *Callitriche stagnalis* (common water starwort). Very rarely, water bodies support plant communities with affinities to the A22 *Littorella uniflora* shore weed) community.

1.7 Around the margins of our lowland ponds and lakes and on the edges of ditches and drains are a number of swamp communities, again communities largely comprise single-species stands such as S1 *Carex elata* (tufted sedge), S2 *Cladium mariscus* (great fen-sedge), S3 *Carex paniculata* (greater tussock sedge), S4 *Phragmites australis* (common reed), S5a *Glyceria maxima* (reed sweet-grass) and S5b *Glyceria maxima* reed sweet-grass, water plantain, branched bur-reed sub-community, S6 *Carex riparia* (greater pond sedge), S7 *Carex acutiformis* (lesser pond sedge), S8 *Scirpus lacustris* (common clubrush), S10 *Equisetum fluviatile* water horsetail, S12 *Typha latifolia* (reedmace), S13 *Typha angustifolia* (lesser bulrush), S14 *Sparganium erectum* (branched bur-reed), S15 *Acorus calamus* (sweet flag), S16 *Sagittifolia sagittifolia* (arrowhead), S17 *Carex pseudocyperus* (Cypress sedge), S18 *Carex otrubae* (false fox-sedge), S19 *Eleocharis palustris* (common

spikerush), S20 *Scirpus lacustris* spp *tabernaemontani* (grey clubrush), S22 *Glyceria fluitans* (floating sweet-grass) water margin vegetation, S23 Other water margin vegetation (watercress, fool's watercress. brooklime etc.), S27 *Carex rostrata* bottle sedge – but lacking (*Potentilla palustris* - marsh cinquefoil) and S28 *Phalaris arundinacea* (reed canary-grass).

1.8 Notable species include **needle spike-rush** (*Eleocharis acicularis*) and **floating club-rush** (*Eleogiton fluitans*), greater tussock sedge (*Carex paniculata*), cyperus sedge (*Carex pseudocyperus*), bottle sedge (*Carex rostrata*), **water violet** (*Hottonia palustris*), flowering rush (*Butomus umbellatus*), **whorled water milfoil** (*Myriophyllum verticillatum*), **tubular water dropwort** (*Oenanthe fistulosa*), **lesser pondweed** (*Potamogeton pusillus*), greater spearwort (*Ranunculus lingua*), mare's-tail (*Hippuris vulgaris*), fine-leaved water dropwort (*Oenanthe aquatica*), thread-leaved water crowfoot (*Ranunculus trichophyllus*) and **water soldier** (*Stratiodes aloides*). **True fox sedge** (*Carex vulpina*) was once recorded from a small field pond at Steward's Ings Lane in Fishlake; however this species is now thought to have become extinct at this location.

1.9 Standing water habitats are also important habitats for a range of amphibians including **great crested newt** (*Triturus cristatus*), **grass snake** (*Natrix natrix*), **water vole** (*Arvicola terrestris*), **water shrew** (*Neomys fodiens*), Odonata and other invertebrates such as snails and crustaceans.

1.10 Swamps and open water provide habitat for coarse fish species, which in turn support birds such as heron (*Ardea cinerea*) and **kingfisher** (*Alcedo atthis*). **Swallows** (*Hirundo rustica*) and **sand martins** (*Riparia riparia*) are regularly seen swooping over standing water to feed upon the invertebrates hovering there. Open water is important for many breeding and wintering water birds. Breeding species include **mute swan** (*Cygnus olor*), greylag goose (*Anser anser*), mallard (*Anas platyrhynchos*), great crested grebe (*Podiceps cristatus*), little grebe (*Tachybaptus ruficollis*), **black necked grebe** (*Podiceps nigricollis*), coot (*Fulica atra*), moorhen (*Gallinula chloropus*), common tern (*Sterna hirundo*), **black-headed gull** (*Larus ridibundus*) and cormorant (*Phalacrocorax carbo*).

Shelduck (*Tadorna tadorna*), **teal** (*Anas crecca*), **wigeon** (*Anas penelope*), **shoveller** (*Anas clypeata*), **pochard** (*Aythya farina*), **golden eye** (*Bucephala clangula*), **Arctic tern** (*Sterna paradisaea*), little egret (*Egretta garzetta*), goosander (*Mergus merganser*), and a range of diving and dabbling ducks are also reliant upon open water habitats for feeding and over winter roosting.

2. National status

2.1 Standing open waters include both natural systems, such as lakes, meres and pools as well as a wide range of man-made waters such as reservoirs, ponds and gravel pits. There are three main types of standing water habitat; nutrient poor (oligotrophic) typically found in upland areas of northern and western Britain: nutrient-enriched waters, typical of lowland Britain and: ponds with intermediate nutrient levels (mesotrophic) which potentially have the highest biodiversity.

3. Local status

3.1 Doncaster's present day open water habitats tend to have been created by man's activities. Large natural water bodies, such as Thorne Mere, have long since been drained and the meandering morass of rivers, fens, bogs, pools and mires of the Hatfield Chase changed almost beyond recognition by drainage and subsequent mineral extraction.

3.2 Whilst it can be validly argued that the Borough does not hold any truly 'natural' large water bodies anymore, the most 'natural' water bodies are to be found at sites such as Shirley Pool SSSI (Site of Special Scientific Interest) located on a paleochannel or Historic River Course. Whilst many other ponds, lakes and pits now appear quite natural they owe their origin to activities such as mineral extraction (clay and sand pits), construction of canal, railway and road embankments (borrow-pits), fishing (historic fishponds), power generation (mill ponds), stock watering (field and

dew ponds) and ornament (the 1790s-1870s fashion for serpentine lakes at country houses and parkland estates). The extensive ditch and drain network of the Humberhead Levels are now the only remnants of the once widespread wetlands. They are highly modified and generally in a 'juvenile' state of colonisation due to repeated interventions such as dredging. Perhaps some of the most natural open water bodies are in fact some of those created as a result of mining subsidence in relatively recent times. These water bodies often received very little intervention from man during their establishment period and, as a result, they support many natural features, variety and wide transition zones between open water, swamp, marsh, carr woodland fen and wet grassland. Several have been designated as Sites of Special Scientific Interest (SSSIs). They are now maturing to an extent that human intervention and 'management' is necessary if we wish to maintain the diversity of habitats and the wide range of dependant wildlife.

3.3 There are still many small field ponds in the Fishlake and Sykehouse areas, but works by Mr C. Howes and Mr S Warburton have highlighted the rapid decline in pond numbers of recent times. In the Parish of Fishlake 197 ponds existed in 1982 compared with 6 in 1981². Some of the remaining ponds such as at Steward's Ings Lane Meadow (SSI 9.10)³, and Cowick Road Pasture and Pond (SSI 9.11) are Sites of Scientific Interest, although even these are drying out. Trumfleet Pit (SSI 7.27) and Trumfleet Pond (SSI 7.28) are also SSI ponds. Semi-natural woodland ponds are also to be found at Hurst Plantation, Savage Brooks and Marr Flatts Wood (SSI 4.32), Hatchell Wood West (SSI 2.44a), Hatchell Wood East (SSI 2.44b) and Martin Beck Common Ponds (SSI 4.24a & 4.24b), Bawtry Forest on the Sherwood Sandstone, and at Howell Wood (SSI 6.1) on the edge of the Coal Measures.

² Chris Hill and Terry Langford (1992) Dying of Thirst: A response to the problem of our vanishing wetland.

³ DMBC, Re-survey of Sites of Scientific Interest in the Doncaster Metropolitan Borough 1996/97, Volumes 1-9

3.4 Mineral extraction (predominantly clay) has resulted in diverse wetland sites at Edlington Brick Pond (SSI 2.7), Shaw Lane Pond (SSI 2.32), Cantley Park Lake (SSI 2.40), Rossington Brick Pond (SSI 2.51), Gravel Hill Plantation, Lake and Gypsy Plantation (SSI 2.54), Rossington Hall Brickponds and Plantations (SSI 2.58a+b), Cementation Pond (SSI, 3.18), Willow Garth Fish Ponds (SSI 3.22), Arksey Pond (SSI 3.25), Black Pond (SSI 3.33a), Moss Brick Pond (SSI 7.20), Joan Croft Pond (SSI 7.26), Lodge Lane Pond (SSI 7.32), Riddings Farm Pond (SSI 7.22a) - now entirely *Glyceria* marsh, and Westfield Ings (SSI 9.5). New ponds are being created as fishing lakes and irrigation lagoons but some, such as Topham Farm pond (used as a source of soil to repair the Sykehouse Barrier Bank), have been created specifically to benefit biodiversity.

3.5 Sand and gravel extraction has created many temporary and semi-permanent water bodies at Brecks Pond (SSI 8.18), Dodge Dike Pond (SSI 8.22), Hurst Plantation, Savage Brooks and Marr Flatts Wood (SSI 4.32), Austerfield Sandpits and Willow Holt (SSI 4.30), Blaxton Common (SSI 4.47a) and Ash Holt (Finningley) (SSI 4.45). Hickleton Marl Pits (SSI 6.33) is a flooded mineral extraction site on the Magnesian limestone. Other recently created ponds on limestone occur at Nursery Lane Quarry (SSI 6.61).

3.6 Water bodies are associated with industrial processes such as sludge lagoons at Adwick-le-Street Sewage Works (SSI 3.16), wastewater settlement lagoons from glass manufacturing at Pilkington's Burgy Banks (SSI 3.28), ash lagoons at Thorpe Marsh Area (SSI 7.25b) and cooling water ponds at the now-defunct Thorpe Marsh Power Station.

3.7 Borrow pits associated with railways, roads canals, and flood defences are a common feature of Doncaster's countryside, although many are now drying out and terrestrialising due to a lack of management. Drains have been created alongside new roads in the Decoy Bank Area (SSI 2.28). Borrow-pits are associated with flood defences on the Ea Beck at Thornhurst Pond (Carcroft) (SSI 7.16), at Norwood (SSI 3.20), Tilts and Old Ea Beck (SSI 3.19), on the River Don at Bentley Ings (SSI 3.30),

Arksey Ings (SSI 3.29), Bentley Bank (SSI 3.27), Barnby Dun Borrow Pits (SSI 8.9a & 8.9b), Thorpe Marsh Area (SSI 7.25b), on the River Dearne at Mexborough Low Pasture (SSI 5.5), at Torne Valley (SSI 4.48a,c,e+f) on the River Torne and at Gainsborough Road Pond (SSI 4.27) on the River Idle.

3.8 The construction of a raised canal network has also created borrow pits at Northfield Pond (SSI 8.4), Croft Ings (SSI 8.8 a,b+c) and Bramwith Lock Woods (SSI 8.3). Long stretches of borrow-pits and numerous small ponds are also associated with railways at Thorne Railway Delves (SSI 9.19), Wrancarr Drain and Braithwaite Delves (SSI 7.29) and in Bentley Ings (SSI 3.30).

3.9 Historic structures such as castles, moated manor houses, mills and country house estates are associated with open water habitats. A large proportion of these are on the Magnesian Limestone, those such as Bilham Park Fish Pond Plantation (SSI 6.25), Hickleton Park (SSI 6.34), Campsmount Park (SSI 7.7), Campsall Country Park (SSI 7.8), Skellow Mill Pond (SSI 7.5), Cusworth Hall (SSI 3.10), Melton College and Cadeby Riddings (SSI 6.50a & 6.50b), Barnburgh Hall (Thunderhole candidate SSI 6.67), Crookhill Park and Plantation (SSI 4.2), St Catherine's Lily Pond (SSI 2.22), Tickhill Castle (SSI 4.18) and Tickhill Mill Pond.

3.10 Askern Pool, Hanging Wood and Highfields Lake (SSI 3.6), Castle Hills, Scawthorpe (SSI 3.17), Arksey Round-About Moat (SSI 3.24) and Moat Hill, Bentley (SSI 3.26) - which is now mostly fen - are historic water bodies located on the eastern edge of the Magnesian Limestone, whereas Fenwick Hall Moat (SSI 7.22b) lies entirely within the Humberhead levels. Ponds in Frickley Park (including Whin Covert) (SSI 6.3) lie on the western foot of the Magnesian Limestone ridge. Bawtry Hall Park and Lake (SSI 4.26a) and Manor Holt - Bawtry Forest (candidate SSI 4.54) are located on the Sherwood sandstone.

3.11 The lowlands of the Humberhead Levels and the Potteric and Loversall Carrs are crossed by a network of regular drainage channels with numerous pumping stations pumping water into highland carrier drains and embanked rivers. Thorne and Hatfield Moors also have a number of open water bodies, which are very important to wildlife given their location in surrounding favourable habitat. Species-rich drain networks in the Torne Catchment include Mother Drain (SSI 2.49b) - Rossington Bridge-, numerous field drains and toe drains in the Torne Valley (SSI 4.48a, c, e, f).

3.12 In the area around the Ea Beck and River Don there are species-rich drains at Wellsyke Drain (SSI 3.13), Old Ings and Chequer Lane (SSI 8.1a+b), Ruskholme (SSI 8.1c), Wrancarr Drain and Braithwaite Delves (SSI 7.29), Thorne Watersides, Oxbows and Ings (SSI 9.12) and many non-SSI in the Thorpe in Balne – Kirk Bramwith area.

3.13 Drains around Thorne Moors and the Hatfield Chase are also important reservoirs of wetland biodiversity. Several drains have been designated as SSIs, such as Oak Moor and Chadwick Dike Area (SSI 9.17), North Soak Drain (SSI 9.24) - East of Maud's Bridge, Old Goodnow Drain (SSI 9.23), Sandhill Farm Drain (Boating Dike) (SSI 9.25) and Redhouse Farm Drain (Boating Dike) (SSI 9.26), both parts of the former River Don, Bletcher's Drain (SSI 9.27), Clay Bank Drain (SSI 9.28a & 9.28b), Hassock Drain (SSI 9.29), M180 North Drain (SSI 9.30a) and Askern's Drain (SSI 9.30b), Crow Trees Moor Drain West and Moor Lane Drain (SSI 9.31a+b), West Moor Drain (SSI 9.37), Remple Common Drain (SSI 9.38) and Hatfield Moors West (SSI 9.40d).

3.14 Drains and ditches also form part of several statutory Nature Conservation sites at Shirley Pool SSSI, Potteric Carr SSSI, Sandall Beat Wood SSSI, Thorne Moors SSSI, SAC and SPA and Hatfield Moors SSSI, SAC and SPA.

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 ditches and drains require consent from the Internal Drainage Board, or the Environment Agency where no Internal Drainage Board exists. Modifications to ponds and water bodies may require Environment Agency Consent. Discharges, abstractions and impoundments require Environment Agency Consent. Water Companies and Internal Drainage Boards also have duties to protect biodiversity.

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 marshes, swamps, open water ditches and pond habitats. They also apply to historic earthworks such as moated sites. Such sites may also be afforded protection through designation as Scheduled Ancient Monuments.

5. Links to associated habitats & species

5.1 The Marshes and Swamps, Lakes and Ponds, Ditches and Drains Habitat Action Plan is linked to the following Habitat Action Plans

- Rivers, Canals, Oxbows, Major Streams and Subsidence Flashes (RCF)
- Minor Streams, Springs, Fens, Flushes, Mires and Fenny Fields (SFM)
- Reedbeds (RB)
- Neutral and Wet Grassland (NWG)
- Wet Woodland (WW)
- Greenways (GW)
- Ancient and Species Rich Hedgerows (ASH)
- Arable Field Margins (AFM)

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 **152** species associated with Marshes and Swamps, Lakes and Ponds, Ditches and Drains.

6. Current factors causing loss or decline

6.1 Habitat loss, such as infilling of drains, piping or culverting of ditches and infilling of ponds can occur, but such activities may require land drainage consent from either the Environment Agency or Internal Drainage Boards. Vulnerable habitats are often within agricultural land away from footpaths or bridleways and therefore losses often go un-reported.

6.2 Maintenance of water levels is critical to the preservation of open water. Abstraction for drinking water has led to a lowering of groundwater levels and aquifer depletion, which affects ground-water-fed water bodies. This causes terrestrialisation of wetland habitats, promoting natural succession to scrub woodland. The water bodies such as Gravel Hill Lake, Rossington and the ponds on Blaxton Common (SSI 4.47a) on the sandy areas of eastern Doncaster are particularly prone to changes in groundwater levels. Future expansion of Doncaster's population will put increased pressure on the aquifers, risking lowering of the water table and drying-out of wet sites. The sandstone aquifer is significantly depleted for irrigation of potato farms in the summer. Conversely, cessation of mine pumping can lead to increasing ground water levels in other areas.

6.3 Development pressures threaten to isolate ponds and water bodies and sever links between open water, drains and other habitats in the surrounding countryside. The St Catherine's Lily Pond (SSI 2.22) is a wetland site that is at risk of isolation if further planned development proceeds, however it is hoped that linking corridors of suitable habitat will be included in the design of the housing sites. Shaw Lane fishing

pond is a small flooded brick pit that is now surrounded on all side by roads and industrial and retail development.

6.4 Abstraction from drains for irrigation lowers ditch and drain levels and could even affect main rivers such as the Torne where there are proposals to allow tidal backflow from the Trent.

6.5 Flood defences have caused the drying up of wetland sites and can sever natural floodplain swamps and marshes from periodic inundation.

6.6 Wet areas such as ponds and flooded fields have become established as a result of past mining subsidence. However, mining subsidence remediation falls under the remit of the Coal Mining Subsidence Act 1992 and the Doncaster Drainage Act 1929, which require that land returns to a state that existed prior to the onset of mining subsidence. The wet areas created will now be lost as the effects of subsidence are rectified on agricultural land.

6.7 Water quality can be adversely affected by some agricultural, industrial and quarrying operations and this may be a factor in the reduction in species diversity noted in Hatfield Chase Drains. Nutrient enrichment causes increased growth and dominance of vigorous plant species and can lead to a loss of biodiversity. High sediment loads can smother vegetation and create anaerobic conditions. There are local problems of septic tank overflows and illegal discharge of untreated sewage direct into Internal Drainage Board drains, as well as releases of storm-water overflows from sewage works. Pressure to comply with the Water Framework Directive is leading to major improvements to Waste Water Treatment Works, which is bringing improvement in the water quality of discharges from sewage works (although this does not tackle the problems of septic tank contamination in IDB drains).

6.8 Despite guidelines on the choice of appropriate weather conditions and the leaving of buffer strips beside open watercourses, spraying of adjacent agricultural land with pesticides and fertilisers can lead to contamination of ditches and drains. Fertiliser application and excessive manuring of fields around ponds, marshes and swamps can also cause nutrient enrichment. There are many examples of agricultural tillage within 6 inches of the drain bank tops in many parts of the Hatfield Chase and wider Humberhead Levels. This leads to bank slippage and erosion, requiring increased drain maintenance.

6.9 Routine drain management, including dredging, artificial bank reinforcement and piping can be detrimental to drain biodiversity and may adversely affect the habitat of species such as water vole. However, the potentially more ecologically damaging piping and over-deepening are now last resort options for achieving the required drainage. The typically steep trapezoidal drain profile also limits the potential biodiversity value of drains by limiting the marginal /emergent growth to a narrow strip.

6.10 Restoration of historic landscapes can be detrimental to the biodiversity of ornamental lakes and ponds that have naturalised. It is difficult to strike an appropriate balance between conflicting objectives for the conservation of historic and wildlife features.

6.11 Use of ponds as fishing lakes causes poor water quality due to the stirring-up of sediments by bottom-feeding fish. Discarded line can be harmful to water birds. Excessive management of emergent vegetation and overhanging branches snag fishing lines and consequently are often results in less than sympathetic cutting.

6.12 Changes in surrounding land uses can have a serious effect on the local water table and water quality, in particular the covering of local catchments with impervious surfaces or the directing of oil and silt-contaminated road run-off into existing water bodies. Ponds on heathland sites are particularly prone to lowered ground water

levels and the desiccation effects of afforestation of surrounding land as may have occurred at Martin Beck Common Ponds (SSI 4.24a & 4.24b).

6.13 Lack of management and low rainfall can result in terrestrialisation of borrow-pits and ponds. These water bodies can sometimes be the last reservoir for protected species such as **great crested newt** (*Triturus cristatus*), which may have lost suitable breeding habitats in the wider countryside.

6.14 Rising sea levels may cause increased salinity of the ground water in low-lying areas and may impair effective drainage of the land.

6.15 Native plant diversity in some water bodies and drains has been reduced due to invasion by introduced plants. Alien plant species associated with still water habitats include New Zealand pigmyweed (*Crassula helmsii*), water fern (*Azolla filiculoides*), water milfoil (*Myriophyllum aquaticum*) (also known as parrot's feather) and Himalayan balsam (*Impatiens glandulifera*). Spread of alien species, in particular *Azolla* and parrot's feather can be a problem in small ponds with public access, where the emptying of aquaria or transfer of excess frogspawn from garden ponds can lead to inadvertent introductions. Himalayan balsam, a plant originally introduced because of its attractive pink skullcap flowers, has escaped the confines of garden and now covers many miles of riverbank and surrounds ponds and marshes in a 6-foot dense forest of succulent, 'triffid'-like undergrowth. *Crassula* is a particular problem because it obliterates all other plants by spreading in shallow water, forming dense floating mats over deeper open water and even spreading onto land. It can be spread by transfer of the smallest fragments of plant material and can easily be caught on birds' feet. *Crassula* is a major problem at Bawtry Hall Park and Lake (SSI 4.26a) and is also present at Dodge Dike Pond (SSI 8.22) and in ponds on Austerfield Sandpits and Willow Holt (SSI 4.30).

6.16 Emptying of aquaria may also be responsible for the presence of the Amazonian freshwater jellyfish *Craspedacusta sowerbii*, which has been recorded at Hatfield Marina for several years. Transfer could also have occurred on canoes or boats brought into the marina since there are also known to be populations in some canal systems.

6.17 Increasing recreation pressures including boating, jet skiing and angling can affect the wildlife value of lakes and ponds. Ponds are also often stocked with fish without the landowner's permission.

6.18 Ponds can also be used as general tipping sites and those near lanes and byways are at risk from fly tipping.

6.19 Reclamation of mineral extraction sites can create opportunities for extensive wetland creation where the end use is primarily for nature conservation and informal recreation. Agricultural reclamation is often most appropriate on balance, but this should not leave the scheme devoid of wildlife gain. Wetlands can be incorporated into an agricultural landscape and enhance its visual and wildlife benefits. Restoration to wetlands and open water bodies may now be restricted, particularly in terms of water body size, by the bird-strike hazard zone in force around Finningley Airport. Because of the risk of aircraft colliding with large and/or flocking birds, the Civil Aviation Authority (CAA) recommends a 13km exclusion zone around all airports, both civil and military. The Environment Agency and Local Planning Authority can advise on any potential wetland creation projects that may be affected.

7. Current local action

Research & Monitoring

7.1 A funding bid is currently being prepared for a sub-regional ponds inventory project.

7.2 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. Many ponds and lakes, marshes, swamps and ditches and drains have been identified as SSIs or as candidate SSIs.

7.3 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.

7.4 The Doncaster Naturalists' Society holds regular field meetings and has carried out detailed surveys of sites with pond, marsh, swamp and ditch and drain habitats. The Society routinely submits biological records to the Local Record Centre at Doncaster Museum.

7.5 Mr Colin Howes of Doncaster Museum has undertaken detailed research into pond losses in the Fishlake area but the survey may now benefit from updating to reflect the current situation.

7.6 The Environment Agency has commissioned surveys of many drains in the Hatfield Chase Area.

Communications & Publicity

7.7 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.

Safeguarding & Management

7.8 The Local Authority owns/manages Local Nature Reserves and candidate LNRs that have ponds, marsh and ditch and drain habitats (e.g. Howell Wood, Sandall Beat Wood and Campsall Country Park. St Catherine's Lily Pond (SSI 2.22) is also in local authority ownership and is managed by the ranger service.

7.9 Sites such as Shirley Pool, Denaby Ings, and Sandall Beat and Potteric Carr are SSSIs. Management plans have been prepared and implemented for these SSSIs. Sandall Beat Wood is also an LNR and several sites with ponds, fishing lakes, marshes and swamps that are SSIs are managed by DMBC.

7.10 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 SSIs, 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, including one for Hexthorpe Ings (SSI 2.16).

Funding & Resources

7.11 The new Environmental Stewardship Scheme (entry level) provides funding for ditch management. The higher-level scheme also targets the maintenance of ponds and 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.

7.12 There are some initiatives that aim to increase and encourage appropriate management of existing ponds, marshes and swamps and watercourses.

Advisory

7.13 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

Links to other Strategies & Plans

7.14 The Environment Agency is completing Catchment Flood Management Plans and Flood Risk Management Strategies, which include objectives to create more washlands and also to seek opportunities for creation of new ponds, marshes and wetlands.

7.15 Doncaster Metropolitan Borough Council's Public Rights of Way Service is currently developing its Rights Of Way Improvement Plan. This document will provide a strategic and thematic overview to the management and development of the public rights of way network across the Borough. The Plan will include some direction on the conservation and enhancement of biodiversity along rights of way, and includes provision for further work on the green lanes of the northern villages and their associated ditch lines.

Policy & Legislation

7.16 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.

8. Objectives, Targets and 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 marshes and swamps, ponds and lakes, and ditches and drains.	Continuous	1.1	<p>Prevent degradation and loss of wetland 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), 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 marsh, swamp, pond, ditch and drain 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), IDBs	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
	2 parishes by 2008.	1.4	Undertake a pond survey in parishes that are a priority for this habitat type (e.g. Fishlake). Use survey results to determine the necessary conservation action to take forward.	DMBC, DNS	To be evaluated	Future Research & Monitoring
	1 site restored and with appropriate management by 2009.	1.5	Restore and ensure appropriate future management of borrow pit sites that have become overgrown and silted up.	DNS, YWT, DMBC, Environment Agency (EA), rail operators	To be evaluated	Safeguarding & Management
	No net loss in biodiversity assets as a result of new drainage schemes approved by the EA or Natural England under the EIA Regulations.	1.6	Assess the impacts of new drainage schemes on ponds, marshes and swamps and drain networks, to protect their biodiversity value, as required under the Environment Act. Request ecological and hydrological surveys where necessary.	EA, NE, IDBs	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 IDB. 5 sites with management improvements for biodiversity by 2009.	1.7	Drainage management and alterations to drainage schemes to reflect the requirement for sustaining and improving marsh, pond and ditch 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.	IDB's	Negligible – Part of regular work	Safeguarding & Management
	Continuous.	1.8	Ensure better regulation and pollution control of discharges into open watercourses to reduce contamination by septic tanks.	DMBC	Staff costs	Advisory/ Safeguarding & Management
	Continuous.	1.9	Ensure better enforcement of regulations regarding no-spray and no-cultivation buffer strips beside watercourses and around ponds.	EA Agricultural Officers within the Ridings and Lower Trent areas	Staff costs	Advisory/ Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	Continuous.	1.10	DMBC to support the EA policy of no further canalisation or culverting of streams, ditches and drains, wherever possible, through delivery of statutory functions and in undertaking land management activities on DMBC land.	DMBC, EA	Staff costs	Policy & Legislation/ Safeguarding and Management.
	By 2010.	1.11	Develop a Pond Inventory - Carry out a comprehensive pond survey for the whole borough to identify, map and quantify ponds in relation to their current biodiversity value and their potential value.	DBAP, DMBC, DNS, Ponds Conservation Trust (PCT), YWT	To be evaluated	Future Research & Monitoring

Objective	Target	Ref	Action	Lead Partners	Costs	Category
2) To restore degraded sites and ensure appropriate management of marshes and swamps, ponds and lakes, and ditches and drains.	2 sites with active habitat management by 2008 and a further 2 sites by 2010.	2.1	<p>1) Identify riparian landowners of existing degraded open water habitats.</p> <p>2) Aim to get farmland adjacent to drains and around ponds, marsh and swamp under Higher-Level ESS. Provide assistance to owners seeking funding for nature conservation management and provide advice on management techniques in order to implement the appropriate management:</p> <p>3) NE to provide baseline data on current number of landholdings with Environmental Stewardship relating to open water habitats.</p>	NE, Farming & Wildlife Advisory Group (FWAG), EA, IDBs, DMBC, PCT, Private landowners, EA	To be evaluated	Safeguarding & Management/ Habitat Creation & Restoration
	1 event by 2008.	2.2	Run a promotional event for farmers to advise and encourage sensitive management of open water habitat.	DMBC, NE, EA, IDBs, FWAG, Linking the Environment And Farming (LEAF)	To be evaluated	Advisory/ Communications & publicity

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	By 2008.	2.3	<p>Review the Environmental Stewardship targeting statements. Check the following are included as initiatives to increase Stewardship points.</p> <ul style="list-style-type: none"> • Traditional management of bank side trees (pollarding). • Selection of appropriate native plants in newly created ponds. • Bank stabilisation/erosion-prevention using soft engineering techniques. • Control of vegetation – especially invasive alien species • Management of fishponds, control of fish introductions and waterfowl numbers • Control and management of recreational uses including water sports. 	NE, DBAP	Staff costs and volunteer time	Policy & Legislation
	Continuous.	2.4	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

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	Continuous.	2.5	1) Ensure the continuation and expansion of the FLAG scheme to address littering of watercourses and illegal tipping in ponds and ditches. 2) Combine this with a public awareness campaign and strict enforcement of fly tipping offences.	DMBC, EA	Negligible – part of regular work	Safeguarding & Management / Communications & Publicity
	By 2008.	2.6	Set up a wetland restoration project group, to focus on the development and implementation of wetland restoration schemes, including securing funds for all aspects of works and project management.	All partners	Staff costs and volunteer time	Safeguarding and Management / Communications and publicity
	Re-instate wet conditions on 2 former floodplain sites by 2010.	2.7	Undertake works such as the removal of flood banks to re-connect segregated flood-plain sites with their river. Undertake any initial management works such as scrub removal, as necessary.	EA lead, all DBAP partners	£5000 to £50 000 per ha depending on individual projects	Habitat Creation & Restoration
	Develop and implement 3 Water Level Management Plans by 2010.	2.8	Draw up and implement Water Level Management Plans for key sites affected by land drainage schemes; Shirley Pool and Thorne Moors (IDB), Hatfield Moors (EA).	EA, IDB	To be evaluated	Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
	5 sites by 2010.	2.9	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 2ha of marshes, swamps, ponds and lakes and ditches and drains linked to existing river, stream, ditch and drain systems.	1 ha of new habitat created by 2010.	3.1	Work with landowners to find sites where new wetlands can be created as part of flood defence works and re-alignment of defences without loss of other priority habitats.	EA, IDB	£5000 to £50,000 per ha depending on individual projects	Habitat Creation & Restoration/ Advisory
	3 new landholdings with higher-level Environmental Stewardship incorporating aquatic habitats by 2010.	3.2	Areas affected by mining subsidence (such as Blackshaw Clough) to be the focus of work to encourage landowners to allow reversion of areas to marshland, basin mire fen, swamp and other aquatic habitats, by encouraging entry into higher level Environmental Stewardship Schemes.	BW, IDB, Private Landowners, NE, FWAG, Coal Authority, YWT, DBAP, DNS and Thorne & Hatfield Moors Conservation Forum (THMCF)	Staff costs and volunteer time	Advisory/ Communications & publicity
	1 ha of wetland habitat created through mineral site restoration, by 2010.	3.3	Promote the restoration of mineral extraction sites to a diverse mosaic of wetland habitats, including the necessary provision for associated priority species.	DMBC, mineral site owners/ Developers	To be evaluated	Safeguarding & Management

Objective	Target	Ref	Action	Lead Partners	Costs	Category
4) Raise public awareness of the importance and special characteristics of marsh and swamp, pond and lake and ditch and drain habitats.	By 2008.	4.1	Run a pond species survey and identification workshop open to the general public.	DNS, YWT	£256	Communications & Publicity/ Advisory
	By 2009.	4.2	Continue the programme of LNR designation to include more sites of open water and drain habitats close to the urban population e.g. Hexthorpe Ings.	DMBC	To be evaluated	Safeguarding & Management
	1 demonstration by 2009.	4.3	Promote good management practice through the use of demonstration site and workshop event.	DMBC, EA, FWAG, LEAF, EN YWT, British Trust for Conservation Volunteers (BTCV)	£2640	Advisory

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

The distribution of Marshes and Swamps, Lakes and Ponds, Ditches and Drains (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:

Callitriche stagnallis sens str, *Callitriche stagnallis sens lat*, *Eleocharis palustris*, *Elodea Canadensis*, *Elodea nuttalli*, *Glyceria maxima*, *Iris pseudacorus*, *Lemna trisulca*, *Lycopus europaeus*, *Lythum salicaria*, *Phragmites australis*, *Potamogeton natans*, *Ranunculus flammula*, *Sparganium erectum*, *Typha latifolia*, *Myosotis scorpioides*

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%  1-3 Species
- 26-50%  4-7 Species
- 51-75%  8-10 Species
- 76-100%  11-14 Species

Marshes and Swamps, Lakes and Ponds, Ditches and Drains

DATE: January 2007

SCALE: 1:160,000

DRAWING NO: HAP/1/MLD1

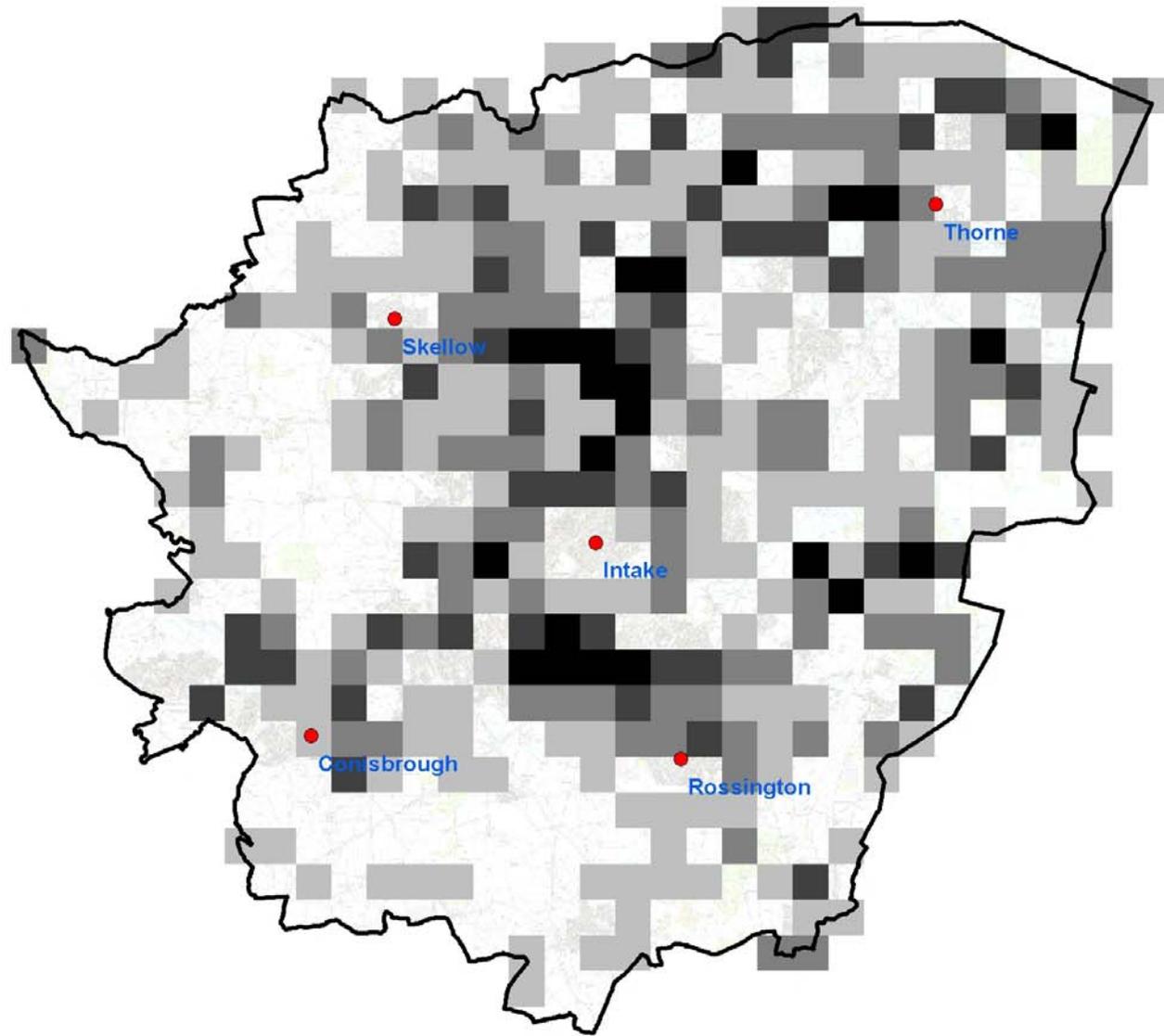
LEGEND

-  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 Marshes and Swamps, Lakes and Ponds, Ditches and Drains (Map 2) has been constructed using a range of information from the local Internal Drainage Boards (IDB's), this includes:

-  All IDB Drains
-  All IDB pumping stations

The area covered by each of the IDB's is also shown.

Known locations of standing water are also shown - 

Marshes and Swamps, Lakes and Ponds, Ditches and Drains

DATE: January 2007
 SCALE: 1:160,000
 DRAWING NO: HAP/1/MLD2



LEGEND

-  Doncaster Borough Boundary
-  Village
-  IDB Pumping Station
-  IDB Drain
-  Standing Water
-  Armthorpe IDB
-  Ashfields and West Moor IDB
-  Black Carr Drainage Board
-  Deame & Dove IDB
-  Dun Drainage Commissioners
-  Finningley IDB
-  Hatfield Chase IDB
-  Potteric Carr IDB
-  Tween Bridge IDB
-  Went IDB

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