

Northern Ireland Habitat Action Plan
Fens
March 2005

1. Current Status

1.1 Biological Status

- 1.1.1 Fens are minerotrophic peatlands, that is, they receive the majority of their water and nutrients from soil, rock and ground water. They occur in river valleys, poorly drained basins or inter-drumlin hollows, along lake margins or on river flood-plains. Fens include a wide range of wetland vegetation types depending on the process of formation, existing and historical land use and the nature of underlying rocks and substrates. For the purposes of this habitat action plan, fens as defined as confined to lowlands.
- 1.1.2 Two broad types of fen can be distinguished. Topogenous fens include those mires where water movements in the peat or soil are generally vertical. They include basin fens and floodplain fens. Soligenous fens are those mires where water movements are dominantly lateral, including valley mires, springs and flushes in the lowlands. Flushes are maintained by the movement or seepage of water and may or may not be peat-forming and in many cases are best dealt with as part of other habitats such as heathland (Fossitt, 2000). Within these two general types, fen vegetation has been traditionally classified into three basic types, 'poor-fens', 'rich-fen' and 'transition mire and quaking bog'.
- 1.1.3 Poor-fens arise where water originates over base-poor rock such as sandstones and granites and occur mainly in the upland margins. Some are associated with lowland heaths or raised bogs. Poor-fens are likely to have a moss layer including or dominated by bog mosses *Sphagnum* spp., purple moor-grass *Molinia caerulea*, bottle sedge *Carex rostrata* and the smaller sedges, such as star sedge *C. echinata* and common sedge *C. nigra*, may dominate amongst the vascular plants. Fossitt (2000) includes flushes that are acidic but not peat-forming in the poor-fen category.
- 1.1.4 Rich-fens (and associated flushes), are fed by mineral-enriched calcareous waters (pH 5 or more) and are mainly confined to the lowlands, often infilling lowland lakes. Vegetation differs in species composition from poor-fens and is usually much more diverse. Rich-fen species include bog pimpernel *Anagallis tenella*, meadow thistle *Cirsium dissectum*, saw sedge *Cladium mariscus*, marsh helleborine *Epipactis palustris*, blunt-flowered rush *Juncus subnodulosus*, grass-of-parnassus *Parnassia palustris*, common butterwort *Pinguicula vulgaris*, black bog-rush *Schoenus nigricans*, and bladderworts *Utricularia* spp..
- 1.1.5 Rich fen habitats include three habitats listed on Annex 1 of the EU Habitats Directive - *Alkaline fens* (7230) and *Calcareous fens with Cladium mariscus and species of the Caricion davallianae* (7210-a priority habitat) and *Petrifying springs with tufa formation (Cratoneurion)* (7220).

- 1.1.6 *Transition mires and quaking bogs* (7140) are also listed under Annex 1 of the EU Habitats Directive.
- 1.1.7 Transition mires and quaking bogs have characteristics that are intermediate between poor or rich fens and bog vegetation. They are usually associated with the wettest parts of a mire and can be found in wet hollows, infilling depressions, or as a transitional zone to areas of open water. In the last case, the water table is determined by vertical fluctuations of the open water body. The vegetation of transition mires forms a floating mat over saturated, spongy or quaking peat. Small to medium-sized sedges e.g. bottle sedge, lesser tussock-sedge *Carex diandra*, slender sedge *C. lasiocarpa*, and bog-sedge *C. limosa* usually dominate but they may occur with common cottongrass *Eriophorum angustifolium*, creeping bent *Agrostis stolonifera*, purple moor-grass, and broadleaved wetland herbs like bogbean *Menyanthes trifoliata*, marsh pennywort *Hydrocotyle vulgaris*, lesser spearwort *Ranunculus flammula*, marsh cinquefoil *Potentilla palustris* and marsh lousewort *Pedicularis palustris*. Transition mires support an extensive moss cover including *Sphagnum* spp., *Calliergon* spp. and *Scorpidium scorpioides*.
- 1.1.8 The definition of fens used here encompasses a much wider range of plant communities than the traditional fen vegetation described above. It includes swamp vegetation which is species-poor and dominated by a mixture of species including bulrush *Scirpus* spp., reed-mace *Typha* spp., reed canary grass *Phalaris arundinacea*, branched bur-reed *Sparganium erectum*, flowering-rush *Butomus umbellatus* and tall sedges such as *Cladium mariscus*, *Carex riparia*, *C. rostrata* or *C. vesicaria*. In addition, tall fen and associated marshy grassland vegetation on deep peat dominated by meadowsweet *Filipendula ulmaria*, tall grasses and rushes is also included. Larger areas (e.g. > 0.5-1 ha) dominated by common reed *Phragmites australis*, swampy woodland or open water are, however, excluded. Many of these taller plant communities tend to dominate on sites affected by past drainage schemes and excessive nutrient enrichment or are transitional to other habitats such as open water and grassland.
- 1.1.9 Aquatic communities, mires, swamps and tall-herb fens which comprise fen vegetation have been the subject of comprehensive review as part of the National Vegetation Classification (NVC), (Rodwell, 1995). NVC is not directly applicable in Northern Ireland however it is possible to compare many of the plant communities in Northern Ireland with those in mainland UK. A large number of plant communities described in the NVC occur in fens in Northern Ireland (Shaw & Wheeler, 1996, Wolfe-Murphy *et al.*, 1992, p. Corbett pers. comm). These include the following low- growing fen communities: M4 *Carex rostrata-Sphagnum recurvum* mire (poor-fen, transition mire), M5 *Carex rostrata-Sphagnum squarrosum* mire (transition mire), M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire (poor-fen), M9 *Carex rostrata-Calliergon cuspidatum* mire (transition mire, rich-fen), M10 *Carex dioica-Pinguicula vulgaris* mire (rich fen, rare in lowlands), M13 *Schoenus nigricans-Juncus subnodulosus* mire (rich-fen, rare), M22 *Juncus subnodulosus-Cirsium palustre* rich fen (local) and S27 *Carex rostrata-Potentilla palustris* fen (transition mire).
- 1.1.10 In addition, a number of tall fen and swamp communities occur although some of these, such as those occurring around Upper Lough Erne, are inadequately described in the NVC.

- 1.1.11 This HAP is largely concerned with the conservation of lowland fens. Upland fens partly surrounded by blanket bog and upland heath are excluded. This HAP closely follows the definition of fen adopted for the Welsh fen HAP (Jones *et al.*, 2003). It incorporates the three categories of fen recognised in the NCC Phase 1 habitat classification from predominantly peat-based substrates (valley, basin and floodplain mires) together with the Phase 1 categories acid, neutral and basic flush and bryophyte-dominated spring.
- 1.1.12 Distinguishing fen from a range of closely associated priority habitats can be problematical. Fen and swamp communities often occur within a matrix of raised bog, wet grassland, open water and wet woodland plant communities. Where these are minor components they are included as part of the fen habitat. However, larger areas of low-lying wet grassland are included in the coastal and the floodplain grazing marsh plan; this principle also applies to significant areas of reed bed, lowland raised bog and wet woodland which are included in their respective plans. Degraded fens are included in the habitat where they occur as rush-dominated wet grassland communities on deep peat as these communities may have replaced other forms of fen or bog vegetation as a result of management neglect or anthropogenic modification.
- 1.1.13 Fens have declined as a result of drainage and control of water levels. Many extensive areas of fen associated with large lakes have disappeared. For instance, prior to successive lowerings of Lough Neagh, fen communities extended in a strip up to several hundred metres wide, stretching southwards from Washing Bay shore to Hog Point; a distance of ca 40km (Cabot, 1999). Many fens in Northern Ireland have been created on former raised bog through peat-cutting down to a level where it is influenced by ground water. This has allowed the natural spread of fen communities. The cessation of peat cutting on these sites has resulted in succession which has probably resulted in a general reduction in fen extent and quality.
- 1.1.14 No comprehensive inventory of fens has been carried out in Northern Ireland. However, the Northern Ireland Countryside Survey 2000 (NICS 2000) (Cooper & McCann, 2001), provides estimates of a range of land cover types including fen and swamp, which are directly comparable to the definition of fen used for this action plan. Other land cover types recorded by the NICS 2000, such as poor fen or fen meadow, may also form part of this habitat.
- 1.1.15 Using NICS 2000, it is estimated that lowland fen (occurring in lowland land-classes) occupies 2,950 ha (comprising 2,075 ha of the 'fen' land cover type and 875 ha of the 'swamp land' cover type) (Cooper & McCann, 2001). This estimate of fen area should be regarded as a minimum. This is because a significant proportion of the 'poor-fen' and 'fen meadow' land cover types occurring in the lowlands could be included as part of this habitat where it occurs on deep peat land cover type. Poor-fen and fen meadow would normally be considered to be part of the purple moor grass and rush pastures habitat action plan.
- 1.1.16 The NICS 2000 suggests a decrease of 18% (484 ha) lowland fen land cover type between 1988 and 1998 with no change in the area of swamp (Cooper & McCann, 2001). The main loss was to reedbed (8%, 212 ha) and mixed agricultural grassland (4%, 75 ha).

- 1.1.17 A number of fen surveys have been undertaken to identify possible Areas of Scientific Interest (ASSIs). The basis for the surveys has been information contained in the Northern Ireland Peatland Survey (Cruickshank & Tomlinson, 1986) and the Northern Ireland Lake Survey (NILS) (Wolfe-Murphy *et al.* 1992). The most comprehensive survey of fens in Northern Ireland was a survey of fens in Co. Down and Co. Armagh (Shaw & Wheeler, 1996). Similar, but less intensive, surveys have also been initiated on the fens of Co. Antrim and Co. Tyrone, and parts of Co. Fermanagh (P. Corbett pers. comm.). It is considered that Northern Ireland holds a significant proportion of the UK fen resource in terms of extent and habitat diversity and quality. The UK is thought to hold a large proportion of the fen surviving in the EU although there is no overall published reliable estimate of the extent of the fen resource in the UK (Jones *et al.*, 2003).
- 1.1.18 Fen surveys in Northern Ireland have shown that many topogenous fens are associated with lakes or lowland raised bogs and occur in interdrumlin hollows. Rich-fens are very restricted occurring mostly in south-east Co. Fermanagh and Lecale (Co. Down). Poor-fens and transition mires are rather more widespread. However, the majority of fen vegetation is tall fen or swamp with inter-mixed wet grassland or swampy woodland.
- 1.1.19 Although there has been no comprehensive survey of the conservation status of fens in the Republic of Ireland, and the status of these habitats is therefore unclear, it is considered that some of the best examples of alkaline fen, calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* and transition and quaking mires in western Europe occur here. No fen monitoring occurs in the Republic of Ireland apart from Pollardstown fen which is being monitored as part of the Kildare Bypass road scheme (ongoing) (Jim Ryan, pers. comm.).
- 1.1.20 The condition of fen vegetation on statutory sites is determined by setting targets or target ranges for carefully selected attributes. Attributes are components or characteristics of the vegetation that are relatively easy to measure, but which are reliable indicators of the 'health' of the habitat.
- 1.1.21 Attributes used to determine the condition of fens on statutory sites include the area occupied by the habitat(s), vegetation height, the cover of litter and bare ground, the cover of herbs, grasses, sedges, brown mosses, *Sphagnum*, purple moor-grass, rank grasses, and presence or absence of positive and negative plant indicator species (Corbett, 2004). A preliminary evaluation indicates that a significant proportion of fen vegetation is in unfavourable condition. A combination of past drainage, nutrient enrichment and lack of management are often the cause for this. Surveys of undesignated sites indicate that many non-statutory sites containing the more sensitive low-growing fen communities may also be in unfavourable condition.
- 1.1.22 Fens are a diverse habitat which support a very wide range of plant and animal species including well recognised species such as European frog *Rana temporaria* and the smooth newt *Triturus vulgaris* and many Northern Ireland species of conservation concern. The latter include breeding birds of taller vegetation e.g. reed bunting *Emberiza schoeniclus*, open areas e.g. breeding waders and open water e.g. shoveler *Anas cyptela*. Northern Ireland fens are particularly important for invertebrates several of which are absent or threatened in Great Britain. These include dragonflies such as

the Irish damselfly *Coenagrion lunulatum*, beetles such as the whirligig beetle *Gyrinus natator*, the water beetle *Haliplus variegates*, the pond skater *Limnopus rufoscutellatus* and the carabid beetle *Pterostichus aterrimus* and butterflies and moths such as the marsh fritillary butterfly *Euphydryas aurinia*.

- 1.1.23 A number of locally rare plant species are associated with fens, such as the Northern Ireland species of conservation concern fen bedstraw *Galium uliginosum*, greater water-parsnip *Sium latifolium*, holy grass *Hierochloe odorata*, Irish lady's-tresses *Spiranthes romanzoffiana*, marsh helleborine *Epipactis palustris* and marsh pea *Lathyrus palustris*.

1.2 Links with other action plans

- 1.2.1 Fens may form a complex mosaic with other Northern Ireland priority habitats such as reedbeds, lowland raised bog, wet woodland, floodplain and coastal grazing marsh and can fringe mesotrophic lakes, marl lakes, eutrophic standing waters and crowfoot rivers. The requirements of these habitats will need to be given due regard during the implementation of this plan.
- 1.2.2 Fens are an important habitat for about 8 UK priority species e.g. reed bunting, marsh fritillary butterfly *Eurodryas aurinia*, the carabid beetle *Pterostichus aterrimus*, the reed beetle *Donacia aquatica* and greater water-parsnip *Sium latifolium*. The requirements of these species should also be taken into account during the implementation of this plan.
- 1.2.3 In addition, fens are important for a range of Northern Ireland priority species including curlew *Numenius arquata*, redshank *Tringa totanus*, lapwing *Vanellus vanellus*, grasshopper warbler *Locustella naevia*, holy grass and the ground beetles *Carabus clatratus* and *Lebia crux-minor*
- 1.2.4 Relevant all-Ireland Species Action Plans have been published for the Irish hare *Lepus timidus hibernicus* and Irish lady's tresses.
- 1.2.5 Relevant published Northern Ireland Species Action Plans include the Irish hare, curlew, redshank, lapwing, marsh fritillary.

2. Current Factors Affecting the Habitat

- 2.1 Drainage – and any subsequent changes in the water-table, particularly the lowering and stabilisation of water-tables, can effect the extent and quality of fens. This can be the result of both direct drainage and indirectly by marginal drainage, through changes in water-levels of lakes and water abstraction from aquifers can also have an effect. Excessive water abstraction from aquifers has resulted in dried up or reduced spring line flows, and generally lowered the high water tables on which some fens depend.
- 2.2 Agricultural practice – such as high grazing levels can result in excessive poaching, nutrient enrichment and eventual changes to fens and agricultural grassland. Conversely, on some fens, lack of grazing (or mowing) can result in a loss of low

growing plant communities and loss of fen to reedbed or woodland and an eventual drying out of the site. Fens are sensitive to changes in grazing levels.

- 2.3 Eutrophication – resulting in nutrient enrichment from intensively managed farmland or other sources has resulted in the widespread replacement of important fen plant communities and associated invertebrate species with less demanding species of lower conservation value.
- 2.4 Land infill - for agricultural land reclamation, waste disposal or development affects a large number of fens. This directly results in the loss of extent and quality of fen vegetation, and can affect water-levels and water quality over a wide area.
- 2.5 Peat-cutting – has effected the character of many important fen sites. Although this has largely ceased, without appropriate management, the biodiversity associated with many sites will continue to deteriorate due to vegetation succession resulting in the loss of open water and more open fen habitats.
- 2.6 Climate change – summary predictions for temperature and sea level rise as a result of global warming have been modelled by the MONARCH project (Harrison *et al*, 2001). These models indicate a much smaller impact in Ireland than in Britain. Climate change could potentially result in changes in the species composition and diversity of fens and associated invertebrate populations.

3. Current Action

3.1 Legal status

- 3.1.1 In 1992, the EC adopted the *Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna*, known as the ‘Habitats Directive’. The Habitats Directive requires member states to designate and manage Special Areas of Conservation (SAC’s) for habitats (listed in Annex 1 of the Directive) and species (listed in Annex 2). A small proportion of these habitats and species, which are considered to be most in need of conservation at a European level, are given priority status. Rich fen habitats include three habitats listed on Annex 1 of the Directive - *Alkaline fens* (7230), *Calcareous fens with Cladium mariscus and species of the Caricion davallianae* (7210-a priority habitat) and *Petrifying springs with tufa formation (Cratoneurion)* (7220).
- 3.1.2 A number of important fen sites have been designated as cSACs. These include Derryleckagh Bog cSAC (transition mire), Lecale fens cSAC (calcareous fen), Magheraveely marl lakes cSAC (calcareous fen).
- 3.1.3 Some of the best examples of fens in western Europe occur in the Republic of Ireland and this is reflected in the total area containing fen proposed as candidate SACs under the Habitats Directive being 36.2km² (Otte, 2003). Some sites in the Republic of Ireland are in state ownership and managed by the National Parks and Wildlife Service and others by such non-governmental organisations (NGOs) as An Taisce – the National Trust for Ireland, and the Irish Peatland Conservation Council.

- 3.1.4 The *Conservation (Nature Habitats, etc.) Regulations (Northern Ireland) 1995* and *The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2004* (The Habitat Regulations) require competent authorities, when considering a plan or project not directly connected with the management of a European site e.g. an SAC or SPA, to undertake an Article 6 assessment. This assessment will determine if the plan or project, either alone or in combination with other plans or projects, is likely to have a significant impact on the site. In the case of a negative or undetermined assessment, a competent authority may only agree to the plan or project where it is satisfied that there are no alternative solutions and that the plan or project must be carried out for imperative reasons of overriding public interest, which may be of a social or economic nature. However, if the site hosts a priority habitat or species then the plan or project may only be approved for: a) reasons of human health, public safety, beneficial consequences of primary importance to the environment, or b) other reasons which the Department (DOE), having considered the opinion of the European Commission (EC), determines are imperative reasons of overriding public interest.
- 3.1.5 Under the terms of the Habitat Regulations, the above Article 6 assessment by the competent authority is required for plans or projects e.g. land reclamation, which are outside European sites but may still have an impact on the site.
- 3.1.6 Guidance to help competent authorities and others to interpret the Habitat Regulations has been published (EHS, 2002).
- 3.1.7 Guidance on the completion of an Article 6 assessment has also been published (European Commission, 2000)
- 3.1.8 Under the *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985*, and more recently under *The Environment (Northern Ireland) Order 2002* Areas of Special Scientific Interest (ASSIs) are identified and declared by the Department of the Environment (DOE) through the Environment and Heritage Service (EHS). As well as ASSIs, the *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985* (NCALO) legislates for National Nature Reserves (NNRs), Marine Nature Reserves (MNRs) and Local Nature Reserves (LNRs). *The Environment (Northern Ireland) Order 2002*, strengthened the protection of ASSIs, recognising the importance of working in partnership with owners and occupiers and facilitating the positive management of these sites. All cSACs are designated as ASSIs prior to designation as cSACs.
- 3.1.9 There are currently 51 ASSIs with fen as a selection feature amounting to 401.2 ha, some conforming to habitats listed in Annex 1 of the EU Habitats Directive: ‘alkaline fens’ (7230), ‘transition mires and quaking bogs’ (7140) and the priority habitats ‘calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*’ (7210) and ‘petrifying springs with tufa formation (*Cratoneurion*)’ (7220).
- 3.1.10 NNRs are established by EHS not only because they represent good examples of habitats, species sites and earth science features but because they also provide valuable facilities for the public to enjoy, appreciate and learn about wildlife.

- 3.1.11 In 2000, the Northern Ireland Biodiversity Group (NIBG) made its Recommendations to Government (NIBG, 2000). These were largely accepted by the Northern Ireland Executive in 2002, with the publication of the *Northern Ireland Biodiversity Strategy* (DOE, 2002). *The Regional Development Strategy 2025* (DRD, 2001) is underpinned by the sustainable approach and includes Strategic Planning Guidelines (SPGs) on the protection of the environment which bring together a comprehensive collection of natural heritage and built heritage strategic guidance that includes sustaining and enhancing biodiversity.
- 3.1.12 Regional Planning and Transportation Division within DRD is responsible for co-ordinating the implementation of the *Regional Development Strategy (RDS) for Northern Ireland 2025* (DRD, 2001). The RDS contains a Spatial Development Strategy and related Strategic Planning Guidelines (SPGs). The emphasis in the SPGs is on competitiveness, sustainable development and tackling social exclusion and division. Operational policies to give effect to the SPGs are contained in Planning Policy Statements (PPSs). Some of these policies have a direct or indirect bearing on the prevention of adverse impacts on priority habitats and species.
- 3.1.13 *PPS2 Planning and Nature Conservation* (DOE, 1997) (under review) contains planning policy for the hierarchy of sites of nature conservation importance. It also addresses trees and woodlands, protection of species and peatlands.
- 3.1.14 *PPS15 Planning and Floodrisk* is currently out to public consultation. It embodies the Government's commitment to sustainable development and the conservation of biodiversity and adopts a precautionary approach to decision making that takes account of climate change.
- 3.1.15 *PPS14 Sustainable Development in the Countryside* is due to be published by the end of 2005.
- 3.1.16 Site protection policies are included in Development Plans. These include the identification of Sites of Local Nature Conservation Importance (SLNCI's). Planning Service is currently considering which SLNCI's will be formally identified in Development Plans. Where such sites are confirmed in adopted plans, specific planning policies will be applied to development proposals on those sites.
- 3.1.17 The development of Local Biodiversity Action Plans (LBAP's) based on District Council areas and/or discrete landscape areas, and the appointment of Local Biodiversity Officers will help to build on the SLNCI network and encourage, co-ordinate and inform local biodiversity action.
- 3.1.18 EC Directive 2000/60/EC, *Establishing a Framework for Community Action in the Field of Water Policy* or the Water Framework Directive (WFD), was transposed into Northern Ireland law by the *Water Environment (WFD) Regulations (Northern Ireland) 2003*. The WFD sets a framework for comprehensive management of water resources in the European Community, within a common approach and with common objectives, principles and basic measures. It will be the driving force behind the setting of acceptable water quality standards on which all naturally occurring standing waters depend for the maintenance of their ecological integrity.

- 3.1.19 The WFD aims to determine baseline trophic states for all surface and groundwaters by setting reference conditions that indicate Good Ecological Status for all waterbody types. Under the WFD, member states must ensure that all waterbodies (excluding Artificial Waterbodies, e.g. Northern Ireland canals and Heavily Modified Waterbodies e.g. some Northern Ireland reservoirs), must be at least of Good Ecological Status by 2015. Artificial and heavily modified waterbodies must attain Good Ecological Potential by this date.
- 3.1.20 There is a requirement under Article 6 of the WFD to create a register of all areas which have been designated as requiring special protection under specific European Community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water. Northern Ireland must achieve compliance with the WFD standards and objectives relating to these protected areas by December 2015. There is an onus on the UK government under the WFD to ensure that any changes in water quantity and quality do not adversely affect sites of international importance.
- 3.1.21 The *Water (Northern Ireland) Order 1999* repealed and re-enacted, with amendments, the *Water Act (Northern Ireland) 1972*. The *Water (Northern Ireland) Order 1999* widens existing powers to license water abstraction to enable controls to be introduced, if necessary, to protect the aquatic environment in specific catchments or to control particular uses or industrial abstractions.
- 3.1.22 *Council Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances* was aimed mainly at the control of discharges of specified substances to groundwater. The impact of the Directive has been limited because a) only a restricted range of substances is controlled, b) it does not address either diffuse pollution or the essential links to the management of abstraction and c) it does not establish a comprehensive system for the monitoring of groundwater.
- 3.1.23 *Policy and Practice for the Protection of Groundwater in Northern Ireland* (EHS, 2001) sets out DOE strategies to protect the groundwater resource from polluting activities from waste disposal, agriculture and industry including creation of land surface zoning, protection zoning around key abstractions, policy statements on the control of groundwater quality and abstractions.
- 3.1.24 *Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources* (the Nitrates Directive) seeks to reduce or prevent the pollution of water caused by the application and storage of inorganic fertiliser and manure on farmland. It is designed to safeguard drinking water supplies and to prevent wider ecological damage in the form of the eutrophication of freshwater and marine waters generally.
- 3.1.25 Article 4 of the Nitrates Directive refers to the establishment and implementation of a Code of Good Agricultural Practice (CoGAP), together with the provision of training and information for farmers promoting the application of the CoGAP on a voluntary basis.
- 3.1.26 Article 5 of the Nitrates Directive requires Member States to implement an Action Programme of mandatory measures in respect of designated Nitrate Vulnerable Zones

(NVZs) or their total territory. Regulations establishing Northern Ireland as the territory to which an action programme under the Nitrates Directive applies, came into operation in October 2004.

- 3.1.27 Farms in the existing 7 groundwater NVZs are subject to the current *Action Programme Regulations (the Action Programme for Nitrate Vulnerable Zones Regulations (Northern Ireland) 1999, SR No.156)*.
- 3.1.28 *The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Northern Ireland) Regulations 2003(SR 2003/319) (SSAFO Regulations)* are designed to help prevent water pollution from agricultural sources and reinforce much of the advice in the Department of Agriculture and Rural Development (DARD) Code of Good Agricultural Practice for the Prevention of Water Pollution. These Regulations set legal requirements for new and substantially reconstructed or enlarged stores brought into use after 1st December 2003.
- 3.1.29 *Council Directive (91/271/EEC) concerning urban waste water treatment* (the Urban Waste Water Treatment (UWWT) Directive) requires member states to identify as sensitive areas freshwaters and marine water which are found to be eutrophic or may become eutrophic. Larger Waste Water Treatment Works (WWTWs) i.e. those treating waste from 10000 population equivalent or more, within sensitive areas are required by the Directive to remove nitrate and/or phosphate from the wastewater streams.
- 3.1.30 The Code of Practice for Agricultural Use of Sewage Sludge has been prepared by the Department of the Environment to complement the *Sludge (Use in Agriculture) Regulations 1989* covering Great Britain and the *Sludge (use in Agriculture) Regulations (Northern Ireland) 1990* which enforce the provisions of *EC Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture*.
- 3.1.31 *The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999* require the submission of an Environmental Impact Assessment (EIA) for certain large-scale development projects and development likely to have a significant effect on the environment. EIA is mandatory for those types of projects listed in Schedule 1 of the Regulations and is also required for those types of projects, listed and described in Schedule 2 of the Regulations, which are either located wholly or in part in a 'sensitive area' or meet or exceeds one of the relevant thresholds and are likely to have significant environmental effects. Sensitive areas include designated Areas of Special Scientific Interest (ASSIs) including Ramsar sites, a designated Area of Outstanding Natural Beauty (AONBs); a designated National Park; World Heritage Sites; Scheduled Historic Monument or European Site as defined in regulation 9 of the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995. EIAs assist Planning Service and EHS in reaching decisions regarding environmental impacts of proposed developments.”
- 3.1.32 The UK Woodland Assurance Standard (UKWAS Steering Group, 2000), a voluntary certification standard, requires that valuable semi-natural habitats are being treated in a manner that does not lead to further loss of biodiversity. Forest Service is certified against this standard and is undertaking a survey of its lands to identify valuable semi-

natural habitats which include grasslands.

- 3.1.33 Forest Service acquisition policy is outlined in *Afforestation – the DANI Statement on Environmental Policy* (DANI, 1993). It states that there should be a presumption against afforestation of botanically rich sites, which have undergone little disturbance for many years.
- 3.1.34 Forests and Water Guidelines (Forestry Commission, 2003), sets out water protection and riparian management standards with which forest managers are required to comply in relation to forest design planning and management of forestry operations which might effect water bodies
- 3.1.35 The relevant Republic of Ireland legislation governing water pollution control and water quality management in Republic of Ireland is provided by the *Local Government (Water Pollution) Acts 1977 and 1990* together with the *Local Government (Water Pollution) Regulations 1978 and 1992*. Anti-pollution provisions are also contained in sections 171 and 172 of the *Fisheries (Consolidation) Act, 1959*. The *Environmental Protection Act, 1992* and associated regulations also makes provision for the protection of the environment, the control of pollution and the establishment of the Environmental Protection Agency (EPA) which is also responsible for monitoring and may initiate prosecutions for pollution offences.

3.2 Management, research and guidance

- 3.2.1 The Department of the Environment (DOE) has a duty to control discharges and emissions to surface and ground waters, including tidal waters out to the three-mile limit. Environment and Heritage Service (EHS), an agency within the Department of the Environment, takes the lead in advising on and in implementing the Government's environmental policy and strategy in Northern Ireland.
- 3.2.2 EHS, as part of the requirements of the Habitats Directive, has prepared conservation objectives for those sites submitted as cSAC's. Where fens occur on cSACs and ASSIs, they are protected by control of potentially damaging operations and by the application of targeted conservation objectives.
- 3.2.3 Common standards monitoring protocols are also being established across the UK to assess the extent and condition of fens within designated sites. However, standards for assessing favourable condition of the habitat in the wider countryside have not yet been agreed.
- 3.2.4 The Management of Sensitive Sites Scheme (MOSS), launched in 2002 by EHS, is a voluntary scheme designed to ensure the positive management of the site features to maintain their extent and favourable condition within ASSIs. Under the scheme, landowners can receive payment for carrying out conservation work within the framework of a written agreement. MOSS covers issues that have relevance to the conservation of the site features including dumping, grazing and control of invasive species. EHS has negotiated several management agreements on ASSIs to help secure sympathetic ASSI management through the MOSS scheme.

- 3.2.5 The Environmental Protection Directorate (EPD) of EHS is responsible for the enforcement of legislation and a range of supporting activities to monitor and report on discharges and emissions to surface and ground waters, to establish the impacts of pollution, to set standards and to issue consent licenses and authorisations.
- 3.2.6 Within the EPD, Water Management Unit (WMU) is responsible for chemical and biological monitoring of lakes. The emphasis has been on monitoring the larger lakes. Lough Neagh and Lough Erne are sampled as part of the UK Environmental Change Network. Accounts of the regional chemistry of Northern Ireland's lakes have been produced as a series of county studies (Gibson, 1986, 1988, 1989, 1991; Gibson et al., 1992). A synoptic survey of Northern Ireland's lakes was conducted in 2002 (Gibson and Jordan, 2002) followed by a second survey in 2003 (Charlesworth *et al.*, 2003) predominantly chosen with the Water Framework, Freshwater Fish and Habitats Directives in mind.
- 3.2.7 Under the *Water (Northern Ireland) Order 1999*, all effluent discharges from both domestic and non-domestic premises which are not connected to the public sewerage system require consent from DOE, where discharge to a water way or the underground stratum is proposed.
- 3.2.8 The WMU of EHS has the role of implementing the WFD. By 2005, a screening exercise to identify significant pressures and impacts on water bodies and the identification of water bodies at risk of failing to achieve Good Ecological Status must be completed by EU member states. WMU has carried this out for all lakes greater than 50 ha in size. Lakes identified to be 'at risk' will be prioritised for water quality improvement actions within the overall framework of a River Basin Management Plan (RBMP).
- 3.2.9 The United Kingdom Technical Advisory Group (UKTAG) was established in 2001 to provide coordinated advice on technical aspects of the implementation of the WFD. It is partnership of the UK environment and conservation agencies and includes partners from the Republic of Ireland. The establishment of International River Basin Districts (IRBDs), where they straddle the border between two EU states, is permitted by the WFD. Seventy percent of Northern Ireland falls within the three IRBDs agreed by Northern Ireland and Republic of Ireland.
- 3.2.10 A groundwater monitoring strategy for Northern Ireland (EHS, 2000) and a policy document on groundwater protection (EHS, 2001) have been produced. WMU monitors groundwater for a number of chemical and microbiological parameters to assess compliance with EC Directives and to assess general groundwater quality. In Republic of Ireland, the EPA has the central role in sampling groundwater resources as part of a national groundwater monitoring programme.
- 3.2.11 DARD, through its Countryside Management Branch (CMB), has developed a series of agri-environment schemes including the Environmentally Sensitive Areas (ESA) Scheme (revised in 2000) and the Countryside Management Scheme (CMS). A further revision to both the ESA and CMS has recently been approved under the current Northern Ireland Rural Development Programme (2000-2006). Their objective is to protect and enhance semi-natural habitats by encouraging more sensitive management

practices. Both these schemes have similar management provisions, are voluntary and apply to the whole farm.

- 3.2.12 The designation of ESAs commenced in 1988 and today there are 5 ESAs in Northern Ireland. Fen, Swamp and Reedbed are all listed as habitats in ESA and CMS and if present on the farm must be managed according to specific management plan prescriptions. The minimum eligible area for the habitats to be managed as a “fen/swamp or reedbed” is 0.1 ha, and the land must be able to be farmed/managed. Landowners/farmers must have at least 3 hectares of land to be eligible to join ESA or CMS.
- 3.2.13 The Habitat Improvement Scheme (HIS) aims to help farmers protect, enhance and establish habitats which are considered to have major conservation value. This is achieved by taking land out of agricultural production or by entering into a 10 year agreement which involves extensive grazing based on non-application of fertilizers and pesticides to the land. No new applications for the HIS are being accepted as the scheme closed in mid-1999. The scheme has been replaced by the Countryside Management Scheme (CMS).
- 3.2.14 The CMS, launched in 1999, was developed with the primary aim of maintaining and enhancing biodiversity and is open to application from all farmers and landowners outside ESAs. As funding is limited, entry into the scheme is competitive, being based on who can offer the greatest environmental benefits. DARD can provide area-based payments on blocks of > 0.1 ha in area within the farm unit, where it meets clearly defined criteria. The priority habitat must be brought under agreement and managed according to the specific objectives and prescriptions of the agri-environment scheme. A sample of these habitats are under long-term monitoring by QUB’s Agri-environment Monitoring Unit (QUB, 2004). CMS and ESA both have a voluntary option to create a habitat along watercourses/standing waters, by leaving ‘grass margins’ either grazed or not grazed. The minimum width of these ‘grass margins’ is 1m. Mowing ungrazed margins is required at least once every 3 years. This will help minimise the nutrient enrichment. Within agri-environment schemes (CMS and ESA) responsible farm waste management is an integral component of the scheme requirements.
- 3.2.15 DARD has developed the Entry Level Countryside Management Scheme (ELCMS) which is due to open mid 2005. ELCMS has been designed to be easily accessible and to deliver a range of basic agri-environment improvements. Participants in the scheme will be required to undertake a field boundary management module, one of 3 possible water quality modules and one of 5 further biodiversity modules. The scheme will complement the existing agri-environment programme.
- 3.2.16 Standard agricultural practice requires the disposal of a variety of liquids and slurries to land. These activities must, however, be carried out with due regard to the prevailing soil moisture conditions and the vulnerability of local surface and groundwater to pollution. Best practice is described in the Department of Agriculture and Rural Development Codes of Good Practice. Disposal of waste to land, other than agricultural waste and sewage sludge applied for the benefit of the ground, is controlled by *Pollution Control and Local Government (Northern Ireland) Order 1978*.

- 3.2.17 The Department of Agriculture and Rural Development (DARD) promotes the Farm Waste Management Scheme (Northern Ireland) 2004 that will aid in the control of agricultural runoff to reedbeds. The scheme provides financial assistance to farmers who are installing or improving farm waste facilities in order to assist compliance with Action Programme measures in Nitrate Vulnerable Zones which have been designated under the Nitrates Directive and with the recently introduced *Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Northern Ireland) Regulations 2003 (SSAFO Regulations)*. The whole of Northern Ireland has been declared a nitrate vulnerable zone under the Nitrates Directive. DARD and DOE have been working together to develop a strategy for the implementation of the Nitrates Directive, and to deal with Phosphate within the context of Northern Ireland's eutrophication problem. Phosphorus controls will be introduced under the WFD. A second DARD consultation paper will be published in April 2005 on draft Regulations under the WFD to control agricultural phosphorus with the aim of introducing these in the summer of 2005.
- 3.2.18 The Action Programme measures developed under the Nitrates Directive will be a major force in tackling diffuse pollution from agriculture. A booklet called "Guidelines and Manure Planning for farmers in Nitrate Vulnerable Zones" has been co-produced by EHS and DARD. Other actions carried out by the Countryside Management Branch to address nutrient enrichment have included: initiatives targeting catchments, pollution referrals and responsible phosphate management; nutrient management planning in the Lough Erne and Lough Neagh catchments; introduction of Codes of Good Agricultural Practice (CoGAP) for the protection of water and introduction of Competence Development.
- 3.2.19 Cross-compliance between EC environmental directives and payment of subsidies under Common Agricultural Policy CAP reform will increase the environmental sustainability of agriculture and the environmental performance of individual farmers. This will potentially reduce diffuse pollution levels. In return for a single payment, farmers must keep their land in good agricultural and environmental condition.
- 3.2.20 DARD has developed a Grassland Fertiliser computer programme which provides farmers with fertiliser recommendations that best match the nutrient requirements for their soil and crop, and in so doing avoid over-supply of nutrients to the environment. Adherence to minimum fertiliser prescriptions (and preferably no fertiliser application at all) is essential in the vicinity of fens, where nutrient drift can result in changes in species composition and habitat status.
- 3.2.21 The *Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2000* require anyone who wishes to carry out a relevant project, i.e. afforestation, deforestation, forest road works or forest quarry works, that is likely to have significant effects on the environment, to obtain consent for the work from DARD. The Regulations define thresholds above which the opinion of Forest Service is required. These thresholds take into consideration sensitive areas, which include Areas of Outstanding Natural Beauty (AONBs), ASSIs, National Parks, Nature Reserves, World Heritage Sites, Scheduled Historic Monuments and European sites. If consent for work is required, the applicant must provide an Environmental Statement in support of the application and where consent is granted, Forest Service may stipulate conditions to which the work is subject.

- 3.2.22 Forestry research projects currently underway to assist forest management particularly in acid sensitive catchments are co-funded by DARD and the Council for Research and Development (COFORD). In addition to these large-scale projects, are a number of smaller projects which include ecological assessments of lakes and impacts on groundwater.
- 3.2.23 The Rivers Agency, as the statutory drainage and flood protection authority for Northern Ireland are responsible for maintaining the effective drainage function of designated watercourses under the *Drainage (Northern Ireland) Order 1973*. All drainage and flood defence proposals are subject to the *Drainage (Environmental Assessment) Regulations (Northern Ireland) 1991*, as amended, which require an assessment at planning stage of the environmental impact of the proposed works. Rivers Agency also consult with EHS on their annual programme of drainage maintenance, where this may have an impact on designated sites of nature conservation importance. This includes both localised operations such as maintenance of outfalls for field drains and more significant river maintenance works or flood defence schemes.
- 3.2.24 EHS has produced a *River Conservation strategy for Northern Ireland* (DOE, 2001) outlining its role and responsibility in protecting, conserving and enhancing the natural and built heritage values of rivers in Northern Ireland and facilitating their sustainable use.
- 3.2.25 Roads Service has produced an Environmental Handbook (under review) as a guidance to road contractors to minimise the impact of roads from the design stage through to construction including the protection of wetland species and habitats inside or outside designated areas.
- 3.2.26 Management of all woodland habitats should comply with the *UK Forestry Standard*, the government's approach to sustainable forestry (Forestry Commission & Department of Agriculture for Northern Ireland, 1998). Much of Northern Ireland's woodland is certified under the *UK Woodland Assurance Standard*, a voluntary certification standard (UKWAS Steering Group, 2000). UKWAS requires that valuable semi-natural habitats which have been colonised, planted or incorporated into plantations, but which have retained their ecological characteristics (or have a high potential to be restored) are being restored or treated in a manner that does not lead to further loss of biodiversity or cultural value. Northern Ireland forestry policy includes a presumption against drainage of wetlands of high conservation value and conversion to other land uses, and in particular seeks to maintain the special interest of these wetlands including fens.
- 3.2.27 Other relevant information is gathered through specialist biological recording groups, Non-Governmental Organisations (NGOs), universities and other government bodies. Biological records are stored in the Museum and Galleries of Northern Ireland (MAGNI) at the Centre for Environmental Data and Recording (CEDaR). At 31st March 2004, over 1.4 million records were held by CEDaR and there are developments underway to make these records more accessible through the Internet. This will be achieved through the National Biodiversity Network, a union of organisations throughout the UK working together to create an information network of biological data providing an accessible data source for biodiversity information.

4. Action Plan Targets

- 4.1 Maintain the total extent of fen in Northern Ireland at 3,000 ha.
- 4.2 Where favourable, maintain the condition of fen in Northern Ireland.
- 4.3 Achieve favourable condition of 95% of fen which lies within designated sites, by 2015.
- 4.4 For stands outside ASSIs, secure favourable condition over, as near as practicable, 100% of the fen resource in Northern Ireland, by 2015.
- 4.5 By 2015, restore 50 ha. of fen.
- 4.6 By 2020, restore a further 50 ha. of fen.

5. Proposed Action with Lead Agencies

5.1 Policy and legislation

- 5.1.1 By 2006, initiate discussions with other government departments to ensure appropriate consultation mechanisms exist for proposed changes in land use.
(ACTION: DOE, DARD, Planning Service, EHS)
- 5.1.2 By 2006, review *Planning Policy Statement 2 (PPS2) – Planning and Nature Conservation*, to include policies relating to the conservation of priority habitat and species.
(ACTION: Planning Service, EHS)
- 5.1.3 By 2006, produce *Planning Policy Statement (PPS15) on Planning and Flood Risk*. This includes an objective to promote an integrated sustainable approach to the management of development and flood risk that, among other matters, will contribute to the conservation and enhancement of the biodiversity of Northern Ireland.
(ACTION: Planning Service, EHS)
- 5.1.4 By 2005, produce *Planning Policy Statement (PPS14) on Sustainable Development in the Countryside* which includes objectives to minimise the impact of housing development on the environmental resources of habitat, water quality and biodiversity of the rural area, thereby contributing to the conservation of biodiversity in Northern Ireland.
(ACTION: DRD, EHS, Planning Service)
- 5.1.5 Identify further examples of fens as SLNCIs for consideration for adoption into appropriate Development Plans.
(ACTION: EHS, Planning Service)

- 5.1.6 Ensure that important fen sites not already identified e.g. as SLNCIs, are recognised and, where appropriate, site protection policies are included in Development Plans and other strategic plans including Local Biodiversity Action Plans (LBAPs).
(ACTION: Planning Service, EHS, DARD, District Councils, Forest Service)
- 5.1.7 In the preparation of Planning Policy Statements, the promotion of biodiversity will be taken into account where appropriate.
(ACTION: Planning service, DRD, EHS)
- 5.1.8 Consider a review of Countryside Management Scheme and Environmentally Sensitive Areas Scheme to include streamlining of habitats/options to 'fit' with Biodiversity Action Plan habitat definitions if there is to be a review of agri-environment schemes under the new Rural Development Programme (2007 – 2013)
(ACTION: DARD)
- 5.1.9 By 2007, ensure that agri-environment scheme prescriptions relating to diffuse pollution and improved farm waste management are contributing, where appropriate, to maintaining or enhancing fens across Northern Ireland.
(ACTION: EHS, DARD)
- 5.1.10 By 2009, ensure that designated fens are properly recognised within River Basin Management Plans as required by the Water Framework Directive.
(ACTION: EHS)
- 5.1.11 By 2006, seek to encourage positive environmental change through the reformed Common Agricultural Policy (CAP), for example, by promoting sustainable agricultural management of fen.
(ACTION: DARD, EHS)
- 5.1.12 By 2007, ensure fens are adequately protected through the CAP.
(ACTION: DARD, EHS)
- 5.1.13 By 2006, ensure that all farmers receiving agri-environment scheme payments and LFA Compensatory Allowance Payments are complying with GFP.
(ACTION: DARD, EHS)
- 5.1.14 Ensure that the delivery of this action plan is fully compatible with relevant aspects of forest policy.
(ACTION: EHS, Forest Service)
- 5.1.15 By 2005, implement an effective policy for assessing septic tank installations and discharges.
(ACTION: EHS)

5.2 Site safeguard and management

- 5.2.1 By 2006, determine the extent and quality of the fen resource which falls within protected areas and notify further sites, if required, to fill significant gaps. In particular, ensure that there is adequate representation of the full range of variation in fen communities found around Northern Ireland.
(ACTION: EHS)
- 5.2.2 By 2006, develop agreed methods for describing and assessing favourable condition for fens.
(ACTION: EHS)
- 5.2.3 By 2006, produce conservation objectives for all statutory sites that incorporate fen habitats including cSACs, ASSIs and NNRs ensuring that the objectives do not conflict with the requirements of fens.
(ACTION: EHS)
- 5.2.4 By 2007, identify priority fen sites in critical need of rehabilitation.
(ACTION: EHS)
- 5.2.5 By 2007, initiate restoration of sites identified at 5.2.4. The full range of fen communities and species should be considered as well as the transitions to other habitat types of conservation interest.
(ACTION: EHS)
- 5.2.6 By 2008, initiate measures intended to achieve favourable condition of all significant stands fens within ASSIs and NNRs.
(ACTION: EHS)
- 5.2.7 By 2007, target positive management through agri-environment schemes, MOSS, river maintenance schemes, the LBAP process and grant aid for biodiversity to secure favourable management on fen sites (including SLNCIs) prioritised in 5.2.4, according to agreed timescales.
(ACTION: EHS, DARD, Rivers Agency)
- 5.2.8 By 2006, promote and implement the management and restoration of fens owned or part-funded by government.
(ACTION: EHS, DARD, Forest Service, Water Service, District Councils)
- 5.2.9 Continue to promote the Farm Waste Management Scheme (Northern Ireland) 2004, agri-environmental schemes, and associated CoGAP including nutrient planning, establishment of buffer zones and controlled grazing to reduce the impact of eutrophication on fen communities and species.
(ACTION: EHS, DARD)
- 5.2.10 Under the terms of the WFD, establish the Water Quality Objectives consistent with the Good Ecological Status of designated fen habitats, by 2009
(ACTION: EHS)

- 5.2.11 As required by WFD, deliver the above water quality objectives by 2015.
(ACTION: EHS)
- 5.2.12 By 2006 determine a methodology to review discharge consents for designated sites to ensure that they are contributing to an adequate level of water quality.
(ACTION: EHS)
- 5.2.13 By 2009, produce local nutrient control plans, involving all stakeholders, within the framework of river basin management plans.
(ACTION: DARD, EHS)
- 5.2.14 Encourage the use of Sustainable Urban Drainage Systems (SuDS) where appropriate, to reduce diffuse pollution and improve the quality of water discharging to fen sites.
(ACTION: Water Service, EHS, Rivers Agency, Planning Service)
- 5.3 Advisory**
- 5.3.1 By 2006, provide information to landowners on the conservation and importance of fen habitat through production, promotion and dissemination of literature.
(ACTION: EHS, DARD)
- 5.3.2 By 2006, develop guidelines that identify those circumstances under which degraded fen restoration should be encouraged.
(ACTION: DARD, EHS)
- 5.3.3 By 2007, develop and promote awareness and training programmes on the conservation, management and restoration of fen through key organisations/individuals involved in the delivery of advice to farmers and land managers.
(ACTION: DARD, EHS)
- 5.3.4 By 2007, promote and develop demonstration sites for the management and restoration of fen.
(ACTION: EHS, DARD)
- 5.3.5 By 2006, encourage applications from potential partners to obtain funding to bring fen habitat into favourable management.
(ACTION: EHS, DARD, District Councils)
- 5.3.6 By 2006, review all relevant guidelines and advisory material on the management, restoration practices, and creation of fen communities.
(ACTION: EHS, DARD, Forest Service)
- 5.3.7 By 2006, provide information to landowners and occupiers on the status, and conservation importance of fen through the production, promotion and dissemination of literature.
(ACTION: EHS, DARD, Forest Service)

- 5.3.8 By 2006, produce a code of best practice for land owners incorporating suitable management, including grazing regimes appropriate to the geographical distribution and ecological variation found in wetlands.
(ACTION: DARD, Forest Service, EHS)
- 5.3.9 Develop guidelines which identify those circumstances under which fen restoration should be actively encouraged.
(ACTION: EHS, DARD, Forest Service)

5.4 International

- 5.4.1 Further develop links with the Republic of Ireland and other European and international organisations to promote the exchange of information and experience in research, management techniques, education and conservation strategies.
(ACTION: EHS)
- 5.4.2 By 2009, prepare River Basin Management Plans for the Northern Ireland component of cross-border catchments, working closely with the Republic of Ireland.
(ACTION: EHS)

5.5 Monitoring and research

- 5.5.1 By 2006, compile an inventory of all fens in Northern Ireland.
(ACTION: EHS)
- 5.5.2 Continue to monitor and maintain the flow and water quality of rivers that drain into designated fen sites.
(ACTION: Rivers Agency)
- 5.5.3 By 2009, ensure that the results of the WFD monitoring programme carried out for the status of protected areas are fully integrated into river basin management plans.
(ACTION: EHS)
- 5.5.4 By 2005, complete a review of water abstractions from and within the vicinity of all designated fen sites and meet targets to maintain water levels in such sites by 2010.
(ACTION: EHS)
- 5.5.5 Continue to commission applied research to help develop beneficial and practical management techniques for the enhancement, restoration and re-creation of fens and populations of associated characteristic species.
(ACTION: DARD, EHS)
- 5.5.6 By 2006, ensure that all relevant information gathered in surveys is passed to the Centre for Environmental Data and Recording (CEDaR) based at the Ulster Museum and to other relevant centres. Encourage access to, and exchange of these records, by contributing to the National Biodiversity Network www-based catalogue of environmental information.
(ACTION: EHS)

- 5.5.7 By 2007, ensure the importance of fen is recognised through the identification of Sites of Local Nature Conservation Importance (SLNCIs) in Development Plans.
(ACTION: EHS, Planning Service, District Councils)
- 5.5.8 By 2008, seek to use locally important fen sites (including SLNCIs) to target positive management through agri-environment schemes, grant aid for biodiversity and restoration management by 2008.
(ACTION: EHS, Planning Service, District Councils)
- 5.5.9 By 2005, review research requirements on the effects of pollution and climate changes on fens and promote research needs accordingly.
(ACTION: DARD, EHS, Academic Partners)
- 5.5.10 Promote research into the role and transport of phosphorus and nitrogen in fresh waters and into the quantification of risks posed by diffuse pollution.
(ACTION: DARD, EHS)
- 5.5.11 Continue to explore methods that will further reduce the risk of water contamination, resulting from forestry operations such as ground preparation, aerial fertilisation and timber harvesting.
(ACTION: Forest Service, DARD, EHS)
- 5.5.12 By 2006, set in place a reporting and monitoring structure to encourage progress towards the delivery of the targets and the completion of actions identified in this plan.
(ACTION: EHS)
- 5.6 Communications and publicity**
- 5.6.1 Provide advice and information on land management through the production, promotion and dissemination of literature, including technical handbooks and leaflets, and use of information technology.
(ACTION: DARD, EHS)
- 5.6.2 Continue to promote Peatlands Park as the flagship for achieving education, increased public awareness and appreciation of peatlands (including fens) in Northern Ireland.
(ACTION: EHS)
- 5.6.3 By 2008, develop demonstration sites to reflect the range of ecological variation and applied management techniques throughout Northern Ireland's fen resource.
(ACTION: EHS, Forest Service, DARD)
- 5.6.4 By 2006, facilitate production of a simple web-page, an attractive booklet and/or CD-ROM for the public and schools which explains the conservation importance of fens in Northern Ireland.
(ACTION: EHS, DENI, Forest Service)
- 5.6.5 By 2006, encourage appropriate access as well as interpretative and educational provisions on key fen sites to increase enjoyment and public awareness of the biodiversity of fens.
(ACTION: EHS, DARD, Forest Service, District Councils)

6. Costings

- 6.1 A table showing the global costs for this and other HAPs is available on the EHS/Biodiversity web page.

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List of Useful Acronyms

ASSI	Area of Special Scientific Interest
BAP	Biodiversity Action Plan
CEDaR	Centre for Environmental Data and Recording
CMD	Countryside Management Division
CMS	Countryside Management Scheme
DARD	Department of Agricultural and Rural Development
DCAL	Department of Culture, Arts and Leisure
DETI	Department of Enterprise, Trade and Industry
DOE	Department of the Environment
DRD	Department for Regional Development
EHS	Environment and Heritage Service
ESA	Environmentally Sensitive Area
ESCRs	Earth Science Conservation Review Site
HAP	Habitat Action Plan
JNCC	Joint Nature Conservation Committee
MAGNI	The National Museums and Galleries of Northern Ireland
NIBG	Northern Ireland Biodiversity Group
NICS	Northern Ireland Countryside Survey
NNR	National Nature Reserve
PPG	Planning Policy Guideline
PPS	Planning Policy Statement
RA	Rivers Agency
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAP	Species Action Plan
SLNCI	Sites of Local Nature Conservation Importance
SoCC	Species of Conservation Concern
SPA	Special Protection Area
WFD	Water Framework Directive
WWT	Wildfowl and Wetlands Trust