Northern Ireland Habitat Action Plan
Lowland Meadow
March 2005

1. Current Status

1.1 Biological status

1.1.1 Lowland meadow is defined in general terms as unimproved neutral grassland found on enclosed land. The substrate is generally a well-drained mineral soil and the habitat is characteristically herb-rich. The habitat has typically survived as hay meadow and is a result of the traditional land use and agricultural practice that are necessary for hay production. The historical continuity of the habitat as grassland, managed for hay production, is therefore important. The lowland meadow habitat is not restricted to hay meadows, but increasingly it is also characterised by unimproved neutral pastures where livestock grazing is the main land use. In non-agricultural settings, lowland meadow-type communities may be found in recreational sites, churchyards, roadside verges and a variety of other localities.

1.1.2 There are no large areas of lowland meadow in Northern Ireland. The habitat is typically fragmented, even in areas where it is relatively frequent, and is often restricted to those small parts of field parcels where agricultural operations are difficult. The habitat is thus often found on relatively steep slopes and is often only a part of fields that are otherwise largely devoted to intensive grass production. The habitat often occurs as part of a transition or habitat mosaic – for example, around the upland fringes, where it often grades into species-rich examples of acid grassland and calcareous grassland. Field boundaries that incorporate an earth bank may act as refuges for lowland meadow communities. The resource also displays a gradual transition to wetter grassland types in the west of the Province.

1.1.3 Lowland meadow is broadly equivalent to the plant community identified as MG5 in the National Vegetation Classification (NVC) of Great Britain (Rodwell, 1991). NVC descriptions and codes are given to plant associations that are characteristic of particular environmental and management conditions. *Cynosurus cristatus-Centaurea nigra* grassland is the typical lowland grassland of grazed hay meadows treated in the traditional fashion on circumneutral brown soils of loamy to clayey texture (Cooper, 1997). Its character is intimately bound with low input agricultural practices, characterised by exclusion of stock during the early growing season, little or no fertiliser application and generally only a light dressing of farmyard manure.

1.1.4 Lowland meadow characteristically has high but variable species richness. Variability in species richness (and content) may reflect the variability inherent within the habitat (McCann, 2003). The most characteristic herb species, such as meadow vetchling *Lathyrus pratensis*, common knapweed *Centaurea nigra*, common bird's-foot-trefoil *Lotus corniculatus*, yellow-rattle *Rhinanthus minor* and bulbous buttercup *Ranunculus bulbosus*, may occur at low frequency. A number of scarce and declining plant species occur in lowland meadow habitats, including greater butterfly-orchid *Platanathera chlorantha*. Fine-leaved grasses, in particular common bent *Agrostis capillaris* and red fescue *Festuca rubra* are major constituents of the sward and crested dog's-tail *Cynosurus cristatus* is frequent and may be abundant. A slightly

more acid type contains species such as heath bedstraw *Galium saxatile* and tormentil *Potentilla erecta* as well as the mosses *Thuidium tamariscinum* and *Pseudoscleropodium purum*, wetter types contain various sedges and rushes while dryer types generally contain abundant white clover *Trifolium* repens and ribwort plantain *Plantago lanceolata*. In undergrazed pastures, scrub or dwarf shrub species may be invasive. Perennial rye-grass is generally sparse and of low vitality. Recognition of the habitat is therefore dependent not only on the presence of a restricted number of indicator species, but also on the presence of a range of species, not all of which will be found in a particular parcel of the habitat. Lowland meadow often grades into species-rich examples of acid grassland (NVC type U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* acid grassland) and calcareous grassland (NVC type CG10 *Festuca ovina – Agrostis capillaris – Thymus praecox* base-rich grassland).

1.1.5 Taking the variability noted in 1.1.4 into account, lowland meadow in Northern Ireland is defined, for the purposes of this plan, as being grasslands which have:-

- a high percentage cover (>30%) of fine-leaved grasses;
- absence or very low percentage (<5%) cover of *Lolium* species;
- a minimum of 10 higher plant species in a representative 4m^2 quadrat;
- <25% cover of scrub or dwarf shrub.

1.1.6 Lowland meadow has undergone considerable contraction and degradation within the UK over the past century. As indicated in *Biodiversity: the UK Steering Group Report, Vol 2* (UK Biodiversity Steering Group, 1995) declines within the UK is almost entirely the result of changing agricultural practices. Since 1930, over 95% of lowland grasslands of conservation value in Britain have been lost (Hopkins & Hopkins, 1993), and around 11500ha of lowland meadow is estimated to exist currently in Britain (Burke & Critchley, 2000). Recent estimates for cover in England and Wales indicate that there are 5000-10000ha of the typical *Cynosurus cristatus-Centaurea nigra* community remaining in England and Wales (UK Biodiversity Group, 1998). Scotland is estimated to hold 2000-3000ha of this community.

1.1.7 The distribution of the habitat is poorly understood in the Republic of Ireland. The habitat occurs as a minor constituent of the Leinster landscape, where it survives in areas in which there are severe constraints on agricultural intensification, or where they are privately or publicly protected (Byrne, 1996). It is likely to have declined in eastern Ireland in the period 1979-1994, where there was a 38% loss of sites known for semi-natural grassland communities in Leinster (Byrne, 1996). Byrne (1996) suggested that the main causes of decline of semi-natural grasslands as a whole in the Republic have been fertiliser addition and drainage.

1.1.8 The area of lowland meadow in Northern Ireland represents a large proportion of the UK resource. However, traditional species-rich hay meadows may have declined in Northern Ireland by as much as 97% over the last 50 years (Northern Ireland Biodiversity Group, 2000). The area of species-rich dry grassland in Northern Ireland was estimated at approximately 5900ha in 1998, of which an estimated 4655ha was in the lowland land classes. From data in Murray *et al.*, (1992) it has been estimated that only 13% of full-field parcels of this habitat type are of high quality in Northern Ireland, defined as those fields in which 4m^2 quadrats contained >20 species. This amounts to an estimated 937ha of high quality habitat. Overall, it is estimated that

there has been a reduction of 20% in the total species-rich dry grassland resource since 1991 (Cooper & McCann, 2001). This figure masks a more severe reduction in some areas, for example a 56% loss in the Mourne lowlands (Cooper & McCann, 2002). Most lowland meadow is found in the wider countryside, with a total of only around 84.41 ha as a feature of Areas of Special Scientific Interest (ASSIs). Species-rich earth banks, with communities broadly analogous to lowland meadow types have also declined by 10% between 1991 and 1998, from an estimated 45981km to 41254km.

1.1.9 In Northern Ireland, the losses of lowland meadow described in 1.1.8 have been mainly the result of conversion to grasslands with more agriculturally preferred grasses. There has been a major contraction of the area used for hay production as many more cattle are now over wintered indoors and silage production with multiple cuts of nutrient-demanding grasses has become prevalent. Repeated cutting and rolling of silage fields prevent many species from setting seed, with the result that plants that can spread vegetatively, such as many grasses, are favoured. Areas peripheral to good quality habitat are also likely to have been affected by fertiliser drift or setting of seed from adjacent improved grassland, resulting in their increasing impoverishment. Threats to non-agricultural examples of the habitat include inappropriate mowing regimes and nutrient inputs. Habitat change has resulted in the localisation, fragmentation and contraction of typical MG5 grassland, and within Northern Ireland, the habitat is concentrated in the south and east of the Province, with a notable concentration in South Armagh (Ballard & Cooper, 1999). A high proportion (56%) are part parcels, their distribution related to physical features such as steep banks or land with rock outcrops. NICS 2000 indicates that there was a gain of 29% of the 1991 area of species-rich dry grassland up to 1998. However, the main gains were from vegetation dominated by tall herbs at the baseline date, although there were also gains from mixed species and other agricultural grassland types. It is likely therefore that much of the 'gained' grassland would be of low quality. These gains were more than offset by 49% losses of the 1991 area, mainly due to conversion to grassland with more agriculturally preferred species and to construction sites. Area was also lost to scrub and bracken *Pteridium aquilinum* encroachment.

1.1.10 Agricultural policy, in particular grant aid for conservation-directed farming practices, is an important factor in the management of the lowland meadow resource. The Department of Agriculture and Rural Development (DARD) recognises that the key to the survival of species-rich grasslands is sensitive grazing management and the application of little or no fertilisers (DARD, 2001). DARD does not differentiate lowland meadow from other species rich grasslands of conservation value, but it is likely that the area and distribution of the resource under agri-environmental prescriptions mirrors the position across the province. The identification of lowland meadow parcels within more dominant grassland types in the wider countryside is important because of the localised distribution of the resource and because of the typically small parcel size occupied by the habitat.

1.1.11 The conservation value of lowland meadows can be determined by the condition of the habitat. Favourable condition is defined by setting targets or target ranges for a series of attributes. These should be components or characteristics of the vegetation that are relatively easy to measure, but which are reliable indicators of the 'health' of the habitat. For lowland meadow, these include the species-richness of the sward, the presence of key indicator species, the absence of inappropriate (generally nitrogen

indicator) species and management practices. Species diversity is also important, in that it takes into account the relative abundance of species. The distribution and condition of Northern Ireland's lowland meadows have been assessed through a combination of commissioned research and surveys carried out by Environment and Heritage Service (EHS) staff.

1.1.12 Lowland meadow supports a range of terrestrial vertebrates and invertebrates. Some of these are widespread and common, some are much more local in their distribution and some are of national importance for their rarity. An example of this last category is the corncrake *Crex crex*, which historically has used hay meadows as a breeding habitat. The reduction in meadow management for hay production has been paralleled by the virtual disappearance of this species from Northern Ireland. Skylark *Alauda arvensis* is a characteristic species of the habitat, and lowland meadow contributes to the habitat mosaic favoured by the Irish hare *Lepus timidus hibernicus*. In agriculturally improved lowland landscapes, lowland meadows can hold outlying populations of typical upland species.

1.1.13 This plan applies to all areas of lowland meadow, whether of good quality as defined in Cooper & McCann (1994) or as relatively impoverished habitat according to the description outlined above (Section 1.1.5). Its conservation interest may be addressed by maintenance of existing good quality habitat, improving the quality of poor examples of the habitat or by recreating the habitat under suitable conditions where none currently exists and where another priority habitat does not exist. EHS has declared 11 ASSIs, which contain lowland meadow as a designation feature. With around 84.41 ha of the habitat within the ASSI network, it is assessed that reasonable coverage has been achieved to date (Corbett, 2003), but a large proportion of the 84.41 ha occurs on just two ASSIs, and the network of sites is not well distributed around the province. In addition to statutory sites, the Ulster Wildlife Trust maintains five sites (in addition to the management of Slievenacloy ASSI) which support around 11 ha of the habitat. The habitat also occurs as a minor constituent of five National Trust properties.

1.2 Links with other action plans

1.2.1 This Lowland Meadow Action Plan identifies specific targets and actions required to deliver Northern Ireland's contribution to the UK Lowland Meadow Action Plan (UK Biodiversity Steering Group, 1998).

1.2.2 Lowland meadow can grade into other priority habitats such as lowland dry acid grassland, purple Moor-grass and rush pastures, upland calcareous grassland, coastal and floodplain grazing marsh and fens. Vegetation transitions and mosaics are dependent on land management, soil, edaphic, climatic, hydrological and topographic factors. The requirements of associated priority habitats should be taken into account during the implementation of this plan.

1.2.3 Northern Ireland lowland meadows are used by a number of UK priority species identified as part of the UK Biodiversity Action Plan (BAP) programme. In particular, hay meadows have until recent times been an important breeding habitat for Corncrake. Other species occurring in this habitat include skylark *Alauda arvensis*

and pink meadow waxcap *Hygrocybe calyptriformis*. The requirements of these species should be taken into account during the implementation of this plan.

1.2.4 In addition, lowland meadows are important for a range of Northern Ireland priority species including the Irish hare, meadow cranesbill *Geranium pratense* and wood cranesbill *G. sylvaticum*. The requirements of these species should be taken into account during the implementation of this plan.

1.2.5 Relevant all-Ireland Species Action Plans have been published for the Irish *hare Lepus timidus hibernicus* and corncrake *Crex crex.*

1.2.6 Relevant published Northern Ireland Species Action Plans include the Irish hare, meadow cranes-bill *Geranium pratense,* and wood cranes-bill *G. sylvaticum*.

2. Current Factors Affecting the Habitat

2.1 Lowland meadow is an artefact of agricultural practices that were more widespread in the past, and the retention of the characteristic features of the habitat depends largely on the maintenance of the principal elements of those practices. Factors which may threaten lowland meadow are described below.

2.1.1 Agricultural improvement – cultivation, fertiliser and pesticide application, ploughing and re-seeding have been the major causes of habitat loss and continue to be a threat.

2.1.2 Grazing – low levels of grazing are necessary to maintain the habitat by retaining a relatively low nutrient status and by keeping competitive species in check. Overgrazing results in a reduction in species diversity as stress-tolerant and nitrophilous species dominate. Supplementary stock feeding can lead to eutrophication as well as localised poaching.

2.1.3 Abandonment – in the absence management by cutting or grazing, lowland meadow undergoes vegetation change leading to rank growth, the loss of many herbs of low stature, invasion by tall herbs and Bracken and/or encroachment by scrub species and woodland.

2.1.4 Industrial and urban development – approximately 7% of species-rich dry grassland was lost to building in Northern Ireland between 1991 and 1998 (Cooper & McCann, 2001), although it is not clear how much of this, if any, was lowland meadow. Road-building may result in the almost unnoticed destruction of small plots of lowland meadow. Mineral and rock extraction and landfill operations are also potential threats to the habitat.

2.1.5 Habitat fragmentation – reduction of stand size and isolation of unimproved grassland parcels results in reduced opportunities for desirable species to colonise relatively impoverished lowland meadow. Fragmentation and a decrease in parcel size further increases the chances and severity of piecemeal habitat loss and species extinctions in the remnant areas.

2.1.6 Afforestation - particularly by commercial coniferous plantations has resulted in significant loss of this habitat in the past.

2.1.7 Erosion – natural processes and recreational pressure can lead to accelerated loss of thin soils, particularly where these are sparsely vegetated. This may occur in tandem with overgrazing and poaching of lowland meadow.

2.1.8 Airborne pollution – acidification and nitrogen enrichment from atmospheric deposition could potentially lead to vegetation change. In Northern Ireland, atmospheric nitrogen deposition increases from west to east and higher levels therefore coincide with the areas of greatest concentration of lowland meadow.

2.1.9 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 lowland meadow and associated invertebrate populations.

3. Current Action

3.1 Legal status

3.1.1 Statutory site designation plays an important role in the conservation of lowland meadow where it occurs in mosaics of other more extensive grassland and heathland sites of conservation interest. The habitat is given legal protection nationally where it occurs within ASSIs. Lowland meadow is not an Annex 1 habitat as defined in the 'Habitats Directive' (*Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).*

3.1.2 At 31st March 2004, 11 ASSIs designated under the *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985* were protected primarily or in conjunction with other features for their lowland meadow interest. This situation contrasts with that in Britain; where 103 SSSIs in Wales support unimproved neutral grassland, while in England around 400 SSSIs contain *Cynosurus-Centaurea* grassland. These regional variations reflect the differences in status, distribution and parcel size across the UK. Further declarations of sites by the Department of the Environment under the *Environment (Northern Ireland) Order 2002* will follow as sites of appropriate conservation status are identified.

3.1.3 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.

3.1.4 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.

3.1.5 *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.

3.1.6 *PPS14 Sustainable Development in the Countryside* is due to be published by the end of 2005.

3.1.7 Site protection policies are included in Development Plans. Sites of Local Nature Conservation Importance (SLNCIs) are being identified for consideration by Planning Service for inclusion in Development Plans. Where such sites are confirmed in adopted plans, specific planning policies will be applied to development proposals on those sites. The SLNCI network will include a significant number of lowland meadow sites that are not designated as ASSIs or NNRs.

3.1.8 Semi-natural areas, which are likely to be of particular environmental importance are protected under the *Environmental Impact Assessment (Uncultivated Land and Semi-Natural Areas) Regulations (Northern Ireland) 2001*. These regulations, which came into operation in Northern Ireland in February 2002, are administered by DARD and seek to ensure that agricultural development of uncultivated land or semi-natural areas must first be assessed for environmental significance. This would also include cases where land use changes are aimed at restoring or enhancing lowland meadow habitat.

3.1.9 *The Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2000* require anyone who wishes to carry out a project including 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 the Department of Agriculture and Rural Development.

3.1.10 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.

3.1.11 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.

3.1.12 Certain large-scale development projects and developments likely to have a significant impact may require an Environmental Impact Assessment (EIA) under the *Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999*. EIA is mandatory for those types of projects listed in Schedule 1 to the Regulations and is also required for those types of projects, listed and described in Schedule 2 to the

Regulations, which is either wholly or in part in a 'sensitive area' or meet or exceeds one of the relevant thresholds and is 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 (AONB), a designated National Park, World Heritage Site, 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.

3.2 Management, research and guidance

3.2.1 Common standards monitoring protocols are being established across the UK to assess the condition of all lowland meadows within designated sites. However, standards for assessing favourable condition in the wider countryside have not yet been agreed. Advice on undesignated areas will depend on the detection of a habitat that is often difficult to differentiate from adjacent communities. Lowland meadow and pasture is a particularly difficult resource to survey. Because the existence of the habitat is dependent more upon individual management practices than on environmental factors, its distribution is one of the most difficult to predict in Northern Ireland (Corbett 2003). The data on which management and guidance must be based are therefore patchily available across Northern Ireland.

3.2.2 Where lowland meadow occurs in ASSIs it is protected by control of potentially damaging operations and by the application of targeted conservation objectives. Management/rehabilitation plans exist for NNRs owned or leased by EHS and UWT also maintains an active management regime for nature conservation at Slievenacloy ASSI. Although this site is primarily managed for other grassland types the lowland meadow component will also be affected beneficially by management agreements.

3.2.3 The Management of Sensitive Sites Scheme (MOSS) was launched in 2002 by EHS. It is a voluntary scheme designed to ensure the positive management of the site features, such as lowland meadow within ASSIs. Under the scheme landowners can receive payment for carrying out conservation work within the framework of a written agreement. MOSS covers such issues as agricultural improvement, grazing and control of invasive scrub species. One-off payments for works such as fencing and scrub clearance to assist grazing can be made.

3.2.4 Within Northern Ireland, planning control is administered by Planning Service. *Planning Policy Statement 2 (PPS2) – Planning and Nature Conservation* contains planning policy for the hierarchy of sites of nature conservation importance. It also addresses trees and woodlands, protection of species and peatlands.

3.2.5 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.

3.2.6 The designation of ESAs commenced in 1988 and today there are five ESAs in Northern Ireland. DARD has determined a number of priority habitats which, if they occur on a farm, must be brought under agreement and managed according to the relevant prescriptions determined by DARD. The priority habitat defined most closely associated with lowland meadow is "dry species-rich grassland". However, this category incorporates various types, which are broadly classified as dry or wet species-rich grassland used for grazing, or as "traditional hay meadows" (DARD, 2001). A sample of these meadows are under long-term monitoring by QUB's Agri-environment Monitoring Unit (QUB, 2004a). Under the revised ESA scheme, 47.47 ha of traditional hay meadow were under prescription at November 2003. Lowland meadow is present in most ESAs, occurring in mosaics with other grassland types. It is likely that lowland meadow will be managed together with other priority grassland types in agri-environment schemes.

3.2.7 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.

3.2.8 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 agicultural 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).

3.2.9 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. At November 2003, 65.51 ha of hay meadow was under CMS prescription. A sample of these meadows are under long-term monitoring by QUB's Agri-environment Monitoring Unit (QUB, 2004b). The CMS has a voluntary option to protect and enhance grass margins adjoining ASSIs, NNRs, SACs, watercourses, lakes, woodlands or field boundaries. Grass margins are at least 2m wide and of a length which DARD will decide. The option of creating grass margins promotes the protection of sensitive habitats from pesticide drift or nutrient enrichment. No grazing, and usually no mowing, is allowed within the buffer strip and funds are available for fencing.

3.2.10 The introduction of Good Farming Practice (GFP), which is applicable to farmers receiving Less Favoured Area (LFA) compensatory payments and those who enter any of the agri-environment schemes, provides protection for semi-natural habitats,

including lowland meadows. GFP consists of compliance with all environmental legislation, 8 verifiable standards and retaining copies of the Codes of Good Agricultural Practice for water, soil and air. These standards and codes apply to the whole farm and are compatible with the need to safeguard the environment and maintain the countryside by sustainable farming. Over 70% of Northern Ireland is classified as LFA.

3.2.11 All Farmers who receive the Single Farm Payment are required to comply with cross compliance from 1st January 2005. Part of cross compliance requires the farmer to keep all their land in 'Good Agricultural and Environmental Condition' and these measures are similar to GFP. As such Farmers are not allowed to destroy any semi-natural habitat.

3.2.12 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 detriment of the environment. Adherence to minimum fertiliser prescriptions is essential in the vicinity of lowland meadow, where nutrient drift can result in changes in species composition and habitat status.

3.2.13 The Rivers Agency, as the statutory Drainage and Flood Protection Authority for Northern Ireland, is 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) Regulation (Northern Ireland)* 1991, as amended, which require an assessment at planning stage of the environmental impact of the proposed works. Rivers Agency also consults 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 the maintenance of outfalls for field drains and more significant river maintenance works. Lowland meadow typically exists on free-draining soils with no form of water management present. The Rivers Agency is committed to avoiding disturbance to lowland meadow where possible, and where disturbance is unavoidable, it will minimise that disturbance, and reinstate sensitively based on the conservation criteria for lowland meadow.

3.2.14 Roads Service has produced a booklet *Road Service Environmental Handbook* (DOE, 1998) which provides guidance on the maintenance of roadside verges. While recognising the importance of herb-rich verges it does not prescribe specific management measures.

3.2.15 The *Northern Ireland Countryside Survey* (NICS), funded by EHS, is a sample survey of Northern Ireland vegetation communities used to estimate the extent and distribution of broad habitats across the Northern Ireland countryside. Repeat surveys are used to assess land-use change. The first phase in the process was *A land classification and landscape ecological study of Northern Ireland* carried out in the early 1990s (Murray *et al.*, 1992). The *NICS 2000* (Cooper & McCann, 2001) repeated the survey in 1998.

3.2.16 Other relevant information is gathered through specialist biological recording groups, Non-Governmental Organisations, universities and other government bodies. Biological records are currently stored in the Museum and Galleries of Northern Ireland (MAGNI) at the Centre for Environmental Data and Recording (CEDaR). CEDaR was established in 1995 in partnership with EHS, MAGNI and the biological recording community. There are currently over 1.4 million records held by CEDaR and there are plans 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 accessible biological data for biodiversity information.

3.2.17 Grassland management advice is available from EHS - Regional Operations staff and the MOSS team, DARD - CMB and NGOs such as the Ulster Wildlife Trust (UWT) the National Trust (NT) and Conservation Volunteers for Northern Ireland (CVNI). The experience of grassland managers is also developed and promoted through organisations such as the Royal Institution of Chartered Surveyors.

3.2.18 Appointment of Local Biodiversity by many District Councils in Northern Ireland will result in the development of Local Biodiversity Action Plans (LBAPs). These plans will encourage, co-ordinate and inform local biodiversity action.

4. Action Plan Targets

4.1 Maintain the area of lowland meadow in Northern Ireland at 937 ha.

4.2 Maintain condition, where favourable, of the existing resource.

4.3 Achieve favourable status of all significant stands of lowland meadow within ASSIs by 2010.

4.4 For stands outside ASSIs, achieve favourable condition over 75% of the resource by 2015.

4.5 Re-establish 10 ha of lowland meadow at carefully targeted sites by 2010.

5. Proposed Actions with Lead Agencies

5.1 Policy and legislation

5.1.1 By 2005, initiate discussions with other government departments to ensure appropriate consultation mechanisms exist for proposed changes in land use.
(ACTION: DARD, EHS, Planning Service, Forest Service, Roads Service, Ministry of Defence (MOD), Department of Enterprise Trade and Investment (DETI))

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)

5.1.4 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 lowland meadow as SLNCIs for consideration for adoption into appropriate Development Plans.
(ACTION: EHS, Planning Service)

5.1.6 Ensure that important lowland meadow 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 Continue to establish appropriate management and stocking levels on unimproved grassland areas by promoting agri-environment schemes and implementing environmental cross-compliance conditions including GFP.
(ACTION: DARD, EHS)

5.1.9 By 2006, ensure that all farmers receiving agri-environment scheme payments and LFA Compensatory Allowance Payments are complying with GFP.
(ACTION: DARD, EHS)

5.1.10 By 2007, ensure that agri-environment scheme prescriptions relevant/appropriate to lowland meadow are contributing to maintaining and enhancing the habitat across Northern Ireland.
(ACTION: DARD, EHS)

5.1.11 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)

5.1.12 Consider the requirements of lowland meadows when grant-aiding new woodland planting schemes.
(ACTION: Forest Service)

5.1.13 By 2005, seek to encourage positive environmental change through the reformed Common Agricultural Policy (CAP), for example, by promoting sustainable agricultural management of lowland meadow.
(ACTION: DARD, EHS)

5.1.14 By 2007, ensure grassland mosaics are adequately protected through the CAP.
(ACTION: DARD, EHS)

5.1 Site safeguard and management

5.2.1 By 2006, produce conservation objectives for all statutory designated lowland meadows including ASSIs and NNRs.
(ACTION: EHS)

5.2.2 By 2006, develop agreed methods for describing and assessing favourable condition for lowland meadow habitats.
(ACTION: EHS, DARD)

5.2.3 By 2007, initiate measures intended to achieve favourable condition of all significant stands of lowland meadow within ASSIs.
(ACTION: EHS)

5.2.4 By 2010, review the coverage of grassland mosaics containing lowland meadow within the ASSI and NNR series, and notify further sites as necessary to fill significant gaps in the range of variation throughout Northern Ireland.
(ACTION: EHS)

5.2.5 By 2006, prioritise areas, timescales and targets, based on designation status and restoration potential, for the conservation, improvement and expansion of lowland meadows.
(ACTION: EHS, DARD, Forest Service)

5.2.6 By 2007, target positive management through MOSS, agri-environment schemes, the LBAP process and grant aid for biodiversity to secure favourable management on lowland meadow sites (including SLNCIs) prioritised in 5.2.5, according to agreed timescales.
(ACTION: EHS, DARD, Forest Service)

5.2.7 By 2006, promote and implement the management and restoration of areas of lowland meadow owned or part-funded by government.
(ACTION: EHS, DARD, Forest Service, District Councils)

5.2.8 By 2005, ensure that, where relevant, biodiversity priorities are addressed in the management of monuments in state care, scheduled monuments and listed buildings.
(ACTION: EHS, DARD)

5.2.9 By 2006, seek to identify further examples of lowland meadow as SLNCIs in Development Plans.
(ACTION: Planning Service, EHS)

5.3 Advisory

5.3.1 By 2006, provide information to landowners and occupiers on the status and conservation importance of lowland meadow through the production, promotion and dissemination of literature.
(ACTION: EHS, DARD)

5.3.2 By 2006, review relevant guidelines and advisory material to promote the use of good agricultural practices that minimise the impact of fertilisers, herbicides and pesticides on lowland meadows.
(ACTION: DARD, EHS)

5.3.3 By 2005, promote awareness of the EIA Regulations by contacting representatives of farmers, land agents, the legal profession and other relevant organisations.
(ACTION: EHS, DARD, Planning Service)

5.3.4 By 2006, provide advice to land owners about suitable management, including grazing regimes appropriate to the geographical distribution and ecological variation found in grassland mosaics that include lowland meadow.
(ACTION: DARD, EHS, Forest Service)

5.3.5 By 2006, encourage applications from potential partners to obtain funding to bring areas of lowland meadow into favourable management.
(ACTION: EHS, DARD, Forest service, Water Service, District Councils)

5.3.6 By 2006, develop guidelines that identify those circumstances under which degraded lowland meadow restoration should be actively encouraged.
(ACTION: EHS, DARD)

5.3.7 By 2006, develop guidance on management and restoration practices for lowland meadow.
(ACTION: EHS, DARD)

5.3.8 By 2007, develop and promote awareness and training programmes on the conservation, management and restoration of lowland meadow through key organisations/individuals involved in the delivery of advice to farmers and land managers.
(ACTION: DARD, EHS)

5.3.9 By 2010, develop demonstration sites to reflect the range of ecological variation and applied management techniques throughout Northern Ireland's lowland meadow resource.
(ACTION: EHS, DARD)

5.4 International

5.4.1 Further develop links with the Republic of Ireland and other European and international organisations and programmes such as the European Environment Agency and the European Centre for Nature Conservation, to promote the exchange of information and experience in research, management techniques, education and conservation strategies for the conservation of lowland meadow.
(ACTION: EHS)

5.4 Monitoring and research

5.5.1 By 2005, set standards for assessing favourable condition of lowland meadows throughout Northern Ireland.
(ACTION: EHS, DARD)

5.5.2 By 2006, establish surveillance and monitoring programmes to assess the condition of lowland meadow habitats within designated sites to aid site management.
(ACTION: EHS)

5.5.3 By 2007, initiate monitoring programmes to establish the effectiveness of government funded schemes and management methods in achieving the targets of this plan.
(ACTION: DARD, EHS, Forest Service)

5.5.4 By 2008, initiate a programme to monitor the total extent and condition of the lowland meadow resource.
(ACTION: EHS)

5.5.5 By 2008, produce an inventory of lowland meadow restoration and re-establishment projects in Northern Ireland.
(ACTION: EHS)

5.5.6 By 2006, review the requirement for and if necessary, commission applied research to help develop beneficial and practical management techniques (including appropriate stocking levels) for the enhancement and restoration of lowland meadow and populations of associated characteristic species.
(ACTION: DARD, EHS)

5.5.7 Encourage access throughout Britain and Ireland to the records held at CEDaR by contributing to the National Biodiversity Network www-based catalogue of survey information.
(ACTION: EHS)

5.5.8 By 2010, monitor lowland meadow restoration sites so that management resources can be focused on areas most likely to show a positive response.
(ACTION: EHS)

5.5.9 By 2015, review the requirement for further research on the effects of pollution and climate change on lowland meadow, and promote research needs accordingly.
(ACTION: EHS)

5.5.10 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 By 2005, devise a strategy for ensuring effective distribution of existing advisory material to grassland managers and if gaps are identified, produce and disseminate appropriate material to fill these.
(ACTION: EHS, DARD)

5.6.2 By 2006, promote the conservation of lowland meadow through the scientific press and popular media.
(ACTION: EHS, DARD)

5.6.3 By 2008, facilitate production of a simple web-site, an attractive booklet and CD-ROM for the public and schools which explain the conservation importance of lowland meadow in Northern Ireland.
(ACTION: EHS, Department of Education, DARD)

5.6.4 By 2008, aim to achieve a minimum of 200 school groups attending grassland education programmes each academic year.
(ACTION: EHS, DARD)

5.6.5 By 2008, encourage appropriate access as well as interpretative and educational provisions on key grassland sites to increase enjoyment and public awareness of lowland meadow.
(ACTION: EHS, DARD, Forest Service, Water 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 RegionalDevelopment
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