

Northern Ireland Habitat Action Plan
Mud Habitats in Deep Water
March 2005

1. Current Status

1.1 Physical and biological status

- 1.1.1 Mud habitats in deep water (circalittoral muds) typically occur below 20-30m in many areas of the UK's marine environment, including marine inlets such as sea loughs. The relatively stable conditions associated with deep mud habitats often lead to the establishment of communities of burrowing megafauna, where deep water (>200m) species may occur with coastal species. The burrowing megafaunal species include burrowing crustaceans such as Dublin Bay prawns *Nephrops norvegicus* and *Calianassa subterranea*. Mud habitats in deep water can also support seapen populations including *Virgularia mirabilis* and *Pennatula phosphorea* (Marine Nature Conservation Review (MNCR) biotope CMU.SpMeg) as well as communities with brittlestars *Amphiura* spp. (CMU.BriAchi).
- 1.1.2 Soft mud communities occur extensively throughout more sheltered locations, where these communities may occur in quite shallow depths (15m). Soft mud communities also occur in deep offshore waters such as the Irish Sea and North Sea, where densities of *N. norvegicus* can reach 68 per 100m².
- 1.1.3 Burrows and mounds produced by megafauna are prominent features on the surface of plains of fine mud, amongst conspicuous populations of seapens, typically *Virgularia mirabilis* and *Pennatula phosphorea* and other burrowing crustaceans such as *Calocaris macandreae*, *C. subterranea* and *Goneplax rhomboides*. The echiuran *Maxmuelleria lankesteri* forms large mounds in some sea lough sites. Epibenthic scavengers include *Asterias rubens*, *Pagurus bernhardus* and *Liocarcinus depurator*. Brittlestars may be present and the infauna can include richly diverse populations of polychaetes and bivalves.
- 1.1.4 Areas of soft anoxic mud can support extensive bacterial mats of *Beggiatoa* spp. The anoxia may be the result of poor water exchange in some sea loughs or of nutrient enrichment. The associated fauna is usually impoverished but scavenging species such as *Asterias rubens* and *Carcinus maenas* are typically present. In extreme conditions of anoxia, little survives except the *Beggiatoa* spp.
- 1.1.5 Offshore mud habitats can be characterised by the burrowing urchin *Brissoopsis lyrifera* and the brittle star *Amphiura chiajei* and in certain areas around the UK and Ireland, such as the northern Irish Sea, this community includes *N. norvegicus*.
- 1.1.6 The distribution of the habitat closely follows that of the *N. norvegicus* fishery. This has resulted in the Department of Agriculture and Rural Development (DARD) and others undertaking a large range of studies on the distribution, benthic structure and fauna, and extent of this habitat e.g. Hensley (1996) and Gowen *et al* (1995)

- 1.1.7 The largest area of mud deposits in Northern Ireland lies off the east coast and extends across a wide expanse between the Isle of Man and the Irish coast. Although this is an area of relatively low wind and tide energy, detailed studies suggest that the muds are mainly relict. A great, circular motion of water (gyre) develops in summer over this area which is important for larval retention (Briggs, R., pers. comm.). Hardly any circalittoral mud is present on the North Coast (Barne *et al.*, 1997). The presence of strong tidal streams, even at depth, prevents the establishment of this habitat in much of Northern Ireland waters.
- 1.1.8 Surveys of the Irish Sea mud patch by DARD, found that the deeper sites from the western Irish Sea are dominated by the burrowing crustacean *Calocaris macandreae* and the heart urchin *Brissopsis lyrifera*, while the shallower eastern side is dominated by the starfish *Asterias rubens* and more mobile taxa such as the swimming crab, *Liocarcinus depurator*.
- 1.1.9 *N. norvegicus*, which is invariably associated with deep mud, has been recorded off Kilkeel and Newcastle. In these locations it has been found at depths of between 26 and 39m, which probably represents the fringes of the Irish Sea *Nephrops* fishery. The sediment in this area has been recorded as a muddy fine sand, which is worked and burrowed. *Nephrops* beds are also found in Strangford Lough on extensive areas of mud plains in the centre of the lough. The mud fraction in this area forms 95% or more of the sediment, is soft, worked and has burrows. There are occasional areas of shell debris, providing for attachment of species such as *Ascidiella aspersa* (Erwin *et al.*, 1986).
- 1.1.10 Although beam trawling occurs over most of the deep mud habitats with *N. norvegicus*, there are some limited areas which are generally minimally affected by anthropogenic disturbance. These include areas which are difficult to trawl due to bedrock close to the surface, steep slopes and sea bed hazards such as wrecks, cables and pipelines (Service, M. pers. comm.). In addition deep mud habitats in Strangford Lough are currently not fished by beam trawling and are relatively undisturbed.
- 1.1.11 Areas with less trawling pressure can hold a range of more sensitive deep mud species such as seapens. Beds of the seapen *Virgularia mirabilis* have been recorded during the Northern Ireland Sub-littoral Survey (NISS) (Erwin *et al.*, 1986) in Carlingford Lough, Strangford Lough, Dundrum Bay and also off Cranfield Point where the beds were found in 20 to 25m of water in an area of firm sand. The shallow mud flats in the upper reaches of Carlingford Lough recorded the most extensive populations of *V. mirabilis* at between 1 and 5m depth. Deeper populations have been recorded from Strangford Lough, including parts of the Quoile River. The burrowing brittle stars *Amphiura filiformis* and *A. chiajei* were also present within this area (Erwin *et al.*, 1986).
- 1.1.12 Survey work on the distribution of sublittoral habitats in the Republic of Ireland has been carried out by EcoServe (2001). They largely focused their work in the southern Irish Sea. Large deposits of muddy sand to the east of Ireland, from Ballbriggan to Howth were mapped, with infralittoral mud located east of Rush Martello Tower (at Rush, Dublin). Small deposits of muddy sand were also identified off east of Rosslare point.

1.2 Links with other action plans

- 1.2.1 This mud habitats in deep water habitat action plan identifies targets and actions required to deliver Northern Ireland's contribution to the UK action plan (UK Biodiversity Steering Group, 1999)
- 1.2.2 The actions proposed in this habitat action plan should be combined with efforts to implement other action plans for marine habitats such as sublittoral sands and gravels and sheltered muddy gravels.
- 1.2.3 Mud habitats in deep water are used by several Northern Ireland priority species including the the sea pen *Virgularia mirabilis*, rugose squat lobster *Munida rugosa* and the sea cucumber *Ocnus planci* . The requirements of these species should be taken into account during the implementation of this plan.

2 Current Factors Affecting the Habitat

- 2.1 Demersal fishing - fishing for *Nephrops* is carried out in some deep-water mud habitats in Northern Ireland. The *Nephrops* grounds that are fished are principally between the east coast and the Isle of Man. Landings are made at Kilkeel, Ardglass and Portavogie. *Nephrops* forms the largest and by far the most important fishery in Northern Ireland (Barne *et al.*, 1997), comprising landings worth up to £10 million per year and supporting the local food processing industry. The majority of *Nephrops* fishing is carried out by benthic trawling which can result in disturbance to the seabed and the removal of non-target species. Where heavy demersal fishing occurs, populations of *Brissopsis lyrifera* may be reduced. Little work has been carried out on the effect of benthic trawling on *Nephrops* habitats in deep water muds. The *Nephrops* population is currently considered to be stable and is being fished at sustainable levels.
- 2.2 Disposal of dredged material - it is possible that deep mud habitats could be influenced by the disposal of dredged material at licensed offshore disposal grounds. Effects of disposal could include smothering, a temporary increase in turbidity and possible contamination.
- 2.3 Laying of cables and pipelines – the laying of cables and pipelines has resulted in the digging away, burying and harrowing of benthic habitats including deep muds.
- 2.4 Oil exploration - exploratory drilling for oil was carried out by Elf in Northern Ireland waters in 1990's. Some of the drilling was carried out in deep mud habitats. Oil rigs and exploration can cause a variety of disturbance effects such as smothering due to disposal of drill cuttings, localised disturbance of sediments due to anchors and rig feet emplacement and trench digging for pipelines.
- 2.5 Pollution - mud in deep water is potentially sensitive to pollution. The fine particulate nature of the habitat and the presence of a gyre associated with the Irish Sea mud patch means that the habitat tends to accumulate and retain contaminants. However, due to the largely offshore and deep distribution of this habitat it is probably less vulnerable to pollution than inshore and intertidal habitats.

- 2.6** Renewable energy - using both wind and marine turbines is currently being proposed at a number of marine locations around Northern Ireland. Such developments may have the potential to impact on certain marine communities.

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 fauna and flora*, known as the 'Habitats Directive'. The Habitats Directive requires member states to designate and manage Special Areas of Conservation (SACs) for habitats (listed in Annex 1 of the Directive) and species (listed in Annex 2). Sites designated under the Habitats Directive in addition to sites designated under the Birds Directive together form the European wide network of sites known as Natura 2000. 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. Although Annex 1 does not specifically refer to mud habitats in deep water, deep mud habitats occur as sub-features of non-reef Annex 1 habitats e.g. *large shallow inlets and bay* and are present in a number of candidate Special Areas of Conservation (cSACs) across the UK including Strangford Lough.
- 3.1.2 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.
- 3.1.3 Under the terms of the Habitat Regulations, the above Article 6 assessment by the competent authority is required for plans or projects e.g. oil and gas exploration, aggregate extraction, marine construction work, land reclamation and dumping of dredged material, which are outside European sites but may still have an impact on the site.
- 3.1.4 Guidance to help competent authorities and others to interpret the Habitat Regulations has been published (EHS, 2002).

- 3.1.5 Guidance on the completion of an Article 6 assessment has also been published (European Commission, 2000)
- 3.1.6 An area of deep mud is situated within Strangford Lough, a Marine Nature Reserve and cSAC. A management scheme has been drawn up for the SAC, which includes provisions to maintain specified habitats at favourable conservation status. However, deep mud is not listed specifically as a feature or sub-feature of the SAC.
- 3.1.7 None of the three species of seapens *Virgularia mirabilis*, *Pennatula phosphorea* or *Funiculina quadrangularis* have statutory protection under Northern Ireland, UK or EC legislation however a recent review of the Northern Ireland Species of Conservation Concern (SoCC) has identified *Virgularia mirabilis* as a priority species under the Northern Ireland Biodiversity Strategy.
- 3.1.8 Discharges to the sea are controlled by a number of EC Directives, including the Dangerous substances, Shellfish (Waters), Integrated Pollution Control, Urban Waste Water Treatment and Bathing Waters Directives. The Oslo and Paris Convention (OSPAR) and North Sea Conference Declarations are also important. The Environment Acts provide powers to regulate discharges to the sea and have set targets and quality standards for marine waters. An extensive set of standards covering many metals, pesticides and other toxic, persistent and bioaccumulative substances, and nutrients have been set under UK legislation.
- 3.1.9 The Food and Environmental Protection Act 1985 (FEPA) protects the marine ecosystem, human health and the legitimate uses of the sea by controlling deposits in the sea, including construction works, through a licensing system.
- 3.1.10 Government departments are responsible for the assessment of the potential impacts of oil and gas exploration and production, aggregate extraction, marine construction work, land reclamation and dumping of dredged material prior to licensing. The conditions attached to these licenses can stipulate that measures are adopted to minimise environmental impacts. Environmental concerns can be used as grounds for the refusal of a license.
- 3.1.11 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*.
- 3.1.12 The WFD aims to rationalise much of the EC's water legislation with an overall purpose of providing a framework for the protection of surface waters including coastal waters. This aims at preventing the deterioration of aquatic ecosystems with a strong emphasis on ecological quality targets.
- 3.1.13 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.

- 3.1.14 WFD will eventually supersede many other EU Directives and will form the basis for the statutory monitoring of water quality in the future. Previous EU legislation has been directed at controlling specific discharges or activities in the marine environment (eg. Urban Waste Water Directive, Bathing Water Directive), whereas the WFD aims to take a holistic view of all activities in the aquatic environment. To facilitate this approach the emphasis has been put on measuring the biological status of organisms rather than physiochemical parameters in discharges or receiving waters. In marine waters the biological status for WFD is calculated by measuring the following elements: benthic invertebrate fauna, macroalgae and angiosperms, phytoplankton and fish fauna (transitional waters only).
- 3.1.15 Ecological status is composed of the biological elements, hydromorphology and physiochemical elements, and is classified as high, good, moderate, poor or bad. The aim of WFD is to achieve at least good ecological status by 2015 and ensure that there is no downward movement between classes. Ecological status is compared to reference conditions. Reference conditions are the status of water bodies that are considered to be 'undisturbed'. The WFD also aims to link the ecological status back to anthropogenic pressures so that management and monitoring programs can be focused. Thus, the pressures on the marine environment are also monitored. To further aid the holistic approach to management under the WFD, emphasis is put on catchment management whereby the reporting and management is undertaken in River Basin Districts (RBDs). To facilitate this approach, the implementation of WFD in Northern Ireland has been completed in communication with colleagues in the Environmental Protection Agency (EPA) and the Marine Institute in the Republic of Ireland

3.2 Management, research and guidance

- 3.2.1 The National Marine Monitoring Programme (NMMP) samples seven monitoring stations around Northern Ireland, four of which are on mud in deep water. Station IS2 is an offshore site situated off Dundrum Bay and site IS1 is an intermediate site situated off Belfast Lough.
- 3.2.2 DARD carries out monitoring in deep mud habitats for the purposes of *Nephrops* stock assessment. This involves incidental sampling of other megafauna, for example, through the use of beam trawls.
- 3.2.3 DARD is currently undertaking detailed analysis of 4 years of survey data to investigate the relationship between the major fisheries and the benthic communities of the area. This will be coupled with sediment particle size data gathered from geochemical studies and acoustic mapping to produce broadscale habitat maps (R.Briggs and M.Service, *pers. comm.*).
- 3.2.4 A broadscale habitat mapping project has also been carried out by DARD, EHS and QUB. The mapping project used acoustic techniques to identify the nature of seabed habitats with supplementary diving and grab samples out to the 50m depth contour (Mitchell & Service, 2004).

- 3.2.5 Between March and November 2003, a review of options for a sustainable UK fishing industry in the medium to long term, was carried out by the Cabinet Office Strategy Unit and their 'Net Benefits' report was published for consultation in March 2004. This report provides 33 recommendations for the sustainable management of the UK's fishing industry. The report calls "for all the key players to come together to manage the UK's fish resources – whether their interest is in scientific and environmental matters, the catching and process industry, or in tourism and development". UK Fisheries Departments are collating a joint UK response to the report, in consultation and collaboration with key industry interests.
- 3.2.6 The Fisheries Act (Northern Ireland) 1966 allows the regulation of fisheries activities in Northern Ireland including fish culture, shellfish fishery and marine fishery. Fisheries regulation is primarily aimed at developing and sustaining commercial fisheries, and some regulations have benefited to marine habitats and non-target species. Of particular benefit in this respect are regulations which limit fishing effort for scallop and the Inshore Fishing (Prohibition of Fishing and Fishing Methods) Regulation (Northern Ireland) SR1993 which imposes vessel length restrictions and no-trawl zones in Northern Ireland sea loughs where immature fish are present. More recent legislation has banned the use of mobile gear in Strangford Lough, while from 2000 onwards, much of the Irish Sea has been closed to directed whitefish fisheries for 3 months during the spring, under European legislation reviewed each year at Fisheries Council.
- 3.2.7 Management functions are also vested in the Loughs Agency which replaced the Foyle Fisheries Commission in 1999 and assumed the functions of the Foyle, Carlingford and Irish Lights Commission in relation to the Foyle and Carlingford Areas. Its functions include the conservation, protection and improvement of the fisheries of the Foyle area and to promote the development of Lough Foyle and Carlingford Lough for commercial and recreational purposes. This will include specific responsibilities for development and licensing of aquaculture in these areas.
- 3.2.8 Biological records of the NI marine environment are currently stored at 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 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 to provide an accessible data source for biodiversity information.

4 Action Plan Targets

- 4.1 Where appropriate, maintain the extent of mud habitats in deep water and associated animal communities.
- 4.2 Maintain representative examples of mud habitats in deep water and their associated animal communities which exhibit minimal anthropogenic influences.
- 4.3 Where appropriate, enhance the extent and condition of nationally important mud habitats in deep water in Northern Ireland.

5 Proposed Actions with Lead Agencies

5.1 Policy and legislation

- 5.1.1 Ensure that policy and legislation governing the use of the marine environment take appropriate accounts of affect on the favourable condition and conservation interest of deep mud habitats.
(ACTION: Planning Service, DARD, Rivers Agency, EHS, DOE, DETI, Harbour Authorities, DCAL, DRD, Loughs Agency)
- 5.1.2 Assist fisheries ministers in pressing for greater account to be taken of marine biodiversity within the Common Fisheries Policy.
(ACTION: EHS, DARD)
- 5.1.3 Ensure that the importance of deep mud habitats is identified and, where appropriate, site protection policies are included in appropriate strategies including Local Biodiversity Action Plans (LBAPs).
(ACTION: EHS, DARD, Loughs Agency, District Councils)
- 5.1.4 Continue to explore and maximise appropriate options for using statutory measures, additional to those specifically designed for nature conservation, to protect deep mud habitats.
(ACTION: EHS, DARD, DCAL, DRD)
- 5.1.5 By 2009, ensure that deep mud habitats are properly recognised within River Basin Management Plans as required by the Water Framework Directive.
(ACTION: EHS)

5.2 Site safeguard and management

- 5.2.1 By 2006 carry out and publish an up to date record of the extent, quality and distribution of deep mud habitats in Northern Ireland.
(ACTION: DARD, EHS)
- 5.2.2 By 2006, identify deep mud habitats that have been damaged or degraded and likely contributing factors.
(ACTION: DARD, EHS)

- 5.2.3 Identify by 2006 nationally important areas of mud habitats in deep water and the associated communities within Northern Ireland waters.
(ACTION: EHS, DARD)
- 5.2.4 By 2007, where feasible, initiate remedial action to restore damaged or degraded deep mud habitats to favourable condition.
(ACTION: EHS, DARD)
- 5.2.5 By 2006, determine the extent and quality of the deep mud habitats resource which falls within protected areas and commence action to notify further sites, if required. In particular, seek to secure adequate representation of the full range of variation in deep mud habitats communities found around Northern Ireland.
(ACTION: EHS)
- 5.2.6 By 2006, ensure that appropriate conservation requirements for deep mud habitats are included in the development and implementation of coastal zone management plans and ensure that they are not managed in isolation from other habitats and communities in these areas.
(ACTION: EHS, DOE, DARD, Loughs Agency)
- 5.2.7 By 2006, define water quality objectives for coastal and estuarine waters that meet the requirements of healthy deep mud habitats communities.
(ACTION: EHS)
- 5.2.8 By 2006, implement measures to provide appropriate action to protect mud habitats in deep waters through the network of cSACs where such habitats are included within the site as an interest feature.
(ACTION: EHS)
- 5.2.9 In conjunction with key stakeholders continue to encourage the development and use of viable harvesting methods for *Nephrops* and other species which contribute to the targets in this plan
(ACTION: DARD, EHS)
- 5.3 Advisory**
- 5.3.1 By 2005, provide advice to key interests involved in the development of the marine environment, on minimising impacts of plans and operations on deep mud habitats.
(ACTION: EHS)
- 5.3.2 By 2005, develop specific guidance to yachting and mooring associations on best practice to avoid damage to high quality and sensitive mud biotopes, and other Northern Ireland biodiversity interests, in deep water such as seapen beds.
(ACTION: EHS)
- 5.3.3 By 2005, develop guidance to sectoral managers and fishery managers concerning the importance of deep mud habitats and their ecological requirements. This should form part of an integrated guidance and training programme to relevant regulators concerning the ecological requirements of Northern Ireland biodiversity interests.
(ACTION: EHS, DOE)

- 5.3.4 By 2005, provide detailed advice and information to planners, oil regulators, fisheries managers and policy-makers on the sensitivity, conservation importance and ecological requirements of mud biotopes in deep water. Particular attention should be drawn to identified sites of national importance in order to raise awareness and promote their protection .
(ACTION: EHS)

5.4 International

- 5.4.1 Further develop links with the Republic of Ireland and other European and international organisations and programmes involved in developing the marine environment and promote the awareness of, and exchange of data and information relating to experience gained in research, management techniques, education and conservation strategies for the conservation of deep mud habitats.
(ACTION: EHS, DARD)

5.5 Monitoring and research

- 5.5.1 By 2006, carry out research into the factors, both natural and anthropogenic, which adversely affect deep mud habitats to understand how these may be avoided or minimised.
(ACTION: EHS, DARD)
- 5.5.2 By 2006, carry out research into the “natural” variability of deep mud habitats in space and time so that monitoring parameters/standards can be set.
(ACTION: EHS, DARD)
- 5.5.3 By 2006 carry out research into the historical variation in extent, condition and distribution of deep water mud habitats in Northern Ireland.
(ACTION: EHS, DARD)
- 5.5.4 By 2006 review the network of deep mud habitats monitoring stations to provide a Northern Ireland contribution to the National Marine Monitoring Plan.
(ACTION: DARD, EHS)
- 5.5.5 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, DARD)
- 5.5.6 By 2007, following completion of 5.5.1, review the HAP, identify new actions where appropriate and prioritise existing ones.
(ACTION: EHS, DARD)
- 5.5.7 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 Promote awareness among coastal users of the conservation importance of deep mud habitats and how to avoid impact on these habitats.
(ACTION: EHS)
- 5.6.2 By 2006, implement at appropriate venues such as the Ulster Museum, the Exploris Aquarium and coastal EHS Countryside Centres 'flagship' programmes for achieving education, increased public awareness and appreciation of deep mud habitats in Northern Ireland.
(ACTION: EHS)

6 Costings

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

7 References

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List of useful Acronyms

ASSI	Area of Special Scientific Interest
BTO	British Trust for Ornithology
CAP	Common Agricultural Policy
CEDaR	Centre for Environmental Data and Recording
CMD	Countryside Management Division
CMS	Countryside Management Scheme
DANI	Department of Agriculture for Northern Ireland
DARD	Department of Agriculture and Rural Development
DCAL	Department of Culture, Arts and Leisure
DETI	Department of Enterprise, Trade and Industry
DOE	Department of the Environment
DRD	Department of Regional Development
EC	European Commission
EHS	Environment and Heritage Service
EN	English Nature
ESA	Environmentally Sensitive Area
GFP	Good Farming Practice
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LFA	Less Favoured Area
MAGNI	Museums and Galleries of Northern Ireland
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
MOSS	Management of Sensitive Sites
NESA	New Environmentally Sensitive Area Scheme
NIBG	Northern Ireland Biodiversity Group
NICS	Northern Ireland Countryside Survey
NNR	National Nature Reserves
NT	National Trust
NVC	National Vegetation Classification
OSPAR	Convention for the Protection of the Marine Environment of the North East Atlantic
RSPB	Royal Society for the Protection of Birds
cSAC	candidate Special Area of Conservation
SAC	Special Area of Conservation
SLNCI	Site of Local Nature Conservation Interest
SNH	Scottish Natural Heritage
SoCC	Species of Conservation Concern
SPA	Special Protection Area
UWT	Ulster Wildlife Trust
WFD	Water Framework Directive
WWT	Wildfowl and Wetlands Trust