

Northern Ireland Habitat Action Plan
Sheltered Muddy Gravels
Final Draft – April 2003

1. Current Status

1.1 Physical and biological status

- 1.1.1 Sheltered muddy gravel habitats occur principally in estuaries, rias and sea loughs in areas protected from wave action and strong tidal streams. In fully marine conditions on the lower shore, this habitat can be extremely species-rich because the complex nature of the substratum supports a high diversity of both infauna and epifauna. However, good quality examples of this habitat are very scarce. Polychaetes and bivalve molluscs are normally dominant and the most varied species, but representatives of most marine phyla can be present. The fauna is often characterised by a large range in body size. As one moves into an estuary, with a consequent reduction in salinity, there is a marked reduction in species richness. Low salinity (mid to upper-estuarine) muddy gravels have a lower, but distinctive, species diversity. This plan concentrates on the intertidal and shallow subtidal high salinity muddy gravel habitats.
- 1.1.2 The Carpet Shell mollusc *Venerupis senegalensis* is often, though not necessarily, present and can sometimes occur in large numbers. The Blunt Gaper *Mya truncata* is another characteristic species. There are considerable variations in the composition of these communities, depending upon the types of sediment present and the salinity regime present. Members of the fully saline community can include the tube-dwelling polychaetes *Sabella pavonina*, *Myxicola infundibulum* and *Amphitrite edwardsi*, the sipunculan worm *Golfingia vulgaris*, the anemones *Sagartia troglodytes* and *Cereus pedunculatus* and the holothurian *Labidoplax digitata*. Burrowing, deposit-feeding polychaetes such as *Nomastus latericeus*, *Aphelochaeta marioni* and *Melinna palmata* may be abundant throughout the salinity range. The presence of coarse gravel and stones at the sediment surface often provides a substratum for the attachment of a variety of fauna and epiflora, for example fucoids, ephemeral green algae with associated littorinids and filamentous red algae.
- 1.1.3 Although the most diverse communities occur in fully saline conditions, a number of different species can occur under reduced salinity (upper-estuarine) conditions. Here, *Mya arenaria* may be present, with the polychaetes *Neanthes virens* and *Cirriformia tentaculata*, the cockle *Cerastoderma edule* and the native oyster *Ostrea edulis*. Oligochaetes and the rag-worm *Hediste diversicolor* usually dominate the upper-estuarine low-salinity muddy gravels.
- 1.1.4 This priority habitat may be considered as an intertidal extension of a habitat more common in the subtidal. The communities of interest to this plan are restricted to the intertidal and shallow subtidal.
- 1.1.5 Analysis of the survey records held on the MNCR database, suggests that fully-saline sheltered muddy gravel communities are scarce in their distribution in the UK. However, the biotope is found extensively in the Solent and Helford rivers. Other notable locations include the rias of south-west Britain, for example the Fal Estuary,

Salcombe Harbour and Milford Haven. Other known sites include the Sound of Arisaig, Lough Foyle, the Dyfi Estuary and Llanbedrog on the Llyn Peninsula.

- 1.1.6 Available descriptions of intertidal muddy gravel beds are often lacking in detail, due to a lack of comprehensive data. They are not easy to survey and monitor, due to the large quantities of coarse material that would need to be laboriously sampled and sieved.
- 1.1.7 Historical data on the distribution of muddy gravel beds are also very limited, presumably for similar reasons to those given above. Information from surveys carried out in the early 1900s in certain inlets (particularly the Kingsbridge and Helford rivers) highlight the extremely diverse communities found in muddy gravel habitats at that time. A review of sedimentary shores in Great Britain in the late 1970's described a similar distribution of muddy gravel communities to that shown by more recent surveys.
- 1.1.8 Within Northern Ireland, sheltered muddy gravels are known to occur in Carlingford Lough, Strangford Lough, Belfast Lough, Larne Lough and Lough Foyle. Ballyhenry Island in Strangford Lough supports particularly large numbers of *Edwardsia timida* in sheltered muddy gravel (B. Picton, pers. comm.) and a permanent patch of *Ascophyllum nodosum mackaii* (D. Birkett, pers. comm.). Very good examples of sheltered muddy gravels are also found near Ringburr Point, in South Kircubbin Bay and West Greyabbey Bay. These support characteristic species such as: *Amphitrite johnstonii*, *Milne-Edwardsia carnea*, *Sipunculus vulgare* and *Priapulid* spp. (P. Boaden, pers. comm.). In the Dorn, muddy gravel supports a diverse range of species including *Venerupis pullastra*, *Golfingia vulgaris* and the echinoderm *Leptosynapta* spp.
- 1.1.9 Within Larne Lough, muddy gravel has been recorded by the Northern Ireland Littoral Survey (NILS) on the upper shore with *Nephtys hombergi*. In Belfast Lough, muddy gravels are present in the Inner Lough and are dominated by *Macoma balthica*, *Cerasatoderma edule*, *Mya arenaria*, *Capitella* spp., *Scolecopsis squamata* and *Scoloplos armiger*. In Carlingford Lough, muddy gravel areas are associated with the sheltered boulder shores north of Killowen, but they were not examined as part of the NILS (Wilkinson *et al*, 1988).

1.2 Links with other action plans

- 1.2.1 This sheltered muddy gravels habitat action plan identifies specific targets and actions required to deliver Northern Ireland's contribution to the UK action plan. (UK Biodiversity Steering Group, 1999).
- 1.2.2 There is some overlap between the coverage of this plan and the HAPs for mudflats, sublittoral sand and gravels and mud in deep water, as the habitats are reasonably similar. The efforts to implement these plans should therefore be co-ordinated to allow the most efficient use of resources.

- 1.2.3 The Northern Ireland Species of Conservation Concern (SoCC) list is currently under review. This review will identify local priority species and those which may require action plans.

2. Current factors affecting the habitat

- 2.1** Little is known about current factors affecting this habitat in Northern Ireland. However, it is likely that the habitat is vulnerable to the following potential impacts.

- 2.1.1 Physical disturbance - the habitat could currently be affected by walkers on the shore, trampling sensitive organisms and leaving boulders turned over. This can affect sensitive underboulder communities, by leaving them to dry out.
- 2.1.2 Water quality - the habitat could be affected by degradation of water quality, for example by a significant increase in suspended sediment which could settle out and smother habitats, and by increases in the levels of organic pollution or increases in the levels of contaminants such as heavy metal and hydrocarbons.
- 2.1.3 Changes in coastal processes - sheltered muddy gravels are also sensitive to changes in the hydrodynamics of their location, for example due to increases in the level of wave exposure or currents, which could increase or reduce the level of scour and erosion. These changes could happen as a result of construction works, such as the construction of bridges, causeways and coastal defences. These types of developments could also have an impact upon the habitat by direct removal in the footprint of the development.
- 2.1.4 Fisheries - in the UK, the habitat has been affected in the past by small scale fisheries for *Venerupis senegalensis* and *Mercenaria mercenaria*. It is not known whether any of these fisheries take place in Northern Ireland. In the sea loughs around Northern Ireland it is common to find cobbles and boulders scattered on muddy gravel shores, forming ideal habitats for winkles (*Littorina littorea*). This species is widely collected but the extent of the impact on the habitat is not known.
- 2.1.5 Invasive species - this habitat is also believed to be sensitive to invasion by the alien species, the Slipper Limpet, *Crepidula fornicata* although this species has not been reported in Northern Ireland.
- 2.1.6 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). The prediction of increased summer temperatures, may lead to an increased level of desiccation in the intertidal area, restricting the distribution of the intertidal species. The decline of overall storminess predicted, is more than likely to be offset by the increased incidence of extreme events which could also affect sheltered muddy gravels by increasing the level of wave energy in the water column, thereby preventing the settlement of fine organic and inorganic materials.
- 2.1.7 Sea level changes - sea level changes will have a key impact on littoral communities which are adapted to certain amounts of desiccation and immersion and to certain

tidal regimes. A net mean sea level rise in the region of 10 – 15cm is predicted for Northern Ireland by 2020 and 65 – 70cm by 2050 (Harrison, *et al*, 2001).

3. Current action

3.1 Legal Status

3.1.1 Areas of muddy gravel are found within Strangford Lough, which is designated as a Marine Nature Reserve and a candidate Special Area of Conservation (cSAC). A management scheme has been drawn up for the cSAC, which includes provisions to maintain specified habitats at favourable conservation status. Muddy gravel is not listed specifically as a feature or sub-feature of the cSAC, although it could possibly be included within the following named sub-features: intertidal sand and gravel communities and subtidal gravel and sand communities.

3.2 Management, research and guidance

3.2.1 Work is being carried out by the Strangford Lough Management Committee to increase public awareness of the marine environment of Strangford Lough. In an effort to prevent disturbance to shores, a booklet has been produced entitled ‘Out and About around Strangford Lough’ to guide the public away from sensitive sites and direct them to more suitable locations. However, the booklet includes a walk around Ballyhenry Island, an area that contains a particularly good example of a sheltered muddy gravel habitat.

3.2.2 Biological records 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 Maintain the extent of sheltered muddy gravels and associated plant and animal communities in Northern Ireland.

4.2 Maintain the condition of sheltered muddy gravels and associated plant and animal communities in Northern Ireland.

4.3 Where appropriate, enhance the extent and condition of sheltered muddy gravels in Northern Ireland.

5 Proposed action with lead agencies

5.1 Policy and legislation

- 5.1.1 Ensure that development schemes, dredging operations, fishing activities or other activities do not adversely affect the integrity or the conservation interest of sheltered muddy gravels.
(ACTION: Planning Service, DARD, Rivers Agency, EHS, DETI, Harbour Authorities, DCAL, DRD)
- 5.1.2 By 2004, review *Planning Policy Statement 2 (PPS2) – Planning and Nature Conservation* taking cognisance of the experience gained in the rest of the UK, the Republic of Ireland and where appropriate, other leading countries in environmentally sensitive planning.
(ACTION: Planning Service, EHS)
- 5.1.3 By 2005, produce Planning Policy Statements (PPSs) on the countryside and the coast to incorporate the conservation of sheltered muddy gravels.
(ACTION: DRD)
- 5.1.4 Ensure that the importance of sheltered muddy gravels is recognised and, where appropriate, site protection policies are included in Development Plans and other strategies including Local Biodiversity Action Plans (LBAPs).
(ACTION: Planning Service, EHS, DARD, District Councils)
- 5.1.5 By 2006, explore options for using statutory measures, aside from those specifically designed for nature conservation, to protect sheltered muddy gravels. Particular consideration should be given to fisheries legislation, and port and harbour regulations.
(ACTION: EHS, DARD, DCAL, DRD)
- 5.1.6 By 2009, ensure that the *Water Framework Directive (WFD)* and the development of River Basin Management Plans address the conservation of sites designated for their sheltered muddy gravels interest.
(ACTION: EHS)

5.2 Site Safeguard and Management

- 5.2.1 By 2004 carry out and publish an up to date record of the extent, quality and distribution of sheltered muddy gravels in Northern Ireland.
(ACTION: EHS)
- 5.2.2 By 2004, identify sheltered muddy gravels that have been damaged or degraded by, for example, coastal defences, drainage schemes, agricultural run-off and land reclamation.
(ACTION: EHS)
- 5.2.3 By 2006, where feasible, initiate remedial action to restore damaged or degraded sheltered muddy gravels to favourable condition.
(ACTION: EHS)

5.2.4 By 2004 determine the extent and quality of the sheltered muddy gravels 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 sheltered muddy gravel communities found around Northern Ireland.

(ACTION: EHS)

5.2.5 Ensure conservation requirements for sheltered muddy gravels 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)

5.2.6 By 2006, define water quality objectives for coastal and estuarine waters that meet the requirements of healthy sheltered muddy gravel communities.

(ACTION: EHS)

5.3 Advisory

5.3.1 Publish guidelines on the selection and designation of intertidal ASSIs for their marine biological importance by 2004.

(ACTION: EHS)

5.3.2 Provide advice to local authorities and others on minimising impacts of plans and operations on sheltered muddy gravels.

(ACTION: EHS)

5.4 International

5.4.1 Further develop links with the Republic of Ireland (Lough Foyle and Carlingford Lough) and other European and international organisations and programmes to promote the exchange of information and experience in research, management techniques, education and conservation strategies.

(ACTION: EHS)

5.4.2 Liaise with research institutes in Europe and elsewhere to exchange data and information on the conservation of sheltered muddy gravels.

(ACTION: EHS)

5.5 Monitoring and Research

5.5.1 By 2005, carry out research into the factors, both natural and anthropogenic which adversely affect sheltered muddy gravels to understand how these may be avoided or minimised.

(ACTION: EHS)

5.5.2 By 2005, carry out research into the “natural” variability of sheltered muddy gravels in space and time so that monitoring parameters/standards can be set.

(ACTION: EHS)

- 5.5.3 By 2006, carry out research into the historical variation in extent and distribution of sheltered muddy gravels in Northern Ireland.
(ACTION: EHS)
- 5.5.4 By 2006, establish standard sheltered muddy gravels monitoring programmes and ensure they are compatible with UK, Republic of Ireland and others.
(ACTION: EHS)
- 5.5.5 By 2006, establish a network of sheltered muddy gravels monitoring stations around Northern Ireland, this should complement a network for the UK and the Republic of Ireland.
(ACTION: EHS)
- 5.5.6 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)

5.6 Communications and publicity

- 5.6.1 Promote awareness among coastal users of the conservation importance of sheltered muddy gravels 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 sheltered muddy gravels in Northern Ireland.
(ACTION: EHS)

6. Costing

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

7. References

Harrison, P. A., Berry, P. M. & Dawson, T. P. (2001) *Climate Change and Nature Conservation in Britain and Ireland: Modelling natural responses to climate change* (the MONARCH project). Oxford, UKCIP Technical Report.

UK Biodiversity Steering Group (1999) *Biodiversity: The UK Steering Group Report: Tranche 2, Volume 2: Maritime species and habitats*. HMSO. London

Wilkinson, M., Fuller, I.A., Telfer, T.C., Moore, C.G. & Kingston, P.F. (1988) *Northern Ireland Littoral Survey*. Report to Environment and Heritage Service, Belfast.

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 Rural 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