

**Northern Ireland Habitat Action Plan**  
**Tidal Rapids**  
**Final Draft – April 2003**

**1. Current Status**

**1.1 Physical and biological status**

- 1.1.1 In this Habitat Action Plan, ‘tidal rapids’ are defined as ‘strong tidal streams resulting from a constriction in the coastline such as at the entrance to, or within the length of an enclosed body of water such as a sea lough, and also areas of very strong tidal streams on the open coast or between islands’. Their depth is usually shallower than five metres but tidal rapids may also occur at deeper situations. In practice, this description covers a broad range of high energy environments ranging from rocky seabed to gravels in deep tidal streams and tide-swept habitats. In deeper situations, defined in this plan as being more than five metres, tidal streams may generate favourable conditions for diverse marine habitats. Wherever they occur, strong tidal streams result in characteristic marine communities rich in diversity, nourished by a constantly renewed food source brought in on each tide. This richness is most marked where it combines a mixing of warm water with a colder, nutrient rich current.
- 1.1.2 The marine life associated with these habitats is abundant in animals fixed on or in the seabed and typically includes soft corals, hydroids, bryozoans, large sponges, anemones, mussels and brittle stars in dense beds. In shallow water, bedrock and boulders often support kelp and sea oak plants, which may grow very long in the tidal currents and can have a variety of animals growing on them. A diverse assemblage of other smaller red and brown seaweeds grow on cobbles and pebbles, many of these being characteristic of these tide-swept situations.
- 1.1.3 In Northern Ireland, tidal rapids occur frequently and are most commonly found within the entrances to sea loughs and between or around islands where accelerated tidal streams are found. In some of these tidal rapids there are extensive areas deeper than 5m, which support very diverse populations of sessile fauna colonising the substrate that is beyond the abrasive effect of long kelp fronds. These deep-water tidal rapids are very rare habitats within Europe although there may be similar sites in the south of Cornwall and on the north-west coast of Scotland especially on the outer isles (D. Erwin, pers.comm.).
- 1.1.4 Within Strangford Lough, good examples of tidal rapid habitats are found in the Narrows, at Rathcunningham, in the channel between Long Sheelagh and Youran, between Sketrick and Rainey Islands, at Rathgorman, at Chapel Island, at the mouth of Ardmillan Bay as well as between Darragh and Castle Islands, and most notably at the two sills in the Dorn inlet at Ardkeen. Most of the Narrows (the 6km long entrance to Strangford Lough) comprises tidal rapids with rich communities found on the shores either side and also on the many shallow rocky areas found within the channel such as The Meadows, Bar Pladdy, around Rock Angus and The Walter Rock. In these locations, rich under-boulder communities are found comprising sponges, hydroids, ascidians and bryozoans. Extensive beds of *Alaria esculenta* and *Saccorhiza polyschides* are found along with encrusting fauna such as *Tubularia* spp. and *Verruca stroema*. Animals that are normally found only in the subtidal are often

frequent in the intertidal parts of tidal rapids, such as sunstars and *Corynactis viridis* (P. Boaden, pers.comm.).

- 1.1.5 The Dorn (a National Nature Reserve) comprises a series of shallow basins or lagoons, connected to Strangford Lough by a narrow inlet. At the entrance to the inlet is a rock sill rising to 1.28m above datum. As the tide falls, water continues to pour over the sill at very high speeds of 0.4 to 0.6 m/sec forming tidal rapids. The sill also results in the level of water retained in the basins continuing to drop slowly for an extra 3.5 hours into the period of a rising tide, which results in normally subtidal species being found in very shallow water - a phenomenon known as “emergence”. (Boaden *et al*, 1975). There is a second sill of boulders between Phersons and Ballywallon Island inside the Dorn inlet.
- 1.1.6 Outside Strangford Lough, tidal rapids occur at the entrance to Carlingford Lough, Dundrum channel, Killough harbour mouth, at the Maidens off Larne Lough, in the entrance to Larne Lough and between Barney’s Point and the Magheramourne spoil tip, the outer coast of Rathlin Island, the entrance to Lough Foyle between Greencastle and Magilligan Point and the outer coast of the Skerries (P. Boaden, pers. comm.).

## **1.2 Links with other action plans**

- 1.2.1 This tidal rapids 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 that share relatively high energy environments, for example maerl beds. The entrances to saline lagoons may provide suitable conditions for the occurrence of tidal rapids.
- 1.2.3 The Northern Ireland Species of Conservation Concern (SoCC) list is currently under review. This review will identify local marine priority species and those which may require action plans.

## **2 Current factors affecting the habitat**

- 2.1 There are thought to be no major disturbances to this habitat at present in Northern Ireland (D. Erwin, pers. comm.) however small-scale localised impacts have occurred. Tidal rapids are protected somewhat from sea-based human activities by the strong tidal streams which make it impracticable to carry out certain activities in these areas, such as fishing.
- 2.1.1 Indirect disturbance - tidal rapids rely on particular water movements. Therefore they are vulnerable to changes in the tidal regime and the construction of seawalls, causeways etc, have the potential to change these processes.
- 2.1.2 Direct physical disturbance - tidal rapids could potentially be adversely affected by the construction of causeways, coastal engineering, bridges, barrages and tidal power

schemes and attempts to remove obstructions to navigation etc. If the construction were inappropriately sited, these could affect tidal rapids by altering the water flow regime and sedimentary loading and by reducing the tidal current. Tidal rapids are potentially at risk from shipwrecks due to the navigational difficulties associated with strong currents.

- 2.1.3 Specimen collection - intertidal tidal rapids are subject to some small-scale damage from boulder turning by winkle collectors and students of marine biology. Overturning boulders and not replacing them results in the exposure of the rich underboulder communities to desiccation and predation.
- 2.1.4 Pollution - localised impact on tidal rapids in Strangford Lough may occur due to poor water quality. The discharge of sewage from an outfall at Walter Rock in Strangford Lough has caused a local increase in the population of spirorbids and a decrease in the number of hydroids (P. Boaden, pers. comm.).
- 2.1.5 Alien species - tidal rapids may also be subject to some disruption from the invasion of the alien seaweed species *Sargassum muticum*. *S. muticum* has been present in Strangford Lough since 1992 and in the Dorn since at least 1998 (Davison, 1998). However, the effect of this species on tidal rapid communities is not known.
- 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 tidal rapid habitat in Larne Lough is subject to the influence of warm water from the cooling outfall of Ballylumford Power Station. However, the effect of this temperature increase on the community structure and biodiversity within the habitat is not known. The decline of overall storminess predicted is more than likely to be offset by the increased incidence of extreme events which could also affect tidal rapids by increasing the level of wave energy in the water column.
- 2.1.7 Sea level changes - sea level changes will have a key impact on habitat and 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 Strangford Lough is protected as a Marine Nature Reserve (MNR) and is included in the UK's list of candidate Special Areas of Conservation (cSACs) which has been submitted to Europe under the terms of the the European Community (EC) Habitats Directive. A management scheme has been drawn up for the European marine site, which includes provisions to maintain specified habitats at favourable conservation status. The Dorn (see 1.1.5) within Strangford Lough, is also a National Nature Reserve (NNR).

- 3.1.2 Tidal rapids are not specifically listed under the EC Habitats Directive. However if the rapid occurs over suitable substrate i.e. rock or a biogenic reef such as a mussel bed, the rapid may qualify under the Annex I habitat ‘reefs’. Using this interpretation, ‘reefs’ have been identified as selection features for both Strangford Lough and Rathlin candidate Special Areas of Conservation (cSACs). Rapids over mixed sediments do not qualify under the present habitat definitions.

### **3.2 Management, research and guidance**

- 3.2.1 The fauna and flora of the tidal rapids in the Dorn has been briefly described in various research papers on the epifauna of *Fucus serratus* such as Boaden *et al*, (1975). Other tidal rapids within Northern Ireland were surveyed as part of the Northern Ireland sub-littoral survey in the mid 1980s ( Erwin *et al*, 1986).
- 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 tidal rapids and associated plant and animal communities in Northern Ireland.
- 4.2 Maintain the condition of tidal rapids and associated plant and animal communities in Northern Ireland.
- 4.3 Where appropriate, enhance the extent and condition of tidal rapids 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 tidal rapids.  
(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 a Planning Policy Statement (PPS) on the coast to incorporate the conservation of tidal rapids.  
(ACTION: DRD)
- 5.1.4 Ensure that the importance of tidal rapids 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 tidal rapids. 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 tidal rapids 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 tidal rapids in Northern Ireland.  
(ACTION: EHS)
- 5.2.2 By 2004, identify tidal rapids 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 tidal rapids to favourable condition.  
(ACTION: EHS)
- 5.2.4 By 2004, determine the extent and quality of the tidal rapids 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 tidal rapids communities found around Northern Ireland.  
(ACTION: EHS)
- 5.2.5 Ensure conservation requirements for tidal rapids 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 tidal rapids communities.  
(ACTION: EHS)

### **5.3 Advisory**

- 5.3.1 By 2004, publish guidelines on the selection and designation of intertidal ASSIs for their marine biological importance.  
(ACTION: EHS)
- 5.3.2 Provide advice to local authorities and others on minimising impacts of plans and operations on tidal rapids.  
(ACTION: EHS)

### **5.4 International**

- 5.4.1 Further develop links with the Republic of Ireland 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 tidal rapids.  
(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 tidal rapids to understand how these may be avoided or minimised.  
(ACTION: EHS)
- 5.5.2 By 2005, carry out research into the “natural” variability of tidal rapids 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 tidal rapids in Northern Ireland.  
(ACTION: EHS)
- 5.5.4 By 2006 establish standard tidal rapids 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 tidal rapids 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 tidal rapids 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 tidal rapids in Northern Ireland.

(ACTION: EHS)

## **6. Costing**

- 6.1 This plan is due for publication in March 2003. The published plan will include projected costings for delivery of the plan.

## **7 References**

Boaden, P.J.S., O'Connor, R.J. & Seed, R. (1975) The composition and zonation of a *Fucus serratus* community in Strangford Lough, C.Down. *Journal of Experimental Marine Biology and Ecology*, Vol. 17, 111-136.

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Erwin, D.G., Picton, B.E, Connor, D.W, Howson, C.M., Gilleece, P., & Bogue, M.J. (1986) *The Northern Ireland Sublittoral Survey*. Ulster Museum, Belfast.

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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 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

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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