

February 2001

**LOWER BANN  
ENVIRONMENTAL  
MANAGEMENT STRATEGY**

**Recommendations for action from the  
Lower Bann Advisory Committee**

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# 1 BACKGROUND TO THE LOWER BANN ENVIRONMENTAL STRATEGY

The River Lower Bann drains Lough Neagh to the sea. The river is used for, amongst other things, game and coarse angling, commercial fishing, jet-skiing, water-skiing, canoeing and rowing. Along its length are important wildlife, landscape, historical and archaeological features. River flows and water levels are regulated by sluice gates and weirs and a system of locks facilitate navigation. Added to this complexity of values and users is an array of statutory agencies responsible for different aspects of river management.

In an attempt to address the situation and manage the Lower Bann river in a integrated way the government in 1994 set up a Lower Bann Advisory Committee and a Lower Bann Co-ordinating Committee. The aim of the Lower Bann Advisory Committee is to:

- advise on the protection of the natural environment and man-made heritage.
- advise on drainage and navigation.
- advise on the management and development of countryside and open air recreation.

The role of the Lower Bann Co-ordinating Committee is to co-ordinate management and policy making amongst the statutory agencies responsible for various aspects of the Lower Bann.

Members of both committees are listed in Appendix I.

The Lower Bann Advisory Committee initiated this environmental strategy by forming a Lower Bann Environmental Strategy Working Group. This working group was drawn mostly from Advisory Committee members but a number of other people were co-opted to add their experiences to the group. Working group members are listed in Appendix II. Draft proposals were discussed with the Lower Bann Advisory and Co-ordinating Committees and a draft Lower Bann Environmental Strategy was sent out for comment to all those organisations on the consultee list in Appendix III. This was followed by two consultation meetings to which all those on the consultee list were invited.

The environmental ‘purist’ approach with a hint of realism was adopted by the EMWorking Group in the production of this document. It is appreciated that the Strategic Aim of EHS in the ‘River Conservation Strategy’ (Feb 2001) is:

*“To protect, conserve and enhance the natural and built heritage values of rivers in Northern Ireland and facilitate their sustainable use.”*

The objectives of the River Conservation Strategy are as follows:

1. To maintain or restore where appropriate, the natural physical structure and function and landscape quality of rivers and their corridors and conserve important earth science features associated with them.
2. To maintain and/or enhance the ecological integrity and biodiversity of rivers.
3. To maintain and, where appropriate, improve the water quality of rivers to meet the needs of conservation.
4. To maintain and protect archaeological features, the industrial heritage and conserve historic buildings associated with rivers and their setting.
5. To increase the potential for public enjoyment of rivers where it is compatible with the other objectives of the river conservation strategy.
6. To promote awareness and appreciation of rivers.

This Environmental Management Strategy for the Lower Bann, February 2001, outlines an approach for the management of this significant natural resource in an integrated, environmentally sustainable way. It addresses all those issues that emerged as important through the consultation process and proposes management actions in relation to these. Some of these management actions are quite specific but many have been expressed in more general terms. This document sets out an agenda for future management action and policy development for all those involved in managing or using the Lower Bann.

In the autumn of 2000, the original Working Group revisited the Environmental Management Strategy with a view to adding an action plan, detailing specific actions, lead agencies and timescales. The group decided that this was the best approach to ensuring that as many of the recommendations as possible were implemented.

This revised document is now being distributed to ascertain the views of the lead statutory agencies and local authorities with regard to implementation of the highlighted actions. The amended plan will then be presented to the Lower Bann Coordinating Committee to steer the implementation of the actions.

## **2 THE LOWER RIVER BANN**

### **2.1 The river catchment**

The Lower Bann drains the Lough Neagh and Lower Bann catchment which covers 4500 square kilometres and encompasses 42% of the land area of Northern Ireland as well as part of County Monaghan in the Republic of Ireland (Map 1). Approximately 300,000 people live in the catchment. Over 80% of the catchment is agricultural; only 10% of this is arable, the rest is pasture grazed by cattle and sheep. There is some afforestation in the higher ground. It has five major tributaries; the Clady, Agivey, Aghadowey and Macosquin Rivers all rise in the west and the Ballymoney River joins from the east. (Map 2). The Lower Bann catchment is principally underlain by tertiary basalt rock.

### **2.2. The river corridor**

The Lower Bann River leaves Lough Neagh at Toome and enters the sea 60 kilometres to the north at Castlerock. In an Irish context it is a large river; it is about 60 metres wide along most of its length with wider stretches at Lough Beg and the Bann Estuary. The overall gradient of the river is modest - it drops from 12.55 metres above sea level from Lough Neagh to its mouth.

Lough Beg is essentially a widening of the Lower Bann, 3 kilometres downstream of Toomebridge. It has an area of approximately 5 square kilometres and apart from the deeper navigation channel the lake is generally about 2 metres deep. The spire of the church on Church Island stands out as a landmark above the low woodland in a deeply tranquil and remote wetland fringe landscape. In this area the valley floor is wide and flat with areas of cut-over bog and extensive flat pastures merging into shallow drumlins.

The Kilrea glaciofluvial complex extends from Portglenone to the Vow (downstream from Movanager). These steep sided sand and gravel hills and ridges are very distinctive with well wooded slopes.

From the Vow to Ballylagan (downstream from Drumahelis) the valley floor widens and flattens where there was a former lake at the confluence of the Agivey, Aghadowey, Macosquin and Ballymoney rivers. Here low-lying fields are criss-crossed by a network of straight drainage ditches. Many of the fields have been enlarged to form extensive open flat pastures with a scanty hedgerow network although close to the Bann there are areas with a small scale field pattern.

From Ballylagan to Coleraine town the valley narrows with steep well wooded sides contrasting markedly with the upstream section.

From Coleraine to the sea the river is a tidal estuary. Downstream from the town there are extensive sand dunes on both banks. The estuary is long and narrow with limited mud flat development on the seaward side.

The Lough Neagh and Lower Bann river catchment

Lower Bann and locations mentioned in the text

### **2.3 Drainage and navigation**

Water levels on Lough Neagh and flows in the Lower Bann are controlled by a system of sluice gates and weirs put in place as a result of a number of drainage schemes. A system of locks makes it possible to navigate along the full length of the river.

Although there had been earlier piecemeal attempts the first large scale drainage scheme was the McMahon Scheme carried out between 1846 and 1856 with a view to reducing the level of Lough Neagh and making the river navigable. This involved building 5 locks and weirs, the removal of a rocky shoal at Portna and limited dredging of the Lower Bann. Because of the engineering compromise between drainage and navigation requirements the McMahon Scheme was considered less than successful. Another drainage scheme, the Shepherd Scheme carried out in the 1930s involved deepening, widening and straightening of the drainage channel and replacing the fixed weirs at Toome, Portna and the Cutts with sluice gates. In response to continuing pressure to alleviate flooding around Lough Neagh the water level was further lowered in the 1940s and 50s by adjusting the management regime of the sluice gates at Toome. The net effect of these drainage schemes was a lowering of the Lough Neagh water level by about 3 metres and a reduction in the natural range of high and low water levels.

#### *The Lough Neagh & Lower Bann Drainage and Navigation Act*

Water levels in Lough Neagh are prescribed through Lough Neagh (Levels) Schemes made under section 1 of the Lough Neagh & Lower Bann Drainage and Navigation Act (NI) 1955. The current Lough Neagh (Levels) Scheme 1955 specifies that the water levels of Lough Neagh should be maintained between 12.45 metres and 12.60 metres above sea level as far as conditions of rainfall, wind and other natural causes allow.

#### *Sluice gate operation*

The sluice gates are managed by Rivers Agency with the aim of maintaining the level of Lough Neagh within the 15 centimetres control range whilst at all times maintaining an adequate flow in the Lower Bann (when the sluice gates are closed a minimum flow to the Lower Bann is constantly discharged through a fish pass beside the sluice gates).

The water level in Lough Neagh is controlled by the Toome sluice gates. Within the statutory 'control' range of 12.45 metres and 12.60 metres above sea level Rivers Agency strive to maintain a 'operational' level of 12.47 metres during the winter months when the risk of lough draw-down is least and flood risk is high and 12.57 metres during the summer months when the opposite applies. The operating levels both provide a 25 millimetre margin within the respective closest limits of the control range in order to provide the necessary leeway. In practice it is impossible to consistently keep Lough Neagh levels within this narrow range because of natural floods and droughts.

#### *Lower Bann Navigation*

The Lower Bann Navigation operated commercially from the 1850s to 1929 when the Lower Bann Navigation Trust was abolished and responsibility was passed to government and thence to Rivers Agency today. There are locks at Toome, Portna,



Movanagher, Carnroe and the Cutts. The navigation is maintained to provide a minimum depth of 1.5 metres along its full length through the placement of weirs, the management of sluice gates and limited dredging.

## **2.4 The natural environment**

### *River habitats and landscapes*

Managed as it is for drainage and navigation the Lower Bann is no longer a natural river. In its natural state before the drainage schemes the river channel had a riffle and pool system which would have supported more diverse plant and animal communities than the more uniform channel does today. The pristine river would also have had a wider water level range over-flooding its banks more than it now does. Before the woodland clearances of the seventeenth century the river would have passed through natural woodland with areas of frequently flooded wet woodland, lowland wet grassland, marsh, reedswamp and bog. With the notable exceptions of Lough Beg and the Bann estuary virtually all of these natural river corridor habitats have now gone. The 'Bann Woods' along the length of the river date from the 1930s drainage scheme when material dredged from the river was deposited in areas then known as 'The Bann Dumps' and later planted with commercial timber. These woods have a very high landscape value, especially because of the sympathetic planting of deciduous trees along the river edge. The 26 blocks of woodland are managed by Forest Service and occupy 17 kilometres of river bank.

Although riverside woods are frequent, an equal proportion of the river length is characterised by an open agricultural landscape managed as pasture. Along the sides of the 60 metre wide open channel there is a generally thin and broken band of reedswamp and rooted macrophytes (underwater plants). Cut-over raised bogs approach the river's edge in the Lough Beg to Portglenone stretch. The largest of these is Ballymacombs More being actively harvested by Bulrush Peat Company.

### *Diatomite*

Diatomite, or Bann clay as it is known locally, is made up of the remains of algae that grew in shallow flooded areas. The diatomite material is made up of the silica cases of many different species of diatom (green algae) that have decayed leaving only their hard outer cases behind. Diatomite occurs at locations all along the Lower Bann from Toome to the Ree downstream of the confluence of the Agivey River. The diatomite was laid down between 7,500 and 5,000 years ago in river embayments and shallow lake environments during the time when early people had colonised the area and before peat bogs had begun to form. The diatomite is important as a scientific resource while its exploitation is notable in the more recent history of the Lower Bann valley. Two diatomite localities have been designated as Areas of Special Scientific Interest.

### *Water quality*

Presently, water quality in rivers is classified using both chemical and biological monitoring techniques. For each system of measurement there are six water quality classes which are; very good, good, fairly good, fair, poor and bad. The table below

shows results for the Lower Bann and its tributaries from the latest River Quality Report published by Environment and Heritage Service in 1999.

River Zone	Water quality classification	
	Biological	Chemical
Lower Bann at Cutts	Fair	Fair
Lower Bann at Kilrea Bridge	Good	Fairly Good
Lower Bann at Portglenone	Good	Fair
Lower Bann at Toome Bridge	Good	Fairly Good
Ballymoney River at Glenstall Bridge	Fairly Good	Fairly Good
Ballymoney River at Ballymena Road Bridge	Fairly Good	Fairly Good
Macosquin River at Ree Bridge	Fairly Good	Good
Agivey River at MoneyCarrie Bridge	Good	Fairly Good
Aghadowey River at White Bridges	Fairly Good	Good
Clady River at Glenone Brisge	Fairly Good	Good

Water quality is depressed along the first section of the Lower Bann reflecting the impact of the algal loading from Lough Neagh and nutrient enrichment throughout the Lough Neagh catchment. Water quality is again depressed between Kilrea Bridge and Coleraine. This is due to the pollution loading from the Ballymoney River. The 1995 River Quality Report attributed the poor water quality in the Ballymoney River to urbanisation combined with discharges from sewage treatment works and storm overflows. It also pointed to possible stress as a result of agricultural inputs. During the summer the Lower Bann suffers from low dissolved oxygen levels.

The Bann Estuary is not classified in the same way due to the salt water environment. The Coleraine Sewage Treatment Works (STW) discharges most of the effluent having received primary and secondary treatment. At times, however, the system is overloaded and effluent is discharged to the estuary having received primary treatment only. This arises as a consequence of the sewage system being linked to storm drains and overloading the treatment works during periods of wet weather. This causes a water quality problem both within the estuary and on Castlerock beach which fails to meet Blue Flag standard because of the Coleraine STW, and other industrial and storm drain discharges in the estuary. Water Service is planning to construct a new sewage treatment works between Portrush and Portstewart with the capacity to treat sewage not only from the two coastal towns but also some of the load from Coleraine and Castlerock. This is expected to prevent poorly treated sewage being discharged into the estuary and, depending upon the necessary procedures having been carried out, is expected to begin in the year 2001.

A new overall framework for the integrated protection of surface waters and groundwaters is currently being established. The EC Water Framework Directive (WFD), which will focus on water quality within the river basin, will be adopted late in 2000. To transpose the requirements of the Directive into domestic legislation it will be necessary to prepare Regulations for Northern Ireland. Target dates for meeting the requirements of the WFD will be confirmed when the Directive is adopted.

One of the objectives of the WFD is that all waters should achieve “good status” which, for rivers, will be defined in terms of invertebrates, aquatic plants, fish communities, hydrological characteristics and river morphology. As a result of the proposed WFD it will be necessary for new methods for assessing water quality to be developed across the community. EHS will commission and collate research to meet the requirements of the WFD relevant to Northern Ireland.

A Management Strategy is currently being prepared for Lough Neagh and its associated wetlands. The strategy will be making recommendations for the future sustainable management of factors which impact on the Lough. It is inevitable that there will be a series of recommendations relating to improving the water quality of the Lough. Although a reasonably long-term project, when the recommendations are implemented, there should be a significant positive outcome for water quality in the Lower Bann.

### *Birds*

The main river channel is not noted for any concentration of birds. Along the length of the river kingfishers are common. At weirs and sluice gates where there is faster moving water and rocky areas there are grey wagtails and dippers. Lough Beg and the Bann Estuary are both important for birds (discussed in the Lough Beg and Bann Estuary sections below).

### *Lough Beg*

Apart from the deeper navigation channel most of Lough Beg is about 2 metres deep. Drainage schemes on the Lower Bann have inadvertently benefited the Lough Beg marginal habitats in that lowered water levels have helped to create an area of wet grassland on the former lake bed one thousand acres in extent on the west shore - an area known locally as ‘The Strand’. This land is grazed but has not otherwise been agriculturally improved. This wet grassland is largely flooded in winter providing habitat for wintering wildfowl and as the winter floods recede the wet grassland supports large numbers of breeding waders (redshank, lapwing, curlew, snipe and occasionally dunlin). In spring and autumn Lough Beg is an important staging post for migrating birds to rest and feed on their way through. The Strand is rich in plant species including a remarkable number of rarities most notably Irish Lady’s Tresses (*Spiranthes spiralis*), Northern reed grass (*Calamagrostis stricta*) and Penny Royal (*Mentha pulegium*). All of Lough Beg with its marginal habitats is protected as an Area of Special Scientific Interest, a Special Protection Area and a Ramsar Site.

Recreation pressure at Lough Beg is low as boats are confined to the deeper navigation channel and access to the lake shore is difficult. There is some wildfowling and birdwatching.

### *Bann Estuary*

From the Cutts weir to the sea for a distance of 11 kilometres the Lower Bann is tidal. The outer estuary is not large (it has a maximum width of 0.5 kilometres). The Coleraine urban section of the estuary supports some reedswamp and woodland fringe but, as the channel further widens in the middle part of the estuary, larger reedswamps appear. There are areas of mudflat and marsh and sand dune systems on both the

Castlerock and Portstewart sides with older dunes at Grangemore, near Articlave. Coleraine Harbour is less commercially active than it once was but a dredged channel for boats entering and leaving the harbour is still maintained between the breakwaters at the Barmouth. The estuary is used by commercial boats, for angling, watersports, walking, etc.

The Bann Estuary is important for birds especially wintering waders and wildfowl that mostly feed on the mudflats and roost on the shore. The estuary usually supports about 4000 birds each winter. Its local importance is highlighted by the success of the birdwatching hide at the railway crossing but it is clearly important in a wider context as it is part of a Lower Bann migration flyway. Each spring and autumn large numbers of birds on their way to and from countries further north pass through the Lower Bann corridor linking to either Lough Neagh or wetlands and coastal areas further south in Ireland or even mainland Europe.

The sand dunes at Portstewart and Grangemouth are managed as National Trust nature reserves. The National Trust also leases the shooting rights from The Honourable The Irish Society over the mudflats to manage these as a no-shooting wildfowl refuge. The North Derry Area of Outstanding Natural Beauty extends to the west side of the Bann Estuary. The Bann Estuary is a proposed Area of Special Scientific Interest and Special Area of Conservation.

#### *Fish*

The Lower Bann flows from Lough Neagh to the sea and the river channel is an important conduit for migrating eels and salmon. The river also has populations of roach (introduced in the 1970s) bream, roach/bream hybrids and pike. There are brown trout in parts of the main channel and all the tributary rivers. Sea trout and grey mullet occur in the Bann Estuary.

The scale fishing rights for both commercial netting and angling on the Lower Bann and the tributary rivers belong to The Honourable The Irish Society. For management purposes these rights are leased to Bann System Ltd for the time being. The eel fishing rights along the river belong to the Lough Neagh Fishermen's Co-operative Society Limited as far downstream as the Cutts, and in the estuary they belong to The Honourable The Irish Society.

Elvers enter the estuary in the autumn having travelled with the Gulf Stream from the Sargasso Sea. In the spring many of them swim upstream aided by special elver ladders at sluices and weirs. To ensure that as many elvers as possible reach Lough Neagh to support the commercial fishery there the Fishermen's Co-operative collect as many of these elvers as they can and transport them for direct release into Lough Neagh. Eels mature in Lough Neagh after 11-14 years after which they descend the river as silver eels to return to the Sargasso Sea to spawn. Silver eels migrate in autumn and will only move when the river is in flood and under conditions of no moonlight. The Fishermen's Co-operative harvest as many of these silver eels as possible using fixed eel traps at Toome, Portna and Movanager. There is a 'Queen's gap' at each eel trap to allow a proportion of eels to escape. Eels are a very important

commercial resource in the Lough Neagh and Lower Bann system bringing an estimated annual income of four million pounds.

Salmon ascend the Lower Bann between May and October with a peak in June and July to reach spawning beds in the head waters of the tributary rivers of the Lower Bann and the feeder rivers of Lough Neagh. These salmon populations are subject to commercial fishing pressure along the North coast. Until very recently Bann System Limited operated commercial salmon traps at the Cutts. Although commercial trapping here has been suspended for the time being Bann System Limited have the right to restart. A small number of salmon draft nets are issued in Lough Neagh. Salmon fry spend two years or so feeding in nursery areas close to where they were spawned before descending the system and returning to the sea as smolts. Angling for game fish is especially popular on the Lower Bann, with Carnroe, Portna and Culiff Rock attracting premium prices for permits from tourists as well as local anglers. Salmon are also caught in the tributary rivers and these provide an additional angling potential for local clubs and tourists.

At Newferry, Portglenone, Kilrea and Movanager coarse anglers can catch remarkably good weights of roach, bream and roach/bream hybrids. These venues are becoming increasingly popular as match venues and represent an important tourism resource. Little is known regarding the movements and feeding habits of the coarse fish population in the river. It is believed that Lough Beg is an important factor in this context and this could be a reason why the coarse fish resource in an area such as Newferry/Portglenone seems so much better than that in an impounded area such as Kilrea.

There are two fish farms on the river. Department of Culture Arts and Leisure, Inland Fisheries operate a fish farm at Movanager and there is another privately owned one at Portna. Because of their sensitivity to water quality these act as good monitoring and early warning systems.

## **2.5 History and archaeology**

The Lower Bann and its banks reveal a particularly interesting story of early man in Ireland and some of its buildings dating from plantation times are of particular interest.

Mountsandel at Coleraine is the site of the oldest human settlement so far recorded in Ireland. These Mesolithic people lived as hunter gatherers 9,000 years ago and were drawn to the Lower Bann as a prolific source of salmon and eels. People exploited other sites along the Lower Bann for salmon and eels in later Mesolithic times as well. Along the Bann stone and flint artefacts have been found and the Newferry/Culbane area is recognised as one of the richest areas for stone artefacts in the British Isles. Evidence of human activity was frequently associated with the diatomite deposits laid down 7,500 to 5,000 years ago. Many swords, some of them richly decorated, dating from the late Bronze age have been found in the Lower Bann. Church Island at Lough Beg probably had religious significance even before the arrival of Christianity when it became, for a time, a monastic site. It is known to have been raided by Vikings who

must have travelled upstream. There are a number of significant plantation buildings along the Lower Bann, for example, Bellaghy Bawn and Movanager Bawn.

The industrial archaeology of diatomite working along the Lower Bann is especially notable. For over a century diatomite was extracted, made into bricks locally or exported for other uses such as making insulation bricks, abrasives (car polish, toothpaste, etc.) and filters (cider, beer production). The first diatomite factories were built at Newferry in 1906 and Portglenone in 1912. During the second World War large quantities of diatomite were exported to English munitions factories to act as an absorbent for explosives (nitro glycerine). Commercial extraction virtually ceased in the 1960s and finally ended in the mid 1990s.

## **2.6 Recreation activities**

Recreation activities on the river include cruising, water-skiing, jet-skiing, powerboating, rowing, sailing, canoeing, game angling, coarse angling, wildfowling, birdwatching and walking.

A very small number of cruisers and other boats navigate along the river although these numbers are expected to rise with the introduction of new navigation signage, a new detailed pilot book and new marina and jetty developments. The passage of these boats causes a wake but this is not generally considered a problem. Riverside habitats are already affected by water level changes and natural wave action which may have a more significant impact. Where watersports activities are concentrated the more frequent recurrence of wash may be causing, and is certainly accelerating, riverbank erosion at some vulnerable places. Walking and riverbank angling activity in itself is not considered to be environmentally damaging although the physical creation of footpaths and fishing stands have the potential to directly damage riverbank habitat if not carried out sympathetically. It is recognised that well designed fishing stands with proper paths can be beneficial by localising activity to managed areas. Canoeists, usually as school parties, frequently use the river but, at current levels, are not considered to have a significant environmental impact.

## **2.7 Lough Neagh Management Strategy**

This is a two-year project with the aim to create an integrated and participatory management strategy for Lough Neagh. The project is funded by the Environment and Heritage Service (DOE), Rivers Agency (DARD), Inland Fisheries and Navigation (DCAL), Water Service (DRD), Environmental Policy Division (DARD) and it is supported by the local councils with boundaries on the Lough.

The aim of the Strategy is to produce recommendations which will ensure the sustainable management of the Lough with particular reference to water quality, water level, navigation and safety, fisheries, sport, leisure, recreation and tourism, the environmental heritage both natural and built and the commercial extraction industries. The process will also develop a spirit and process of involvement and participation

between the various bodies, councils and interested parties. It is envisaged that the Management Strategy will be ready for publication in spring 2002.

### 3 ROLES AND RESPONSIBILITIES

**Rivers Agency, DARD** is the drainage authority for the Lower Bann under the Lough Neagh and Lower Bann Drainage and Navigation Act (Northern Ireland) 1955. Rivers Agency is responsible for maintaining water levels on Lough Neagh and the sluice gates and weirs throughout the system.

**Waterways Ireland** is the new navigation authority for the Lower Bann, from Toome to the Cutts. The navigation powers originally implemented by Rivers Agency, were transferred to this cross-border body on 1<sup>st</sup> April 2000.

**Department of Culture, Arts and Leisure** (Inland Waterways) (DCAL) has responsibility for water recreation and navigation on Lough Neagh, but is not the designated navigation authority.

**The Honourable the Irish Society** claims ownership of the bed and soil of the river, having been granted title to the Lower Bann from the open sea to Lough Neagh in 1662.

**Bann System Ltd** is a wholly owned subsidiary of The Honourable the Irish Society which is responsible for managing the fishery and other interests in the Lower Bann and the tributary rivers.

**Environment and Heritage Service, DOE** has responsibility for developing and implementing environmental policy in Northern Ireland including the control of pollution of water and land, the conservation of the natural environment and the protection of monuments and historic buildings.

**Fisheries Conservancy Board** is responsible for the conservation and protection of the salmon and inland fisheries in Northern Ireland. It is involved in pollution monitoring and the issuing of fishing licences.

**Inland Fisheries Division, Department of Culture Arts and Leisure** is responsible for the development, support and protection of sea and inland fisheries in Northern Ireland. It carries out research into fisheries, operates a fish farm at Movinagher, promotes public angling and provides an advisory service to the Fisheries Conservancy Board. The recent Salmonid Enhancement Scheme was administered by the then Fisheries Division, DANI

**Northern Ireland Tourist Board** is charged with developing the tourism potential of Northern Ireland and has responsibility for out-of-state promotion and the development of tourism infrastructure at home.

**Sports Council for Northern Ireland** has a statutory responsibility for the promotion of sport and physical recreation. The Sports Council represents those who require access to natural sporting facilities.



**Local councils (Coleraine, Ballymoney, Ballymena, Antrim and Magherafelt)** have statutory responsibilities for recreation, tourism and economic development. They manage local recreational facilities and promote countryside access and local tourism.

**The Coleraine Harbour Commissioners** are the navigation authority for the river from the Cutts to the sea. They are responsible for the management of the Coleraine Harbour and maintain the dredged and marked navigation channel to the sea.

**The Lough Neagh Fishermen's Co-operative Society Limited** owns the eel fishing rights from Lough Neagh to the Cutts (at Coleraine) and operates fixed eel traps in the river at Toome, Portna and Movanager.

**Forest Service, DARD** has an authority role in relation to all woodlands in Northern Ireland. It manages the Bann Woods for timber production, landscape value and recreational use.

**The National Trust** works for the preservation of places of historic interest and natural beauty. At the Bann Estuary it owns and manages the Portstewart and Grangemouth sand dunes as nature reserves and manages the outer mud flats as a wildfowl refuge.

**Countryside Management Division, DARD** is charged with influencing and supporting good countryside management and conservation practices amongst the farming community.

**Planning Service, DOE** has the task of helping to create a physical environment and framework for social and economic activity which will enhance the quality of life in Northern Ireland. It achieves this through Policy Statements, Area Plans and the development control process considering individual planning applications.

**Lower Bann Advisory Committee** provides advice to central and local government on the management and development of the Lower Bann. Membership includes; elected representatives from the five riparian councils, The Honourable The Irish Society, Bann System Limited, River Bann and Lough Neagh Association, Royal Society for the Protection of Birds, Council for Nature Conservation and the Countryside, Ulster Angling Federation, Ulster Coarse Fishing Federation, Royal Yachting Association, Irish Water Ski Federation, Irish Amateur Rowing Union, Ulster Farmers' Union, Northern Ireland Agricultural Producers Association, Rural Development Council, Lough Neagh Fishermen's Co-operative Society Limited, Northern Ireland Environment Link, Canoe Association of Northern Ireland, Historic Monuments Council and Coleraine Harbour Commissioners.

**Lower Bann Co-ordinating Committee** provides a mechanism for the co-ordination of the activities of the various statutory bodies and their management responsibilities. Membership includes; Rivers Agency, Environment and Heritage Service, Fisheries Conservancy Board, Minerals and Petroleum Unit (DED), Northern Ireland Tourist Board, Sports Council for Northern Ireland, Coleraine Borough Council, Ballymoney Borough Council, Ballymena Borough Council, Antrim Borough Council and Magherafelt District Council.

## 4 AIM, OBJECTIVES AND MANAGEMENT ACTIONS

This section lays out the aim, objectives and management actions for the Lower Bann Environmental Management Strategy.

The future environmental integrity of the river corridor is dependent on integrated management. Due consideration must be given to the overriding principle of sustainable and appropriate development. It should be noted that the following objectives have been drawn up with environmental considerations being given primary importance.

### **Aim**

*“The Strategy will highlight the need for, and actions to ensure the conservation, sustainable development and integrated management of the Lower Bann corridor for the long-term benefit of the environment, local people and visitors”.*

### **Objectives**

The following **objectives** have been devised to ensure the long-term integrity of the Lower Bann River as an environmental resource. Under each objective more specific **management actions** are listed.

- Sustainable River Management Framework
- Habitats and biodiversity
- Fisheries
- Landscapes
- Natural physical features
- Archaeology
- Water quality
- Water levels and river flows
- Recreation management
- Education and public awareness

### **4.1 Sustainable River Management**

#### **Objective 1**

**To maintain and expand the administration framework which will support the management and sustainable development of the natural environment and heritage quality of the Lower Bann.**

## **Management actions to achieve this objective**

### **4.1.1 To lobby for the continuation and further development of a comprehensive 'management structure' to oversee the management and sustainable development of the river.**

This 'management system' was initiated in 1994 and the second term of the Lower Bann Advisory Committee ended in December 2000. The Committee provides a forum for discussion, where interested parties and statutory agencies provide an overview of management issues and make specific recommendations. The current Co-ordinating Committee, with representation from the relevant statutory bodies, plays a valuable role in implementing policy on the river. The general consensus is that these management bodies should continue until they can be improved on or replaced by some other structure. Since the reorganisation of Divisions within the new Department of Agriculture & Rural Development, and the introduction of the new cross-border navigation authority, Waterways Ireland, there does not appear to be a clear agency to champion the continuation of the present structure. There is a definite need for one 'management' body that has a watching brief on issues relevant to the Lower Bann that can preserve the environmental integrity of the river whilst advising on sustainable management and development.

### **4.1.2 Ensure that future revisions of Area Plans contain relevant measures to protect the Lower Bann River corridor.**

Along the Lower Bann corridor future Area Plans should identify Areas of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation, Sites of Constraint for Mineral Development, Sites of Local Nature Conservation Importance, Local Landscape Policy Areas, Areas of Special Archaeological Interest, green belt and other policy areas as appropriate to protect the special attributes of the river and corridor.

### **4.1.3 Maintain a high degree of public participation in management decisions affecting the Lower Bann.**

Many different bodies have an interest in the Lower Bann as a recreational, economic and environmental resource. In line with Local Agenda 21, it is vital that every effort is made to continue a high degree of public participation in management decisions over and above the membership of the Advisory Committee to ensure the continued sustainable management of the river. Every effort should be made by both Committees (or other successor) to communicate with and involve all those with an interest in the river. A database of landowners, businesses, community groups, sporting clubs, etc. would be very useful to keep these people informed of issues e.g. riverbank erosion grants and advice, watersports management arrangements, fishing developments, etc.

### **4.1.4 Consider forming a Lower Bann Trust/Funding Partnership**

Many of the actions recommended in this environmental strategy will require funds beyond the resources of the existing statutory agencies or, arguably, lie outside their areas of responsibility. There would be merit in forming some form of Lower Bann partnership with the capacity to draw down funds for environmental enhancement and sustainable development projects. This possibility should be further explored in the

short space of time remaining before the arrival of the next round of European Union funding.

#### **4.1.5 Ensure the Establishment of a Northern Ireland Coastal Forum**

The coastal and estuarine habitats at the mouth of the Bann are very important in terms of habitat, archaeology, and coastal processes. The beach, dunes, saltmarsh, reedswamps etc. all play a vital function in sea defence and it has been shown that interference with the natural processes can have a severe adverse affect on the adjacent coastline. As people have more spare time available and the ability to purchase second homes by the sea, there will be even greater pressures from recreation and development on coasts and estuaries. EHS have given a commitment to set up a Coastal Forum for Northern Ireland. As yet this forum has not been initiated. The Forum, with representation from the Sports Council, EHS, LBAC, RSPB, National Trust, etc. will be invaluable to ensure the management and enhancement of natural features while accommodating sustainable levels and types of recreation.

#### **4.1.6 Preparation of a Lower Bann River Corridor baseline study detailing habitats, species and current activities.**

There are many economic and recreational demands on the river environment of the Lower Bann. These demands all have an impact on the semi-natural habitat and biodiversity. In order to assess the over-all impact of all the activities on the system, a baseline study must be carried out to determine the status of the habitat, including woodlands, wet grasslands, reed swamps, etc. and the notable species at this particular time. The results of this study will provide invaluable data that will inform the management structure's decisions on the future sustainable management of the river. It is recommended that this study be repeated on a cyclical basis to determine loss/gain of particular habitats/species and highlight impacts of any detrimental activities taking place on the river.

It is envisaged that the initial round of this study will be information gathering and data crunching, however subsequent follow up studies, with their research element, could form the basis of post-graduate work. Thus the need for this work should be highlighted to tertiary educational establishments.

## **4.2 Habitats and Biodiversity**

### **Objective 2**

**To maintain, and where possible enhance, habitats and biodiversity along the Lower River Bann whilst recognising other uses of the river.**

### **Management actions to achieve this objective**

#### **4.2.1 Map distribution of notable plant and animal species and habitats including woodlands, wet grasslands, reed swamps, submerged aquatic plant and other riverside habitats.**

An outline river corridor character assessment was carried out in 1995 as part of the Lower River Bann Tourism and Recreation Study. This draws a general picture of the river corridor but is not detailed enough to act as a baseline for monitoring the environmental health of the river and its habitats. A post-graduate University of Ulster student has gathered detailed information on riverside habitats as part of her thesis. More specific habitat and species monitoring should be carried out by employing a field ecologist to survey, collate and report on key aspects of the environmental state of the river corridor. To support this photographic monitoring using oblique and vertical aerial photographs is a useful way to check that policies to maintain and improve habitats and landscape character of the river are effective and should be programmed to happen on a regular basis. Further information gathering could be carried out by postgraduate students, although any such project would have to involve a research element. This management action will form the information database for the sustainable development of the river and is therefore linked to the more general management actions in Objective 1.

#### **4.2.2 Manage existing Areas of Special Scientific Interest and evaluate other areas of semi-natural habitat and earth science interest as candidate Areas of Special Scientific Interest**

Along the Lower Bann there are ASSIs at Toome, Lough Beg and Culnafay (at Newferry east). Environment and Heritage Service have recently designated the Bann Estuary complex of sand dune, saltmarsh, reedswamp, mudflat and estuarine habitats as an ASSI. The Lower Bann estuary will now form one of the candidate SAC sites for the Natura 2000 suite.

Management plans with clear conservation objectives should be prepared for all ASSIs within the Lower Bann area and regular site integrity monitoring be carried out to ensure that features of special interest are maintained. Management Agreements may be necessary to maintain the conservation interest of a site.

All of Lough Beg with its marginal habitats is protected as an ASSI, a Special Protection Area (SPA) and a Ramsar Site. It is a requirement under the Conservation (Natural Habitats, etc.) (Northern Ireland) Regulations 1995 that conservation plans are prepared for all SPAs. Environment and Heritage Service have initiated the preparation of a catchment management plan for the Lough Neagh and Lough Beg SPA, which is due for publication in 2002.

#### **4.2.3 Prepare a Management Plan for the Bann Estuary.**

The tidal Bann Estuary, including the newly designated ASSI, with its sand dune systems, marshes, reedswamps and mudflats is ecologically very different from the rest of the Lower Bann river. Close to and within this area there is urban development (Coleraine), a harbour, two marinas, two golf courses, housing and other developments. Development pressure within the immediate vicinity of the estuary is low and user conflicts are not severe but this may not always be the case as both banks of the estuary

potentially represent premium development locations for housing and industry. If future development is to be managed in a way that is environmentally sustainable and in harmony with other uses an overall Management Plan for the Bann Estuary will be necessary. An Estuary Management Plan produced in partnership with Environment and Heritage Service, Planning Service, the National Trust, the RSPB, the Lower Bann Advisory Committee, Coleraine Borough Council, Coleraine Harbour Commissioners, Bann System Limited, and other owners and users should be prepared as soon as possible to guide future development and secure sound environmental management of the estuary. As ASSI designation obliges EHS to produce a management plan, this exercise should be extended to cover the tidal reaches of the river, not just the estuary.

#### **4.2.4 Initiate research work to determine how Lough Beg functions as an ecological unit in order that management options for returning it to a macrophyte dominated lake can be explored with a view to implementation.**

The shallow waters of Lough Beg recently supported extensive macrophyte beds but increasing eutrophication has largely destroyed these over the past 15-20 years. The disappearance of this natural habitat may have coincided with the introduction of roach to the system in the 1970s and is probably also linked to the marked decline in the numbers of pintail and shoveler duck using the lake. Restoring the macrophyte beds in Lough Beg will not be easy especially because of the large size of the lake and the constant input of highly eutrophic water from Lough Neagh. Accepting that this will be a long process, work should nevertheless be started as soon as possible to better understand how Lough Beg functions as an ecological unit. For example, a better understanding is needed of how the shoreline floods and how water circulates within and through Lough Beg and the relationship to water quality gradients within the lake. Also the interaction between fish, invertebrates, breeding wader populations, algae and macrophytes needs to be better understood before it will be possible to even consider management options for restoring the lake from one dominated by algae to one more naturally dominated by macrophytes.

#### **4.2.5 Safeguard semi-natural habitats along the river corridor.**

In addition to woodlands there are numerous pockets of semi-natural habitat scattered all along the river corridor that are not, or likely to be ever formally protected by nature conservation designations. Where possible these should be protected through good liaison with landowners and various incentive schemes. The river environment would benefit from an uncultivated buffer zone along the river bank margins. Ideally this fringe should have a range of habitat types including open meadows, scrub and native deciduous trees (although trees should not be planted where there is existing good quality semi-natural habitats such as wet grassland or marsh as at Lough Beg and the Bann estuary). Much of the land bordering the river is good quality agricultural land so the creation of buffer zones would only be conceivable through generous payments to farmers possibly through Agri-environment and other schemes. For the foreseeable future this may only be achievable where there is justification in linking the creation of buffer zones to the control of riverbank erosion (discussed in section 4.4.2). This recommendation could be implemented by local community groups working in conjunction with landowners.

#### **4.2.6 Minimise disturbance to important feeding and roosting bird sites at Lough Beg and Bann Estuary by continuing to manage refuges as disturbance free areas.**

There is a tradition of wildfowling on the Lower Bann especially at Lough Beg. This activity is considered to be sustainable provided that adequate wildfowl refuge systems are in place. The west shore of Lough Beg has been designated as a National Nature Reserve and a management agreement has been set up between BASC and EHS. The RSPB manage an additional area of the Lough for bird life. It is recognised that it is important to manage wildfowl refuges not simply as no-shooting areas but as disturbance free areas to give birds ample opportunity to feed and roost. The wildfowl refuge managed by the National Trust at the Bann estuary is long established and working well. Whilst it is recognised that a small part of the estuary is being shot this season, consideration should be given to expanding disturbance free areas.

#### **4.2.7 Explore options for developing a restoration programme on the Ballymacombs More bog.**

Ballymacombs More bog at Newferry is currently being harvested for peat by the Bulrush Peat Company who hold a lease from the Forest Service until 2009 with an option to renew. There are diatomite layers below the peat bog which should be disturbed as little as possible because of their scientific value. Planting of part of the bog has begun. When commercial operations cease totally, the land could ultimately be converted to agricultural use, forestry, recreational use, if possible restored as bog, mixed wildlife habitat or as some combination of these. It would be preferable to have the area restored as a bog and expert guidance should be sought as soon as possible. There could be an opportunity here to develop an interpretation programme looking at the local environmental conditions under which diatomite and later peat were formed and linking this to the contemporary activities of early man. The opportunity should be taken now to open a debate on the current management practices on the site and future restoration programme options. Other examples of best practice should be explored.

#### **4.2.8 Monitor wintering and breeding bird populations**

The important populations of wintering waterfowl (wildfowl and waders) are counted monthly as part of a nationally co-ordinated bird monitoring programme, the wetland bird survey (WeBS), at Lough Beg and the Bann Estuary. These counts should continue. The west strand at Lough Beg is the largest intact area of wet grassland in Northern Ireland and supports one of the most important populations of breeding waders (redshank, snipe, curlew and lapwing) in Northern Ireland in spring and summer. RSPB and EHS jointly monitor the breeding populations of these breeding birds annually through a Breeding Wader Survey on the western shore. This survey work should also continue. The area has been designated as a National Nature Reserve and a management agreement has been set up with input from relevant partners including the wildfowlers.

## 4.3 Fisheries

### Objective 3

**To protect and enhance game and coarse fish populations.**

#### Management actions to achieve this objective

##### 4.3.1 Research and monitor game and coarse fish populations

The number of adult salmon entering the Lower Bann and Lough Neagh system was monitored through a fish counter at Portna for a short time during the early 1970s. Since then there has been no monitoring of numbers of fish entering the system but in 1997 Fisheries Division provided a new counter and this is now producing valuable results. If salmon are to be managed it is imperative that numbers and movements are known and it is important that a fish counter on the Lower Bann is retained and where practical other counters placed on tributary rivers. Staff at the Fisheries Conservancy Board monitor salmon and trout redds at their spawning grounds and it is recommended that this valuable work should continue. Coarse fish move in shoals occupying a stretch of river for a time before moving on. It is believed that Lough Beg is a principle spawning area in spring and early summer with movement throughout the river in winter but in truth very little is known about the feeding ecology, population structure, movement and spawning habits of coarse fish in the Lower Bann. Because of the potential to develop tourism angling on the river a better understanding of the ecology and distribution of coarse fish in the Lower Bann is essential to ensure that management of the river is sympathetic to sustaining healthy fish stocks.

To take informed decisions on the management of game and coarse fish it will be necessary to carry out more detailed research and monitoring than is presently undertaken. The following is an indication of just some of the work that is needed.

Systematically collect data on game fish catches

Monitor the numbers of adult salmon entering and moving through the system

Monitor habitats, salmon and trout redds

Monitor the distribution of juvenile salmon and trout in tributary rivers

Monitor smolt productivity and movement.

Research age/size profile of coarse fish populations along the length of the Lower Bann through a comprehensive sampling programme.

Establish where spawning, nursery and feeding areas are for coarse fish within the Lower Bann system and its feeder rivers.

Research migratory movements of coarse fish throughout the year.

Monitor survival rates of elvers migrating naturally vs. those artificially transported

Research extent and effects of predation (cormorants, mink).

##### 4.3.2 Prepare plans for the management of game and coarse (including eels) fish throughout the Lower Bann and Lough Neagh catchment.

There is a confusing number of agencies involved in various aspects of the management of rivers and fish in Northern Ireland. Management plans aimed at



enhancing game and coarse fish populations throughout the Lower Bann and Lough Neagh catchment would improve the collective effectiveness of Fisheries Division, Fisheries Conservancy Board, Rivers Agency, Lough Neagh Fishermen's Co-operative, Bann System Limited, angling clubs and others in working together to achieve mutually agreed objectives. Fisheries Division will be publishing a Salmon Management Plan in the near future, which is welcome but Government must ensure that it is properly financed for it to work. In the absence of fishery plans for other fish it is important that constraints are built into the Salmon Management Plan to prevent developments aimed at improving salmon stocks damaging trout and other fish stocks. Management plans should also be prepared for other fish.

At present DCAL are leading a review into inland fisheries in Northern Ireland. It is envisaged that the results of this enquiry will influence future fisheries policy. A £50k survey into coarse fish management was planned but lack of resources have prevented its production. It is essential that steps are taken to ensure that the next round of EU funding may facilitate study on coarse fish populations and further resources for salmon habitat enhancement. Fisheries will also be studied within the remit of the Lough Neagh Management Strategy. In particular, it is hoped that there will be an outline of a management plan for the commercially important eel fishery.

#### **4.3.3 Encourage definitive research (students or consultants) into the effects of artificial freshets on the movement of salmon up the river with a view to implementing the most appropriate regime for the mutual benefit of all interested parties.**

Adult salmon will only ascend the river during periods of increased flows. At times of low flow salmon hold back below the Cutts weir at Coleraine and to a greater extent below the weir at Carnroe. The flow in the Lower Bann is artificially controlled by a system of sluice gates and weirs which tend to smooth out the influence of smaller natural floods. With the sluice gate system it is theoretically possible to generate artificial freshets (floods) by deliberately releasing water to encourage salmon to move. There are differing views on this. One is that low flows benefit fishing at Carnroe, because it is alleged that the fish pass is impassable in low flow conditions, and thus delays the arrival of salmon at the spawning beds on rivers further upstream in the system and is detrimental to angling in the tributary rivers. Another view is that fish can pass freely through fish passes at weirs at all except the extreme lowest water flows and that if fish are drawn into Lough Neagh by artificial freshets when water levels are low, sand bars block fish access to the mouths of some of Lough Neagh's rivers making them even more vulnerable to poaching while they wait to enter. Limited freshet trials have been carried out to test the reaction of fish. However, research needs to be undertaken into the benefits or otherwise of freshets for salmon migration and for any possible impact on other interests, e.g. sensitive sites on the shores of Lough Beg or Lough Neagh. Reliable fish counters and a camera should be included as part of the research process.

#### **4.3.4 Improve access to and quality of spawning and nursery habitats for game fish.**

The populations of salmon in the tributary rivers of the Lower Bann and Lough Neagh catchment are very small compared to their historical levels. This is due to a variety of reasons including over-fishing at sea, changes in food availability at sea, disease, damage to spawning and nursery areas through drainage and navigation work, water quality deterioration, obstructions and water abstraction, and possibly other reasons. To improve game fish populations both spawning and nursery habitat should be restored where possible. Poorly designed hydro-electric schemes are an issue of concern in that they have the potential to damage game fish stocks by reducing summer flows past the plant to such an extent that adult salmon are prevented from migrating upstream or by directly killing or injuring fish in the turbines or grills. Smolts coming downstream are also at great risk. As a general principle hydro-electric schemes should not be approved until a full environmental appraisal shows that the effect on fish populations will be acceptable and that damage is not being done to other elements of the river system. In general, intake and outflow screens should be appropriately positioned and monitored, adequate bypass and return systems should be in operation, the precautionary approach should be used when determining residual flows in the river and developers of future hydro-electric schemes should set aside 5% of the original capital cost for post-commissioning modifications.

When clubs etc. are planning to improve the quality of spawning and nursery habitats for game fish, they should seek high quality advice from appropriate DCAL, EHS and Rivers Agency staff. It is preferable that indigenous fish are used in re-stocking programmes. In particular access cases, it is vital that other river users, especially canoeists, are consulted about physical works in the river.

## **4.4 Landscapes**

### **Objective 4**

**To maintain and enhance attractiveness of landscapes along the Lower River Bann.**

#### **Management actions to achieve this objective**

##### **4.4.1 Safeguard natural and man-made features of landscape value and character along the river corridor.**

A distinctive feature of the Lower Bann is its wooded banks. Forest Service has sympathetically planted deciduous trees along the river edge in the 26 blocks of the Bann Woods they manage. The deciduous fringe of the Bann Woods should be retained in perpetuity. In addition to the Forest Service holdings there are a number of privately owned woods along the riverbank that add to the wooded landscape and every possible encouragement should be given to retain these and, if possible, extend them.

Many of the urban and industrial sites as viewed from the river are poorly designed and landscaped. This to some extent applies also to many of the amenity sites such as jetties, locks, car parks, etc. in public ownership. Attention should be focused on all of

these sites to evaluate their potential for improvement and, where possible, action should be taken to improve them. All new developments along the river should be carefully designed to fit into the natural river setting.

#### **4.4.2 Research the extent, causes of and possible solutions to riverbank erosion and develop a restoration and landowner education programme for eroded stretches.**

Erosion is a natural process accelerated where banks have no trees and are heavily grazed. However, it is noted that wooded and ungrazed stretches are also showing some signs of erosion. The precise cause of this erosion is not clear but a number of factors are likely to be involved including river flow, tree clearance, cattle trampling, watersports activity and fluctuating water levels. In an effort to halt the erosion some landowners have tipped stones and rubble along the eroded banks. While this may be protecting land in some areas it could be deflecting the problem to downstream banks and has a very negative visual impact especially when viewed from the river.

Whilst erosion is a natural process, research needs to be done to better understand the causes and to establish the best solutions for management. As a first step in tackling this issue the extent of the problem should be established by mapping the precise extent of the erosion.

In terms of maintaining present areas of agricultural land, it is expected that planting scrub and trees along with fencing to prevent grazing animals trampling down the banks and/or killing trees would be the best approach. It may be advantageous in some areas also to establish reed swamp fringes as additional protection from wave action. As this may entail planting on the river bed, the Irish Society's property, prior consultation with that body would be required. A pilot project has already begun on the stretch of bank opposite Drumaheglis Marina. Funding was secured, and a range of bank protection options implemented by Conservation Volunteers NI. Rivers Agency technical staff have agreed to evaluate this pilot.

A proactive approach will be needed to secure funding sources and to encourage landowners/farmers to become involved in similar restoration schemes, taking on board the results of the pilot project. In some instances it may be possible to link with the DARD Countryside Access Scheme to establish access opportunities along with riverbank restoration where it will not cause unacceptable disturbance to fishing, farming and wildlife interests and there is a demonstrated need. At present access to the countryside and in particular occupiers liability are being reviewed by EHS. The results of this study could have an impact on access along the river.

## 4.5 Natural physical features

### Objective 5

**To research the distribution and depositional history of diatomite and associated sand and peat deposits and ensure that features of earth science interest are not damaged or destroyed.**

#### Management actions to achieve this objective

##### **4.5.1 Carry out further work to identify the distribution and quality of the remaining diatomite resource.**

An initial survey of the distribution of diatomite deposits was carried out by the University of Ulster for Environment and Heritage Service in 1991. This survey located 55 sites and identified those that were considered most important but indicated the need for additional survey work.

##### **4.5.2 Carry out stratigraphical analysis to reveal the environmental conditions under which the diatomite and associated sand and peat deposits were laid down.**

It is possible to learn how climate and other environmental factors changed over the period by studying cores taken through the diatomite. From a scientific point of view diatomite is very useful in trying to assess past rates and causes of climate change and trophic state of water bodies. Along with this, archaeological excavations at Toome, Newferry and Culbane (between Newferry west and Portglenone) reveal evidence in the diatomite (as charcoal, fish bones, tools, etc.) of early Mesolithic man living in the area more than 5,000 years ago. There is a complex environmental and archaeological story still to be unravelled by further study of the diatomite deposits.

##### **4.5.3 Give statutory protection to the remaining diatomite sites and as far as possible protect all diatomite sites through development control and liaison with landowners.**

Diatomite sites at Toome and Culnafay (Newferry east) have already been declared ASSIs to protect them from damage. Of the 55 known diatomite sites not all will merit designation as ASSIs, yet collectively they represent the last remaining fragments of a once more widespread resource. Further evaluation work should be carried out to establish if there are other good quality diatomite sites that merit ASSI designation.

Should situations arise where sites are expected to be destroyed then detailed stratigraphical analysis and sample collection should be carried out prior to development. It is important that samples are collected and kept if the site would otherwise be lost but this must be considered a last resort as cores can be difficult to interpret at a later date when studied without the context of their undisturbed original location.

#### **4.5.4 Produce and distribute and information and awareness raising leaflet relating to diatomite sites.**

In non-designated sites few landowners are likely to be aware of the significance of diatomite deposits on their land. An educational campaign, targeted at landowners and the public should be organised to help create an appreciation and understanding of the need to protect these non-designated sites.

## **4.6 Archaeology**

### **Objective 6**

**To identify, record, protect and research features and areas of archaeological, historical, architectural and industrial interest within and beside the River and along the Lower Bann corridor.**

#### **Management actions to achieve this objective**

##### **4.6.1 Undertake and encourage research into local archaeology and history, including the social history of the fisheries, the diatomite industry and brick-making.**

Much is already known about the local history and archaeology of the Lower Bann. This information is incorporated in the Monuments and Buildings Record (MBR) which makes the results of archaeological and historical research, field survey and excavation on all aspects of the built, buried and maritime man-made heritage available to the public. The MBR is maintained by Environment and Heritage Service: Built Heritage and provides a starting point for research and offers secure archive to preserve and make available research data generated by academic and private researchers and research groups, whether or not the work is published. EHS also provide general advice on setting up and carrying out a project linked to MBR. Any additional research onto the archaeology and history of the Lower Bann corridor would be most welcome.

##### **4.6.2 Protect features of archaeological and historical interest along the Lower Bann corridor.**

It is imperative that features and buildings of archaeological and historical interest should not be destroyed or damaged. To achieve this the potential impact on the man-made heritage of any works, including dredging and drainage, within or beside the river, should be independently assessed and a mitigation strategy devised in consultation with EHS. Environment and Heritage Service gives specific advice on the subject:

Before any works are undertaken beside or within the river:

- The nature and extent of the archaeological, historical and industrial remains which are known to exist, or are likely to survive, in the area affected by the proposed works, must be properly identified.
- The impact of any works on the resource must be assessed.

- Proposals for mitigation of impacts must be proposed and agreed with EHS. A strategy for dealing with remains which may not be discovered until development is under way should be drawn up.

The Historic Monuments and Archaeological Objects (NI) Order 1995 requires that the discovery of any artefacts (whether or not in the course of such works) shall be reported to the appropriate authorities.

## **4.7 Water Quality**

### **Objective 7**

**To improve water quality throughout the Lower Bann catchment.**

#### **Management actions to achieve this objective**

##### **4.7.1 Prepare an integrated catchment management plan for the Lough Neagh and Lower Bann catchment.**

The recent Water Appeals Commission hearing on the proposal to extract more water from Lough Neagh recommended “the drawing up and commencement of implementation of a management plan for the Lough Neagh catchment”. The forthcoming European Union Water Framework Directive will require member states to draw up river catchment plans that take into account water quality and water quantity, along with socio-economic and environmental issues. In addition to this the Northern Ireland Eutrophication Strategy to be published in Autumn 2000 will have implications for the Lough Neagh and Lower Bann catchment. To effectively manage this area an integrated management plan for the Lough Neagh and associated parts of the Lower Bann catchment is being prepared to take an overview of water quality, water quantity, nature conservation, fisheries, navigation, farming, recreation and other issues.

##### **4.7.2 Improve water quality standards on the Lower Bann river system**

Water quality in the Lower Bann is affected by characteristics of, and activities within, the entire Lough Neagh and Lower Bann catchment. From the water quality section on Page 7 it is clear that there are three major issues in relation to water quality in the Lower Bann. These are, firstly, excessive nutrients from farmland throughout the Lough Neagh and Lower Bann catchment causing eutrophication and secondly, pollution loading from both Ballymoney and Coleraine Sewage Treatment Works and thirdly, other industrial activity in the catchment. It is imperative that the sewerage infrastructure and treatment works in the area is capable of dealing with any additional loading before planning permission for further development is granted. Whilst it is noted that there are plans to upgrade the sewerage infrastructure, it is recommended that short-term measures should be implemented in the interim.

Action should be taken to improve water quality along the length of the river and its tributary rivers to at least “good” as defined in both the chemical and biological

General Quality Assessments as used by Environment and Heritage Service. In working towards improved water quality it is important that all data collected on water quality, including data on metal loadings, should be available to the public in an easily interpreted form.

#### **4.7.3 Establish river watch teams for each tributary river.**

Experience in other parts of the world has shown that, rather than simply leaving river management to a range of statutory agencies, there is much to be gained from engaging local interests proactively through the formation of “river watch teams”. Angling clubs are often a lone voice calling for improvement in water quality and river habitats but the formation of partnerships of government agencies (responsible for environmental conservation, drainage, fisheries, water quality, etc.), angling clubs, local community groups, land-owning interests, elected representatives, schools and other interest groups focusing on a local river can be very effective. This approach can result in a much more integrated delivery of local river management and is best done in the context of individual rivers. Encouragement and support from statutory agencies and bodies involved in river management should be given to such groups.

## **4.8 Water levels and river flows**

### **Objective 8**

**To ensure that Lower Bann water levels and flows are managed, as far as practicable, with minimal adverse environmental impact.**

### **Management action to achieve this objective**

#### **4.8.1 Carry out a study to assess the economic and environmental impact of high and low water levels and river flows throughout the Lough Neagh and Lower Bann hydrological system.**

A number of issues arise from the management of the sluice gates in the Lower Bann. Within the river, for example, abrupt changes in water level, including freshet release, can cause difficulties for anglers and boaters. Fish movements are sensitive to river flows and the Lough Beg grasslands can be re-flooded in spring destroying the nests of breeding waders. Water level management also has environmental impacts throughout the Lough Neagh wetlands. For example, wetlands can be negatively affected by excessive drawdown but damage can also be caused to ground nesting birds by unseasonal floods. It is not possible to address water level issues simply in a nature conservation or fishing context as there are enormous implications for eel fishing, navigation and farming throughout the Lough Neagh catchment as well. Often the needs of these legitimate interests conflict. In order to achieve a balanced water level management strategy it will be necessary to carry out a study to assess the economic and environmental impact of high and low water levels and river flows throughout the Lough Neagh and Lower Bann hydrological system. This should be done in the context of the integrated management plan for the Lough Neagh catchment already in production.

## 4.9 Recreation management

### Objective 9

**To ensure that water-based and land-based recreation activities on the Lower Bann are environmentally sustainable.**

#### Management actions to achieve this objective

##### 4.9.1 Continue and further refine the Watersports Management Plan for the Lower Bann.

Powered watersports especially water-skiing and jet-skiing have become well established on the river but this has the potential to damage the environment through wave action and to disrupt the activities of other river users. The PIEDA Tourism and Recreation Study on the Lower Bann identified the fact that most people who use the Lower Bann value the natural environment and the peace and quiet of the river. To meet these conflicting expectations, means have to be found to allow powered watersports activity in certain areas whilst maintaining an overall peaceful environment. Three public watersports zones have been agreed for the Lower Bann initially through established practice but latterly refined through a public consultation process. The watersports zone from the entrance of Lough Beg through Newferry to the beginning of the Glenone Forest is zoned for jet-skiing and water-skiing, there is a water-ski zone from Drumaheglis Marina and Caravan Site to Loughan Island and a water-ski zone in the Bann estuary from the Coleraine Marina to the Port marker downstream of the Cranagh Fisheries pier. It has been agreed that people launching from Council controlled slips within these zones should register, provide proof of at least third-party insurance and abide by conditions of use laid down. It was agreed that there should be annual meetings between users, statutory agencies and other interests involved in each of these three areas to review the effectiveness for the watersports management system and plan for the coming season. Watersports on the Lower Bann should continue to be managed through this control system and the system refined and developed as necessary. The essential elements of the system are listed as follows;

- Maintain a common registration system for powerboat users on the Lower Bann
- Maintain a record of launches from public slips
- Manage the public slips during periods of moderate to heavy demand
- Maintain a system of signs and leaflets defining the watersports zones and explaining the watersports management system
- Review and re-issue the Lower Bann Users Code
- Define the recreational carry capacity for each water sport area
- Continue the annual review meetings and produce an agreed Lower Bann Watersports Action Plan in the spring of each year.
- Regularly monitor the situation through activity and questionnaire surveys.



Waterways Ireland is now the navigation authority for the Lower Bann. They have the powers to introduce byelaws on the river but will be becoming familiar with the river and activities before considering future management options. There should be a review of the situation to assess if it is necessary to introduce byelaws to underpin the management of recreational activities that potentially damage the environment or disadvantage other users.

#### **4.9.2 Ensure that water based and bankside recreational activities and associated developments (walking, fishing, cycling, picnicking, etc.) do not damage the river corridor.**

Sections of the Lower Bann riverbank are legitimately used for walking, fishing, cycling, picnicking etc. In managing current recreation activities and encouraging new ones every effort should be made to ensure that the environmental impact is minimised. Sensitivity zoning techniques are being used to guide development policy on Lough Erne. The appropriateness of similar techniques for the Lower Bann should be considered. To gather information to support future management decisions it is important that levels of visitor activity should be monitored. This could be achieved through regular activity and questionnaire surveys.

### **4.10 Education and public awareness**

#### **Objective 10**

**To ensure that the public understand and value the Lower Bann, use it safely without conflict, and are involved in the sustainable management of the river system.**

#### **Management actions to achieve this objective**

##### **4.10.1 Maintain a good quality navigation and safety signage system and provide complementary navigation information**

Recent work by Rivers Agency (1997/98) to improve the safety and navigation signage is welcomed. The safety and navigation signage system should be kept in place and improved upon where possible by the new navigation authority. To provide information on safe river passage and to reinforce some of the watersports management messages (watersports zones, restrictions, etc.) A commitment to produce a detailed pilot book for the Lower Bann river and Lough Neagh, by the River Bann and Lough Neagh Association is applauded. Publication of this document is anticipated in 2001. This document would be complemented by a navigation chart.

##### **4.10.2 Revise and re-issue the Lower Bann Users Code and provide other watersports zoning information as necessary.**

A revised version of the Lower Bann Users Code was produced by Rivers Agency in 1999. It was envisaged that the navigation notes would be a temporary leaflet used until the new navigation authority Waterways Ireland was operational. There are several inaccuracies in the notes which need to be addressed in follow up literature. In

addition to this Lower Bann Users Code, each council should provide signs and leaflets explaining the detail of watersports zoning systems in operation at river access points under their control.

#### **4.10.3 Provide interpretative material and prepare a Lower Bann management information and interpretative plan.**

Interpretative material such as leaflets, booklets, interpretation panels, videos, etc. should be provided as required at key visitor access sites along the Lower Bann. Interpretation should cover river wildlife, settlement history, drainage schemes, navigation system, historic and archaeological features, water quality, diatomite formation, recreational uses, etc. It is recognised that Coleraine Borough Council has employed consultants to produce a plan and that interpretative panels are being erected. The Tourism and Recreation Study made recommendations for an integrated approach to the provision of management, interpretation and education material. Rivers Agency, local councils, Bann System Limited, Forest Service, National Trust, EHS and others all have management responsibilities relating to various aspects on the river and its banks. If all interested parties are to work together effectively then this can be best achieved through an agreed interpretative plan for the river.

#### **4.10.4 Maintain birdwatching facilities at the Bann Estuary and establish public birdwatching facilities at Lough Beg.**

The birdwatching hide at the Bann Estuary is well sited, managed and used. Although Lough Beg is the other birdwatching “honeypot” on the Lower Bann, currently no provision for birdwatching exists. An appropriately placed birdwatching hide at Lough Beg, taking account of access, disturbance, alignment and light, would be a useful aid to interpreting and raising awareness of the wildlife value of the lake.

#### **4.10.5 Promote increased links with schools and colleges using the river for field study and encourage water based outdoor educational activities.**

Some schools and colleges already use the river for field study. Provision of more interpretative material and possible pooling of educational material used on the river could beneficially increase an understanding of the river by school children. Giving people an opportunity to enjoy the river in an environmentally friendly manner ultimately increases the value people place on the river as a natural resource. Special emphasis should be put on encouraging local schools to use the river for field study and outdoor educational activities. Some business and clubs give disabled people an opportunity to experience water-skiing and canoeing on the river. This should be encouraged.

#### **4.10.6 Continue the production of the newsletter “Eel Express.”**

A newsletter, Eel Express, is produced jointly by the Lower Bann and Lough Neagh Advisory Committees and is aimed at user groups, landowners, government agencies, local communities and anyone with an interest in Lough Neagh and the Lower Bann. It is normally produced twice per year and 1700 copies are circulated. It serves a useful function in keeping a wide range of people informed of issues affecting the river and its production should continue.

#### **4.10.7 Produce an education pack to control river associated litter.**

The various activities associated with river corridors can result in physical presence of unwanted material. Since the introduction of Landfill Tax rivers are used increasingly as a means of disposing of fallen animals and general farm waste including drench bottles, silage covers and fertilizer bags. Hardfill material is also dumped into rivers to combat erosion. Recreational sites, including those along rivers tend to have higher levels of associated litter than the surrounding countryside. Litter will have hazardous effects in the river system as well as negative aesthetic effects on the banks. An education pack should be targeted at farmers/landowners, schools and river users.

## 5. ACTION PLAN

The following Action Plan for the implementation of the Lower Bann Environmental Management Strategy highlights the objectives, management actions, lead agencies and time scale. The commitment to implement the actions within the stated time scale will be sought from the lead agencies in the near future.

### Sustainable River Management

**Objective 1** To maintain and expand the administration framework that will support the management and sustainable development of the natural environment and heritage quality of the Lower Bann.

Action	Lead Agencies	Time-scale
1.1 To lobby for the continuation and further development of a management structure' to oversee the management and sustainable development of the river.	LBAC, LBCC	Spring 2001
1.2 Ensure that future revisions of Area Plans contain relevant measures to protect the Lower Bann River corridor.	PS, LBAC EHSNH	ongoing
1.3 Maintain a high degree of public participation in management decisions affecting the Lower Bann.	LBAC	Ongoing
1.4 Consider forming a Lower Bann Trust/Funding Partnership	LBAC, LBCC,FB	Early 2001
1.5 Ensure the Establishment of a Northern Ireland Coastal Forum	EHS, LBAC	ASAP
1.6 Preparation of a Lower Bann River Corridor baseline study detailing habitats, species and current activities.	EHSNH, U, LBAC	ASAP

### Habitats and Biodiversity

**Objective 2** To maintain, and where possible enhance, habitats and biodiversity along the Lower River Bann whilst recognising other uses of the river.

Action	Lead Agency	Time-scale
2.1 Map distribution of notable plant and animal species and habitats including woodlands, wet grasslands, reed swamps, submerged aquatic plant and other riverside habitats.	EHSNH, U	ASAP
2.2 Manage existing Areas of Special Scientific Interest and evaluate other areas of semi-natural habitat and earth science interest as candidate Areas of Special Scientific Interest	EHSNH	Ongoing
2.3 Prepare a Management Plan for the Bann Estuary.	EHSNH	ASAP
2.4 Initiate research work to determine how Lough Beg functions as an ecological unit in order that management options for returning it to a macrophyte dominated lake can be explored	EHSNH	?

with a view to implementation.		
2.5 Safeguard semi-natural habitats along the river corridor.	EHSNH LCG, LA	Ongoing
2.6 Minimise disturbance to important feeding and roosting bird sites at Lough Beg and Bann Estuary by continuing to manage refuges as disturbance free areas.	BASC, EHSNH, NT, RSPB	Ongoing
2.7 Explore options for developing a restoration programme on the Ballymacombs More bog.	FS, LA EHSNH	?
2.8 Monitor wintering and breeding bird populations	EHSNH, RSPB	Ongoing

## Fisheries

**Objective 3** To protect and enhance game and coarse fish populations.

Action	Lead Agency	Time-scale
3.1 Research and monitor game and coarse fish populations	DCALIF, FCB	ASAP
3.2 Prepare plans for the management of game and coarse (including eels) fish throughout the Lower Bann and Lough Neagh catchment.	FCB, UAF, UCFF, DCALIF, LNFCo-op	ASAP
3.3 Encourage definitive research (students or consultants) into the effects of artificial freshets on the movement of salmon up the river with a view to implementing the most appropriate regime for the mutual benefit of all interested parties.	U, LBCC, BSL, UAF	?
3.4 Improve access to and quality of spawning and nursery habitats for game fish.	BSL, DCALIF, DARDs, LAC	ASAP

## Landscapes

**Objective 4** To maintain and enhance attractiveness of landscapes along the Lower River Bann.

Action	Lead Agency	Time-scale
4.1 Safeguard natural and man-made features of landscape value and character along the river corridor	EHSNH, FS, PS, LA, EHS HM	Ongoing
4.2 Research the extent, causes of and possible solutions to riverbank erosion and develop a restoration and landowner education programme for eroded stretches	RA, EHS	2000

## Natural physical features

**Objective 5** To research the distribution and depositional history of diatomite and associated sand and peat deposits and ensure that features of earth science interest are not damaged or destroyed.

Action	Lead Agency	Time-scale
5.1 Carry out further work to identify the distribution and quality of the remaining diatomite resource.	EHSNH, U	?
5.2 Carry out stratigraphical analysis to reveal the environmental conditions under which the diatomite and associated sand and peat deposits were laid down.	EHSNH	?
5.3 Give statutory protection to the remaining diatomite sites, and as far as possible, protect all diatomite sites through development control and liaison with landowners.	EHSNH, PS,	Asap
5.4 Produce and distribute an information and awareness raising leaflet.	EHSNH	?

## Archaeology

**Objective 6** To identify, record, protect and research features and areas of archaeological, historical, architectural and industrial interest within and beside the River and along the Lower Bann corridor.

Action	Lead Agency	Time-scale
6.1 Undertake and encourage research into local archaeology and history, including the social history of the fisheries, the diatomite industry and brick-making.	LCG EHSNH,	?
6.2 Protect features of archaeological and historical interest along the Lower Bann corridor.	EHSNH PS	ASAP

## Water Quality

**Objective 7** To improve water quality throughout the Lower Bann catchment.

Action	Lead Agency	Time-scale
7.1 Prepare an integrated catchment management plan for the Lough Neagh and Lower Bann catchment.	EHSNH DARDCMD WS	2002

7.2 Improve water quality standards on the Lower Bann river system	EHSNH DARDCMD WS	ASAP
7.3 Establish river watch teams for each tributary river.	LAG LCG Canal Gps Schools	Asap

## Water levels and river flows

**Objective 8** To ensure that Lower Bann water levels and flows are managed, as far as practicable, with minimal adverse environmental impact.

Action	Lead Agency	Time-scale
8.1 Carry out a study to assess the economic and environmental impact of high and low water levels and river flows throughout the Lough Neagh and Lower Bann hydrological system.	RA U, WI	2000

## Recreation management

**Objective 9** To ensure that water-based and land-based recreation activities on the Lower Bann are environmentally sustainable.

Action	Lead Agency	Time-scale
9.1 Continue and further refine the Watersports Management Plan for the Lower Bann.	LBAC WI	Ongoing
9.2 Ensure that water based and bankside recreational activities and associated developments (walking, fishing, cycling, picnicking, etc.) do not damage the river corridor.	LA EHSNH SC	Ongoing

## Education and public awareness

**Objective 10** To ensure that the public understand and value the Lower Bann, use it safely without conflict, and are involved in the sustainable management of the river system.

Action	Lead Agency	Time-scale
10.1 Maintain a good quality navigation and safety signage system and provide Lower Bann navigation information	WI, CHC, RBLNA	Ongoing

10.2 Revise and re-issue the Lower Bann Users Code and provide other watersports zoning information as necessary.	WI	Ongoing
10.3 Provide interpretative material and prepare a Lower Bann management information and interpretative plan.	LA EHSNH LCG	Ongoing
10.4 Maintain birdwatching facilities at the Bann Estuary and establish public birdwatching facilities at Lough Beg.	NT, LA	Ongoing
10.5 Promote increased links with schools and colleges using the river for field study and encourage water based outdoor educational activities.	LAC Schools etc	Ongoing
10.6 Continue the production of the newsletter "Eel Express."	LBAC	Ongoing
10.7 Produce an education pack to control river associated litter.	LA, LCG	ASAP



## KEY

Abbreviation	Organisation
BASC	British Association for Shooting and Conservation
BSL	Bann System Limited
CHC	Coleraine Harbour Commissioners
DCALIF	Dept of Culture Arts and Leisure, Inland Fisheries
DCALIW	Dept of Culture Arts and Leisure, Inland Waterways
DARDCMD	Department of Agriculture & Rural Development, Countryside Management Division
DARDS	Department of Agriculture & Rural Development, Scientists
EHSNH	Environment & Heritage Service, Natural Heritage
EHSHM	Environment & Heritage Service, Historic Monuments
FB	Funding Bodies
FCB	Fisheries Conservancy Board
FS	Forest Service
LA	Local Councils
LCG	Local Community Groups
LAC	Local Angling Clubs
LBAC	Lower Bann Advisory Committee
LBCC	Lower Bann Co-ordinating Committee
LNFCo-op	Lough Neagh Fishermen's Co-operative Society
NT	National Trust
PS	Planning Service
RA	Rivers Agency
RBLNA	River Bann & Lough Neagh Association
RSPB	Royal Society for the Preservation of Birds
SC	Sports Council
U	Universities
UAF	Ulster Angling Federation
WS	Water Service
WI	Waterways Ireland

**LOWER BANN ADVISORY COMMITTEE (Dec 2000)**

Councillor Ian Johnston	Ballymena Borough Council
Councillor Joe McKernan	Ballymena Borough Council
Councillor Paul Michael	Antrim Borough Council
Councillor Roderick Swann	Antrim Borough Council
Councillor John Junkin	Magherafelt District Council
Councillor Patrick McErlean	Magherafelt District Council
Alderman Joseph A Gaston	Ballymoney Borough Council
Councillor Malachy McCamphill	Ballymoney Borough Council
Alderman James McClure	Coleraine Borough Council
Councillor Mrs Olive Church	Coleraine Borough Council
Mr Edward Montgomery	The Honourable The Irish Society
Mr Tony Miller	Bann System Limited
Commander Peter Campbell	River Bann and Lough Neagh Assoc
Ms Anita Donaghy	Royal Society for the Protection of Birds
Dr Claire Carter	Council for Nature Conservation and the Countryside
Mr Newell McCreight	Ulster Angling Federation
Mr Dave Taylor	Ulster Coarse Fishing Federation
Mr Denzel Dinsmore	Royal Yachting Association
Mr Sam McAleese	Irish Water Ski Association
Mr Victor Hamill	Irish Amateur Rowing Union
Mr Mervyn Kelso	Ulster Farmers' Union
Mr Crawford Sim	Inland Waterways Association
Mr Wilfred Mitchell	Northern Ireland Agricultural Producers Association
Mr Eugene Carson	Rural Development Council
Mr Jack Gault	Northern Ireland Environment Link
Mr Robin Ruddock	Canoe Association of NI
Mr Annesley Malley	Historic Monuments Council
Rev Oliver Kennedy	L. Neagh Fishermen's Co-operative Society Limited
Mr Ivan Wilson	Coleraine Harbour Commissioners

## LOWER BANN CO-ORDINATING COMMITTEE

Ms Hazel Campbell	Department of Culture, Arts and Leisure
Mr Bob Bleakley	Environment & Heritage Service, DOE
Mr Peter Taggart	Minerals and Petroleum Unit, Department of Economic Development (DED)
Mr Stephen Wilson	The Sports Council for Northern Ireland
Mr David Cartmill	Northern Ireland Tourist Board
Mr Brian Finn	Fisheries Conservancy Board
Mr Ronnie McBride	Director of Development & Leisure, Ballymena Borough Council
Mr Philip Lucas	Chief Leisure & Tourism Officer, Antrim Borough Council
Mr John Paul	Chief Recreation & Amenities Officer, Ballymoney Borough Council
Mr Ian Lee	Director of Leisure & Tourism, Coleraine Borough Council
Mr Michael Browne	Development Officer, Magherafelt District Council
Mr Kevin Murphy	Rural Development Division, Ballymena
Mr Lionel Duddy	Coleraine Harbour Commissioners

**Lower Bann Environmental Strategy Working Group**

Mr Jim Allen	Local environmentalist
Ms Denise Campbell	University of Ulster at Coleraine
Dr Clare Carter	University of Ulster at Coleraine/LBAC
Ms Anita Donaghy	Royal Society for the Protection of Birds/LBAC
Cllr David Ford	Antrim Borough Council/LNAC/LBAC
Mr Jack Gault	Northern Ireland Environment Link/LBAC
Mr Ronan Gorman	Federation of Lough Neagh and Lough Beg Wildfowlers/LNAC
Mr Newell McCreight	Ulster Angling Federation/LNAC/LBAC
Mr Robin Ruddock	Canoe Association of Northern Ireland/LBAC
Mr Bob Bleakley	Environment & Heritage Service
Ms Pamela Patterson	Environment & Heritage Service

## Environmental Strategy Consultees

Aghadowey Regeneration Group  
Agivey Anglers  
Antrim Borough Council  
Ballymena Borough Council  
Ballymoney Borough Council  
Bannside Rambling Club  
Bellaghy Bawn  
Council for Nature Conservation and the Countryside  
Camus House B&B  
Canoe Association of Northern Ireland  
Castleroe Regeneration Group  
Coleraine Anglers  
Coleraine Borough Council  
Coleraine Harbour Commissioners  
Coleraine Marina  
Coleraine Yacht Club  
Conservation Volunteers  
Countryside Management Division  
Department of Economic Development  
Economic Development Unit  
Edge Waterski School  
Federation of Lough Neagh and Lough Beg Wildfowlers  
Fisheries Conservancy Board  
Fisheries Division, DANI  
Garvagh & District Development Association  
Glenullin & Agivey Conservation & Development Group  
Historic Monuments and Buildings Branch  
Historic Monuments Council  
Inland Waterways Association  
Irish Amateur Rowing Union  
Irish Water Ski Association  
Kilrea and District Angling Club  
Kilrea Enterprise Group  
Kingfisher Angling Centre  
Lough Beg Coach Houses  
Lough Neagh Fishermen's Co-operative Society Limited  
Lower Bann & Moyola Rivers Angling Development Initiative  
Magherafelt District Council  
Movanager Fish Farm, DANI  
Moyola Conservation Group  
Moyola Fishing Club  
National Trust

Newferry Development Association  
Newferry Waterski Club  
Northern Ireland Agricultural Producers Association  
Northern Ireland Environment Link  
Northern Ireland Tourist Board  
Portglenone Enterprise Group  
Portna Fish Farm  
Rivers Agency  
Royal Yachting Association  
Royal Society for the Protection of Birds  
Rural Community Network  
Rural Development Council  
Rural Development Division  
South Derry Gun Club  
Seaton's Marina  
Shaftesbury Estate of Lough Neagh Limited  
Ski Supreme Water Ski School  
Sports Council for Northern Ireland  
The Honourable The Irish Society  
Toome Industrial Development Amenities & Leisure Regeneration Group  
Ulster Angling Federation  
Ulster Coarse Fishing Federation  
Ulster Farmers Union  
Ulster Society For the Protection of the Countryside  
Ulster Wildlife Trust  
University of Ulster at Coleraine  
Woodhall Residential Centre