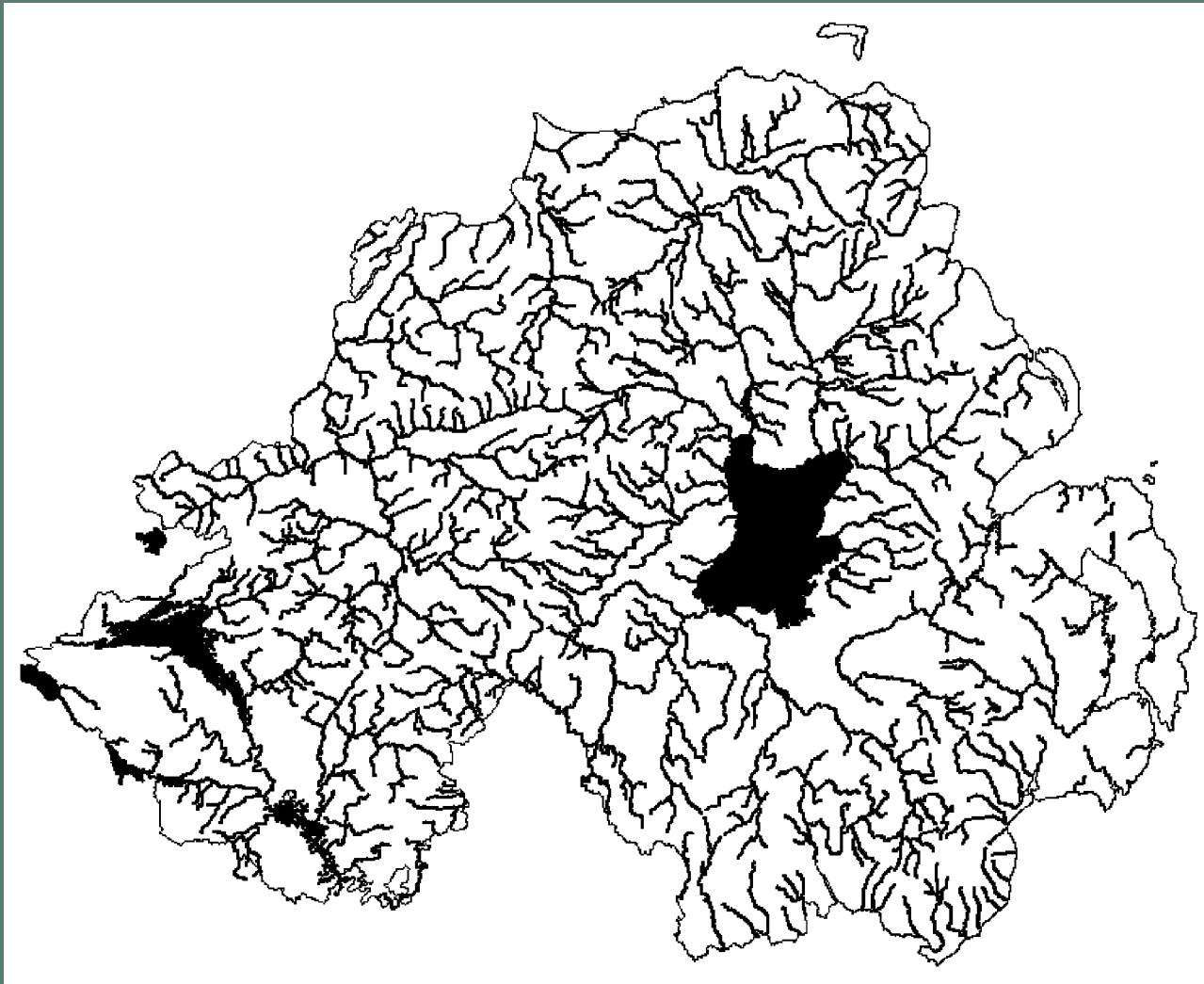


River Conservation Strategy

An Environment and Heritage Service strategy to protect, conserve and enhance the natural and built heritage values of rivers in Northern Ireland and facilitate their sustainable use

ENVIRONMENT AND HERITAGE SERVICE



**ENVIRONMENT AND HERITAGE SERVICE
RIVER CONSERVATION STRATEGY**

**A strategy to protect, conserve and enhance the natural and
built heritage values of rivers in Northern Ireland and
facilitate their sustainable use**

January 2001

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FOREWORD



Rivers are an important element of our natural environment and we have a duty to conserve them. Within Environment and Heritage Service (EHS) our attention to date on conserving rivers has largely focussed on managing and improving water quality. Our influence in protecting the natural heritage, landscape and built heritage value of our rivers has been positive but rather piecemeal and largely achieved through the provision of advice to other government agencies, such as Planning Service, Rivers Agency and others.

The decision taken by EHS to designate a number of rivers as Areas of Special Scientific Interest has resulted in EHS commissioning new research into aspects of Northern Ireland's rivers in order to be in a position to select the best examples of the different river types that we have here. Using this more comprehensive overview of rivers, and activities resulting in adverse impacts, we have reviewed our approach to river conservation and prepared this Strategy as our way forward over the next few years.

This River Conservation Strategy is a starting point – we recognise that the new EC Water Framework Directive and the response to the Northern Ireland Biodiversity Strategy proposals will bring new priorities. We also recognise that this River Conservation Strategy deals with rivers alone and not the total freshwater resource including lakes. The Strategy puts considerable emphasis on establishing partnerships both within and outside government. Building on experience gained through these relationships and the background of evolving national and international policy in relation to freshwaters, this Strategy will be reviewed in three years time.

I am confident that this Strategy provides a sound basis for all those involved to work together to ensure that our rivers are conserved for future generations.

A handwritten signature in cursive script that reads "J R Lamont".

J R Lamont
Environment and Heritage Service
Chief Executive

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INTRODUCTION

The Northern Ireland River Conservation Strategy (the Strategy) is a statement by the Environment and Heritage Service (EHS) on how it proposes to identify and protect the natural and built heritage of our rivers and facilitate their sustainable use. A great deal of work is already being done by a range of Government Departments, Agencies and others to further the conservation of rivers in Northern Ireland and this should continue. EHS has a specific role to play in protecting water quality, the built heritage, landscape quality and nature conservation value of rivers and in facilitating, through local authorities, the provision of public access to the countryside. This can only be achieved by working in close partnership with others. By publishing this Strategy, EHS aims to clarify its role in relation to river conservation and provide a framework on which to build future relations with other Government Departments and Agencies, interested parties and the general public, in pursuit of the objectives of this Strategy.

Rivers¹ are particularly complex to manage. Their physical structure is the dynamic result of natural processes of erosion and deposition but these processes are frequently interrupted by human intervention. Land use and activities throughout the catchment influence water quality and quantity. Since rivers have served as a focus of human activity for thousands of years, they are particularly rich in archaeological and historic features. Rivers are put to a wide variety of uses ranging from effluent disposal, fish farming, water supply, irrigation and power generation to angling, boating, walking and enjoying the countryside. Inevitably, there are conflicts between some of these uses and many have an impact on natural river processes.

Many different parties are directly or indirectly involved in the management of

rivers. The small scale of land holdings in Northern Ireland means that numerous farms abut rivers. Normally, riparian landowners own the bed to the mid-point of the river. Angling rights are usually in the hands of people other than the landowners. Government Departments and Agencies have a statutory responsibility for a wide range of river functions including flood protection, land drainage, navigation, fisheries management, recreation, protection of water quality, planning, nature conservation and protection of the built heritage.

All Departments and Agencies involved with rivers now have a responsibility to ensure that the resource is managed in the interests of sustainability. Also, given the complexity of issues relating to rivers, it is essential that their management is co-ordinated and engages all interested parties. The Strategy seeks to involve the wider community in a partnership to protect rivers for their conservation value. People with an interest in their local river play an important part in its guardianship. They may act as individuals or through conservation bodies, community groups, river action groups, angling clubs or local history societies. Interests may focus on angling, wildlife, landscape, archaeology or recreational access for boating or canoeing, but all have an equal interest in the good quality of their river and in sustaining its various resources. In the longer term, the Strategy will seek to form the basis of a partnership between EHS and these bodies in relation to river conservation.

In the Strategy, the rich natural and built heritage associated with rivers in Northern Ireland is outlined and impacts of greatest significance are discussed. Six main objectives towards conserving Northern Ireland's rivers are set out together with a description of the actions that EHS will take to achieve them. The success of the Strategy will be reviewed in three years time.

¹ For the purposes of this document rivers are taken to be all of the blue lines in 1:50,000 OS maps. These include streams and larger ditches, mill races and drains. The total resource in Northern Ireland is estimated to be 15,455 km long.

1 RIVERS IN NORTHERN IRELAND – THEIR CONSERVATION VALUE AND INTEREST

Conservation value is attributed to rivers for a range of physical, habitat, species, landscape and built heritage features. These are outlined briefly below.

1.1 PHYSICAL CHARACTERISTICS / RELATION TO GEOLOGY AND LOCATION

The form of river valleys is influenced by the underlying geology, often modified by more recent glacial activity. Geological processes and structures control the distribution of upland blocks, which influence rainfall intensity and frequency, drainage patterns and stream gradients. Upland streams on the north and east coasts, often have steep gradients and flow directly into the sea. Elsewhere, streams drain into progressively larger rivers before entering the sea. However, one-third of Northern Ireland is drained by streams that flow into the Lough Neagh basin, drained by the Lower Bann. Geology influences stream length, channel form and flow character. These vary from short turbulent streams in bedrock gorges descending from steep slopes, to low gradient rivers that meander slowly through the flood plains. In Fermanagh and Antrim, dissolution of limestone results in underground flow of sections of river. In places, glacial scouring and meltwater flows have produced substantial valleys in which modern streams are clearly too small to account for valley size. Valley-side terraces are frequent remnants of former higher level valley bottoms, which have been incised by streams following drainage of glacial lakes or during post-glacial land rise.

Rivers should be viewed as dynamic systems, naturally changing through time and, ideally, allowed to do so. Their characteristics depend largely on their interaction, over time,

with the underlying geology. While past river engineering and other human activities have had a major impact on river structure, lateral development through meandering is still ongoing in many low gradient sections.

1.2 VEGETATION TYPES AND DISTRIBUTION

Vegetation communities change along the length of a river as it flows from its upland headwater to its junction with the sea or inland lake. The type of vegetation community present and the species that make up the community are dependent on such characteristics as flow velocity, nutrient status of the water and bed structure of the river. In general, the vegetation changes in a predictable sequence along natural or lightly modified rivers. However, in more heavily modified rivers, or where special features occur, such as waterfalls, this sequence can be disrupted. In the uplands, the river community is comprised of mosses and liverworts best suited to survive where nutrient-poor water flows rapidly over a bedrock and boulder river-bed. The water velocity slows as the river descends onto the lowland, resulting in a change in the composition of the river-bed, with sands, gravels and cobbles now present. This change of river-bed, coupled with more nutrient-rich water allows higher plants such as water crowfoots and starworts to become established in the channel, with reed canary grass along the margins. The water velocity continues to decrease as the river flows across the floodplain towards the sea allowing silt to build up. This substrate, along with nutrient-rich water, allows pondweeds and waterlilies to take root and for the marginal vegetation to develop both in width and diversity. However, it must be remembered that rivers are dynamic systems and this broad pattern can vary greatly over short distances and floods also bring changes over time. This results in a lot of local variation in plant communities.

Naturally-functioning rivers have associated habitats influenced by high water tables and flooding. These riparian and floodplain habitats include reedswamps, wet woodlands, fens and wet grasslands. Agricultural and urbanisation pressures have greatly diminished the extent of these habitats, but many fragments remain.

One vegetation type, Floating vegetation of Ranunculus of plain and sub-mountainous rivers, is given special significance in that it is listed in Annex I of the EC Habitats Directive (Box 1).

BOX 1

HABITATS AND SPECIES OF COMMUNITY IMPORTANCE

The EC Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "EC Habitats Directive") requires that habitats and species of community importance be protected. The habitats and species listed in the EC Habitats Directive that are associated with rivers and occur in Northern Ireland are:

Annex I habitats

Floating vegetation of Ranunculus of plain and sub-mountainous rivers

Annex II species

Pearl mussel	<i>Margaritifera margaritifera</i>
White-clawed Crayfish	<i>Austropotamobius pallipes</i>
Sea lamprey	<i>Petromyzon marinus</i>
River lamprey	<i>Lampetra fluviatilis</i>
Brook lamprey	<i>Lampetra planeri</i>
Atlantic salmon	<i>Salmo salar</i>
Allis shad	<i>Alosa alosa</i>
Twaite shad	<i>Alosa fallax fallax</i>
Otter	<i>Lutra lutra</i>

1.3 INVERTEBRATES

Altitude, geology, water quality and physical form of rivers all influence the kinds of invertebrate communities present. Where rivers are impacted by factors such as poor water quality, modified river channels or changes in flow, the invertebrate communities are distorted in terms of species composition

and abundance, from that which would be expected in natural/pristine river conditions. Our rivers support two invertebrate species listed in the EC Habitats Directive and also identified as priority species in the UK Biodiversity Strategy. The freshwater pearl mussel is notable because it formerly occurred in populations of several million in many of our rivers. The reasons for decline are not fully understood but drainage activity, poor water quality and pearl fishing have probably all played a part in drastically reducing the range and numbers of pearl mussels. Recent surveys have shown that there are very few populations left and these have low numbers of individuals, which show no signs of successful reproduction. A recent survey of white-clawed crayfish revealed that they occur in moderate numbers in much of the Erne catchment and in parts of the Blackwater and Ballinderry catchments of Lough Neagh.

1.4 MAMMALS

Otters are listed in the EC Habitats Directive and are identified as priority species in the UK Biodiversity Strategy. They are common in most of our rivers, making Northern Ireland one of the strongholds for this species in Europe. Several species of bat feed over water, especially where there is good tree cover most notably Daubenton's bat. Bridges are often used as bat roosts.

1.5 FISH

Irish rivers and lakes support fewer fish species than those of Great Britain. A number of the species present are known to have been introduced and there has been much translocation of stocks between catchments. Salmon are listed in Annex II of the EC Habitats Directive as a species of community importance. There are salmon runs in many of Northern Ireland's rivers but we know that these are at much lower levels than in the past, through declines in recorded angling and commercial fish catches. Most of the returning salmon are first winter grilse; multi-

winter spring salmon are much less common than before. The reasons for these declines in salmon stocks are complex and not fully understood. Disease, over-exploitation, poor water quality, damage to in-river spawning and nursery habitats, physical blockages to migration in rivers and declines in feeding resources at sea may all be implicated. Due to a strong local interest in angling for salmon, considerable effort has been put into restoring salmon stocks. Sea trout, which spawn in rivers but migrate to sea, have also declined. Resident brown trout remain widespread in rivers. Some rivers entering large lakes are spawning and nursery habitat for larger lake trout; especially notable are dollaghan from Lough Neagh and sonaghan and gillaroo from Lough Melvin.

Rudd, believed to have been introduced by early man, has largely been replaced by roach, a recently introduced coarse fish that has now become common in lower reaches of rivers in the Lough Erne and Lough Neagh catchments. Slow moving reaches of rivers bordering lakes also support bream, roach/bream hybrids, perch and pike. Eels are present in most rivers. Among the smaller fish our rivers support are minnows, three-spined stickleback, gudgeon and stone loach. Of note are brook, river and sea lamprey because they are listed in Annex II of the EC Habitats Directive. The latter two spend most of their adult life at sea but all three spawn in gravel beds in rivers and develop as ammocoetes (the larval stage) in freshwater. We know that brook lampreys are present in some of our rivers but we don't know the status of river or sea lamprey.

Allis and twaite shad are two fish species listed in Annex II of the EC Habitats Directive that live at sea but spawn in freshwater. Twaite shad are sporadically reported at sea but allis shad may no longer occur in our rivers. Again, like the lampreys, very little is known about their status in Northern Ireland.

1.6 BIRDS

Riparian habitats support a whole range of woodland and waters' edge bird species. Three species that are specifically dependent on rivers are dipper, kingfisher and grey wagtail. Dippers feed in rocky, shallow river reaches and often nest under bridges. They are most common in upland streams but are found at all levels where there is suitable habitat. Kingfishers feed in deeper slow moving waters and nest in excavated tunnels in sandy riverbanks. They are less common in upland streams. Grey wagtails are widespread on our rivers and often nest in man-made structures such as bridges.

Along lower reaches of some rivers, vegetation communities provide suitable habitat for grebes, coots and other wetland birds. Naturally functioning floodplains (i.e. those that flood in winter and have high water tables at other times) support wintering wetland birds which may include, ducks, geese, swans and waders. Populations of breeding waders on floodplains have seriously declined with improved drainage.

1.7 LANDSCAPE

Rivers help to create landscapes, linking diverse land uses by a common thread. However, the lines of many rivers have been altered to make them more efficient at draining land, to reduce flooding and in some cases to gain land for a particular purpose. River margins often have good tree cover and this can form an important element in intensively farmed and urban landscapes, as well as stabilizing river banks and acting as wildlife corridors. In many areas, routes of travel evolved beside rivers and these continue to be used as roads today. Rivers were crossed at fording places, leading to the development of major routes since prehistoric times and eventually bridges and towns.

1.8 ACCESS AND RECREATION

Rivers are a vital part of our countryside and there is a natural attraction to follow the line in the landscape that they provide. They provide an opportunity to view wildlife and our environment from another perspective. The value of our rivers for angling has already been mentioned in section 1.5 *Fish*. There is a weak tradition of rights of way in Northern Ireland, such that established walks along rivers are relatively rare. However, through the efforts of district councils, often in partnership with local communities and angling clubs, the network of paths along rivers is increasing.

Canoeists use a number of accessible rivers. Sports such as water-skiing, jet-skiing, rowing and sailing are confined to the few rivers which are large enough such as the Lower Bann, Lagan and Erne. Likewise, cruisers are confined to the Erne and Lower Bann.

1.9 ARCHAEOLOGY AND BUILT HERITAGE

Rivers and waterways have been a focus of human activity since earliest prehistoric times, from about 7000BC. Archaeological, historical, architectural and industrial heritage sites in and adjacent to rivers all reflect the need for, and use of water as a resource for domestic, agricultural, industrial and transport purposes. River fisheries have always been an important source of food. They were also part of the ritual landscape and certain kinds of sites, such as megalithic tombs or barrows, are often found in river valleys, indicating a physical or spiritual link with water. River names are among the earliest place-names and are sometimes identified with the names of ancient deities. Sources of rivers are known to have had special significance for pre-Christian peoples and together with lakes were used as sites for ritual deposits of metalwork or human and animal remains. Settlement sites, established to make use of rivers, range from prehistoric farms, ritual and burial sites to Early Christian farms and

monasteries, plantation castles and country houses. Rivers were also important as sources of power for mills and water supply for canals and navigations.

There may be traces of encampments, settlements and industrial remains of any period on the banks of a watercourse, and stray finds of objects and artifacts of archaeological interest can be made. Boating accidents often resulted in the loss of boats and valuable cargoes, which can come to light during river channel works. The remains of fords and bridges, quays and moorings, fish weirs and traps, mills and machinery, or boats and cargoes from any period may survive in rivers, as well as objects from dumped rubbish, casual losses and votive or religious offerings. Canals are important features of built heritage and require sensitive maintenance.

There are many purpose-built historic buildings, including bridges, mills, quays, canal locks and weirs, which are founded within, abut or adjoin rivers and other man-made waterways. Some of these are derelict and partially ruined, others are still used, whether for their original or an alternative use. All of them are important as aspects of our built heritage.

2 FACTORS IMPACTING ON THE CONSERVATION VALUE OF RIVERS IN NORTHERN IRELAND

All of the rivers in Northern Ireland have been affected by human activities to some degree. In their natural state, rivers erode, transport and deposit sediments. These processes create features that are valuable for wildlife, providing a range of habitats and enhancing river storage capacity during high flows. Artificial changes to this state due to river engineering, are often unsustainable and result in an increasing need for intervention. Rivers may be impacted by direct physical modification such as drainage and flood protection work, bridges, weirs and structures for power generation, land-use practices in the catchment affecting water quality and quantity, the introduction of exotic plant and animal species and recreational pressure. The section below briefly outlines these impacts.

2.1 DRAINAGE AND FLOOD PROTECTION WORK

Early drainage schemes were introduced in the eighteenth century and many doubled as navigations. During World War II and in the post war years, the priority in the UK was to maximize the nation's food production. In response to Government policy, major arterial drainage schemes were undertaken and rivers were modified to improve their ability to drain land. Such works generally entailed straightening, widening and deepening of river channels. In Northern Ireland, many rivers and their tributaries were subject to major drainage works before the schemes for agricultural improvement came to an end in the 1980s. In many instances, drainage works resulted in altered water levels and in particular 'flashy' flows which could be in fundamental conflict with the needs for water power at mills, where consistency of flow is important. These works sounded the death knell of many water mills and resulted in damage to the built heritage, rendering that,

which survives even more rare and precious. A recent survey carried out by EHS found that only 20.9% of river channels in Northern Ireland were classified as having semi-natural physical characteristics; most river channels have some degree of artificial modification. This compares unfavorably with England and Wales with 28.2% unmodified river length and Scotland with 44.5%.

There are currently no new major schemes being undertaken for the purpose of land drainage. The Rivers Agency of the Department of Agriculture and Rural Development (DARD) is responsible for maintenance work (i.e. the removal of impediments to flow) on 6,850 km of rivers designated under The Drainage (Northern Ireland) Order 1973. The Rivers Agency is also responsible for the maintenance of existing flood defences and the provision of new flood protection measures where it is considered that flooding could endanger life or cause damage to property.

The effect of arterial drainage schemes, carried out to increase agricultural productivity, has been to reduce the natural diversity in the structure, substrate and flows in river channels. The reduction in habitat diversity, both in and adjacent to rivers, and alteration of flows has had profound impacts not just on the landscape but also on the organisms that live there. The impacts are not confined to the river channel. Obviously, the drainage schemes were designed to improve drainage and reduce the frequency and extent of flooding; a consequence of this is that many floodplains no longer act as naturally functioning systems and associated habitats and species have been lost or severely reduced. Flows are more 'flashy' and effective drainage up-river often leads to sudden flooding in the lower reaches. Despite fishery impact mitigation measures, these changes have adversely affected plant and animal communities and have possibly contributed to the reduction or local extinction of some species such as the freshwater pearl mussel.

Channel deepening, widening, flood defence and other activities associated with watercourse management carried out in the past, have had a significant impact on historic features. Many bridges, weirs, millraces, fords and archaeological sites have been removed or altered by earlier drainage and flood defence schemes. In a few cases, these past works have led to the discovery of new objects, sites and features and, in some respects, have increased our knowledge and understanding of the past and its built heritage.

Treasure hunting along rivers is a problem which became more apparent through the Blackwater drainage scheme. Silt spread on nearby fields was searched initially illegally and later under licence and very important archaeological objects were found. This activity is controlled by the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995.

2.2 OBSTACLES IN RIVERS

Some rivers have been impounded to create reservoirs for water supply, and weirs have been added to others to create a head of water for the generation of hydroelectric power or to supply fish farms. Historically, many water powered mills operated in Northern Ireland. Their construction involved building weirs across rivers and drawing water off through a mill race to be returned to rivers downstream. Some of these structures formed impassable barriers to migrating fish, at least in times of low flow, and reduced or eliminated the opportunity for fish to use spawning and nursery habitats upstream. The majority of these weirs have now been deliberately dismantled or have been washed away by floods but many remain as redundant structures. Of those that remain, many are naturally passable or have purpose-built fish passes. Some however, still remain as obstacles to migrating fish, although they may be valuable for historical or industrial heritage reasons.

Culverts are man-made structures that enclose stretches of rivers. They may be short sections under roads or railways or, in urban areas, may extend for much longer distances underground. Culverts replace the natural bed and banks of rivers and in some cases impede migration of animals along the river. They also disguise the source of polluting discharges, sewerage overflows, road run-off, etc.

2.3 WATER ABSTRACTION

Water may be abstracted from rivers for a range of purposes, including public water supply, supply to industry, fish farming, hydroelectric power schemes, livestock watering, crop irrigation and other agricultural purposes. Abstraction of water has caused considerable, much publicized concern in the south of England in recent years where, with low rainfall and a deficit in the water available for public supply, watercourses have been reduced to trickles or even become dry in the summer. With higher rainfall in Northern Ireland and lower demand for water, such circumstances rarely occur. However, even moderate reductions in flows can have an adverse effect on river communities, particularly on migratory species such as salmon, which may be unable to ascend a river due to low flow conditions.

2.4 LAND USE PRACTICES IN THE CATCHMENT

Good water quality is essential to the maintenance of healthy plant and animal communities in rivers. A major current concern about water quality is the high level of nutrient enrichment in rivers. Nutrient enrichment arises both from widely dispersed agricultural practices, which involve the application of excess phosphorus in the form of farm wastes and artificial fertilizers to land and from point sources, including discharges from Waste Water Treatment Works, industry and septic tanks. The main symptom of nutrient enrichment is greatly increased growth of plants including algae, a process

known as eutrophication. This excessive growth of aquatic plants can obstruct flows, resulting in the silting up of spawning beds and loss of fish breeding habitat. Indirectly, it may also cause extreme variations in dissolved oxygen, which can result in fish kills.

Around 2,500 reports of water pollution are investigated by EHS every year and of these about 65% are substantiated. About one third of the substantiated reports result from farms, with other significant sources arising from industry and sewage treatment. High sediment loads may enter watercourses as a result of operations such as sand and gravel washing or development works taking place in or near rivers. Insecticides from sheep dips are a particular concern. Pollution incidents have the potential to kill fish and invertebrates, damage plant communities and affect other animals in the food chain such as otters and wetland birds.

The land-use in river catchments has a direct effect on water quality and quantity in rivers. For example, extensive drainage, overgrazing and urbanisation in catchments leads to higher levels of silt loss and rapid run-off of rain, generating flashier floods.

Along many reaches of rivers, riparian vegetation is very much reduced or absent because of intensive farming activities or urban development. This results directly in a damaging loss of habitats and species but also reduces the potential buffering capacity of this zone against river siltation and eutrophication.

Silt from land run-off and organic matter resulting from eutrophication in rivers (mentioned above), accumulates on the bed and may fill the spaces between coarse sediments. This is particularly damaging for species that depend for part or all of their lifecycle on free flowing, oxygen rich, water passing through these coarse sediments. Siltation is a widespread problem in our rivers and impacts on such species as spawning

salmon and trout, water crowfoot, freshwater pearl mussels and lampreys.

Forests may increase the risk of acidification of surface waters because of the increased interception of atmospheric pollutants in tree crowns. There is little evidence of acidification in Northern Ireland, although some areas, such as the Western Sperrin Mountains and the Mourne are vulnerable because of the poor buffering capacity of the associated types of underlying rock.

Litter from domestic, industrial and agricultural sources is present in most rivers - most noticeable as plastic material caught in overhanging trees. Much of the litter entering rivers eventually ends up on coast and lake shorelines. Farm animals occasionally drown in rivers and are washed downstream but in recent years, changes in the way that fallen farm animals are dealt with has led to an increase in deliberate disposal in rivers. These carcasses can have a significant impact on local river amenity.

2.5 INTRODUCED SPECIES

If a species of plant or animal is introduced to a place where it does not naturally occur, it is variously referred to as introduced, non-native, exotic or alien. Some such species can co-exist without having a significant impact on their new environment. In many cases however, they have no natural competitors, diseases or predators to control them and they become invasive as a consequence. In these circumstances, introduced species often lead to the displacement of native species through habitat changes, predation, competition for resources or spread of disease. Freshwater systems are amongst the most vulnerable to introductions and rivers provide an ideal route for the spread of such species. Northern Ireland benefits by its relative geographical isolation and so has fewer introduced species than Great Britain. Several however, are already well established and some of these pose a threat to native species. Over time, many

introduced species do achieve equilibrium with their environment, but this can take decades or even centuries and may be at the expense of native competitors.

- **Plants**

Canadian pondweed is an example of an introduced species that is now widespread in rivers in Northern Ireland. New Zealand water fern occurs on the lower reaches of the Lagan and Upper Bann rivers from where it has spread into Lough Neagh. There are a number of bankside species such as monkey flower, giant hogweed, Japanese knotweed and Himalayan balsam which were brought to Northern Ireland as garden plants but which have escaped and spread in the countryside. There is considerable risk of further garden plant escapes to the wild, especially aquatic species used in garden ponds. Where conditions are suitable, some of these species are very vigorous and suppress native river and bankside species.

- **Mammals**

Most of our river systems have populations of North American mink which descended from escaped animals from mink farms established after World War II. The spread of mink and potential impact on native species initially caused considerable concern. Now that mink have become widely established, it is not apparent that they are having a significant impact.

- **Fish**

Several species of fish have been introduced for angling or aquaculture. Most of the coarse fish species in Northern Ireland have been introduced, such as pike, roach and tench. These can have a profound effect on natural ecosystems. Although it is accepted that roach is a relatively recent introduction, the others are long established in Northern Ireland and are of significant economic benefit in terms of angling. Historical stocking of salmon and trout from sources

other than local populations may have caused a reduction in genetic diversity amongst certain local populations. Further introductions of non-native fish species could be damaging by upsetting the ecological balance of plant and animal communities, by competing directly with local fish species and other wildlife or by spreading diseases.

- **Invertebrates**

A number of non-native invertebrate species have established themselves in rivers in Northern Ireland. Several species of shrimp (from North America) have become established, in some cases displacing native shrimps. Zebra mussels, recently established in Lough Erne, have the potential to spread into lower reaches of rivers.

The native white-clawed crayfish is listed in Annex II of the EC Habitats Directive as a species of community importance and has a very local distribution in Northern Ireland. Some rivers in Great Britain have non-native crayfish which compete with native white-clawed crayfish and have been the carriers of crayfish plague which decimates native crayfish populations. There are currently no non-native crayfish in Northern Ireland.

2.6 CLIMATE CHANGE

There has been relatively little work done on the effect of climate change on river and stream habitats. It is expected that flashy flows may increase due to more concentrated rainfall. It is also possible that periods of low flow will increase. These changes in flow regime could physically affect streambed habitats and, taken together with temperature rise, could effect density, growth patterns and life cycles of plant and invertebrate communities, impede fish migration and affect spawning. The recent Department of the Environment, Transport and the Regions (DETR) report on climate change ranks the vulnerability of rivers and streams in the UK as 'high'.

2.7 RECREATIONAL PRESSURE

The impact of recreational pressure on the conservation value of rivers is local but can be significant. Game fishing for salmon and trout is of good quality in many of our rivers. There are many local angling clubs and the tourist related product is currently undergoing active development. Access for game angling is normally low-key involving little more than provision of stiles. Coarse fishing has a smaller traditional following within Northern Ireland but on lower reaches of Lough Erne rivers and on the Lower Bann and Quoile, access is being improved and fishing stands are provided, leading to a growth in both local and tourist coarse fishing. The provision of angling facilities has the potential to result in negative impacts on riverbank habitats and species if not well evaluated and designed.

Where fishery enhancement projects are well planned, they benefit fish populations and can also have a wider biodiversity benefit. Poorly planned projects can damage natural stretches of river by introducing inappropriate physical modifications or genetic fish stocks that are not local.

Active water-sports such as water-skiing, jet-skiing, rowing and sailing take place locally on some larger rivers. Cruisers are confined to the Erne and Lower Bann. If the level of recreation on or adjacent to a given watercourse is high, it can lead to problems such as bank erosion at access points or from boat wash. Noise and disturbance may deter breeding birds although most species are remarkably tolerant of the presence of people. Careful planning of facilities and co-operation between users can help to minimise environmental impacts.

There are proposals, but no commitments, to re-water the Ulster Canal, Newry Canal, Lagan Navigation and the Coalisland Canal. These developments would increase cruiser traffic on the Upper Bann and Lagan rivers, with possible negative consequences for plant and animal communities. Canal development

could also lead to changes in the catchment hydrology affecting water balances and flows and cause the further spread of non-native aquatic species.

3 THE ROLE AND RESPONSIBILITIES OF ENVIRONMENT AND HERITAGE SERVICE IN RELATION TO RIVER MANAGEMENT

Environment and Heritage Service (EHS) is an agency within the Department of the Environment. The aim of EHS is "to protect and conserve the natural and built heritage and to promote its appreciation for the benefit of present and future generations". The three broad functions addressed by EHS are Natural Heritage, Built Heritage and Environmental Protection. In addition, EHS addresses a fourth cross-cutting function, in promoting awareness and appreciation of the environment and heritage.

3.1 NATURAL HERITAGE RESPONSIBILITIES

Identification and management of sites of nature conservation value including:

- survey and designation of Areas of Special Scientific Interest (ASSIs)
- fulfillment of obligations under appropriate EC Directives and International conventions
- designation and management of nature reserves

Protection of biodiversity including:

- formulation and implementation of a Northern Ireland Biodiversity Strategy in partnership with others
- protection of rare and endangered species under the Wildlife Order (Northern Ireland) 1985
- financial support to conservation bodies
- provision of nature conservation advice to Planning Service, Rivers Agency and other Government Departments and Agencies

Protection of landscapes including:

- designating valued areas of the countryside as Areas of Outstanding Natural Beauty or National Parks
- taking steps to manage and promote enjoyment of such areas in a sustainable fashion

Support for countryside access including:

- provision of grant aid to district councils
- provision of advice to district councils and other agencies on all aspects of access provision

3.2 BUILT HERITAGE RESPONSIBILITIES

Protection and recording archaeological sites and monuments, historic buildings and other heritage features including:

- taking archaeological sites and monuments into State Care and/or scheduling them for protection
- listing buildings of special architectural or historic interest
- provision of grant aid to owners of listed buildings and drawing up management agreements with owners of land on which scheduled monuments are located
- compiling and maintaining a register of historic parks, gardens and demesnes
- extending records of the archaeological and built heritage through survey and recording, including where appropriate excavation recording
- provision of advice on the archaeological and built heritage to Planning Service, Rivers Agency and other Government Departments and agencies

3.3 ENVIRONMENTAL PROTECTION RESPONSIBILITIES

Control of air, water and land pollution including:

- issuing and implementing catchment-based water quality management strategies
- implementation of water related EC Directives
- monitoring and regulating discharges to the aquatic environment
- monitoring and reporting water quality
- responding to reports of water pollution
- the provision of advice on water quality matters to Planning Service, Rivers Agency and other Government Departments and Agencies

3.4 PROMOTING AWARENESS AND APPRECIATION OF THE ENVIRONMENT AND HERITAGE

EHS is committed to developing its education and influencing role to complement its statutory duties, in order to make progress towards the UK Government's wider environmental and sustainable development objectives.

4 OBJECTIVES OF THE RIVER CONSERVATION STRATEGY

The value of rivers and the impacts on them have been outlined above in sections 1 and 2 respectively. This section sets out the overall aim and the objectives of the Strategy.

4.1 STRATEGY AIM

Rivers are an important resource for water-based recreation, water abstraction, hydroelectric generation, etc. and have an important drainage function. The Strategy recognizes that the conservation of rivers has to be balanced against other river uses and therefore adopts the principles of sustainable development. The most commonly used definition of sustainable development is: *'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'* (World Commission on Environment and Development, 1987). The UK Government's commitments to sustainable development are set out in the publication 'A Better Quality of Life' published in 1999. Reflecting this approach, the underlying principle of the Strategy is that rivers should be used in an environmentally sustainable manner that supports commercial and recreational needs, whilst protecting water quality and their natural and built heritage values.

The overall aim of this Strategy is:

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

4.2 STRATEGY OBJECTIVES

The objectives to meet the overall aim of the Strategy are detailed below.

- 1. 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. Maintain and/or enhance the ecological integrity and biodiversity of rivers.**
- 3. Maintain and where appropriate, improve the water quality of rivers to meet the needs of conservation.**
- 4. Maintain and protect archaeological features, the industrial heritage and conserve historic buildings associated with rivers and their setting.**
- 5. Increase the potential for public enjoyment of rivers where it is compatible with the other objectives of the river conservation strategy.**
- 6. Promote awareness and appreciation of rivers.**

5 DELIVERY OF THE RIVER CONSERVATION STRATEGY OBJECTIVES

To meet the objectives of the Strategy, EHS works with a range of Government Departments and Agencies, other partners and the general public. The activities that EHS will engage in to meet the objectives of the Strategy (set out in section 4.2 *Strategy Objectives*) are discussed below:

5.1 WORKING WITH PLANNING SERVICE

The planning system

Rivers and river corridors are important linking elements in the landscape and have considerable nature conservation value. However, of the total river resource, only a small proportion will be protected through designation as statutory sites of nature conservation importance (section 5.3 *Designating Sites of Nature Conservation Importance*). Protection for the overall river and river corridor resource can however be facilitated by the planning system.

The planning system exists to regulate the development and use of land in the public interest. The Department of the Environment is responsible for planning control in Northern Ireland. The Department's functions are set out in the Planning (Northern Ireland) Order 1991 and these consist of formulating planning policies, producing development plans and exercising control of development. The Planning Service, an Agency within the Department, administers these functions.

The Department is committed to the principles set out in the 1999 Government publication 'UK Sustainable Development Strategy'. In working towards sustainable development, among other things, the Department will aim to conserve both the archaeological and built heritage and natural resources (including wildlife, landscape,

water, soil, and air quality), taking particular care to safeguard designations of national and international importance.

In formulating policies and plans and in determining planning applications, the Department will be guided by the precautionary principle that, where there are significant risks of damage to the environment, its protection will generally be paramount, unless there are imperative reasons of overriding public interest.

Planning Policy Statements

Regional policies on particular aspects of land-use planning that apply to the whole of Northern Ireland are prepared by Planning Service and normally issued through Planning Policy Statements (PPSs). The contents of PPSs are taken into account in preparing development plans and are also material to decisions on individual planning applications and appeals. PPSs of specific importance to the conservation of rivers include:

PPS 2 'Planning and Nature Conservation' which sets out regional planning policies for the hierarchy of sites of nature conservation importance. It also addresses trees and woodlands, protection of species and peatlands.

PPS 6 'Planning, Archaeology and the Built Heritage' which sets out regional planning policies for the protection and conservation of archaeological remains and elements of the historic landscape.

From time to time, PPSs are updated or new ones prepared. EHS will liaise with Planning Service to ensure that, where appropriate, nature conservation, landscape and built heritage values, and access and recreation opportunities in relation to rivers and river corridors are addressed in new or revised PPSs.

Development plans

Development plans are published by the Planning Service and may be in the form of area plans, local plans or subject plans. These apply regional planning policies at the appropriate local level and advise the general public, statutory agencies and other interested bodies of the policy framework and land use proposals that will be used to guide development decisions within their local area. Statutory sites and features are generally identified in development plans and where appropriate, local designations and policy statements prepared.

To ensure that appropriate protection is afforded to rivers and river corridors in development plans, EHS will liaise with Planning Service. Many rivers and river corridors are of considerable nature conservation value because of their habitat, species, physical features or earth science interest. Those with no statutory designation may be identified as Sites of Local Nature Conservation Importance (SLNCIs) in development plans together with local policy statements, highlighting their notable features, to protect them and their special significance from adverse development proposals (see also section 5.3 *Identification of Sites of Local Nature Conservation Importance*).

In urban situations, the linear corridors formed by rivers may be designated as Local Landscape Policy Areas or open space to protect them from inappropriate development. Where rivers or streams bound or cross development sites, local policy statements may be included in development plans to draw attention to the need to retain, protect and integrate these in an appropriate manner into the design and layout of development proposals. These and other policies may also be used to protect rivers and river corridors for access and recreation opportunities.

Many rivers and river corridors form an important element of the historic landscape

and may be included within Areas of Significant Archaeological Interest designated in development plans. Such designations seek to identify particularly distinctive areas of the historic landscape and they are likely to include a number of individual and related archaeological sites and monuments. Local policy statements will normally be included in plans to protect the overall character and integrity of these distinctive areas.

EHS advises Planning Service on the preparation of development plans to ensure that nature conservation, landscape and built heritage values and access and recreation opportunities, in relation to rivers and river corridors are identified and appropriate policy statements included to protect them.

Development control

Where development proposals for new built development such as housing, bridges or hydroelectric schemes have the potential to impact on the conservation value of rivers, EHS gives advice to Planning Service on how to respond to these proposals. Careful consideration is given by EHS to the implications of development proposals on the nature conservation, landscape, countryside access and recreation and built heritage values of rivers and river corridors. Often planning permission will only be granted subject to conditions or a planning agreement to mitigate any adverse impacts, including where appropriate, the provision of compensatory measures for the enhancement of the river corridor.

The presence of archaeological remains in river corridors, indicative of past human activity, is also taken into account when assessing development proposals. The general presumption is that archaeological sites and their settings should, where possible, be preserved. In cases where development affecting archaeological remains is considered acceptable, EHS will advise on required archaeological mitigation measures including, where appropriate, excavation recording at the developer's expense.

Certain large-scale development projects and developments likely to have a significant impact on rivers or river corridors, may require an Environmental Impact Assessment (EIA) under the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999. EIAs assist Planning Service and EHS in reaching decisions regarding the environmental impacts of proposed developments.

EHS will liaise Planning Service on developments that could adversely impact on nature conservation, landscape or built heritage values or access and recreation opportunities in relation to rivers and river corridors and, where appropriate, advocate mitigating measures.

In working with Planning Service, EHS will:

- 1. ensure that, where appropriate, nature conservation, landscape and built heritage values and access and recreation opportunities in relation to rivers and river corridors are addressed in new or revised Planning Policy Statements (*contributes to objectives 1,2,3,4 and 5*)**
- 2. ensure that nature conservation, landscape and built heritage values and access and recreation opportunities in relation to rivers and river corridors are identified in development plans and appropriate policy statements included to protect them (*contributes to objectives 1,2,3,4 and 5*)**
- 3. liaise on developments that could adversely impact on nature conservation, landscape or built heritage values or access and recreation opportunities in relation to rivers and river corridors and, where appropriate, advocate mitigating measures (*contributes to objectives 1,2,3,4 and 5*)**

5.2 WORKING WITH RIVERS AGENCY

Responsibility for drainage and flood defence

The Rivers Agency is responsible for drainage and flood defence in Northern Ireland. The Drainage (Northern Ireland) Order 1973 and the Drainage (Environmental Assessment) Regulations (Northern Ireland) 1991 as amended in 1998, provide the legislative basis for carrying out watercourse maintenance work and flood defence schemes. Responsibility for these duties rests with the Department of Agriculture and Rural Development and the functions are executed, on its behalf, by the Rivers Agency. Rivers Agency currently maintains 6,850km of designated watercourse, designated under the Drainage Order by the Drainage Council, the statutory body that scrutinizes Rivers Agency in the execution of its functions. Rivers Agency also carries out flood defence schemes to protect urban development where there is a threat to life or property.

In carrying out its functions, Rivers Agency is required by the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 to "have regard to the need to conserve the natural beauty and amenity of the countryside and the need to protect (as far as reasonably practicable) flora, fauna and geological and physiographical features of the countryside from any harmful effects which might result from the exercise of such function(s)." Rivers Agency is a 'competent authority' under the terms of the Conservation (Natural Habitats) Regulations (Northern Ireland) 1995 with regard to the management of European sites (Special Protection Areas under the Birds Directive and Special Areas of Conservation under the EC Habitats Directive).

Rivers Agency has a duty under the Drainage Order to carry out fisheries enhancement work where their activities have damaged fishery interests. This work is carried out

with advice from Department of Culture, Arts and Leisure (DCAL), Inland Fisheries.

Watercourse maintenance programme

Rivers Agency manages designated watercourses on a rolling programme and issues a comprehensive watercourse maintenance programme every year for consultation. In carrying out maintenance works on designated watercourses, the Rivers Agency, through its environmental staff, carries out pre-work assessments on all watercourses. Selected watercourses are subject to survey, in conjunction with engineering staff, in order to agree works, methodology, and mitigation. This is carried out using either a walkover survey or river corridor survey, as appropriate. Good working practices, as defined in the Agency's document entitled "Sensitive River Maintenance", are employed during operations. Opportunities are also sought for mitigation which would have landscape and habitat benefits, including the sensitive treatment of bridges and mills. Archaeological sites adjacent to rivers are identified for their protection during the works. Post-works audit surveys are carried out on selected rivers to confirm compliance of works with agreed environmental criteria to assess the suitability of the recommended works.

EHS advises Rivers Agency on the potential impacts of the annual watercourse maintenance programme on the nature conservation, landscape and built heritage values of rivers.

Where rivers are designated as ASSIs or Special Areas of Conservation (SACs), or where watercourses pass through other protected areas, Rivers Agency has a responsibility to avoid causing damage in carrying out its works. To ensure that watercourse maintenance is executed in a way that will sustain the interest for which sites were declared, EHS and Rivers Agency will

prepare Watercourse Maintenance Agreements for rivers within ASSIs and SACs.

Because rivers have been a focus of human activity in Ireland for nine millennia, any work on rivers has the potential to destroy or alter prehistoric or historic evidence. Where drainage or flood defence work leads to the discovery of features that were previously unknown, it is important that these are reported and properly recorded. To ensure that practices are followed to minimise impacts of watercourse maintenance operations on the built heritage, a leaflet 'Rivers and Archaeology' has been developed to advise contractors of their responsibilities on finding archaeological objects.

Flood defence schemes

New flood defence schemes require an Environmental Assessment under the Drainage (Environmental Assessment) Regulations (Northern Ireland) 1991, as amended in 1998. As a statutory consultee, EHS will advise Rivers Agency on potential impacts of new flood defence schemes on the nature conservation, landscape and built heritage values of rivers and river corridors.

River restoration

The Rivers Agency is committed to 'conserving and enhancing the natural environs of watercourses wherever possible' in carrying out its drainage and flood defence functions. On a trial basis, Rivers Agency has carried out river restoration demonstration projects, in conjunction with its watercourse maintenance work, on small sections of the River Tall, Co. Armagh, and the Ballysally River, Coleraine. These have served to develop skills and techniques within the Agency that achieve environmental enhancement of rivers, while maintaining the desired drainage capacity. EHS will encourage Rivers Agency to become involved in further restoration projects and will work with them to identify locations, partnerships and mechanisms through which enhancement

and restoration can be achieved on rivers of high nature conservation or amenity value.

In working with Rivers agency, EHS will:

4. **advise on the potential impacts of the annual watercourse maintenance programme and on major flood defence schemes on the nature conservation, landscape and built heritage values of rivers** (*contributes to objectives 1,2,3,4 and 5*)
5. **prepare joint Watercourse Maintenance Agreements for rivers within ASSIs and SACs** (*contributes to objectives 1,2 and 3*)
6. **work with them to identify locations, partnerships and mechanisms through which enhancement and restoration can be achieved on rivers of high nature conservation or amenity value** (*contributes to objectives 1,2,3,4,5 and 6*)

5.3 DESIGNATING SITES OF NATURE CONSERVATION IMPORTANCE

Nature conservation designations

EHS has begun the process of designating a suite of rivers as ASSIs and SACs for their Northern Ireland and European importance respectively. The selection, designation and management of these sites is described below.

Evaluating rivers

Rivers are selected for designation as ASSIs using criteria such as diversity, naturalness, rarity, typicalness etc. set out in 'Guidelines for the selection of Biological ASSIs in Northern Ireland'. As rivers are complex systems, a large amount of data is needed to apply the criteria. An objective method for

assessing the physical character and quality of river habitats is River Habitat Survey (RHS) which was used in Northern Ireland in 1995 and 1996 to provide an overview of the physical characteristics and habitats of rivers. EHS also carried out a comprehensive macrophyte survey of rivers in 1996. This and other available information on species, water quality and catchment characteristics was analyzed using a software package called SERCON (System for Evaluating Rivers for Conservation) which provided a systematic evaluation of the conservation value of rivers in Northern Ireland.

Selection and designation of river ASSIs
The Department has a statutory obligation to protect special sites for their natural heritage value by designating them as ASSIs under the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended).

Rivers are selected as ASSIs by carrying out more detailed field surveys on the best rivers selected by SERCON to check their integrity and, if their conservation value is confirmed as high enough, precise ASSI boundaries are drawn up to include riparian habitats associated with the river. The approach taken is to ensure that the river ASSI network has the best examples of rivers in Northern Ireland selected on a regional basis. EHS is preparing conservation objectives for all ASSI features (i.e. habitats and species for which sites were declared) with target levels for each.

The first two rivers to be designated as ASSIs in Northern Ireland were the Cladagh (Swanlinbar) River and the Upper Ballinderry River in 2000. EHS will designate the Owenkillew River in 2001 and a further four rivers over the next three years. Stretches of other rivers and smaller watercourses are also included in ASSIs.

Designating stretches of rivers as ASSI and defining conservation objectives enables EHS to work closely with owners of riverbed and

riparian habitat. It enables EHS to assess the likely impact of potentially damaging operations and negotiate management agreements with landowners in appropriate cases. Other Government Departments and Agencies are required to consult with EHS over proposed activities likely to affect ASSIs. This includes activities both upstream and throughout the catchment beyond the boundaries of the protected area that might affect water quality or quantity.

Selection and designation of river SACs

It is a requirement of the EC Habitats Directive that a representative proportion of habitats and species of community importance within each member state be protected within Special Areas of Conservation (SACs). The Directive specifies the habitats and species that are considered to be of community importance (Listed in Box 1 on page 2).

Some of the rivers designated, or proposed, as ASSIs will also meet the criteria for selection as SACs. The enabling legislation to designate and manage SACs in Northern Ireland is the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995, known as the Habitats Regulations. Designating sites as SACs brings an enhanced level of protection beyond that which applies to ASSIs. Two key differences are that:

- a) Competent Authorities (those with statutory responsibilities) must review existing consents, licences and permissions. If these could significantly damage the site, the Competent Authority must take such action as is necessary to ensure that the site is not damaged.
- b) Competent Authorities may not allow an activity that will damage the nature conservation interest of the site unless there is no alternative and there are "imperative reasons of overriding public interest, including those of a social or economic nature".

There are other differences described more fully in The Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 Guidance Note – March 1995.

Through the Department of the Environment, Transport and the Regions, EHS will submit to the European Commission the Cladagh (Swanlinbar) River, the Upper Ballinderry River and Owenkillew River as candidate SACs. EHS will also select additional rivers as candidate SACs to protect salmon. If these are acceptable to the Commission, they will be formally designated.

EHS will prepare conservation objectives for all SAC features with target levels for each. As a competent authority, EHS will take into account the requirements of the EC Habitats Directive when consenting new activities on river SACs and review existing consents to ensure they are not having a significant effect. Other competent authorities have the same responsibilities for activities for which they give consent.

Sites of Local Nature Conservation Importance

Where stretches of river or river corridor are of local nature conservation importance for habitat, species, physical feature or earth science reasons but are not designated as ASSI or SAC, then they may be identified as Sites of Local Nature Conservation Importance (SLNCI) in development plans. EHS will advise Planning Service on the inclusion of SLNCIs in development plans.

In designating sites of nature conservation importance, EHS will:

7. **declare a series of rivers and their associated riparian habitats as ASSIs with the aim of protecting the full range of natural river variation in Northern Ireland (contributes to objectives 1,2,3 and 6)**

8. submit a list of candidate SAC rivers to the European Commission including the Cladagh (Swanlinbar) River, the Upper Ballinderry River, the Owenkillew River and additional rivers to protect salmon (*contributes to objectives 1,2,3 and 6*)
9. prepare conservation objectives for river ASSI and SAC features (*contributes to objectives 1,2 and 3*)
10. take into account the requirements of the EC Habitats Directive when consenting new activities on river SACs and review existing consents to ensure they are not having a significant effect (*contributes to objectives 1,2 and 3*)
11. advise Planning Service on the inclusion of stretches of river or river corridor in development plans as SLNCIs (*contributes to objectives 1,2,3 and 6*)

5.4 TAKING ACTION FOR BIODIVERSITY

Northern Ireland Biodiversity Strategy

The Convention on Biological Diversity requires the development of national plans or programmes for the conservation and sustainable use of biological diversity. The UK Biodiversity Action Plan was published in January 1994 and has been progressed into a number of detailed habitat and species action plans. Following on from this, 'Biodiversity in Northern Ireland – Recommendations to Government for a Biodiversity Strategy' was published by the Government's advisory group on biodiversity, the Northern Ireland Biodiversity Group, in October 2000.

Habitat and species action plans

UK habitat and species action plans with targets and proposed actions have been published for priority habitats and species. These will be supplemented with additional habitats and species to form a list of Northern Ireland priority habitats and species for which Northern Ireland action plans will be prepared.

The following UK priority species occur mainly in rivers in Northern Ireland:

- | | |
|---------------------------|------------------------------------|
| • Otter | <i>Lutra lutra</i> |
| • Allis shad | <i>Alosa alosa</i> |
| • Twait shad | <i>Alosa fallax fallax</i> |
| • White-clawed crayfish | <i>Austropotamobius pallipes</i> |
| • Freshwater pearl mussel | <i>Margaritifera margaritifera</i> |
| • River jelly lichen | <i>Collema dichotomum</i> |

Recent surveys have been carried out to establish the distribution and condition of freshwater pearl mussel populations and white-clawed crayfish in Northern Ireland. EHS will carry out further research into the distribution and status of UK priority species which occur in rivers. EHS will also prepare a Northern Ireland species action plan for freshwater pearl mussel as recommended by the Northern Ireland Biodiversity Strategy Recommendations. There is ongoing research into elements of the freshwater pearl mussel life-cycle to aid the design of future re-introduction programmes.

The Northern Ireland Biodiversity Strategy Recommendations also propose a species action plan for river water-crowfoot *Ranunculus fluitans*, a rare species in Ireland that has only been found in the Sixmilewater River.

At the UK level, there is a habitat action plan for chalk rivers (not relevant to Northern

Ireland) but not for any other river type. The Northern Ireland Biodiversity Strategy Recommendations purpose a Northern Ireland habitat action plan for crowfoot rivers (these are rivers that support common water-crowfoot plant communities not to be confused with the rare water-crowfoot plant species mentioned above). At the UK level there is a proposal to adopt a habitat action plan for dynamic (high energy) gravel bed rivers. This substantially overlaps with the proposed crowfoot habitat action plan and if adopted, could apply to many river reaches in Northern Ireland.

It is not yet possible to be more specific in relation to habitat and species action plans until Government responds to the Northern Ireland Biodiversity Strategy Recommendations. EHS, in partnership with other Government Departments and Agencies will give a clear indication on how species and habitat action plans in relation to rivers will be taken forward by 2001.

Funding biodiversity projects

EHS will grant-aid biodiversity projects that further the objectives of river species or habitat action plans where they meet relevant criteria. Other sources of funding are also available for biodiversity projects such as the Heritage Lottery Fund.

Species protection

Important river species such as otters, crayfish, river water-crowfoot and birds are protected under the Wildlife (Northern Ireland) Order 1985. It is the responsibility of the police to enforce the Wildlife Order. To help them in this work, the police have a Wildlife Liaison Officer who works closely with EHS staff. To help raise public awareness of the law in relation to protected species, EHS will produce a new Wildlife Order explanatory booklet. EHS also provides advice to other Government Departments and Agencies in relation to protected species.

In some situations, cormorants and otters are perceived as a threat to fishery interests. Research in GB has shown that whilst cormorants (and other fish eating birds and mammals) may have local impacts on fish populations, there is no evidence for widespread fish population declines attributable to predators. Where it is demonstrated that predation does cause serious damage to fisheries locally, EHS encourages non-lethal measures, such as scaring. In exceptional cases, where non-lethal methods have been shown to be ineffective, EHS issues licenses to shoot small numbers of cormorants within specified limits.

Control of non-native species

The impact of introduced non-native plant and animal species on the nature conservation value of rivers is discussed in section 2.5 *Introduced species*.

Under the Wildlife Order, it is an offence to deliberately introduce to the wild any non-native plant or animal species that is not normally resident in Northern Ireland. Schedule 9 of the Order lists species which are not indigenous but have become established in the wild. Release of these species into the wild is also an offence. DCAL and DARD have various responsibilities, relating to fisheries and agriculture, to control introductions of plants and animals to prevent the spread of disease. Giant Hogweed, Japanese knotweed, and Himalayan Balsam have invaded riverbanks displacing native plant species. A leaflet and poster on the dangers of and control measures for giant hogweed have been produced.

Zebra mussels colonized Lough Erne in the mid 1990s and have now become firmly established. To limit the spread of zebra mussels to other lake and river systems, EHS works with other Government Departments and Agencies to carry out research and run a public awareness campaign. EHS has

recommended that Zebra Mussels are added to Schedule 9 of the Wildlife Order.

To help prevent the introduction and spread of non-native freshwater fish, invertebrates and plants to freshwater systems, EHS provides advice to other Government Departments and Agencies in relation to protected species and the release of non-native plants and animals to the wild. The Northern Ireland Biodiversity Strategy Recommendations recognized the threat to biodiversity posed by introduced species and made clear the need for an all-Ireland review and cross-sectoral approach. EHS will consider this proposal in the context of its response to the final strategy recommendations.

Climate change

EHS will commission research into the potential impact of climate change on the nature conservation value of rivers with particular emphasis on rivers with SAC status.

In taking action for biodiversity, EHS will:

12. carry out further research into the distribution and status of UK priority species which occur in rivers (*contributes to objectives 2,3, and 6*)
13. prepare a Northern Ireland species action plan for freshwater pearl mussel (*contributes to objectives 1,2,3 and 6*)
14. give a clear indication on how species and habitat action plans relating to rivers will be taken forward by 2001 (*contributes to objectives 1,2,3 and 6*)
15. grant-aid biodiversity projects that further the objectives of species or habitat action plans relevant to rivers (*contributes to objectives 1,2,3 and 6*)

16. produce a new Wildlife Order explanatory booklet to help raise public awareness of the law in relation to protected species and the release of non-native plants and animals to the wild (*contributes to objectives 2 and 6*)
17. work with other Government Departments and Agencies to carry out research and run a public awareness campaign aimed at limiting the spread of zebra mussels to other lake and river systems (*contributes to objectives 2,3 and 6*)
18. consider the Northern Ireland Biodiversity Strategy Recommendations for an all-Ireland review of introduced species and the adoption of a cross-sectoral approach (*contributes to objectives 2, 3 and 6*)
19. commission research into the potential impact of climate change on the nature conservation value of rivers with particular emphasis on rivers with SAC status (*contributes to objectives 1 and 2*)

5.5 WORKING WITH AGRICULTURE, FORESTRY AND FISHERY AUTHORITIES

Agriculture

The impacts of farming on rivers have been outlined in *section 2.4 Land use practices in the catchment*. Countryside Management Division of DARD promotes environmentally friendly working practices on farms through advice and education. DARD offers a wide range of delivery methods including provision of farm pollution risk assessments and farm waste management plans. These are supported by a range of advisory leaflets on the Code of Good Agricultural Practice for the protection of water. To maximize the

benefits of the farm pollution prevention initiative, DARD prioritizes farm visits based on information and advice from EHS on river catchments most under stress from farming activity.

Agri-environment Schemes such as the Environmentally Sensitive Areas Scheme and the Countryside Management Scheme, both administered by DARD, are designed to encourage landowners to adopt, or continue with, environmentally sensitive farming practices. Agri-environment schemes have the potential to benefit the landscape, built heritage features, water quality and habitats associated with rivers, by compensating farmers for loss of agricultural productivity and paying for positive management. To maximize the benefits of Agri-Environment Schemes, EHS provides information and advice to DARD to maintain and enhance riparian habitats and landscapes, control nutrient losses to rivers and protect built heritage features.

Forestry

About 5.5% of Northern Ireland is managed for forestry by Forest Service, DARD. Forestry within river catchments is subject to published guidelines designed to protect freshwater ecosystems during forestry operations (Forest and Water Guidelines, 3rd Edition 2000). Adherence is a requirement of the Government's UK Forestry Standard and voluntary certification under the UK Woodland's Assurance Standard. It has been pointed out in section 2.4 *Land use practices in the catchment* that the Western Sperrin Mountains and the Mourne are vulnerable to acidification. Afforestation in these areas has not been extensive and further afforestation will be subject to scrutiny under the Environmental Impact Assessment (Forestry) Regulations (Northern Ireland) 2000. EHS will liaise with Forest Service on the environmental management of its estate and decisions relating to afforestation of new areas where there may be an impact on nature

conservation, landscape or built heritage values of rivers or river corridors.

Fisheries management

DCAL, Inland Fisheries is responsible for the establishment and development of fisheries, including the carrying out of fish stock assessments, fish habitat surveys, management of fisheries habitat directly and by provision of grant aid. In support of the work of Inland Fisheries, the Agricultural and Environmental Science Division, DARD carries out research into fisheries development and management. The Fisheries Conservancy Board and the Loughs Agency are responsible for the protection and conservation of fish stocks in their respective areas. A Northern Ireland salmon management plan is being developed on a partnership basis within the jurisdiction of the Fisheries Conservancy Board aimed at enhancing the value of salmon fisheries. This also has the potential to contribute to the requirements of the EC Habitats Directive where salmon are listed as an Annex II species.

Fisheries enhancement work includes the creation or improvement of spawning beds or nursery habitat or the improvement of holding areas for adult fish to improve angling opportunities. This may involve the addition of materials such as gravel or boulders to create spawning beds or resting places, or the building of low weirs to create pools. In rivers that are highly modified, for example because of past drainage work, fisheries enhancement work can improve river structure and enhance biodiversity. In more natural river reaches, it is important that fisheries enhancement work is carefully planned so that it does not inadvertently damage natural river features and biodiversity value. It is also important that fish for stocking are sourced from local genetic stock. To ensure that fishery enhancement measures do not damage nature conservation or built heritage values of rivers or river corridors,

EHS liaises with DCAL, Inland Fisheries and other relevant Government Departments and Agencies.

In working with agriculture, forestry and fishery authorities, EHS will:

- 20. provide information and advice to DARD on river catchments most under stress from farming activity to assist in the delivery of their farm pollution prevention initiative (contributes to objectives 2,3 and 6)**
- 21. provide information and advice to DARD on Agri-Environment Schemes to maintain and enhance riparian habitats and landscapes, control nutrient losses to rivers and protect built heritage features (contributes to objectives 2,3 and 4)**
- 22. liaise with Forest Service on the environmental management of its estate and decisions relating to afforestation of new areas, where there may be an impact on nature conservation, landscape or built heritage values of rivers or river corridors (contributes to objectives 2,3 and 4)**
- 23. liaise with DCAL, Inland Fisheries and other relevant Government Departments and agencies to ensure that fishery enhancement measures do not damage nature conservation or built heritage values associated with rivers or river corridors (contributes to objectives 2,3 and 4)**

5.6 MONITORING AND REGULATING WATER QUALITY

The Water Order

The Department has a statutory duty under the Water Act (Northern Ireland) 1972 to promote the conservation of water resources and the cleanliness of water in waterways and underground strata. In performing this duty, the Department is required to have regard to the needs of industry and agriculture, the protection of fisheries, the protection of public health, the preservation of amenity value and the conservation of flora and fauna. To protect the aquatic environment, the Water Quality Unit of EHS prepares water quality management plans, controls effluent discharges, takes action to combat or minimize the effects of pollution and monitors water quality. The new Water Order (Northern Ireland) 1999 repeals and re-enacts with amendments the Water Act (Northern Ireland) 1972. The water quality provisions of the Order will come into effect in 2001.

River water quality monitoring

EHS maintains a network of river water quality monitoring stations across Northern Ireland, using both chemical and biological techniques. Rivers are monitored for a range of purposes including water quality classification, compliance with EC Directives and specific studies. Up-to date information on the river water quality monitoring programmes and the classifications can be found on the EHS website. The following reports can also be obtained from EHS:

- River Quality in Northern Ireland 1995
- A River Water Quality Monitoring Strategy for Northern Ireland

EHS is currently reviewing the possibility of using this monitoring data to assess

compliance with conservation objectives for designated rivers.

Water quality policy

EHS policy is to generally manage river, estuarine and coastal waters under adopted classification schemes with no downward movement between classes, and to maintain or improve water quality in surface waters and underground strata as required by national policy, EC Directives and international agreements. EHS will develop water quality targets, publish plans and support management activities to deliver this general policy.

Regulation of discharges

Under the Water Act, EHS operates a system of statutory consents for discharges to waterways or underground strata of trade effluent or sewage or any other noxious or polluting matter. All private waste water treatment works and discharges from single dwellings i.e. septic tanks, require a Water Act consent. Consent is refused where a discharge would result in unacceptable pollution. Where consent is granted, conditions are imposed and the discharge is monitored to ensure compliance with consent conditions.

Being part of the Crown, the Water Service is not bound by the statutory discharge consent requirements of the Water Act. Water Service sewerage systems are, however, subject to the requirements of the Urban Waste Water Treatment Regulations (Northern Ireland) 1995 and under these regulations, standards for 37 of the largest waste water treatment works will be in place by January 2001. In addition, EHS is currently in the process of setting standards for all Water Service discharges. Compliance against these standards is assessed regularly and the information is also placed on the public register. EHS is also drawing up standards for

the regulation of discharges from Water Service combined sewer overflows on sewerage systems.

Pollution incidents

Table 1 shows the total number of substantiated pollution incidents, recorded by sector category, for the years 1996 to 1999. The definitions of 'severity' are listed in the EHS report "Water Pollution Incident and Prosecution Statistics 1999". The reduction in the number of incidents achieved since 1996 was 17.4%. EHS aims to achieve a 20% reduction in the number of high and medium severity incidents by 2003 based on 1996 figures.

	1996	1997	1998	1999
Industry	525	365	435	347
Agriculture	502	549	467	438
Sewage & Water	371	351	276	347
Domestic	186	205	227	155
Transport	40	53	64	53
Other	431	300	172	166
SUBSTANTIATED INCIDENTS	2055	1823	1641	1506

Pollution response

The Department may take action to prevent water pollution or, where pollution has occurred, to remedy or mitigate the effects on waterways. The cost of such action will be recovered from the polluter as a contract debt if they can be identified. "EHS's Water Pollution Response Procedures" set out the generic guidelines for pollution response within Northern Ireland for both inland and coastal pollution.

EHS operates a round the clock water pollution hotline which enables members of the public to report pollution incidents. The hotline number, 0800 80 70 60, is well

advertised in telephone directories, newspapers and angling journals. All pollution incidents are recorded on a computerized management information system known as PILOTS (Pollution Incident Logging and Tracking System). PILOTS is networked to all field agents, including the Fisheries Conservancy Board and the Loughs Agency.

Prosecutions

The Water Act provides for a fine of up to £20,000 on summary conviction in a Magistrate's Court of a water pollution offence. On conviction on indictment, the penalty may be a term of imprisonment, an unlimited fine or both. Costs are also usually awarded against offenders for the expenses incurred in the analysis of statutory samples. An order for compensation may also be made by the court if there was a fish kill. A detailed account of fines and costs recovered in respect of incidents which occurred during 1998, is given in the 1999 Water Pollution Incident and Prosecution Statistics report. EHS will instigate prosecution proceedings for all high and medium severity pollution incidents.

Pollution prevention

EHS is actively engaged in pollution prevention measures. For example, advisory visits are made to industry and in conjunction with the Industrial Research and Technology Unit, seminars on effluent control and waste minimization are targeted at particular sectors, e.g. the food and the minerals extraction industries. EHS is involved with a number of UK inter-agency initiatives including the production of advisory leaflets, the Oil Care Campaign and a scheme for the accreditation of oil pollution response and clean up contractors. EHS is also a strong advocate and supporter of Sustainable Urban Drainage Systems (SUDS) (see section 5.10 *Developing partnerships*).

Abstraction control

There is currently no system of abstraction licensing in Northern Ireland, although EHS can oppose new development of abstraction under the planning process. EHS has also stated that groundwater baseflow contributions to surface waterways (e.g. rivers/ lakes and wetlands) should be maintained at an acceptable level in the document "Policy and Practice for the Protection of Groundwater in Northern Ireland." Under the new Water Act EHS will have powers to create regulations to control water abstraction and will keep this under review. EHS has exerted a degree of control on water abstractions by including volume limits in Water Act consents to discharge.

EC Water Framework Directive

The EC Water Framework Directive (WFD) came into effect in December 2000. The purpose of the WFD is to establish an overall framework for the integrated protection of surface waters and groundwaters based on the river basin, the natural unit for the management of water. To transpose the requirements of the Directive into domestic legislation, it will be necessary to prepare Regulations for Northern Ireland.

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, hydromorphological and physico-chemical characteristics. As a result of the proposed WFD, it will be necessary for new methods for assessing ecological quality to be developed across the community. EHS will commission and collate research to meet the requirements of the WFD relevant to Northern Ireland.

The WFD will also require Member States to establish a register of areas designated as requiring special protection under specific EC legislation, including those sites designated for conservation of habitats or

species directly dependent on water. In this way, this Directive will integrate the requirements of the EC Birds (79/409/EEC) and the EC Habitats (92/43/EEC) Directives. Member States must also achieve compliance with any standards and objectives relating to these Protected Areas not later than 15 years after adoption, unless otherwise specified in other Community legislation. Many of the proposed Special Protection Areas (SPAs) and SACs designated under the latter two EC Directives respectively and forming the Natural 2000 sites in Northern Ireland, may have a water dependent element in their designation.

Catchment management planning

Water Quality Management Strategies have been proposed by EHS for the Lagan catchment and jointly with the Department of Environment and Local Government in the Republic of Ireland for the Foyle and Erne catchments. These strategies report on past and present water quality status, examine the demands and impacts of various uses within the catchments and set out management options to address a range of water quality issues. To ensure that important issues are being progressed, EHS will review the Foyle, Erne and Lagan proposed water quality management strategies to examine progress since their production and produce prioritized action plans in support of agreed water quality targets.

Under the WFD, it will be a requirement to prepare River Basin Management Plans. These plans will set out targets for "good status" and the measures necessary to achieve them. Good status has yet to be precisely defined but will be measured against the WFD monitoring system that is being developed. These plans will be strategic in nature and will provide a framework to report to the European Commission. As the WFD defines Ireland as one "ecoregion", River Basin Management Plans will be prepared on a cross-border basis. There will still be a

need to address river catchment planning at a local level.

Eutrophication and action to control nutrient enrichment

EHS published a consultation paper in September 1999, which gave an overview of the problem in Northern Ireland's waters and outlined many of the nutrient control activities presently being supported by all sectors of the community. It also proposed many other actions that could be supported to further alleviate this most serious situation. The key aim is to control and reduce the surplus of nutrients in the aquatic environment, especially phosphorus.

EHS will publish a strategy to control nutrient enrichment in Northern Ireland's waters. The strategy will include the establishment of a eutrophication action team, with partners in other Departments and Agencies, to lend active support to many nutrient control measures and the delivery of an education and awareness programme. In particular, the promotion of "best management practice" and of "reduced or zero nutrient" commodities will be supported. Nutrient recovery and trapping systems will also be promoted.

In monitoring and regulating water quality, EHS will:

- 24. maintain a network of river water quality monitoring stations across Northern Ireland using both chemical and biological techniques (*contributes to objectives 1,2 and 3*)**
- 25. review the possibility of using water quality monitoring data to assess compliance with conservation objectives for designated rivers (*contributes to objectives 1,2 and 3*)**
- 26. set standards for all Water Service discharges and place these on a public register (*contributes to objectives 2,3 and 6*)**

27. aim to achieve a 20% reduction in the number of high and medium severity pollution incidents by 2003 based on 1996 figures (*contributes to objectives 2 and 3*)
28. instigate prosecution proceedings for all high and medium severity pollution incidents (*contributes to objectives 2 and 3*)
29. take emergency action to prevent water pollution in appropriate cases or, where pollution has occurred, to remedy or mitigate the effects on waterways (*contributes to objectives 2 and 3*)
30. continue a programme of proactive pollution prevention (*contributes to objectives 2,3 and 6*)
31. keep powers to create regulations to control water abstraction under review (*contributes to objectives 1,2 and 3*)
32. commission and collate research to meet the requirements of the WFD relevant to Northern Ireland (*contributes to objectives 1,2 and 3*)
33. review the Foyle, Erne and Lagan proposed water quality management strategies (*contributes to objectives 2 and 3*)
34. publish a strategy to control nutrient enrichment in Northern Ireland's waters (*contributes to objectives 2, 3 and 6*)

5.7 RECORDING AND PROTECTING HISTORIC MONUMENTS AND BUILDINGS

Working with other Government Departments and Agencies

Much of the activity in protecting historic monuments and buildings associated with

rivers and river corridors is achieved through working with other Government Agencies as described in sections 5.1 *Working with Planning Service* and 5.2 *Working with Rivers Agency* respectively.

Recording historic monuments and buildings

EHS maintains the Monuments and Building Record which makes available to the public, information on sites of archaeological interest contained in the Northern Ireland Sites and Monuments Record, on listed and other historic buildings and structures, industrial heritage features and historic parks, gardens and demesnes. EHS will continue to record and provide information and advice to Government Departments and Agencies and the public on the full range of Built Heritage features in Northern Ireland. Where ancient routeways cross rivers there may be archaeological evidence of bridges, fords and other interesting finds. EHS will research routeways crossing rivers and highlight their potential for further investigation and possible protection.

Protecting historic monuments and buildings

Historic monuments are scheduled under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 according to several criteria, including period, rarity, group value, diversity, fragility and excavation potential. Scheduled Monument Consent is required from EHS for any activities which would result in their demolition, destruction or disturbance, or for any removal, repair or alteration. Deliberate flooding or tipping on a scheduled historic monument is also prohibited.

Buildings of special architectural or historical interest are protected by listing under the Planning (Northern Ireland) Order 1991. Any proposed changes that might affect the character of either the exterior or interior of these buildings are controlled by statute and

require listed building consent and/or planning permission.

Protecting archaeological finds

Under the Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995, all archaeological excavations are licensed by EHS. The law also requires that all archaeological finds be reported. It is an offence to search for archaeological objects without a licence and also not to report archaeological finds within fourteen days. It is also an offence to be in possession of a metal detector on a scheduled historic monument and EHS actively campaigns to highlight the damage caused by unlicensed treasure hunting and prosecutes offenders.

Re-watering of canals

There is an ongoing debate about re-watering some of Northern Ireland's disused canals. This raises a number of natural and built heritage issues. For example, a canal linking the Lough Erne and Lough Neagh systems would spread the non-native zebra mussel and there may be losses of built heritage features from the original infrastructure through the re-engineering process. No decision has been taken in regard to these but EHS will support plans to re-water canals where these proposals are conservation based and take due account of both the natural and built heritage.

In protecting historic monuments and buildings, EHS will:

- 35. record and provide information and advice to Government Departments, Agencies and the public on the full range of Built Heritage features in Northern Ireland (contributes to objective 4 and 6)**
- 36. research routeways crossing rivers and highlight their potential for further investigation and possible protection (contributes to objectives 1 and 4)**

- 37. protect important archaeological features and historic buildings associated with rivers and river corridors (contributes to objectives 1 and 4)**
- 38. actively campaign to highlight the damage caused by unlicensed treasure hunting on rivers and river corridors and prosecute offenders (contributes to objectives 4 and 6)**
- 39. will support plans to re-water canals where these proposals are conservation based and take due account of both the natural and built heritage (contributes to objectives 1,2,3 and 4)**

5.8 SUPPORTING RIVER ACCESS AND RECREATION

Balancing public access and river conservation

The provision of public access to rivers has an important role to play in helping people understand and value the natural and built heritage qualities of rivers. EHS supports the provision of public access to rivers but recognises that the provision of access infrastructure and the activity generated by enhanced access has the potential to disturb wildlife and damage river features of conservation value. In recognition of the need to foster public access in an environmentally sustainable way, EHS, in partnership with the Sports Council for Northern Ireland, has now established the Northern Ireland Countryside Access and Activities Network (CAAN). The network is based on the recommendations of the Northern Ireland Countryside Recreation Strategy published in 1998. Its aims include, amongst other things, ensuring that the recreational use of the countryside is managed in a way that reduces conflict between the various users and that environmental damage

caused by such use is minimized. The network has a small team of dedicated staff. In the context of this Strategy, EHS will continue to support CAAN in their role of developing river based recreation activities in an environmentally sustainable way.

Promotion of riverside access

District councils are actively involved in promoting countryside recreation and tourism activity. This sometimes involves developing and promoting access along rivers for anglers and walkers. To support this work, EHS provides information and advice to district councils in exercising their duties and powers under the Access to the Countryside (Northern Ireland) Order 1983.

EHS may also grant aid individual projects promoted by district councils under the Access Order. EHS assesses such applications under published criteria and preferably in the context of countryside access strategies prepared by district councils for their respective areas. EHS expects that all proposals are shown to be environmentally sustainable. An example of good practice is that a corridor of vegetation separates pathways from the river with only occasional viewpoints going close to the water.

Water-based recreation and navigation

DCAL has custodial responsibility for those abandoned Northern Ireland waterways in Government ownership, primarily the Lagan Navigation and Coalisland Canal. DCAL has a strategic objective to develop the navigational/recreational potential of these inland waterways as well as providing water recreation facilities for public use on any waterway.

Waterways Ireland is responsible for the management, maintenance, development and restoration of the inland navigable waterway system throughout the island, principally for recreational purposes. Departmental responsibility for Waterways Ireland rests

with DCAL in Northern Ireland and the Department of Arts, Heritage, Gaeltacht and the Islands in the Republic of Ireland.

EHS will liaise with DCAL, Inland Waterways and Waterways Ireland to ensure that water-based recreation or navigation developments do not adversely impact on nature conservation, landscape or built heritage values in relation to rivers and river corridors.

In supporting river access and recreation, EHS will:

- 40. support CAAN in their role of developing river based recreation activities in an environmentally sustainable way (*contributes to objectives 5 and 6*)**
- 41. provide information and advice to district councils (*contributes to objectives 1,2,3,4 and 5*)**
- 42. provide grant aid for the provision of environmentally sustainable access to rivers where applications meet relevant criteria (*contributes to objectives 5 and 6*)**
- 43. liaise with DCAL, Inland Waterways and Waterways Ireland to ensure that water-based recreation or navigation developments do not adversely impact on nature conservation, landscape or built heritage values in relation to rivers and river corridors (*contributes to objectives 1,2,3 and 4*)**

5.9 PROMOTING EDUCATION AND PUBLIC AWARENESS

Education and awareness role

EHS has statutory responsibilities for various aspects of river conservation and gives advice

to other Government Departments and Agencies. Much of this work though, would be ineffective without public support and EHS recognises the need to influence the formal education sector and also to help the general public understand and appreciate the natural and built heritage values of rivers.

Education

There is some river conservation educational material on the market but none integrating natural and built heritage values and none based on examples from Northern Ireland. EHS will seek appropriate partners to develop river based educational material, possibly in CD-ROM format. EHS will also support others in promoting education and public awareness by providing grant aid for river conservation based educational and interpretative material where applications meet relevant criteria.

EHS seeks to influence others involved in delivering environmental education and will ensure that advisors in the Education and Library Boards are aware of river conservation issues.

Public awareness

Providing relevant information is a key part of raising awareness of river conservation issues. EHS publishes Northern Ireland water quality and pollution incident reports and has produced a series of leaflets on topics including water quality monitoring, pollution prevention advice, rivers and archaeology, zebra mussels and lampreys. EHS will continue to produce publications relevant to river conservation and will seek partners to produce a handbook on river conservation detailing government responsibilities, good practice management and ways that people can get directly involved in aspects of managing their local river. EHS will also put

relevant river conservation information on the EHS website and will run river conservation based events through its events programme.

In promoting education and public awareness, EHS will:

44. **seek partners to develop river conservation based educational material, possibly in CD-ROM format** (*contributes to objective 1,2,3,4,5, and 6*)
45. **provide grant aid for river conservation based educational and interpretative material** (*contributes to objective 1,2,3,4,5, and 6*)
46. **ensure that advisors in the Education and Library Boards are aware of river conservation issues** (*contributes to objective 1,2,3,4,5, and 6*)
47. **produce publications relevant to river conservation and seek partners to produce a handbook on river conservation** (*contributes to objective 1,2,3,4,5, and 6*)
48. **put relevant river conservation information on the EHS website** (*contributes to objective 1,2,3,4,5, and 6*)
49. **promote river conservation based activities in the EHS events programme** (*contributes to objective 1,2,3,4,5, and 6*)

5.10 DEVELOPING PARTNERSHIPS

Working with other Government Departments and Agencies

Other sections of this Strategy highlight various relationships that EHS has, or will establish, with other Government Department and Agencies to help deliver river conservation objectives. Some of EHS's other partnership work in relation to river conservation is detailed below.

Area based management structures

One mechanism for working in partnership is through area based management structures. Examples of area based management structures whose brief includes at least some element of river conservation include;

- Lough Neagh Advisory Committee/Lough Neagh Co-ordinating Committee
- Lower Bann Advisory Committee/Lower Bann Co-ordinating Committee
- Lough Erne Advisory Consultative Group/Lough Erne Management Liaison Committee

Each has an advisory tier made up of user and interest groups with a parallel committee made up of relevant statutory bodies. DCAL acts as the lead agency for the Lough Erne and Lower Bann management structure and EHS for the Lough Neagh management structure.

Catchment management planning initiatives

A number of catchment management planning initiatives are active. Examples include the Erne Sustainable Wetlands Project funded by European Life and other funders, the Lough Melvin catchment project led by the Northern Regional Fisheries Board, supported by a range of agencies including EHS and the

Lough Neagh Management Strategy, involving EHS in partnership with other agencies. EHS will continue to support catchment management planning initiatives such as these where there is an opportunity to progress the objectives of this Strategy.

Cross border co-operation

Under the North South Ministerial Council, a Water Quality Working Group has been established composed of officials from both jurisdictions to take forward co-operation on water quality management issues as mandated by Ministers. Several potential areas for environmental co-operation have been agreed, so far. Work currently being undertaken includes preparation for implementation of the EC Water Framework Directive and a review of the proposed water quality management strategies for the Erne and Foyle river systems.

Public participation

EHS also recognizes that local people have a keen interest in their local rivers and wish to actively participate in activities that influence how these rivers are managed. Angling clubs are often involved in this type of work but district councils, through the Agenda 21 process, tourism, recreation access and other local interests also have a key role to play in supporting and advising local communities. A number of local river action groups already exist. To facilitate local participation in issues relating to rivers and the promotion of best management practice, EHS will seek partners to publish guidance on who does what in relation to rivers, what can be done in terms of best management practice and where to get further information. This guidance will also be made available on the EHS website.

Provision of grant aid

EHS provides grant aid support for environmental projects with elements of biodiversity, countryside access,

environmental education or community involvement. EHS will provide grant aid to support organisations or individuals wishing to carry out projects that further the objectives of this Strategy that meet relevant criteria.

Sustainable Urban Drainage Systems (SUDS)

Rivers in urban areas are often highly modified. Urban rivers may be canalized, have hard man-made banks or be culverted underground. Urban catchments have a high proportion of impermeable surfaces with the effect of increasing rates of surface water run-off and thus increasing the risk of flooding. These man-made modifications to urban rivers and their catchments damage the natural structure of rivers, resulting in the loss of the natural in-stream and riparian habitats, unnaturally extreme flows and poor water quality. It is possible to avoid many of these undesirable impacts by applying good practice principles where urban development is taking place. Techniques used include the use of permeable surfaces to increase infiltration rates to groundwater, use of wide grassed drains and retention ponds, rather than pipes, to slow down water release to watercourses and the use of natural processes to break down contaminants. The term Sustainable Urban Drainage Systems (SUDS) has been coined for this approach. EHS will promote the concept of SUDS to other Government Departments, Agencies and individuals including Water Service, Roads Service, Planning Service, Rivers Agency, Building Control Officers, conservation groups, developers, architects and others as appropriate.

Litter abatement

EHS has published a detailed guidance note on tackling the illegal fly tipping of waste, which includes litter. This has been produced as part of its support role to district councils

but is also relevant to others involved in tackling the issue, and the document is available on the EHS website. EHS also provides support to the work of Tidy Northern Ireland and others in their educational and awareness raising activities. (An example of a local initiative is the Bryson House Belfast Hills Watch Scheme.)

In working with others, EHS will:

- 50. continue support for area based management structures (*contributes to objectives 1,2,3,4,5 and 6*)**
- 51. support catchment management planning initiatives where there is an opportunity to progress the objectives of this Strategy (*contributes to objectives 1,2,3,4,5 and 6*)**
- 52. support the North South Water Quality Working Group (*contributes to objectives 1,2,3,4,5 and 6*)**
- 53. seek partners to publish guidance on who does what in relation to rivers, what can be done in terms of best management practice and where to get further information (*contributes to objectives 1,2,3,4,5 and 6*)**
- 54. provide grant aid to support organisations or individuals wishing to carry out projects that further the objectives of this Strategy (*contributes to objectives 1,2,3,4,5 and 6*)**
- 55. promote the concept of SUDS to other agencies and individuals (*contributes to objectives 1,2,3,4, and 6*)**
- 56. support district councils and others in their work to control fly tipping and litter (*contributes to objectives 1,2,3,4,5 and 6*)**

GLOSSARY AND ABBREVIATIONS

ASSI – Area of Special Scientific Interest.

Biodiversity – (Biological Diversity) – the variety of life, as indicated by the number of species present.

Buffering Capacity – Capacity of the rocks to reduce the impact of acidification.

CAAN – Countryside Access and Activities Network.

Competent authority – A Government Department or other Agency designated to carry out responsibilities during the implementation or enforcement of specific legislation.

DARD – Department of Agriculture and Rural Development.

DCAL – Department of Culture, Art and Leisure.

DETR – Department of the Environment, Transport and the Regions.

DOE – Department of the Environment.

EC Directive – Legislation issued by the European Commission, which requires a Member State to implement its requirements, for example to achieve specified environmental standards.

Ecosystem – A biological community of interacting organisms and their physical environment.

EHS – Environment and Heritage Service.

Eutrophic – A description of water which is of rich nutrient status and high biological productivity.

Eutrophication – The process of nutrient enrichment of water together with the biological changes it causes.

Floodplain – The low relief area of valley floor adjacent to a river that is periodically inundated by flood waters.

Habitat – The natural home of an organism.

Invertebrates – Animals without a backbone, e.g. insects, snails.

Macrophyte – Any plant large enough to be seen with the unaided eye, including all higher water plants, together with some algal species.

Mesotrophic – A description of water which is of medium nutrient status and medium biological productivity.

PILOTS – Pollution Incident Logging and Tracking System. A computer based system to provide information regarding source, type and cause of water pollution incidents.

Precautionary principle – The principle that when there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing action. The distinction between precautionary and preventative action is that action is precautionary if scientific certainty is lacking.

Reach – A length of river channel.

RHS – River Habitat Survey developed by the Environment Agency, England and Wales.

Riparian – Bankside and immediately adjacent land.

SAC – Special Area of Conservation.

SERCON – System for Evaluating Rivers for Conservation.

Spawning – Spawn – produce as eggs or young.

SUDS – Sustainable Urban Drainage Systems.

Suspended solids – Undissolved matter carried in the water column.

WFD – EC Water Framework Directive

Environment & Heritage Service
Natural Heritage
Commonwealth House
35 Castle Street
Belfast BT1 1GH
Tel: (028) 9025 1477 – Fax: (028) 9054 6660
Website [http:// www.ehsni.gov.uk](http://www.ehsni.gov.uk)

Environment & Heritage Service
Environmental Protection
Calvert House
23 Castle Place
Belfast BT1 1FY
Tel: (028) 9025 4750 – Fax: (028) 9025 4865
Website [http:// www.ehsni.gov.uk](http://www.ehsni.gov.uk)

Environment & Heritage Service
Built Heritage
5-33 Hill Street
Belfast BT1 2LA
Tel: (028) 9023 5000 – Fax: (028) 9054 3111
Website [http:// www.ehsni.gov.uk](http://www.ehsni.gov.uk)



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