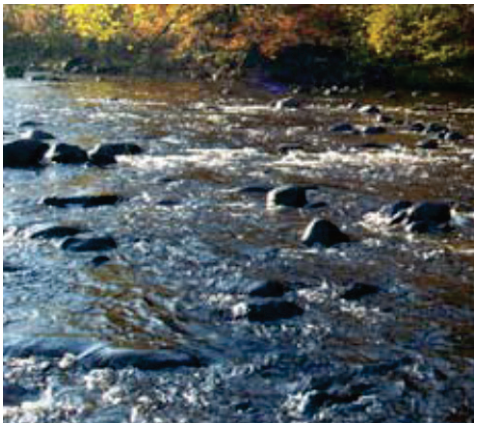
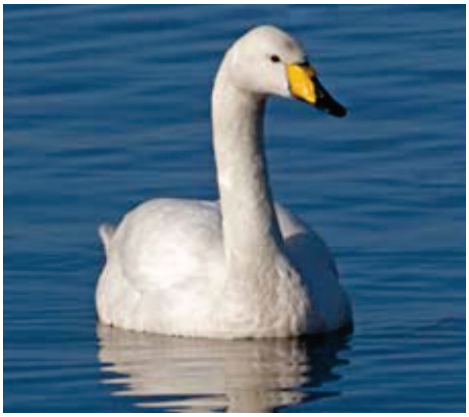
Delivering the programme of measures in the Northern Ireland River Basin Management Plans

A progress report for the North Western, Neagh Bann and North Eastern River Basin Districts 2012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Executive summary

Across Northern Ireland, within the North Western, Neagh Bann and North Eastern river basin districts, we are broadly on track to implement the measures we identified as necessary by 2015. This interim report summarises the good progress made to date in putting in place the programme of measures described in the first river basin management plans which were published for each river basin district in 2009. Our aim in the plans was to provide a clean, healthy environment which would deliver considerable benefits for all the people of Northern Ireland in the 21st century. This is in line with the Department of the Environment strategic objective *"To create prosperity and well-being through environment and heritage excellence."*

The progress made to date is a result of the co-ordinated efforts of a range of responsible authorities, stakeholders and the many businesses that use the water environment. Some of the measures completed so far have delivered many benefits, including biodiversity enhancement and improved fisheries. Securing such social, economic and environmental benefits, services that the water environment's ecosystems provide, is an important goal of river basin management planning and one that stakeholders have assisted in achieving.

Funding for implementation of all the measures has been provided through a mix of public, private and third party funding including European grant aid and additional support provided through the Water Quality Improvement Grant from the Department of the Environment.

Some of the main successes include measures to address nutrient enrichment, or eutrophication, of the water environment. This is a problem throughout Northern Ireland however due to actions taken largely since the introduction of the Nitrates Action Programme Regulations (NI) 2006 and also the Phosphorus (use in Agriculture) Regulations (Northern Ireland) 2006, the trend of average concentrations of phosphorus in rivers indicates that levels are either stable or decreasing.

Considerable progress has been made setting up structures at a local level to facilitate implementation of the programme of measures. Each of the three river basin districts has been divided into three Catchment Stakeholder Group areas with a dedicated Catchment Management Officer working in each area. This network of groups across Northern Ireland provides a structure to deliver effective stakeholder engagement and encourage the development of partnership working. Each river basin district has also been subdivided into nine local management areas. Local action plans to cover each of the local management areas has been developed and are currently being implemented. The plans include, for example, a programme of river walks to target known problem areas or high risk areas within a catchment with a view to putting in place additional measures to address the problem.

The Department of the Environment has dedicated resources to facilitate the establishment and development of rivers trusts. Rivers Trusts have a proven record of delivering practical

implementation projects on the ground and attract external funding. Throughout Northern Ireland a number of river trusts are emerging as a means of engaging the local community to take action and assist in delivery of measures to improve the water environment.

Progress has also been made in relation to developing water quality models for each of the river basin districts. A SIMCAT (SIMulation of the water quality of CATchments) model has been developed which represents the behaviour of flow and pollutants in the rivers. It will assist greatly with the management of point and diffuse sources. A modelling tool specifically for lakes is also being developed for Lough Neagh as part of a European funded project "Development of Lake Management Tools".

Although good progress has been made it is clear however that discussions are still ongoing in many areas to develop and implement the appropriate solutions, and that work is still required to make the necessary environmental improvements. In particular, increased effort and resource is required to improve the assessment of the chemical status of the water environment with regards to priority substances. More work is needed to assess and understand diffuse pollution sources and the associated options for managing this pressure. Implementation of measures to improve the physical characteristics of our rivers, estuaries and coastal waters has proved to be a challenging area. Tackling modifications of the beds, banks and shores of surface waters is technically difficult and also requires co-ordinated partnership action across catchments. Progress has however been made developing a tool for assessing the extent to which barriers impede fish migration.

In addressing the threat of invasive alien species, action plans, contingency plans and best management practice guidance have been developed for a wide range of invasive species through the Invasive Species Ireland Project. These plans provide advice in taking forward action to tackle the problem of invasive alien species. In implementing these management plans action has taken place across many parts of Northern Ireland as a result of efforts by government departments, land owners, anglers, local councils, environmental non-governmental organisations, local community groups and rivers trusts. Action undertaken has included controlling the growth of invasive plant species such as Japanese knotweed and giant hogweed on river banks in a number of catchments. Progress has also been made in taking forward a partnership project to control the invasive intertidal grass species common cord grass (*Spartina anglica*). Whilst much progress has been made in recent years in taking forward management action for a range of invasive species, control is however extremely difficult in many catchments due to the nature of the habitats in which the invasive species occur, resource availability and the availability of an effective and suitable control option for some invasive species. This is particularly the case for submerged invasive aquatic plants and Zebra mussels.

This report demonstrates that we are moving in the right direction but more action is still required to meet both our short and long term objectives to protect and improve the water environment. We need sustainable solutions that take account of economic and social needs as well as environmental needs. We also need to continue to work with our colleagues in Ireland to ensure the shared water catchments in the North Western and Neagh Bann International River Basin Districts are being managing in a co-ordinated manner to ensure objectives for our shared rivers, lakes estuaries and coastal waters are achieved.

1. Introduction

The first river basin management plans (RBMP)[1] for the North Western, Neagh Bann and North Eastern river basin districts in Northern Ireland were published in 2009. The plans set out targets for the protection and improvement of the water environment within each of the districts, and describe how we in Northern Ireland, planned to achieve those targets through the implementation of measures to prevent deterioration and to tackle the impacts of existing pressures.

This interim report is for responsible authorities and stakeholders. It summarises progress to date in putting in place the programme of measures described in the first river basin management plans.

A technical report was submitted in December 2012 to the European Commission, as required by the Water Framework Directive, outlining our progress to date of implementing the measures.

The implementation of the programme of measures is the responsibility of a wide range of stakeholders, government departments and responsible authorities including for example the Department of the Environment (lead co-ordinating Department), Department of Agriculture and Rural Development, Department for Regional Development and the Department of Culture Arts and Leisure. Northern Ireland Water, Loughs Agency, the Northern Ireland Fishery Harbour Authority, Belfast Harbour Commissioners and a number of other responsible authorities, public bodies and stakeholders also have a key role.

The types of measure needed to improve and protect the water environment are very diverse. They range from buffer strips, nutrient management, changes in sewage treatment, control of chemical use and removal or easement of fish barriers to techniques to control invasive alien species. We have a long history of managing some of the pressures, with clear planning processes and well defined roles and responsibilities. For other pressures such as diffuse pressures and addressing physical pressures on beds, banks and shores we will continue to work with our water policy colleagues and other stakeholders to ensure we have the necessary controls in place to manage these pressures.

We have carried out a wide range of partnership activities both within and outside of government. We will continue to work with stakeholders to ensure efficient and effective delivery of our Water Framework Directive targets.

[1] http://www.doeni.gov.uk/niea/water-home/wfd.htm

2. Improving the water environment

2.1 Managing pressures on water quantity

There has been good progress with the implementation of measures to address pressures on water flows and levels following the introduction of the Water Abstraction and Impoundment (Licensing) Regulations (NI) in 2006. These regulations aim to provide a single and consistent environmental risk based approach to the assessment and authorisation of water abstraction and impoundment activities within Northern Ireland.

Table 1: Progress on issuing licenses to manage flows and levels in Northern Ireland

	Number of abstraction and impoundment authorisations issued by May 2013		
	Not started	**Ongoing**	**Complete**
Number of abstraction and impoundment authorisations issued	0	386	240

There are two levels of authorisations; Permitted Controlled Activities which apply to small scale activities which present a minimal risk and then licenses which apply to activities which are likely to pose a greater risk[2]. Table 1 shows that 240 abstraction and impoundment authorisations have been issued to date and 386 authorisations are ongoing which means that the issuing of the license is underway but not complete. To date there is a 92% compliance rate for all authorisations issued.

To manage water usage effectively we need to understand how much water is available and where it is available after considering the needs of the environment. NIEA have acquired a new hydrological model called Low Flows Enterprise ™ (LFE). The model is being used to refine the hydrological classifications carried out for the river basin management plans and to assign water resource availability for up to 18,000 river stretches within Northern Ireland. It is being used to develop water resource strategies within catchments to assist with determining flows for regulatory purposes in support of issuing licenses through the abstraction and impoundment licensing regulations.

[2] http://www.doeni.gov.uk/niea/water_abstraction_impoundment_guidance_for_abstractions_and_impoundments.pdf

Since the river basin management plans were published research has continued in association with other agencies across the United Kingdom to assess the ecological impacts of changes in hydrology, including water transfers. Work is continuing on a project to examine the pressures associated with water resource management activities and how biological indicators respond to such pressures. This research includes field testing survey techniques to inform the development of a flow optimisation framework. The framework will provide appropriate recommendations for mitigation measures to be adopted for managed flow regimes with specific ecological impacts. Research is also continuing to develop our understanding of the relationships between groundwater abstractions and the associated impact on surface waters.

Case study – Northern Ireland Water "Water Efficiency Plan"

Northern Ireland Water supplies approximately 710 million litres of high quality drinking water each day to Northern Ireland's 1.7 million population, with each person using an average 150 litres per day. Research has indicated that demand will increase over the next twenty years. Water is a valuable resource and it makes sense to use it wisely and reduce waste as much as possible. The Water Efficiency Plan describes how Northern Ireland Water is promoting the efficient use of water throughout Northern Ireland.

Water efficiency measures within the plan include:

- Promotion both within Northern Ireland Water and externally the efficient use of water;
- Utilise local media to raise public awareness about water efficiency;
- Extensive schools and community education programmes which are used to raise the awareness about water efficiency;
- School education programme highlights the potential for water reduction usage in schools;
- Northern Ireland Water will seek to engage with other public and private bodies to promote water efficiency;
- Utilisation of the company's website; and
- Public education including; leaflets and brochures, public displays, public speaking engagements, editorials, exhibitions and events

Northern Ireland Water is also striving to reduce leakage from its infrastructure to the Economic Level of Leakage. This is a calculated level of leakage at which any further reduction in the leakage level would incur costs in excess of the benefits derived from the savings. Despite the two cold winters experienced in 2009/10 and 2010/11 Northern Ireland Water has continued to make good progress in reducing leakage across the network. Leakage activity resulted in a reported leakage figure of 168.23 ML/day compared to a target of 171 ML/day in 2012.

2.2 Managing pressures on water quality

The programme of measures includes the requirements of European legislation relating to the protection of bathing waters, water used for shellfish production, water affected by nitrate pollution from agriculture, waters subject to discharges of waste water and waters important for the conservation of protected habitat and species. The legislative requirements for these Directives have been met.

Sewage and industry

Action to address point source pollution is carried out through the process of licensing consents to discharge. Under the Water Order (Northern Ireland) 1999 it is an offence to discharge trade or sewage effluent to waterways or water in underground strata without the consent of the Department of the Environment. The Northern Ireland Environment Agency administers a system of discharge consents which lay down conditions relating to the quality and quantity of effluent that may be discharged.

The programme of measures for the first River Basin Management Plans cycle included an action to review all consents to ensure the conditions being set were compliant with the Water Framework Directive objectives. The Northern Ireland Environment Agency is currently undertaking a review of all consents. There has been significant progress in drafting Water Framework Directive compliant standards for all wastewater treatment works serving a population equivalent of greater than 250. An operational policy has been drafted to outline these standards. A new catchment model known as SIMCAT (SIMulation of the water quality of CATchments) has been developed for Northern Ireland to look at cumulative impacts of discharges at a catchment scale. This model was completed in 2012 and should inform the basis for reviewing consents on a catchment scale. All new industrial consents issued by the Northern Ireland Environment Agency are compliant with the Water Framework Directive objectives.

Wastewater treatment works and networks have been prioritised based on their performance for investment under the Northern Ireland Water Capital Investment Programme, known as Price Control process. During the 2010 and 2013 Price Control process £840 million of investment has been made by Northern Ireland Water. This investment will improve water quality through upgrades to wastewater treatment works, elimination of unsatisfactory intermittent discharges and improvements to rural wastewater treatment works. A prioritised list of wastewater treatment works has been produced by the Northern Ireland Environment Agency and Northern Ireland Water for inclusion in an investment programme for 2015 and 2021. The prioritisation of sewerage networks is ongoing.

Work has also been carried out by Northern Ireland Water and the Northern Ireland Environment Agency to identify potential development constraints with regard to the capacity of current wastewater treatment works and the associated capacity in the water environment. Further discussion will be required on how this process can be implemented.

The Northern Ireland Environment Agency is continuing to develop a consenting policy in relation to discharge consents which promotes the installation of reed beds and constructed wetlands for treatment of sewage and industrial effluent. A European funded project commenced in 2011 with the aim of providing scientific evidence on the effectiveness and sustainability of using fast growing energy crops in particular Short Rotation Copice willow for the treatment of organic effluents. This study will inform the development of the consenting policy in this area.

Septic tanks

Since 2009 the Northern Ireland Environment Agency has carried out research to examine legislative requirements and responsibilities and identification of best practice in relation to septic tanks. Following on from this research the current process for handling domestic consent applications for septic tanks has been reengineered and a new application process supported by operational guidance has been implemented since the end of January 2012. Domestic septic tank enforcement inspections are currently being targeted towards sites with known pollution problems. A risk assessment process has been developed to identify septic tanks which sit in areas of poor water quality and high groundwater vulnerability which will inform a Northern Ireland wide septic tank inspection plan. This is to be piloted in May 2013. Given the high number of septic tanks in Northern Ireland, estimated over 120,000, it will take considerable time to measure improvements as a result of this new system.

Agriculture

Throughout Northern Ireland actions taken largely since the introduction of the Nitrates Action Programme Regulations (NI) in 2006 and also the Phosphorus (use in Agriculture) Regulations (Northern Ireland) in 2006 have contributed significantly to the either stable or decreasing average concentrations of phosphorus in rivers[3]. The programme of measures included additional measures in relation the agricultural sector and good progress has also been made in relation to these measures.

A voluntary agreement to lower phosphorus levels in animal feedstuffs has been made between the Department of Agriculture and Rural Development and the Northern Ireland Grain Trade Association, which represents the main animal feed supply companies in Northern Ireland. This, along with the reduced use of phosphorus fertilisers, has resulted in

[3] http://www.doeni.gov.uk/index/protect_the_environment/water/nitrates_.htm

a reduction in the phosphorus balance for Northern Ireland agriculture. Balancing the phosphorus budget reduces the risk of phosphorus contamination of our waterways.

A research project has been commissioned to investigate reduced levels of phosphorus inputs on farms and its effect on long term crop performance and sustainability. Lower phosphorus inputs have also been encouraged through advice and promotion of the Manure Efficiency Technology Scheme. A total of 232 advanced slurry systems were grant-aided during 2010-2012. Recent research has found that the average phosphorus balance of agriculture within Northern Ireland has reduced from 16.3kg P/ha in 2003 to 10 kg P/ha in 2010. This should result in a significant reduction in the contribution of phosphorus inputs to inland waters from agriculture. Estimated nutrient budgets have been completed for eight catchments. Further work will be needed to establish nutrient loadings for the remaining catchments and to assess trends in these catchments.

Targeted catchment activities to address diffuse agriculture

The river basin management plans for Northern Ireland are being implemented at a local level through the development of 26 local management area action plans. The 26 plans which are currently operational include actions to identify diffuse pollution from agricultural sources. Identified farms are then targeted for advice and regulatory action. Targeted engagement is also provided through a network of nine Catchment Stakeholder Groups across Northern Ireland. A range of pollution prevention initiatives targeted at improving education and awareness and advice to the public are conducted, including issues such as hazardous chemical use and disposal.

Since the beginning of 2009 the Department of Agriculture and Rural Development, Countryside Management Delivery Branch, has published a total of 25 press articles dealing with pollution prevention and the more efficient use of farm nutrients on farms. In addition to this, one to one farm nutrient and waste management advice was given to approximately 2,000 farmers from late 2008 - 2012. During this time the Department of Agriculture and Rural Development advisers also developed and delivered a poster campaign, providing a targeted dimension to Water Framework Directive awareness raising and advice for farmers. The poster highlighted farmer contributions to the implementation of the local management area action plans by featuring best practice in relation to farm nutrient and waste management on farms in nine local management areas.

Training on farm nutrient and waste management was delivered to more than 1,500 farmers through the Department of Agriculture and Rural Development College of Agriculture, Food and Rural Enterprise workshops during the period 2009 – 2012.

Further work is required in the area of diffuse pollution. Several projects have been undertaken to investigate the contribution of diffuse sources of nutrients to the water environment for example land use modelling of sources of nitrate and the assessment of

nutrient loads to lakes, estuaries and sea loughs. This information will be used to inform the development of a diffuse pollution model. Results from investigative monitoring and passive samplers may also provide information on diffuse sources of pesticides and other trace organic substances.

Forestry

The Forest Service continues to use the Forest and Water Guidelines to reduce and prevent diffuse pollution impacts from forestry on the water environment. Existing legislation, binding environmental codes of practice and guidelines all play a major role in protecting water quality in forested areas. Five new forestry measures have been completed in the first river basin management cycle. Forest Service Management Plans are now in place for all Forest Service woodlands. The plans provide the basis for sustainable forest management. They cover the whole range of major forest operations including harvesting, planting, aerial fertilising and road making. Clear proposals for the management of riparian areas are an integral part of all the plans. The multiple benefits of riparian native woodland are increasingly being recognised and the creation of more wet woodlands including floodplain forests is also a target in UK Biodiversity Action Plans. The planting of private woodlands is being encouraged through forestry grant schemes. Maps have also been produced in co-operation with other agencies showing where afforestation should be encouraged. The maps indicate where forests should be developed taking account of sensitive and protected areas.

Urban

Good progress has been made in relation to measures required to control pressures in the urban environment. With regards to Sustainable Urban Drainage Systems (SuDs) a consultation document on proposals for the promotion and wider use of SuDs within Northern Ireland was issued in 2011. Following on from this a 'Cross Agency' Northern Ireland Storm Water Management Group has been set up with a mandate to implement storm water management across Northern Ireland by 2013. This may require the development or amendment of new legislation so that SuDs will become mandatory. In addition to this a new draft planning policy statement "Planning and Flood Risk" was published for consultation in 2012. This policy will be integral to the successful implementation of SuDs. An amendment has also been made to the Planning (General Development) (Amendment) Order (Northern Ireland) 2012 to require the use of porous or permeable materials for areas in excess of 50 m^2 in shops, financial and professional services, buildings and schools, colleges, universities and hospitals.

Another measure which has been taken forward to reduce pollution in the urban environment is in relation to misconnections between the sewerage system and surface water drains which can result in untreated wastewater entering the environment rather than going to wastewater treatment works. A system has been set up to record

misconnections and a number of demonstration projects have been taken forward in conjunction with Northern Ireland Water to identify the misconnections and get them re-directed. Work has also been carried out in some industrial estates to identify misconnections and an education and awareness campaign has been taken forward.

The environmental damage caused by oil can be significant and expensive to remedy. It is a highly visible form of pollution and even a small amount can cause a great deal of harm as it forms a film on the surface of water drastically reducing the transfer of oxygen into the water. Since 2009 new legislation has been introduced, The Control of Pollution (Oil Storage) Regulations (Northern Ireland) 2010, to control above ground oil storage facilities in the industrial, commercial and institutional sectors. The regulations complement and enhance existing water pollution controls in Northern Ireland such as the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 2003 and have helped to reduce the amount of oil-related pollution incidents.

Quarry and mineral permissions

The programme of measures included the carrying out of a review of old mineral permissions. This measure included a mechanism for reviewing all existing planning conditions with a view to securing improved operating and environmental standards within the quarrying industry. In line with the rest of the UK and Ireland legislation was introduced through The Planning Reform (Northern Ireland) Order 2006 which requires the initial review of old mineral permissions. Implementation of this review however has not been taken forward and a decision is still awaited as to whether the review will be introduced.

Mineral mapping has been undertaken in order to highlight where specific reserves are located, what type they are and what constraints exist in the form of environmental designations. An Area of Constraint on Mineral Developments of 3586km^2 has been designated to protect areas of Northern Ireland. This figure does not include protected areas which are also designated as An Area of Constraint on Mineral Developments. In relation to specific minerals planning policy further consideration will need to be given to development of a new Planning Policy Statement on Planning and Minerals.

Waste and contaminated land

Three measures were included in the river basin management plans to reduce discharges and impacts from waste disposal and contaminated land. The measures included the development of Site Waste Management Plans to ensure the better management of waste from construction sites; a regime to deal with historical contaminated land and the development of Mine Waste Plans.

As a result of a review carried out by the Department of the Environment Food and Rural Affairs and the introduction of the bespoke environmental management system by the Construction Employers Federation the Department of the Environment feels that the

introduction of Site Waste Management Plan Regulations at this time is not required and would add additional bureaucracy to the construction and demolition industry at a time of low economic activity. The Construction Employers Federation with the support of the Northern Ireland Environment Agency and the Institute of Environmental Management and Assessment has introduced a new environmental management system, called NVIR-O-CERT, which will require participating construction businesses to commit to continual environmental improvement. The initiative has been designed to be of benefit to businesses of all sizes but with a particular awareness of the need to cater for smaller businesses. A standardised range of environmental Key Performance Indicators will be introduced for the local construction industry. This will help monitor and reduce waste going to landfill, energy use and water use, with the overall aim of improving resource efficiency within the sector.

A regime to deal with historical contaminated land has not yet been brought into operation.

New legislation, The Planning (Management of Waste from Extractive Industries) Regulations (Northern Ireland) 2010 has come into force. This legislation requires applicants to submit Mine Waste Plans if there is extractive waste on their sites. This includes demonstrating specific discharge consents are in place. Guidance is being prepared to help the industry comply with the new regulations and to date there have been no Mine Waste Plans approved.

Drinking water protection

In terms of protecting drinking water sources since 2009 Northern Ireland Water have developed Drinking Water Safety Plans. These plans are the most effective way of ensuring that a water supply is safe for human consumption and that it meets the health based standards and other regulatory requirements. It is based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain from catchment to consumer. The plans are used to map water supply systems, identify the hazards at each stage of the system from catchment, through treatment and the distribution system to the customer's tap, and to assess the risks that these hazards pose. The plans will be used to further inform the investment strategy for drinking water treatment supply systems. Investment needs will be prioritised on the risks associated with securing the provision of safe, clean drinking water.

Phosphorus in detergents

New legislation is being introduced which will enforce a ban on the use of Phosphorus in detergents. The Detergents Regulations 2010 will come into force from 30 June 2013 and will reduce the amount of Phosphorus entering the water environment.

Pollution Inventories

To protect human health and the environment the concentration of Priority Substances must be limited. Priority Substances are harmful substances. Priority Hazardous Substances are a subset of these and are considered extremely harmful. Concentrations of Priority and Priority Hazardous Substances in water must meet environmental standards set under the Water Framework Directive to meet the objective of good status. In addition Priority Hazardous substances must be phased out by 2025.

For each river basin district an inventory of emissions, discharges and losses of all Priority Substances and pollutants listed in the Environmental Quality Standards Directive is being compiled. The first inventory is due to be completed by 22 December 2013.

A tiered approach has been established to build the inventories. The first inventory will assess the relevance of substances for each river basin district, and for each relevant substance, point source loads, estimated diffuse loads and data gaps will be reported. Work is on-going to assess the relevance of substances. Subsequent inventories will involve more detailed analysis to identify the main sources and hotspots of emissions. The inventories will help to check the effectiveness of measures implemented to achieve reduction and phasing out of emissions as required.

Case study – improving and protecting bathing waters

In 2012, 22 of Northern Ireland's bathing waters achieved the mandatory standards of the EC Bathing Water Directive, with 16 bathing waters achieving the more stringent 'excellent' water quality standard.

The revised Bathing Water Directive, which must be implemented fully by 2015, sets standards that are significantly more stringent than those of the current directive. All bathing waters are required to be classed as 'sufficient', or better, by 2015.

In October 2011, work commenced on investigative studies in five bathing water catchments; Waterfoot, Ballygalley, Brown's Bay, Ballyholme and Ballywalter. Faecal bacteria monitoring across each catchment was used to identify areas which required further investigation. River walks have focused on these target areas to determine activities which present the greatest risks to bathing water quality. The information obtained has been used to develop and implement actions within the catchments. Actions include, for example, repairs to silage clamps and re-location of farmyard manure heaps away from the river, improvements in septic tank discharges, and reductions in direct discharges due to misconnections.

These projects will contribute to improvements in the quality of local rivers and streams and will reduce the faecal bacteria risk to nearby bathing waters. This will benefit the biodiversity in the rivers, as well as beach users and tourism.

Brown's Bay

2.3 Managing barriers to fish and managing pressures on beds, banks and shores

One of the key objectives of the river basin management plan is to tackle the impact of past and future modifications to the physical characteristics (the bed, banks and shores) of our rivers, lakes, estuaries and coasts. Activities which may cause such modifications have been reviewed and existing controls have been identified. One of the measures in the first cycle programme of measures was to identify current guidance and procedures for control and collate this into a handbook. A draft handbook has been developed and the next step is to produce the final guidance handbook.

Through the implementation of the local management area action plans the Northern Ireland Environment Agency catchment management officers now have an awareness of restoration schemes being carried out by other government departments and agencies. The Agency, however, is not the lead for the development and implementation of restoration measures and this area of work requires partnership working with a number of government departments and agencies as well as local stakeholders.

Since 2009 a number of restoration projects have been carried out by the Department of Agriculture and Rural Development Rivers Agency (see table 2), the Department for Culture Arts and Leisure (eight small schemes funded in 2010), Loughs Agency and various local stakeholders. The projects have all improved the physical habitat of our rivers.

The Northern Ireland Environment Agency has carried out research on the links between ecology and changes to the structure of the physical characteristics of rivers. The research was completed in 2011 and a report produced “Hydromorphology pressures and macroinvertebrate communities in Northern Ireland rivers: a landscape approach”. This research will inform further investigations to identify areas to target for restoration schemes. An inventory of restoration schemes already completed or planned has also been compiled.

In terms of identifying barriers to fish good progress has been developing a tool to assess the extent to which barriers impede migration of a wide range of species. The tool was finalised in March 2011 and is now being used as part of a pilot programme of barrier assessment. The focus has initially been on two catchments where prior knowledge of barriers already exists in the Ballinderry and Lagan catchments. Work will continue to identify barriers and prioritise the barriers for subsequent consideration of whether they can or should be removed subject to funding being made available. Eight projects are being carried out to monitor fish movement at impoundment structures. One project has been

completed which removed an impassable weir on the Lodge Burn in Coleraine (see the case study on page 19 for more information).

Table 2: example of restoration schemes carried out since 2009

River Basin District	Location of scheme	Summary of restoration
North Western	Lough Neas Drain, Ballymagorry, County Tyrone	Restoration measures including addition of new substrate, rock groynes, step pool system for fish passage to a perched culvert and removal of a flap valve and associated pipework to restore the natural outlet to the Burndennet River.
	Ballinamallard River, Ballinamallard, County Fermanagh	Completion of enhancement scheme including native tree planting and invasive species management.
	Tempo River, County Fermanagh	Habitat restoration for fish as survey had indicated only 1 or 2 fish classes using the reach due to homogeneity of the substrate. 500m channel enhancement carried out including thalweg creation, nursery and spawning stone addition. Reach fenced to allow natural vegetation establishment and a cattle drinker was created to limit poaching and sediment release.
Neagh Bann	Lodge Burn, Coleraine, County Londonderry / Derry	Flood alleviation scheme designed to include weir removal, channel restoration and the creation of a step pool fish pass for year round access to upper catchment for fish (see case study on page19 for more details).
North Eastern	Ballygawley River, County Tyrone	Flood alleviation scheme scheduled to commence spring 2013. Fishery habitat measures were designed by DCAL Inland Fisheries autumn 2012 and will be implemented by Rivers Agency as part of the scheme.
	River Bush, Bushmills, County Antrim	Addition of nursery cobble / boulders to a 150m channel between Armoy and Stranocum.
	Annacloy River, County Down	Fishery rehabilitation works.
	Cushendall River, Cushendall, County Antrim	Local fishery habitat improvement works within Cushendall village including the creation of deflectors and localised channel narrowing to create a low flow

		channel for fish passage. This scheme was a joint venture between Rivers Agency and Inland Fisheries

In terms of marine morphology the first cycle programme of measures included a measure to develop and implement a protocol for maintenance dredging. This measure was to be taken forward by the Department for Regional Development Ports in liaison with Nothern Ireland Environment Agency and ports representatives. The purpose of the measure was to set out 'best practice' for maintenance dredging activities by the port authorities and when implemented would ensure issues associated with a range of Environmental Directives would be dealt with in a streamlined and proportionate manner which would allow the effect of maintenance dredging to be assessed without placing a disproportionate burden on those who commission or approve maintenance dredging operations. There has been a delay progressing this measure so further discussion will be needed to take this forward.

Case study – Lodge Burn in Coleraine, addressing barriers to fish

The Lodge Burn was prone to flooding on the lower reaches in Coleraine. The photo below to the left is the view from the outlet of a large culvert before the scheme commenced. The water depth was low and there was a steep climb for fish up a concrete apron before they could approach the culvert. This was addressed by a series of small pools leading up to the culvert which was enhanced to improve the conditions for fish passage. Flood walls were built along the banks to reduce the level of flood risk to adjacent properties. The overall cost for the flood alleviation scheme including enhancements and fish passage work was just over £2 million. The fish passage work was approximately £80,000.

Before scheme commenced

After scheme was completed

Further downstream there was a small artificial lake which was subject to siltation problems and required regular maintenance. The river was re-profiled and the lake removed. This should address the siltation issue and also improve fish passage.

Improvements made further downstream of the culvert to deal with siltation problems

2.4 Managing pressures and risks from invasive alien Species

The Wildlife Order (NI) 1985 contains new provisions to strengthen the regulatory framework for controlling the introduction of invasive alien species as a result of amendments made to it through the Wildlife and Natural Environment (Northern Ireland) Act 2011. Under the Order it is an offence for any person to release any animal species which is of a kind not ordinarily resident in Northern Ireland or to cause the further release of any animal species listed specifically in the legislation. It is also an offence to plant or otherwise cause to grow any plant species listed within the Order. As a result of the amendments made to the Order several new invasive aquatic plant species were added to the list.

The amendments to the Wildlife Order (NI) 1985 also gave the Department of the Environment the power to introduce an Order to prohibit the sale of high risk alien species. Through this power the Department of the Environment are currently looking into legislating for a range of aquatic species to be included within provisions of a ban for sale.

In taking forward this new power a comprehensive framework for undertaking risk assessments, for the purpose of banning the sale of high risk invasive species has been developed as part of the Invasive Species Ireland Project[4]. This risk assessment framework has been based on the European Plant Protection Organisation (EPPO) risk assessment framework.

Catchment scale eradication and control projects have also taken place since 2007 on a number of catchments across Northern Ireland (see table 3 for example projects and also the case study on page 23 for more information on a European funded project, with part funding from the Department, carried out in Northern Ireland, Ireland and Scotland).

Research has shown that invasive alien species can be transferred in ships ballast water that is released when ships take on cargo in port. The ballast water can contain larvae of a variety of species that can become invasive when released into a non-native environment. The Maritime and Coastguard Agency can only advise ships to exchange ballast water in open sea. There are currently no binding requirements to enforce ballast water management on vessels. A measure was included in the river basin management plans to take action to control ballast water to prevent the establishment of native species however it was recognised that action on ballast water is a global issue headed by the Maritime Organisation who lead negotiations to have the International Convention for the Control and Management of Ships Ballast Water and Sediments in 2004. The Convention has not yet been fully ratified so full powers to control ballast water are not currently in place.

[4] http://invasivespeciesireland.com/

Table 3: examples of invasive alien species control projects (please note this is not an exhaustive list but provides an overview).

River Basin District	Location of scheme	Invasive alien species involved in control programme
North Western	River Faughan	Knotweed species, giant hogweed, Himalayan balsam, *Rhododendron x superponticum* and cherry laurel
	Ballinamallard River, Ballinamallard, County Fermanagh	Japanese knotweed, giant hogweed and Himalayan balsam
Neagh Bann	Upper Bann (Gilford area)	Giant hogweed
	Upper Ballinderry River	Giant hogweed, cherry laurel and Japanese knotweed
	Sixmilewater River (Dunadry)	Floating pennywort (now eradicated)
	Clanrye River	Giant hogweed, Himalayan balsam and knotweed species
	Newry Canal	Giant hogweed, Himalayan balsam and knotweed species
	Portmore Lough (small pond nearby)	Parrots feather and curly waterweed (now eradicated)
	Carlingford Lough	Common cord grass (mapping progressed)
North Eastern	River Lagan (Dromore Co.Down)	Floating pennywort
	River Lagan (Dromore Co.Down) and Lisburn areas)	Japanese knotweed
	Balloo woodland	Floating pennywort
	Glastry clay pitts	Floating pennywort, New Zealand pigmy-weed and water fern
	Dundrum dam	Curly waterweed
	Lady Dixon park	Floating pennywort, water fern and fringed waterlily
	Belfast waterworks	Fringed waterlily
	Crawfordsburn	Floating pennywort, curly waterweed, New Zealand pigmy-weed, parrots feather and water fern (now eradicated)

	Larne - Carnfunnock	Nuttall's waterweed and curly waterweed (now eradicated)
	Strangford lough	Carpet sea squirt
	Strangford lough	Common cord grass
	Murlough (Dundrum) bay	Common cord grass

Case study – controlling priority invasive non-native riparian plants European project

A £2.6 million CIRB (**C**ontrolling Priority **I**nvasive Non-native Riparian Plants and **R**estoring Native **B**iodiversity) project was launched at Queen's University Belfast on 1st February 2011 and will run until December 2014. The project is part financed by the European Union's INTERREG IVA Cross-border Programme and partly financed by the Department of the Environment Northern Ireland and the Department of the Environment, Community and Local Government in Ireland.

This project is being carried out in trial river catchments in Ireland, Northern Ireland and Scotland. One of the trial river catchments in Northern Ireland is the Newry canal / Clanrye river which is found in the Newry and Mourne area of Northern Ireland. The aims are to control and if possible eradicate four invasive alien riverbank plants: giant hogweed, Japanese knotweed, Himalayan balsam and Rhododendron.

Project Objectives

1. Control and eradication of four high impact riparian invasive species.
2. Prevent new invasions, reinvasion or further spread of the four high impact riparian invasive species.
3. Demonstrate restoration of critical ecosystem services following Invasive species control.
4. Carry out a cost benefit analysis of invasive non-native plant species (INNS) management in the project area.

Initial surveys in the Newry catchment show a major proportion of the distribution of all four of the target invasive plant species was found on the Newry Canal and Newry River.

Implementation of measures

In the **Newry catchment**, Giant Hogweed has been sprayed from Bessbrook downstream, and on the Newry Canal and river from Carnbane Industrial Estate. Approximately 6.5 km of river has been treated during 2011. Himalayan Balsam was treated on the Cusher River in August starting at Clare Glen and working downstream, covering about 4 km of river. Japanese Knotweed, which is distributed around Newry, Bessbrook and Camlough, was entirely sprayed in the Newry catchment in September 2011.

Before spraying

After spraying

2.5 Managing other pressures

Donegal County Council in partnership with the Northern Ireland Environment Agency were awarded European funding of €2.3m for a project to conserve the Freshwater Pearl Mussel. The project was launched in 2011 and a technical group has identified catchments where management plans will be produced with the aim of trialling and putting in place measures to conserve the Freshwater Pearl Mussel. The catchments are the Upper Ballinderry River, the Owenkillew River and the Swanlinbar (Claddagh) River. All the rivers are designated as Special Areas of Conservation. Catchment surveys have been completed and high frequency catchment monitoring is ongoing through eight telemeterised stations. Trialling of measures in relation to forestry, agriculture and septic tanks is ongoing in selected catchments. Sediment traps have been installed, an experimental forestry plot has been established, detailed forest drainage mapping has been undertaken and a household survey has taken place in relation to Freshwater Pearl Mussel awareness and water usage. Draft plan strategies are in preparation and liaison with stakeholders is ongoing.

Since 2009 the Department of the Environment has dedicated resources to facilitate the establishment and development of river trusts. Throughout Northern Ireland a number of river trusts are emerging as a means of engaging the local community to take action and assist in delivery of the programme of measures. The trusts have a proven record of delivering practical implementation projects on the ground and attract external funding.

3. Conclusion and next steps

The report demonstrates that good progress has been made on the implementation of the programme of measures for the first cycle of the Northern Ireland river basin management plans. The legislative framework, supported by the economic incentives and funding to encourage support and action, and the use of education and advice has facilitated implementation of measures on the ground. The process has highlighted where we have achieved successes but more work is required to secure the targets set out in the plan.

Some of the main successes include measures to address nutrient enrichment, or eutrophication, of the water environment. This is a problem throughout Northern Ireland however due to actions taken largely since the introduction of the Nitrates Action Programme Regulations (NI) in 2006 and also the Phosphorus (use in Agriculture) Regulations (Northern Ireland) 2006, the trend of average concentrations of phosphorus in rivers indicates that levels are either stable or decreasing.

Considerable progress has been made setting up implementation structures at a local level to facilitate implementation of the programme of measures. Each river basin district has been divided into three catchment stakeholder group areas with dedicated catchment management officers working in each area. These groups facilitate effective stakeholder engagement and encourage the development of partnership working. The river basin districts have also been subdivided into nine local management areas. Local action plans have been developed and are being implemented[5]. The plans include, for example, a programme of river walks complimented by additional biological monitoring. This work assists in developing a targeted programme of measures to address local pressures affecting water body status and hence the achievement of objectives.

Since 2009 the Department of the Environment has dedicated resources to facilitate the establishment and development of rivers trusts. Throughout Northern Ireland a number of river trusts are emerging as a means of engaging the local community to take action and assist in delivery of the programme of measures. The trusts have a proven record of delivering practical implementation projects on the ground and attract external funding.

Many of the measures completed so far have delivered benefits beyond those required by legislation. The environmental improvements have also contributed to biodiversity enhancement and benefits for fisheries, recreation and tourism. These achievements have been made possible by organisations and stakeholders working together to deliver effective partnership working.

We need to continue to work with our colleagues in Ireland to ensure the shared water catchments in the North Western and Neagh Bann International River Basin Districts are

[5] http://www.doeni.gov.uk/niea/water-home/wfd.htm

being managing in a co-ordinated manner to ensure objectives for our shared rivers, lakes estuaries and coastal waters are achieved.

Although good progress has been made more work is required to tackle complex issues and develop and implement appropriate solutions. The assessment of chemical status particularly with regards to priority substances requires more work along with the development of pollution reduction plans. Similarly the review of diffuse pollution sources and associated options for control will need to be taken forward. Implementation of hydromorphological measures has proved to be a challenging area. Progress has been made developing the biological tools to assess the ecological impacts of changes in hydrology from abstraction and flow regulation activities. Progress has also been made developing a tool for assessing the extent to which barriers impede fish migration. These hydromorphological tools are currently being piloted to prioritise measures at a catchment scale. Implementation of these measures has been delayed due to the scale, cost, complexity and feasibility of delivering these measures.

Over the next year we will be updating the characterisation and risk assessment for the second river basin management plans which will be published in December 2013. As part of this work we will review the significant water management issues we will face in achieving our objectives for 2021 and 2027. The review will take account of our experience implementing the first programme of measures and will consider options for adding to and improving our approaches as appropriate. We will continue to engage with stakeholders throughout 2013 through the work of the catchment management officers and through the catchment stakeholder groups. We will also consult on the significant water management issues from 22 December 2013.

We are currently running a consultation which is open until 22 June 2013 on the how the second cycle river basin management plans should be developed. This consultation "Consultation on timetable and work programme for development of the second cycle river basin management plans 2015-2021" is the first step in the process of writing the second plans. It is an opportunity for stakeholders to shape the plans, the way that river basin planning is delivered and for them to be involved in how improvements to the water environment are prioritised.