

River Basin Management Plan - Strategic Environmental Assessment

Strategic Environmental Assessment of River Basin Management Plans and Programme of Measures - Mitigation Measures and Environmental Monitoring Programme (Northern Ireland only)

December 2009

1. Mitigation Measures

The following Table 1 outlines the various mitigation measures to be put in place as part of the River Basin Management Plan implementation process and links them with Section 7 on 'The measures we will use to achieve environmental objectives' included in the Plans for the river basin districts. At the broad level, implementation of the Plan is expected to bring environmental improvements, since it tackles specific pressures on water quality. However, there are some cases where negative impacts may arise in the wider environment.

It should be noted that for the purposes of these **mitigation measures** in all cases the term Appropriate Assessment (AA) refers to the assessment process as specified in Article 6 of the Habitats Directive. This starts with screening to determine whether a likely significant impact from the plan/programme is expected to occur to a Natura 2000/Ramsar site as a result of activities in/adjacent to/in the catchment of a Natura 2000/Ramsar site. If, in accordance with AA guidance (guidance produced by the EU and NIEA in Northern Ireland), it can be shown that there is no potential for impact at the screening stage, no further assessment may be required. However when the plan/programme being screened lies within or adjacent to a Natura 2000/Ramsar site then such a determination must be made in consultation with NIEA. If the plan/programme is within the catchment (surface and groundwater) of a Natura 2000/Ramsar site, such consultation with NIEA is only necessary for those water dependent Natura 2000 sites which are listed in the WFD Register of Protected Areas.

The key sector for each measure in the River Basin Plan, requiring mitigation, are given in the first column of the table. The SEA reference number for the applicable mitigation measure(s) is given in the fourth column of the table. Mitigation Measures in **black** are from the SEA Environmental Report, while Mitigation Measures in **red** are from the Habitats Directive Assessment. The final column considers how the Mitigation Measures will be addressed during implementation of the Plans.

Table 1 Mitigation Measures brought forward into the final RBMP and POM

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
Abstraction and flow regulation	Targeted assessment of water resource availability and management priorities	The potential for this measure to result in significant environmental impacts depends on the actions involved.	AB1	None. However, it is highly recommended that when the specific details as to the types of changes to statutes and regulations are proposed, that these be subject to environmental	This will be addressed as required.

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
				assessment to identify potential impacts and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	
Abstraction and flow regulation	Assess compliance of monitored abstractions and compensation flows with licence conditions.	<ul style="list-style-type: none"> • Direct positive impact on water and on aquatic biodiversity due to minimum flow and flow variability. • Indirect positive impacts for human health and soils. • Indirect positive impacts for population and for material assets including angling and tourism. • Positive impact on cultural heritage where minimum flows keep submerged archaeology from exposure. • Negative impacts to cultural heritage where compensation flows cause damage to riverine or bank side archaeology. • Habitats Directive Assessment has identified this as desirable, with overall benefits for protected areas. 	AB5	This alternative should take account of the compensation flow requirements on regulated rivers to maintain minimum flow or flow variability, where applicable, to maintain good hydrological status and support ecology.	<p>Flow controls and the regulation of ecological flows is a key aspect of the Abstraction & Impoundment (Licensing) Regulations. Where a 'significant' environmental impact occurs as a result of a diversion of water then NIEA are in a position to take enforcement action.</p> <p>All environmental impacts are considered and mitigation measures are included in any license issued. The amount of water permitted for abstraction will depend upon the scale and nature of the project and site-specific fishery, nature conservation protection designations and WFD hydrology standards.</p> <p>The DOE consult with other agencies that have responsibility the Habitats Regulations in Northern Ireland as part of the assessment & decision</p>

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
					making process.
Abstraction and flow regulation	Promotion of efficient use of water	This measure is directed at education and awareness and is extremely valuable in aiding the conservation of water resources. While this measure is expected to only result in positive impacts, mitigation measures are recommended to refine it and increase its usefulness.	<p>AB6/ AB7/ AB8</p> <p>AB9</p> <p>AB All</p>	<p>Although water conservation awareness campaigns have been implemented the message has not hit home for many people. It is therefore recommended that a working group be established to develop tools to promote water awareness and these tools are included in future water awareness campaigns.</p> <p>Suitable education and awareness campaigns are recommended to provide residential users with the tools / knowledge to reduce water consumption. It is also strongly recommended that water metering schemes promote conservation.</p> <p>A focussed awareness campaign on water use and the value of water should be implemented to reduce the volumes of water used / wasted, followed by leakage improvement and only then new infrastructure. Any new infrastructure, e.g. storage, should source its fuel from renewable sources.</p>	<p>The Northern Ireland Water Resource Strategy 2002 – 2030 emphasises the need to rationalise existing uneconomic water sources and concentrate on the sources that can meet our needs cost effectively and reliably. The main aim is rationalisation of drinking water sources.</p> <p>Implementation of the Northern Ireland Water Resource Plan, which is currently under review, will ensure that this rationalisation takes place.</p> <p>Northern Ireland Water encourage the wise use of water through a number of campaigns. An example of such a campaign is the promotion of the ‘Hippo Water Saver’. This is a simple and low cost water saving device to help conserve water in toilet cisterns.</p>

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Agriculture	To develop and implement Local management area action plans to target advice and regulatory action	<ul style="list-style-type: none"> • Direct positive impact for soils and water quality. • Indirect positive impacts on aquatic ecology and human health. • Positive impact on cultural heritage. • The Appropriate Assessment has identified that by their voluntary nature it is difficult to achieve consistent and application of these schemes. 	AG8	<p>An information and advice campaign targeted at farmers should be implemented on a national scale. This should focus on prevention first followed by BMP as core themes. It will be important that adequate consideration is given not just to water and biodiversity but also soils and cultural heritage, as a narrowly focussed approach may lead to indirect negative impacts on these areas. It is also recommended that information campaigns highlight best practice in the sector in order to demonstrate that an economically viable farming operation is possible within such schemes. Opportunities for agri-tourism should also be highlighted as a way to supplement farm income while protecting the environment. Guidance shall also include information relating to implementation in areas protected for biodiversity.</p>	<p>The Code of Good Agricultural Practice (COGAP) is promoted by DARD for the prevention of pollution of water, air and soil. The Code is designed to provide practical guidance for farmers and growers in relation to pollution control. It also serves as a reference document for those involved in providing pollution control advice to farmers.</p> <p>The Northern Ireland Countryside Management Scheme (NICMS) enhances the agri-environment programme's ability to reduce water pollution from agricultural sources and to improve water quality on farms. NICMS participants will continue to draw up obligatory farm waste management plans and in addition they will have the option of taking up new farm waterway and riparian zone management measures which aim to enhance river and riverbank biodiversity.</p> <p>The College of Agriculture, Food and Rural Enterprise</p>

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					(CAFRE) hold training workshops that cover Cross Compliance, Field Boundary Management, Dealing with Farm Wastes, Nitrates Information and Nitrates derogation in NI.
Agriculture	Ensure sustainable use of manures with high a phosphorus content, particularly poultry and pig manures.	Ensuring that manure is used sustainably would contribute to achieving the overall positive impact of reducing phosphorus. Assessment of this measure would be premature prior to a decision being made on the specific proposals to be implemented. Some of the technical proposals that could be chosen were assessed under separate measures and mitigation recommended.	AG10	None. However, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc., and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Agriculture	Review and investigation of the effectiveness of wetlands in the reduction of nutrient loadings	Review and investigation of the effectiveness of wetlands in reducing nutrients is part of the information gathering stage of the planning process. Therefore, this type of measure is not expected to result in significant environmental impacts and as such was not assessed. However, the potential impacts associated with development of wetlands were assessed under a separate measure (PM2) and mitigation was recommended.	AG14 (New Measure)	None. However it is strongly recommended that when specific proposals are put forward that these be subject to environmental assessment to identify potential impacts. A review of the mitigation measures in the SEA, in particular PM2, should be carried out to determine if they are applicable.	This will be addressed as required.
Collection & Treatment of Sewage	Review waste water consent conditions to ensure that adequate controls and emission limits are set. Further development of	This type of measure is not expected to result in significant environmental impacts and as such was not assessed. However, impacts could occur if systems are found to be in noncompliance, and thus require upgrade.	WW8	None. However, it is highly recommended that when specific proposals are chosen, that that these be subject to environmental assessment to identify potential	This will be addressed as required.

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
	<p>mathematical models for all of Northern Ireland to look at cumulative impacts of discharges at a catchment scale.</p> <p>Detailed studies of the consents for sewer systems to address the volume spilt from overflows in urban areas.</p>	Therefore, it is anticipated that this measure would be the first step in implementation of measures such as improvements in treatment or plan upgrades. These types of measures were assessed and mitigation recommended.		impacts. A review of the mitigation measures in the SEA should be carried out to determine if they are applicable.	
Collection & Treatment of Sewage	Address the environmental impacts of inadequate private sewerage discharges and support sustainable development as part of PC10.	The potential for this measure to result in significant environmental impacts depends on the actions involved. Assessment of this measure would be premature prior to a decision being made on the specific projects to be implemented. It should be noted that some of the projects that could be chosen, e.g. installation of higher standards of treatment, were assessed under separate measures and mitigation recommended.	WW9	None. However, it is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts and that review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Collection & Treatment of Sewage	<p>Mapping and method development to calculate the vulnerability of receiving waters</p> <p>Investigate provision of main sewers or On-site Waste Water Treatment Systems maintenance programmes in priority areas (existing systems, large unsewered populations where water quality is threatened)</p>	<ul style="list-style-type: none"> • Direct positive impacts on water and soil quality in the short term. • Indirect impacts on aquatic biodiversity and human health, timeframe would depend on speed of implementation. • Indirect negative impacts on biodiversity are possible due to changes in nutrient composition. • Appropriate Assessment notes that the return of surface and groundwaters to a more natural state as existed pre phosphate products would be a positive impact. 	<p>UP7/ UP8/ UP11</p> <p>UP8</p>	<p>New wastewater treatment infrastructure, including sludge disposal infrastructure, will be subject to environmental assessment at the project level to reduce indirect impacts to biodiversity, landscape, cultural heritage, air quality and climate.</p> <p>Intelligent transport programmes should be put in place to minimise the amount of emissions associated with movement of sludges from on-</p>	<p>In terms of septic tanks, the Water Order consenting process is the key control for ensuring the protection of our waters and this operates alongside the planning system by restricting the location of new developments.</p> <p>Planning Service has issued a planning strategy for rural Northern Ireland; standards and joint UK guidance for on-site systems are also</p>

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		<ul style="list-style-type: none"> • Direct positive impacts on the provision of water management infrastructure. • Indirect positive impacts on water as an economic resource. • May have cost implications at the local authority and individual level. • Indirect air and climate impacts due to increases in sludge disposal and transport. • Indirect positive impacts to air quality due to a reduction in nuisance odours. • Indirect negative impacts to human health if land spreading of sludges occurs without proper guidance. • Education essential for owners of on-site systems to raise awareness of need for ongoing maintenance of on-site treatment systems. 	<p>UP7/ UP11</p> <p>UP11</p>	<p>site treatment systems.</p> <p>An Appropriate Assessment will be required for new structures.</p> <p>Upgraded treatment works should be required to introduce BAT, including the use of renewable energy sources, in order to reduce GHG emissions and others resulting from increased demand for treatment.</p>	<p>available. NIEA consents all discharges and undertakes inspections and enforcement where water pollution related to septic tanks and / or proprietary on-site systems is identified.</p>
Collection & Treatment of Sewage	Identify where there are potential constraints on development	Development of constraints mapping is part of the information gathering stage of the planning process. This measure could be the first step in ensuring the zoning of lands is directly linked to the provision of adequate and appropriate wastewater treatment infrastructure.	UP10	None. However, it is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment, where required, and Appropriate Assessment to identify potential impacts. In addition, a review of the mitigation measures in the SEA should be carried out to determine if they are applicable.	This will be addressed as required.
Collection & Treatment of	Awareness programme on septic tank maintenance,	This measure is directed at education and awareness and is extremely valuable in aiding improvements in water quality. While this	UP7/ UP8	The education programme should be carried out in tandem with the new requirements for tank	The education programme would aim to be carried out in tandem with the new

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Sewage	installation and design	measure is expected to only result in positive impacts, mitigation measures are recommended to refine it and increase its usefulness.		maintenance and include guidance on disposal of sludges.	requirements. NIW provide guidance on Septic Tank, Domestic Treatment Plant and Cesspool Services which includes best practice.
Collection & Treatment of Sewage	<p>To introduce seasonal discharge consents where possible to promote installation of reed beds and constructed wetlands for sewage treatment and</p> <p>Review and investigation of the effectiveness of wetlands in the reduction of nutrient loadings</p>	<ul style="list-style-type: none"> • Direct positive impacts on material assets through improvements to existing infrastructure. • Indirect positive impacts on water quality, biodiversity, soils and human health by improving effluent quality. • Indirect positive impacts to water as an economic resource and the sectors dependent on it. • Contributes to sustainable development by ensuring adequate water and wastewater infrastructure. • Potential negative impacts if additional landtake is required for existing or new infrastructure. • Indirect negative impacts on biodiversity, soils, and cultural heritage, if sited inappropriately. • Additional costs likely to upgrade systems. • Appropriate Assessment found that reduced nutrient loads may improve water quality and reduce the impacts of eutrophication. Particularly important for protected areas with more stringent objectives, e.g. freshwater pearl mussels 	<p>WW10/ WW11/ WW12</p> <p>WW10/ WW11/ WW12</p>	<p>An assessment under Article 6 of the Habitats Directive will be required.</p> <p>If additional landtake is required environmental studies should be carried out to assess the impact on the environment.</p>	This will be addressed as required.

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
		or hard water lakes.			
Urban Development	<p>Develop an extended regulatory tool kit.</p> <p>Review of diffuse pollution sources and options for control</p>	The details as to the management controls to be included are not yet available.	UB5	None. However, it is highly recommended that when the details as to the management controls to be included are known, that these be subject to environmental assessment to identify potential impacts and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Urban Development	Assess diffuse loads and allow for their prioritisation of new actions.	Development of a screening tool is part of the information gathering stage of the planning process. It is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts.	UB7	None. However, it is highly recommended that when specific proposals are chosen, that these be subject to environmental assessment to identify potential impacts and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Forestry	<p>Introduce more stringent actions for the most sensitive areas, when scientific evaluation establishes a need. E.g. phased felling of smaller harvesting coup rather than felling a large forest block all at once</p> <p>Development of maps indicating where forests should</p>	There are a number of guidelines/management controls identified as potential measures, the details of which are not yet available. However, as these are likely to require some changes to forestry practices it is strongly recommended that when the details of these are known they are compared with the suite of mitigation measures recommended for Forestry in the SEA, to determine if any of the required mitigation measures apply, as well as being subject to an environmental assessment and, where required, an Appropriate	FALL	Future guidelines for forestry should be developed through a steering group represented by bodies such as Coillte, the Forest Service (Northern Ireland), the Forest Service (Ireland), National Parks and Wildlife Service, the Central Fisheries Board (Ireland), the Fisheries Conservancy Board (Northern Ireland) the Northern Ireland Environment Agency, and representatives from the relevant	The publication 'Forests and Water Guidelines' provide guidance to forest mangers on how forests should be designed and operations planned to protect and enhance the water environment. They also give clarity to practitioners on how field operations should be carried out. These guidelines apply equally to

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	<p>be developed taking account of sensitive and protected areas.</p>	<p>Assessment to identify potential impacts other than those related to water, e.g. climate, population, etc.</p> <p>Some of the impacts that could potentially occur:</p> <ul style="list-style-type: none"> • Negative impacts for climate and material assets. • Negative impact on the economic value of forests through restrictions and limitations. • Direct long-term benefits to water and soil quality. • Indirect long-term benefits to human health and aquatic biodiversity. 	<p>F2 to F8</p> <p>F3</p> <p>F5</p>	<p>planning authorities to ensure that the final guidelines take a holistic approach to the environment which includes biodiversity, landscape, climate and cultural heritage interests. Consideration should be given to identifying and implementing as a priority those alternatives that can be applied to forests only starting or midway through the growth cycle.</p> <p>It is recommended that prior to any changes in forest size or species mix, a study is carried out to determine the change, if any, in the carbon dioxide sequestering capacity of the forest. Should sequestering capacity be reduced, compensation measures will be required to offset these.</p> <p>An Appropriate Assessment will be required for changes in the structure of existing forests to include structural diversity and increased open space.</p> <p>An Appropriate Assessment will be required if a new plantation is proposed to be developed on</p>	<p>both state and private forests.</p> <p>The guidelines were substantially revised taking account of the latest research and advice from a wide spectrum of water regulatory authorities and conservation agencies.</p> <p>A new forestry bill has been introduced to the Northern Ireland Assembly in June 2009. The new bill reflects recent developments in Northern Ireland forestry policy and strategy and is anchored in the UK Government's international commitments on sustainable forest management, biodiversity and climate change.</p> <p>Any planned increase in forest cover will consider WFD commitments and taking into account the following environmental and land use constraints:</p> <ul style="list-style-type: none"> • Peat greater than 50cm depth • Land over 300 metres

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			<p>F13</p> <p>F13/ F14</p> <p>F19</p> <p>F19</p>	<p>peat sites or erodible soils in areas or catchments in areas protected for biodiversity (i.e. an SAC, SPA or Ramsar).</p> <p>Should it be proposed to mitigate acid impacts symptomatically using basic material, this should be avoided in protected areas, particularly in sensitive freshwater pearl mussel catchments.</p> <p>An Appropriate Assessment will be required if it is proposed to mitigate acid impacts symptomatically using basic material or proposed to manage catchment drainage to increase residence times and soil wetting, including no drainage in some areas.</p> <p>Detailed studies should be carried out prior to the introduction of any non-native species to be used as a biological control method.</p> <p>An Appropriate Assessment will be required if it is proposed to introduce non-native species to be used as a biological control</p>	<ul style="list-style-type: none"> • Special Areas of Conservation (SAC) • Special Protection Areas (SPA) • Scheduled Monuments and Zones • Ramsar Convention Sites • Areas of Special Scientific Interest (ASSI) • Breeding wader Areas

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				method.	
Forestry	Assessment of operations on a catchment basis	Measure involves assessing operations causing a significant threat to water quality on a whole catchment basis.	F20	A determination with regard to the requirement for SEA for Forestry practices under the provisions of the SEA Directive and Appropriate Assessment under the Habitats Directive should be made.	This will be addressed as required.
Industry & Other Businesses	Review of diffuse pollution sources and options for control	There are a number of management controls identified as potential measures, the details of which are not yet available. The overall positive aspect of these measures should be noted as they provide the tools, methodologies and data required to inform key actions arising from the Plan.	IND1	None. However, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment to identify potential impacts other than those related to water, e.g. population, etc, and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Industry & Other Businesses	Achieve compliance with discharge consent / licence standards to reduce inputs at source.	<ul style="list-style-type: none"> • Overall direct positive impact to water quality. • Indirect positive impact to biodiversity, soils, human health and water as an economic resource. • Indirect negative impacts for targeted activities as additional costs may be incurred through provision of upgrades or changes in management practices. 	IND3	It is important to ensure the environmental quality standards that are set for receiving waters are achieved. Particular attention should be placed on discharges to EU protected areas in case a licence requires more stringent standards.	NIEA has committed to delivering a key strategic target of achieving 90% compliance with Water (NI) Order 1999 discharge consent standards by 2016. The standards that have been set have been established through a UK Technical Advisory Group (UKTag) and this is supported by a number of expert working groups to establish a consistent and

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					scientific basis for the standards. The technical standards developed have also been subject to peer review across Europe to ensure their appropriateness.
Industry & Other Businesses	Review of diffuse pollution sources and options for control Assess diffuse loads and allow for their prioritisation of new actions.	<ul style="list-style-type: none"> • Overall positive impacts to water and aquatic biodiversity. • Direct and indirect positive impacts on material assets due to provision of upgraded water infrastructure and protection of water as an economic resource. • Indirect positive impacts to human health and soils. • Indirect negative impacts to material assets due to additional costs associated with provision of upgrades or changes in management practices. • If preparation of catchment nutrient budgets takes account of the specific requirements/objectives of EU designated sites this result in a significant positive impact to these protected areas. 	IND7	Catchment nutrient budgets should be prepared and limits set according.	Ongoing research nutrient budgets, by the Agri-Food and Biosciences Institute, will be published when it is completed.
Freshwater Morphology	Assess technical feasibility and cost effectiveness of restoration measures	<ul style="list-style-type: none"> • Direct positive impacts for water quality and aquatic biodiversity. • Negative impacts to architecture, archaeology and cultural heritage due to removal of structural features. • Indirect negative impacts on landscape 	PM6 PM6/ PM9	An Appropriate Assessment will be required for remediation schemes. An archaeology, architecture and cultural heritage assessment will be required before removal of	An inter-departmental working group will be established to develop and put in place by December 2010 appropriate guidance to supplement legislation offering control over

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		<p>due to removal of structural features.</p> <ul style="list-style-type: none"> • Direct positive impacts to biodiversity due to remediation of channelisation or barriers. • Negative impacts to existing habitats, which have developed as a result of physical modifications. • Indirect negative impacts on human health, population and material assets due to the removal of flood defences. • Benefit to rivers that were previously straightened or where habitats for fish spawning were destroyed. 	PM6	<p>any physical modifications with potential for cultural heritage value. Mitigation measures will be in agreement with the relevant authority. This assessment should include reference to cultural heritage in the context of the existing landscape.</p> <p>A flood impact assessment should be carried out for all channelisation and barrier remediation schemes to determine whether an increased risk of flooding would occur as a result.</p>	<p>physical modifications, which will ensure compliance with WFD requirements.</p> <p>NIEA has agreed to take part along with other stakeholders in pilot study to explore the use of catchment wide sustainable flood risk management techniques. This is being lead by Rivers Agency.</p>
Freshwater Morphology	Develop and implement restoration measures on selected water bodies	Difficult to determine what impacts would result from remediation schemes until more details are available about what would be involved in the schemes.	PM7	An Appropriate Assessment will be required for remediation schemes.	The Northern Ireland Countryside Management Scheme (NICMS) participants have the option of taking up new farm waterway and riparian zone management measures which aim to enhance river and riverbank biodiversity.
Freshwater Morphology	Produce appropriate guidance to supplement legislation offering control over physical modifications	<ul style="list-style-type: none"> • Positive benefit for fish movement and for the wider biodiversity of surface waters. • Indirect negative impacts on climate if hydroelectric facilities were removed/curtailed. 	PM9	An Appropriate Assessment will be required for impassable barrier remediation schemes.	An inter-departmental working group will be established to develop and put in place by December 2010 appropriate guidance to supplement legislation

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		<ul style="list-style-type: none"> • Economic benefit in the improvement of fishery resources through the removal impassable barriers. • Direct positive impacts for water quality and aquatic biodiversity. • Negative impacts to architecture, archaeology and cultural heritage due to removal of structural features. • Indirect negative impacts on landscape due to removal of structural features. • Negative impacts to existing habitats, which have developed as a result of physical modifications. • Indirect negative impacts on human health, population and material assets due to the removal of flood defences. 		cultural heritage assessment will be required before removal of any physical modifications with potential for cultural heritage value. Mitigation measures will be in agreement with the relevant authority. This assessment should include reference to cultural heritage in the context of the existing landscape.	offering control over physical modifications, which will ensure compliance with WFD requirements.
Marine Morphology	Develop and implement protocol for maintenance dredging to ensure compliance with the Habitats, Birds & Water Framework Directives	There are a number of management controls identified as potential measures, the details of which are not yet available.	PM1	None. However, it is strongly recommended that when the details of these are known, they are subject to an environmental assessment, where required, and Appropriate Assessment to identify potential impacts other than those related to water, e.g. population, etc., and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	This will be addressed as required.
Alien Species	Targeted eradication of alien species at a catchment scale for Giant Hogweed, Japanese Knotweed and Spartina	The potential for this measure to result in significant environmental impacts depends on the actions involved.	Local Issues	None. However, it is highly recommended that these be subject to an environmental assessment and Appropriate	This will be addressed as required.

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	Anglica			Assessment once the details are available and that a review of the mitigation measures in the SEA be carried out to determine if they are applicable.	
All	Development of action plans for designated freshwater pearl mussel SACs	The details of these are not yet available. However, a suite of potential freshwater pearl mussel measures was assessed as part of the Environmental Report. Therefore, it is strongly recommended that when the details of these are known they are compared with the suite of mitigation measures recommended in the SEA, to determine if any of the required mitigation measures apply.	<p>FPM 3</p> <p>FPM 5</p> <p>FPM 6/ FPM7</p> <p>FPM 8</p>	<p>It is recommended that compensation for riparian buffer zones be linked to annual upkeep of fences and management of buffers to ensure the ongoing benefit of this alternative.</p> <p>All access roads or bridges of any size have a pollution risk that can cause damage to mussel populations during construction and operation. Any future roads or bridges of any size should be subject to an impact assessment for potential damage to the mussel population alone or in conjunction with other effects.</p> <p>An impact assessment will be required for future roads and bridges of any size to ascertain the potential of damage to the mussel population alone or in conjunction with other effects.</p> <p>A clear instruction to ensure lime is not used in catchment roads or hard surfaces shall be</p>	<p>Financial incentives such as the Northern Ireland Countryside Management Scheme (NICMS) enhance the agri-environment programme's ability to reduce water pollution from agricultural sources and to improve water quality on farms. NICMS participants have the option of taking up new farm waterway and riparian zone management measures which aim to enhance river and riverbank biodiversity.</p> <p>NIEA has initiated an internal working group to clarify the agency role and approach to road construction projects and has already engaged with Roads Service and the consultants managing planned road projects. The purpose of these meetings is to highlight potential environmental problems</p>

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
			<p>FPM 9</p> <p>FPM 10/ FPM11/ FPM12</p> <p>FPM 17/ FPM18/ FPM19</p> <p>FPM 25</p> <p>FPM26/ FPM27</p>	<p>incorporated into local authority plans and operation organisation.</p> <p>Flood and ecological impact assessments will be required prior to any remediation works. There is a need for a holistic approach to be applied so that implementation does not result in indirect negative impacts in other issue areas.</p> <p>It is recommended that prior to any changes in forest size or species mix a study is carried out to determine the change in the carbon dioxide sequestering capacity of the forest. Should sequestering capacity be reduced, compensation measures will be required to offset these.</p> <p>In-stream data loggers for turbidity and regular water sampling will be required as part of measures to address municipal and domestic wastewater as well as industrial discharges.</p> <p>Any works in the river bed or bank either for fisheries management, pipeline laying or</p>	<p>during the planning phase and to ensure necessary mitigation measures are considered and written into the project specifications and contracts.</p> <p>Any planned increase in forest cover will consider WFD commitments and taking into account the following environmental and land use constraints:</p> <ul style="list-style-type: none"> • Peat greater than 50cm depth • Land over 300 metres • Special Areas of Conservation (SAC) • Special Protection Areas (SPA) • Scheduled Monuments and Zones • Ramsar Convention Sites • Areas of Special Scientific Interest (ASSI) • Breeding wader Areas <p>Drainage schemes must now meet the requirements of the Drainage Environmental Impact Assessment regulations, by considering significant</p>

Key Sector	Measures	Assessment Summary	SEA Ref. No.	SEA and HDA Mitigation Measures	How the Mitigation Measure will be addressed during implementation
				<p>other purposes shall be subject to an ecological impact assessment. Weirs, croys and stone bank reinforcement are unsuitable for freshwater pearl mussel SACs and alternatives should be found.</p> <p>There is a need for a holistic approach to be applied to measures aimed at physical modifications or preventing sand and gravel extraction so that implementation does not result in indirect negative impacts in other issue areas. Flood and aquatic impact assessments will be required prior to any river bed or bank works.</p>	<p>effects on the environment of the proposed works.</p> <p>Department of Culture, Arts & Leisure (DCAL) works closely with Rivers Agency to provide advice and guidance, under the terms of a Service Level Agreement, to mitigate the impacts of drainage maintenance works on habitat. This requires that all drainage works must include mitigation and, where funding permits, fishery rehabilitation measures under the direction of DCAL Fisheries Technical Officers.</p> <p>Existing controls over the removal of substrate from rivers prevent the removal of material from river beds.</p>

2. Environmental Monitoring Programme

SEA requires that monitoring be carried out in order to identify, at an early stage, any unforeseen adverse effects due to implementation of a Plan or Programme, and to be able to take remedial action. Monitoring is carried out by reporting on a set of indicators, which enable positive and negative impacts on the environment to be measured. Environmental targets and indicators were developed during the SEA and the preparation of the RBMP and POM (refer to Table 2). It is useful to note here that the monitoring programme currently being carried out under the WFD will form a substantial element of the Environmental Monitoring Programme required under the SEA. Carrying out the Environmental Monitoring Programme will be the responsibility of NIEA. NIEA will liaise with other Departments and Agencies through the Water Framework Directive Implementation Working Group (IWG).

Table 2 Environmental Monitoring Programme

Target	Indicator	Data Availability, Source and Frequency
BFF: Halt spread of Alien Species and their associated impact to the aquatic environment.	Geographical spread of Alien Species in the District.	National Invasive Species Database from Invasive Species Ireland (joint project between NPWS and NIEA). Compilation is ongoing.
BFF: Halt deterioration of habitats or their associated species due to water quality related issues by 2015, in line with the Water Framework Directive.	<u>Interim Indicator:</u> Status of Northern Ireland Priority Species. <u>Interim Indicator:</u> Status of Northern Ireland Priority Habitats. <u>Long Term Indicator:</u> Status of EU Protected Habitats and Species. <u>Long Term Indicator:</u> Condition of Selection Features in sites designated for nature conservation (SACs, SPAs, Ramsar and ASSIs) (based on 6 year rolling programme)	UK Biodiversity Action Plan. NIEA. Published every 3 years. Northern Ireland Biodiversity Strategy. NIEA. Published every 3 years. 2 nd UK Report on Implementation of the Habitats Directive. JNCC. Published every 6 years. Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.
P: Provide adequate water and wastewater treatment infrastructure capacity to all urban and suburban areas (cities, towns and villages) within the District by 2015.	Amount of new development in urban and suburban areas where adequate water and wastewater treatment infrastructure is not in place.	Data to be sourced from DOENI, not currently centrally compiled.

<p>P: Strictly control rural development with the provision of individual wastewater treatment units in accordance with the conditions relating to quality and quantity of effluent discharge as part of the consent to discharge effluent granted by the DOENI.</p>	<p>Number of domestic discharge consent conditions applications granted by NIEA with conditions formulated to ensure sustainable discharges to waterways or soakaway to underground strata.</p>	<p>Data to be sourced from DOENI.</p>
<p>P: Mapping of large unsewered populations and method development to calculate the vulnerability of receiving waters to loading of on-site systems.</p>	<p>Number of septic tanks mapped, calculated loads and priority areas identified.</p>	<p>Data to be sourced from DOENI.</p>
<p>HH: All drinking water areas (including groundwater), as identified on the register of protected areas, to achieve good status, or maintain high status, by the deadlines set in the final Plan.</p>	<p><u>Interim Indicator:</u> Compliance with Drinking Water Standards. <u>Long Term Indicator:</u> Parameters to be measured in accordance with the environmental quality standards to determine Good Status.</p>	<p>Annual Drinking Water Quality Report. NIEA. Published annually</p>
<p>HH: All bathing waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by the deadlines set in the final Plan.</p>	<p><u>Interim Indicator:</u> Compliance with Bathing Water Standards. <u>Long Term Indicator:</u> Parameters to be measured in accordance with the environmental quality standards to determine Good Status.</p>	<p>Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.</p>
<p>HH: All economic shellfish waters, as identified on the register of protected areas, to achieve good status, or maintain high status, by the deadlines set in the final Plan.</p>	<p><u>Interim Indicator:</u> Compliance with the Quality of Shellfish Water Regulations. <u>Long Term Indicator:</u> Parameters to be measured in accordance with the environmental quality standards to determine Good Status.</p>	<p>Reporting of Shellfish Waters Directive monitoring data to EC under standardised and rationalised reporting (Reporting Decision 95/337/EC). NIEA. Reporting every three to four years.</p>
<p>HH: All water bodies designated for salmonids, as identified on the register of protected areas, to achieve good status, or maintain high status, by the deadlines set in the final Plan.</p>	<p><u>Interim Indicator:</u> Freshwater Fish Directive compliance. <u>Long Term Indicator:</u> Parameters to be measured in accordance with the environmental quality standards to determine Good Status.</p>	<p>Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.</p>
<p>S: Reduce the number of fields with a P-index of 3 or above (i.e. with excess P).</p>	<p><u>Interim Indicator:</u> Soil Phosphorus levels by P-Index for Managed Grassland soils.</p>	<p>Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually.</p>

S: Achieve risk reduction targets as detailed in the Soil Directive for areas identified as at risk (not yet established).	<u>Long Term Indicator:</u> Monitoring programme as established under the requirements for the Soil Directive (once established).	Not yet established.
W: No deterioration in status of waters currently with high or good status (WFD Objective).	<u>Interim Indicator:</u> Environmental Quality Statistics relating to water quality. <u>Long Term Indicator:</u> Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Restoration to good status of waters currently at moderate, poor or bad status (WFD Objective).	<u>Interim Indicator:</u> Environmental Quality Statistics relating to water quality. <u>Long Term Indicator:</u> Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Progressively reduce chemical pollution in waters (WFD Objective).	<u>Interim Indicator:</u> Environmental Quality Statistics relating to water quality. <u>Long Term Indicator:</u> Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
W: Limit pollution inputs to groundwaters and prevent deterioration (WFD Objective).	<u>Interim Indicator:</u> Environmental Quality Statistics relating to water quality. <u>Long Term Indicator:</u> Water status in 2015 report.	Northern Ireland Environmental Statistics Report. (Central Statistics and Research Branch (CSRB) DOE. Published annually. Water Status Report to published in 2015 as part of second RBMP cycle. NIEA
AQ: Minimise total emissions to air associated with nutrient management.	Distance / number of vehicle trips used to transport nutrients; to be used as a proxy indicator for emissions associated with nutrient management activities, such as removal by tanker of slurry in areas of nutrient surplus.	Not currently compiled – monitoring of this would need to be integrated into the Waste Licences for operators of these activities. This information could be included in the Annual Environmental Report for each licensed facility.
AQ: Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary as set out in license for new or upgraded wastewater infrastructure.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC license process. This information is usually included in the Annual Environmental Report for each licensed facility.

AQ: Compliance with odour criteria to prevent deterioration in amenity beyond the site boundary due to changes in industrial practices due to plan implementation.	Number of complaints received related to odour.	Monitored by the DOENI as part of the IPPC license process. This information is usually included in the Annual Environmental Report for each licensed facility.
C: Use BAT, including renewable energy, to minimise GHG from new or upgraded wastewater infrastructure in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO ₂ equivalent in tonnes from new or upgraded water infrastructure, e.g. WWTP / WWTW, including emissions associated with the digestion and / or incineration of sludge.	To be calculated based on changes in water infrastructure at the second RBMP cycle in 2015.
C: Use BAT, including renewable energy, to minimise GHG from changes in industrial practices due to plan implementation in line with the UK's commitments to reduce GHG emissions under the Kyoto Protocol.	Calculated CO ₂ equivalent in tonnes due to changes in industrial practices.	To be calculated at start of the second RBMP cycle in 2015 based on changes in industrial practices, records of which are held as part of the IPPC licence process by the DOENI.
C: No net loss of CO ₂ sequestering vegetation due to changes in forestry practices as a result of Plan activity.	Calculated CO ₂ sequestering potential of forest vegetation based on forest cover.	CO ₂ sequestration potential could be sourced from the National Council for Forest Research and Development or similar source. Land cover information to be sourced from the Northern Ireland Forest Service.
MA1: No increase in the amount of infrastructure at risk from flooding as a result of Plan activities. In this case the length of road and rail infrastructure at risk will be used as a proxy indicator for infrastructure in general.	<u>Interim indicator:</u> Number of Flood Risk Management Plans prepared in accordance with the Floods Directive (2007/60/EC). <u>Long Term Indicator:</u> Length of road and rail infrastructure at risk from flooding.	Information on number prepared to be sourced from the Rivers Agency. Information flood risk to be sourced from the Rivers Agency.
MA2: Increase investment in water management infrastructure.	Water services investment expenditure per annum.	To be sourced from the Northern Ireland Water annual expenditure figures.
MA2: Achievement of the targets set out in the Investment Strategy for Northern Ireland 2008 - 2018 to upgrade water and wastewater treatment infrastructure to comply with current standards by 2014. (NI)	Progress towards completion of projects Alpha (to upgrade water treatment and delivery systems) and Omega (to upgrade wastewater treatment and sludge disposal facilities) as laid out in the Northern Ireland Investment Strategy 2008 – 2014.	To be sourced from Northern Ireland Water and Utility Regulator progress reports as they are published.
MA3: Minimise impacts to economic activity due to Plan implementation without conflicting with the objectives of the WFD.	Percent change in land cover types due to Plan implementation.	Land cover information to be sourced from Northern Ireland Countryside Survey (updated every ten years, latest survey completed in 2008, report not yet published)

<p>MA4: Achieve sustainable use of water in the context of maintaining its economic benefit.</p>	<p>Change in economic value of water relative to the baseline reports: The Northern Ireland Water Framework Directive Article 5 Economic Analysis of Water Use</p>	<p>Economic studies carried out as a part of the plan making process during the second cycle of river basin management planning.</p>
<p>CH: No physical damage or alteration of the context of cultural heritage features due to Plan activities.</p>	<p>Changes in the condition of monuments on the SMR (Northern Ireland) due to Plan implementation.</p> <p>Number of listed structures at risk due to Plan implementation.</p>	<p>Condition and Management Survey of the Archaeological Resource for Northern Ireland. NIEA. Updated on an ongoing basis.</p> <p>Built Heritage at Risk Northern Ireland (BHARNI) Register. NIEA and Ulster Architectural Heritage Society. Updated on an ongoing basis.</p>
<p>L: No damage to designated landscapes as a result of Plan implementation.</p>	<p>Number of water and wastewater treatment plants sited in landscapes with a high sensitivity to change.</p> <p>Percentage changes in land cover types in areas with a high sensitivity to change.</p>	<p>Data on number of new wastewater treatment plants to be sourced from Northern Ireland Water</p> <p>Northern Ireland Countryside Survey (updated every ten years, latest survey completed in 2008, report not yet published)</p>