

Draft River Basin Management Plans

ARTIFICIAL AND HEAVILY MODIFIED WATER BODIES

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Introduction

- 1.1 This document provides summary information on the proposals for designating freshwater water bodies as heavily modified or artificial and the draft classification results for such bodies.
- 1.2 The Water Framework Directive provides that surface water bodies may be designated as heavily modified where all the following conditions apply:
 - (i) the bodies are not artificial water bodies;
 - (ii) their physical characteristics (i.e. hydromorphological characteristics) have been substantially changed in character as a result of human activity;
 - (iii) the improvements to their modified physical characteristics necessary to achieve good ecological status would have a significant adverse impact on one or more of the water uses listed in paragraph 1.5 below or on the wider environment; and
 - (iv) the benefits provided by the use or uses cannot, for reasons of technical feasibility or disproportionate costs, reasonably be achieved by other means, which are a significantly better environmental option.
- 1.3 Water bodies may be designated as artificial water bodies if they were created by man where no water body previously existed.
- 1.4 NIEA is proposing to designate any water body meeting the criteria outlined in paragraphs 1.2 or 1.3 above as heavily modified or artificial, respectively.
- 1.5 The uses in relation to which water bodies may be designated as heavily modified or artificial are:
 - (a) navigation, including port facilities;
 - (b) activities associated to water storage, such as hydropower generation or drinking water supply;
 - (c) water regulation;
 - (d) flood protection;
 - (e) other important sustainable human development activities.
- 1.6 Designation of water bodies as heavily modified or artificial changes both the way their status is classified and the objectives that apply to them:
- 1.7 The status of heavily modified and artificial water bodies is described in terms of "ecological potential". This is a measure of how the ecological quality of such a water body compares with the maximum quality achievable given the constraints imposed by the modified or artificial physical characteristics necessary for the use or for the protection of the wider environment. The ecological potential of a water body may be maximum, good, moderate, poor or bad¹.
- 1.8 Except where so doing is technically infeasible or disproportionately expensive, the objective for a water body designated as heavily modified or artificial that is not at

¹ See Sections 1.2 and 1.2.5 of Annex V to the Water Framework Directive.

maximum or good ecological potential is to restore it with the aim of achieving good ecological potential by 2015. 'Good ecological potential' represents an ecological quality only slightly less than the maximum ecological potential the body could achieve.

2. Designation of heavily modified or artificial water bodies

- 2.1 This section summarises how NIEA has identified the water bodies it is proposing for designation as heavily modified or artificial. Following this consultation, the water bodies confirmed as heavily modified or artificial will be notified in the finalised plan at the end of 2009.
- 2.2 In identifying the water bodies proposed for designation as heavily modified and artificial, NIEA has followed the general approach to designating such water bodies set out in European guidance².
- 2.3 As part of the initial characterisation of the Northern Ireland River Basin District, which was completed in 2004 and reported in 2005³, NIEA identified water bodies as provisionally heavily modified or artificial. The identification of these water bodies was based on assessments of the risk that known alterations to the bodies' hydromorphological characteristics associated with one or more of the uses listed in paragraph 1.5 were likely to be substantial enough to prevent the achievement of good ecological status. The risk assessment was conducted using a number of datasets. River Habitat Survey (RHS) information was used to assess approximately 50% of Northern Ireland's water bodies. In addition a map based approach was used to identify additional pressures such as river straightening, land-use pressures, shoreline reinforcement and land claim.
- 2.4 Following the initial characterisation work, NIEA gathered additional information to help refine its risk assessments and the HMWB identification process was repeated. This resulted in a number of provisional heavily modified water bodies being filtered out. As a large number of water bodies were still provisionally identified as HMWB, NIEA held marine and freshwater workshops in conjunction with a UKTAG screening method to identify those water bodies that clearly met the criteria for designation as heavily modified (see paragraph 1.2). Information on the method it used to do this is available at:

http://www.wfduk.org/tag_guidance/article_4/heavily_modified_wb.
- 2.5 The initial results of the work described above proposed 54 river water bodies and 16 lake water bodies for designation as heavily modified. These results were based upon information available to NIEA as of March 2008.
- 2.6 The initial characterisation in 2005 identified 11 artificial water bodies. It has been recognised that more information is needed before designation of artificial water bodies is complete. NIEA is currently working on obtaining additional information

²http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/guidancesnos4sheavilysmo/EN_1.0_&a=d and http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/gds04shmwbspolicyssummar/EN_1.0_&a=d

³ <http://www.ni-environment.gov.uk/article5report.pdf>

upon their modification and use. NIEA is working to complete the assessment for artificial water bodies in time for the final river basin management plan in 2009.

2.7 Since March 2008, NIEA has obtained additional information about physical modifications and their associated use to water bodies. This has led to the removal of two heavily modified water bodies. Further information is still needed on another one provisional heavily modified water body in order to make a judgement on whether it meets the criteria for designation. NIEA is working to complete assessments for these bodies in time for the finalised river basin management plan in 2009.

2.8 The updated proposals are set out in Tables 1 and 2 below

Table 1: No of river HMWB assigned to sector

Sector	River waterbodies
Drinking water supply	19
Flood defence only	20
Navigation only	2
Drinking water supply and wider environment	5
Wider environment only	2
Flood defence and wider environment	1
Flood Risk Management and Navigation	3

Table 2: No. of lake HMWB assigned to sector

Sector	Lake waterbodies
Drinking water supply	6
Flow regulation	1
Wider environment and flow regulation	7
Drinking water and wider environment	1
Wider env, flow regulation and navigation	1

3. Classification information

3.1 This section summarises how NIEA has classified the ecological potential of the water bodies it is proposing for designation as heavily modified or artificial. The draft classification results will be updated for the finalised river basin management plan, which is to be published at the end of 2009. In updating the results, NIEA will take account of responses to this consultation.

3.2 To classify the ecological potential of proposed heavily modified and artificial water bodies, NIEA applied the methodology⁴ recommended by UKTAG⁵. The methodology is based on an approach known as the 'alternative approach'. This approach was agreed between Member States and the European Commission under the Common

⁴ http://www.wfduk.org/tag_guidance/Article%2011/POMEnvStds/gep_guidance_final

⁵ The UK Technical Advisory Group on the Water Framework Directive established by the UK government administrations and comprising representatives from SEPA, the Environment Agency, the Environment & Heritage Service for Northern Ireland, SNH, Natural England, Countryside Council for Wales and the Department for the Environment & Local Government in the Republic of Ireland.

Implementation Strategy for the Water Framework Directive⁶.

- 3.3 The methodology is based on the principle that a heavily modified or artificial water body will only be able to achieve its maximum ecological potential if its hydromorphological characteristics are improved to the fullest extent possible without significant adverse impacts on the use or the wider environment.
- 3.4 A water body is assessed as being at good ecological potential or better if:
- (a) all mitigation is in place except that expected to deliver only very minor ecological benefits;
 - (b) water quality achieves a standard equivalent to that needed for good ecological status; and
 - (c) other pressures are causing no more than a slight disturbance.
- 3.5 The methodology requires knowledge of the specific characteristics of the water bodies as well as of the needs of the uses reliant on the modified or artificial characteristics. Much of the necessary knowledge was provided by the stakeholders through a classification workshop held in October 2008.
- 3.6 The impacts of other pressures, including pressures on water quality, are assessed using the same standards as apply to similar unmodified water
- 3.7 To produce results in time for the draft plan, NIEA used a number of working assumptions additional to those set out in the UKTAG methodology. These additional assumptions are summarised in the Table 3 below:

Table 3: Assumptions used for the purposes of producing a first estimate of the ecological potential of heavily modified water bodies for the draft river basin management plans	
Category of adverse impact	Assumption used to decide if the modifications would cause a significant adverse impact on the water environment
<p><u>Impoundments</u></p> <p>Adverse impact on the movement of Atlantic salmon and sea trout between habitats important in their life cycles</p>	<p>In the absence of evidence to the contrary from an existing site-specific study:</p> <p>(a) If there was a known natural barrier downstream of the impoundment, it was assumed that the impounding works had no adverse impact on the movement of salmon or sea trout.</p> <p>(b) If the catchment upstream of the dam was less than 10 km², it was assumed that any adverse impact on salmon or sea trout populations was likely to be no more than slight and consequently did not require mitigation to achieve good ecological potential.</p>
<p>Adverse impacts on the:</p> <p>(i) river flows necessary to maintain</p>	<p>(a) If the length of river downstream of the impoundment in which any standards or condition</p>

⁶http://circa.europa.eu/Members/irc/env/wfd/library?l=/framework_directive/thematic_documents/hydromorphology/technical_reportpdf/_EN_1.0_&a=d

<p>river habitats and their associated aquatic plants or animals; (ii) morphological characteristics; or (iii) water quality</p> <p>in the river downstream of the impoundment</p>	<p>limits for good ecological status were failed was less than 1.5 km, it was assumed that the adverse impacts on the river water body were no more than slight and consequently did not require mitigation to achieve good ecological potential.</p> <p>(b) In the absence of any morphological assessments it was assumed that there was an adverse morphological impact downstream of the impoundment</p> <p>(c) It is assumed there is an adverse impact on water quality if compensation flow is released from the impoundment and no chemistry monitoring site lies within 1.5km downstream.</p>
Mitigation measure	Assumption used to estimate what would be needed to deliver required mitigation
Establish an appropriate baseline flow regime.	(a) An appropriate baseline flow regime in the river downstream of the impoundment was assumed to comprise a minimum flow equivalent to at least Q_{n95}
Designated use	Assumption used to estimate if mitigation would have a significant adverse impact on the designated use
Public water supply	<p>(a) For single source water supply zones (i.e. no potential to balance demand using several sources), if the zones were identified as being in deficit, any mitigation requiring a reduction in abstraction was assumed likely to have a significant adverse impact on the use.</p> <p>(b) For water supply zones with multiple sources, consideration was given to the overall effect of mitigation on the supply/demand balance for the zone.</p>

3.8 The draft assessments of the ecological potential class of the proposed heavily modified water bodies are summarised in Table 4 below. These results are based on the information available to NIEA at the October 2008 HMWB classification workshop.

3.9 In some cases uncertainties still exist and such water bodies will be reviewed in time for final classification in 2009.

Table 4: Hydromorphological classification of heavily modified water bodies (after October 2008 workshop)		
	Number of water bodies proposed for designation with hydromorphological conditions consistent with GEP or better or MEP or worse	
	Rivers	Lakes

	GEP or better	MEP or worse	GEP or better	MEP or worse
Purpose for which water body designated	Number of water bodies with hydromorphological conditions consistent with class by purpose(s) for which designation is proposed			
Flood risk Management	6	14		
Water storage for drinking water supply	2	17		6
Water storage for flow regulation			1	
Navigation	2			
Wider environment		2		
Drinking water supply and wider environment		5		1
Flow regulation and wider environment			4	3
Flood risk management and wider environment	1			
Flood risk management and navigation	1	2		
Wider environment, flow regulation and navigation			1	

3.10 Table 5 combines the results set out in Table 4 above with monitoring results used to assess the effects of pollution, if any, on the water bodies concerned. The data on the effects of pollution is based on information available from monitoring data from the period 2005-2007. It has not been possible to complete a full assessment on rivers and this work will be completed in 2009 prior to the final draft river basin plan. A total of 11 heavily modified water bodies were downgraded to MEP or worse as a result of the chemical classification of the water body.

Table 5: Overall classification results for 2008 by purpose for which water body would be designated as heavily modified				
	Classification of water bodies proposed for designation			
	Rivers		Lakes	
	GEP or better	MEP or worse	GEP or better	MEP or worse
Purpose for which water body designated	Distribution of overall classification by purpose(s) for which designation is proposed			
Flood risk Management	3	17		
Water storage for drinking water supply	1	18		6
Water storage for flow regulation			1	
Navigation	1	1		
Wider environment		2		
Drinking water supply and wider		5		1

environment				
Flow regulation and wider environment				7
Flood risk management and wider environment	1			
Flood risk management and navigation		3		
Wider environment, flow regulation and navigation				1

3.11 NIEA is planning work to review the classification results with the assistance of stakeholders concerned prior to the finalisation of the river basin management plan at the end of 2009 with the aim of reducing uncertainties.