

River Basin Management Plans

Introduction to identification and classification of heavily modified and artificial water bodies

December 2009

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Abbreviations

AFBI	Agri-Food Biosciences Institute
AILRegs	Abstraction and Impoundment Licensing (2006) Regulations
AONB	Area of Outstanding Natural Beauty
ASSI	Area of Special Scientific Interest
AWB	Artificial Water Body
BEP	Bad Ecological Potential
CSO	Combined Sewer Overflow
DARD	Department of Agriculture and Rural Development
DCAL	Department of Culture, Arts and Leisure
DWS	Drinking Water Supply
ESB	Electricity Supply Board
FRM	Flood Risk Management
GEP	Good Ecological Potential
GES	Good Ecological Status
GIS	Geographical Information System
HEP	Hydroelectric Power
HMWB	Heavily Modified Water Body
MEP	Moderate Ecological Potential
NAV	Navigation
NB	Neagh Bann
NE	North Eastern
NH	Natural Heritage, NIEA
NICMS	Northern Ireland Countryside Management Scheme
NIEA	Northern Ireland Environment Agency
NIW	Northern Ireland Water
NNR	National Nature Reserve
NW	North Western
PEP	Poor Ecological Potential
pHMWB	provisional Heavily Modified Water Body
POM	Programme of Measures
RBD	River Basin Districts
RHAT	River Hydromorphology Assessment Technique
RHS	River Habitat Survey
SAC	Special Areas of Conservation
SEPA	Scottish Environment Protection Agency
SP	Specific Pollutant
SPA	Special Protection Area
SUDS	Sustainable Urban Drainage System
UKTAG	United Kingdom Technical and Advisory Group
WE	Wider Environment
WFD	Water Framework Directive
WMU	Water Management Unit, NIEA
WWTW	Waste Water Treatment Works

1. Introduction

The overall goal of the Water Framework Directive (WFD) is for Member States to achieve “good ecological status” (GES) in all surface waters and ground waters by 2015. In order for the overall classification of a water body to be classed as “high,” the chemistry, ecology and hydromorphology must all be individually classified as “high,” where the hydromorphology is used as a supporting element for the ecology.

In accordance with Article 4 (3) of the WFD member states are permitted to identify surface water bodies where the physical structure has been changed for a specific use and designate them as heavily modified water bodies (HMWB). HMWB are bodies of water which, as a result of physical alterations by human activity are substantially changed in character and therefore cannot meet GES. Instead of GES, these water courses must meet “good ecological potential” (GEP).

Where a watercourse has been changed for a specific use such as flood prevention, or water storage, the ecological potential may be assessed by comparing the watercourse with a similar unmodified river. A trial was carried out by consultants in 2008 to assess ecological potential by comparing a modified river with a natural river. The Killylane Burn was historically dammed to create a water storage reservoir and was compared with the more natural Glenwhirry River¹ but other pressures in the water body made it difficult to assign deterioration in ecological class to the river morphology demonstrating the difficulty in using this method at this stage. This is further compounded by the fact that monitoring stations may be at varying distances from modifications, for example a biology site located in an urban area not close to the upstream dam. It was decided by Northern Ireland Environment Agency (NIEA) to use the United Kingdom Technical Advisory Group (UKTAG) mitigation measures approach to assign ecological potential. This method incorporates assessing morphological pressures with biological and chemical classifications for each water body.

This report aims to show the steps taken by NIEA in designating water bodies as heavily modified or artificial. Details of the information used to classify these water bodies are provided. To complement hydromorphological improvements to the channel the water quality within water bodies should be improved where classified as less than good status by identifying and mitigating against pollution pressures.

¹ Assessment of the effect of impoundment on the status of the Killylane Burn and Glenwhirry River, and their derogation as “Heavily Modified Water Bodies”. Bláithín Ní Ainín, Ian Donohue, Martyn Kelly and Kenneth Irvine. Freshwater Ecology Research Group and Bowburn-consultancy.co.uk

2. Designation methods

Provisional identification of heavily modified waterbodies in 2004/2005

In 2005 a desk top study was carried out to identify potential heavily modified waterbodies (pHMWB) for the Article 5 Characterisation process². Geographical Information System (GIS) maps and aerial photography were used to highlight pressures present. A provisional list was submitted in 2005 for the Article 5 report (Table 1).

Waterbody	Number of pHMWBs
Rivers	148
Lakes	15

Table 1. Potential HMWBs identified through the Article 5 process.

After the Article 5 report more information on morphological pressures became available from the Water Management Unit Hydrology Team and Northern Ireland Water (then Water Service) through aerial photography, GIS datasets, and River Habitat Survey (RHS) site surveys conducted in summer 2005. As a result of further monitoring information being available and guidance following a HMWB workshop held in Prague in October 2005, the provisional list for the Article 5 report was reassessed.

This information reduced the number of pHMWBs to 77 rivers with the number of lake pHMWBs remaining unchanged at 15.

Refinement using the SEPA Rapid Designation Technique 2007³

Due to the large number of water bodies identified as potentially heavily modified it was considered necessary to use the SEPA Rapid Designation approach to progress the final designations given the lack of knowledge on morphological/ecological links and the timeframe involved. This approach was endorsed by the UKTAG. The SEPA rapid designation approach identifies water bodies that are most clearly “HMWB,” without having to conduct detailed site specific studies.

² NIEA “*Water Framework Directive Summary Report of the characterisation and impact analyses required by Article 5 Northern Ireland,*” 2005

³ SEPA Rapid designation UKTAG WP 11s “*Criteria and Guidance Principles for the designation of heavily modified water bodies,*” 2007

Using the SEPA rapid designation technique four areas are considered, which are:-

- The wider environment;
- Water storage;
- Navigation; and
- Urban, residential and commercial land use.

If restoration measures could be taken to achieve GES without impacting on the specified use of the water body, then it was removed from the pHMWB list. If making the hydromorphological alterations to achieve GES within the waterbody will have a significant adverse effect on a specified use or the wider environment, and there is no better environmental option for delivering the benefits served by the modification, then the water body is designated as a HMWB without the need for further investigation.

Other sites were identified as requiring further information or site specific study. Following on from work carried out under the NS Share project⁴, a designation workshop was convened in October 2007 with attendees from Natural Heritage and Water Management Unit (WMU) ecologists, hydrologists and morphologists. All sites were assessed using the SEPA rapid designation technique and the following final designations were agreed (Table 2).

Surface Water category	HMWB
Rivers	54
Lakes	16

Table 2. HMWBs identified through the application of the SEPA rapid designation technique and site specific study.

3. Classification

Background

UKTAG produced a guidance document in March 2008 for classifying HMWBs⁵. The guidance assesses the ecological potential of HMWB based upon the use of generic checklists known as the ‘Alternative Approach’. The checklists describe mitigation measures that can be used as a way of assessing whether more can be done to increase the ecological potential of a water body (see *Appendix V – Templates of*

⁴ NS Shared Aquatic Resource – a NI/ROI WFD project partly funded by the EU Interreg project

⁵ UKTAG paper “*Guidance on the Classification of Ecological Potential for Heavily Modified water Bodies and Artificial Water Bodies,*” 2008

UKTAG sheets used (available on the website) for example of a mitigation spreadsheet). This assessment allows simple classification of HMWBs to good ecological potential (GEP) or better, or less than GEP.

A water body is assessed as being at GEP or better if:

- a) all mitigations are in place except those expected to deliver only very minor ecological benefit;
- 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.

The next step in the process is to define the mitigation measures which might be needed for those water bodies which are worse than GEP.

The UKTAG mitigation measures approach was adopted by NIEA to assess ecological potential for each designated HMWB. Each water body was assigned a category for the water use sector from:

- Water storage for drinking (DWS)
- Water storage for flow regulation (WS)
- Navigation (NAV)
- Flood risk management (FRM)
- Wider environment (WE)

The number of lake and river water bodies assigned for each sector in 2008 is given in Table 3.

Sector	River water bodies
Drinking water storage	20
Flood risk management	23
Navigation only	2
Drinking water storage and wider environment	6
Wider environment only	2
Flood risk management and wider environment	1

Sector	Lake water bodies
Drinking water supply only	6
Water storage for flow regulation only	1
Wider environment and flow regulation	7
Drinking water and wider environment	1
Wider environment, flow regulation and navigation	1

Table 3. UKTAG sectors for water use

Classification Process – February 2009

A workshop was held in NIEA offices in Lisburn in October 2008 to classify the ecological potential of each heavily modified water body. 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 stakeholders. Stakeholders that attended included: Northern Ireland Water (NIW), Rivers Agency (RA), Loughs Agency (LA), DCAL, Agri-Food and Bioscience Institute (AFBI), Waterways Ireland, representatives of Enniskillen Council and Donegal County Council, Natural Heritage (NH), Electricity Supply Board (ESB), WMU Ecologists, WMU Hydrologists and WMU Morphologists.

Where all mitigation measures for the water use are in place *Good Ecological Potential or better* was the classification. Where all mitigation measures for the water use are not in place *Moderate Ecological Potential or worse* was assigned.

54 river water bodies and 16 lakes were classified during the workshop according to their ecological potential. The mitigation measures identified will be used for objective setting and river basin management plans. During the workshop it became apparent that some water bodies had a combination of specified uses previously not considered (further details are given on pages 14 and 15 along with details of additional water bodies identified as HMWB and AWB and the exclusion of other water bodies, where further information has become available). Table 4 details the final number of water bodies for each specified use following discussion at the workshop.

Sector	River waterbodies
Drinking water storage	18
Flood risk management	19
Navigation only	2
Drinking water storage and wider environment	5
Wider environment only	2
Flood risk management and wider environment	1
Flood risk management and navigation	4

Sector	Lake waterbodies
Drinking water supply only	6
Drinking water and wider environment	1
Water storage for HEP and flood risk management	1
Water storage for HEP, flood risk management and wider environment	3
Flood risk management and wider environment	4
Flood risk management, wider environment and navigation	1

Table 4. Designation of each water body to a sector use following workshop

The main amendment from the workshop is the introduction of a new sector use for river water bodies, amalgamating flood risk management and navigation. This was considered necessary for 3 water bodies located in the Neagh Bann River Basin District (RBD) and 1 water body in the North Western River Basin District, where it was felt that both uses should be considered. Additionally, 3 water bodies were dropped from the HMWB list as further information revealed they no longer functioned as their specified use as pre-determined prior to the workshop.

For lakes, it was decided to split flow regulation into hydroelectric power (HEP) and flood risk management (FRM). Both of these sectors modify the natural water level regime by altering the lake outlet but they have different management objectives and therefore impact on the water body differently. By considering them separately, each sector can be targeted specifically through the programme of measures.

51 rivers and 16 lakes were classified by the end of the workshop for hydromorphology (and using further information) to their ecological potential for each river basin district (Table 5A-C). At this stage, the water bodies assigned GEP were Good Ecological Potential or better and those assigned MEP were Moderate Ecological Potential or worse.

Water body ID	Catchment and Water Type	Name	Workshop Ecological Potential	Specified Use
GBNI3NW0025	Lower Erne Lake	Castlehume	GEP	HEP and flood risk management
GBNI3NW0008	Upper Erne Lake	Upper Lough Erne SAC/SPA	MEP	Wider environment, HEP and flood risk management
GBNI3NW0007	Lower Erne Lake	Lower Lough Erne Devenish	MEP	Wider environment, HEP and flood risk management
GBNI3NW0006	Lower Erne Lake	Lower Lough Erne Kesh	MEP	Wider environment, HEP and flood risk management
GBNI1NW363602039	Upper Erne River	River Erne (Enniskillen)	GEP	Navigation only
GBNI1NW363601072	Lower Erne River	Erne (Beleek)	GEP	Navigation and Flood Risk Management
GBNI1NW010102093	Strule River	River Strule (Omagh)	MEP	Flood risk management
GBNI1NW010102033	Camowen River	Glenhordial	MEP	Drinking water storage
GBNI1NW010102030	Camowen River	Lough Nadarragh Disused, L. Fingrean & L. Macory	MEP	Drinking water storage
GBNI1NW010102009	Fairywater River	Lough Bradan,	MEP	Drinking water storage
GBNI1NW010102050	Derg River	Lough Lee, Killen Burn	No longer HMWB (28/01/09)	Drinking water storage
GBNI1NW010102074	Mourne River	Mourne River (Sion Mills)	GEP	Flood risk management
GBNI1NW020202010	Roe River	Altnaheglis, Owenrigh River	MEP	Drinking water and wider environment
GBNI1NW393901002	Burnfoot River	Skeoge River (Shantallow)	MEP	Flood risk management
GBNI1NW020204031	Faughan River	River Faughan	MEP	Drinking water storage

Table 5A – North Western following workshop and further information

Water body ID	Catchment and Water Type	Name	Workshop Ecological Potential	Specified Use
GBNI3NE0019	Kilkeel and Mourne Lake	Silent Valley Reservoir	MEP	Drinking water storage and wider environment
GBNI1NE050505114	Kilkeel and Mourne River	Silent Valley, Kilkeel & Annalong River Binnan Tunnel	MEP	Drinking water storage and wider environment
GBNI1NE050505110	Kilkeel and Mourne River	Foffany Reservoir, Shimna River	MEP	Drinking water storage and wider environment
GBNI1NE050505036	Kilkeel and Mourne River	Annalong	MEP	Drinking water storage
GBNI1NE050502084	North Down and Ards / River	Ballyholme River (Bangor)	MEP	Flood risk management
GBNI1NE050504085	North Down and Ards / River	Cully's Burn (Newtownards)	GEP	Flood risk management
GBNI1NE050502083	North Down and Ards / River	Ballysallagh Upper & Lower, Crawfordsburn River	No longer HMWB	Drinking water storage
GBNI1NE050504080	Comber River	Enler River (Dundonald)	MEP	Flood risk management
GBNI1NE050503087	Lagan River	Connswater (Belfast)	MEP	Flood risk management
GBNI1NE050503003	Lagan River	Blackstaff River (Belfast)	MEP	Flood risk management
GBNI1NE050503002	Lagan River	Blackstaff River (Belfast)	GEP	Flood risk management
GBNI1NE050503119	Lagan River	Clowney water (Belfast)	MEP	Flood risk management
GBNI1NE050503104	Lagan River	River Lagan tributary(Belfast)	MEP	Flood risk management
GBNI3NE0028	Belfast Lough North Lake	Lough Mourne	MEP	Drinking water storage
GBNI1NE050501004	Belfast Lough North River	Lough Mourne Copeland Reservoir Copeland River	MEP	Drinking water storage
GBNI1NE050501120	Belfast Lough North River	Woodburn North & South, Woodburn River	MEP	Drinking water storage
GBNI1NE040404049	Bush River	Altnahinch	MEP	Drinking water storage
GBNI1NE040403064	Glenariff River	Collin Burn Lough Garve 1 & 2 Inver River Associated with Dungonnell above	MEP	Drinking water storage
GBNI1NE040404053	Bush River	Burn Gushet River (North Ballymoney)	MEP	Wider environment
GBNI1NE040404054	Bush River	Burn Gushet River (North Ballymoney)	MEP	Wider environment

Table 5B – North Eastern following workshop and further information

Water body ID	Catchment and Water Type	Name	Workshop Ecological Potential	Specified Use
GBNI3NB0021	Newry Lake	Cam Lough	MEP	Drinking water storage
GBNI1NB060601017	Newry River	Camlough,	MEP	Drinking water and wider environment
GBNI1NB030307049	Blackwater River	Clay Lake	MEP	Drinking water storage
GBNI1NB030307048	Blackwater River	Seaghan Reservoir, Butter River	MEP	Drinking water storage
GBNI1NB030307109	Blackwater (Callan) River	Killeen Water (Armagh)	MEP	Flood risk management
GBNI1NB030307025	Blackwater River	River Rhone (Dungannon)	MEP	Flood risk management
GBNI1NB030307173	Blackwater River	Altmore 1 & 2, Torrent River	MEP	Drinking water storage
GBNI1NB030304060	Balinderry River	Ballinderry River (Cookstown)	GEP	Flood risk management and wider environment
GBNI3NB0027	Moyola Lake	Lough Fea	GEP	Drinking water storage
GBNI1NB030303005	Moyola River	Lough Fea, White Water, Sruhannaclogh, Sruhanpollakeeran	MEP	Drinking water and wider environment
GBNI1NB030303144	Moyola River	Coppies Burn (Magherafelt)	MEP	Flood risk management
GBNI3NB0024	Glenavy Lake	Stoneyford Reservoir	No longer HMWB	Drinking water storage
GBNI1NB030306083	Glenavy River	Stoneyford Reservoir & Leathemstown	No longer HMWB	Drinking water storage
GBNI1NB030305162	Six Mile Water River	Plasketts Burn (Antrim)	MEP	Flood risk management
GBNI1NB030305122	Six Mile Water River	Six mile Water (Doagh, Antrim)	MEP	Flood risk management
GBNI1NB030305204	Six Mile Water River	Six Mile Water (Ballyclare)	GEP	Flood risk management
GBNI1NB030302199	Main River	Killylane Reservoir, Glenwhirry River, Donaghy, Crosswater 2 & 3	MEP	Drinking water storage
GBNI1NB030302233	Main River	Dungonnell Dam	MEP	Drinking water storage
GBNI1NB030302022	Main River	Artoges River	No longer HMWB	Drinking water and wider environment
GBNI1NB030302018	Roe River	Braid River(Ballymena)	MEP	Flood risk management
GBNI1NB030301149	Lower Bann River	River Bann (Portglenone)	MEP	Flood risk management and navigation

Water body ID	Catchment and Water Type	Name	Workshop Ecological Potential	Specified Use
GBNI1NB030301220	Lower Bann River	Lower Bann (Ballymoney Trib)	MEP	Flood risk management
GBNI1NB030301214	Lower Bann River	Bann (South of Coleraine)	MEP	Flood risk management* and navigation
GBNI1NB030301071	Lower Bann River	Ballinrees	MEP	Drinking water storage
GBNI3NB0017	Upper Bann Lake	Lough Island Reavy	MEP	Drinking water storage
GBNI1NB030308188	Upper Bann River	Lough Island Reavy, Muddock River	MEP	Drinking water storage
GBNI3NB0026	Upper Bann Lake	Spelga Dam	MEP	Drinking water storage
GBNI1NB030308089	Upper Bann River	Spelga Dam, Upper Bann	MEP	Drinking water storage
GBNI1NB030308197	Upper Bann River	River Bann (Banbridge)	MEP	Flood risk management
GBNI1NB030308103	Upper Bann River	River Bann (Bannfoot, Craigavon)	MEP	Flood risk management and navigation
GBNI3NB0016	Lough Neagh and peripherals Lake	Lough Portmore	No longer HMWB	Wider environment and flood risk management
GBNI3NB0013	Lower Bann Lake	Lough Beg	GEP	Wider environment, flood risk management and Navigation
GBNI3NB0003	Lough Neagh & peripherals Lake	Lough Neagh Antrim	GEP	Wider environment and flood risk management
GBNI3NB00005	Lough Neagh & peripherals Lake	Lough Neagh Cookstown	GEP	Wider environment and flood risk management
GBNI3NB00002	Lough Neagh & peripherals Lake	Lough Neagh Craigavon	GEP	Wider environment and flood risk management

Table 5C – Neagh Bann following workshop and further information

Classification Process - March – May 2009

Following the October 2008 workshop further investigations by NIEA were carried out and 4 additional HMWB and 1 Artificial Water Body (AWB) were identified (Table 6). These 5 additional river water bodies were then subjected to the same processes as before, with a specified use being designated before using the UKTAG mitigation measures approach. Site specific field studies were carried out where more information was required. The RHAT method⁶ was used to assess the structural elements of the water body.

In this period, further information became available for some water bodies that meant they no longer met the conditions of Article 4(3) that are necessary for HMWB designation. The hydromorphological condition of Portmore Lough was classified as “Good,” using the Lake-MImAS tool⁷. Further information became available from NIW on disused water supplies and as a result Stoneyford lake and river were removed from the HMWB list. In total, 3 water bodies were removed from the HMWB list and 4 additional HMWB and 1 AWB were included. Lough Neagh was previously considered as 3 water bodies (GBNI3NB0002, GBNI3NB0003 and GBNI3NB0005) but these were merged and it is now assessed in its entirety (as GBNI3NB0032).

Water Body ID	Name	Sector	HMWB/AWB
GBNI1NB030306208	Lagan Canal (Goudy River)	WE	HMWB
GBNI1NB030306194	Lagan Canal (Aghalee Burn)	WE	HMWB
GBNI1NE050503108	Lagan Canal (River Lagan)	FRM	HMWB
GBNI1NB030307145	Coalisland Canal (Torrent River)	FRM	HMWB
GBNI1NB060604048	Newry Canal AWB	FRM	AWB
GBNI3NB0024	Stoneyford Reservoir	DWS	Non-HMWB
GBNI1NB030306083	Stoneyford Reservoir & Leathemstown	DWS	Non-HMWB
GBNI3NB0016	Lough Portmore	WE&FRM	Non-HMWB

Table 6. Additional water bodies identified and removed assigned to sector

54 river water bodies and 12 lakes went forward for the final river basin management plans and are inclusive of the additional water bodies identified above. Tables 7a and 7b reflect these changes and assignment to sector use.

⁶ River Hydromorphology Assessment Technique (RHAT) Training Guide (2009) NIEA. ISBN : 978-1-905127-97-9

⁷ J.S. ROWAN. Development of Lake-MImAS as a decision-support tool for managing hydromorphological alterations to lakes. SNIFFER 2008.

Sector	River waterbodies
Drinking water storage	17
Flood risk management	24
Navigation only	1
Drinking water storage and wider environment	5
Wider environment only	2
Flood risk management and wider environment	1
Flood risk management and navigation	4

Table 7a: Final Number of river HMWB/AWB assigned to sector

Sector	Lake waterbodies
Drinking water supply only	3
Drinking water and wider environment	3
Water storage for HEP and flood risk management	1
Water storage for HEP, flood risk management and wider environment	3
Flood risk management and wider environment	1
Flood risk management, wider environment and navigation	1

Table 7b: Final Number of Lake HMWBs assigned to sector

Classification process – May - June 2009

Rivers

The applicability of ecological and chemical data from existing monitoring stations relative to the modifications responsible for HMWB designation was assessed. In several cases the current monitoring station(s) was/were considered appropriate. For other locations the combined scores currently being used for classification were not considered to represent the pressure. The evaluation of monitoring data followed the UKTAG guidance recommendations in section 3 UKTAG paper “*Guidance on the Classification of Ecological Potential for Heavily Modified Water Bodies and Artificial Water Bodies*,” 2008. At all sites combined physico-chemistry data (results from previous 3 years) was used where available. If GEP was assigned and the chemistry was less than good, the final classification was changed to Moderate Ecological Potential (MEP) (chemistry does not reduce classification lower than moderate and a higher chemistry class did not raise the workshop classification).

Available biology data was then considered to assign all WFD classes. All GEP and MEP sites were broken down into GEP or better, Moderate EP, Poor EP and Bad EP. No water bodies have been assigned maximum ecological potential at this stage, as it is not considered that the procedure is sufficiently developed to do so. If any of the biological elements were “Poor,” the water body was classified PEP, if any were

“Bad,” it was classified BEP. Fish monitoring data, which was only available for a limited number of HMWBs was excluded where it was felt that it may have been adversely affected due to the modification for which the water body was originally designated (e.g. an impoundment without a fish pass). The final classifications are presented in Tables 8A-C. These classifications take account of monitoring data, the final classification of each water body and the reason for their downgrade in classification where applicable. Where water body IDs have changed these too are noted. For water bodies identified as *Bad Hydrology the water body **has not** been further downgraded due to its hydrology because the flow modification was the original reason for HMWB designation.

Lakes

All of the lakes are monitored once every three years and the overall classification was based on the data that had been collected up to the end of 2008.

In accordance with guidance from the UKTAG Lakes Task Team⁸, overall lake classification defaults to the lowest class produced by the biological quality elements and TP. However, at this time classification tools are only available for phytoplankton, diatoms and macrophytes but the latter are not used for HMWB classification as they are directly influenced by the modifications.

Therefore if a lake was assessed as being at GEP using the mitigation measures worksheet, the overall classification would only remain GEP if TP, phytoplankton and diatoms were at least GEP also. If TP, phytoplankton or diatoms were assessed as being moderate, poor or bad, the overall classification was lowered accordingly.

⁸ G. Phillips, 2008. Pilot Lake Classification for England Wales and Scotland. LTT paper 143.

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final classification
GBNI3NW0025	Lower Erne Lake	Castlehume	GEP	MEP	Moderate Total Phosphate (TP)
GBNI3NW0008	Upper Erne Lake	Upper Lough Erne SAC/SPA	MEP	MEP	Moderate TP and diatoms
GBNI3NW0007	Lower Erne Lake	Lower Lough Erne Devenish	MEP	MEP	Moderate TP and diatoms
GBNI3NW0006	Lower Erne Lake	Lower Lough Erne Kesh	MEP	MEP	Moderate TP and diatoms
GBNI1NW363602039	Upper Erne River	River Erne (Enniskillen)	GEP	MEP	Moderate phys chem. (Dissolved Oxygen) and biology
GBNI1NW363601072	Lower Erne River	Erne (Beleek)	GEP	MEP	Moderate Diatoms
GBNI1NW010102093	Strule River	River Strule (Omagh)	MEP	MEP	Biology good or better
GBNI1NW010102033	Camowen River	Glenhordial	MEP	PEP	Poor diatoms
GBNI1NW010102030	Camowen River	Lough Nadarragh Disused, L. Fingrean & L. Macory	MEP	MEP	*Bad hydrology
GBNI1NW010102009	Fairywater River	Lough Bradan, The Blackwater	MEP	MEP	Biology high
GBNI1NW010102074	Mourne River	Mourne River (Sion Mills)	GEP	PEP	Poor diatoms
GBNI1NW020202010	Roe River	Altnaheglish, Owenrigh River	MEP	MEP	*Bad hydrology
GBNI1NW393901002	Burnfoot River	Skeoge River (Shantallow)	MEP	PEP	Poor invertebrates and fish
GBNI1NW020204031	Faughan River	River Faughan	GEP	PEP	Poor diatoms

Table 8A – North Western

* Water body not downgraded due to hydrology because it is directly linked to the modification

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final classification
GBNI3NE0019	Kilkeel and Mourne Lake	Silent Valley Reservoir	MEP	MEP	High Biological Status
GBNI1NE050505114	Kilkeel and Mourne River	Silent Valley, Kilkeel & Annalong River Binnan Tunnel	MEP	MEP	Bad fish but may be due to the modification.
GBNI1NE050505110	Kilkeel and Mourne River	Foffany Reservoir, Shimna River	MEP	MEP	Bad Hydrology*
GBNI1NE050505036	Kilkeel and Mourne River	Annalong	MEP	MEP	Bad Hydrology* and Moderate invertebrates
GBNI1NE050502084	North Down and Ards / River	Ballyholme River (Bangor)	MEP	BEP	Bad invertebrates and fish
GBNI1NE050504085	North Down and Ards / River	Cully's Burn (Newtownards)	GEP	MEP	Nothing for biology, brought down by chemistry (Moderate phys. chem.)
GBNI1NE050504080	Comber River	Euler River (Dundonald)	MEP	PEP	Poor invertebrates
GBNI1NE050503087	Lagan River	Connswater (Belfast)	MEP	BEP	Bad invertebrates and fish
GBNI1NE050503003	Lagan River	Blackstaff River (Belfast)	MEP	BEP	Bad invertebrates
GBNI1NE050503002	Lagan River	Blackstaff River (Belfast)	GEP	BEP	Bad invertebrates
GBNI1NE050503119	Lagan River	Clowney water (Belfast)	MEP	MEP	Nothing for biology
GBNI1NE050503104	Lagan River	River Lagan tributary(Belfast)	MEP	PEP	Poor invertebrates and macrophytes

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final classification
GBNI3NE0028	Belfast Lough North Lake	Lough Mourne	MEP	PEP	Poor TP
GBNI1NE050501004	Belfast Lough North River	Lough Mourne Copeland Reservoir Copeland River	MEP	MEP	Bad Hydrology* No biology or chemistry results
GBNI1NE050501120	Belfast Lough North River	Woodburn North & South, Woodburn River	MEP	MEP	Bad fish but may be due to the modification.
GBNI1NE040403064	Glenarriff River	Collin Burn Lough Garve 1 & 2 Inver River Associated with Dungonnell above	MEP	MEP	There was no biological data available for this water body
GBNI1NE040404049	Bush River	Altnahinch	MEP	MEP	Biology moderate or better
GBNI1NE040404053	Bush River	Burn Gushet River (North Ballymoney)	MEP	PEP	Poor invertebrates
GBNI1NE040404054	Bush River	Burn Gushet River (North Ballymoney)	MEP	PEP	Poor invertebrates
GBNI1NE050503108	Lagan River	Lagan Canal (River Lagan)	MEP	MEP	Biology moderate or better

Table 8B – North Eastern

* Water body not downgraded due to hydrology because it is directly linked to the modification

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final classification
GBNI3NB0021	Newry Lake	Cam Lough	MEP	MEP	Moderate TP and phytoplankton
GBNI1NB060602017	Newry River	Camlough, Flurry River	MEP	PEP	Poor invertebrates and poor hydrology*
GBNI1NB030307049	Blackwater River	Clay Lake	MEP	PEP	Poor invertebrates
GBNI1NB030307048	Blackwater River	Seaghan Reservoir, Butter River	MEP	MEP	Bad hydrology*
GBNI1NB030307109	Blackwater (Callan) River	Killeen Water (Armagh)	MEP	BEP	Bad invertebrates
GBNI1NB030307025	Blackwater River	River Rhone (Dungannon)	MEP	BEP	Bad invertebrates
GBNI1NB030307173	Blackwater River	Altmore 1 & 2, Torrent River	MEP	PEP	Poor fish and invertebrates
GBNI1NB030304060	Balinderry River	Ballinderry River (Cookstown)	GEP	PEP	Poor macrophytes
GBNI3NB0027	Moyola Lake	Lough Fea	GEP	GEP	High Biology
GBNI1NB030303005	Moyola River	Lough Fea, White Water, Sruhannaclogh, Sruhanpollakeeran	MEP	MEP	Bad hydrology* and moderate macrophytes
GBNI1NB030303144	Moyola River	Coppies Burn (Magherafelt)	MEP	PEP	Poor invertebrates
GBNI3NB0024	Glenavy Lake	Stoneyford Reservoir	MEP	No longer HMWB	Not applicable
GBNI1NB030306083	Glenavy	Stoneyford River	MEP	No longer HMWB	Not applicable
GBNI1NB030305162	Six Mile Water River	Plaskets Burn (Antrim)	MEP	PEP	Poor invertebrates

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final classification
GBNI1NB030305122	Six Mile Water River	Six Mile Water (Antrim)	MEP	PEP	Poor fish and diatoms
GBNI1NB030305204	Six Mile Water River	Six Mile Water(Ballyclare)	GEP	MEP	Moderate Invertebrates
GBNI1NB030302199	Main River	Killylane Reservoir, Glenwhirry River , Donaghy, Crosswater 2 & 3	MEP	MEP	Biology moderate or better
GBNI1NB030302233	Main River	Dungonnell Dam	MEP	MEP	Biology moderate or better
GBNI1NB030302018	Roe River	Braid River(Ballymena)	MEP	PEP	Poor macrophytes
GBNI1NB030301149	Lower Bann River	River Bann (Portglenone)	MEP	PEP	Poor macrophytes
GBNI1NB030301220	Lower Bann River	Lower Bann (Ballymoney Trib)	MEP	PEP	Poor invertebrates
GBNI1NB030301214	Lower Bann River	Bann (South of Coleraine)	MEP	PEP	Poor macrophytes and diatoms
GBNI1NB030301071	Lower Bann River	Ballinrees	MEP	PEP	Poor invertebrates
GBNI3NB0017	Upper Bann Lake	Lough Island Reavy	MEP	MEP	Moderate TP and phytoplankton
GBNI1NB030308188	Upper Bann River	Lough Island Reavy, Muddock River	MEP	PEP	Poor macrophytes and bad hydrology*
GBNI3NB0026	Upper Bann Lake	Spelga Dam	MEP	Moderate or worse	Insufficient biological data to classify more specifically
GBNI1NB030308089	Upper Bann River	Spelga Dam, Upper Bann	MEP	MEP	Bad Hydrology*
GBNI1NB030308197	Upper Bann River	River Bann (Banbridge)	MEP	MEP	Moderate Invertebrates and macrophytes
GBNI1NB030308103	Upper Bann River	River Bann (Bannfoot, Craigavon)	MEP	PEP	Poor invertebrates

ID	Catchment and water type	Name	Ecological potential	Final Classification	Reason for final morph classification.
GBNI3NB0016	Lough Neagh and peripherals Lake	Lough Portmore	GEP	No longer HMWB	Not applicable
GBNI3NB0013	Lower Bann Lake	Lough Beg	GEP	PEP	Poor TP, phytoplankton and diatoms
GBNI3NB0032	Lough Neagh and peripherals Lake	Lough Neagh Antrim	GEP	BEP	Bad TP
GBNI1NB030306208		Lagan Canal (Goudy River)	MEP	BEP	Bad invertebrates
GBNI1NB030306194		Lagan Canal (Aghalee Burn)	MEP	PEP	Poor invertebrates
GBNI1NB030307145		Coalisland Canal (Torrent River)	MEP	PEP	Poor macrophytes and diatoms
GBNI1NB060604048		Newry Canal AWB	MEP	MEP	Nothing available

Table 8C – Neagh Bann

* Water body not downgraded due to hydrology because it is directly linked to the modification

Summaries for each water body identified as HMWB within the North Western, North Eastern and Neagh Bann River Basin Districts are available on the website and give an overview of the pressures identified during the workshop (Hydromorphological Ecological Potential) and any further information (*Heavily modified and artificial water bodies – North Western River Basin District, Heavily modified and artificial water bodies – North Eastern River Basin District, and Heavily modified and artificial water bodies – Neagh Bann River Basin District*). Chemical and biological classifications are also provided. Details of water bodies removed from the HMWB list are provided in *Water bodies removed from the heavily modified water body list*, available on the website.

Improvements to the morphology may not provide an appropriate ecological response unless there is otherwise “Good water quality.” It is therefore recommended for all sites that any sources of pollution are investigated and eliminated where possible to ensure that all relevant attributes are assessed.

Notes

The definition of a freshet, (as referred to in the River Basin District documents above) is a sudden release in river flow that results from heavy rain or melting of snow. Research has shown that freshets act as a stimulus for the migration of fish and in many rivers. Within the UK, freshet flows are released downstream from impoundments so that their quantity, duration and frequency facilitate the migration of fish.

CONCLUSION

Heavily modified water body and artificial water body designation will be an ongoing process within the following 6 year river basin cycle with the possible inclusion of further sites or removal of currently designated sites as methodologies develop and more details are known. The sites identified within this report will be assessed and programmes of measures identified to achieve Good Ecological potential. Where this target is not possible within the specified timeframe of one river basin cycle derogations will be applied for and programmes of measures over a longer timeframe will be identified.