Planning for third cycle River Basin Management Plan 2021 - 2027

December 2019

Consultation on Significant Water management Issues

Appendix 2: Overall water quality status interim results 2018 and pressure analysis

Northern Ireland Environment Agency
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Overall water quality status interim results and pressure analysis

2.1 Comparison of overall water body status from 2015-2018

This chapter sets out the changes in WFD status assessment between the 2015 classification and the 2018 interim classification update. In 2015, Northern Ireland published the second cycle River Basin Plans including the status for all water bodies (rivers, lakes, groundwater, transitional and coastal water bodies), the objectives that water bodies should achieve by 2021 and a Programme of Measures to achieve the objectives. In 2015, just over 37.4 % of all water bodies were at 'good' status.

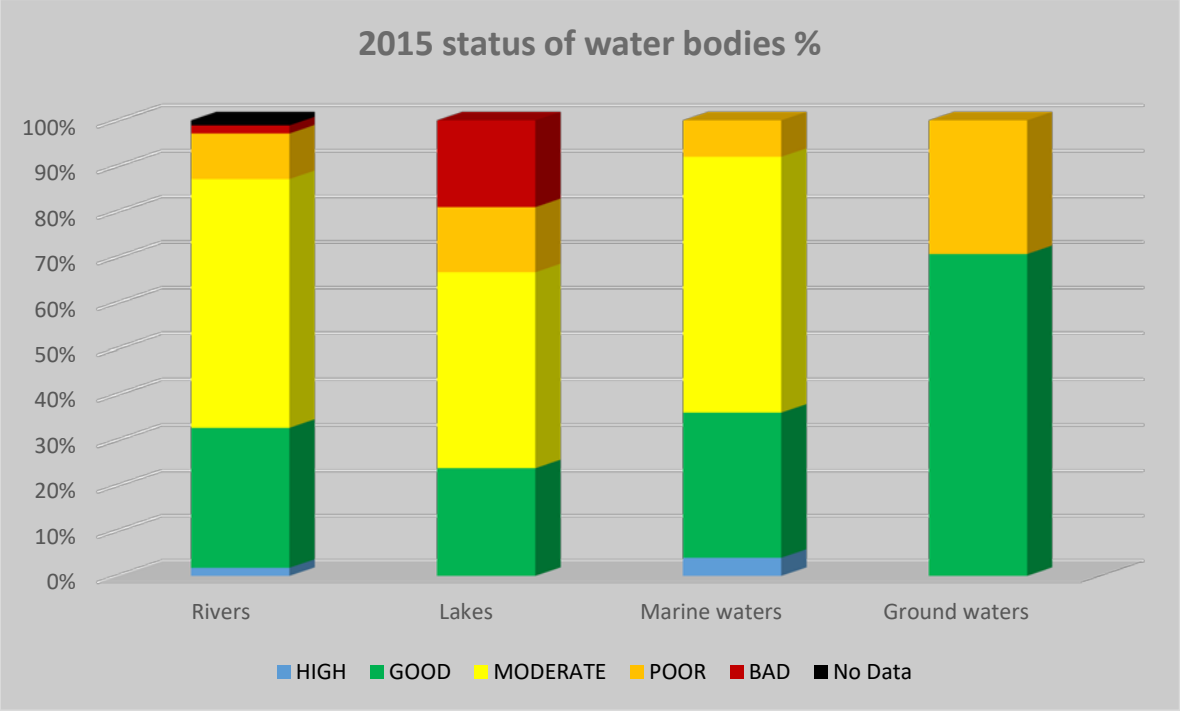

Figure 3: 2015 Status of water bodies

In 2018, an interim assessment of the status of all water bodies was carried out to determine progress towards achieving the objectives set for each of these water bodies to reach by 2021. The current interim classification update indicates there has been a slight decline from 2015 where 37.4 % of all water bodies were at 'good or better' to 36.6 % at 'good or better' in 2018.

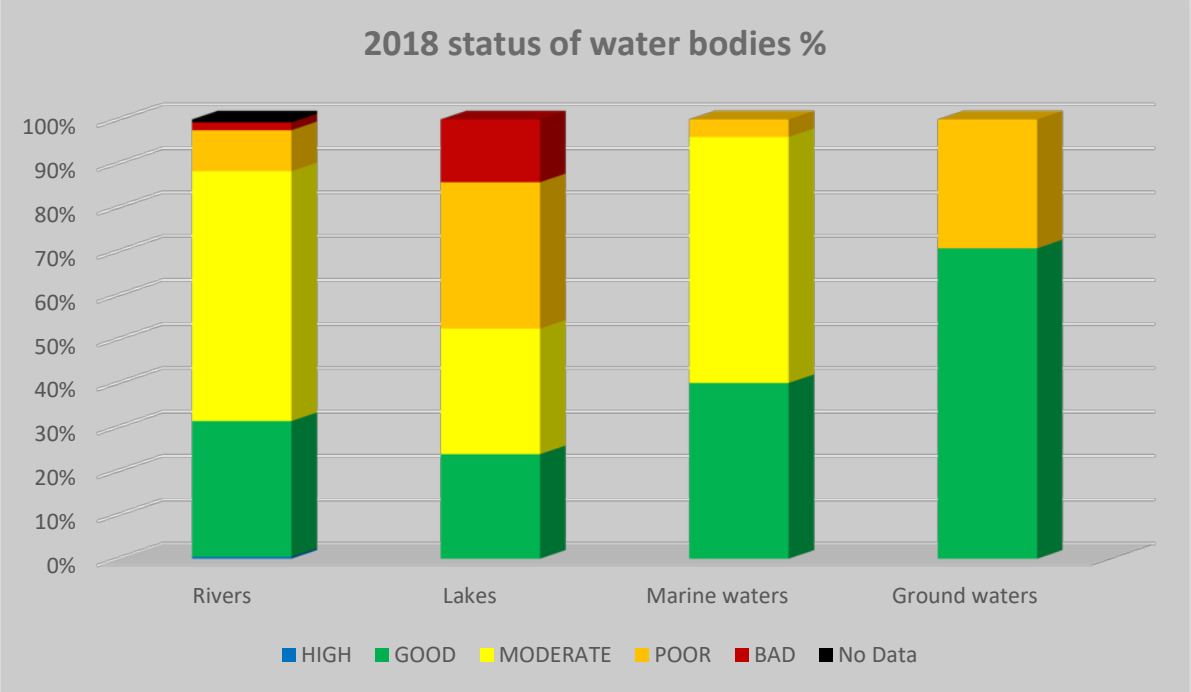

Figure 4: 2018 Status of water bodies

2.2 Are we on track to achieve the objectives set for 2021

The target for the end of the second cycle in 2021 is to have up to 70 % of Northern Ireland water bodies at 'good or better' status.

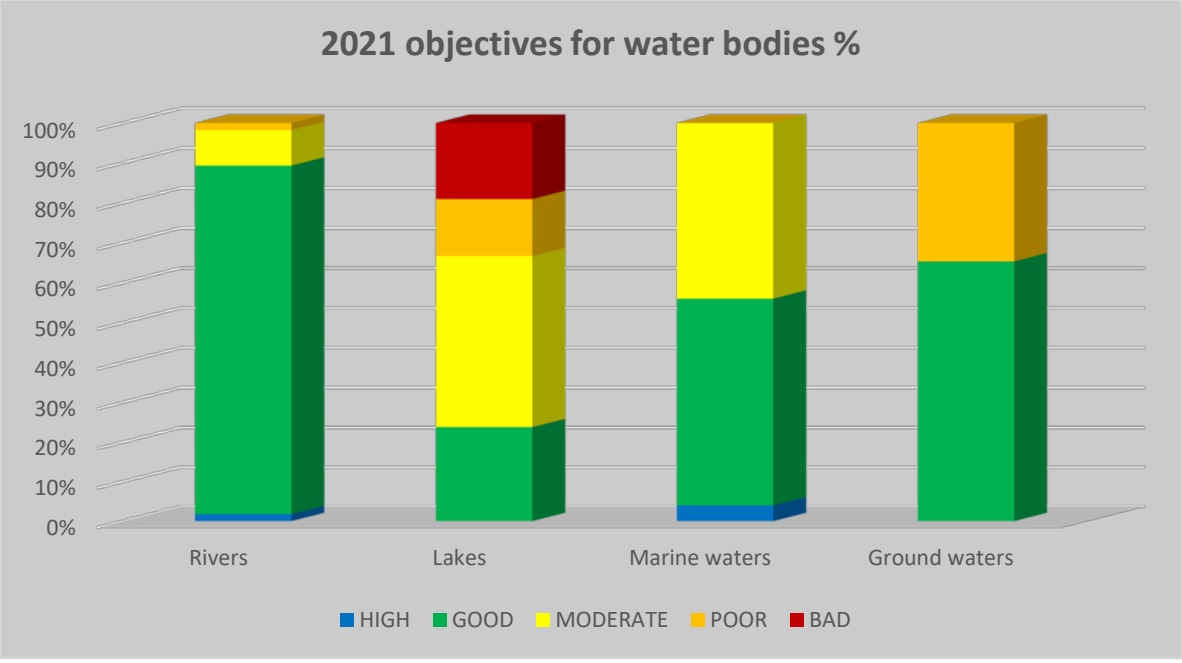

Figure 5: 2021 Objectives of water bodies

The 2018 classification update has shown a mix of results with variance both toward good status and away from good status. The changes from the 2015 status show an

2.3.2 Lakes

There are 21 lakes in total. The table below compares the 2015 and 2018 classification:

Lake status class	2015	2018
Good	5	5
Moderate	9	6
Poor	3	7
Bad	4	3

Table 4: Lake status in 2015 and 2018

In 2018 Lough Neagh improved from 'bad' to 'poor' and Lower Lough Erne, Upper Lough Erne and Upper Lough MacNean deteriorated from moderate to poor. Although the classification for Lough Neagh showed an improvement from 'bad' to 'poor', the status changes are due to fluctuations around the poor/bad boundary therefore confidence in an actual improvement is low.

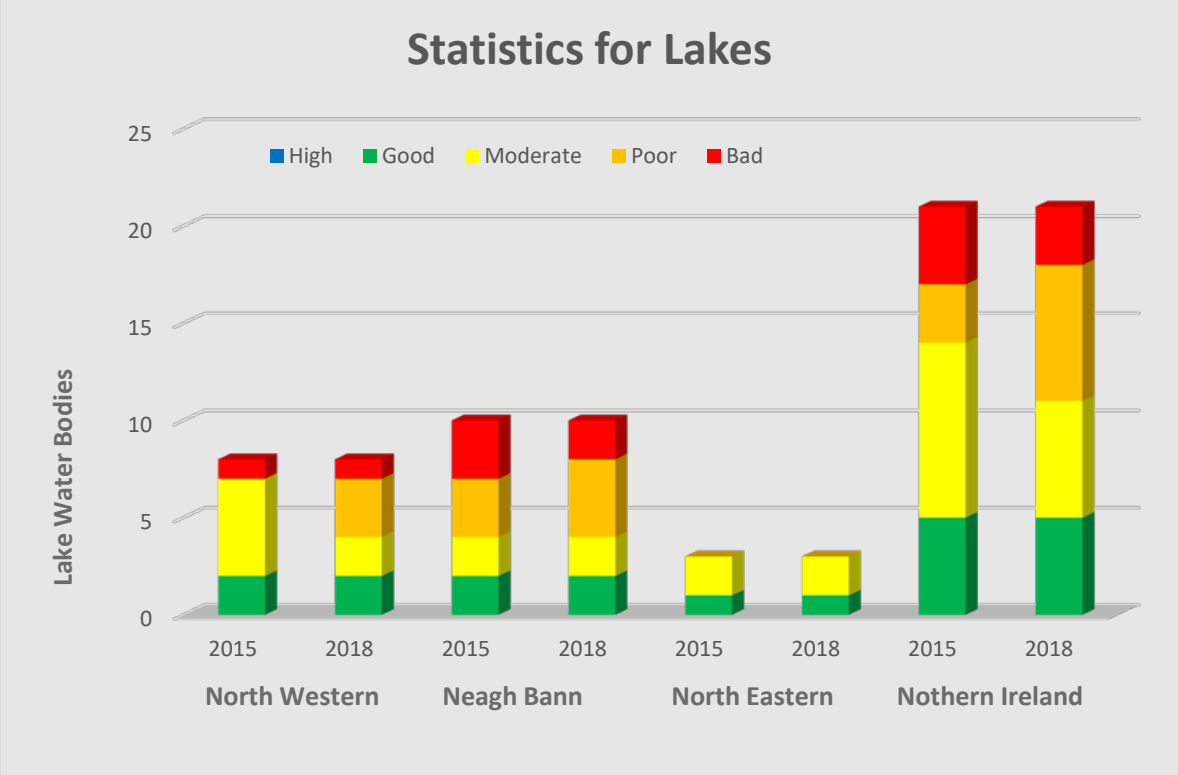

Figure 9: Statistics for lakes

A risk assessment was carried out looking at underlying trends and 2018 status to determine the risk of each lake water body not meeting the objective set for 2021.

More detail on the risk of surveillance lakes not meeting their objectives can be found in the supporting documents on the website[2].

The table below shows the number of water bodies at risk of not meeting the 2021 objectives.

All of Northern Ireland	Risk Category	Number of lakes
Total number of lakes		21
Risk of not meeting 2021 objectives	Not at risk	7
	May be at risk	3
	At risk	11

Table 5: lakes at risk of not meeting the 2021 objectives

Overall, 7 lakes were assessed as ‘not at risk’, 3 were assessed as ‘may be at risk’ and 11 lakes were assessed as ‘at risk’ of not meeting their 2021 objectives. Overall only 5 lakes have a prediction of ‘good’ status identified for 2021 based on 2018 classifications. The remaining 16 are not expected to reach ‘Good’ status in this timeframe.

Ecological recovery time can be much longer in lakes in comparison to rivers due to the internal loading of phosphorus. This is due to the release of phosphorus from the sediments of lakes which has built up historically when nutrient inputs were higher than that required for the biology of the lake. Under the correct conditions, the sediments can release substantial pulses of phosphorus to the water for use by plants and animals. This is one of the reasons why lakes do not respond as quickly or noticeably to nutrient reduction programmes or lake restoration works as other habitats.

A study is currently being carried out by Agri-Food and Biosciences Institute (AFBI) looking at the quantification of phosphorus release from sediments in Lough Neagh and factors affecting the recovery of water quality.

In previous reports, NIEA have reported overall status for surface waters as shown above. Going forward, statistics will be available to report Ecological Status and Chemical Status separately, as defined by the Directive. More detail can be found in

[2] https://www.daera-ni.gov.uk/articles/significant-water-management-issues-2019

supporting documents on the website[3].

2.3.3 Groundwater

In 2015, NIEA assessed groundwater quality and quantity status. Groundwater body status has only two classifications: good and poor. 68 % of groundwater bodies are classified as good.

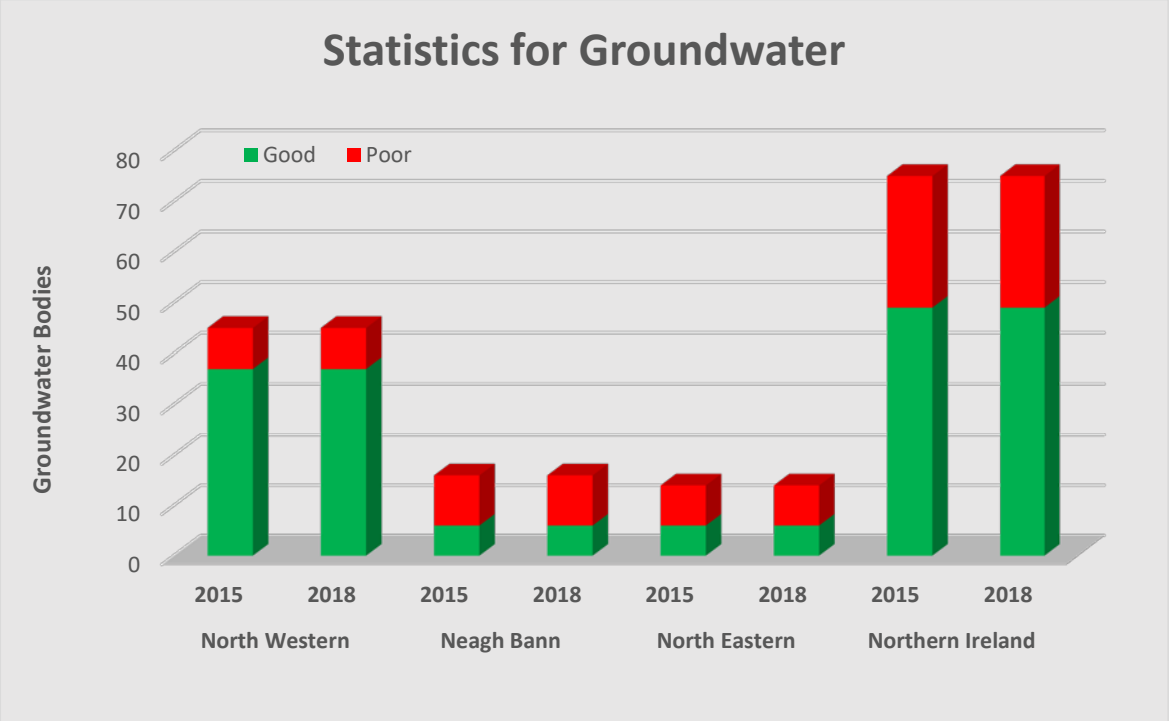

Figure 10: Statistics for groundwater

Flow and transport processes (of dissolved substances) are a lot slower in groundwater than in surface water. As a result the status of groundwater changes at a slower speed and sampling frequencies are lower in comparison to surface water. Due to the lower sampling frequencies no interim classification was carried out in 2018, as only a limited dataset was available at that point in time. From a catchment perspective nutrients are the significant issues in Northern Ireland's water bodies. Groundwater risk assessments have therefore concentrated on assessing potential impacts from nitrate and orthophosphate as well as single element failures that caused poor groundwater body status in the 2015 classification.

To assess the risk, groundwater monitoring data (averages from 2012-2017) have been compared against respective screening and threshold values, as well as compared against historical averages (note the screening and threshold values for orthophosphate are both interim values). For Nitrate and Orthophosphate data from

2008-2011 was used to assess a deterioration or an improvement. For single element failures values derived from the 2015 classification were used to assess a deterioration or an improvement.

For nitrate all monitored groundwater bodies were below their respective screening (25mg NO_3/l) and threshold (37.5mg NO_3/l) values, which means that none of the groundwater bodies are at risk of being at poor status for nitrates. Overall the average nitrate concentrations decreased in 13 (i.e. improvement in water quality) and increased in 11 groundwater bodies (i.e. deterioration in water quality).

For orthophosphate 2 of the monitored groundwater bodies were above their respective interim screening value (0.03mg/l), but all groundwater bodies were below their respective interim threshold value (5mg/l), which means that none of the groundwater bodies are at risk of being at poor status for orthophosphate. Overall the average orthophosphate concentrations decreased in 11 groundwater bodies (i.e. improvement in water quality) and increased in 13 groundwater bodies (i.e. deterioration in water quality).

All groundwater bodies except one, the Faughan groundwater body, are expected to meet their 2021 objectives. The Faughan groundwater body is a superficial groundwater body which was at good status in the last WFD reporting cycle but expected to be at poor status in 2021 due to the impact of a significant point source pressure. Groundwater chemical classification tests were applied to this water body to assess if it has deteriorated (i.e. from good to poor). It is predicted that in the 2021 reporting cycle this water body previously classified as good status will be downgraded to poor status.

The significant water management issues for groundwater are pollution from diffuse and point sources as well as an increase in chloride concentration in the coastal groundwater body Coleraine-Kilrea suggesting saline intrusion.

2.3.4 Transitional and coastal water bodies

There are 25 transitional and coastal water bodies in total. The table below compares the 2015 and 2018 classification.

Transitional & Coastal Status class	2015	2018
High	1	0
Good	8	10
Moderate	14	14
Poor	2	1
Bad	0	0

Table 6: Transitional & Coastal Water body status 2015 & 2018

Overall, 2 water bodies deteriorated, one from 'high' to 'good' and one from 'good' to 'moderate'. 3 water bodies improved, two from 'moderate' to 'good' and the other from 'poor' to 'moderate'.

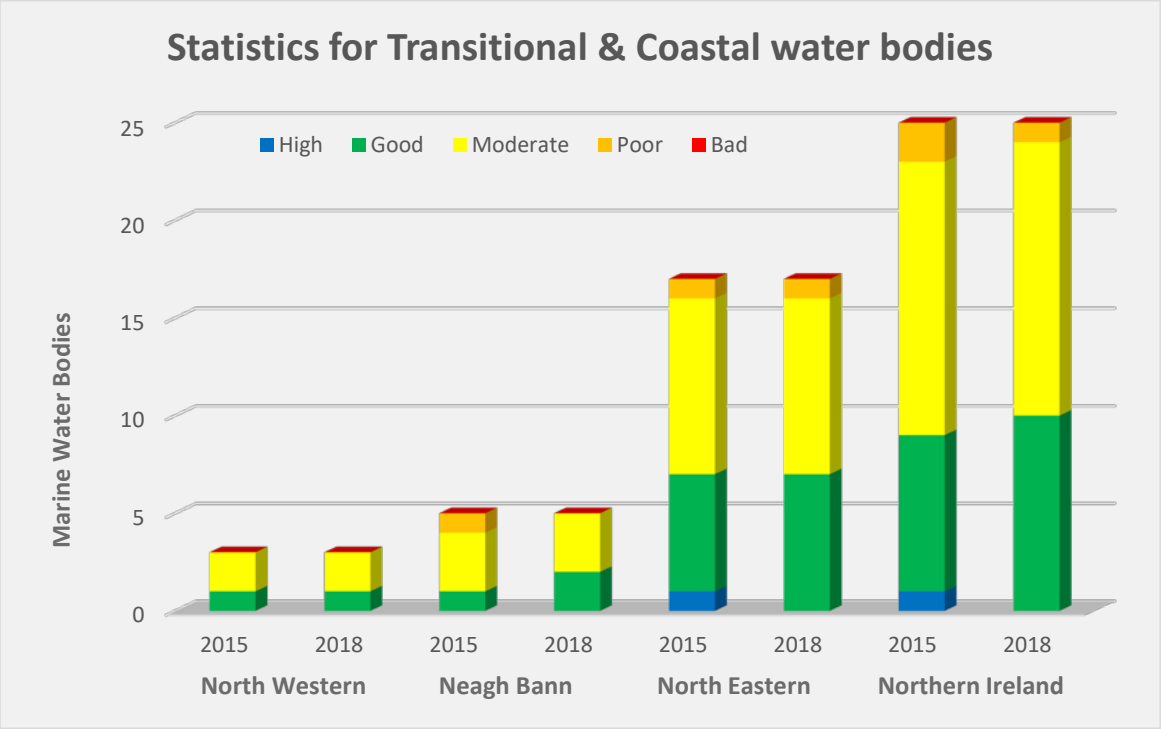

Figure 11: Statistics for transitional and coastal water bodies

There has been a decline in the number of 'high' status marine water bodies from one in 2015 to zero in 2018 and this reflects the development of more comprehensive monitoring data and a better understanding of the marine plant communities in the interim period. In particular, there is now a better assessment of the role of Non-Native Invasive Species (NNIS), for example, *Sargassum muticum*, an opportunistic green algal species impacting the resident macroalgal communities. *Sargassum muticum* has caused one of the high status marine water bodies to decline to good status since the WFD 1st Cycle commenced in 2009. In contrast

however, there has been a small increase in the number of water bodies at 'good status'. 40 % of all marine water bodies were at 'good status' in 2018. Similarly, there has been a slight decrease in the number of water bodies at poor status accounting for 4 % of marine water bodies.

The reasons for failure to achieve good status in marine surface waters are complex and it is rare that one single assessed parameter is responsible. For example, nutrients (Dissolved Inorganic Nitrogen, (DIN)) continue to drive the failures in transitional and coastal sea loughs and account for 32% of water body failures overall. A range of chemical parameters prevent approximately half of all marine waters achieving good status due to persistent contribution.

Reasons for Water body Failure 2015-2018		
	2015	**2018**
Actual No of Failing Water bodies (25 in total)	18	16
% of water bodies with single failing quality elements	20	20
% of failing water bodies with multiple failing quality elements	52	44
% of failing water bodies with DIN failures	32	32
% of failing water bodies with Annex VIII and/or X failures	52	52

Table 7: Reasons for transitional & Coastal water bodies not at 'good or better'

Trend analysis and risk assessment for transitional & coastal water bodies

In the case of Winter DIN, 67 % of Northern Ireland's water bodies were good or better in terms of their nutrient (DIN) status. All water bodies that were classified at good or better status were coastal water bodies with only three systems (Belfast Lough Inner, Belfast Harbour, and Carlingford Lough) being classified as less than good status. Those that failed to achieve good status were all inshore waters, either sea loughs or estuaries (transitional waters).

DIN is one of the most important elements in determining the status of our coastal and transitional waters. There are a number of sources of nutrient enrichment of rivers and marine waters, such as wastewater and septic tanks, but the most significant cause remains the run-off of organic and chemical fertilisers from agricultural land.

The principle river systems are the Foyle (with its tributaries the Mourne, Derg, Strule and Finn Rivers) and the River Erne which drains the uplands of Cavan, Fermanagh and Monaghan. Lough Foyle is the main coastal water and Upper and Lower Lough Erne, Lough Melvin and Lough MacNean the main lakes.

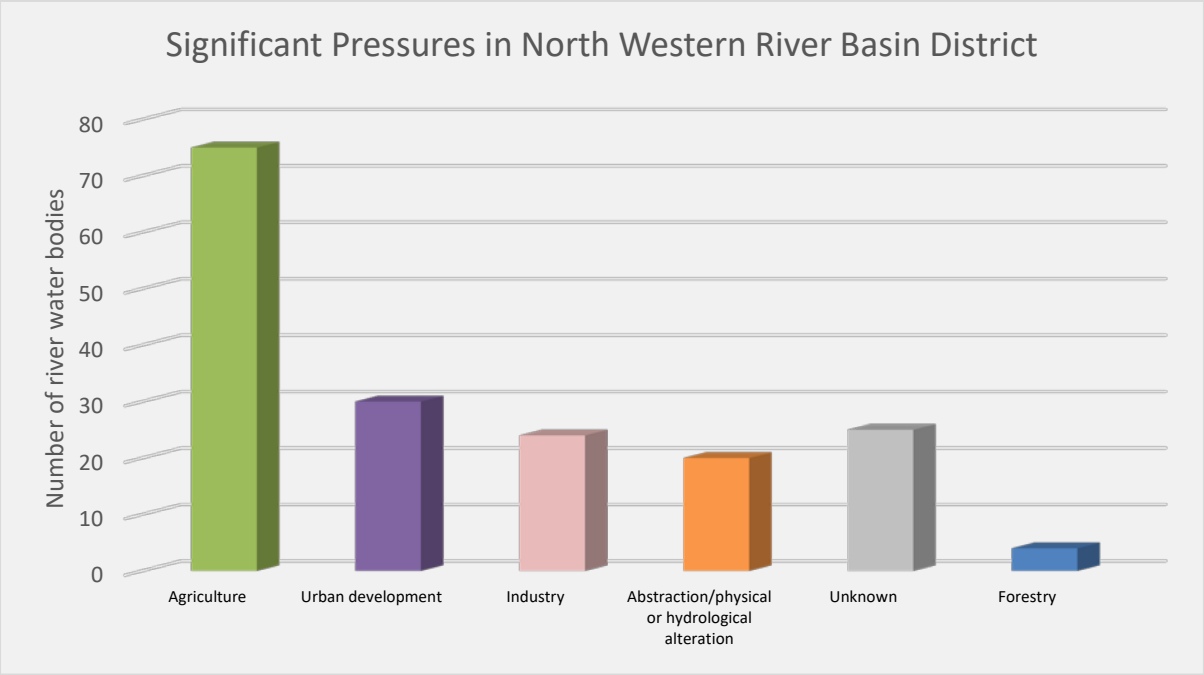

Figure 15: Number of river water bodies allocated to each pressure within the NWRBD 2018

The pressure analysis in the NWRBD has identified agriculture as the most significant pressure, followed by pressure from urban development and industry. The 'unknown' pressure will require further investigation in the next cycle RBMP.

3.3 Significant Pressures in the Neagh Bann River Basin District

The Neagh Bann River Basin District (NBRBD) covers an area of around 5740 km^2. It includes all of County Armagh, large parts of Counties Antrim, Londonderry, Down and Tyrone and a small area County Fermanagh. There are 199 river water bodies in the NBRBD, 141 are currently not meeting 'good ecological status'.

The principle river system is the Bann, with its tributaries the Moyola, Ballinderry, Blackwater, Six Mile Water and Main. The Newry river system drains into Carlingford Lough. Lough Neagh, located in the centre of the district is the main lake, with other smaller ones include Lough Fea, Portmore, Ross and Beg. This district has a limited coastline to the north where the River Bann enters the Atlantic and to the south where the Newry system enters Carlingford Lough.

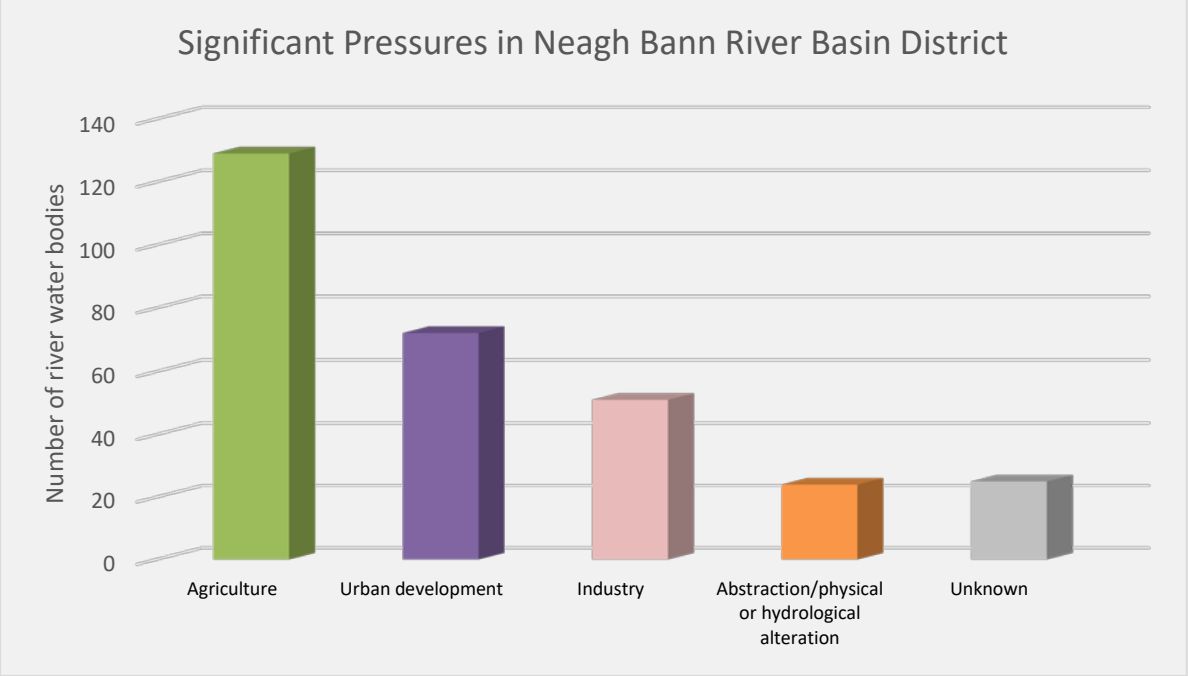

Figure 16: Number of river water bodies allocated to each pressure with the NBRBD in 2018

The pressure analysis in the NBRBD has identified agriculture as the most significant pressure, followed by pressure from urban development, abstraction or physical alteration and also 'unknown', which will require further investigation.

3.4 Significant Pressures in the North Eastern River Basin District

The North Eastern River Basin District (NERBD) covers an area of around 4000 km^2, including 1000 km^2 of marine waters. It takes in large parts of Counties Antrim and Down and a smaller portion of Londonderry. There are 89 river water bodies in the NERBD, 71 are currently not meeting 'good ecological status'.

The principle river systems are the Lagan, Bush and Quoile as well as the smaller systems draining from the Glens of Antrim, and the County Down Coastline. The NERBD has an extensive coastline including Larne, Belfast and Strangford Loughs, with Lough Mourne, Clea Lakes and Silent Valley the main lakes.