

3rd Cycle Draft Upper Shannon (Lough Allen) Catchment Report (HA 26A)



Catchment Science & Management Unit

Environmental Protection Agency

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Preface

This document provides a summary of the water quality assessment outcomes for the Upper Shannon (Lough Allen) Catchment, which have been compiled and assessed by the EPA, with the assistance of the Local Authority Waters Programme (LAWPRO), local authorities and RPS consultants to inform the draft 3rd Cycle River Basin Management Plan. The information presented includes status and risk categories of all waterbodies, details on protected areas, significant issues, significant pressures, source load apportionment modelling and load reduction assessments for nutrients where applicable, an overview of the 2nd Cycle Areas for Action and a list of proposed 3rd Cycle Areas for Action. These characterisation assessments are largely based on information available to the end of 2018, including the WFD Status Assessment for 2013-2018. Protected Area assessments are based on water quality information up to 2018 for Natura 2000 and Salmonid Waters; 2019 for Drinking Water; and 2020 for Nutrient Sensitive Areas and Bathing Waters.

The purpose of this draft report is to provide an overview of the situation in the catchment, draw comparison between Cycle 2 and Cycle 3, and help support the draft River Basin Management Plan 2022-2027 consultation process. Once the consultation process is completed the report will be finalised to reflect any changes and comments made as a result of the consultation process.

Water Framework Directive – key dates and terminology	
Cycle 2 – EPA Characterisation and Assessment	Characterisation and assessment to inform the Cycle 2 RBMP was largely based on 2010-2015 WFD monitoring data.
Cycle 2 Catchment Assessments	Catchment Assessments based on the Cycle 2 characterisation and assessment were published in September 2018.
2 nd Cycle River Basin Management Plan (RBMP) 2018-2021	This plan was for WFD Cycle 2 which runs from 2016-2021. This RBMP was published late, with this plan covering 2018-2021.
2 nd Cycle Areas for Action	These 189 Areas for Action were selected under the RBMP 2018-2021
Cycle 3 -EPA Characterisation and Assessment	Cycle 3 runs from 2022-2027. Assessments to inform the Cycle 3 RBMP is largely based on 2013-2018 WFD monitoring data. This is the latest WFD monitoring assessment period for which all data are available.
Cycle 3 Catchment Assessments	Catchment Assessments based on the Cycle 3 characterisation and assessment were published in August 2021.
3 rd Cycle River Basin Management Plan 2022-2027	This draft RBMP is for WFD Cycle 3 which runs from 2022-2027. Public consultation on this plan by the DHLGH and LAWPRO is taking place in late 2021 and early 2022.
3 rd Cycle Recommended Areas for Action – Protection/ Restoration/Projects	These recommended Areas for Action have been identified in the draft RBMP 2022-2027 and feedback can be given in the public consultation on this plan. They fall into 3 categories – Areas for Protection, Areas for Restoration and Catchment Projects.

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1 Introduction

This report aims to provide an overview of the water quality status, risk, key issues and significant pressures for all waterbodies in the catchment based on the Characterisation Assessment undertaken for the 3rd Cycle River Basin Management Plan. In addition, a comparative overview of the water quality in the Upper Shannon (Lough Allen) catchment between Cycle 2 and Cycle 3 characterisation is provided along with a summary of the progress made in the 2nd Cycle Areas for Action. The recommended list for the 3rd Cycle Areas for Action is also provided.

To Provide context, the Upper Shannon (Lough Allen) catchment covers an area of 604km² and is characterised by the Brefine upland areas including the karst area of the Geevagh Hills, location of the Arigna Coalfield, the karstic southern slopes of Cuilcagh Mountain and the western flanks of Slieve Anierin (literally The Iron Mountain) and rich in iron ore) which surround the lowland area containing the large source of the River Shannon (Shannon Pot) and Lough Allen (Figure 1).

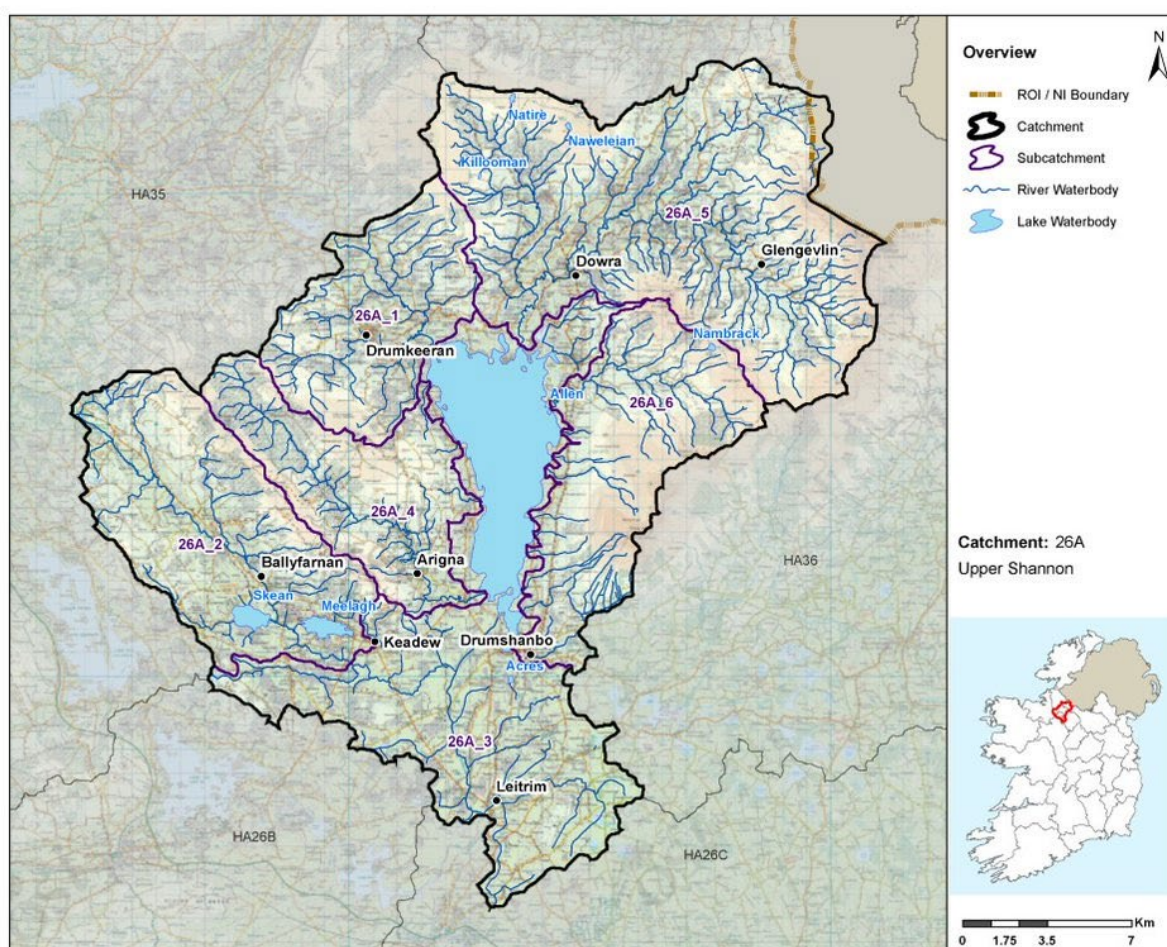


Figure 1: Overview of subcatchments in the Upper Shannon (Lough Allen) catchment

The Upper Shannon (Lough Allen) catchment is divided into six subcatchments (Figure 1) with 25 river waterbodies, eight lake waterbodies and 18 groundwater bodies (Figure 2).

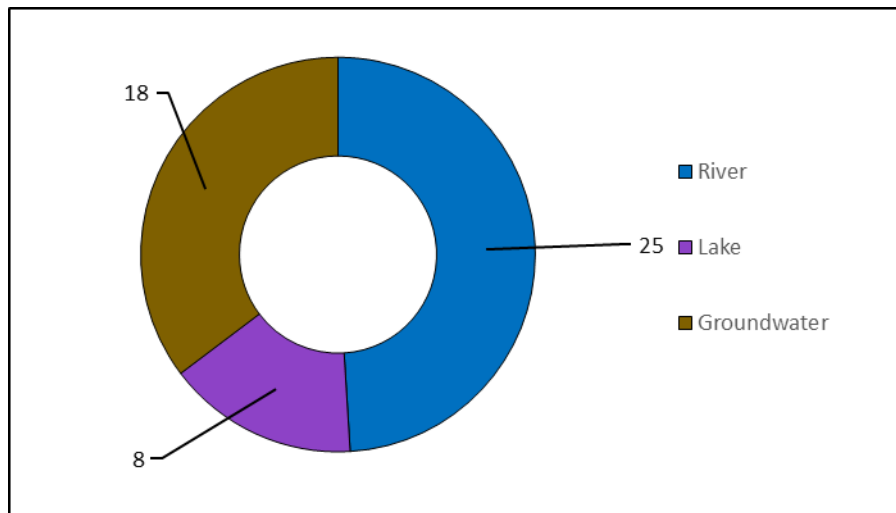


Figure 2: Waterbody types and numbers in the Upper Shannon (Lough Allen) Catchment.

2 Waterbody Overview

2.1 Waterbody Status

- ◆ This assessment to inform the 3rd Cycle RBMP is largely based on WFD monitoring data for the period 2013-2018, which is the latest WFD monitoring assessment period for which all data are available.
- ◆ For this assessment to inform Cycle 3, there is one waterbody achieving High Status (Bellavally Stream_010), 29 achieving Good Status, four achieving Moderate Status and seven achieving Poor Status. There are 10 unassigned waterbodies in the catchment. All waterbodies must achieve at least Good Ecological status.
- ◆ There are two river waterbodies (Bellavally Stream_010 & Feorish (Ballyfarnon)_020) that must achieve High Ecological Status (HES) in this catchment. These waterbodies are listed in Appendix 1. Bellavally Stream_010 is achieving High Status and Feorish (Ballyfarnon)_020 is at Good Status.
- ◆ The number of waterbodies achieving High Status has reduced by two between Cycle 2 and Cycle 3. The number of waterbodies at Moderate Status and Poor Status have each increased by one. The number of waterbodies at Good Status remained at 29 (Figure 3 & Table 1).

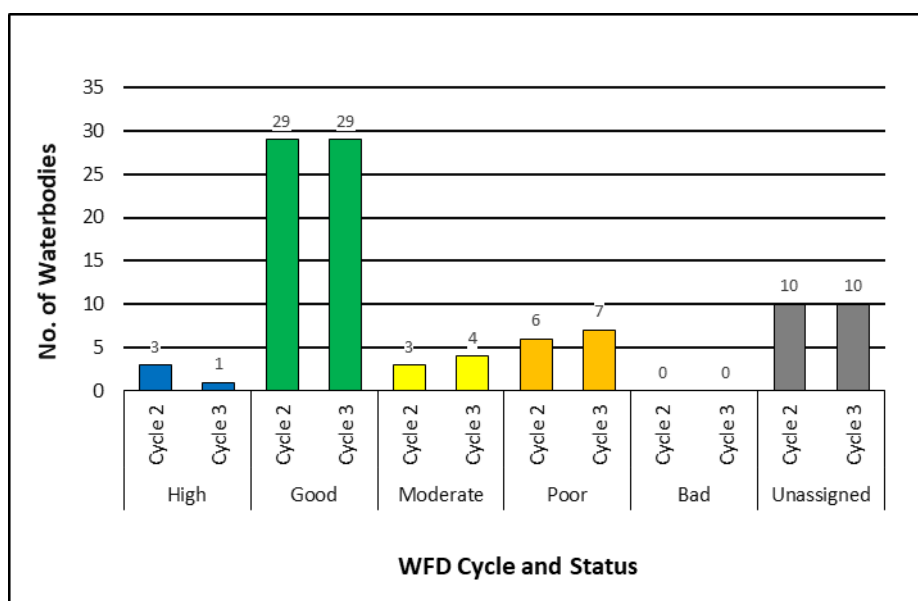


Figure 3: Waterbody Status Breakdown (All waterbodies)

Table 1: Waterbody Status Breakdown Table (All Waterbodies)

2013-2018 Status	River		Lake		Transitional		Coastal		Groundwater		Total	
	Cycle 2	Cycle 3	Cycle 2	Cycle 3	Cycle 2	Cycle 3	Cycle 2	Cycle 3	Cycle 2	Cycle 3	Cycle 2	Cycle 3
High	3	1	0	0	0	0	0	0	0	0	3	1
Good	11	11	0	0	0	0	0	0	18	18	29	29
Moderate	2	3	1	1	0	0	0	0	0	0	3	4
Poor	4	5	2	2	0	0	0	0	0	0	6	7
Bad	0	0	0	0	0	0	0	0	0	0	0	0
Un-assigned	5	5	5	5	0	0	0	0	0	0	10	10
Total	25	25	8	8	0	0	0	0	18	18	51	51

- ◆ Figure 4 illustrates the change in status between Cycle 2 (assessment based largely on 2010-2015 WFD Monitoring data) and Cycle 3 (assessment largely based on 2013-2018 WFD monitoring data).
- ◆ Over this period, 38 (93%) waterbodies have remained unchanged and three (7%) waterbodies have declined in status.¹
- ◆ There is an overall decline in the status of three waterbodies across the catchment since the Cycle 2 assessment.

¹ Unassigned waterbodies have not been considered in this Status class change assessment and therefore are not represented in Figure 4. Percentage displayed in the Figure 4 are in relation to the total number of waterbodies with status assigned in both cycles, as opposed to total number of all waterbodies.

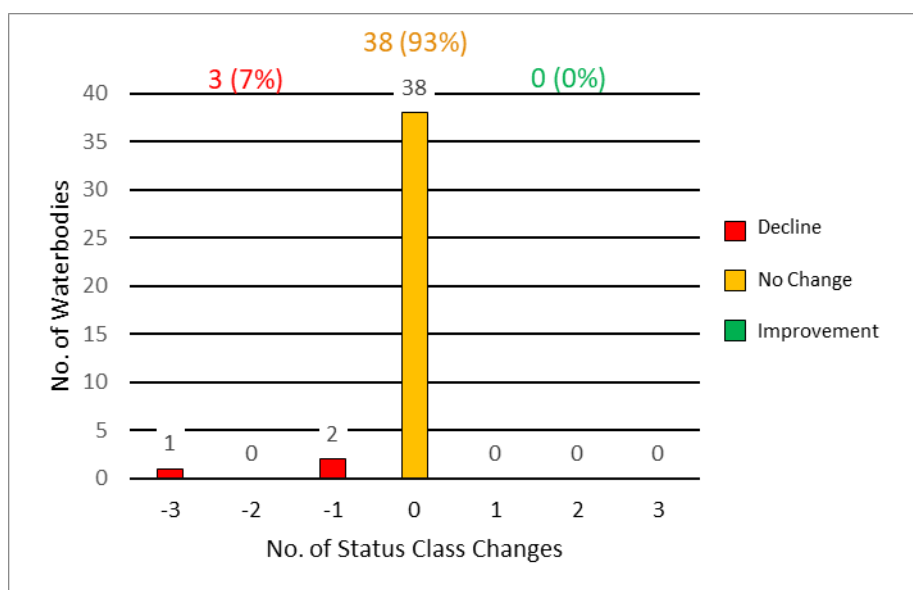


Figure 4: Status Class Changes between Cycle 2 and Cycle 3

2.2 Protected Areas

2.2.1 Drinking Water

- ◆ There are three surface waterbodies in the catchment identified as Drinking Water Protected Areas (DWPA) based on water abstraction data on the abstraction register and from other sources in 2018. All groundwater bodies nationally are identified as DWPA. DWPA layers can be viewed at <https://gis.epa.ie/EPAMaps/Water> - see *Protected Areas - Drinking Water*.
- ◆ All three drinking waters in the catchment met the DWPA objective in 2019:
- ◆ For more detailed information please see the EPA reports on drinking water quality in 2019 for [Public Supplies](#)² and [Private Supplies](#)³.

2.2.2 Bathing Waters

- ◆ There are no bathing waters in or directly adjacent to the catchment identified under the Bathing Water Regulations 2008.
- ◆ For more detailed information please see the EPA report on [bathing water quality in 2020](#)⁴.

2.2.3 Shellfish Areas

- ◆ There are no designated shellfish areas in the catchment.

The locations of Protected Areas associated with Public Health (Drinking Water, Bathing Water and Shellfish Areas, where applicable) are illustrated in Figure 5 below.

²<https://www.epa.ie/publications/compliance--enforcement/drinking-water/annual-drinking-water-reports/drinking-water-quality-in-public-supplies-2019.php>

³<https://www.epa.ie/publications/compliance--enforcement/drinking-water/annual-drinking-water-reports/focus-on-private-water-supplies-2019.php>

⁴<https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/bathing-water-quality-in-ireland-2020-.php>

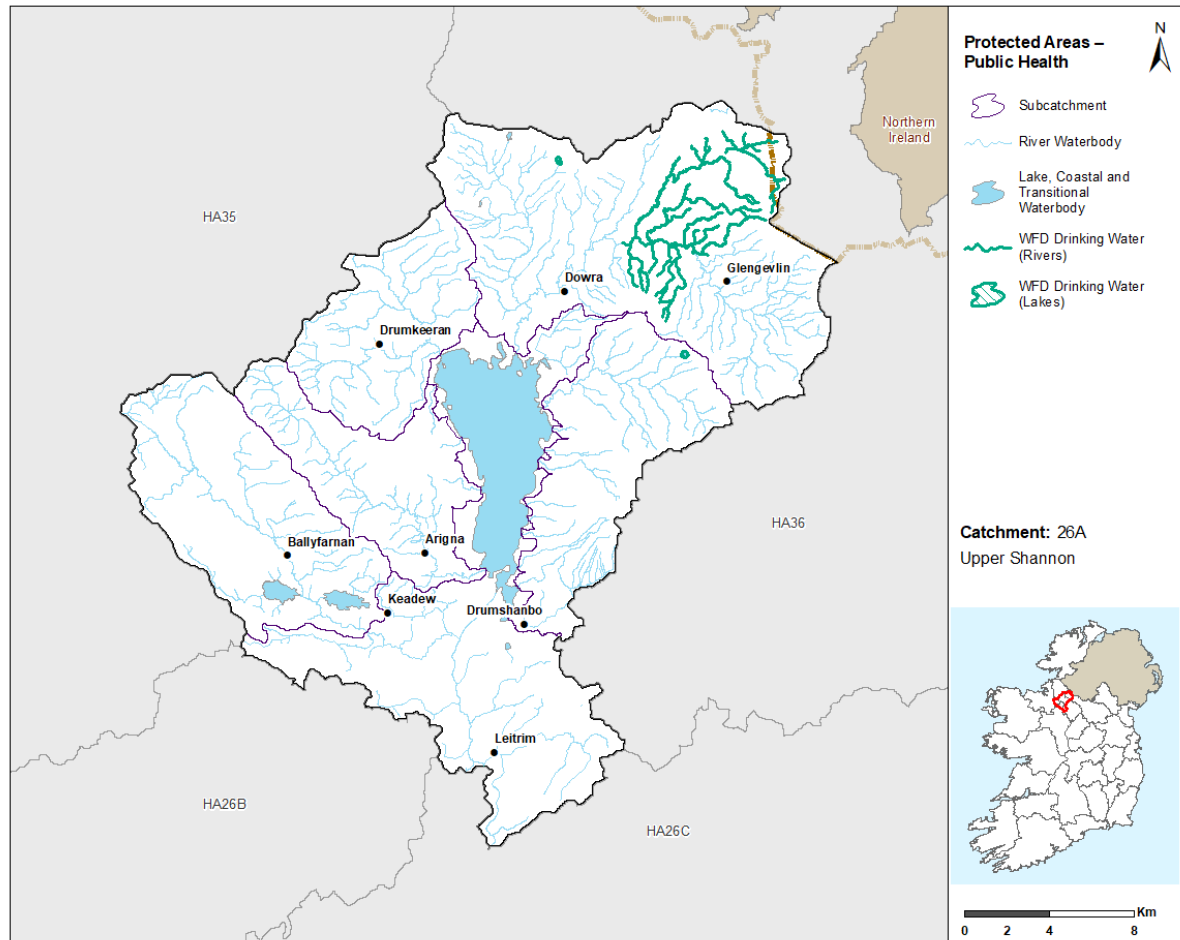


Figure 5: Protected Areas – Public Health

2.2.4 Natura 2000 Sites and Salmonid Waters

- ◆ Many of the habitats and species listed for protection in the Birds and Habitats Directives are water dependent. The Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) with water dependent habitats or species in this catchment are presented in Figure 6, along with waterbodies designated as salmonid waters (S.I. No. 293 of 1988) and waterbodies with Fresh Water Pearl Mussel habitat, where identified.
- ◆ There are two SACs in this catchment, both of which have water dependent habitats or species. The waterbodies within these SACs were assessed for associated water dependent habitats and species and if they met the supporting requirements for habitats and species using their 2013-2018 WFD status. For the purposes of the assessment, it was assumed that Good ecological status is adequate to meet the supporting conditions of all habitats and species with the exception of the Freshwater Pearl Mussel, which has additional requirements for supporting conditions set out in the Freshwater Pearl Mussel Regulations (S.I. No 296 of 2009) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation.
- ◆ Specific water supporting conditions have not been identified for the dependent bird species in the SPAs and so waterbodies associated with SPAs are not included in this assessment.

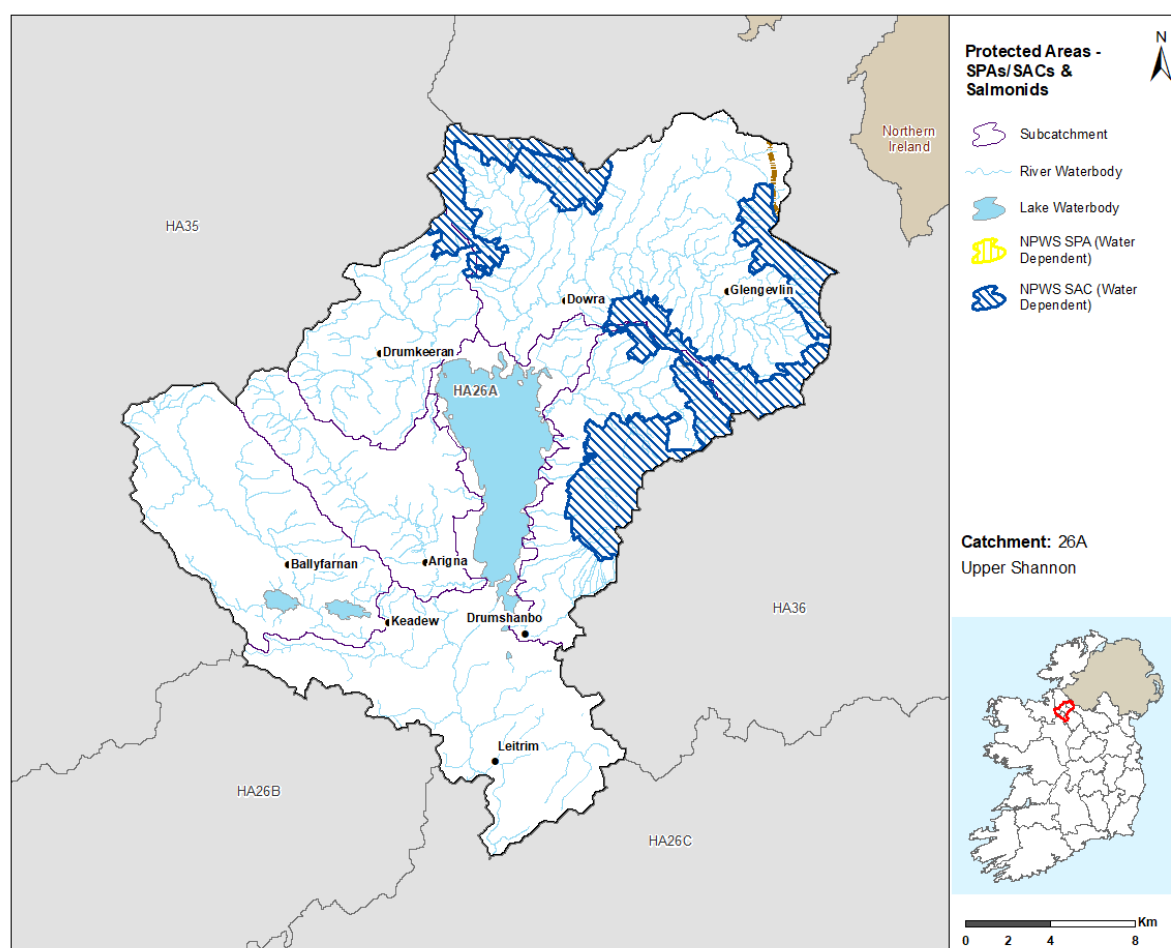
Results of the overall assessment for this catchment are outlined in Table 2 below, information at a waterbody level can be viewed at [Catchments.ie](https://www.catchments.ie).⁵

Table 2: Natura 2000 Network Assessment Summary

Water Body Type	Total No.	Meeting the Requirements	Did not meet the Requirements	Unknown*
Lakes	4	4	0	0

*As the waterbody status was unassigned.

- ◆ There are no river waterbodies with FWPM habitats in the catchment.
- ◆ There are no groundwater bodies delineated and assessed as Groundwater Dependent Terrestrial Ecosystems for this catchment.
- ◆ Water dependent SACs/ SPAs (including FWPM SAC sub-catchments) and salmonid waters in the catchment are illustrated in Figure 6.



⁵<https://www.catchments.ie/download/catchments-assessments-protected-areas-supporting-documents/>

Figure 6: Water Dependent SPAs / SACs and Salmonid Waters

2.2.5 Nutrient Sensitive Areas

- ◆ There are no Nutrient Sensitive Areas in the catchment.

2.3 Heavily Modified Waterbodies

- ◆ Based on the 1st and 2nd RBMPs there are currently no designated heavily modified water bodies (HMWBs) in the catchment. There will be a consultation period on HMWBs for the 3rd Cycle RBMP and this will be completed for inclusion in the 3rd Cycle Final RBMP.

2.4 Artificial Waterbodies

- ◆ There is one artificial waterbody in the Upper Shannon (Lough Allen) Catchment, the Shannon Erne (Upper Shannon A).
- ◆ The artificial waterbody is currently at Poor Status. Prior to Cycle 3, the waterbody was at Poor Status in Cycle 2, therefore, no change in status has been observed over the two cycles.

3 Waterbody Risk

3.1 Overview of Risk

- ◆ A waterbody that is *At Risk* means that either the waterbody is currently not achieving its Water Framework Directive (WFD) environmental objective of Good or High Ecological Status or that there is an upward trend in nutrients or ammonia and if this trend continues the waterbody Status will decline by the end of Cycle 3 and will fail to meet its environmental objective.
- ◆ A waterbody can be considered as *Review* for the following three reasons:
 - The waterbody does not have status assigned to it yet, it is referred to as an unassigned waterbody, and therefore there is not enough evidence to determine if it is *At Risk* or *Not At Risk*.
 - The waterbody has shown some slight evidence of improvement, but more evidence is needed before it can be considered as *Not At Risk*.
 - Measures are planned or have already been implemented for the waterbody and no further measures should be applied until there is enough time to assess if these measures are working.
- ◆ A waterbody is *Not At Risk* when it is achieving its environmental objective of either High or Good Status and that there is no evidence indicating that there is a trend towards status decline.
- ◆ In total, there are 51 waterbodies in the Upper Shannon Catchment and 11 (22%) are currently *At Risk*, 11 (22%) in *Review* and 29 (59%) are *Not At Risk*.

3.2 Surface Waters

- ◆ For the 25 rivers waterbodies, seven (28%) are *At Risk*, eight (32%) are in *Review* and 10 (40%) are *Not At Risk*.

- ◆ For the eight lake waterbodies, three (38%) are *At Risk*, two (25%) are in *Review* and three (38%) are *Not At Risk*. Acres, Meelagh and Allen are the lake waterbodies *At Risk*.
- ◆ The largest proportion of *At Risk* waterbodies are found in river waterbodies, accounting for seven (64%) of the 11 *At Risk* waterbodies. Figure 7 gives an overview of the breakdown of risk across waterbody types for both Cycle 2 and Cycle 3.
- ◆ Overall, there is an increase in two *At Risk* waterbodies and a decrease of two *Not At Risk* waterbodies between Cycle 2 and Cycle 3. There is also an additional *Review* waterbody in Cycle 3, the Shannon Erne (Upper Shannon A) artificial waterbody that did not have risk assigned in Cycle 2.

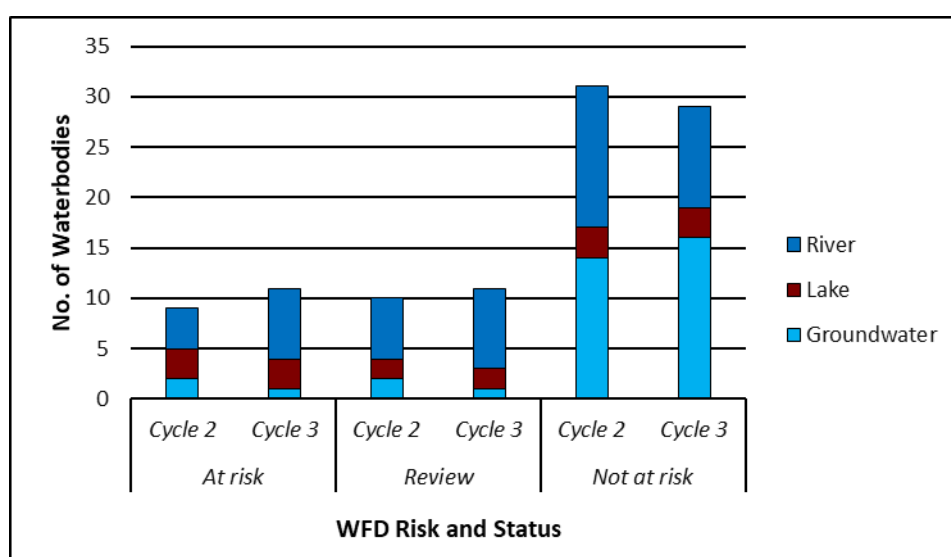


Figure 7: Number of waterbodies in each risk category

- ◆ The location of the *At Risk*, *Review* and *Not At Risk* surface waterbodies for Cycle 3 are shown in Figure 8 while the surface waterbodies that have experienced a change in risk between Cycle 2 and Cycle 3 are shown in Figure 9.

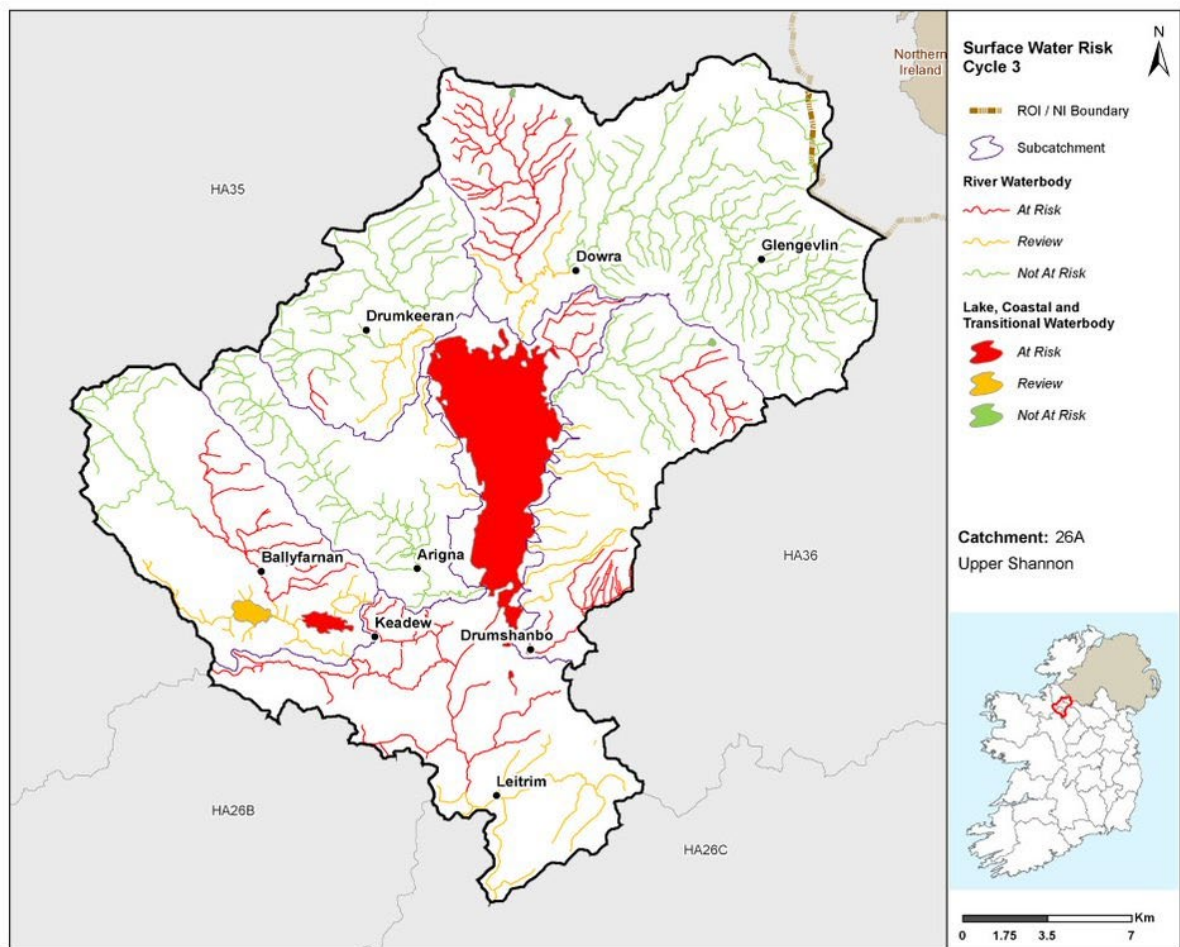


Figure 8: Surface Water Risk Cycle 3

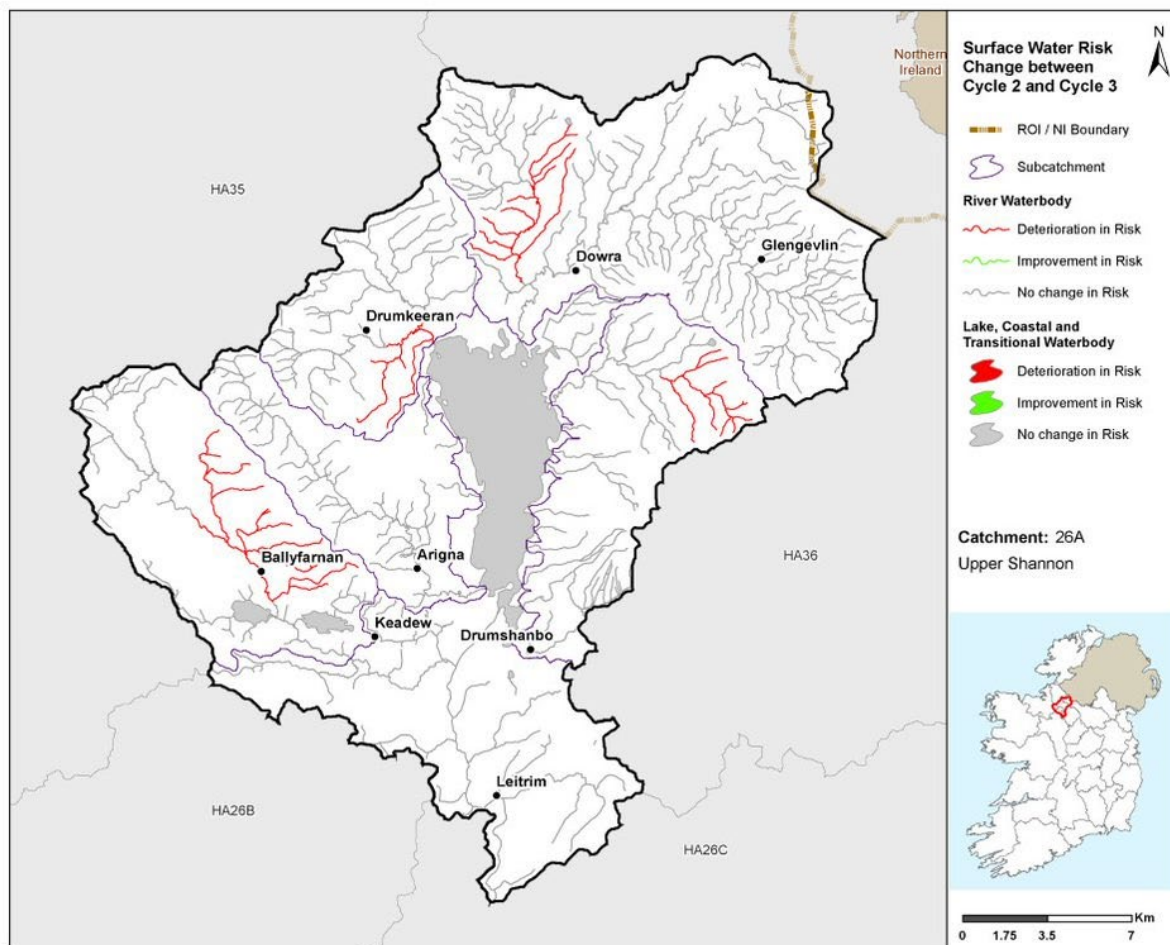


Figure 9: Surface Water Risk Change between Cycle 2 and Cycle 3

3.3 Groundwater

- ◆ For the 18 groundwater bodies, one (6%) is *At Risk* (Geevagh), one (6%) is in *Review* and 16 (88%) are *Not At Risk*.
- ◆ In Cycle 2, there were two groundwater bodies (Geevagh & Carrick on Shannon) *At Risk* in this catchment, two in *Review* and 14 *Not At Risk*.
- ◆ The location of the *At Risk*, *Review* and *Not At Risk* groundwater bodies for Cycle 3 are shown in Figure 10 while the groundwater bodies that have experienced a change in risk between Cycle 2 and 3 are shown in Figure 11.

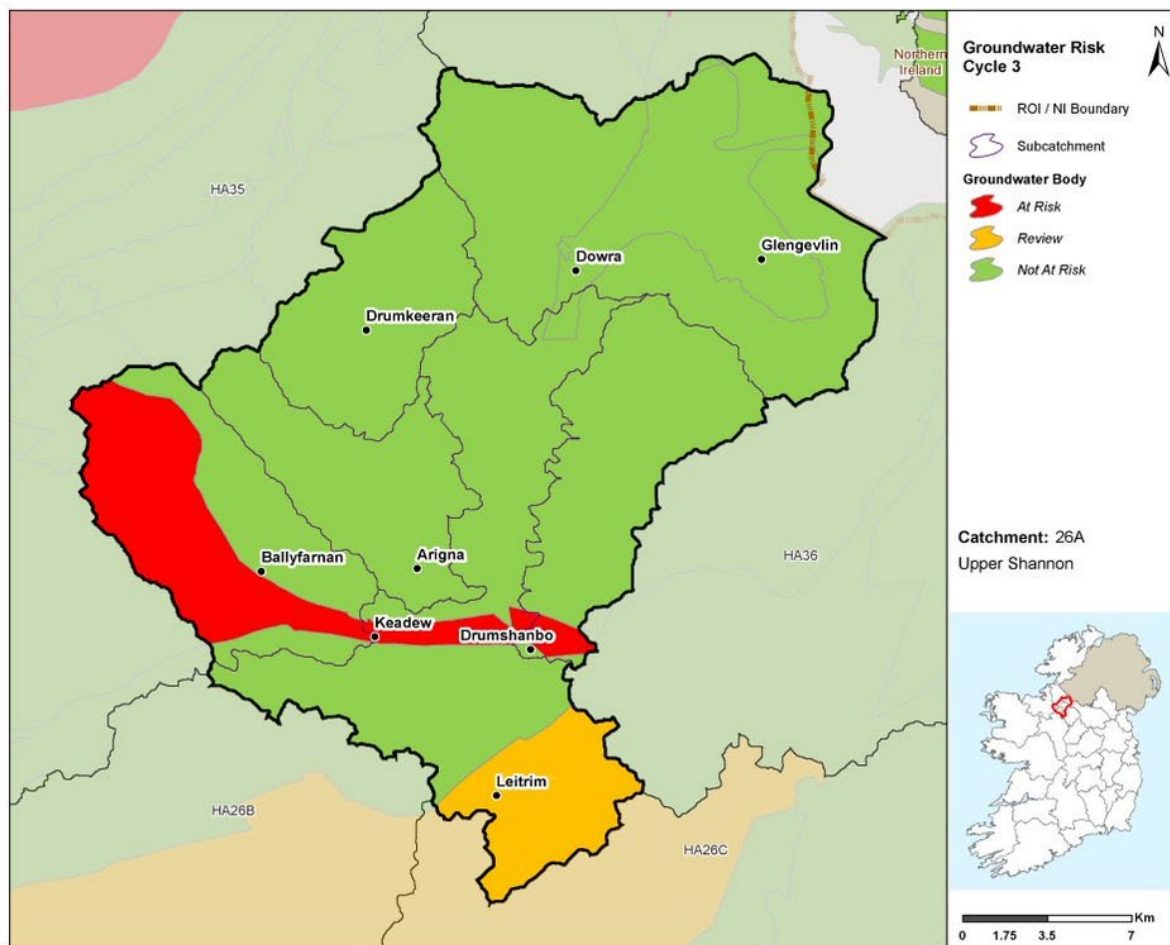


Figure 10: Cycle 3 Groundwater Body Risk

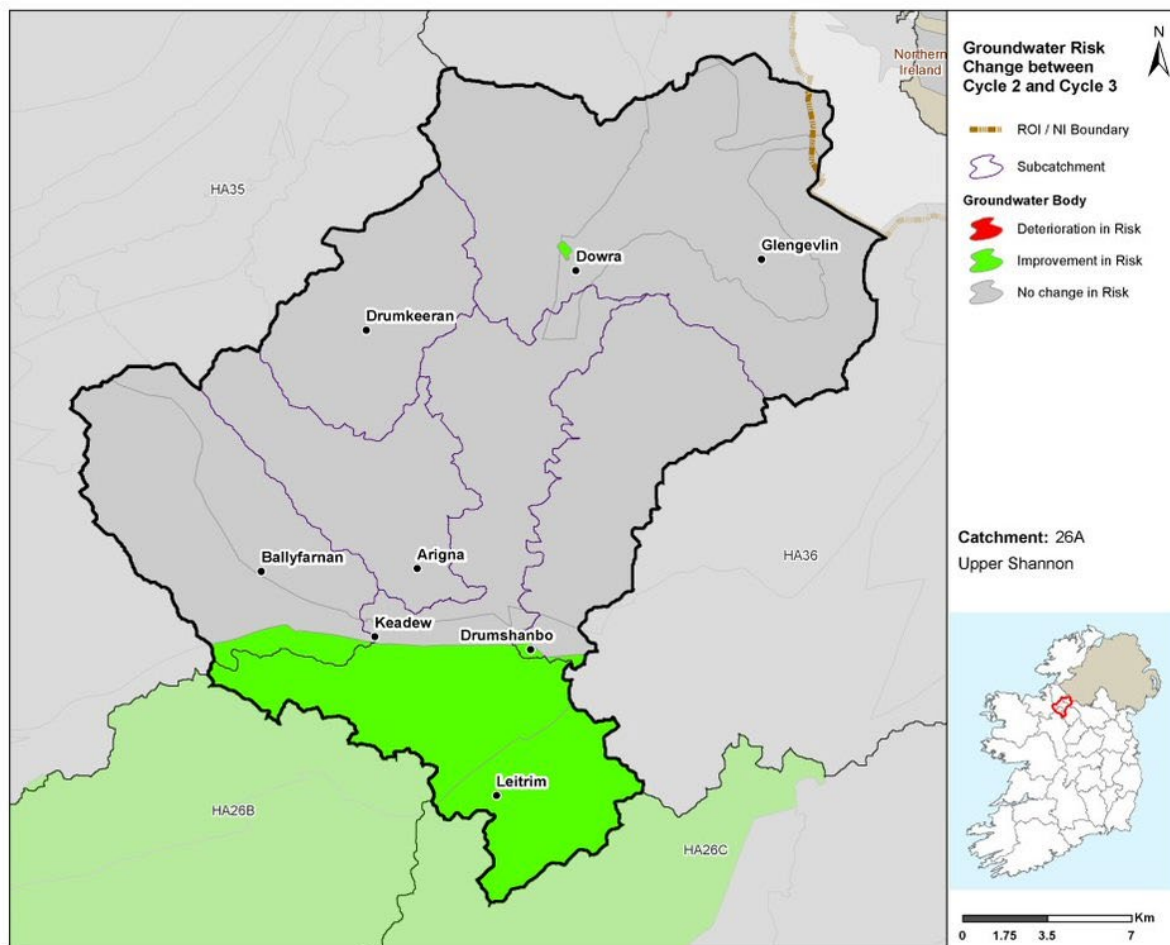


Figure 11: Groundwater Body Risk Change between Cycle 2 & Cycle 3

3.4 Heavily Modified Waterbodies

- ◆ There are currently no designated heavily modified water bodies (HMWBs) in the catchment. There may be changes to HMWB designation once the Cycle 3 HMWB assessment has been completed and consulted on for the 3rd Cycle Final RBMP.

3.5 Artificial Waterbodies

- ◆ In total, there is one artificial waterbody, Shannon Erne (Upper Shannon A) in the Upper Shannon Catchment.
- ◆ This waterbody is currently in *Review* in Cycle 3.

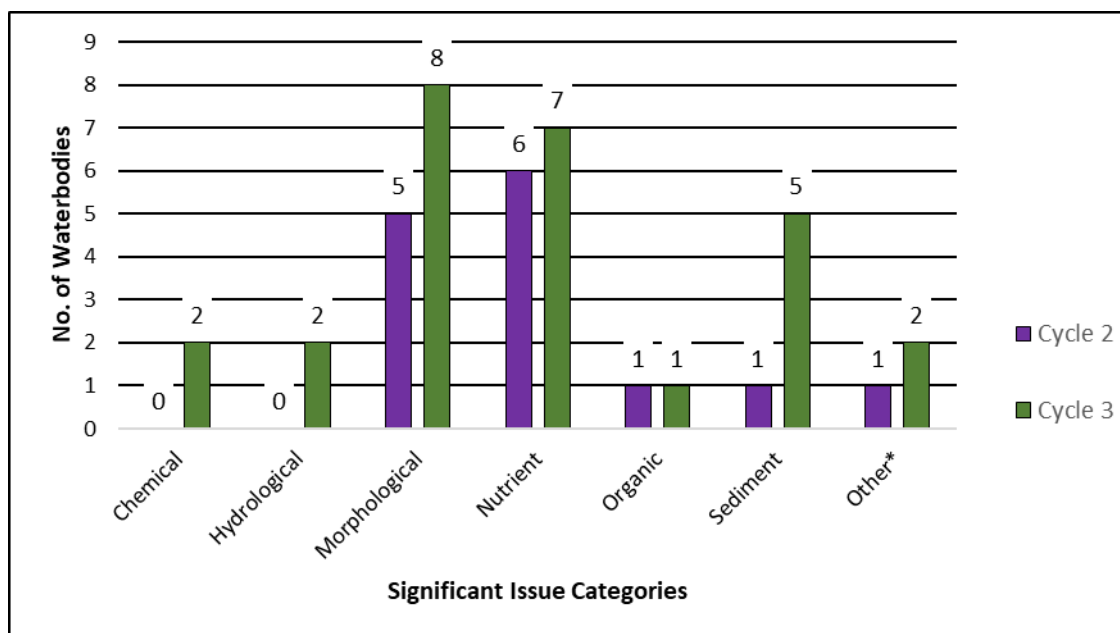
4 Significant Issues in *At Risk* Waterbodies

4.1 All Waterbodies

- ◆ Morphological impacts and excess nutrients remain the most prevalent issues in the Upper Shannon (Lough Allen) catchment (Figure 12) with each impacting eight and seven waterbodies each in Cycle 3. Sediment pollution showed the greatest change and is impacting

five waterbodies in Cycle 3, compared to one waterbody in Cycle 2. Chemical and hydrological issues are impacting two waterbodies each, while organic pollution is impacting one waterbody in Cycle 3. Acidification is impacting two river waterbodies (Owennayle_010 & Owennayle_020) and diminution of quality of associated surface waters for chemical reasons has been identified in Geevagh groundwater body.

- For river waterbodies, the main significant issues are morphological impacts (5), sediment (4), nutrient pollution (3), hydrological (2), other impacts (2), organic (1) and chemical (1).
 - For lake waterbodies, the main significant issues are nutrient pollution (3), morphological impacts (3), chemical (1) and sediment pollution (1).
 - The only *At Risk* groundwater body (Geevagh) the significant issue is nutrient pollution as well as diminution of quality of associated surface waters for chemical reasons.
- ◆ Between Cycle 2 and Cycle 3, the categories with the greatest increase in the number of waterbodies impacted are sediment pollution and morphological issues. Sediment pollution increased by four waterbodies from one waterbody in the previous cycle, while morphological issues has increased by three waterbodies from five to eight.
 - ◆ The numbers of waterbodies with hydrological and chemical issues have both increased from no waterbodies to two from Cycle 2 to Cycle 3. Similarly, other pressures are impacting two waterbodies in Cycle 3, having increased from waterbody in Cycle 2.
 - ◆ The number of waterbodies impacted by organic pollution has remained unchanged over the both cycles, impacting one waterbody.

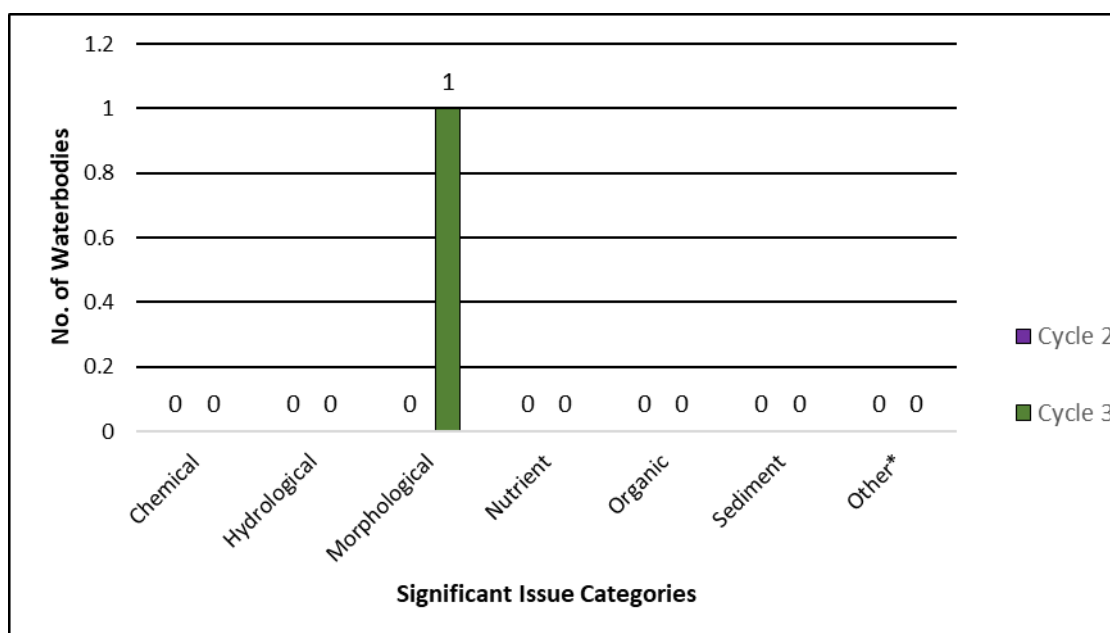


*Other - Acidification, saline intrusion, elevated temperature, litter, microbiological pollution and unknown impacts have all been grouped into the "Other" issues category for the purpose of this report

Figure 12: Significant Issues across all *At Risk* WBs between Cycle 2 and Cycle 3

4.2 High Status Objective Waterbodies

- ◆ In Cycle 3, there is one High Status Objective waterbody, the Feorish (Ballyfarnon)_020, in the Upper Shannon Catchment. Morphological issues are currently impacting the *At Risk* waterbody (Figure 13).



*Other - Acidification, saline intrusion, elevated temperature, litter, microbiological pollution and unknown impacts have all been grouped into the "Other" issues category for the purpose of this report

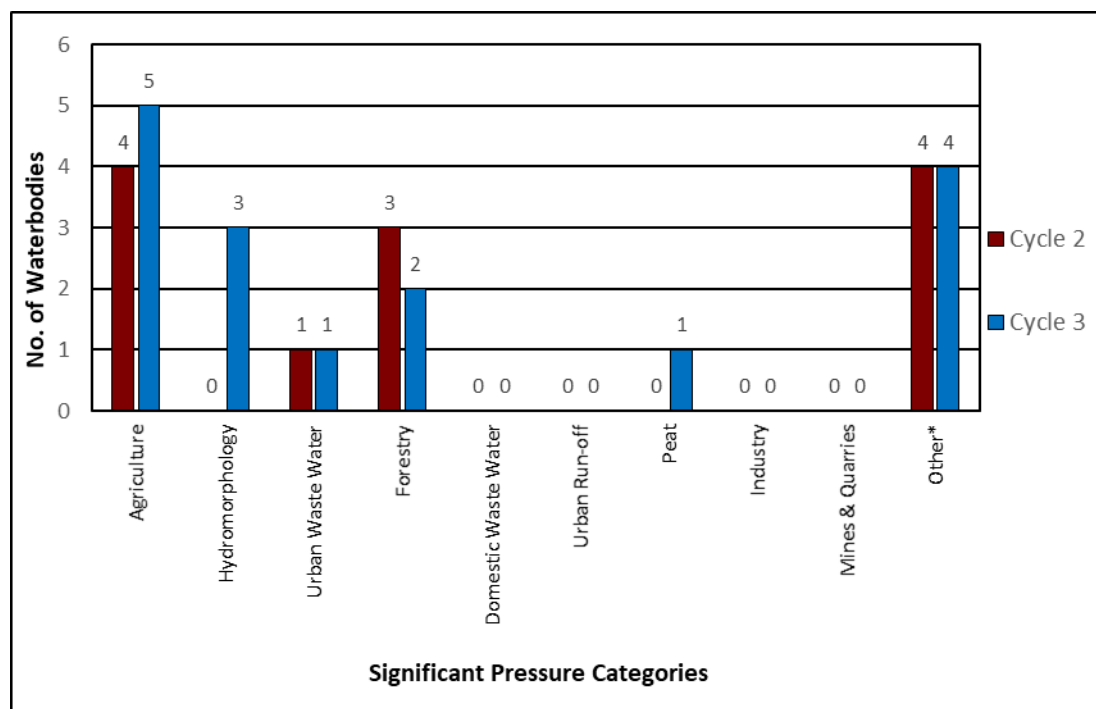
Figure 13: Significant Issues in *At Risk* High Status Objective Waterbodies

5 Significant pressures in *At Risk* Waterbodies

5.1 All Waterbodies

- ◆ Where waterbodies have been classed as *At Risk*, significant pressures have been identified.
- ◆ Figure 14 shows a breakdown of the number of *At Risk* waterbodies in each significant pressure category.
- ◆ The significant pressure affecting the greatest number of waterbodies is agriculture and other⁶ followed by hydromorphology, forestry, peat and urban waste water.
- ◆ When comparing Cycle 2 and Cycle 3 the biggest change is an increase of three waterbodies where hydromorphology is a significant pressure from no waterbodies in Cycle 2 to three waterbodies in Cycle 3.
- ◆ The increase in hydromorphology significant pressures is likely to be associated with more detailed assessment by the EPA based on the recently developed Morphological Quality Index tool and associated increasing awareness of hydromorphology rather than new significant hydromorphology pressures since Cycle 2.

⁶ Abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species have all been grouped into the "Other" pressure category for the purpose of this report



*Other – abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species have all been grouped into the “Other” pressure category for the purpose of this report

Figure 14: Significant Pressure (All *At Risk* Waterbodies)

5.1.1 Pressure Type

5.1.1.1 Agriculture

- ◆ Agriculture is a significant pressure in three river waterbodies (Drumshanbo Stream_010, Owennayle_020 and Yellow (Ballinaglera)_010), one lake waterbody (Allen) and one groundwater body (Geevagh). The issue related to agriculture in this catchment is diffuse phosphorus loss to surface waters from, for example, direct discharges; or runoff from yards, roadways or other compacted surfaces, or runoff from poorly draining soils. Sediment is also a problem from land drainage works, bank erosion from animal access or stream crossing, with landslides common in one river waterbody. Chemical contamination was identified in one of the river waterbodies and it is suspected to be linked to sheep dipping, with further investigation required.
- ◆ The significant pressure affecting the IE_SH_G_105 Geevagh groundwater body is likely to be agriculture, due to the groundwater contribution of phosphate to *At Risk* surface waterbodies.

5.1.1.2 Other

- ◆ *Invasive species*
Invasive species are a pressure in two lake water bodies (Lough Allen and Lough Meelagh). In both cases, the invasive species is the Zebra Mussel.
- ◆ *Unknown Anthropogenic Pressures*
The unknown pressure is located in the Gowlaunrevagh_010 and Shannon (Upper)_040, river water bodies as well as Geevagh groundwater body. The fish status is impacted in Shannon (Upper)_040.
- ◆ *Other Anthropogenic Pressures – Windfarms*
There are issues with sedimentation from a wind farm development upstream of Meelagh Lake.

5.1.1.3 Hydromorphology

- ◆ Hydromorphology is a significant pressure in three river waterbodies (Drumshanbo Stream_010, Feorish (Ballyfarnon)_020 and Shannon (Upper)_040). Dams, barriers, locks and weirs is the dominant hydromorphology subcategory in the catchment with two river waterbodies (Drumshanbo Stream_010 and Shannon (Upper)_040) within the catchment subject to these types of modifications. The Feorish (Ballyfarnon)_020, river waterbody, has extensive land drainage works with loose sediment following the river bank being recontoured within the village.

5.1.1.4 Forestry

- ◆ Forestry has been identified as a significant pressure in two waterbodies (Owennayle_010 river waterbody and Acres lake waterbody). The significant issues are a combination of general forestry pressures including clearfelling, thinning, replanting. The effects of these activities include increased nutrient loads and alteration of habitat due to siltation. Evidence of acidification is noted in one of the water bodies. Acidification was also noted in the Owennayle_010 waterbody

5.1.1.5 Peat

- ◆ Change of land use from peat to burnt areas, with some felling and planting has been identified as a significant pressure in one river waterbody (Owennayle_020). This has resulted in increased sediment loads and acidification, which alters habitats, morphology and hydrology.

5.1.1.6 Urban Waste Water

- ◆ Urban Waste Water Treatment Agglomerations have been identified as a significant pressure in one *At Risk* waterbody (Drumshanbo Stream_010) in Cycle 3, no change from Cycle 2. Drumshanbo WWTP, which impacts Drumshanbo_010, is scheduled to be upgraded by 2022.

Table 3: Urban Waste Water Treatment Agglomerations identified as significant pressures in *At Risk* waterbodies in Cycle 3

Facility name	Facility Type	Waterbody	2013-18 Ecological Status	Irish Water's Expected CIP Completion Date ⁷
Drumshanbo D0144	Agglomeration PE of 2,001 to 10,000	Drumshanbo_010	Poor	2021

Figure 15 – Figure 18 illustrates the locations of waterbodies for the four most common pressures in order of prevalence (agriculture, other, hydromorphology and forestry) within the catchment in Cycle 3.

⁷ Based on Irish Water's Capital Investment Programme (2020-2024) as of February 2021 and may be subject to change.

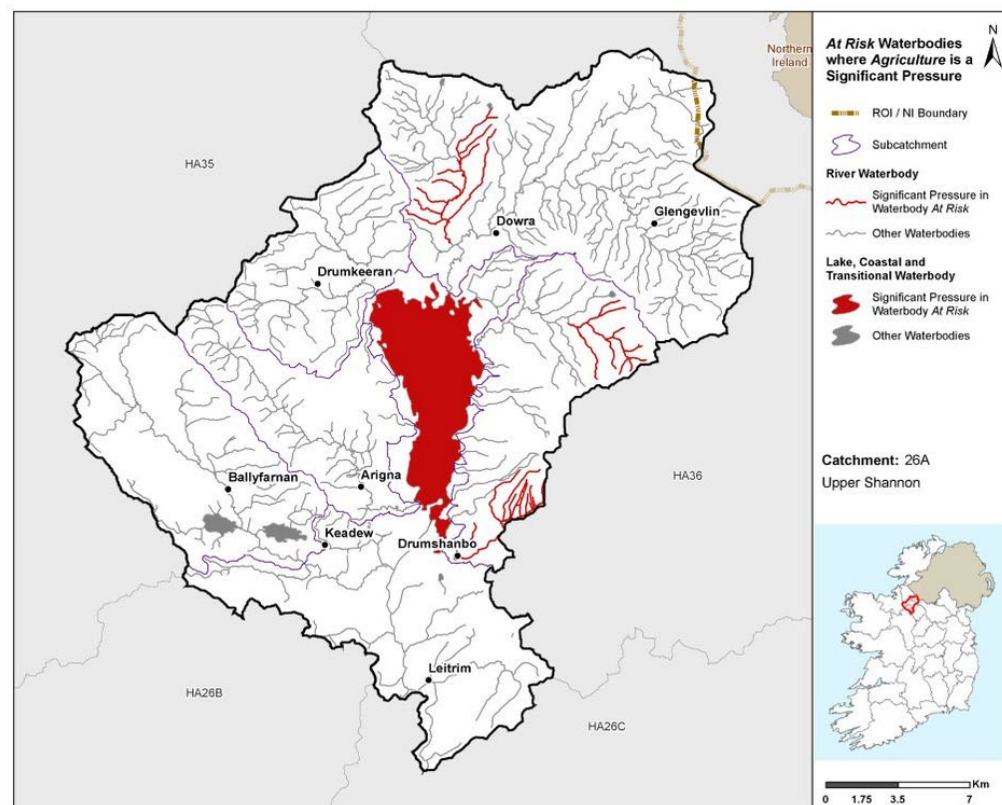


Figure 15: Locations of Waterbodies where Agriculture is a Significant Pressure

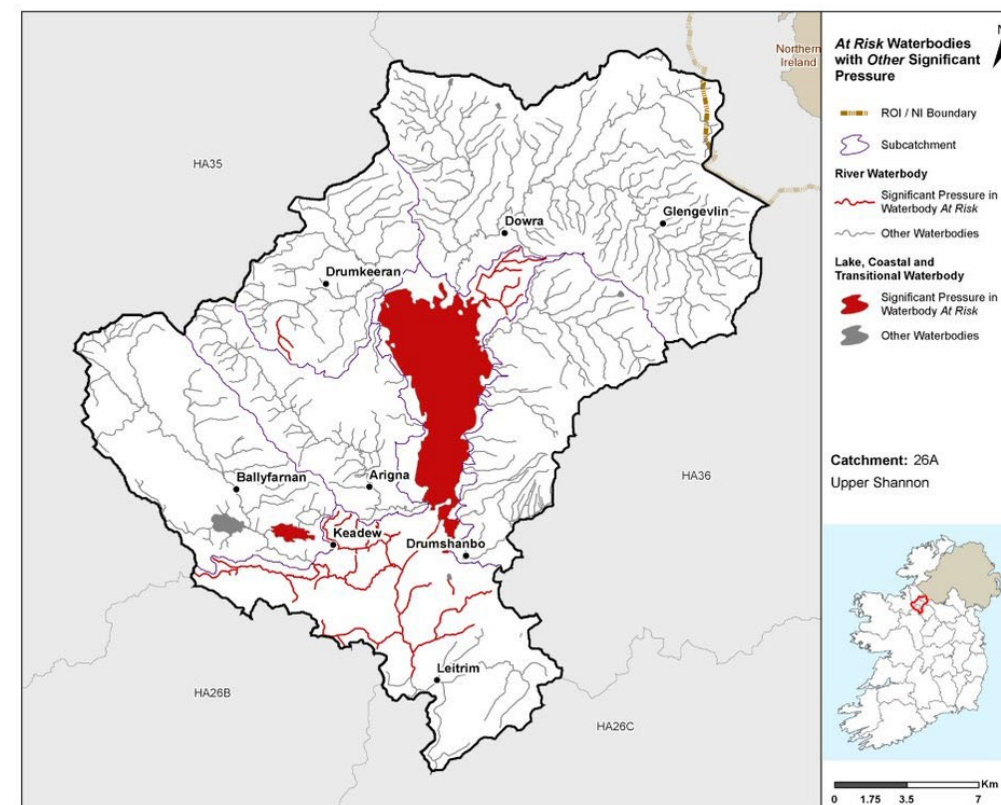


Figure 16: Locations of Waterbodies where Other is a Significant Pressure

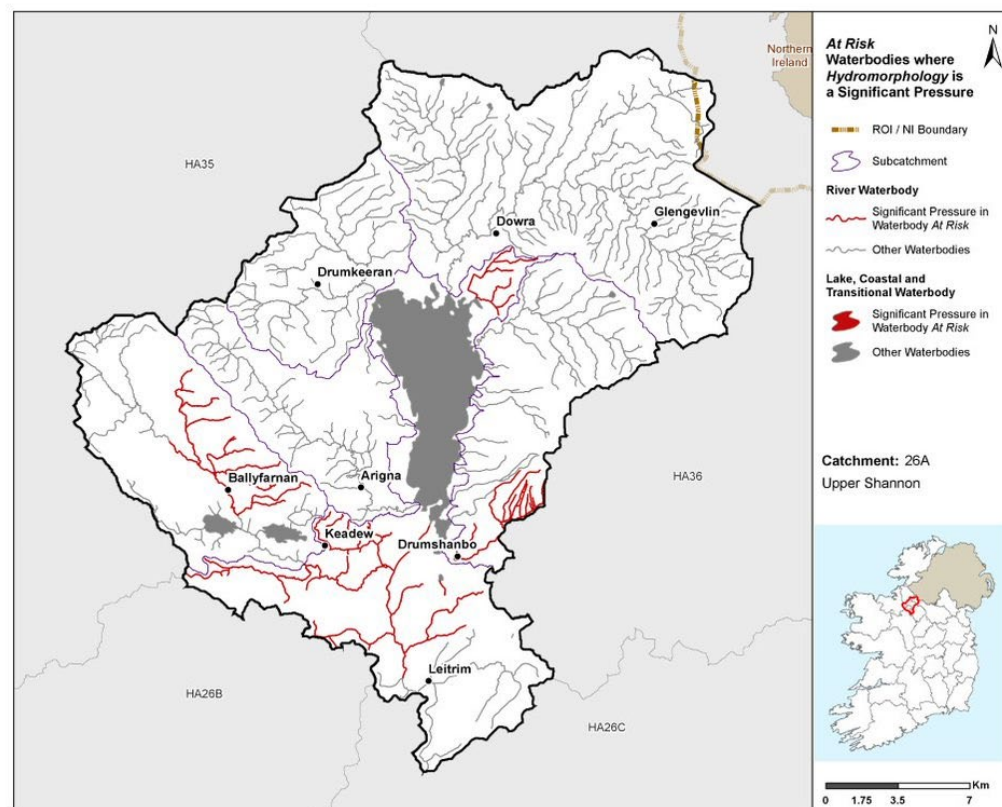


Figure 17: Locations of Waterbodies where Hydromorphology is a Significant Pressure

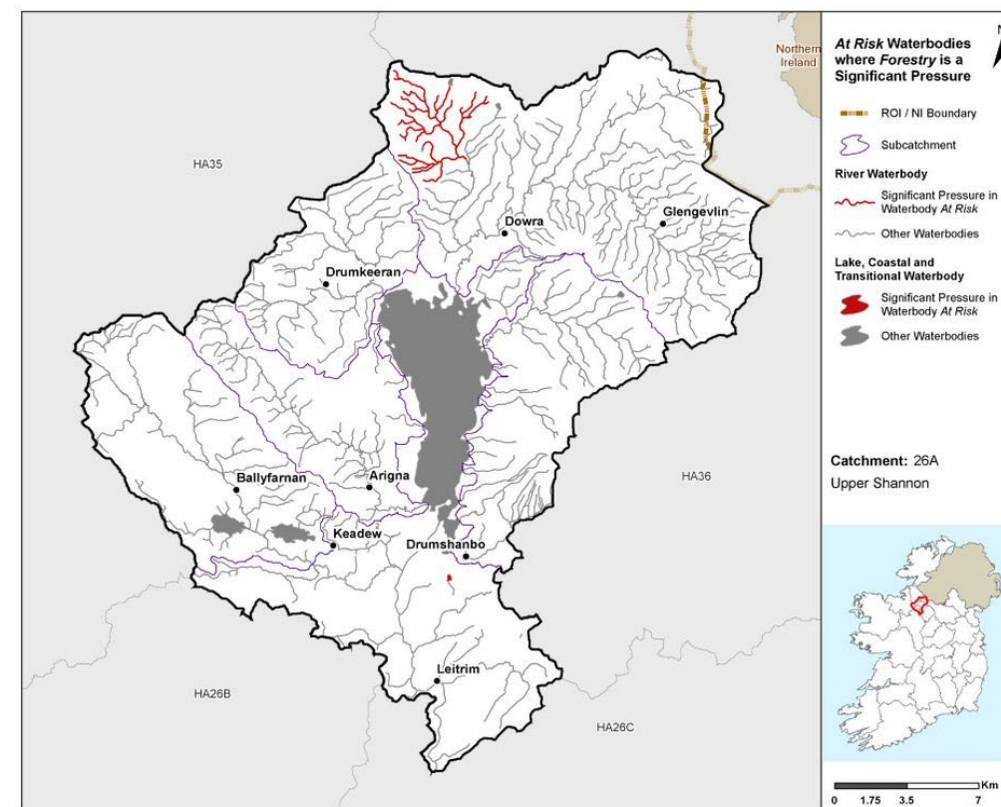
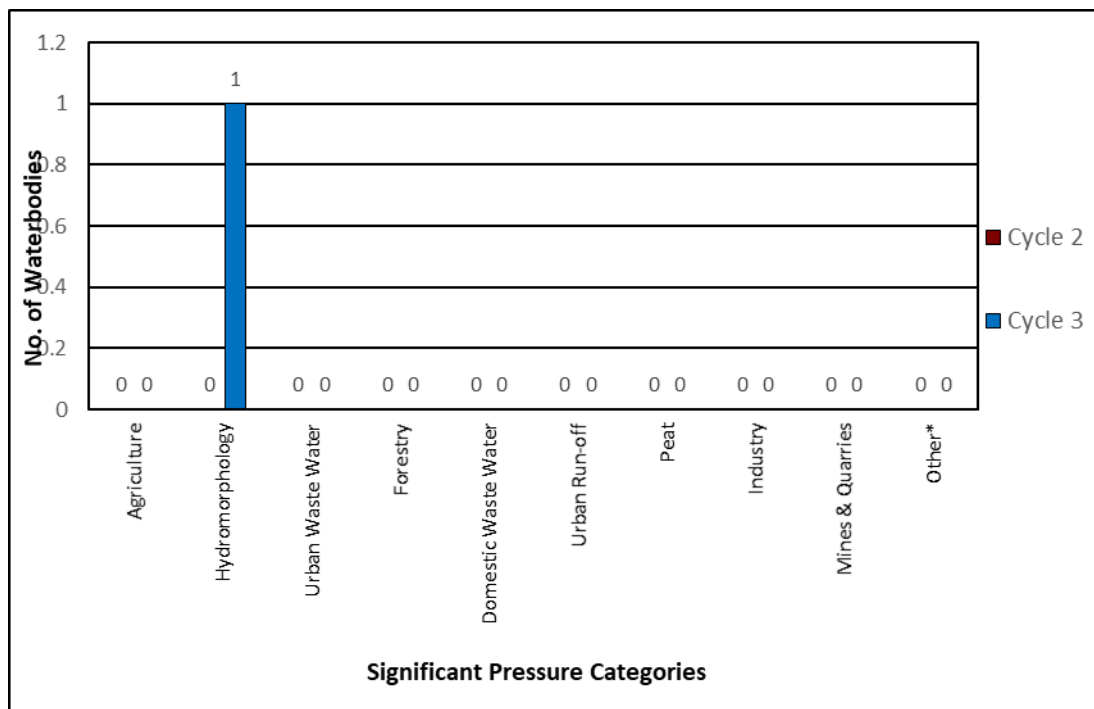


Figure 18: Locations of Waterbodies where Forestry is a Significant Pressure

5.2 High Status Objective Waterbodies

- ◆ Hydromorphology is also the dominant significant pressure in the only High Status Objective waterbody (Feorish (Ballyfarnon)_020).



*Other – abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species have all been grouped into the “Other” pressure category for the purpose of this report

Figure 19: Significant Pressure in At Risk High Status Objective Waterbodies

6 Source Load Apportionment Modelling (SLAM)

- ◆ The EPA has developed Source Load Apportionment Models (SLAM) for both P and N which estimate the proportion of the phosphorus and nitrogen inputs, respectively, to waters in each catchment that comes from each sector.
- ◆ The main data inputs for the model for agriculture are the 2018 land parcel (LPIS) and animal (AIMs) data from the Department of Agriculture Food and the Marine. The Urban Waste Water (UWW) data comes from Irish Water’s discharge monitoring data. The model also calculates the inputs from a range of other sectors, including for example, forestry, septic tanks, peat, urban runoff and atmospheric deposition.
- ◆ In the catchment pasture, forestry and deposition on water are responsible for 30%, 27% and 19% of the nitrogen load respectively while land in pasture, peat and deposition on water contribute 30%, 27% and 19% of the phosphorus loadings for the catchment respectively (Figure 17).

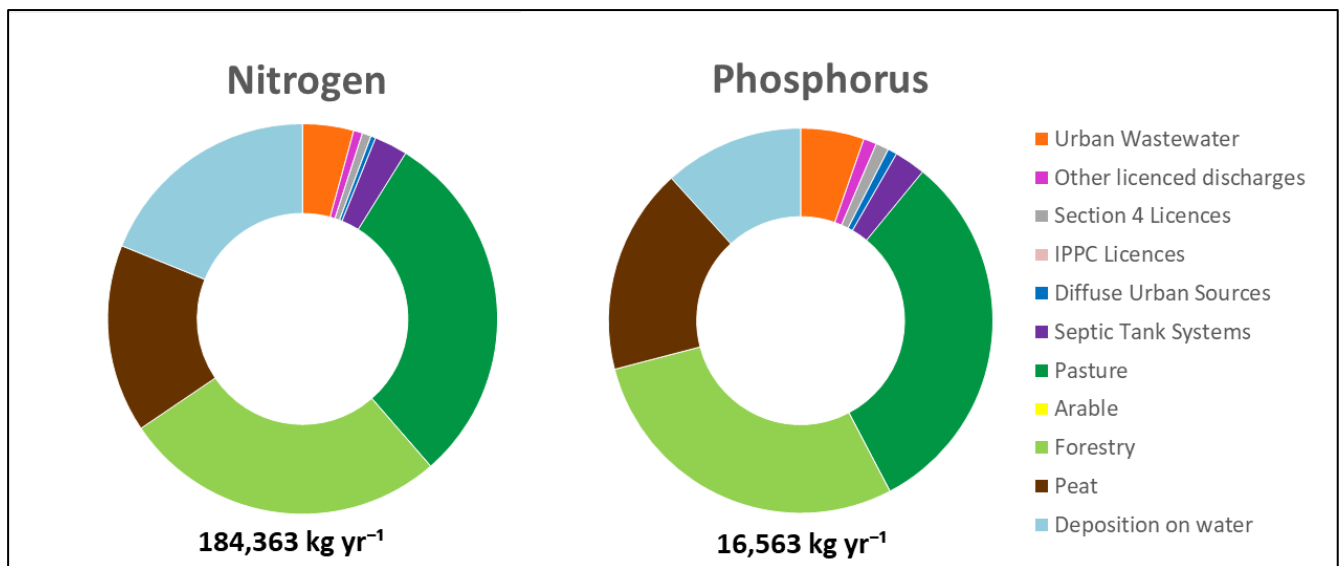


Figure 20: Estimated Proportions of N & P from Each Sector in the Upper Shannon (Lough Allen) Catchment

7 Load Reduction Assessment

7.1 Nitrogen Load Reduction

- ◆ An assessment was undertaken to determine if nitrogen reductions in rivers, streams and lakes are required for Transitional and Coastal (TRACs) waterbodies to achieve their WFD environmental objective. The outcome of the assessment indicated that 10 of the 46 catchments require N reductions in our inland waters to restore some TRAC waterbodies. Nitrogen load reduction to meet TRAC WFD objectives are not required in the Upper Shannon (Lough Allen) Catchment.

7.2 Phosphorus / Sediment Load Reduction

- ◆ Further modelling work is required to determine if and what P load reductions are required.

Figure 21 highlights areas where agricultural measures for sediment and phosphorus should be targeted. Waterbodies with blue fill are areas where sediment or phosphorus should be targeted. Pollution Impact Potential mapping for both phosphorus and nitrogen in the catchment are provided in Appendix 2.

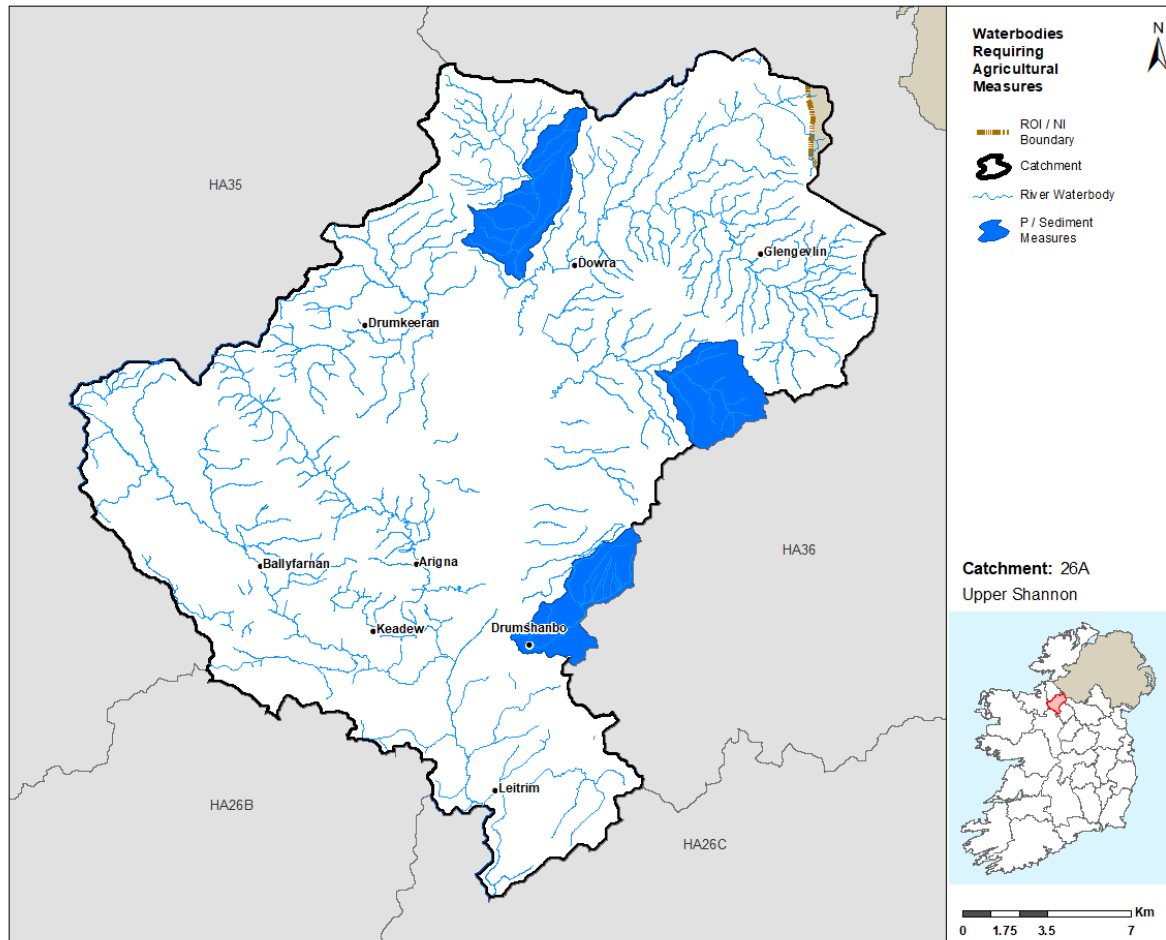


Figure 21: Waterbodies where Agricultural Measures should be Targeted

8 2nd Cycle Areas for Action

8.1 Area for Action Overview

- ◆ There was one Area for Action, comprising of seven waterbodies, selected for further characterisation and action in the catchment for the 2nd Cycle River Basin Management Plan. The Areas for Action in the catchment are listed in Table 4 and shown in Figure 22. LAWPRO, in conjunction with local authorities and stakeholders from the Western and Borders Regional Operational Committee, have been working in these areas since 2018.

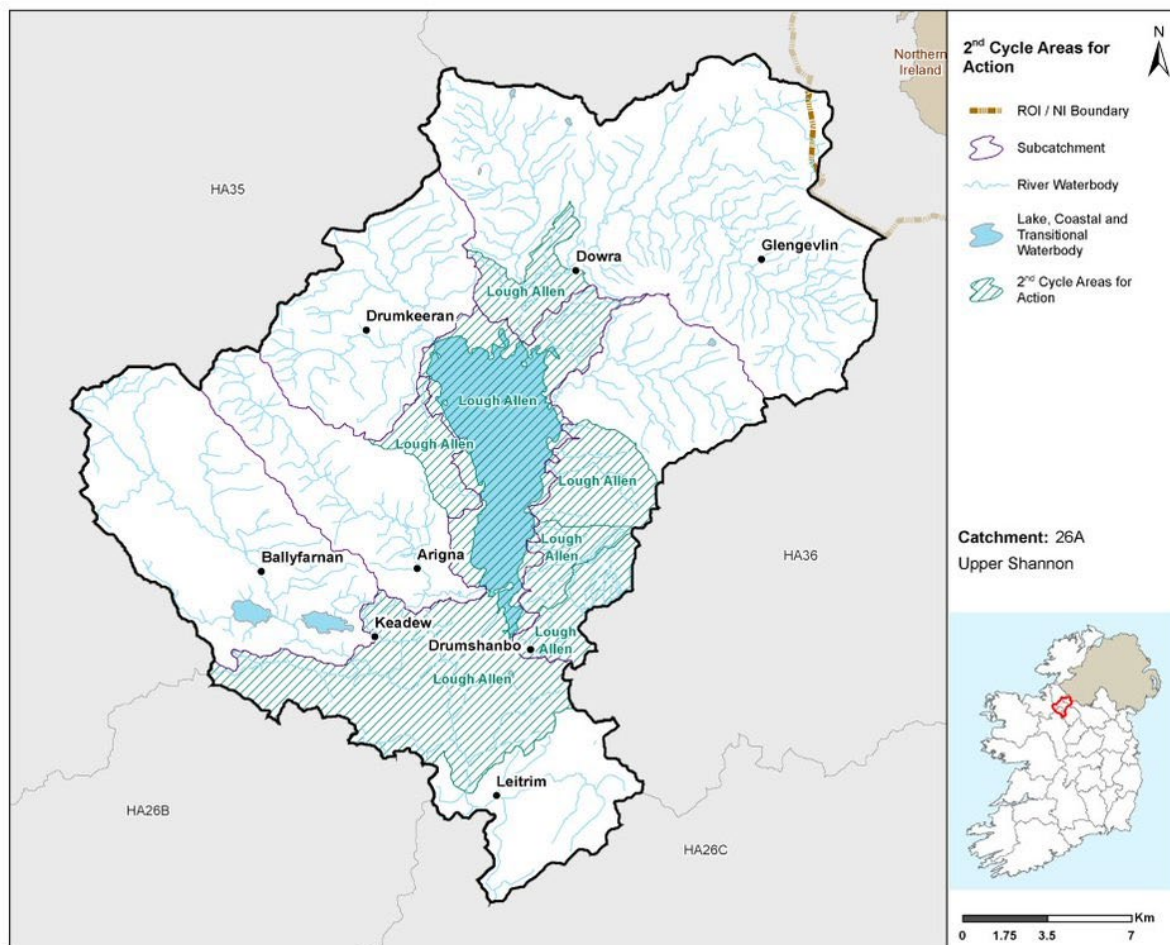


Figure 22: 2nd Cycle Areas for Action Locations

Table 4: 2nd Cycle Areas for Action

2 nd Cycle Area for Action	Number of waterbodies	Sub-catchment	Local Authority	Reason for Selection
Lough Allen	7	26A_3	Leitrim	<ul style="list-style-type: none"> Multiple pressures which can be investigated at the same time. Long term challenge requiring cross agency approach.

8.2 Status Change in 2nd Cycle Areas for Action

- ♦ For Cycle 3, of the seven waterbodies in the 2nd Cycle Areas for Action, there are two waterbodies at Moderate Status, one waterbody at Poor Status, and four waterbodies where status has not been assigned.

- ◆ There is overall no change in the status of the seven 2nd Cycle Areas for Action waterbodies across the catchment.⁸
- ◆ Of the three waterbodies (two river waterbodies (Drumshanbo Stream_010, Shannon (Upper)_040) and Allen lake waterbody) within the 2nd Cycle Areas for Action which had status assigned, all three experienced no change in status between Cycle 2 and Cycle 3 (Figure 23).

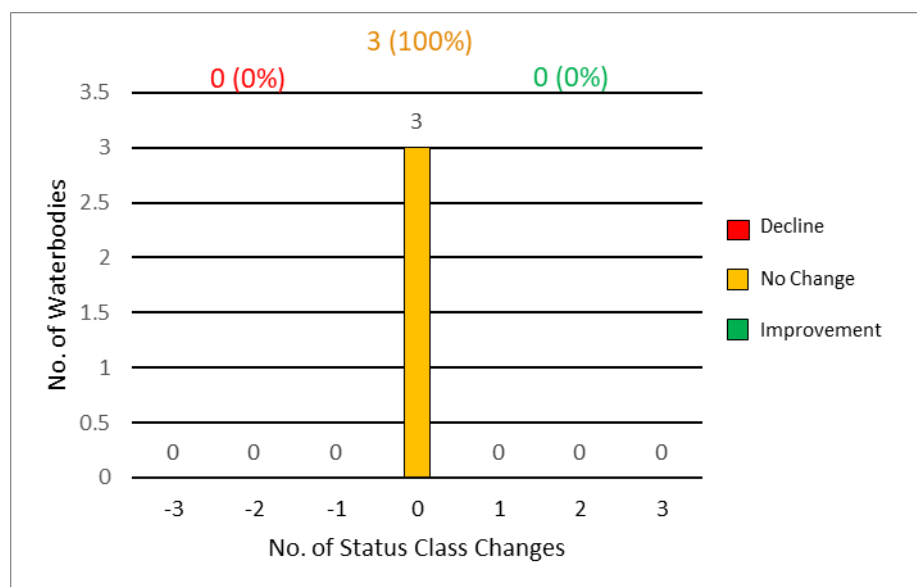


Figure 23: 2nd Cycle Area for Action Waterbody Status Class Changes between Cycle 2 and Cycle 3

8.3 Waterbody Risk in 2nd Cycle Areas for Action

- ◆ For the seven waterbodies in the 2nd Cycle Areas for Action, three (34%) of these are currently *At Risk* and four (57%) are in *Review*.
- ◆ For the six river waterbodies, two (33%) are *At Risk* and four (67%) are in *Review*.
- ◆ The only lake waterbody (Allen) in a 2nd Cycle Area for Action is *At Risk*.
- ◆ The largest proportion of *At Risk* waterbodies are found in river waterbodies, accounting for two (67%) of the three *At Risk* waterbodies. Figure 24 gives an overview of the breakdown of risk across waterbody types for both Cycle 2 and Cycle 3 in 2nd Cycle Areas for Action.
- ◆ Overall, there is no change in risk in 2nd Cycle Areas for Action between Cycle 2 and Cycle 3.

⁸ Status class change cannot be calculated for waterbodies where status has not been assigned in either cycle 2 or 3 and therefore these waterbodies are not represented in Figure 18. Percentage displayed in the chart below are in relation to the total number of waterbodies with status assigned in both cycles, as opposed to total number of all waterbodies.

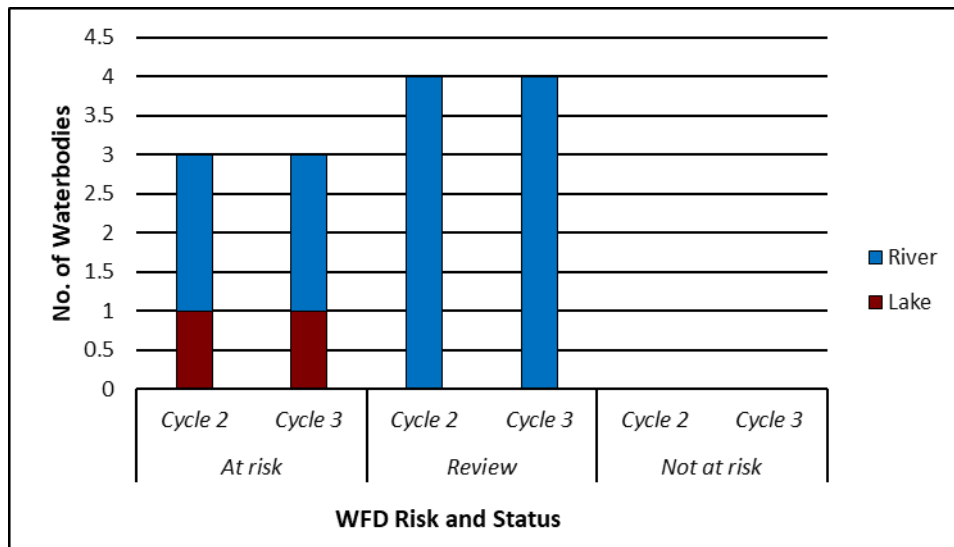
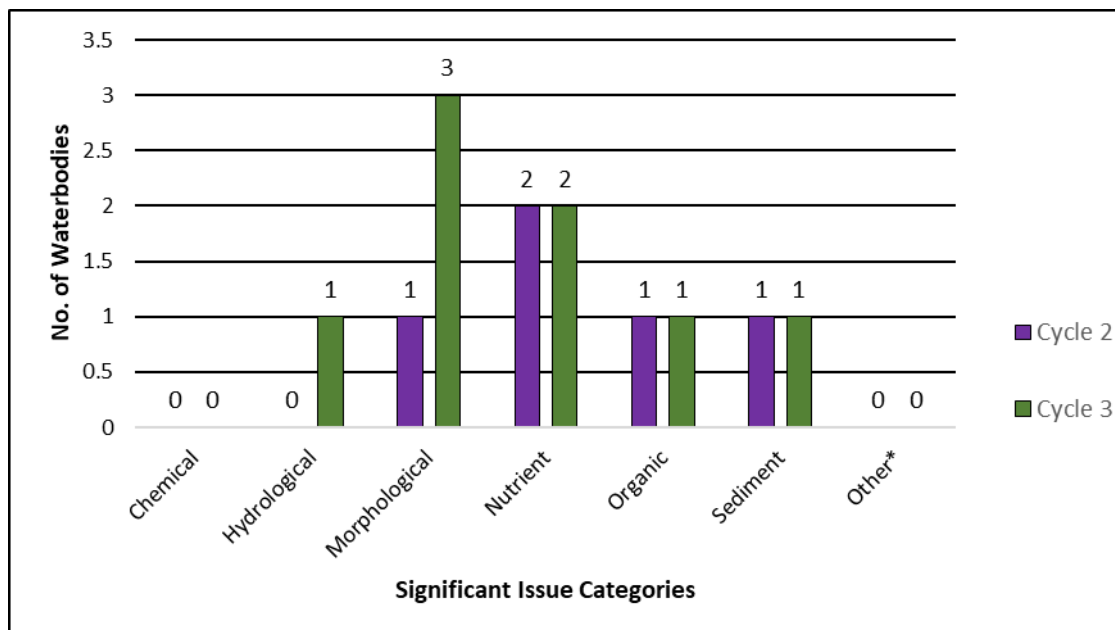


Figure 24: Number of waterbodies in each risk category in 2nd Cycle Areas for Action

8.4 Significant Issues in 2nd Cycle Areas for Action

- ◆ Based on the EPA assessment for Cycle 3, the significant issues in the 2nd Cycle Areas for Action are morphological impacts and nutrient pollution, each impacting three and two waterbodies respectively (Figure 25). This is followed by sediment, organic and hydrological which are all impacting one waterbody each.
- ◆ The number of 2nd Cycle Areas for Action waterbodies associated with each of the significant issues categories has increased or remained unchanged between Cycle 2 and Cycle 3.

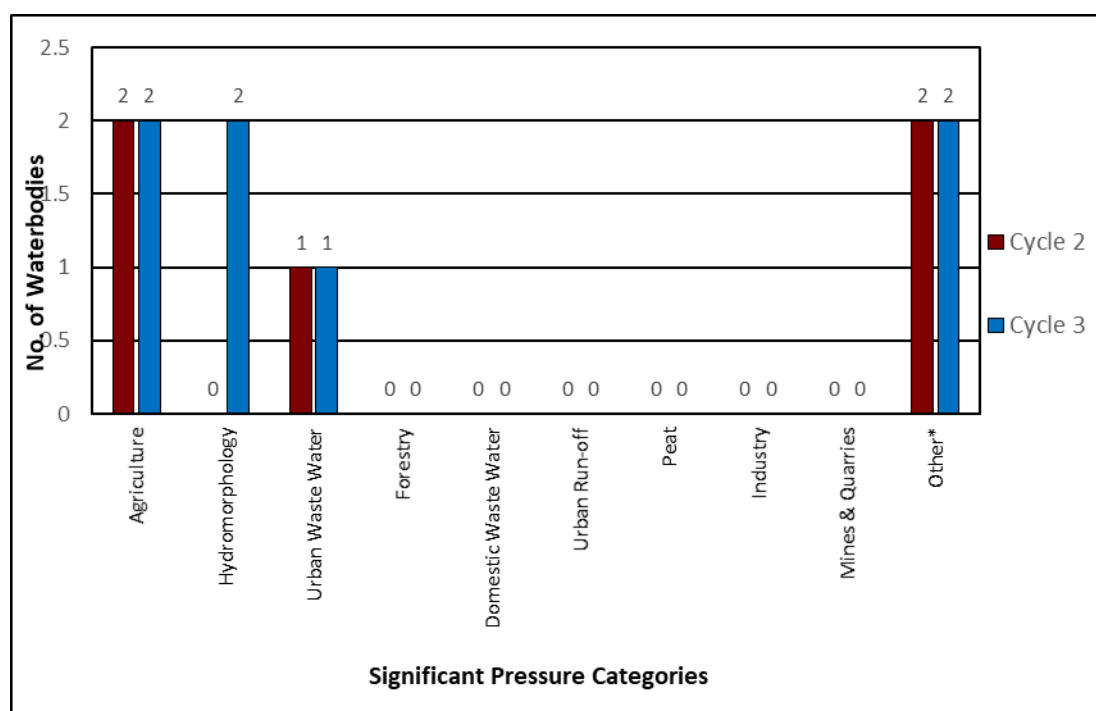


*Other - Acidification, saline intrusion, elevated temperature, litter, microbiological pollution and unknown impacts have all been grouped into the "Other" issues category for the purpose of this report

Figure 25: Significant Issues across all 2nd Cycle Areas for Action Waterbodies

8.5 Significant Pressure in 2nd Cycle Areas for Action

- ◆ For Cycle 3, in 2nd Cycle Areas for Action waterbodies in the catchment the dominant significant pressures are:
 - Hydromorphology, agriculture and other pressures are all impacting two waterbodies each. Both agriculture and other pressures remained unchanged when compared to Cycle 2, however, hydromorphology has increased from no waterbodies to impact two waterbodies.
 - Urban waste water remains unchanged when compared to the previous cycle, impacting one waterbody in both cycles.
- ◆ When comparing the significant pressures in the 2nd Cycle Areas for Action between Cycle 2 and 3 there has been no change in all significant pressure categories in the catchment with the exception of hydromorphology. Hydromorphology was impacting no waterbodies in the previous cycle and has now increased to impact two waterbodies.



*Other – abstractions, aquaculture, atmospheric, anthropogenic pressures, historically polluted sites, waste, water treatment and invasive species have all been grouped into the “Other” pressure category for the purpose of this report

Figure 26: Significant Pressures in 2nd Cycle Area for Action Waterbodies

9 3rd Cycle Recommended Areas for Action

9.1 Recommended Areas for Action Overview

- ◆ For the 3rd Cycle Draft River Basin Management Plan Areas for Action have been extended out to not only include Prioritised Areas for Action undertaken by LAWPRO which focussed on restoring waterbodies, but to also include restoration work undertaken by all agencies under Areas for Restoration. In addition, protection work is included under Areas for Protection and research, pilot schemes and community initiatives are included under Catchment Projects. The

aim of the 3rd Cycle Plan is to capture all activity that is working to restore, improve and/or protect waterbodies.

- ◆ The Recommended 3rd Cycle Areas for Action list will be included in the Draft River Basin Management Plan and will be finalised after the consultation period.
- ◆ There are five Areas for Action, comprising of 17 waterbodies, recommended for further characterisation and action in the catchment for the 3rd Cycle River Basin Management Plan. Seven of the 17 waterbodies in the 3rd Cycle Recommended Areas for Action are *At Risk*, six are in *Review* and four are *Not At Risk*. The five Recommended Areas for Action consist of three Areas for Protection and five Areas for Restoration. LAWPRO are the proposed lead organisation in two Recommended Areas for Action and NFGWS are the proposed lead on the remaining three Recommended Areas for Action. The Recommended Areas for Action in the catchment are listed in Table 5 and shown in Figure 27. The reason for selecting for each waterbody in a Recommended Area for Action is provided in Appendix 3.

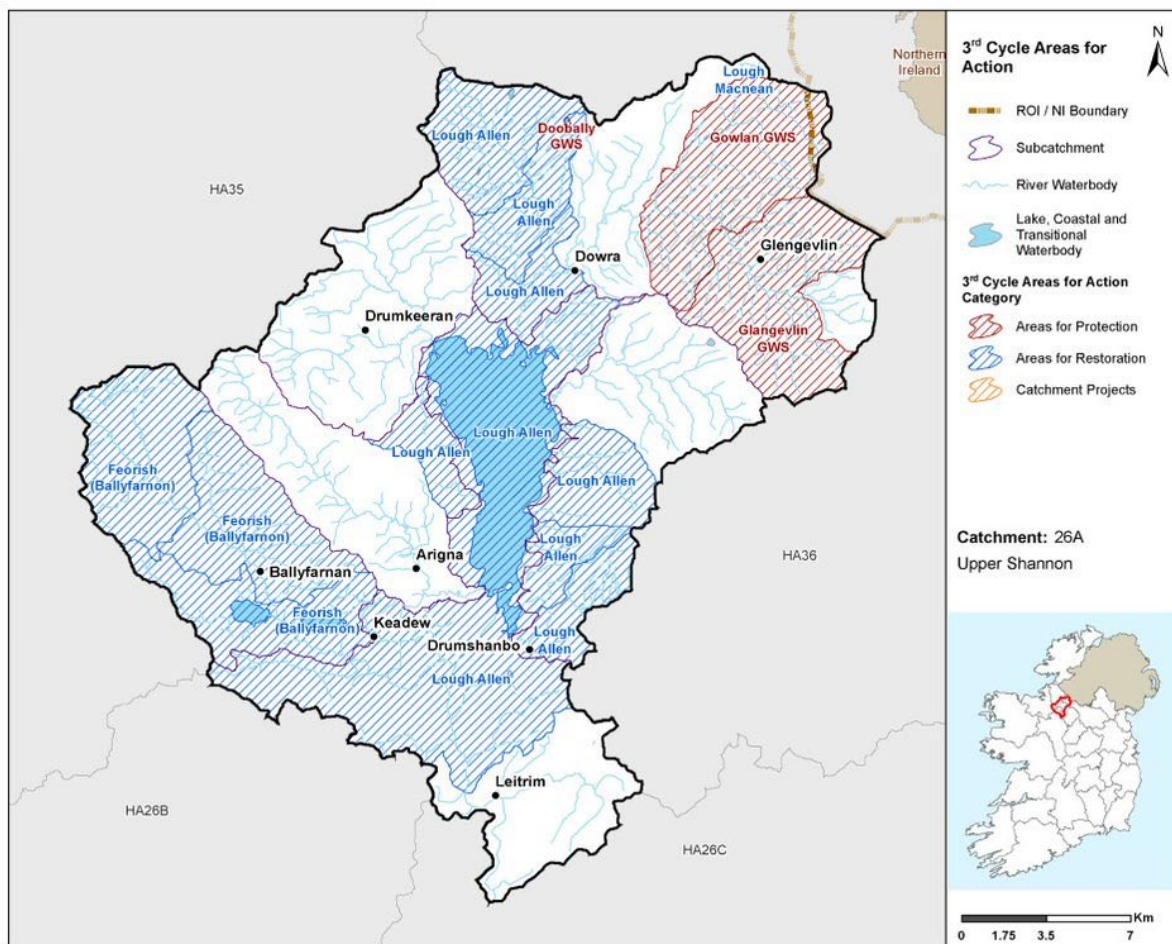


Figure 27: 3rd Cycle Recommended Areas for Action Locations

Table 5: 3rd Cycle Recommended Areas for Action Breakdown

3rd Cycle Recommended Areas for Action	Number of Waterbodies	Recommended Areas for Action Category	Recommended Areas for Action Sub-category	Lead Organisation
Lough Allen	9	Restoration	Prioritised Areas for Action LAWPRO	LAWPRO
Feorish (Ballyfarnon)	5	Restoration	Prioritised Areas for Action LAWPRO	LAWPRO
Glangevlin GWS	1	Protection	Public Health Areas for Protection NFGWS, IW, HSE, LAs, SFPA	NFGWS
Gowlan GWS	1	Protection	Public Health Areas for Protection NFGWS, IW, HSE, LAs, SFPA	NFGWS
Doobally GWS	1	Protection	Public Health Areas for Protection NFGWS, IW, HSE, LAs, SFPA	NFGWS

10 Catchment Summary

- Of the 25 river waterbodies, seven are *At Risk* of not meeting their WFD objectives.
- Three out of eight lake waterbodies are *At Risk* of not meeting their WFD objectives. These are Acres, Meelagh and Allen.
- One out of 18 groundwater bodies (Geevagh) is *At Risk*.
- There are 11 waterbodies *At Risk* in Cycle 3 compared to nine waterbodies *At Risk* in Cycle 2.
- The main significant issues are from morphological impacts and nutrient pollution, followed by sediment, chemical, hydrological, other impacts and organic pollution.
- The main significant pressures are agricultural pressures followed by other pressures, hydrological pressures, forestry, peat and urban waste water.
- The main impacts and pressures driving the change between Cycle 2 and Cycle 3 are increases in waterbodies impacted by morphological and chemical. The increase in hydromorphological impacts is likely to be associated with a stronger evidence base and increasing awareness of hydromorphology rather than new significant hydromorphology pressures since Cycle 2.
- There was no overall change in the 2nd Cycle Areas for Action since Cycle 2. Three waterbodies were *At Risk* and four were in *Review* in both cycles.
- There are five 3rd Cycle Recommended Areas for Action for Cycle 3. They comprise of 17 waterbodies with seven waterbodies *At Risk*, six in *Review* and four *Not At Risk*.

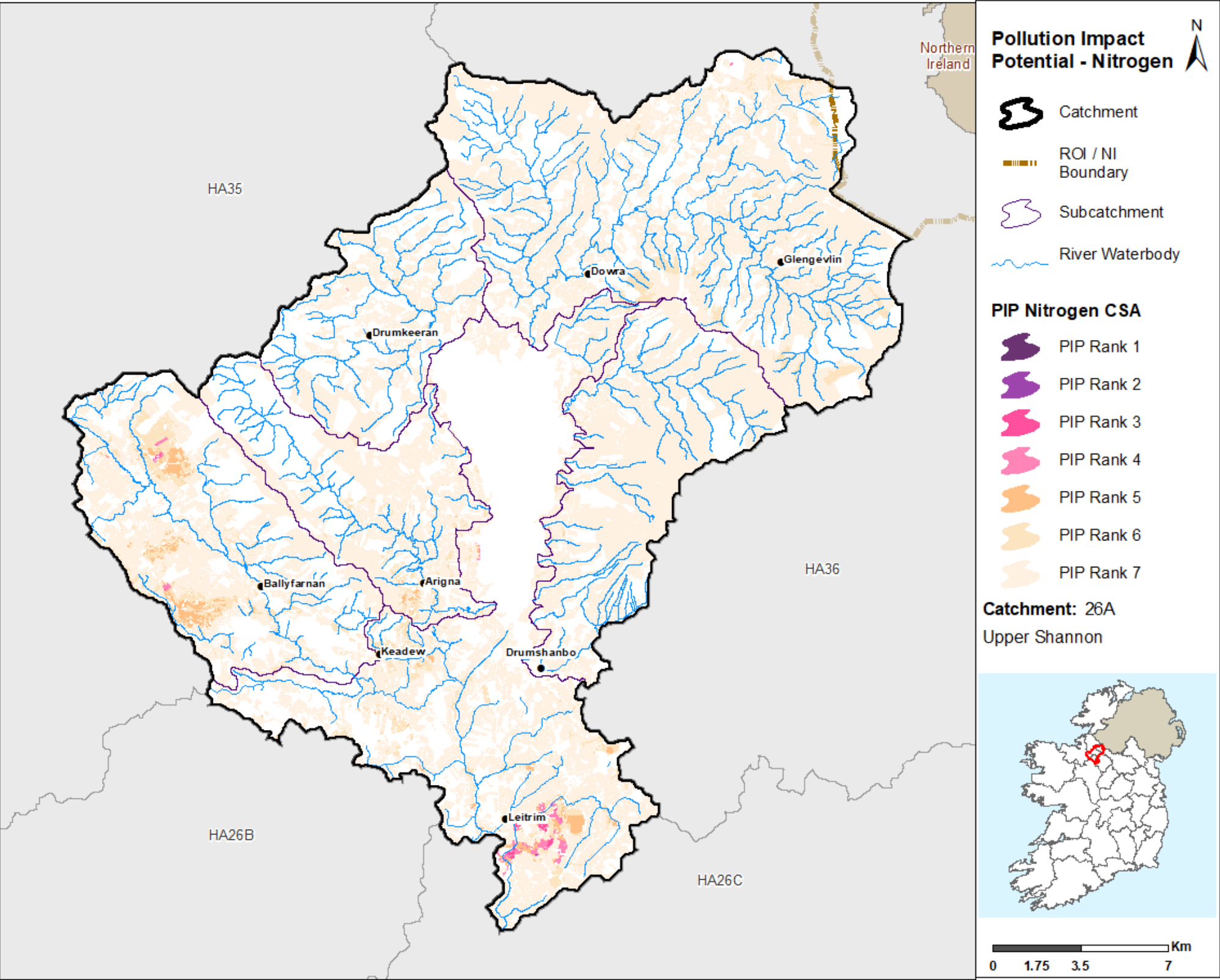
Appendix 1

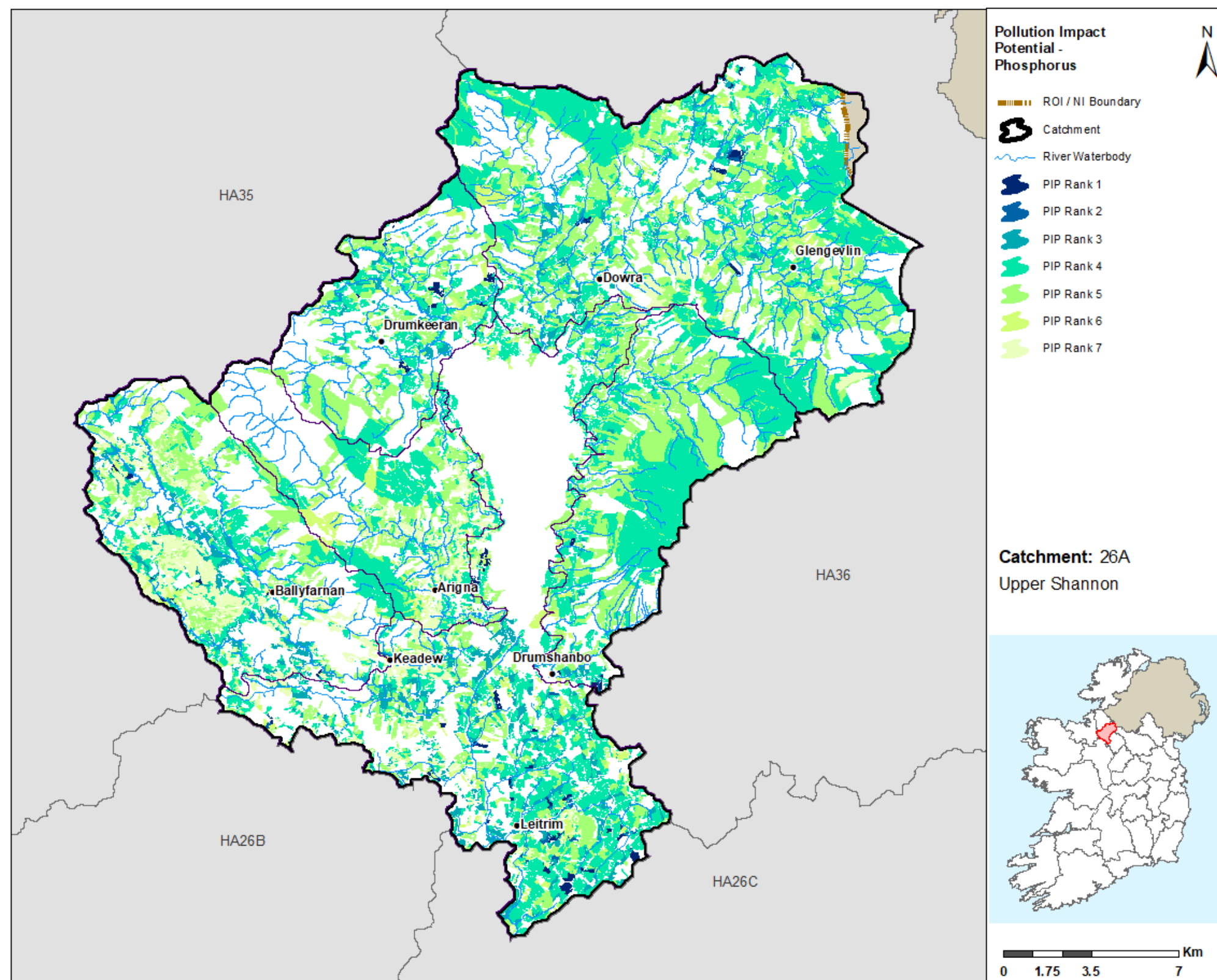
High ecological status objective waterbodies

Waterbody Name	Waterbody Type	Waterbody Code	Status 2013-2018
BELLAVALLY STREAM_010	River	IE_SH_26B320120	High
FEORISH (BALLYFARNON)_020	River	IE_SH_26F020250	Good

Appendix 2

Pollution Impact Potential Mapping





Appendix 3

Summary information on all waterbodies in the Upper Shannon (Lough Allen) Catchment

Subcatchment Code	Waterbody Code	Waterbody Name	Waterbody Type	Risk 10-15	Risk 13-18	Status 10-15	Status 13-18	High Ecological Status Objective Waterbody	Significant Pressures	Recommended Areas for Action Name	Recommended Areas for Action (reasons for selection)
	IE_26A_AWB_SEW	Shannon Erne (Upper Shannon A)	River		Review	Poor	Poor	No			
26A_4	IE_SH_26A020100	ARIGNA (ROSCOMMON)_010	River	Not at risk	Not at risk	Good	Good	No			
26A_4	IE_SH_26A020300	ARIGNA (ROSCOMMON)_020	River	Not at risk	Not at risk	Good	Good	No			
26A_5	IE_SH_26B320120	BELLAVALLY STREAM_010	River	Not at risk	Not at risk	High	High	Yes			
26A_1	IE_SH_26D020200	DIFFAGHER_010	River	Not at risk	Not at risk	Good	Good	No			
26A_6	IE_SH_26D050400	Drumshanbo stream_010	River	At risk	At risk	Poor	Poor	No	Ag, Hymo, UWW	Lough Allen	Existing PAA - requires further characterisation
26A_2	IE_SH_26F020080	FEORISH (BALLYFARNON)_010	River	Not at risk	Not at risk	Good	Good	No		Feorish (Ballyfarnon)	HS Site in non HSO WB not achieving High. Ensure full subcatchment is included.
26A_2	IE_SH_26F020250	FEORISH (BALLYFARNON)_020	River	Not at risk	At risk	High	Good	Yes	Hymo	Feorish (Ballyfarnon)	At risk HSO WB. Proposed by RCC & SCC.
26A_2	IE_SH_26F020400	FEORISH (BALLYFARNON)_030	River	Review	Review	Poor	Poor	No		Feorish (Ballyfarnon)	Pesticide issues / dumping issues with pesticide & herbicide containers found. Education & awareness needed here. NOTE: Poor status is being driven by fish, not invertebrates.
26A_1	IE_SH_26G120050	GOWLAUNREVAGH_010	River	At risk	At risk	Poor	Poor	No	Other		
26A_1	IE_SH_26O020100	OWENGAR (LEITRIM)_010	River	Not at risk	Not at risk	Good	Good	No			
26A_1	IE_SH_26O020200	OWENGAR (LEITRIM)_020	River	Not at risk	Review	Good	Good	No			
26A_5	IE_SH_26O030300	OWENMORE (GLANGEVLIN)_010	River	Not at risk	Not at risk	Good	Good	No		Glangevlin GWS	The NFGWS would like to highlight that the Glangevlin GWS groundwater Zone of Contribution is situated within the Owenmore(Glangevlin)_010 and therefore would like to propose its inclusion for selection as a PAA.
26A_5	IE_SH_26O050050	OWENNAYLE_010	River	At risk	At risk	Moderate	Moderate	No	For	Lough Allen	Existing PAA - requires further characterisation
26A_5	IE_SH_26O050100	OWENNAYLE_020	River	Not at risk	At risk	Good	Moderate	No	Ag, Peat	Lough Allen	Existing PAA - requires further characterisation
26A_5	IE_SH_26S020300	SHANNON (Upper)_020	River	Not at risk	Not at risk	Good	Good	No			
26A_5	IE_SH_26S020340	SHANNON (Upper)_030	River	Review	Review	Unassigned	Unassigned	No		Lough Allen	Existing PAA - requires further characterisation
26A_3	IE_SH_26S020500	SHANNON (Upper)_040	River	At risk	At risk	Moderate	Moderate	No	Hymo, Other	Lough Allen	Existing PAA - requires further characterisation
26A_3	IE_SH_26S020550	SHANNON (Upper)_050	River	Review	Review	Unassigned	Unassigned	No			
26A_6	IE_SH_26S090100	STONY_010	River	Review	Review	Unassigned	Unassigned	No		Lough Allen	Existing PAA - requires further characterisation

Subcatchment Code	Waterbody Code	Waterbody Name	Waterbody Type	Risk 10-15	Risk 13-18	Status 10-15	Status 13-18	High Ecological Status Objective Waterbody	Significant Pressures	Recommended Areas for Action Name	Recommended Areas for Action (reasons for selection)
26A_6	IE_SH_26S650770	SHEKINACURRY_010	River	Review	Review	Unassigned	Unassigned	No		Lough Allen	Existing PAA - requires further characterisation
26A_4	IE_SH_26T050840	TARMO_010	River	Review	Review	Unassigned	Unassigned	No		Lough Allen	Existing PAA - requires further characterisation
26A_6	IE_SH_26Y010100	YELLOW (BALLINAGLERA)_010	River	Not at risk	At risk	High	Poor	No	Ag		
26A_6	IE_SH_26Y010200	YELLOW (BALLINAGLERA)_020	River	Not at risk	Not at risk	Good	Good	No			
26A_5	UKGBNI1SH262601001	SHANNON (Upper)_010	River	Not at risk	Not at risk	Good	Good	No		Gowlan GWS	NAR - not proposed, but Blue Dot site present in WB The NFGWS would like to propose that Garvagh Lough is included within a PAA on the basis of Public Health. The lake is used for water abstraction by Gowlan GWS. While the lake is not currently assigned a WFD classification, the downstream waterbody (Shannon(Upper)_010) is of 'Good' water quality and could be targeted for protection. In addition, part of the Garvagh Lough catchment is situated within the Cuilcagh -Anieran Uplands SAC.
26A_5	IE_SH_26_410	Natire	Lake	Not at risk	Not at risk	Unassigned	Unassigned	No			
26A_5	IE_SH_26_411	Nawelean	Lake	Not at risk	Not at risk	Unassigned	Unassigned	No		Doobally GWS	The NFGWS would like to propose that Nawelean Lough is included within a PAA on the basis of Public Health. The lake is used for water abstraction by Doobally GWS. While the lake is not currently assigned a WFD classification, the downstream waterbody (Owenayle_020) is of 'Moderate' water quality and could be targeted for Restoration. This maybe facilitated by the expansion of the Lough Allen PAA.
26A_6	IE_SH_26_536	Nambrack	Lake	Not at risk	Not at risk	Unassigned	Unassigned	No			
26A_2	IE_SH_26_673	Skean	Lake	Review	Review	Unassigned	Unassigned	No		Feorish (Ballyfarnon)	Pesticide issues / dumping issues with pesticide & herbicide containers found. Education & awareness needed here plus a thorough investigation of the issues.
26A_3	IE_SH_26_681	Acres	Lake	At risk	At risk	Poor	Poor	No	For		
26A_5	IE_SH_26_698	Killooman	Lake	Review	Review	Unassigned	Unassigned	No			
26A_2	IE_SH_26_711	Meelagh	Lake	At risk	At risk	Poor	Poor	No	Other	Feorish (Ballyfarnon)	Pesticide issues / dumping issues with pesticide & herbicide containers found. Education & awareness needed here plus a thorough investigation of the issues.
26A_3, 26A_6	IE_SH_26_716	Allen	Lake	At risk	At risk	Moderate	Moderate	No	Ag, Other	Lough Allen	Existing PAA - requires further characterisation

Subcatchment Code	Waterbody Code	Waterbody Name	Waterbody Type	Risk 10-15	Risk 13-18	Status 10-15	Status 13-18	High Ecological Status Objective Waterbody	Significant Pressures	Recommended Areas for Action Name	Recommended Areas for Action (reasons for selection)
26A_5, 35_8, 36_20, 36_24	IE_NW_G_042	Glenfarne	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_3, 26B_1, 26B_2, 26B_3, 26B_4, 26B_5, 26B_6, 26C_10, 26C_11, 26C_12, 26C_3, 26C_4, 26C_5, 26D_7, 26D_9, 26E_3, 34_4, 36_15	IE_SH_G_048	Carrick on Shannon	Groundwater	At risk	Review	Good	Good	No			
26A_2, 26A_3, 26A_6, 26B_2, 26B_3, 26B_4, 26B_5, 26B_6, 26C_11, 34_1, 34_17, 34_18, 35_7, 35_9, 36_15	IE_SH_G_073	Curlew Mountains	Groundwater	Review	Not at risk	Good	Good	No			
26A_2, 26A_3, 26A_6, 35_9, 36_15	IE_SH_G_105	Geevagh	Groundwater	At risk	At risk	Good	Good	No	Ag, Other		
26A_5	IE_SH_G_262	Historic Waste Facility (S22-02567)	Groundwater	Review	Not at risk	Good	Good	No			
26A_2, 26A_3, 26B_3, 26B_5, 26B_6, 34_18, 35_5, 35_7, 35_9	IE_WE_G_0028	Gorteen	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_2, 35_6, 35_9	IE_WE_G_0036	Riverstown	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_2, 34_16, 34_18, 35_2, 35_4, 35_5, 35_6, 35_7, 35_9	IE_WE_G_0037	Ballymote	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_1, 26A_2, 26A_4, 35_6, 35_9	IE_WE_G_0110	South Belhavel Lough	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 35_6, 35_8, 36_24	IE_WE_G_0111	North Belhavel Lough	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 36_20, 36_24	IEGBNI_NW_G_021	Ballintempo	Groundwater	Not at risk	Not at risk	Good	Good	No			

Subcatchment Code	Waterbody Code	Waterbody Name	Waterbody Type	Risk 10-15	Risk 13-18	Status 10-15	Status 13-18	High Ecological Status Objective Waterbody	Significant Pressures	Recommended Areas for Action Name	Recommended Areas for Action (reasons for selection)
26A_3, 26A_6, 26C_10, 26C_4, 36_13, 36_14, 36_15, 36_19, 36_21, 36_22, 36_23, 36_6, 36_7	IEGBNI_NW_G_031	Newtown-Ballyconnell	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 26A_6, 36_1, 36_15, 36_23, 36_6, 36_7	IEGBNI_NW_G_035	Anierin-Cuilcagh East	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 36_1, 36_23, 36_24	IEGBNI_NW_G_036	Marble Arch	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 36_1, 36_23	IEGBNI_NW_G_040	Claddagh-Swanlinbar	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_1, 26A_2, 26A_3, 26A_4, 26A_5, 26A_6, 35_6, 35_8, 35_9, 36_1, 36_15, 36_23, 36_24, 36_6	IEGBNI_SH_G_002	Lough Allen Uplands	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_5, 36_1, 36_24	IEGBNI_SH_G_003	Shannon Pot	Groundwater	Not at risk	Not at risk	Good	Good	No			
26A_3, 26A_5, 36_1, 36_24	IEGBNI_SH_G_264	Glenade Dowra	Groundwater	Not at risk	Not at risk	Good	Good	No			

Ag: Agriculture

M+Q: Mines and Quarries

DWW: Domestic Waste Water

Peat: Peat Drainage and Extraction

For: Forestry

UR: Urban Run-off

Hymo: Hydromorphology

UWW: Urban Waste Water

Ind: Industry

Note: Significant Pressures for *Review* waterbodies have not been included as they will need to be confirmed as part of an Investigative Assessment.