Foyle Catchment Assessment 2010-2015 (HA 01)

Catchment Science & Management Unit

Environmental Protection Agency

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Preface

This document provides a summary of the characterisation outcomes for the water resources of the Foyle Catchment, which have been compiled and assessed by the EPA, with the assistance of local authorities and RPS consultants. The information presented includes status and risk categories of all water bodies, details on protected areas, significant issues, significant pressures, load reduction assessments, recommendations on future investigative assessments, areas for actions and environmental objectives. The characterisation assessments are based on information available to the end of 2015. Additional, more detailed characterisation information is available to public bodies on the EPA WFD Application via the EDEN portal, and more widely on the catchments.ie website. The purpose of this document is to provide an overview of the situation in the catchment and help inform further action and analysis of appropriate measures and management strategies.

This document is supported by, and can be read in conjunction with, a series of other documents which provide explanations of the elements it contains:

1. An explanatory document setting out the full characterisation process, including water body, subcatchment and catchment characterisation.
2. The Final River Basin Management Plan, which can be accessed on: www.catchments.ie.
3. A published paper on Source Load Apportionment Modelling, which can be accessed at: http://www.jstor.org/stable/10.3318/bioe.2016.22
4. A published paper on the role of pathways in transferring nutrients to streams and the relevance to water quality management strategies, which can be accessed at: http://www.jstor.org/stable/pdf/10.3318/bioe.2016.19.pdf
5. An article on Investigative Assessments which can be accessed at: https://www.catchments.ie/download/catchments-newsletter-sharing-science-stories-june-2016/

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1 Introduction

The Foyle catchment includes the area drained by the River Foyle and by all streams entering tidal water between Culmore Point, Co. Derry and Coolkeeragh, Co. Derry. This is a cross border catchment with a surface area of 2,919km², 914km² of which is located within the Republic of Ireland (RoI). The largest urban centres in the catchment are Ballybofey and Stranorlar. The population (in the RoI) is approximately 29,650, with a population density of 32 people per km². The eastern half of the catchment, located in Northern Ireland, drains most of County Tyrone and a small part of north western County Derry. The part of the catchment located in Donegal is largely mountainous and is underlain by granites and metamorphic rocks of various types that are relatively poor aquifers.

The River Derg rises on the southeastern slopes of the Bluestack Mountains, flowing through Lough Derg and across the border, at which point it is met by the Leaghany River. The Mourne Beg River rises the Bluestacks, outflowing from Mourne Lough then flowing across the border and into the Derg River near Castlederg. The Derg River then continues through Tyrone, meeting the Mourne River near Newtown Stewart which then flows north to Strabane and Lifford.

The Finn River rises upstream of Finntown and flows into Lough Finn, after which it turns east. The northern slopes of the Bluestacks are also drained by the Stranagoppoge, Glashagh, Reelan, Clogher and Burn Daurnett Rivers, all of which flow into the main river upstream of Ballybofey. The northern side of the Finn catchment is drained by the Cummirk, Elatagh, Corlacky and Ballynalach Rivers which also flow into the Finn between Finnstown and Balleybofey. The Finn then passes Killygordon before joining the Mourne River to become the Foyle River at Lifford and Strabane.

The Deele River rises at Lough Deele, flowing east and joined by the Cloghroe River. It continues east through Convoy and Ballindrait before joining the Foyle north of Lifford.

The area around Raphoe is drained by the Swilly Burn River which flows into the Foyle as it continues northwards. The Johnston and Carrigans Streams flow into the Foyle before it flows north into Derry City and out to sea via Lough Foyle. An arterial drainage scheme was completed on the Deele and Swilly Burn Rivers by the OPW between 1961 and 1968.

The Foyle catchment comprises nine sub-catchments with 41 river water bodies, five lakes, one transitional water body and eight groundwater water bodies (Table 1, Figure 1). There are no designated heavily modified water bodies (HMWB) in the catchment.

Table 1. List of subcatchments in the Foyle catchment.

Subcatchment ID	Subcatchment Name
01_1	MourneBeg_SC_010
01_2	Finn[Donegal]_SC_030
01_3	Finn[Donegal]_SC_020
01_4	MourneBeg_SC_020
01_5	LeaghanyRiver_SC_010
01_6	Deele[Donegal]_SC_010
01_7	Finn[Donegal]_SC_040
01_8	Finn[Donegal]_SC_010
01_9	JohnstonStream_SC_010

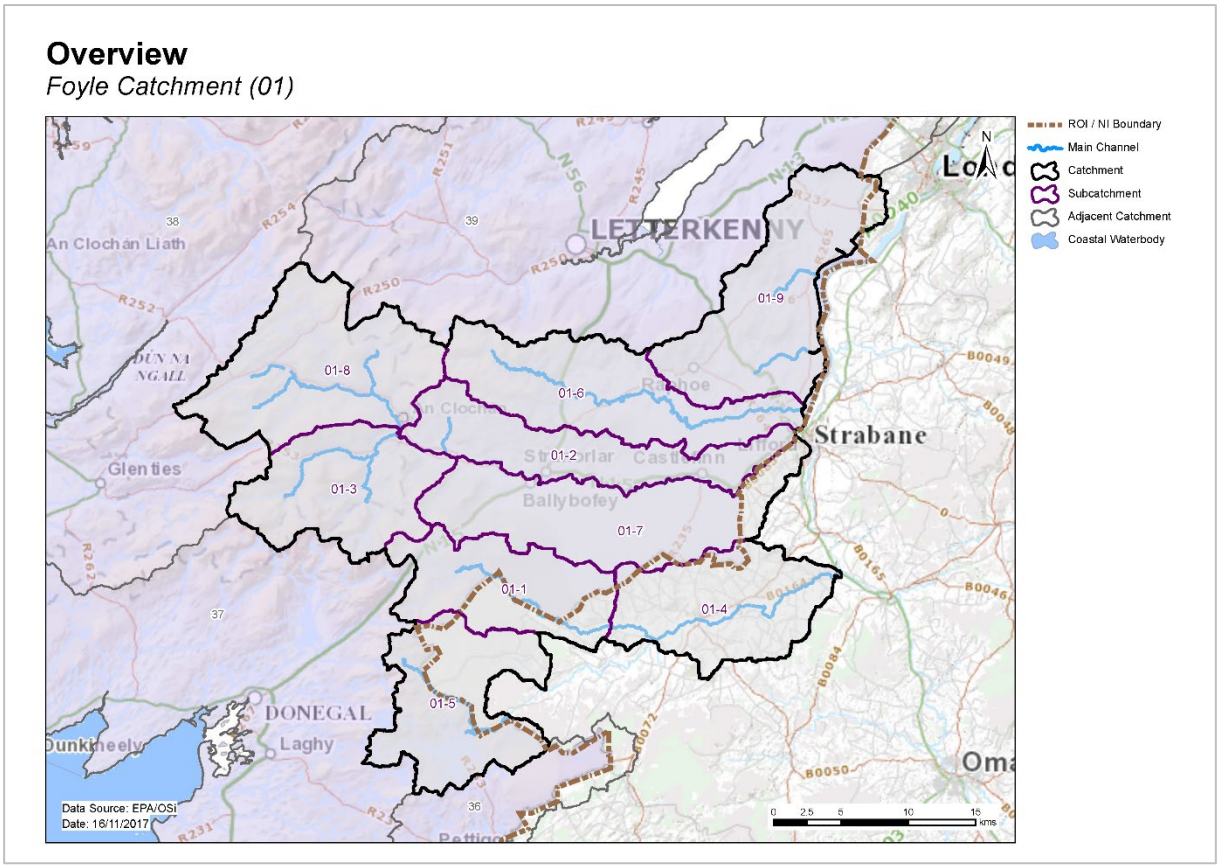

Figure 1. Subcatchments in the Foyle catchment

2 Water body status and risk of not meeting environmental objectives

2.1 Surface water ecological status

2.1.1 Rivers and lakes

- There were 10 (22%) surface water bodies at Good or High status, and 21 (46%) at less than Good status in 2015 (Table 2, Figure 2). Fifteen (32%) river and lake water bodies are unassigned.
- None of the surface water bodies have a High Ecological Status objective.
- The numbers of water bodies at each status class in 2007-09 and 2010-15 are shown in Figure 3 (rivers) and Figure 4 (lakes).
- Nine water bodies have improved and seven have deteriorated since 2007-2009 (Figure 5).
- The variation in nutrient concentrations and loads in the Foyle [Finn (Donegal)] main channel is considered in Appendix 1.

2.1.2 Transitional and Coastal (TraCs)

- One TraC water body is present in the catchment (Foyle and Faughan estuaries) and was unassigned in 2010-15 (Table 2, Figure 2).

Table 2. Summary of surface water body status and risk categories

	Number of water bodies	2010-2015 Status						Risk Category		
		High	Good	Mod	Poor	Bad	Un-assigned	*Not at Risk*	*Review*	*At Risk*
Rivers	41	0	7	9	12	0	13	7	13	21
Lakes	5	0	3	0	0	0	2	3	2	0
TraC	1	0	0	0	0	0	1	0	0	1

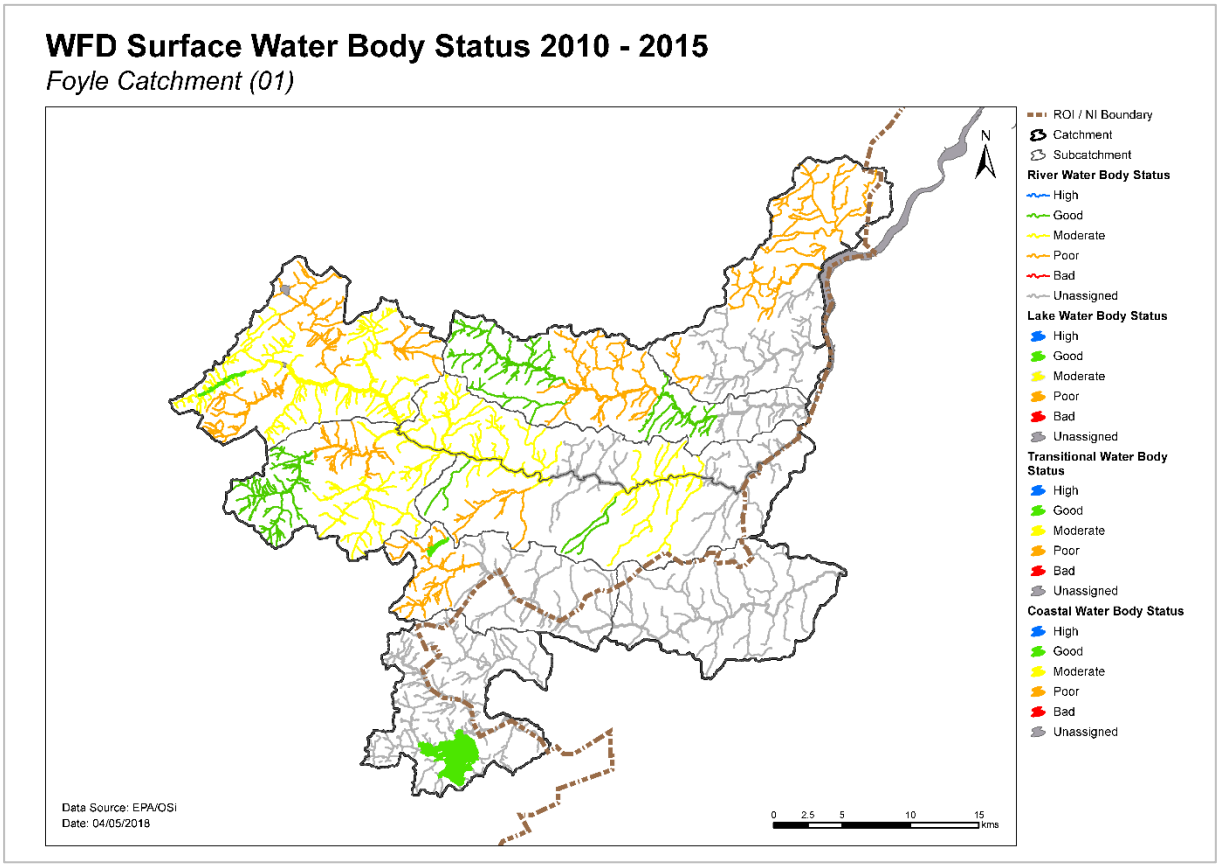

Figure 2. Surface water ecological status.

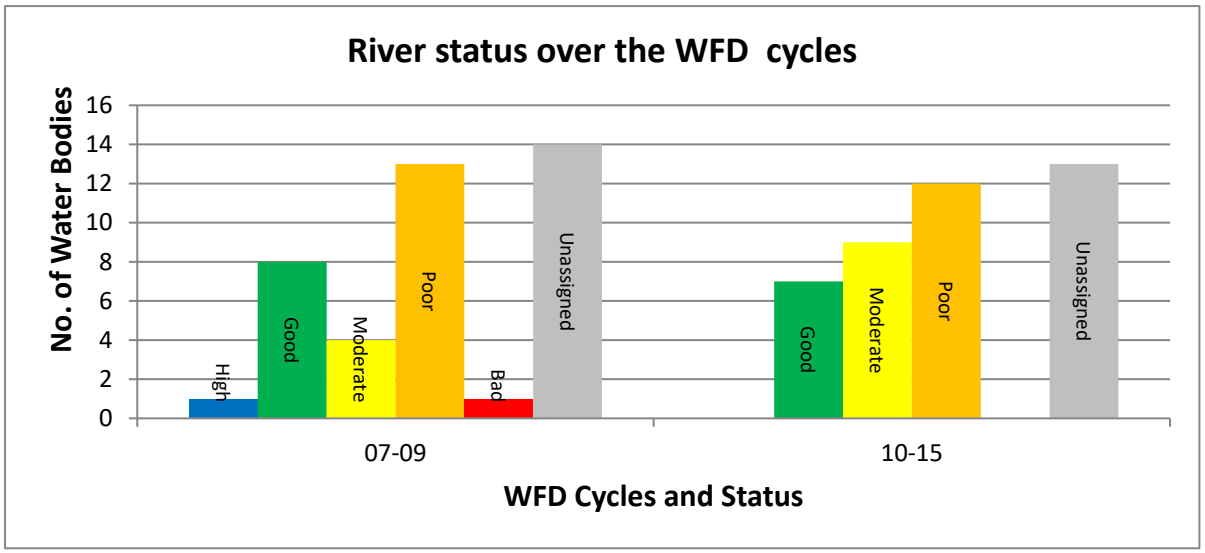

Figure 3. Number of rivers at each status class in 2007-09 and 2010-15

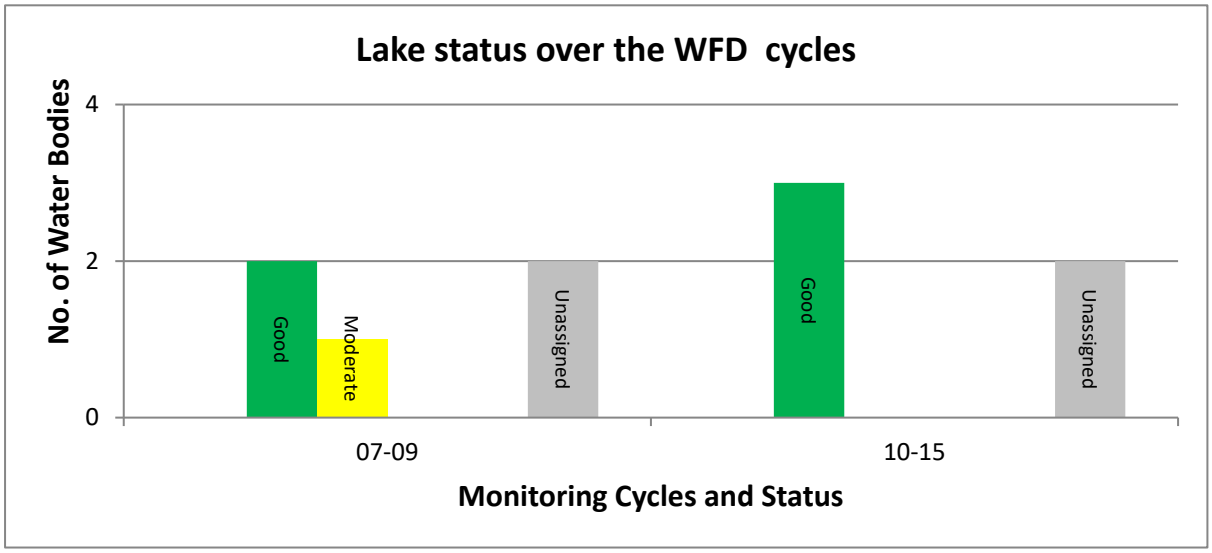

Figure 4. Number of lakes at each status class in 2007-09 and 2010-15

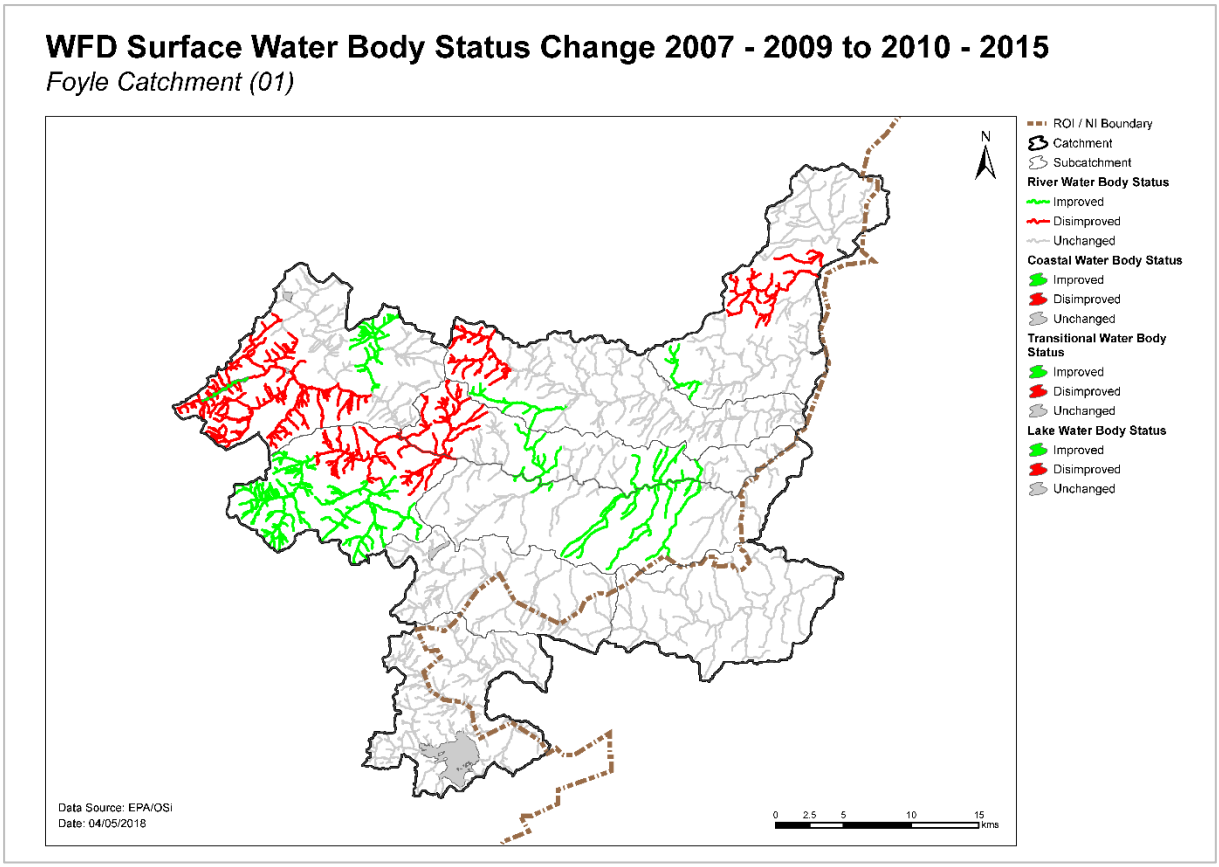

Figure 5. Surface water body status change from 2007-09 to 2010-15.

2.2 Groundwater Status

- Of the eight groundwater bodies, seven were at Good status in 2015 and one was at Poor status (Table 3 and Figure 6).

- The numbers of groundwater bodies at each status class in 2007-09 and 2010-15 are shown in Figure 7.

Table 3. Summary of water body status and risk for groundwaters

	Number of water bodies	2010-2015 Status		Risk Category		
		Good	Poor	*Not at Risk*	*Review*	*At Risk*
Groundwater	8	7	1	7	0	1

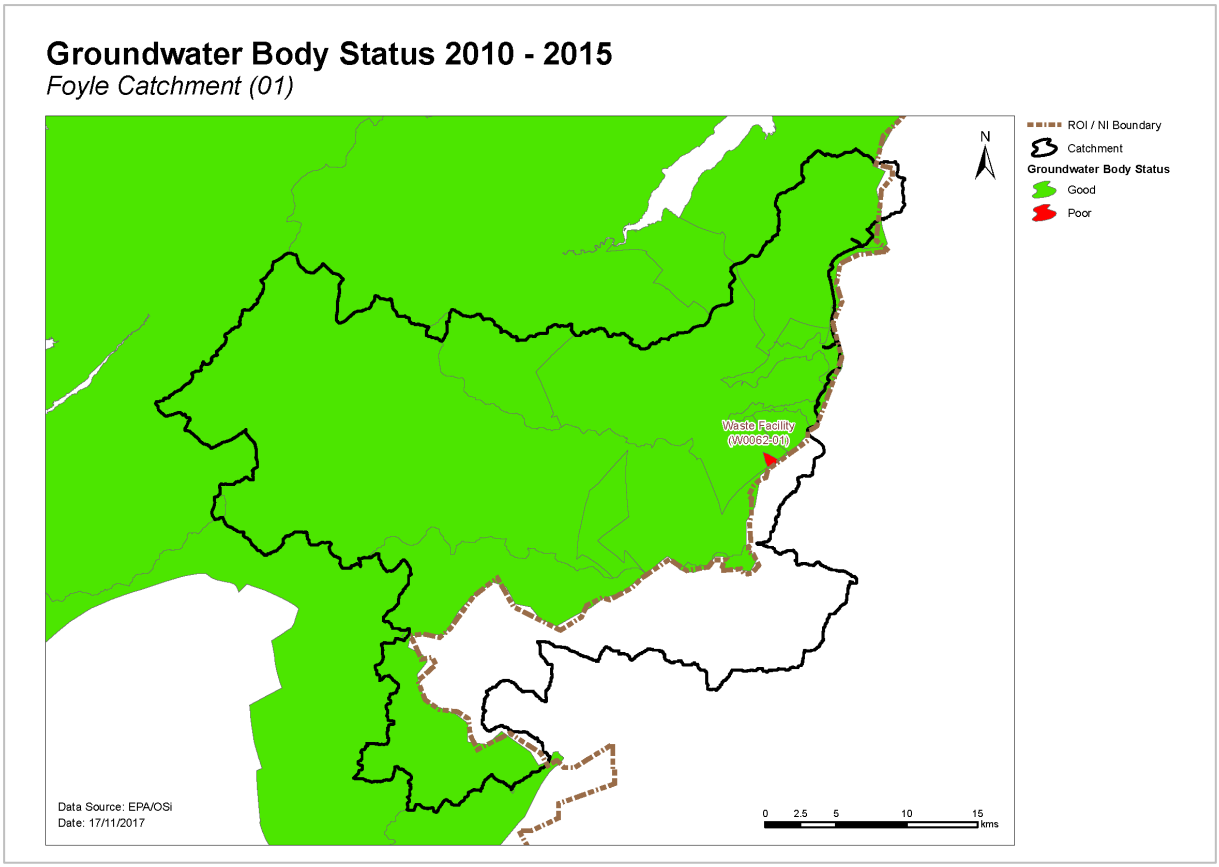

Figure 6. Groundwater body status

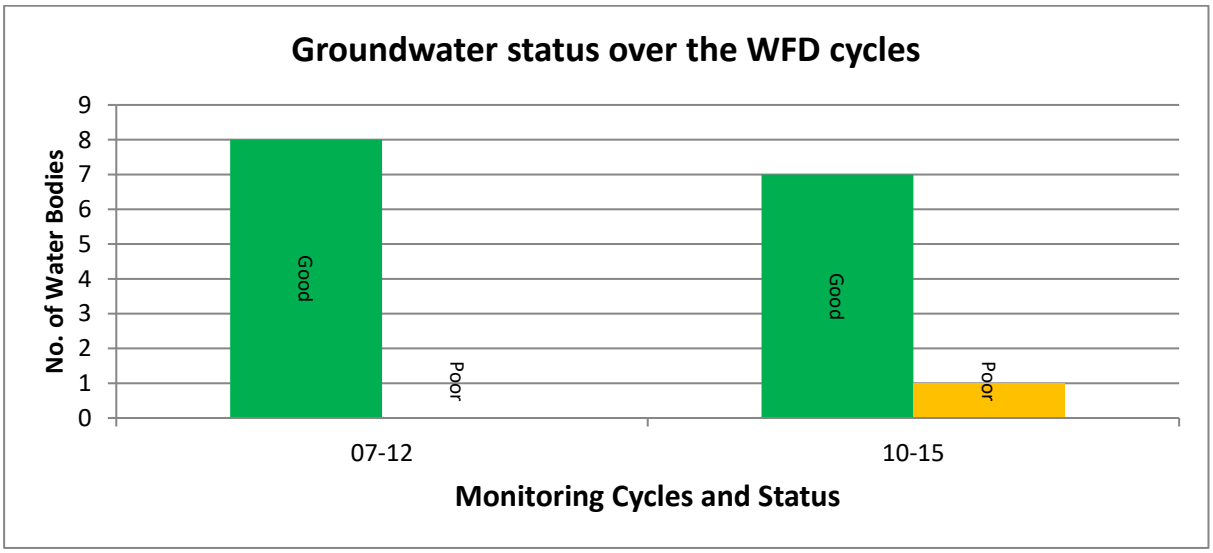

Figure 7. Number of groundwater body at each status class in 2007-12 and 2010-15

2.2.1 Risk of not meeting surface water environmental objectives

2.2.2 Rivers and Lakes

- There are seven *Not at Risk* river water bodies and three lake water bodies (Table 2, Figure 8) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.

- There are 13 river and two lake water bodies that are in *Review*. This applies to nine water bodies where more information is required and six water bodies where measures have recently been implemented and improvements have not yet been realised.

- Twenty-one river water bodies in the catchment are *At Risk* of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes. There are no *At Risk* lake water bodies. Summary information for *At Risk* water bodies is given in Appendix 2.

2.2.3 Transitional and Coastal (TraC)

- The Foyle and Faughan Estuaries TraC water body is *At Risk* of not meeting its water quality objectives (Table 2, Figure 8). Measures will be needed in this water body to improve the water quality outcomes.

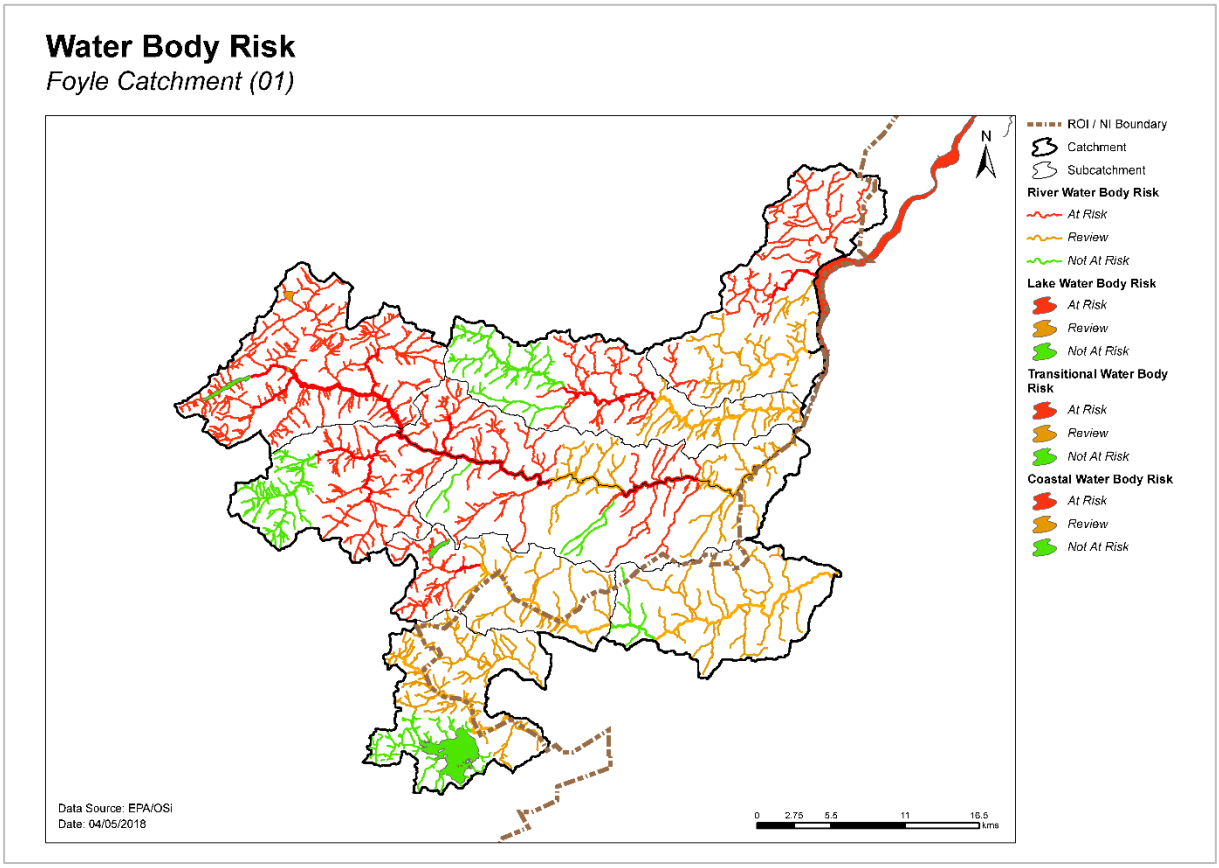

Figure 8. Surface water body risk.

2.3 Risk of not meeting groundwater body environmental objectives

- Seven groundwater bodies are *Not at Risk* (Figure 9, Table 3) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.

- One groundwater body is *At Risk* of not meeting its water quality objectives. Measures will be needed in this water body to improve the water quality outcomes. Waste Facility (W0062-01 (IE_NW_G_085) is *At Risk* because of ammonia issues and because it is hydrologically linked to *At Risk* surface water bodies that are meeting their water quality objectives where it is considered likely that groundwater is a contributing source of nutrients.

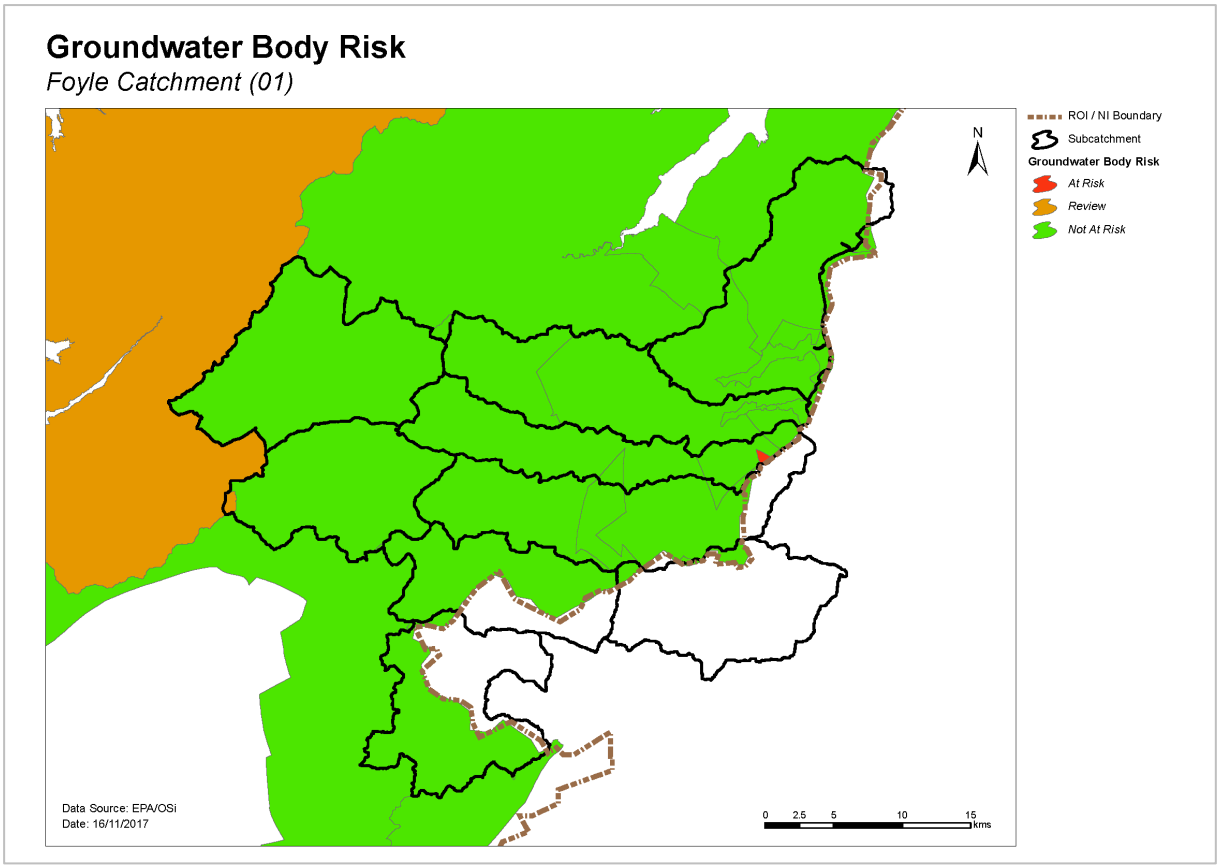

Figure 9. Groundwater body risk

2.4 Protected Areas

2.4.1 Drinking Water Protected Areas

- One public water supply is present in the catchment (see details in Table 4).
- The Lough Mourne intake was compliant with the standards for both nitrate and pesticides in 2015 and therefore met its protected area objectives.

Table 4. Details on public water supplies

Scheme Code	Scheme Name	Water Body	Water Body Code
0600PUB1076	Lough Mourne	Lough Mourne (LWB)	IE_NW_01_104

2.4.2 Bathing Waters

- There are no designated bathing waters in the catchment.

2.4.3 Shellfish Areas

- There are no designated shellfish areas in the catchment.

2.4.4 Nutrient Sensitive Areas

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

2.4.5 Natura 2000 Sites

- There are six Special Areas of Conservation (SACs) in the catchment, not all of which have water quality and/or quantity conservation objectives for their qualifying interests.

- Nine rivers water bodies have been prioritised for action as the water conservation objectives for their habitats and/or species are not being supported by ecological status (Appendix 3).

- There are three Special Protected Areas (SPAs) in the catchment:

    - Derryveagh and Glendowan Mountains SPA
    - Lough Derg (Donegal) SPA
    - Pettigo Plateau Nature Reserve SPA

  As there are no specific water quality and quantity supporting conditions identified in the site-specific conservation objectives for these SPAs, the intersecting water bodies are not assigned priority action for WFD protected area purposes in the second cycle.

2.5 Heavily Modified Water bodies

- There are no designated heavily modified water bodies (HMWBs) in the catchment.

- There are no designated artificial water bodies (AWBs) in the catchment.

3 Significant issues in *At Risk* water bodies

- Excess nutrients, mainly phosphorus but also ammonium, are the dominant issue in the river water bodies. Approximately half of the cases where there is a nutrient pressure are also impacted by another pressure, including chemical, microbiological, organic, acidification and hydromorphological pressures.

- Poor habitat quality is significant in the catchment due to high levels of fine sediment, channelisation, land drainage, forestry activities, peat harvesting, erosion and embankments.

- Groundwater water bodies act as a pathway to surface waters and may be contributing some of the elevated ammonia in places. A review of the pathway links is on-going.

4 Significant pressures

4.1 Water bodies

- Where river and lake water bodies have been classed as *At Risk*, by water quality or survey data, significant pressures have been identified.

- Figure 10 shows a breakdown of the number of *At Risk* water bodies in each significant pressure category.

4.1.1 Rivers, lakes, transitional and coastal (TraC)

- Significant pressures have been identified during the initial characterisation process in 22 water bodies, 16 of which have multiple pressures. The significant pressures will be refined as further characterisation is carried out.

- The significant pressure affecting the greatest number of water bodies is agriculture, followed by forestry, peat, urban waste water, hydromorphological pressures, domestic waste water, other and diffuse urban (Figure 10). There are no significant pressures for lake water bodies in the Foyle catchment.

4.1.2 Groundwater

- The groundwater body that is *At Risk* (Waste Facility (WOO62-01) (IE_NW_G_085)) is impacted by a licenced waste facility. The key parameter of concern is ammonia.

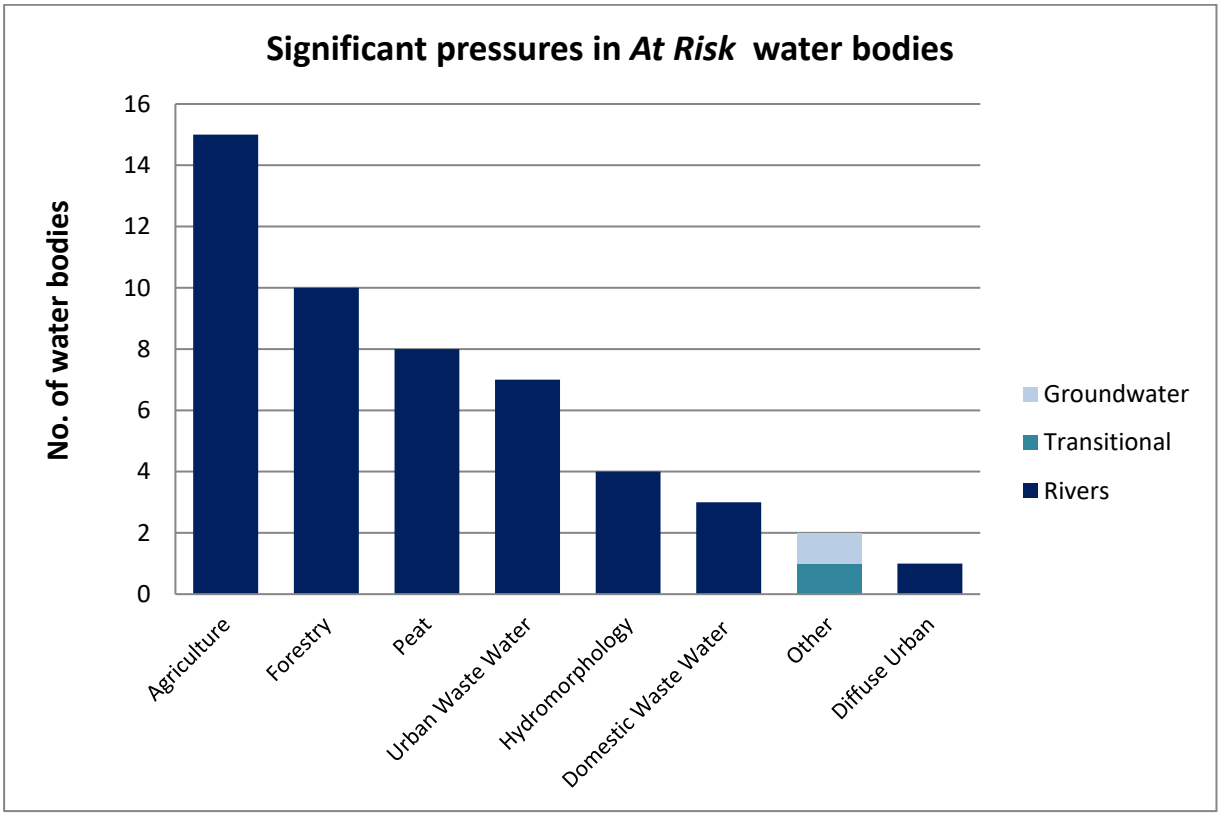

Figure 10. Significant pressures impacting on *At Risk* water bodies.

4.2 Pressure type

4.2.1 Agriculture

- Agriculture is a significant pressure in the 15 river water bodies (Figure 11). The issues related to farming in this catchment are mainly loss of phosphorus to surface waters from, for example, direct discharges; or runoff from yards, roadways or other compacted surfaces, or runoff from poorly draining soils. Sediment can also be a problem from land drainage works, bank erosion from animal access or stream crossings. Impacts by pesticides is also an issue with sheep dip recorded as an issue in seven water bodies, and MCPA and pesticides noted for two water bodies. The pollution impact potential map showing areas of relative risk for phosphorus loss from agriculture to surface water is given in Appendix 4.

4.2.2 Forestry

- Forestry has been identified as a significant pressure in 10 river water bodies (Figure 12). The significant issues are a combination of general forestry pressures such as acidification, drainage, road construction, planting and clearfelling. These pressures have resulted in nutrient loss, morphological changes and organic pollution.

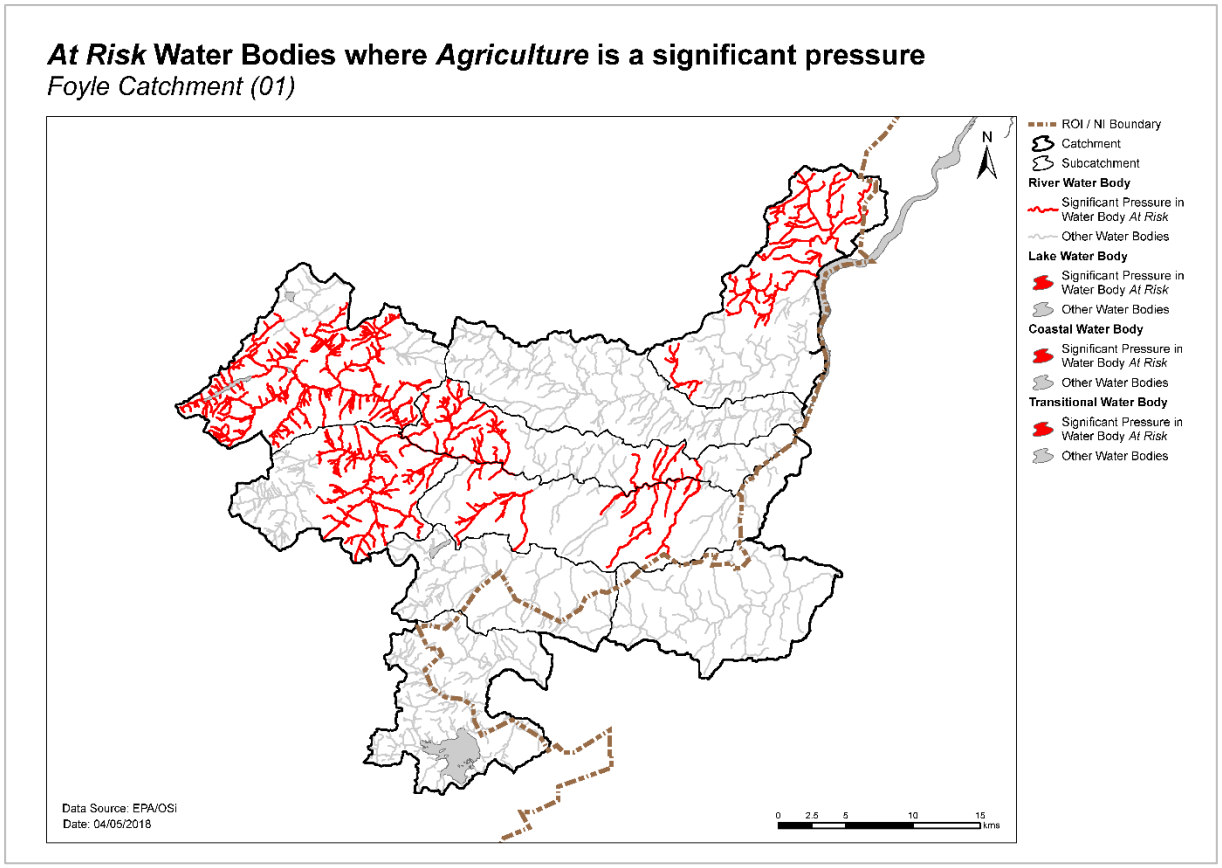

Figure 11. Water bodies that are *At Risk* and are impacted by agricultural activities

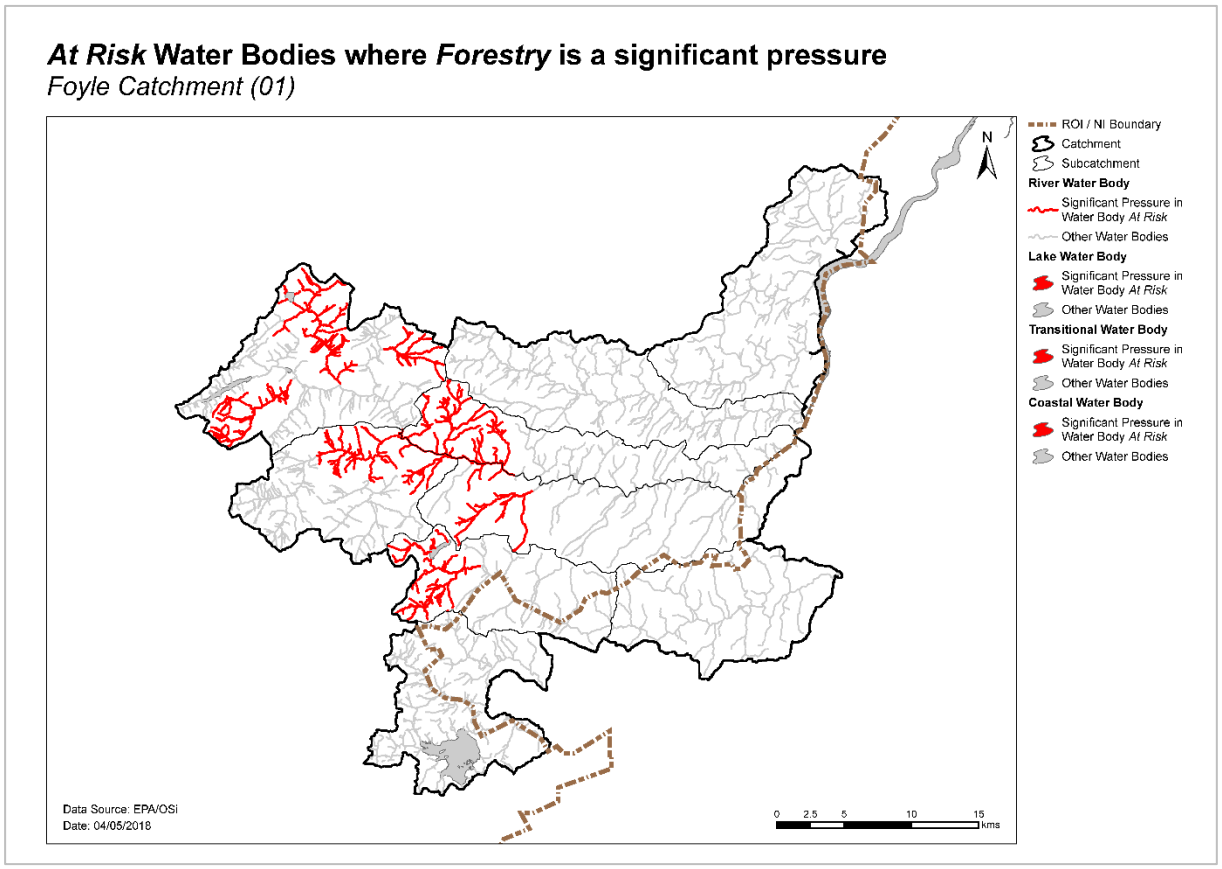

Figure 12. Water bodies that are *At Risk* and are impacted by forestry activities

4.2.3 Extractive Industry

- *Peat*

  Peat drainage and extraction has been identified as a significant pressure in eight river water bodies in Finn [Donegal] subcatchments (SC01_2, 01_3 and 01_8) resulting in elevated concentrations of ammonium, and organic and hydromorphological impacts (Figure 13).

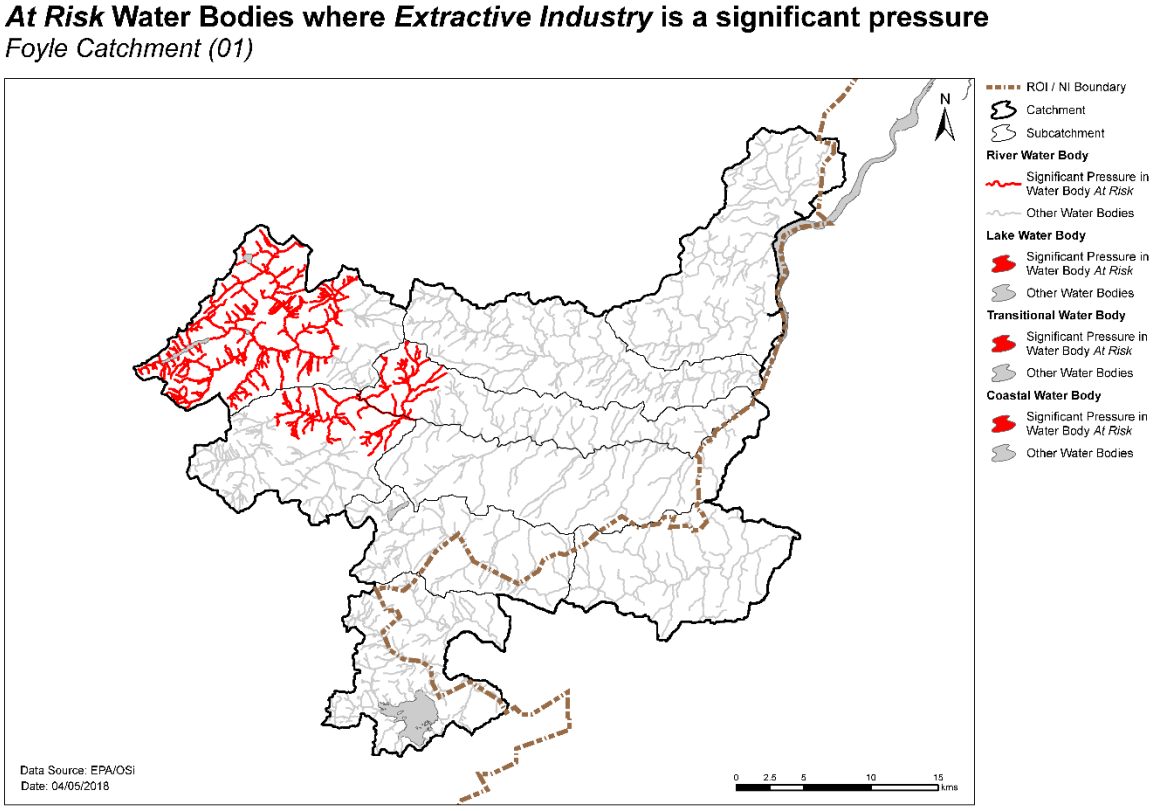

Figure 13. Water bodies that are *At Risk* and are impacted by peat

4.2.4 Urban Waste Water Treatment Plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been identified as significant pressures in seven *At Risk* water bodies; details are given in Table 5 and Figure 14. Five of these *At Risk* water bodies are impacted by WWTPs or agglomerations that are scheduled to be upgraded, and one WWTP, St Johnston, which is impacting St Johnston_010, has already been upgraded.

4.2.5 Hydromorphology

- River water bodies (3) within the Johnston Stream (01_9) subcatchment are subject to extensive modification due to drainage and embankment schemes (Figure 15). Extensive land drainage also exists within one river water body of the Finn [Donegal] (SC01_8) subcatchment, in addition to evidence of erosion linked to animal activity.

Table 5. Urban Waste Water Treatment Plants and agglomerations identified as Significant Pressures in *At Risk* water bodies and expected completion dates of capital works, where applicable.

Facility name	Facility Type	Water Body	10-15 Ecological Status	Expected Completion Date
Convoy D0344	1,001 to 2,000 p.e.	Deele (Donegal)_030	Poor	2018
Finntown No. 2 Housing Scheme A0492	< 500 p.e.	Finn (Donegal)_010	Moderate	*N/A*[1]
Finntown No.1 Housing Scheme A0484	< 500 p.e.	Finn (Donegal)_010	Moderate	*N/A*[1]
Ballybofey-Stranorlar D0120	2,001 to 10,000 p.e.	*Finn (Donegal)_060* [2]	Moderate	2019
Castlefinn D0514	500 to 1,000 p.e.	Finn (Donegal)_080	Moderate	*2021*[3]
St Johnston D0538	500 to 1,000 p.e.	St Johnston_010	Poor	Complete
Raphoe D0209	1,001 to 2,000 p.e.	Swilly Burn_010	Poor	2021
Carrigans A0307	< 500 p.e.	Carrigans_010	Poor	*N/A*[1]
Killea D0537	500 to 1,000 p.e.	Carrigans_010	Poor	2021

4.2.6 Domestic Waste Water

- Domestic waste water has been identified as a significant pressure in three rivers located in the Finn [Donegal] subcatchments (SC01_2, 01_3, 01_7 and 01_8) (Figure 16). The impacts relate to inadequate domestic waste water treatment often allied with unsuitable percolation areas or direct discharges particularly in areas with poorly draining soils. This results in in elevated nutrient concentrations in receiving waters.

4.2.7 Other

- *Unknown anthropogenic*
  One *At Risk* transitional water body has unknown anthropogenic pressures, Foyle and Faughan Estuaries (Figure 17).

4.2.8 Diffuse Urban

- Diffuse urban pressures, caused by misconnections, leaking sewers and runoff from paved and unpaved areas, has been identified as a significant pressure in the Finn (Donegal)_060 river water body (Figure 18). This is associated with the Ballybofey and Stranorlar agglomerations where there is a combined chemical and nutrient pressure.

[1] *Currently not specified in improvement plans.*
[2] *The agglomeration network, rather than the WWTP, has been identified as a significant pressure impacting Finn (Donegal)_060.*
[3] *Castlefinn Agglomeration is served by two WWTPs, Castlefinn WWTP and Stranorlar Road Housing Scheme WWTP. The upgrade relates to the Castlefinn WWTP.*

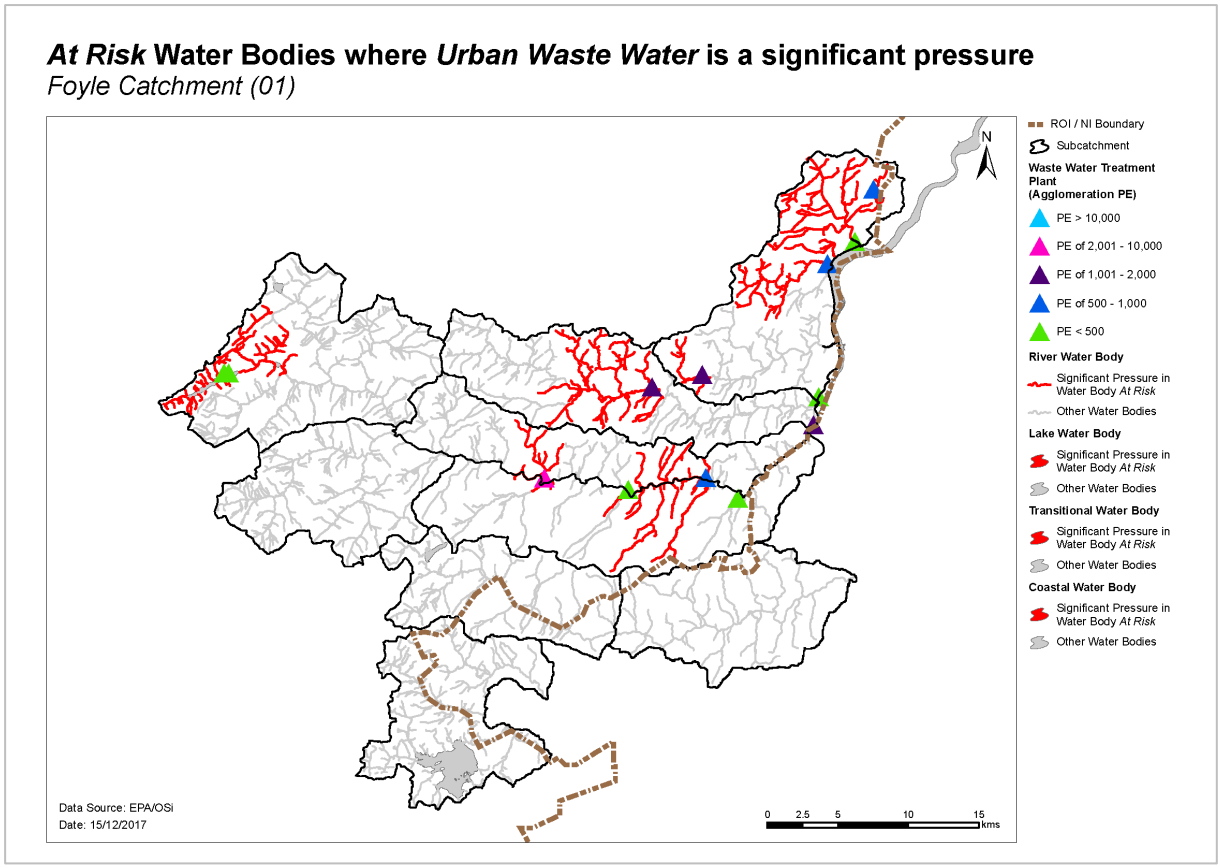

Figure 14. Water bodies that are *At Risk* and are impacted by Urban Waste Water pressures

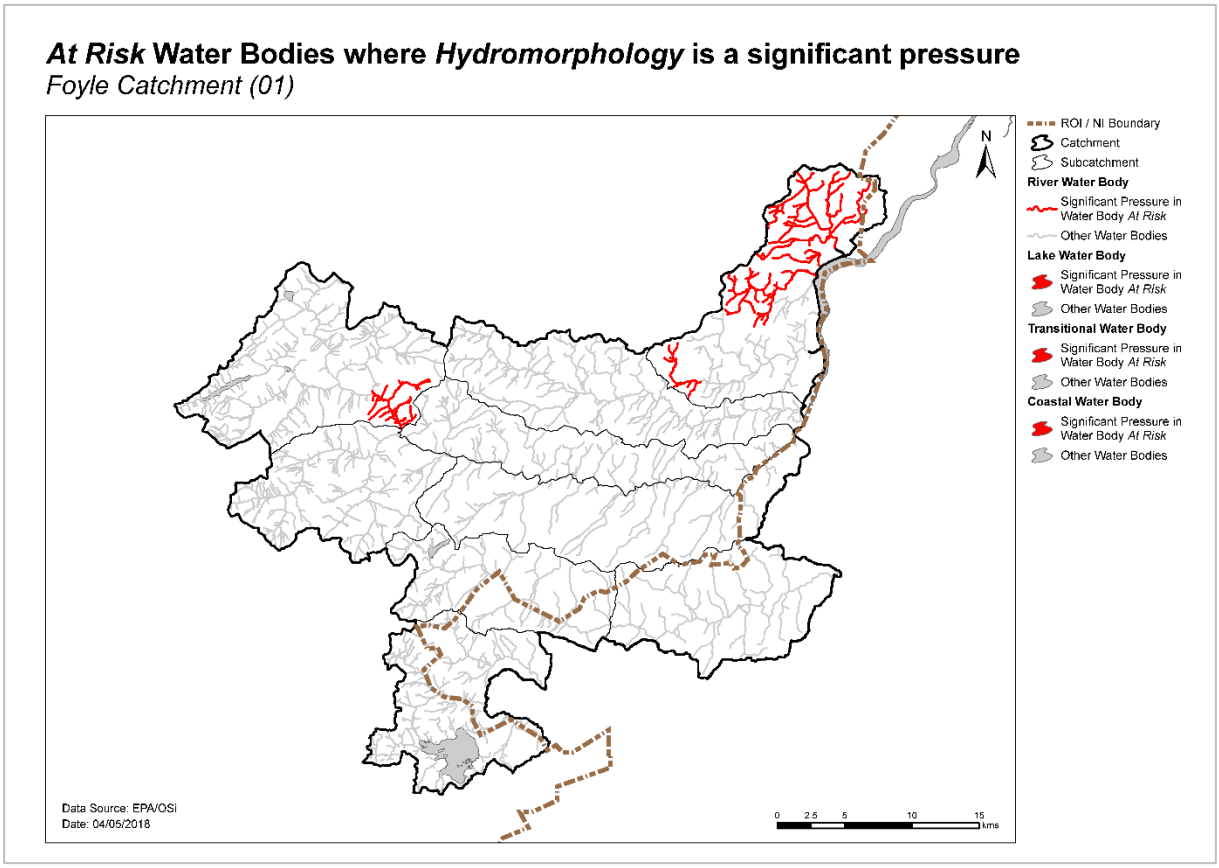

Figure 15. Water bodies that are *At Risk* and are impacted by hydromorphological impacts

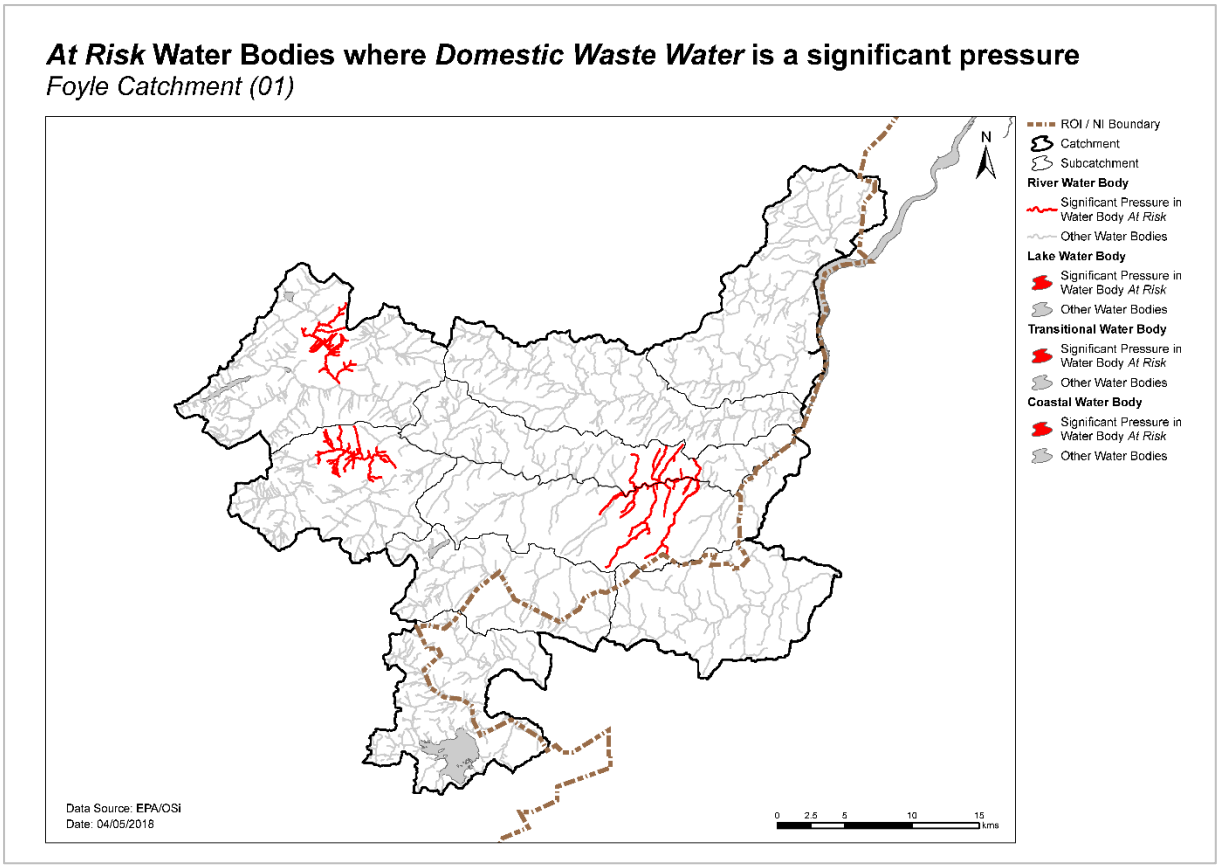

Figure 16. Water bodies that are *At Risk* and are impacted by domestic waste water impacts

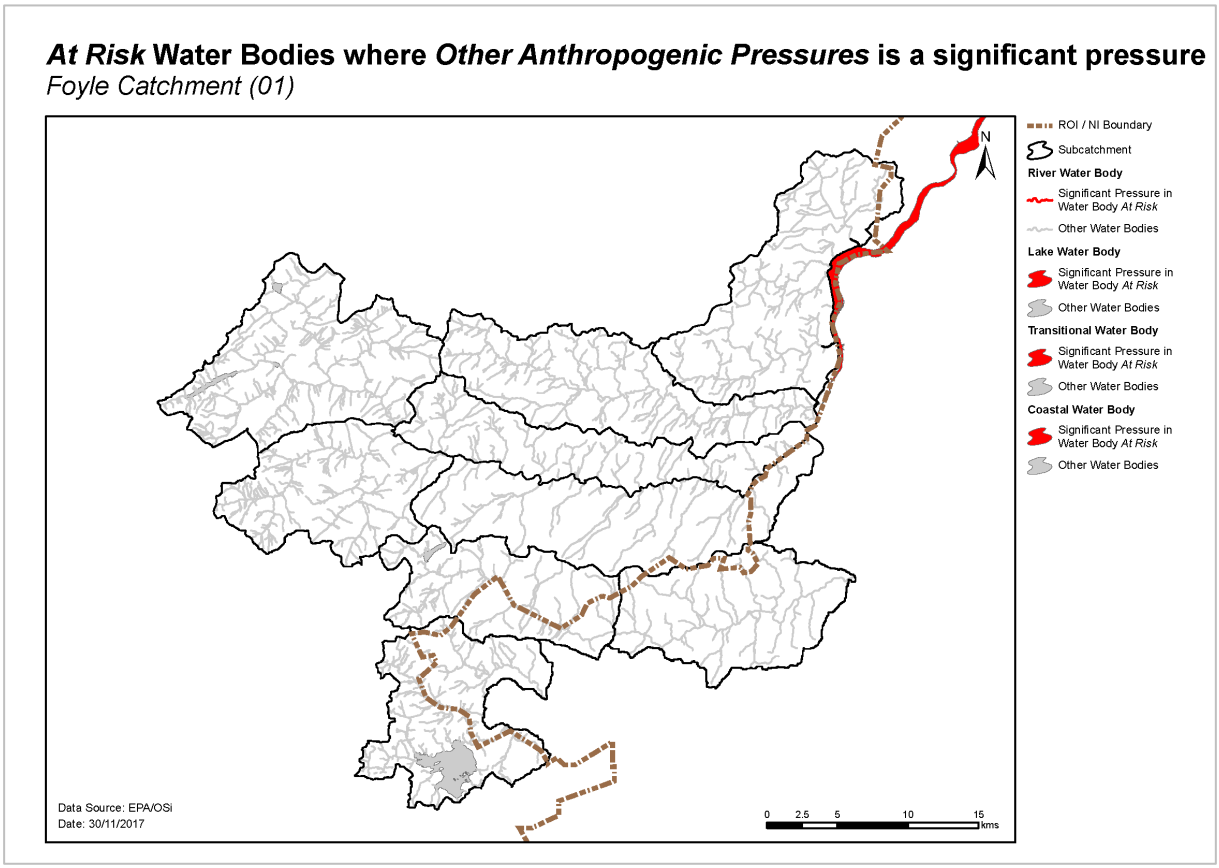

Figure 17. Water bodies that are *At Risk* and are impacted by unknown anthropogenic pressures.

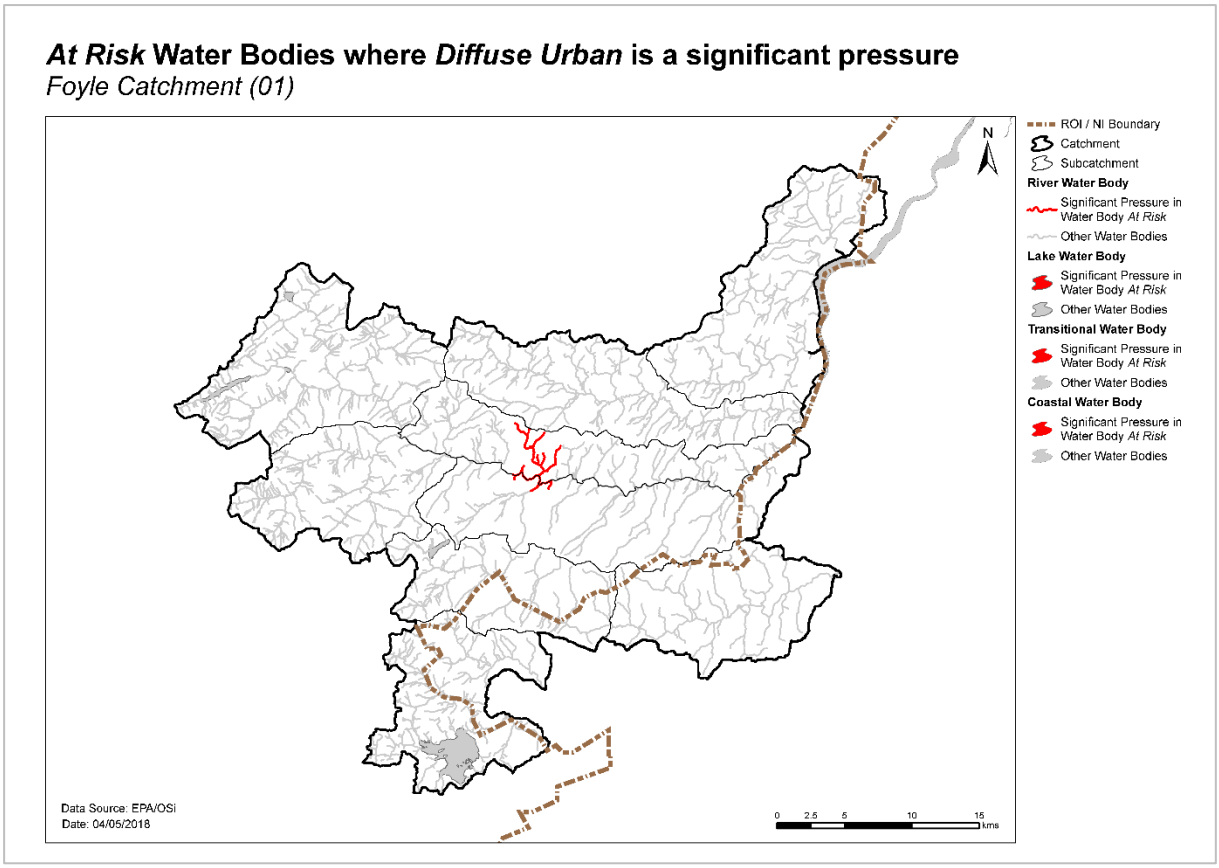

Figure 18. Water bodies that are *At Risk* and are impacted by diffuse urban pressures.

5 Load reduction assessment

5.1 River water body load reductions

- For water bodies where phosphorus monitoring data are available, the reduction in P load that would be required to bring the mean concentration back to the EQS of 0.035 mg/l as P, can be estimated using a simple method based on the average 2013 to 2015 concentration and the average flow, or the estimated 30th percentile flow (Q30) where flow data are not available. The relative load reductions are ranked on a national scale from Very High (>1 kg/Ha/y), to High (0.5-1 kg/Ha/y), to Medium (0.25-0.5 kg/Ha/y) to Low (<0.25 kg/Ha/y). Note that P load reductions may also be required in other water bodies, but without chemistry monitoring data a quantitative estimate cannot be calculated.

- Water chemistry data were available for 15 of the 19 *At Risk* water bodies in the Foyle catchment. Mean phosphorus concentrations were satisfactory in all of these and therefore none appear to require a P load reduction.

5.2 TraC load reductions

Some 18 estuaries in Ireland have been monitored on a continual basis since 1990 as part of Ireland's commitment under the Convention for the Protection of the Marine Environment of the North-East Atlantic (the Ospar Convention). This has shown that generally over the long term, nutrients have decreased but further reduction will be required in many cases to support Good Ecological Status.

However, many estuaries have not been monitored to the same degree, and different estuaries may require reductions in different nutrients.

The Foyle and Faughan Estuary has been placed *At Risk* based on the status assigned by the NIEA with elevated phosphate concentrations identified as a significant issue. The load reduction requirements are currently unknown and will require further assessment.

6 Further characterisation and local catchment assessments

- Further characterisation through local catchment assessments is needed in 21 of the river and lake water bodies *At Risk* to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified (Table 6).
- Further characterisation through local catchment assessments is needed in 15 of the river and lake water bodies *At Review* to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified (Table 6).

Table 6: Investigative Assessment Allocation for *At Risk* and *At Review* River and Lake water bodies in the Catchment.

Risk	IA 1	IA 2	IA 3	IA 4	IA 5	IA 6	IA 7	IA 8	IA 9	IA 10	Total
At Risk	13	0	0	0	7	1	10	0	0	0	31
Review	6	0	10	0	0	0	0	0	0	0	16
Note water bodies may have multiple categories of Local Catchment Assessments											

7 Catchment summary

- Of the 41 river water bodies, 21 are *At Risk* of not meeting their WFD objectives
- There are no lake water bodies *At Risk* in the catchment.
- Excess nutrient loss, mainly phosphate, leading to eutrophication is a major issue for surface water bodies in the catchment. The significant pressures relating to excess nutrients are primarily diffuse agriculture and urban waste water.
- The Foyle and Faughan Estuary is assigned Moderate status by NIEA and, thus, this transitional water body is *At Risk.* The dominant source of phosphorus is the riverine inputs from the freshwater environment. Therefore, the significant pressures recorded for river and lake water bodies also apply to this transitional water body.
- Of the eight groundwater bodies, one is *At Risk*. The significant issue is excess ammonia and the significant pressure is a waste facility. Due to the lack of surface water and groundwater interactions in this catchment, this is unlikely to be impacting surface water quality.

8 Areas for Action

The characterisation outcomes described above have highlighted that there is significant work to do in the catchment to protect and restore water quality, and meet the objectives of the WFD. During the development of the draft river basin management plan it became apparent that there would be a need

to prioritise areas for collective action so that the best return on investment could be achieved. 190 Areas for action have been selected nationally in a process as described below. There are 2 areas for action in the Foyle catchment.

8.1 Process of Selection

Following the publication of the draft river basin management plan in early 2017, the EPA and the Local Authority Waters and Communities Office (LAWCO) jointly led a collaborative regional workshop process to determine where, from a technical and scientific perspective, actions should be prioritised in the second cycle. The prioritisation process was based on the priorities in the draft river basin management plan, the evidence from the characterisation process, and the expertise, data and knowledge of public body staff with responsibilities for water and the different pressure types. The recommended areas for action selected during the workshops were then agreed by the Water and Environmental Regional Committees.

The recommended areas for action are an initial list of areas where action will be carried out in the second cycle. All water bodies that are *At Risk* still however, need to be addressed. As issues are resolved, areas for action will be removed from the list and new areas will be added. If additional monitoring shows that new issues have arisen, new areas may become a priority and may need to be added to the work programme.

The initial list of areas for action is not therefore considered as a closed or finite list; it simply represents the initial areas where work will be carried out during the second WDS planning cycle from 2018 to 2021.

8.2 Outcomes of process

The outcomes for the Foyle catchment are summarised below.

- Two recommended areas for actions (Table 7, Figure 19) were selected.
- These are the River Finn and St Johnstons.
- These include 16 *At Risk* and five *Review* river and lake water bodies.
- There are no groundwater bodies that are *At Risk* due to groundwater contribution of nutrients to surface water bodies.

A remaining sixteen *At Risk* and *Review* surface water bodies were not included in the recommended areas for action for the second cycle. The distribution of these is presented in Figure 20. These include:

- fifteen river water bodies – five *At Risk* and ten *Review,* and
- one *At Risk* transitional water body.

Table 7. Recommended Areas for Action in the Foyle Catchment

Recommended area for action	Number of water bodies	SCs	Local authority	Reason for Selection
River Finn	20	1_2, 1_3, 1_7, 1_8	Donegal	• Five deteriorated water bodies. • Three water bodies on the main channel only dropped to less than Good status in the last monitoring cycle. • Starts at the Headwaters. • Supports salmonid and SAC protected areas • Build on planned improvements in Ballybofey/Stranorlar WWTP upgrade. • Cross Border Partnership with Loughs Agency on-going. • Supports improvement of the Foyle-Faughan estuary
St Johnstons	1	1_9	Donegal	• One deteriorated water body. • Build on completed St Johnstons WWTP improvements, restore 1 deteriorated WB. • Possible quick win • Supports improvement of the Foyle-Faughan estuary.

9 Environmental Objectives

The environmental objectives are the target status for each *At Risk* or *Review* water body and the date by which that status is expected to be achieved (Appendix 3). Where a water body is *Not at Risk* and is already at its target status, the environmental objective is deemed to have been met.

9.1 Surface Water

- Assuming resources are available and actions are taken in the recommended areas for action, of the 16 *At Risk* river water bodies, it is predicted that all 16 will achieve their objective by 2027. For the five *Review* surface water bodies, the absence of information on these water bodies means that there is no scientific basis to quantify an environmental objective date, and therefore a 2027 date is set for these water bodies, see Table 8.

Table 8. Environmental objective dates for water bodies in the Areas for Action

Risk Category	No. of Water Bodies	No. of WBs for 2021 Improvement	No. of WBs for 2027 Status Improvement
Rivers			
At Risk	16	0	16
Review	3	0	3
Lakes			
At Risk	0	0	0
Review	2	0	2
Total	21	0	21

- Eleven water bodies have met their 2015 environmental objective.
- Due to planned upgrade works at an urban waste water treatment plant, a 2021 objective is applied to the one of the remaining five *At Risk* water bodies. As action is not yet planned to be taken in the remaining four *At Risk* surface water bodies, a 2027 date is applied.
- For the nine *Review* surface water bodies, the absence of information on these water bodies means that there is no scientific basis to quantify an environmental objective date and therefore a 2027 date is applied, see Table 9.

Table 9. Environmental objectives dates in the *At Risk* and *Review* surface water bodies not included in Areas for Action

Risk Category	No. of Water Bodies	No. of WBs for 2021 Improvement	No. of WBs for 2027 Status Improvement
Rivers			
At Risk	5	1	4
Review	10	0	10
Lakes			
At Risk	1	0	1
Review	0	0	0
Total	16	1	15

9.2 Groundwater

- Seven of the eight groundwater bodies are currently Good status and, therefore, have met their environmental objectives.
- The one groundwater body, Waste Facility (W0062-01), in the Foyle catchment that is less than Good status has an environmental objective date of 2027.

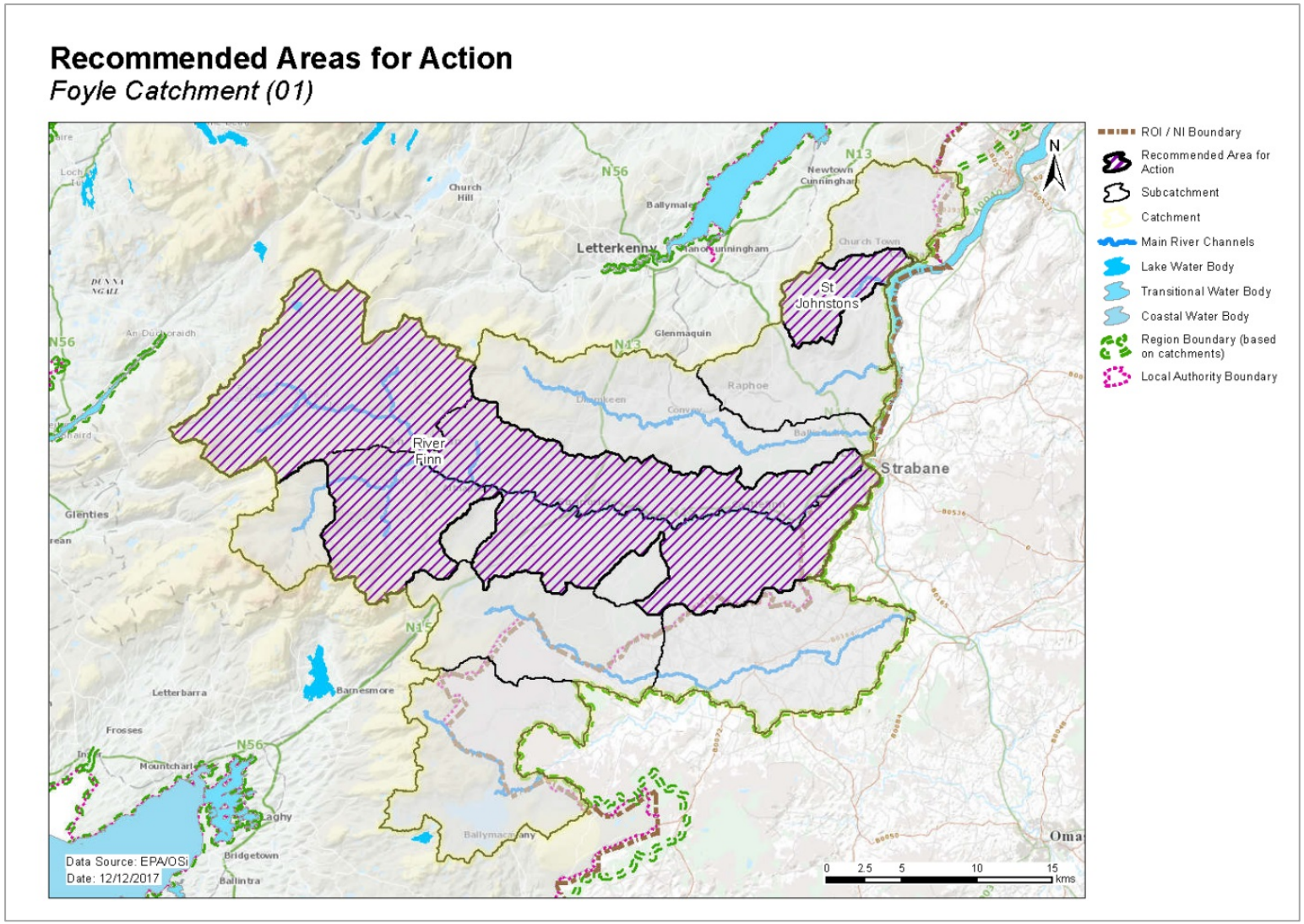

Figure 19. Location of Recommended Areas for Action in the Foyle Catchment

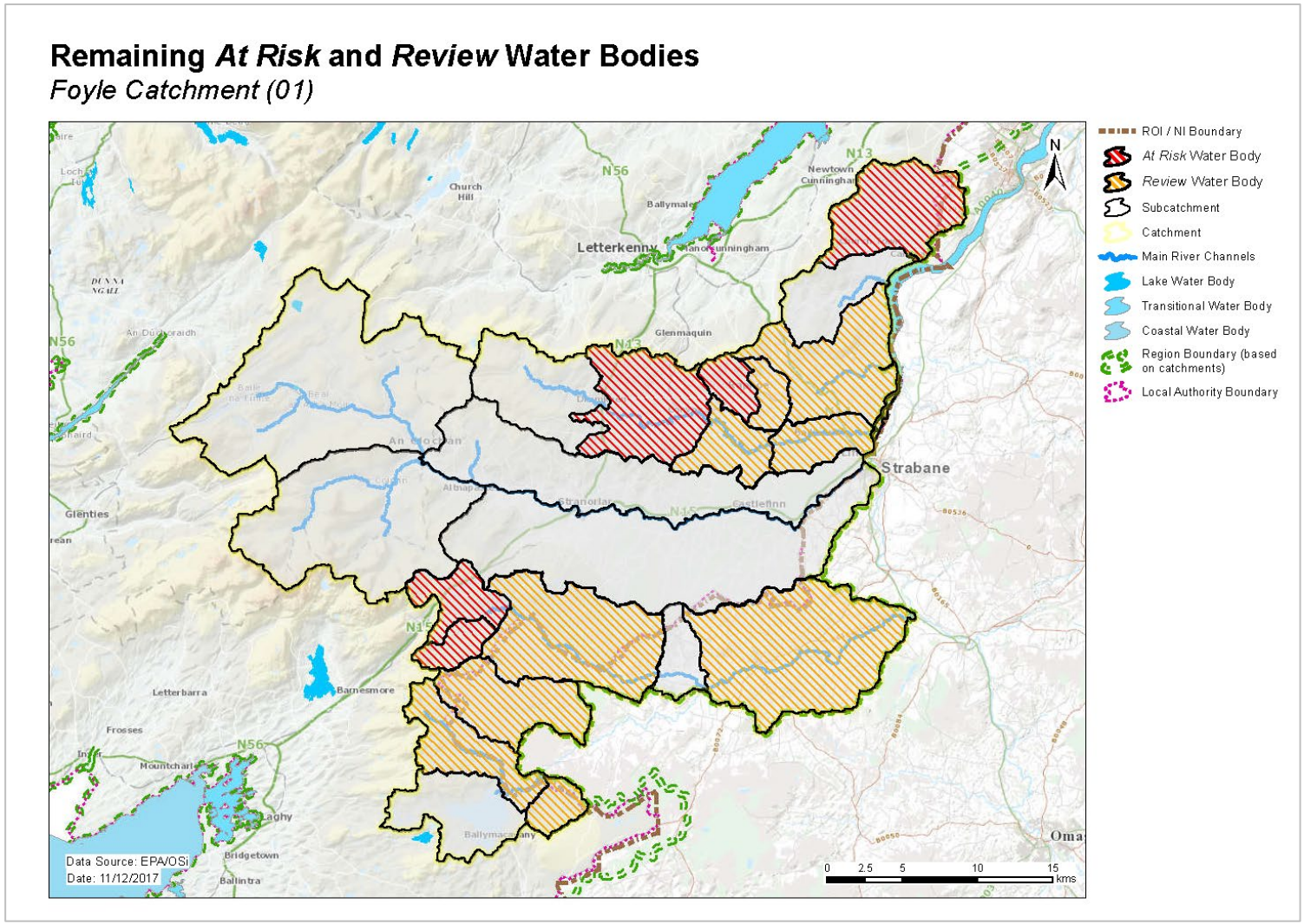

Figure 20. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Foyle Catchment

10 Acknowledgements

This Foyle Catchment Assessment (Version 2) has been produced by the Catchment Science & Management Unit, EPA, with the assistance of the following:

- Donegal County Council.
- Local Authorities Waters & Communities Office.
- Inland Fisheries Ireland.
- Loughs Agency.
- Irish Water.
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- Ecological Monitoring & Assessment Unit, EPA.
- Hydrometric & Groundwater Section, EPA.
- Informatics Section, EPA.
- Laboratories, EPA.
- Office of Environmental Enforcement, EPA.
- Northern Ireland Environment Agency.
- DAFM Agriculture.
- DAFM Forest Service.
- Coillte.
- Teagasc.
- Health Service Executive.
- National Parks and Wildlife Service.
- Loughs Agency.
- National Federation of Group Water Schemes.
- Office of Public Works.

Appendix 1 Catchment Scale Nutrient concentrations and in-stream loads

The main channel in the Foyle catchment is the Finn (Donegal) River. The estimated Q30 flow ranges from 1.9m^3/s at FINN (DONEGAL)_010 to 15.4m^3/s at FINN (DONEGAL)_080.

Average orthophosphate and total oxidised nitrogen (TON) concentrations are below detection limits from FINN (DONEGAL)_010 to FINN (DONEGAL)_070. At FINN (DONEGAL)_080, concentrations of 0.015mg/l and 0.019mg/l were measured for orthophosphate and TON, respectively. The EQS for orthophosphate (0.035mg/l) and threshold for TON (2.6mg/l) were not exceeded at any of the main channel water bodies. Ammonia concentrations ranged from 0.040 to 0.093mg/l along the river. The EQS (0.065mg/l) ammonia was exceeded at FINN (DONEGAL)_060.

Appendix 2 Summary information on *At Risk* and *Review* surface water bodies

Subcatchment code	Water body code	Water body name	Water body type	Risk	Ecological Status 07-09	Ecological Status 10-15	High Ecological Status Objective Water Body Y/N	Significant Pressures	Date to Meet Environmental Objective	Recommended Area for Action Name
01_1	IE_NW_01B010100	BUNADAOWEN_010	River	At risk	Poor	Poor	N	For	2027	
01_1	IE_NW_01M010200	MOURNE BEG_010	River	At risk	Poor	Poor	N	For	2027	
01_1	UKGBNI1NW010102066	Mourne Beg River (Derrygoonan)	River	Review	Unassigned	Unassigned	N		2027	
01_2	IE_NW_01F010500	FINN (DONEGAL)_040	River	At risk	Good	Moderate	N	Ag,For,Peat	2027	River Finn
01_2	IE_NW_01F010600	FINN (DONEGAL)_050	River	At risk	Unassigned	Moderate	N	Ag,For	2027	River Finn
01_2	IE_NW_01F010800	FINN (DONEGAL)_060	River	At risk	Poor	Moderate	N	DU,UWW	2027	River Finn
01_2	IE_NW_01F010910	FINN (DONEGAL)_070	River	Review	Unassigned	Unassigned	N		2027	River Finn
01_2	IE_NW_01F011100	FINN (DONEGAL)_080	River	At risk	Poor	Moderate	N	Ag,DWW,UWW	2027	River Finn
01_2	UKGBNI1NW010104074	Finn River	River	Review	Unassigned	Unassigned	N		2027	River Finn
01_2	UKGBNI5NW250010	Foyle and Faughan Estuaries	Transitional	At risk	Moderate	Unassigned	N	Other	2027	
01_3	IE_NW_01C060100	CLOGHER (FINN)_010	River	At risk	Poor	Moderate	N	Ag	2027	River Finn
01_3	IE_NW_01R010500	REELAN_020	River	At risk	Moderate	Poor	N	Ag,DWW,For,Peat	2027	River Finn
01_4	UKGBNI1NW010102095	Derg River (Millbrook)	River	Review	Unassigned	Unassigned	N		2027	
01_5	UKGBNI1NW010102067	Glendergan River	River	Review	Unassigned	Unassigned	N		2027	
01_5	UKGBNI1NW010103065	Owenboy Burn	River	Review	Unassigned	Unassigned	N		2027	
01_5	UKGBNI1NW010104068	Derg River (Crocknacunny)	River	Review	Unassigned	Unassigned	N		2027	
01_6	IE_NW_01D010500	DEELE (DONEGAL)_030	River	At risk	Poor	Poor	N	UWW	2021(measures planned)	
01_6	IE_NW_01D010600	DEELE (DONEGAL)_040	River	Review	Good	Good	N		2027	
01_6	IE_NW_01D010650	DEELE (DONEGAL)_050	River	Review	Good	Unassigned	N		2027	
01_7	IE_NW_01B020200	BURN DAURNETT_010	River	At risk	Poor	Poor	N	Ag,For	2027	River Finn
01_7	IE_NW_01D150930	DRESNAGH_010	River	Review	Unassigned	Unassigned	N		2027	River Finn
01_8	IE_NW_01_109	Muck DL	Lake	Review	Unassigned	Unassigned	N		2027	River Finn
01_8	IE_NW_01_111	Shivnagh	Lake	Review	Unassigned	Unassigned	N		2027	River Finn
01_8	IE_NW_01C030100	CUMMIRK_010	River	At risk	Unassigned	Poor	N	For,Peat	2027	River Finn
01_8	IE_NW_01C030300	CUMMIRK_020	River	At risk	Poor	Poor	N	Ag,DWW,For,Peat	2027	River Finn
01_8	IE_NW_01E020100	ELATAGH_010	River	At risk	Unassigned	Poor	N	For	2027	River Finn
01_8	IE_NW_01E020300	ELATAGH_020	River	At risk	Poor	Moderate	N	Ag,Peat	2027	River Finn
01_8	IE_NW_01F010200	FINN (DONEGAL)_010	River	At risk	Good	Moderate	N	Ag,Peat,UWW	2027	River Finn
01_8	IE_NW_01F010350	FINN (DONEGAL)_020	River	At risk	Good	Moderate	N	Ag,Peat	2027	River Finn
01_8	IE_NW_01F010400	FINN (DONEGAL)_030	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	River Finn

Subcatchment code	Water body code	Water body name	Water body type	Risk	Ecological Status 07-09	Ecological Status 10-15	High Ecological Status Objective Water Body Y/N	Significant Pressures	Date to Meet Environmental Objective	Recommended Area for Action Name
01_8	IE_NW_01S020200	STRANAGOPPOGE_010	River	At risk	Good	Poor	N	Ag,For,Peat	2027	River Finn
01_9	IE_NW_01S010280	ST JOHNSTON_010	River	At risk	Moderate	Poor	N	Ag,Hymo,UWW	2027	St Johnstons
01_9	IE_NW_01S030200	SWILLY BURN_010	River	At risk	Bad	Poor	N	Ag,Hymo,UWW	2027	
01_9	IE_NW_01S030250	SWILLY BURN_020	River	Review	Poor	Unassigned	N		2027	
01_9	IE_NW_01S030500	SWILLY BURN_030	River	Review	Unassigned	Unassigned	N		2027	
01_9	UKGBNI1NW010103062	CARRIGANS_010	River	At risk	Poor	Poor	N	Ag,Hymo,UWW	2027	

Ag: Agriculture

DWW: Domestic Waste Water

For: Forestry

Hymo: Hydromorphology

Ind: Industry

M+Q: Mines and Quarries

Peat: Peat Drainage and Extraction

DU: Diffuse Urban

UWW: Urban Waste Water

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

Protected Area: If a water body is one or more of the following: Drinking Water Protected Area; Bathing Water; Shellfish Area; Nutrient Sensitive Area or; a Natura 2000 site with a water dependent qualifying interest with a water quality and/or quantity conservation objective, then it has been highlighted as a protected area in this table.

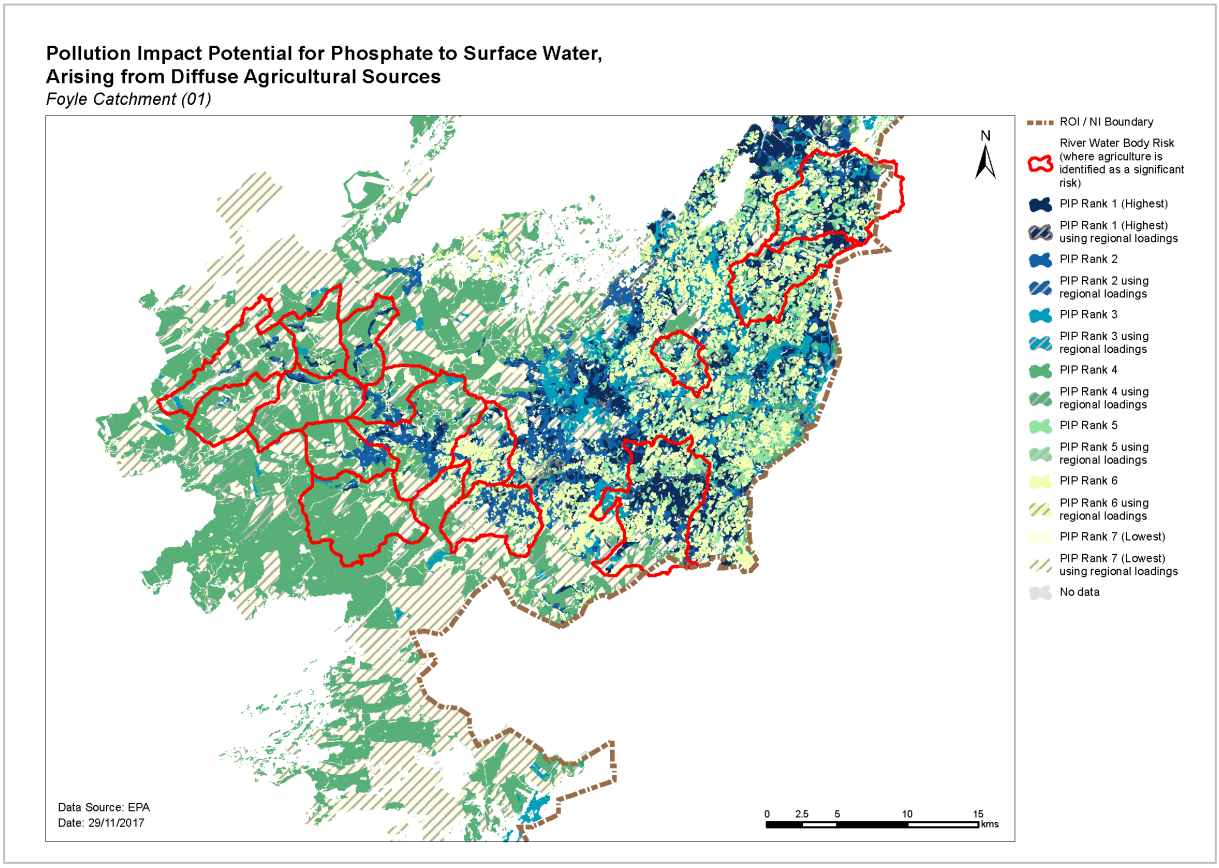
Appendix 3 Prioritisation of water bodies with Natura 2000 site qualifying interests

Note that additional water dependent species have been added that are not qualifying interests within the SACs (i.e. Arctic char (Salvelinus alpinus) have been added to River Finn SAC).

SAC Name	Relevant Qualifying interests	Target status	Water body type	Water bodies	Status (risk)	Prioritise?	Code	Survey data?
River Finn SAC 002301	3110	At least Good	Lake	Finn DL Lough	Good (NAR)	No	IE_NW_01_102	No
			Lake	Derg DL	Good (NAR)	No	IE_NW_01_115	No
	1106	Good	River	Finn River	Unassigned (R)	Yes	UKGBNI1NW010104074	Yes
			River	FINN (DONEGAL)_010	Moderate	Yes	IE_NW_01F010200	Yes
			River	FINN (DONEGAL)_020	Moderate	Yes	IE_NW_01F010350	Yes
			River	FINN (DONEGAL)_030	Moderate	Yes	IE_NW_01F010400	Yes
			River	FINN (DONEGAL)_040	Moderate	Yes	IE_NW_01F010500	Yes
			River	FINN (DONEGAL)_050	Moderate	Yes	IE_NW_01F010600	Yes
			River	FINN (DONEGAL)_060	Moderate	Yes	IE_NW_01F010800	Yes
			River	FINN (DONEGAL)_070	Unassigned (R)	Yes	IE_NW_01F010910	Yes
			River	FINN (DONEGAL)_080	Moderate	Yes	IE_NW_01F011100	Yes
	Arctic char (not listed)	Good	Lake	Finn DL Lough	Good (NAR)	No	IE_NW_01_102	No
Meentygrannagh Bog SAC 000173	7230	Good GW level	Groundwater	Ballybofey GWB	Good (NAR)	No	IEGBNI_NW_G_048	No
Croaghonagh Bog SAC 000129	None							
Dunragh Loughs/Pettigo Plateau SAC 001125	None							
Meenaguse Scragh SAC 001880	None							
Cloghernagore Bog And Glenveagh National Park SAC 002047	3110	At least Good	Lake	Muck DL	Unassigned (R)	No	IE_NW_01_109	No

Appendix 4 Pollution Impact Potential (PIP) Map for Phosphorus

For areas where agriculture is deemed as the significant pressure, areas of high risk to surface water can be targeted. The map below shows relative risk of loss of phosphorus to surface water. The risk of phosphorus losses is strongly correlated on whether the land is poorly draining or free draining and the loadings applied i.e. significant loadings applied on poorly draining areas result in a high potential risk to surface water. However, this figure does not imply that actual losses from these areas are occurring but is a useful tool for informing where resources should be focused (i.e. by allowing high risk areas to be identified and prioritised for further investigation). PIP maps are available online at a scale of 1:20,000 and can be accessed by public bodies via the EDEN process.



Appendix 5 Local Catchment Assessment Categories

Category	Assessment & Measures Evaluation Details
IA1	Further information provision (e.g. from IFI, LAs, EPA)
IA2	Point source desk-based assessment
IA3	Assessment of unassigned status water bodies, requiring field visit(s)
IA4	Regulated point sources, requiring field visit/s
IA5	Stream (catchment) walk to evaluate multiple sources in a defined (1 km) river stretch (used as the basis for estimating resource requirements)
IA6	Stream (catchment) walk in urban areas
IA7	Stream (catchment) walk along >1 km river stretches
IA8	Stream (catchment) walk along high ecological status (HES) objective rivers
IA9	Lakes assessment, requiring field visits
IA10	Groundwater assessments, requiring field visits