Upper Shannon (Lough Ree) Catchment Assessment 2010-2015 (HA 26E)

Catchment Science & Management Unit

Environmental Protection Agency

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Version no. 3

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Preface

This document provides a summary of the characterisation outcomes for the water resources of the Upper Shannon (Lough Ree) 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

This catchment covers an area of 581km² and is characterised by a relatively flat landscape underlain by impure limestones to the east and purer and karstified limestones under and to the west of Lough Ree. There are extensive sand and gravel deposits to the east and northeast of Athlone that form a productive groundwater aquifer. The western part of the catchment is drained by the Hind River, which flows south through Roscommon Town before turning east and making its way to Lough Ree. There are numerous karst depressions and springs in the western part of the catchment. The River Inny flows into Lough Ree from the east about halfway between the northern and southern ends of the lake. The south-eastern corner of the catchment is drained by the Breensford River which flows west from Mount Temple and into Lough Ree via Killinure Lough. The Shannon outflows from the southern end of Lough Ree making its way towards Athlone.

The Upper Shannon (Lough Ree) catchment comprises six subcatchments (Table 1, Figure1) with 18 river water bodies, nine lakes and six groundwater bodies. There are no transitional or coastal water bodies in the catchment.

Table 1. List of subcatchments in the Upper Shannon (Lough Ree) catchment

Subcatchment ID	Subcatchment Name
26E_1	Bilberry_SC_010
26E_2	Knockcroghery_SC_010
26E_3	Clooneigh_SC_010
26E_4	Breensford_SC_010
26E_5	Hind_SC_010
26E_6	Shannon[Upper]_SC_090

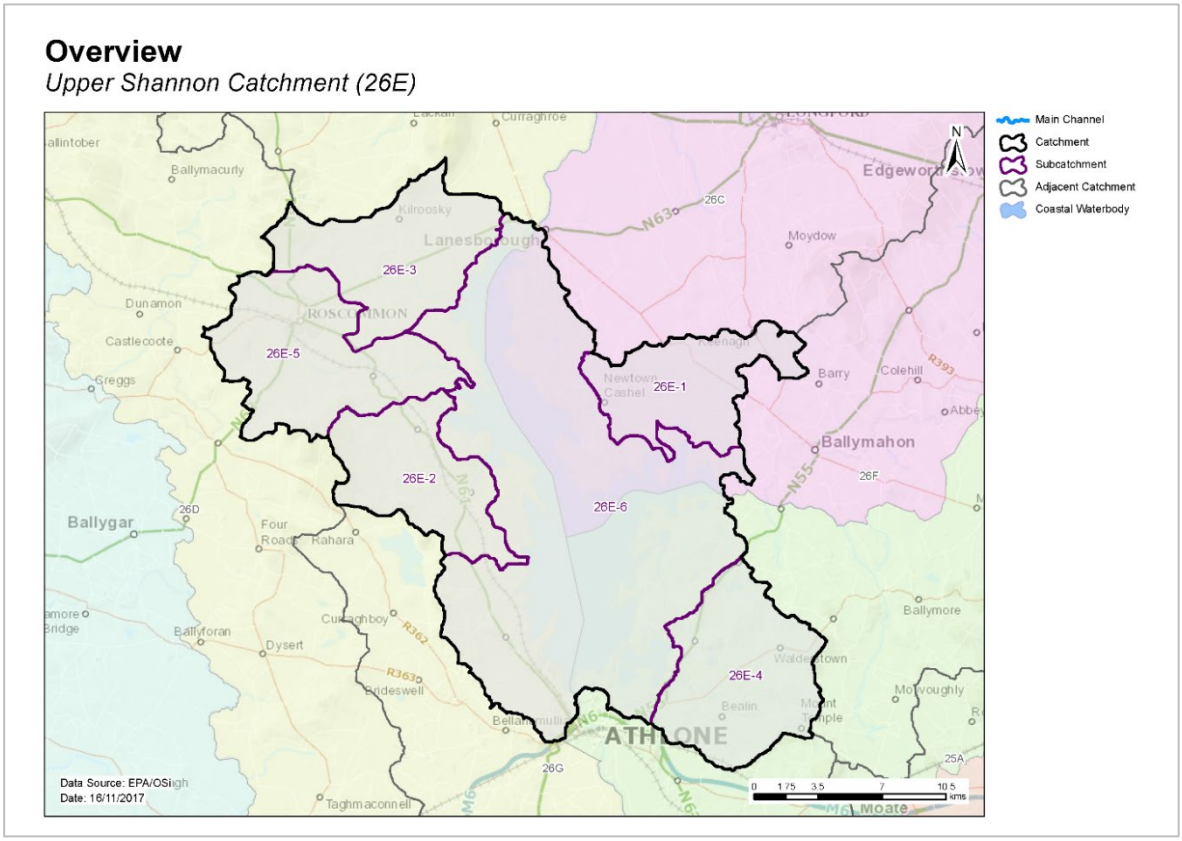


Figure 1. Subcatchments in the Upper Shannon (Lough Ree) catchment

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 four (15%) river and lake water bodies at Good or High status, and nine (33%) at less than Good status in 2015 (Table 2, Figure 2). Fourteen (52%) rivers and lakes are unassigned.
- One lake water body has a high ecological status objective (Coosan). In 2015 this achieved High status (Figure 3, Appendix 1).
- The numbers of water bodies at each status class in 2007-09 and 2010-15 are shown in Figures 4 (rivers) and 5 (lakes).
- Four water bodies have improved and three have deteriorated since 2007-09 (Figure 6).
- The variation in nutrient concentrations and loads in the Upper Shannon main channel (Hind) is illustrated in Appendix 2.

Table 2. Summary of water body status and risk results for rivers and lakes

	Number of water bodies	2010-15 Status						Risk Categories		
		High	Good	Mod	Poor	Bad	Unassigned	*Not at Risk*	*Review*	*At Risk*
Rivers	18	0	1	4	4	0	9	3	7	8
Lakes	9	1	2	1	0	0	5	4	4	1

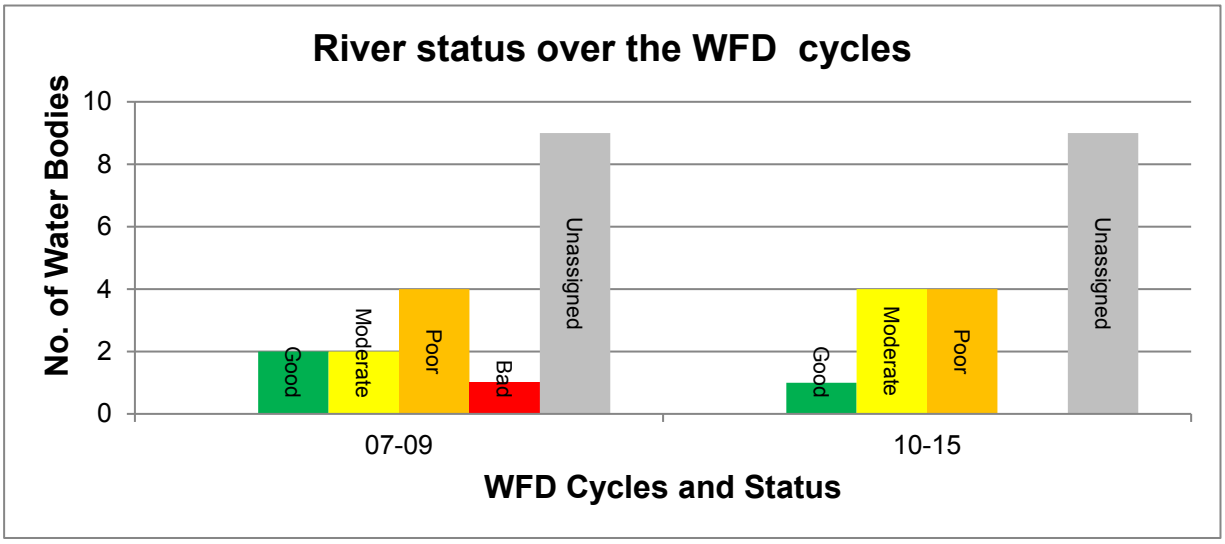


Figure 4. Number of rivers at each status class in 2007-09 and 2010-15

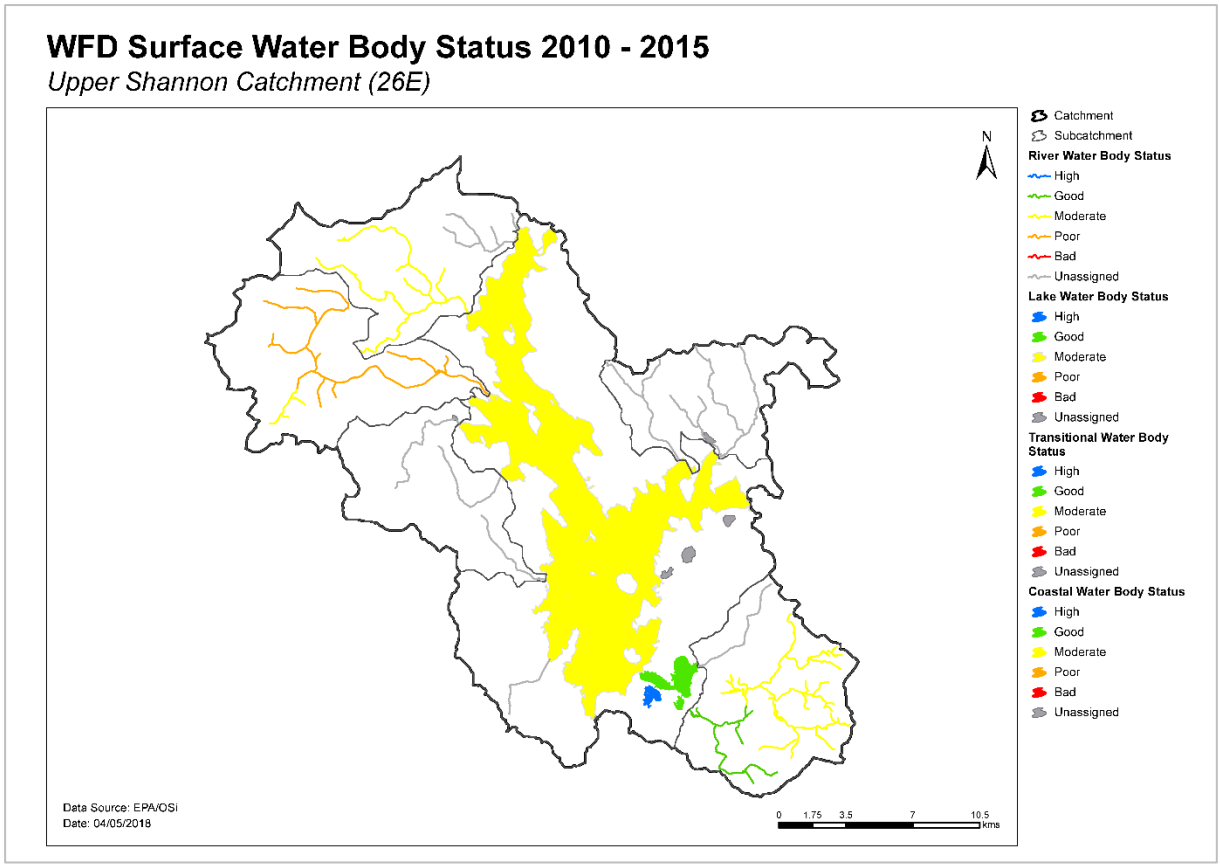


Figure 2. Surface water ecological status

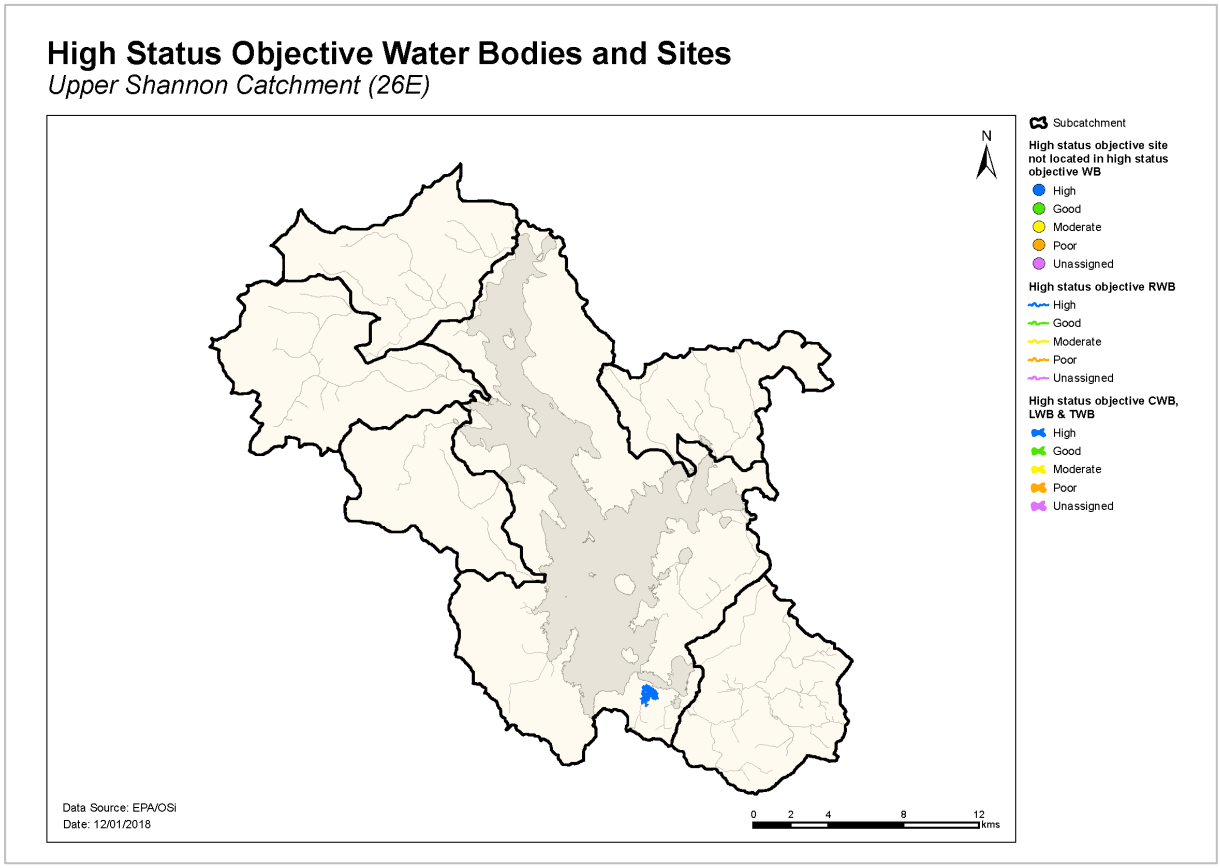


Figure 3. High ecological status objective water bodies and sites

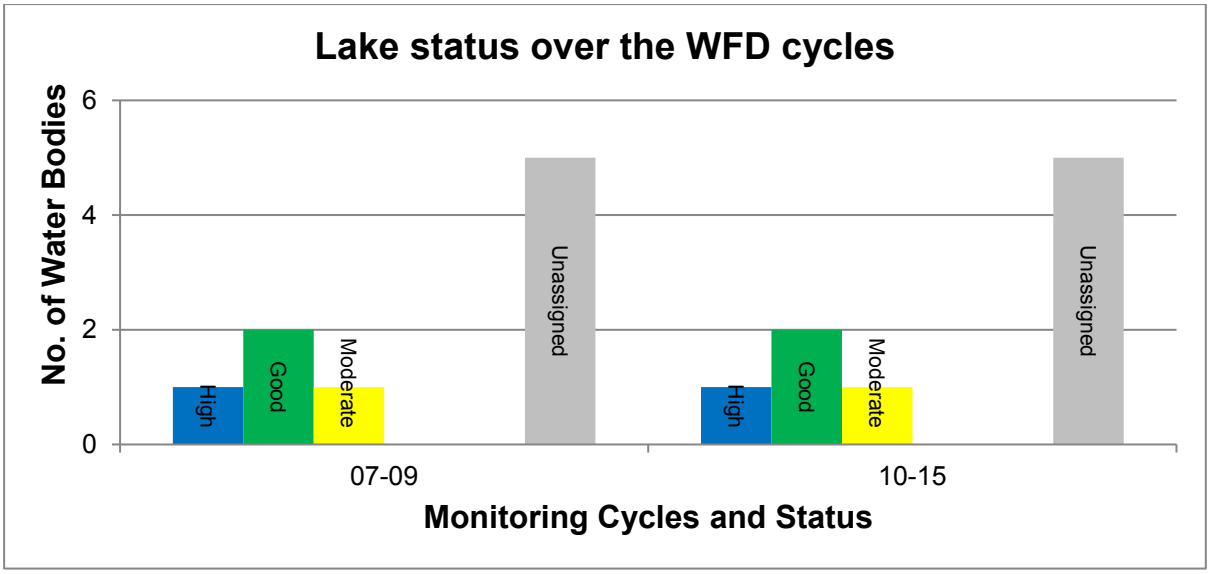


Figure 5. Number of lakes at each status class in 2007-09 and 2010-15

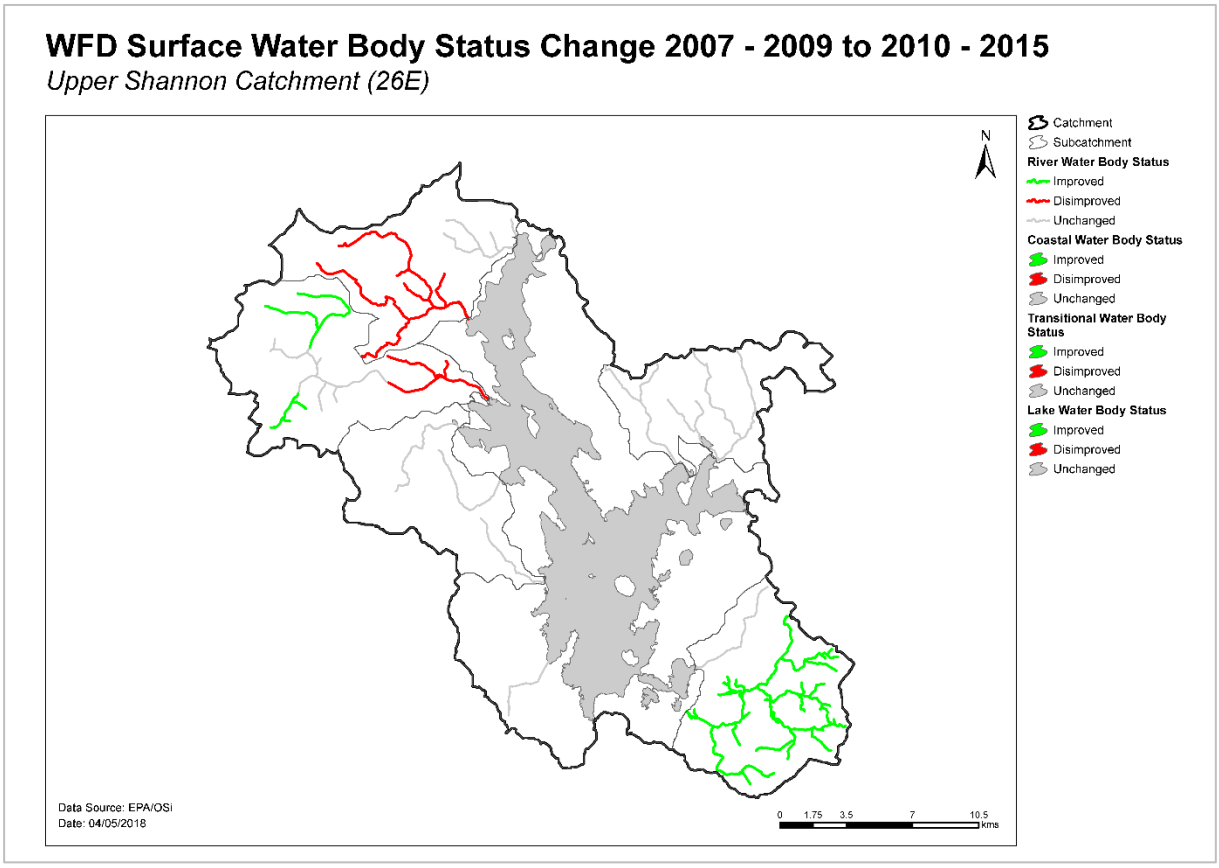


Figure 6. Surface water body status changes from 2007-09 to 2010-15

2.2 Groundwater status

- All six groundwater bodies were at Good status in 2015 (Table 3).

Table 3. Summary of water body status and risk for ground waters

	Number of water bodies	2010-15 Status		Risk Categories		
		Good	Poor	*Not at Risk*	*Review*	*At Risk*
Groundwater	6	6	0	2	4	0

2.3 Risk of not meeting surface water environmental objectives

2.3.1 Rivers and lakes

- There are three river and four lake water bodies that are *Not at Risk* (Figure 7, Table 2) which require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- There are seven river and four lake water bodies in *Review*. This includes 10 water bodies where more information is required and one water body where measures have recently been implemented and improvements have not yet been realised.
- Eight river water bodies and one lake water body 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. Summary information for the *At Risk* water bodies is given in Appendix 3.

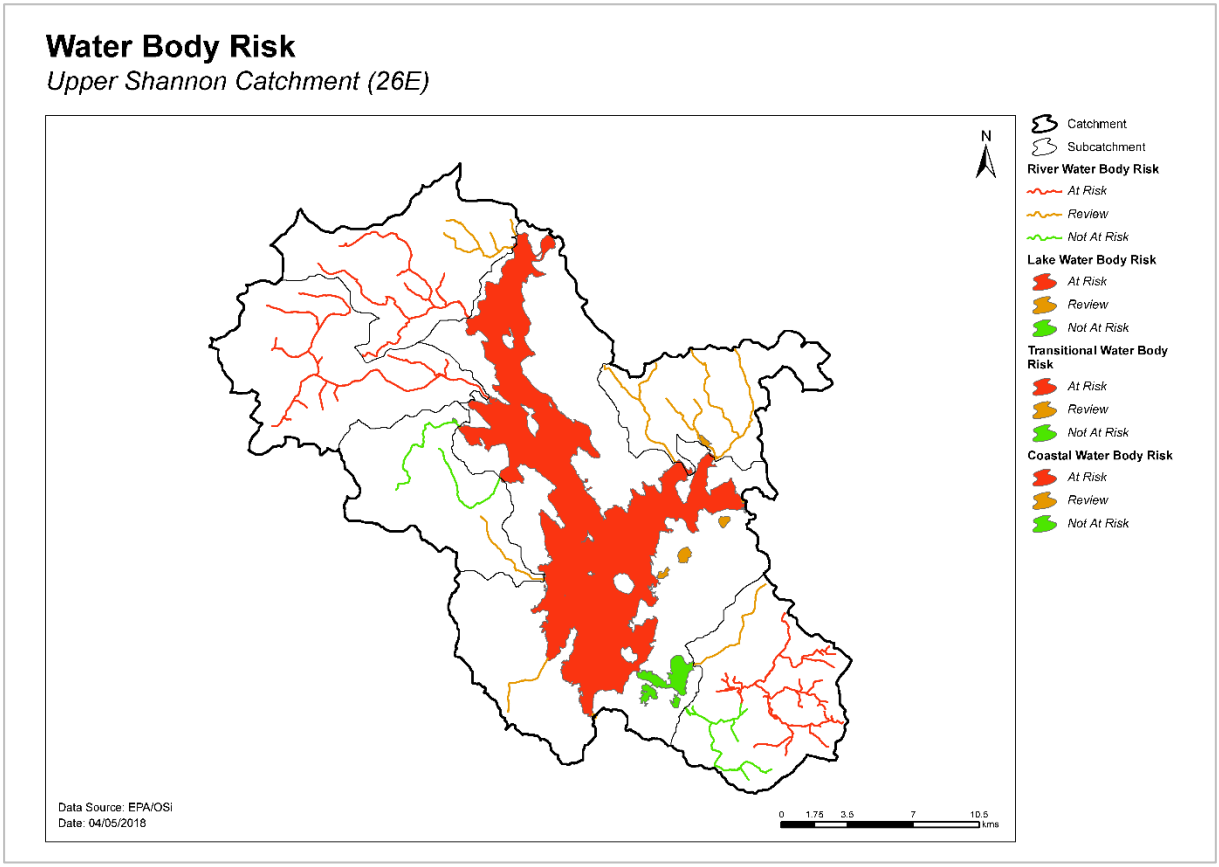


Figure 7. Surface water body risk

2.4 Risk of not meeting groundwater environmental objectives

- Two groundwater bodies are *Not at Risk* (Figure 8, Table 3) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Four groundwater bodies are in *Review* (Figure 8). Funshinagh and Inny are in *Review* because they are hydrologically linked to surface waters that are not meeting water quality objectives where it is considered likely that groundwater is a contributing source of phosphorus. GWDTE-Lough Ree Fen 9 (SAC000440) is impacted by historic drainage while Athlone Gravels has elevated nitrate concentrations.

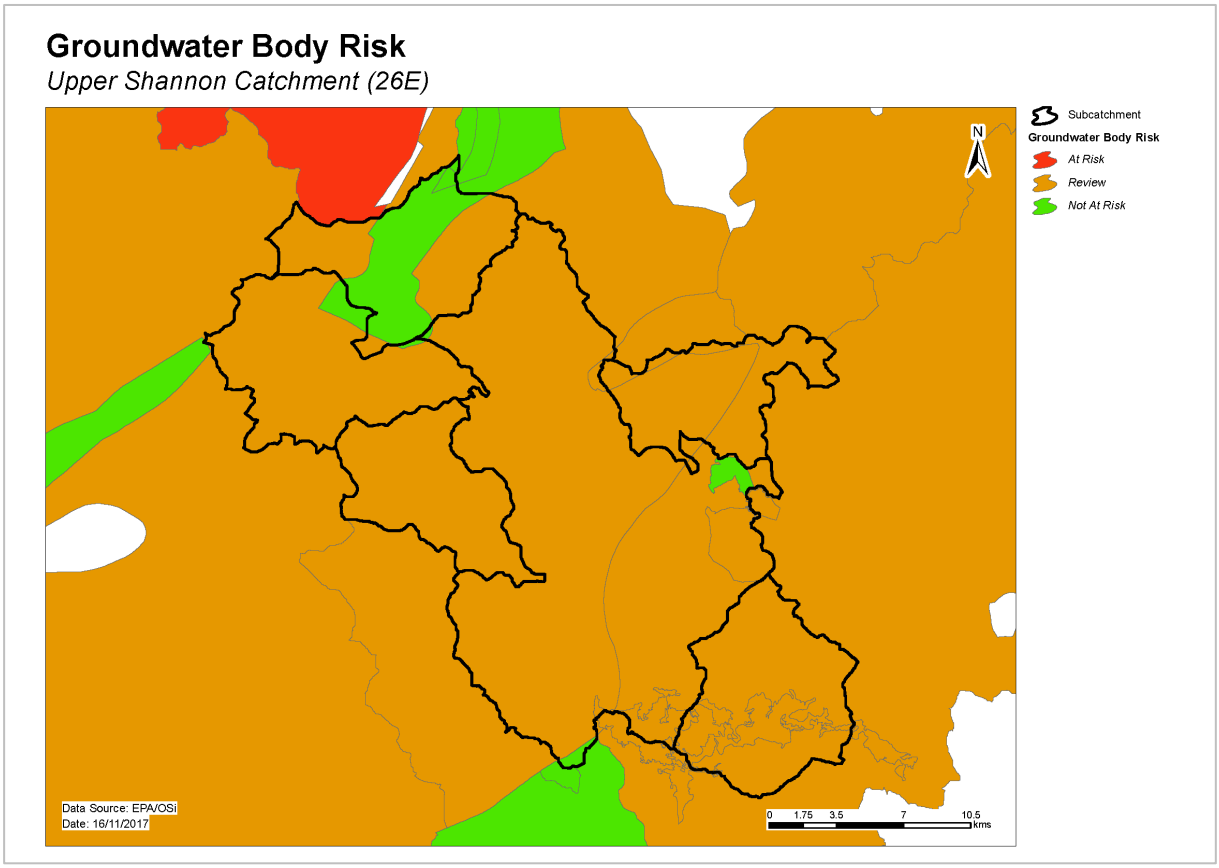


Figure 8. Groundwater body risk

2.5 Protected areas

2.5.1 Drinking water abstractions

- There are 23 abstractions in the Upper Shannon (Lough Ree) catchment comprising 20 public supplies and three private supplies (Clonrelick Infiltration G, Carrowcrim/Holywell and Derrane/Coolteigue) (Appendix 4).
- All 23 of the abstractions are from groundwater bodies. Two from the Inny GWB and 21 from the Funshinagh GWB. The list of the public supplies and the associated water bodies is provided in Appendix 4.
- All sources were compliant with the standard for nitrate in 2015.
- All sources were compliant with the standards for pesticides in 2015.

2.5.2 Bathing Waters

- There are no designated bathing waters in the catchment.

2.5.3 Shellfish Areas

- There are no designated shellfish areas in the catchment.

2.5.4 Nutrient Sensitive Areas

- There are no designated nutrient sensitive areas in the catchment.

2.5.5 Natura 2000 Sites

- There are five Special Areas of Conservation (SACs) in the catchment (Appendix 5), not all of which have water quality and/or quantity conservation objectives for their qualifying interests.
- One lake water body (Ree) has been prioritised for action as the water conservation objectives for their habitats and/or species are not being supported by ecological status (Appendix 5).
- There is one Special Protected Area (SPA) in the catchment:
    - Lough Ree SPA

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

2.6 Heavily modified water bodies

- There are no heavily modified water bodies (HMWBs) in the catchment.
- There is one artificial water body (AWB) in the catchment - the Royal Canal (West of Lough Owel feeder). It was classified as having Good Ecological Potential (GEP) in 2010-2015.

3 Significant issues in *At Risk* water bodies

- Excess nutrients, primarily phosphate, leading to eutrophication is the dominant issue in the rivers and lakes.
- Poor habitat quality caused by morphological and hydrological issues is also a concern in a limited number of water bodies.
- Groundwater bodies act as a pathway to surface waters and may be contributing some of the phosphate in places. A review of the pathway links is on-going. Nitrate concentrations, while elevated in places, are not sufficiently high to cause a concern for drinking water purposes.

4 Significant pressures

4.1 Water bodies

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

4.1.1 Rivers and lakes

- The significant pressure affecting the greatest number of water bodies is urban waste water, followed by agriculture, diffuse urban, other pressures (invasive species and waste), hydromorphological pressures and peat drainage and extraction.
- Figure 9 shows a breakdown of the number of *At Risk* water bodies in each significant pressure category. Significant pressures have been identified through the initial characterisation process in

nine water bodies, three of which have multiple pressures. The significant pressures will be refined as further characterisation is carried out.

4.1.2 Groundwater

- There are no *At Risk* groundwater bodies within the catchment.

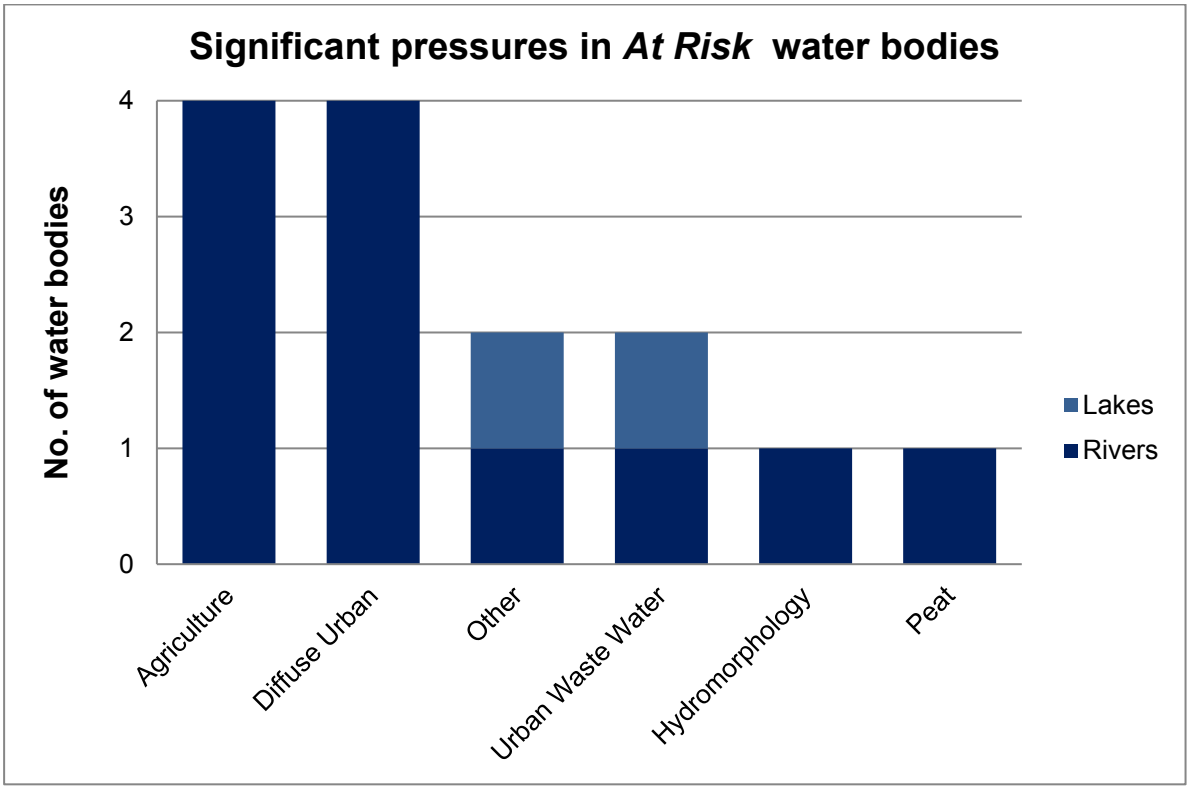


Figure 9. Significant pressures impacting on *At Risk* water bodies

4.2 Pressure type

4.2.1 Agriculture

- Agriculture is a significant pressure in four river water bodies, Clooneigh_010, Clooneigh_020, Breensford_010 and Rocksavage_010 (Figure 10). The issues related to farming in this catchment are 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 can also be a problem from land drainage works, bank erosion from animal access or stream crossings. The pollution impact potential map showing areas of relative risk for phosphate loss from agriculture to surface water is given in Appendix 6.

4.2.2 Diffuse urban

- Diffuse urban pressures, caused by misconnections, leaking sewers and runoff from paved and unpaved areas, have been identified as a significant pressure in four river water bodies (Hind_010, Hind_020, Hind_030 and Jiggy (Hind)_010) from Roscommon town (Figure 11).

4.2.3 Other significant pressures

- *Invasive species*

  Zebra mussels and Asian Clams – have been identified as a potentially significant pressure in one lake water body, Lough Ree (Figure 12). The Asian Clams are likely present due to flow of warm water from the power plant.

- *Waste*
  One river has been identified as impacted by waste facilities (Figure 13). The Jiggy (Hind)_010 is *At Risk* due to several pressures including leachate from Roscommon Landfill Facility (W0073).

4.2.4 Urban waste water treatment plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been identified as a significant pressure in two *At Risk* water bodies, Lough Ree and Jiggy (Hind)_010; details are given in Table 4, Figure 14. Upgrade works on the Rocommon agglomeration network, which is impacting Jiggy (Hind)_010, are scheduled to be completed by 2020.

Table 4. Waste Water Treatment Plants and agglomerations identified as significant pressures in *At Risk* water bodies and expected completion dates for associated upgrade works, where applicable.

Facility name	Facility Type (p.e)	Water Body	2010-15 Ecological Status	Expected Completion Date
Ballyleague D0229	1,001 to 2,000 p.e.	Lough Ree	Moderate	*NA* [1]
Hodson Bay D0377	500 to 1,000 p.e.	Lough Ree	Moderate	*NA* [1]
Roscommon D0116	2,001 to 10,000 p.e.	*Jiggy (Hind)_010* [2]	Poor	2020

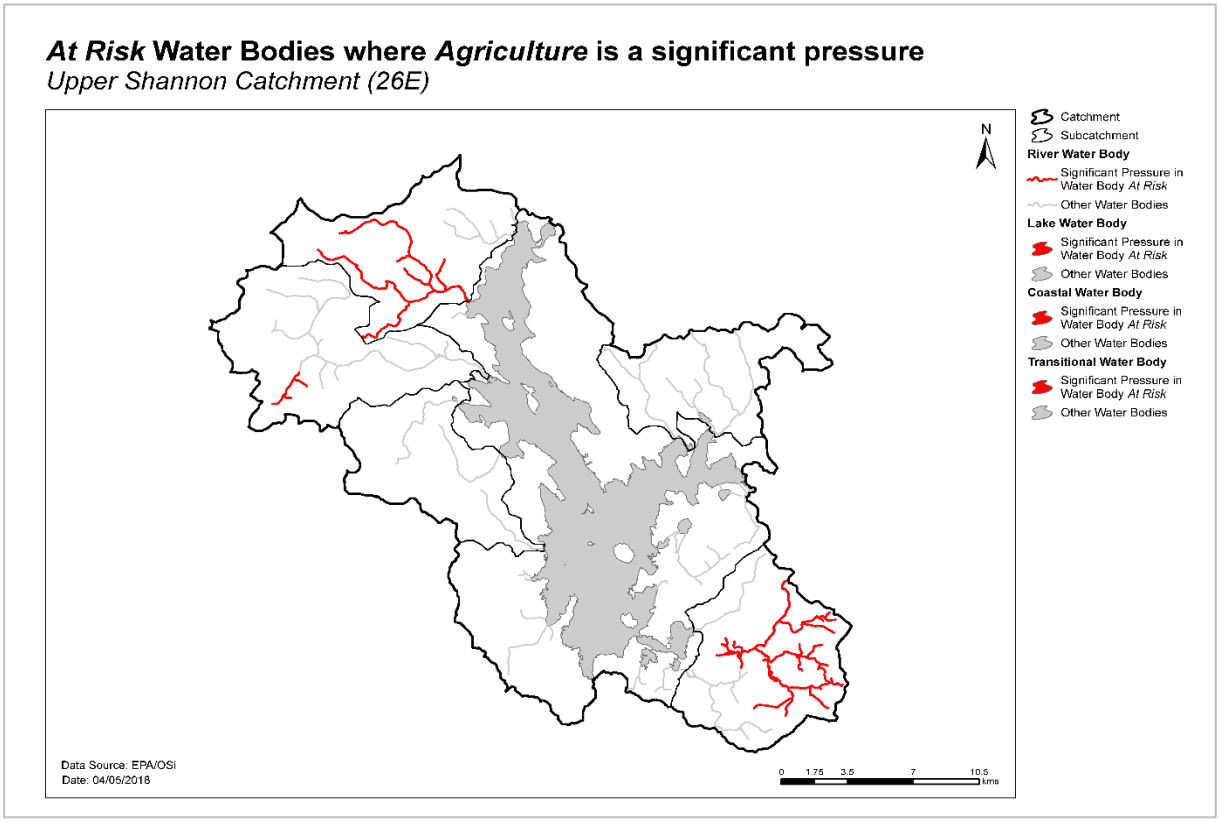


Figure 10. Water bodies that are *At Risk* and are impacted by agricultural activities

4.2.5 Hydromorphology

- Hydromorphology is a significant pressure in one water body. The Jiggy (Hind)_010 within the Hind (26E_5) subcatchment is subject to extensive modification due to the presence of a drainage

[1] *Currently not specified in improvement plans.*
[2] *The agglomeration network rather than the WWTP, has been identified as a significant pressure impacting Jiggy (Hind)_010.*

scheme and flood alleviation works. This water body that is *At Risk* and impacted by hydromorphological pressures as shown in Figure 15 and listed in Appendix 3.

4.2.6 Extractive industry

- *Peat*

  Peat drainage and extraction has been identified as a significant pressure in one water body, Breensford_010, with peat cutting resulting in elevated sediment (Figure 16). This has resulted in increased sediment loads, which alters habitats, morphology and hydrology.

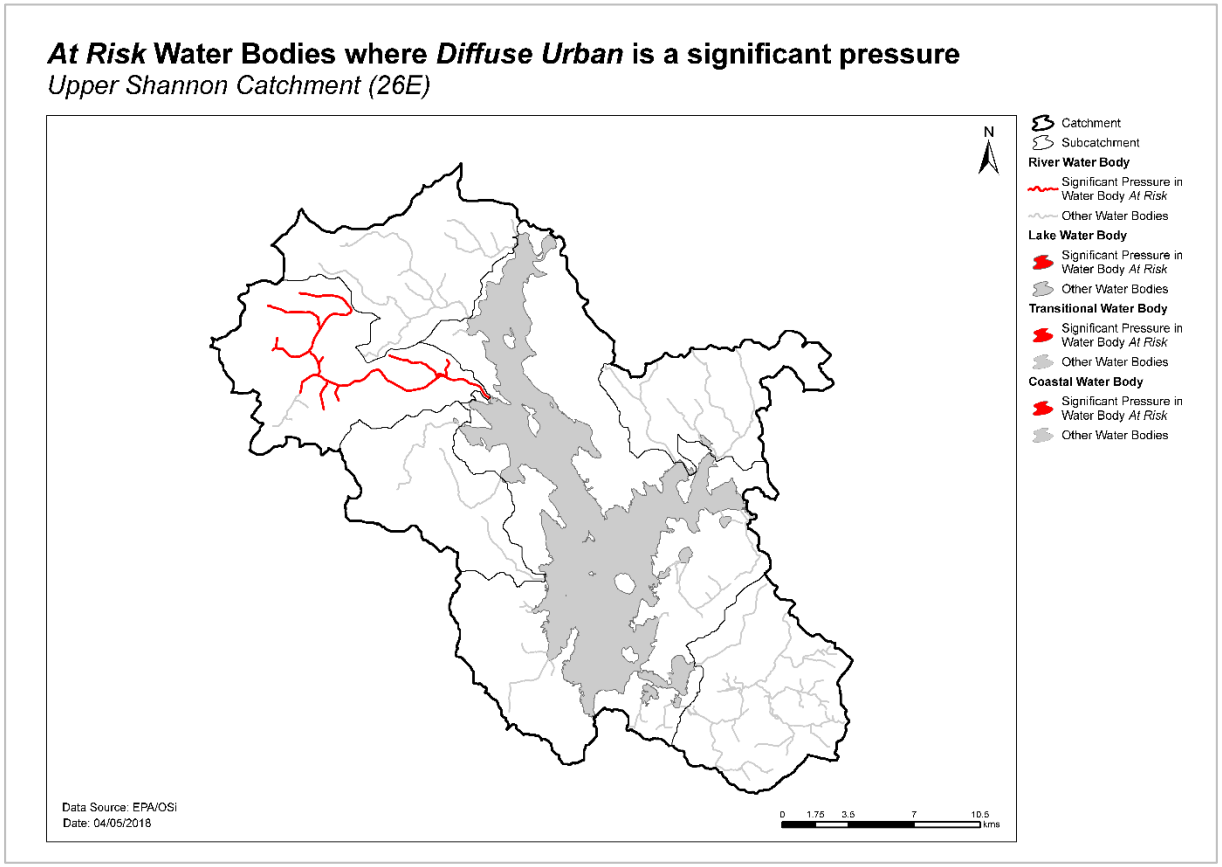


Figure 11. Water bodies that are *At Risk* and are impacted by diffuse urban pressures

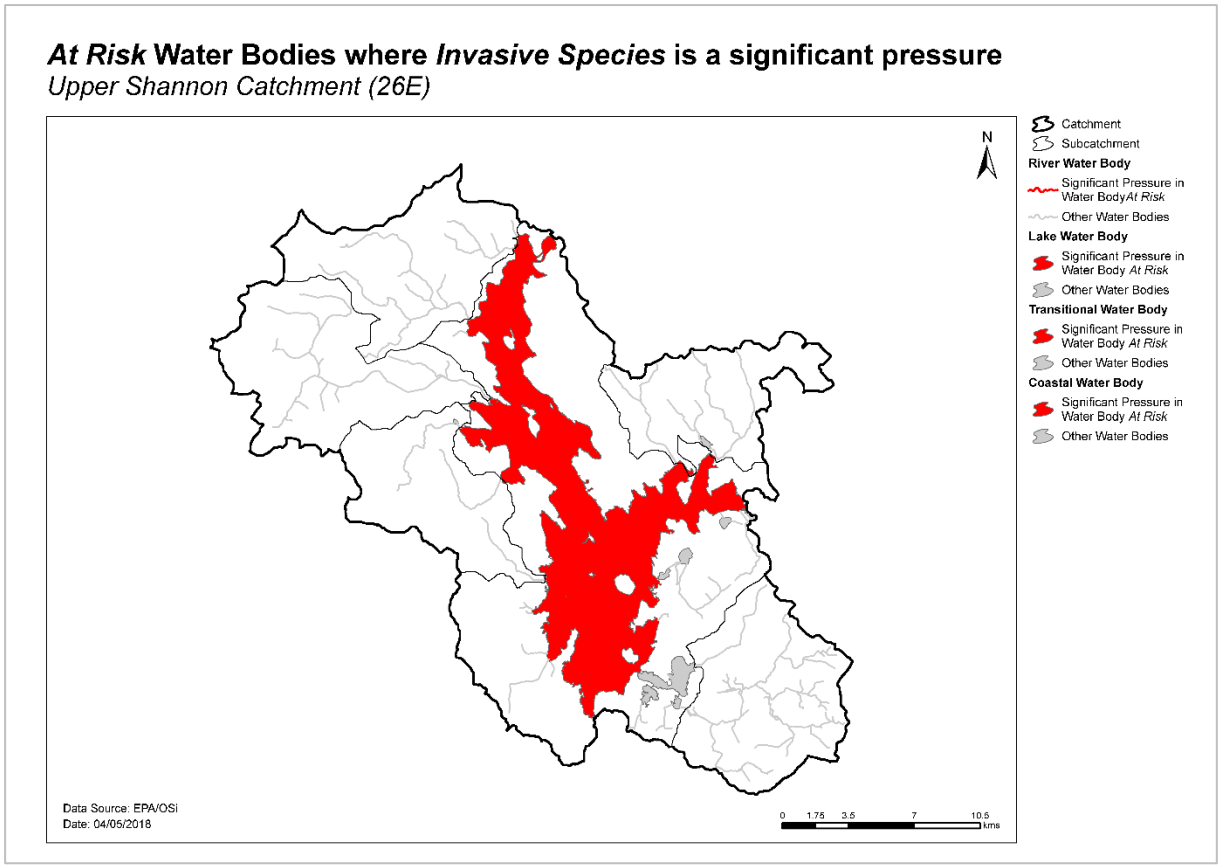


Figure 12. Water bodies that are *At Risk* and are impacted by invasive species

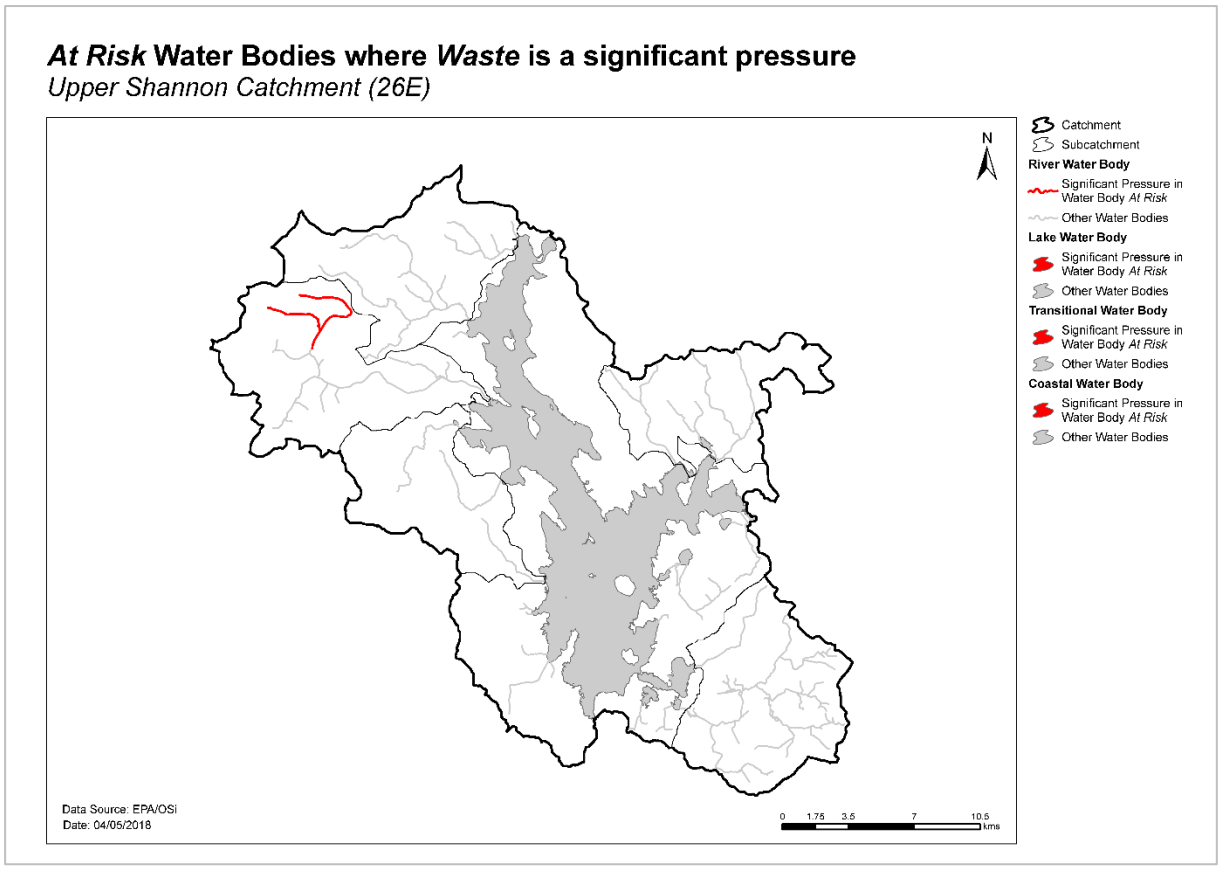


Figure 13. Water bodies that are *At Risk* and are impacted by waste

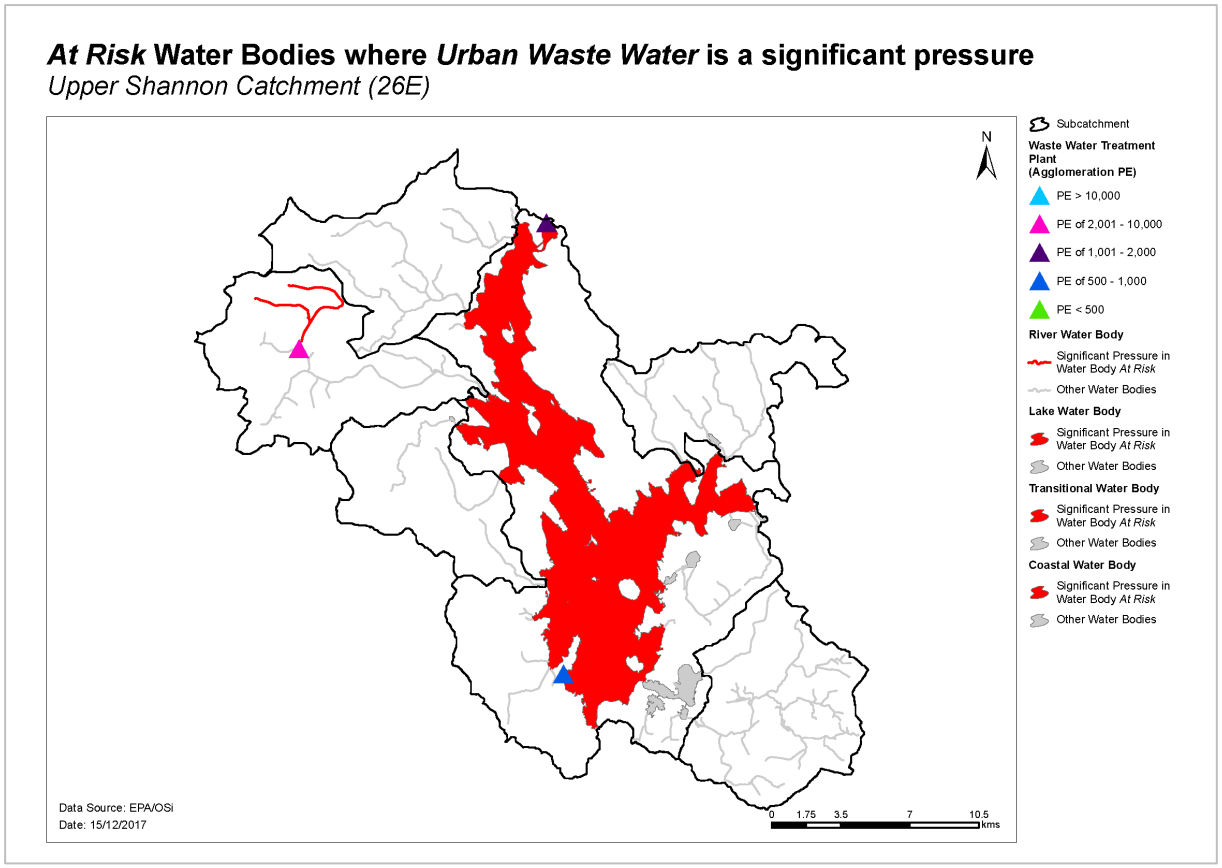


Figure 14. Water bodies that are *At Risk* and are impacted by urban waste water

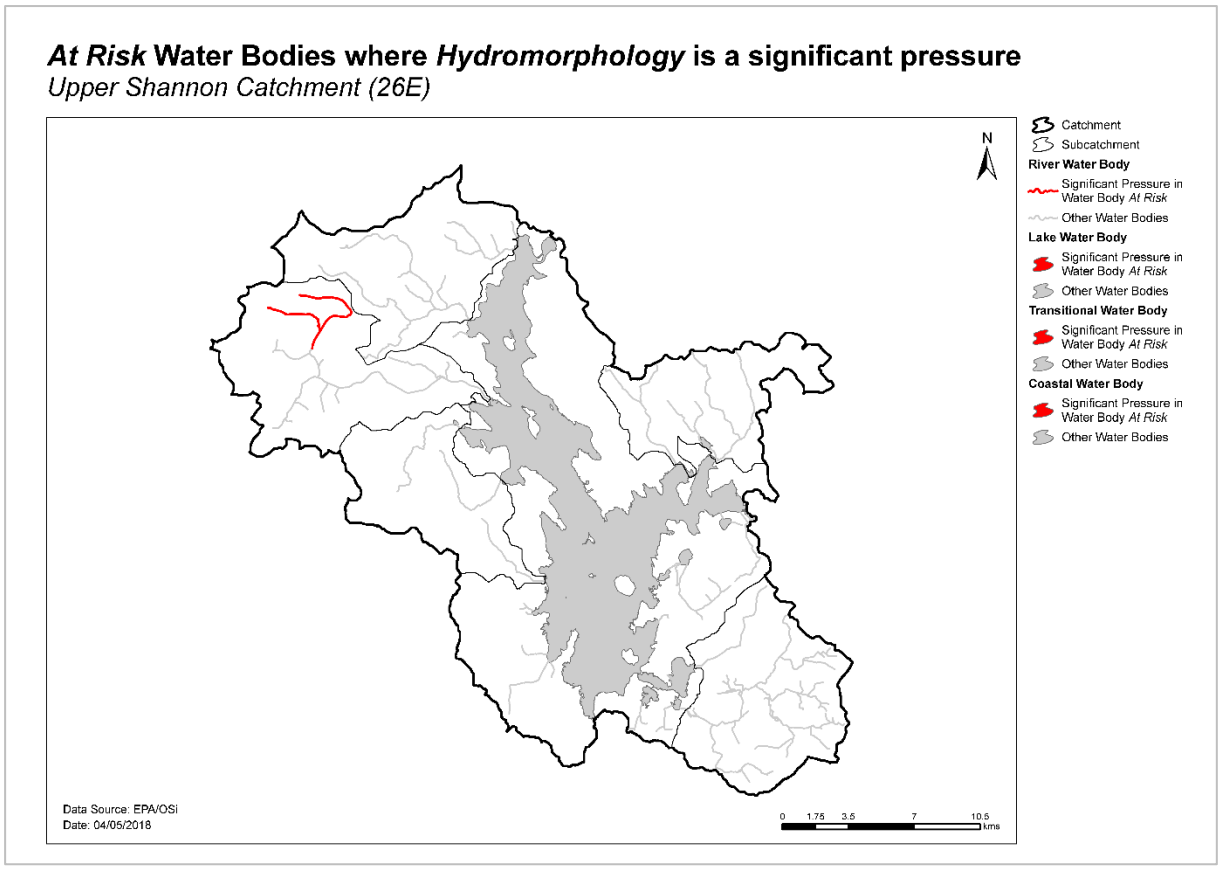


Figure 15. Water bodies that are *At Risk* and are impacted by hydromorphological pressures

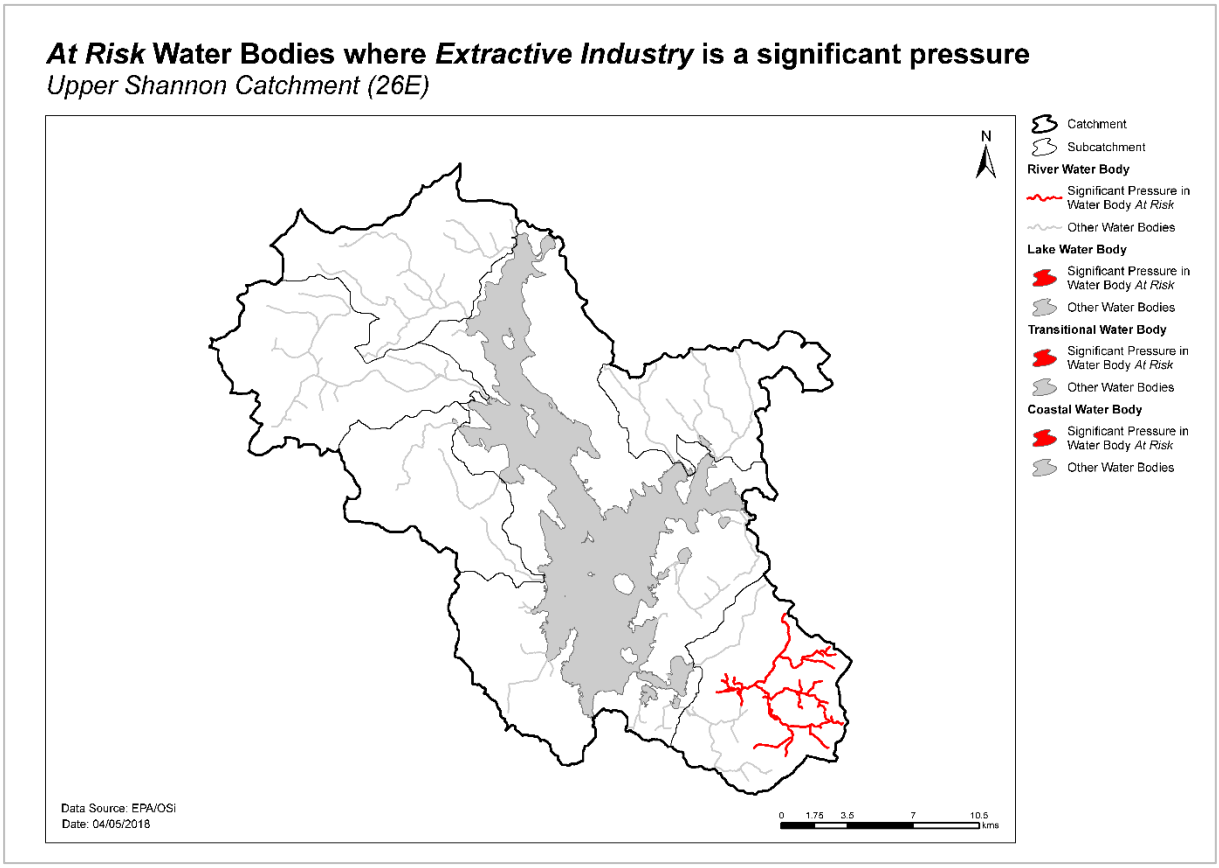


Figure 16. Water bodies that are *At Risk* and are impacted by extractive industries

5 Load reduction assessment

5.1 River water body load reductions

- Phosphate is the main parameter influencing water quality in rivers in the catchment.
- Using the available monitoring data, it has been calculated that in order to achieve mean phosphate concentrations below the EQS of 0.035 mg/l (mean), in the monitored water bodies across the catchment, additional load reductions are required in one river water body, the Hind_010 (Table 5).
- The information given below should be taken as a guide which is aimed at i) enabling resources to be targeted to specific areas requiring improvement and ii) estimating the amounts of reductions needed so that appropriate measures can be considered. While some of the load reductions required may be achieved from measures that are already in place (but water quality improvements are not yet evident), it is also possible that additional load reductions will be required because of increased pressures in some places. Investigative assessments will also likely provide evidence for additional load reduction requirements, especially in unmonitored water bodies.

Table 5. Relative load reductions required in monitored water bodies that are *At Risk*.

Water Body	P Load Reduction Required
Hind_010	Med

5.2 TraC load reductions

- There are no TraC water bodies in the Upper Shannon (Lough Ree) catchment.

6 Further Characterisation and Local Catchment Assessments

- Further characterisation through Local Catchment Assessments is needed in nine of the *At Risk* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Further characterisation through Local Catchment Assessments is needed in 11 *Review* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Brief definitions on the 10 IA assessment scenarios are given in Appendix 7 and the number of IAs required for each scenario are given in Table 6.

Table 6. Local catchment assessment allocation for *At Risk* and *Review* river and lake water bodies

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

7 Catchment summary

- Of the 18 river water bodies, eight are *At Risk* of not meeting their WFD objectives.
- One out of nine lake water bodies is *At Risk* of not meeting its WFD objectives.
- Excess nutrient loss, mainly phosphate, leading to eutrophication is a major issue for rivers and lakes in the catchment. The significant pressures relating to excess nutrients are primarily urban waste water, agricultural and diffuse urban pressures.
- Hydromorphological (or physical) conditions (including the input of high levels of fine sediment) and poor habitat quality are an issue for a limited number of surface water bodies.
- There are no groundwater bodies *At Risk*. Groundwater bodies act as a pathway to surface waters and may be contributing some of the phosphate in places. A review of the pathway links is on-going. Nitrate concentrations, while elevated in places, are not sufficiently high to cause a concern for drinking water purposes.

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 Upper Shannon (Lough Ree) 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 WFD planning cycle from 2018 to 2021.

8.2 Outcomes of process

The outcomes for the Upper Shannon (Lough Ree) catchment are summarised below.

- Two recommended areas for actions (Table 7, Figure 17) were selected.
- These are the Jiggy/Hind and Clooneigh.
- These include seven *At Risk* and one *Review* river water bodies.
- One groundwater body, which is in *Review* due to groundwater contribution of nutrients to surface water bodies, intersects with the two recommended areas for action, see Table 8. Actions taken to improve surface water will need to take account of the groundwater contribution to surface water.

A remaining 12 *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 18. These include:

- twelve surface water bodies – two *At Risk* and 12 *Review.*

Table 7. Recommended Areas for Action in the Upper Shannon (Lough Ree) Catchment

Recommended area for action	Number of water bodies	SCs	Local authority	Reason for Selection

Jiggy/Hind	5	26E_5	Roscommon	• Building work completed by Roscommon County Council to address diffuse urban pollution. • Potential 'quick win' in the upper reaches of the subcatchment. • One deteriorated water body. • Headwaters flowing into Lough Rinn.
Clooneigh	3	26E_3	Roscommon	• Manageable area to focus measures. • Two potential 'quick wins'. • Two deteriorated water bodies. • Headwaters flowing into Lough Rinn.

Table 8. Groundwater bodies intersecting with surface water bodies in areas for action

Groundwater body			Intersecting surface water body		Recommended Area for Action
Code	Name	Risk	Code	Name	
IE_SH_G_091	Funshinagh	Review	IE_SH_26C060030	CLOONEIGH_010	Cloooneigh
			IE_SH_26C060200	CLOONEIGH_020	
			IE_SH_26K670950	KEELCURRAGH_010	
			IE_SH_26H010300	HIND_010	Jiggy/Hind
			IE_SH_26H010400	HIND_020	
			IE_SH_26H010500	HIND_030	
			IE_SH_26J010090	JIGGY (HIND)_010	
			IE_SH_26R070250	ROCKSAVAGE_010	

9 Environmental Objectives

9.1 Surface Water

- Assuming resources are available and actions are taken in the recommended areas for action, of the seven *At Risk* river water bodies, it is predicted that three (43%) will improve by 2021 and four (57%) will achieve their objective by 2027. For the one *Review* river water body, the absence of information on this water body means that there is no scientific basis to quantify an environmental objective date, and therefore a 2027 date is set for this water body, see Table 9.

Table 9. 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
At Risk	7	3	4
Review	1	0	1
Not at Risk	0	0	0
Total	8	3	5

- Seven surface water bodies have met their 2015 environmental objective.
- As action is not yet planned to be taken in the remaining two *At Risk* surface water bodies, a 2027 date is applied to them both.

- For the ten *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 10.

Table 10. 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	1	0	1
Review	6	0	6
Lakes			
At Risk	1	0	1
Review	4	0	4
Total	12	0	12

9.2 Groundwater

- All six groundwater bodies in the catchment are Good status and, therefore, have met their environmental objectives.

10 Acknowledgements

This Upper Shannon (Lough Ree) Catchment Assessment (Version 3) has been produced by the Catchment Science & Management Unit, EPA, with the assistance of the following:

- Roscommon County Council
- Longford County Council.
- Westmeath County Council.
- Inland Fisheries Ireland.
- Local Authorities Waters & Communities Office.
- Irish Water.
- RPS Group.
- Ecological Monitoring & Assessment Unit, EPA.
- Hydrometric & Groundwater Section, EPA.
- Informatics Section, EPA.
- Laboratories, EPA.
- Office of Environmental Enforcement, EPA.
- DAFM Agriculture.
- DAFM Forest Service.
- Coillte.
- Teagasc.
- Geological Survey Ireland.
- National Parks and Wildlife Service.
- Marine Institute.

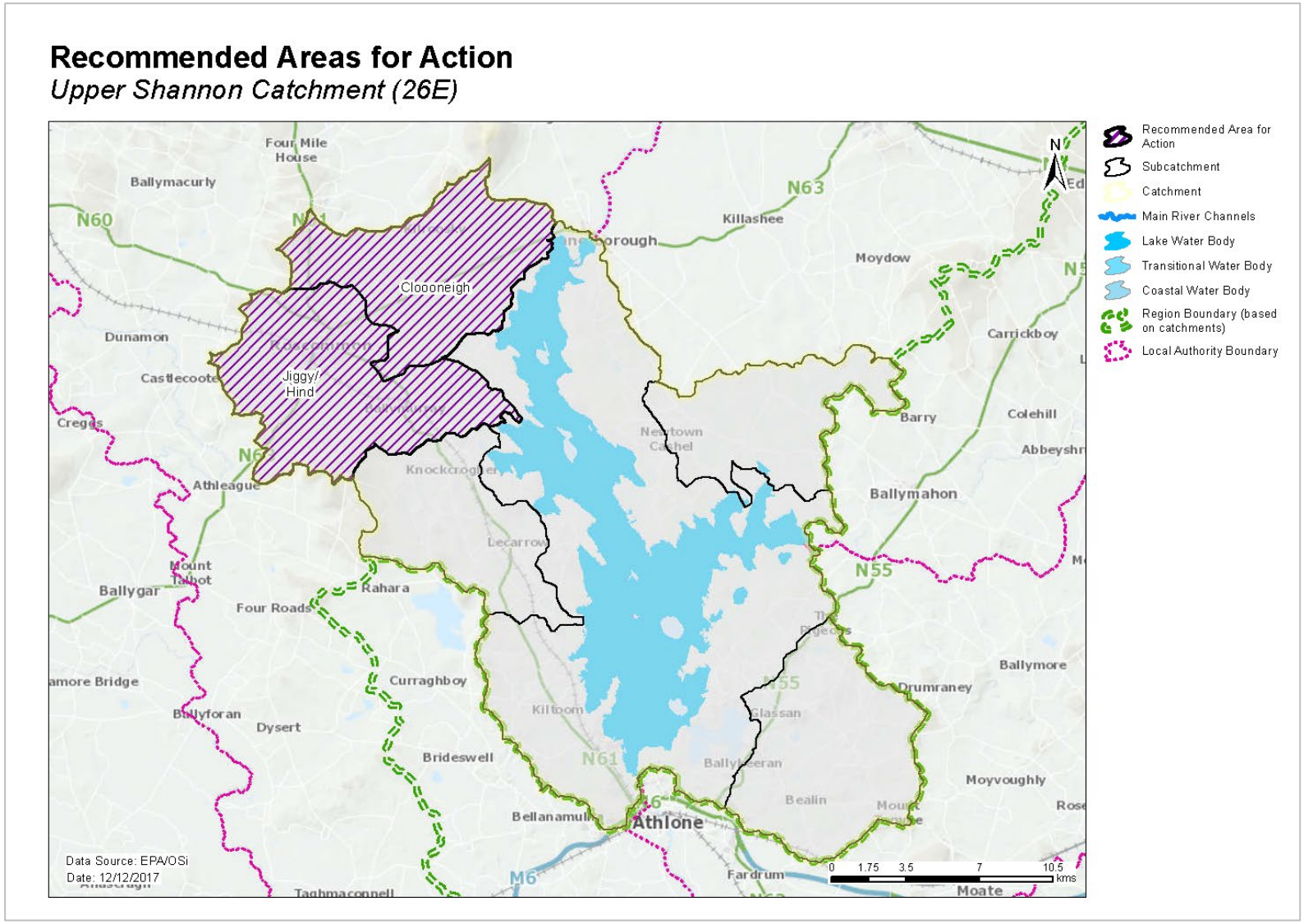


Figure 17. Location of Recommended Areas for Action in the Upper Shannon (Lough Ree) Catchment

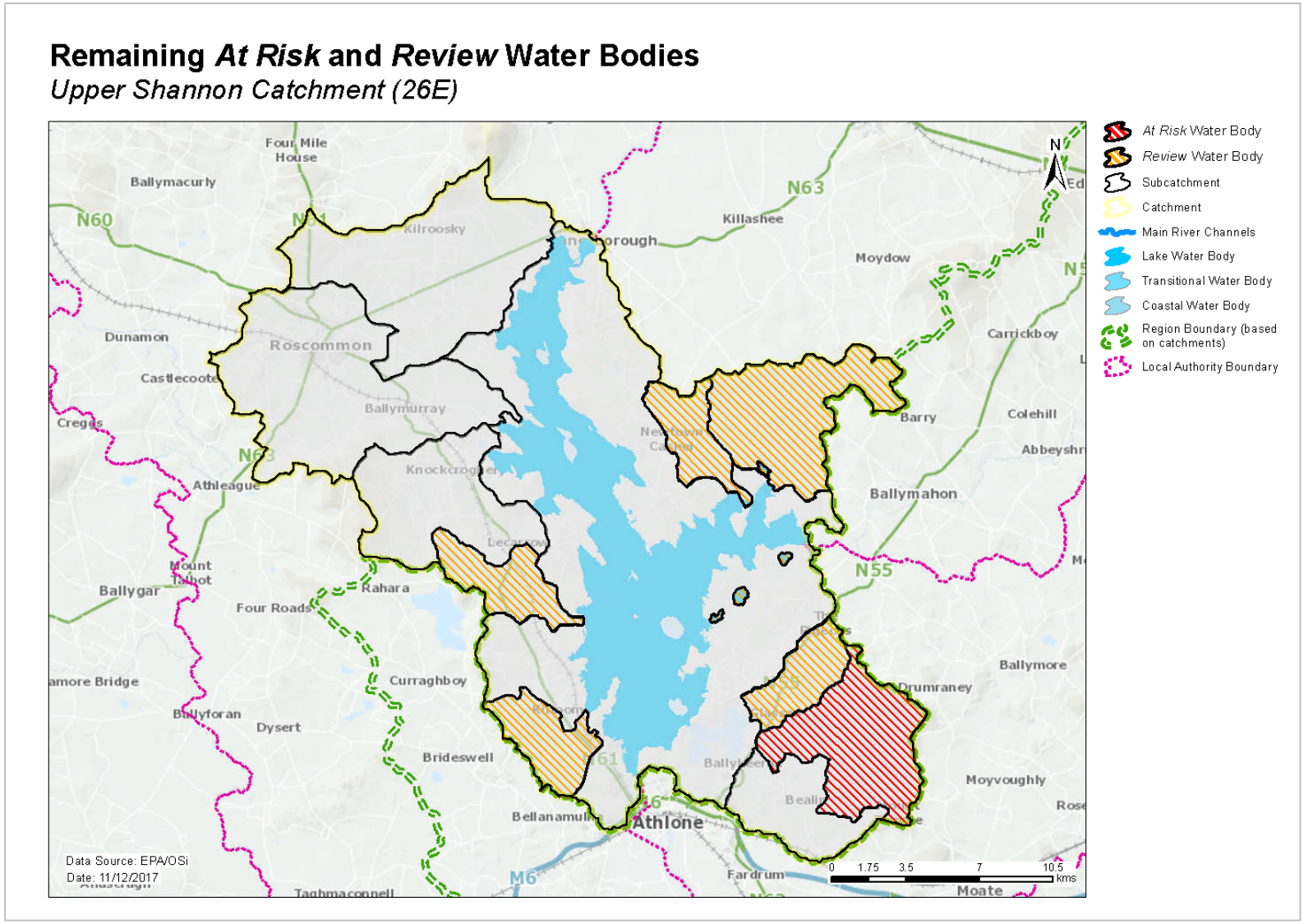


Figure 18. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Upper Shannon (Lough Ree) Catchment

Appendix 1 High ecological status objective water bodies

Water body/Site	Type	Codes	2015 Status
Coosan	Lake	IE_SH_26_750c	High

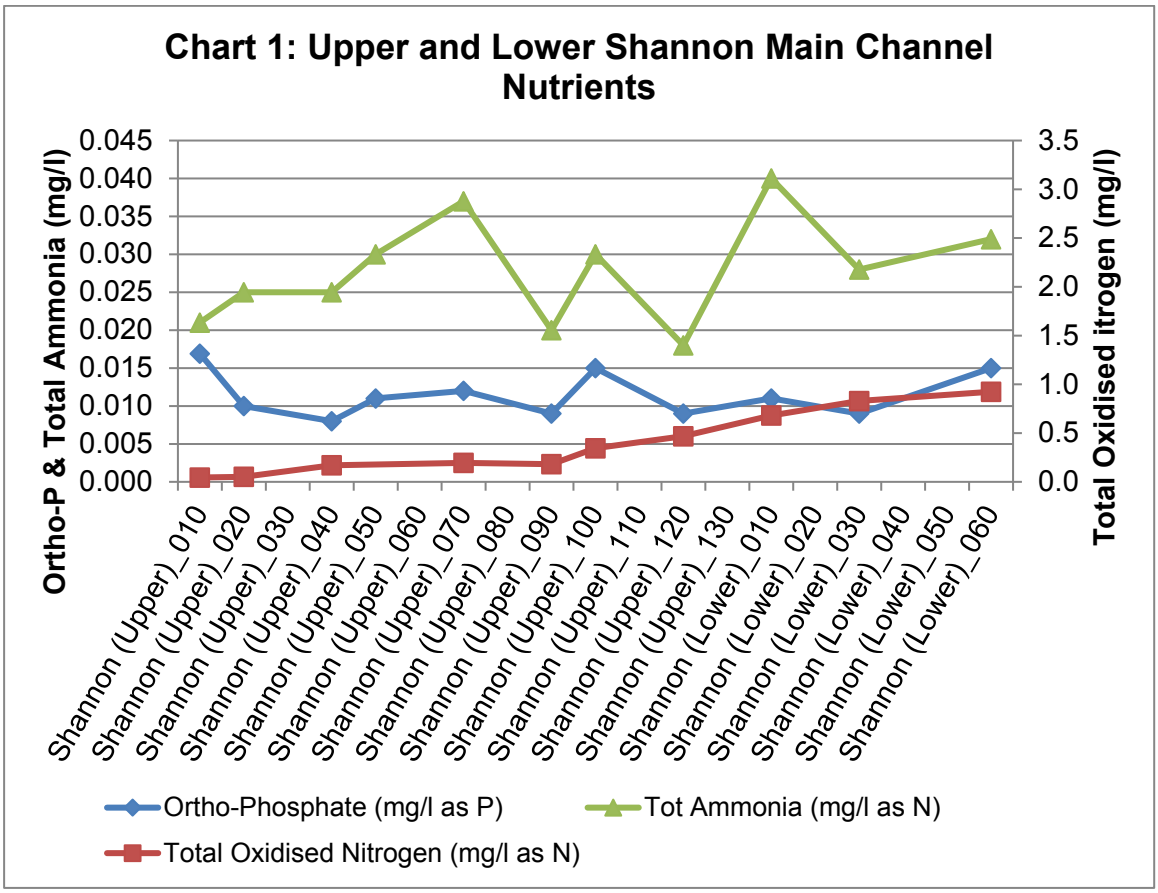
Appendix 2 Catchment scale nutrient concentrations and in-stream loads

The results of the instream water quality assessment for the Shannon (Upper and Lower) main channel are illustrated in Chart 1. The assessment is based on the mean concentrations between 2013 and 2015 at each site where monitoring data is available. Only 12 of the 17 main channel water bodies have water quality data associated with them.

The results show that average nutrients concentrations in the Shannon main channel are below their corresponding threshold values. Concentrations of orthophosphate range from 0.008 to 0.017mg/l, with the highest concentration observed in the headwater SHANNON (UPPER)_010. Small spikes of orthophosphates are observed in the SHANNON (UPPER)_100, which receives water from the FEORISH (TARMONBARRY)_020 of poor ecological status, and the SHANNON (LOWER)_060 which is the receives the primary discharge from the Castleroy Waste water Treatment Plant (WWTP).

Ammonia concentrations show no significant trend along the main channel and range from 0.018 to 0.037mg/l. The small concentration spikes of ammonia are observed in SHANNON (UPPER)_070 and SHANNON (LOWER)_010. The SHANNON (UPPER)_070 is the receiving water body for several small WWTPs including Dromod, Drumsna, Jamestown and Roosky & Environs. The SHANNON (LOWER)_010 is the receiving water body for the Banagher WWTP.

Total Oxidised Nitrogen (TON) concentrations are low at the head waters but increase from 0.018mg/l in the SHANNON (UPPER)_090 to 0.92mg/l in the SHANNON (LOWER)_060. TON remains well below the 2.6mg/l threshold value throughout the channel.



Appendix 3 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
26E_1	IE_SH_26_638	Derrymacar	Lake	Review	Unassigned	Unassigned	N		2027	
26E_1	IE_SH_26_750a	Ree	Lake	At Risk	Moderate	Moderate	N	Other,UWW	2027	
26E_1	IE_SH_26D080850	Drumnee_010	River	Review	Unassigned	Unassigned	N		2027	
26E_1	IE_SH_26L840850	Ledwithstown_26_010	River	Review	Unassigned	Unassigned	N		2027	
26E_2	IE_SH_26C230700	Carrowphadeen_010	River	Review	Unassigned	Unassigned	N		2027	
26E_3	IE_SH_26C060030	Clooneigh_010	River	At Risk	Good	Moderate	N	Ag	2021	Cloooneigh
26E_3	IE_SH_26C060200	Clooneigh_020	River	At Risk	Good	Moderate	N	Ag	2021	Cloooneigh
26E_3	IE_SH_26K670950	Keelcurragh_010	River	Review	Unassigned	Unassigned	N		2027	Cloooneigh
26E_4	IE_SH_26B100100	Breensford_010	River	At Risk	Poor	Moderate	N	Ag,Peat	2027	
26E_4	IE_SH_26G060300	Glassan Stream_010	River	Review	Unassigned	Unassigned	N		2027	
26E_5	IE_SH_26H010300	Hind_010	River	At Risk	Poor	Poor	N	DU	2027	Jiggy/Hind
26E_5	IE_SH_26H010400	Hind_020	River	At Risk	Poor	Poor	N	DU	2027	Jiggy/Hind
26E_5	IE_SH_26H010500	Hind_030	River	At Risk	Moderate	Poor	N	DU	2027	Jiggy/Hind
26E_5	IE_SH_26J010090	Jiggy (Hind)_010	River	At Risk	Bad	Poor	N	DU,Hymo,Other,UWW	2027	Jiggy/Hind
26E_5	IE_SH_26R070250	Rocksavage_010	River	At Risk	Poor	Moderate	N	Ag	2021	Jiggy/Hind
26E_6	IE_SH_26_498	Ross WH	Lake	Review	Unassigned	Unassigned	N		2027	
26E_6	IE_SH_26_511	Creggan	Lake	Review	Unassigned	Unassigned	N		2027	
26E_6	IE_SH_26_623	Doonis	Lake	Review	Unassigned	Unassigned	N		2027	
26E_6	IE_SH_26B210730	Ballybay_26_010	River	Review	Unassigned	Unassigned	N		2027	
26E_6	IE_SH_26S021660	Shannon (Upper)_110	River	Review	Unassigned	Unassigned	N		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

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

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

Appendix 4 Drinking water supplies in the catchment

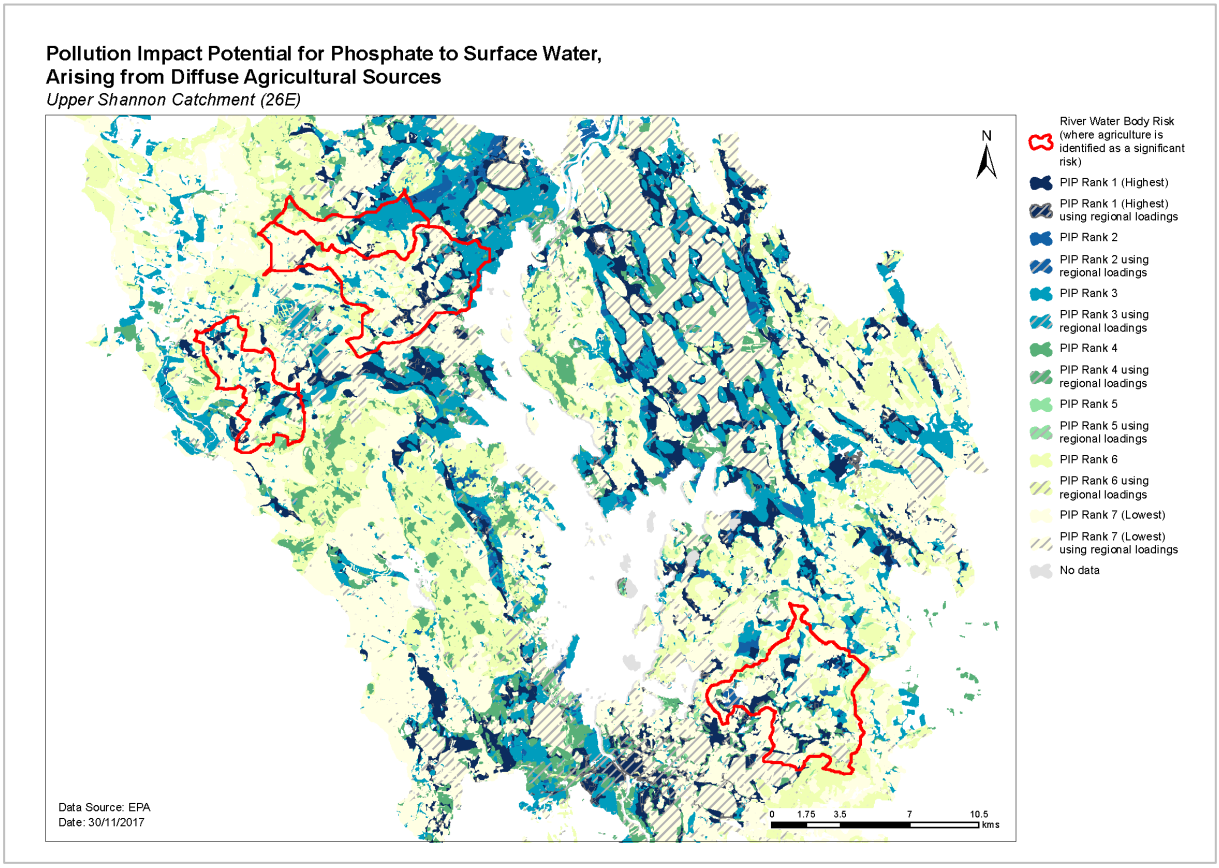
Scheme Code	Scheme Name	Water Body	Water Body Code	Objective met?
2000PUB1007	Glenmore Spring	Inny GWB	IE_SH_G_110	Yes
3200PRI2001	Clonrelick Infiltration G			
2000PUB1009	Lanesboro	Funshinagh GWB	IE_SH_G_091	Yes
2000PUB1013	Newtowncashel			
2600PRI3017	Carrowcrim/Holywell			
2600PRI3034	Derrane/Coolteigue			
2600PUB1002	Roscommon Central WSS -Ballinagard Borehole 1			
	Roscommon Central WSS -Ballinagard Borehole 2			
	Roscommon Central WSS -Ballinagard Borehole 3			
	Roscommon Central WSS -Ballinagard Borehole 4			
	Roscommon Central WSS -Ballinagard Borehole 5			
	Roscommon Central WSS -Ballinagard Borehole 6			
	Roscommon Central WSS -Ballinagard Borehole 7			
	Roscommon Central WSS -Ballinagard Borehole 8			
	Roscommon Central WSS -Ballinagard Borehole 9			
	Roscommon Central WSS -Ballinagard Borehole 10			
	Roscommon Central WSS -Rockfield Spring (N0.3)			
2600PUB1003	Knockcroghery - Lecarrow Borehole			
	Knockcroghery - Toberreeoge Spring			
2600PUB1006	Ballyleague			
2600PUB1019	Lecarrow WSS -Borehole			
	Lecarrow WSS -Spring			
	Lecarrow WSS -Borehole			

Appendix 5 Prioritisation of water bodies with Natura 2000 site qualifying interests

SAC Name	Relevant Qualifying interests	Target status	Water body type	Water bodies	Status (risk)	Prioritise?	Code	Survey data?
Ballinturly Turlough SAC 000588	3180	Good GW level/quality	Groundwater	Funshinagh	Good (R)	No	IE_SH_G_091	No
Carn Park Bog SAC 002336	none							
Corbo Bog SAC 002349	none							
Fortwilliam Turlough SAC 000448	3180	Good GW level/quality	Groundwater	Funshinagh	Good (R)	No	IE_SH_G_091	No
Lough Ree SAC 000440	Potential 3150	Good	Lake	Ree	Moderate (AT RISK)	Yes	IE_SH_26_750a	Yes
	7230	Good GW level	Groundwater	Curraghroe	Good (NAR)	No	IE_SH_G_075	No
			Groundwater	Funshinagh	Good (R)	No	IE_SH_G_091	No
			Groundwater	Inny	Good (R)	No	IE_SH_G_110	No
			Groundwater	GWDTE Lough Ree Fen 12 (SAC000440)	Good (NAR)	No	IE_SH_G_165	No
			Groundwater	GWDTE Lough Ree Fen 9 (SAC000440)	Good (R)	No	IE_SH_G_162	No
			Groundwater	Athlone Gravels	Good (R)	No	IE_SH_G_246	No

Appendix 6 Pollution Impact Potential (PIP) Map for Phosphate

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 phosphate to surface water. The risk of phosphate 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 7 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