# Donagh-Moville Catchment Assessment 2010-2015 (HA 40)

**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 Donagh-Moville 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 Donagh-Moville catchment includes the area drained by the River Donagh and all streams entering tidal water between Dunaff Head and Culmore Point, Co. Derry, draining a total area of 507 km². The largest urban centre in the catchment is Carndonagh. The other main urban centre is Moville. The total population of the catchment is approximately 18,300 with a population density of 36 people per km². The catchment is largely mountainous and is entirely underlain by metamorphic rocks that provide limited groundwater resources.

This catchment comprises the northern and eastern parts of the Inishowen Peninsula and is drained by several relatively small rivers which flow from the mountains in the centre of the peninsula. The Clonmany River drains the northern slopes of Raghtin More and Bulbin, flowing into the sea at Tullagh Bay. The River Straid drains the northern flanks of Slieve Snaght, flowing into the western side of Trawbreaga Bay.

The Donagh and Glennagannon Rivers flow north through the centre of the catchment past Carndonagh and into the eastern side of Trawbreaga Bay. The Malin Peninsula is drained by the Keenagh River flowing northwest and into the sea south of Malin Head.

Much of the north-eastern part of the Inishowen Peninsula is drained by the Culduff River, which flows in a clockwise spiral past Gleneely and into the sea at Culdaff bay. The southeastern part of the catchment is drained by a series of small rivers including the Aught, Cabry, Drung, Fad, Breedagh and Greencastle Rivers that run southeast from an upland ridge oriented parallel to the shoreline of Lough Foyle.

This catchment comprises six sub-catchments (Table 1, Figure 1) with 36 river water bodies, one lake, one transitional, five coastal water bodies, three which are common to other catchments, and two groundwater bodies. There are no heavily modified water bodies in the catchment. Several water bodies are shared with Northern Ireland.

Table 1. List of subcatchments in the Donagh-Moville catchment

| Subcatchment ID | Subcatchment Name |
|---|---|
| 40_1 | Clonmany_SC_010 |
| 40_2 | Glennagannon_SC_010 |
| 40_3 | Malin[Stream]_SC_010 |
| 40_4 | Culduff_SC_010 |
| 40_5 | Greencastle_SC_010 |
| 40_6 | BogstownRiver_SC_010 |

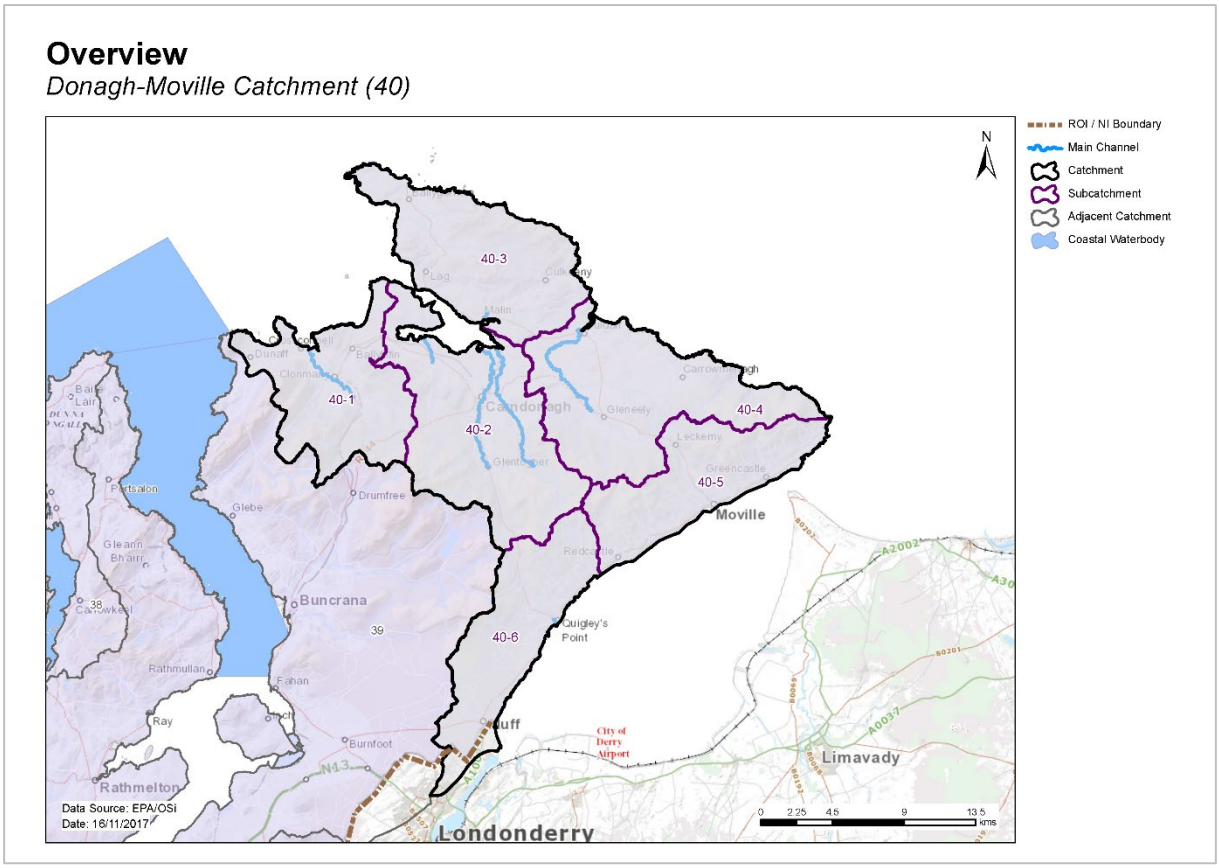


Figure 1. Location and subcatchments in the Donagh-Moville catchment

# 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 eight (22%) river and lake water bodies at Good or High status, and 16 (43%) at less than Good status in 2015 (Table 1). Thirteen (35%) river water bodies are unassigned.

- Four water bodies (3 rivers, 1 lake) have a High Ecological Status objective. In 2015, one water body was at High status, two at Good and one at Poor (Appendix 1, Figure 3).

- The numbers of river water bodies at each status class in 2007-09 and 2010-15 are shown in Figure 4, with the catchment-wide changes illustrated in Figure 6. Two river water bodies have improved and seven have deteriorated. There was no change in the status of the lakes.

- The Donagh-Moville catchment is comprised of several river water bodies rather than one main channel. The largest channels in the catchment are the Clonmany and Donagh Rivers, the variation in nutrient concentrations and loads in which are illustrated in Appendix 2.

### 2.1.2 Transitional and Coastal (TraCs)

- Of the six TraCs water bodies, one was at High status, with the remaining five being unmonitored (Table 2 and Figure 5).

- One of the TraC water bodies has a High Ecological Status objective, North-western Atlantic Seaboard (HAs 37;38). In 2015, this water body was at High status (Appendix 1, Figure 3).

- The numbers of TraCs water bodies at each status class in 2007-09 and 2010-2015 are shown in Figure 5.

Table 1. Summary of surface water body status and risk categories

| | Number of water bodies | 2010-2015 Status | | | | | | Risk Categories | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | High | Good | Mod | Poor | Bad | Un-assigned | *Not at Risk* | *Review* | *At Risk* |
| Rivers | 36 | 0 | 7 | 1 | 14 | 1 | 13 | 5 | 11 | 20 |
| Lakes | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| TraCs | 6 | 1 | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 1 |

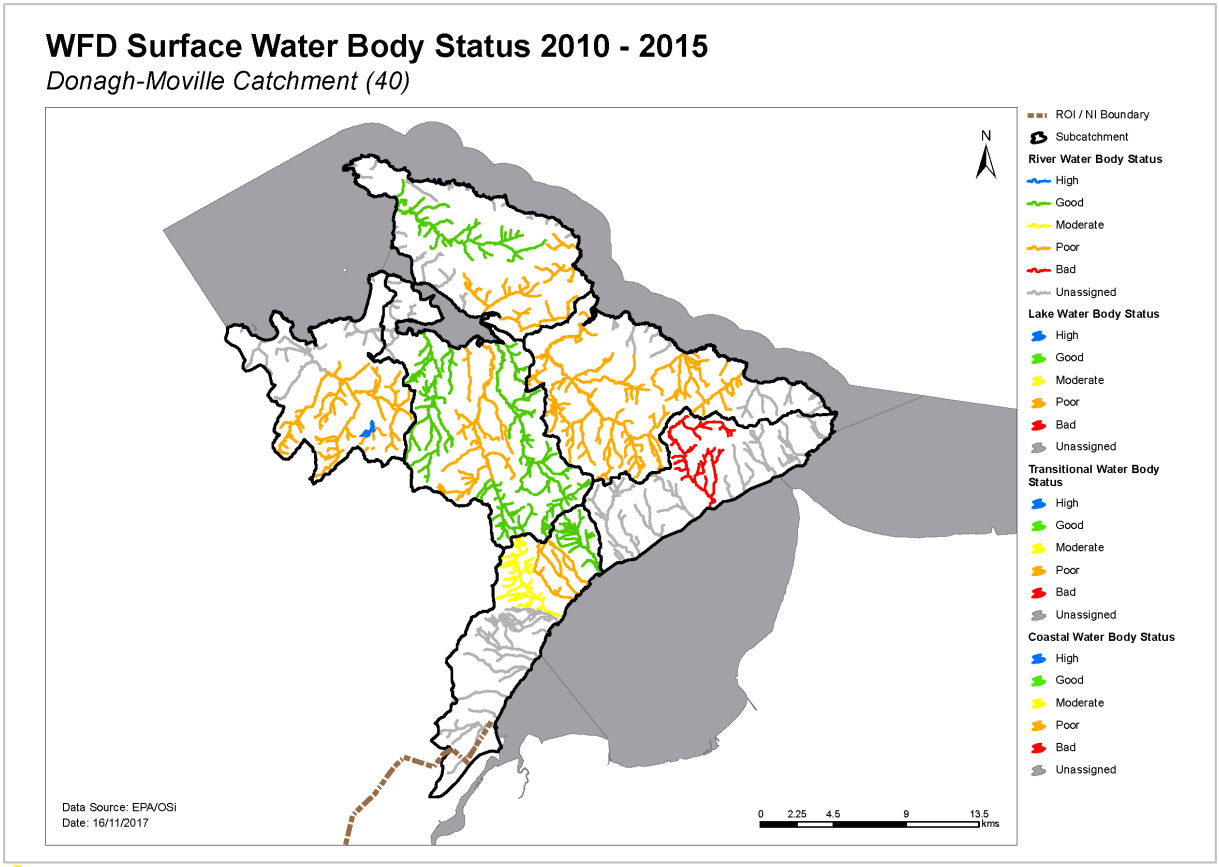



Figure 2. Surface water ecological status.

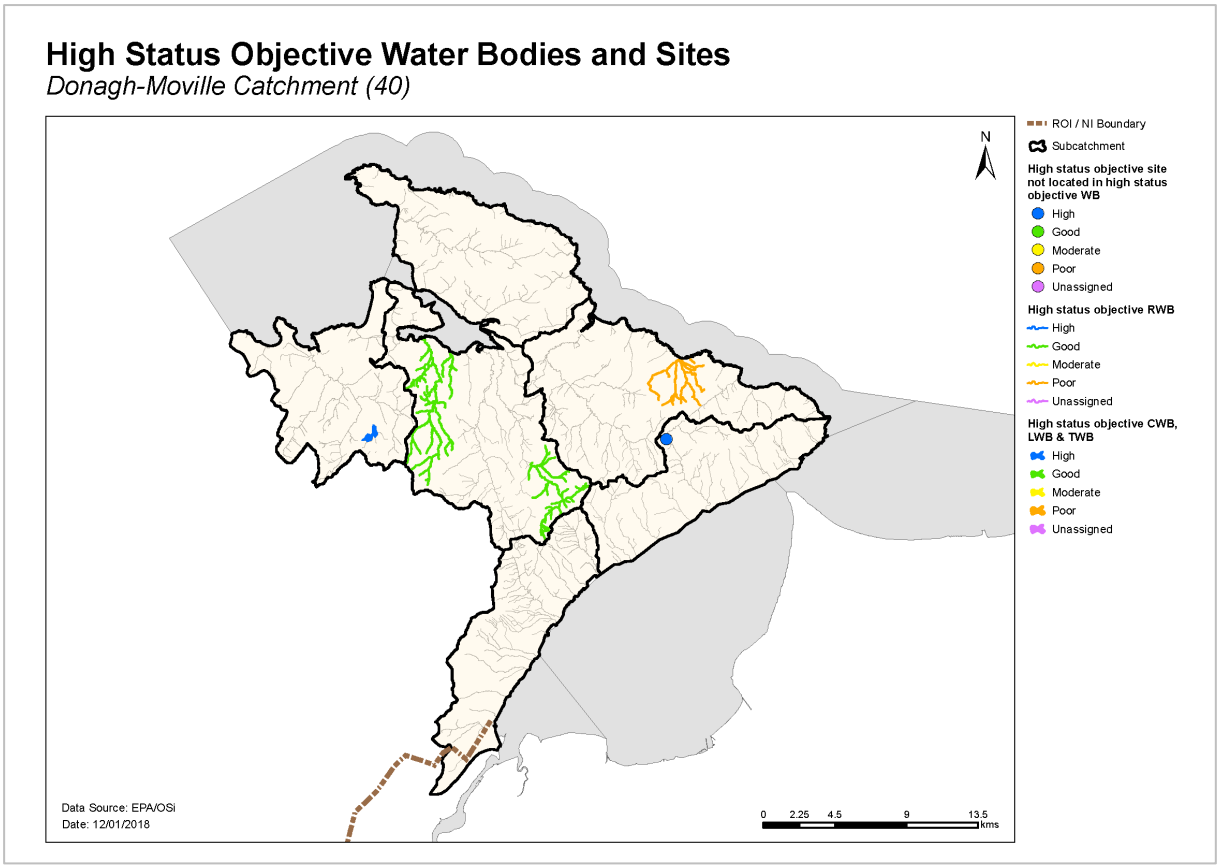



Figure 3. High ecological status objective water bodies and sites

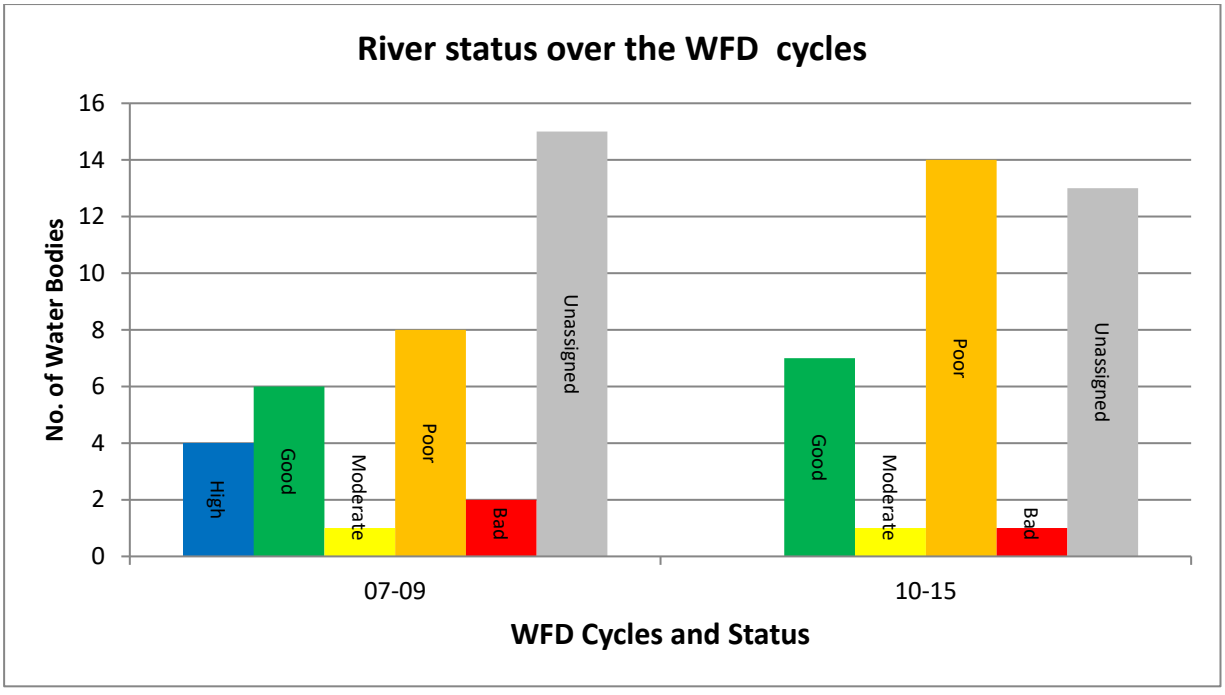



Figure 4. Number of rivers at each status class in 2007-2009 and 2010-2015

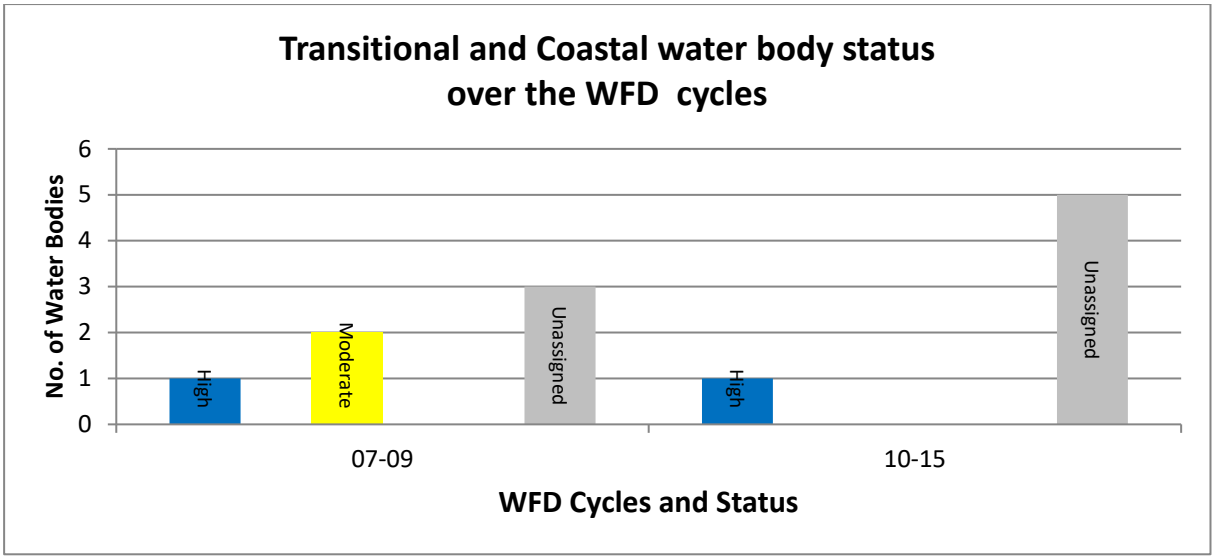



Figure 5. Number of transitional and coastal water bodies at each status class in 2007-2009 and 2010-2015

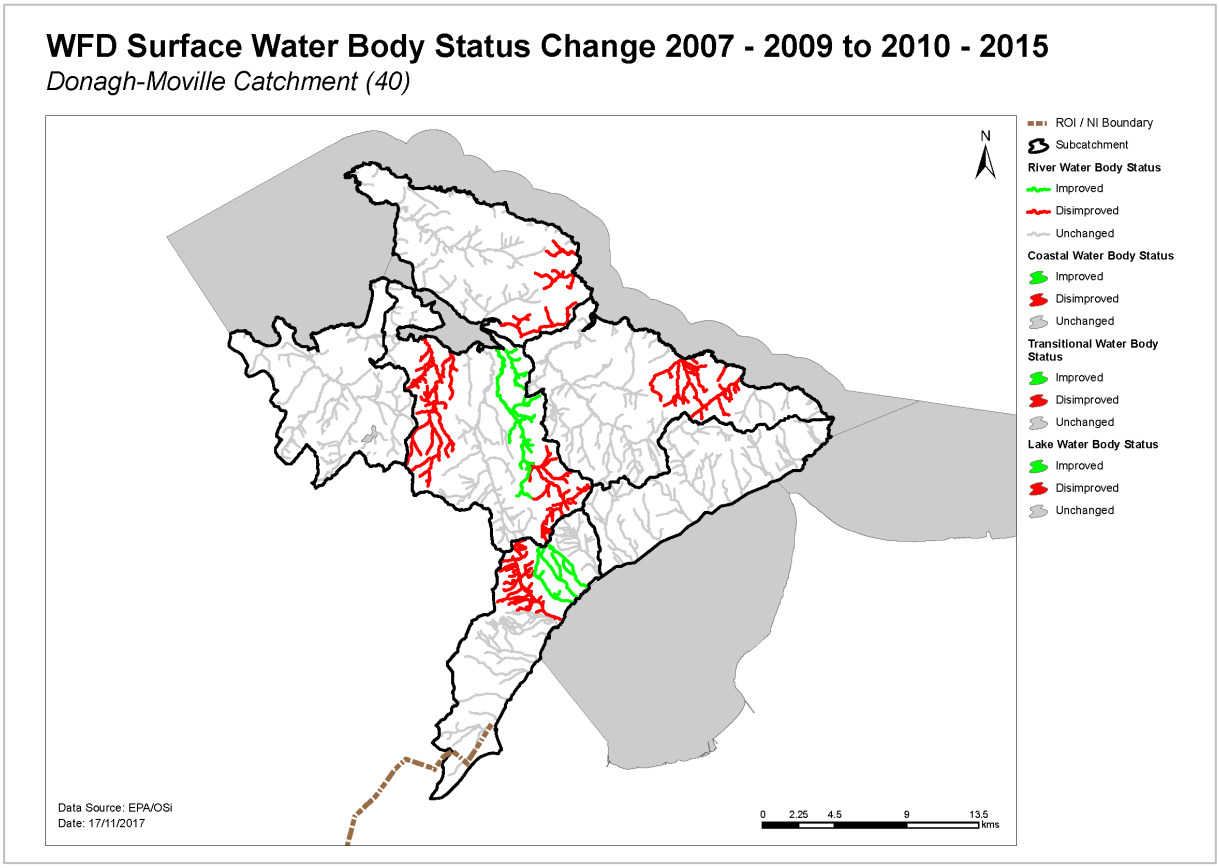



Figure 6. Surface water body status change from 2007-2009 to 2010-2015.

## 2.2 Groundwater status

- Both groundwater bodies in the catchment are classed as Good status and no changes occurred over the last WFD cycle (Table 3 and Figure 7).

Table 3. Summary of groundwater body status and risk

| | Number of water bodies | 2010-2015 Status | | Risk Category | | |
|---|---|---|---|---|---|---|
| | | Good | Poor | *Not at Risk* | *Review* | *At Risk* |
| Groundwater | 2 | 2 | 0 | 2 | 0 | 0 |

## 2.3 Risk of not meeting surface water environmental objectives

### 2.3.1 Rivers and Lakes

- Five river water bodies and one lake water body are *Not at Risk* (Figure 7 and Table 1) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Eleven river water bodies are in *Review*. This applies to eight river water bodies where more information is required and three river water bodies where measures have recently been implemented and improvements have not yet been realised.
- Twenty 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. Summary information for the *At Risk* water bodies is given in Appendix 3.

### 2.3.2 Transitional and Coastal (TraC)

- Five of the six TraC water bodies are *Not at Risk* (Figure 7, Table 2) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- One water body is *At Risk* of not meeting its water quality objectives. Measures will be needed to improve the water quality outcomes.

## 2.4 Risk of not meeting groundwater quality objectives

- Both 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.

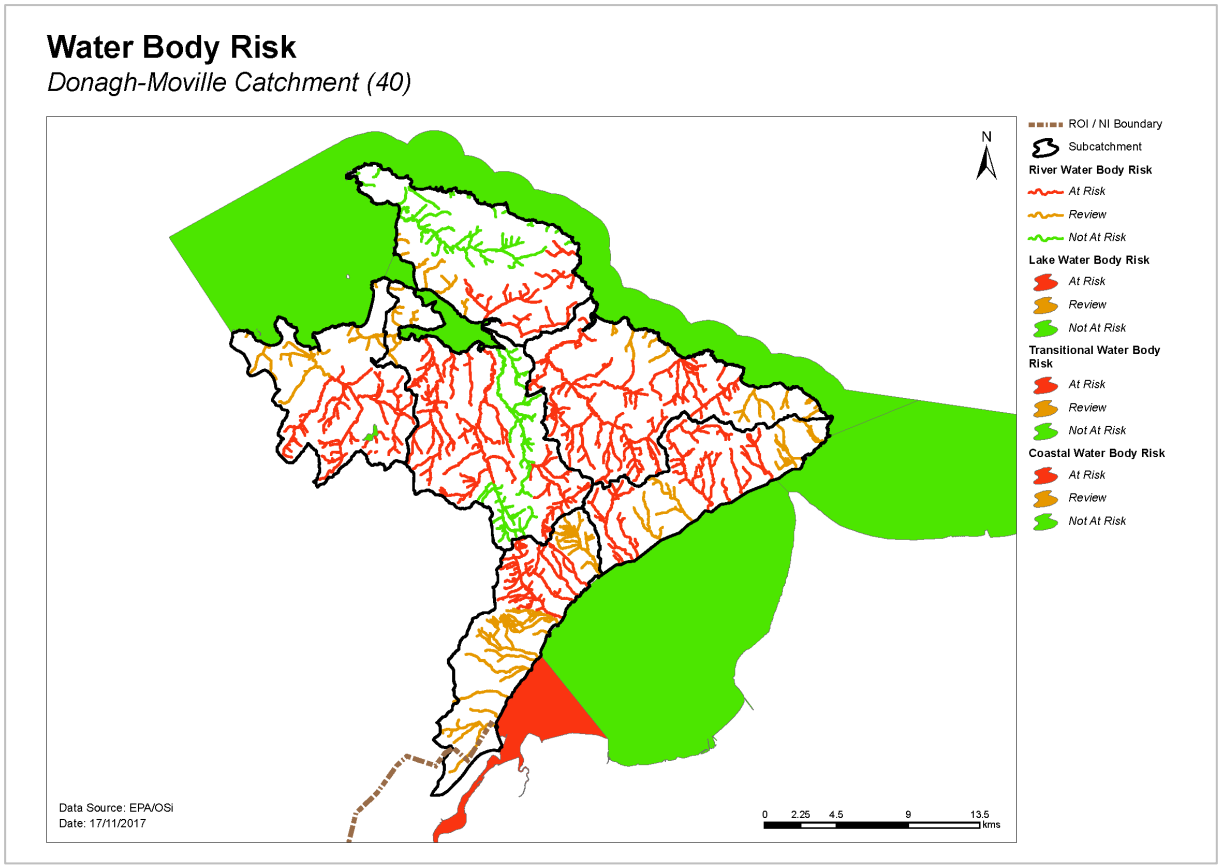



Figure 7. Surface water body risk.

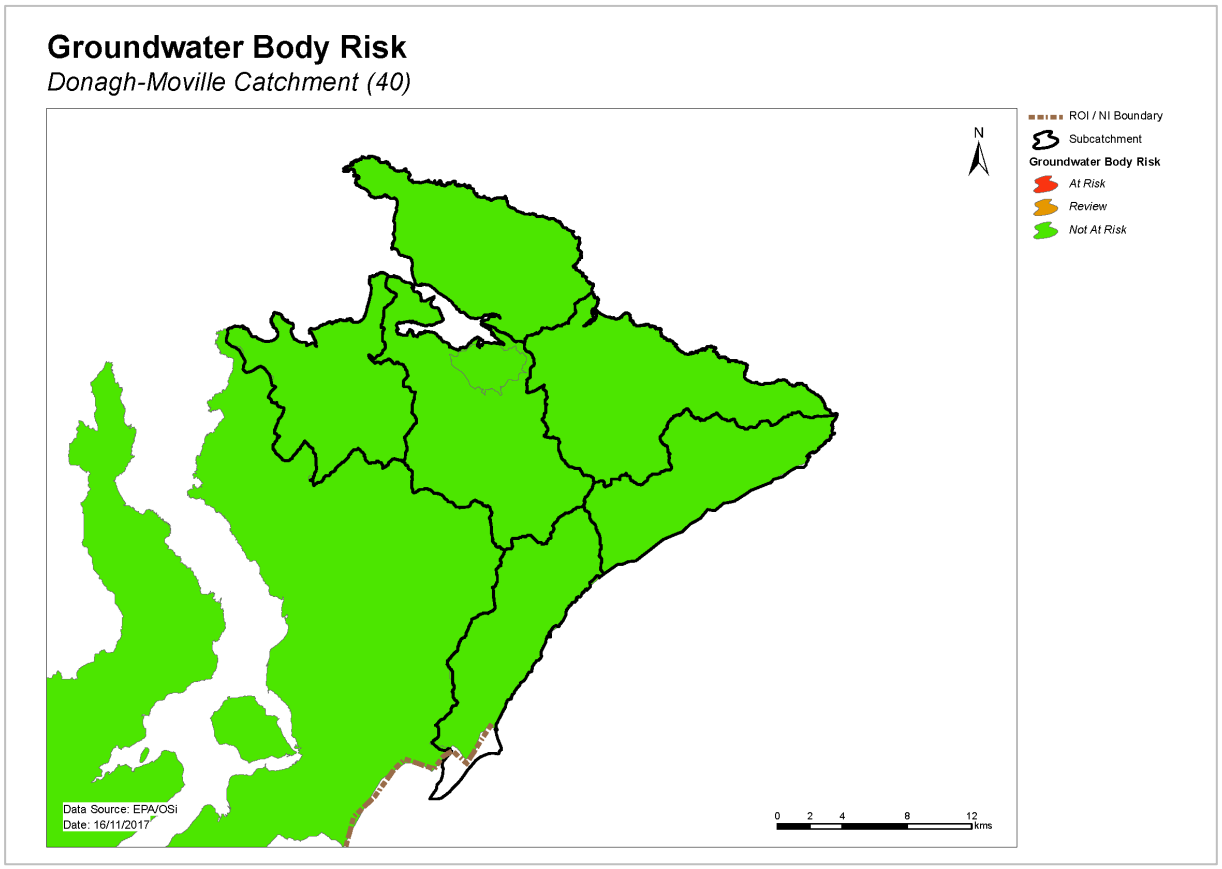



Figure 8. Groundwater body risk

## 2.5 Protected areas

### 2.5.1 Drinking Water Protected Areas

- There are six drinking water schemes in total with nine abstractions in the Donagh-Moville Catchment, comprising the Carndonagh, Greencastle, Inishowen East and West, Culdaff and Gleneely supplies all owned by Irish Water. There are no private group water schemes in the catchment.
- Three of the drinking water abstractions are from groundwater bodies (Gleneely GWB, Carndonagh GWB and Greencastle GWB), one from a WFD lake Lough Fad or Fad Meendoran and one from the outlet of Lough Nastackan on the Culdaff river, and one from the Ballymacarthur Stream. The list of the public supplies and the associated water bodies is provided in Appendix 4.
- All sources were compliant with the standards for nitrate in 2015.
- All public sources were compliant with the standards for pesticides in 2015.
- All nine-drinking water protected areas had therefore met their WFD protected area objectives in 2015.

### 2.5.2 Bathing Waters

- There are two designated marine bathing water areas in catchment. Both are in a satisfactory condition. The list of the bathing waters and the associated water bodies is provided in Table 4.

### 2.5.3 Shellfish Area

- There is one designated shellfish area in the Donagh Moville catchment. The shellfish area is compliant with the relevant standards and there are no water quality issues of concern. The details on this shellfish water and the associated water bodies are provided in Table 5.

Table 4. Bathing Waters in the catchment

| Bathing Water | | Water Body Intersection | | Objective met? | |
|---|---|---|---|---|---|
| Name | Code | Name | Code | Yes | No |
| Stroove | IENWBWC230_0000_0100 | North Atlantic Seaboard(HA40;02) | IE_NW_230_0000 | ✓ | |
| Culdaff | IENWBWC230_0000_0200 | North Atlantic Seaboard(HA40;02) | IE_NW_230_0000 | ✓ | |

Table 5. Shellfish Waters in the catchment

| Shellfish Area | | Water Body Intersection | | Objective met? | |
|---|---|---|---|---|---|
| Name | Code | Name | Code | Yes | No |
| Trawbreaga Bay | IEPA2_0043 | North Atlantic Seaboard(HA40;02) | IE_NW_230_0000 | ✓ | |

### 2.5.4 Nutrient Sensitive Areas

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

### 2.5.5 Natura 2000 Sites

- There are two Special Areas of Conservation (SACs) in the catchment, not all of which have water quality and/or quantity conservation objectives for their qualifying interests.
- The groundwater body (Lough Swilly GWB) with water dependent qualifying interests within these SACs has met its WFD Protected area objectives (Appendix 5).

- There are three Special Protected Areas (SPAs) in the catchment:
    - Lough Foyle SPA 004087
    - Malin Head SPA 004146
    - Trawbreaga Bay SPA 004034

  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.

## 2.6 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 in some case ammonia, are the dominant issues in the rivers.
- Hydromorphological pressures are noted in the catchment, resulting in poor habitat quality.
- Impacts from phosphorus as well as specific pollutants have been identified as significant issues using Northern Ireland Environment Agency (NIEA) monitoring data.
- As there are no *At Risk* groundwater bodies, there are no significant issues associated with them.

# 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.
- Figure 9 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 in 21 water bodies by the initial characterisation process, 13 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 domestic waste water, urban waste water, other, diffuse urban, hydromorphological pressures and peat drainage/extraction.
- The significant pressures affecting the Foyle and Faughan estuaries are unknown.

### 4.1.2 Groundwater

- As there are no *At Risk* groundwater bodies, there are no significant pressures associated with them.

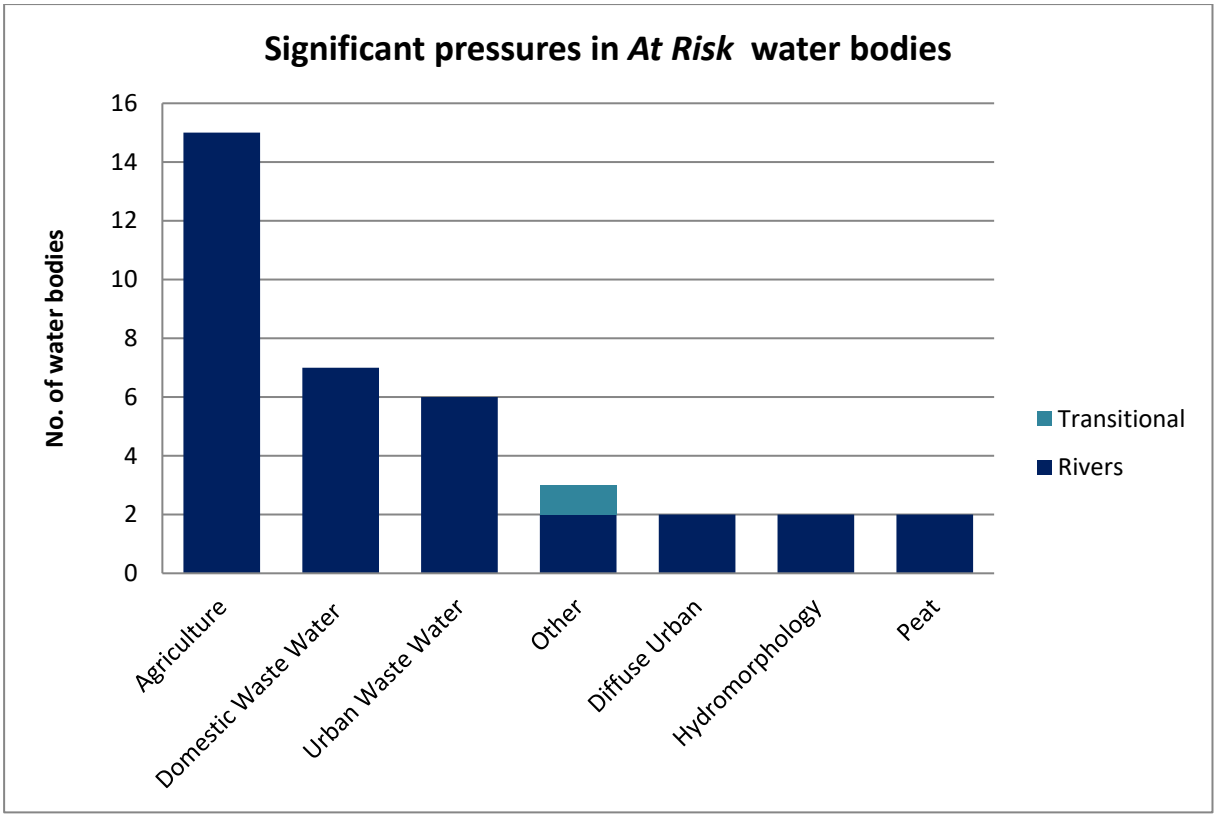


Figure 9. Significant pressures impacting on *At Risk* water bodies.

## 4.2 Pressure types

### 4.2.1 Agriculture

- Agriculture is a significant pressure in the catchment areas of 15 river water bodies. The water bodies affected by farming are shown in Figure 10. The issues related to farming in this catchment are mainly loss of 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 phosphorus loss from agriculture to surface water is given in Appendix 6.

### 4.2.2 Domestic Waste Water

- Domestic waste water treatment systems (septic tank systems) has been identified as a significant pressure in seven river water bodies located in subcatchments Clonmany (SC_010), Glennagannon (SC_010) and Malin [Stream] (SC_010) (Figure 11). The impacts relate to unsuitable domestic waste water systems located on poorly draining soils with insufficient percolation. This has resulted in elevated nutrient concentrations in nearby watercourses.

### 4.2.3 Urban Waste Water Treatment Plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been identified as significant pressures in six *At Risk* river water bodies; details are given in Table 6 and Figure 12. Moville WWTP, which impacts Bredagh_010, is scheduled to be upgraded by 2021.

Table 6. 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 | Water Body | 10-15 Ecological Status | Expected Completion Date |
|---|---|---|---|---|
| Moville D0212 | 2,000 to 10,000 p.e. | Bredagh_010 | Bad | 2021 |
| Clonmany D0533 | 500 to 1,000 p.e. | Clonmany_020 | Poor | *N/A* [1] |
| Gleneely A0368 | < 500 p.e. | Culdaff_010 | Poor | *N/A* [1] |
| Culdaff A0308 | < 500 p.e. | Culdaff_020 | Poor | *N/A* [1] |
| Carndonagh-Malin D0113 | 2,001 to 10,000 p.e. | *Donagh_030* [2] | Poor | *N/A* [1] |
| Redcastle Housing Scheme A0494 | < 500 p.e. | Fad (Redcastle)_010 | *Unassigned* [3] | *N/A* [1] |

### 4.2.4 Other significant pressures

*Unknown Anthropogenic*

- The transitional water body Foyle and Faughan Estuaries has unknown anthropogenic pressure(s) and further investigative assessment will need to be undertaken. Figure 13.

*Water Treatment*

- One *At Risk* river Clonmany_010, is impacted from discharges from the water treatment plant. Figure 14.

*Waste*

- One *At Risk* river Cabry_010 is impacted by illegal waste dumping Figure 15.

### 4.2.5 Diffuse Urban Pressures

- Diffuse urban pressures, caused by misconnections, leaking sewers and runoff from paved and unpaved areas, have been identified as a significant pressure in two river water bodies in the Greencastle_SC_010 subcatchment (Figure 16). This is a diffuse pressure from urban expansion in the Moville and Greencastle agglomerations with misconnections and lack of capacity in the existing system. This area is being considered under the Moville/Greencastle sewerage scheme, but no progress has been made to-date.

[1] *Currently not specified in improvement plans.*
[2] *The agglomeration network, rather than the WWTP, has been identified as a significant pressure impacting Donagh_030.*
[3] *Ecological Status is not available for Fad (Redcastle)_010, however, following discussions with Donegal County Council, this water body was deemed to be At Risk of not meeting its environmental objectives.*

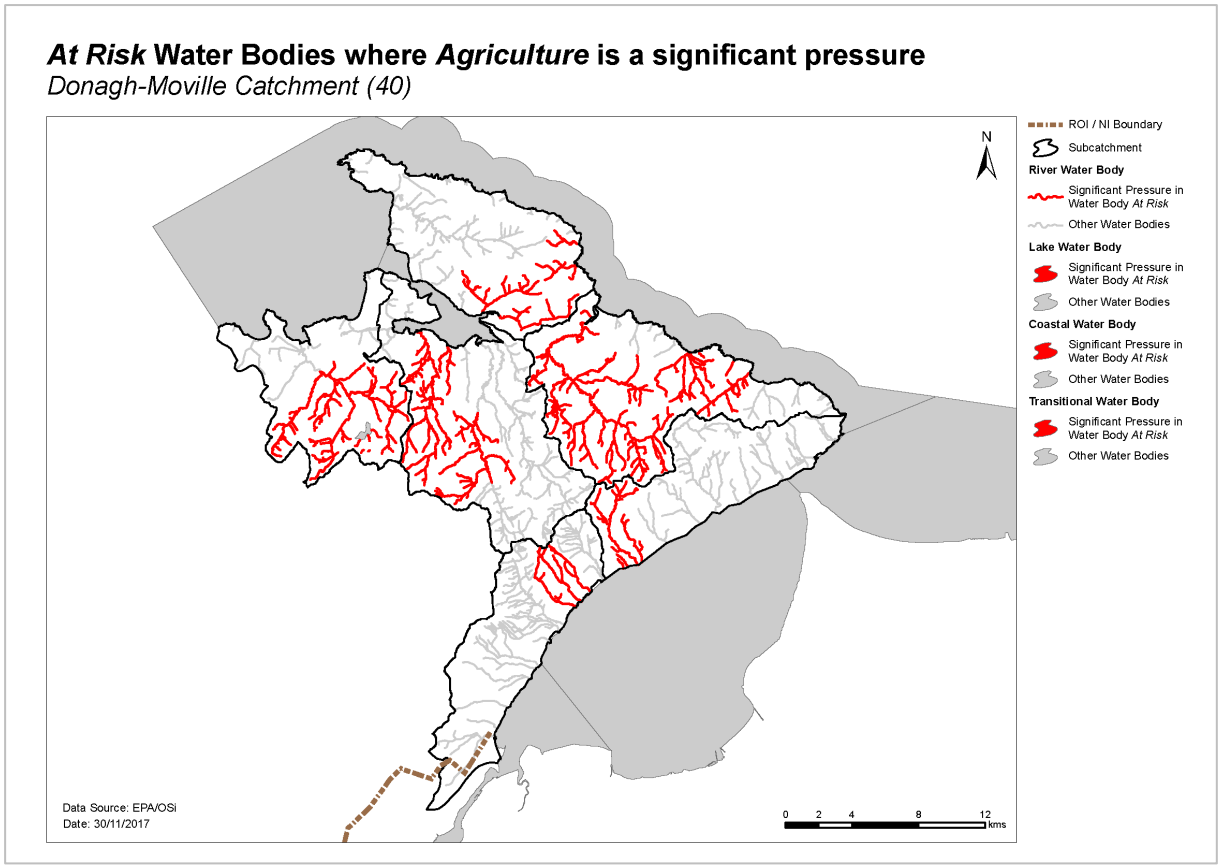



Figure 10. Water bodies that are *At Risk* and are impacted by agricultural activities

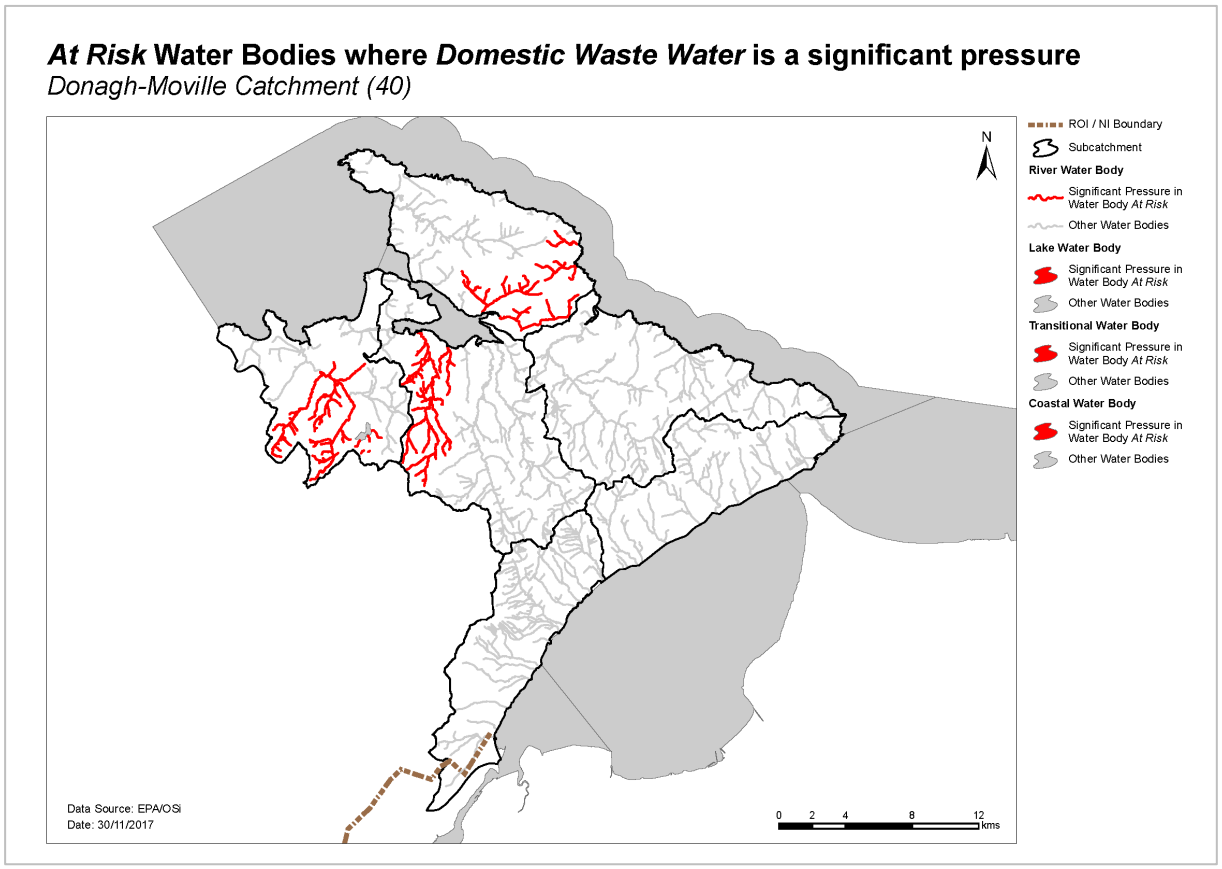



Figure 11. Water bodies that are *At Risk* and are impacted by domestic waste water treatment

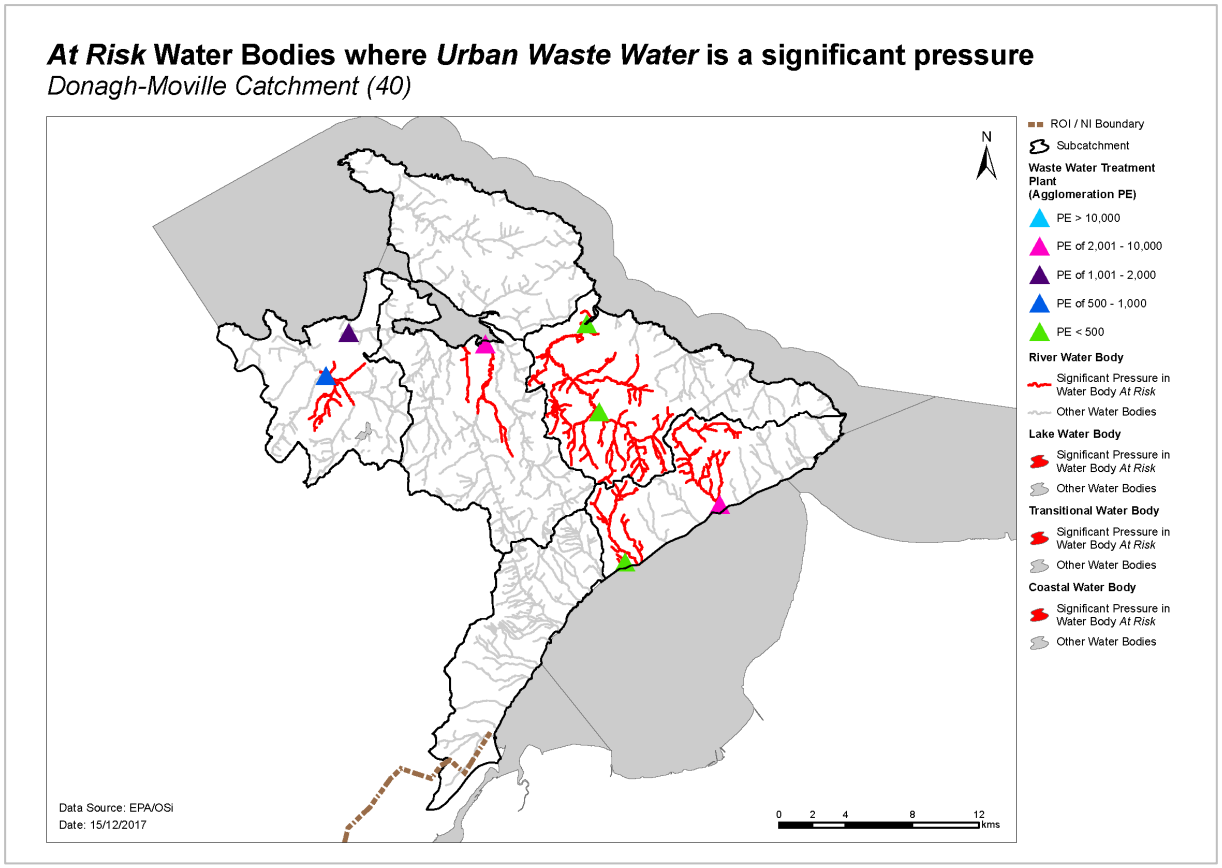



Figure 12. Water bodies that are *At Risk* and are impacted by urban waste water treatment systems

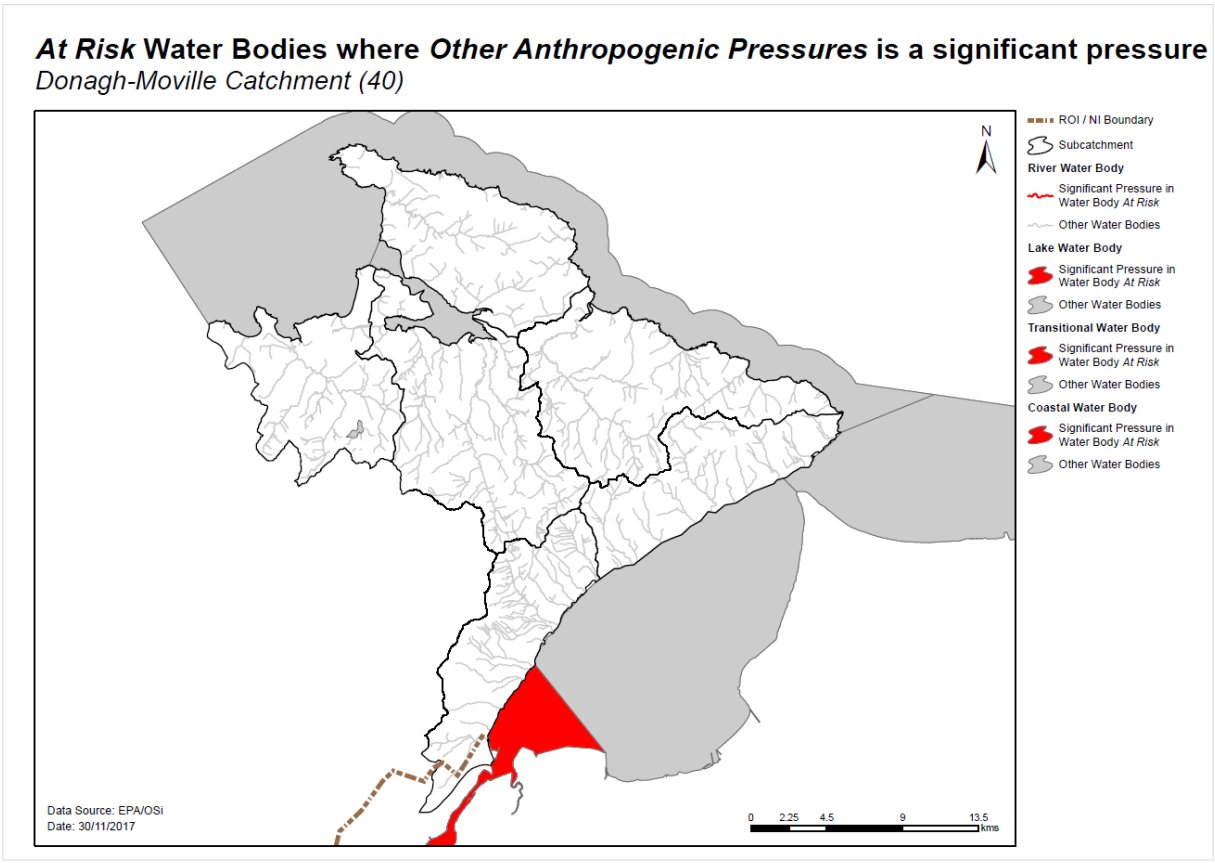



Figure 13. Water bodies that are *At Risk* and are impacted by other anthropogenic pressures

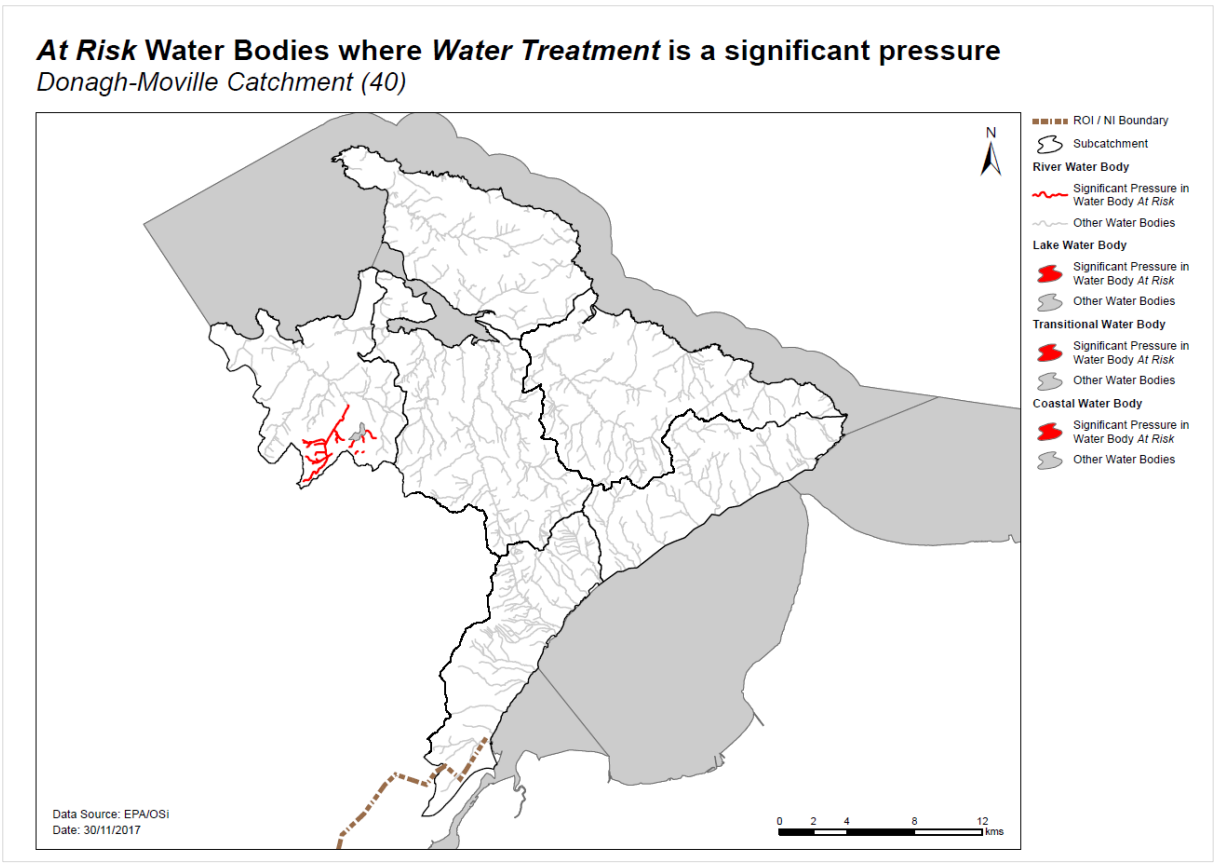



Figure 14. Water bodies that are *At Risk* and are impacted by water treatment

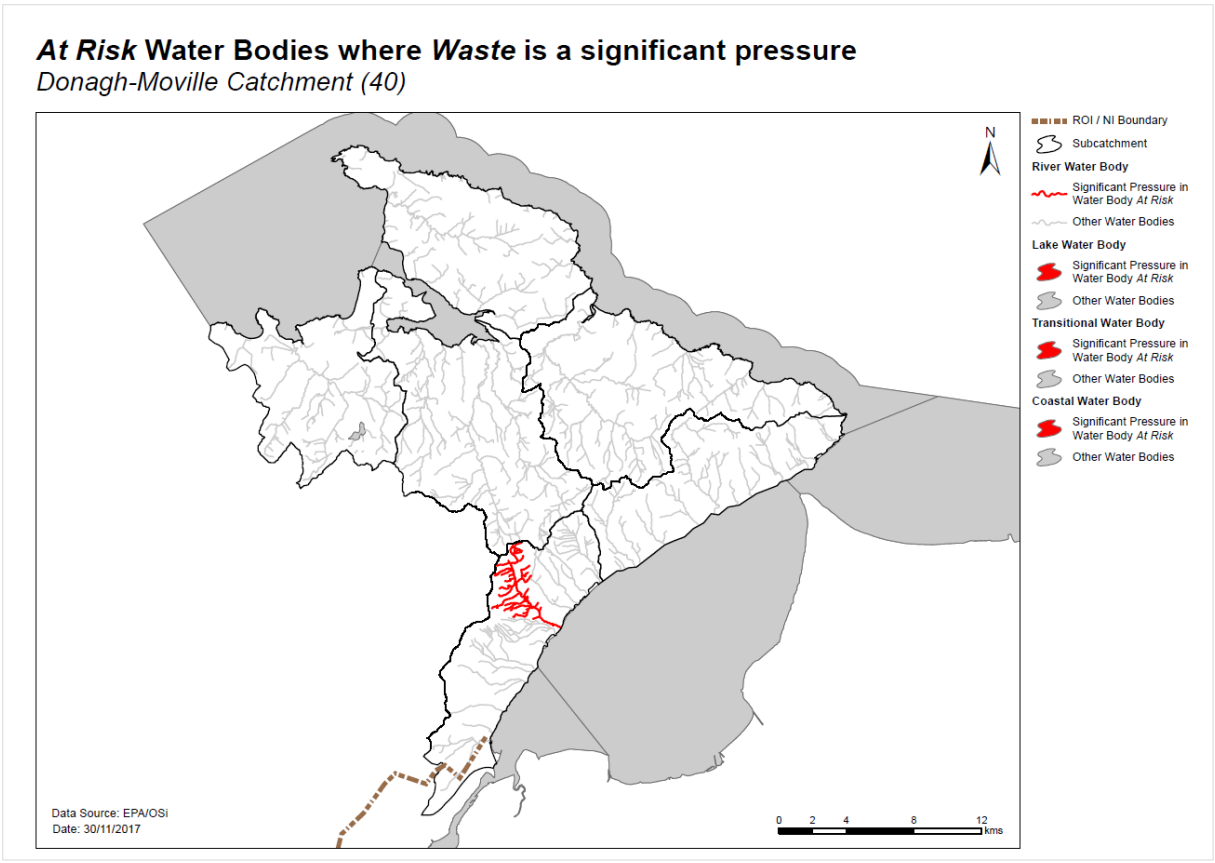



Figure 15. Water bodies that are *At Risk* and are impacted by waste

### 4.2.6 Hydromorphology

- The topography and high rainfall within river water bodies (2) of the Glennagannon (SC40_2) and Bogstown River (SC40_6) subcatchments have contributed to high levels of fine sediment (Figure 17). In addition, the river water body within the Glennagannon subcatchment was subject to recent dredging.

### 4.2.7 Extractive Industry

*Peat*

- Peat drainage and extraction have been identified as a significant pressure in two river water bodies in the Glennagannon (SC_010) subcatchment (Figure 18), resulting in elevated ammonia concentrations and impacts by fine sediment.

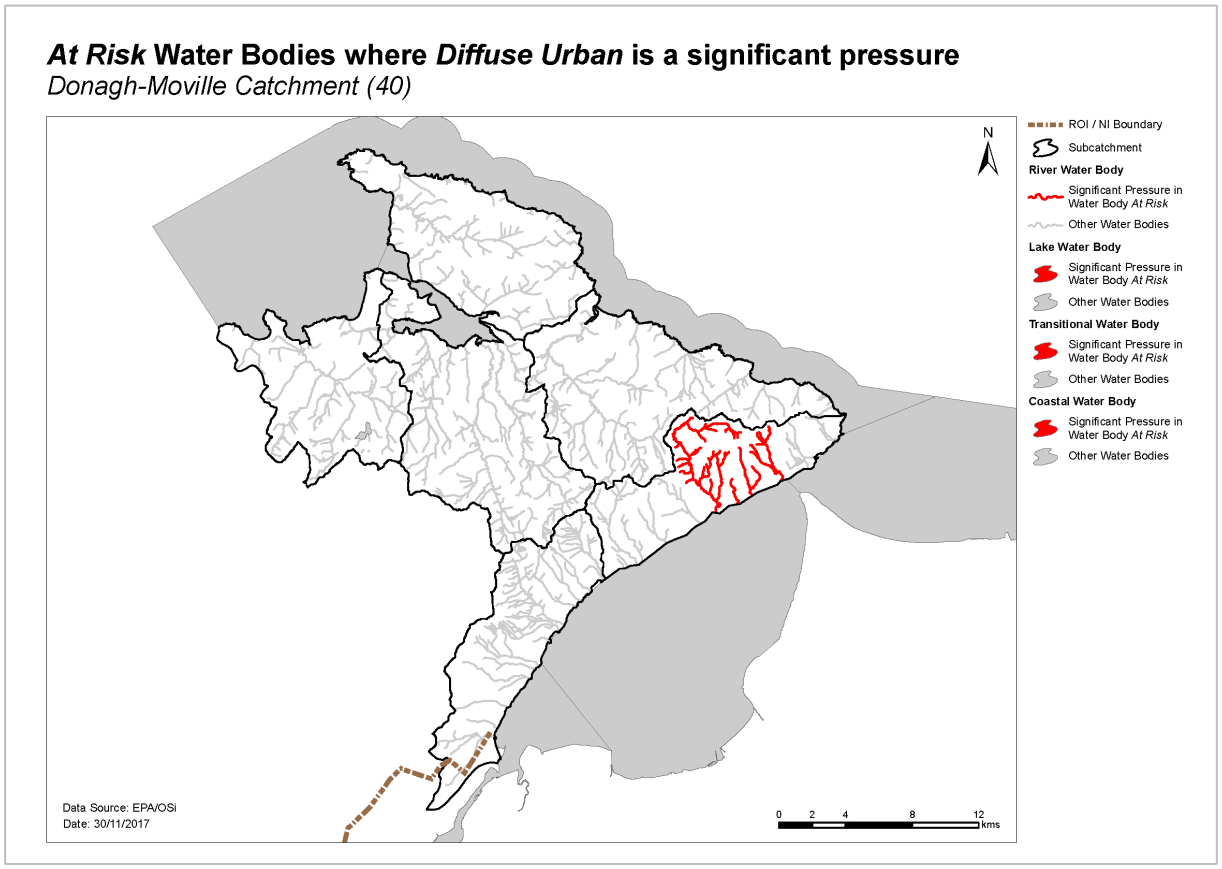



Figure 16. Water bodies that are *At Risk* and are impacted by diffuse urban pressures

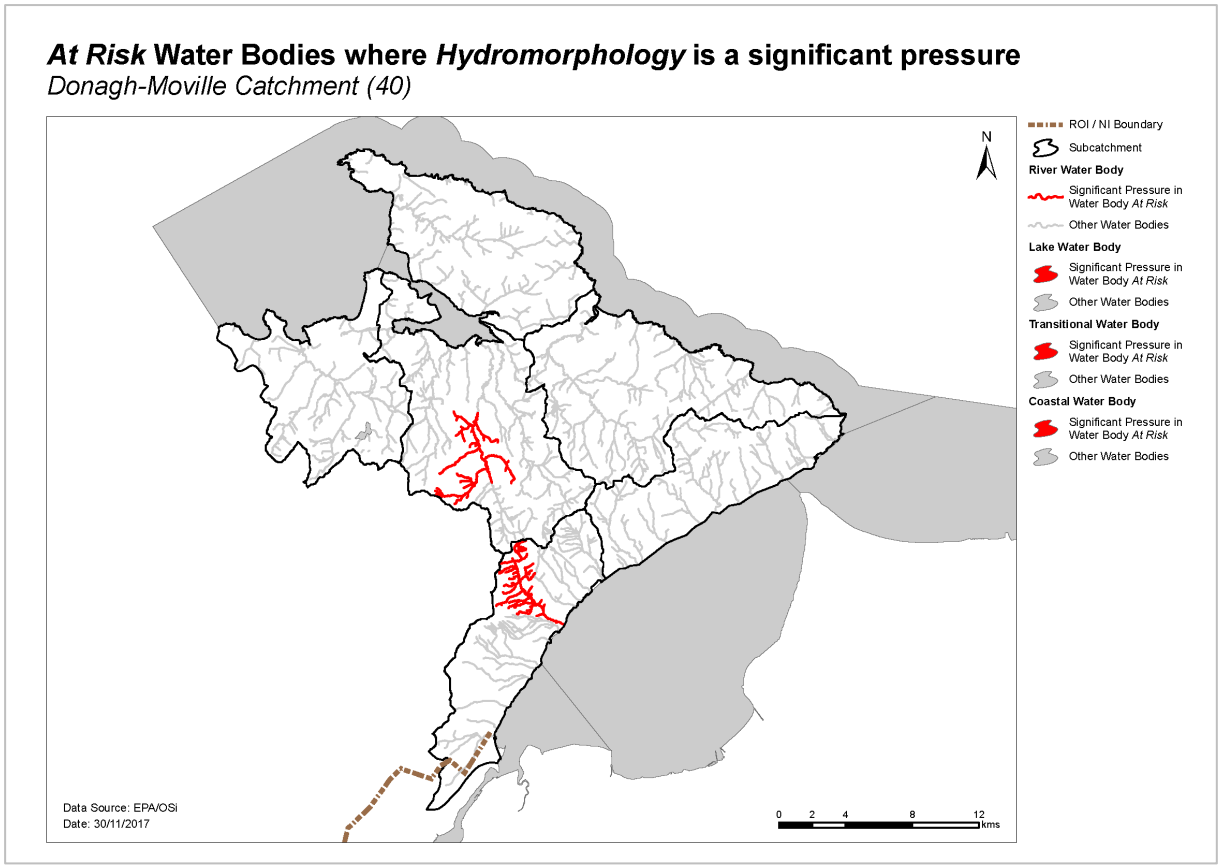



Figure 17. Water bodies that are *At Risk* and are impacted by hydromorphological pressures

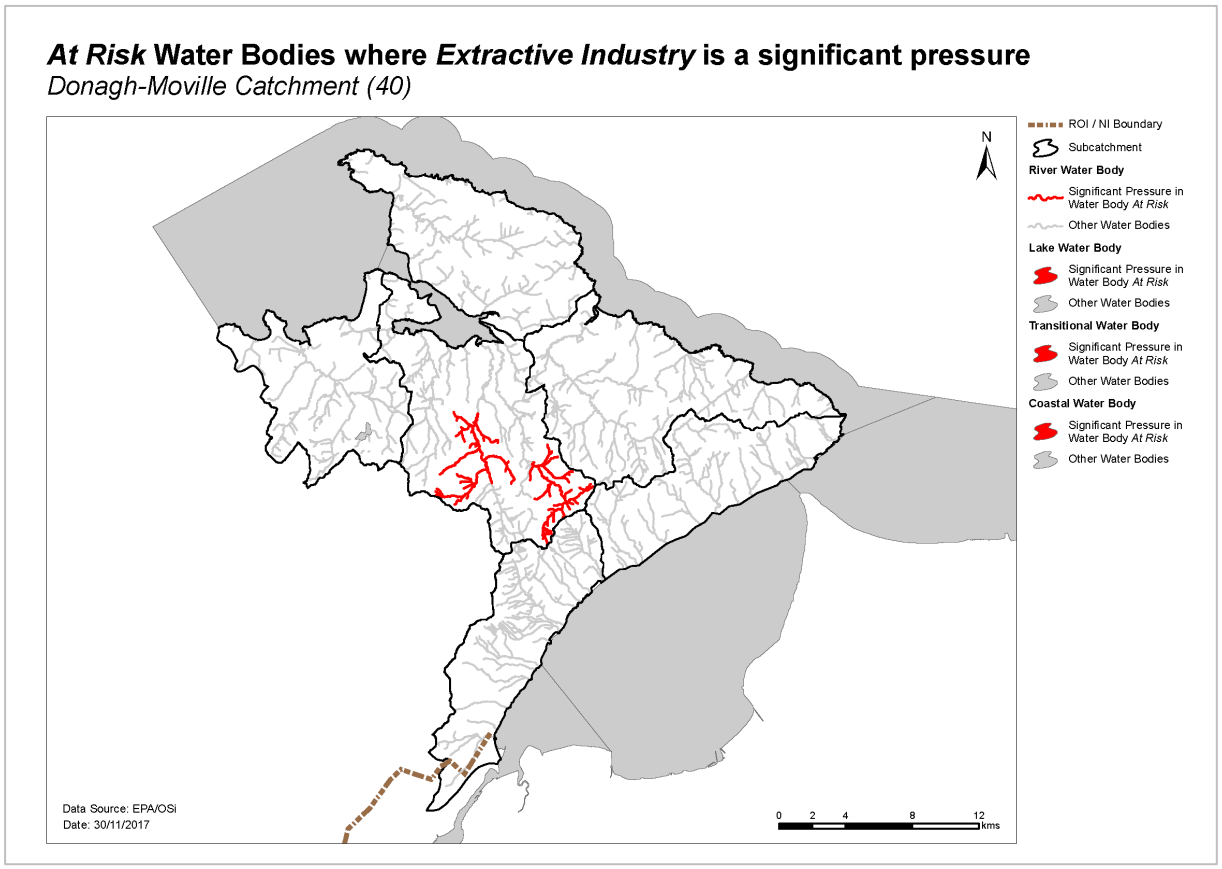



Figure 18. Water bodies that are *At Risk* and are impacted by peat drainage and extraction.

# 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 30$^{th}$ 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 14 of the 21 *At Risk* river water bodies in the Donagh-Moville catchment. Mean phosphorus concentrations were below the EQS in all of them which means that they did not require load reductions.

## 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 where monitoring data in insufficient, an ongoing programme of modelling has been undertaken to estimate potential nutrient load removal from contributing sub-catchments.

Different estuaries may require reductions in different nutrients. Further modelling work is required to determine precisely what load reductions are required, but in the interim, further monitoring will be carried out to assess the improvements resulting from various planned measures, and to confirm the nature of the issues.

The Foyle and Faughan Estuary has been placed At Risk based on the status assigned by the NIEA with elevated phosphate concentrations identified as the significant issue. The load reduction needed in the Foyle and Faughan estuary, which is a cross border estuary, is currently unknown and will require further assessment.

# 6 Further Characterisation and Local Catchment Assessments

- Further characterisation through local catchment assessments is needed in 21 *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 101 assessment scenarios are given in Appendix 7.

Table 7. Investigative Assessment Allocation for *At Risk* and *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 | 12 | 0 | 0 | 0 | 4 | 2 | 5 | 2 | 0 | 0 | 25 |
| Review | 5 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 12 |
| Note water bodies may have multiple categories of Local Catchment Assessments | | | | | | | | | | | |

# 7 Catchment summary

- Of the 36 river water bodies, 20 are *At Risk* of not meeting their WFD objective.
- There are no lake water bodies *At Risk.*
- Three of the *At Risk* river water bodies are High Ecological Status (HES) objective water bodies that are not meeting their HES objective.
- Excess nutrients, mainly phosphorus but in some case ammonia, are the dominant issues in rivers. Many these cases relate to excess phosphorus leading to eutrophication, primarily from waste water sources, both urban waste water plants and domestic waste water and agricultural sources.
- There is one transitional water body to the south-west, the Foyle and Faughan Estuary, is assigned Moderate status by NIEA and, thus, this transitional water body is *At Risk* of not meeting their WFD objective. Phosphate and priority substances are the issues affecting status. The dominant source of phosphorus is the riverine inputs from the freshwater environment of this catchment. Therefore, the significant pressures recorded for river and lake water bodies also apply to the transitional water body.
- There are no *At Risk* groundwater bodies.

# 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 5 areas for action in the Donagh/Moville 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 Donagh Moville catchment are summarised below.

- Five recommended areas for actions (Table 8, Figure 19) were selected.
- These are the Roosky, Donagh, Clonmany, Malin and Lough Nastackan.
- These include 13 *At Risk* and one *Review* river water bodies.
- There are no *At Risk* or *Review* groundwater bodies in the catchment.

A remaining eighteen *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:

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

Table 8. Recommended Areas for Action in the Donagh Moville Catchment

| Recommended area for action | Number of water bodies | SCs | Local authority | Benefit |
|---|---|---|---|---|
| Roosky | 2 | 40_6 | Donegal | • One deteriorated water body.<br>• Possibility to build on the improvement in Status of one water body.<br>• Small geographical area.<br>• Multiple pressures that can be investigated at the same time. |
| Donagh | 2 | 40_2 | Donegal | • One Deteriorated High Ecological status objective water body.<br>• Starting in the Headwaters.<br>• Multiple pressures incorporating both rural and urban areas. |
| Clonmany | 5 | 40_1 | Donegal | • Similar pressures and issues in all water bodies in the subcatchment.<br>• Whole subcatchment action area starting from the headwaters.<br>• Build on improvements in the Clonmany WWTP. |
| Malin | 3 | 40_3 | Donegal | • Two deteriorated water bodies both of which have previously been Good status.<br>• Same multiple significant pressures in the deteriorated water bodies selected in this action area. |

| | | | | |
|---|---|---|---|---|
| Lough Nastackan | 2 | 40_4 | Donegal | • Two deteriorated water bodies.<br>• One of the deteriorated water bodies has a High Ecological Status objective.<br>• Both deteriorated water bodies were previously at High status.<br>• Individual water bodies with no inflowing water bodies.<br>• Same single significant pressure in both water bodies. |

# 9 Environmental Objectives

## 9.1 Surface Water

- Assuming resources are available and actions are taken in the recommended areas for action, of the 13 *At Risk* river water bodies, it is predicted that 10 (77%) will improve by 2021 and three (23%) 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 10.

Table 10. 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* | 13 | 10 | 3 |
| *Review* | 1 | 0 | 1 |
| **Total** | 14 | 10 | 4 |

- Eleven surface water bodies have met their 2015 environmental objective.
- As action is not yet planned to be taken in the remaining eight *At Risk* surface water bodies, a 2027 date is applied to all eight of the water bodies.
- For the 10 *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 11.

Table 11. 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* | 7 | 0 | 7 |
| *Review* | 10 | 0 | 10 |
| *TraC's* | | | |
| *At Risk* | 1 | 0 | 1 |
| *Review* | 0 | 0 | 0 |
| **Total** | 18 | 0 | 18 |

## 9.2 Groundwater

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

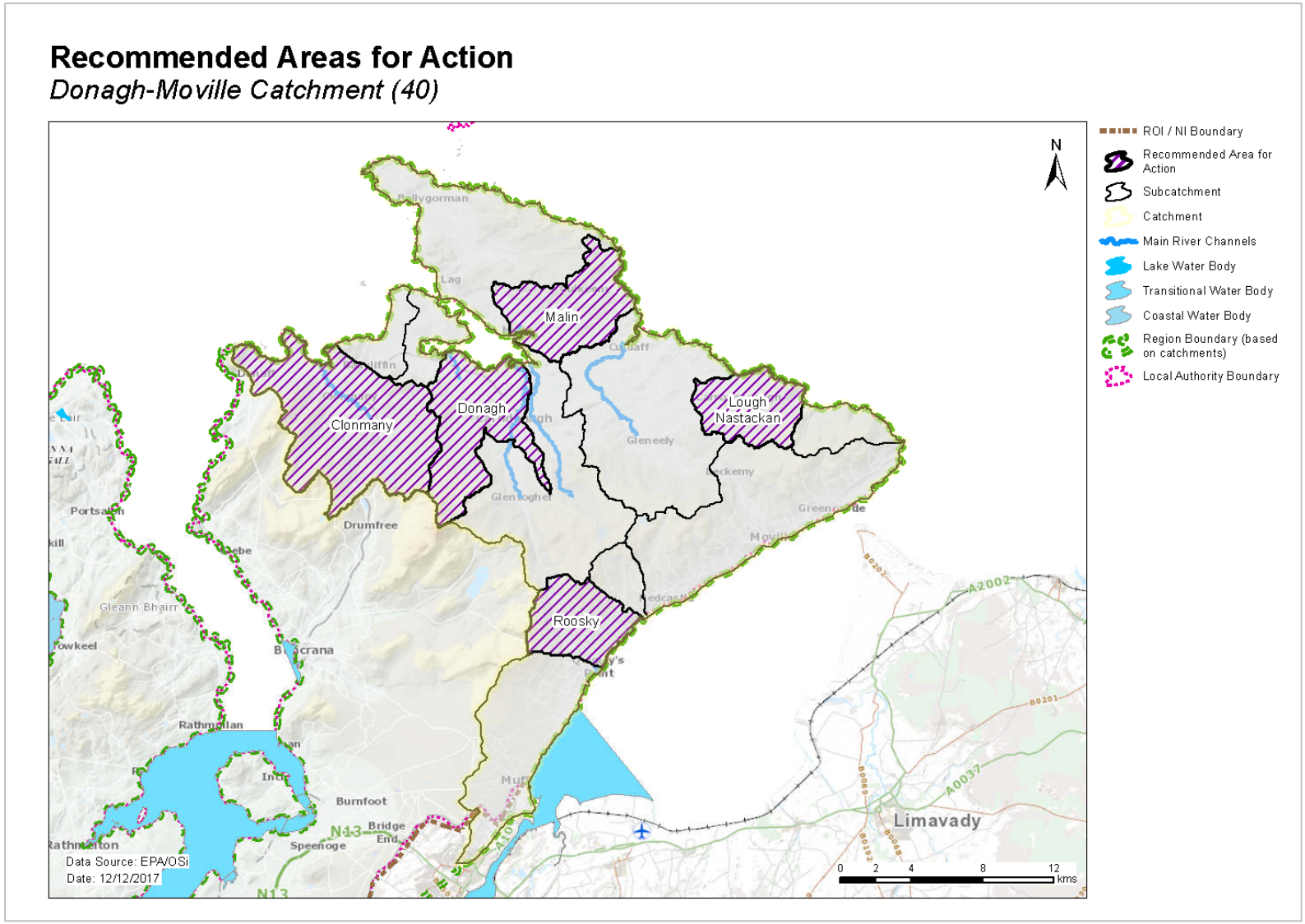



Figure 19. Location of Recommended Areas for Action in the Donagh-Moville Catchment

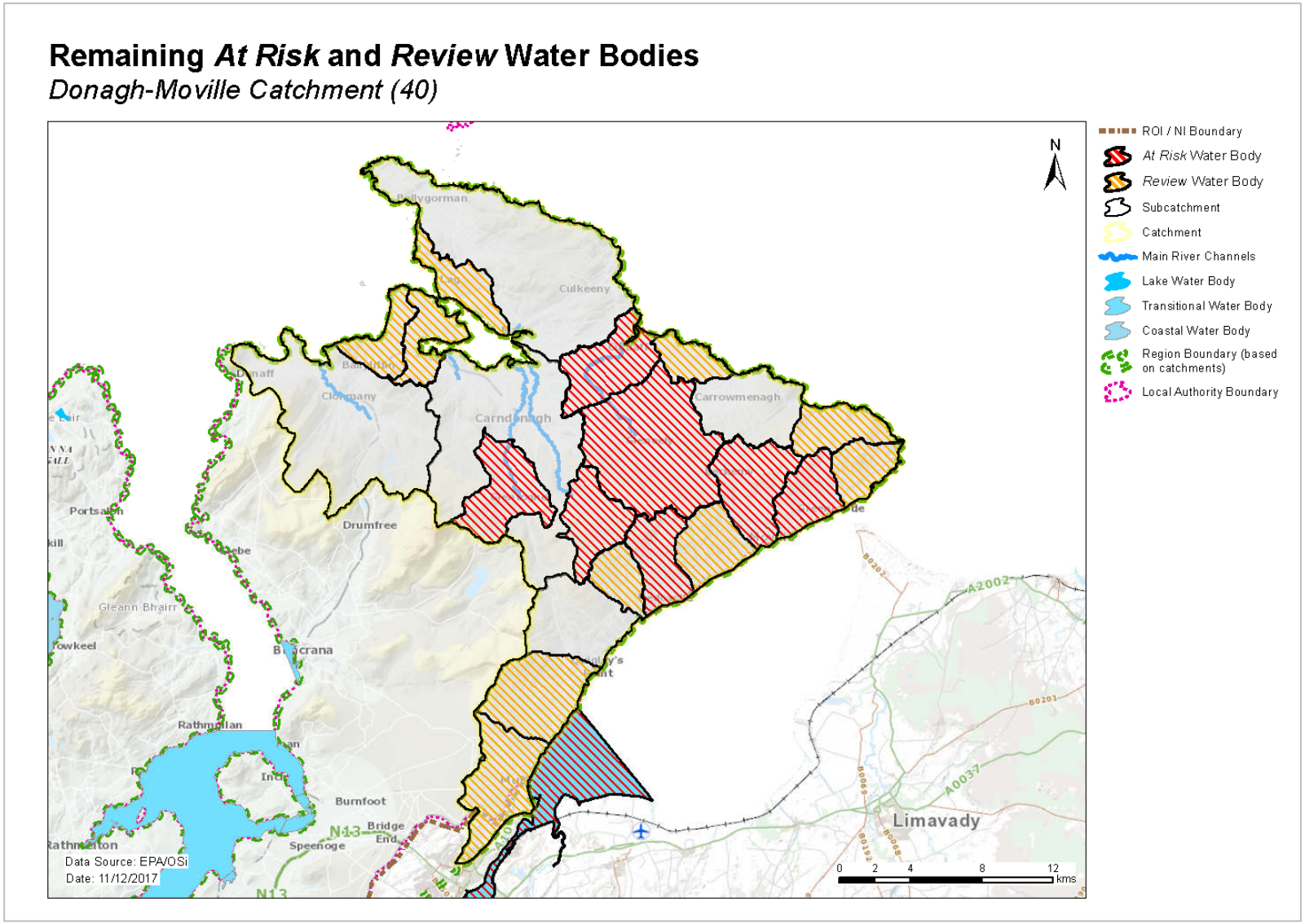



Figure 20. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Donagh-Moville Catchment

## 10 Acknowledgements

This Donagh-Moville 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.
- Loughs Agency.
- Irish Water.
- Inland Fisheries Ireland.
- RPS Group.
- 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 High ecological status objective water bodies

| Water body/ Site | Type | Codes | 2015 Status |
|---|---|---|---|
| GLENNAGANNON_010 | River | IE_NW_40G010015 | Good |
| STRAID_010 | River | IE_NW_40S010400 | Good |
| LOUGH NASTACKAN STREAM_010 | River | IE_NW_40L030400 | Poor |
| Fad Meendoran | Lake | IE_NW_40_2 | High |
| North-western Atlantic Seaboard (HAs 37;38) | Coastal | IE_NW_100_0000 | High |

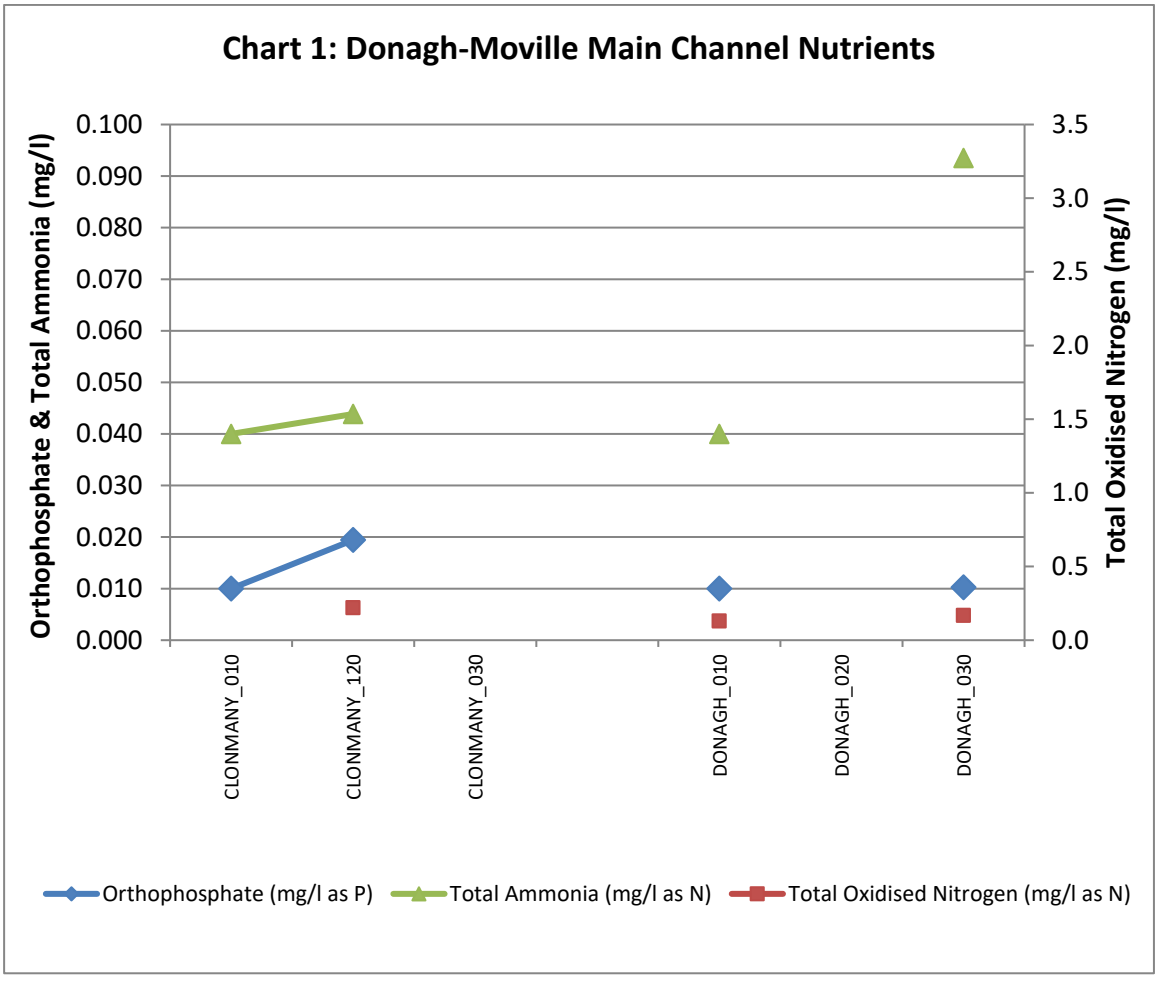
## Appendix 2 Catchment Scale Nutrient concentrations and in-stream loads

The results of the water quality assessment for the Donagh-Moville catchment main channels are illustrated in Chart 1.

Along the Clonmany and Donagh Rivers, orthophosphate concentrations are well below the EQS (0.035mg/l) at all water bodies where data is available, ranging from 0.010 to 0.019mg/l. Orthophosphate increases slightly from CLONMANY_010 to CLONMANY_020, while concentrations in the Donagh show no spatial trend.

Total oxidised nitrogen (TON) concentrations only marginally exceed the limits of detection in both rivers with values consistently below 0.5mg/l at all water bodies where data is available. The TON threshold for drinking water (2.6mg/l) is not exceeded.

Ammonia concentrations in the Clonmany and Donagh Rivers range from 0.040 to 0.094mg/l. In the Clonmany, no observable spatial trend is evident. In the Donagh, a significant spike of 0.094mg/l is observed at DONAGH_030, which exceeds the EQS for ammonia (0.065mg/l).



## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 40_1 | IE_NW_40A090780 | Ardagh 40_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_1 | IE_NW_40C010300 | Clonmany_030 | River | Review | Unassigned | Unassigned | N | | 2027 | Clonmany |
| 40_1 | IE_NW_40B010200 | Ballyhallan_010 | River | At Risk | Poor | Poor | N | Ag,DWW | 2021 | Clonmany |
| 40_1 | IE_NW_40C010100 | Clonmany_010 | River | At Risk | Poor | Poor | N | Ag,DWW,Other | 2021 | Clonmany |
| 40_1 | IE_NW_40C010200 | Clonmany_120 | River | At Risk | Poor | Poor | N | Ag,DWW,UWW | 2027 | Clonmany |
| 40_1 | IE_NW_40C040400 | Cloontagh_010 | River | At Risk | Poor | Poor | N | Ag | 2021 | Clonmany |
| 40_2 | IE_NW_40R020770 | Rashenny 40_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_2 | IE_NW_40D010100 | Donagh_020 | River | At Risk | Unassigned | Poor | N | Ag,Hymo,Peat | 2027 | |
| 40_2 | IE_NW_40D010400 | Donagh_030 | River | At Risk | Poor | Poor | N | UWW | 2027 | Donagh |
| 40_2 | IE_NW_40G010015 | Glennagannon_010 | River | At Risk | High | Good | Y | Peat | 2027 | |
| 40_2 | IE_NW_40S010400 | Straid_010 | River | At Risk | High | Good | Y | Ag,DWW | 2021 | Donagh |
| 40_3 | IE_NW_40B200980 | Ballycramsy_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_3 | IE_NW_40B030400 | Ballyboe_010 | River | At Risk | Good | Poor | N | Ag,DWW | 2021 | Malin |
| 40_3 | IE_NW_40M010200 | Malin Stream_010 | River | At Risk | Poor | Poor | N | Ag,DWW | 2021 | Malin |
| 40_3 | IE_NW_40P020200 | Portaleen_010 | River | At Risk | Good | Poor | N | Ag,DWW | 2021 | Malin |
| 40_4 | IE_NW_40C720780 | Crocklummon_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_4 | IE_NW_40R040490 | Redford_Glebe_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_4 | IE_NW_40C020100 | Culdaff_010 | River | At Risk | Poor | Poor | N | Ag,UWW | 2027 | |
| 40_4 | IE_NW_40C020150 | Culdaff_020 | River | At Risk | Poor | Poor | N | Ag,UWW | 2027 | |
| 40_4 | IE_NW_40L010200 | Long Glen_010 | River | At Risk | High | Poor | N | Ag | 2027 | Lough Nastackan |
| 40_4 | IE_NW_40L030400 | Lough Nastackan Stream_010 | River | At Risk | High | Poor | Y | Ag | 2021 | Lough Nastackan |
| 40_5 | IE_NW_40C150980 | Cooly 40_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_5 | IE_NW_40C210960 | Carrowhugh_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_5 | IE_NW_40F010300 | Fad (Redcastle)_010 | River | At Risk | Unassigned | Unassigned | N | Ag,UWW | 2027 | |
| 40_5 | IE_NW_40B020400 | Bredagh_010 | River | At Risk | Bad | Bad | N | DU,UWW | 2027 | |
| 40_5 | IE_NW_40G020400 | Greencastle_010 | River | At Risk | Unassigned | Unassigned | N | DU | 2027 | |
| 40_6 | IE_NW_40A010930 | Aught 40_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_6 | IE_NW_40A080820 | Ardmore 40_010 | River | Review | Unassigned | Unassigned | N | | 2027 | |
| 40_6 | IE_NW_40C030200 | Cabry_010 | River | At Risk | Good | Moderate | N | Hymo,Other | 2021 | Roosky |
| 40_6 | IE_NW_40D020200 | Drung_010 | River | Review | Good | Good | N | | 2027 | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 40_6 | IE_NW_40R010300 | Roosky_010 | River | At Risk | Bad | Poor | N | Ag | 2021 | Roosky |
| 40_6 | UKGBNI5NW250010 | Foyle And Faughan Estuaries | Transitional | At Risk | Moderate | Unassigned | N | Other | 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 4 Drinking water supplies in the catchment

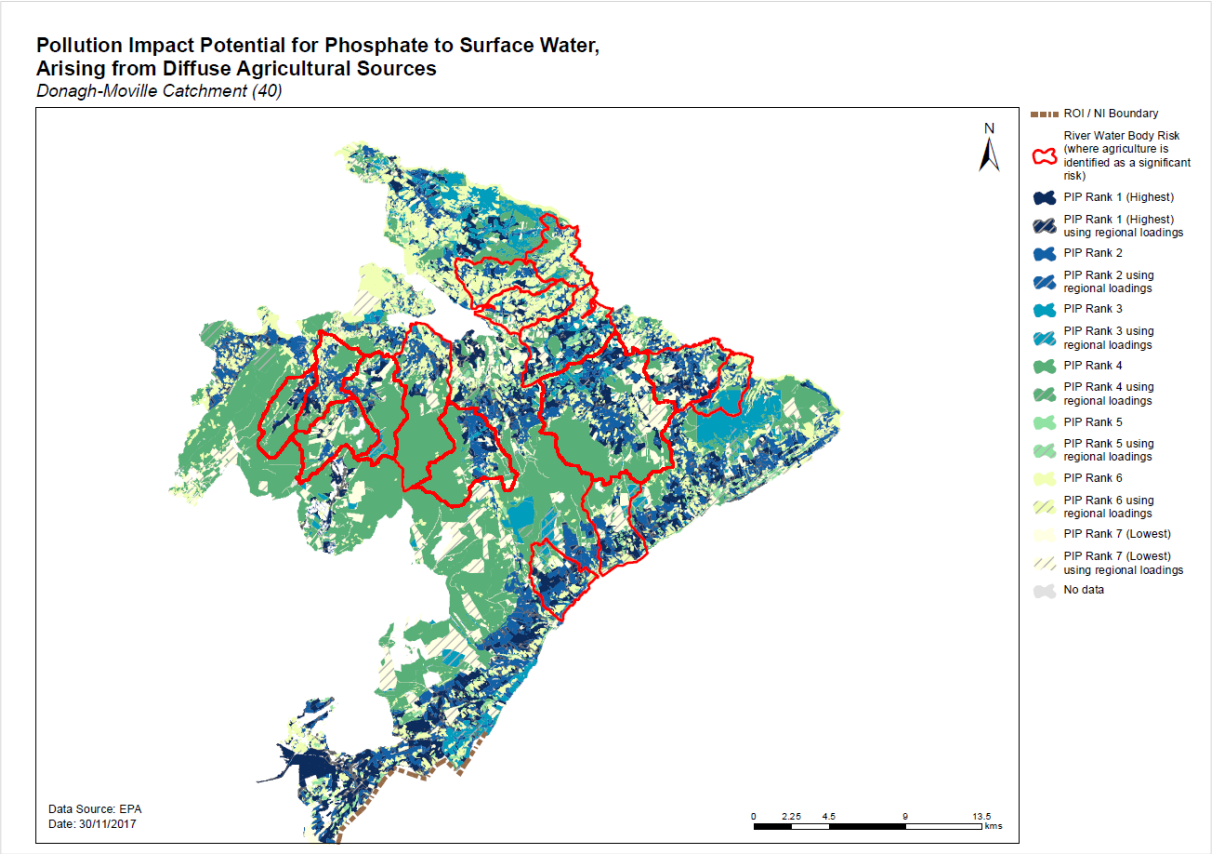
| Scheme Code | Scheme Name | Water Body | Water Body Code |
|---|---|---|---|
| 0600PRI3011 | Gleneely 1 | Gleneely 1 | IEGBNI_NW_G_050 |
| 0600PUB1007 | Carndonagh, Mixed Supply Tir Na League Borehole 1 | Carndonagh GWB | IE_NW_G_078 |
| 0600PUB1007 | Carndonagh, Mixed Supply Tir Na League Borehole 2 | Carndonagh GWB | IE_NW_G_078 |
| 0600PUB1007 | Carndonagh, Mixed Supply Tir Na League Borehole 3 | Carndonagh GWB | IE_NW_G_078 |
| 0600PUB1015 | Greencastle Stream At Ballymacarthur | Greencastle GWB | IEGBNI_NW_G_050 |
| 0600PUB1022 | Inishowen East Lough Nastackan | Inishowen East Culdaff | IE_NW_40C020100 |
| 0600PUB1118 | Culdaff Culdaff Borehole 1 | Culdaff | IEGBNI_NW_G_050 |
| 0600PUB1118 | Culdaff Culdaff Borehole 2 | Culdaff | IEGBNI_NW_G_050 |
| 0600PUB1005 | INISHOWEN WEST Fad Meendoran - Lough Fad | Fad Meendoran - Lough Fad | IE_NW_40_2 |

## 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? |
|---|---|---|---|---|---|---|---|---|
| North Inishowen Coast SAC 002012 | 21A0 | Good GW level | Groundwater | Lough Swilly GWB | Good (NAR) | No | IEGBNI_NW_G_059 | Yes |
| Magheradrumman Bog SAC 000168 | None | | | | | | | |

## Appendix 6 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 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 |