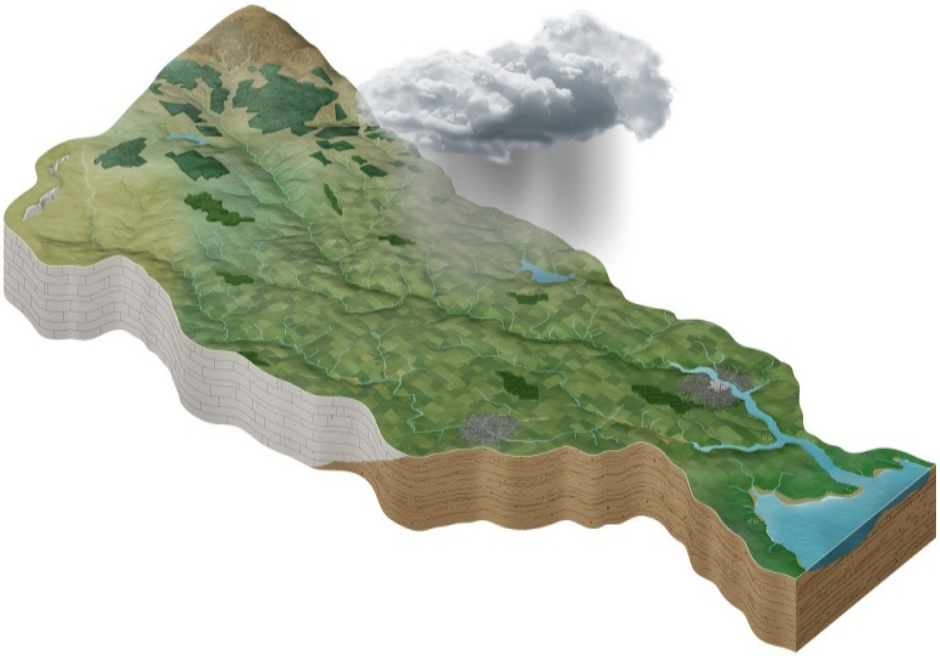
Newry-Fane-Glyde-Dee Catchment Assessment 2010-2015 (HA 06)



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 Newry-Fane-Glyde-Dee 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 includes the area drained by the Newry, Fane, Glyde and Dee rivers, and by all streams entering tidal water between Murlough Upper and The Haven, Co. Louth. This is a cross border catchment with a surface area of 2,125 km², 1390 km² of which is located within the Republic of Ireland (RoI). The largest urban centre is Dundalk. The other main urban centres are Carrickmacross, Ardee, Kingscourt, Dunleer and Castleblaney and the total population (in the RoI) is approximately 115,900, with a population density of 83 people per km². There are extensive gravel deposits along much of the coast in this catchment, which are an important local groundwater resource.

The southern coastal part of this catchment is drained by the Slieveboy River, which flows into the sea north of Clogher Head. The River Dee rises to the west of Kingscourt, flowing east, through Nobber and Ardee, after which it is joined by the White River flowing from Dunleer. The Dee then makes its way to the sea at Annagassan.

The Glyde River also rise on the high ground to the west of Kingscourt, flowing east where it is joined by the Proules River which drains the area around Carrickmacross, and through Tallanstown before joining the River Dee just before the coast at Dundalk Bay. An arterial drainage scheme was completed on the Glyde and Dee Rivers by the OPW between 1950 and 1957.

The Fane River rises in the north-western corner of the catchment, flowing southeast through Castleblaney and Lough Muckno, the Fane is joined from the west by the Ballykelly River at Castlering before flowing out to sea just south of Blackrock. The Castletown River rises in south County Armagh flowing south and east where it is joined west of Dundalk by the Cully Water and Kilcurry Rivers. The river becomes tidal just before it enters Dundalk and then flows into Dundalk Bay via Dundalk Harbour. The town of Dundalk and much of its southern hinterland are drained by the Ramparts River, while the Flurry River flows into Dundalk Harbour from the north.

The central area of the Cooley Peninsula is drained by the Big river, flowing into Dundalk Bay, while the northern side of the peninsula is drained by a series of streams flowing north into Carlingford Lough.

The Newry-Fane-Glyde-Dee catchment comprises 15 sub-catchments (Figure 1) with 68 river water bodies, ten lakes, nine transitional and four coastal water bodies, and 19 groundwater bodies. There are no heavily modified water bodies or artificial water bodies in the catchment.

Table 1. List of subcatchments in the Newry, Fane, Glyde and Dee catchment

Subcatchment ID
06_1
06_10
06_11
06_12
06_13
06_14
06_15
06_2
06_3
06_4
06_5
06_6
06_7
06_8
06_9

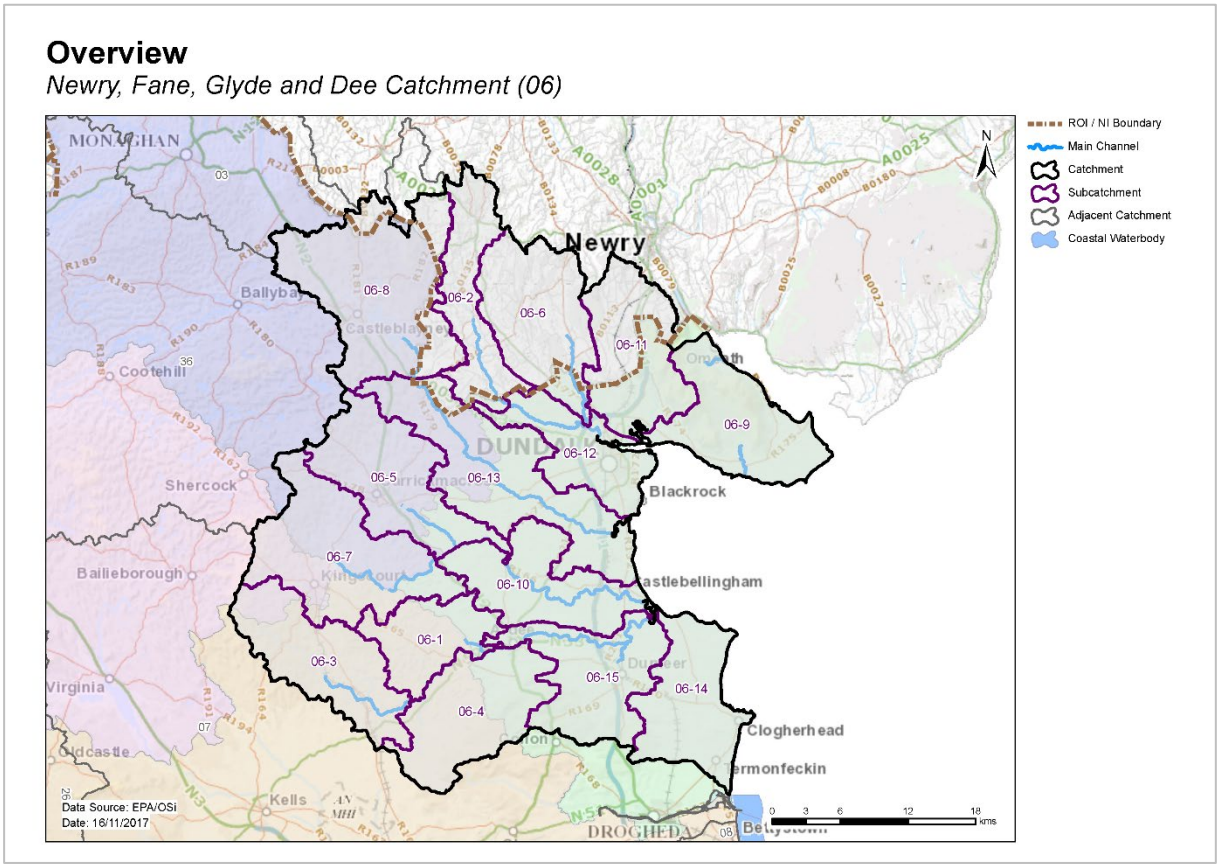


Figure 1. Location and subcatchments in the Newry-Fane-Glyde-Dee catchment.

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 17 (22%) rivers and lake water bodies at Good or High status, and 35 (45%) at less than Good status in 2015 (Table 2 and Figure 2). Twenty-six (33%) river water bodies and lakes water bodies are unassigned.
- None of the surface water bodies have a high status objective.
- The numbers of water bodies at each status class in 2007-09 and 2010-2015 are shown in Figure 3 for rivers and Figure 4 for lakes.
- The variation in nutrient concentrations and loads in the largest river main channels (Fane, Glyde and Dee) are illustrated in Appendix 1.

2.1.2 Transitional and Coastal (TraC)

- One (8%) TraC water body was at Good status, and 2 (15%) at less than Good status in 2015 (Table 2). Ten (77%) TraC water bodies are unassigned.
- The numbers of TraC water bodies at each status class in 2007-09 and 2010-2015 are shown in Table 2 and Figure 4.
- Coastal water body Louth Coast (HA 06), IE_NB_025_0000 is shared with Catchment 07 Boyne.

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

	Number of water bodies	2010-2015 Status						Risk		
		High	Good	Mod	Poor	Bad	Un-assigned	*Not at Risk*	*Review*	*At Risk*
Rivers	68	0	16	14	17	0	21	13	21	34
Lakes	10	0	1	1	1	2	5	1	4	5
TraCs	13	0	1	2	0	0	10	3	8	2

- Since 2007-09 when WFD monitoring began. Six water bodies (5 rivers and 1 lake) have improved and 15 water bodies (13 rivers and 2 lakes) have deteriorated (Figure 6).

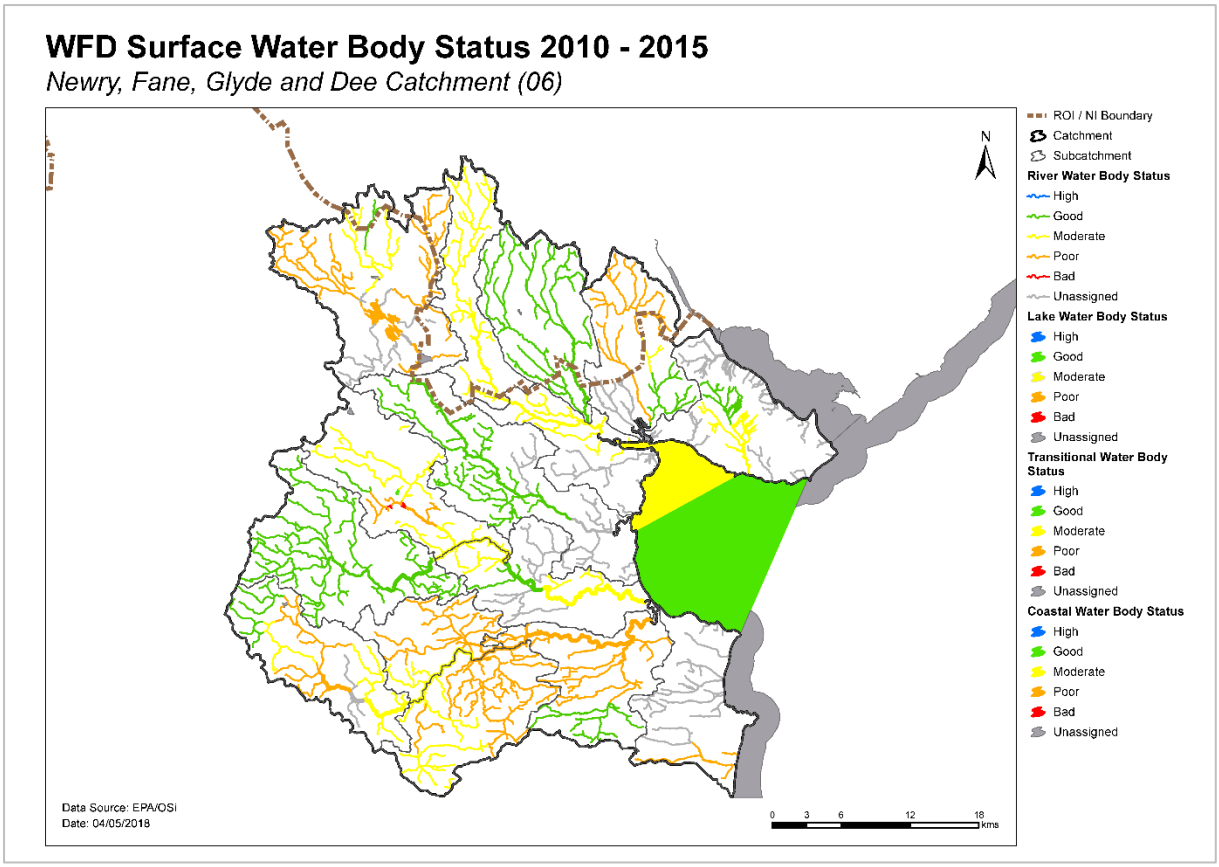


Figure 2. Surface water body status

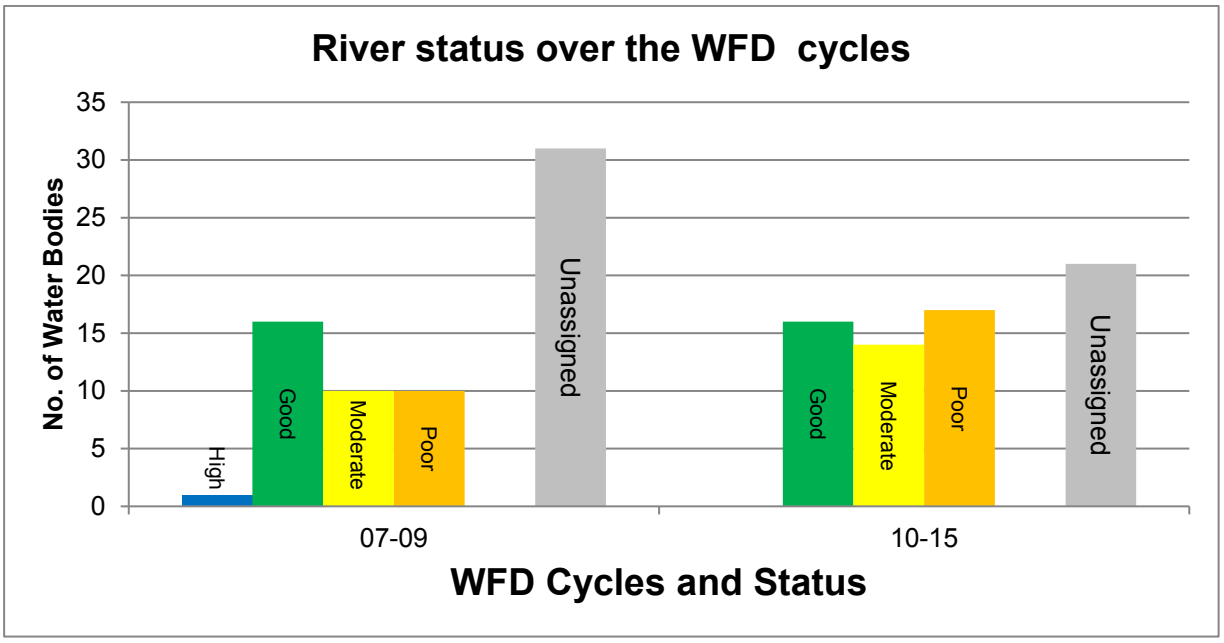


Figure 3. Number of rivers at each status class in 2007-09 and 2010-15

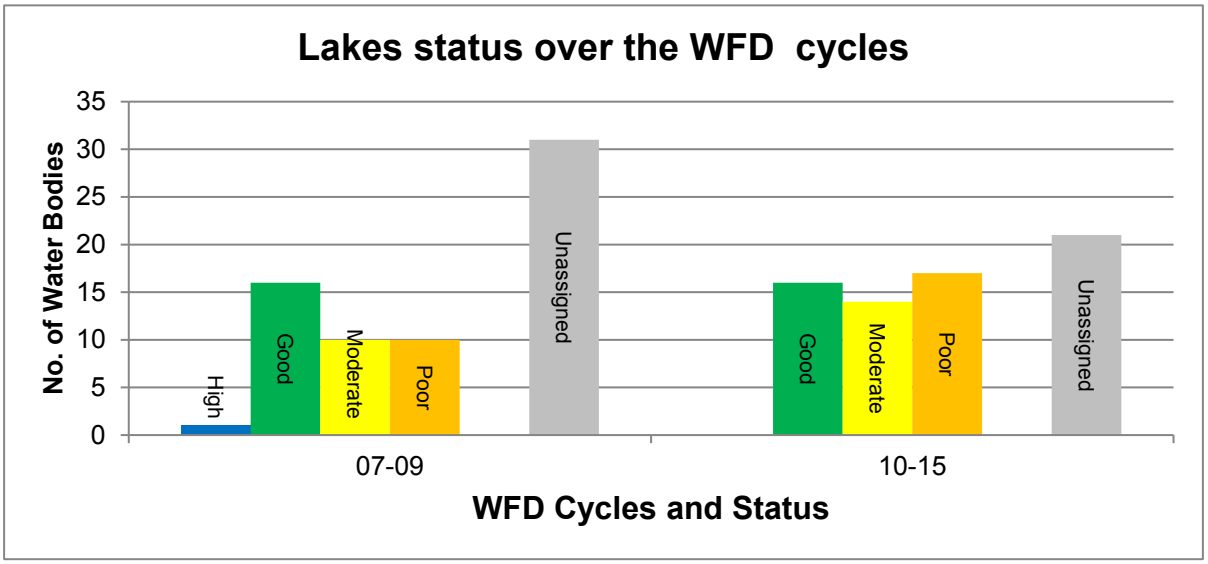


Figure 4. Number of lakes at each status class in 2007-09 and 2010-15

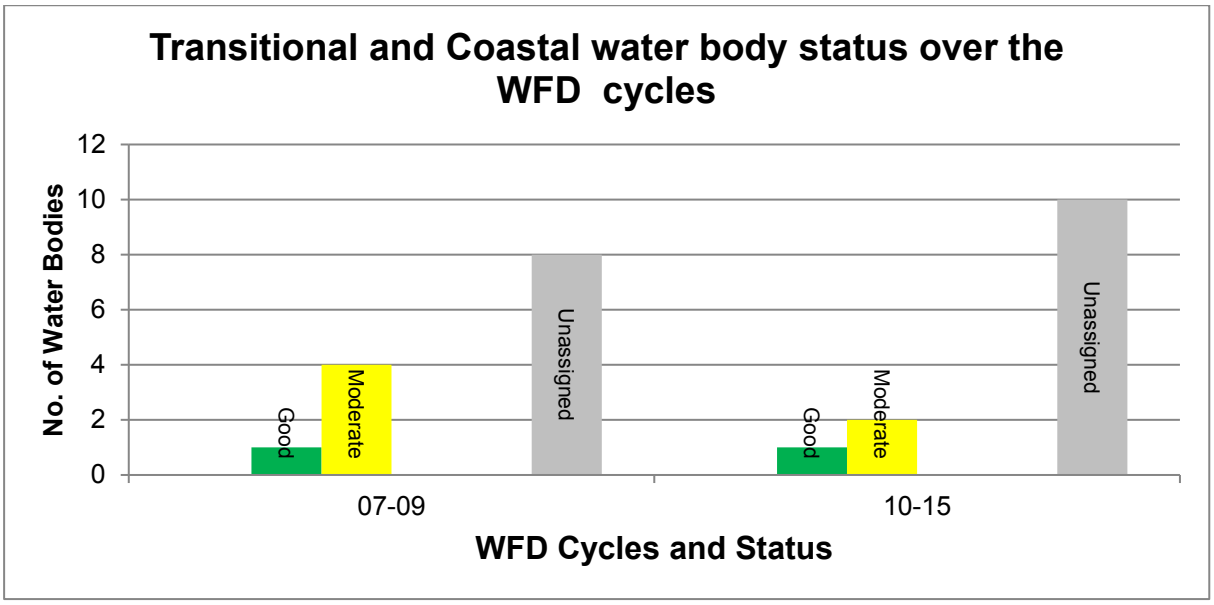


Figure 5. Number of transitional and coastal water bodies at each status class in 2007-09 and 2010-15.

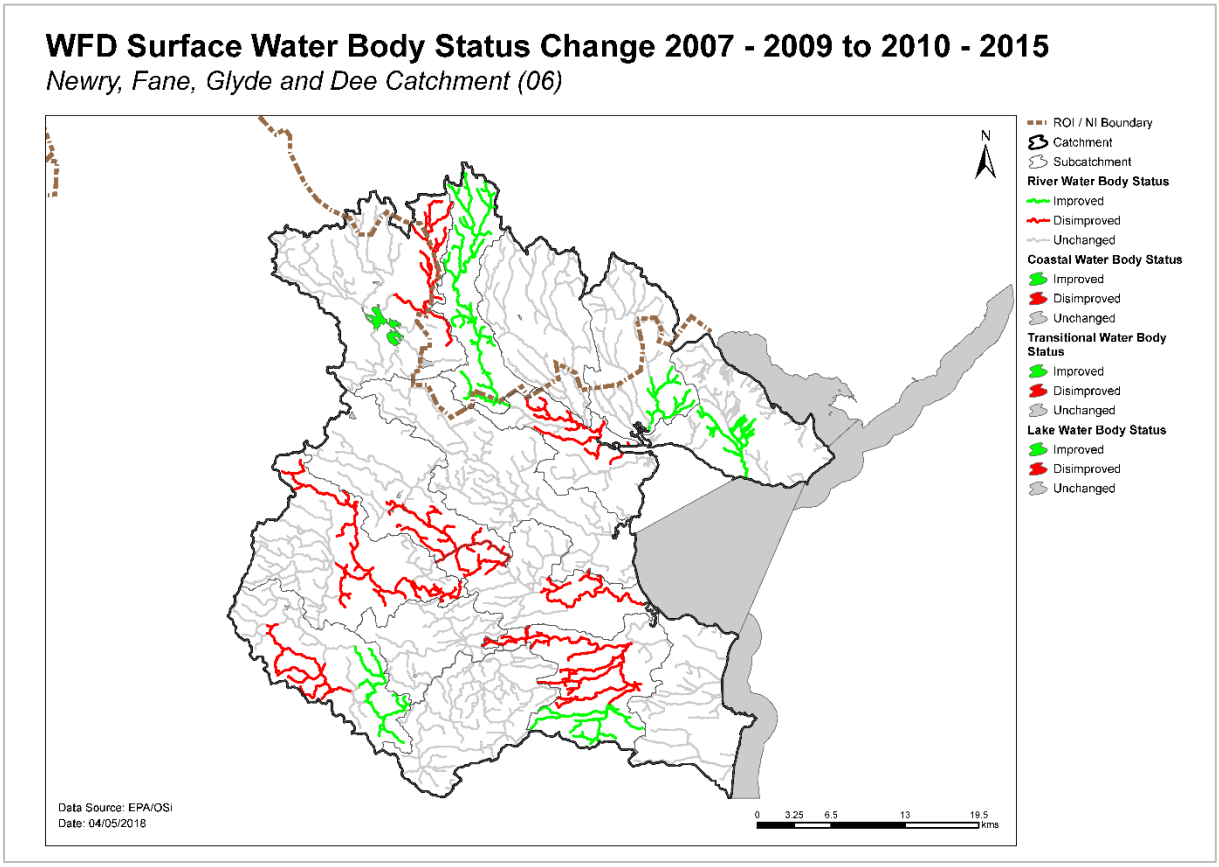


Figure 6. Surface water body status change from 2007-09 to 2010-15

2.2 Groundwater Status

- There were 12 (92%) groundwater bodies at Good status and one (8%) at Poor status in 2015 (Table 3, Figure 7). All groundwater bodies were classed as Good status at the end of the first WFD cycle (Figure 8) and therefore one groundwater body has deteriorated.

Table 3. Summary of groundwater body status and risk

	Number of water bodies	2010-2015 Status		Risk Categories		
		Good	Poor	*Not at Risk*	*Review*	*At Risk*
Groundwater	12	11	1	8	3	1

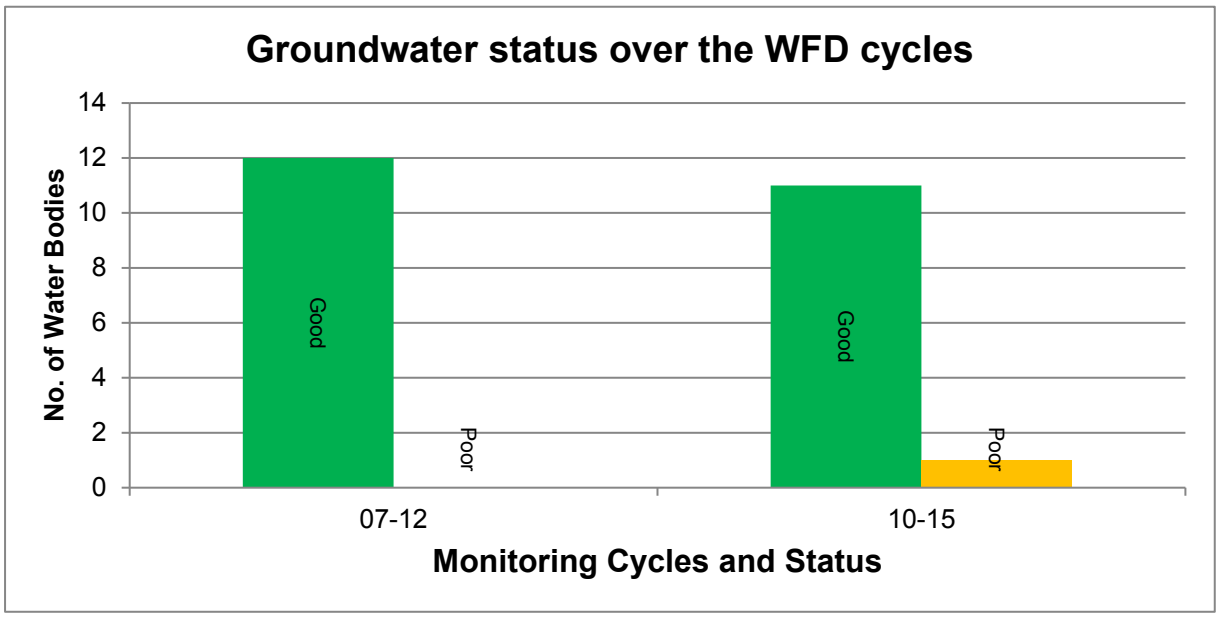


Figure 7. Number of groundwater bodies at each status class in 2007-12 and 2010-15

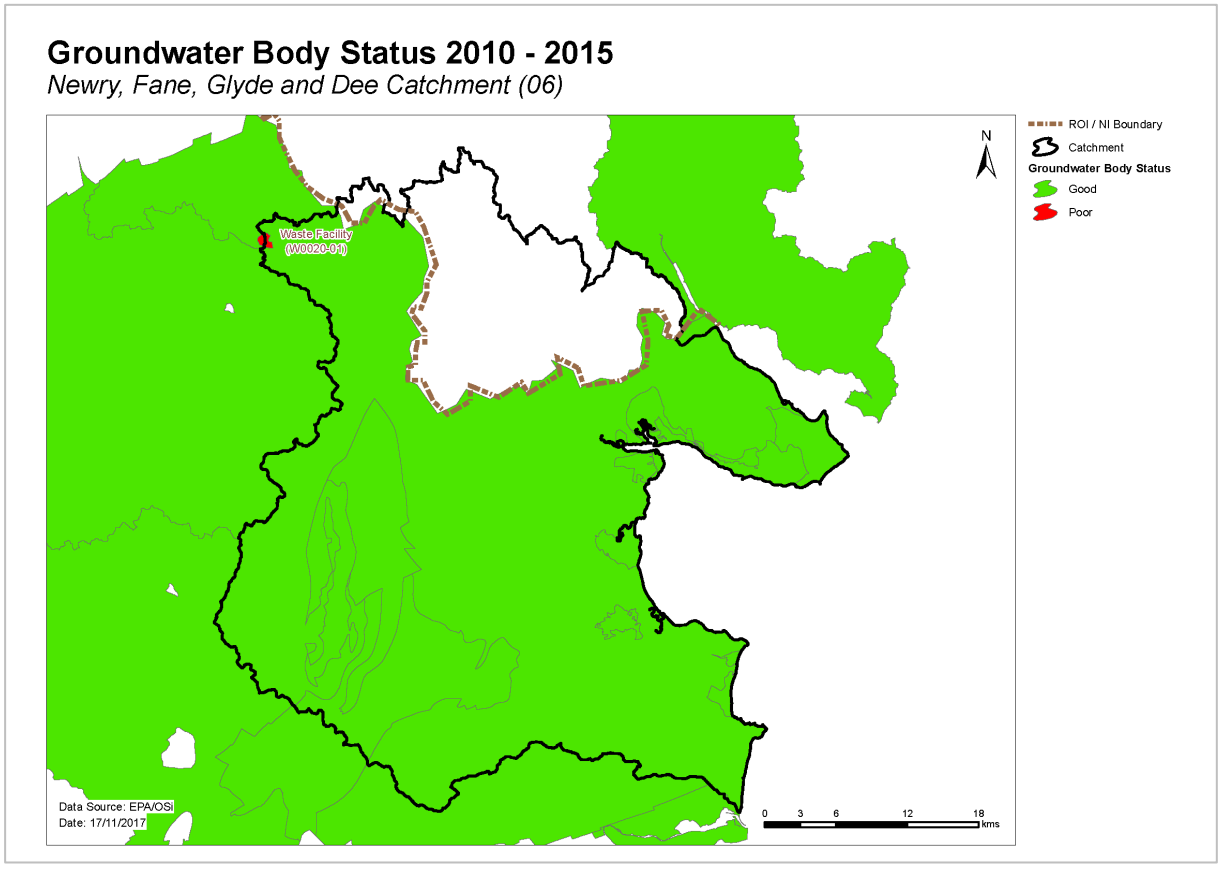


Figure 8. Groundwater body status

2.3 Risk of not meeting surface water environmental objectives

2.3.1 Rivers and Lakes

- Thirteen river water bodies and one lake water body are *Not at Risk* (Figure 9, Table 2) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.

- Twenty-one river water bodies and four lake water bodies are in *Review*. This applies to 15 river and two lake water bodies where more information is required, and five river and two lake water bodies where measures have recently been implemented and improvements have not yet been realised.
- Thirty-four river water bodies and five lake 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)

- Three TraC water bodies are *Not at Risk* (Figure 9, Table 2) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Eight TraC water bodies are in *Review* where more information or data is required to assess whether the water bodies are *At Risk*.
- Two TraC 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.

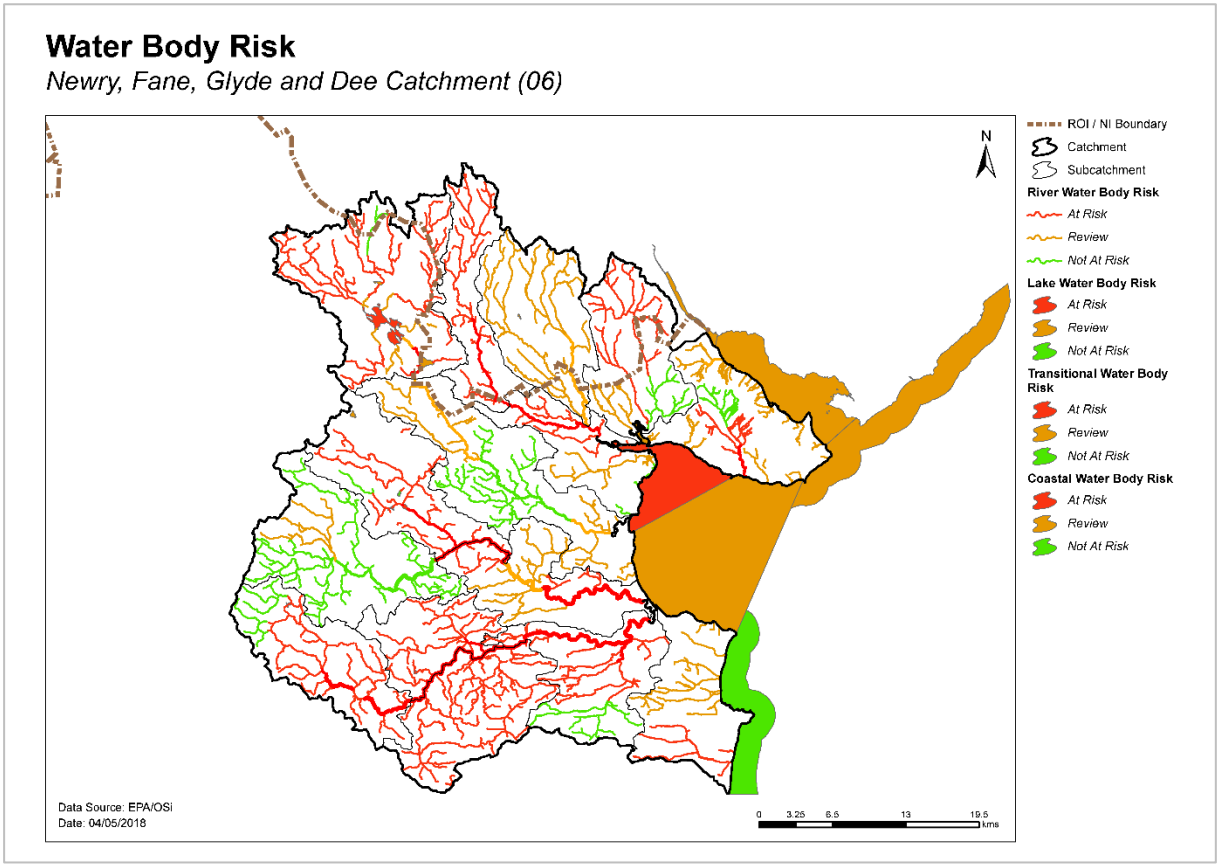


Figure 9. Surface water body risk

2.4 Risk of not meeting groundwater body environmental objectives

- Eight groundwater bodies are *Not at Risk* (Figure 10, Table 3) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Three groundwater bodies 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 nutrients (Figure 10).

- There is one groundwater body IE_NB_G_026 which is *At Risk* due to ammonia issues in this catchment. Measures will be needed in this water body to improve the water quality outcomes.

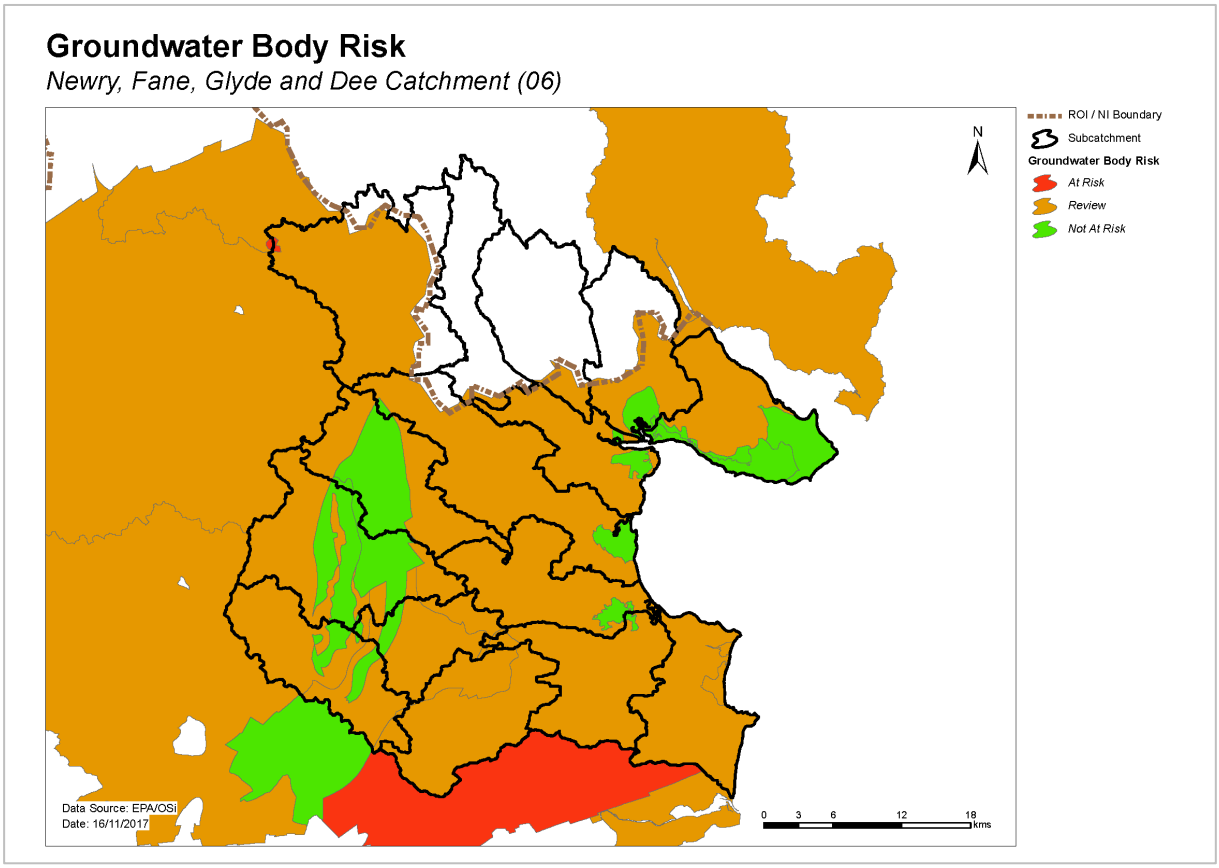


Figure 10. Groundwater body risk

2.5 Protected Areas

2.5.1 Drinking Water Protected Areas

- There are 44 drinking water abstractions in the Fane Glyde Catchment, comprising of eight group water schemes (Meath Hill GWS, Kilanny-Reaghstown GWSS, Grangebellow, Mountain Park, Ardaghy, Tenure, Churchill & Oram GWSS and Donaghmoyne GWSS) and 16 public supplies (Carrickmacross PWS, Ardee, Cooley, Carlingford, Omeath, Castletown, Kilmainhamwood WS, Nobber WS, Lobinstown Village, Carrickleck, Kingscourt PWS, Inniskeen, Drumcondrath, Greenmount, Tallanstown, and Cavanhill).

- Thirty-one of the abstractions are from six groundwater bodies (Louth, Dundalk, Carrickmacross, Ardee, Dundalk Gravels and Kingscourt); three of the abstractions are from lakes (Monalty Lough, Nagaranam and Muckno Mill); and 10 of the abstractions are from rivers (Dee_070, Carlingford_010, Knocknagoran_010, Dee_020, Fane_040, Dee_060, Dee_100, Glyde_050, Fane_050 and Ballymascanlan_010). The list of the public supplies and the associated water bodies is provided in Appendix 2.

- All sources were compliant with the drinking water standards for nitrate in 2015.

- Most sources were compliant with the standards for pesticides in 2015. The exceptions were Dee_100 for scheme 2100PUB1002, Glyde_50 for scheme 2100PUB1005, and Dee_70 and Ardee GWB for scheme 2100PUB1001.

- Fifteen of the 19 drinking water protected areas had therefore met their objectives in 2015. The remaining four (Ardee GWB, Dee_070, Dee_100 and Glyde_050) have not met their objectives in 2015 due to non-compliance with standards for pesticides.

2.5.2 Bathing Waters

- There are four designated bathing water areas in the Fane Glyde catchment; all are marine bathing waters. All are in a satisfactory condition. The list of the bathing waters and the associated water bodies is provided in Table 4.

Table 4. Bathing Waters in the catchment

Bathing Water		Water Body Intersection		Objective met?	
Name	Code	Name	Code	Yes	No
Shelling Hill/Templetown	IENBBWC040_0000_0100	Outer Dundalk Bay	IE_NB_040_000	✓	
Port, Lurganboy	IENBBWC025_0000_0300	Louth Coast (HA 06)	IE_NB_025_0000	✓	
Clogherhead	IENBBWC025_0000_0200	Louth Coast (HA 06)	IE_NB_025_0000	✓	
Seapoint	IENBBWC025_0000_0100	Louth Coast (HA 06)	IE_NB_025_0000	✓	

2.5.3 Shellfish Area

- There are two designated shellfish areas in the catchment. The shellfish areas are compliant with the relevant standards and there no water quality issues of concern. The list of the shellfish areas and the associated water bodies is provided in Table 5.

Table 5. Shellfish Waters in the catchment

Shellfish Area		Water Body Intersection		Objective met?	
Name	Code	Name	Code	Yes	No
Dundalk Bay	IEPA2_0044	Inner Dundalk Bay	IE_NB_040_0100	✓	
		Outer Dundalk Bay	IE_NB_040_000		
		Mourne Coast	GBNIIE6NB020		
		Louth Coast (HA06)	IE_NB_025_0000		
Carlingford Lough	IEPA2_0004	Newry Estuary	UKGBNI5NB030010	✓	
		Carlingford Lough	GBNIIE6NB030		

2.5.4 Nutrient Sensitive Areas

- There are six designated (in 2010) nutrient sensitive areas in the Newry-Fane-Glyde-Dee catchment. All six are meeting their environmental objectives because tertiary treatment is either in place or scheduled to be implemented in 2017. The list of nutrient sensitive areas and their associated water bodies are provided in Table 6.

2.5.5 Natura 2000 Sites

- There are four Special Areas of Conservation (SACs) in the catchment (Appendix 4). However, these SACs do not have water quality and/or quantity conservation objectives for their qualifying interests.

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

    - Boyne Estuary SPA SPA
    - Carlingford Lough SPA
    - Dundalk Bay SPA
    - Stabannan-Braganstown 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.

Table 6. Nutrient Sensitive Areas in the catchment

Nutrient Sensitive Area		Agglomeration		2021 Objective met?		Comment
Name	Code	Name	Code	Yes	No	
River Proules Upper	IEGBNIRI_NB_2001_0014b	Carrickmacross	D0062	✓		Tertiary Treatment in place.
River Proules Lower	IEGBNIRI_NB_2001_0014a			✓		Tertiary Treatment in place.
Lough Monalty, County Monaghan	IEGBNILK_NB_2001_0025			✓		Tertiary Treatment in place.
Lough Muckno, County Monaghan	IEGBNILK_NB_2001_0024	Castleblaney	D0205	✓		Tertiary Treatment in place.
Castletown Estuary	IEGBNITW_NB_2001_0038a	Dundalk	D0053	✓		Upgrade works to include Tertiary Treatment are scheduled for 2017.
Inner Dundalk Bay	IEGBNITW_NB_2001_0038b			✓		Upgrade works to include Tertiary Treatment are scheduled for 2017

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 phosphorus, leading to eutrophication, is the dominant issue in rivers and lakes in the Newry-Fane-Glyde-Dee Catchment. Excess ammonium is also a concern in a limited number of water bodies.
- Hydromorphological issues are noted for several rivers and lakes, arising from activities such as channelisation and land drainage.
- Other significant issues which are of concern for a limited number of water bodies include: invasive species (Zebra mussels) in two lakes; legacy chemical issues from an oil spill; organic pollution from wastewater and agricultural activities; and acidification from forestry.
- Castletown Estuary and Inner Dundalk Bay transitional water bodies are impacted by eutrophication and are nitrogen limited. Castletown Estuary is failing for phosphorus.
- Of the 12 groundwater bodies, one is *At Risk*. For IE_NB_G_026 the significant issue is excess ammonia, from a waste facility.

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 10 show a breakdown of the number of *At Risk* water bodies, respectively, in each significant pressure category.
- Significant pressures have been identified by the initial characterisation process in 42 water bodies 24 of which have multiple pressures. The significant pressures will be refined as further characterisation is carried out.

4.1.1 Rivers, lakes, transitional and coastal (TraC)

- The significant pressure affecting the greatest number of river water bodies is agriculture, followed by hydromorphological pressures, urban wastewater, Diffuse urban, industry and forestry (Figure 10).
- The significant pressure affecting the Castletown Estuary and Inner Dundalk Bay transitional water bodies is Urban Waste Water.

4.1.2 Groundwater

- The significant pressures affecting IE_NB_G_026 the significant impact is excess ammonia and the significant pressure is a licenced waste facility (W0020-01), which contributes excessive ammonia concentrations.

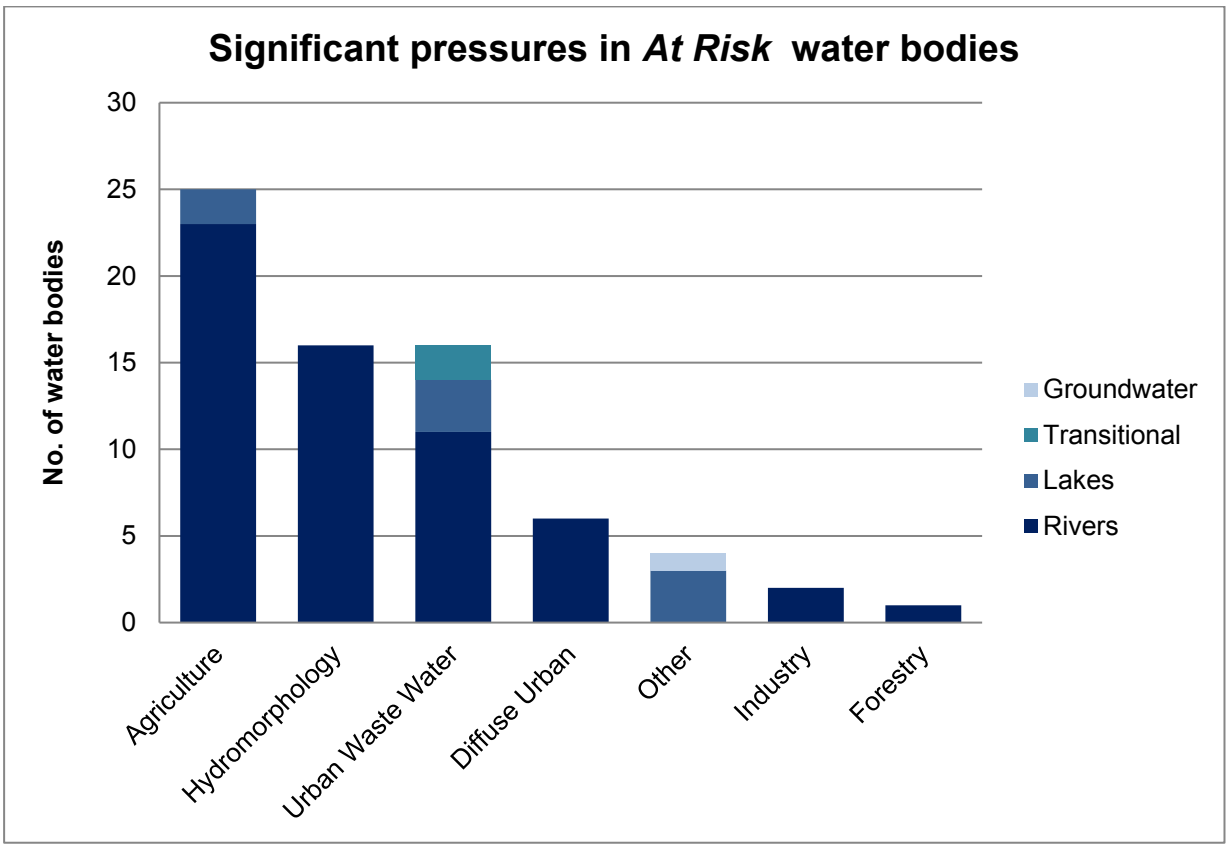


Figure 10. Significant pressures impacting on *At Risk* water bodies.

4.2 Pressure type

4.2.1 Agriculture

- Agriculture is a significant pressure in 23 river water bodies and 2 lakes; the affected water bodies are shown in Figure 11. The issues related to farming are 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.
- A significant proportion of the catchment is underlain by poorly draining soils and subsoils, and there are significant areas of high pollution impact potential for phosphate to surface water (see Appendix 5).

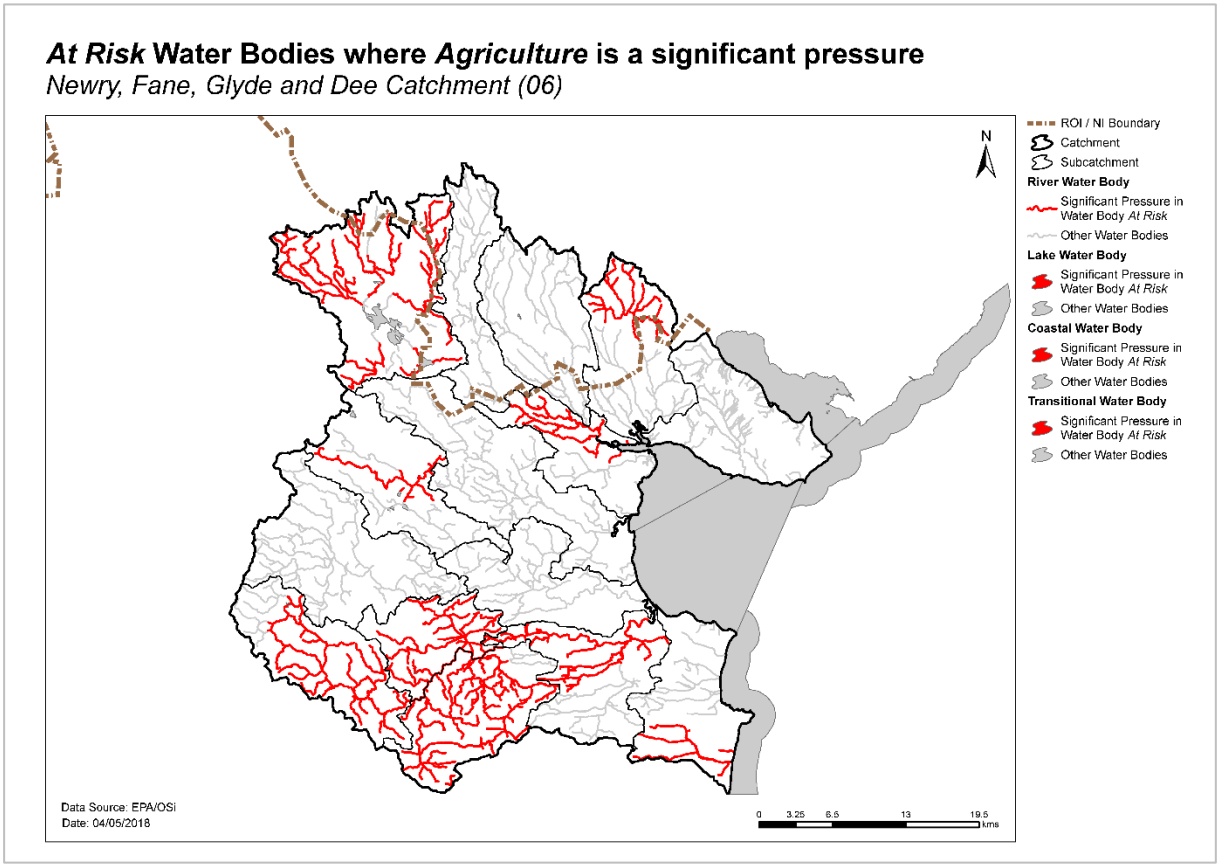


Figure 11. Water bodies that are *At Risk* and are impacted by agricultural activities

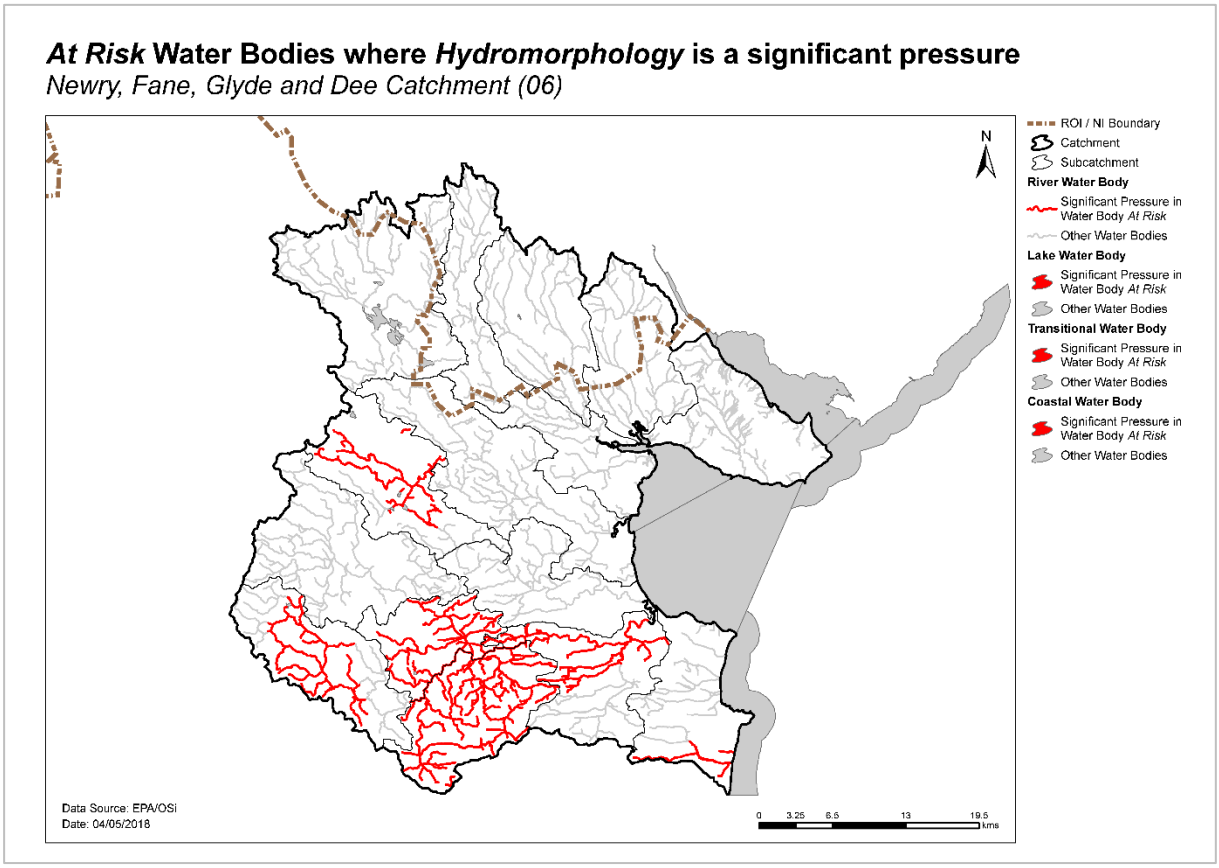
4.2.2 Hydromorphology

- River water bodies (16) within the Dee and Glyde subcatchments are subject to extensive modification (Figure 12/Table 6a). Drainage schemes exist which have led to altered flow, high levels of siltation and habitat degradation. A weir was identified as a barrier to migration within a river water body of the Dee subcatchment on the White Stream.

Table 6a – Hydromorphological Pressures in the Fane-Glyde Catchment

Pressure	Sub-Catchment	Water body Code
Modification due to Drainage Schemes (Channelisation)	Dee_SC_020 & Dee_ SC_030	Dee_050
	Dee_ SC_020 & Dee_ SC_030	Dee_060
	Dee_ SC_010	Dee_020
	Dee_ SC_010	Dee_030
	Dee_ SC_010	Kilmainham_020
	Dee_ SC_010	Moynagh_040
	Dee_ SC_020 & Dee_ SC_030	Dee_050
	Dee_ SC_020 & Dee_ SC_030	Dee_070
	Dee_ SC_020 & Dee_ SC_030	Killary Water_010
	Dee_ SC_020 & Dee_ SC_030	Killary Water_020
	Glyde_ SC_020	Proules_030
	Gyde_ SC_020	Rossdreenagh Stream_010
	Glyde_ SC_020	Rossdreenagh Stream_020
	Burren_ SC_010	Termonfeckin_020
	Dee_ SC_040	Dee_070
	Dee_ SC_040	Dee_080
	Dee_ SC_040	Dee_090
In River Structures	Dee_ SC_040	White_030

Figure 12. Water bodies that are *At Risk* and are impacted by hydromorphological impacts



4.2.3 Urban Wastewater Treatment Plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been identified as significant pressures in 16 *At Risk* water bodies; details are given in Table 7 and the locations are shown in Figure 13. Ten of these *At Risk* water bodies are impacted by WWTPs that are scheduled to be upgraded, and two water bodies, Dee_050 and Moynagh_040, are impacted by the Nobber WWTP, which is due to be upgraded in 2017.

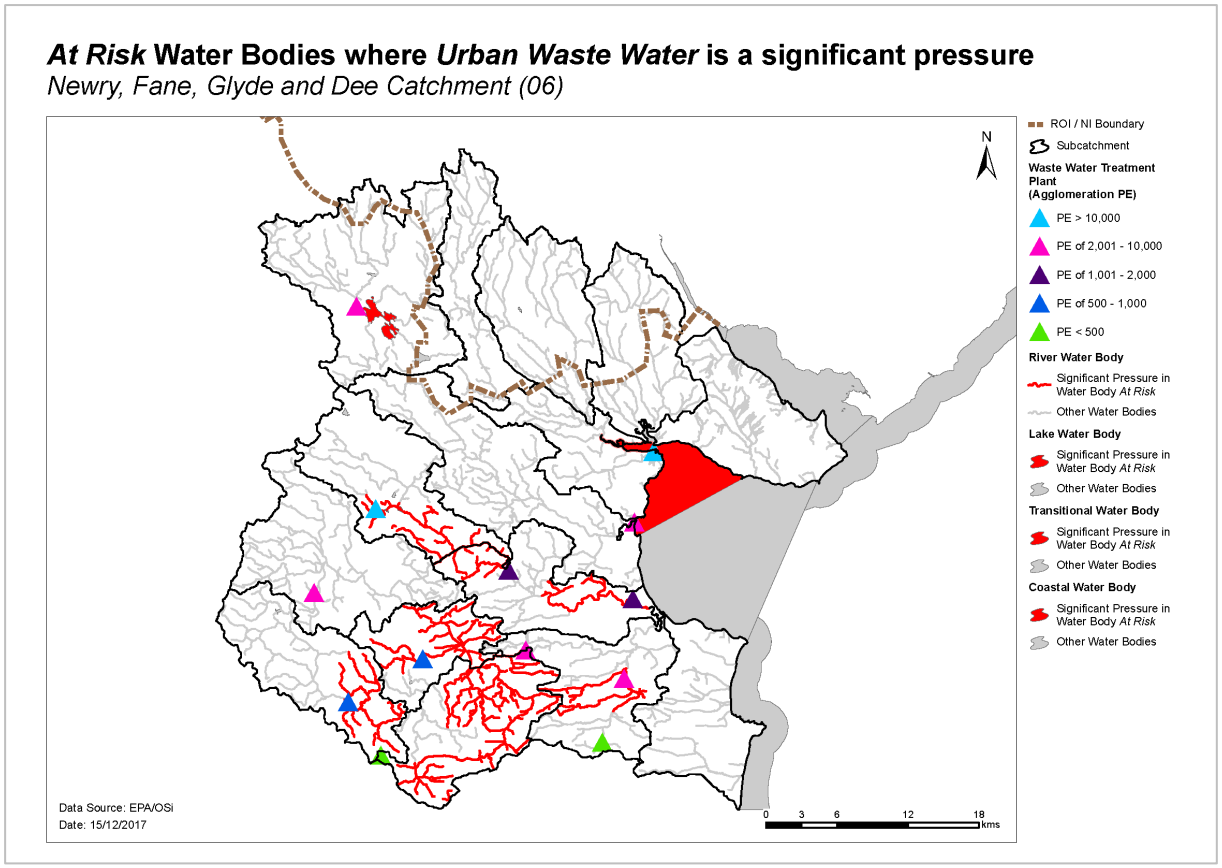


Figure 13. Water bodies that are *At Risk* and are impacted by urban waste water

Table 7. Urban 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
Carrickmacross D0062	> 10,000 p.e.	Monalty	Bad	2020
Carrickmacross D0062	> 10,000 p.e.	Naglack	Bad	2020
Carrickmacross D0062	> 10,000 p.e.	Proules_020	Poor	2020
Carrickmacross D0062	> 10,000 p.e.	Proules_030	Poor	2020
Castleblayney D0205	2,001 to 10,000 p.e.	Muckno	Poor	2019
Nobber D0487	500 to 1,000 p.e.	Dee_050	Moderate	2017
Nobber D0487	500 to 1,000 p.e.	Moynagh_040	*Unassigned* [1]	2017
Drumconrath D0483	500 to 1,000 p.e.	Dee_070	Poor	2018
Ardee D0117	2,001 to 10,000 p.e.	Dee_080	Poor	2019
Castlebellingham D0269	1,001 to 2,000 p.e.	Glyde_070	Moderate	2021
Castletown A0044	< 500 p.e.	Killary Water_010	Moderate	*N/A* [2]
Dunleer D0111	2,001 to 10,000 p.e.	White (Louth)_020	Poor	*N/A* ***Error! Bookmark not defined.***
Dunleer D0111	2,001 to 10,000 p.e.	White (Louth)_030	Poor	*N/A* ***Error! Bookmark not defined.***
Tallanstown D0270	1,001 to 2,000 p.e.	*Glyde_050*[3]	Moderate	*N/A* ***Error! Bookmark not defined.***
Blackrock D0188	2,001 to 10,000 p.e.	Inner Dundalk Bay	Moderate	*N/A* [4]
Dundalk D0053	> 10,000 p.e.	Inner Dundalk Bay	Moderate	2018
Dundalk D0053	> 10,000 p.e.	Castletown Estuary	Moderate	2018

[1] *Ecological Status is not available for Moynagh_040, however, following discussions with Meath County Council, this water body was deemed to be At Risk of not meeting its environmental objectives.*

[2] *Currently not specified in improvement plans.*

[3] *The agglomeration network rather than the WWTP, has been identified as a significant pressure impacting Glyde_050.*

[4] *Blackrock agglomeration network is scheduled to be upgraded by 2019, however, the WWTP, which currently not scheduled to be upgraded, has been identified as a significant pressure impacting Inner Dundalk Bay.*

4.2.4 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 six river water bodies in the (Figure 14). These issues are associated with towns including Carrickmacross and Kingscourt, as well as oil spills in urban areas.

4.2.5 Other – Invasive Species and Water Supply

- *Invasive Species*

  Significant pressures identified under the category of 'Other' include invasive species and water supply. Invasive species are a significant pressure in two lakes, IE_NB_06_234 Monalty and IE_NB_06_55 Naglack, as there are zebra mussels present in these water bodies. Figure 15

- *Abstraction*

  Water supply was also identified as a significant pressure for one lake, IE_NB_06_209 Brackan, where abstraction is taking place in a small lake that is impacted from eutrophication. Figure 16.

4.2.6 Industry

- Industry has been identified as a significant pressure in two river water bodies. (Figure 17). Elevated total ammonia concentrations from an industrial site is the main issue of concern regarding Fane_010, while an abstraction associated with another facility and elevated nutrient from a further site, are the main issues of concern regarding Big (Louth)_020.

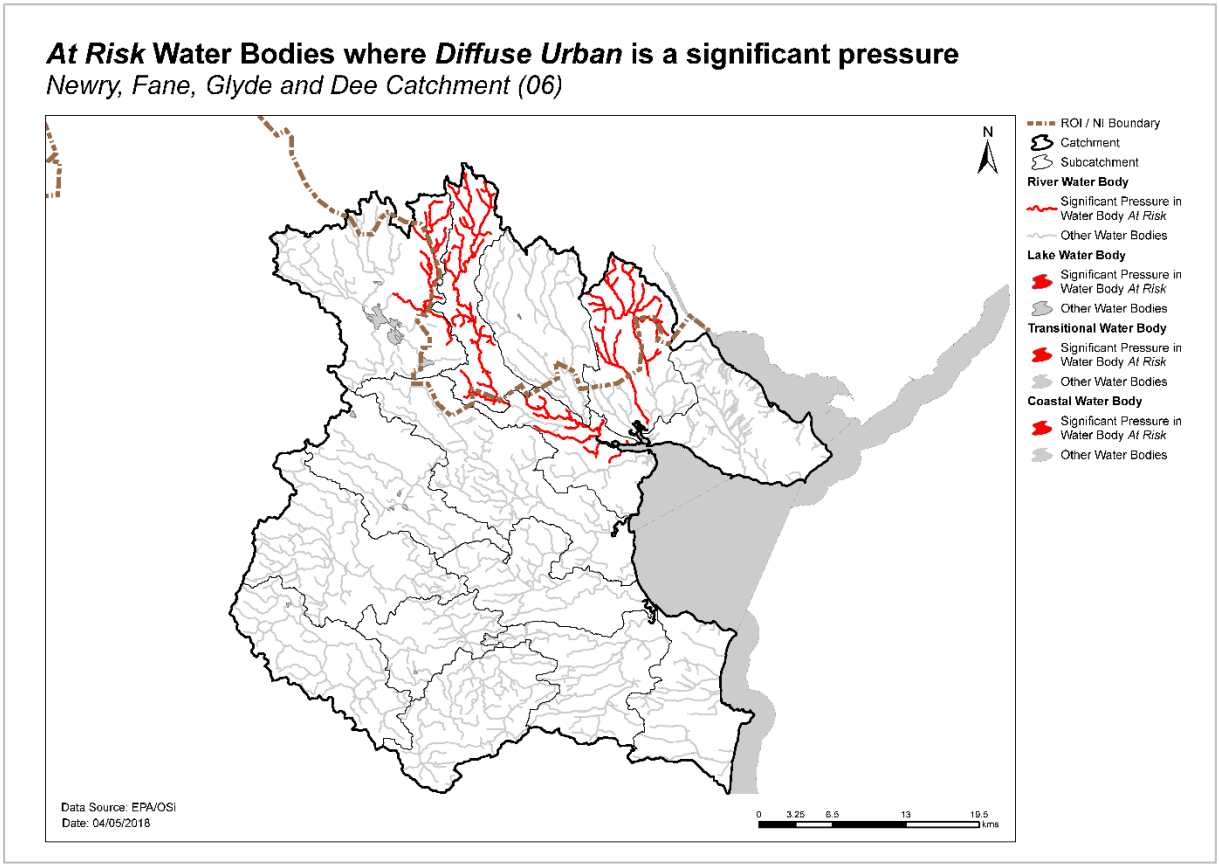


Figure 14. Water bodies that are At Risk and are impacted by diffuse urban pressures

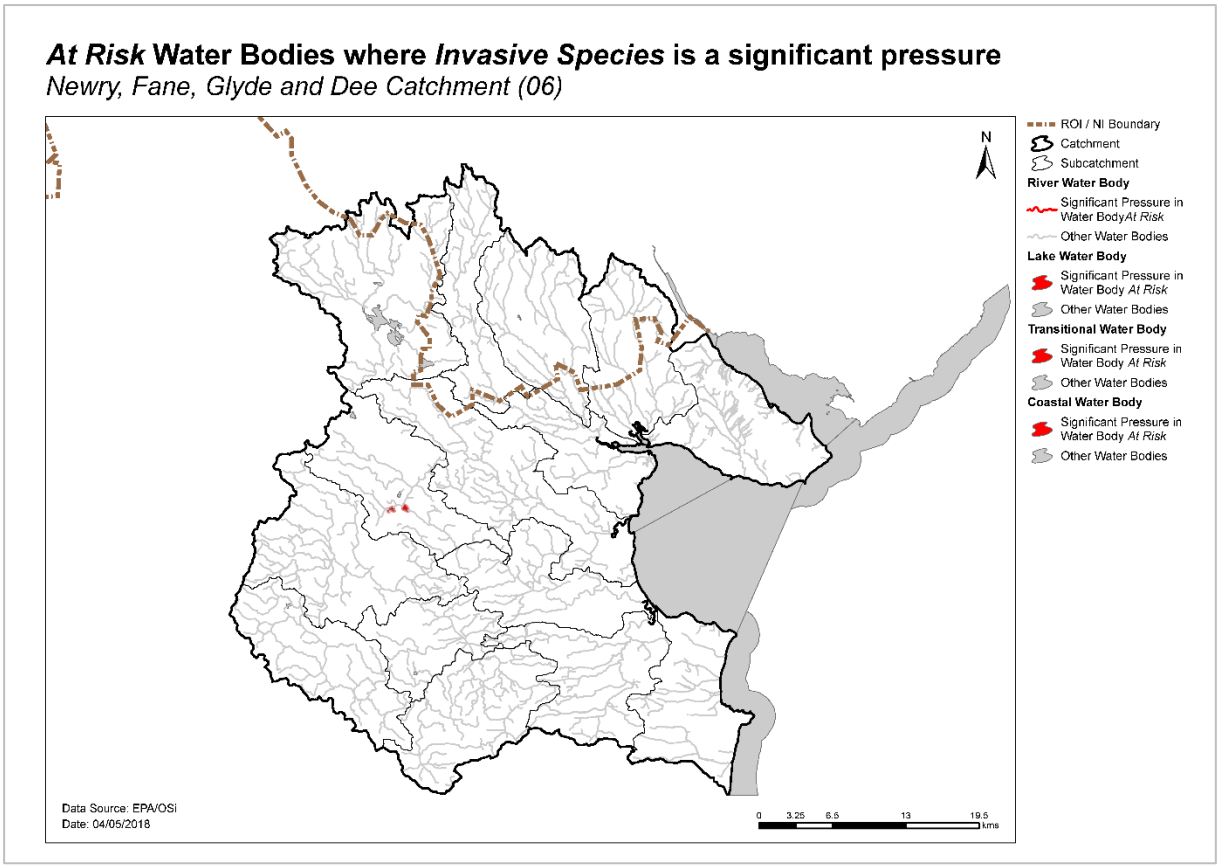


Figure 15. Water bodies that are *At Risk* and are impacted by invasive species

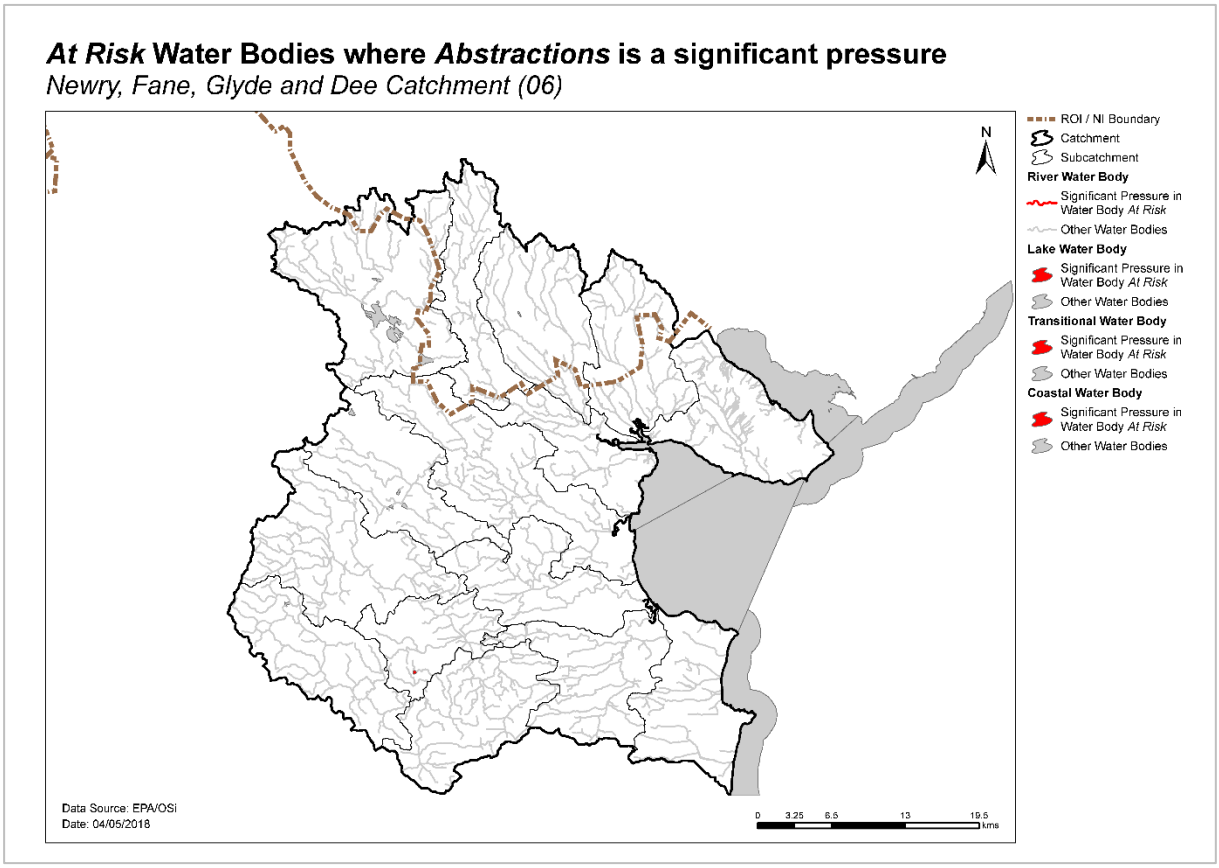


Figure 16. Water bodies that are *At Risk* and are impacted by abstraction pressures

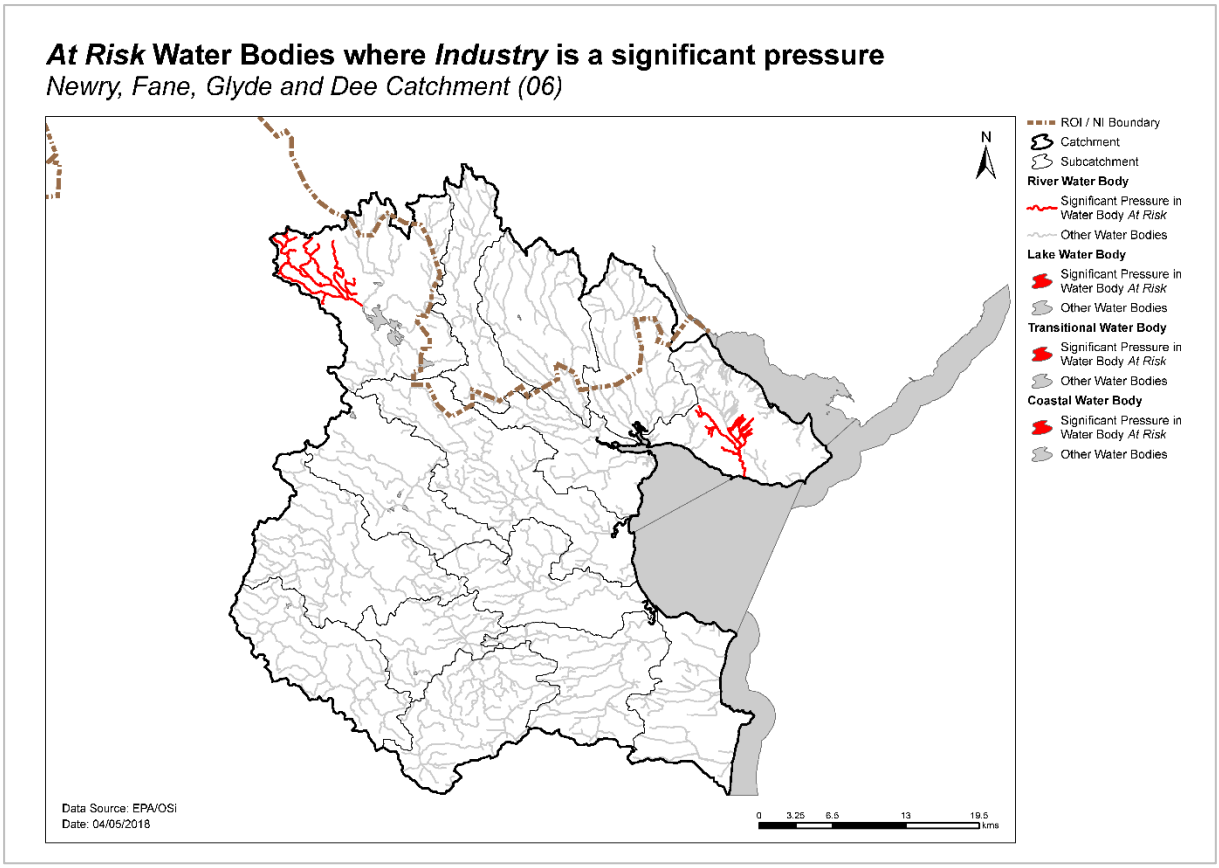


Figure 17. Water bodies that are *At Risk* and are impacted by industrial discharges

4.2.7 Forestry

- Forestry has been identified as a significant pressure in one river water body, (UKGBNI1NB060608252 FLURRY_020).

5 Load reduction assessment

5.1 River water body load reductions

- Phosphorus is the main parameter influencing water quality in rivers in the Newry-Fane-Glyde-Dee catchment.
- 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.
- In the Newry-Fane-Glyde-Dee catchment, water chemistry data were only available for 26 of the 68 water bodies. Of these 26 water bodies, the available data indicate that load reductions are required in eight river water bodies (Table 9). The largest reductions will be needed in the Dee_080 and Proules_020 water bodies, followed by White (Louth)_020. The load reductions needed in the majority of the river water bodies is low.

Table 9. Relative load reductions required in monitored water bodies that are *At Risk.*

WATER BODY	P Load Reduction Required
DEE_080	V. High
PROULES_020	V. High
WHITE (LOUTH)_020	High
DEE_090	Low
DEE_050	Low
KILLARY WATER_020	Low
CASTLETOWN_020	Low
KILMAINHAM (DEE)_020	Low

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.

- An estuary model was run for Inner Dundalk Bay Estuary where the main algal blooms are found. The results indicate that a 15% reduction in N load should improve the status of this estuary. This reduction should be achieved with the planned upgrade to the Dundalk waste water treatment plant.
- Phosphorus load reductions are also required to support the Castletown estuary but the percentage P reduction required is unknown.

6 Further characterisation and local catchment assessments

- Further characterisation through local catchment assessments is needed in 39 of the *At Risk* water bodies (Table 10) 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 25 of the *Review* water bodies to refine the understanding of the significant pressures at the site/field scale so that, if necessary, specific and targeted measures can be identified.

Table 10. Local Catchment Assessment Allocation for *At Risk* and *Review* River and Lake Water Bodies in the Catchment.

	IA 1	IA 2	IA 3	IA 4	IA 5	IA 6	IA 7	IA 9	Total
At Risk	31	2	9	2	3	7	10	1	65
Review	7	1	16	0	0	0	0	0	24
Note water bodies may have multiple categories of Local Catchment Assessments									

7 Catchment summary

- Of the 68 river water bodies, 34 are *At Risk* of not meeting their WFD objectives.
- Out of the ten lake water bodies, five *At Risk* of not meeting their WFD objectives.
- Excess nutrient loss, mainly phosphorus, leading to eutrophication is the dominant issue in the rivers and lakes in the catchment. The significant pressures relating to excess nutrients are primarily agricultural (diffuse and point), but also waste water (urban and domestic).
- Two of the thirteen transitional and coastal water bodies, Castletown Estuary and Inner Dundalk Bay, are *At Risk* due to their Moderate ecological status.
- In Castletown Estuary, the status is driven by phosphorus and phytoplankton. In Inner Dundalk Bay status is driven by phytoplankton and macroalgae. Modelling of the relationship between nutrients, chlorophyll, light limitation and the production of biomass within Inner Dundalk Bay has shown that the estuary is nitrogen limited.
- The dominant source of nutrients to both transitional water bodies is the direct input from Dundalk wastewater treatment, followed by wastewater and agriculture inputs via the freshwater environment.
- There is one *At Risk* ground water bodies in the catchment. In IA_NB_G_026, the significant issue is ammonia and the significant pressure is a landfill.

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 four areas for action in the Fane-Glyde 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 Newry-Fane-Glyde-Dee catchment are summarised below.

- Four recommended areas for actions (Table 11, Figure 18) were selected.
- These are the Glyde-Proules, Kilmainham (Dee), Castletown and Big (Louth).
- These include 13 *At Risk* and six *Review* river and lake water bodies.
- There is one groundwater body that is *Review* due to groundwater contribution of nutrients to surface water bodies, intersect with four of the recommended areas for action, see Table 12. Actions taken to improve surface water will need to take account of the groundwater contribution to surface water.

A remaining fifty-five *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 19. These include:

- 45 river and lake water bodies; 26 *At Risk* and 19 *Review*, and
- ten transitional and coastal water bodies; two *At Risk* and eight *Review*.

Table 11. Recommended Areas for Action in the Newry-Fane-Glyde-Dee Catchment

Recommended area for action	Number of water bodies	SCs	Local authority	Reason for Selection
Glyde-Proules	1	6_10	Monaghan/ Louth	• Five deteriorated water bodies. • One of the deteriorated water bodies, Glyde_050, is also not meeting its Protective Area objective. • Build on recent improvements in two water bodies. • Upgrade works are planned for Carrickmacross WWTP.
Kilmainham (Dee)	2	6_3	Meath	• Restore deteriorated water body
Castletown	2	6_2 6_12	Louth/ NIEA	• One deteriorated river water body, Castletown_030. • Build on recent improvements in the two water bodies upstream feeding into Castletown_030. • Improvements would benefit Castletown estuary. • Cross Border Partnership may be required.
Big (Louth)	2	6_9	Louth	• Desk study into abstraction regime. • Was at High status in the recent past. • Engagement possibilities with interested farmers in the area.

Table 12. Groundwater bodies intersecting with surface water bodies in recommended areas for action

Groundwater body name	Groundwater body risk	River water body code	River water body code	Recommended Area for Action	Groundwater body code
		IE_NB_06B280720	BAWN 06_010		IEGBNI_NB_G_019
		IE_NB_06G020100	GLYDE_020	Glyde-Proules	IEGBNI_NB_G_019
		IE_NB_06G020900	GLYDE_060		IEGBNI_NB_G_019
		IE_NB_06G021230	GLYDE_070		IEGBNI_NB_G_019
		IE_NB_06M170410	MAPASTOWN_010		IEGBNI_NB_G_019
		IE_NB_06W040900	WHITECROSS_010		IEGBNI_NB_G_019
		IE_NB_06K040100	KILMAINHAM (DEE)_020	Kilmainham (Dee)	IEGBNI_NB_G_019
		IE_NB_06C010200	CASTLETOWN_020	Castletown	IEGBNI_NB_G_019
		IE_NB_06C010310	CASTLETOWN_030		IEGBNI_NB_G_019
		UKGBNI1NB060608246	CASTLETOWN_010		IEGBNI_NB_G_019
Louth	Review	IE_NB_06B010300	BIG (LOUTH)_020	Big (Louth)	IEGBNI_NB_G_019

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 13 *At Risk* surface water bodies, it is predicted that two water bodies (15%) will improve by 2021 and eleven water bodies (85%) will achieve their objective by 2027. For the six *Review* water bodies, 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 13.

Table 13. 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	11	2	9
Review	5	0	5
Lakes			
At Risk	2	0	2
Review	1	0	1
Total	19	2	17

- Seventeen water bodies have met their 2015 environmental objective.
- Due to planned upgrade works at an urban wastewater treatment plant, a 2021 objective is applied to one of the 28 remaining *At Risk* water bodies. As action is not yet planned to be taken in the remaining 27 *At Risk* surface water bodies, a 2027 date is applied to all 27 18 of the remaining water bodies.
- For the 27 *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 14.

Table 14. 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	23	0	23
Review	16	0	16
Lakes			
At Risk	3	0	3
Review	3	0	3
TraCs			
At Risk	2	1	1
Review	8	0	8
Total	55	1	54

9.2 Groundwater

- Eleven of the twelve groundwater bodies are currently Good status and, therefore, have met their environmental objectives.
- The one groundwater body, Waste Facility (W0020-01), in the Fane Glyde catchment that is less than Good status has an environmental objective date of 2027.

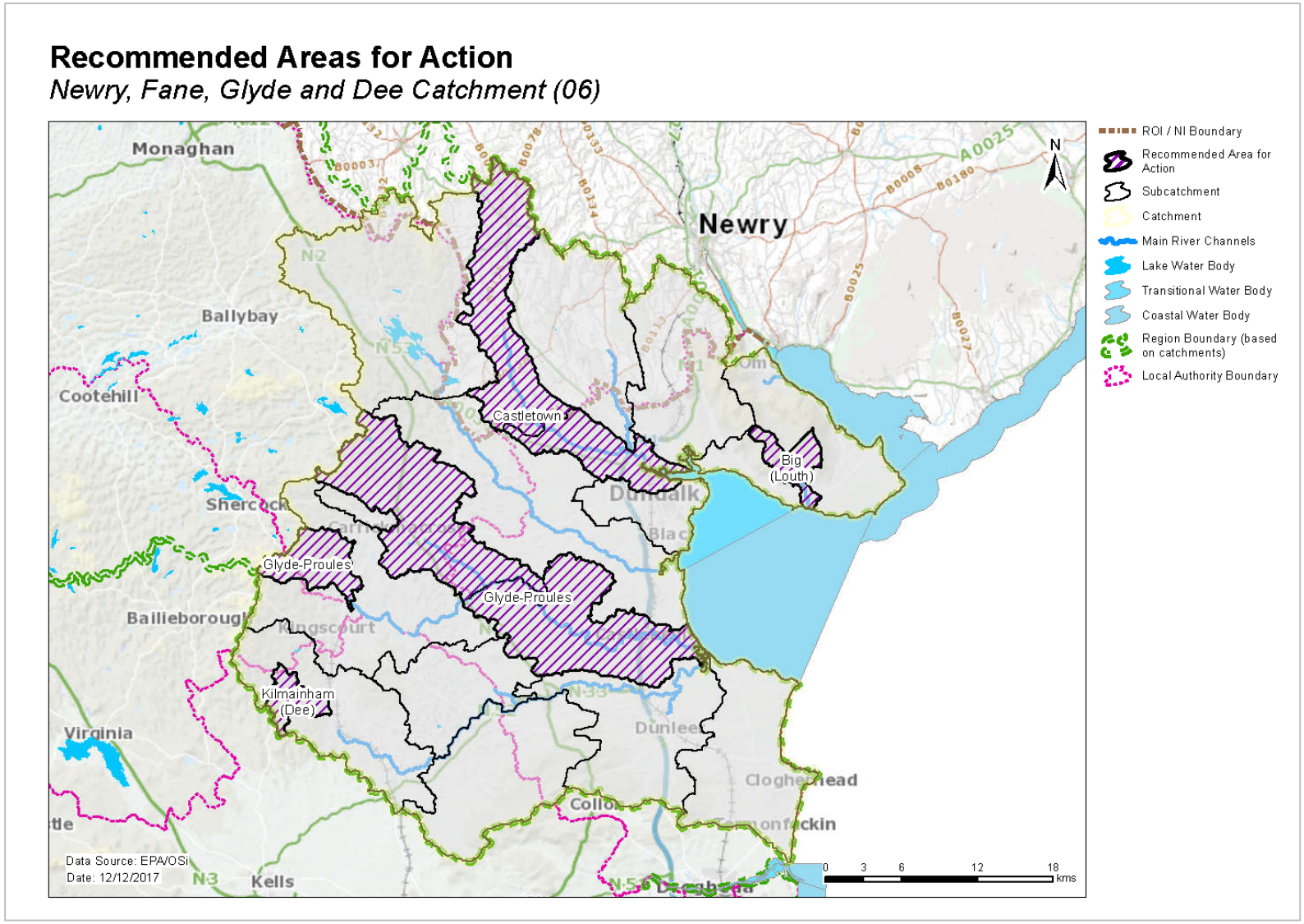


Figure 18. Location of Recommended Areas for Action in the Fane Glyde Catchment

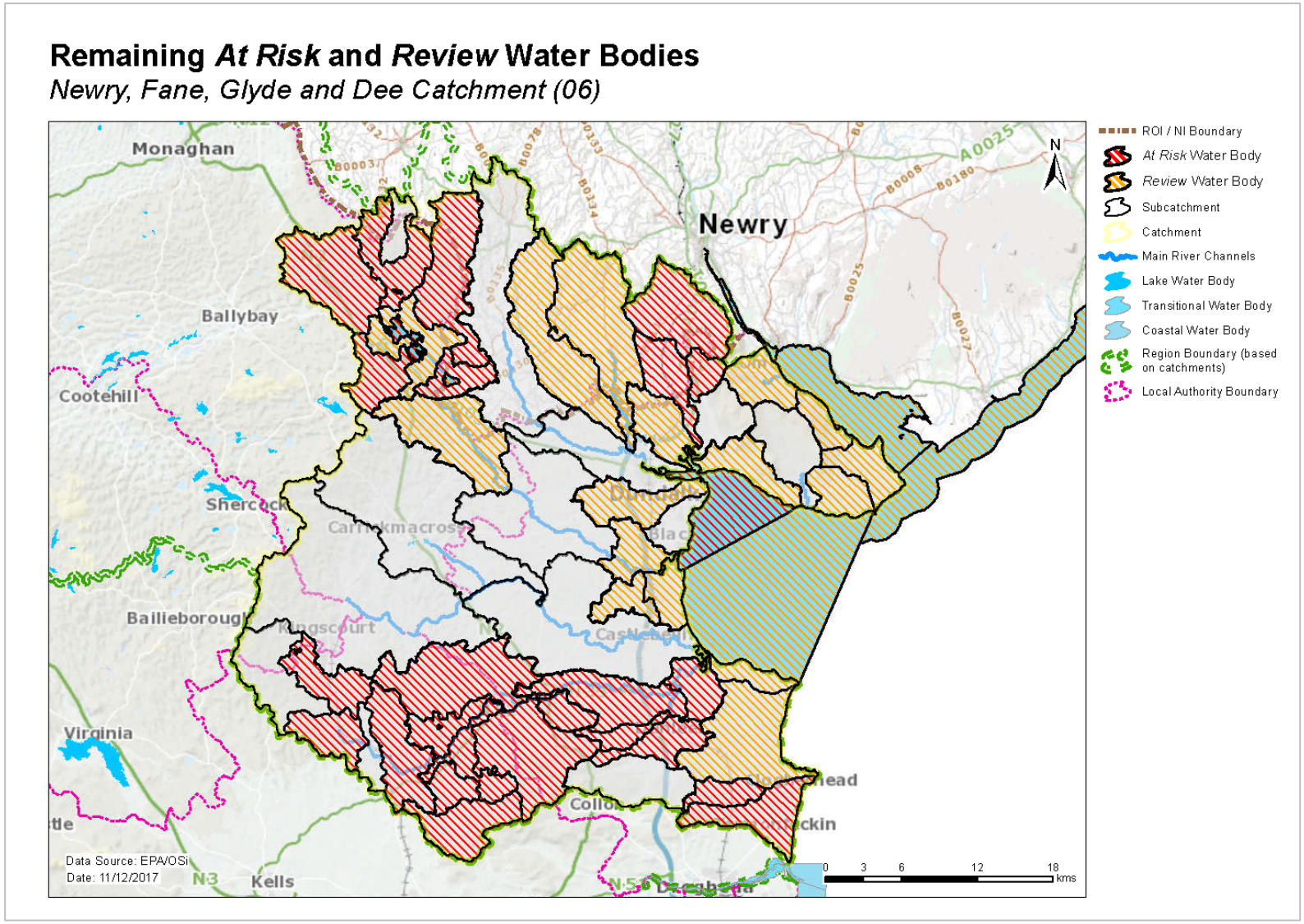


Figure 19. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Fane Glyde Catchment

10 Acknowledgements

This Newry-Fane-Glyde-Dee Catchment Assessment (Version 3) has been produced by the Catchment Science & Management Unit, EPA, with the assistance of the following:

- Louth County Council
- Meath County Council.
- Monaghan County Council.
- Inland Fisheries Ireland.
- Local Authorities Waters & Communities Office.
- Irish Water.
- Northern Ireland Environment Agency.
- 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 Catchment Scale Nutrient concentrations and in-stream loads

The results of the water quality assessment for the Fane, Glyde and Dee channels are illustrated in Charts 1 and 2.

Orthophosphate concentrations in the Dee increased along the main channel, ranging in concentration from 0.026 to 0.059mg/l. Exceedances of the Environmental Quality Standard (EQS) for good status (0.035mg/l) occurred at DEE_050, 070, 080, 090 and 100. TON concentrations showed a progressive increase in concentration moving downstream, reaching a peak value of 3.04mg/l at DEE_100. Total ammonia concentrations were above the EQS (0.065mg/l) threshold value at eight of the nine main channel sampling locations. Significantly elevated ammonia concentrations were apparent at DEE_050 (0.34mg/l) and DEE_080 (0.33mg/l).

For the Fane, monitoring data is only available on the main channel for the FANE_010 and FANE_050. Orthophosphate concentrations increased along the main channel ranging from 0.018 to 0.032mg/l, remaining below the EQS. Total ammonia concentrations decreased between FANE_010 (0.052mg/l) and FANE_050 (0.018mg/l), again without exceeding the EQS for ammonia. TON increased markedly from 0.66 to 1.15mg/l between FANE_010 and FANE_050.

Orthophosphate concentrations were moderately elevated along the Gylde main channel with values either close to or marginally exceeding the EQS. The highest orthophosphate concentration (0.07mg/l) occurred at GLYDE_020. TON concentrations increased uniformly progressing downstream ranging in concentration from 1.33 to 2.84mg/l at GLYDE_020 and GLYDE_070 respectively. Ammonia concentrations were typically below the EQS with the exception of GYLDE_020 (0.232mg/l) which also has elevated orthophosphate.

The distribution of load for orthophosphate and TON mirrored the gradual increase in stream concentrations and discharge moving downstream (Chart 2). The ammonia loading trend for the Dee show that while there are comparable concentration spikes at DEE_050 (0.34mg/l) and DEE_080 (0.33mg/l), the associated ammonia load at DEE_080 is twice as high as DEE_050, corresponding to a two-fold increase in river flow between the two locations. In the Fane and Glyde the orthophosphate and TON loads increased downstream corresponding to increasing flow and concentration whereas spikes in ammonia loading were associated with localised spikes in ammonia concentrations in downstream channel reaches.

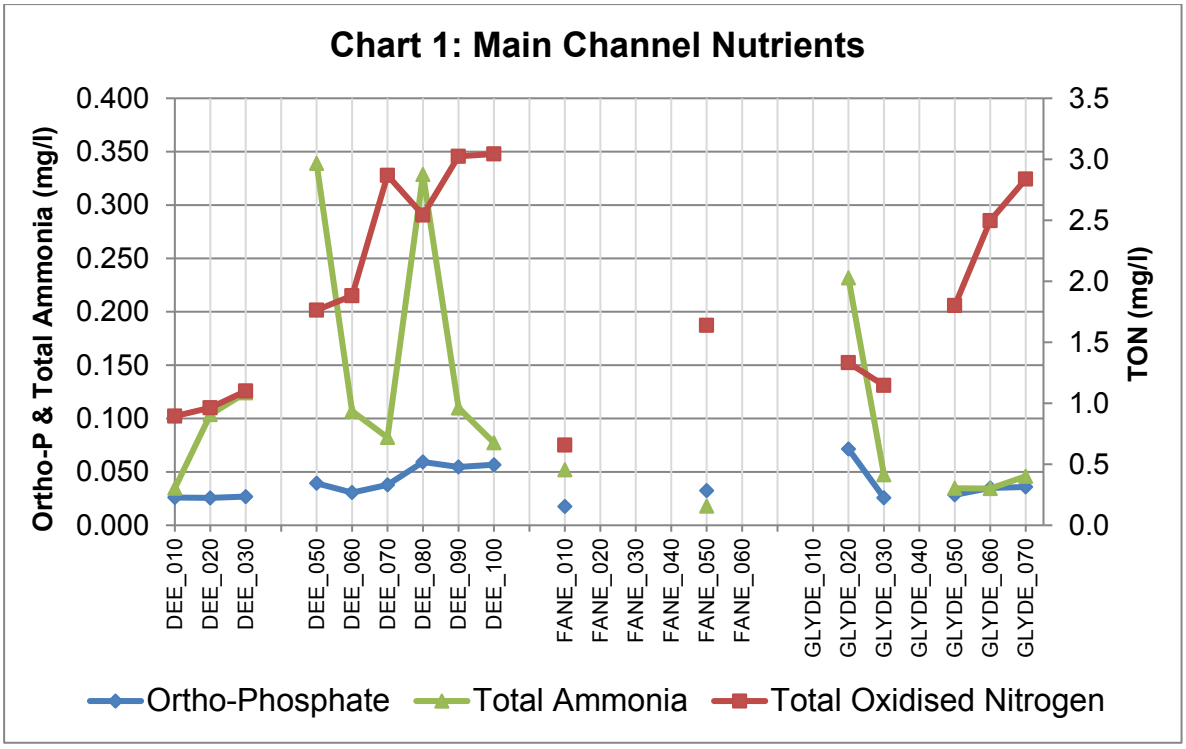


Chart 1: Main Channel Nutrients
Ortho-P & Total Ammonia (mg/l)
TON (mg/l)
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
DEE_010
DEE_020
DEE_030
DEE_050
DEE_060
DEE_070
DEE_080
DEE_090
DEE_100
FANE_010
FANE_020
FANE_030
FANE_040
FANE_050
FANE_060
GLYDE_010
GLYDE_020
GLYDE_030
GLYDE_040
GLYDE_050
GLYDE_060
GLYDE_070
Ortho-Phosphate
Total Ammonia
Total Oxidised Nitrogen

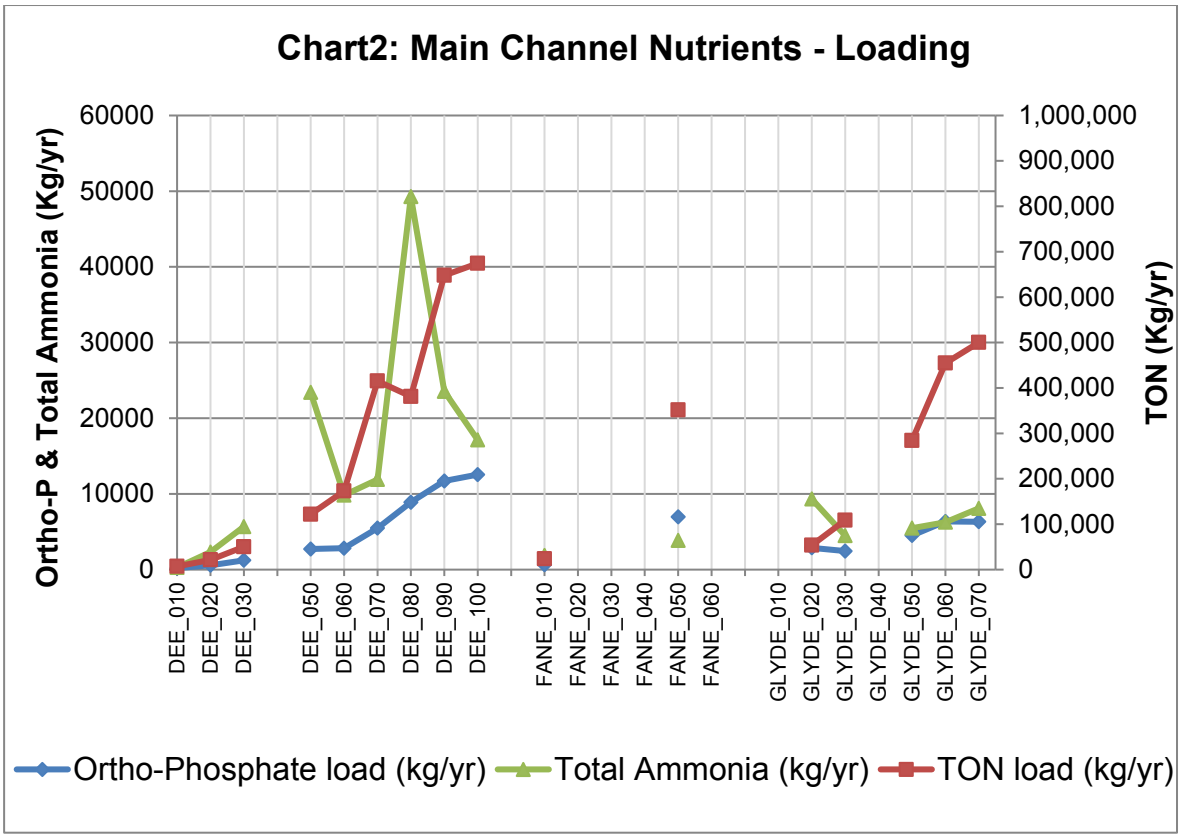


Chart2: Main Channel Nutrients - Loading
Ortho-P & Total Ammonia (Kg/yr)
TON (Kg/yr)
60000
50000
40000
30000
20000
10000
0
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
DEE_010
DEE_020
DEE_030
DEE_050
DEE_060
DEE_070
DEE_080
DEE_090
DEE_100
FANE_010
FANE_020
FANE_030
FANE_040
FANE_050
FANE_060
GLYDE_010
GLYDE_020
GLYDE_030
GLYDE_040
GLYDE_050
GLYDE_060
GLYDE_070
Ortho-Phosphate load (kg/yr)
Total Ammonia (kg/yr)
TON load (kg/yr)

Appendix 2 Drinking water supplies in the catchment

Scheme Code	Scheme Name	Water Body	Water Body Code
2300PRI2011	Meath Hill GWS	Louth GWB	IEGBNI_NB_G_019
2400PRI2018	Killanny- Reaghstown GWSS	Louth GWB	IEGBNI_NB_G_019
	Killanny- Reaghstown GWSS	Monalty Lough LWB	IE_NB_06_234
2100PRI3004	Grangebellow	Louth GWB	IEGBNI_NB_G_019
2100PRI3009	Mountain Park	Dundalk GWB	IE_NB_G_015
2100PRI3010	Ardaghy	Louth GWB	IEGBNI_NB_G_019
2100PRI3011	Tenure	Louth GWB	IEGBNI_NB_G_019
2400PRI2020	Churchill & Oram GWSS	Muckno Mill LWB	IE_NB_06_244
2400PRI2013	Donaghmoyne GWSS	Lough Nagaranam LWB	IE_NB_36_383
2400PUB1005	Carrickmacross	Carrickmacross GWB	IE_NB_G_016
	Carrickmacross PWS	Carrickmacross GWB	IE_NB_G_016
	Carrickmacross PWS	Carrickmacross GWB	IE_NB_G_016
2100PUB1001	Ardee	Ardee GWB	IE_NB_G_018
	Ardee	Ardee GWB	IE_NB_G_018
	Ardee	DEE_070 RWB	IE_NB_06D010670
2100PUB1004	Cooley	Dundalk GWB	IE_NB_G_015
	Cooley	Dundalk Gravels GWB	IE_NB_G_024
	Cooley	Dundalk GWB	IE_NB_G_015
	Cooley	Dundalk Gravels GWB	IE_NB_G_024
	Cooley	Dundalk Gravels GWB	IE_NB_G_024
2100PUB1010	Carlingford	Dundalk GWB	IE_NB_G_015
	Carlingford	Carlingford_010 RWB	IE_NB_06C620800
2100PUB1012	Omeath	Louth GWB	IEGBNI_NB_G_019
	Omeath	Louth GWB	IEGBNI_NB_G_019
	Omeath	KNOCKNAGORAN_010 RWB	IE_NB_06K250770
2300PUB1003	Castletown	Louth GWB	IEGBNI_NB_G_019
2300PUB1012	Kilmainhamwood WS	Louth GWB	IEGBNI_NB_G_019
2300PUB1017	Nobber WS	Ardee GWB	IE_NB_G_018
2300PUB1058	Lobinstown Village	Louth GWB	IEGBNI_NB_G_019
2300PUB1079	Carrickleck	Kingscourt GWB	IE_NB_G_017
0200PUB1015	Kingscourt PWS	DEE_020 RWB	IE_NB_06D010035
2400PUB1009	Inniskeen	FANE_040 RWB	UKGBNI1NB060608249
2300PUB1005	Drumcondrath	DEE_060 RWB	IE_NB_06D010600
2100PUB1002	Greenmount	DEE_100 RWB	IE_NB_06D011100
2100PUB1005	Tallanstown	GLYDE_050 RWB	IE_NB_06G020700
2100PUB1018	Cavanhill	FANE_050 RWB	IE_NB_06F010900
	Cavanhill	BALLYMASCANLAN_010 RWB	UKGBNI1NB060602038
2100PUB1011	Greenore	Dundalk GWB	IE_NB_G_015
2100PUB1013	Ballybinaby Borehole & Sheelagh Borehole	Louth GWB	IEGBNI_NB_G_019
2300PUB1055	Crossguns Borehole	Ardee GWB	IE_NB_G_018
2300PUB1057	Julianstown Borehole	Ardee GWB	IE_NB_G_018
2300PUB1078[5]	Newtown Borehole	Ardee GWB	IE_NB_G_018

[5] *No scheme name for 2100PUB1013, 2300PUB1055, 2300PUB1057 or 2300OUB1078, but abstraction locations given.*

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
06_1	IE_NB_06_209	Brackan	Lake	At risk	Unassigned	Moderate	N	Ag,Other	2027	
06_1	IE_NB_06D010600	Dee_050	River	At risk	Moderate	Moderate	N	Ag, Hymo	2027	
06_1	IE_NB_06D010670	Dee_060	River	At risk	Unassigned	Poor	N	Ag, Hymo, UWW	2027	
06_2	UKGBNI1NB060608246	Castletown_010	River	At risk	Poor	Moderate	N	DU	2027	Castletown
06_3	IE_NB_06_54	Ervey	Lake	At risk	Unassigned	Unassigned	N	Ag	2027	
06_3	IE_NB_06D010035	Dee_020	River	At risk	Unassigned	Poor	N	Ag,Hymo	2027	
06_3	IE_NB_06D010150	Dee_030	River	At risk	Moderate	Poor	N	Ag,Hymo	2027	
06_3	IE_NB_06D010360	Dee_040	River	At risk	Poor	Moderate	N	Ag,UWW	2027	
06_3	IE_NB_06K040100	Kilmainham (Dee)_020	River	At risk	Good	Moderate	N	Ag,Hymo	2021	Kilmainham (Dee)
06_3	IE_NB_06M460800	Moynagh_040	River	At risk	Unassigned	Unassigned	N	Ag,Hymo,UWW	2027	
06_4	IE_NB_06K010100	Killary Water_010	River	At risk	Unassigned	Moderate	N	Ag,Hymo,UWW	2027	
06_4	IE_NB_06K010500	Killary Water_020	River	At risk	Poor	Poor	N	Ag,Hymo	2027	
06_5	IE_NB_06_234	Monalty	Lake	At risk	Poor	Bad	N	Other,UWW	2027	Glyde-Proules
06_5	IE_NB_06_55	Naglack	Lake	At risk	Poor	Bad	N	Other,UWW	2027	Glyde-Proules
06_5	IE_NB_06P010300	Proules_020	River	At risk	Unassigned	Poor	N	UWW	2027	Glyde-Proules
06_5	IE_NB_06P010600	Proules_030	River	At risk	Moderate	Poor	N	Hymo,UWW	2027	Glyde-Proules
06_5	IE_NB_06R030260	Rossdreenagh Stream_010	River	At risk	Unassigned	Moderate	N	Hymo	2027	Glyde-Proules
06_5	IE_NB_06R030400	Rossdreenagh Stream_020	River	At risk	Unassigned	Moderate	N	Ag,Hymo	2027	Glyde-Proules

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
06_5	IE_NB_36_383	Nagarnaman	Lake	Review	Unassigned	Unassigned	N		2027	Glyde-Proules
06_6	UKGBNI1NB060608228	Kilcurry_010	River	Review	Good	Good	N		2027	
06_6	UKGBNI1NB060608235	Cully Water_010	River	Review	Good	Good	N		2027	
06_6	UKGBNI3NB0028	Cashel Upper	Lake	Review	Unassigned	Unassigned	N		2027	
06_7	IE_NB_06G020100	Glyde_020	River	Review	Good	Good	N		2027	Glyde-Proules
06_8	IE_NB_06_244	Muckno Mill	Lake	Review	Unassigned	Unassigned	N		2027	
06_8	IE_NB_06_56	Muckno	Lake	At risk	Bad	Poor	N	UWW	2027	
06_8	IE_NB_06A011000	Annahale Stream_010	River	At risk	Unassigned	Unassigned	N	Ag	2027	
06_8	IE_NB_06F010200	Fane_010	River	At risk	Poor	Poor	N	Ag,Ind	2027	
06_8	UKGBNI1NB060603027	County Water_010	River	At risk	Moderate	Poor	N	Ag,DU	2027	
06_8	UKGBNI1NB060608229	Fane_020	River	Review	Unassigned	Unassigned	N		2027	
06_8	UKGBNI1NB060608250	Fane_030	River	At risk	Poor	Poor	N	Ag	2027	
06_8	UKGBNI1NB060608253	Gentle Owen's Lake Stream_020	River	At risk	Moderate	Moderate	N	Ag	2027	
06_8	UKGBNI3NB0020	Ross MN	Lake	Review	Unassigned	Unassigned	N		2027	
06_9	IE_NB_06B010300	Big (Louth)_020	River	At risk	Poor	Moderate	N	Ind	2027	Big (Louth)
06_9	IE_NB_06B460680	Ballynamaghery_010	River	Review	Unassigned	Unassigned	N		2027	
06_9	IE_NB_06C620800	Carlingford_010	River	Review	Unassigned	Unassigned	N		2027	
06_9	IE_NB_06G180630	Greenore_010	River	Review	Unassigned	Unassigned	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
06_9	IE_NB_06K250770	Knocknagoran_010	River	Review	Unassigned	Unassigned	N		2027	
06_9	IE_NB_06R330950	Rockmarshall_010	River	Review	Unassigned	Unassigned	N		2027	
06_9	GBNIIE6NB020	Mourne Coast	Coastal	Review	Unassigned	Unassigned	N		2027	
06_9	GBNIIE6NB030	Carlingford Lough	Coastal	Review	Moderate	Unassigned	N		2027	
06_9	IE_NB_030_0200	Carlingford Lagoons	Transitional	Review	Unassigned	Unassigned	N		2027	
06_9	IE_NB_030_0250	Shilties Lough	Transitional	Review	Unassigned	Unassigned	N		2027	
06_9	UKGBNI5NB030010	Newry Estuary	Transitional	Review	Moderate	Unassigned	N		2027	
06_10	IE_NB_06B280720	Bawn 06_010	River	Review	Unassigned	Unassigned	N		2027	Glyde-Proules
06_10	IE_NB_06G020700	Glyde_050	River	At risk	Good	Moderate	N	UWW	2027	Glyde-Proules
06_10	IE_NB_06G020900	Glyde_060	River	Review	Good	Good	N		2027	Glyde-Proules
06_10	IE_NB_06G021230	Glyde_070	River	At risk	Good	Moderate	N	UWW	2027	Glyde-Proules
06_10	IE_NB_06M170410	Mapastown_010	River	Review	Unassigned	Unassigned	N		2027	Glyde-Proules
06_10	IE_NB_06W040900	Whitecross_010	River	Review	Unassigned	Unassigned	N		2027	Glyde-Proules
06_10	IE_NB_040_0000	Outer Dundalk Bay	Coastal	Review	Good	Good	N		2027	
06_11	UKGBNI1NB060602038	Ballymascanlan_010	River	At risk	Poor	Poor	N	DU	2027	
06_11	UKGBNI1NB060608247	Flurry_010	River	At risk	Poor	Poor	N	Ag,DU	2027	
06_11	UKGBNI1NB060608251	Raskeagh_010	River	Review	Unassigned	Unassigned	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
06_11	UKGBNI1NB060608252	Flurry_020	River	At risk	Unassigned	Moderate	N	DU,For	2027	
06_11	IE_NB_040_0200	Castletown Estuary	Transitional	At risk	Moderate	Moderate	N	UWW	2027	
06_11	IE_NB_040_0300	Ballymascanlan Estuary	Transitional	Review	Unassigned	Unassigned	N		2027	
06_12	IE_NB_06C010200	Castletown_020	River	At risk	Unassigned	Moderate	N	Ag	2021	Castletown
06_12	IE_NB_06C010310	Castletown_030	River	At risk	Good	Moderate	N	Ag,DU	2027	Castletown
06_12	IE_NB_06R010300	Ramparts_010	River	Review	Unassigned	Unassigned	N		2027	
06_12	IE_NB_040_0100	Inner Dundalk Bay	Transitional	At risk	Moderate	Moderate	N	UWW	2021 (measures planned)	
06_13	IE_NB_06D470300	Drummeenagh_010	River	Review	Unassigned	Unassigned	N		2027	
06_13	IE_NB_06F010950	Fane_060	River	Review	Unassigned	Unassigned	N		2027	
06_13	IE_NB_06K210970	Killincoole_010	River	Review	Unassigned	Unassigned	N		2027	
06_13	UKGBNI1NB060608249	Fane_040	River	Review	Good	Good	N		2027	
06_14	IE_NB_06J020630	Johnstown 06_010	River	Review	Unassigned	Unassigned	N		2027	
06_14	IE_NB_06S160790	Slieveboy 06_010	River	Review	Unassigned	Unassigned	N		2027	
06_14	IE_NB_06T010250	Termonfeckin_010	River	At risk	Unassigned	Unassigned	N	Ag	2027	
06_14	IE_NB_06T010400	Termonfeckin_020	River	At risk	Poor	Poor	N	Ag,Hymo	2027	
06_14	IE_NB_040_0600	Corstown Lagoon	Transitional	Review	Unassigned	Unassigned	N		2027	
06_15	IE_NB_06D010710	Dee_080	River	At risk	Poor	Poor	N	Hymo,UWW	2027	
06_15	IE_NB_06D011000	Dee_090	River	At risk	Moderate	Poor	N	Ag,Hymo	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
06_15	IE_NB_06D011100	Dee_100	River	At risk	Unassigned	Poor	N	Ag,Hymo	2027	
06_15	IE_NB_06W010400	White (Louth)_020	River	At risk	Moderate	Poor	N	UWW	2027	
06_15	IE_NB_06W010500	White (Louth)_030	River	At risk	Moderate	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.

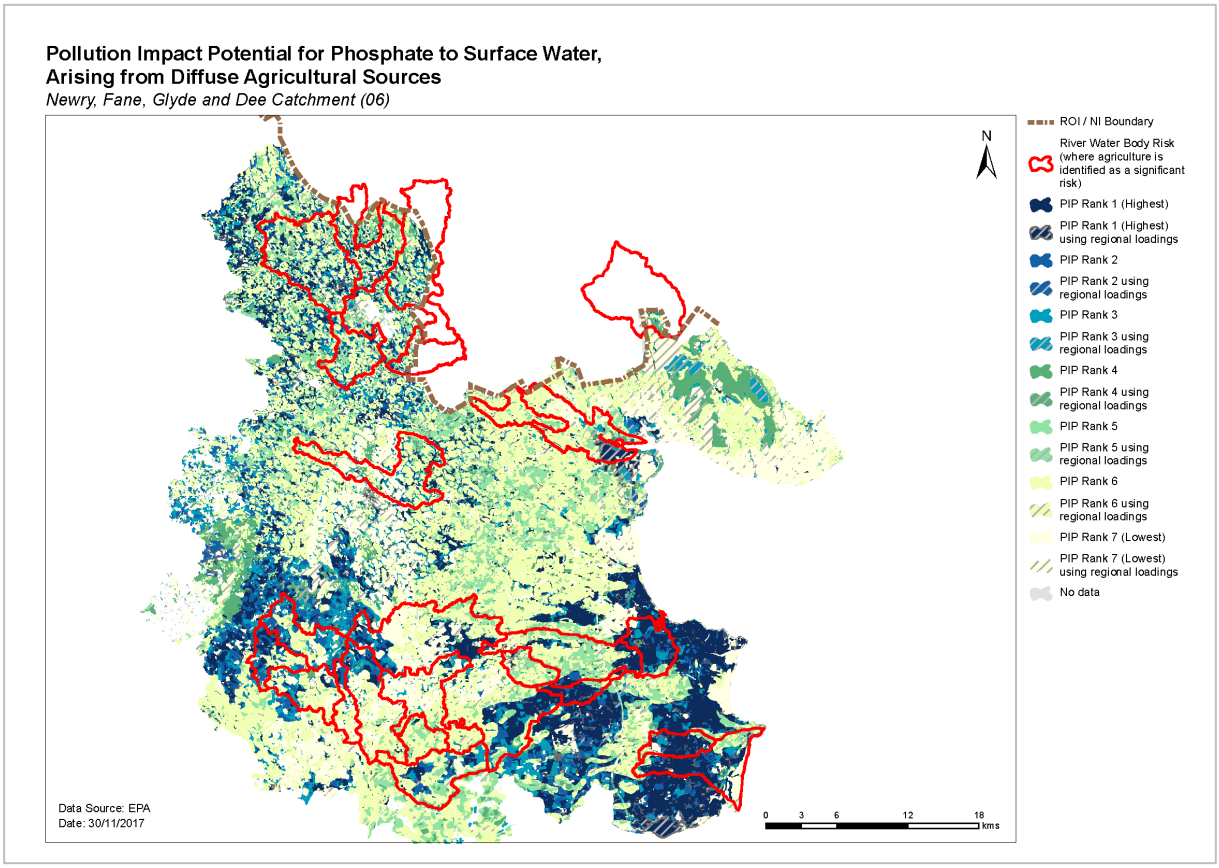
Protected Area: If a water body is one or more of the following: Drinking Water Protected Area; Bathing Water; Shellfish Area; Nutrient Sensitive Area or; a Natura 2000 site with a water dependent qualifying interest with a water quality and/or quantity conservation objective, then it has been highlighted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

Appendix 4 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?
Carlingford Shore SAC 002306	None							
Dundalk Bay SAC 000455	None							
Clogher Head SAC 004159	None							
Boyne Coast and Estuary SAC 001957	None							

Appendix 5 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 6 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