Boyne Catchment Assessment 2010-2015 (HA 07)

Catchment Science & Management Unit

Environmental Protection Agency

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Valued water resources supporting vibrant communities

Preface

This document provides a summary of the characterisation outcomes for the water resources of the Boyne 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/

Table of contents

1 Introduction

This catchment includes the area drained by the River Boyne and by all streams entering tidal water between The Haven and Mornington Point, Co. Meath, draining a total area of 2,694km². The largest urban centre in the catchment is Drogheda. The other main urban centres are Navan, Trim, Kells, Virginia, Bailieborough, Athboy, Kinnegad, Edenderry and Enfield. The total population of the catchment is approximately 196,400 with a population density of 73 people per km².

The catchment is underlain by metamorphic rocks in the north and limestone bedrock in the centre and south of the catchment. There are extensive sand and gravel areas in this catchment, particularly along the upper reaches of the Boyne.

The historic source of the River Boyne is the Trinity Well, southeast of Carbury, Co. Kildare. The Boyne flows west from here, turning north at Edenderry, through the raised bog landscape of north County Kildare, after which it is joined from the west by the (Castlejordan) Yellow River. The river is joined by the (Longwood) Blackwater and the (Raharney) Deel Lough Lene, in the Deel catchment, drains to both to the Boyne system via a surface channel, and the Shannon system via an underground karstic flow route. The Stoneyford River then enters the Boyne.

The Athboy River joins the Boyne, before the Boyne flows east through Trim and is joined by the Knighsbrook and Boycetown Rivers. The River Skan flows into the Boyne from the south just as the Boyne turns towards Navan. The (Kells) Blackwater flows into the Boyne from the in Navan, having begun its journey in County Cavan north of Bailieborough, through Lough Ramor and Kells.

After Navan, the Boyne continues eastwards, sweeping around the southern side of the Brú na Bóinne ancient site, before becoming tidal to the west of the M1 motorway. The Boyne flows through Drogheda and out to the Irish Sea between the Haven and Mornington Point. An arterial drainage scheme was completed on the Boyne River by the OPW between 1969 and 1986 and flood relief works were carried out at Johnstown and Mornington during 2012.

The Boyne catchment comprises 20 subcatchments with 114 river water bodies, 11 lakes, one transitional and three coastal water bodies, and 25 groundwater bodies (Table 1, Figure1).

Table 1. List of subcatchments in the Boyne catchment

Subcatchment ID	Subcatchment Name
07_1	Boyne_SC_110
07_2	Boyne_SC_030
07_3	Boyne_SC_080
07_4	Boyne_SC_010
07_5	Blackwater[Kells]_SC_010
07_6	Blackwater[Longwood]_SC_010
07_7	Deel[Raharney]_SC_010
07_8	Blackwater[Kells]_SC_030
07_9	Boyne_SC_040
07_10	Blackwater[Kells]_SC_020
07_11	Yellow[Castlejordan]_SC_010
07_12	Boyne_SC_050
07_13	Boyne_SC_070
07_14	Moynalty_SC_010
07_15	Boyne_SC_120
07_16	Boyne_SC_020
07_17	Boyne_SC_130
07_18	Boyne_SC_100
07_19	Boyne_SC_090
07_20	Boyne_SC_060

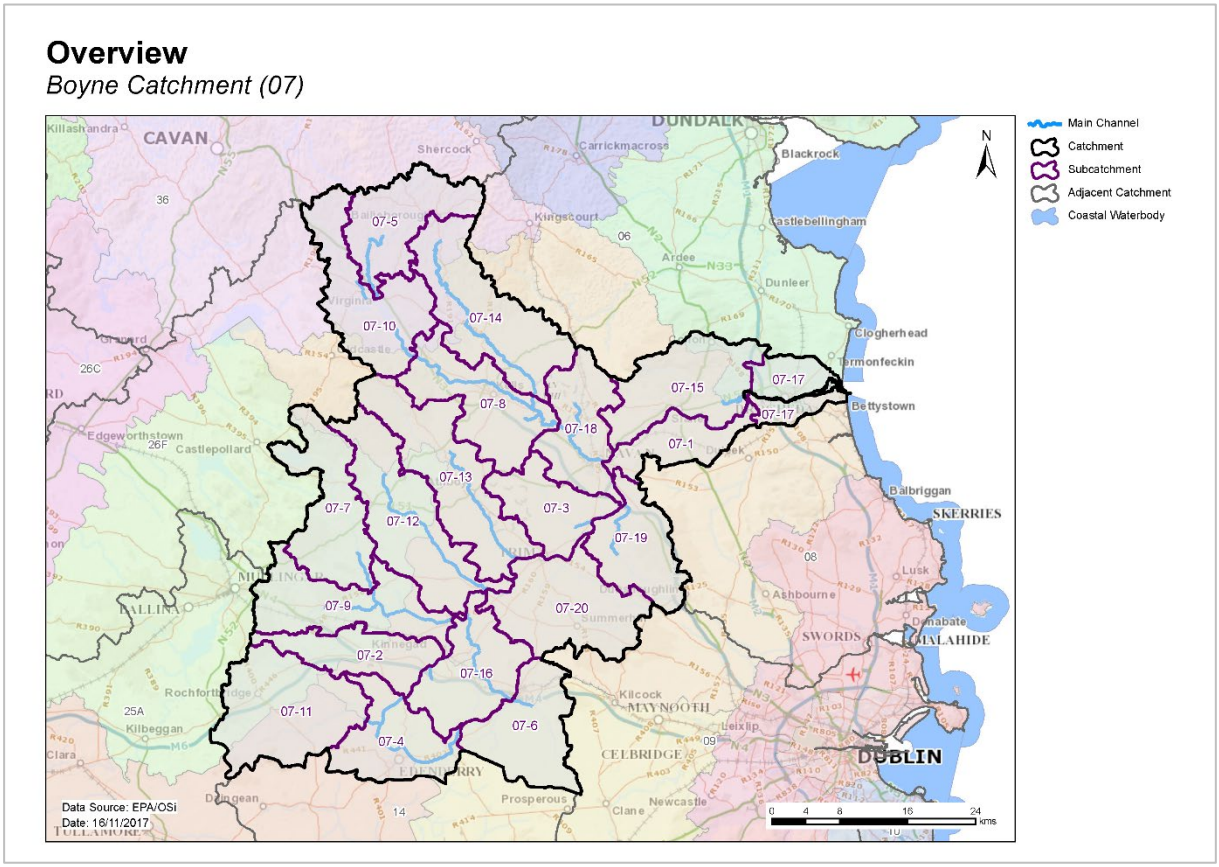


Figure 1. Subcatchments in the Boyne catchment

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 30 (24%) river and lake water bodies at Good or High status, and 68 (54%) at less than Good status in 2015 (Table 2, Figure 2). Twenty-seven (22%) river and lakes water bodies are unassigned.
- One river water body (Chapel Lake Stream_010) and one lake water body (Bane Noggin Hill) have a high ecological status objective. In 2015, these water bodies were at High status (Figure 3, Appendix 1).
- The numbers of water bodies at each status class in 2007-09 and 2010-15 are shown in Figures 4 (rivers) and 5 (lakes).
- Sixteen river water bodies and one lake water body have improved in status and 19 have deteriorated since 2007-09 (Figure 7).
- The variation in nutrient concentrations and loads in the Boyne main channel is illustrated in Appendix 2.

2.1.2 Transitional and Coastal (TraC)

- Of the four transitional and coastal (TraC) water bodies, two coastal water bodies were at Good status (Boyne Estuary Plume Zone and North-western Irish Sea (HA 08)), one transitional water body was at Moderate status (Boyne Estuary) and one coastal was unassigned (Louth Coast (HA06)) (Table 2, Figure 2).
- There is one coastal water body with a high ecological status objective, North-western Irish Sea HA08. This water body was at Good status in 2015 (Appendix 1).
- The numbers of TraC water bodies in each status class in 2007-09 and 2010-15 is shown in Figure 6.
- Note that North-western Irish Sea (HA 08) and Louth Coast (HA 06) are shared with other catchments.

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

	Number of water bodies	2010-15 Status						Risk Categories		
		High	Good	Mod	Poor	Bad	Unassigned	*Not at Risk*	*Review*	*At Risk*
Rivers	114	1	26	43	20	0	24	28	19	67
Lakes	11	1	2	0	2	3	3	3	3	5
TraC	4	0	2	1	0	0	1	1	2	1

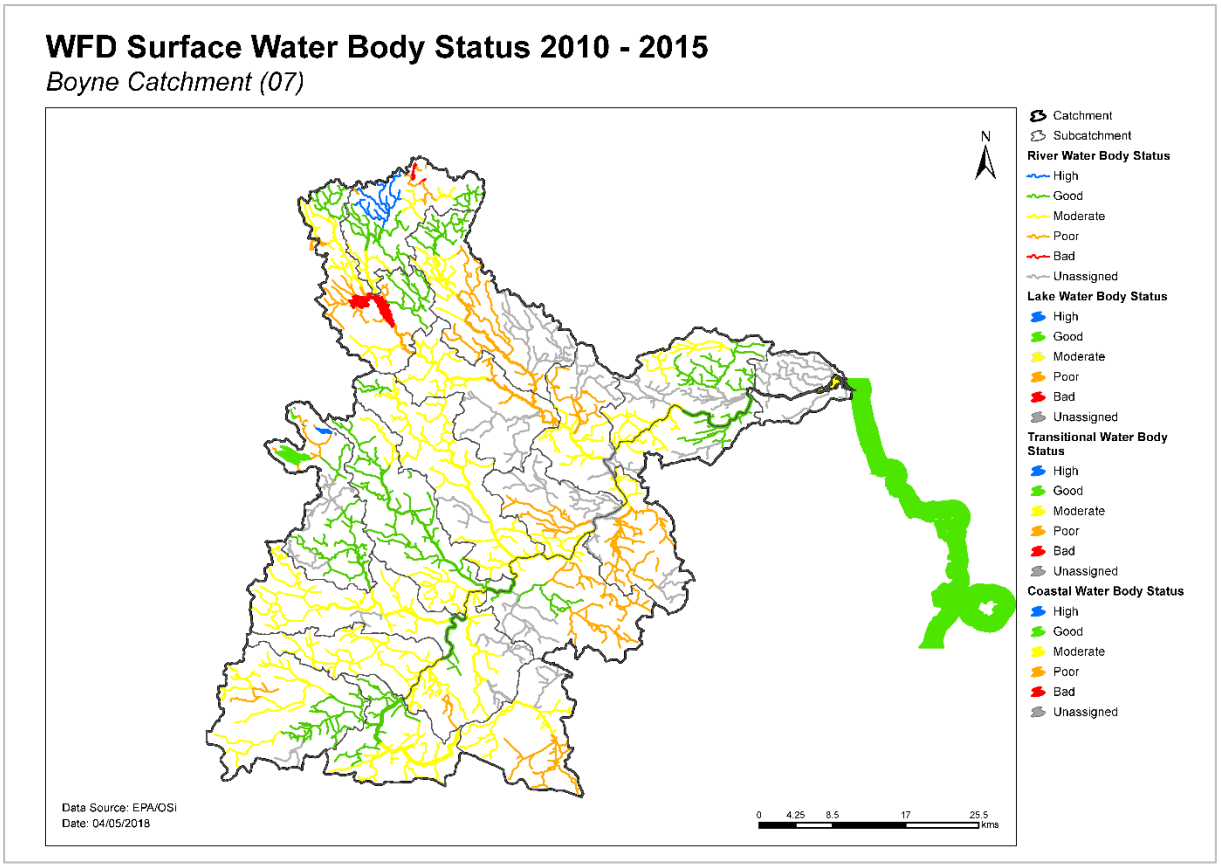


Figure 2. Surface water ecological status

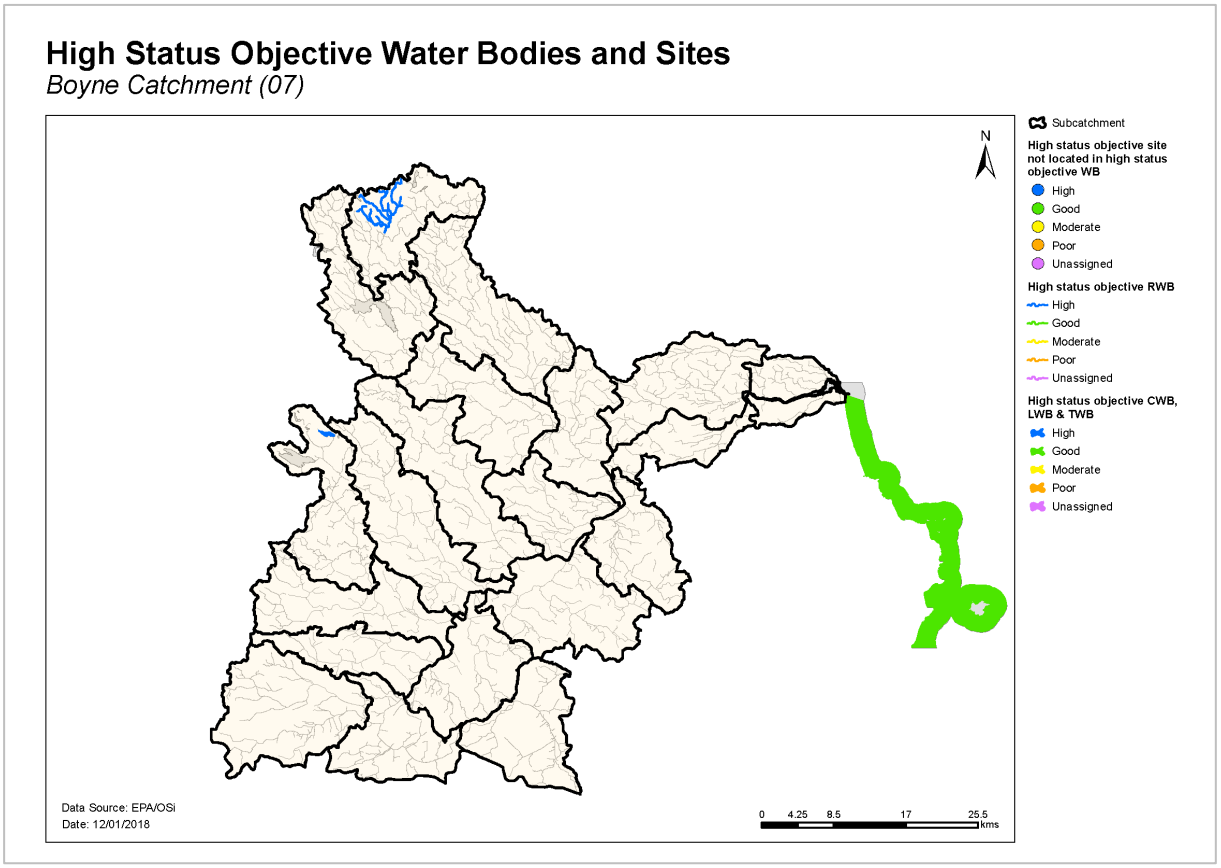


Figure 3. High ecological status objective water bodies and sites

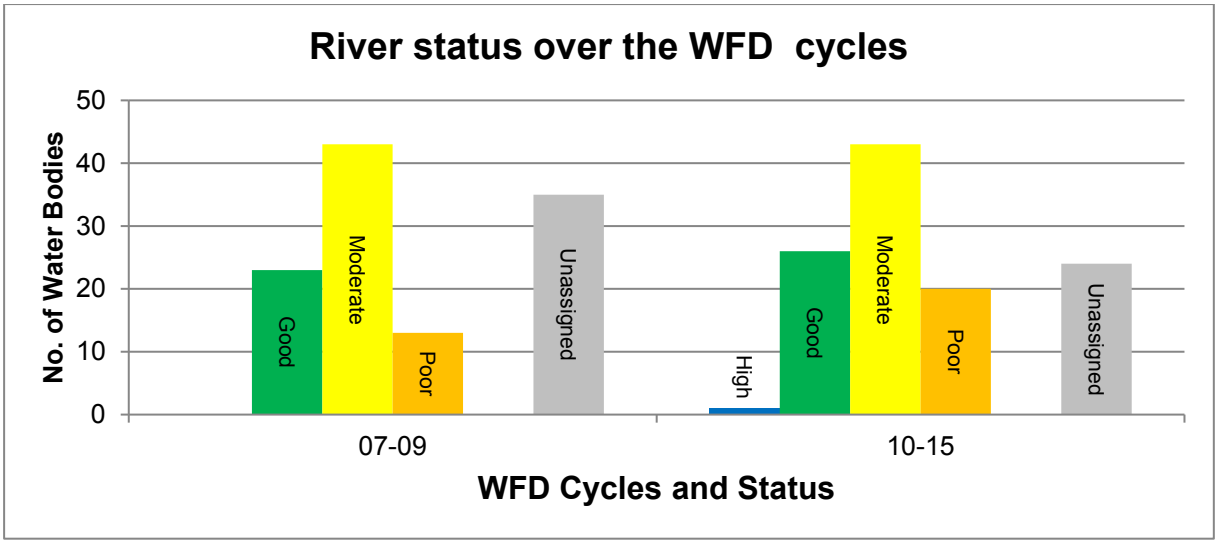


Figure 4. Number of rivers at each status class in 2007-09 and 2010-15

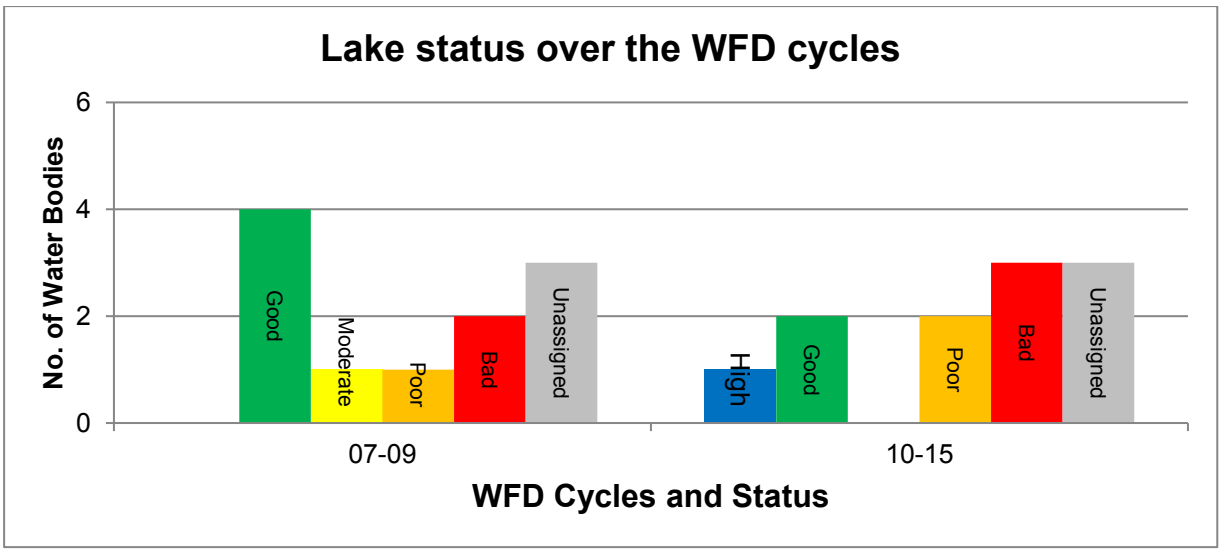


Figure 5. Number of lakes at each status class in 2007-09 and 2010-15

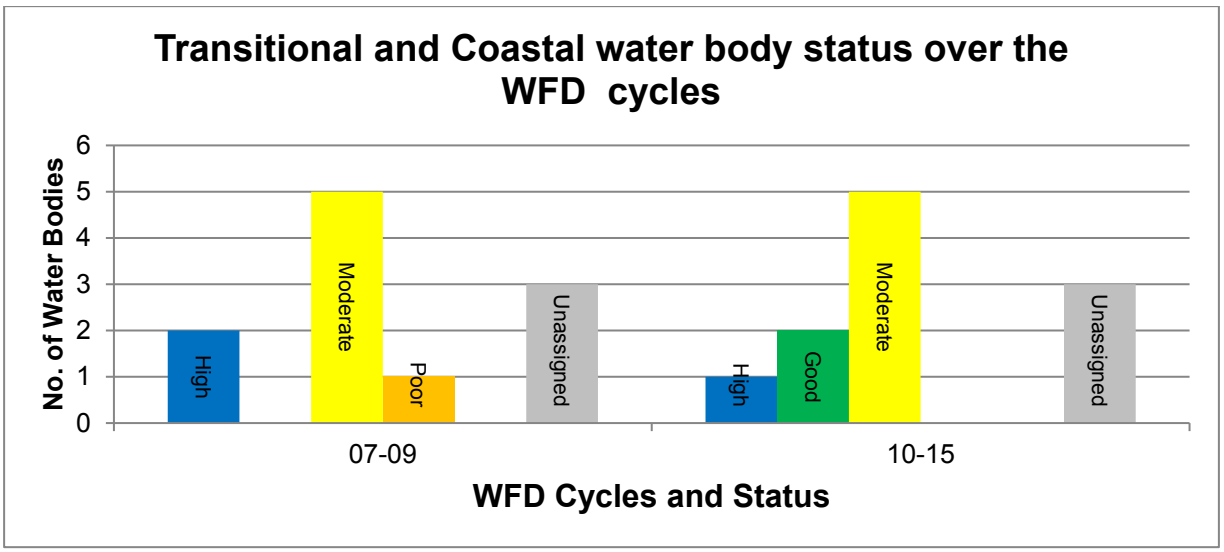


Figure 6. Number of transitional and coastal water bodies at each status class in 2007-09 and 2010-15

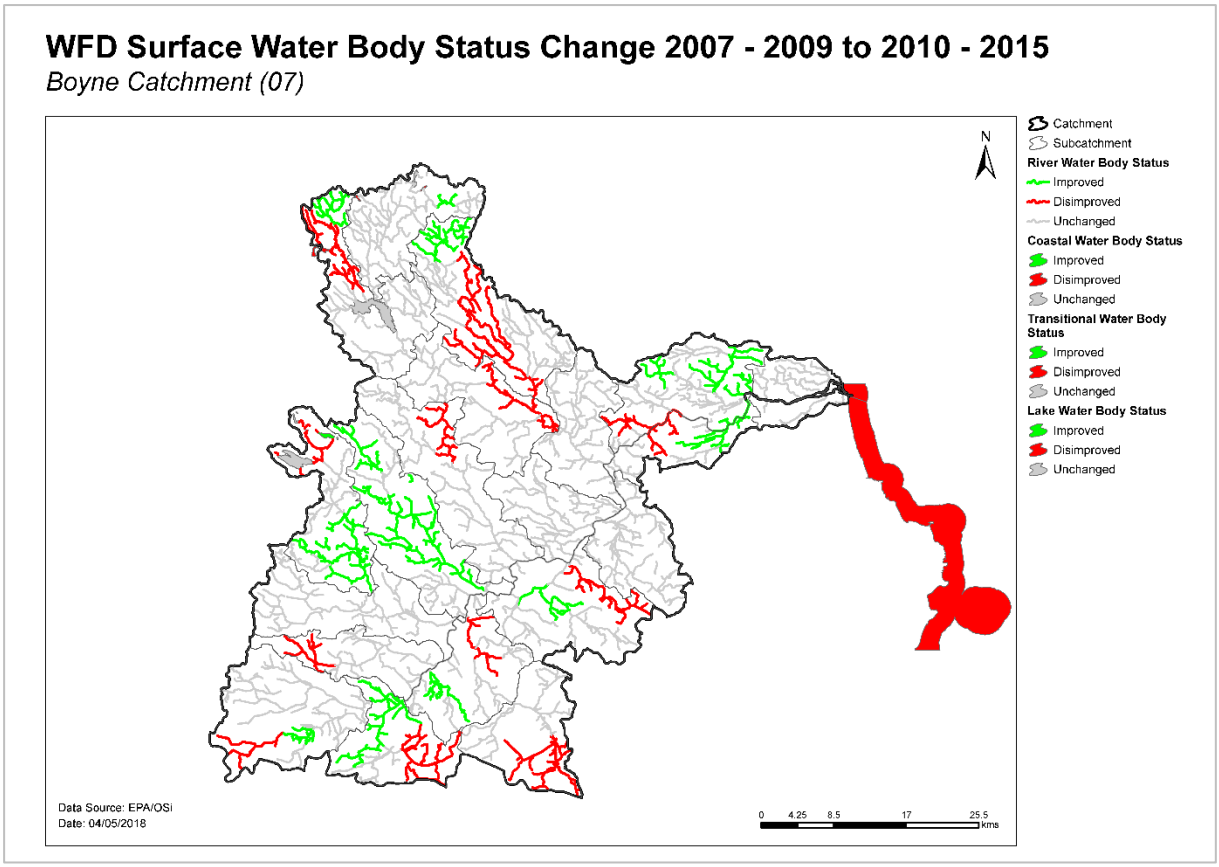


Figure 7. Surface water body status changes from 2007-09 to 2010-15.

2.2 Groundwater status

- Of the 25 groundwater bodies, 22 were at Good status in 2015 and three were at Poor status (Table 3, Figure 8).

Table 3. Summary of groundwater body status and risk categories

	Number of water bodies	2010-15 Status		Risk Categories		
		Good	Poor	*Not at Risk*	*Review*	*At Risk*
Groundwater	25	22	3	8	11	6

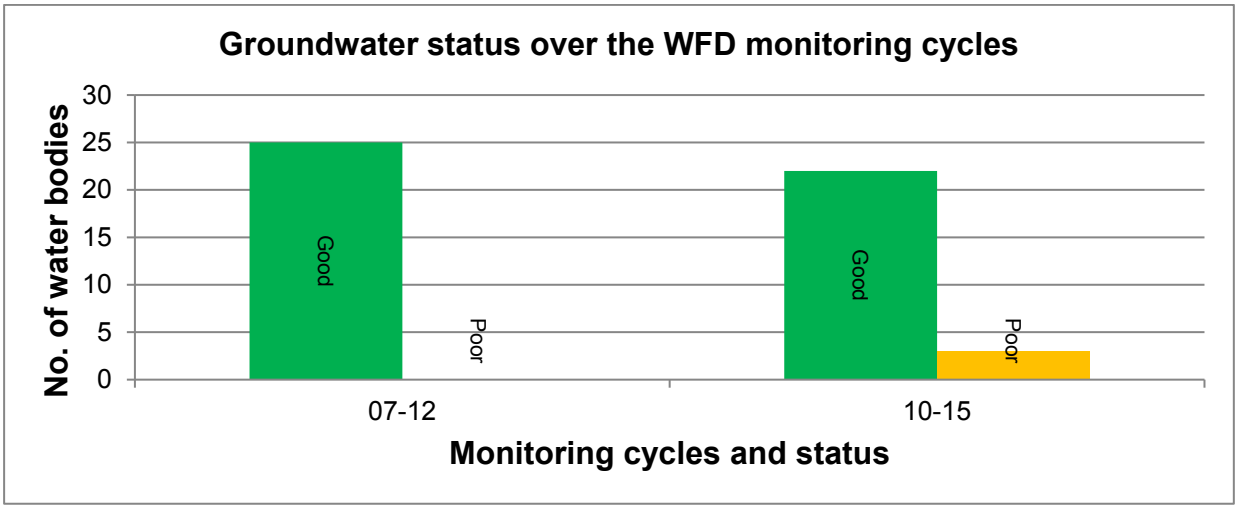


Figure 8. Number of groundwater bodies at each status class in 2007-12 and 2010-15

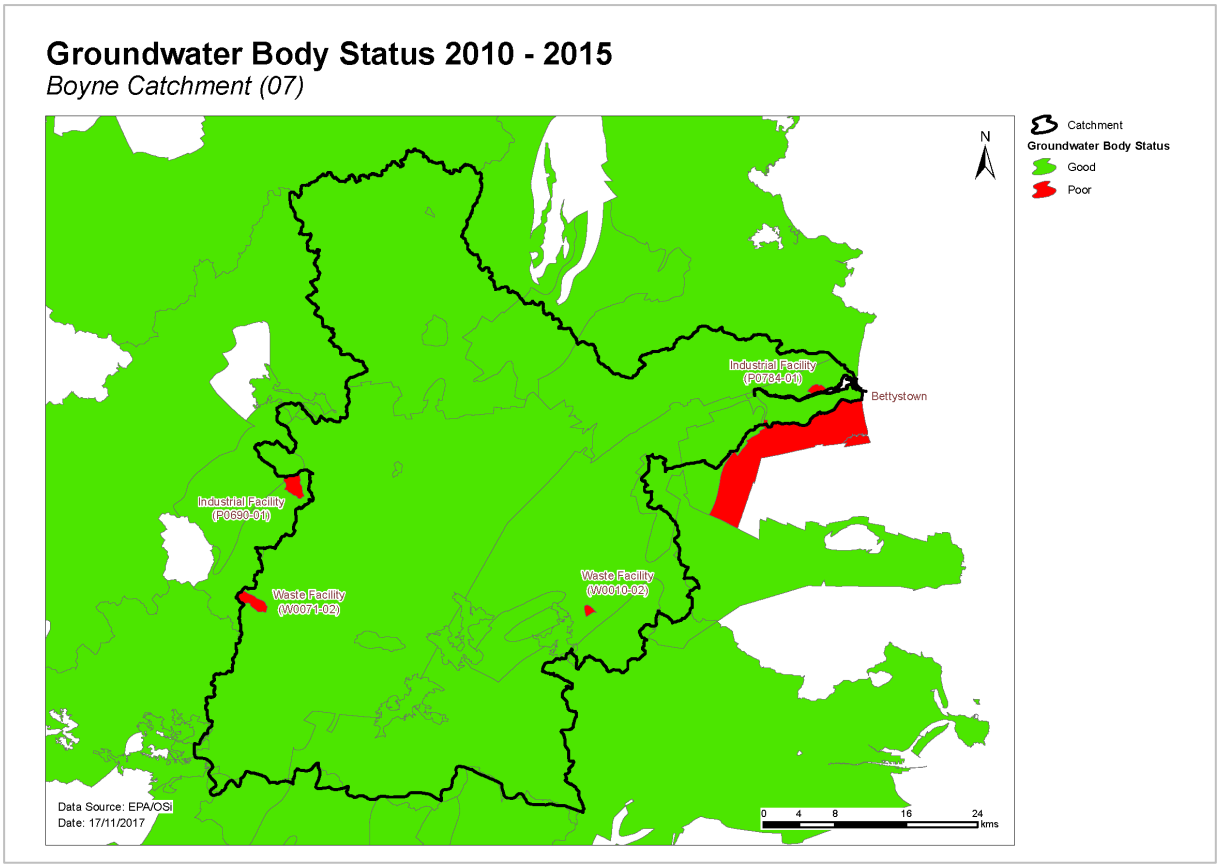


Figure 9. Groundwater body status 2010-15

2.3 Risk of not meeting surface water environmental objectives

2.3.1 Rivers and lakes

- There are 28 *Not at Risk* river water bodies and three lake water bodies (Figure 10, Table 2) which require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- There are 19 river water bodies and three lake water bodies in *Review*. This applies to three water bodies where measures have recently been implemented and improvements have not yet while more information is required for the remaining water bodies in *Review*.
- Sixty seven 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)

- One coastal water body Louth HA06 is *Not at Risk and* requires no additional investigative assessment or measures to be applied, other than those measures that are already in place (Table 2, Figure 10).
- Two coastal water bodies (Boyne Estuary Plume Zone and North-western Irish Sea (HA 08)) are in *Review* where more information is required
- One transitional water body (Boyne Estuary) in the catchment is *At Risk* of not meeting its water quality objectives. Measures will be needed in this water body to improve the water quality outcomes.

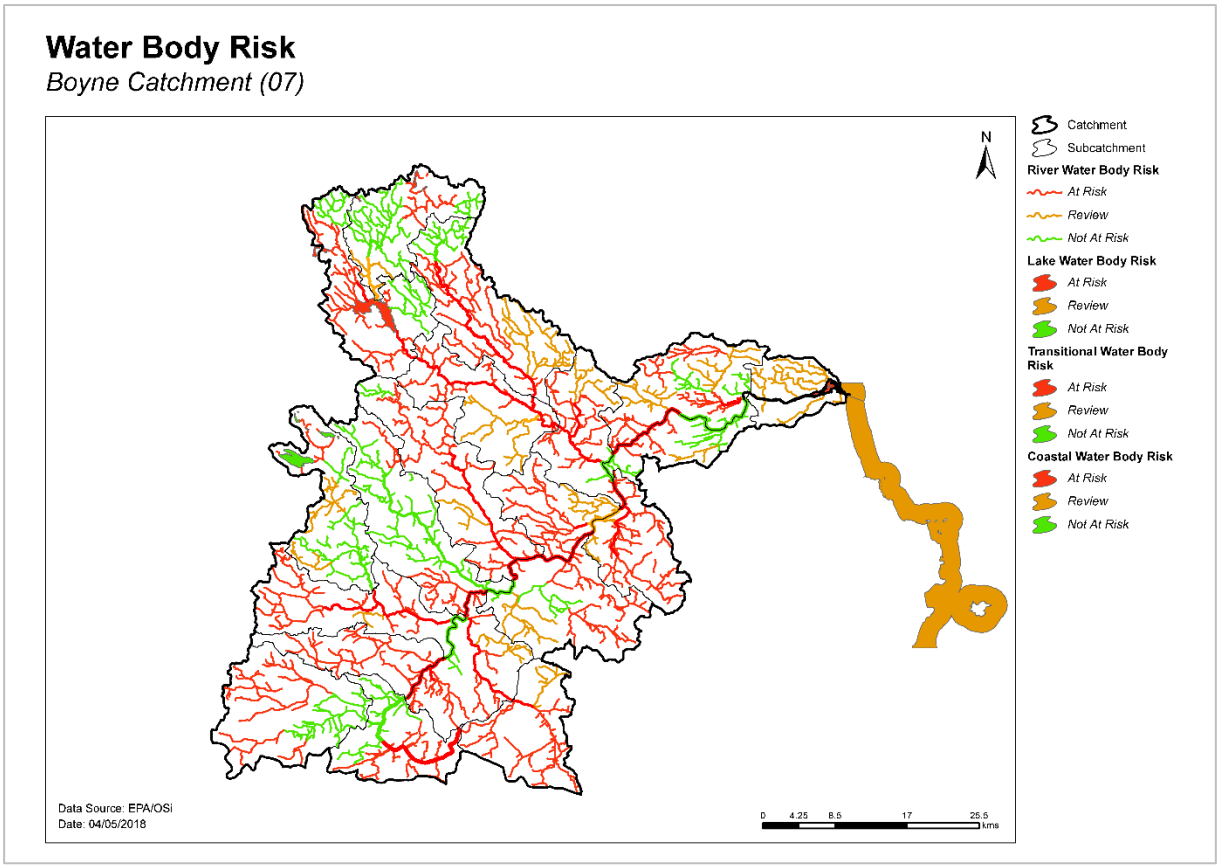


Figure 10. Surface water body risk

2.4 Risk of not meeting groundwater environmental objectives

- Eight groundwater bodies are *Not at Risk* (Figure 11, Table 3) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Eleven groundwater bodies are in *Review* (Figure 11). Bailieborough, Moynalvy, Donore, Hill of Tara and Kilrathmurry Gravels are in *Review* due to nitrate concentrations. GWDTE-Mount Hevey Bog (SAC002342), GWDTE-Killyconny Bog (Cloghbally) (SAC000006) and GWDTE-Raheenmore Bog (SAC000582) have drainage issues. Drogheda groundwater body is 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.
- There are six groundwater bodies which are *At Risk* (Figure 11). Measures will be needed in these water bodies to improve the water quality outcomes. Derravarragh and Trim groundwater bodies are *At Risk* because they are hydrologically linked to *At Risk* surface waters that are not meeting water quality objectives where it is considered likely that groundwater is a contributing source of phosphorus (Table 4). Wilkinstown groundwater body has elevated nitrate concentrations. Two groundwater bodies have ammonia issues (Waste Facility (W0010-02) and Waste Facility (W0071-02)); while one (IE_EA_G_029 Industrial Facility (P0784-01)) is *At Risk* due to PCE issues.

Table 4. Summary of *At Risk* surface water bodies where phosphate from groundwater may contribute to an impact.

Groundwater body name	Receiving water body code	Receiving water body name
Trim	IE_EA_07B011800	BLACKWATER (KELLS)_120
Trim	IE_EA_07B020060	BLACKWATER (LONGWOOD)_010
Trim	IE_EA_07B020100	BLACKWATER (LONGWOOD)_020
Trim	IE_EA_07B020200	BLACKWATER (LONGWOOD)_030
Trim	IE_EA_07B020300	BLACKWATER (LONGWOOD)_040
Trim	IE_EA_07B020600	BLACKWATER (LONGWOOD)_050
Trim	IE_EA_07B020600	BLACKWATER (LONGWOOD)_050
Trim	IE_EA_07B030200	BOYCETOWN_010
Trim	IE_EA_07B030300	BOYCETOWN_020
Trim	IE_EA_07B040200	BOYNE_010
Trim	IE_EA_07B041500	BOYNE_100
Trim	IE_EA_07B041700	BOYNE_120
Trim	IE_EA_07B042010	BOYNE_150
Trim	IE_EA_07B042100	BOYNE_160
Trim	IE_EA_07K020300	KNIGHTSBROOK_010
Trim	IE_EA_07K020500	KNIGHTSBROOK_030
Trim	IE_EA_07M010300	MATTOCK_030
Trim	IE_EA_07S010150	SKANE_010
Trim	IE_EA_07S010300	SKANE_020
Trim	IE_EA_07S010510	SKANE_030
Trim	IE_EA_07S010600	SKANE_040
Derravarragh	IE_EA_07L030040	Lough Lene-Adeel Stream_010

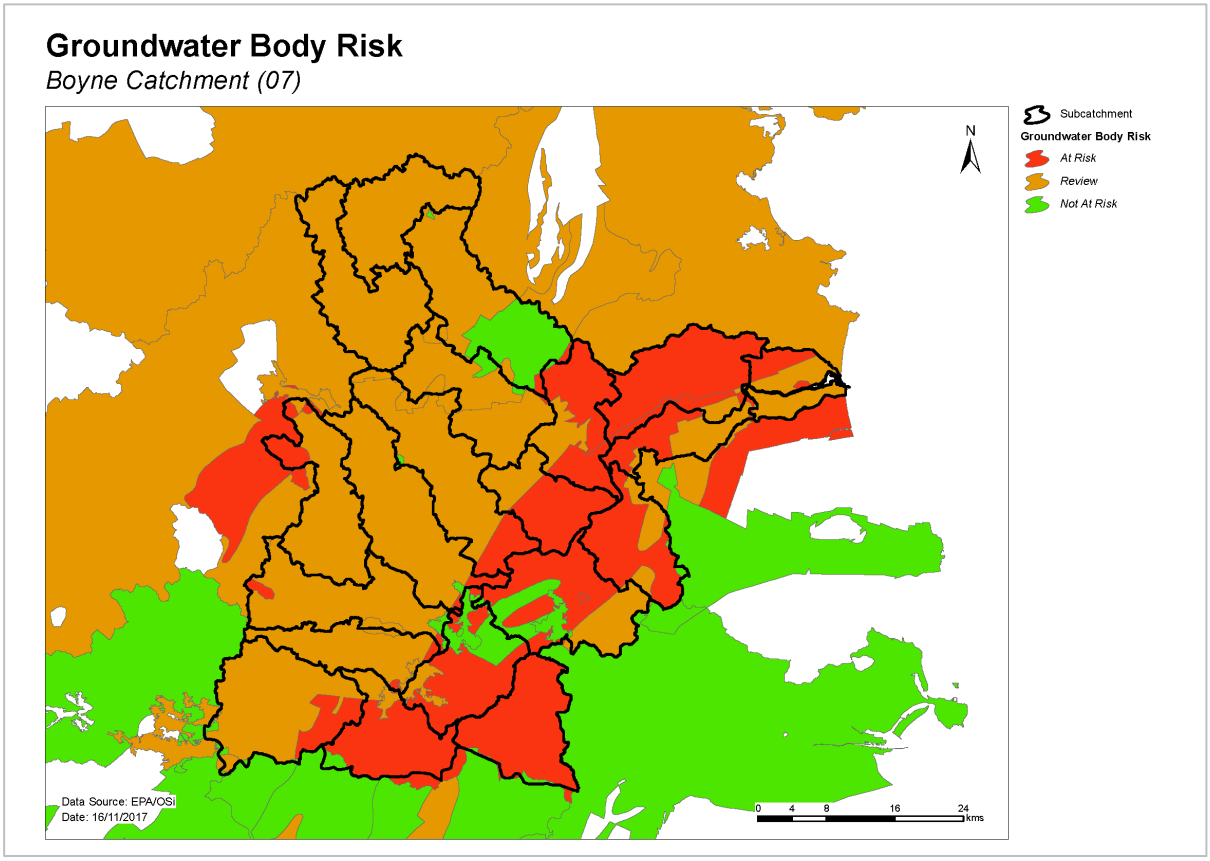


Figure 11. Groundwater body risk

2.5 Protected areas

2.5.1 Drinking water abstractions

- There are 89 abstractions in the Boyne Catchment comprising six group water schemes, eight public supplies and five private supplies (Appendix 4).
- Seventy-five of the abstractions are from nine groundwater bodies, six are from five lakes (Nadrageel Lough, Lough Acurry, Drumkeery Lough, Lough Skeagh and Lough Lene), and the remainder are from eight river water bodies. The list of the public supplies and the associated water bodies is provided in Appendix 4.
- All sources were compliant with the standard for nitrate in 2015.
- Four sources were non-compliant for pesticides in 2015 (Dunshaughlin, Kells/Oldcastle WS and both Staleen schemes), which are abstracted from Trim, Lough Lene-Adeel Stream_010 and Boyne_180 water bodies, respectively. The key issue in all of the sources was MCPA, with the Boyne_180 water body also having Amyl Methyl Ether present. All other sources were compliant.
- Thirty-eight of the abstractions do not have data available regarding nitrates or pesticides.

2.5.2 Bathing waters

- There is one designated bathing water in the catchment (Lough Lene). It is in a satisfactory condition as outlined in Table 5.

Table 5. Designated bathing waters in the catchment

Bathing water		Water body intersection		Objective met?	
Name	Code	Name	Code	Yes	No
The Cut, Lough Lene	IEEABWL07_274_0100	Lene	IE_EA_07_274	✓	

2.5.3 Shellfish areas

- There are no designated shellfish areas in the catchment.

2.5.4 Nutrient Sensitive Areas

- There are three designated Nutrient Sensitive Areas (NSAs) (Boyne Estuary, Boyne (River) and Boyne River) associated with two waste water treatment plants (Drogheda and Navan).
- Navan waste water treatment plant has tertiary treatment and, therefore, is compliant environmental objectives.
- Drogheda waste water treatment plant will be upgraded to include tertiary treatment in 2017.
- The list of NSAs, associated agglomerations and intersecting water bodies are provided in Table 6.

2.5.5 Natura 2000 Sites

- There are eight Special Areas of Conservation (SACs) in the catchment (Appendix 5), not all of which have water quality and/or quantity conservation objectives for their qualifying interests.
- Eleven rivers water bodies have been prioritised for action as the water conservation objectives for their habitats and/or species are not being supported by ecological status (Appendix 5).
- There are two Special Protected Areas (SPAs) in the catchment:
    - Boyne Estuary SPA
    - River Boyne and River Blackwater 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		Water body intersection		Objective met?		Comment
Code	Name	Name	Code	Code	Name	Yes	No	
IETW_EA_2010_0001	Boyne Estuary	Drogheda	D0041	IE_EA_010_0100	Boyne Estuary		✓	Will be upgraded to include tertiary treatment in 2017.
IERI_EA_1994_0001	Boyne (River)	Navan	D0059	IE_EA_07B041900	Boyne_140	✓		Tertiary treatment is in place.
				IE_EA_07B042010	Boyne_150			
				IE_EA_07B042100	Boyne_160			
IERI_EA_2010_0006	Boyne River	Navan	D0059	IE_EA_07B042100	Boyne_160	✓		Tertiary treatment is in place.
				IE_EA_07B042150	Boyne_170			
				IE_EA_07B042200	Boyne_180			

2.6 Heavily modified water bodies

- There are no heavily modified water bodies (HMWBs) in the catchment.
- There are two designated artificial water bodies (AWB) in the catchment – Royal Canal Main Line and Grand Canal Main West of Lowtown. These are both at Good Ecological Potential.

3 Significant issues in *At Risk* water bodies

- Excess phosphorus leading to eutrophication is the dominant issue in the rivers and lakes.
- The issues affecting groundwater bodies include excess ammonia and phosphorus concentrations that are being delivered to surface water bodies that are *At Risk*, via groundwater. There are elevated concentrations of ammonia in two groundwater bodies, and PCE in a third.
- Alternation of hydromorphological (or physical) conditions is one of the most significant issues in rivers in the Boyne Catchment. This includes inputs of excess fine sediment and alteration of the morphology of the river channel, which in turn alter habitat conditions. This can occur because of, for example, implementing river and field drainage schemes, forestry activities, animal access, and discharge from quarries.
- The Boyne Estuary IE_EA_010_0100 is impacted by nutrients (DIN) and by dissolved oxygen and BOD conditions. This is resulting in phytoplankton, macroalgae and invertebrate issues.

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

4.1.1 Rivers, lakes, transitional and coastal (TraC)

- Significant pressures have been identified during the initial characterisation process in 73 surface water bodies, 51 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 hydromorphological pressures, peat, urban waste water, domestic waste water, industry, other, diffuse urban and quarries.

4.1.2 Groundwater

- The groundwater bodies *At Risk* and are being impacted primarily by agriculture. In addition, Trim groundwater body is also being impacted by domestic waste water. IE_EA_G_066 and IE_EA_G_083 are impacted by waste from waste disposal facilities; whereas IE_EA_G_029 is impacted by an industrial site .

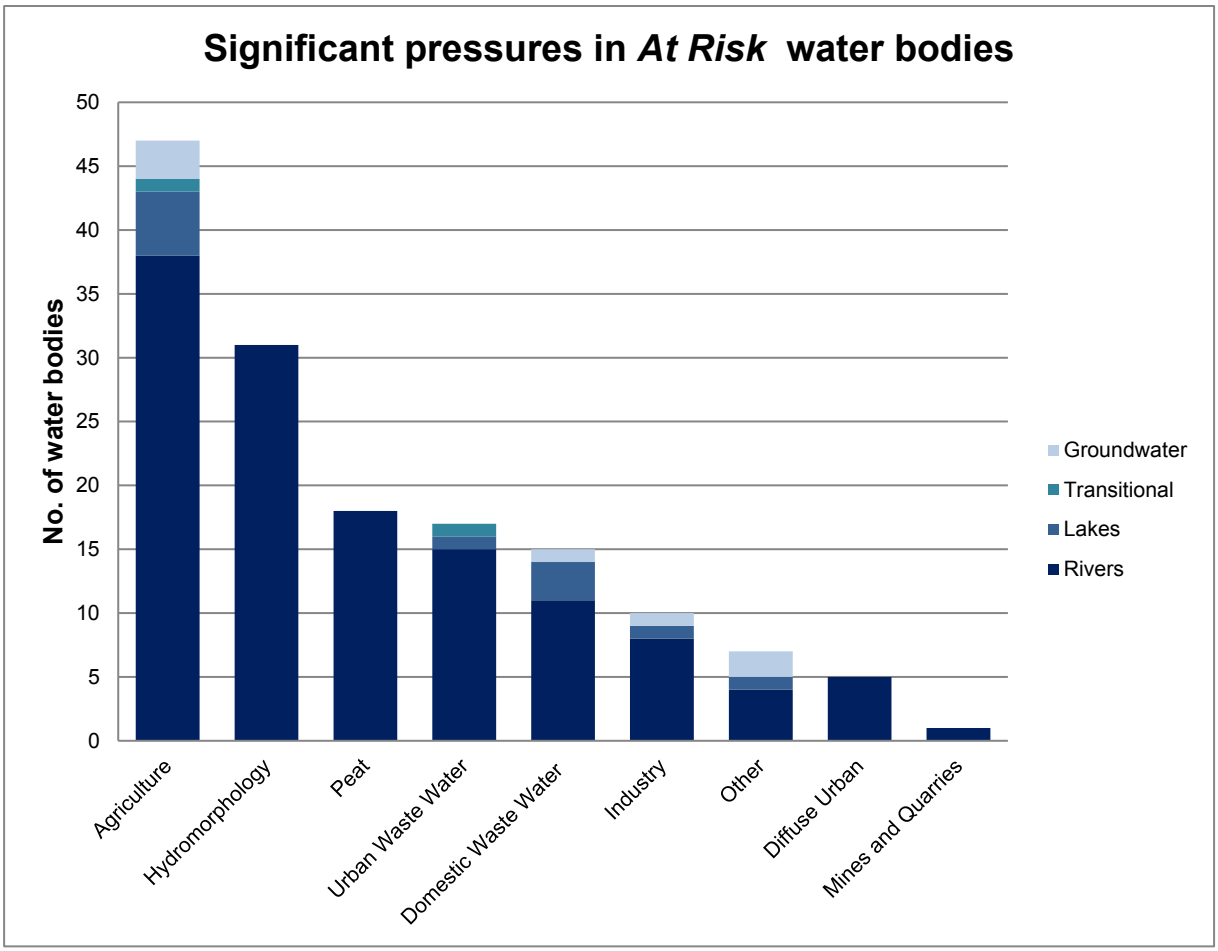


Figure 12. Significant pressures impacting on *At Risk* water bodies

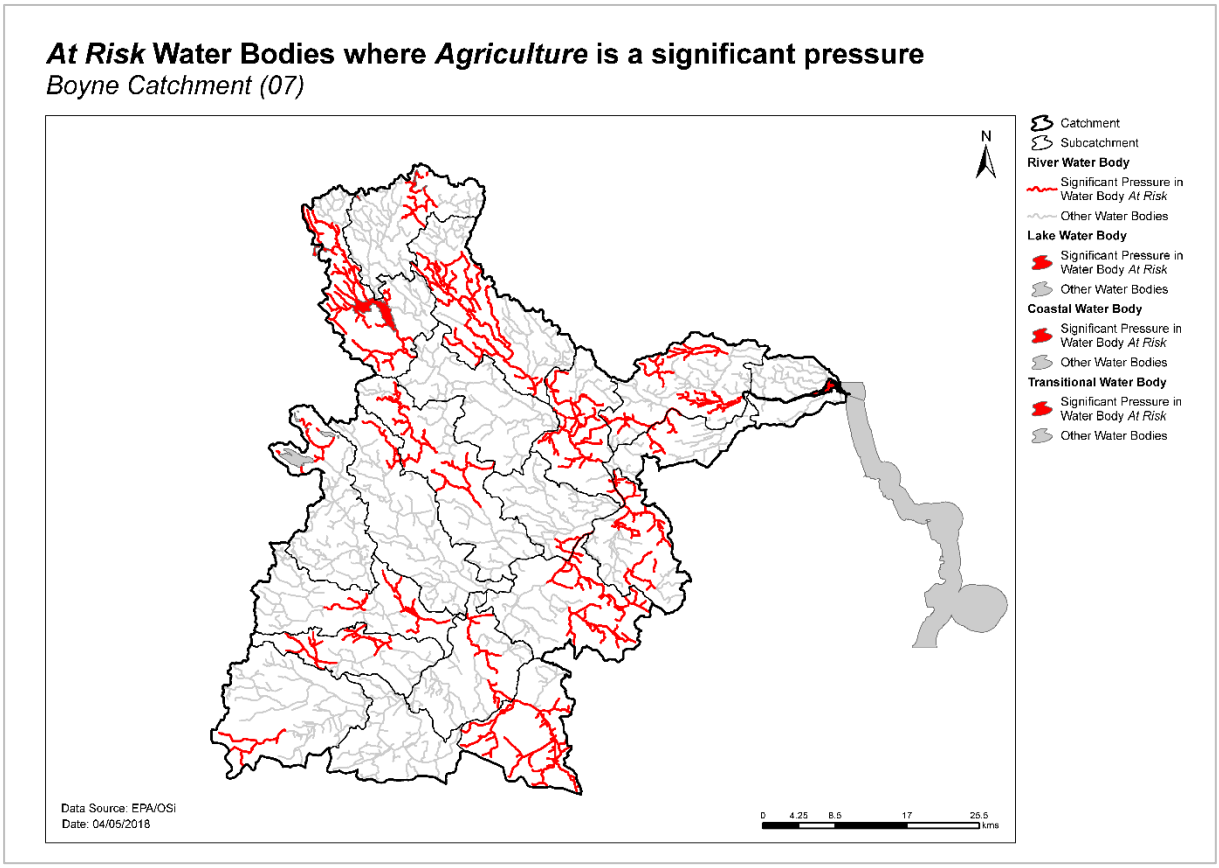
4.2 Pressure type

4.2.1 Agriculture

- Agriculture is a significant pressure in 38 river, five lake water bodies, one transitional and three groundwater bodies (Figure 13, Appendix 3). The issues related to farming in this catchment are predominantly due to 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.

Figure 13. Water bodies that are At Risk and are impacted by agricultural activities



4.2.2 Hydromorphology

- Hydromorphology is a significant pressure in 31 river water bodies. A number of river water bodies within the Boyne , Blackwater (Kells) , Moynalty , Blackwater [Longwood] and Deel [Raharney] subcatchments are subject to extensive modification due to the presence of drainage schemes. Resulting siltation was identified as an issue within seven of these channelised river water bodies located within the Boyne subcatchments. See Appendix 3 for information on these water bodies (Figure 14).

Pressure	Sub-Catchment	Water body Code
Modification due to Drainage Schemes (Channelisation)	Boyne_SC_110, Boyne_ SC_120	Boyne_160
	Boyne_030	Boyne_040
		Kinnegad_010

	Boyne_ SC_060, Boyne_ SC_080	Boyne_090
		Boyne_100
	Boyne_ SC_010	Boyne_010
		Boyne_020
	Deel_ SC_010	Lough Lene-Adeel Stream_010
	Blackwater(Kells)_ SC_030	Blackwater_090
		Blackwater_100
	Boyne_ SC_040	Deel_050
		Deel_060
	Blackwater(Kells)_ SC_020	Blackwater_080
	Boyne_ SC_050	Boyne_060
		D'Arcy's Crossroads Stream_010
	Boyne_ SC_070	Athboy_020
		Athboy_030
		Athboy_040
		Athboy_050
		Athboy_060
		Boyne_080
	Moynalty_ SC_010	Moynalty_020
		Moynalty_050
		Moynalty_060
	Boyne_ SC_120	Boyne_160
	Boyne_ SC_020	Blackwater(Longwood)_050
		Boyne_040
		Boyne_060
	Boyne_ SC_090	Skane_030
	Boyne_ SC_060	Boycetown_010
		Boycestown_020
		Knightsbrook_030

Table 6a – Water bodies affected by hydromorphological pressures

4.2.3 Extractive industry

- *Peat*

  Peat drainage and working has been identified as a significant pressure in 18 river water bodies (Figure 15, Appendix 3). This has resulted in increased sediment loads, which alters habitats, morphology and hydrology. There have also been fluctuations in ammonia concentrations.

- *Mines & Quarries*

  Quarries have been identified as a potentially significant pressure in Boyne_040 river water body. The significant issue is sediment.

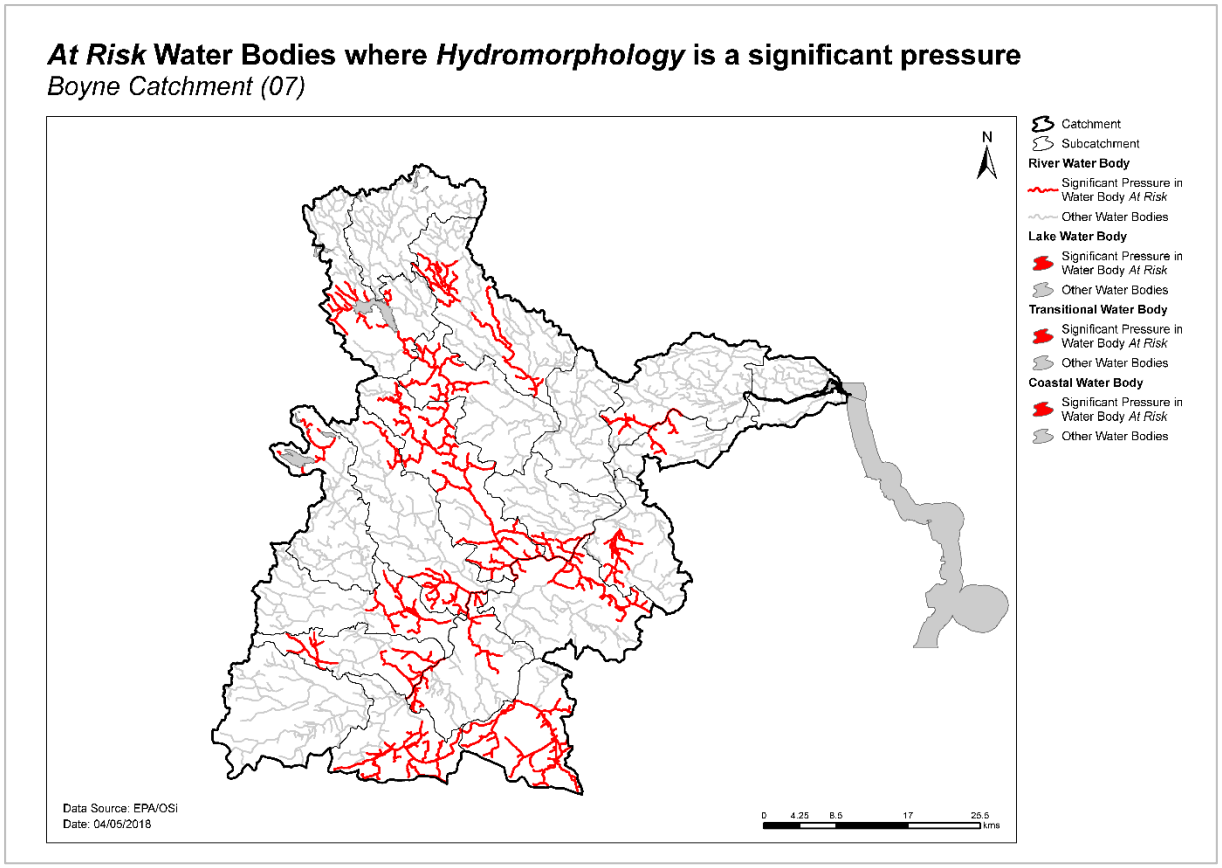


Figure 14. Water bodies that are *At Risk* and are impacted by hydromorphological pressures

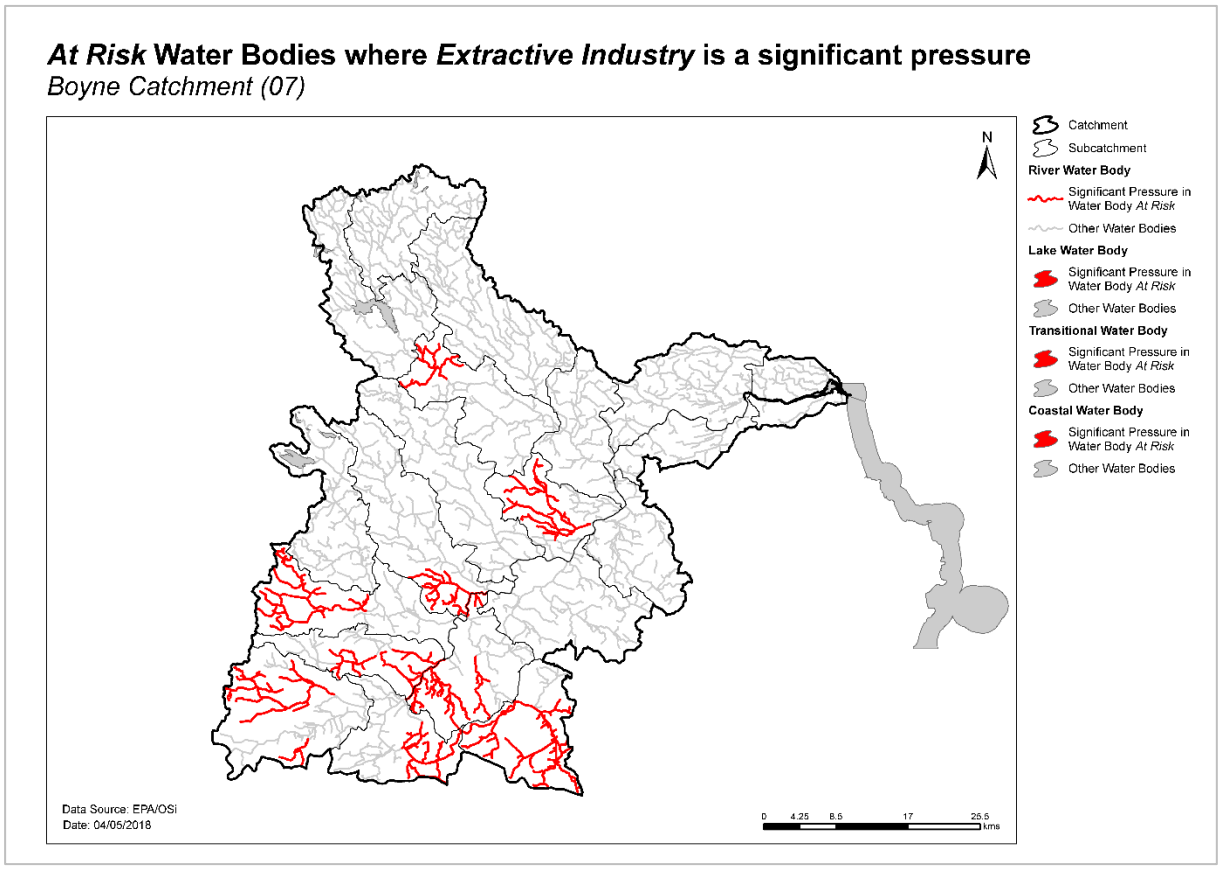


Figure 15. Water bodies that are *At Risk* and are impacted by extractive industries

4.2.4 Urban waste water treatment plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been highlighted as significant pressures in 17 *At Risk* water bodies; details are given in Table 7 and Figure 16. Five of these *At Risk* water bodies are impacted by WWTPs that are scheduled to be upgraded, and three water bodies, Boyne_060, Kinnegad_030 and Blackwater (Kells)_110, are impacted by WWTPs where upgrade works were completed in 2016 and 2017.

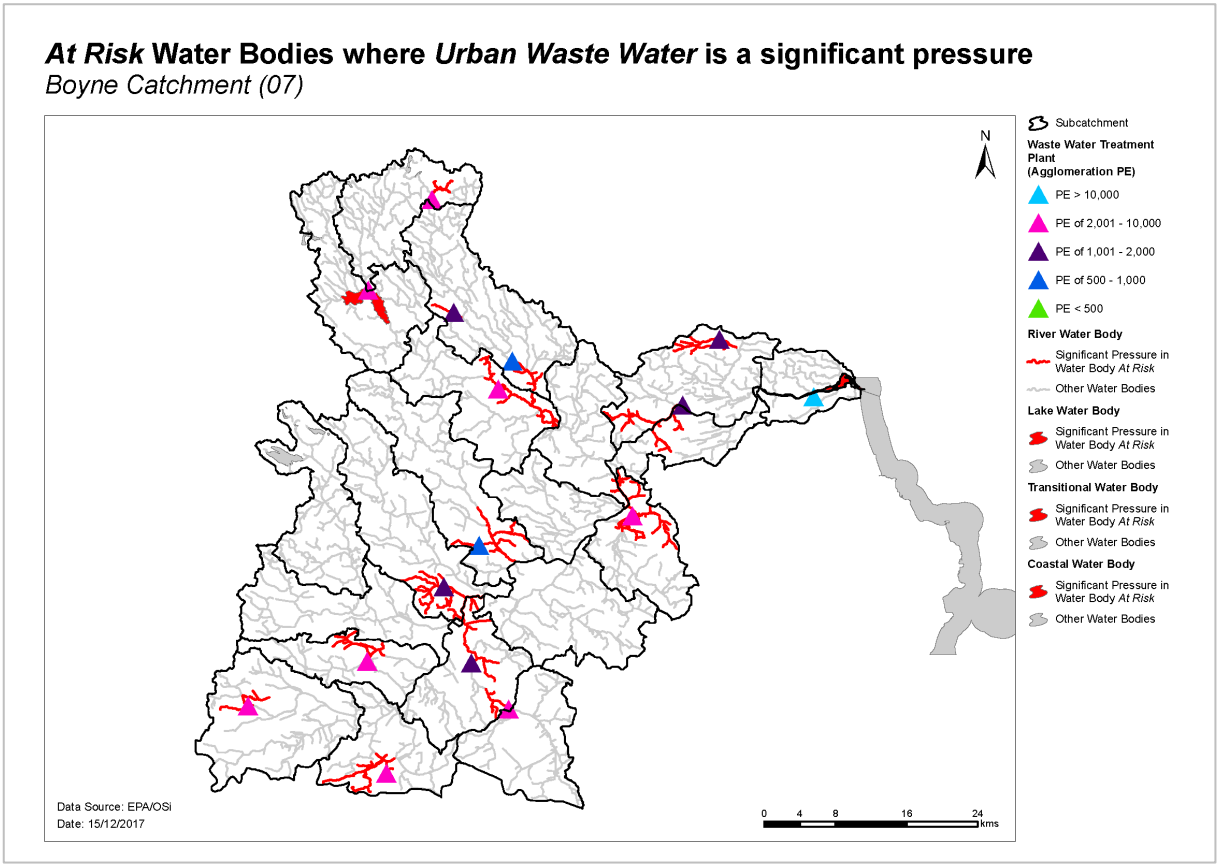


Figure 16. Water bodies that are *At Risk* and are impacted by urban waste water

Table 7. Waste Water Treatment Plants 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	2010-15 Ecological Status	Expected Completion Date
Slane D0257	1,001 to 2,000 p.e.	Boyne_160	Moderate	*NA*[1]
Rochfortbridge D0101	2,001 to 10,000 p.e.	Castlejordan_010	Poor	*NA*[1]
Ballivor D0254	1,001 to 2,000 p.e.	Boyne_060	Moderate	Complete
Longwood D0250	1,001 to 2,000 p.e.	Blackwater (Longwood)_050	Moderate	*NA*[1]
Kildalkey D0486	500 to 1,000 p.e.	Athboy_060	Moderate	*NA*[1]
Carlanstown D0488	500 to 1,000 p.e.	Moynalty_060	Poor	*NA*[1]
Mullagh D0252	1,001 to 2,000 p.e	Mullagh Lough Stream_010	Moderate	*NA*[1]
Collon D0261	1,001 to 2,000 p.e	Mattock_010	Moderate	*NA*[1]
Enfield D0131	2,001 to 10,000 p.e.	Blackwater (Longwood)_030	*Unassigned* [2]	2024
Dunshaughlin D0138	2,001 to 10,000 p.e	Boyne_120	Moderate	2023
Dunshaughlin D0138	2,001 to 10,000 p.e.	*Skane_040* [3]	Poor	*NA* [3]
Kinnegad D0104	2,001 to 10,000 p.e.	Kinnegad_030	Moderate	Complete
Edenderry D0110	2,001 to 10,000 p.e.	Boyne_020	Moderate	*NA*[1]
Bailieborough D0085	2,001 to 10,000 p.e.	Blackwater (Kells)_020	Moderate	2024
Virginia D0255	2,001 to 10,000 p.e.10,000	Lough Ramor	Bad	2024
Kells D0127	2,001 to 10,000 p.e.	Blackwater (Kells)_110	Poor	Complete
Drogheda D0041	> 10,000 p.e.	Boyne Estuary	Moderate	2018

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

[2] *Ecological Status is not available for Blackwater (Longwood)_030, however, following discussions with Meath County Council, this water body was deemed to be At Risk of not meeting its environmental objectives.*

[3] *The Dunshaughlin agglomeration network, rather that the WWTP, has been identified as a significant pressure impacting Skane_040. The agglomeration network is currently not scheduled to be upgraded.*

4.2.5 Domestic waste water

- Domestic waste water has been identified as a significant pressure in 11 river water bodies, three lake (Acurry, Skeagh Upper and Drumkeery) water bodies and one groundwater body IE_EA_G_002 (Figure 17, Appendix 3). The significant issues arise from unsuitable domestic waste water treatment systems, especially when they are poorly sited on areas of high pollution impact potential/poorly draining soils or discharging directly into the water bodies. This results in enrichment and organic contamination.

4.2.6 Industry

- Industrial discharges have been identified as significant pressures in eight river water bodies and one lake (Ramor lake) (Figure 18, Appendix 3). Point source discharges containing elevated nutrient and organic concentrations are the main issues associated with these industrial discharges.

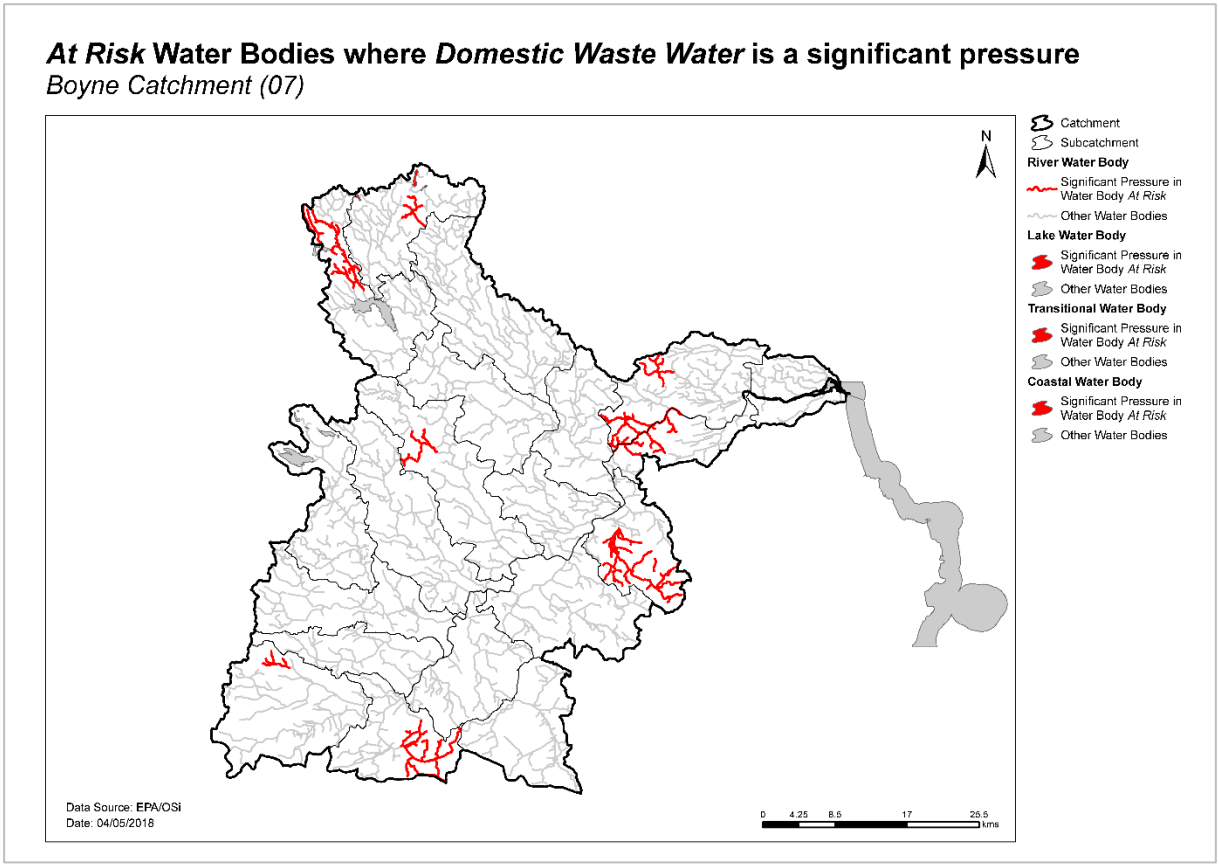


Figure 17. Water bodies that are *At Risk* and are impacted by domestic waste water

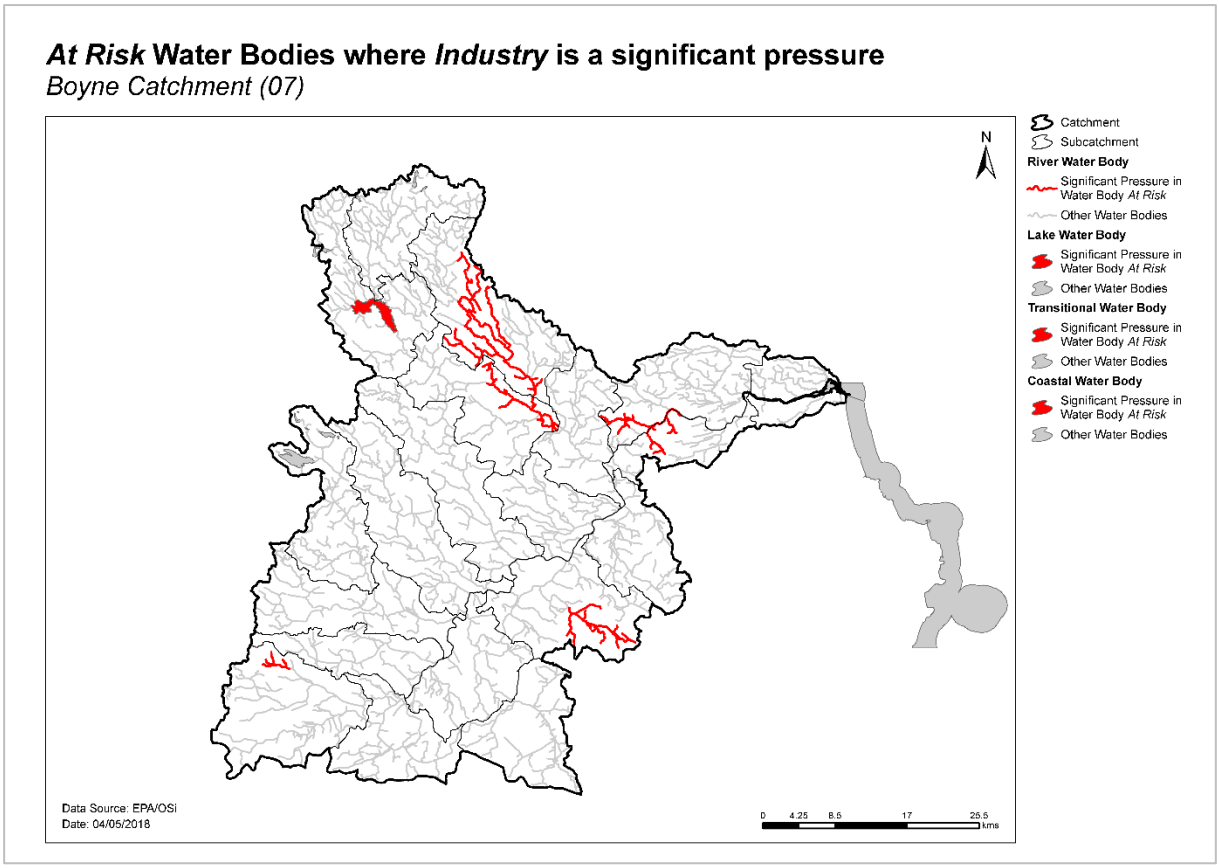


Figure 18. Water bodies that are *At Risk* and are impacted by industry

4.2.7 Other significant pressures

- *Unknown Anthropogenic*
  Three *At Risk* river water bodies have unknown anthropogenic pressures, Blackwater (Longwood)_040, Boyne_150 and Boyne_160 (Figure 19).

- *Invasive species*
  Zebra mussels have been identified as a significant pressure in Ramor lake (Figure 20).

- *Waste*
  A landfill within Riverstown_010 catchment area has been identified as a significant pressure for this river water body (Figure 21) and groundwater body IE_EA_G_083. The significant pressure on the At *Risk* groundwater body IE_EA_G_066 is a Waste Facility .

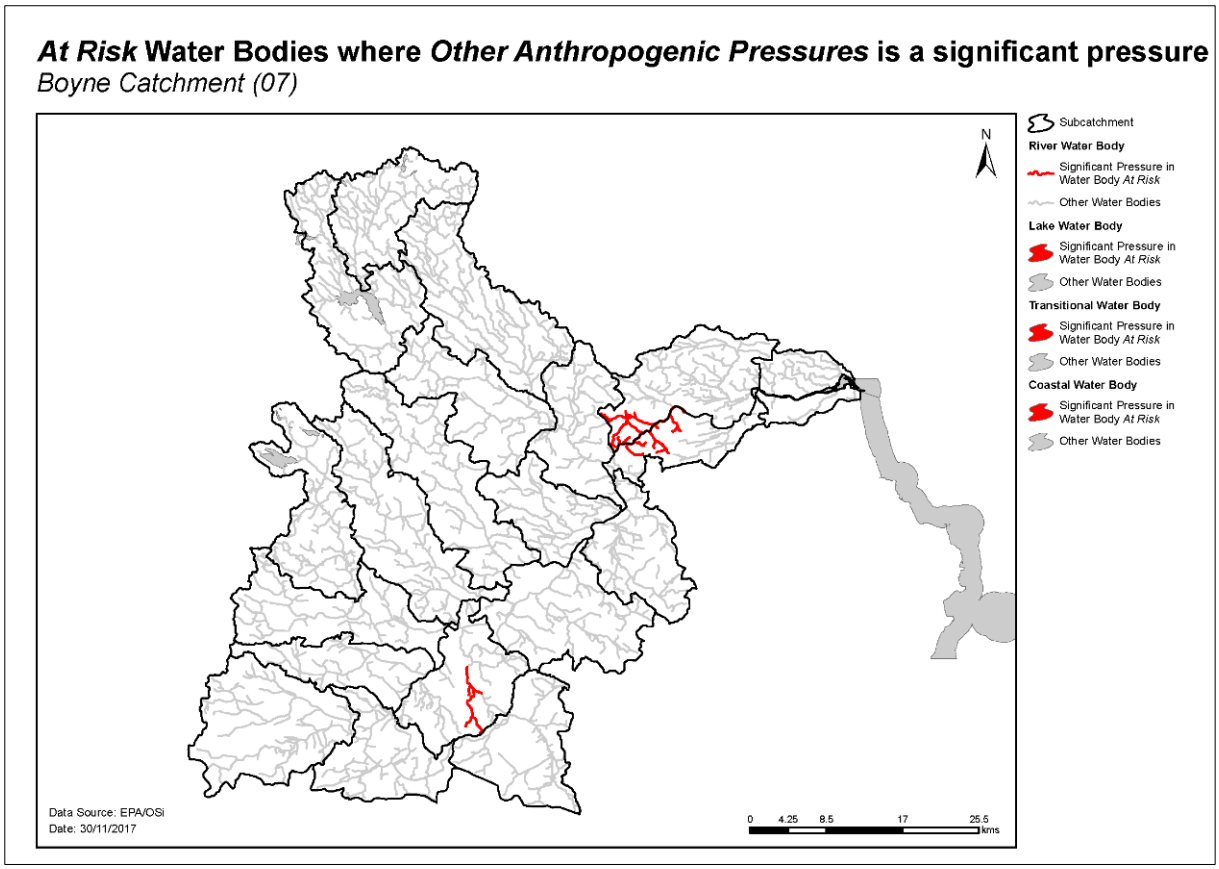


Figure 19. Water bodies that are *At Risk* and are impacted by other Anthropogenic pressures

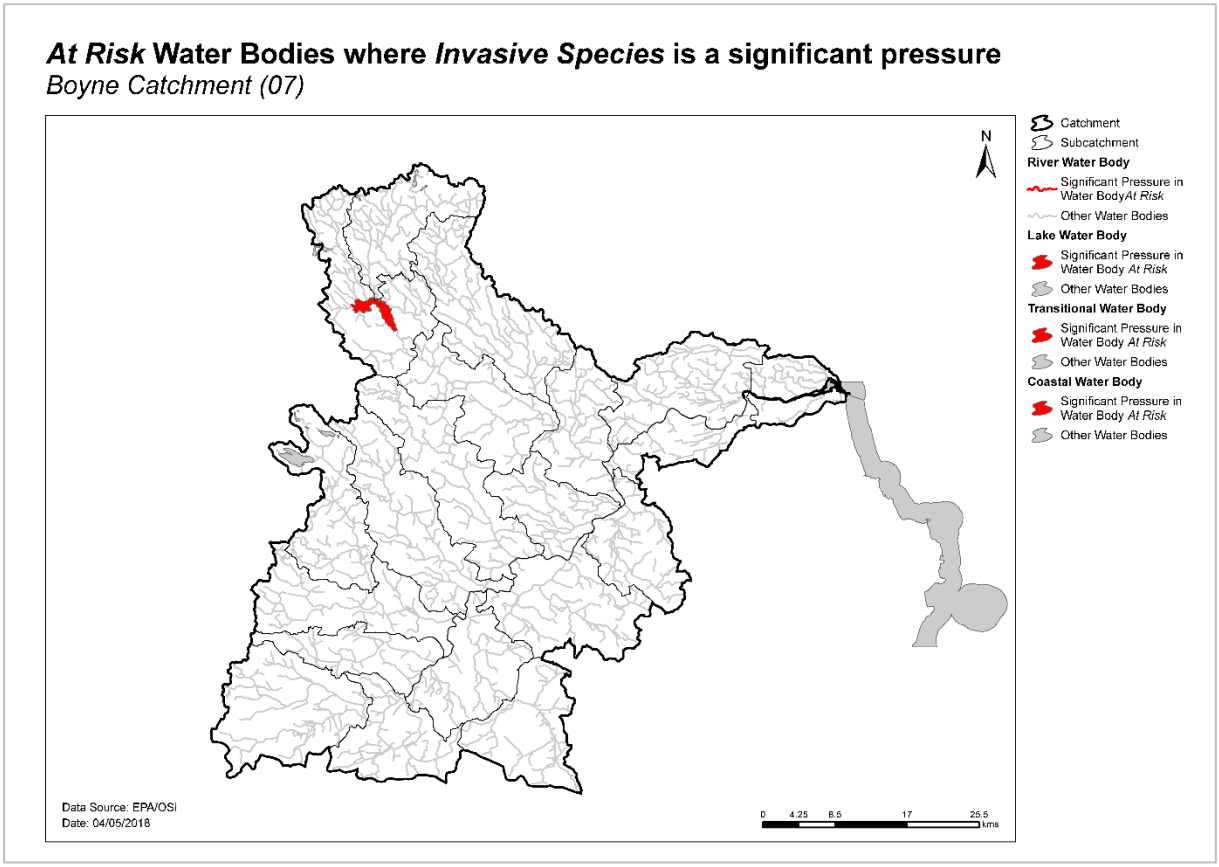


Figure 20. Water bodies that are *At Risk* and are impacted by Invasive species

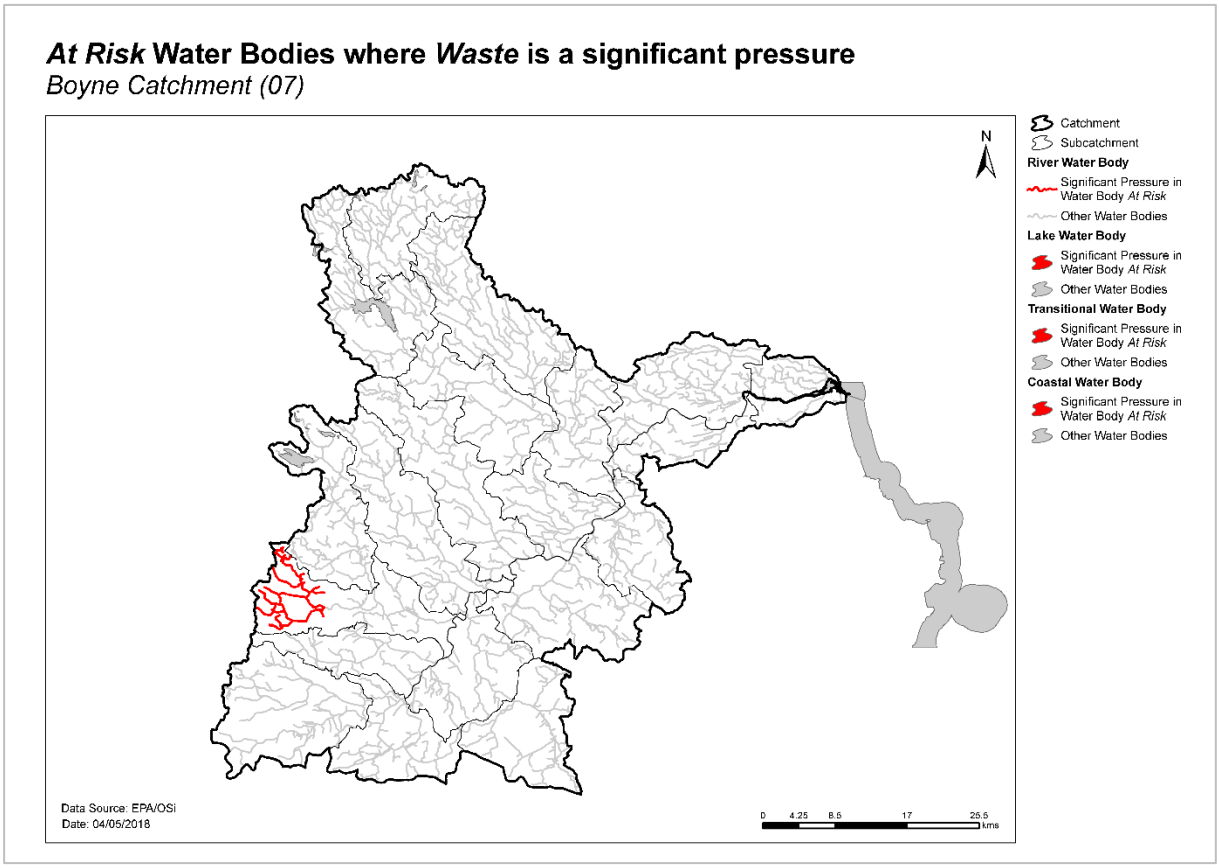


Figure 21. Water bodies that are *At Risk* and are impacted by Waste Activities

4.2.8 Diffuse urban

- Diffuse urban pressures, caused by misconnections, pumping station overflows, leaking sewers and runoff from paved and unpaved areas, have been identified as a significant pressure in five river water bodies (Figure 22, Appendix 3). For both Boyne_020 and Riverstown_020 in particular, there were unfinished housing estates and old pumping stations which are likely to be cause significant impacts. The significant issues are a combination of enrichment due to elevated orthophosphate and ammonia concentrations.

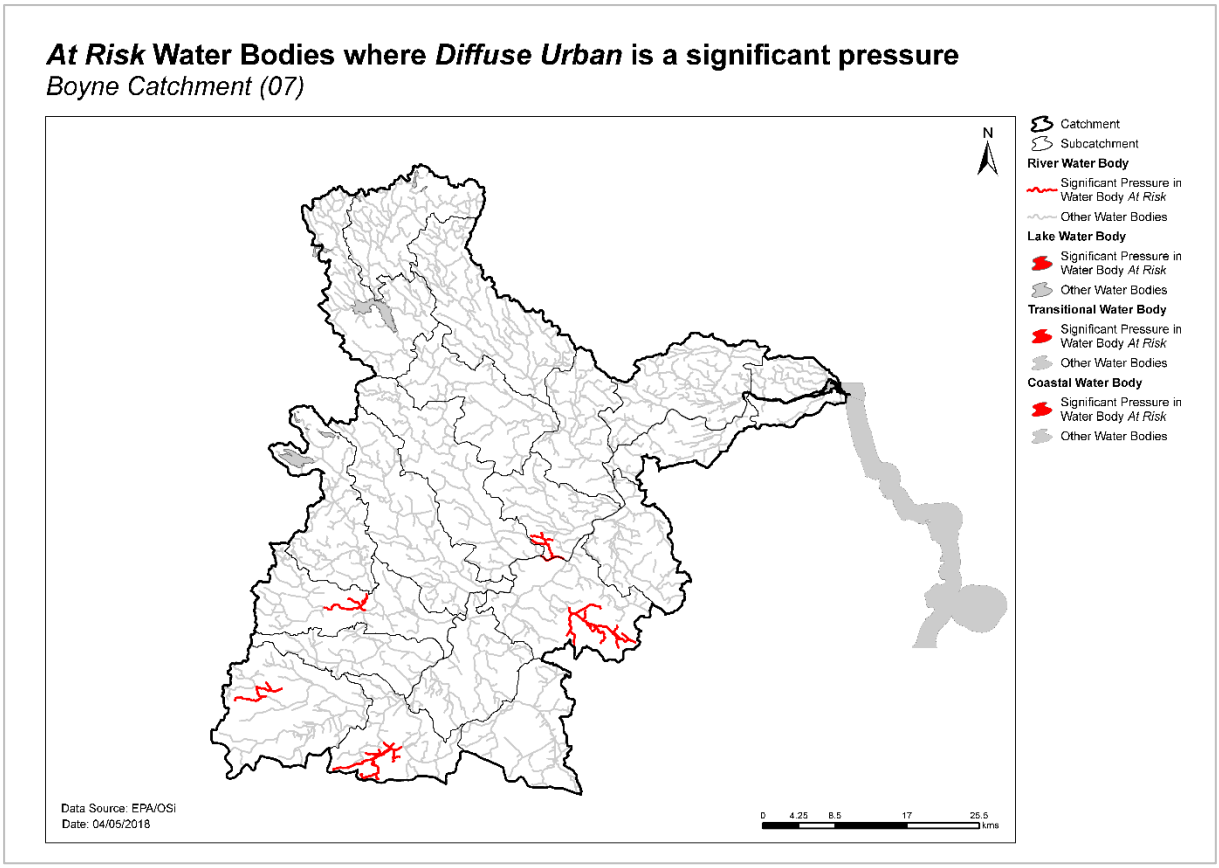


Figure 22. Water bodies that are *At Risk* and are impacted by diffuse urban pressures

5 Load reduction assessment

5.1 River water body load reductions

- Phosphate is the main parameter influencing water quality in rivers in the 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 Boyne catchment, water chemistry data are available for 81 of the 148 water bodies. The available data indicate that load reductions are required in 12 of these river water bodies (Table 9).

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

Water Body	P Load Reduction Required
MOYNALTY_030	High
BOYNE_020	Med
MULLAGH LOUGH STREAM_010	Med
CASTLEJORDAN_010	Med
MATTOCK_010	Low
KINNEGAD_020	Low
Yellow [Blackwater (Kells)]_020	Low
BLACKWATER (KELLS)_040	Low
DEVLIN'S_010	Low
KNIGHTSBROOK_010	Low
CLADY (MEATH)_020	Low
CLADY (MEATH)_010	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.

- Estuarine water quality modelling has been carried out by the EPA for the Boyne estuary and further modelling is required. To date the modelling highlights that the Boyne Estuary is N limited and that reductions in DIN of approximately 30% of the 2015 load (or 1,680 t yr^{-1}) are required to reduce the macroalgae and return the water body to Good status. As the macroalgae start their growth period in late spring/early summer, a focus on achieving reductions during this period to start with would potentially be the most effective.
- The largest source of nutrients to the Boyne Estuary is the inputs from diffuse and small point sources around the catchment. The Drogheda WWTP, which is due for an upgrade in 2018, also contributes directly to the estuary and might be expected to have a disproportionately higher impact in summer when there is less dilution. However, review of the monitoring data for the Boyne catchment highlights that there is a wide variability in the mean annual TN loading to the estuary. In 2011 and 2013 for example, the monitored catchment TN emissions were more than 30% less than the 2015 loads. This suggests that nutrient reductions from around the catchment will be required, in addition to the load reduction from the Drogheda WWTP upgrade, to support the estuary. The Boyne Plume Zone would also benefit from these nutrient load reductions.

- To help focus the catchment wide effort, river water bodies with mean TN concentrations >2.6 mg/l (the transitional waters EQS at zero salinity) were ranked in terms of the load reductions that would be required to reduce their concentrations below 2.6 mg/l (Table 10). A simple concentration x flow equation was used to estimate loads. The greatest N load reductions to the overall catchment would be achieved by starting at the top of the list and working down.
- Further work is required, as part of an local catchment assessment process, to determine the significant pressures for nitrogen in each of these water bodies. Initial assessment of deep groundwater component has estimated the contribution of N to be relatively low in comparison to the total catchment loads.

Table 10. River water body TON load reduction ranking.

Water body	N Load Reduction Required
BOYNE_140	V. High
BOYNE_050	V. High
BLACKWATER (KELLS)_110	High
BOYNE_160	High
BLACKWATER (KELLS)_090	High
DEEL (RAHARNEY)_050	High
BOYNE_040	High
BOYNE_100	High
MOYNALTY_060	High
BLACKWATER (LONGWOOD)_020	High
MATTOCK_030	High
BOYNE_120	High
DEEL (RAHARNEY)_060	High
BLACKWATER (KELLS)_100	High
MOYNALTY_030	High
BOYNE_070	High
BOYNE_080	High
Yellow [Blackwater (Kells)]_020	High
BOYNE_030	Med
BLACKWATER (KELLS)_080	Med
Boyne_180	Med
STONYFORD_040	Med
BOYNE_010	Med

As part of the Irelands commitment to the Ospar Convention, nutrient flux or load monitoring has been carried out on the Boyne Estuary since 1990 (Figure 22a and 22b). Further analysis of these nutrient load trends is available at http://dx.doi.org/10.3318/BIOE.2016.23.

Figure 22a – Total Nitrogen Load (Tonnes/year) 1990-2015

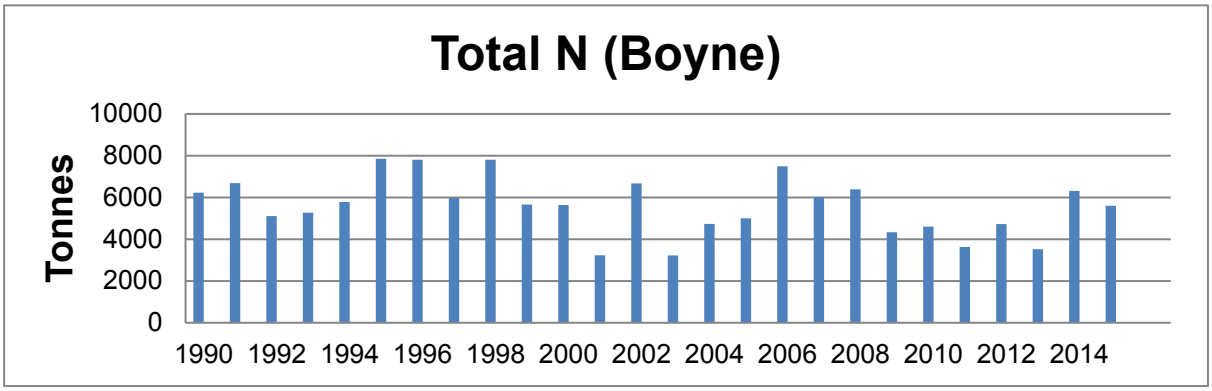
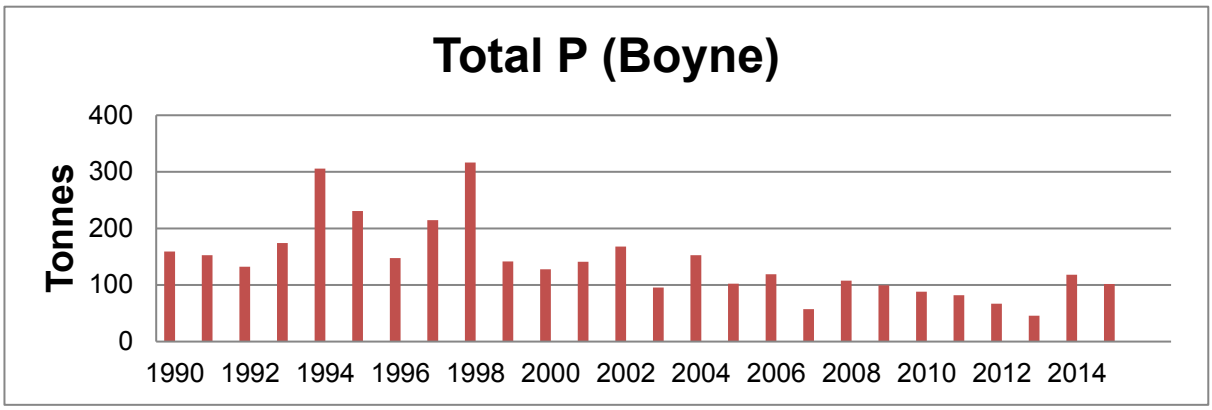


Figure 22b – Total Phosphorus Load (Tonnes/year) 1990-2015



6 Further Characterisation and Local Catchment Assessments

- Further characterisation through local catchment assessments is needed in 72 of the *At Risk* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Further characterisation through local catchment assessments is needed in 22 *Review* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Brief definitions on the 10 IA assessment scenarios are given in Appendix 7 and the number of IAs required for each scenario are given in Table 11.

Table 11. Investigative assessment allocation for *At Risk* and *Review* river and lake water bodies

Risk	IA 1	IA 2	IA 3	IA 4	IA 5	IA 6	IA 7	IA 8	IA 9	IA 10	Total
At Risk	71	1	9	5	1	6	25	0	5	0	145
Review	7	0	12	0	0	1	0	0	2	0	22
Note water bodies may have multiple categories of Local Catchment Assessments											

7 Catchment summary

- Of the 114 river water bodies, 67 are *At Risk* of not meeting their WFD objectives.
- Five out of the eleven lake water bodies are *At Risk* of not meeting their WFD objectives.
- Excess nutrient loss, mainly phosphate, leading to eutrophication is a major issue for surface water bodies in the catchment. The significant pressures relating to excess nutrients are primarily agricultural (diffuse and point), but also extractive industry and waste water (urban and domestic).
- Hydromorphological (or physical) conditions (including the input of excessive fine sediment) and poor habitat quality are also a major issue for several surface water bodies. The significant pressures relating to hydromorphological conditions are channel modifications as well as impacts from agriculture and extractive industries.
- The Boyne Estuary (IE_EA_010_0100) is *At Risk* and is being impacted by macroalgae and phytoplankton issues. The estuary is N limited. Urban waste water and diffuse agriculture are the significant pressures.
- There are six *At Risk* groundwater bodies in the catchment. Derravarragh and Trim groundwater bodies are *At Risk* as they are hydrologically linked to surface waters where it is considered likely that groundwater is a contributing source of nutrients, and the significant pressure is agriculture. Wilkinstown groundwater body is *At Risk* due to nitrate concentrations, and is likely to be impacted by agriculture. The remaining three groundwater bodies (IE_EA_G_066, IE_EA_G_083 and IE_EA_G_029) are *At Risk* due to ammonia and PCE issues from waste and industrial facilities.

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 seven areas for action in the Boyne 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. Since this selection, the Local Authorities Water and Communities Office (LAWCO) have undertaken public engagement and feedback sessions in each local authority.

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, or when feedback from the public engagement process is assessed, areas for action may 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 Boyne catchment are summarised below.

- Seven recommended areas for actions (Table 12, Figure 23) were selected.
- These are the Moynalty, Lough Lene, Boycetown, Athboy, Nadreegeel, Blackwater (Longwood), and Upper Boyne.
- These include 25 river and lake water bodies – 22 *At Risk* and three *Review.*
- Four groundwater bodies, which are *At Risk* or *Review* due to groundwater contribution of nutrients to surface water bodies, intersect with five 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 72 *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 23. These include:

- 69 river and lake water bodies – 50 *At Risk* and 19 *Review,* and
- three transitional and coastal water bodies – one *At Risk* and two *Review.*

Table 11. Recommended Areas for Action in the Boyne catchment

Recommended area for action	Number of water bodies	SCs	Local authority	Reason for Selection
Moynalty	8	07_14	Meath	• Salmonid river. • Potential for 'quick wins'. • Possible high nitrate areas which would help with TraC water nitrate reduction requirement. • Four deteriorated water bodies.
Lough Lene	1	07_7	Westmeath	• Headwaters to Lough Lene which has heritage values and is a popular designated bathing location. • Deteriorated water body. • Lough Lene failed to meet protected area objective for drinking water.
Boycetown	2	07_20	Meath	• Build on work completed by Meath County Council – stream walks completed on the lower portion: ~80 cattle access points were identified. • Two deteriorated water bodies.
Athboy	6	07_13	Meath	• Headwater tributaries to the Boyne main channel. • Long term challenge - five of the six water bodies are At Risk. • Building on work completed by Meath County Council to reduce nutrient concentrations in the river water body. • One deteriorated water body.
Nadreegeel	2	07_10	Cavan	• Cavan/Monaghan lakes scenario project. • Headwaters to Nadreegeel Lough. • Potential 'quick win'. • Building on existing work completed by Cavan Co Co. • Will provide insight into question regarding river monitoring stations downstream of failing lakes. • A group water scheme here abstracts immediately upstream. • Public water abstraction. • One deteriorated water body.
BLACKWATER (LONGWOOD)	4	07_16 07_6	Kildare Meath	• Building on work completed by Kildare County Council. • Opportunity to address spikes in ammonia from peat. • Headwaters of Blackwater (Longwood). • Opportunity to work with Bord naMona (BnM) and Office of Public Works (OPW).
Upper Boyne	2	07_4	N/A	• Drinking water protected area for the largest amount of consumers (Water abstraction at Trim & Kishawanny boreholes which are the raw water for Edenderry Public supply). • Multiple pressures in multiple areas • Edenderry Area Drainage Plan due in 2021 so preparatory work could feed into it e.g. upgrades required for some pumping stations. • Cross County project • Building on existing knowledge from works completed by Offaly County Council. • Premier angling River

Table 12 Groundwater bodies that intersect with surface water bodies in Recommended Areas for Action

Groundwater bodies			Intersecting surface water bodies		Recommended Areas for Action
Code	Name	Risk	Code	Name	
IE_SH_G_077	Derravarragh	At risk	IE_EA_07L030040	Lough Lene-Adeel Stream_010	Lough Lene
IE_SH_G_238	Tynagh Gravels	Review	IE_EA_07L030040	Lough Lene-Adeel Stream_010	
IE_EA_G_001	Athboy	Review	IE_EA_07L030040	Lough Lene-Adeel Stream_010	
			IE_EA_07A010050	ATHBOY_020	Athboy
			IE_EA_07A010070	ATHBOY_030	
			IE_EA_07A010100	ATHBOY_040	
			IE_EA_07A010300	ATHBOY_050	
			IE_EA_07A010500	ATHBOY_060	
			IE_EA_07K410830	KNOCKSHANGAN_010	
IE_EA_G_002	Trim	At risk	IE_EA_07A010500	ATHBOY_060	
			IE_EA_07B020300	BLACKWATER (LONGWOOD)_040	BLACKWATER (LONGWOOD)
			IE_EA_07B030200	BOYCETOWN_010	Boycetown
			IE_EA_07B030300	BOYCETOWN_020	
			IE_EA_07B040200	BOYNE_010	Upper Boyne
			IE_EA_07B040300	BOYNE_020	

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 22 *At Risk* surface water bodies, it is predicted that five (23%) will improve by 2021 and the remaining 17 (77%) will achieve their objective by 2027. For the three *Review* surface water bodies, the absence of information on these water bodies means that there is no scientific basis to quantify an environmental objective date and therefore a 2027 date is set, see Table 13.

Table 13: Environmental objective dates for water bodies in the Recommended 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	21	5	16
Review	3	0	3
Lake			
At Risk	1	0	1
Review	0	0	0
Total	25	5	20

- Thirty-two surface water bodies have met their 2015 environmental objective. One of the 32 water bodies met the environmental objective for ecological status but failed to meet the protected area objective.
- As action is not yet planned to be taken in the remaining 51 *At Risk* surface water bodies, a 2027 date is applied to all 51 of the water bodies.
- For the 21 *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 13.

Table 13: Environmental objectives dates in the *At Risk* and *Review* surface water bodies not included in Recommended 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	46	0	46
Review	16	0	16
Lakes			
At Risk	4	0	4
Review	3	0	3
TraC's			
At Risk	1	0	1
Review	2	0	2
Total	72	0	72

9.2 Groundwater

- Twenty-two of the 25 groundwater bodies are currently Good status and, therefore, have met their environmental objectives.
- Of the three Poor status groundwater bodies, all have a 2027 environmental objective, see Table 14.

Table 14. Environmental Objective dates of Poor status groundwater bodies in the Boyne catchment

Water body code	Water body name	Environmental Objective
IE_EA_G_029	Industrial Facility (P0784-01)	2027
IE_EA_G_066	Waste Facility (W0010-02)	2027
IE_EA_G_083	Waste Facility (W0071-02)	2027

10 Acknowledgements

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

- Meath County Council.
- Cavan County Council.
- Louth County Council.
- Westmeath County Council.
- Kildare Countu Council.
- Offaly County Council.
- Fingal County Council.
- Inland Fisheries Ireland.
- Local Authorities Waters & Communities Office.
- Irish Water.
- RPS Group.
- Ecological Monitoring & Assessment Unit, EPA.
- Hydrometric & Groundwater Section, EPA.
- Informatics Section, EPA.
- Laboratories, EPA.
- Office of Environmental Enforcement, EPA.
- Department of Housing, Planning and Local Government.
- DAFM Forest Service.
- DAFM Agriculture.
- Bord Na Mona.
- Coillte.
- Teagasc.
- Geological Survey Ireland.
- National Federation of Group Water Schemes.
- National Parks and Wildlife Service.
- National Water Forum.

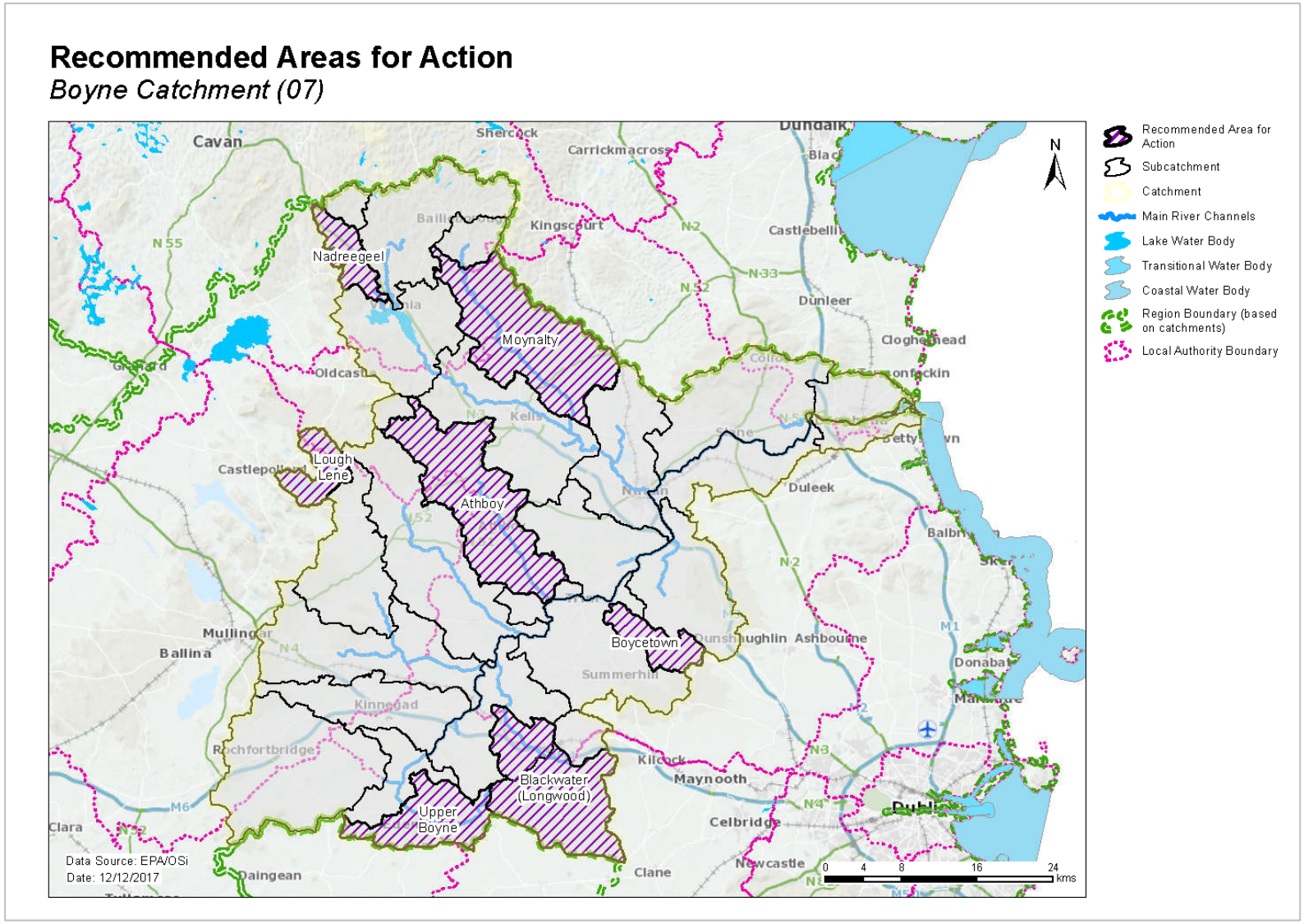


Figure 23. Location of Recommended Areas for Action in the Boyne Catchment

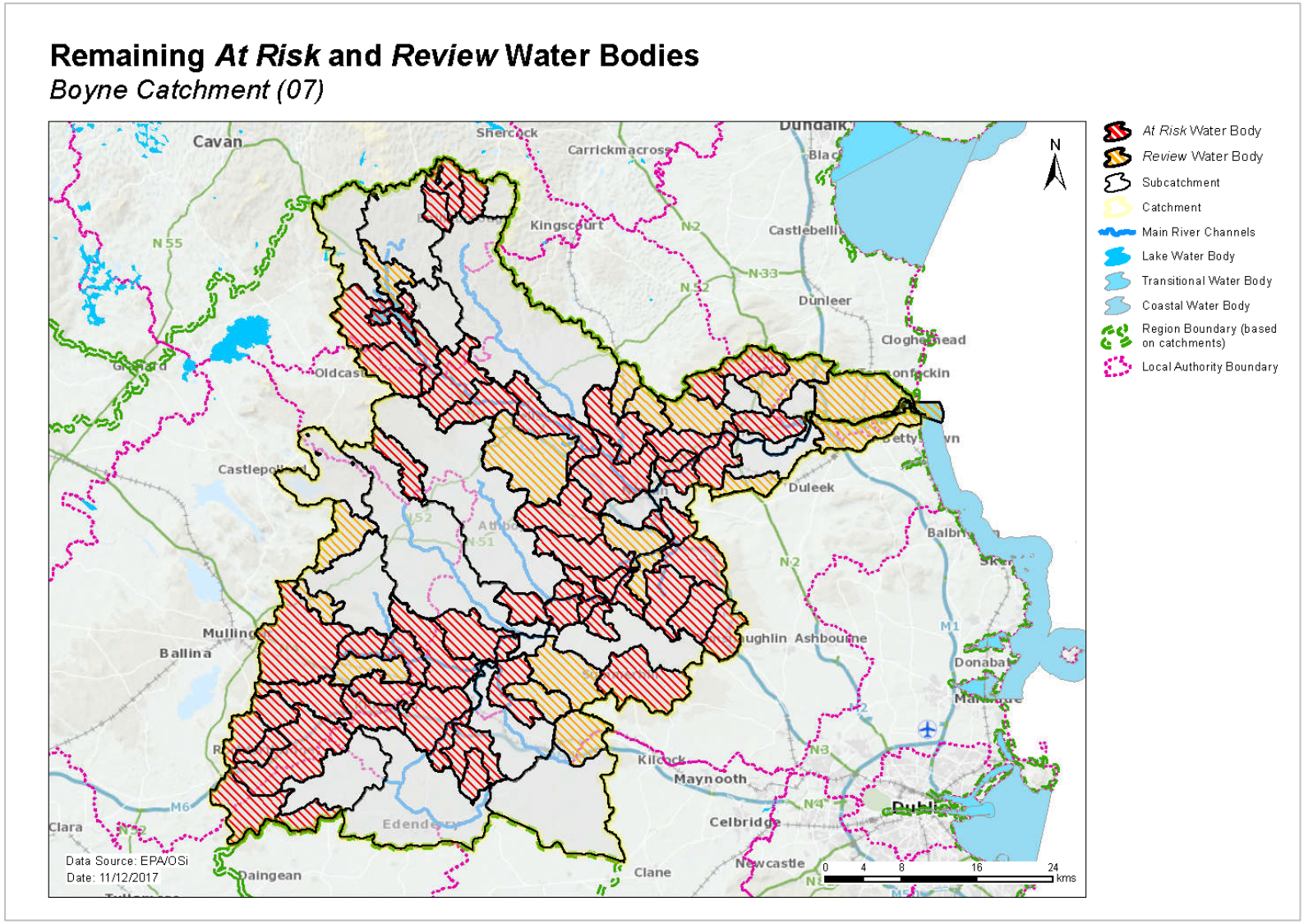


Figure 24. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Boyne Catchment

Appendix 1 High ecological status objective water bodies and sites

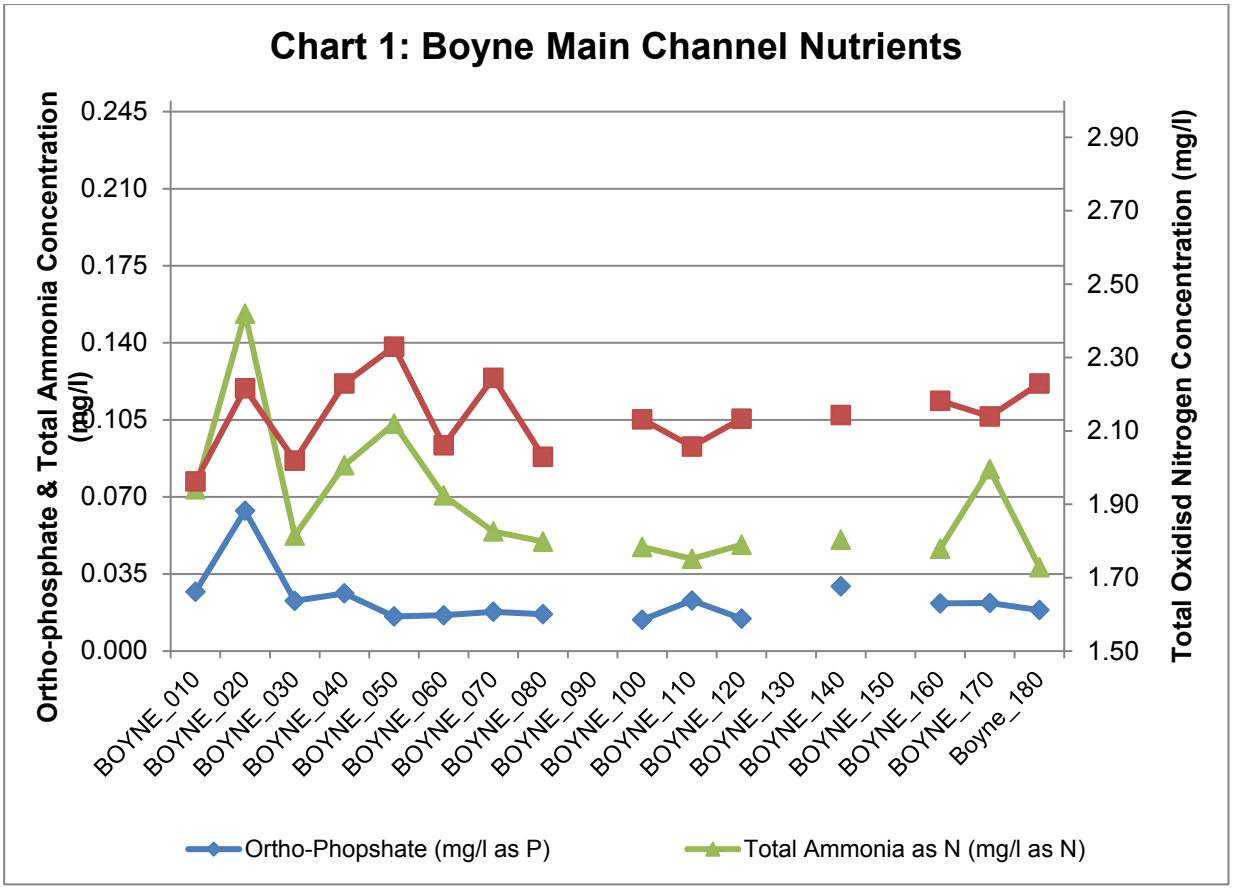
Water body/site	Type	Codes	2015 Status
Chapel Lake Stream_010	River	IE_EA_07C050700	High
Bane Noggin Hill	Lake	IE_EA_07_270	High
North-western Irish Sea HA08	TRaC	IE_EA_020_0000	Good

Appendix 2 Catchment scale nutrient concentrations and in-stream loads

The results of the instream water quality assessment for the Boyne main channel are illustrated in Chart 1. The assessment is based on the mean concentrations between 2013 and 2015 at each site from the headwaters down to the estuary. Except for BOYNE_020 (0.064mg/l) stream, orthophosphate concentrations are below the EQS (0.035mg/l) ranging between 0.014 and 0.029mg/l.

Ammonia concentrations exceed the EQS (0.065mg/l) at 6 of the 18-main channel water bodies. Significant peaks in concentration are apparent at BOYNE_020 (0.153mg/l) and BOYNE_050 (0.103mg/l). TON concentrations are moderately low from the headwaters to the outlet, ranging from 1.96 to 2.33mg/l. Minor peaks in TON at BOYNE_020 and BOYNE_050 are consistent with elevated ammonia.

Stream flow increased from the headwaters at BOYNE_010 to Boyne_180, ranging from 0.81 to 49.4m^3/sec. Orthophosphate and TON loads gradually increase downstream with increasing channel flow. A significant ammonia load (126,702Kg/yr.) was apparent at BOYNE_170, corresponding to a flow of 48.6m^3/sec.



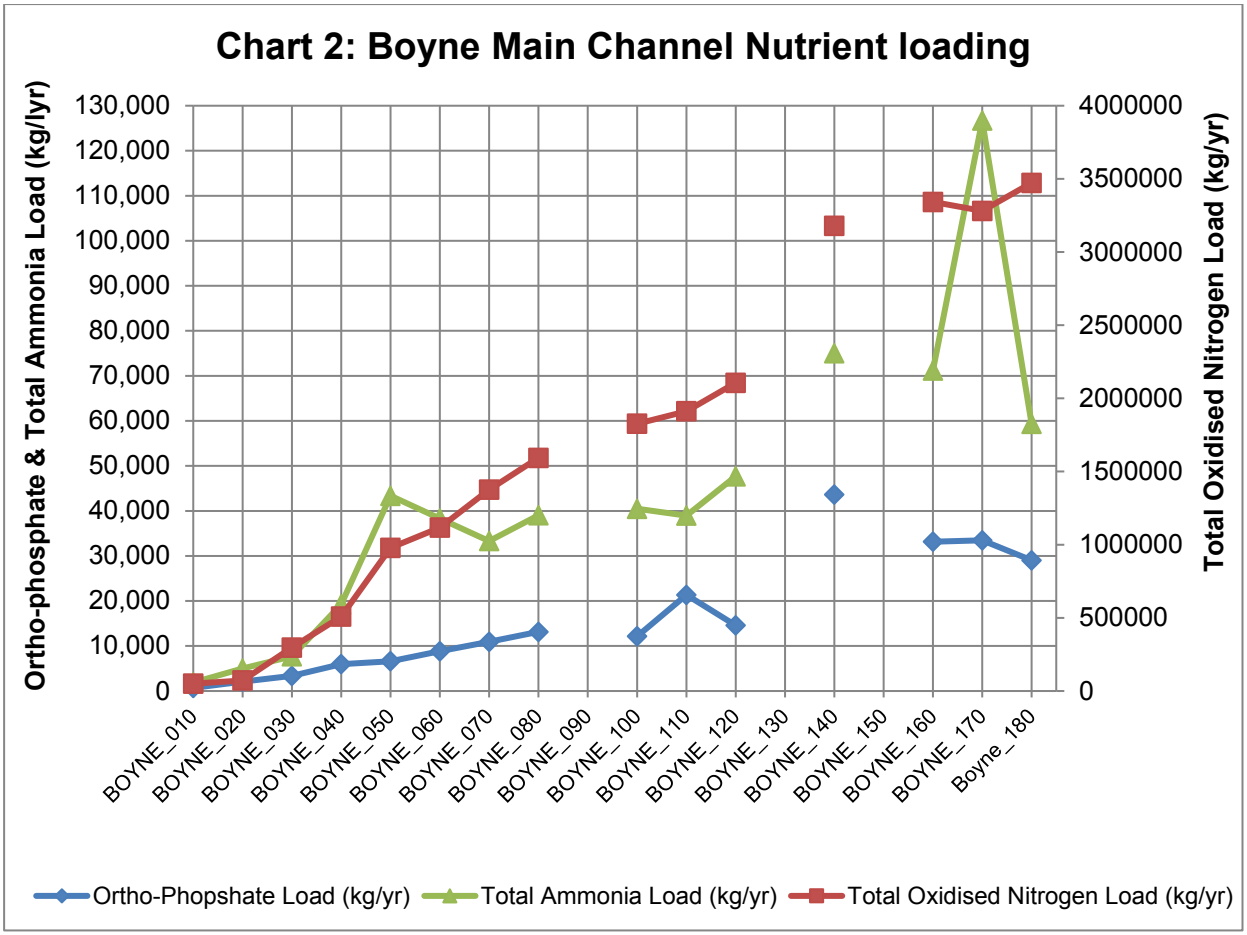


Chart 2: Boyne Main Channel Nutrient loading
Ortho-phosphate & Total Ammonia Load (kg/lyr)
Total Oxidised Nitrogen Load (kg/yr)
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
BOYNE_010
BOYNE_020
BOYNE_030
BOYNE_040
BOYNE_050
BOYNE_060
BOYNE_070
BOYNE_080
BOYNE_090
BOYNE_100
BOYNE_110
BOYNE_120
BOYNE_130
BOYNE_140
BOYNE_150
BOYNE_160
BOYNE_170
Boyne_180
Ortho-Phopshate Load (kg/yr)
Total Ammonia Load (kg/yr)
Total Oxidised Nitrogen Load (kg/yr)

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
07_1	IE_EA_07B042010	Boyne_150	River	At risk	Moderate	Moderate	N	DWW,Other	2027	
07_1	IE_EA_07B042100	Boyne_160	River	At risk	Good	Moderate	N	Ag,DWW,Hymo,Ind,Other, UWW	2027	
07_1	IE_EA_07R030640	Roughgrange (Main Channel)_010	River	Review	Unassigned	Unassigned	N		2027	
07_1	IE_EA_010_0100	Boyne Estuary	Transitional	At risk	Good	Moderate	N	Ag,UWW	2027	
07_2	IE_EA_07K010060	Kinnegad_010	River	At risk	Good	Moderate	N	Ag,Hymo	2027	
07_2	IE_EA_07K010100	Kinnegad_020	River	At risk	Unassigned	Moderate	N	Peat	2027	
07_2	IE_EA_07K010200	Kinnegad_030	River	At risk	Moderate	Moderate	N	Ag,UWW	2027	
07_3	IE_EA_07C010100	Clady (Meath)_010	River	At risk	Poor	Unassigned	N	Peat	2027	
07_3	IE_EA_07C010260	Clady (Meath)_020	River	At risk	Poor	Poor	N	Peat	2027	
07_4	IE_EA_07B040200	Boyne_010	River	At risk	Good	Moderate	N	DWW,Hymo,Peat	2027	Upper Boyne
07_4	IE_EA_07B040300	Boyne_020	River	At risk	Moderate	Moderate	N	DU,Hymo,UWW	2027	Upper Boyne
07_5	IE_EA_07_242	Acurry	Lake	At risk	Good	Poor	N	Ag,DWW	2027	
07_5	IE_EA_07_267	Skeagh Upper	Lake	At risk	Bad	Bad	N	Ag,DWW	2027	
07_5	IE_EA_07_268	Drumkeery	Lake	At risk	Poor	Bad	N	Ag,DWW	2027	
07_5	IE_EA_07B010170	Blackwater (Kells)_020	River	At risk	Poor	Moderate	N	UWW	2027	
07_5	IE_EA_07B010280	Blackwater (Kells)_030	River	At risk	Unassigned	Poor	N	Ag	2027	
07_5	IE_EA_07B010420	Blackwater (Kells)_040	River	At risk	Moderate	Moderate	N	Ag,DWW	2027	
07_5	IE_EA_07B010800	Blackwater (Kells)_070	River	Review	Moderate	Moderate	N		2027	
07_6	IE_EA_07B020060	Blackwater (Longwood)_010	River	At risk	Good	Poor	N	Ag,Hymo,Peat	2027	Blackwater (Longwood)
07_6	IE_EA_07B020100	Blackwater (Longwood)_020	River	At risk	Moderate	Moderate	N	Ag,Hymo,Peat	2027	Blackwater (Longwood)
07_6	IE_EA_07C220690	Cloncurry_010	River	Review	Unassigned	Unassigned	N		2027	
07_7	IE_EA_07_178	Glass	Lake	Review	Unassigned	Unassigned	N		2027	
07_7	IE_EA_07_190	Doo WH	Lake	Review	Unassigned	Unassigned	N		2027	
07_7	IE_EA_07_223	Ben	Lake	Review	Unassigned	Unassigned	N		2027	
07_7	IE_EA_07D010080	Deel (Raharney)_020	River	Review	Unassigned	Unassigned	N		2027	
07_7	IE_EA_07K330580	Killynan_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
07_7	IE_EA_07L030040	Lough Lene-Adeel Stream_010	River	At risk	Moderate	Poor	N	Ag,Hymo	2027	Lough Lene
07_8	IE_EA_07B011100	Blackwater (Kells)_090	River	At risk	Moderate	Moderate	N	Hymo,Peat	2027	
07_8	IE_EA_07B011200	Blackwater (Kells)_100	River	At risk	Moderate	Moderate	N	Hymo	2027	
07_8	IE_EA_07B011500	Blackwater (Kells)_110	River	At risk	Good	Poor	N	Ind,UWW	2027	
07_8	IE_EA_07T180970	Toberultan_010	River	Review	Unassigned	Unassigned	N		2027	
07_9	IE_EA_07B340940	Ballyhaw_010	River	Review	Unassigned	Unassigned	N		2027	
07_9	IE_EA_07D010400	Deel (Raharney)_050	River	At risk	Moderate	Moderate	N	Hymo	2027	
07_9	IE_EA_07D010600	Deel (Raharney)_060	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	
07_9	IE_EA_07R010090	Riverstown_010	River	At risk	Moderate	Moderate	N	Other,Peat	2027	
07_9	IE_EA_07R010200	Riverstown_020	River	At risk	Moderate	Moderate	N	Ag,DU,Peat	2027	
07_10	IE_EA_07_273	Nadreegeal	Lake	At risk	Moderate	Poor	N	Ag	2027	Nadreegeel
07_10	IE_EA_07_275	Ramor	Lake	At risk	Bad	Bad	N	Ag,Ind,Other,UWW	2027	
07_10	IE_EA_07B011000	Blackwater (Kells)_080	River	At risk	Poor	Poor	N	Ag,Hymo	2027	
07_10	IE_EA_07C020930	Cross Water_010	River	At risk	Unassigned	Moderate	N	Ag	2027	
07_10	IE_EA_07N010500	Nadreegeel Lough Stream_020	River	At risk	Good	Moderate	N	Ag,DWW	2021	Nadreegeel
07_11	IE_EA_07C040050	Castlejordan_010	River	At risk	Poor	Poor	N	DU,Peat,UWW	2027	
07_11	IE_EA_07C040100	Castlejordan_020	River	At risk	Moderate	Moderate	N	Peat	2027	
07_11	IE_EA_07C080190	Castletown Tara Stream_010	River	At risk	Unassigned	Unassigned	N	Peat	2027	
07_11	IE_EA_07M040400	Milltownpass_010	River	At risk	Unassigned	Moderate	N	DWW,Ind	2027	
07_11	IE_EA_07R040300	Rochfortbridge Stream_010	River	At risk	Unassigned	Moderate	N	Peat	2027	
07_11	IE_EA_07Y020070	Yellow (Castlejordan)_010	River	At risk	Good	Moderate	N	Ag	2027	
07_12	IE_EA_07B040900	Boyne_060	River	At risk	Unassigned	Moderate	N	Hymo,Peat,UWW	2027	
07_12	IE_EA_07D060030	D'arcy's Crossroads Stream_010	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	
07_13	IE_EA_07A010050	Athboy_020	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	Athboy
07_13	IE_EA_07A010070	Athboy_030	River	At risk	Unassigned	Moderate	N	Ag,DWW,Hymo	2027	Athboy
07_13	IE_EA_07A010100	Athboy_040	River	At risk	Good	Moderate	N	Hymo	2027	Athboy
07_13	IE_EA_07A010300	Athboy_050	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	Athboy

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
07_13	IE_EA_07A010500	Athboy_060	River	At risk	Moderate	Moderate	N	Hymo,UWW	2027	Athboy
07_13	IE_EA_07B041200	Boyne_080	River	At risk	Moderate	Moderate	N	Hymo	2027	
07_13	IE_EA_07K410830	Knockshangan_010	River	Review	Unassigned	Unassigned	N		2027	Athboy
07_14	IE_EA_07A200940	AGHNANEANE_Or_HERMITAGE_010	River	Review	Unassigned	Unassigned	N		2027	Moynalty
07_14	IE_EA_07M030100	Moynalty_020	River	At risk	Unassigned	Moderate	N	Ag,Hymo	2027	Moynalty
07_14	IE_EA_07M030300	Moynalty_030	River	At risk	Moderate	Poor	N	Ag,Ind	2021	Moynalty
07_14	IE_EA_07M030700	Moynalty_040	River	At risk	Moderate	Poor	N	Ag,Ind	2021	Moynalty
07_14	IE_EA_07M030800	Moynalty_050	River	At risk	Good	Poor	N	Ag,Hymo,Ind	2021	Moynalty
07_14	IE_EA_07M030900	Moynalty_060	River	At risk	Good	Poor	N	Ag,Hymo,Ind,UWW	2021	Moynalty
07_14	IE_EA_07M060400	Mullagh Lough Stream_010	River	At risk	Moderate	Moderate	N	UWW	2027	Moynalty
07_14	IE_EA_07R320900	Reask 07_010	River	Review	Unassigned	Unassigned	N		2027	Moynalty
07_15	IE_EA_07C030930	Castleparks07_010	River	Review	Unassigned	Unassigned	N		2027	
07_15	IE_EA_07D020140	Devlin's_010	River	At risk	Poor	Moderate	N	Ag,DWW	2027	
07_15	IE_EA_07M010100	Mattock_010	River	At risk	Moderate	Moderate	N	Ag,UWW	2027	
07_15	IE_EA_07M010220	Mattock_020	River	Review	Moderate	Good	N		2027	
07_15	IE_EA_07M010300	Mattock_030	River	At risk	Unassigned	Unassigned	N	Ag	2027	
07_16	IE_EA_07B020200	Blackwater (Longwood)_030	River	At risk	Poor	Unassigned	N	Ag,UWW	2027	Blackwater (Longwood)
07_16	IE_EA_07B020300	Blackwater (Longwood)_040	River	At risk	Unassigned	Moderate	N	Other,Peat	2027	Blackwater (Longwood)
07_16	IE_EA_07B020600	Blackwater (Longwood)_050	River	At risk	Good	Moderate	N	Ag,Hymo,UWW	2027	
07_16	IE_EA_07B040600	Boyne_040	River	At risk	Moderate	Moderate	N	Hymo,M+Q,Peat	2027	
07_16	IE_EA_07G020400	Glash_010	River	At risk	Unassigned	Poor	N	Peat	2027	
07_16	IE_EA_07G020600	Glash_020	River	At risk	Poor	Moderate	N	Peat	2027	
07_16	IE_EA_07R020680	Rathcore Stream_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
07_17	IE_EA_07S320550	Stagrennan_010	River	Review	Unassigned	Unassigned	N		2027	
07_17	IE_EA_07T270880	Tullyeskar_010	River	Review	Unassigned	Unassigned	N		2027	
07_17	IE_EA_010_0000	Boyne Estuary Plume Zone	Coastal	Review	High	Good	N		2027	
07_17	IE_EA_020_0000	North-western Irish Sea (Ha 08)	Coastal	Review	High	Good	Y		2027	
07_18	IE_EA_07B011800	Blackwater (Kells)_120	River	At risk	Moderate	Moderate	N	Ag	2027	
07_18	IE_EA_07B041700	Boyne_120	River	At risk	Moderate	Moderate	N	Ag,UWW	2027	
07_18	IE_EA_07D490060	Demailestown_010	River	Review	Unassigned	Unassigned	N		2027	
07_18	IE_EA_07Y010800	Yellow [Blackwater (Kells)]_010	River	Review	Unassigned	Unassigned	N		2027	
07_18	IE_EA_07Y011100	Yellow [Blackwater (Kells)]_020	River	At risk	Poor	Poor	N	Ag	2027	
07_19	IE_EA_07B041600	Boyne_110	River	Review	Unassigned	Unassigned	N		2027	
07_19	IE_EA_07S010150	Skane_010	River	At risk	Unassigned	Unassigned	N	DWW	2027	
07_19	IE_EA_07S010300	Skane_020	River	At risk	Poor	Poor	N	Ag,DWW	2027	
07_19	IE_EA_07S010510	Skane_030	River	At risk	Poor	Poor	N	DWW,Hymo	2027	
07_19	IE_EA_07S010600	Skane_040	River	At risk	Poor	Poor	N	Ag,UWW	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
07_20	IE_EA_07B030200	Boycetown_010	River	At risk	Moderate	Poor	N	Ag,Hymo	2027	Boycetown
07_20	IE_EA_07B030300	Boycetown_020	River	At risk	Moderate	Poor	N	Ag,Hymo	2027	Boycetown
07_20	IE_EA_07B041400	Boyne_090	River	At risk	Moderate	Moderate	N	DU,Hymo	2027	
07_20	IE_EA_07B041500	Boyne_100	River	At risk	Moderate	Moderate	N	Ag,Hymo	2027	
07_20	IE_EA_07K020300	Knightsbrook_010	River	At risk	Poor	Poor	N	Ag,DU,Ind	2027	
07_20	IE_EA_07K020500	Knightsbrook_030	River	At risk	Unassigned	Poor	N	Ag,Hymo	2027	
07_20	IE_EA_07T010400	Tromman Stream_010	River	Review	Unassigned	Unassigned	N		2027	

Ag: Agriculture

DWW: Domestic Waste Water

For: Forestry

Hymo: Hydromorphology

Ind: Industry

M+Q: Mines and Quarries

Peat: Peat Drainage and Extraction

DU: Diffuse Urban

UWW: Urban Waste Water

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	Objective met? Yes /No	Reason why not met
2300PRI2009	Kiltale GWS	Trim	IE_EA_G_002	Yes	N/A
1400PRI3031	Ballindoolin *(GWS)*	Trim	IE_EA_G_002	Yes	N/A
2100PRI3001	Ballymakenny *(PWS)* Yellowbatter Borehole 2	Drogheda	IE_EA_G_025	Yes	N/A
	Ballymakenny Yellowbatter Borehole 1	Drogheda	IE_EA_G_025	Yes	N/A
	Ballymakenny Yellowbatter Borehole 3	Drogheda	IE_EA_G_025	Yes	N/A
2100PRI3005	Drybridge	Wilkinstown	IE_EA_G_010	Yes	N/A
2100PRI3006	Tullyallen Tullyallen Borehole 1	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 2	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 3	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 4	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 5	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 6	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 7	Wilkinstown	IE_EA_G_010	Yes	N/A
	Tullyallen Tullyallen Borehole 8	Wilkinstown	IE_EA_G_010	Yes	N/A
2100PRI3007	Sheepgrange	Wilkinstown	IE_EA_G_010	No data	N/A
2300PRI2009	Kiltale GWS	Trim	IE_EA_G_002	Yes	N/A
2300PRI4013	Avourwen Housing Estate	Drogheda	IE_EA_G_025	Yes	N/A
2300PRI4015	Knightswood Housing Estate	Drogheda	IE_EA_G_025	Yes	N/A
2500PRI2004	Ballyfore/Ballykilleen	Trim	IE_EA_G_002	Yes	N/A
0200PRI2005	Billis Lavey GWS	Nadrageel Lough	IE_EA_07_273	No data	N/A
0200PRI2008	Clifferna GWS	Lough Acurry	IE_EA_07_242	No data	N/A
0200PRI2016	Drumkeery GWS	Drumkeery Lough	IE_EA_07B010280	No data	N/A
2300PUB1062	Dunsany Borehole, Cottrel	Hill of Tara	IE_EA_G_028	No data	N/A
2300PUB1063	Belpher Borehole	Hill of Tara	IE_EA_G_028	No data	N/A
2300PUB1064	Ross Borehole	Hill of Tara	IE_EA_G_028	No data	N/A
2300PUB1065	Knockmark Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1068	Batterstown	Athboy	IE_EA_G_001	Yes	N/A
1400PUB1012	Clogherinkoe	Trim	IE_EA_G_002	Yes	N/A
1400PUB1013	Clonuff	Trim	IE_EA_G_002	Yes	N/A
1400PUB1022	Newtown Borehole	Trim	IE_EA_G_002	No data	N/A
2100PUB1007	Collon Collon Borehole 3	Wilkinstown	IE_EA_G_010	Yes	N/A
	Collon Collon Borehole 2	Wilkinstown	IE_EA_G_010	Yes	N/A
	Collon Collon Borehole 1	Wilkinstown	IE_EA_G_010	Yes	N/A
2100PUB1015	Kilineer	Wilkinstown	IE_EA_G_010	No data	N/A
2100PUB1020	Drybridge	Drogheda	IE_EA_G_025	Yes	N/A
2300PUB1001	Athboy WS	Athboy	IE_EA_G_001	Yes	N/A
2300PUB1002	Ballivor WS	Trim	IE_EA_G_002	Yes	N/A
2300PUB1004	Clonard	Athboy	IE_EA_G_001	Yes	N/A

Scheme Code	Scheme Name	Water Body	Water Body Code	Objective met? Yes /No	Reason why not met
2300PUB1007	Dunshaughlin	Trim	IE_EA_G_002	No	MCPA
2300PUB1010	Enfield WS	Trim	IE_EA_G_002	Yes	N/A
2300PUB1013	Kilmessan WS	Trim	IE_EA_G_002	Yes	N/A
2300PUB1014	Longwood WS	Longwood	IE_EA_G_018	Yes	N/A
2300PUB1015	Moynalty WS	Moynalty	IE_EA_G_015	Yes	N/A
2300PUB1018	Slane WS	Trim	IE_EA_G_002	Yes	N/A
2300PUB1019	Summerhill Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1050	Clonycavan	Athboy	IE_EA_G_001	Yes	N/A
2300PUB1053	Drummorel Borehole	Donore	IE_EA_G_021	No data	N/A
2300PUB1054	Mullagh Raf Borehole	Wilkinstown	IE_EA_G_010	No data	N/A
2300PUB1056	Leggagh Borehole	Wilkinstown	IE_EA_G_010	No data	N/A
2300PUB1059	Bective Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1060	Kilmessan Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1061	Dunsany	Trim	IE_EA_G_002	Yes	N/A
2300PUB1069	Tubberultan Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1070	Castlepole Borehole	Bailieborough	IE_EA_G_006	No data	N/A
2300PUB1071	Carnaross	Bailieborough	IE_EA_G_006	Yes	N/A
2300PUB1072	Oakley Park Borehole	Bailieborough	IE_EA_G_006	No data	N/A
2300PUB1073	Wastlands Borehole	Moynalty	IE_EA_G_015	No data	N/A
2300PUB1074	Ballair Borehole	Moynalty	IE_EA_G_015	No data	N/A
2300PUB1075	Newtown Borehole	Moynalty	IE_EA_G_015	No data	N/A
2300PUB1076	Leggagh Borehole	Wilkinstown	IE_EA_G_010	No data	N/A
2300PUB1081	Agher Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1083	Rathmolyon Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1084	Moat Borehole	Longwood	IE_EA_G_018	No data	N/A
2300PUB1085	Readstown Summerhill	Trim	IE_EA_G_002	Yes	N/A
2300PUB1086	Windtown Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1087	Gaeltrim Borehole	Trim	IE_EA_G_002	No data	N/A
2300PUB1088	Rathkenna Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1089	Robinstown Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1095	Croboy Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1096	Kilwarden Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1097	Anneville Boreholes (2 No	Athboy	IE_EA_G_001	No data	N/A
2300PUB1099	Ashfield Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1101	Ballina Brocey Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1102	Kinnegad Park Borehole	Athboy	IE_EA_G_001	No data	N/A
2300PUB1103	Ardmulchan Borehole	Trim	IE_EA_G_002	No data	N/A
2500PUB1008	Edenderry P.W.S. Borehole 1	Trim	IE_EA_G_002	Yes	N/A
	Edenderry P.W.S. Kishawanny Bridge	Trim	IE_EA_G_002	Yes	N/A
	Edenderry P.W.S. Borehole 2	Trim	IE_EA_G_002	Yes	N/A
0200PUB1002	Bailieborough PWS	Lough Skeagh	IE_EA_07_267	No data	N/A
2100PUB1022	Rosehall	Killineer Reservoir	IE_EA_07T270880	Yes	N/A
	Rosehall	Barnattin Reservoir	IE_EA_07T270880	Yes	N/A
3200PUB1003	Ballany Low Level Reservoir	Lough Lene	IE_EA_07_274	Yes	N/A
3200PUB1004	Ballany High Level Reservoir	Lough Lene	IE_EA_07_274	Yes	N/A
2300PUB1009	Trim WS	KNIGHTSBROOK_030	IE_EA_07K020500	Yes	N/A
2300PUB1011	Kells/Oldcastle WS	Lough Lene-Adeel Stream_010	IE_EA_07L030040	No	MCPA
2100PUB1019	Staleen	Boyne_180	IE_EA_07B042200	No	MCPA; Amyl Methyl Ether

Scheme Code	Scheme Name	Water Body	Water Body Code	Objective met? Yes /No	Reason why not met
	Staleen	Boyne_180	IE_EA_07B042200	No	MCPA; Amyl Methyl Ether
2300PUB1016	Navan & Midmeath WS River Blackwater	BLACKWATER (KELLS)_120	IE_EA_07B011800	Yes	N/A
	Navan & Midmeath WS River Boyne	BOYNE_120	IE_EA_07B041700	Yes	N/A

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

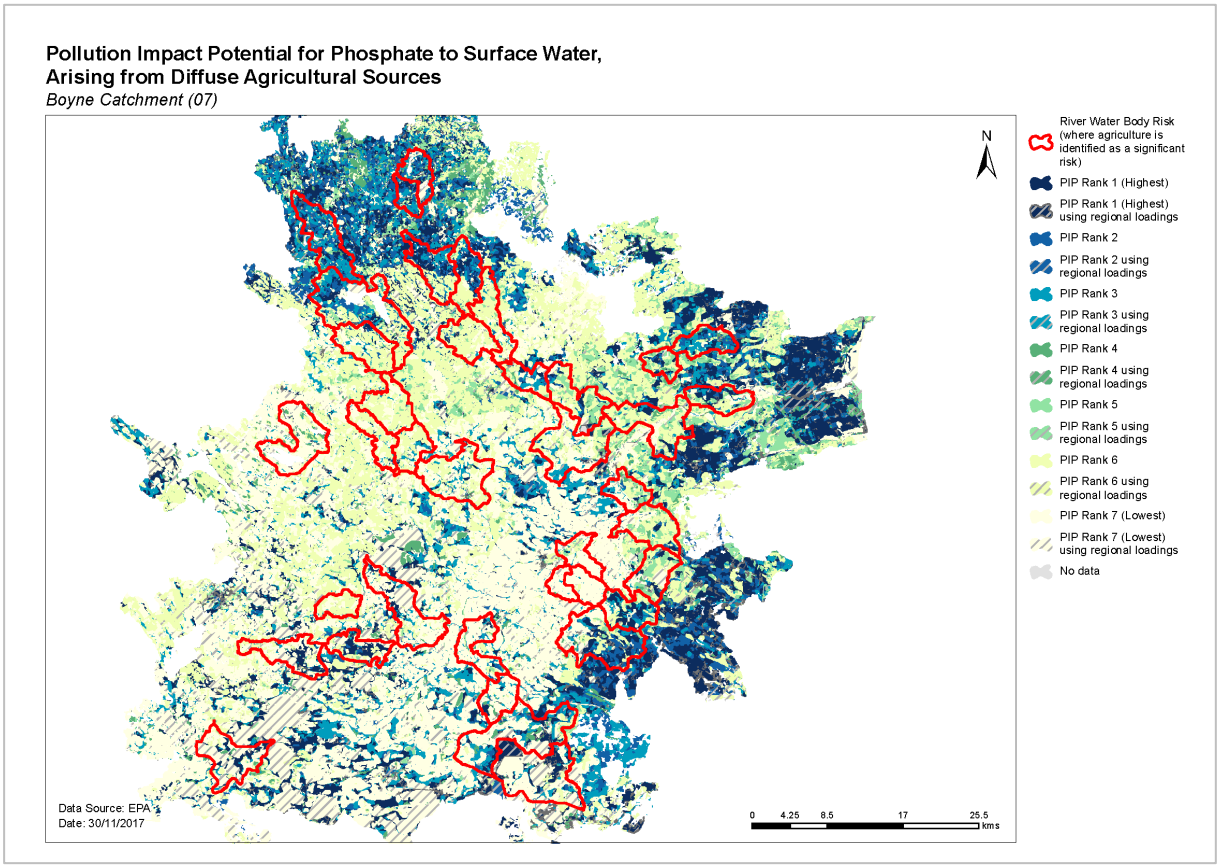
Note that additional water dependent species have been added that are not qualifying interests within the SACs (i.e. White-clawed Crayfish (Austropotamobius pallipes; 1192) has been added to Lough Bane And Lough Glass SAC and Lough Lene SAC).

SAC Name	Relevant Qualifying interests	Target status	Water body type	Water bodies	Status (risk)	Prioritise?	Code	Survey data?
Boyne Coast And Estuary SAC 001957	none							
Killyconny Bog (Cloghbally) SAC 000006	none							
Lough Bane And Lough Glass SAC 002120	3140	At least Good	Lake	Bane Noggin Hill	High (NAR-HES obj)	No	IE_EA_07_270	No
	1092 (population possibly extinct)	At least Moderate	Lake	Bane Noggin Hill	High (NAR-HES obj)	No	IE_EA_07_270	No
			Lake	Glass	Unassigned (R)	No	IE_EA_07_178	No
Lough Lene SAC 002121	3140	At least Good	Lake	Lene	Good (NAR)	No	IE_EA_07_274	No
	1092 (population possibly extinct)	At least Moderate	Lake	Lene	Good (NAR)	No	IE_EA_07_274	No
Raheenmore Bog SAC 000582	none							
Mount Hevey Bog SAC 002342	none							
White Lough, Ben Loughs And Lough Doo SAC 001810	3140	At least Good	Lake	Annagh-White	Good (NAR)	No	IE_EA_07_258	No
			Lake	Doo	Unassigned (R)	No	IE_EA_07_190	No
			Lake	Ben	Unassigned (R)	No	IE_EA_07_223	No
	1092	At least Moderate	Lake	Annagh-White	Good (NAR)	No	IE_EA_07_258	No
			Lake	Doo	Unassigned (R)	No	IE_EA_07_190	No
			Lake	Ben	Unassigned (R)	No	IE_EA_07_223	No

SAC Name	Relevant Qualifying interests	Target status	Water body type	Water bodies	Status (risk)	Prioritise?	Code	Survey data?
River Boyne And River Blackwater SAC 002299	7230	Good GW level	Groundwater	GWDTE-Newtown Lough Fen (SAC002299)	Good (NAR)	No	IE_EA_G_075	No
			Groundwater	Athboy GWB	Good (R)	No	IE_EA_G_001	No
	1106	Good	River	Boyne_010	Moderate (AT RISK)	Yes	IE_EA_07B040200	Yes
			River	Boyne_020	Moderate (AT RISK)	Yes	IE_EA_07B040300	Yes
			River	Boyne_030	Good (NAR)	No	IE_EA_07B040400	Yes
			River	Boyne_040	Moderate (AT RISK)	Yes	IE_EA_07B040600	Yes
			River	Boyne_050	Good (NAR)	No	IE_EA_07B040800	Yes
			River	Boyne_060	Moderate (AT RISK)	Yes	IE_EA_07B040900	Yes
			River	Boyne_070	Good (NAR)	No	IE_EA_07B041000	Yes
			River	Boyne_080	Moderate (AT RISK)	Yes	IE_EA_07B041200	Yes
			River	Boyne_090	Moderate (AT RISK)	Yes	IE_EA_07B041400	Yes
			River	Boyne_100	Moderate (AT RISK)	Yes	IE_EA_07B041500	Yes
			River	Boyne_110	Unassigned (R)	Yes	IE_EA_07B041600	Yes
			River	Boyne_120	Moderate (AT RISK)	Yes	IE_EA_07B041700	Yes
			River	Boyne_130	Unassigned (NAR)	No	IE_EA_07B041810	Yes
			River	Boyne_140	Unassigned (NAR)	No	IE_EA_07B041900	Yes
			River	Boyne_150	Moderate (AT RISK)	Yes	IE_EA_07B042010	Yes
			River	Boyne_160	Moderate (AT RISK)	Yes	IE_EA_07B042100	Yes
			River	Boyne_170	Good (NAR)	No	IE_EA_07B042150	Yes
			River	Boyne_180	Good (NAR)	No	IE_EA_07B042200	Yes

Appendix 6 Pollution Impact Potential (PIP) Map for Phosphate

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



Appendix 7 Local catchment assessment categories

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