Fish in Rivers Factsheet

ERBD **Boyne Catchment** **Factsheet: 2022/04**

The River Boyne rises in Co. Kildare in an area of flat agricultural land approximately 8.5km west of Edenderry. It flows along the border of Co. Kildare and Co. Offaly before entering Co. Meath. It drains land predominantly used for agriculture and flows through a number of towns, including Trim, Navan and Slane, before finally reaching the sea just east of Drogheda in Co. Louth. The River Boyne and its tributaries provide one of Ireland's best game fisheries and offers good opportunities for brown trout, salmon and sea trout angling (O'Reilly, 2009; ERFB, 2010). An arterial drainage scheme was undertaken in the Boyne catchment by the Office of Public Works (OPW), on the main channel and tributaries upstream of Navan, between 1969 and 1985 to provide flood relief (O' Grady, 1991). Some stretches of the main channel and its tributaries are still subject to regular channel maintenance by the OPW.

Inland Fisheries Ireland conducts annual nation-wide fish sampling surveys to assess the status of stocks in Ireland's rivers, lakes and transitional waters. This report presents the results of a catchment-wide survey of the River Boyne catchment in 2022.

A total of 37 sites were surveyed by electro-fishing (CEN 2003) on the River Boyne catchment between the 6th of July and 15th of September 2022.

The survey methods included 10-minute timed Electro-Fishing (TEF_{10}) and Area Delineated Electro-Fishing (ADEF handset). All TEF_{10} fish count results were converted to minimum population estimates according to Matson *et al.* (2018).

River Boyne at Slane Castle Demesne (Site 17)

Iascach Intíre Éireann
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Figure 1. River Boyne sub-catchments and location of electrofishing survey sites, 2022

Blackwater (Kells) and Mattock sub-catchments

Fourteen sites were surveyed on the Blackwater (Kells) River sub-catchment and one on the Mattock River during 2022 (Figure 2 and Table 1). One Water Framework Directive (WFD) long-term surveillance monitoring (SM) site was surveyed in the Blackwater (Kells) sub-catchment upstream of Lough Ramor (Figure 2 and Table 1).

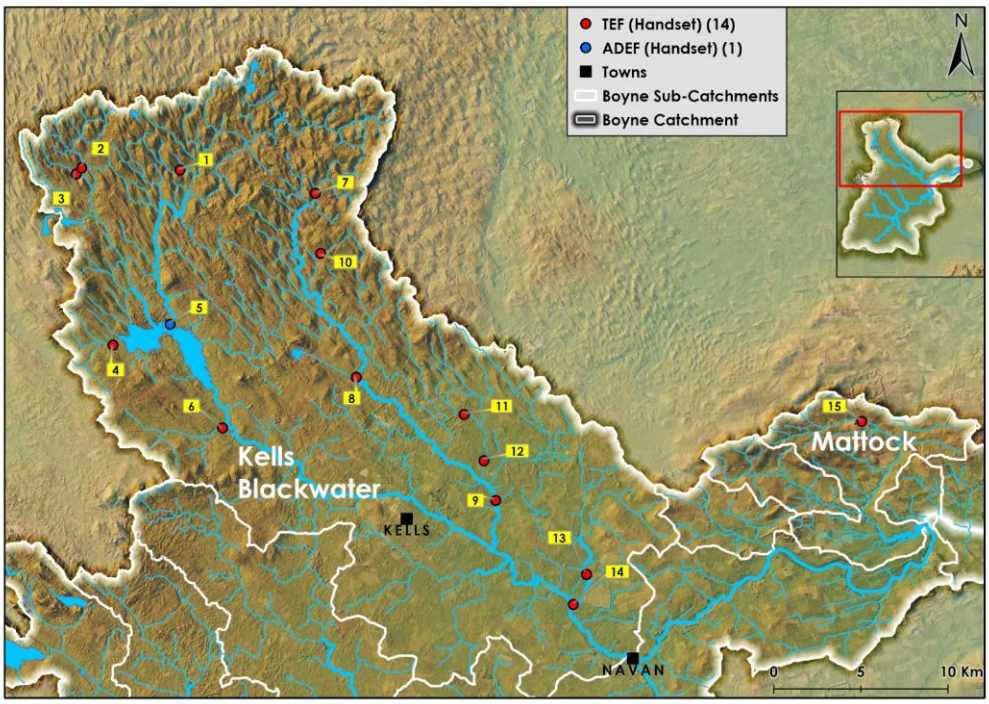

Figure 2. Location of electrofishing survey sites on Blackwater (Kells) (Sites 1-14) and Mattock (Site 15) sub-catchments, 2022

Table 1. Site survey details for the Blackwater (Kells) and Mattock sub-catchments, 2022

No.	Sub-catchment	River	Site	Method	WFD SM	Date
1	Blackwater (Kells)	Seefin	Greaghadossan	TEF (Handset)	No	15/09/2022
2		Assan	Assan Northwest	TEF (Handset)	No	15/09/2022
3		Assan	Drummanduff	TEF (Handset)	No	15/09/2022
4		Eighter	Eighter	TEF (Handset)	No	05/09/2022
5		Blackwater (Kells)	U/S of Lough Ramor	ADEF (Handset)	Yes	07/07/2022
6		Blackwater (Kells)	Crosswater Bridge	TEF (Handset)	No	05/09/2022
7		Moynalty	Ballynamona	TEF (Handset)	No	15/09/2022
8		Barora	Mullagh Bridge	TEF (Handset)	No	31/08/2022
9		Moynalty	Rossmeen	TEF (Handset)	No	31/08/2022
10		Barora	County Bridge	TEF (Handset)	No	07/07/2022
11		Moynalty	Kilbeg Lower	TEF (Handset)	No	31/08/2022
12		Moynalty	Gravelstown	TEF (Handset)	No	13/07/2022
13		Tatestown	Milestown	TEF (Handset)	No	31/08/2022
14		Tatestown	Tatestown	TEF (Handset)	No	07/07/2022
15	Mattock	Mattock	Mattock GAA	TEF (Handset)	No	06/07/2022

Table 2. Minimum density estimates (no. fish/m^2) for the Blackwater (Kells) and Mattock sub-catchments, 2022. Previous results are shown where applicable.

Kells Blackwater									
Site no.	1	2	3	4	5			6	7
Species	2022	2022	2022	2022	2013	2021	2022	2022	2022
Brown trout	0.095	0.333	0.155	–	0.212	0.116	0.048	0.049	0.082
0+ brown trout	–	0.265	0.155	–	0.143	0.050	0.011	0.030	0.066
1+ & older brown trout	0.095	0.068	–	–	0.069	0.067	0.037	0.020	0.016
Salmon	–	–	–	–	0.010	–	0.002	–	–
0+ salmon	–	–	–	–	0.003	–	–	–	–
1+ & older salmon	–	–	–	–	0.008	–	0.002	–	–
European eel	0.022	–	–	–	0.010	0.004	0.015	0.015	–
Gudgeon	–	–	–	0.016	0.038	0.004	0.002	–	–
Minnow	–	–	–	–	0.031	0.006	0.009	–	–
Perch	–	–	–	–	0.008	0.028	0.004	–	–
Roach	–	–	–	0.008	0.013	0.002	–	–	–
Stone loach	–	–	0.031	–	–	–	0.004	–	0.090
Three-spined stickleback	–	–	0.093	0.098	0.005	–	–	0.030	–
All fish	**0.117**	**0.333**	**0.279**	**0.122**	**0.328**	**0.175**	**0.085**	**0.094**	**0.173**

Blackwater (Kells)								Mattock
Site no.	8	9	10	11	12	13	14	15
Species	2022	2022	2022	2022	2022	2022	2022	2022
Brown trout	0.129	0.153	–	0.570	–	0.011	0.042	–
0+ brown trout	–	–	–	0.570	–	0.011	0.021	–
1+ & older brown trout	0.129	0.153	–	–	–	–	0.021	–
Salmon	0.009	–	–	–	–	–	–	–
0+ salmon	–	–	–	–	–	–	–	–
1+ & older salmon	0.009	–	–	–	–	–	–	–
European eel	–	–	–	–	–	–	–	0.031
Gudgeon	–	–	–	–	–	–	0.011	–
Lamprey sp.	0.009	–	–	–	–	0.011	–	–
Minnow	0.026	0.091	–	–	–	–	0.285	0.172
Stone loach	0.224	0.019	–	–	0.260	–	0.875	0.073
Three-spined stickleback	–	–	0.602	0.443	0.104	0.125	–	0.016
All fish	**0.396**	**0.262**	**0.602**	**1.013**	**0.363**	**0.147**	**1.212**	**0.291**

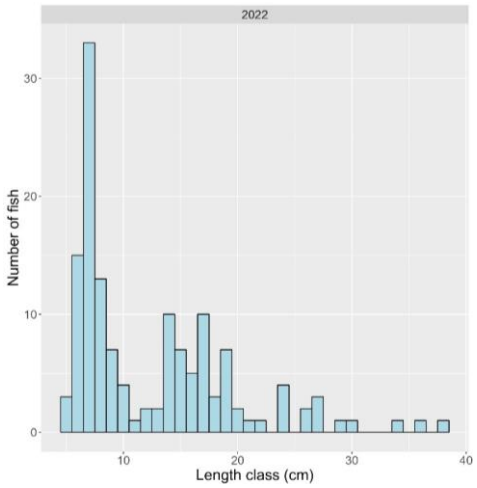

Figure 3. Length frequency distribution for brown trout (n=140) in the Blackwater (Kells) sub-catchment, 2022 (n=9 sites)

Table 3. Salmonid % age class structure (where recorded) for the Blackwater (Kells) sub-catchment, 2022.

Species	Site no.	% Catch				
		0+	1+	2+	3+	4+
Brown trout	1	-	100	-	-	-
	2	81	19	-	-	-
	3	100	-	-	-	-
	5	30	49	4	11	7
	6	60	-	40	-	-
	7	80	20	-	-	-
	8	-	79	21	-	-
	9	-	80	13	7	-
	11	100	-	-	-	-
	13	100	-	-	-	-
	14	50	-	50	-	-
Salmon	5	-	100	-	-	-
	8	-	100	-	-	-

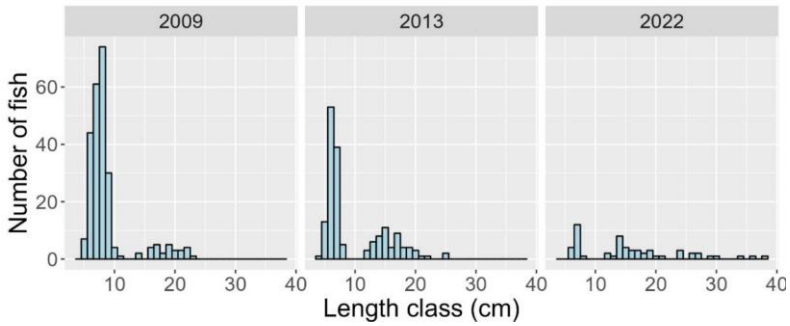

Figure 4. Length frequency distribution for brown trout (2009 n=250; 2013 n=167; 2022 n=57) in the Blackwater (Kells) River sub-catchment at Site 5 (just upstream of Lough Ramor).

Blackwater River (Kells) at Crosswater Bridge (Site 6)

Table 4. Fish ecological status for the Blackwater (Kells) and Mattock sub-catchments, 2022

Site No.	2009	2013	2021	2022
Blackwater (Kells) sub-catchment				
1	–	–	–	M
2	–	–	–	M
3	–	–	–	M
4	–	–	–	P
5	M	M	M	M
6	–	–	–	P
7	–	–	–	M
8	–	–	–	M
9	–	–	–	P
10	–	–	–	P
11	–	–	–	M
12	–	–	–	P
13	–	–	–	P
14	–	–	–	P
Mattock sub-catchment				
15	–	–	–	P

River Boyne main channel and Castlejordan, Deel, Stoneyford, Athboy, Skane, Boycetown, Knightsbrook, Tromman and Longwood sub-catchments

Three sites were surveyed on the main channel of the River Boyne, as well as two on the Castlejordan, two on the Deel, two on the Stoneyford, five on the Athboy, one on the Skane, one on the Boycetown, two on the Knightsbrook, one on the Tromman and three on the Longwood sub-catchments in 2022. Three WFD surveillance monitoring sites were surveyed on the River Boyne main channel at Boyne Bridge and Slane (sites 16/ 17 & 18) and one on the Athboy River at Clonleason (site 25) (Figure 5 and Table 5).

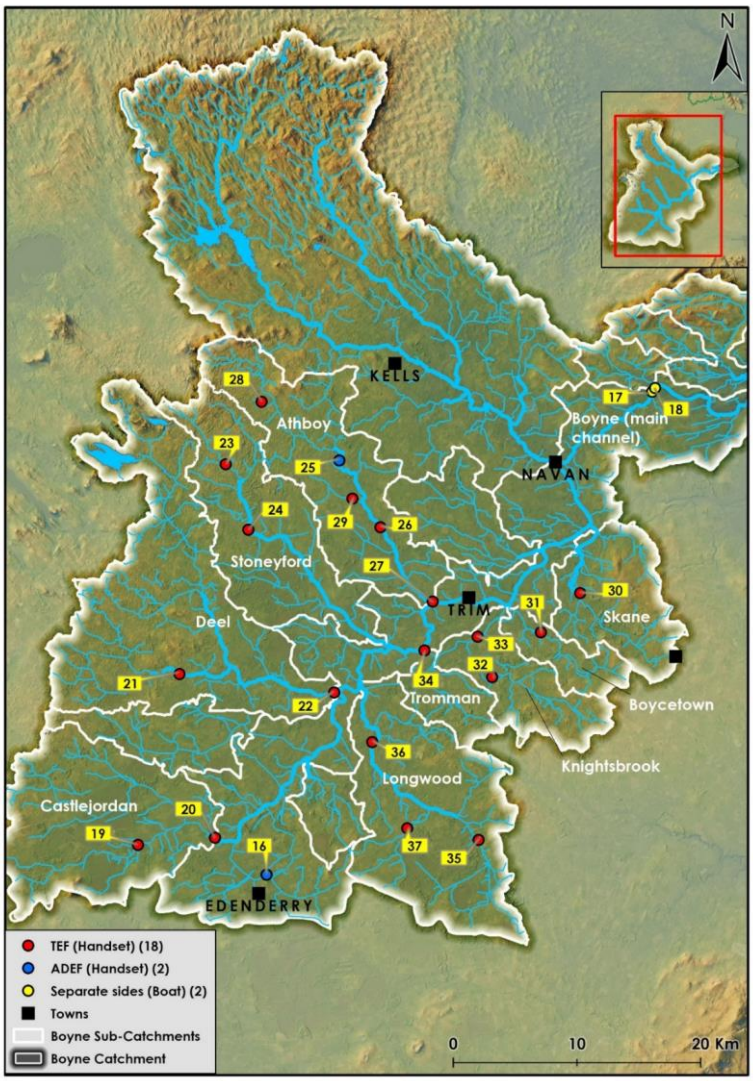

Figure 5. Location of electrofishing survey sites on River Boyne main channel (Sites 16-18) and subcatchments (Castlejordan (Sites 19-20), Deel (Site 21-22), Stoneyford (Sites 23-24), Athboy (Sites 25-29), Skane (Site 30), Boycetown (Site 31), Knightsbrook (Sites 32-33), Tromman (Site 34) and Longwood (Sites 35-37)), 2022

Table 5. Site survey details for the River Boyne main channel and sub-catchments (Castlejordan, Deel, Stoneyford, Athboy, Skane, Boycetown, Knightsbrook, Tromman and Longwood), 2022

No.	Sub-catchment	River	Site	Method	WFD SM	Date
16	Boyne	Boyne	Boyne Bridge	ADEF (Handset)	Yes	05/07/2022
17		Boyne	Slane Castle Demesne (left bank)	ADEF (Separate sides-boat)	Yes	06/07/2022
18		Boyne	Slane Castle Slip (right bank)	ADEF (Separate sides-boat)	Yes	06/07/2022
19	Castlejordan	Yellow	Garr Bridge	TEF (Handset)	No	12/07/2022
20		Yellow	Clonmore	TEF (Handset)	No	12/07/2022
21	Deel	Riverstown	Mill Land South	TEF (Handset)	No	11/07/2022
22		Deel	Ballyadams	TEF (Handset)	No	29/08/2022
23	Stoneyford	Stoneyford	Archerstown East	TEF (Handset)	No	12/07/2022
24		Stoneyford	Southhill East	TEF (Handset)	No	12/07/2022
25	Athboy	Athboy	Bridge near Clonleasan	ADEF (Handset)	Yes	05/07/2022
26		Athboy	Fordrath	TEF (Handset)	No	30/08/2022
27		Tremblestown	Kilnagross Bridge	TEF (Handset)	No	11/07/2022
28		Gibbonstown	Gibbonstown Bridge	TEF (Handset)	No	07/07/2022
29		Bunboggan	Bunboggan	TEF (Handset)	No	30/08/2022
30	Skane	Skane	Kilmessan Bridge	TEF (Handset)	No	01/09/2022
31	Boycetown	Boycetown	Milltown Bridge	TEF (Handset)	No	01/09/2022
32	Knightsbrook	Knightsbrook	Dangan Southwest	TEF (Handset)	No	01/09/2022
33		Knightsbrook	Knightsbrook	TEF (Handset)	No	01/09/2022
34	Tromman	Tromman	Boards Mill	TEF (Handset)	No	30/08/2022
35	Longwood	Longwood	Knockanally New Bridge	TEF (Handset)	No	29/08/2022
36		Longwood	Longwood East	TEF (Handset)	No	29/08/2022
37		Coolree	Kilmurray North	TEF (Handset)	No	29/08/2022

River Boyne at Boyne Bridge (Site 16)

Table 6. Minimum density estimates (no. fish/m^2) for the Boyne main channel and sub-catchments (Castlejordan, Deel, Stoneyford, Athboy, Skane, Boycetown, Knightsbrook, Tromman and Longwood), 2022. Previous results are shown where applicable.

Boyne				Castlejordan		Deel			Stoneyford
Site no.	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Species	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**
Brown trout	0.065	–	–	0.214	0.086	0.164	0.063	0.089	0.198
0+ brown trout	–	–	–	0.021	–	0.094	0.027	0.063	0.077
1+ & older brown trout	0.065	–	–	0.193	0.086	0.070	0.036	0.025	0.121
Salmon	–	–	–	–	0.025	0.094	0.054	–	0.022
0+ salmon	–	–	–	–	0.008	0.094	0.018	–	–
1+ & older salmon	–	–	–	–	0.016	–	0.036	–	0.022
Minnow	0.015	–	0.019	0.027	0.049	–	0.009	–	–
Pike	–	0.0003	–	–	–	–	–	–	–
Roach	–	0.0003	–	–	–	–	–	–	–
Stone loach	–	–	–	0.021	–	0.047	–	–	–
All fish	**0.080**	**0.001**	**0.019**	**0.262**	**0.160**	**0.305**	**0.127**	**0.089**	**0.220**

Athboy								Skane
Site no.	**25**			**26**	**27**	**28**	**29**	**30**
Species	**2012**	**2016**	**2022**	**2022**	**2022**	**2022**	**2016**	**2022**	**2022**
Brown trout	0.123	0.047	0.150	0.179	0.014	0.020	0.157	0.322	0.386
0+ brown trout	0.024	0.009	0.022	0.044	0.014	0.020	0.063	0.267	0.114
1+ & older brown trout	0.099	0.038	0.128	0.135	–	–	0.094	0.055	0.272
Salmon	0.038	0.017	–	–	–	–	–	–	–
0+ salmon	0.009	0.004	–	–	–	–	–	–	–
1+ & older salmon	0.028	0.013	–	–	–	–	–	–	–
European eel	–	–	–	0.024	–	–	–	–	0.021
Lamprey sp.	–	–	–	–	–	–	0.189	–	–
Minnow	–	–	–	0.056	0.024	–	–	0.018	–
Pike	–	–	0.004	–	–	–	–	–	–
Stone loach	0.005	–	0.018	0.016	0.010	–	–	–	–
Three-spined stickleback	0.005	0.009	–	0.036	–	0.060	0.047	–	0.079
All fish	**0.170**	**0.072**	**0.172**	**0.310**	**0.048**	**0.080**	**0.393**	**0.341**	**0.486**

Boycetown		Knightsbrook		Tromman	Longwood		
Site no.	**31**	**32**	**33**	**34**	**35**	**36**	**37**
Species	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**	**2022**
Brown trout	0.517	0.030	0.280	0.257	0.220	0.109	0.201
0+ brown trout	0.276	0.030	0.190	0.059	0.117	0.045	0.166
1+ & older brown trout	0.241	–	0.090	0.197	0.103	0.064	0.035
Salmon	–	–	0.063	–	–	0.042	–
0+ salmon	–	–	0.053	–	–	0.042	–
1+ & older salmon	–	–	0.011	–	–	–	–
European eel	–	–	–	0.020	–	0.018	–
Minnow	–	0.059	–	–	–	0.124	–
Stone loach	–	0.020	–	0.026	–	0.027	–
Three-spined stickleback	0.143	0.109	–	0.020	–	0.009	0.288
All fish	**0.659**	**0.217**	**0.343**	**0.323**	**0.220**	**0.330**	**0.490**

Table 7. Salmonid % age class structure (where recorded) for the Boyne, Castlejordan, Deel, Stoneyford, Athboy, Skane, Boycetown, Knightsbrook, Trommen and Longwood sub-catchments, 2022

Species	Sub-catchment	Site no.	% Catch 0+	1+	2+	3+
Brown trout	Boyne	**16**	-	60	40	-
	Castlejordan	**19**	11	79	11	-
		20	-	60	30	10
	Deel	**21**	57	43	-	-
		22	43	57	-	-
	Stoneyford	**23**	75	25	-	-
		24	44	33	22	-
	Athboy	**25**	15	30	55	-
		26	24	14	62	-
		27	100	-	-	-
		28	100	-	-	-
		29	83	17	-	-
	Skane	**30**	33	41	26	-
	Boycetown	**31**	55	45	-	-
	Knightsbrook	**32**	100	-	-	-
		33	70	26	4	-
	Trommen	**34**	26	68	6	-
	Longwood	**35**	59	35	6	-
		36	41	35	12	12
		37	83	17	-	-
Salmon	Castlejordan	**20**	33	67		
	Deel	**21**	100	-	-	-
		22	33	67	-	-
	Stoneyford	**24**	-	100	-	-
	Knightsbrook	**33**	83	17	-	-
	Longwood	**36**	100	-	-	-

Table 8. Fish ecological status for the River Boyne and sub-catchments (Castlejordan, Deel, Stoneyford, Athboy, Skane, Boycetown, Knightsbrook, Trommen and Longwood), 2022

Site No.	2009	2012	2016	2022
River Boyne				
16	–	–	–	P
17	–	–	–	N/A
18	–	–	–	N/A
Castlejordan sub-catchment				
19	–	–	–	M
20	–	–	–	M
Deel sub-catchment				
21	–	–	–	M
22	–	–	–	M
Stoneyford sub-catchment				
23	–	–	–	M
24	–	–	–	M
Athboy sub-catchment				
25	G	G	P	P
26	–	–	–	G
27	–	–	–	P
28	–	–	–	P
29	–	–	M	M
Skane sub-catchment				
30	–	–	–	G
Boycetown sub-catchment				
31	–	–	N/A	M
Knightsbrook sub-catchment				
32	–	–	–	P
33	–	–	–	G
Tromman sub-catchment				
34	–	–	–	M
Longwood sub-catchment				
35	–	–	–	M
36	–	–	–	G
37	–	–	–	M

Stoneyford River at Southhill East (Site 24)

Athboy River at Bridge near Clonleason (Site 25)

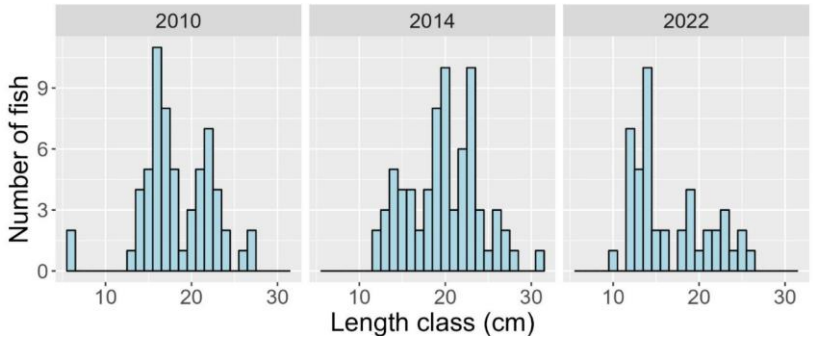

Figure 6. Length frequency distribution for brown trout (2010 n=61, 2014 n=72, 2022 n=45) in the River Boyne at Site 16 (Boyne Bridge) (note: Boyne Bridge site was moved in 2022 due to previous site being overgrown)

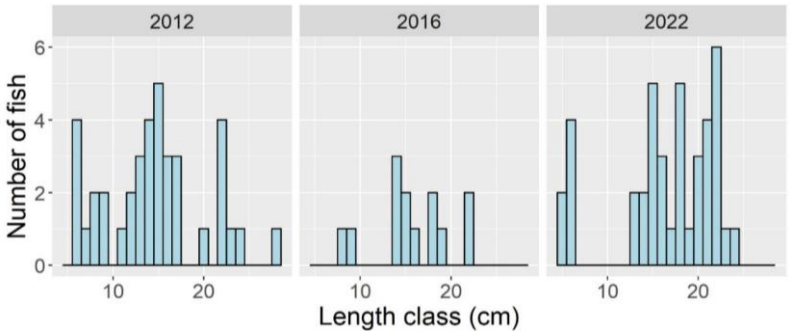

Figure 7. Length frequency distribution for brown trout (2012 n=38, 2016 n=13, 2022 n=40) in the Athboy River sub-catchment at Site 24 (Bridge near Clonleasan).

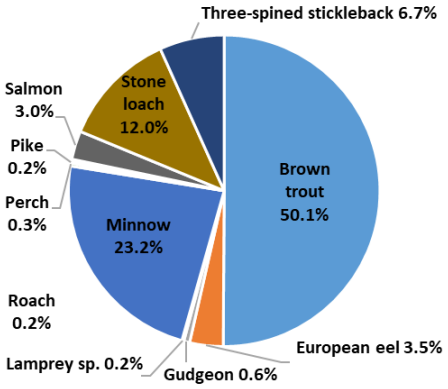

Figure 8. Fish species composition (%), River Boyne catchment, 2022

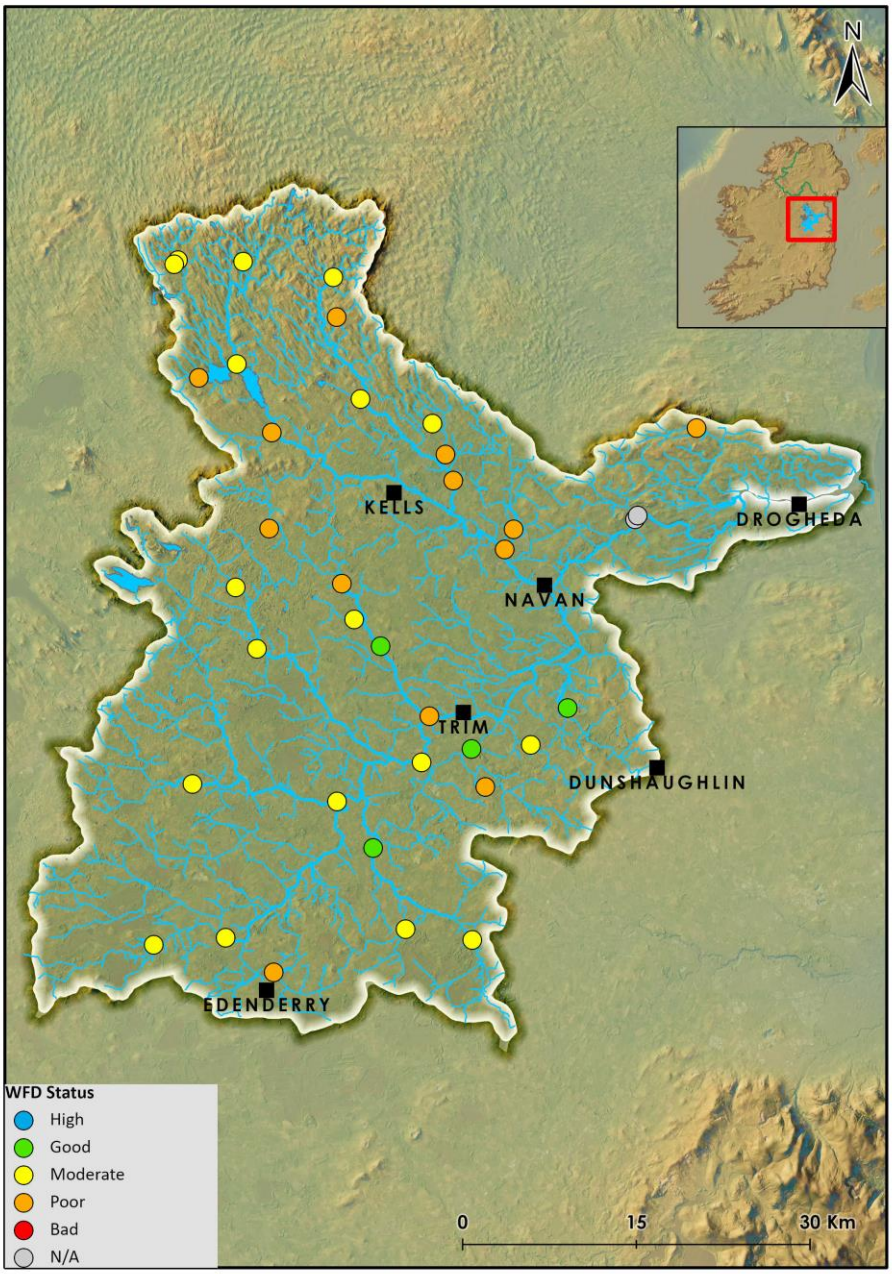

Figure 9. Fish ecological status in the River Boyne catchment, 2022

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Summary

A total of 11 fish species were recorded at 37 sites surveyed on the River Boyne catchment in 2022.

Brown trout was the most common and most abundant species present (31 sites, 84%), followed by stone loach and three-spined stickleback (16 sites each, 43%), minnow (15 sites, 41%), salmon and European eel (eight sites each, 22%), gudgeon (three sites, 8%), pike, roach and lamprey sp. (two sites each, 5%) and perch (one site, 3%).

Brown trout ranged in length from 4.7 to 38.4cm. Four age classes were present (0+, 1+, 2+ and 3+), with 1+ being the most abundant cohort. The highest density of 0+ brown trout (0.570 fish/m^2) was recorded at Site 11 on the Moynalty River at Kilbeg Lower. The greatest density of 1+ and older brown trout (0.272 fish/m^2) was recorded on Site 30 on the Skane River at Killmessan Bridge.

Salmon ranged in length from 5.5 to 16cm. Two age classes were present (0+ and 1+), with 0+ being the most abundant cohort. The highest density of salmon 0+ salmon (0.094 fish/m^2) was recorded at Site 21 on the Riverstown River at Mill Land South while the greatest density of 1+ and older salmon (0.036 fish/m^2) was recorded on Site 22 on the Deel River at Ballyadams.

Salmonids were not recorded at six sites across the catchment. Tolerant fish species (e.g. three-spined stickleback, minnow and stone loach) often proliferated at these sites. These species are more tolerant of poor water quality and poor habitat than type specific indicator species (e.g. brown trout and salmon). When dominant at a site or present in relatively high abundances they can be an indicator of poor water quality (Kelly *et al*., 2007).

Three-spined stickleback were recorded at 20 sites. The highest density (0.602 fish/m^2) of three-spined stickleback was observed at site 10 (Barora River at County Bridge a tributary of the Moynalty) followed by site 11 (0.482 fish/m^2) (Moynalty at Kilbeg Lower).

Minnow were present at 17 sites. The highest density of minnow (0.285 fish/m and 0.172 fish/m^2) was recorded on sites 14 (Tatestown River) and 15 (Mattock River) respectively.

Stone loach were recorded at 17 sites. A relatively high density of stone loach was also recorded at site 14 (0.875 fish/m^2).

Moynalty River at Kilbeg Lower (Site 11)

Mattock River at Mattock GAA (site 15)

A Water Framework Directive fish classification tool (FCS2) was developed for Irish rivers in 2011 (SNIFFER 2011). The tool works by comparing various fish community metric values within a site to those predicted for a site under un-impacted conditions. In general, a site will achieve High status if indicator species (e.g., both salmonid cohorts 0+ and 1+ and older) are present and in expected numbers. Status will decline if such cohorts are missing, are in poor abundance, or if more tolerant species proliferate.

Fish ecological status was assigned to 35 of the 37 sites surveyed in the Boyne catchment during 2022 (Table 4 and Table 8;). Four sites achieved Good status, with eighteen sites Moderate and thirteen Poor. Four sites were surveyed previously on this catchment and when

compared with their most recent previous surveys, three remained unchanged, while one site which had previously been unassigned, was classified as having Moderate status (Figure 9).

The reasons for the failures in fish ecological status (i.e., Moderate or worse) were due to lower-than-expected abundance of type specific indicator species (e.g. salmon and trout) or the absence of certain age cohorts indicating recruitment failures.

Failures and deteriorations in fish ecological status were likely caused by nutrient enrichment, hydromorphological (e.g. habitat modification and fish passage obstruction due to artificial barriers) and other pressures.

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