

Camlin Catchment Review



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TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	METHODOLOGY	3
3.	GEOGRAPHIC LOCATION	5
4.	CATCHMENT CHARACTERISTICS / HYDROLOGY	5
5.	WATER QUALITY	6
5.1	OVERVIEW OF PRESSURES	6
5.2	MAIN RIVER CAMLIN CHANNEL (EPA CODE: 26C01)	8
5.3	RIVER RHINE (EPA CODE: 26R04)	11
5.4	CLOONCOOSE STREAM (EPA CODE: 26C20)	11
5.5	LISSAMEEN STREAM (EPA CODE: 26L24)	12
5.6	CLONKEEN STREAM (EPA CODE: 26C11)	12
5.7	RIVER FALLAN (EPA CODE: 26F01)	14
5.8	MINOR TRIBUTARIES	14
6.	FISH POPULATIONS	14
6.1	TROUT TRAPPING IN THE CAMLIN CATCHMENT	15
6.2	GENETIC ASSESSMENT OF BROWN TROUT	16
7.	AQUATIC ECOLOGY	18
8.	DESIGNATED AREAS	18
9.	DISCUSSION	19
	REFERENCES.....	20
	PLATES	22



1. INTRODUCTION

This document provides an overview of the Camlin Catchment in Co. Longford. The Camlin Catchment is located in Co. Longford within the Upper Shannon catchment (catchment ID: 26C). The 4th order River Camlin flows into the Upper River Shannon at Cloodara and rises southwest of Granard, Co. Longford. The dominant landuse in the catchment is pastoral agriculture.

The Environmental Protection Agency (EPA) carries out biological water quality monitoring in the catchment. The most recent published reports are from the 2010-2015 monitoring assessments (WFD, 2018a, 2018b). The most recent report showed that two sites had high status, five had good status, another 5 had moderate status and two sites had poor status. The main pressures on the catchment are urban run-off, urban wastewater, agriculture, land drainage, forestry activities including clearfelling and dams, barriers, locks and weirs, and unknown anthropogenic pressures.

There are several barriers to upstream migration in the catchment including Termonbarry Weir on the River Shannon [Upper], Bourke's Lock and Longford town weir. Common Frog, Smooth Newt, Otter, White-clawed crayfish and Kingfisher have all been recorded in the catchment.

A genetic study of Brown Trout has also show that the River Camlin is an important catchment for Brown Trout production. Roach, Gudgeon, Perch, Stone loach, Pike, Brown trout, Lamprey sp. and Nine-spined stickleback have all been recorded in the catchment.

2. METHODOLOGY

A desk study was undertaken to gather available information on the Camlin Catchment. Information sources reviewed as part of the current assessment included Environmental Protection Agency (EPA) envision maps (gis.epa.ie) to view historical and current biological water quality status (Q rating), land use and Water Framework Directive waterbody status. The EPA catchments database (catchments.ie) was also accessed. In addition, the National Parks and Wildlife Service (NPWS) site synopses, as well as protected species data held on the NPWS/National Biodiversity Data Centre (NBDC) online databases were accessed. The Inland Fisheries Ireland database of past fish surveys was consulted. Maps were generated with QGIS, and online aerial imagery was accessed to characterise the nature of the catchment. A full bibliography of information sources reviewed is given in the reference section.

In addition, site visits were undertaken during July and August 2021. During the July visit the weir in Longford town was observed. A windshield tour of the catchment was undertaken during late-August 2021.

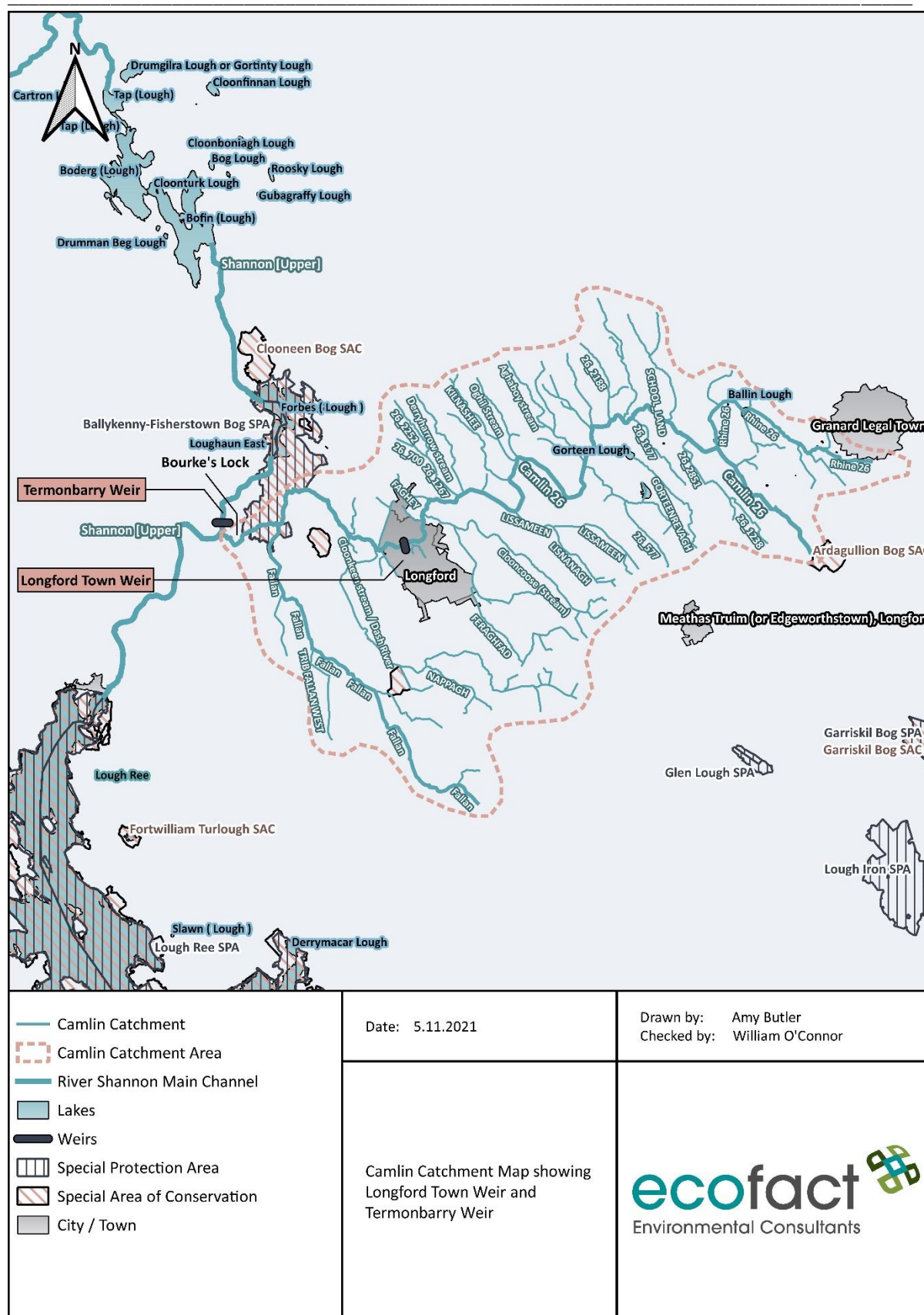


Figure 1 Camlin Catchment Map showing Longford Town Weir and Termonbarry Weir



3. GEOGRAPHIC LOCATION

The Camlin Catchment is located in the center of Co. Longford. The catchment originates west of Granard town and flows through Longford town. This is north of Edgeworthstown, Co. Longford. The main River Camlin channel flows in a predominantly south-west direction passing through and near the villages of Ballinalee, Cullyfad and Ennybegs. The regional road R194 runs through the catchment from Granard to Longford town.

4. CATCHMENT CHARACTERISTICS / HYDROLOGY

The catchment is part of the Upper Shannon catchment (catchment ID: 26C). There are several rivers in the catchment including the 4th order River Camlin (EPA code: 26C01), the 3rd order Rivers Rhine 26 (EPA code: 26R04), Lissameen (EPA code: 26L24), Clooncoose (Stream) (EPS code: 26C20), Clonkeen (Stream) (EPA code: 26C11) and the 2nd order River Fallan (EPA code: 26F01).

The main channel of the River Camlin rises c. 5.5 km south-west of Granard town in the north of Co. Longford. From here the river flows in an almost zig-zag pattern before joining the River Shannon at Cloondara town. The Camlin River is joined by the 3rd order Rhine River (EPA code: 26R04) c. 6.4 river km (rkm) from the river's source. A further 25.5 rkm downstream the 3rd order Clonkeen Stream (EPA code: 26C11) joins the River Camlin directly downstream of Longford town. A further 6.8 km downstream the 3rd order River Fallan (EPA code: 26F01) joins the River Camlin. Approximately 3.2 rkm downstream the now 4th order River Camlin flows into the 6th order River Shannon [Upper] (EPA code: 26S02). Approximately 1.9 rkm upstream of the River Camlin's confluence with the River Fallan there is a split off, of the River Camlin that flows into the River Shannon c. 1.4 rkm downstream. This split off is the River Fishertown (EPA code: 26F51). There are 6 lakes in the catchment which rivers flow through. There are 6 smaller lakes which are not connected by surface waters.

The topography in the area is relatively flat. The highest point is Corn Hill at 331m above sea level. Where the River Camlin rises the elevation is 97 m and it is 34 m where it joins the River Shannon. There are several land uses in the area. The dominant landuse is pastoral agriculture. Scattered throughout the catchment and often along riverbanks there are peatlands and forestry which is both commercial, mixed and transitional woodland scrub. There is a large area of mixed agriculture, woodland and forestry around Cullyfad town, Co. Longford. Longford town is the only significant urban area in the catchment and consists of industrial and commercial areas, artificial surfaces, sports and leisure facilities etc. In the lower reaches particularly on the River Fallan there are large wetland areas. There are several artificial structures in the catchment. There is a weir named the Camlin Weir located on the main River Camlin channel, in Longford Town (shown in Figure 1 and 3). It is located approximately 0.8rkm downstream from the EPA monitoring station 26C010800. This weir has been identified by IFI (2021) as a complete barrier to adult Salmon, a high impact partial barrier to cyprinids, juvenile Salmon, adult Lamprey and adult Trout. Juvenile Eels would be able to climb the weir at the edges. However, during high floods, the weir has been identified as a high impact barrier for all fish species. IFI (2021) has identified the Camlin Weir as damaged and in need of repair. IFI have described it as "*not fit for purpose in its current configuration*".

There is a weir on the lower River Camlin, outside the townland of Cloondara. This weir was built in the 1770's. The weir is c. 1.1rkm upstream from where the River Camlin meets the River Shannon. There is an EPA monitoring station (EPA station code: RSRS26C011100) c. 0.1rkm downstream of the weir. The 2020 Q rating was Q3. There is also a lock, named Bourke's Lock, outside Cloondara on an artificial canal. This is located c. 0.35rkm upstream from where the Camlin River meets the River Shannon.



Another weir is situated c. 0.5km upstream, outside the village of Termonbarry, Co. Roscommon, where the Camlin River meets the River Shannon. Ecofact (2016) has described this weir as a barrier that “contributes to the general absence of Salmon in the upper reaches of the River Shannon” and have stated that it needs to be updated. This is a barrier to fish migration up the River Shannon.

There is a canal, named the Royal Canal, which was built in 1817. This canal connects the River Shannon to Dublin City. There are 46 locks along the 145km route (Longford.ie, n.d.).

There has been work done on the river by the OPW (Office of Public Works) over the years. The OPW (2017) show that some of the works on the River Camlin are channel reprofiling works and gradient correction works.

5. WATER QUALITY

The EPA carried out biological water quality sampling all over Ireland and classifies rivers into five quality classes (status) which are High, Good, Moderate, Poor and Bad. These statuses are assigned at approximately 3-yearly intervals. These follow the standards in the European legislation, the Water Framework Directive (WFD). These ratings take consideration of ecology, physio-chemical condition (for example nutrient concentrations) and physical conditions of rivers.

In order to have generally healthy stocks of fish an EPA rating of Q3-4 is required which is equivalent to WFD status “Moderate”. These sites have been shown to have the highest species richness (Kelly *et al.* 2007).

5.1 Overview of Pressures

There are 14 National Water Monitoring Stations on the main Camlin River channel and its tributaries. There are other monitoring sites included online but these have not been used in recent years. The most up-to-date Q-value records were recorded in 2020.

The most recent published reports are from the 2010-2015 monitoring assessments (WFD, 2018a, 2018b). The Q-value for each monitoring station, along with the past records, are illustrated in Table 1. Of the 14 monitoring stations used in 2020, 2 were assessed as Q4-5 (high status) at the EPA stations RS26A110300 and RS26R040700. Another 5 were assessed as Q4 (good status) at the EPA stations RS26C011000, RS26C010800, RS26C010600, RS26C010050 and RS26F010200. There were 5 assessed as Q3-4 (moderate status). Finally, 2 were assessed as Q3 (poor status). The EPA have attributed the “moderate” and “poor” statuses to lack of macroinvertebrate families present.

Table 1 EPA Q Value ratings from 2011 – 2020 along the main Camlin River channel and the identified pressures impacting the “at risk” sections.

Waterbody	EPA Station Code	Q Values				Risk Status	Pressure(s)
		2011	2014	2017	2020		
Camlin_070	RS26C011000	Q2-3	Q3	Q3	Q4	At Risk	Urban run-off, Urban wastewater, Hydromorphology, siltation
Camlin_060	RS26C111000	N/A	N/A	N/A	N/A	At Risk	Urban wastewater, diffuse urban, agriculture
Camlin_050	RS26C010800	Q4	Q4	Q4	Q4	Not At Risk	



Waterbody	EPA Code	Station	Q Values				Risk Status	Pressure(s)
			2011	2014	2017	2020		
Camlin_040	RS26C010700		Q4-5	Q4-5	Q4-5	Q3-4	Not At Risk	
Camlin_030	RS26C010600		Q4-5	Q4-5	Q4-5	Q4	Not At Risk	
Camlin_030	RS26A110300		Q4	Q4-5	Q4-5	Q4-5	Not At Risk	
Camlin_020	RS26C010200		Q4-5	Q4	Q4-5	Q3-4	Not At Risk	
Camlin_010	RS26C010050		N/A	Q3	Q3-4 (2018)	Q4	At Risk	Channelisation, Forestry
Clooncoose Stream_010	RS26C200300		Q4	Q4	Q3-4	Q3-4	At Risk	Agriculture
Fallan_010	RS26F010040		Q3-4	Q3-4	Q3-4	Q3-4	At Risk	Forestry, Agriculture
Fallan_010	RS26F010020		Q4	Q3-4	Q3-4	Q3-4	At Risk	
Fallan_020	RS26F010200		Q4	Q4	Q4	Q4	Not At Risk	
Rhine_010	RS26R040700		Q4	Q4	Q3-4	Q4-5	At Risk	Agriculture, Urban Run-off
Rhine_010	RS26R040200		Q3	Q3	Q2-3	Q3	At Risk	
Shannon[Upper]_090	RS26C011100		Q3-4	Q3-4	Q3-4	Q3	At Risk	Agriculture

The risk from pressures in the environment in the administrative sections along the Camlin River have also been identified. In total, 22 administrative sections have been assessed. The WFD (2018a) and (2018b) reports state that 9 sections are “not at risk” from pressures, 7 are “at risk” from pressures and the remaining 6 sections are currently “under review”. The subcatchment assessment for the Camlin_SC_010 lists the current pressures on the catchment. This subcatchment includes the entire Camlin Catchment upstream of Longford town. The current pressures are forestry activities including clearfelling, urban wastewater, agriculture and unknown anthropogenic pressures. These pressures are considered significant (WFD, 2018a). The subcatchment assessment for the Shannon[Upper]_SC_060 lists the pressures on the Camlin Catchment from upstream of Longford Town to the confluence with the River Shannon [Upper]. The pressures in this area are urban run-off, urban wastewater, agriculture, land drainage, forestry activities including clearfelling and dams, barriers, locks and weirs (WFD, 2018b).

Agriculture appears to be the main pressure on water quality in the catchment. This pressure occurs in combination with other pressures, including forestry, channelisation and urban run-off. Table 1 illustrates the pressures affecting the different waterbodies. A lack of macroinvertebrate diversity has also led these rivers to be assessed as “*poor ecological status*”. Siltation has been observed in the waterbodies “at risk”. As mentioned previously, high levels of ammonia and phosphate have been recorded on the main River Camlin channel and one tributary the Cloonkeen Stream (WFD, 2018b). The recorded high levels of ammonia on the main channel of the River Camlin (EPA section: Camlin_070) are c. 4km downstream of Longford Town. The EPA has a current monitoring station here. In 2017 the water was rated as Q3, but in 2020 it was given a Q4 rating.

There are two Wastewater Treatment Plants in the catchment. The Granard WwTP is located at the source of the River Rhine. This WwTP is not overloaded and carries out secondary treatment. In 2020 the plant was compliant with all Emission Limit Values (ELVs) (Irish Water, 2020). The other WwTP is located in Longford town. The plant carries out tertiary treatment with N&P removal and is not



overloaded. In 2019 the plant was compliant with all Emission Limit Values (ELVs) (Irish Water, 2019). Both sections of the catchment to which these plants discharge are under pressure from urban wastewater.

The three most important spawning systems for Trout in the Camlin catchment according to local anglers are the Clooncoose River, River Fallon and the River Dash/Conkeen. The Fallon River (specifically FALLAN_010 IE_SH_26F010040) is under significant pressure from agriculture and forestry (clear-felling). The Clooncoose Stream (specifically Clooncoose stream_010 IE_SH_26C200300) is currently under no significant pressures. Lastly, the Dash/Cloonkeen Stream is unassigned concerning significant pressures meaning it is not known if significant pressures exist.

Overall, the main pressures in the catchment are urban run-off, urban wastewater, agriculture, land drainage, forestry activities including clear-felling and hydromorphology (channelisation), (dams, barriers, locks and weirs) and unknown anthropogenic pressures.

5.2 Main River Camlin channel (EPA code: 26C01)

There are seven EPA monitoring sites on the main River Camlin channel. The most upstream site (EPA station code: RSRS26C010050) is located at the bridge downstream of Cloonfin Lough. This site was rated Q4 in 2020 equivalent to WFD status “Good”. The next site (EPA station code: RSRS26C010200) is located at the bridge upstream from Ballinallee Bridge. It was rated Q3-4 in 2020 equivalent to WFD status “Moderate”. The next site is located at Argar Bridge (EPA station code: RS26C010600) and was rated Q4 in 2020. The next site (EPA station code: RS26C010700) is located at the bridge over the R194. This site was rated Q3-4 in 2020. Downstream from here there is another EPA monitoring site (EPA station code: RS26C010800) which was rated Q4 in 2020. There are two more monitoring stations on the main River Camlin channel. Approximately 6.9 rkm upstream from where the River Camlin flows into the River Shannon an EPA monitoring station (EPA station code: RS26C011000) was rated Q4 in 2020. At Cloondara, Co. Longford, c. 1.2 rkm the EPA have rated a site (EPA station code: RS26C011100) Q3 equivalent to WFD status “Poor” in 2020. According to the EPA “Seven sites were surveyed on the Camlin in 2020. Four of the sites remained at satisfactory condition with the remaining three in unsatisfactory condition. Four sites showed a decline in Q value since 2017. Two sites did show signs of improvement in 2020. The uppermost site 0050 on the Camlin showed an improvement from moderate ecological status to good ecological status and one of the lower sites (1000) improved from poor to good ecological condition.”

From the source of the River Camlin to c. 720 m past its confluence with the River Rhine the channel is considered “At risk” and “Moderate” WFD status. Downstream of here the main River Camlin channel is considered “Not at risk” and “Moderate” WFD status as far as Longford town. There is a section of the river c. 2.8 rkm long has “Unassigned” status and is considered “At risk”. The channel downstream as far as the L1002 road is also considered “At risk” and “Poor” WFD status 2031-2018. Downstream from here as far as the River Shannon the channel is considered “Moderate” WFD status and “At risk”. The sections at risk upstream of Longford town have significant siltation issues due to forestry and channelisation (WFD, 2018a). The section at risk at Longford town is under pressure from urban wastewater, diffuse urban and agriculture. Downstream of where the river crosses the L1001 the significant pressures, are physical habitat changes due to animal access, and urban wastewater and diffuse urban sources of pollution. These have resulted in siltation and elevated concentrations of ammonia. In the lower reaches where the River Camlin flows into the River Shannon [Upper] the issues are agriculture and animal access resulting in siltation (WFD, 2018b).



The Longford Leader (2013) reported that IFI were investigating over 2,000 dead fish in a 6km stretch on the main River Camlin channel. This was located from an old railway bridge named Cartron Bridge, c. 2.5km west of Longford Town, to the confluence with the River Shannon. The Longford Leader (2013) reports that low water levels and high temperatures was a factor in the high mortality. IFI staff took water samples to identify the source of pollution. Among the 2,000 dead fish were Brown Trout, Roach, Pike and Eel. White-clawed Crayfish were also recorded dead (Longford Leader, 2013).

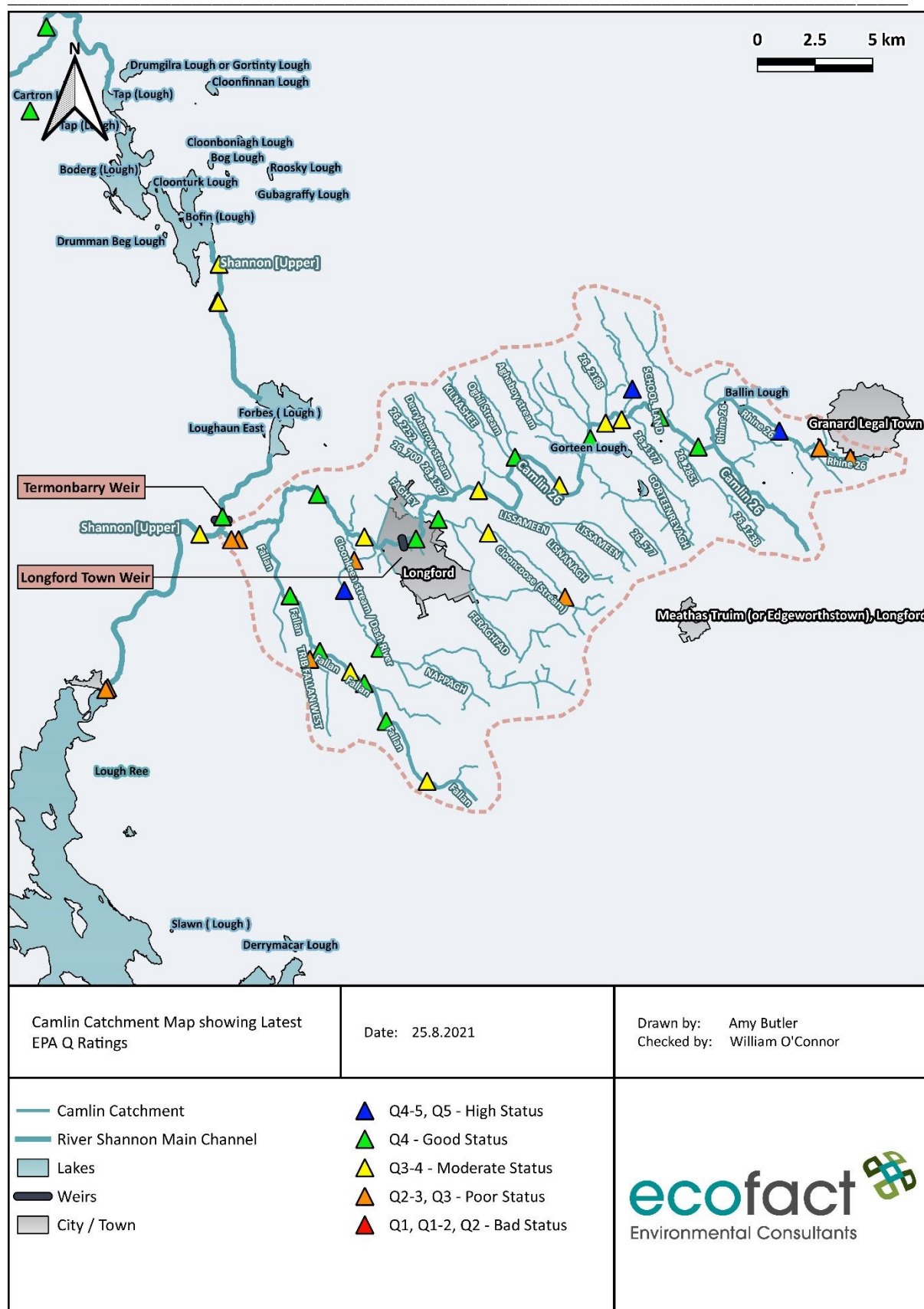


Figure 2 Camlin Catchment Map showing Latest EPA Q Ratings.



5.3 River Rhine (EPA code: 26R04)

The River Rhine rises c. 1.5 km south of Granard town at a small lake called Loughanagower (EPA segment code: 26_512). The river flows west for a short distance before turning north-west and then south to where it meets the main River Camlin. The River Rhine is joined by one 2nd order stream (EPA code: 26_3858). This stream is unnamed on the EPA maps. There are three named 1st order streams. These are the Granardkill Stream (EPA code: 26G99), Muckerstaff Stream (EPA code: 26M86) and the Halcartron Stream (EPA code: 26H13). It is joined by two unnamed 1st order streams (EPA segment codes: 26_2522, 26_2286).

In addition, there are three lakes on the river. These are Kileen Lough (EPA segment code: 26_687), Ballin Lough (EPA segment code: 26_504) and Cloonfin Lough (EPA segment code: 26_450). There are also three small lakes not connected to the River Rhine by surface water in the upper reaches of the river. These are not named on EPA maps. The lakes named Ballin Lough, and Killen Lough are within c. 0.8km of one another. These lakes are within c. 2.0km of Cloonfin Lough. These 3 lakes are located within 10km of the town of Granard. Killen Lough has an area of approximately 0.063km². Ballin Lough has an approximate area of 0.028km². Cloonfin Lough has an approximate area of 0.0002km². Ballin and Killeen Lough are in the vicinity of agricultural land, forest, and wetlands. Cloonfin Lough is encircled by forest areas, wetlands, and semi-natural areas. The lake named Listraghee is situated c. 2.2km west of Cloonfin Lough. It has an approximate area of 0.0004km². The primary landuse in the area is agriculture.

The entirety of the River Rhine including its tributaries is considered to be “At Risk” under Water Framework Directive (WFD) status. The upper reaches are considered “Poor” WFD status 2013-2018 as far as where the river crosses the L1068 road. From here, to its confluence with the River Camlin the river is considered “Moderate WFD status 2013-2018. The EPA carries out biological water quality monitoring at two sites on the River Rhine. The first site (EPA station code: RS26R040200) is located c. 760 m downstream from the river’s source. This site was rated Q3 equivalent to WFD status “Poor” in 2020. The second EPA monitoring site is located c. 4 rkm downstream from here where the river crosses the L1068. This site (EPA station code: RS26R040700) was rated Q4-5 in 2020 equivalent to WFD status “High. According to the EPA *“A lack of sensitive macroinvertebrates indicated that the upper Rhine was once again at poor ecological condition with hydro morphological influences noted here. In stark contrast the lower site at Ballymore Br. had improved to high ecological condition with good numbers of class A taxa recorded here.”* In the subcatchment assessment is stated that there are significant issues regarding nutrients and siltation in the River Rhine due to urban wastewater and agriculture (WFD, 2018a).

5.4 Clooncoose Stream (EPA code: 26C20)

The 3rd order Clooncoose Stream (EPA code: 26C20) flows into the River Camlin directly upstream of Longford town. It rises 10 rkm upstream from the confluence with the River Camlin. Near the Clooncoose Stream’s source there are two small 1st order streams which join the stream. These are the Ballynagoshen Stream (EPA code: 26B64) and an unnamed waterway (EPA segment code: 26_1947). The 3rd order Kilnasavoge Stream (EPA maps: 26K19) flows into the Clooncoose Stream c. 1.6 rkm upstream from confluence with the River Camlin. The Kilnasavoge Stream rises 8 rkm upstream from here and is joined by the 2nd order Feraghfad Stream (EPA code: 26F10). There are two 1st order streams that join the Feraghfad Stream which are the Aghanahown (EPA code: 26A27) and the Killinlastra (EPA code: 26K35). There is one small lake (EPA segment code: 26_2) in the upper reaches. Most of the Clooncoose Stream catchment is considered “Not at Risk” and “Good” WFD status 2013-2018. However, the Clooncoose Stream, upstream of the L1071 road is considered “At risk” and



Moderate WFD status. The EPA carries out biological water quality monitoring at two sites on the Clooncoose Stream. The furthest upstream site (EPA station code 26C200300) is located where the river crosses the L1071 road. This site was rated Q3-4 in 2020 equivalent to WFD status “Moderate”. Approximately 3.4 rkm downstream the other EPA monitoring site (EPA station code: RS26C200500) is rated Q4 in 2005 equivalent to WFD status “Good”. The EPA described the stream as “*Conditions in the Clooncoose stream were once again unsatisfactory in 2020.*”

5.5 Lissameen Stream (EPA code: 26L24)

The 3rd order Lissameen Stream (EPA code: 26L24) flows into the River Camlin approximately 6 rkm upstream of Longford town. Approximately 2.5 rkm upstream from here the Lissameen Stream is joined by the Lisnanagh Stream (EPA code: 26L25). The Lisnanagh Stream is also joined by the 1st order Newtownbond Stream (EPA code: 26N01) and the Lissameen Stream is joined by the 1st order Drumnacross 26 Stream (EPA code: 26C37).

There is no EPA water quality monitoring here. The waterways here are considered “Not at risk” and “Good” WFD status 2013-2018.

5.6 Clonkeen Stream (EPA code: 26C11)

The Clonkeen Stream (EPA code: 26C11) rises c. 9 rkm upstream. The Clonkeen Stream flows into the River Camlin directly downstream of Longford town. The stream is joined by six 1st order waters way which are the Back of the hill Stream (EPA code: 26B49), Moyra Stream (EPA code: 26M20), Bohermore Stream (26B56), Trangarrow Stream (EPA code: 26T10), Ballymichan Stream (EPA code: 26B74) and one unnamed waterway (EPA segment code: 26_3139). The 2nd order Nappagh Stream (EPA code: 26NO2) also joins the Clonkeen Stream. There has been no EPA monitoring on this stream since 1989. The entire stream and its tributaries are considered “At risk” and are “Unassigned” WFD status.

IFI also reported a fish kill on the waterbody named by the EPA as the Cloonkeen Stream (known locally as the River Dash). This fish kill is currently under investigation by IFI. This fish kill originated in the Stonepark area. This stream begins north of Ardagh, a town c. 11km southeast of Longford Town. This stream joins the River Camlin c. 0.45rkm upstream from where the Longford Leader (2013) reported another fish kill. The Cloonkeen Stream has been identified as a waterbody that has high levels of ammonia and phosphate (WFD, 2018b). The source of these increases are due to modifications of the channel, mainly for animal access for agriculture (WFD, 2018b). The EPA envision maps show that several coniferous plantations are situated adjacent to the Cloonkeen Stream. There is also a small urban centre located on the Cloonkeen Stream named Stone Park. Two wetlands are adjacent to this stream. One of these wetlands is the protected NHA/SAC named Mount Jessop.

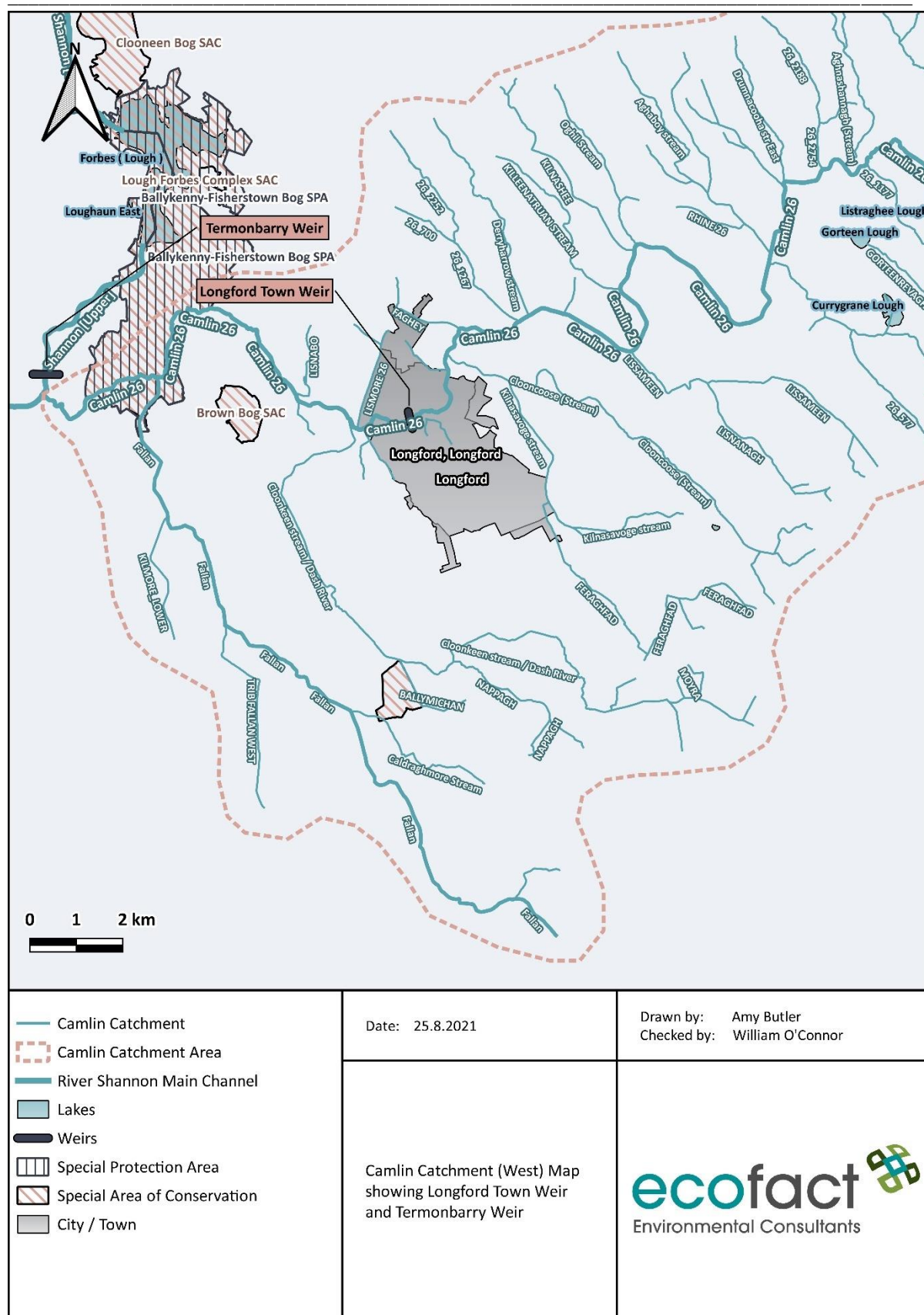


Figure 3 Camlin Catchment (West) Map showing Longford Town Weir and Termonbarry Weir



5.7 River Fallan (EPA code: 26F01)

The 2nd order River Fallan flows into the River Camlin c. 3.4 rkm upstream from its confluence with the River Shannon. The River Fallan rises c. 17.4 rkm upstream. The River Fallan is joined by four 1st order streams. These are the Caldraghmore Stream (EPA code: 26C43), the Trib Fallan West (EPA code: 26F52), the Kilmore Lower Stream (EPA code: 26K46) and an unnamed waterway (EPA code: 26_3903). The EPA carries out biological water quality monitoring on the River Fallan. The most upstream site (EPA station code: RS26F010020) was rated Q3-4 in 2020. Another site c. 6.6 km downstream (EPA station code: RS26F010040) was rated Q3-4 in 2020 also. The last monitoring site (EPA station code: RS26F010200) was rated Q4 in 2020 and is located 4.8 rkm downstream. According to the EPA *“The Fallan River was unsatisfactory at the upper site (0020) and at the mid station (0040). The lower site surveyed (0200) remained satisfactory. The catchment is dominated by agriculture – predominantly intensive pasture.”*

Upstream of the EPA monitoring station 26F010040 the River Fallan is considered “At risk” and “Moderate” WFD status 2013-2018. Downstream as far as EPA station 26F010200 the river is “Not at risk” and is “Good” WFD status. Downstream from here and including the Kilmore Lower Stream the channel is considered “At risk” and “Moderate” WFD status. The at risk portion of the River Fallan is under pressure from agriculture and clearfelling forestry (WFD, 2018b).

5.8 Minor Tributaries

There are several other 1st and 2nd order tributaries in the Camlin Catchment. Other tributaries include the Lisnabo, Lismore 26, Faghey, Derryharrow Stream, Killeenatruan Stream, Kilnashee, Oghil Stream (EPA station code: RS26C010600), Aghaboy Stream, Aghnashannagh Stream, Drumnacoocha East, Drumnacoocha West, Aghnashannagh Stream, Schoolland, Currygrane Lough Stream, Brownbog 26, Lissameen, Templemichael 26 and Demesne 26. There are also several unnamed tributaries with the following segment codes: 26_2754, 26_2522, 26_2844, 26_1267, 26_3858, 26_3567, 26_991, 26_1177, 26_3858 and 26_2851.

The Lisnabo (EPA station code:), Lismore 26 (EPA station code: RS26L48), Brownbog 26 are considered “At risk”. There are unnamed tributaries, 26_2522, 26_3858 and 26_991 are also “at risk”. There is an EPA monitoring station (EPA station code: RS26A110300) on the 2nd order Aghnashannagh Stream. This site was rated Q4-5 in 2020 equivalent to WFD status “High”.

6. FISH POPULATIONS

IFI carried out an electro-fishing in the Camlin Catchment in 2011 (IFI, 2012). The sites assessed were the townlands of Killoe and Lisnabo. Killoe is approximately 5km northeast of Longford Town. Lisnabo is located approximately 4km northwest of Longford Town. There is an EPA monitoring station (EPA station code: RSR26C011000) located at a bridge, west of Lisnabo. The most recent rating is from 2020 and it was awarded a Q4 rating. The EPA also have a monitoring station (EPA station code: RSR26C010600) in Killoe. The most recent Q rating is from 2020 and was awarded a Q4.

A total of 8 species were recorded by IFI (2012) at Lisnabo. The species found (and the total minimum density) from most abundant to least abundant are as follows: Roach (0.232 no. m²), Gudgeon (0.011 no. m²), Perch (0.010 no. m²), Stone Loach (0.004 no. m²), Pike (0.003 no. m²), Brown Trout (0.002 no. m²), Lamprey sp. (0.001 no. m²) and Nine-spined Stickleback (0.001 no. m²). The substrate type in the river was cobble and emergent vegetation was dominant on the bankside. These results are illustrated in Table 2.



A total of 5 fish species were recorded at Killoe by IFI (2012). The species found (and the total minimum density) from most abundant to least abundant are as follows: Gudgeon (0.186 no. m²), Cyprinid fry (0.047 no. m²), Stone Loach (0.034 no. m²), Brown Trout (0.025 no. m²), Roach (0.017 no. m²) and Lamprey sp. (0.013 no. m²). The substrate type in the river was a mix of cobble/gravel/mud/silt and sand and emergent vegetation was on the bankside. These results are illustrated in Table 3.

Table 2 Inland Fisheries Ireland (IFI) electrofishing results from the River Camlin at Lisnabo in 2011.

Common Name	2008		Total minimum density	2011		Total minimum density
	0+	1+ & older		0+	1+ & older	
Roach	-	-	0.006	-	-	0.232
Gudgeon	-	-	0.002	-	-	0.011
Perch	-	-	0.006	-	-	0.010
Stone loach	-	-	-	-	-	0.004
Pike	-	-	0.002	-	-	0.003
Brown trout	0.001	-	0.001	0.002	-	0.002
Lamprey sp.	-	-	-	-	-	0.001
Nine-spined stickleback	-	-	-	-	-	0.001
All Fish	-	-	0.017	-	-	0.262

Table 3 Inland Fisheries Ireland (IFI) electrofishing results from the River Camlin at Killoe in 2011.

Common Name	2011		Total minimum density
	0+	1+ & older	
Gudgeon	-	-	0.186
Cyprinid fry	-	-	0.047
Stone loach	-	-	0.034
Brown trout	0.021	0.004	0.025
Roach	-	-	0.017
Lamprey sp.	-	-	0.013
All Fish	-	-	0.321

There are records from the NBDC website of European Eel and Stone Loach (2008) in the Camlin catchment.

6.1 Trout Trapping in the Camlin Catchment

There was a project in the 1990's in the Camlin Catchment which involved several angling clubs in the Lough Ree catchment. Together they established the Lough Ree trout hatchery. From correspondence with local anglers it is known that several fish traps were installed in rivers where spawning was confirmed. In the Camlin Catchment this included the Clooncoose River, River Fallan and the River Dash/Conkeen Stream which according to local anglers are the three most important rivers in the catchment for spawning. Fish were removed from the traps to holding tanks in the river. IFI then would strip the fish and fertilise the eggs. These fish were then released upstream. The fertilised eggs were brought to a hatchery which was located in Athlone. It is said that there was a very high success rate from this. Unfed fry would then be released in February /March back into the river system. During this project genetic sampling and stream work was also carried out by IFI.

However, with no data it is hard to estimate the success rate of this project, but it has been said by local anglers at the time that there was an increase in fish stocks in the lakes of the Lough Ree catchment. This practice ended in the early 2000's.



6.2 Genetic Assessment of Brown Trout

IFI carried out a genetic assessment of Brown Trout in Lough Ree in collaboration with Queen's University, Belfast. The results of which were delivered as a conference presentation in 2017 entitled "Population structure and genetic stock identification of brown trout (*S. trutta*) from Mid Shannon system (Lough Ree and Lough Sheelin)" as part of the Understanding Brown Trout – Genes, Ecology and Citizen Science - IFI Conference.

Lough Ree is located on the borders of counties Roscommon, Westmeath and Longford. The lake is a prime location for angling in Ireland. It is a mixed fishery with good stocks of trout, pike and other species of coarse fish. Rehabilitation works on the lake in combination with improved water quality has resulted in increasing numbers of wild trout stocks. The main rivers that flow into the lake are the River Inny and River Shannon. As part of the study the region was sampled over a 4-year period, from 2011-2014. A total of 2,834 trout (N adults = 1,317, N juveniles = 1,497) were recorded during the survey. The average abundance of trout per site was 14.

Using a method called Genetic Stock Identification (GSI) and a software called STRUCTURE the genetic origin / ancestral location of each sample recorded in Lough Ree was identified. The analysis showed that 26.4% of the adult trout sampled from Lough Ree had genetic markers associated with the Camlin River indicating that these individuals spawned in the River Camlin. This is the highest abundance, after the Lower River Inny, which consisted of 38% of the adult sample. This analysis provides evidence for the Camlin River as an important spawning area for trout stocks in the greater catchment region (IFI, 2017).

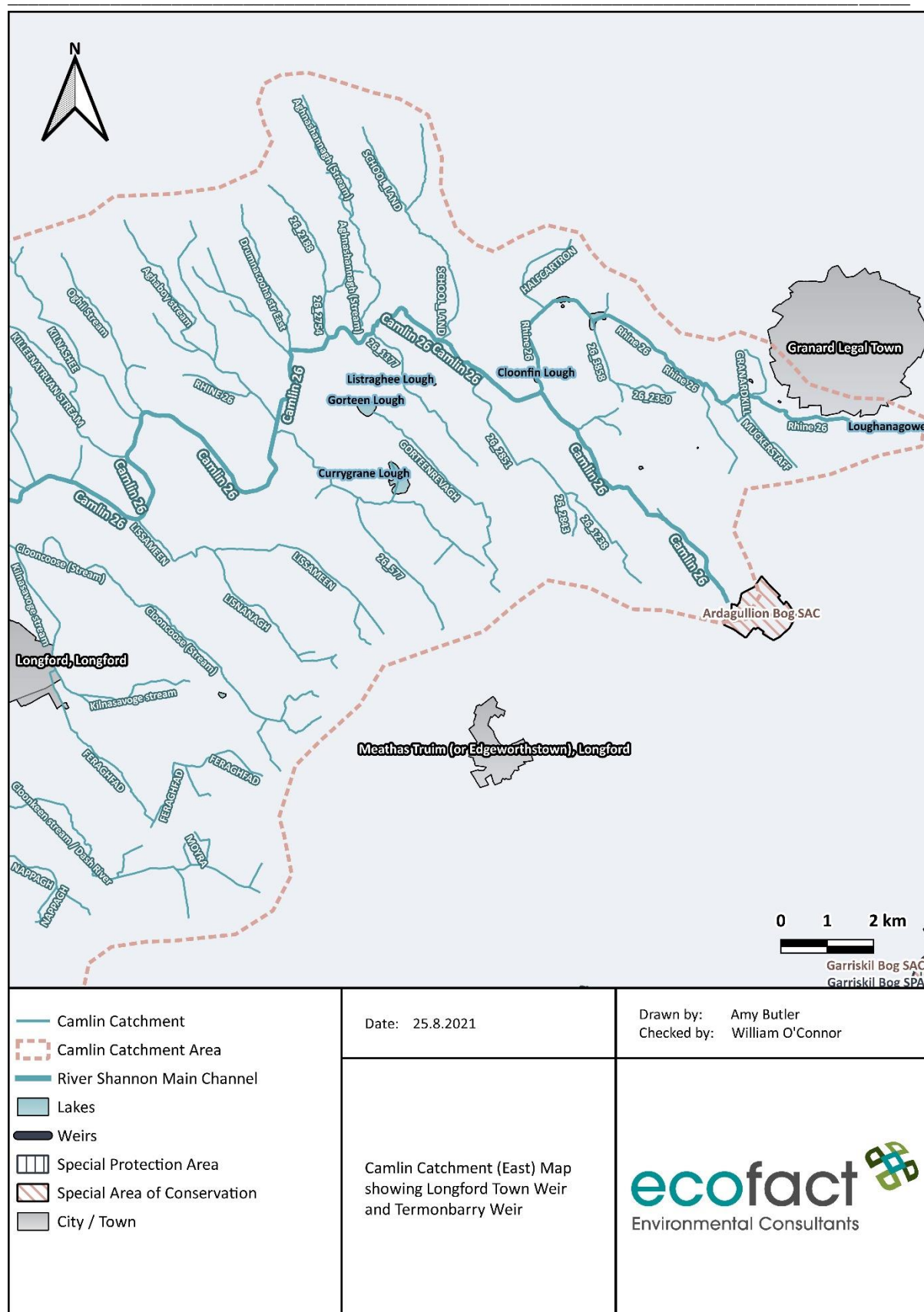


Figure 4 Camlin Catchment (East) Map showing Longford Town Weir and Termonbarry Weir



7. AQUATIC ECOLOGY

A review of the National Biodiversity Data Centre maps was undertaken to evaluate the aquatic ecology of the Camlin Catchment.

Common Frog (*Rana temporaria*) have been recorded several times throughout the Camlin Catchment. There are records from near the River Camlin at Ballinalee from 2020 as well as several records in the wider Ballinalee area and the wider Longford town area from 2003-2020. Smooth Newt (*Lissotriton vulgaris*) have also been recorded in the catchment. This species was recorded in 2020 c. 2km north of the River Camlin near Enybegs and c. 250 m from the 1st order Clontumpher Stream (EPA code: 26C61). There is another record from a drainage ditch in 2011. This is c. 600 m from the River Camlin in the townland of Glenoghil.

European Otter (*Lutra lutra*) have been recorded throughout the catchment. There are records in the River Fallan catchment and Royal Canal area from 2012. There are also upstream records from the Ballinalee area. The records are from 1991-2011. The records are from Aghaga Bridge, Kilnacarrow Bridge and the townland of Clonbroney. White-clawed crayfish (*Austropotamobius pallipes*) have been recorded throughout the catchment. There are records from 1992-2014. There are records as far downstream as Ballykenny Bridge which is c. 1.2 rkm upstream of where the Fishertown Stream splits off from the River Camlin. There are also records from Longford town, Balinalee town and Ballymore Bridge in the River Rhine.

Common Kingfisher (*Alcedo atthis*) have been confirmed breeding in the Camlin Catchment. There are records from 2007-2011 in the River Fallan / Royal Canal area. There was also a record of a Kingfisher near Balinalee in 2012.

8. DESIGNATED AREAS

There are four Special Areas of Conservation (SACs) situated within the Camlin catchment. These are the Mount Jessop Bog SAC [002202] located approximately 5km south of Longford Town. This SAC is designated for degraded raised bogs capable of natural regeneration and bog woodland. A section of the Ardagullion Bog SAC [002341], which is designated for active raised bogs, degraded raised bogs capable of natural regeneration and depressions on peat substrates of the Rhynchosporion, is located approximately 18km east of Longford Town. The Brown Bog SAC [002346] is located approximately 4km west of Longford Town. The qualifying interests are active raised bogs, degraded raised bogs capable of natural regeneration and depressions on peat substrates of the Rhynchosporion. The Lough Forbes Complex SAC [001818] is located approximately 5km west of Longford Town. The site is designated for active raised bogs, degraded raised bogs capable of natural regeneration, depressions on peat substrates of the Rhynchosporion, natural euphoric lakes with Magnopotamion or Hydrocharition type vegetation and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*.

There is one Special Protected Area (SPA) in the Camlin catchment. This is a section of the Ballykenny-Fisherstown Bog SPA [004101] and is situated approximately 5km west of Longford Town. It is a designated SPA for Greenland White-fronted Geese. The SACs and SPAs are shown in Figures 3 and 4.

There are six Proposed Natural Heritage Areas (pNHAs) and one Designated Natural Heritage Area (NHA) situated in the Camlin catchment. The only designated NHA is the Mount Jessop Bog NHA [001450] (designated for peatlands) and is located 5km south of Longford Town. The pNHAs are named Carrickglass Demesne [001822] and is situated approximately 4km east of Longford Town, Ardagullion Bog [002069]



located approximately 15km east of Longford Town, Derrymore Bog [000447] located 4km southeast of Longford Town, Royal Canal [002103] located within Longford Town, Brown Bog [000442] located 4km west of Longford Town and Lough Forbes Complex [001818] located 5km west of Longford Town.

9. DISCUSSION

This document has provided an overview of the Camlin Catchment in Co. Longford in terms of the catchment characteristics, water quality and ecology. A genetic study of Brown Trout has shown that the River Camlin is an important catchment for Brown Trout production. Roach, Gudgeon, Perch, Stone loach, Pike, Brown trout, Lamprey sp. and Nine-spined stickleback have all been recorded in the catchment. Common Frog, Smooth Newt, Otter, White-clawed crayfish and Kingfisher have all been recorded in the catchment.

Water quality in the catchment is below where it should be for healthy fish populations. The most recent monitoring showed that two sites had high status, five had good status, another five had moderate status and two sites had poor status. The main pressures on the catchment are urban run-off, urban wastewater, agriculture, land drainage, forestry activities including clearfelling and dams, barriers, locks and weirs, and unknown anthropogenic pressures. The three mains' pressures which can be stated as poor water quality, habitat degradation and barriers to fish migration. Fish passage is an issue throughout the Shannon catchment.

The main reasons for poor water quality in the catchment are agriculture and urban wastewater. In the most recent round of EPA monitoring four sites showed deteriorations in water quality and three showed increases with all other sites remaining the same. At the sites where water quality deteriorated three were considered not at risk and one was considered at risk. The at risk site was located on the Shannon[Upper]_090 where agriculture is the significant pressure. The sites where water quality did increase were all at risk and under significant pressures indicating there is a water quality issue throughout the catchment that is not improving. During the site visits several agricultural activities were noted which may be negatively impacting the catchment. These included drains being dug out to drain into rivers, significant stream vegetation clearance, tree felling and cattle access. These types of works are not appropriate for a catchment which is already under pressure from agriculture and have likely resulted in increased siltation and nutrients to enter the Camlin Catchment.

Dams, barriers, locks and weirs are causing significant barriers to upstream migration. Two major barriers are located at Termonbarry Weir on the River Shannon [Upper] and also Longford town weir. Another barrier has been identified on the L1063 road upstream of Ballinallee. An assessment of the migration barriers in the area could be undertaken to better understand the connectivity of the Camlin catchment and so that mitigation can be put in place to aid migration.

In order to improve this catchment in the interest of general biodiversity including fish stocks engagement with all relevant stakeholders and anglers must be carried out to cease the harmful river work activities such as vegetation clearance and identify and where appropriate remove/mitigate for migration barriers. It is considered that it is most appropriate to maintain and improve upon the current habitats present and that practices such as fish hatcheries and hydromorphological changes are not appropriate. In addition, there has been a recent fish kill on the river. It is important that these events are thoroughly investigated. Through this the source can be identified and further issues prevented.

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PLATES



Plate 1 Termonbarry Weir on the Upper River Shannon directly upstream of where the River Camlin joins the river.



Plate 2 Non-functional fish pass at Termonbarry Weir.



Plate 3 Navigational Weir on the River Camlin at Cloondara. One of the migration barriers in the catchment.



Plate 4 Old Mill building (now apartments) on the River Camlin at Cloondara, Co. Longford.



Plate 5 Weir at Longford Town – another barrier to upstream migration.



Plate 6 Evidence of littering and scum on the water surface near Longford town weir.



Plate 7 View of River Camlin where it crosses under the N4 road north of Longford town.

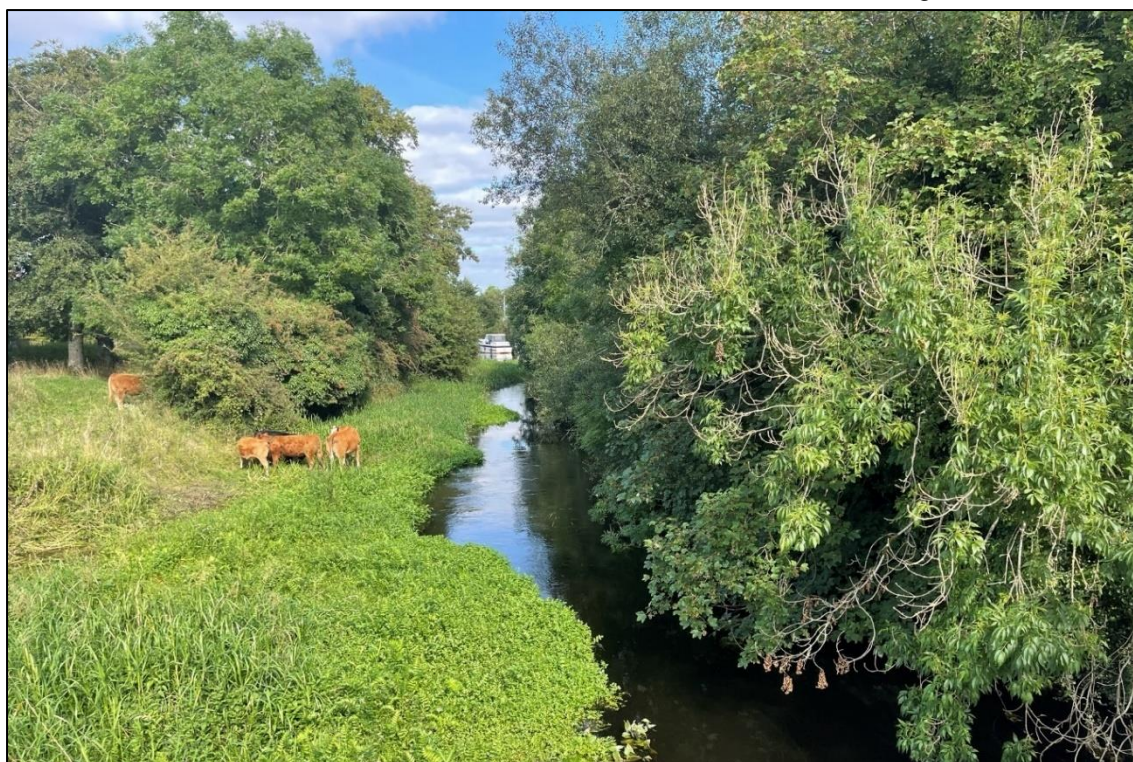


Plate 8 EPA monitoring station RS26C011100 on the 4th order River Camlin. This site was rated Q3 in 2020.



Plate 9 EPA monitoring station RS26C010700 on the River Camlin. The most recent Q rating is from 2020 and was Q3-4. This is a decline on the previous rating of Q4-5 in 2017.

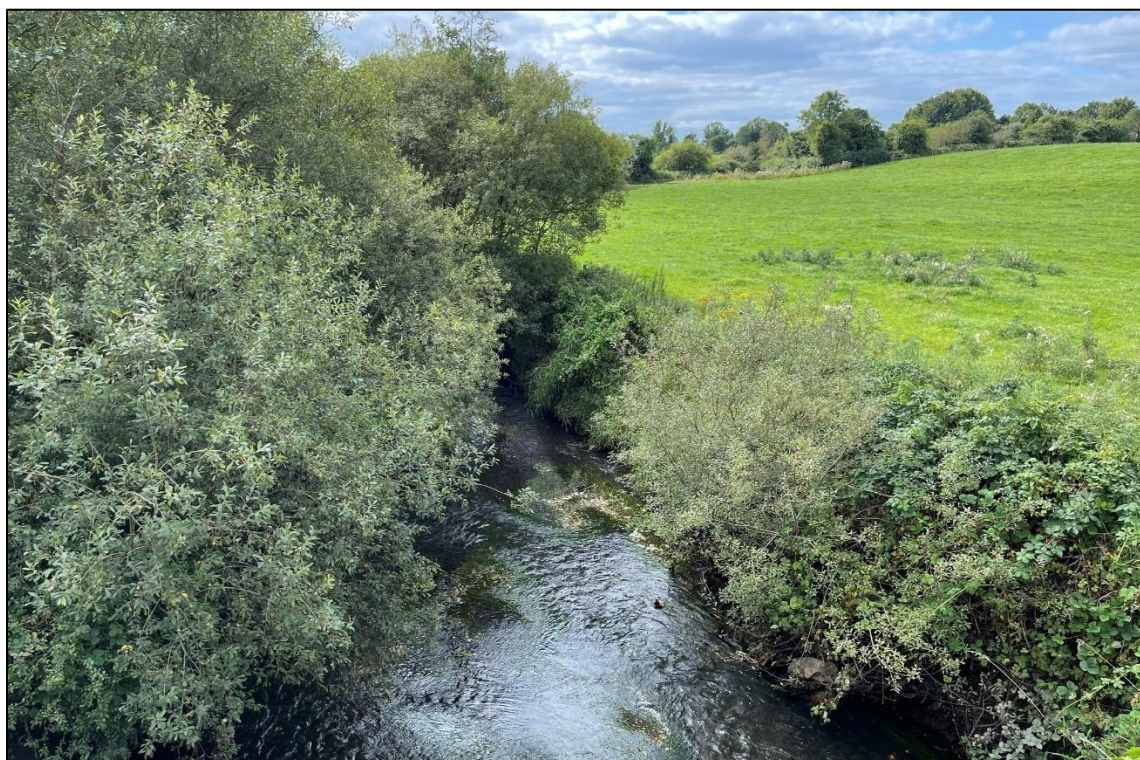


Plate 10 EPA monitoring station RS26C010600 on the River Camlin. The most recent Q rating is from 2020 and was Q4. This is a decline on the previous rating of Q4-5 in 2017.



Plate 11 EPA monitoring station RS26C010200 on the River Camlin. This site was rated Q3-4 in 2020 declining from 4-5 in 2017.

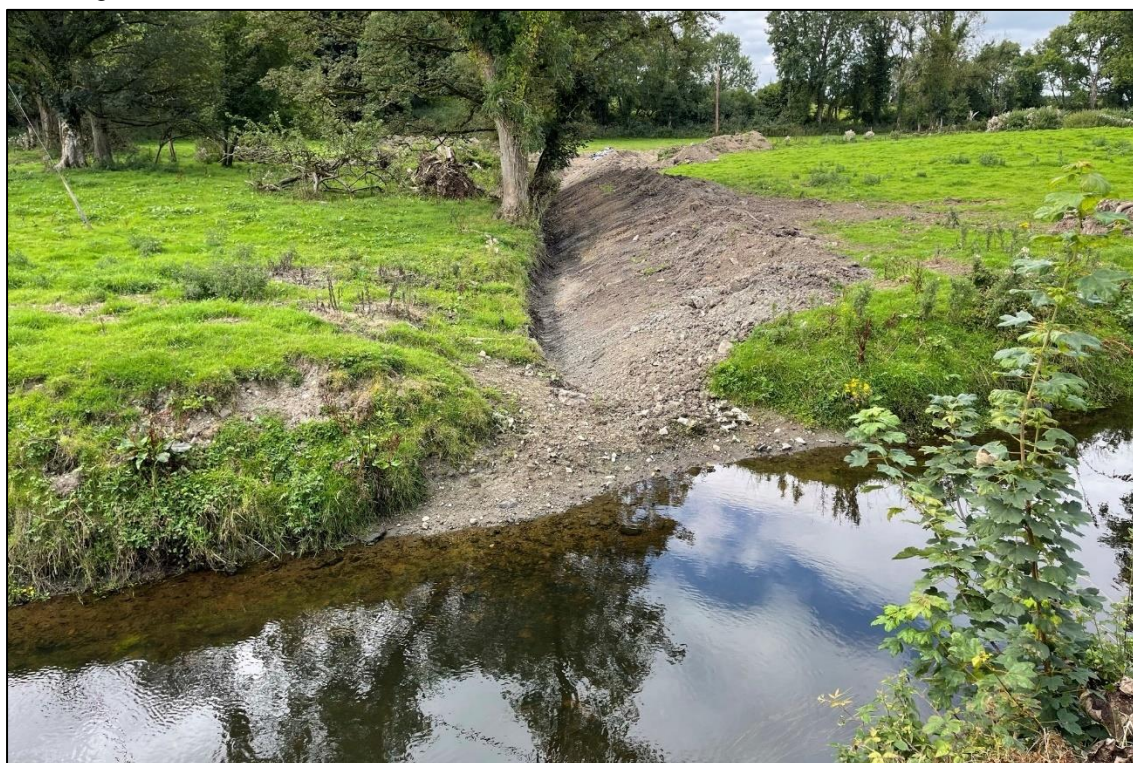


Plate 12 EPA monitoring station RS26C010200 on the River Camlin. There was evidence of a drain being dug out and recent soil excavation.



Plate 13 View of River Camlin adjacent to Balinallee WwTP.



Plate 14 EPA monitoring station RS26C010050 on the River Camlin. This site was rated Q4 in 2020. This site had improved from Q3-4 in 2018.



Plate 15 EPA monitoring station RS26C010050 on the River Camlin. The soil adjacent to the river had recently been cleared.



Plate 16 EPA monitoring station RS26F010020 on the River Fallan. This site was rated Q3-4 in 2020.

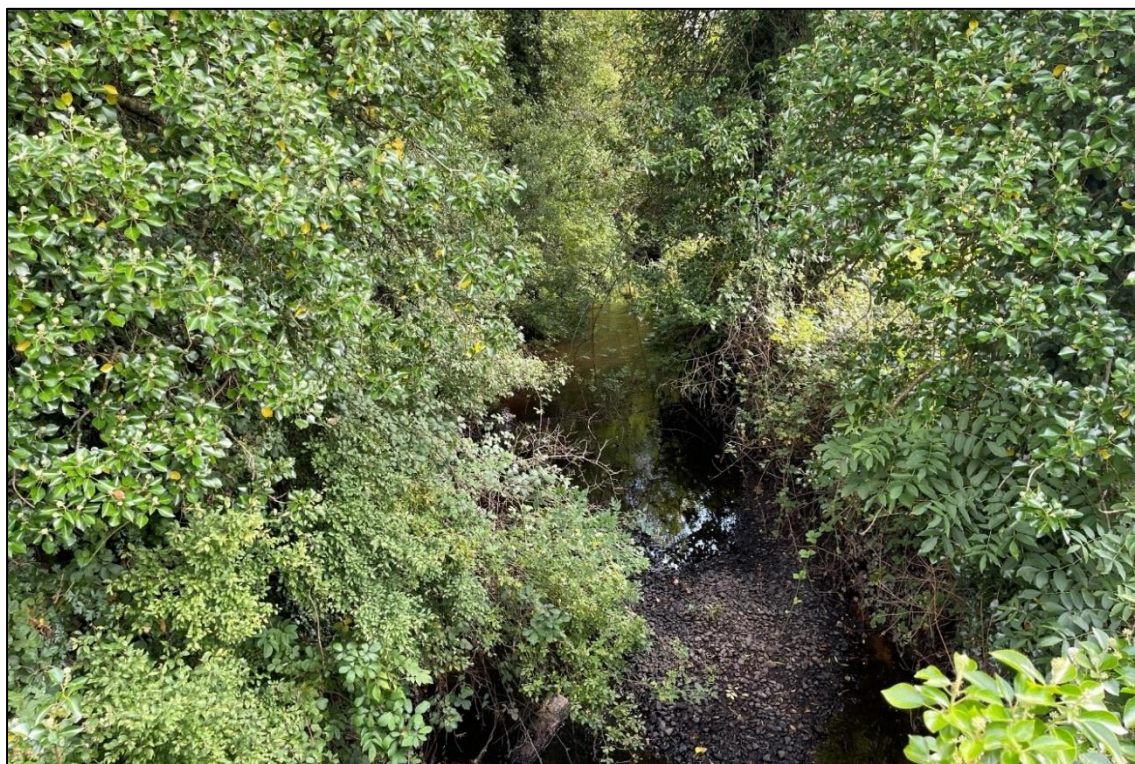


Plate 17 EPA monitoring station RS26F010040 on the River Fallan. This site was rated Q3-4 in 2020.



Plate 18 EPA monitoring station RS26F010200 on the River Fallan. This site was rated Q4 in 2020.



Plate 19 Site on the lower River Dash/Cloonkeen Stream. There was a recent fish kill on this stretch of river.



Plate 20 EPA monitoring station RS26A110300 on the 2nd order Aghnashannagh Stream. This site was rated Q 4-5 by the EPA in 2014, 2017 and 2020 by the EPA. There is a trackway in the background of the photo.



Plate 21 Evidence of cattle access and bank erosion at EPA monitoring station RS26A110300 on the 2nd order Aghnashannagh Stream.

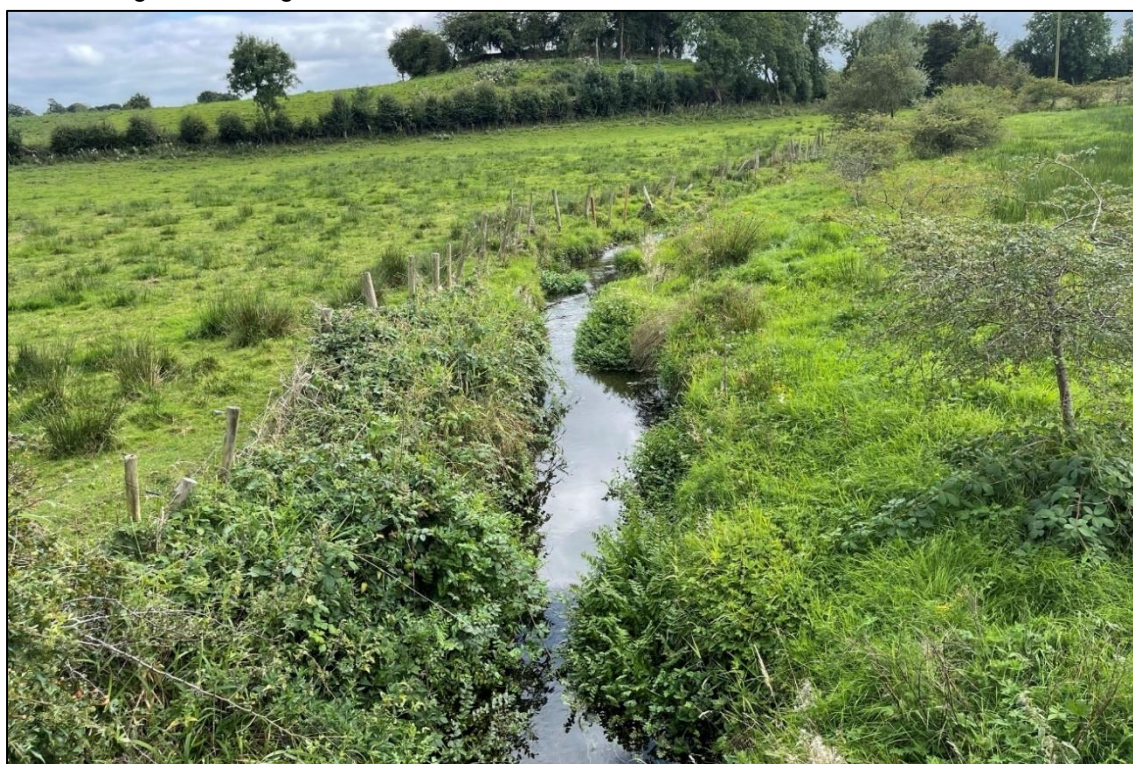


Plate 22 EPA monitoring station RS26R040700 on the River Rhine. This site was rated Q4-5 in 2020. This was an improvement on the previous rating of 3-4 in 2017.



Plate 23 EPA monitoring station RS26C200300 on the Cloncoose Stream. This site was rated Q 3-4 in 2020. A large section of vegetation had recently been cleared on the riverbank.



Plate 24 EPA monitoring station RS26C200300 on the Cloncoose Stream. Showing recently felled tree and area where vegetation was cleared.



Plate 25 EPA monitoring station RS26R040200 on the River Rhine. This site was very overgrown. This site was rated Q3 in 2020, an improvement from Q2-3 in 2017



Plate 26 Example of a fish trap used to capture trout by the Lee Trout hatchery project (Photo credit: Michael Galvin, Camlin Anglers)



Plate 27 Trout being 'stripped' during the Lough Ree Trout hatchery project (Photo credit: Michael Galvin, Camlin Anglers).