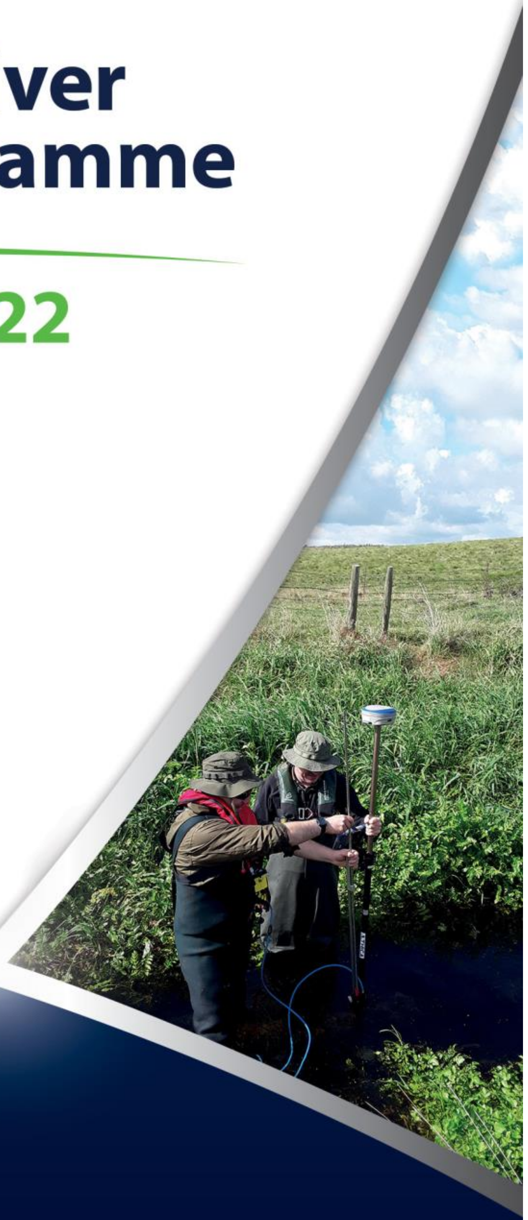
Environmental River Enhancement Programme

Annual Report 2022

IFI/2023/1-4638



Iascach Intíre Éireann
Inland Fisheries Ireland

EREP 2022 Annual Report

Inland Fisheries Ireland & the Office of Public Works

Environmental River Enhancement Programme

Iascach Intíre Éireann
Inland Fisheries Ireland

Oifig na nOibreacha Poiblí
Office of Public Works

Acknowledgments

The assistance and support of OPW staff from each of the three Arterial Drainage Maintenance Regions is gratefully appreciated, along with the support of the OPW Environment Section. The support provided by regional IFI colleagues in various River Basin Districts and within Research & Development, in respect of site surveys is also acknowledged. Overland access to waterways was kindly provided by landowners in a range of channels across the country.

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Executive Summary

The 2022 catchment-wide survey was conducted in the Lung catchment, part of the Boyle Arterial Scheme. 20 bank-based and 8 boat-based sites were surveyed for fish status. Regarding classification, the Ecological Quality Ratio results indicate that 38% of the sites on the Lung meet the minimum requirements of Good status, with half of these being High. The remainder of fishing sites were classified as Moderate, Poor and Bad status. 32 sites were surveyed using the River Hydromorphology Assessment Technique, and 22% of these were classified as Good with the remainder being Moderate and Poor. As part of the hydromorphological investigations, longitudinal connectivity in the catchment was assessed using IFI's Barrier Assessment and Screening Tool. There were 1,119 potential barriers identified during the survey and 93% of these were assessed. Of those surveyed to date, 97 (9.4%) were surveyed as barriers to fish passage, comprising 82 bridge aprons/culverts, 14 weirs and 1 ford.

The River Stonyford survey site on the Boyne was re-visited and a new method trialled to geo-reference physical variables which is high-resolution and suitable for a fine scale. The physical survey demonstrates that cobble and gravel substrate is present to various degrees in all of the sites, and that where present, this substrate coincides with higher velocities. Silt is present in deeper pool sections. This type of habitat is suitable for all life stages of the resident brown trout stock in the channel.

Two soft-engineering case studies are presented on the Moy and Glyde schemes. Woody deflectors were installed on the River Eignagh (C1/49) and woody bundles used for bank protection on the Rossdreenagh River C25(7D). Both of these examples illustrate the success of joint walkovers between IFI and the OPW at trialling new measures where maintenance works are already scheduled.

Results were collated together for all catchment-wide surveys completed under the EREP since 2017. The catchment-wide survey approach involves electro-fishing, hydromorphology and barrier surveys in sites on OPW scheme channels and outside of the scheme but within the same watershed. 198 sites were fished across all five catchments, with only 37 sites achieving Good or High status, as required under the Water Framework Directive. This is a concerning result as it equates to just under 19% of all sites. As regards the hydromorphological status, 157 surveys were completed in the five catchments. Again, a low proportion of sites achieved Good status or higher, 19% in all equating to just 30 sites. 4,961 potential barriers to fish passage were surveyed across the five catchments. In total, there are 444 barriers, meaning 8.9% of sites visited are problematic to various degrees.

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1 Introduction

The year 2022 was the final in the current five-year EREP agreement between the Office of Public Works (OPW) and Inland Fisheries Ireland (IFI). The majority of the 2022 field season focussed on the Lung catchment-wide survey. Data on fish and hydromorphology was collected in line with Water Framework Directive methodologies, adding to the growing dataset on these topics provided annually to OPW. Data on longitudinal connectivity – a key topic within hydromorphology – was added to, with further barrier assessment and screening taking places within various OPW catchments nationally.

The River Stonyford in the Boyne Arterial Drainage Scheme was re-visited and surveyed, adding to a large long-term dataset on fish, instream flora and morphology. Highlighted also in this report are two case studies of soft-engineering measures implemented by OPW staff, on the River Eignagh (Moy) and Rossdreenagh River (Glyde). In addition to this planned survey work for the 2022 period, other catchment-wide surveys were finished which were incomplete from previous years due to pandemic related re-scheduling or poor weather conditions. This included barrier assessments in the Deel and Kells Blackwater among others. All of these data points which pose problems for fish passage are incorporated into the GIS shapefiles sent to the OPW Environment Section annually.

Collaboration with IFI colleagues and counterparts in OPW is key to the success of the EREP. Knowledge sharing and transfer is part of the ongoing best practice among the IFI and OPW teams. Training was facilitated on the RHAT methodology by the EREP team with the OPW Environment Section, with a number of site visits across the Lung catchment demonstrating the breakdown of recently collated surveys.

2 Lung Catchment-wide Survey Programme

The Lung catchment is located in the upper Shannon River basin and comprises 674 km^2 of catchment area with several large lakes spread throughout. The majority of the catchment is located in County Roscommon, but it also crosses into Mayo and Sligo (Figure 2.1). The Lung catchment is part of the Boyle Arterial Drainage Scheme, which was completed by the Office of Public (OPW) works between 1982 and 1992, benefitting an area of 10,845 hectares (Ryan Hanley, 2014b). There are 318 kilometres of channel length in the OPW scheme, out of a total of 581 kilometres of river channel in the entire catchment. The Lung and Breedoge Rivers both drain into Lough Gara which subsequently drains into the Boyle River. The Boyle River is further connected to Lough Key, Oakport Lough and Lough Eidin before joining the River Shannon just upstream of Carrick-on-Shannon.

Figure 2.1 Location of the Lung catchment within OPW Drainage Schemes.

The Lung catchment is largely underlain by softer limestones with a more-resistant ridge of bedrock on the northern fringes of the catchment. There is a hummocky glacial landscape around Boyle which can be seen on the digital elevation model (Figure 2.2), most of which is outside of the OPW scheme. Some of the limestones within the catchments are a karst landscape, and indeed there are limited surface waters around the plains of Boyle, to the south of the town.

The main land use depicted on the Corine (2018) landcover maps in the catchment is pasture, but there are also significant areas of raised bog, forest plantation (both broadleaf and coniferous), and heterogenous agricultural areas (agriculture with significant natural vegetation). This mixture of land uses reflects the marginal nature of the land across much of the catchment, typical of low-lying drained areas. Urlaur Lakes complex and Errit Lough are designated Special Areas of Conservation (SACs) for Hard Water Lakes. There are 5 bog SACs in the catchment Callow, Tullaghanrock, Derrinea in the Lung catchment and Bellanagare and Cloonshanville in the Breedoge. All are designated as active raised bogs, as well as degraded bogs with potential for regeneration. Cloonshanville also has a designated bog woodland.

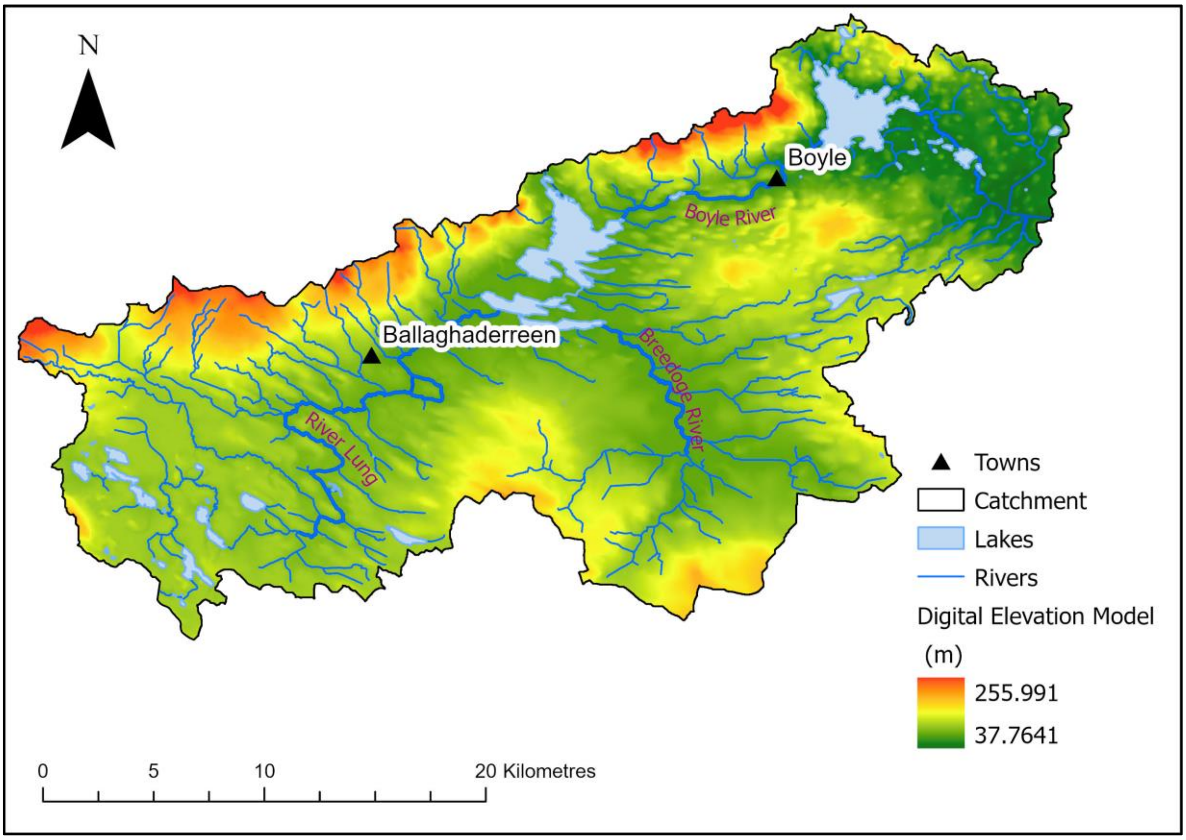


Figure 2.2 Geography of the Lung catchment showing major tributaries, lakes, towns and elevation.

2.1 Fish Population Index

The Lung Catchment was surveyed for fish during July and August 2022. A total of 27 sites were fished to understand fish density, distribution, and population structure. Each fishing site was also assessed to identify potential hydromorphological pressures.

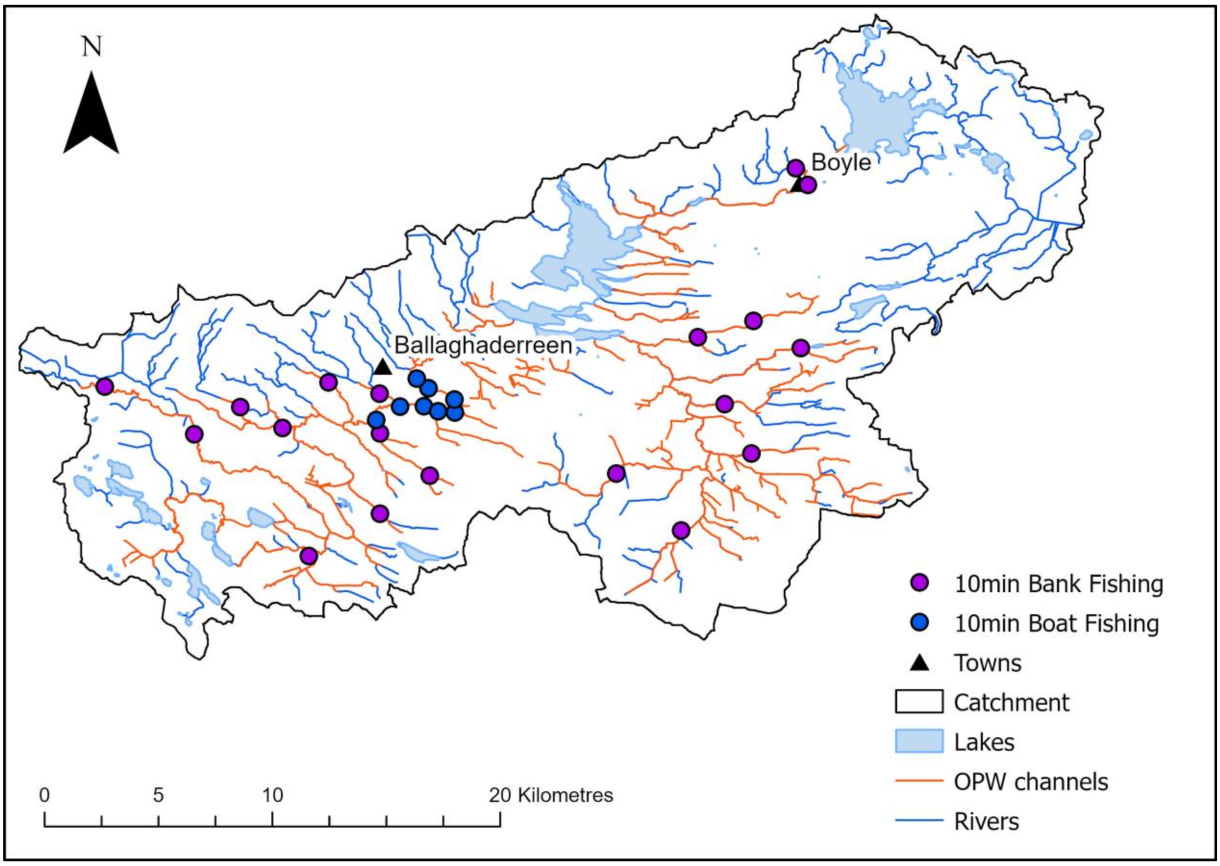


Figure 2.3 Distribution of bank (n=19) and boat (n=8) electrofishing sites around the Lung catchment.

In completing the 2022 Fish Population Index (FPI) survey, 19 bank-based and 8 boat-based sites were electro-fished. All of the boat sites were located on the main stem of the River Lung. In total 703 fish were captured, measured, and returned from both bank- and boat-based surveys. Roach (n=202) were the most abundant fish encountered during the boat fishing (Figure 2.4), followed by minnow (n=70), pike (n=22) and brown trout (n=17). In contrast, the bank-based fishing catch was dominated by brown trout (n=171), minnow (n=117) and stickleback (n=49).

Bank sites (n=19) were fished using a bank-based 10-minute electrofishing method developed to capture species present within the survey stretch on the day and time of the survey. The bank sites averaged at 28 m in length and 2.9 m in wetted width. Boat sites were fished using a boat and electrofishing kit powered by a generator. This particular kit is designed to capture fish in deeper channels greater than 0.5 m in depth. Although more powerful the deeper and wider a channel is the more area of water body for fish to escape / by pass the targeted areas for catching. This method allows the capturing of fish species present within the channel to give an understanding of species abundance and diversity.

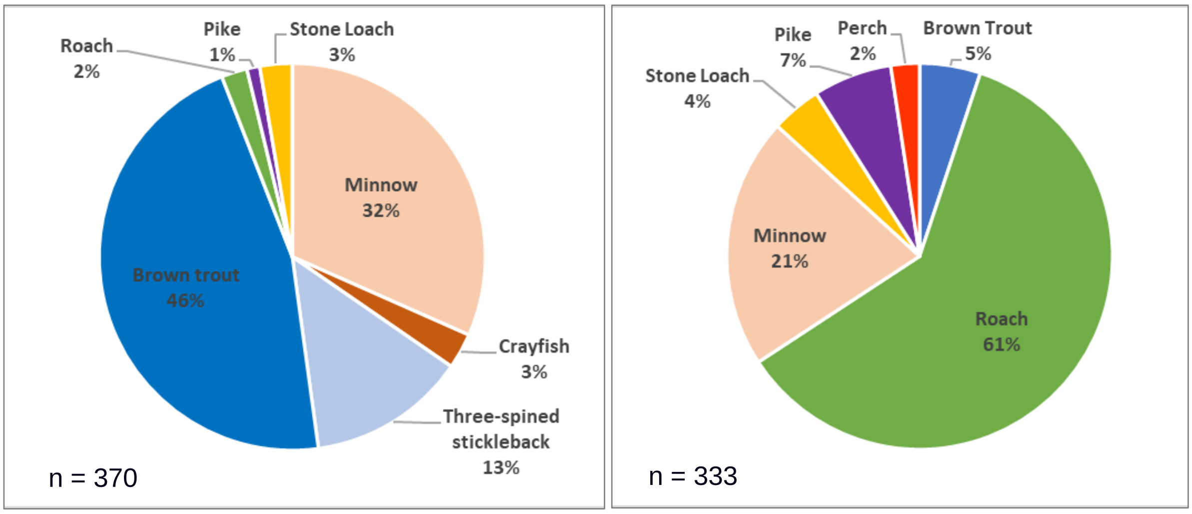


Figure 2.4 Composition of fish species captured during bank (left) and boat (right) electrofishing surveys.

During the bank-based fishing, two age classes of brown trout were captured with 0+ fish measuring between 4-9 cm and 1+ fish measuring 10-21 cm (Figure 2.5). Larger brown trout were captured during the boat-based fishing with the largest recorded at 30 cm.

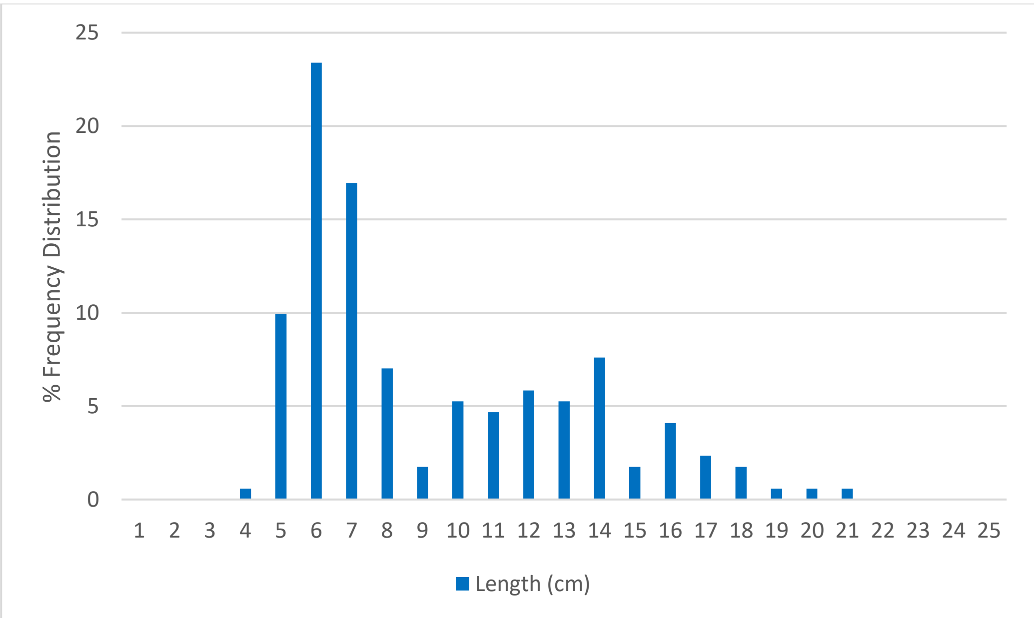


Figure 2.5 Percentage length frequency distribution of brown trout captured by bank-based electrofishing from the Lung FPI Survey 2022.

Brown trout are widely distributed within the Lung Catchment (Figure 2.6). Trout were present in 16 of the fishing sites. Fishing sites where brown trout numbers were greater than 20 were located on the Easky River, a non-OPW channel and in sites on the Lissydaly (C1/20) and Kiltaclar (C/16) Stream. Fishing sites on the Owennaforeesha River (C6/7/5), Carricknabraher River (C6/7/1), Creen Stream (C6/1) and the Kiltaclar Stream (C/16), returned brown trout numbers greater than 10.

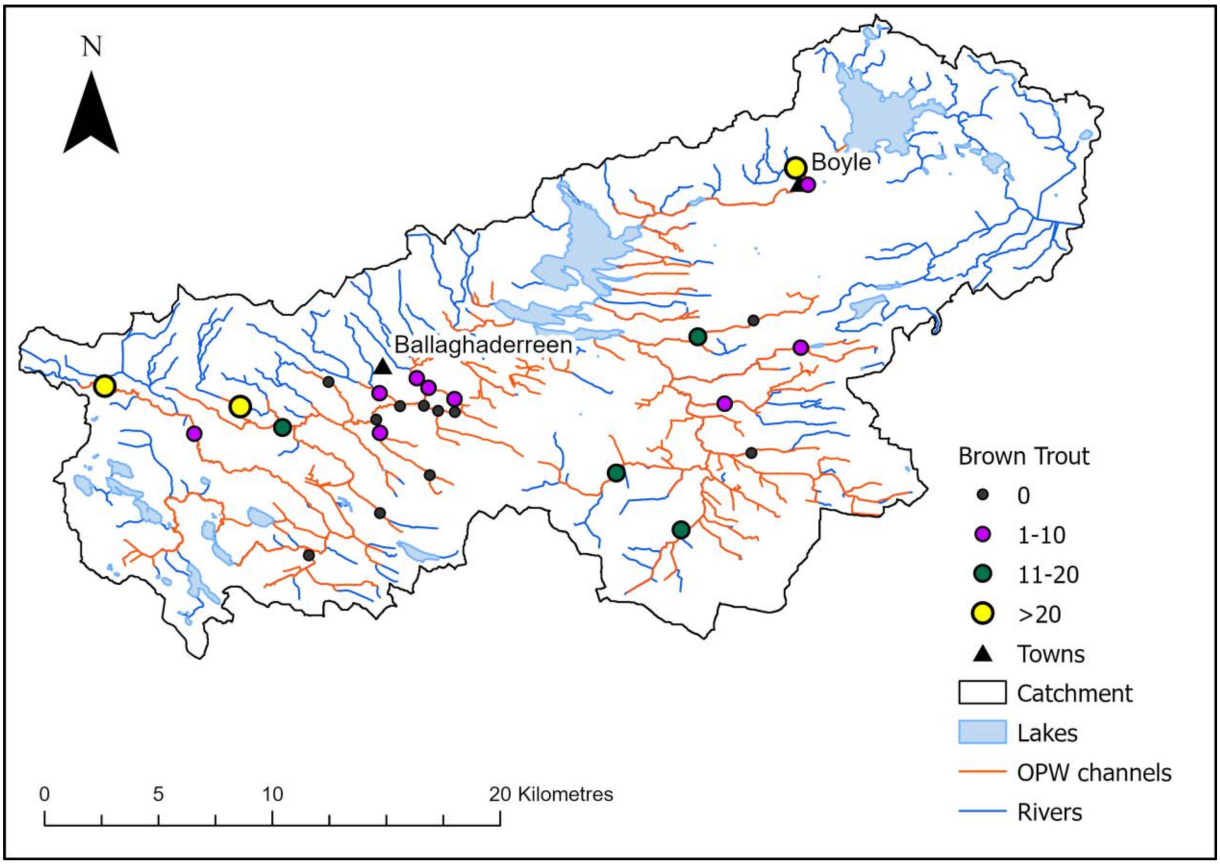


Figure 2.6 Distribution and abundance of brown trout.

2.1.1 Ecological Quality Ratio (EQR)

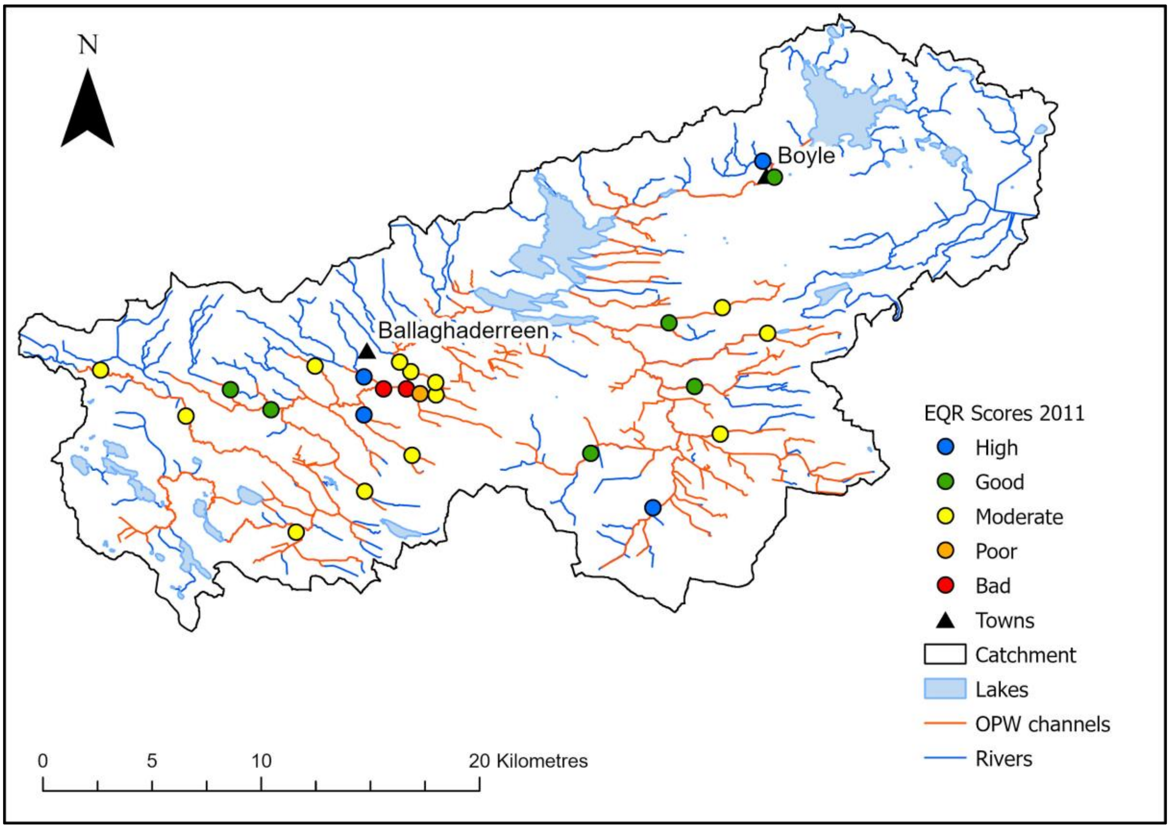
The EQR is a WFD-compliant method used to determine fish status with respect to reference conditions. Presence and absence of salmonids influence the EQR scores given to a water body. When calculating an EQR score for any waterbody salmonids are scored by presence and abundance of both age classes (0+ and 1+ fish). This plays a significant role in the model output. If both 0+ and 1+ salmon/trout are recorded during the fishing survey the waterbody will achieve a higher EQR score, whereas if only one age class was present the riverine system would achieve a lower EQR score. Presence of both classes of salmonids at a given site is an indication of recruitment within the riverine system.

EQR scores for fish were generated for 26 of the sites fished in 2022. For comparison, EQRs were also generated for the same 26 sites which were fished as part of a catchment wide survey by EREP in 2011 (Figure 2.7). Over the 11-year period EQR status of 5 sites deteriorated, 18 remained the same and 3 sites improved. 1 site downgraded from High Status to Moderate and 4 sites went from Moderate to Poor. From the improved sites, 2 sites went from Good status to High status and another from Moderate to Good.

Focusing solely on the 2022 EQR results, 8% of sites graded as Bad status, 19% Poor status, 35% scored Moderate status, 19% scored Good status and the remaining 19% classified as High status. The WFD requirement is Good status and above, therefore 38% (n=10) of the sites from the Lung catchment-wide fishing survey are meeting WFD standards for fish.

All of the boat sites failed to meet Good Status, with 2 sites scored as Bad, another 2 scored Poor and the remaining 3 classified as Moderate. The boat fishing turned larger numbers of coarse fish which influenced the EQR score significantly, The River Lung is populated with Perch, Pike and Roach which is evident in Figure 2.4.

Reporting on brown trout only, 4 of the 5 sites classified with a Good EQR status had both age classes present. Of the 9 sites that scored as Moderate status, 2 sites had both classes present and 2 sites had only 1 class of trout present. The remaining 5 Moderate sites had no trout present but were diverse in other species. Out of the 5 sites that scored a Poor score, only 2 sites had one age class present, which were in low abundance (<3) and the other 3 sites had no brown trout present. The 2 sites scored as bad status had no trout present. Salmon influences EQR scores in a similar way as brown trout presence. The EQR scoring system also accounts for the diversity of species present in a waterbody - including lamprey, crayfish, stone loach, stickleback, minnow and others along with 0+ and 1+ salmonids.



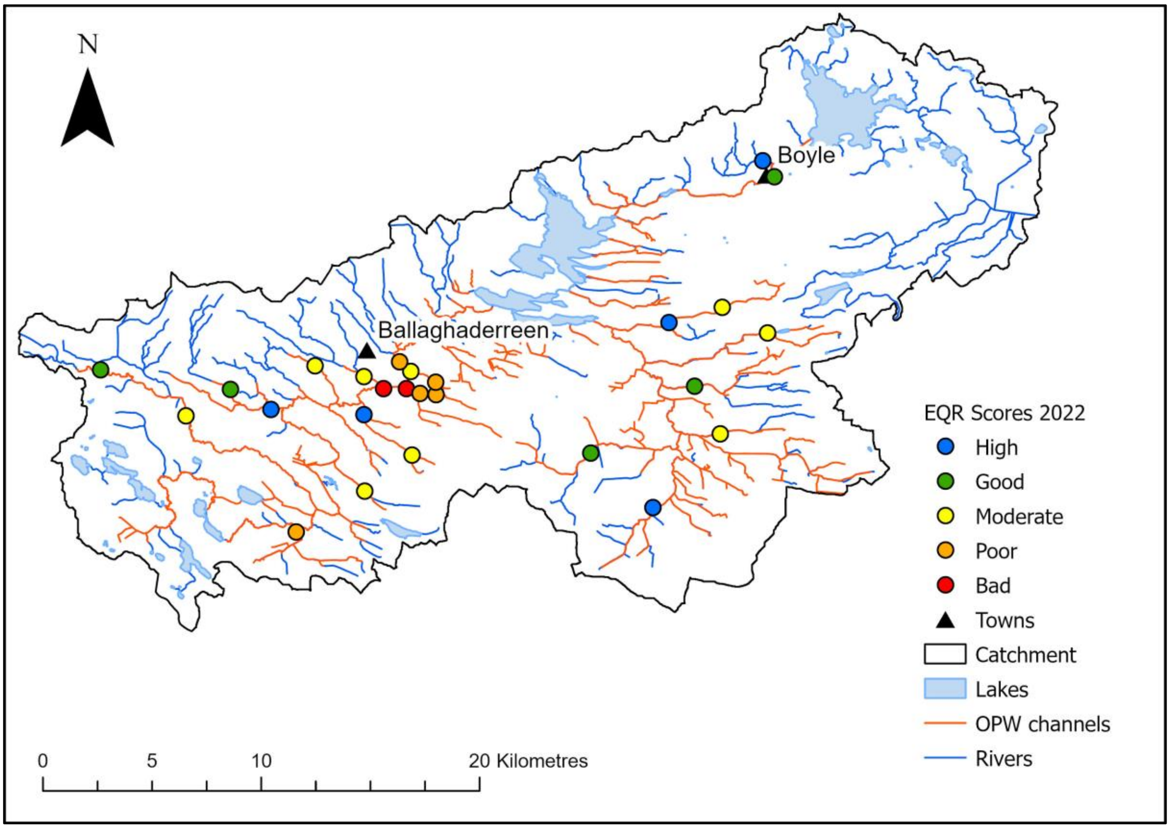


Figure 2.7 Fishing locations with Ecological Quality Ratio (EQR) scores generated for 2011 (top) and 2022 (bottom).

2.2 River Hydromorphological Assessment Technique

The Lung catchment was surveyed for hydromorphology using the River Hydromorphology Assessment Technique (RHAT) following Murphy and Toland (2014). This method is the standard assessment for assessing hydromorphology for the WFD nationally. Visual field observations are recorded every 50 metres over a 500-metre walkover. All surveys in the Lung were carried out at similar water levels, at the same time of the year.

32 sites were surveyed using the RHAT on the Lung catchment with 30 of these located on the OPW scheme channels (Figure 2.8). 22% of sites classed as Good (n=7), 69% of sites classed as Moderate (n=22) and 9% classed as Poor (n=3). Of the two non-OPW scheme channels, one was Good and one was Poor, with the latter largely being affected by its location close to human activities.

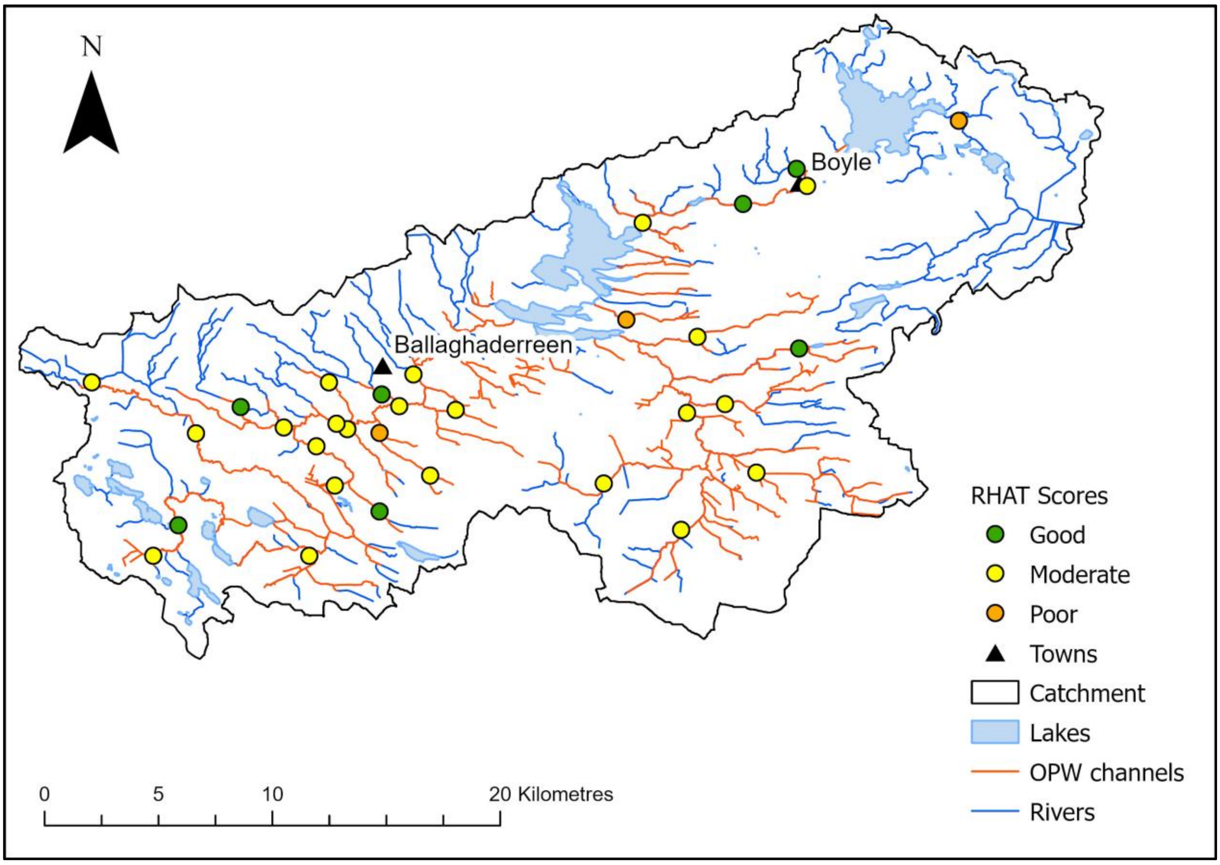


Figure 2.8 RHAT scores for sites surveyed (n=32).

When RHAT scores are averaged they ranged from 1.05-2.86 (Figure 2.9). Of the averaged attributes, riparian land use and floodplain connectivity scored lower. Barriers to continuity and bank structure and stability on average score higher within the catchment.

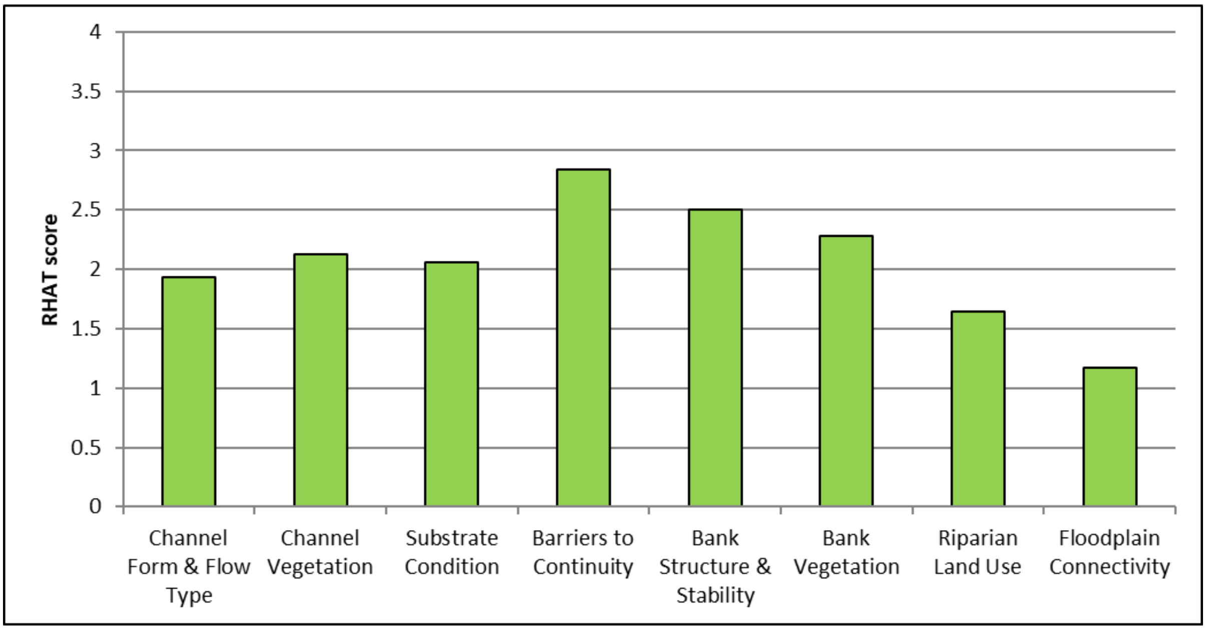


Figure 2.9 Mean RHAT scores for all sites in the Lung (n=32).

2.2.1 Hydromorphological pressures

This section aims to illustrate some common issues identified in this catchment, which have negative impacts on certain attributes within the RHAT methodology (Table 2.1). Other, lower scoring attributes, including riparian land use and floodplain connectivity will be discussed more generally in the case studies (Section 2.2.2).

Table 2.1 RHAT attribute and pressure identified.

RHAT attribute	Issue identified
1. Channel form & flow	Channelisation and limited flows
2. Channel vegetation	Excessive and homogenous instream vegetation
3. Substrate condition	Excessive fine sediment
5. Bank vegetation	Lack of bank vegetation
6. Bank structure & stability	Slumping banks, lack of bank vegetation, bank trampling

Instream vegetation proliferates in areas of low gradient where tree cover is limited or absent (Figure 2.10). This issue is typically seen in channels which are extremely straight and have limited flows and excessive fine sediment. For example, in the Errit stream (C1/24/2/1), pondweed (*Potamogeton*) and flaggers (*Sparganium erectum*) were both excessive in parts of the stretch.

Figure 2.10 Proliferation of instream vegetation in areas of low gradient on the Errit stream (C1/24/2/1, Moderate status).

The RHAT methodology defines tree extent for the entire reach in the following, increasing order: isolated/scattered; regularly spaced/single; occasional clumps; semi-continuous and continuous. When considering the least dense tree cover (isolated/scattered and regularly spaced/single) 23 sites out of the 32 had limited tree extent along at least one bank top. 16 of those 23 sites had limited tree extent along both bank tops, which is 50% of the total number of sites surveyed in the Lung. In areas of limited tree extent, the bank vegetation can often be quite homogenous (Figure 2.11).

11 sites contain brown or green algae, and it varies whether it is minor or excessive at the site. Where it is excessive, it is often associated with bank trampling (Figure 2.12). In total, 9 sites of the 32 had cattle poaching present on at least one bank. Depending on the extent of this issue, it can affect bank structure & stability. Excessive algal growth would affect the score for channel vegetation.

Figure 2.11 Uniform bank vegetation on the Raherlous stream (C1/13, Moderate status).

Figure 2.12 Bank tramping and excessive algal growth on channel C6/1 (left, Moderate status) and algae on the main Lung channel (right, C1, Moderate status).

Other, more minor issues – in terms of their effect on RHAT scoring – observed include:

- trash/dumping
- hard reinforcement of the banks
- use of weedkillers in the riparian corridor

8 sites had trash or dumping present instream, which was 25% of the total sites surveyed. Although not directly affecting any of the RHAT attributes, unless it affected the substrate condition for example, it likely has negative effects on water quality. Hard reinforcement was observed at a few locations, usually in close proximity to infrastructure. There were some areas along the main Lung where it was evident weedkiller had been used close to the bank top. Obviously it is an issue for water quality, but also an issue for vegetation, as only homogenous pioneer vegetation gets to establish.

Figure 2.13 Reinforcement along the bank (left) and weedkiller used along the bank top (right) on the main Lung (C1).

2.2.2 Case studies

There are examples below of sites scored using the RHAT. All are located on OPW scheme channels within the Boyle Arterial Drainage Scheme. A range of scores are presented from Poor to Good.

Poor and Moderate status

This site is on the Aghalustia stream (C1/12) which has undergone extensive re-alignment and was classed as Poor status for hydromorphology (Figure 2.14). Despite a good gradient break at the road bridge, the majority of the site walked has extremely limited gradient, resulting in no perceptible flow for much of the reach. The instream habitat was dominated by excessive fine sediment and instream vegetation including pondweed. The site is over-deepened resulting in limited floodplain connectivity and there was limited bank vegetation as well as coniferous plantation (with a buffer) along the bank top.

Figure 2.14 Channelised section of the Aghalustia stream (C1/12) with limited flows and coniferous plantation along the banks (left, Poor status). The same channel further upstream, with improved substrate, flows and instream vegetation (right, Moderate status).

Roughly 3 kilometres further upstream on the same channel (C1/12) re-naturalising is evident in areas which were over-widened (Figure 2.14). The channel has attempted to narrow itself with alternating vegetated side bars. The location is in an area of better gradient. This section of channel has much improved substrate compared to downstream as well as heterogenous vegetation. Overall, it was classed as Moderate status.

Moderate status

The next example is on the Mantua river (C6/9), which drains into the Breedoge through marginal farmland and bog. The channel has been extensively re-aligned and was classified as Moderate status overall. Limited gradient hinders the channel flows and substrate at this site, and silt is excessive throughout. There are some good examples of instream vegetation at the site and no one type is dominating. There is a lack of bank vegetation and limited floodplain connectivity. This channel is quite typical of the issues encountered in the Lung catchment more widely.

Figure 2.15 Mantua river has limited flows and some instream vegetation (C6/9, Moderate status).

Good status

This example is from a relatively large tributary (C1/11) off the main Lung channel, just south of Ballaghaderreen. It was classified as Good status. Clear from the images, there is poor floodplain connectivity and limited bank vegetation. The land use is dominated by rough pasture, a moderately scoring attribute. However it scores highly on other attributes including channel form & flow and substrate condition. There is good variety in flows and depths as well as heterogenous substrate, neither of which are common in OPW scheme channels.

Figure 2.16 Meandering section of channel with diverse flows, limited bank vegetation (C1/11, Good status).

2.3 Barrier Screening and Assessment

2.3.1 I-BAST surveys

The Lung catchment has been surveyed for barriers using the Barrier Assessment and Screening Tool (i-BAST) developed by IFI's National Barrier Programme. The surveys were started in the Boyle River in 2021 by the Shannon RBD colleagues and subsequently completed in the Breedoge and Lung by R&D staff on the EREP and NBP teams. Surveying is typically carried out by a two-person team using the i-BAST tool to locate and assess whether or not a structure is a barrier to fish passage.

There were 1,119 potential barriers identified in the catchment. 1,037 were visited and assessed with a further 78 not able to be assessed due to issues of access or safety (Figure 2.17). Just 4 structures remain to be visited and assessed, including a weir on the Boyle River at Knockvicar and one on the Lung River just outside Ballaghaderreen. A total of 97 barriers to fish passage were identified and measured in the Lung catchment thus far (Table 2.2, Figure 2.17). Of the cohort of 97 barriers, at least 48 coincide with the OPW structure database. The majority are culverts/bridge aprons with minor weirs and one ford (Table 2.2).

Table 2.2 Barriers identified and assessed in the Lung survey.

Structure type	Number
Culvert / bridge apron	82
Weir	14
Ford	1
Total	**97**

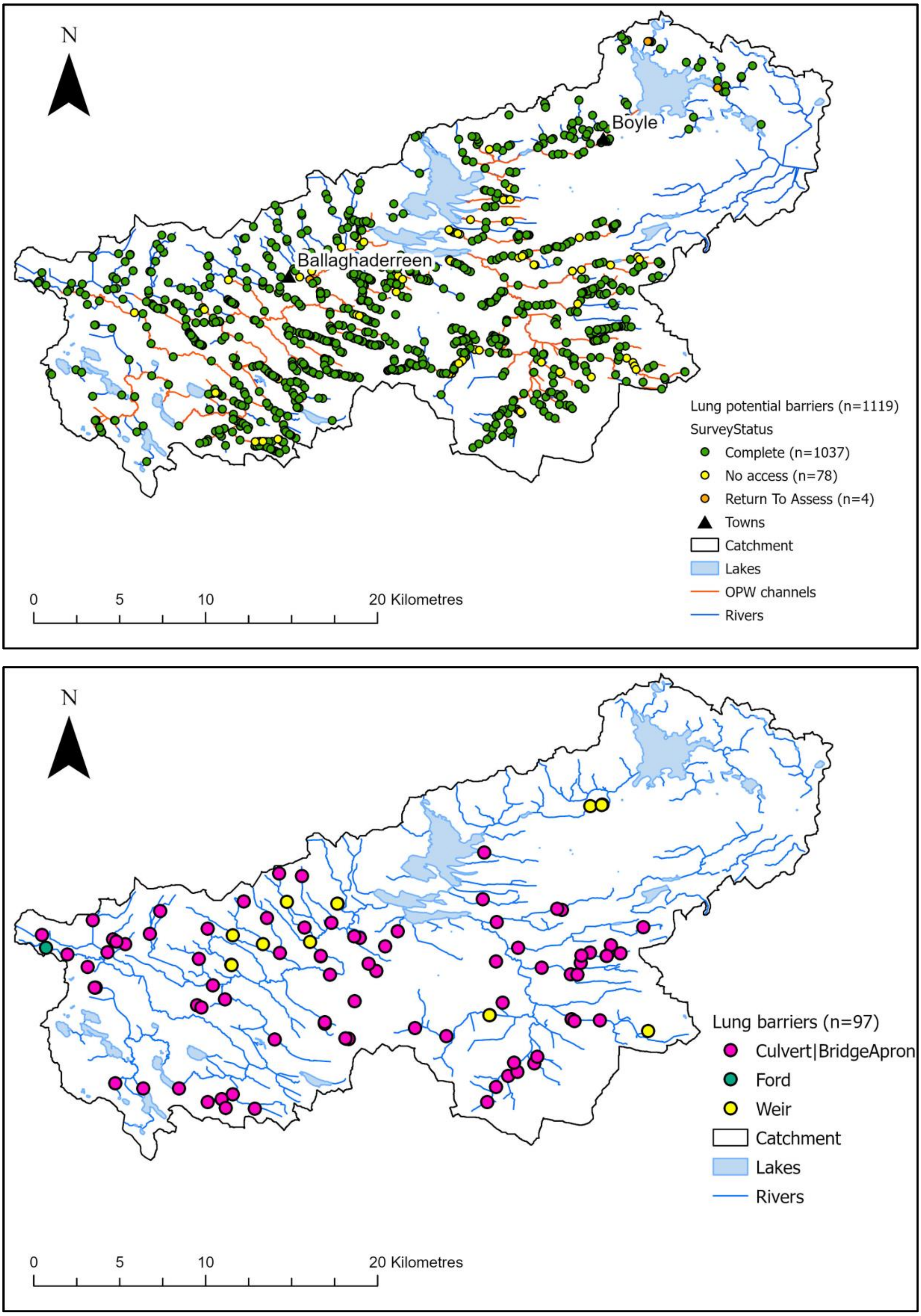


Figure 2.17 Potential barriers and survey status (top). Barriers assessed and surveyed to date (bottom).

Typical issues encountered include perched bridge aprons and pipe culverts. On the Breedoge river system, there are numerous examples of bridge aprons with small drops (Figure 2.18). The majority of minor drops would be passable in higher flows. However in the low flow period, which can extend through a good portion of the year, they all present problems for fish passage.

Figure 2.18 Bridge aprons with minor drops in the Breedoge catchment. Bella River (C6/4, top left); upstream tributary (C6/7/5/5); Mantua River (C6/9, bottom left); Owennaforeesha River (C6/7/5 bottom right).

2.3.2 Main stem barriers

Larger barriers or those structures proposed for mitigation are often surveyed by IFI staff trained in the WFD111 methodology developed by SNIFFER (Scotland and Northern Ireland Forum for Environmental Research, 2010). Surveyors assess each structure, dividing it into transects with similar hydraulic properties. Depending on the type of transect, various measurements of same are taken including hydraulic head height and dimensions. Flow is measured across each transect at the inlet, mid-point and outlet. Each transect is assessed for fish passability for a range of target species, and subsequently the structure is assigned an overall passability ranking. There are several structures on the main stem of the Boyle and Lung rivers (Figure 2.19).

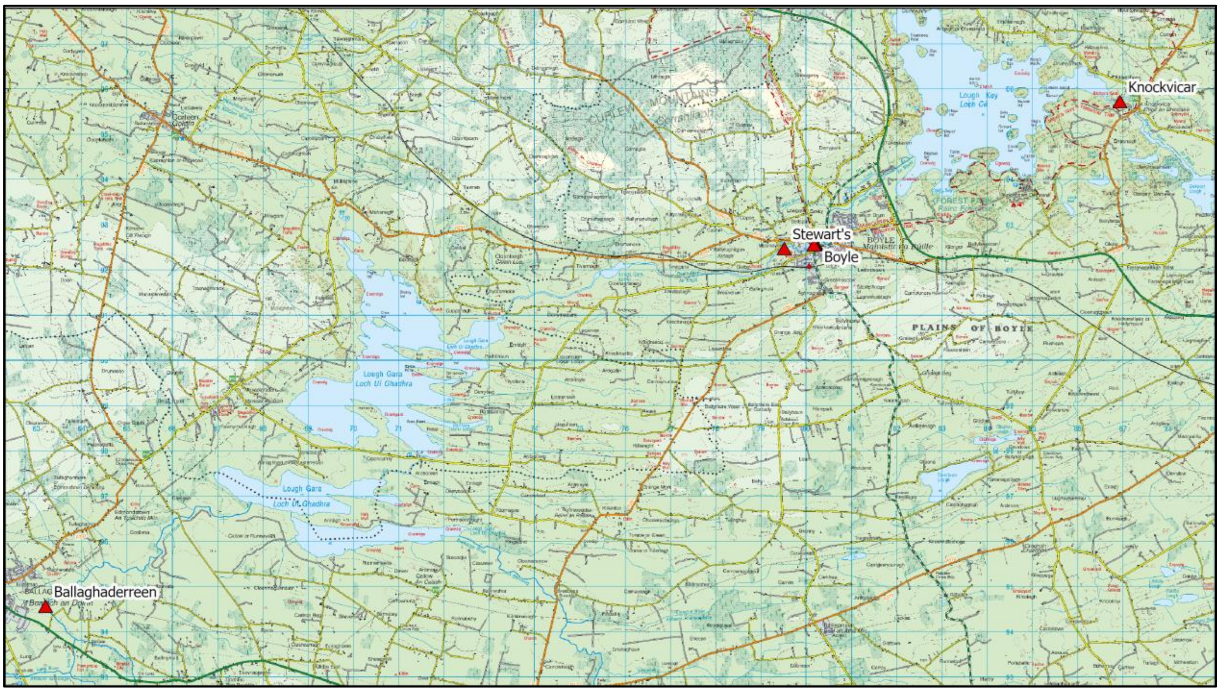


Figure 2.19 Location of weirs on the main stem of the Boyle and Lung rivers.

The first encountered going in an upstream direction from Carrick-On-Shannon is the weir on the Boyle River at Knockvicar, which is navigable for boats, and has a lock gate (Figure 2.20). It has not yet been assessed using the WFD111 methodology. Upstream of Lough Key, there is a series of three small weirs in Boyle town, which were measured using the i-BAST tool (Figure 2.21). All have small head heights and fish passes along the weir face.

Figure 2.20 Knockvicar weir (left) and lock gate (right) on the Boyle River.

Figure 2.21 Sequence of small weirs on the Boyle River.

650 metres upstream of this sequence is Stewart's weir, which has a tailrace offtake to supply industry (Figure 2.22). It was assessed using the WFD111 methodology developed by SNIFFER (Scotland and Northern Ireland Forum for Environmental Research, 2010) in 2018. The weir a 1.4 metre hydraulic head. Two transversals were measured – the sloping weir face and the fish pass. The velocity of waters through the latter impedes fish passage. On the day of the survey, the structure was deemed a High Impact Partial Barrier to adult salmon, trout and juvenile eel, and a Complete Barrier to juvenile salmonids, cyprinids and adult lamprey.

Figure 2.22 Oblique drone picture of Stewart's weir, on the Boyle River.

There is one major weir on the Lung River, just east of Ballaghaderreen town. It is a more recent construction than Stewart's or Knockvicar weir. It is a crump weir used to gauge water levels on the OPW scheme at Banada Bridge. It presents a barrier to fish migration but has not yet been assessed using the WFD111 methodology.

Figure 2.23 Weir on the Lung River at Ballaghadeerreen.

2.4 Catchment context

2.4.1 Water quality

Water quality data can be accessed on the Environmental Protection Agency website (EPA, 2023a). For the Lung, it was assessed in 2020, two years prior to our catchment-wide survey. Similar to other WFD metrics, Good status is the requirement. 21 sites were monitored for water quality, with 67% (n=14) passing the minimum requirement. 19% (n=4) were categorised as Moderate and 14% (n=3) as Poor (Figure 2.24 Water quality assessed in 2020 (EPA, 2023a).Figure 2.24), therefore 33% of sites assessed are failing to achieve required standards.

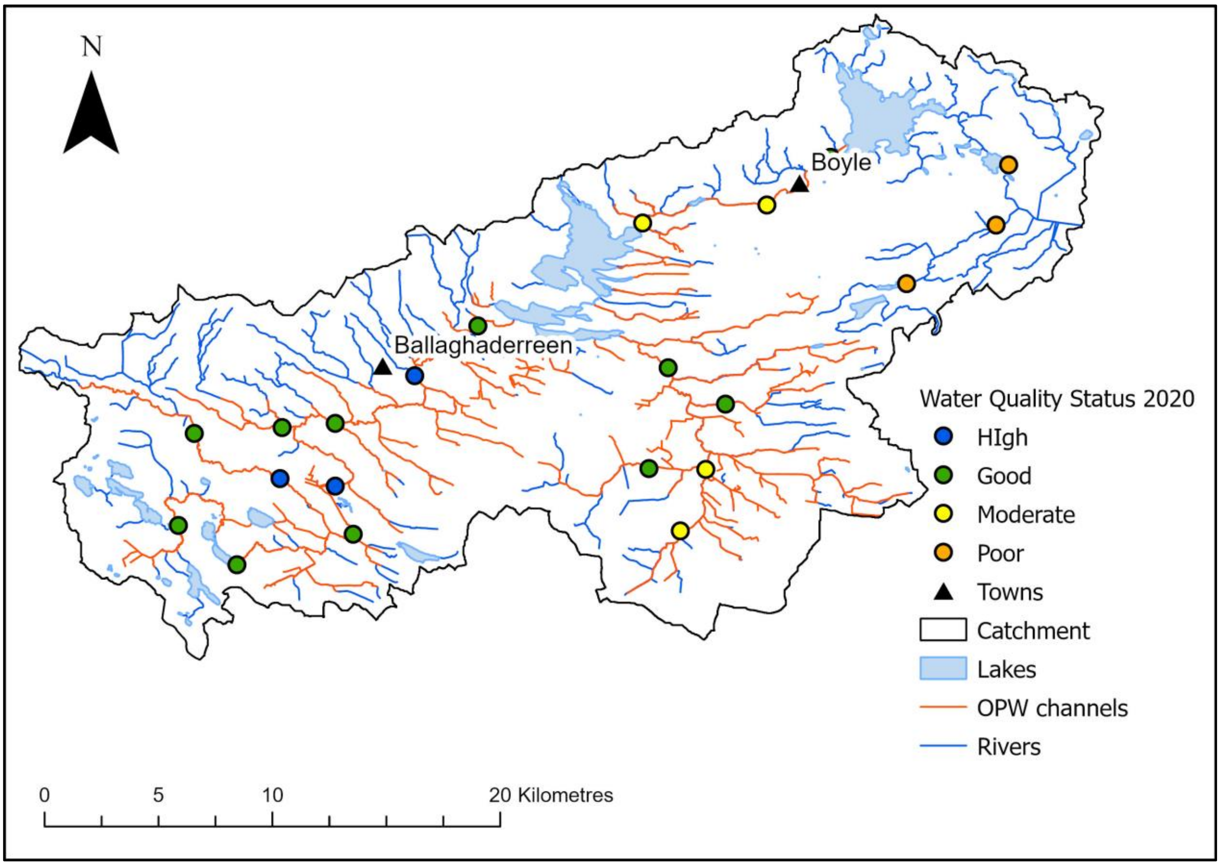


Figure 2.24 Water quality assessed in 2020 (EPA, 2023a).

2.4.2 Pressures

There are six sub catchment units within the survey area, following the EPA WFD regions (Figure 2.25). Their mainland uses and pressures are summarised in Table 2.3 using data from the Water Framework Directive Application (EPA, 2023b) and an online map portal (EPA, 2023a). Pasture is the main land use across five of the regions, with bog dominating the remainder. This was evident during the field surveys. Also notable is the amount of forestry in the Breedoge catchment in comparison to the other areas. This is reflected in the fact that it is a significant pressure here, but not elsewhere due to the excessive forest cover in this part of the catchment. Hydromorphology is a significant pressure in 3 of the 6 sub catchment areas.

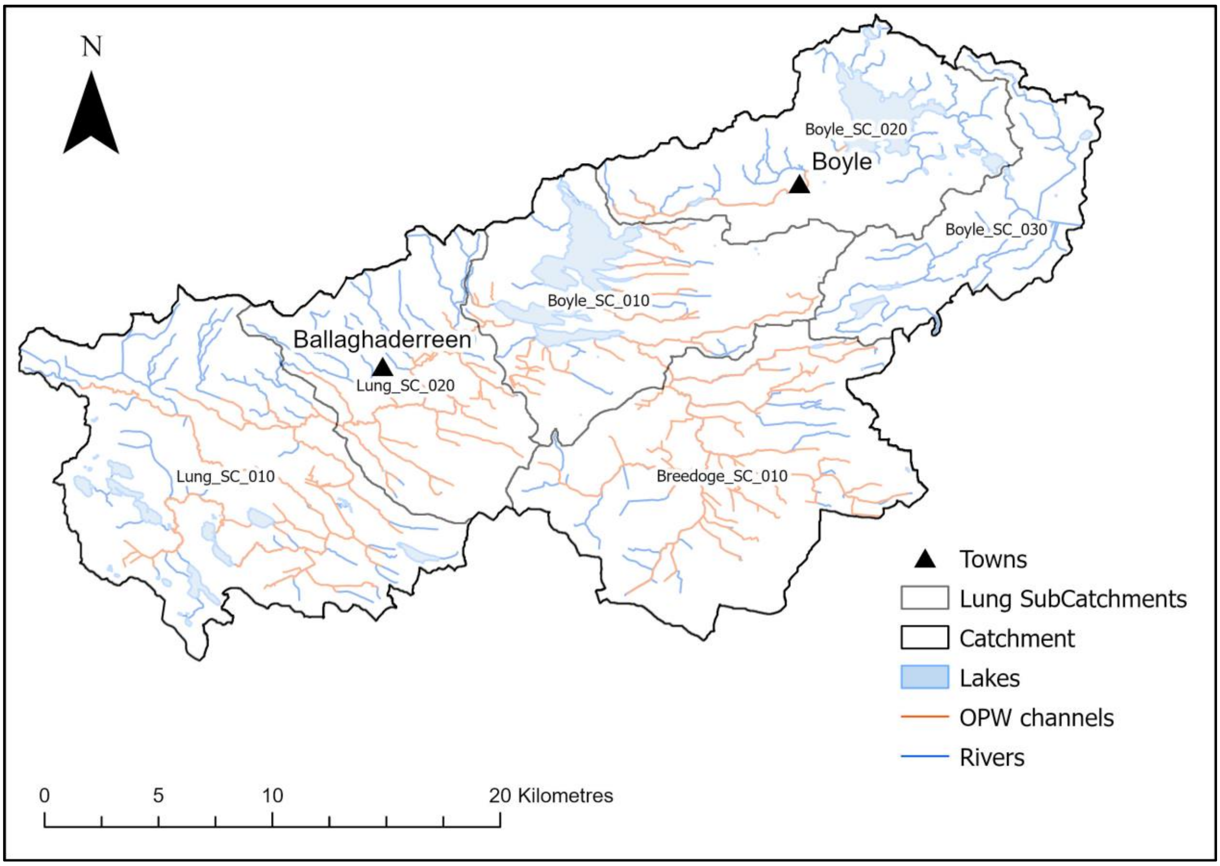


Figure 2.25 Sub catchments within the Lung.

Just one of the RHAT survey sites in the Lung_SC_010 occurred on a channel (C1/24) where hydromorphology is listed as a significant pressure, and it attained Good status. Four RHAT survey sites occurred on the Breedoge_SC_010 sub catchment where hydromorphology is a significant pressure. All were on OPW scheme channels and were classed as Moderate including the Breedoge (C6); Owenaforeesha (C6/7/5); Mantua (C6/9) and Bella (C6/4) Rivers. The main issues were with Channel form & flow; Substrate condition; Bank vegetation; Riparian land use and Floodplain connectivity. There are no OPW scheme channels in the

Boyle_SC_030 and no RHAT surveys were conducted here. Some of the channels where hydromorphology is listed as a significant pressure coincide with Drainage District channels.

Table 2.3 Land use and pressures per sub catchment

		n)	ssures
Breedoge_SC_010	Frenchpark, Ballinameen, Bellanagare	Forestry Pasture* Peat	Agriculture Extractive industry Forestry Hydromorphology Urban run-off
Lung_SC_010	Kilmovee, Loughglinn	Bog* Pasture Transitional woodland/scrub	Agriculture Anthropogenic pressures Extractive industry Hydromorphology Invasive species Urban run-off
Lung_SC_020	Ballaghaderreen	Cut bog Pasture* Forestry	Agriculture Anthropogenic pressures
Boyle_SC_010	Kingsland	Arable land Pasture* Transitional woodland/scrub	Agriculture Anthropogenic pressures Invasive species
Boyle_SC_020	Boyle	Extractive sites Pasture* Urban fabric	Agriculture Anthropogenic pressures Invasive species
Boyle_SC_030	n/a	Arable land Pasture* Peat bog Mixed forest/marsh and grassland Woodland scrub	Agriculture Anthropogenic pressures Domestic waster water Hydromorphology Invasive species

2.5 Conclusion

20 bank-based and 8 boat-based sites were surveyed for fish status. Regarding classification, the Ecological Quality Ratio results indicate that 38% of the sites on the Lung meet the minimum requirements of Good status. 32 sites were surveyed using the River Hydromorphology Assessment Technique. 22% of sites were classed as Good, with the remainder failing to achieve the required standard. Of the averaged attributes, riparian land use and floodplain connectivity scored lower followed by channel form & flow type and substrate condition. A total of 97 barriers to fish passage were identified and measured in the Lung catchment overall.

Pasture and bog are the dominant land uses in the catchment, with spruce forestry also evident across the Breedoge. Given the low-lying landscape and poorly-draining soils, agriculture is a significant pressure, but the catchment is not as intensively farmed as elsewhere. This is reflected in the good water quality throughout the Lung in comparison to the Breedoge and Boyle. The Breedoge is impacted by forestry and the Boyle by various anthropogenic pressures. The Moderate and Poor water quality assessed on these two rivers respectively reflects these significant pressures.

3 Stonyford

3.1 Introduction

Five sample sites were distributed within a 1 km non-shaded section of the Stonyford River, a tributary of the river Boyne. It is a characteristic lowland river with low-moderate flow velocities, abundant macrophytes and a mixed bed load. The river has been arterially drained and channel morphology exhibits many characteristics typical of channelisation e.g., deeply incised, trapezoidal form that isolates the river from its historical floodplain, and uniform flow dominated by extended glides. The channel has also been subject to cyclical river maintenance which has helped to maintain a very homogenous physical form.

The objective is to quantify the effects of a commonly adopted stream rehabilitation methodology (fencing) on a hydromorphologically altered stream. The rehabilitation strategy is to exclude the pressure of livestock by fencing from the riverbank, providing cattle drinks, and allowing the riparian bankside vegetation and instream channel to recover (see locations in Figure 3.1). As part of the strategy, channel maintenance ceased at these locations. The basic experimental design is a BACI (before, after, control, impact) style design with the target channel [Stonyford tributary (C1/32/33)] in the Boyne Arterial Drainage Scheme monitored for ten years.

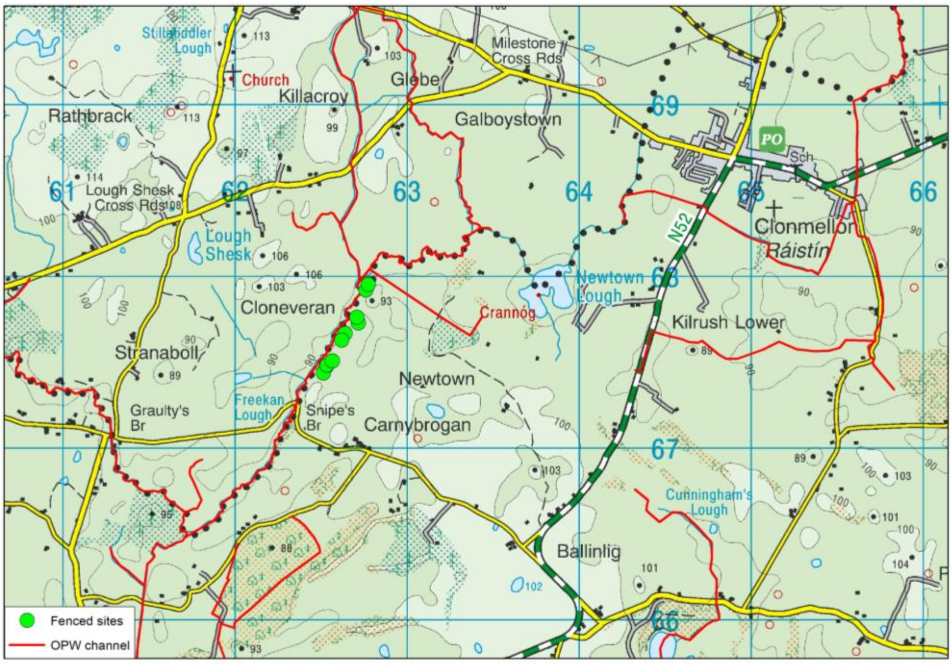


Figure 3.1 Map showing the location of the Stonyford channel (C1/32/33) where fencing and monitoring was undertaken.

The short-term response (two years post-works) study has been published in the peer-reviewed journal *Ecological Engineering* (O'Briain *et al.,* 2017). Findings on same were also presented in the EREP annual reports 2016, 2017, and 2018 documenting the initial short- and medium-term responses, with a particular emphasis on changes in the fish community (IFI, 2017; Coghlan *et al.*, 2018; McCollom *et al.,* 2019). The long-term physical response was published in *Geomorphology* (O'Briain *et al.,* 2022) and summarised briefly in the EREP annual report 2020 (Fleming *et al.,* 2020). This section reports mainly on the survey results captured in 2022 with some reference to previous years.

3.2 Methodology

A physical survey was completed for each site within the Stonyford survey reach following the same method as 2013-2014, 2016–2018 and 2020. A series of lateral transects (n=11) spaced at 3m longitudinally were surveyed for each site (n=5). This year, a Carlson BRX7 GNSS receiver was used to collect geo-referenced point data. At each point, substrate and vegetation type, velocity (m/s) and elevation (m) were recorded. Additionally, these sites were electro-fished using the same methodology as in previous years 2013-2014, 2016-2018. The surveys were completed in July and September 2022.

3.3 Results

3.3.1 Fish

The typical population structure in the sampling sites included brown trout (*Salmo trutta*), three-spined stickleback (*Gasterosteus aculeatus*), roach (*Rutilus rutilus*), lamprey *sp.* (*Lampetra Sp.*). The fish population breakdown over the sampling period is given in Figure 3.2. When other species are excluded, 1,541 fish were captured, measured and released in the five survey sites over the seven sampling periods of this study. Note that for the second survey period in 2022 (b), one site was unable to be electro-fished due to safety concerns on the day.

Other species present in very small numbers over the sampling period included salmon (*Salmo salar*), crayfish (*Austropotamobius pallipes*), European eel (*Anguilla Anguilla*), perch (*Perca fluviatilis*) pike (*Esox lucius*) and stone loach (*Barbatula barbatula*).

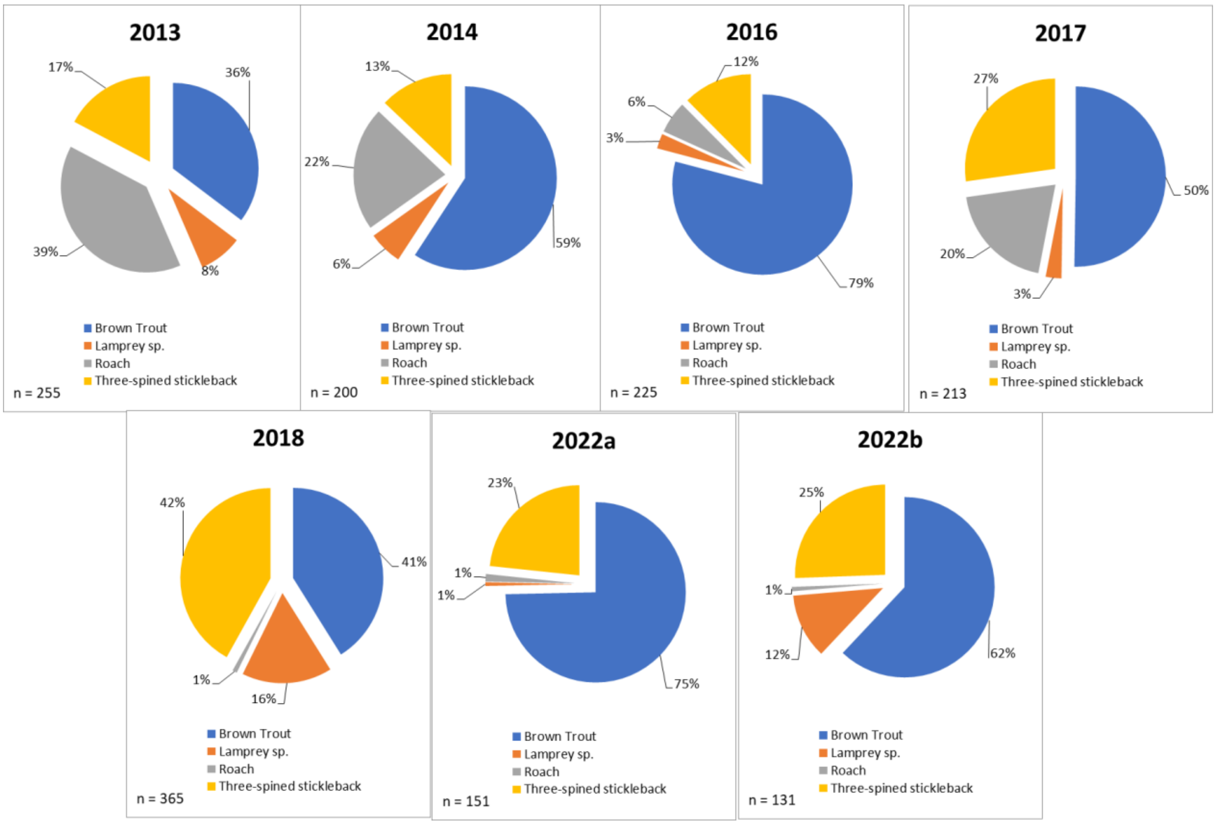


Figure 3.2 Composition of the fish community showing the four main species captured in five sites over seven survey periods 2013-2022.

The fish community composition demonstrates that over the intervening survey years after fencing was implemented and maintenance pressure removed (including 2016 onwards), the proportion of roach at the site has reduced significantly.

3.3.2 Hydromorphology and macrophytes

Contour plots were generated for visualisation purposes from the point data using an interpolation method in ArcGIS Pro (see

Figure 3.3 and Figure 3.4). Analysing the elevation data recorded, it was identified that this stretch (650 m) of channel had a slope of 0.0018 m.

Vegetation type was categorised into 4 groups: BLBE – broad leaved branched emergent; F – fringing; LE – linear emergent; LFP – linear floating patched. OW/NO was recorded where no vegetation was present, an indication of open water patches. Substrate type was categorised into 3 groups: CO – cobble; GP – gravel/pebble; SI – silt.

Gradient varied for each of the five survey sites. Sites 1, 2 and 4 had comparable gradient averaging at 0.005 m. Sites 3 and 5 are characterised by a slightly higher gradient averaging 0.016 m. Such variances in gradient directly influences velocity which is clear in Figure 3.4 as both sites 2 and 5 demonstrate higher velocity values.

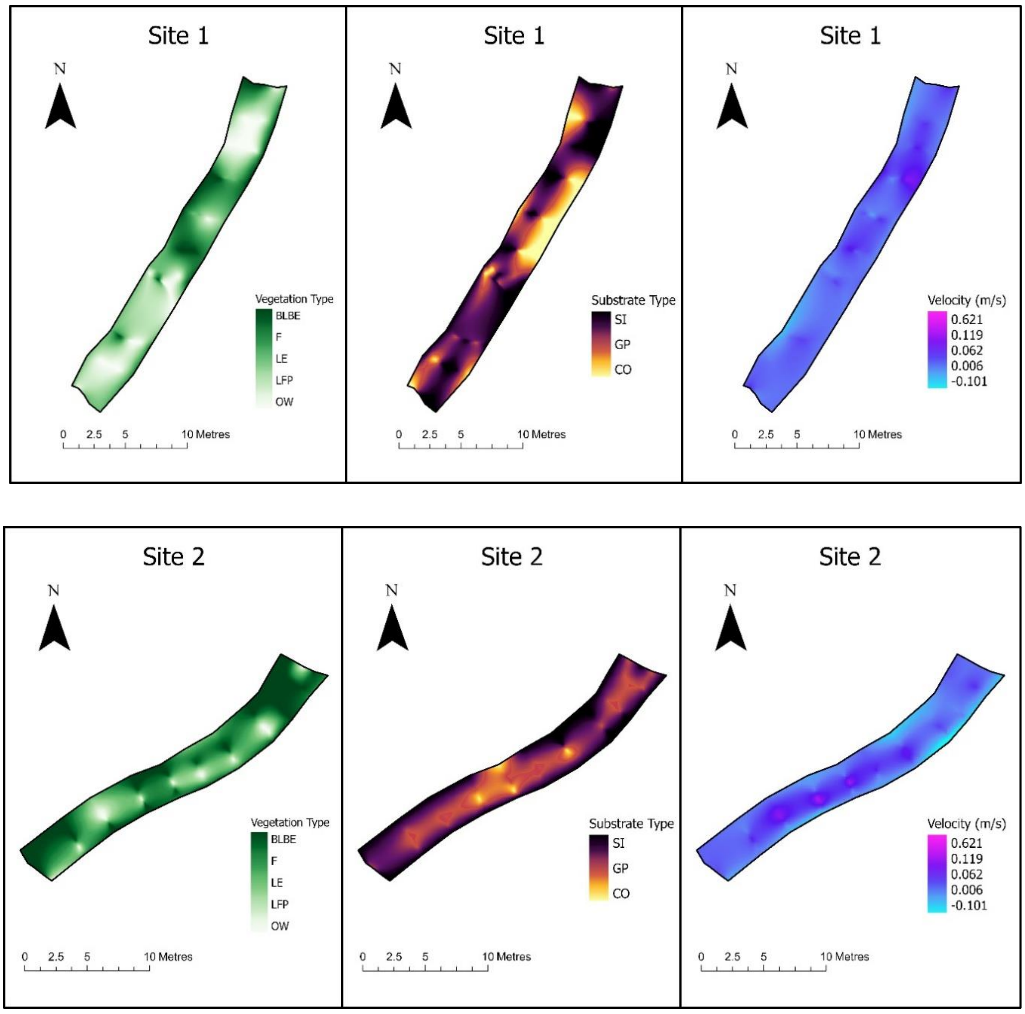


Figure 3.3 Interpolation plots generated for the the control section (sites 1 and 2) visualising vegetation type, substrate type and velocity.

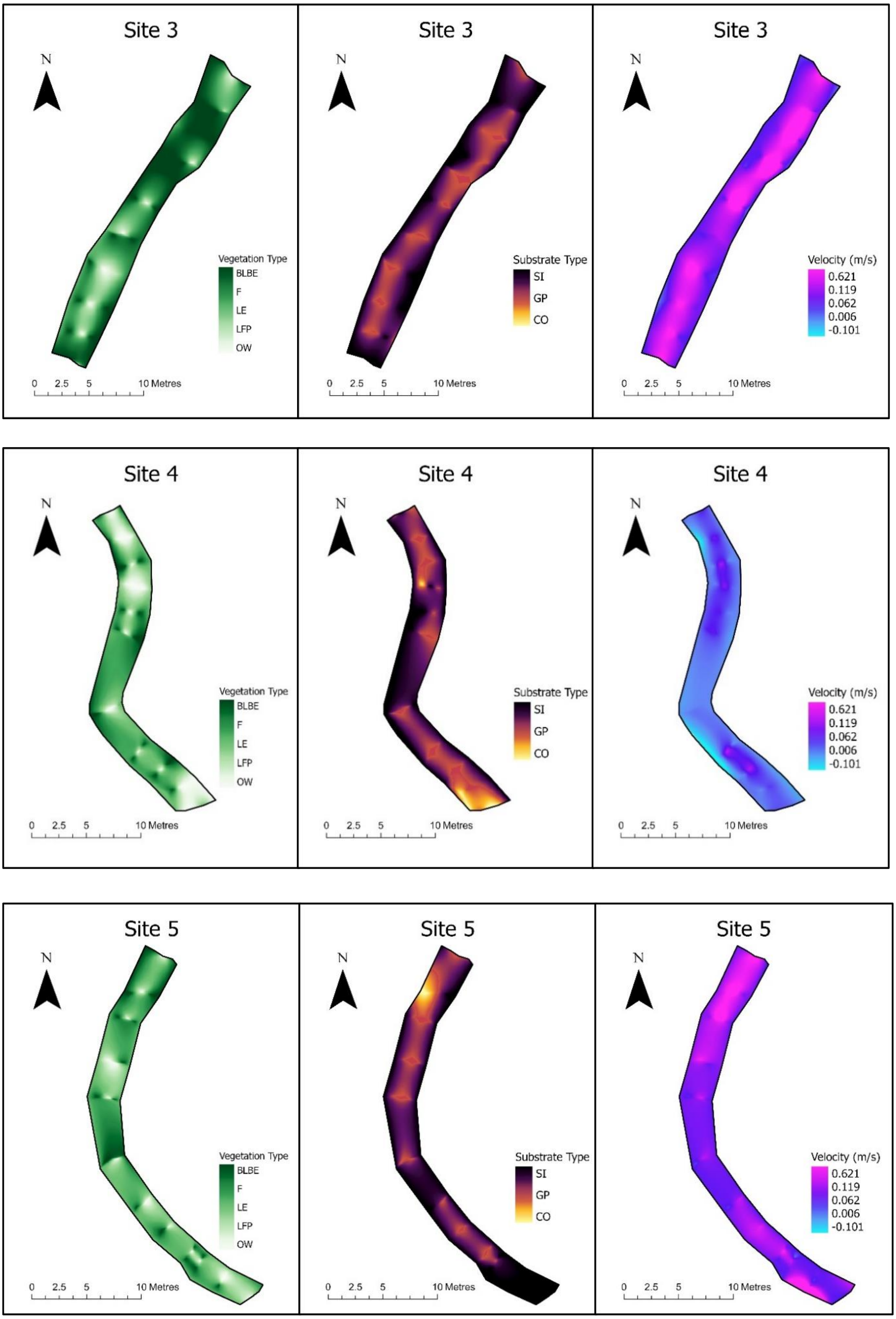


Figure 3.4 Interpolation plots generated for the experimental section (sites 3, 4 and 5) visualising vegetation type, substrate type and velocity.

BLBE was the most dominant vegetation type recorded, followed by LE (Figure 3.5). F and LFP was only present at a few survey points. Presence of dense vegetation is expected in a channel with low gradient and absent canopy cover. Although this section of river channel had dense instream vegetation, patches of no vegetation and open water were recorded at 26% of the survey points (Figure 3.5).

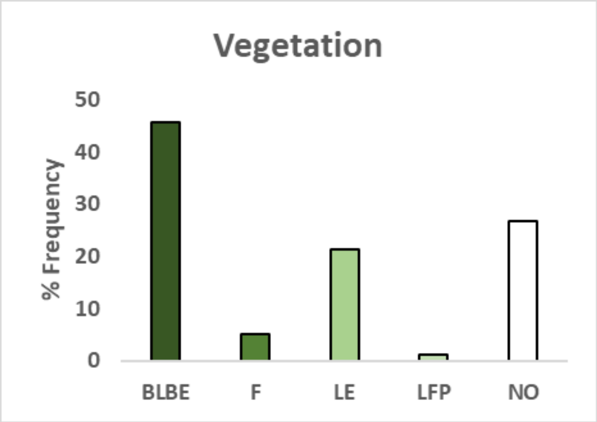


Figure 3.5 Percentage frequency of each vegetation type recorded throughout the Survey Stretch in 2022 (BLBE – broad leaved branched emergent; F – fringing; LE – linear emergent; LFP – linear floating patched; NO – none (open water)).

The drone image below (Figure 3.6) shows vegetation colonisation in Site 4 before the survey was completed. The inset graphic showing the contour plot generated, demonstrates the plots are representative of the site when point data was collected. From the imagery and the plot, it is possible to identify changes in vegetation type and their distribution within the study site. Open water patches are also visible, which coincides with the plot.

Figure 3.6 Drone image of site 4 in July giving context to the plot generated displaying vegetation patches and open water patches.

SI was the most dominant substrate type recorded, followed by GP and CO (Figure 3.7). Substrate distribution is heavily influenced by vegetation type which also influences velocity.

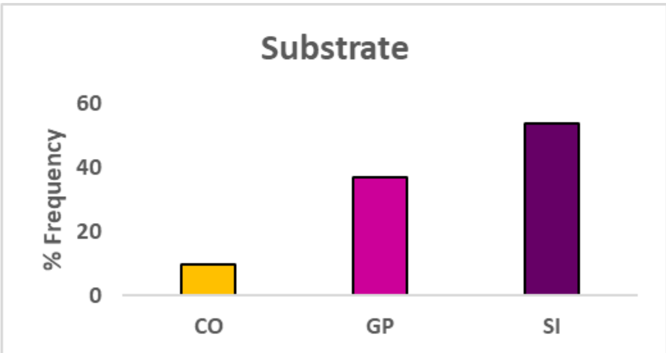


Figure 3.7 Percentage frequency of each substrate type recorded throughout the survey stretch in 2022 (CO – cobble; GP – gravel/pebble; SI – silt).

Vegetation type influences substate in various ways, largely depending on their root systems and morphology. Flora with complex root systems traps fine sediment. Variety in vegetation type allows diverse processes within the water column.

As well as influencing substrate, vegetation in turn prompts changes in velocities. As the dense vegetation narrows the channel, this often forces the water into areas where no vegetation is present or directly down into the bed. As the instream flora displaces and directs the flow, velocity improves locally. As the speed of the water increases the coarser substrate is flushed of fine sediment exposing cobbles and gravels.

Site 3 – one of the survey sites with better gradient – presents characteristics of a channel with improved velocities (

Figure 3.8). The below pictures show some of the good quality gravels recorded onsite.

Figure 3.8 On site photos taken of site 3 in September of spawning gravels available giving context to the plot generated displaying substrate condition.

3.4 Conclusion

As this is the first year of this survey using new and improved technology for the team to geo-reference physical habitat variables, it is not visually comparable to surveys carried out at this site in previous years. Previous contour plots where generated using the 3D Field Programme. This new method trailed at this site is applicable to many other surveys in the future for the EREP. Understanding the application of this equipment and software, means this level of surveying can and be carried out pre- and post- future works, assisting in the understanding of how instream work progresses during a specific monitoring period.

Fencing this site and eliminating maintenance has allowed the river to change naturally, and monitoring these sites closely provides an understanding of this re-naturalising process for a river system of this type.

Fish numbers fluctuate each year, firstly improving in 2016-2018, following the initial fencing and removal of maintenance. In 2022, fish numbers reduced from an average of 267 (2016-2018) to 141 fish. The numbers of roach have decreased greatly since the pre-survey results which is reflective of the alterations in river flow and habitat since vegetation removal has been restricted.

It is evident form the physical survey that each of the attributes (velocity, substrate and vegetation) are interlinked with one another. The habitat quality in this stretch of channel has improved over time, providing diverse areas for resident brown trout stocks to inhabit. Having allowed this section of river to re-naturalise, it is important for biodiversity to maintain it in that state for the longer term. It is hoped that this study will provide a template for other sites, where re-naturalisation can feasibly occur in other OPW schemes.

4 Soft engineering case studies

4.1 Eignagh River (C1/49)

The Eignagh River (C1/49) flows south-east from Lough Talt, through Aclare, then drains a bog area before entering the main River Moy. A site located in the bogland area was selected for this pilot study which was trialling a soft engineering approach to alternating and single deflectors. This river, although relatively small, plays an important role for diadromous fish species, with Atlantic salmon using it for spawning as the riverbed supports good spawning gravels in its upper reaches. Individual adult sea lamprey have also been found here in the 2006 and 2007 surveys.

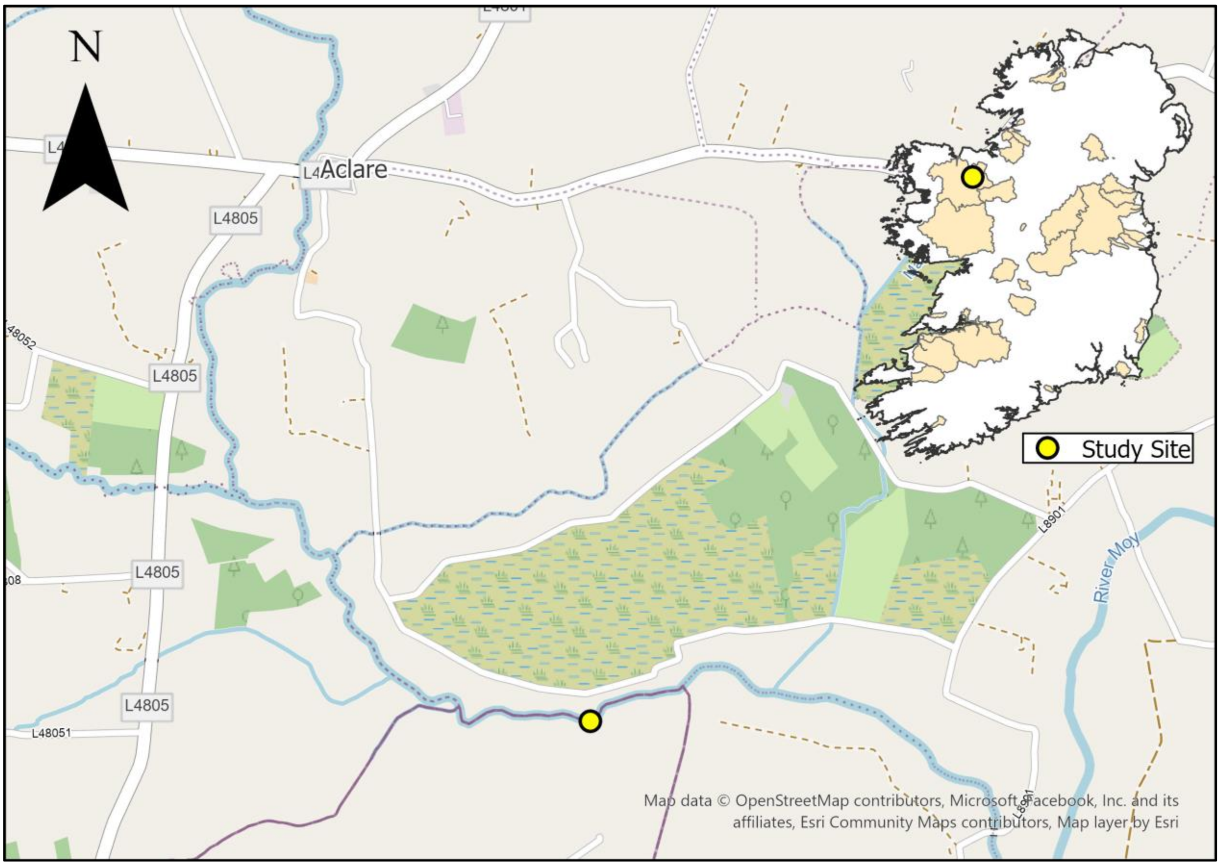


Figure 4.1 Location of the deflectors installed in the Eignagh River.

The installation of timber structures was completed in July 2019. The 2019 annual report (Fleming *et al.,* 2020) details the installation process as well as some action shots from the day of works. The ford located at this site influenced selection and facilitated access of heavy machinery into the channel to complete the installation works for this project. It is evident that the ford isn't used regularly as the access banks are heavily vegetated.

The stretch of channel selected is heavily modified due to arterial drainage, with the channel displaying all characteristics of a drained channel. The channel morphology is uniform for all elements including flows, depths, and substrate type. The aim was that the introduction of these deflectors would support the generation of scour pools, therefore diversifying habitat options for fish. Deflectors function by directing flows, thereby increasing velocity locally and creating areas of differential scour and deposition. Placing of the timbers securely was important to ensure stability in high flows. The structures were placed at an appropriate height to ensure they were functioning during lower flows but overtopped in flood conditions.

Figure 4.2 Photo of one completed pair of deflectors taken in July 2019 (top left) and photo of same in June 2020 (top right) and again in March 2023 (bottom). All photos were taken in low water levels.

In September 2022, a physical survey was completed at the site where the deflectors were installed. The survey was completed using a Carlson BRX7 GNSS receiver, which was used to collect point data with a high-resolution GPS signal. This survey involved the recording of bed elevation (m) and velocity (m/s) to identify how the deflectors influence each attribute.

Contour plots were generated for visualisation purposes from the point data using an interpolation method in ArcGIS Pro. It is evident from the plots that the woody structures influence bed levels (Figure 4.3) and velocities (Figure 4.5). Riverbed level/elevation recordings range between 40.7 m and 41.17 m. The 0.5 m difference in elevation also includes the gradual gradient changes within the channel over the 60 m distance where no data was collected. The plot (shown in Figure 4.3 and Figure 4.4) shows bed level is higher at the edges behind the deflectors where substrate is deposited, which is also clearly visible from the site photos. Lower bed levels are evident between the structures where velocities are greatest and as a result deepening the bed.

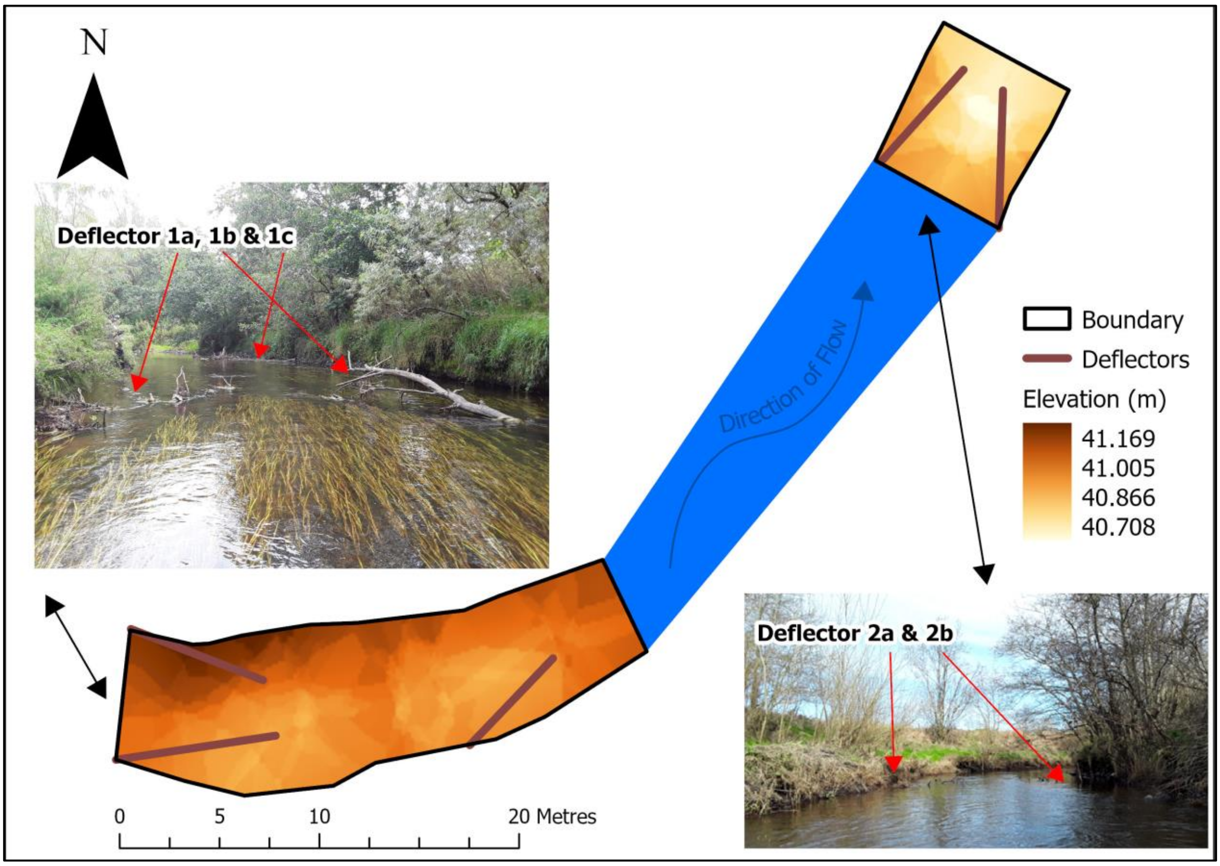


Figure 4.3 Bed levels (m) recorded throughout the study site in 2022, where deflectors were installed in the Eignagh River in 2019.

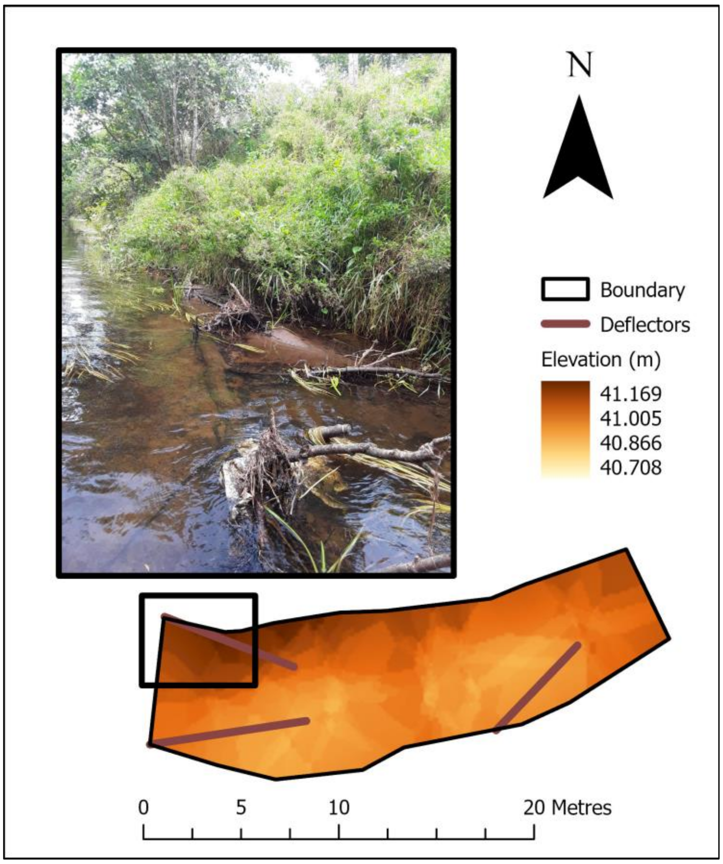


Figure 4.4 Evidence of silt build up behind deflector 1a (see Figure 4.3).

Velocities are greatest between the structures which is clear in Figure 4.5. The pink colour represents the higher velocities (0.192m/s – 0.155m/s) recorded at this site, whereas the blue represents slower flows (0.092m/s – 0.044m/s).

Looking at Figure 4.5 it is clear to see that these structures influence and divert the flow. The paired deflectors (1a and 1b; 2a and 2b) force the water between them and therefore greater velocities are evident. The single deflector (1c) re-routes the water to the left-hand side of the channel. Both the paired and single deflectors have an influence on the flows in this section of channel and are involved in shaping the channel morphology locally.

In meandering channels the greater flows are present at the outer bend of a meander. Blue patches are present behind each structure which indicates slower stagnated waters, and this is particularly noticeable behind deflectors 2a and 2b.

Defectors create variable flow conditions, narrow flow paths, and deepen mid-channel flows. They are suitable structures for use in drained channels where flows can tend to be homogenous. Flow heterogeneity is important for migratory fish species which utilise diverse flows for different stages of their lifecycle. The trapping of material behind such structures can provide suitable habitat to support lamprey. Also, the exposed sediment over time will vegetate providing refuge habitat for other local wildlife improving biodiversity.

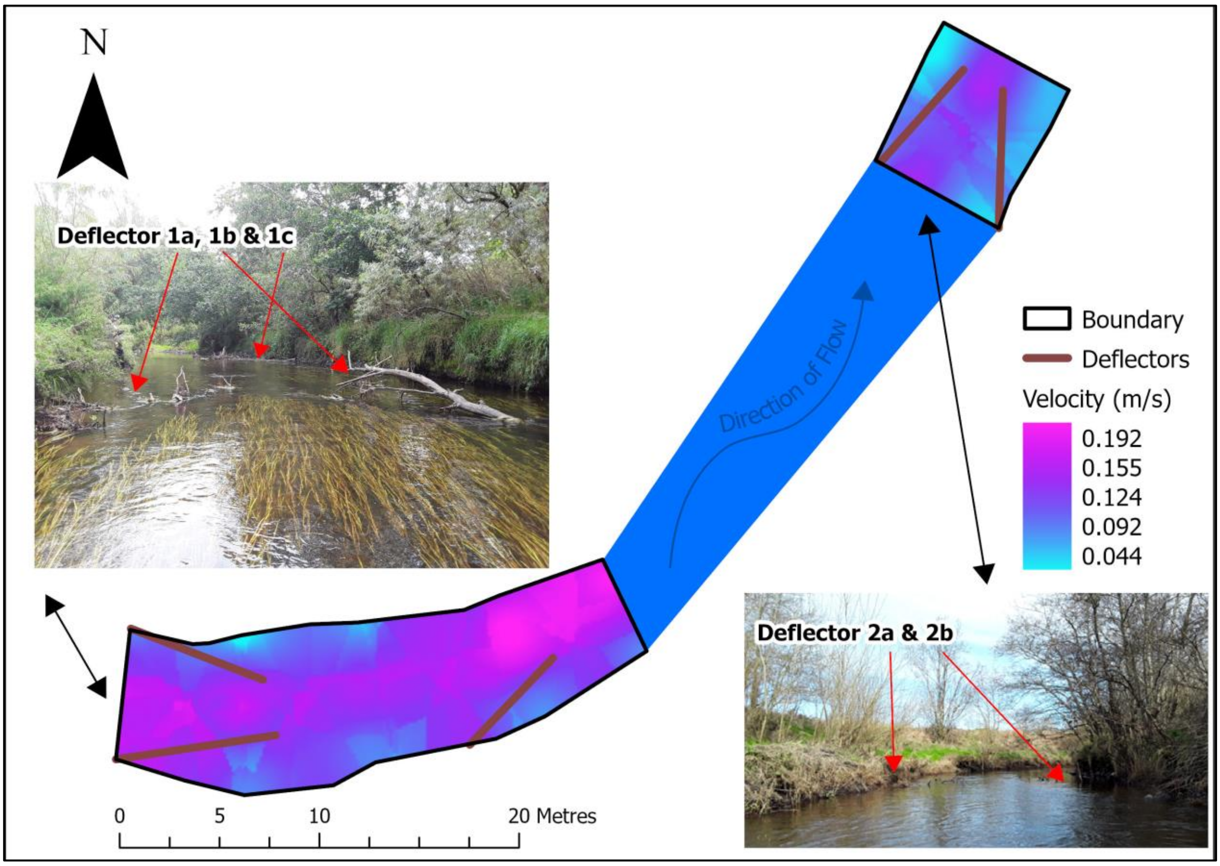


Figure 4.5 Velocities (m/s) recorded throughout the study site in 2022, where deflectors were installed in the Eignagh River in 2019.

The EREP team plans to monitor these deflectors over time to understand the longevity of timber material in the water body. Such works are a learning process for both OPW and IFI. It is important to monitor these studies to identify learnings which can be applied to similar projects in the future.

4.2 Rossdreenagh River C25(7D)

The Rossdreenagh River C25(7D) is located east of Carrickmacross, Co. Monaghan and is a tributary of the Proules which is within the broader Glyde catchment. This channel was scheduled for maintenance as part of the maintenance programme in 2020. A walkover of this site prior to maintenance was undertaken in January 2020 with attendees from local OPW offices and EREP team members. Due to Covid-19 and time restrictions that summer, the maintenance work on this channel was postponed by the OPW and other channels were prioritised.

In August 2022 the plan was revised, and the site was re-visited between OPW Drainage Maintenance and Environment Section personnel, EREP team and IFI regional staff to ensure the initial plan of works was still valid, and to identify any other opportunities. Planned works were completed on the channel shortly after the site visit and a post-works walkover was undertaken in late September.

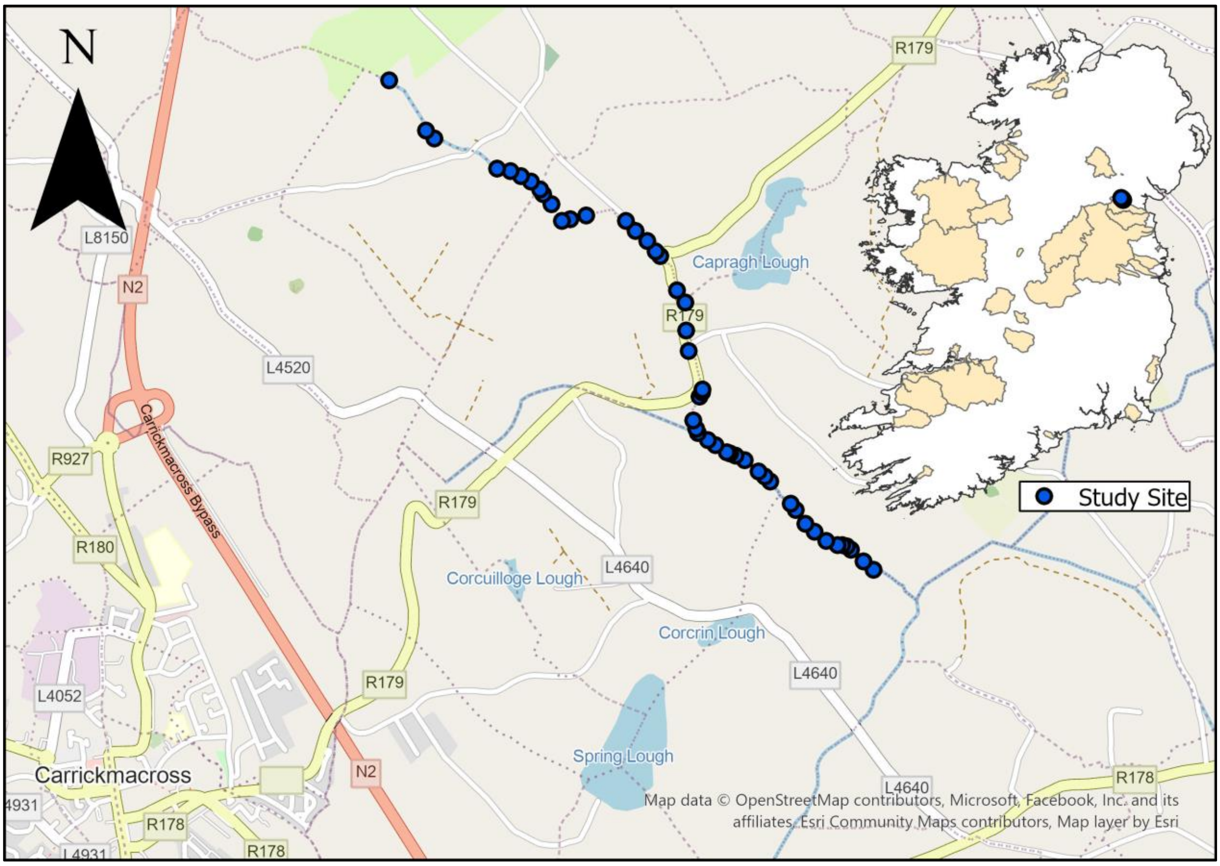


Figure 4.6 Location of sites for work identified during the walkover. Inset: location of site within the OPW schemes.

During the initial walkover in 2020 advice was given on the implementation and best practice of the 10 Steps to Environmentally Friendly Maintenance (Brew and Gilligan, 2019). Within the

3 kilometres of channel walked, 40 work sites were identified (Figure 4.6) with removal of blockages that hindered flood conveyance the main area of focus. The maintenance crew were also advised to leave many sections untouched where no maintenance was required. In 2022, there were opportunities within this section of channel to trial a new softer bank protection. There was woody material available on site which could be used (Figure 4.7).

Figure 4.7 Figure – Raw material available on site.

The available timber was bundled into the bank where erosion had caused some minor bank slippage. These timbers were supported by vertical stakes and rebar (Figure 4.8). We plan to visit this area of works and monitor its success and naturalisation process over the next few years. Similar works to this could be undertaken on other channels where raw material is available for use.

Figure 4.8 Woody bundle as bank protection (left – photo taken from the channel channel; right – photo taken on right-hand bank)

There was a minor jump barrier identified during the walkover (Figure 4.9). Along with a drop present the bridge apron was relatively shallow in low water levels and presented a swim barrier. We advised the placement of boulders available from the channel across the bridge apron (Figure 4.9). The boulders positioned like this hold water over the structure improving the water depth of the bridge, easing fish passage.

Figure 4.9 Strategic positioning of boulders at a bridge apron to alleviate a minor drop (right). Note that the photo on the right is taken during very low water levels.

The EREP team plans to re-visit these works and document the naturalisation process over time which will determine if they were successful. Such works are a learning process for both OPW and IFI. Similar scenarios can be identified on other channels and the same environmentally-friendly measures applied.

5 Five year review: catchment-wide comparison

Five catchments were selected across various OPW schemes to conduct catchment-wide surveys (Figure 5.1). Refining the methods used in the 2016 and 2017 surveys of the Bonet and the South Inny, the following catchments were surveyed for fish, hydromorphology and barriers over the course of the 2018-22 cycle:

Catchment	Report	Reference
North Inny	EREP annual report 2018	McCollom *et al*., 2019
Deel	EREP annual report 2019	Fleming *et al*., 2020
Glyde	EREP annual report 2020	Fleming *et al*., 2021
Kells Blackwater	EREP annual report 2021	Fleming *et al*., 2022
Lung	EREP annual report 2022	this report, Chapter 2

For the purpose of completeness, data from the 2017 survey of the South Inny (Coghlan *et al.*, 2018) has also been included in the following review, although it pre-dated the 2018-22 cycle.

These five catchments have geographical characteristics that distinguish them. The Glyde and Kells Blackwater both rise in the hummocky glacially-sculpted uplands found across counties Cavan and Monaghan, which are underlain by predominantly older, more resistant bedrock. The Inny is in the same region geographically but sits on younger limestones, typical of the midlands, and this topography results in less gradient across the catchment. Similarly, the Lung is largely underlain by softer limestones with a more-resistant ridge of bedrock on the northern fringes of the catchment, and a hummocky glacial landscape around Boyle, most of which is outside of the OPW scheme. The Deel is also underlain by similar-age limestones, with more resistant shales and sandstones forming an outer ridge along the south and southwestern fringes, resulting in a saucer shape to the catchment.

The Deel, Kells Blackwater and Glyde have larger gradient differentials overall with 300 m+ variation in comparison to the Inny and Lung which both have closer to 200 m difference. This smaller gradient differential has impacts for the channel types that exist there and how the channel morphology is affected by ongoing drainage activities.

The Kells Blackwater and Glyde both have tillage in the lower parts of the catchment, whereas in the majority of the other catchments, land use is dominated by pasture. On a national scale, agriculture has been highlighted as the dominant land use and also as the most significant pressure on inland waterways, with hydromorphology coming in second (EPA, 2020).

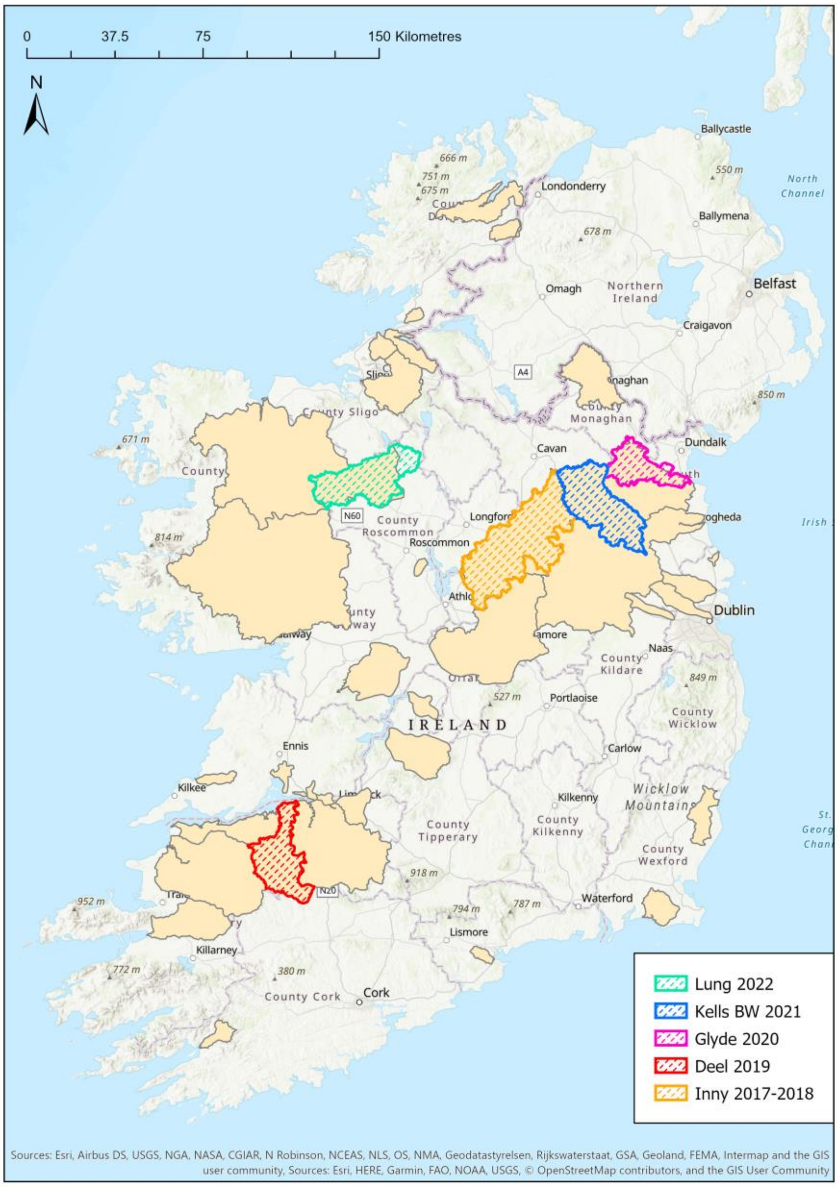


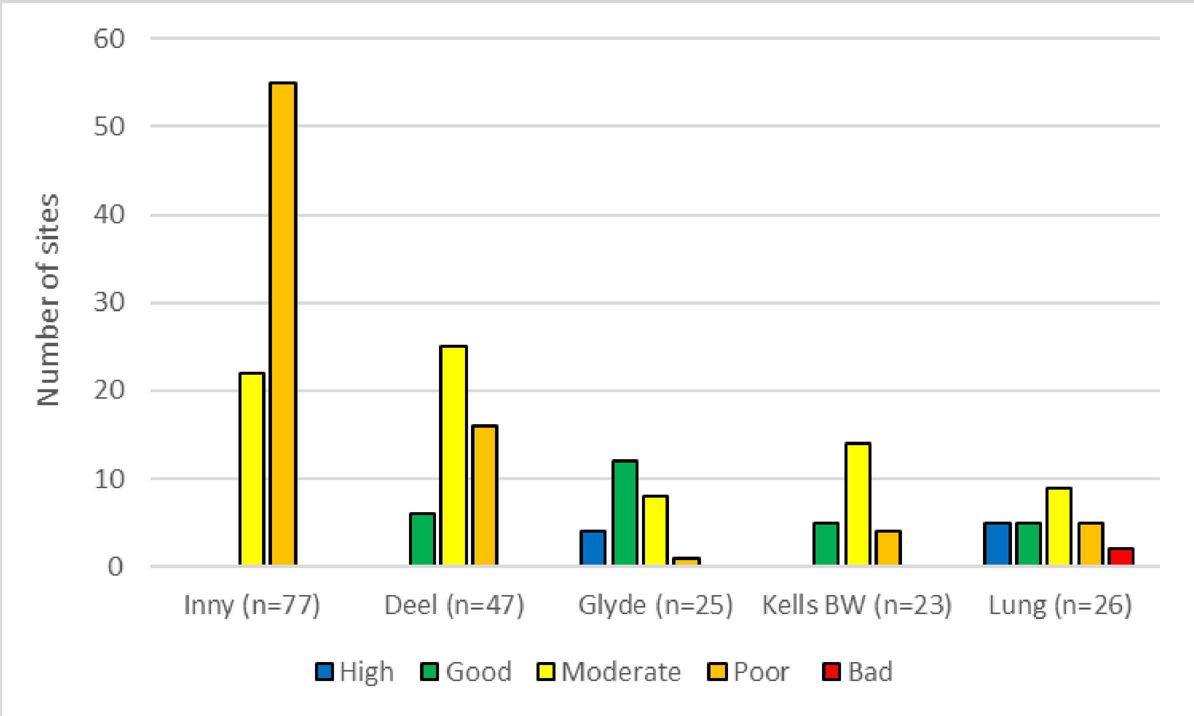
Figure 5.1 Location of catchment-wide surveys within OPW scheme catchments.

5.1 Fish status

Examining fish status in the first instance, the catchments vary widely with their results for the Ecological Quality Ratio (EQR). 198 sites were fished across all catchments, with only 37 sites achieving Good or High status which is required under the Water Framework Directive. This is a concerning result as it equates to just under 19% of all sites.

When looking at the catchments individually, no sites fished on the Inny achieved the minimum requirement of Good status. By comparison, 64% of sites fished on the Glyde achieved Good status or higher which was the best outcome of all catchments. Looking at the Lung, which could be characterised geographically as similar to the Inny, 38% of sites achieved the minimum of Good status or higher. Better results might have been expected in the Kells

Blackwater given the good potential habitat but just under 22% of sites achieved Good status. This is reflective of the pressures that exist in this catchment among them intensive agriculture and the large urban centres which generate anthropogenic pressures. Similarly the Deel hasn't fared well with just under 13% of sites achieving Good status.



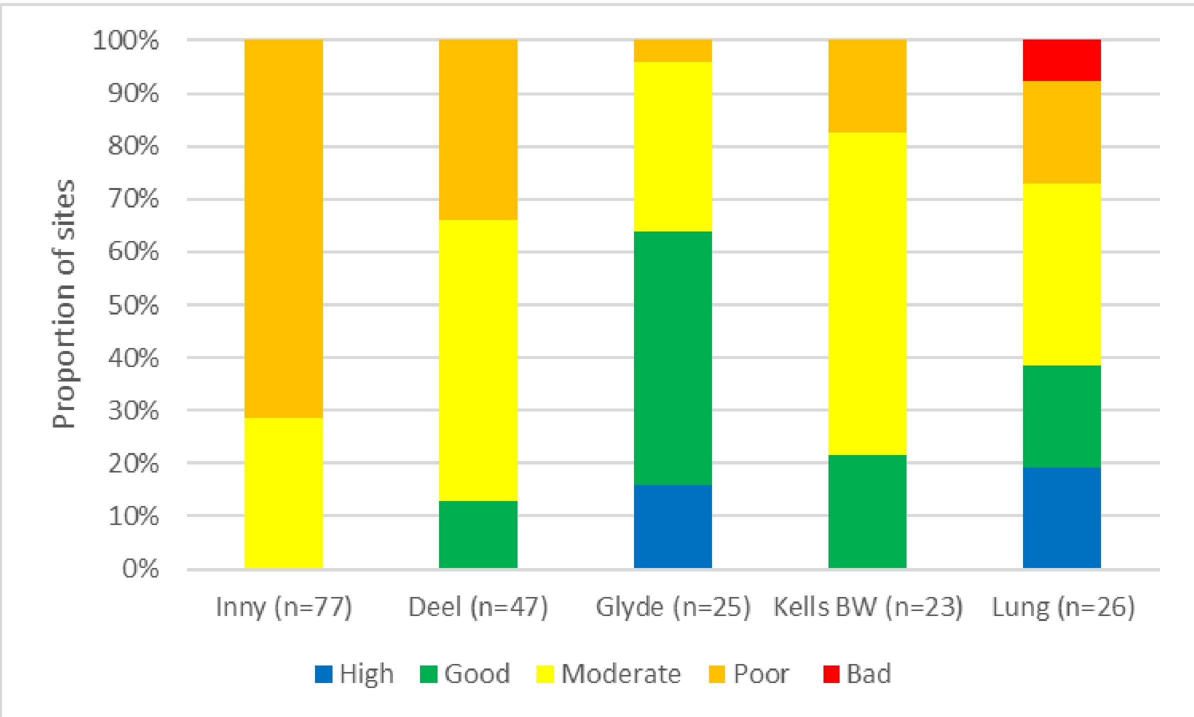


Figure 5.2 Ecological Quality Ratio results per catchment, showing fish status in a bar chart (top) and stacked bar chart (bottom).

5.2 Water quality

Closely linked with the fish status is the water quality. Salmonids can be a good indicator as they are more sensitive that other species with respect to water quality. Salmonids generally fare better at Q3 and above sites i.e. Moderate, Good or High (Kelly et al., 2007). In comparison with salmon, trout would be the more tolerant species and smaller numbers of salmon are generally found in Q3 sites. Non-salmonids generally dominate the fish populations at poor quality sites (Q2-3).

Two-thirds or more of sites failed to achieve Good water quality status in the Inny, Deel and Kells Blackwater which all had a lower proportion of sites with Good fish status (Figure 5.2). Agriculture and hydromorphology are significant pressures on water quality across all these catchments. Additionally, urban waste water is another pressure affecting the Inny in particular.

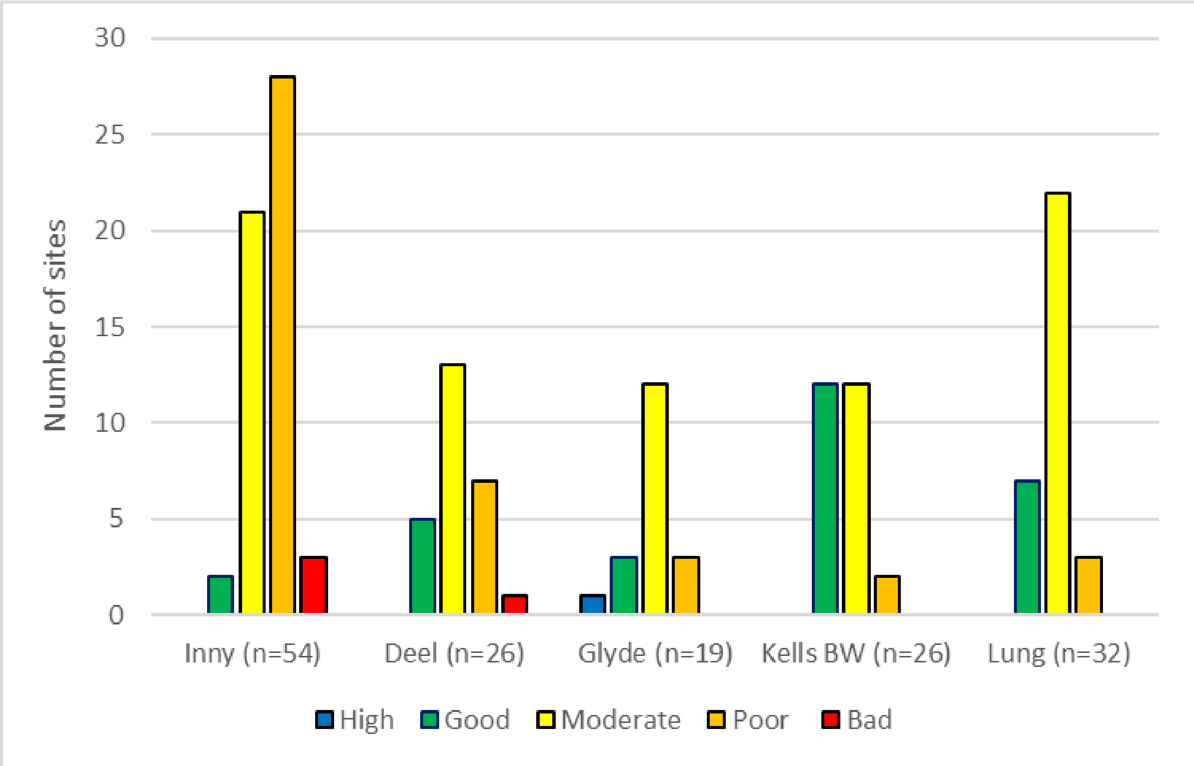
In contrast to these three catchments, roughly two-thirds of sites in both the Glyde and Lung achieved Good status for water quality. The pressures that exist in these two catchments are similar to the others (agriculture, hydromorphology and urban run-off/waste water), but at a catchment-scale appear to be less severe.

5.3 Hydromorphological status

As regards the hydromorphological status, 157 surveys were completed in the five catchments (Figure 5.3). Again, a low proportion of sites achieved Good status or higher, 19% in all equating to just 30 sites. The Inny again fared worst with regards to status, 96% failing to achieve targeted status. For the remaining catchments, the Deel, Glyde and Lung all ranged between 19-22% of sites achieving Good status or higher, meaning roughly 80% of sites in all those catchments are failing. The Kells Blackwater did the best overall, with 46% of sites achieving Good status.

There is not a simple correlation between the hydromorphological status and fish status, indicating that other factors not included in these metrics are at play. It is reasonable to assume that water quality and longitudinal accessibility or lack thereof (i.e. presence of barriers) are affecting the fish community at a given site. Mitigating these pressures, for example through implementing buffer strips for water quality and removal of barriers, should be beneficial to both hydromorphological status and fish status.

Degraded habitat will not be fixed with an easy solution. However, given just over half the sites achieved Moderate status for hydromorphology, there is potential here for making gains.



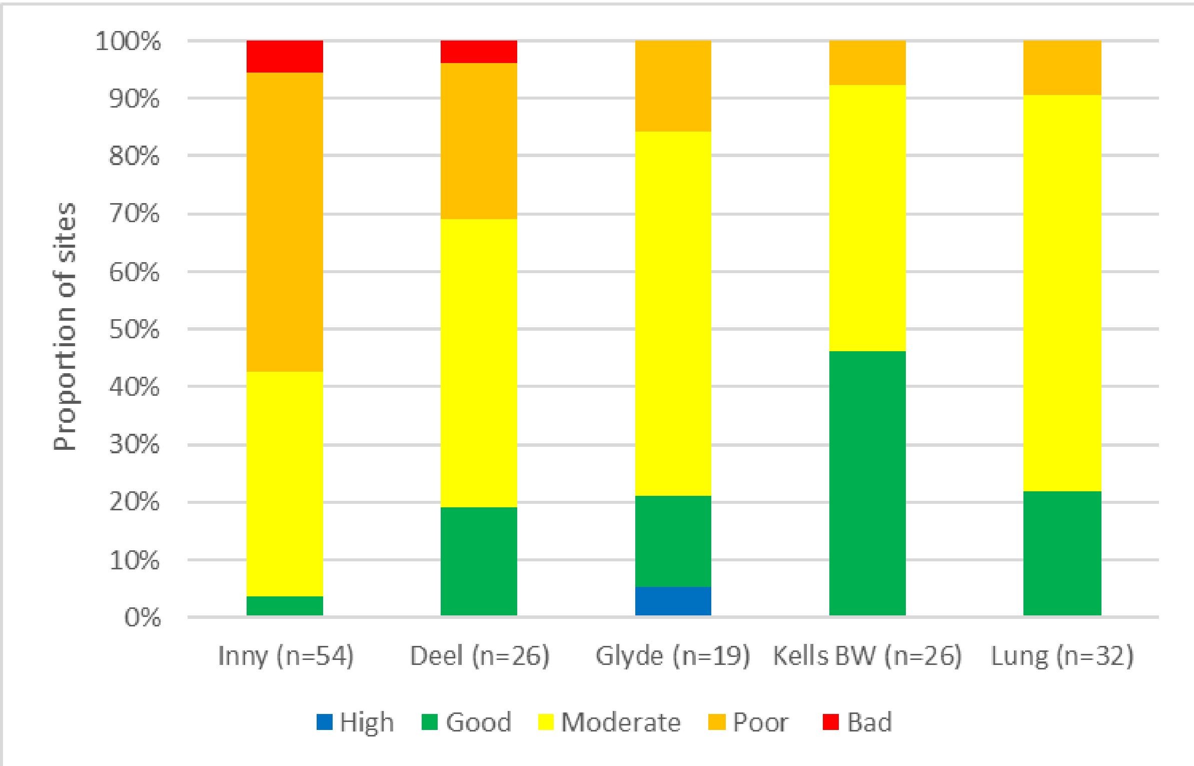


Figure 5.3 River Hydromorphology Assessment Technique results per catchment, showing hydromorphological status in a bar chart (top) and stacked bar chart (bottom).

When the RHAT scores are broken down by individual attributes and averaged, the results can be interrogated (Figure 5.4). Riparian land cover and flood plain connectivity are both very low scoring across all catchments.

Looking at two catchments which are similar geographically – the Inny and Lung – some similarities can be drawn. The channel form & flow type attribute is low scoring for both in comparison to the rest of the surveyed catchments. The lower gradient in these two catchments makes them less resilient to the historical effects of arterial drainage. The channels are in dis-equilibrium following management and they struggle to re-establish natural forms and flows for their river type due to their limited gradient. In a similar vein, their limited flows mean they are more prone to establishing tracts of homogenous instream vegetation, hence it is also an attribute which is lower scoring. One major difference in the average scores for these two catchments is in bank structure and stability and associated with it, bank vegetation. The Lung rates better for both these attributes, as bank vegetation has a positive impact on bank structure and stability.

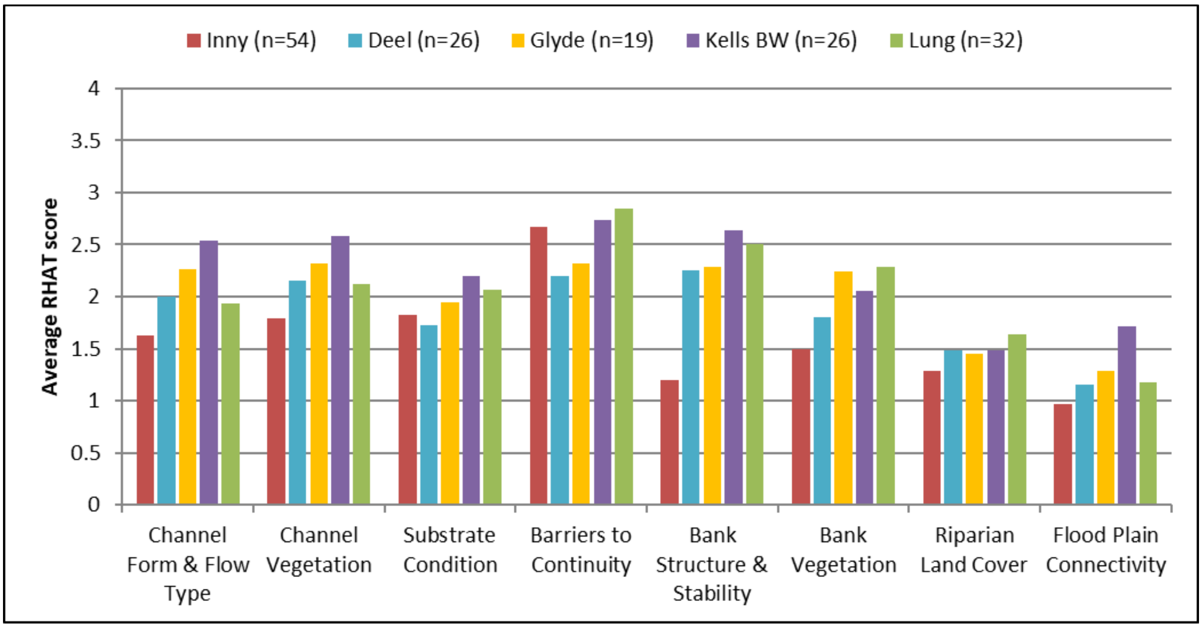


Figure 5.4 Average scores per RHAT attribute for each catchment survey.

5.4 Barriers to fish passage

Over 5,000 potential barriers to fish passage have been assessed across the five catchment-wide survey areas:

	Inny	Deel	Glyde	Kells BW	Lung	Total
Potential points	1673	758	665	1182	1119	**5397**
Remaining	0	1	1	5	4	**11**
No access	119	75	44	109	78	**425**
No barrier	1399	591	580	1007	940	**4517**
Barrier	155	91	40	61	97	**444**
Total surveyed (Barrier + No barrier)	1554	682	620	1068	1037	**4961**
Barrier % (Barriers/ total surveyed)	**10**	**13.3**	**6.5**	**5.7**	**9.4**	**8.9**

In total, there are 444 barriers of the 4,961 actually surveyed, meaning 8.9% of sites visited are problematic to various degrees. Where structure access was limited due to safety, landowner restrictions or visibility, these points were unable to be assessed (n=425). Generally these sites are in lower order streams so are not as significant at the catchment scale. The highest proportion of barriers was found in the Deel, Inny and Lung followed by the Glyde and Kells Blackwater (Figure 5.5).

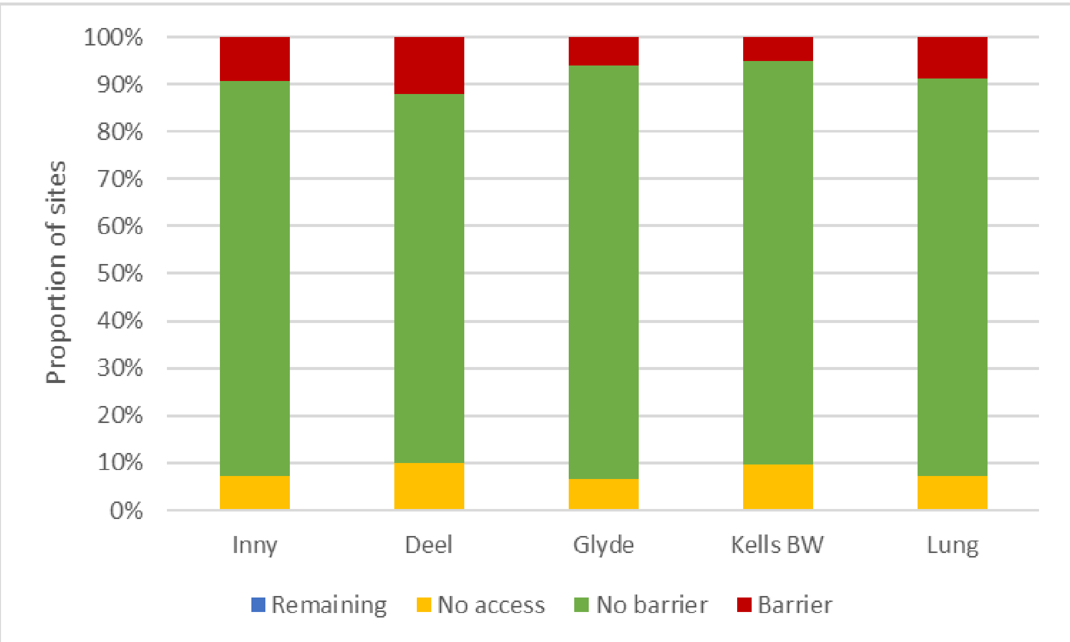


Figure 5.5 Stacked bar chart showing potential barriers and their survey status.

5.4.1 National barrier assessment

At a national scale across all OPW schemes, 913 barriers to fish passage have been identified including the 425 from the above five catchments (Figure 5.6). The high density of access bridges across OPW catchments means there are usually more structures to survey by comparison with non-drainage catchments. Some, but not all, of these structures are inevitably part of the OPW remit with respect to ongoing maintenance. Cataloguing the problems has been a concerted effort by various teams across IFI co-ordinated by the National Barrier Programme. As can be seen from the map, the survey coverage of different catchment areas varies and the catchment-wide efforts completed as part of this cycle of the EREP has very much enriched the dataset. This data is collated annually for the OPW but is also available on IFI's Open Data Portal (IFI, 2023), where it is updated regularly.

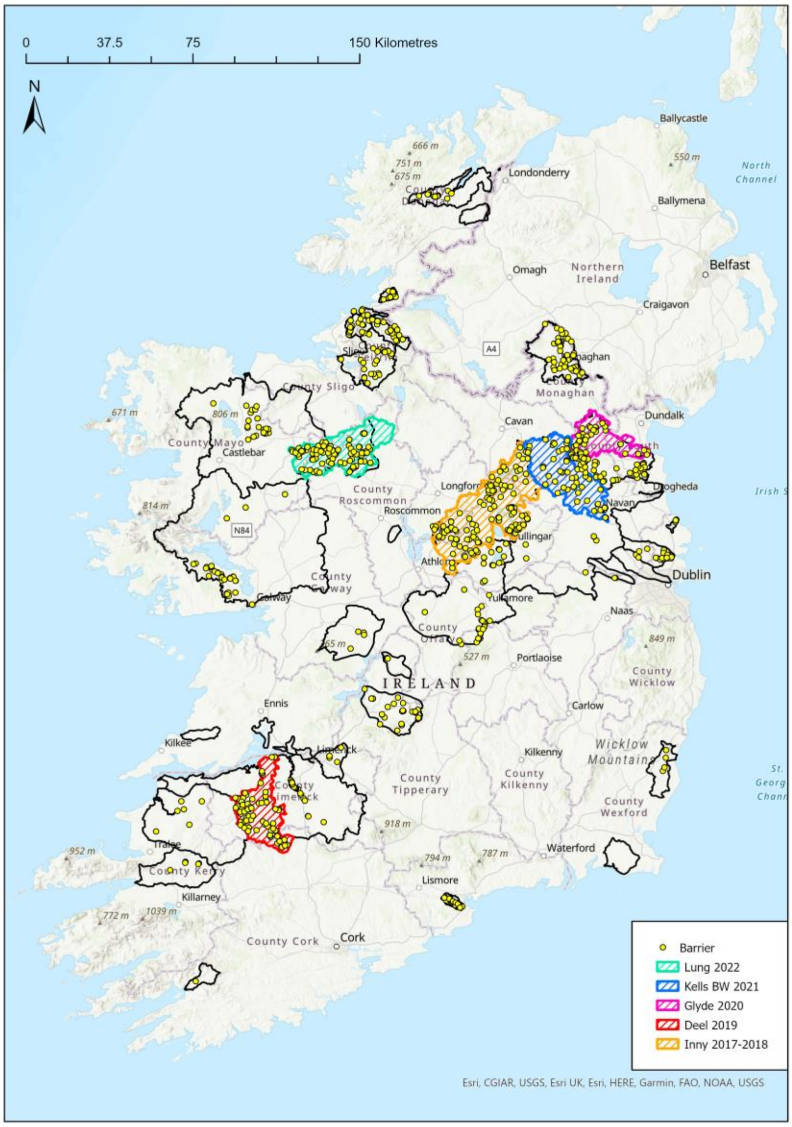
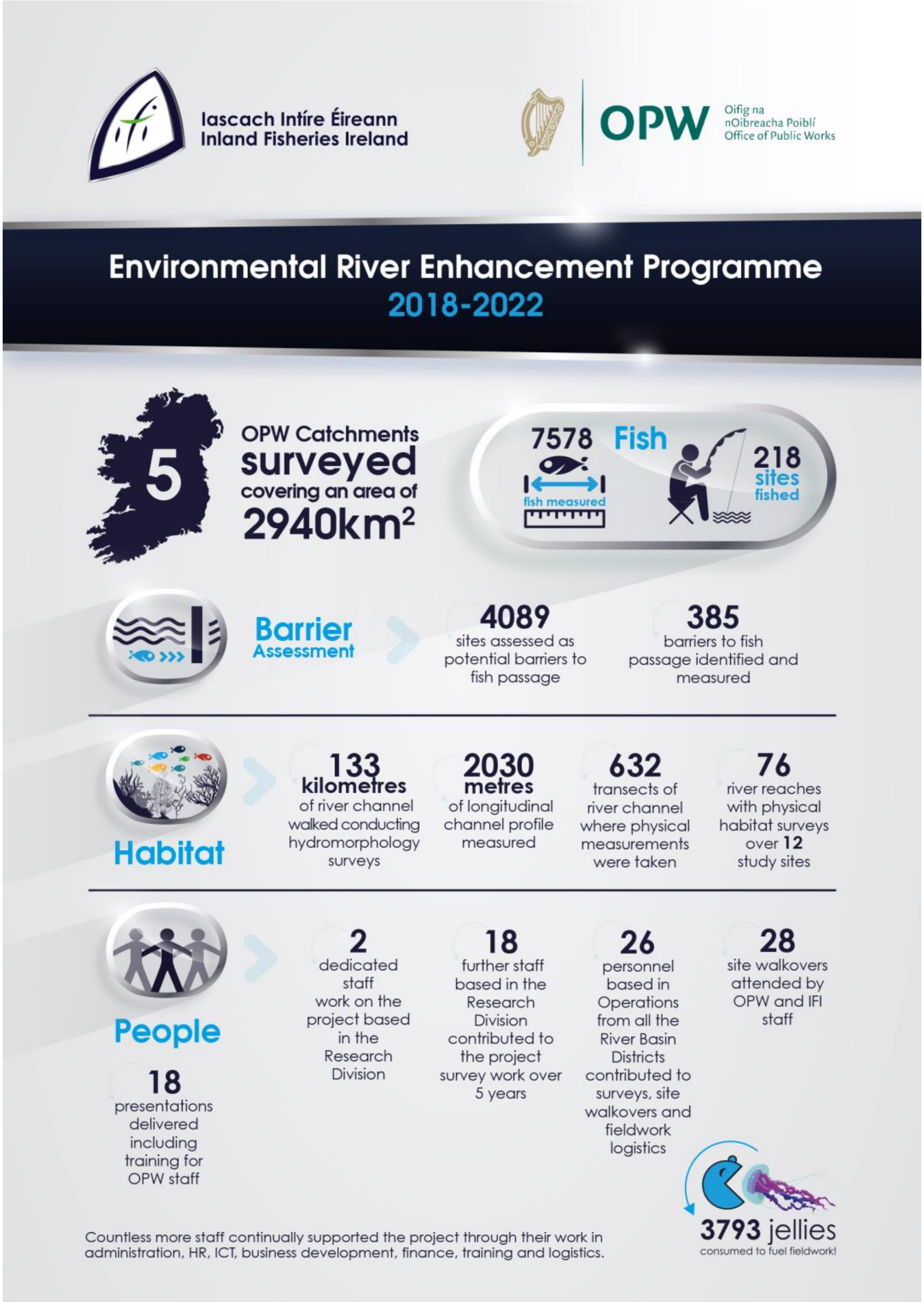


Figure 5.6 Location of barriers in OPW scheme catchments.

6 Conclusion/ summary

The end of the 2018-2022 cycle of the EREP is a time for reflection on the achievements of the programme in the last five years. Metrics summarised below indicate the scope and breadth of the project over a five-year period which was impacted by changes in project personnel and changes to work processes as a result of the pandemic.



Changes in how IFI operate internally has instigated the creation of the Projects Office to focus on enhancement measures, continuing on from work done in previous EREP cycles implementing so-called ‘Capital Works’ to enhance river stretches for fisheries habitat. Data gathered under EREP 2018-2022 cycle is being used by the Projects Office to select sites for future enhancement works, which are planned in collaboration with OPW. As the Projects Office is leading on capital instream projects, we feel the programme needs a name change to reduce any confusion over what we are doing during the coming years. The programme will be renamed to OPW Environmental Research & Monitoring Programme.

The aim for the new cycle is to build and develop on this existing knowledge, and indeed the learnings from previous EREP cycles to promote improvements in biodiversity and habitat in arterially drained catchments. The programme will undergo a change of direction for the 2023-27 cycle, with a specific focus on implementing and assisting OPW with applied measures in the areas of barrier mitigation, implementing enhanced maintenance effectively, soft-engineering, riparian measures and trying to promote a more nuanced approach to management than is currently in place.

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