

Sampling Fish for the Water Framework Directive Summary Report

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Inland Fisheries Ireland



Inland Fisheries Ireland

National Research Survey Programme

Sampling Fish for the Water Framework Directive - Summary Report 2020

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Executive summary

Inland Fisheries Ireland has been assigned the responsibility by the EPA of delivering the fish monitoring requirements of the Water Framework Directive (WFD) in Ireland. In 2020, nine lakes, 44 river sites and one transitional water body were surveyed as part of the national WFD fish surveillance monitoring programme. An additional two lakes, 217 river sites and nine transitional water bodies were surveyed as part of a new index catchment monitoring approach to WFD fish monitoring and to support other IFI projects and programmes. Ecological fish status was assigned to the majority of sites and waterbodies.

All surveys were conducted using a suite of European standard methods, including a range of different net types to sample lakes and transitional waters and a ten-minute electrofishing method (TEF₁₀) for sampling rivers.

Nine fish species were captured across the 11 lakes surveyed in 2020, with brown trout the most abundant species recorded. The FIL2 ecological classification tool was used together with expert opinion to assign fish ecological status to each lake surveyed. Three lakes were assigned a status of High; five lakes were assigned Good; two lakes were assigned as Poor and one lake was assigned as Bad. All lakes had been surveyed previously and when compared to previous result, it was found that seven lakes (64%) had an unchanged ecological status, two (18%) showed an improvement in status, with the remaining two, i.e. Fern and Glencar Loughs (18%) showing a deterioration.

Thirteen fish species were recorded across river sites surveyed in 2020, with brown trout the most abundant species, occurring in 235 out of 261 sites. The FCS2-Ireland ecological classification tool was used together with expert opinion to assign ecological status to each river site. A total of 21 sites were classified as High status, 80 were classified as Good, 110 were classified as Moderate, 44 were classified as Poor and four were classified as Bad. Two sites were unclassified, following a sense check using expert opinion. Of the 259 sites assigned an ecological fish status in 2020, 128 sites had previously been surveyed and classified. Of these the status of 76 (59.3%) sites remained stable between surveys, while 40 (31.3%) sites deteriorated and 12 (9.4%) showed an improved status.

A total of 46 species of fish were captured in the ten transitional waters surveyed in 2020. Sand Goby and Flounder were the most abundant species recorded. Species richness is an important indicator of water quality in transitional waters and both Broad Lough and the Lower Bandon had the highest



species richness with 23 different species recorded. The Upper Bandon had the lowest species richness, recording only four species. The EMFI ecological classification tool, together with expert opinion was used to assign ecological status to each transitional water surveyed. Six transitional waters were classified as Good, three as Moderate and one as Poor.



1. INTRODUCTION

In December 2000, the European Union introduced the Water Framework Directive (WFD) (2000/60/EC) as part of a new standardised approach for all Member States to manage their water resources and to protect aquatic ecosystems. The WFD was transposed into Irish Law in December 2003 (Water Regulations S.I. No. 722 of 2003).

The fundamental objective of the WFD is to protect and maintain the status of waters that are already of good or high quality, to prevent any further deterioration and to restore all waters that are impaired so that they achieve at least good ecological status by 2027 and to ensure long term sustainable use.

Ireland is currently in its second cycle of its River Basin Management Plans (RBMPs). These RBMPs outline the approach governments will take to protect national waters. The first RBMP cycle ran from 2009-2014, the second cycle from 2015-2021 and the third cycle will run from 2022-2027.

A key step in the WFD process is for EU Member States to assess the health of their surface waters through national monitoring programmes. Classification tools are the main instruments used to classify the status (High, Good, Moderate, Poor or Bad) of each water body (section of a river or other surface water). Once each country has determined the current status of their water bodies, ongoing monitoring helps to track the effectiveness of measures needed to clean up water bodies and achieve good status. The responsibility for monitoring fish has been assigned to Inland Fisheries Ireland (IFI) by the EPA (EPA, 2006 and 2021). A national fish stock surveillance monitoring programme has been conducted since 2007 at specified locations. The monitoring programme encompasses lakes, rivers and transitional waters (estuaries and lagoons) and provides information on the status of fish species present in these water bodies as well as on their abundance, growth patterns, and population demographics. The river fish monitoring programme is currently being updated to follow an index catchment approach that will provide a more comprehensive overview of the health of fish stocks in each catchment for both IFI, the EPA and other stakeholders. For transitional waters the programme will be similarly updated to rationalise monitoring activity and to include waterbodies with substantive deterioration in status.

Despite the COVID-19 pandemic and the resulting restrictions and lockdowns, the WFD fish surveillance monitoring programme in 2020 was successful in targeting selected waterbodies; nine lakes, 43 river sites and one transitional water body were surveyed nationwide. An additional two lakes, 218 river sites and nine transitional water bodies were surveyed as part of a new index catchment monitoring approach to WFD fish monitoring and for other IFI projects and programmes.

All necessary measures and precautions were taken to ensure the health and safety of staff, with a number of risk assessments carried out and standard operating procedures drawn up prior to commencement. A team of IFI staff carried out the monitoring surveys (scientists from the Research Division). The surveys were conducted using a suite of European standard methods; electric fishing is the main survey method used in rivers, with various netting techniques used in both lakes and estuaries. Field survey work was conducted from June to October, which is the optimum time for sampling fish in Ireland.

This report summarises the main findings of the fish stock surveys in all water bodies (lakes, rivers and transitional waters) surveyed in 2020 and reports the current ecological status of the fish stocks in each.

Detailed reports on all water bodies surveyed are available to download on the dedicated WFD fish website (www.wfdfish.ie).

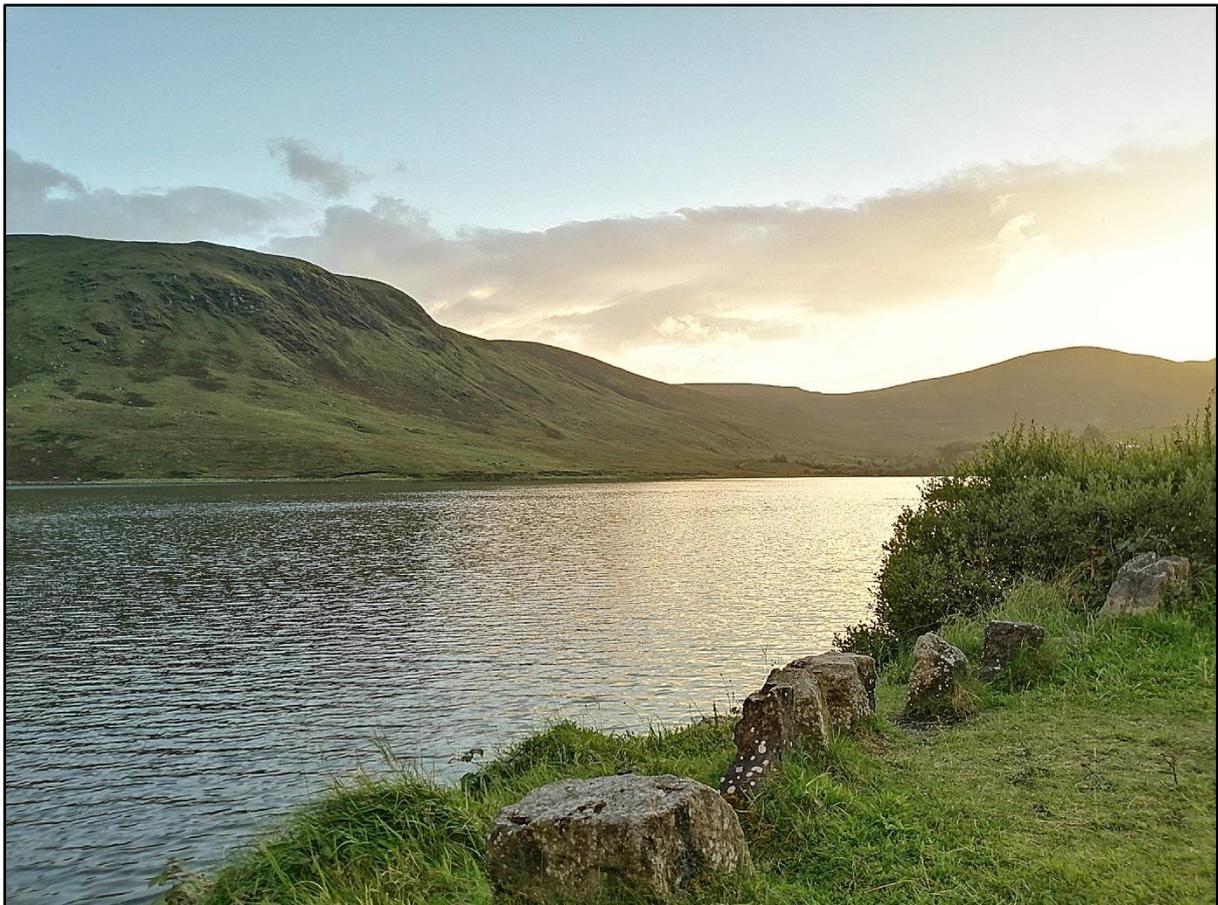


Plate 1.1 Lough Talt, Co. Sligo (WRBD) surveyed in 2020 as part of the WFD fish surveillance monitoring programme.



2. STUDY AREA

Inland Fisheries Ireland is organised based on six River Basin Districts (RBDs), the Eastern RBD (ERBD), South Eastern RBD (SERBD), South Western RBD (SWRBD), Western RBD (WRBD), the Shannon RBD (SHRBD) and the North Western RBD (NWRBD). Surveys were carried out in all six RBDs during 2020 (Fig. 2.1). For ease of navigation through the report the results are presented as surveillance monitoring (SM) or additional value (AV) sites (Fig. 2.1). Additional value sites were surveyed to provide a more comprehensive overview of fish ecological status in each waterbody or catchment and to support other projects and programmes.

2.1 Lakes

Eleven lakes were surveyed between the 17th of August and the 30th of September 2020. Two lakes were in the SWRBD, five in the WRBD and four in the NWRBD (Fig. 2.1). In total, nine of the lakes surveyed were surveillance monitoring waterbodies (SM). These SM waterbodies are normally surveyed on a three-year rolling cycle as part of the WFD programme, but there are some exceptions to this rule that have been agreed with the Environmental Protection Agency. Two additional lakes were surveyed as part of IFI's ongoing Owenriff Fish Population Rehabilitation Plan (IFI, 2018); one of these lakes is also on the WFD operational monitoring programme. These latter sites are presented as additional value (AV) sites (Table 4.2, Fig. 2.1).

2.2 Rivers

A total of 261 sites were surveyed between the 30th of June and 30th of September 2020. A total of 15 river sites were surveyed in the ERBD, 151 in the SERBD, 25 sites in the SHRBD, 6 in the SWRBD, 58 in the WRBD and six in the NWRBD. Of these sites 44 were surveillance monitoring sites (SM). The remaining 217 sites were additional value sites (AV) of which 29 of these sites were located within surveillance monitoring waterbodies. These AV sites were surveyed to give a more comprehensive overview of catchment health (Table 4.4 and Fig. 2.1).

2.3 Transitional waters

Ten transitional water bodies were surveyed between the 1st of September and 20th of October 2020. Four transitional water bodies were surveyed in the ERBD, two in the SERBD and four in the SWRBD. One of the transitional waters surveyed was a WFD SM waterbody. The remaining nine transitional water bodies were surveyed as part of IFI's marine survey programme. The results of these surveys are presented in this report as AV waterbodies (Table 4.5 and Fig. 2.1).

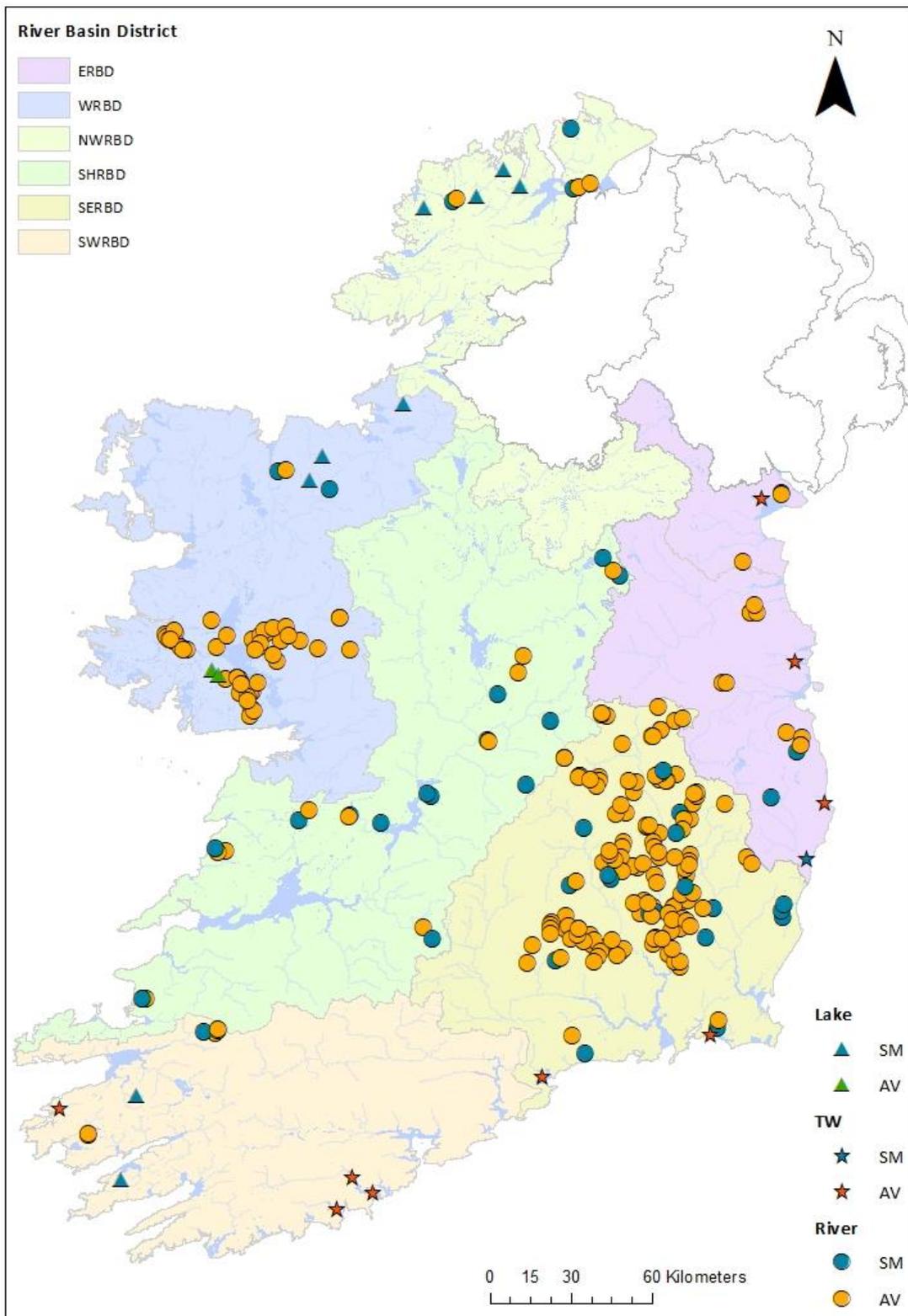


Fig. 2.1. Location of WFD fish surveillance monitoring (SM) and additional value (AV) surveys carried out on lakes, rivers and transitional waters (TW) from June to October 2020.

3. METHODS

All surveys were conducted using a suite of European standard methods (CEN, 2003; CEN, 2005a; CEN, 2015) and IFI standard operating protocols. Electrofishing is the main survey method used in rivers, while a multi-method netting approach is used in both lakes and transitional waters.

Procedures are required for disinfection of equipment to prevent dispersal of alien species and other organisms to uninfected waters. A standard operating procedure was compiled by Inland Fisheries Ireland for this purpose (Caffrey, 2010) and is followed by staff in IFI when moving between water bodies.

3.1 Lakes

Lake water bodies were surveyed using a netting method developed and tested during the NSSHARE Fish in Lakes Project 2005-2006 (Kelly *et al.*, 2007a and 2008) and updated during a recent method intercalibration exercise (Connor *et al.*, 2017). The method is based on the European CEN standard for sampling fish with multi-mesh monofilament survey gill nets (12 panel, 5-55mm mesh size) using a stratified random sampling design (CEN, 2015). However, the netting effort has been reduced (approximately 50%) for Irish lakes to minimise damage to fish stocks. Each lake is divided into depth strata (0-2.9m, 3-5.9m, 6-11.9m, 12-19.9m, 20-34.9m, 35-49.9m, 50-75m, >75m) and random sampling was then conducted within each depth stratum (CEN, 2015). Surface floating multi-mesh monofilament survey gill nets, fyke nets (one unit comprised of three fyke nets; leader size 8m x 0.5m) and single panel large mesh multifilament braided gill nets are also used to supplement the CEN standard gill netting effort.

All fish apart from perch were measured and weighed on site and scales were removed from all brown trout and salmon. Live fish were returned to the water whenever possible (i.e. when the likelihood of their survival was considered to be good). Samples of fish were retained for further analysis.



Plate 3.1 Retrieving a net from Lough Beagh, Co. Donegal (NWRBD).

3.2 Rivers

Electrofishing is the method of choice to obtain a representative sample of the fish assemblage in rivers. It is a well-established technique used by fishery biologists globally for sampling fish and is generally the most non-destructive, effective and cost-efficient means of sampling. This technique complies with European Committee for Standardisation (CEN) guidelines for fish stock assessment in wadeable rivers (CEN, 2003). All river sites were surveyed using the 10-minute timed electrofishing (TEF₁₀) method (Matson *et al.*, 2018).

The TEF₁₀ electric-fishing method is a qualitative procedure and involves two operators. The equipment consisted of one portable generator (220/240V) with an appropriate control unit (DC converter) or electrofishing backpack, a cathode and an anode. Electrofishing took place by wading in a zigzag manner in an upstream direction for exactly ten minutes at a steady pace (Matson *et al.*, 2018).

All fish were counted and measured on site. A sub sample of scales was taken from salmonids for age analysis in the laboratory.

An evaluation of habitat quality is critical to any assessment of ecological integrity. A simple habitat assessment was carried out at each site. General physical characteristics of the site were recorded, with reference being made to river typology, land use, river pressures, riparian and bank vegetation and instream features such as habitat type, flow type, and substrate type. Wetted width and depth were measured at five transects at each site, with five depth intervals across each transect. Chemical parameters recorded included water temperature ($^{\circ}\text{C}$) and conductivity ($\mu\text{S}/\text{cm}$).



Plate 3.2 Habitat assessment at Rathanna Br. on the Mountain River, Co. Carlow (River Barrow catchment).

3.3 Transitional waters

Transitional waters (estuaries/lagoons) are an interface habitat, where freshwater flows from rivers and mixes with the tide and salinity of the sea. As such, they provide a challenging habitat to survey

due to their constantly changing environmental conditions. In every 24-hour period, the tidal level rises and falls twice, subjecting extensive areas to inundation and exposure.

Wightman *et al.* (2020), describes the multi-method approach, including the use of beach-seine netting, beam trawling and setting fykes nets, utilised by IFI staff to survey transitional waters in 2020. A modified beach-seine net was used in 2020 to increase efficiency and to ensure compliance with COVID-19 restricted working conditions.



Plate 3.3 Aerial view of the Argideen Estuary (Photo courtesy of IFI and No. 3 Operational Wing, Irish Air Corps (Aer Chór na hÉireann)).

3.4 Fish ecological status

An essential step in the WFD monitoring process is the classification of the ecological status of lakes, rivers and transitional waters. These assist in identifying the objectives that must be set in the individual River Basin Management Plans (RBMPs).

Three fish ecological classification tools have been developed to assign status to fish stocks in Irish lakes, rivers and transitional waters for WFD purposes. The Fish in Lakes (FIL2) ecological classification tool was used to assign ecological status to lakes surveyed in 2020 (Kelly *et al.*, 2012). An ecological classification tool for fish in rivers (Fisheries Classification Scheme 2 (FCS2-Ireland)) was developed in

2011 to assign ecological status to fish in rivers for the Republic of Ireland and Northern Ireland along with a separate version for Scotland (SNIFFER, 2011). The Estuarine Multi-Metric Fish Index (EMFI) developed in 2013, was used to assign status to transitional water bodies (Harrison and Kelly, 2013).



Plate 3.4 Lakeside view of Glencar Lough Co. Sligo (WRBD).



4. RESULTS

4.1 Lakes

4.1.1 Fish species distribution and abundance

A total of nine fish species (sea trout are included as a separate “variety” of trout) were recorded across the lakes surveyed during 2020 (Table 4.1). Eels and brown trout had the widest distribution, occurring in all 11 lakes surveyed (100%). This was followed by salmon, recorded in 45.5%, Arctic char (36.4%), minnow (36.4%), three-spined stickleback (18.2%), pike (18.2%), perch (18.2%), sea trout (9.1%) and flounder (9.1%) (Table 4.1).

Table 4.1. Fish species recorded in lakes surveyed in 2020

	Scientific name	Common name	Number of lakes	% of lakes
1	<i>Anguilla anguilla</i>	European eel	11	100
2	<i>Salmo trutta</i>	Brown trout	11	100
3	<i>Salmo salar</i>	Atlantic salmon	5	45.5
4	<i>Salvelinus alpinus</i>	Arctic char	4	36.4
5	<i>Phoxinus phoxinus</i>	Minnow	4	36.4
6	<i>Gasterosteus aculeatus</i>	Three-spined stickleback	2	18.2
7	<i>Perca fluviatilis</i>	Perch	2	18.2
8	<i>Esox lucius</i>	Pike	2	18.2
9	<i>Salmo trutta</i>	Sea trout*	1	9.1
10	<i>Platichthys flesus</i>	Flounder	1	9.1

Note: *sea trout are included as a separate "variety" of trout.

The distribution and abundance of the most common fish species captured amongst all lakes surveyed in 2020 is shown in Figures 4.2 to 4.9. Species abundance was recorded as Catch-Per-Unit-Effort (CPUE), which is the number of fish per metre of survey net (fish/m). In addition to the species displayed in the figures, sea trout were captured on Lough Beagh and flounder were captured on Glencar lough.

Brown trout was the most abundant species captured during the 2020 survey season and the dominant species in eight of the 11 lakes surveyed (Fig 4.2). The highest CPUE recorded for brown trout was in Lough Acoose, with a value of 0.665 fish/m of net. Perch were recorded as the most dominant species in one lake, Lough Fern, with a CPUE value of 2.836 fish/m of net (Fig 4.6).

Low numbers of fish were captured in Loughs Bofin and Agraiffard, where eels and pike were the most abundant species respectively.



4.1.2 Ecological status - Classification of lakes using 'FIL2'

All 11 lakes surveyed in 2020 were assigned a draft fish ecological status class using the FIL2 ecological classification tool, together with expert opinion. Three were classified as High ecological status, five as Good, two as Poor and one as Bad (Table 4.2, Figure 4.1).

Of the 11 lakes surveyed in 2020, all 11 had previously been sampled and assigned a fish ecological status. Seven lakes (64%) had an unchanged ecological status, two (18%) showed an improvement in status, with the remaining two, i.e. Fern and Glencar Loughs (18%) showing a deterioration.

Table 4.2 Summary details and fish ecological status of lakes surveyed for the WFD fish surveillance monitoring programme.

Lake name	WFD Code	Survey type	Catchment	FIL2 Typology	Area (ha)	Previous Status	2020 status
SWRBD							
Acoose	SW_22_208	SM	Caragh	2	66.3	G (2017)	Good
Glenbeg	SW_21_444	SM	Coastal	2	66.2	G (2017)	Good
NWRBD							
Anure	NW_38_83	SM	Gweedore	1	133.1	G (2015)	Good
Beagh	NW_38_80a	SM	Lackagh	2	259.0	H (2017)	High
Fern	NW_39_13	SM	Leannan	1	181.0	P (2017)	Bad
Glen	NW_38_22	SM	Lackagh	1	167.7	H (2016)	High
WRBD							
Bofin	WE_30_335	AV	Corrib	1	92.0	B (2017)	Poor
Agraffard	WE_30_334	AV	Corrib	1	29.0	B (2017)	Poor
Easky	WE_35_136	SM	Easky	1	118.7	G (2017)	Good
Talt	WE_34_405	SM	Moy	4	96.9	H (2017)	High
Glencar	WE_35_139	SM	Drumcliff	4	114.6	H (2013)	Good

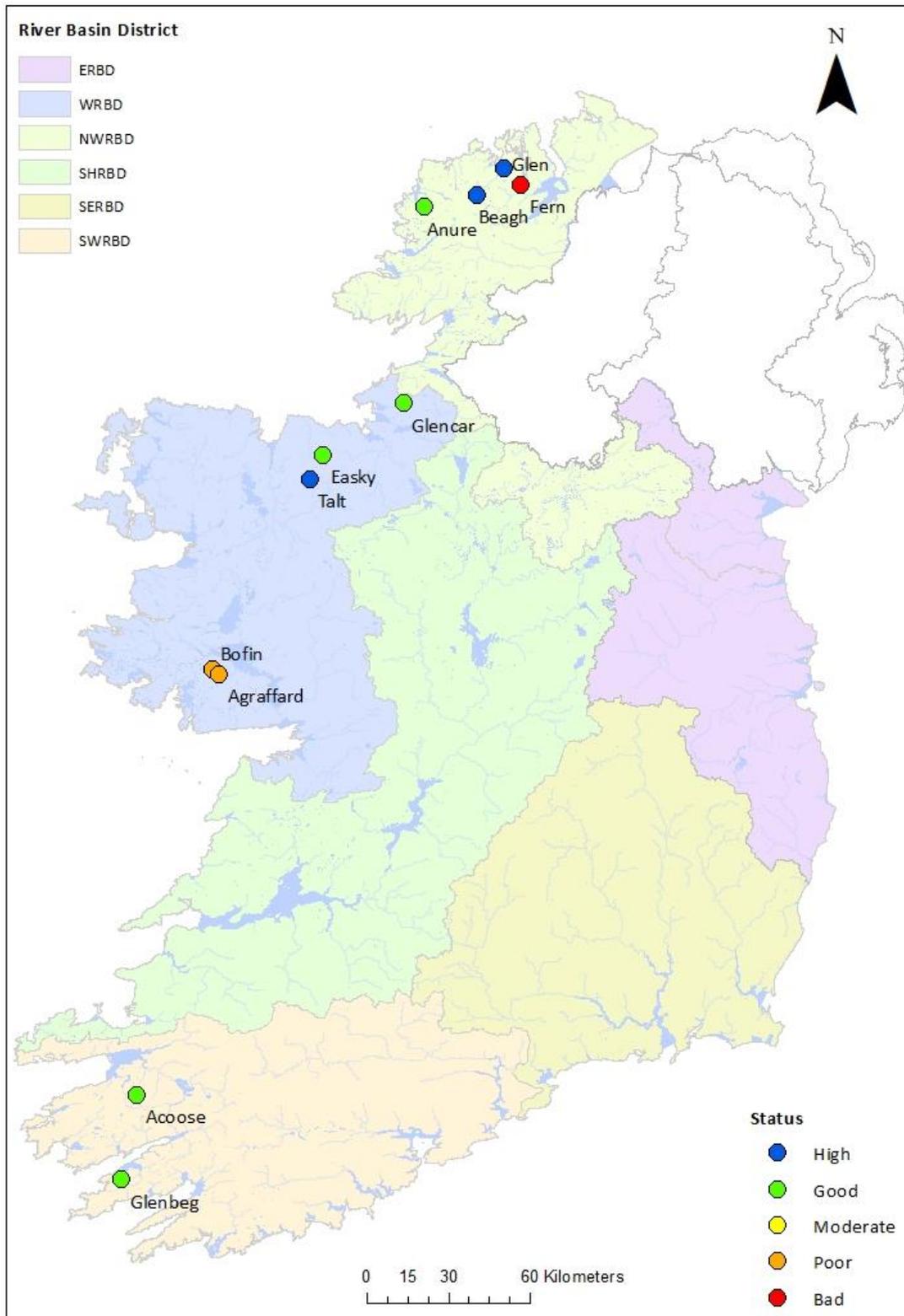


Fig. 4.1. Fish ecological status of lakes surveyed during 2020. Status was assigned using the FIL2 ecological classification tool.



Plate 4.1 Releasing a brown trout on Glenbeg Lough (SWRBD).



Plate 4.2 Electrofishing on the Triogue River, Co. Laois (SERBD).



4.2 Rivers

4.2.1 Fish species distribution and abundance

A total of 13 fish species (sea trout are included as a separate “variety” of trout) were recorded across the river sites surveyed in 2020 (Table 4.3). Brown trout had the widest distribution, occurring in 235 out of the 261 sites surveyed (90%). This was followed by salmon recorded at 134 sites (51.3%), three-spined stickleback at 85 sites (32.6%), stone loach at 73 sites (28.0%), minnow at 52 sites (19.9%), eels at 46 sites (17.6%), lamprey at 35 sites (13.4%), pike at seven sites (2.7%), dace at five sites (1.9%), perch and roach at three sites each (1.2%) and nine-spined stickleback, sea trout and gudgeon at two sites (0.8%) each (Table 4.3).

Brown trout fry (0+) and 1+ and older were recorded at 204 sites (76%) in 2020. Salmon fry (0+) were captured at 112 sites (43%) and salmon parr (1+ and older) were caught at 109 sites (41%).

Table 4.3. Fish species recorded in river sites surveyed in 2020. Age cohorts for brown trout and salmon ate also shown.

	Scientific name	Common name	Number of river sites	% river sites
1	<i>Salmo trutta</i>	Brown trout (all age classes)	235	90.0
		Brown trout 0+	204	76.0
		Brown trout 1+ and older	204	76.0
2	<i>Salmo salar</i>	Salmon (all age classes)	134	51.3
		Salmon 0+	112	43.0
		Salmon 1+ and older	109	41.0
3	<i>Gasterosteus aculeatus</i>	Three-spined stickleback	85	32.6
4	<i>Barbatula barbatula</i>	Stone loach	73	28.0
5	<i>Phoxinus phoxinus</i>	Minnow	52	19.9
6	<i>Anguilla anguilla</i>	European eel	46	17.6
7	<i>Lampetra sp.</i>	Lamprey sp.	35	13.4
8	<i>Esox lucius</i>	Pike	7	2.7
9	<i>Leuciscus leuciscus</i>	Dace	5	1.9
10	<i>Perca fluviatilis</i>	Perch	3	1.2
11	<i>Rutilus rutilus</i>	Roach	3	1.2
12	<i>Pungitius pungitius</i>	Nine-spined stickleback	2	0.8
13	<i>Salmo trutta</i>	Sea trout*	2	0.8
14	<i>Gobio gobio</i>	Gudgeon	2	0.8

Note: *sea trout are included as a separate "variety" of trout.



The distribution and abundance of the most common fish species captured amongst all river sites surveyed in 2020 is shown in Figures 4.2 to 4.8 and 4.10 to 4.13. Abundance was recorded as fish density, the number of fish per meter² of the site. In addition to the species displayed, sea trout were captured at two sites, nine-spined stickleback were captured at two sites and gudgeon were recorded at two sites.

Brown trout was the most abundant species recorded in rivers in 2020, occurring at 235 sites (Fig. 4.2). The Funshinaug site on Ballynalty River, in the Corrib catchment, had the highest density recorded with 1.43 fish/m². This site also recorded the highest density of brown trout fry (1.21 fish/m²). Goats Br. on the Little Arrigle River (River Nore catchment) in the SERBD, had the highest density of 1+ & older brown trout (0.70 fish/m²).

Salmon were widely distributed occurring at 134 sites (Fig 4.3). The highest density of salmon, 1.25 fish/m², was found at Priests valley on the Duiske River which is located within the River Barrow catchment in the SERBD. The highest density of salmon fry (0.97 fish/m²) was also recorded at the Priests valley site. Peigs Lane on the Duiske River, also in the River Barrow catchment had the highest density (0.49 fish/m²) of salmon parr.

European eels were captured at 46 sites (Fig 4.4). The highest eel density, 0.1 fish/m², was recorded at Ballymurphy on the Clashganny River, River Barrow catchment.

Pike were captured at seven sites (Fig 4.5). The highest density of pike, 0.02 fish/m², was recorded on the Ballyfinboy River (Bridge just upstream of Lough Derg) in the SHRBD.

Perch were captured at three sites (Fig 4.6). Inghid Bridge on the Moyree River, in the River Fergus catchment in the SHRBD had the highest density of perch, 0.01 fish/m².

Minnow were present at 52 sites surveyed in 2020 (Fig 4.7). The highest density of minnow, 0.66 fish/m² was found at Gales Br. on the Douglas River in the River Barrow catchment.

Three-spined stickleback were widely distributed occurring at 85 sites in 2020 (Fig 4.8). Fuer Bridge on the Douglas River in the River Barrow catchment had the highest density of three-spined stickleback with 2.73 fish/m². Nine-spined stickleback were recorded at two sites. One fish was captured in the WRBD on the Tobercurry River, Co. Sligo. A single nine-spined stickleback was also captured on the Burren River at Ullard Bridge, Co. Carlow in the River Barrow catchment.

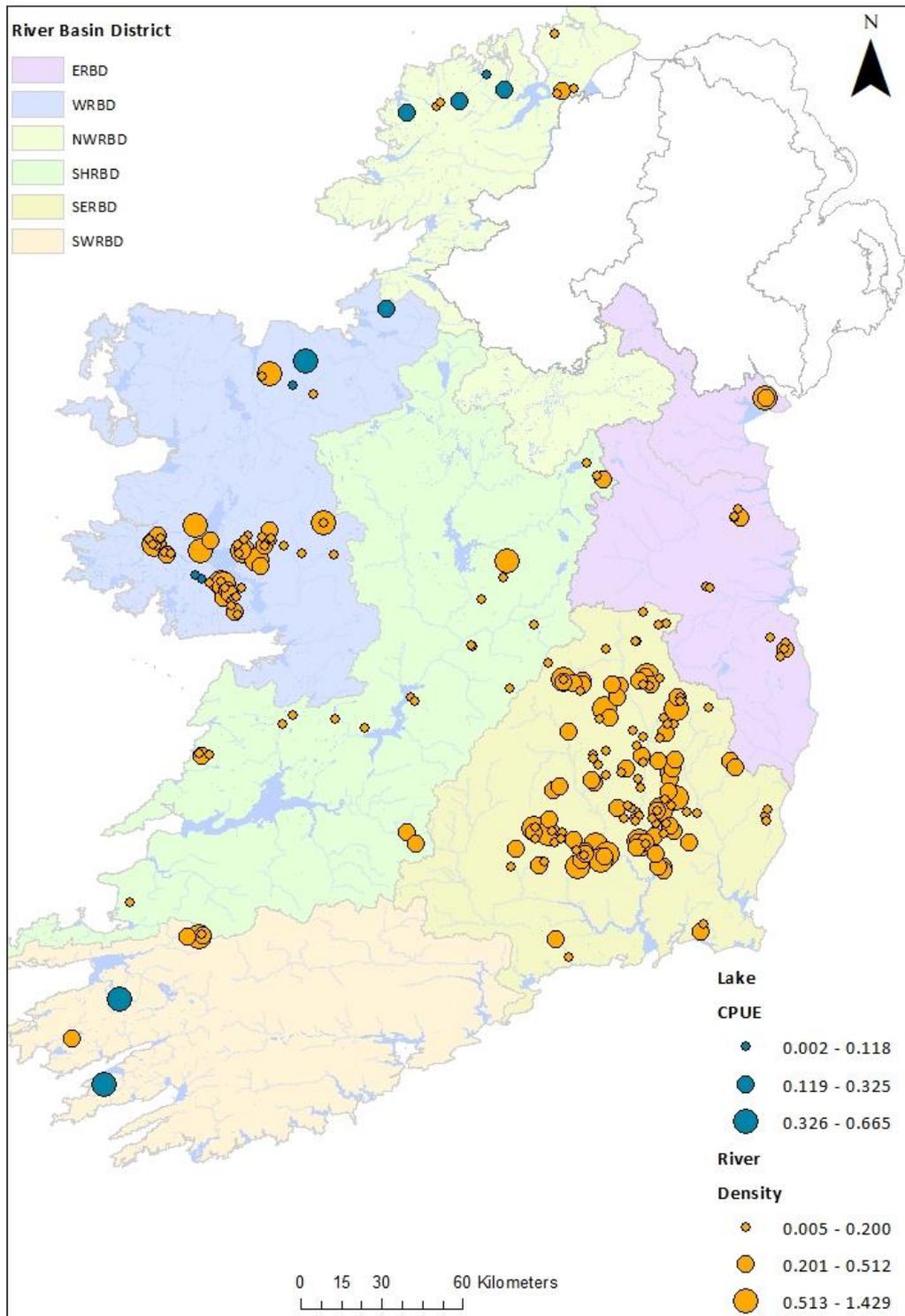


Fig. 4.2. Brown trout distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note CPUE and density are not comparable).

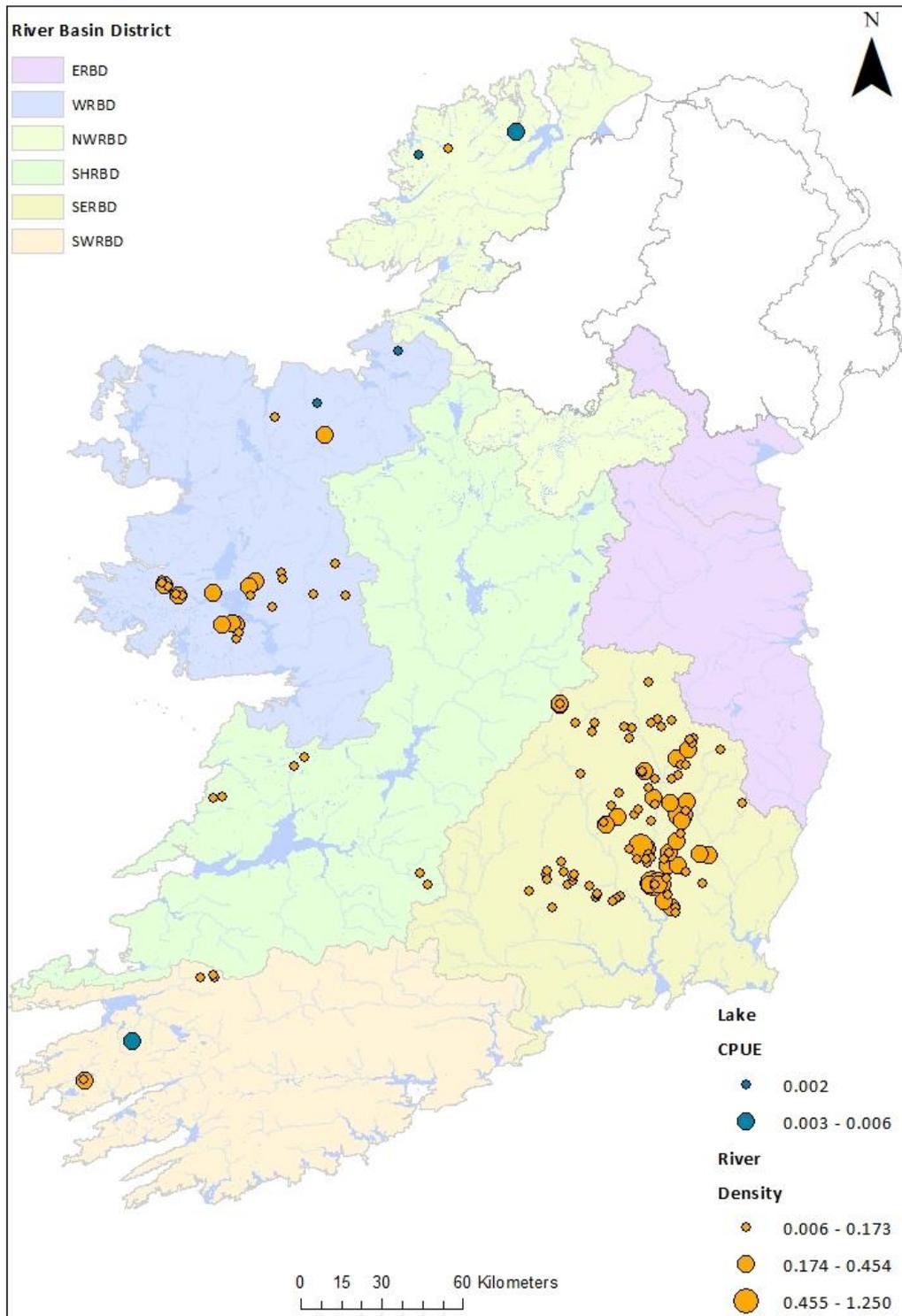


Fig. 4.3. Atlantic salmon distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note CPUE and density are not comparable).

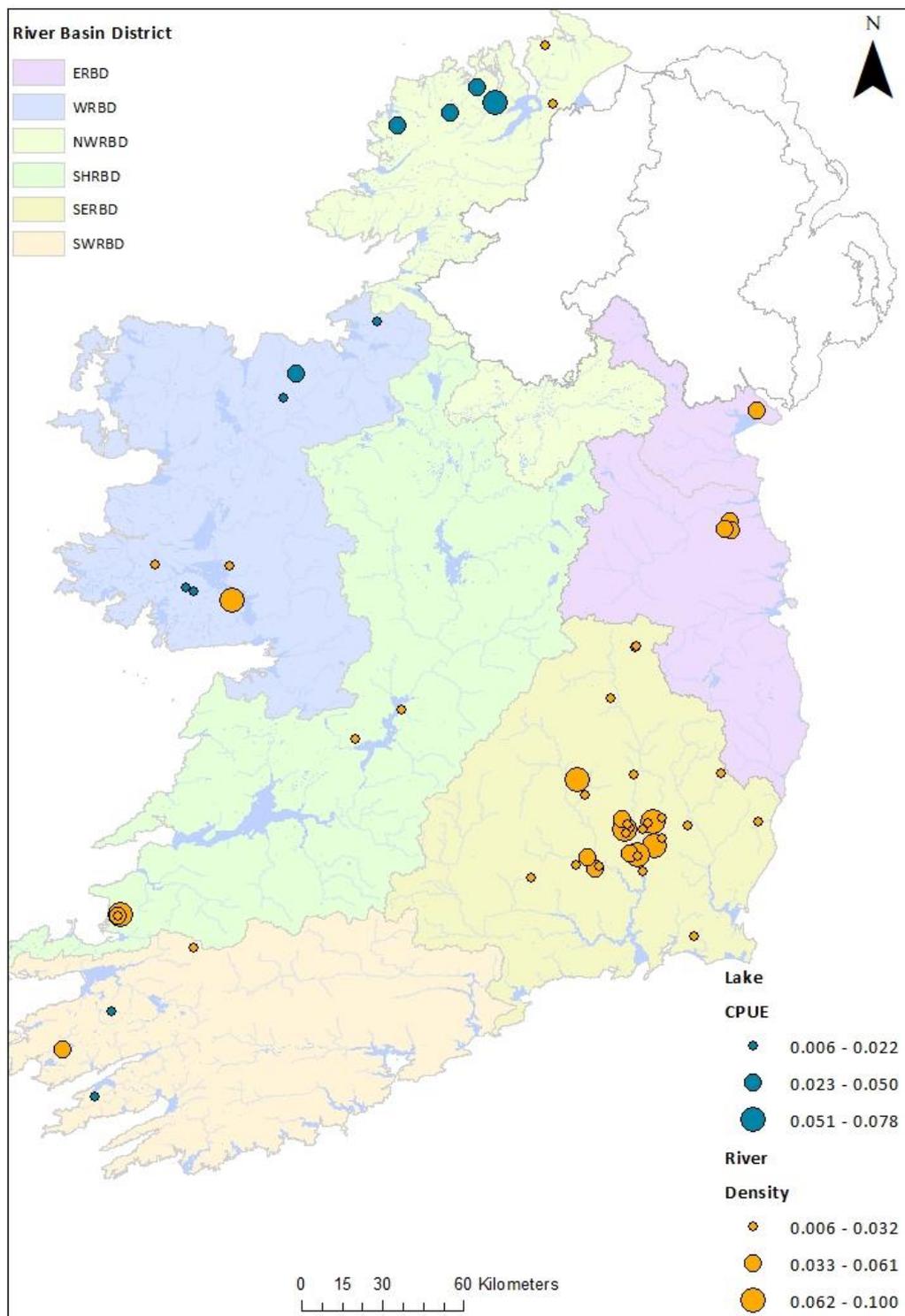


Fig. 4.4. European eel distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note – CPUE and density are not comparable).

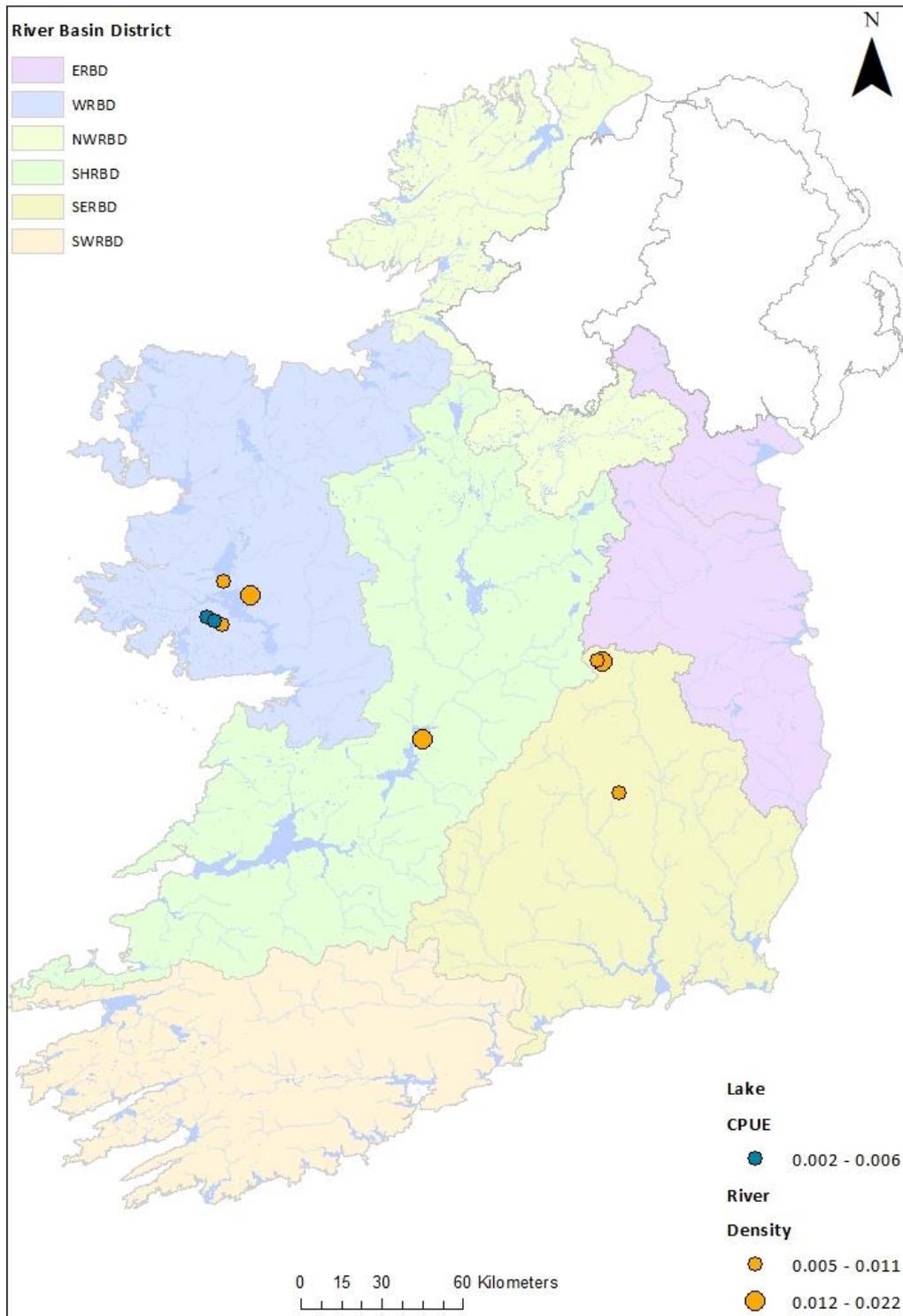


Fig. 4.5. Pike distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note CPUE and density are not comparable).

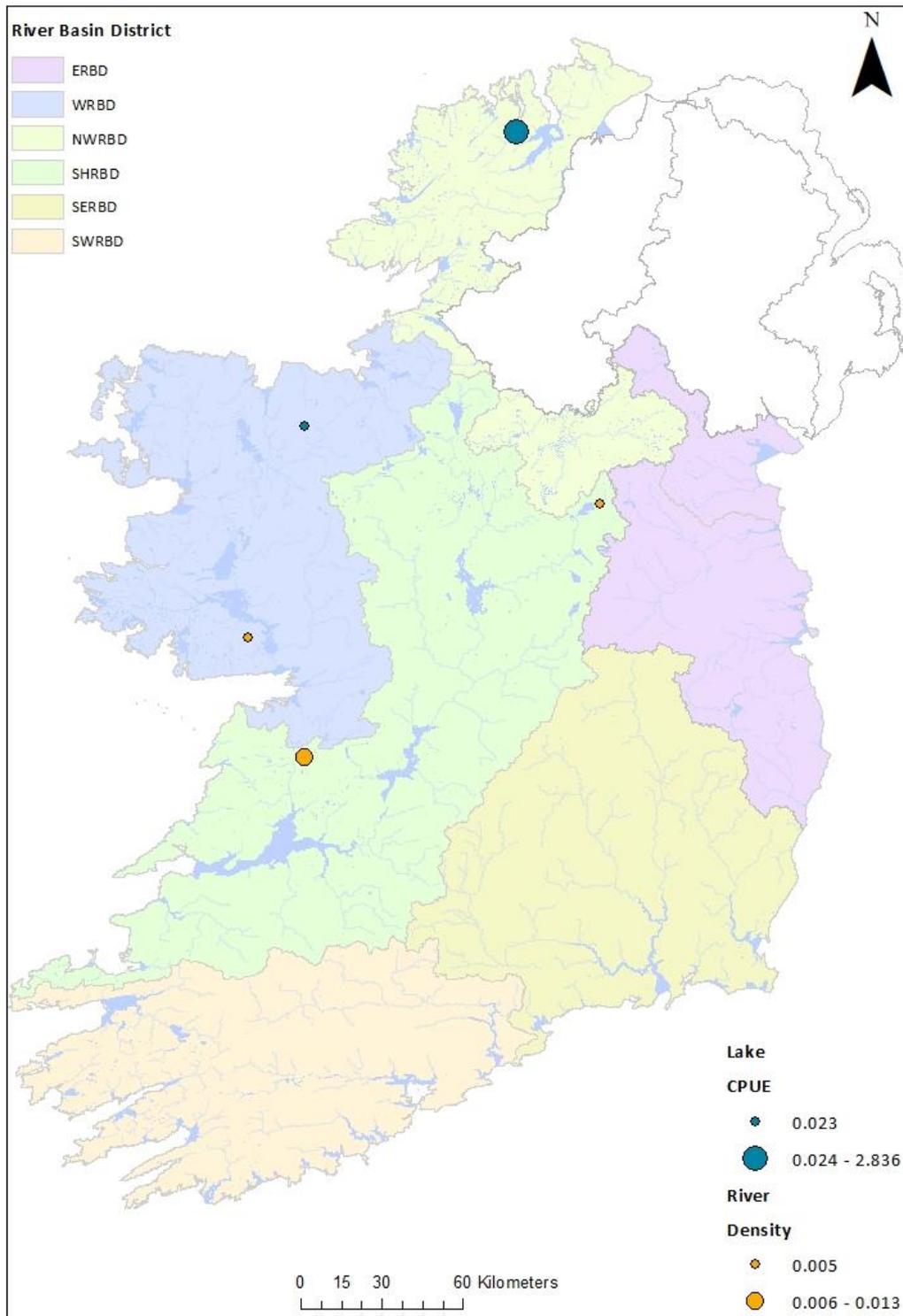


Fig. 4.6. Perch distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note CPUE and density are not comparable).

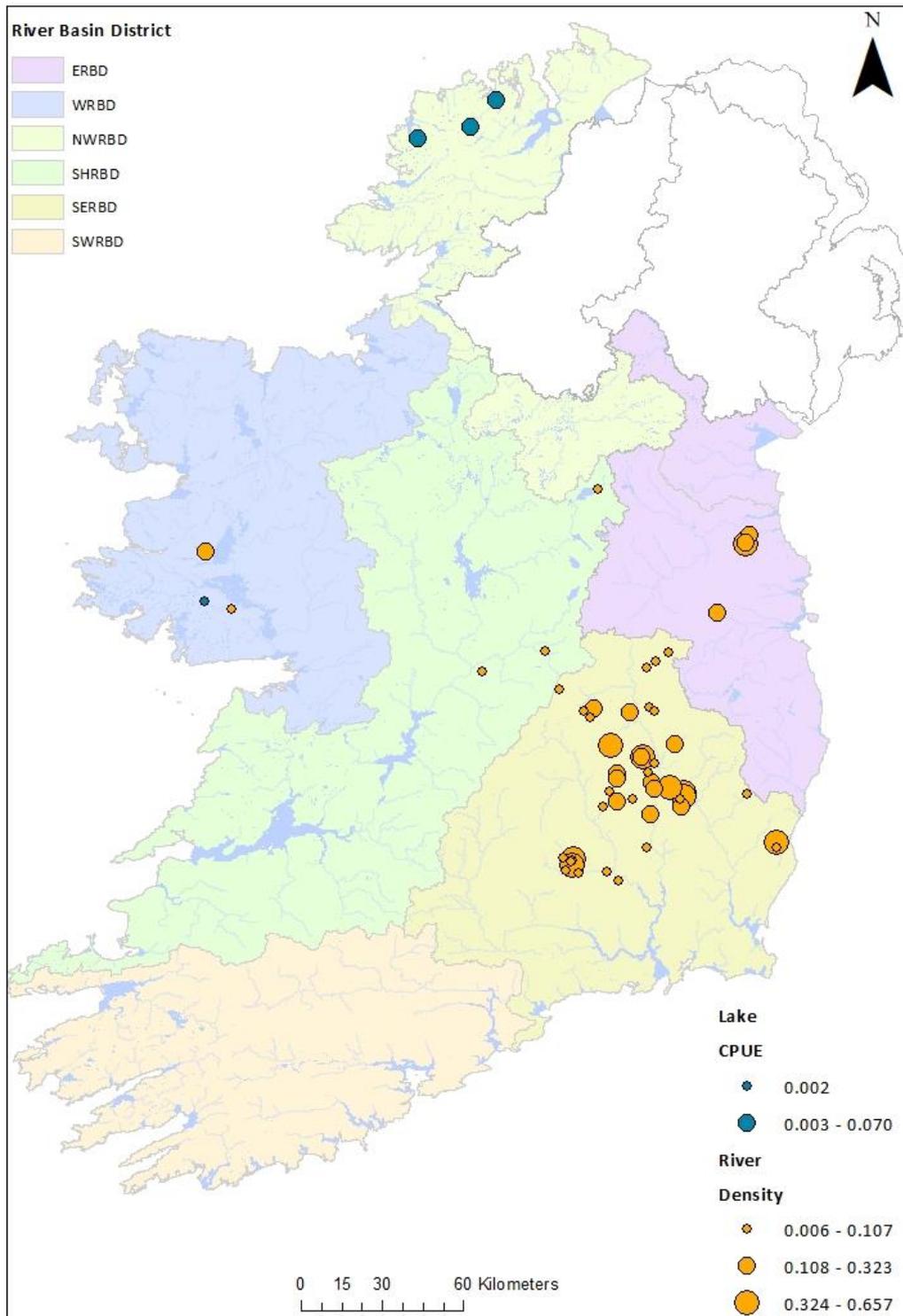


Fig. 4.7. Minnow distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. (Note CPUE and density are not comparable).

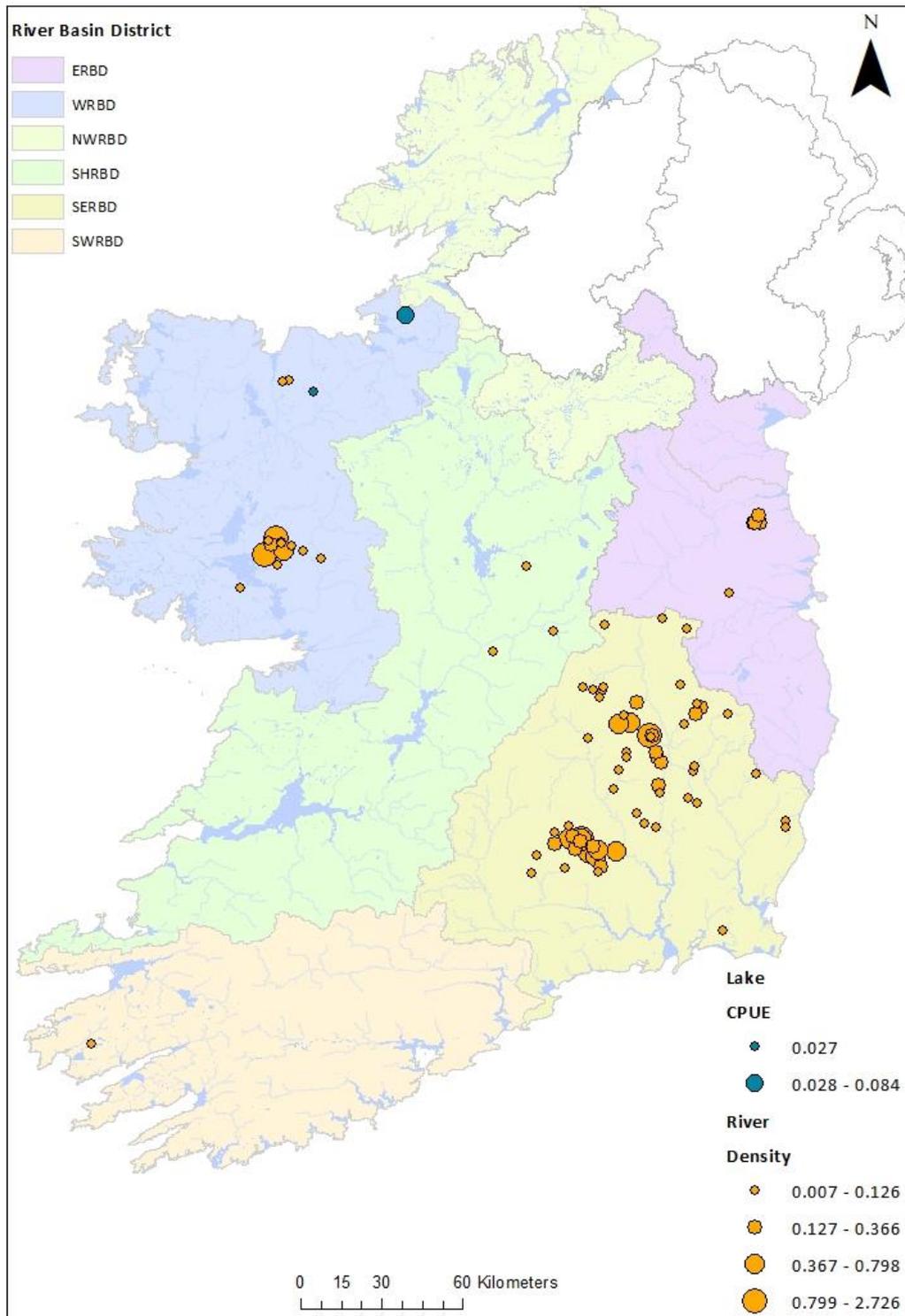


Fig. 4.8. Three-spined stickleback distribution and abundance in lakes (CPUE (No. fish/m net)) and rivers (Density (No. fish/m²)) surveyed for WFD fish monitoring during 2020. Note CPUE and density are not comparable.

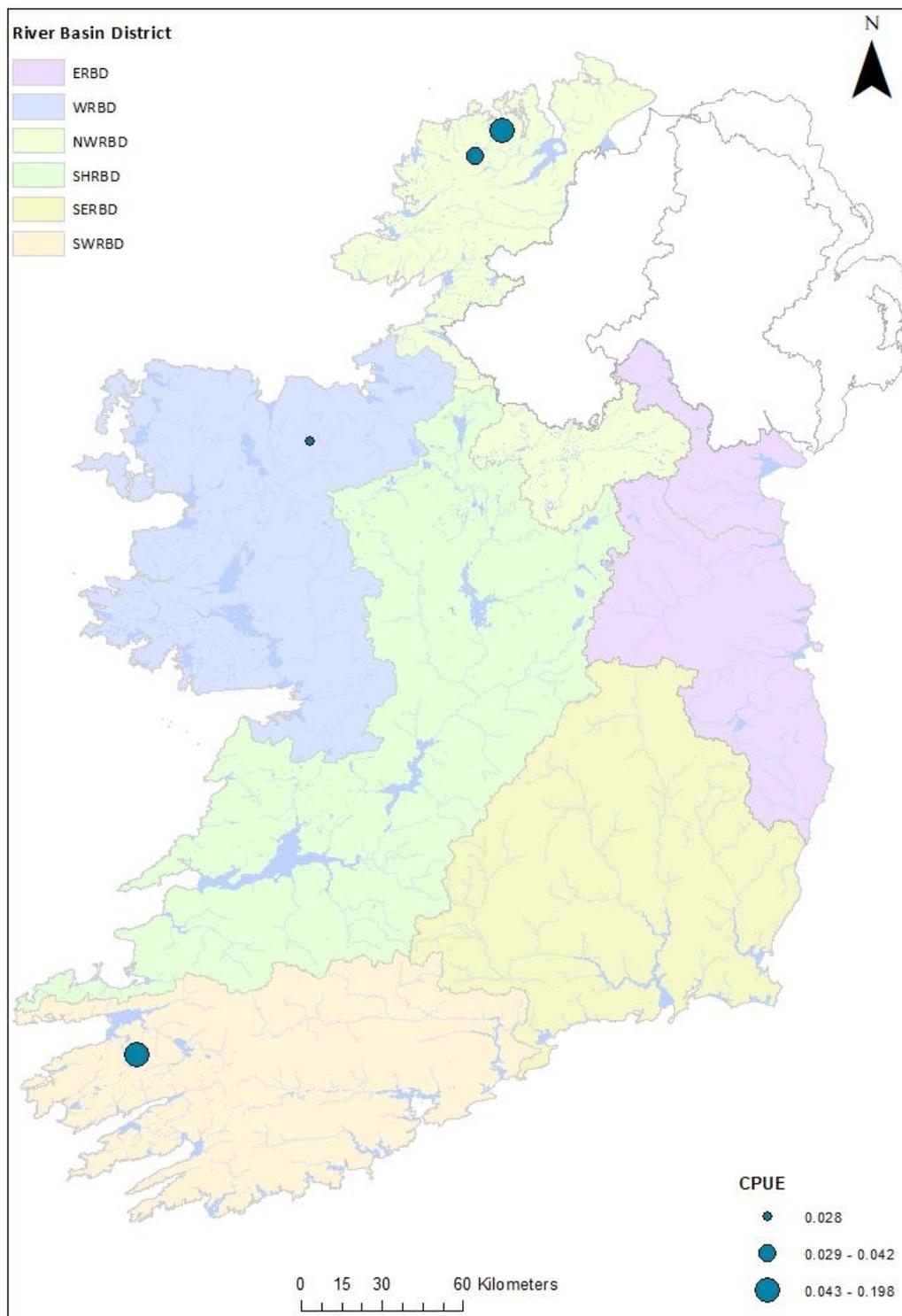


Fig. 4.9. Arctic char distribution and abundance (CPUE (No. fish/m net)) in lakes surveyed for WFD fish monitoring during 2020.

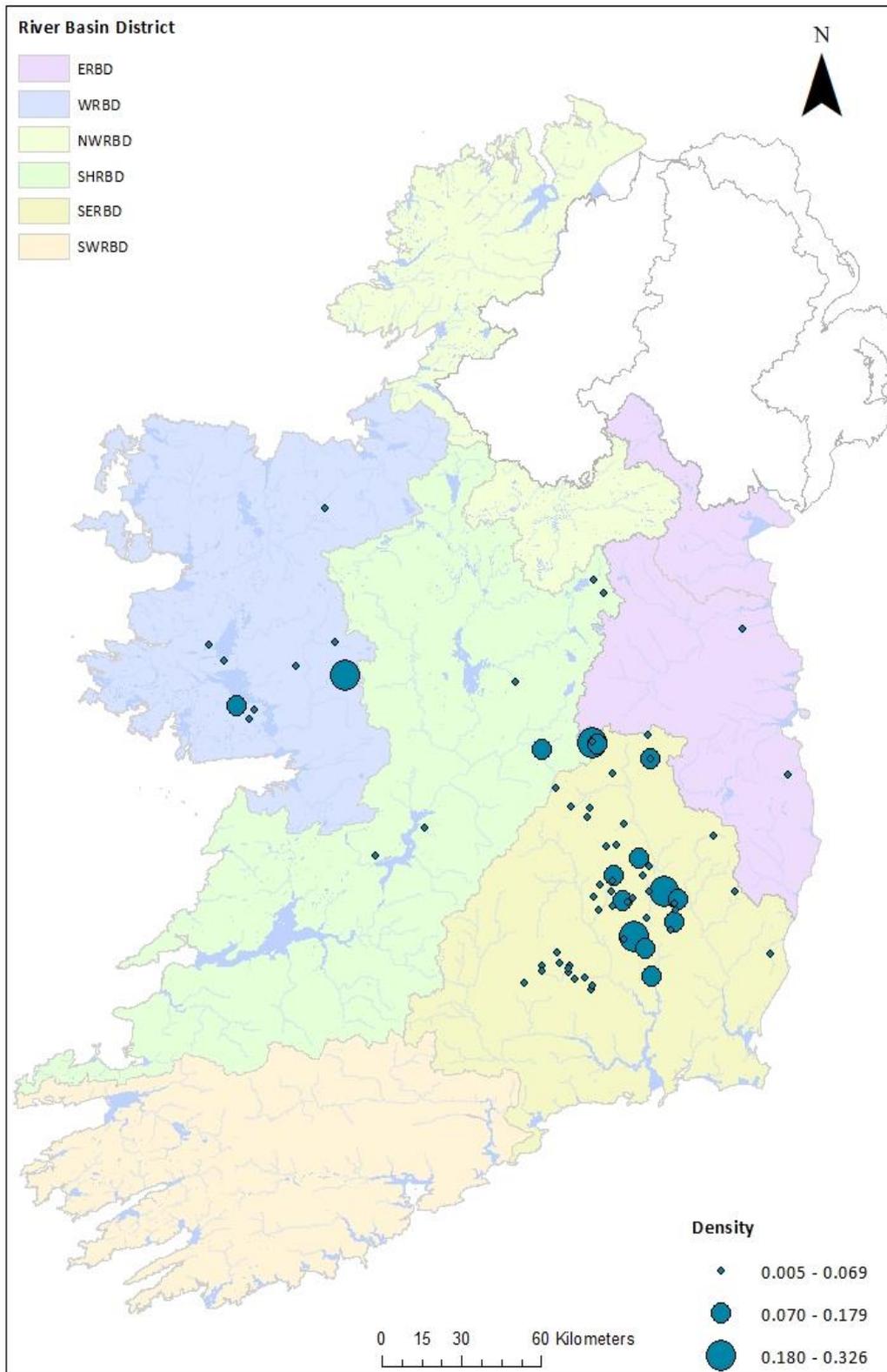


Fig. 4.10 Distribution and abundance of stone loach (fish/m²) at river sites surveyed for WFD fish monitoring during 2020.

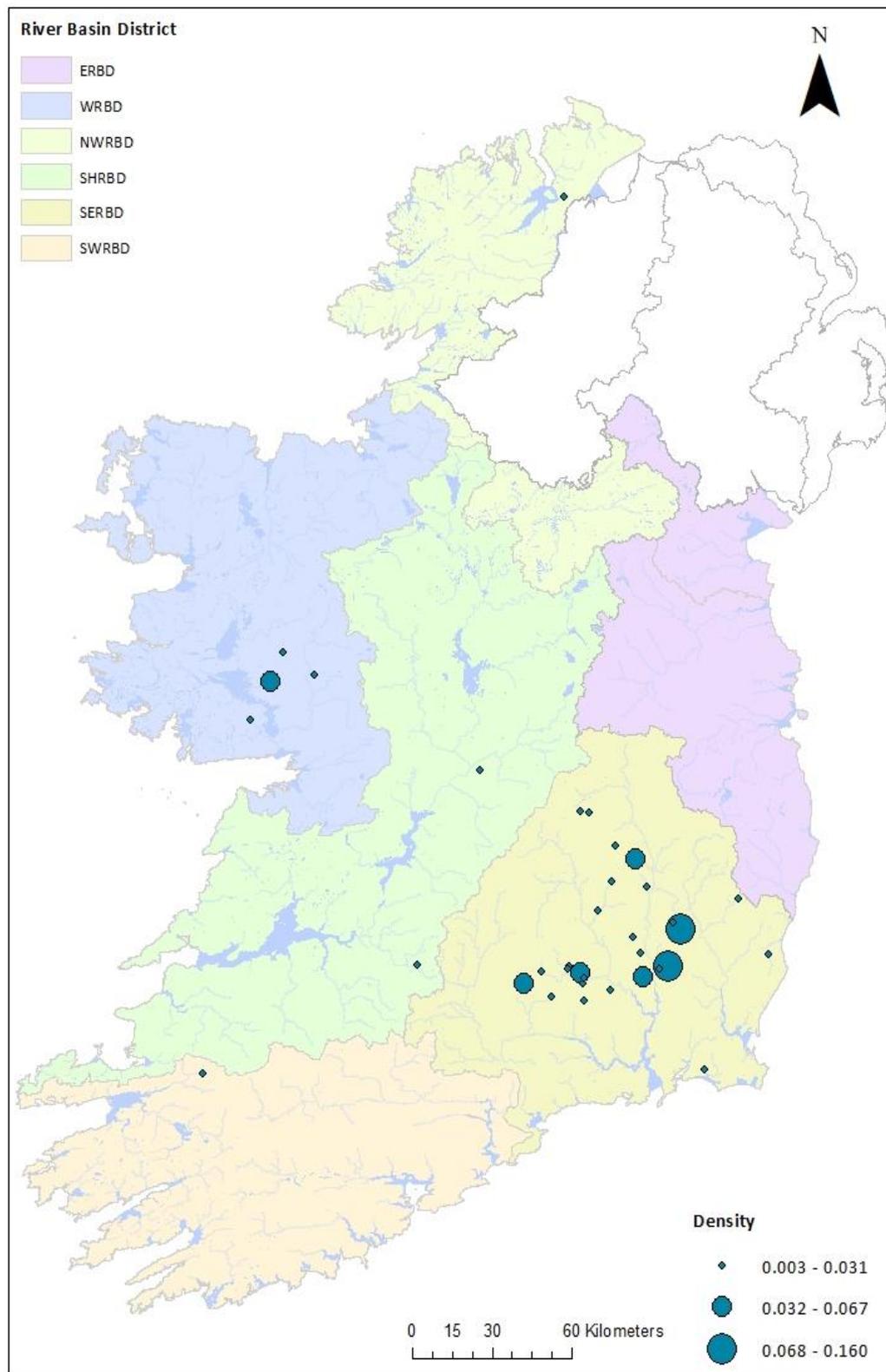


Fig. 4.11 Lamprey sp. distribution and abundance (fish/m²) at river sites surveyed for WFD fish monitoring during 2020.

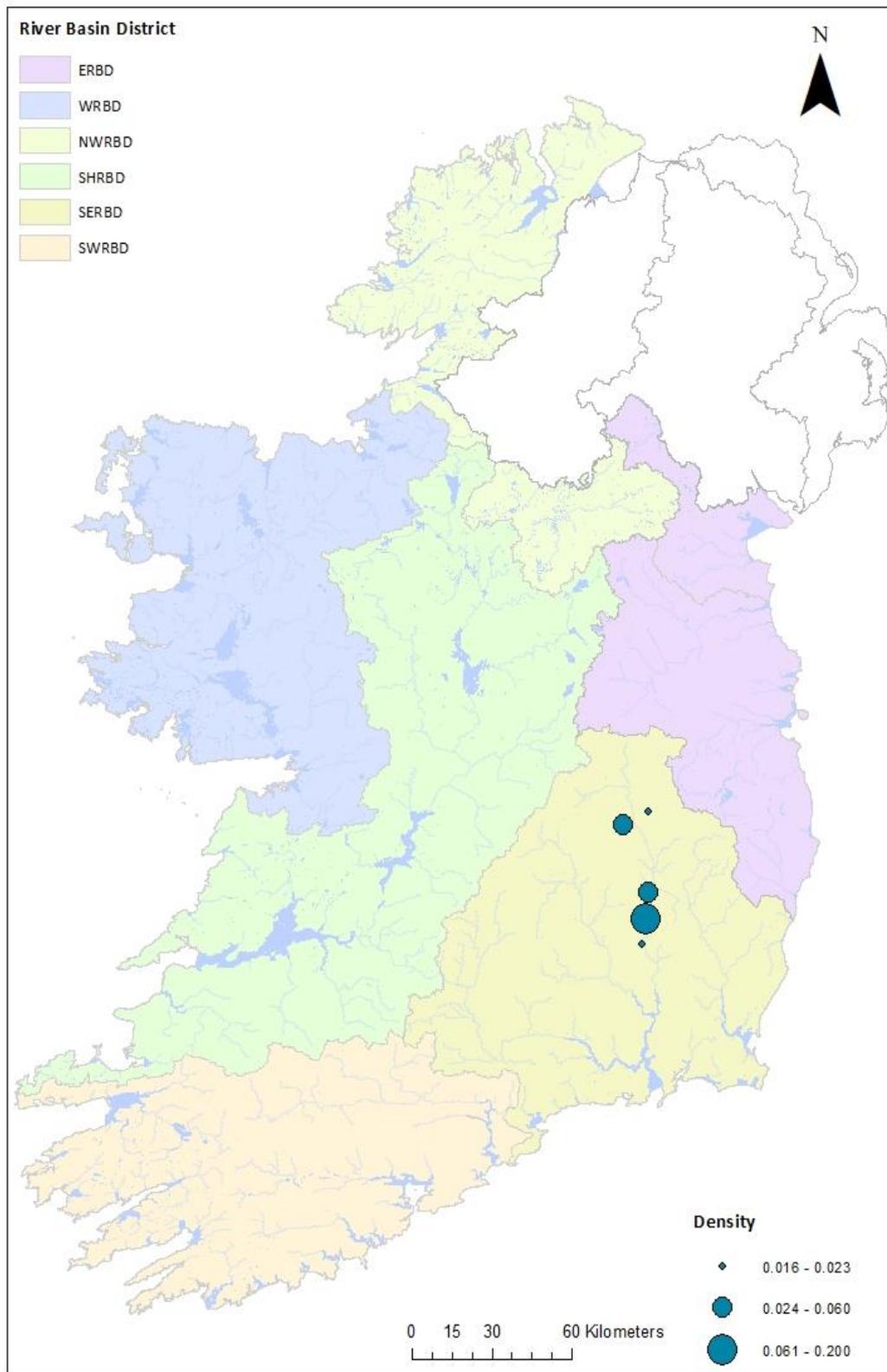


Fig. 4.12 Distribution and abundance of dace (fish/m²) at river sites surveyed for WFD fish monitoring during 2020.

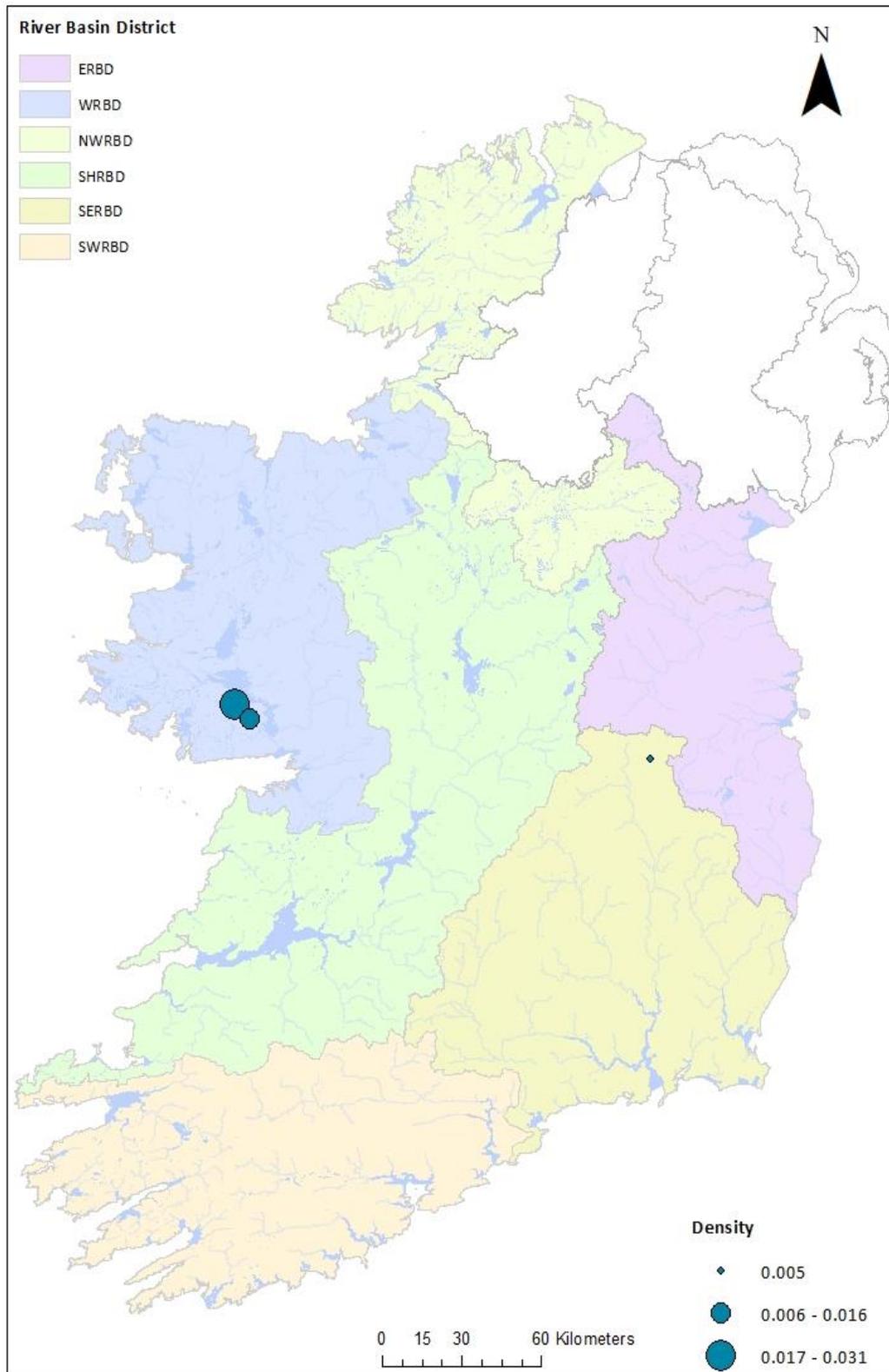


Fig. 4.13 Distribution and abundance of roach (fish/m²) at river sites surveyed for WFD fish monitoring during 2020.



4.2.2 Fish Ecological status – Classification of rivers using 'FCS2 Ireland'

The FCS2-Ireland ecological classification tool was run on all 261 river sites surveyed in 2020, the results were then sense checked with expert opinion. In total 259 sites were assigned a fish ecological status, while two sites were left unassigned.

Of the 259 sites assigned an ecological fish status in 2020, 128 sites had previously been surveyed and classified. Of these the status of 76 (59.3%) sites remained stable between surveys, while 40 (31.3%) sites deteriorated and 12 (9.4%) showed an improved status.

A total of 44 sites surveyed were surveillance monitoring sites (SM). In total 43 were assigned an ecological status, one site was left unassigned. Of the sites classified, two were assigned as High status, 16 as Good, 19 as Moderate, six as Poor. No sites were classified as Bad (Table 4.4; Fig. 4.14).

A total of 217 sites were surveyed as additional value sites (AV), 216 of these sites were assigned an ecological status, one site was left unassigned. Of the sites classified, 19 (8.8%) were classified as High status, 64(29.6%) as Good, 91 (42.1%) as Moderate, 38 (17.5%) as Poor and four as Bad (2.0%) (Table 4.4; Fig. 4.14).

Of the 217 AV sites, 29 sites were located within a surveillance monitoring waterbody. Of these, two (6.9%) were classified as High status, eight (27.6%) as Good, 13 (44.8%) as Moderate, four (13.8%) as Poor and two (6.9%) as Bad (Table 4.4).



Table 4.4 Summary details of rivers sites surveyed and fish ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
ERBD						
Big River	Big River (Louth)	Ballygoly Br.	SM	NB_06_642	G (2012)	Moderate
	Big River (Louth)	Balygoly Southeast	AV	NB_06_642	-	Moderate
White River	White River (Louth)	Martinstown Br.	AV	NB_06_239	P (2016)	Bad
Nanny	Nanny trib.	Boolies Little East	AV	EA_08_370	-	Poor
	Nanny trib.	Boolies Little	AV	EA_08_282	M (2016)	Moderate
	Bellewstown	Johnstown East	AV	EA_08_266	-	Moderate
	Nanny trib.	Knockisland	AV	EA_08_310	M (2016)	Poor
Rye Water	Rye Water	Anne's Br.	AV	EA_09_608	M (2018)	Moderate
	Moygaddy	Moygaddy Castle	AV	EA_09_1060	-	Poor
Dargle	Dargle	Bahana	SM	EA_10_1148	G (2018)	Good
	Dargle	Tinnnahinch	AV	EA_10_1275	G (2018)	Poor
	Killough	Newtown Road	AV	EA_10_1413	M (2019)	Good
	Glencullen	Boranaltry West	AV	EA_10_1277	-	Poor
	Scalp	Countybrook East	AV	EA_10_1277	-	Moderate
Glenealo	Glenealo	Br. d/s Upper Lake	SM	EA_10_793	M (2017)	N/A
SERBD						
Banoge	Banoge	Br. u/s Owenavorrhagh confl	SM	SE_11_257	M (2013)	Moderate
Owenavorrhagh	Owenavorrhagh	Ballycanew Br.	SM	SE_11_251	M (2016)	Moderate
	Owenavorrhagh	Br. N of Ballinamona	SM	SE_11_251	M (2011)	Moderate
Clody	Clody	Ford (Br.) 3km u/s Bunclody	SM	SE_12_2098	H (2013)	Good
	Clody	Kelly's Quarter	AV	SE_12_2098	-	Good
Derry	Derry	Curravanish	AV	SE_12_1442	-	High
	Rosanastraw stream	Kilcommon Br.	AV	SE_12_781	-	Moderate
Douglas (Ballon)	Douglas	Myshall Br.	AV	SE_12_789	-	Good
Slaney	Slaney	Kelsha Br.	AV	SE_12_1524	-	Moderate
Urrin	Urrin	Buck's Br.	SM	SE_12_2605	G (2014)	Good
Duncormick	Duncormick	Br. nr Duncormick Rly St	SM	SE_13_745	M (2014)	Moderate
	Duncormick	Cullen's Crossroads	AV	SE_13_676	-	Moderate
Aughnavaud	Aughnavaud	Bauck Hill	AV	SE_14_1913	G (2015)	Poor
	Aughnavaud	Turra Br.	AV	SE_14_1913	M (2015)	Moderate
Barrow	Barrow	Rathcoffey Br.	AV	SE_14_1049	G (2015)	Good
	Barrow	Rathcoffey woods	AV	SE_14_1049	-	Good
	Glenlahan	Clarahill	AV	SE_14_588	-	Good
Barrowmount	Barrowmount	Johnville Br.	AV	SE_14_1383	M (2015)	Moderate
Burren	Aghalona	Grangeford	AV	SE_14_1296	-	Good
	Aghalona	Inchisland	AV	SE_14_1296	-	Moderate
	Burren	Ballintraire Crossroads	AV	SE_14_1781	-	High
	Burren	Ballynunnery Church	AV	SE_14_1781	-	High
	Burren	Rathoe Br.	AV	SE_14_1781	G (2015)	Good
Burren	Staplestown	AV	SE_14_1781	G (2015)	Good	



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
SERBD						
Burren	Burren	Ullard Br.	SM	SE_14_1781	M (2015)	Good
	Burren	Coolsneachta	AV	SE_14_347	M (2015)	Moderate
	Burren	Garyhill Br.	AV	SE_14_347	-	Good
Clashganny	Clashganny	Ballymurphy	AV	SE_14_1756	G (2015)	Moderate
	Clashganny	Ballyroughan Little	AV	SE_14_1756	G (2015)	Moderate
Coolinkisha	Coolinkisha	Coolnakisha East	AV	SE_14_81	-	Moderate
Cushina	Cushina	Cushina Br.	AV	SE_14_276	M (2015)	Poor
Dinin (Borris)	Dinin River	Corries Br.	AV	SE_14_1492	M (2015)	Moderate
	Dinin River	Kilcloney Br.	AV	SE_14_1492	M (2015)	Moderate
	Killoughternane	Corries Confl.	AV	SE_14_1424	G (2015)	Good
	Seskinnamadra	Ballinree Br.	AV	SE_14_1424	G (2015)	Good
Douglas (Barrow)	Douglas	Castletown Br.	AV	SE_14_1490	-	Poor
	Douglas	Clonagh Br.	AV	SE_14_1304	M (2015)	Poor
	Douglas	Fuer Br.	AV	SE_14_1482	G (2015)	Poor
	Douglas	Gales Br.	AV	SE_14_1304	G (2015)	Moderate
Duiske	Coolroe	Peig's Lane	AV	SE_14_201	G (2015)	Good
	Duiske	Coolroe House	AV	SE_14_201	-	Good
	Duiske	Priests Valley	AV	SE_14_201	G (2015)	High
	Duiske	Raheendenore	AV	SE_14_201	M (2015)	Moderate
	Duiske	Tikerlevan	AV	SE_14_201	M (2015)	Good
	Duiske	Well Lane	AV	SE_14_201	G (2015)	Good
Figile	Figile	Ticknevin	AV	SE_14_987	P (2015)	Moderate
Fushoge	Fushoge	Coolrain	AV	SE_14_1283	M (2015)	Moderate
	Fushoge	Fushoge Br.	AV	SE_14_1283	M (2015)	Poor
	Fushoge	Killeshin	AV	SE_14_1283	P (2015)	Poor
	Fushoge	Olderrig Br.	AV	SE_14_1283	G (2015)	High
Glasha	Glasha	Rosnamullane	AV	SE_14_1746	-	Good
	Glasha	Tonafarna	AV	SE_14_1746	-	Moderate
Gowran	Gowran	Br. N of Goresbridge	SM	SE_14_1879	M (2015)	Moderate
	Gowran	Garryduff	AV	SE_14_1879	H (2015)	Moderate
	Gowran	Gowran Village	AV	SE_14_1879	M (2015)	Moderate
	Gowran	Grange Lower	SM	SE_14_1879	M (2015)	Moderate
Greese	Greese	Ballycore	AV	SE_14_946	G (2015)	High
	Greese	Br. NE of Belan House	SM	SE_14_946	H (2015)	Good
	Greese	Ballynure Park	AV	SE_14_1747	G (2015)	Moderate
	Greese	Colbinstown	AV	SE_14_1747	G (2015)	Good
	Greese	Spratstown_Br	AV	SE_14_1747	G (2015)	Moderate
Lerr	Lerr	Grangeford Br.	AV	SE_14_536	G (2015)	Moderate
	Lerr	Alymerstown Br.	AV	SE_14_536	G (2015)	Moderate
	Lerr	Mullarney	AV	SE_14_157	G (2015)	Good
	Lerr	Prumplestown Br.	SM	SE_14_157	M (2015)	Poor



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
SERBD						
Madlin	Madlin	Madlin Br.	AV	SE_14_1382	-	Poor
Monefelim	Acore	Barraghcore Br.	AV	SE_14_1663	G (2015)	Good
	Monefelim	Monefelim	AV	SE_14_1663	H (2015)	High
Mountain	Monefelim	Grangehill	AV	SE_14_1663	G (2015)	Good
	Mountain	Earthworks Br.	AV	SE_14_203	G (2015)	High
	Mountain	Owlbeg	AV	SE_14_203	H (2015)	High
	Mountain	Rathanna Br.	AV	SE_14_114	M (2015)	Moderate
Owenass	Augnabriskey	Spearpoint	AV	SE_14_1483	G (2015)	High
	Owenass	Barkmill West	AV	SE_14_303	-	Moderate
	Owenass	Barkmill	AV	SE_14_303	-	Moderate
	Owennahallia	Esker	AV	SE_14_1718	G (2015)	Good
Philipstown	Blackwater	Rossnagad	AV	SE_14_253	M (2015)	Moderate
	Philipstown	Killoneen	AV	SE_14_1561	B (2015)	Poor
	Philipstown	Magheramore West	AV	SE_14_1561	-	Poor
Pollmounty	Philipstown	Magheramore	AV	SE_14_1561	P (2015)	Poor
	Aughnacrew	Ballywilliam	AV	SE_14_1921	P (2015)	Moderate
	Pollmounty	Curraun abstraction	AV	SE_14_1921	H (2015)	Good
Slate	Pollmounty	Templeudigan	AV	SE_14_1921	M (2015)	Good
	Slate	Agar Br.	AV	SE_14_999	-	Poor
	Slate	Ballyteige	AV	SE_14_999	M (2015)	Moderate
	Slate	Glenaree	AV	SE_14_999	-	Bad
	Slate	NW of Robertstown	AV	SE_14_999	M (2015)	Moderate
	Slate	Rathangan	AV	SE_14_999	G (2015)	Good
Stradbally	Slate	Tannery Park	AV	SE_14_999	G (2015)	Good
	Stradbally	Clone Br.	AV	SE_14_575	G (2015)	Good
	Stradbally (Trib)	Timahoe Village	AV	SE_14_1772	M (2015)	Poor
Triogue	Stradbally	Timogue Br.	AV	SE_14_1278	M (2015)	Moderate
	Crooked	Clopook	AV	SE_14_1442	M (2015)	Moderate
	Triogue	Eyne Br.	AV	SE_14_1016	M (2015)	Moderate
	Triogue (Trib)	Knocknagroagh	AV	SE_14_259	M (2015)	Moderate
Tully	Triogue	Kyle Br.	AV	SE_14_1016	P (2015)	Moderate
	Finnery Stream	Clarey	AV	SE_14_572	M (2015)	Moderate
	Finnery Stream	Gorteen Br.	AV	SE_14_572	G (2015)	Moderate
	Boherbaun Stream	Boleybeg	AV	SE_14_572	-	Moderate
	Finnery Stream	Asgulusian Br.	AV	SE_14_434	-	Good
	Tully Stream	Nurney	AV	SE_14_842	M (2015)	Moderate
	Tully Stream	Pullagh	AV	SE_14_842	M (2015)	Moderate
Tully Stream	Soomeragh Br.	SM	SE_14_842	M (2015)	Moderate	
Ballyroan	Ballyroan	Gloreen Br.	SM	SE_15_1938	M (2017)	Moderate
Dinin (Nore)	Dinin	Black Br.	AV	SE_15_85	H (2017)	Moderate
	Dinin	Coolraheen North	AV	SE_15_936	-	Good



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status	
SERBD							
Dinin (Nore)	Dinin	Corbetstown	SM	SE_15_926	H (2017)	High	
	Gloshia	East of Seven C/R	AV	SE_15_348	-	Poor	
	Gloshia	Kilcollan	SM	SE_15_348	H (2017)	Good	
	Clogh	Clogh North	AV	SE_15_959	-	Poor	
	Clogh	Clogh South	AV	SE_15_959	-	Poor	
	Coan	Burns Br.	AV	SE_15_126	P (2017)	Poor	
	Coolbaun	Coolbaun	AV	SE_15_109	-	Poor	
	Firoda	North Br.	AV	SE_15_1884	G (2017)	Moderate	
	Firoda	North of Glenmagoo	AV	SE_15_1884	-	Moderate	
	Firoda	Skehana	AV	SE_15_1884	-	Moderate	
	Ardough	U/s of three counties br.	AV	SE_15_87	-	Good	
Glory	Glory	Br. E of Raheen_a	SM	SE_15_1870	G (2013)	Good	
	Glory	Br. E of Raheen_b	SM	SE_15_1870	M (2008)	Good	
	Glory	Chapelizod Br. North	AV	SE_15_1870	-	Good	
	Glory	Dunnamaggan	AV	SE_15_1870	-	Good	
	Glory	Rogerstown	AV	SE_15_1870	-	Good	
	Glory	Rossenarra	AV	SE_15_364	-	Good	
King's (Kilkenny)	Foilmarnell	Ballintaggart	AV	SE_15_629	-	Good	
	Tullaroan	Ballyclovan	AV	SE_15_1986	-	Moderate	
	Tullaroan	Killaloe Br.	AV	SE_15_1986	G (2016)	Moderate	
	Tullaroan	Bigmeadow	AV	SE_15_1986	G (2016)	Poor	
	Munster	Bolakeale	AV	SE_15_1734	-	Good	
	Munster	Cappagh Br.	AV	SE_15_1734	-	Moderate	
	Munster	Gortnacurragh	AV	SE_15_1734	-	Moderate	
	Rathculbin	Caherlesk Br.	AV	SE_15_1137	-	Moderate	
	Rathculbin	Cormick Bend	AV	SE_15_1137	-	Moderate	
	King's	Carbine Br.	AV	SE_15_181	-	Moderate	
	King's	Clashduff	AV	SE_15_699	-	Poor	
	King's	Copper East	AV	SE_15_282	-	Good	
	King's	Garrynoe	AV	SE_15_282	-	Good	
	Greatwood	Corbally Northeast	AV	SE_15_686	-	Moderate	
	Owbeg	Drimeen	AV	SE_15_501	-	Poor	
	Stoneyford	Stoneyford Br.	AV	SE_15_1991	-	Moderate	
	Knocknahown	Wilford's Br.	AV	SE_15_222	-	Moderate	
	Little Arrigle	Little Arrigle	Ballylowra North	AV	SE_15_1814	-	High
		Little Arrigle	Goat's Br.	AV	SE_15_1814	-	High
		Knocktopher	Knocktopher East	AV	SE_15_1212	-	Good
Nuenna	Nuenna	Br. d/s Clomantagh	SM	SE_15_1029	M (2017)	Moderate	
	Nuenna	Tobernapeastia	AV	SE_15_1029	-	Moderate	
Anner	Anner	Drummon Br.	SM	SE_16_2342	G (2014)	Good	
	Anner	Gurteen East	AV	SE_16_2342	-	Moderate	



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
SERBD						
Clashawley	Killnaule	Milltown St.John	AV	SE_16_2360	-	Good
	Clashawley	Spidalfield	AV	SE_16_440	-	Poor
Mahon	Kealfoun	Fews	AV	SE_17_532	-	Moderate
	Mahon	Pumphouse Weir	SM	SE_17_825	G (2014)	Poor
SHRBD						
Tyshe	Tyshe	Sackville Br.	AV	SH_23_427	-	Poor
	Tyshe	Abbeylands Br.	AV	SH_23_427	-	Bad
	Tyshe	West Br. Ardferat at Friary	SM	SH_23_427	P (2012)	Poor
Bow	Bow	Bow River Br.	SM	SH_25_2145	M(2013)	Moderate
Ballyfinboy	Ballyfinboy	Ballinderry Br.	SM	SH_25_1853	G (2016)	Moderate
	Ballyfinboy	Br. just u/s L. Derg	SM	SH_25_1853	M (2016)	Moderate
Dead	Cahernahillia	Coolbaun Northeast	AV	SH_25_2551	-	Good
	Dead	Pope's Br.	SM	SH_25_1893	G (2012)	Good
Glenafelly	Glenafelly	Br. 3km E of Longford	SM	SH_25_2084	G (2013)	Poor
Graney	Graney	Caher Br. S of L. Graney	SM	SH_25_2081	G (2013)	Moderate
	Leaghort	Leaghort West_A.	AV	SH_25_2081	-	Bad
Little	Cloghan	Br. 2km SW of Cloghan	SM	SH_25_3014	M (2015)	Moderate
	Cloghan	Guernal	AV	SH_25_3014	M (2015)	Good
Tullamore	Tullamore	Br. SW of Ballycowen Br.	SM	SH_25_3798	M (2016)	Moderate
Boor	Boor	Br. NW of Kilbillaghan	SM	SH_26_3921	G (2013)	Moderate
Inny	Inny	Glebe	AV	SH_26_2664	-	Moderate
	Inny	Br. 1 km S of Oldcastle	SM	SH_26_2060	G (2014)	Good
Mountnugent	Mountnugent	Mountnugent Br.	SM	SH_26_2742	G (2013)	Good
Tang	Tang	Crush Br.	AV	SH_26_3719	-	Good
	Tang	Ballycogyduff Br.	AV	SH_26_997	-	Moderate
Moyree	Moyree	Br. u/s of Fergus River	SM	SH_27_1178	M(2013)	Poor
	Moyree	Inghid Br.	AV	SH_27_1178	-	Moderate
Annagh	Kildeema	Donnsallagh Br.	AV	SH_28_242	-	Moderate
	Kildeema	Kildeema Br.	AV	SH_28_241	-	Good
Glendine	Glendine	Knockloskeraun Br. S of M	SM	SH_28_231	G (2013)	Moderate
SWRBD						
Cummeragh	Oweveen	East of Bird sanctuary	AV	SW_21_6814	-	High
	Owengarriff	Owengarriff Path	AV	SW_21_2064	-	High
Shanowen	Cordal	Cordal Northeast	AV	SW_22_3452	-	Moderate
	Cloone	Ford (Br.) u/s Maine R confl	SM	SW_22_3452	H (2011)	Good
	Shanowen	Kilquane North	AV	SW_22_3452	-	Moderate
	Shanowen	Sheheree Br.	AV	SW_22_3452	-	Moderate



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
WRBD						
Bealnabrack	Bealnabrack	d/s of Fulachtaí Fia	AV	WE_30_201	-	Poor
	Bealnabrack trib.	Gowlaunlee East	AV	WE_30_2601	-	Moderate
	Bealnabrack trib.	Stone Row	AV	WE_30_201	-	High
	Bealnabrack trib.	Gowlaunard East	AV	WE_30_3351	-	Good
	Glenglosh	Bunnaviskaun	AV	WE_30_201	-	Moderate
Failmore	Failmore	Knocknagur_a	AV	WE_30_1464	-	Poor
	Failmore	Knocknagur_b	AV	WE_30_1464	-	Moderate
	Failmore	Luggaun South	AV	WE_30_2703	-	Moderate
	Teernakil	Teernakill South	AV	WE_30_1463	-	Good
Joyces's	Joyce's	Griggins	AV	WE_30_2598	-	Moderate
	Joyce's	Munterowen East	AV	WE_30_2598	-	Good
Black	Kilshanvy	Ballinully	AV	WE_30_3520	-	Moderate
	Ballinully	Ballynauly	AV	WE_30_3520	-	Poor
	Shrulle	Br. d/s of Lodge	AV	WE_30_3484	-	Good
	Shrulle	Br. at Kilshanvy	SM	WE_30_2928	G (2012)	Good
	Carrowmore	Dalgan Demesne_a	AV	WE_30_2928	-	Moderate
	Carras	Outlawns	AV	WE_30_2928	-	Good
	Toberroe	Toberroe	AV	WE_30_2928	-	Good
	Togher	Cloonaglasha	AV	WE_30_1903	-	Moderate
	Cullagh	Tonroe North	AV	WE_30_1151	-	Good
	Clare	Sinking	Baunoges_a	AV	WE_30_1911	-
Sinking		Baunoges_b	AV	WE_30_1911	-	Moderate
Grange	Grange	Cloondahamper	AV	WE_30_653	-	Moderate
Nanny (Tuam)	Nanny	Tuam Garda Stn.	AV	WE_30_1128	-	Moderate
Carrick	Carrick	Carrick East	AV	WE_30_2788	-	High
Clonbur	Clonbur	Clonbur North	AV	WE_30_2912	-	Good
Cross	Cross	Carrownturly	AV	WE_30_1231	-	Poor
	Cross	Cross Village	AV	WE_30_1231	-	Good
	Cross	Curraghbaun	AV	WE_30_1231	-	Good
	Cross	Frenchbrook South	AV	WE_30_1231	-	Moderate
	Cross	Gortnastang	AV	WE_30_1231	-	Poor
Ballynalty	Ballynalty	Funshinaugh	AV	WE_30_3219	-	High
	Ballynalty	Fushinaugh NE	AV	WE_30_3219	-	Moderate
	Ballynalty	u/s of Ballynalty Bay	AV	WE_30_3219	-	Good
	Ballynalty	Houndwood South	AV	WE_30_3219	-	Poor
	Larragan	Pollagh	AV	WE_30_3143	G (2016)	Good
Derrypark	Derrypark	Derrypark	AV	WE_30_1063	-	Good
Moycullen	Killaguile	Ballyquirke Site 2	AV	WE_30_3542	-	Good
Drimneen	Drimneen	Drimneen	AV	WE_30_2013	-	Moderate
	Drimneen	d/s Carrowndulla Lough	AV	WE_30_2013	-	Moderate
Drimneen	Raha	u/s Drimneen Br.	AV	WE_30_2013	-	Moderate



Table 4.4 Cont. Summary details of rivers surveyed and ecological status 2020

Sub catchment	River	Site name	Survey type	Water body ID	Previous status	2020 Status
WRBD						
Railway	Railway	Rushveala_A	AV	WE_30_2025	-	High
	Railway	d/s of Railway line	AV	WE_30_2025	-	High
	Railway	Rushveala_B	AV	WE_30_2025	-	Good
Knockbane	Knockbane	An Cnoc Ban	AV	WE_30_3093	-	Poor
	Knockbane	Oghery	AV	WE_30_3093	-	Moderate
	Knockaunranny	Knockaunranny	AV	WE_30_3093	-	Moderate
	Atavamore	u/s Tawneybeg River	AV	WE_30_2197	-	Poor
Lough Kip	Lough Kip River	Dr. Leamhchoille	AV	WE_30_262	-	Good
	Lough Kip River	Knockgarve Northeast	AV	WE_30_262	-	Poor
Owendunnakilla	Owendunnakilla	Doon_a	AV	WE_30_3542	-	Good
	Owendunnakilla	Doon_b	AV	WE_30_3542	-	Moderate
Owenriff	Rusheeny	d/s of L. Beg	AV	WE_30_1787	-	Good
Ardderroo	Ardderroo	Letter Northwest	AV	WE_31_2094	-	Good
	Sruffaunboy	Gortgar Southeast	AV	WE_31_1083A	-	N/A
Behy	Behy	Behy Br.	SM	WE_34_3999	G (2015)	Good
	Srafaungal	Carrownlabaun	AV	WE_34_1868	-	Moderate
Tobercurry	Tobercurry	Br. just u/s Moy River	SM	WE_34_2633	G (2014)	Good
NWRBD						
Devlin	Cronaniv Burn	Br. u/s Dunlewy Lough	SM	NW_38_800	H (2014)	High
	Dunlewy trib.	Bunleanarudda Br.	AV	NW_38_800	-	Poor
Burnfoot	Burnfoot	Glen	AV	NW_39_1105	M (2015)	Moderate
	Burnfoot	Thompson's Town	AV	NW_39_1105	-	Moderate
	Burnfoot	Br. in Burnfoot	SM	NW_39_1105	M (2015)	Poor
Ballyhallan	Ballyhallan	Br. u/s Clonmany River	SM	NW_40_1082	G (2015)	Moderate

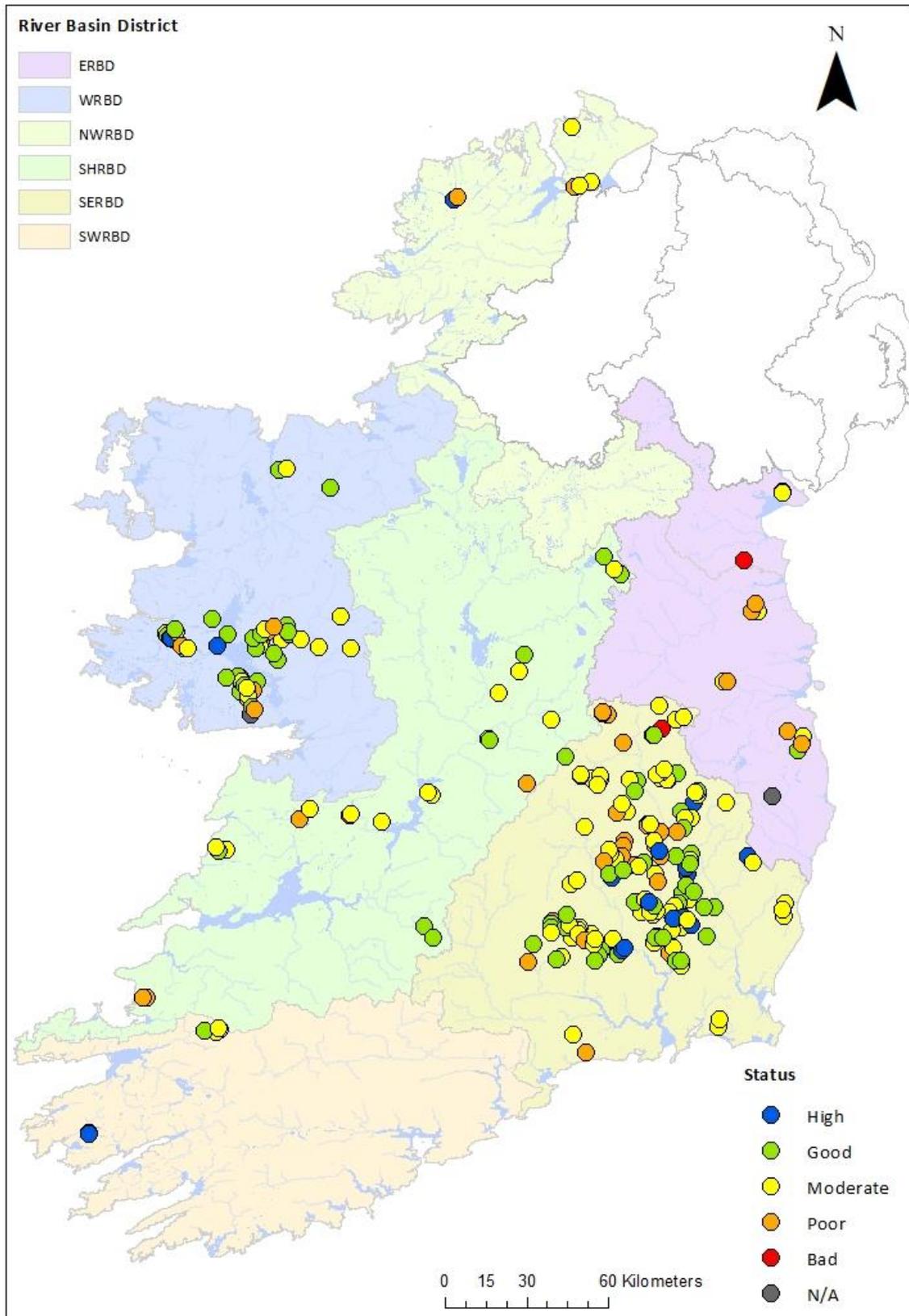


Fig. 4.14. Fish ecological status of river sites surveyed during 2020 using the FCS2-Ireland ecological classification tool.



4.3 Transitional waters

4.3.1 Fish species distribution and species richness

A total of 46 species (sea trout are included as a separate “variety” of trout) were captured across the ten transitional waters surveyed in 2020. Flounder and sand goby were the most widely distributed species, recorded in all ten waterbodies.

Species richness (SR), the number of species captured, is a strong indicator of the health of transitional water bodies. Table 4.5 and Figure 4.15 shows the species richness recorded at each transitional water in 2020. Species richness ranged from four species in the Upper Bandon estuary to 23 species in the Lower Bandon waterbody and Broad Lough lagoon.

4.1.2 Fish ecological status - Classification of Transitional waters using ‘EMFI’

All ten transitional waters surveyed during 2020 were assigned a fish ecological status class using the EMFI ecological classification tool (Harrison and Kelly, 2013), together with expert opinion. Six waterbodies (60%) were classified as having Good ecological status, three (30%) as Moderate and one (10%) as Poor (Table 4.5, Figure 4.15). The Upper Bandon waterbody was assigned Poor fish status for 2020 and previously for the 2016 survey (Table 4.5).

Overall nine transitional waters had been surveyed previously (Table 4.5). Seven waterbodies (78%) showed no change in ecological status, while two (22%) had deteriorated, namely Argideen estuary and Broadmeadow Water. The Avoca estuary, the only SM waterbody surveyed, has remained at Good status (Table 4.5).

Table 4.5 Species richness (SR) and fish ecological status of transitional waters surveyed in 2020

Water body	WFD SM Code	Survey type	SR	Dominant species		Previous Status	2020 status
				Scientific name	Common name		
Argideen	SW_090_0200	AV	15	<i>Pomatoschistus minutus</i>	Sand goby	G (2018)	Moderate
Avoca	EA_150_0100	SM	14	<i>Chelon labrosus</i>	Thick-lipped mullet	G (2018)	Good
Bandon Upper	SW_080_0300	AV	4	<i>Pomatoschistus minutus</i>	Sand goby	P (2016)	Poor
Bandon Lower	SW_080_0100	AV	23	<i>Pomatoschistus minutus</i>	Sand goby	G (2016)	Good
Bridgetown	SE_080_0100	AV	17	<i>Pomatoschistus minutus</i>	Sand goby	G (2009)	Good
Broad Lough	EA_130_0100	AV	23	<i>Pomatoschistus minutus</i>	Sand goby	G (2010)	Good
Broadmeadow Water	EA_060_0100	AV	9	<i>Pomatoschistus minutus</i>	Sand goby	G (2010)	Moderate
Castletown	NB_040_0200	AV	11	<i>Sprattus sprattus</i>	Sprat	M (2009)	Moderate
Colligan	SE_140_0100	AV	22	<i>Sprattus sprattus</i>	Sprat	G (2008)	Good
Ferta	AW_220-0100	AV	19	<i>Pollachius pollachius</i>	Pollack	-	Good



Plate 4.4 Sea bass captured in Broad Lough in the ERBD.

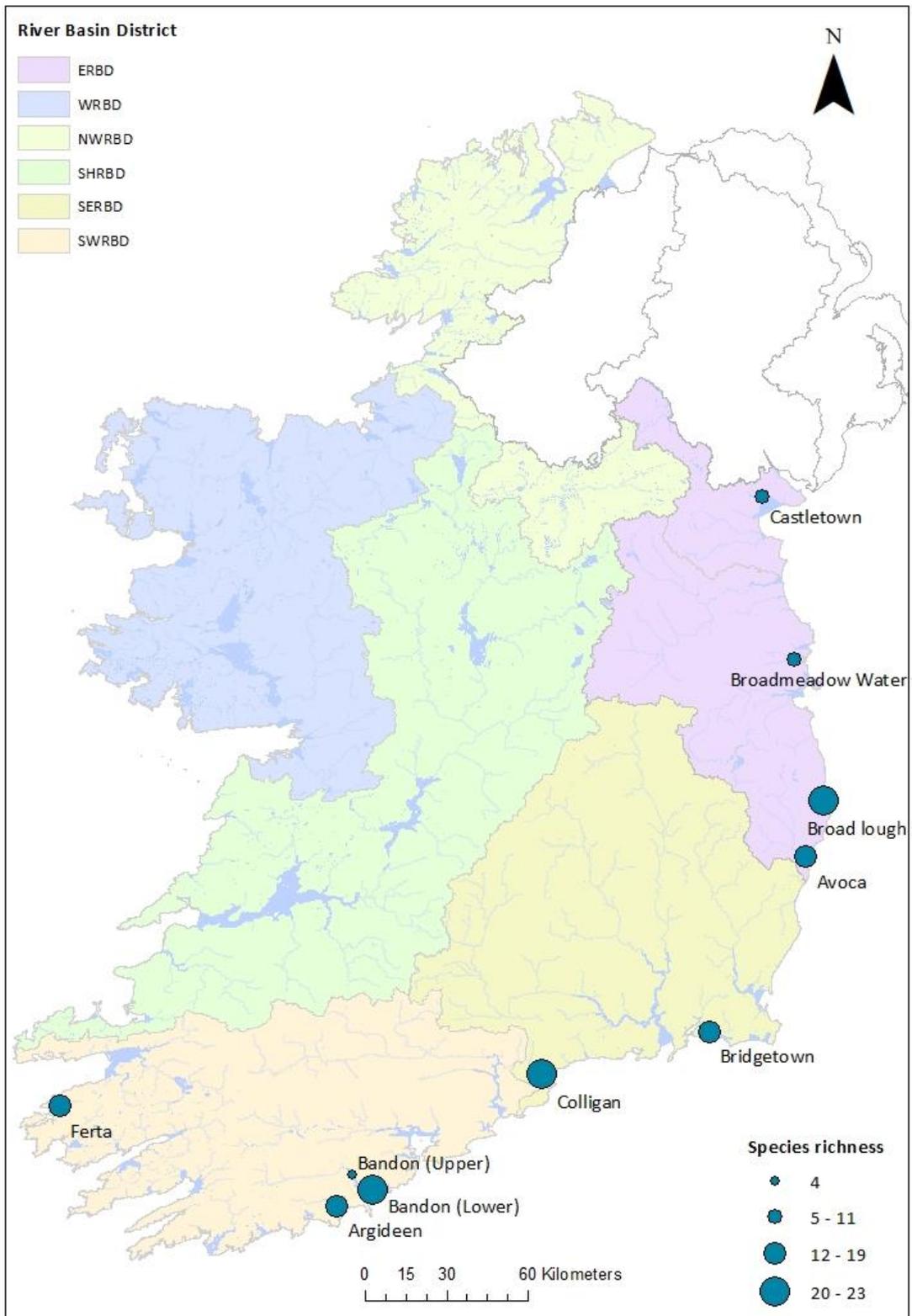


Fig. 4.15 Species richness in transitional water bodies surveyed in 2020

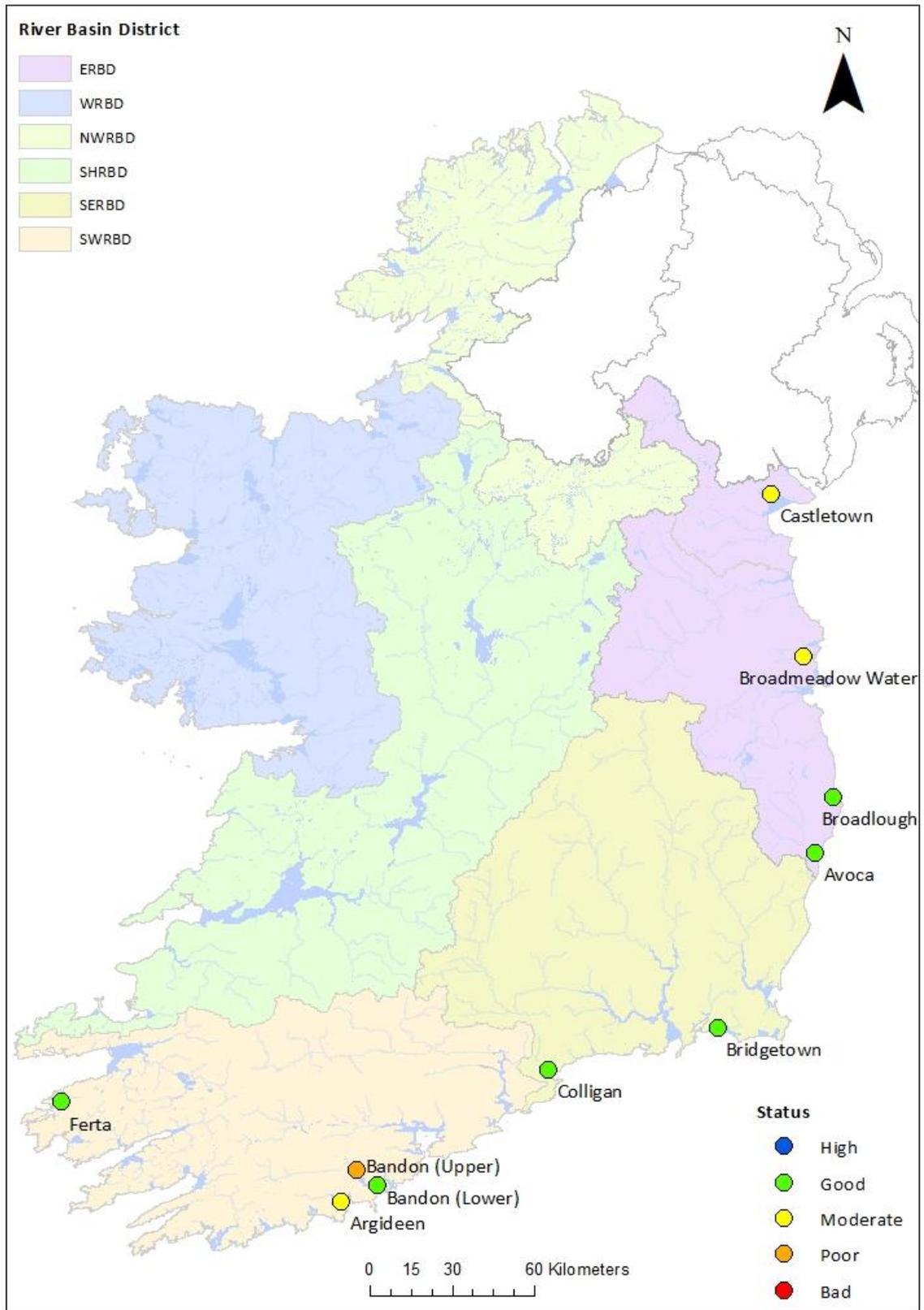


Fig. 4.16. Ecological status of transitional waters surveyed during 2020 using the EMFI ecological classification tool.



5. DISCUSSION

5.1 Lakes

A total of nine fish species (sea trout are included as a separate “variety” of trout) were recorded across the lakes surveyed during 2020. Brown trout and eels were the most widely distributed species recorded, occurring in all 11 lakes surveyed in 2020. Brown trout was also the most abundant species recorded in the majority of lakes surveyed during 2020.

Eight lakes were assigned a fish ecological status of High or Good for 2020. Three lakes were assigned a status of Poor or Bad. When compared to previous surveys the fish ecological status of six lakes has remained stable; however one lake (Lough Fern) deteriorated from Poor to Bad and Glencar lake changed from High to Good status. Perch were first recorded in an IFI survey in Lough Fern in 2014 (Kelly *et al.*, 2015a) and since then the population has increased substantially. Perch were the dominant species in the lake during the 2020 survey, resulting in an ecological classification of Bad for this lake. Loughs Bofin and Agraffard, part of the Owenriff system (Corrib catchment), were both assigned a status of Poor and although this is a slight improvement when compared to the previous result, both waterbodies continue to have a lower than expected abundance of type specific species present which contributes to the failure in fish ecological status. IFI (2018) described how pike had been introduced to the Owenriff catchment in the recent past and the presence of the species most likely contributed to a Bad fish ecological status in 2017. A rehabilitation plan to assist in the recovery of the salmonid population has been put in place to address some of the pressures in the catchment (IFI, 2018).

5.2 Rivers

A total of 13 fish species (sea trout are included as a separate “variety” of trout) were recorded across the river sites surveyed during 2020. Brown trout was most widely distributed species, occurring at 90% of all sites surveyed. Salmon were also widely distributed but to a lesser extent, occurring at 51.3% of sites.

Overall, 259 river sites that were surveyed during 2020 were assigned a fish ecological status. Following a sense-checking exercise, two sites, Br. d/s Upper Lake on the Glenealo River and Gortgar Southeast on the Sruffaunboy River, were not assigned a status.

Of the sites classified, 21 (8.1%) sites were classified as having High ecological status, 80 (30.9%) as Good, 110 (42.5%) as Moderate, 44 (17.0%) as Poor and four (1.5%) as Bad. A total of 128 sites had



previously been surveyed and classified. Of these 76 (59.3%) sites remained stable between surveys, 40 (31.3%) sites deteriorated between surveys and 12 (9.4%) showed an improved status.

In total 44 surveillance monitoring (SM) sites were surveyed. One of these sites, Br. d/s Upper Lake, was not assigned an ecological status. Of the remaining 43 sites assigned a status, two (4.7%) were classified as High status, 16 (37.2%) as Good, 19 (44.2%) as Moderate and six (13.9%) as Poor status. No sites were classified as bad. When these sites were compared with the previous most recent WFD SM surveys, 26 (60.5%) showed no change in ecological status, 15 (34.9%) deteriorated and only two (4.6%) improved.

A total of 217 sites were surveyed as additional value sites (AV), 216 of these sites were assigned an ecological status, one site was left unassigned. Of the sites classified, 19 (8.8%) were classified as High status, 64 (29.6%) as Good, 91 (42.1%) as Moderate, 38 (17.5%) as Poor and four as Bad (2.0%) (Table 4.4; Fig. 4.14). 29 of the AV sites were located within a surveillance monitoring site waterbody, two (6.9%) were classified as High status, eight (27.6%) as Good, 13 (44.8%) as Moderate, four (13.8%) as Poor and two (6.9%) as Bad.

Where a site showed an improvement in ecological status between surveys, the reason was generally due to an increase in type specific fish species abundance, or the presence of an age cohort not recorded in previous surveys, i.e. indicating an improvement in recruitment status.

The most common reason for a site deteriorating between surveys was a decrease in type specific fish species abundance caused by various pressures such as water quality and presence of barriers to fish migration. In some cases, an age cohort previously recorded at the site was not captured during the most recent survey, indicating a failure in recruitment. This suggests either water quality issues, physical habit degradation or a combination of both and other pressures that affect fish species recruitment and persistence.

An increase or high abundance of tolerant fish species such as minnow, 3-spined stickleback or stone loach can be an indicator of a deterioration in water quality (Kelly *et al.*, 2007b). For example, three sites (Ballyclovan, Big Meadow, Killaloe Bridge) on the Tullaroan River (Kings/Nore catchment) were assigned moderate and poor fish ecological status. The Big Meadow site deteriorated from Good to Poor and the Killaloe Bridge site which is located further downstream changed from Good to Moderate between the two most recent surveys. Killaloe Bridge was also moderate status. The relatively high density of minnow and 3-spined stickleback and presence of the additional indicator, filamentous algae, at both sites indicated that there may have been a source of pollution present upstream of the



Big Meadow site. Similarly the Cloondahamper site on the Grange river (Corrib catchment) in the WRBD, was assigned a status of moderate. This site had a relatively high abundance of stone loach. The presence of this fish species can be an indicator of organic pollution, therefore further investigation is recommended for this site and others where relatively high abundances of these species were present (see IFI factsheets (Gordan *et al* 2021a, 2021b and 2021c) for more details for the Barrow, Corrib and Nore catchments).

5.3 Transitional waters

A total of 46 species (sea trout are included as a separate “variety” of trout) were captured across the ten transitional waters surveyed in 2020. Sand goby and flounder were the two most widely distributed species in 2020. Important angling species were also recorded across the ten water bodies including pollack, cod, salmon, brown trout, sea trout, conger eel, , lesser spotted dogfish, European sea bass and thick lipped grey mullet.

The Bandon Lower and Broad Lough waterbodies had the highest species richness with 23 different species recorded during each survey. The Colligan Estuary followed closely with a total of 22 species. The Bandon Upper recorded the lowest species richness with only four species recorded. This is not unexpected as the freshwater tidal sections of estuaries in Ireland (i.e. more riverine and freshwater) tend to have less species present. This reflects the poorer diversity of freshwater fish populations when compared to the diversity of marine fish populations present in the lower estuary waterbodies.

The EMFI ecological classification tool, together with expert opinion was used to assign ecological status to the ten transitional waters surveyed in 2020. Six (60%) of the sites surveyed were assigned a classification of Good, three sites (30%) were assigned Moderate and the remaining site (10%) as Poor. The Upper Bandon was assigned a status of Poor in 2020. This was due to the relatively poor species diversity recorded during this survey.

Comparisons with ecological status from previous surveys found that seven transitional waterbodies (78%) showed no change, while two (22%) had deteriorated, namely Argideen estuary and Broadmeadow Water. Both will be considered for regular triennial monitoring in the revised transitional waters programme. The Avoca estuary, the only SM waterbody surveyed, has remained at Good status (Table 4.5).



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