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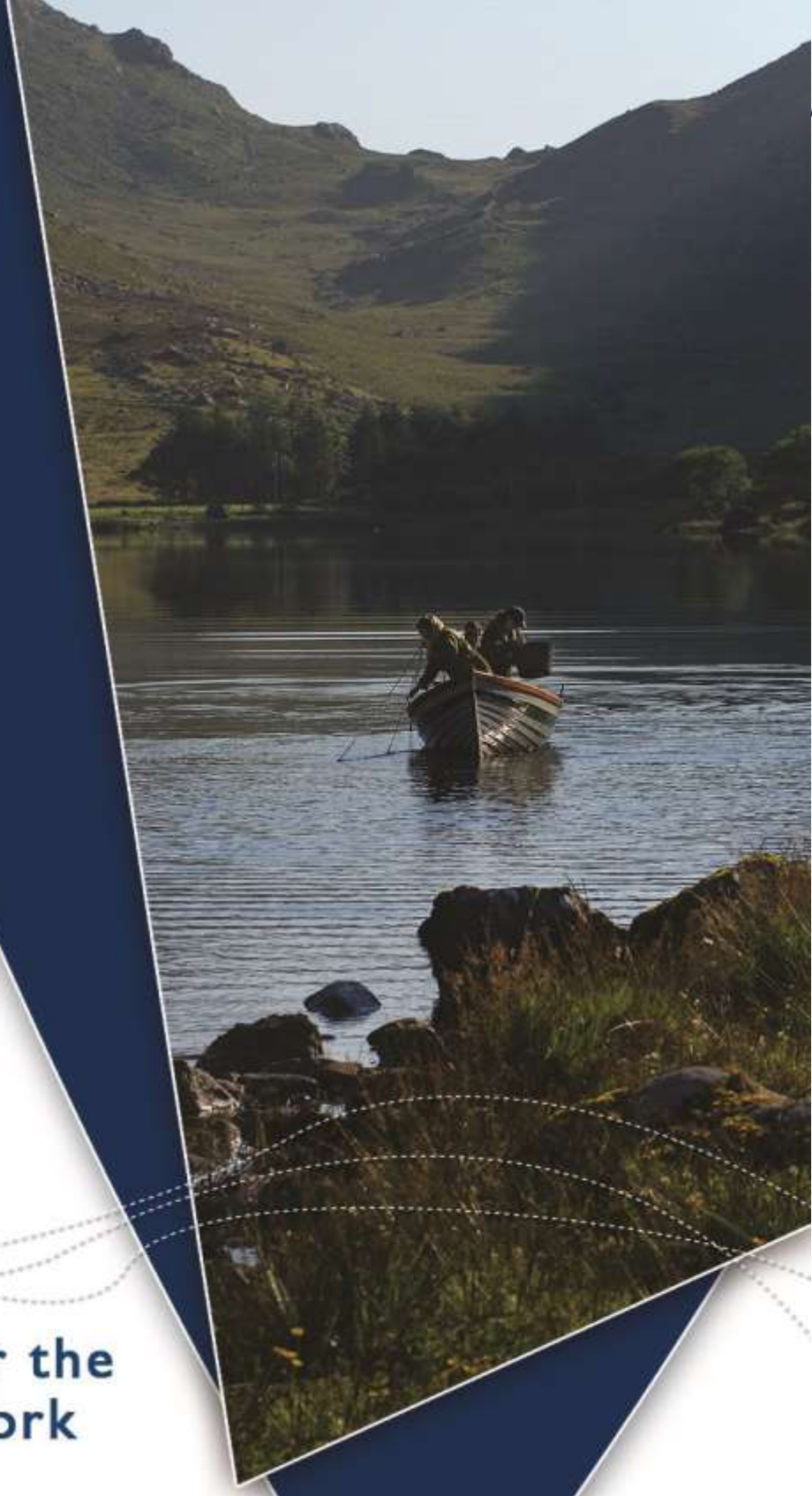

Sampling Fish for the Water Framework Directive

Lakes 2014

Derrybrick Lough

IASCACH INTIRE ÉIREANN
INLAND FISHERIES IRELAND

Water Framework Directive Fish Stock Survey of Derrybrick Lough, August 2014

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Cover photo: Netting survey on Lough Brin © Inland Fisheries Ireland

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1.1 Introduction

Derrybrick Lough is located in the Erne catchment, north-east of Killeshandra and approximately five kilometres south-west of Belturbet. The lake is situated at an altitude of 48m above sea level, has a surface area of 36ha, a mean depth of 2.1m and a maximum depth of 4.9m. The lake is categorised as typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and high alkalinity (>100mg/l CaCO3). Derrybrick Lough is located within the Lough Oughter and associated loughs Special Area of Conservation (NPWS, 2002). The geology of the area is predominantly Lower Carboniferous Limestone.

A previous survey by the Inland Fisheries Trust (IFT) in 1969 established rudd, bream, perch, pike and rudd x bream hybrids to be present in the lake (IFT, unpublished data). A second survey in August 1980 found that roach were numerous, there was a poor stock of rudd, small bream, small perch, a fair stock of pike and a good stock of roach x bream hybrids (up to 1.125g) (IFT, unpublished data). The lake was also surveyed by Inland Fisheries Ireland (formerly the Central Fisheries Board and the Northern Regional Fisheries Board) in 2005 as part of the NS Share Fish in Lakes project, and this survey found that roach followed by perch were the dominant fish species in the lake (Kelly *et al*., 2007). Pike, roach x bream hybrids and eels were also present. A subsequent survey was undertaken on Derrybrick Lough in 2008 and 2011 as part of the Water Framework Directive surveillance monitoring programme (Kelly *et al*., 2009 and Kelly *et al*., 2012a). During the 2011 survey, perch were found to be the dominant species present in the lake. Roach, pike, roach x bream hybrids and eels were also captured during the survey.

This report summarises the results of the 2014 fish stock survey carried out on the lake, as part of the Water Framework Directive surveillance monitoring programme.

Plate 1.1. Derrybrick Lough

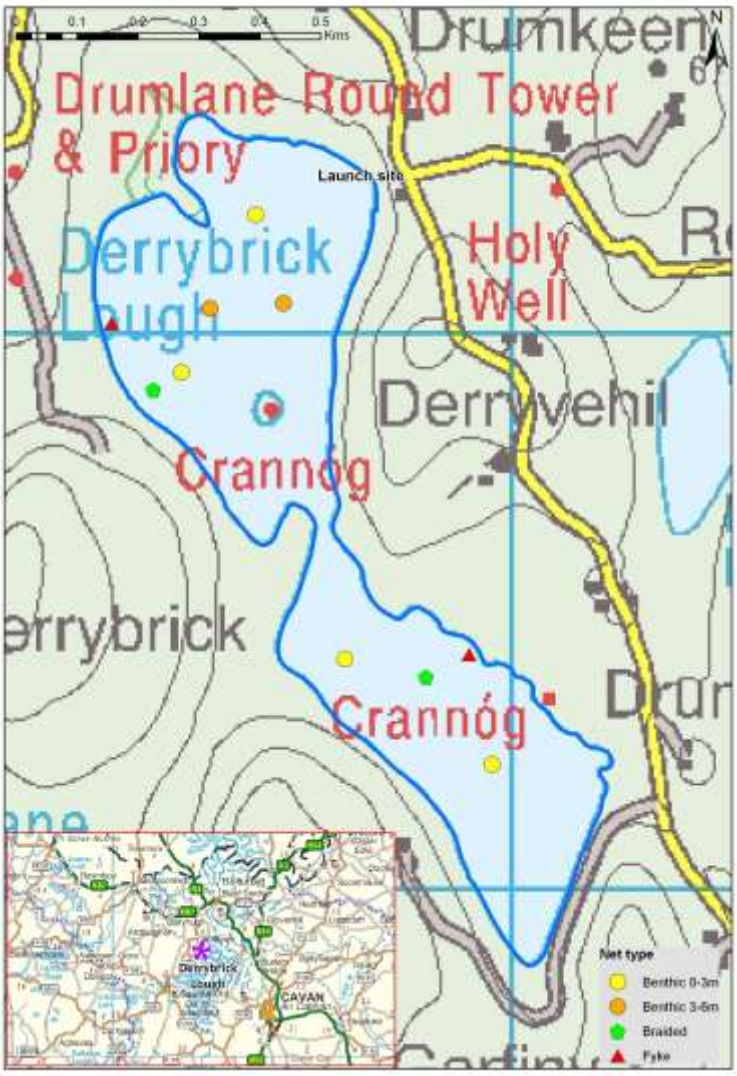

Fig. 1.1 Location map of Derrybrick Lough showing locations and depths of each net

1.2 Methods

Derrybrick Lough was surveyed over one night on the 27th of August 2014. A total of two sets of Dutch fyke nets and six benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (4 @ 0-2.9m and 2 @ 3-5.9m) were deployed in the lake (eight sites). The netting effort was supplemented using two benthic braided survey gill nets (62.5mm mesh knot to knot) at two additional sites. Nets were deployed in the same locations as were randomly selected in the previous surveys in 2008 and 2011. A handheld GPS was used to mark the precise location of each net. The angle of each gill net in relation to the shoreline was randomised.

All fish apart from perch were measured and weighed on site and scales were removed from all roach and pike. 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.

1.3 Results

1.3.1 Species Richness

A total of four fish species were recorded on Derrybrick Lough in August 2014, with 724 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Perch was the most abundant fish species recorded, followed by roach, eels and pike. During the previous surveys in 2008 and 2011 the same species composition was recorded with the exception of roach x bream hybrids, which were not captured during the 2014 survey but were recorded during the 2008 and 2011 surveys and bream which were only recorded in the 2008 survey.

Table 1.1. Number of each fish species captured by each gear type during the survey on Derrybrick Lough, August 2014

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Benthic braided gill nets	Fyke nets	Total
Perca fluviatilis	Perch	605	0	0	605
Rutilus rutilus	Roach	112	0	0	112
Esox lucius	Pike	1	1	1	3
Anguilla anguilla	Eel	0	0	4	4

1.3.2 Fish abundance

Fish abundance (mean CPUE) and biomass (mean BPUE) were calculated as the mean number/weight of fish caught per metre of net. For all fish species except eel, CPUE/BPUE is based on all nets, whereas eel CPUE/BPUE is based on fyke nets only. Mean CPUE and BPUE for all fish species captured in the 2008, 2011 and 2014 surveys are summarised in Table 1.2. Mean CPUE and BPUE for all species is illustrated in Figure 1.2 and 1.3.

Perch was the dominant species in terms of abundance (CPUE) and biomass (BPUE). Although the mean perch CPUE and BPUE was considerably higher in 2014 than in 2008 and 2011, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3). The mean roach CPUE and BPUE fluctuated slightly over the three sampling years; however, these differences were also not statistically significant (Table 1.2; Fig 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Derrybrick Lough, 2008, 2011 and 2014

Scientific name	Common name	2008	2011	2014
			Mean CPUE	
Perca fluviatilis	Perch	0.571 (0.216)	0.233 (0.081)	2.016 (1.008)
Esox lucius	Pike	0.003 (0.003)	0.007 (0.004)	0.008 (0,004)
Rutilus rutilus	Roach	0.256 (0.128)	0.123 (0.085)	0.373 (0.113)
Rutilus rutilus x Abramis brama	Roach x bream hybrids	0.021 (0.012)	0.025 (0.025)	-
Abramis brama	Bream	0.003 (0.003)	-	-
Anguilla anguilla	European eel	0.1 (0.05)	0.091 (0.075)	0.033 (0.016)
			Mean BPUE	
Perca fluviatilis	Perch	10.856 (4.250)	9.291 (4.003)	25.257 (7.818)
Rutilus rutilus	Roach	6.666 (6.666)	14.622 (13.448)	7.857 (6.073)
Esox lucius	Pike	22.373 (10.515)	3.848 (2.251)	24.006 (10.381)
Rutilus rutilus x Abramis brama	Roach x bream hybrids	32.498 (19.541)	58.492 (58.492)	-
Abramis brama	Bream	0.6633 (0.663)	-	-
Anguilla anguilla	European eel	24.183 (8.449)	33.266 (31.166)	5.500 (2.433)

Note: On the rare occasion where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species.

*Eel CPUE and BPUE based on fyke nets only

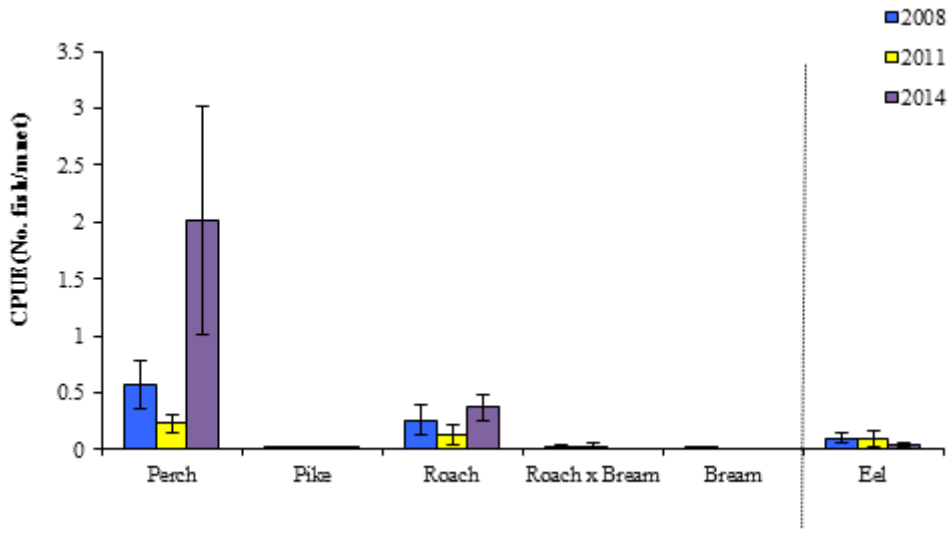

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Derrybrick Lough (Eel CPUE based on fyke nets only), 2008, 2011 and 2014

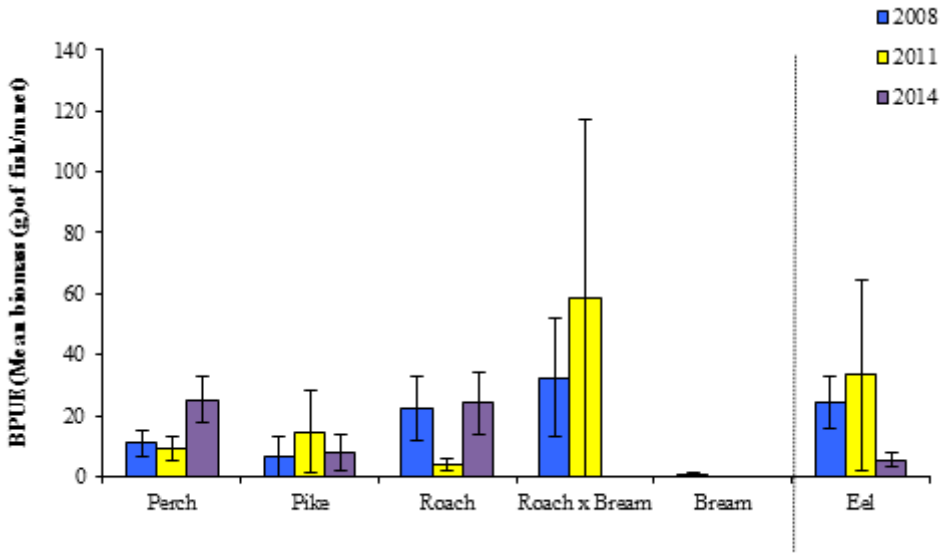

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Derrybrick Lough (Eel BPUE based on fyke nets only), 2008, 2011 and 2014

1.3.3 Length frequency distributions and growth

Perch captured during the 2014 survey ranged in length from 5.0cm to 27.0cm (mean = 8.3cm) (Fig. 1.4) with four age classes present, ranging from 0+ to 3+, with a mean L1 of 5.9cm (Table 1.3). The dominant age class was 0+ (Fig. 1.4). Perch captured during the 2008 and 2011 surveys had a similar length range and a slightly smaller age range and growth rate to the 2014 survey (Fig. 1.4).

Roach captured during the 2014 survey ranged in length from 5.0cm to 26.8cm (mean = 13.7cm) (Fig.1.5) with six age classes present, ranging from 1+ to 6+, with a mean L1 of 6.5cm (Table 1.4). The dominant age class was 2+ (Fig. 1.5). Roach captured during the 2008 survey had a wider length range than the 2014 survey and perch captured during the 2011 survey had the narrowest length range. Age ranges and growth rates were similar over the three sampling years with the dominant age class increasing slightly in size from 2011 to 2014 to 2008 respectively (Fig.1.5).

Pike captured during the 2014 survey ranged in length from 34.3cm to 59.5cm and eels ranged from 41.0cm to 53.0cm.

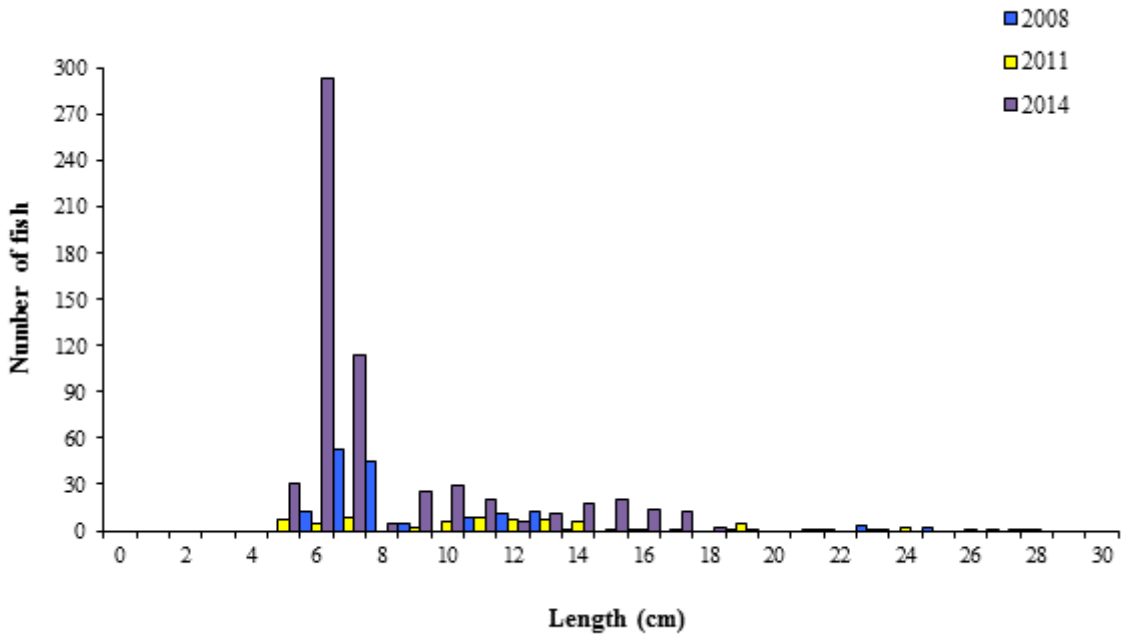

Fig. 1.4. Length frequency of perch captured on Derrybrick Lough, 2008, 2011 and 2014

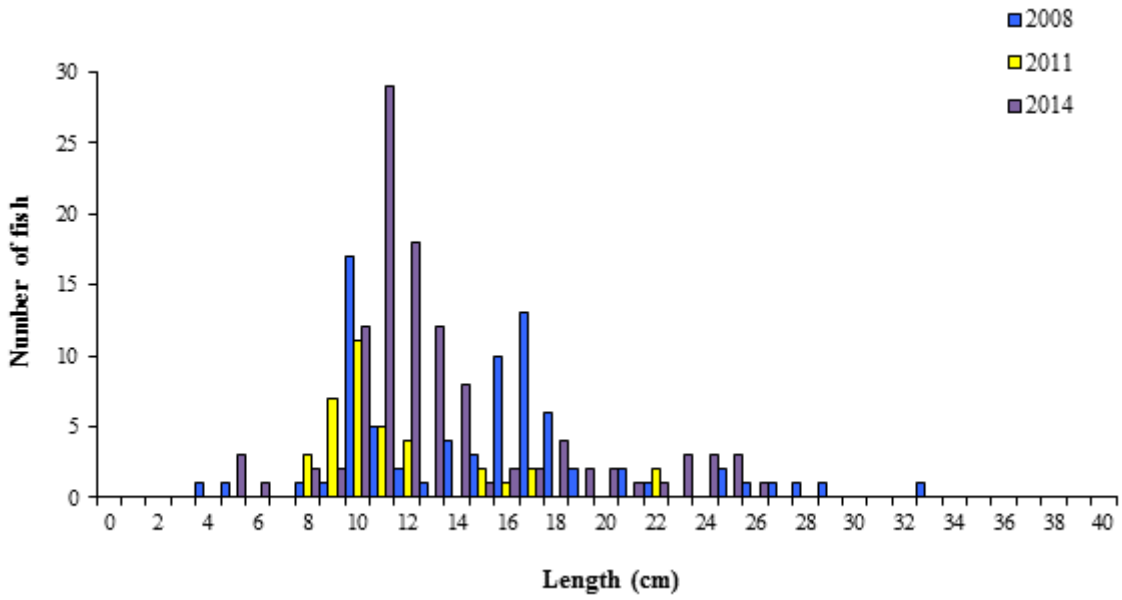

Fig. 1.5. Length frequency of roach captured on Derrybrick Lough, 2008, 2011 and 2014

Table 1.3. Mean (±SE) perch length (cm) at age for Derrybrick Lough, August 2014

	L_1	L_2	L_3
Mean	5.9 (0.1)	10.5 (0.4)	20.4 (1.7)
N	35	23	2
Range	4.2-9.0	8.4-16.2	18.6-22.1

Table 1.4. Mean (±SE) roach length (cm) at age for Derrybrick Lough, August 2014

	L_1	L_2	L_3	L_4	L_5
Mean	6.5 (0.2)	11.9 (0.4)	17.7 (0.7)	21.6 (1.4)	22.3 (0.4)
N	42	22	14	4	2
Range	4.3-9.0	7.8-14.3	12.2-21.3	18.3-24.6	21.9-22.7

1.4 Summary

Perch was the dominant species in terms of abundance (CPUE) and biomass (BPUE) captured in the survey gill nets during the 2014 survey.

Although the mean perch CPUE and BPUE was considerably higher in 2014 than in 2008 and 2011, these differences were not statistically significant. Perch ranged in age from 0+ to 3+, indicating reproductive success in each of the previous four years. The dominant age class was 0+.

The mean roach CPUE and BPUE fluctuated slightly over the three sampling years, however, these differences were also not statistically significant. Roach ranged in age from 1+ to 6+, indicating reproductive success in the previous six years. The dominant age class was 2+.

Classification and assigning lakes with an ecological status is a critical part of the WFD monitoring programme. It allows River Basin District managers to identify and prioritise lakes that currently fall short of the minimum "Good Ecological Status" that is required by 2015 if Ireland is not to incur penalties.

A multimetric fish ecological classification tool (Fish in Lakes – 'FIL') was developed for the island of Ireland (Ecoregion 17) using IFI and Agri-Food and Biosciences Institute Northern Ireland (AFBINI) data generated during the NSSHARE Fish in Lakes project (Kelly *et al.*, 2008). This tool was further developed during 2010 (FIL2) in order to make it fully WFD compliant, including producing EQR values for each lake and associated confidence in classification (Kelly *et al*., 2012b). Using the FIL2 classification tool, Derrybrick Lough has been assigned an ecological status of Moderate in 2005, 2008 and 2014 and Poor in 2011 based on the fish populations present.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Derrybrick Lough an overall draft ecological status of Poor, based on all monitored physico-chemical and biological elements, including fish.

1.5 References

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