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Sampling Fish for the Water Framework Directive

Lakes 2011

Corglass Lough

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Corglass Lough, June 2011

Fiona L. Kelly, Lynda Connor, Emma Morrissey, Ciara Wogerbauer, Ronan Matson, Rory Feeney and Kieran Rocks

Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin

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Cover photo: Lynda and Fiona gill netting © Inland Fisheries Ireland

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1.1 Introduction

Corglass Lough is situated in the Erne catchment, north of Killeshandra, Co. Cavan (Plate 1.1, Fig. 1.1). The lake has a surface area of 34ha and is relatively shallow, with a mean depth of 1.6m and a maximum depth of 6m. The lake falls into typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (mean depth <4m), less than 50ha and high alkalinity (>100mg/l $CaCO_3$). Corglass Lough is located within the Lough Oughter and its associated loughs Special Area of Conservation (NPWS, 2002). The geology of the area is predominantly Lower Carboniferous Limestone.

The lake is a popular coarse fishery and has historically held a good stock of coarse fish species, including rudd, roach, perch, bream, pike, tench, roach x bream hybrids and roach x rudd hybrids (M. Fitzpatrick, *pers*. *comm*.). The lake has also been long-lined for eels in the past by commercial eel fishermen. Zebra mussels are present in the lake and are thought to have colonised post 2003 (M. Fitzpatrick, *pers. comm*.).

Corglass lake was previously surveyed in July 2005 by Inland Fisheries Ireland (formerly the Central and Northern Regional Fisheries Boards) for the NS Share "Fish in Lakes Project", with six species (plus two hybrids) being captured – perch, pike, roach, bream, tench, eels, roach x bream hybrids and roach x rudd hybrids (Kelly *et al*., 2007). Corglass Lough was also surveyed in 2008 as part of the Water Framework Directive surveillance monitoring programme (Kelly *et al*., 2009). During this survey, perch and roach were found to be the dominant species present in the lake. Bream, pike, roach x bream hybrids and eels were also captured during the survey.

This report summarises the results of the 2011 fish stock survey carried out on the lake, as part of the Water Framework Directive surveillance monitoring programme.

Plate 1.1. Corglass Lough

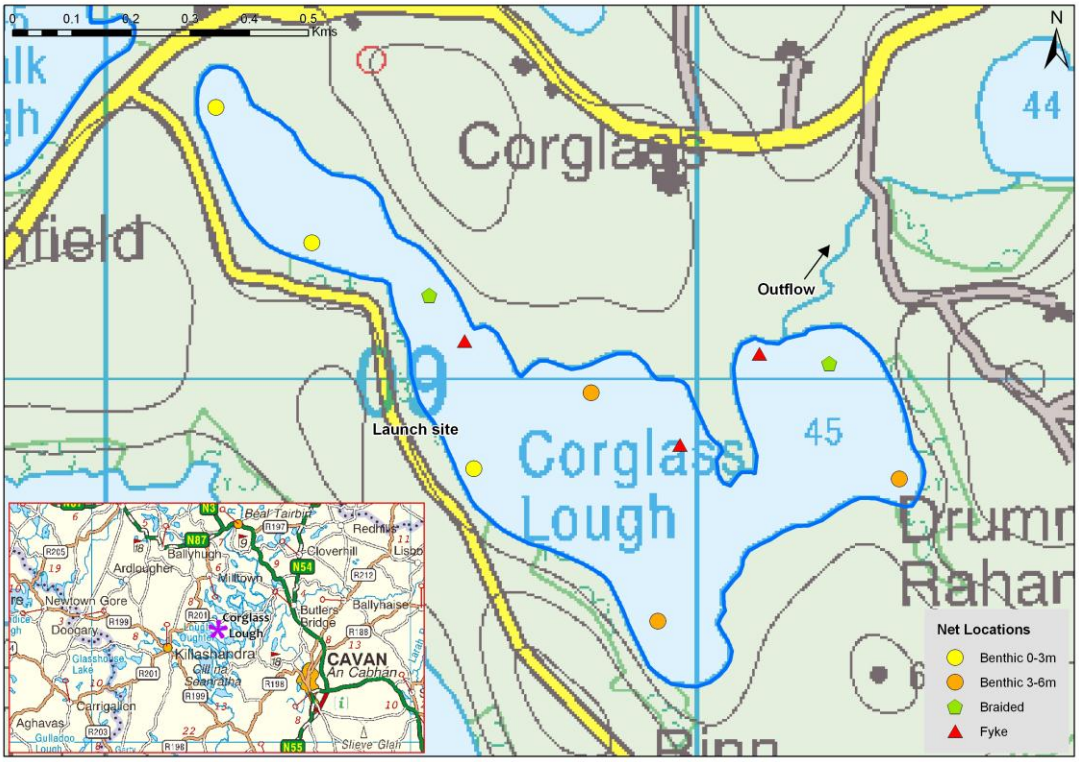

Fig. 1.1. Location map of Corglass Lough showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Corglass Lough was surveyed over one night on the 29th of June 2011. A total of three sets of Dutch fyke nets and six benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (3 @ 0-2.9m and 3 @ 3-5.9m) were deployed in the lake (nine 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 survey in 2008. 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, pike, tench, rudd and roach x bream hybrids. 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 six fish species and one type of hybrid were recorded on Corglass Lough in June 2011, with 522 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, roach x bream hybrids, tench, rudd and pike were also recorded. During the previous survey in 2008 the same species composition was recorded with the exception of rudd and tench, which were recorded during the 2011 survey but were not captured in the 2008 survey and bream which were present in the 2008 survey but were not captured in the current survey.

Table 1.1. Number of each fish species captured by each gear type during the survey on Corglass Lough, June 2011

Scientific name	Common name	Number of fish captured			
		Benthic mono multimesh gill nets	Benthic braided gill nets	Fyke nets	Total
Perca fluviatilis	Perch	241	0	13	254
Rutilus rutilus	Roach	221	3	5	229
Esox lucius	Pike	3	3	0	6
Scardinius erythrophthalmus	Rudd	1	0	0	1
Tinca tinca	Tench	4	0	0	4
Rutilus rutilus x Abramis brama	Roach x bream hybrid	17	7	0	24
Anguilla anguilla	European 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 2008 and 2011 are summarised in Table 1.2. Mean CPUE and BPUE for all fish species is illustrated in Figures 1.2 and 1.3.

Although the mean roach CPUE and BPUE was higher in 2011 than in 2008, these differences were not statistically significant (Figs. 1.2 and 1.3). The differences in the mean roach CPUE and BPUE between Corglass Lough and five similar lakes was also assessed, and found to be statistically significant (Kruskal-Wallis, $P<0.05$) (Fig. 1.4 and Fig. 1.5). Independent-Samples Mann-Whitney U tests between each lake showed that Corglass Lough had a significantly higher mean brown trout CPUE than Upper Lough Corrib, Lower Lough Corrib and Lough Sheelin ($z = -2.695$ $P<0.05$, $z = -2.693$ $P<0.05$and $z = -3.045$ $P<0.05$) (Fig. 1.4) and a significantly higher mean brown trout BPUE than Upper Lough Corrib, Lough Sheelin and Lower Lough Corrib ($z = -2.598$ $P<0.05$, $z = -2.867$ $P<0.05$and $z = -2.851$ $P<0.05$) (Fig. 1.5).

Although the mean perch CPUE was lower in 2011 than in 2008 and the mean perch BPUE was higher in 2011 than in 2008, these differences were not statistically significant (Figs. 1.2 and 1.3). The differences in the mean perch CPUE and BPUE between Corglass Lough and three other similar lakes was assessed, with no overall significant differences being found (Fig. 1.6 and 1.7).

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

Scientific name	Common name	2008	2011
		Mean CPUE	
Perca fluviatilis	Perch	0.896 (0.307)	0.75 (0.346)
Esox lucius	Pike	0.009 (0.004)	0.019 (0.007)
Rutilus rutilus	Roach	0.460 (0.157)	0.687 (0.211)
Scardinius erythrophthalmus	Rudd	-	0.003 (0.003)
Tinca tinca	Tench	-	0.012 (0.009)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.093 (0.047)	0.075 (0.037)
Abramis brama	Bream	0.003 (0.003)	-
Anguilla anguilla	European eel	0.05 (0.028)	0.022 (0.005)
		Mean BPUE	
Perca fluviatilis	Perch	16.454 (6.352)	17.684 (9.085)
Esox lucius	Pike	17.673 (11.286)	31.962 (18.971)
Rutilus rutilus	Roach	28.491 (9.320)	64.896 (18.748)
Scardinius erythrophthalmus	Rudd	-	1.409 (1.409)
Tinca tinca	Tench	-	20.206 (13.921)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	6.927 (3.433)	30.189 (12.617)
Abramis brama	Bream	8.484 (8.484)	-
Anguilla anguilla	European eel	11.344 (5.688)	8.2388 (1.451)

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

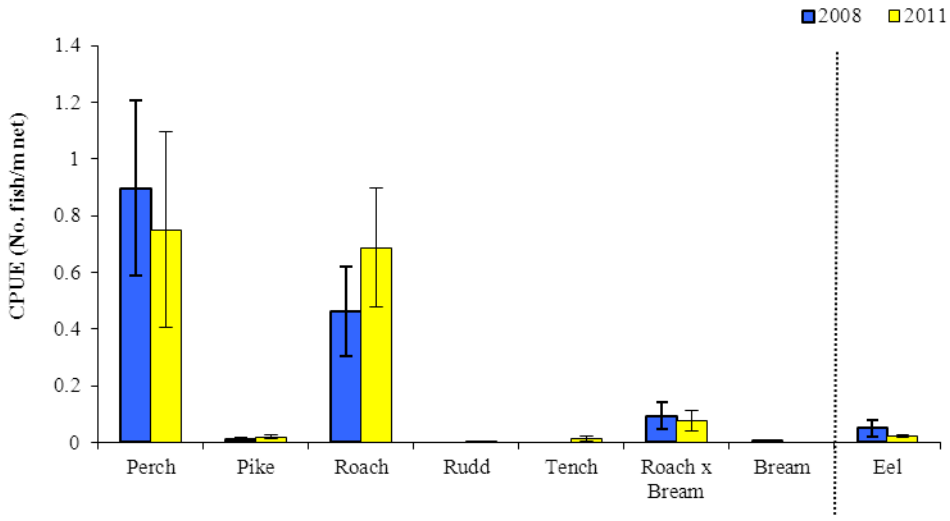

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Corglass Lough (Eel CPUE based on fyke nets only), 2008 and 2011

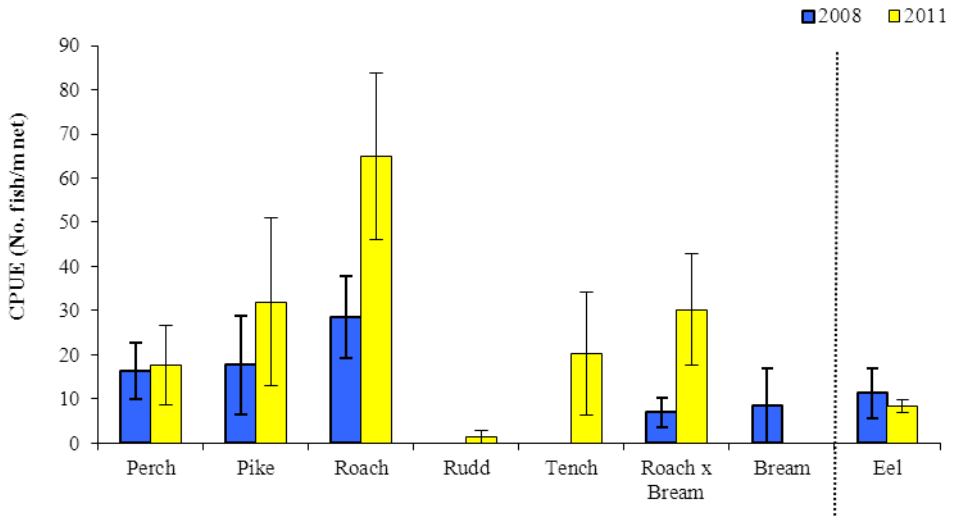

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Corglass Lough (Eel CPUE based on fyke nets only), 2008 and 2011

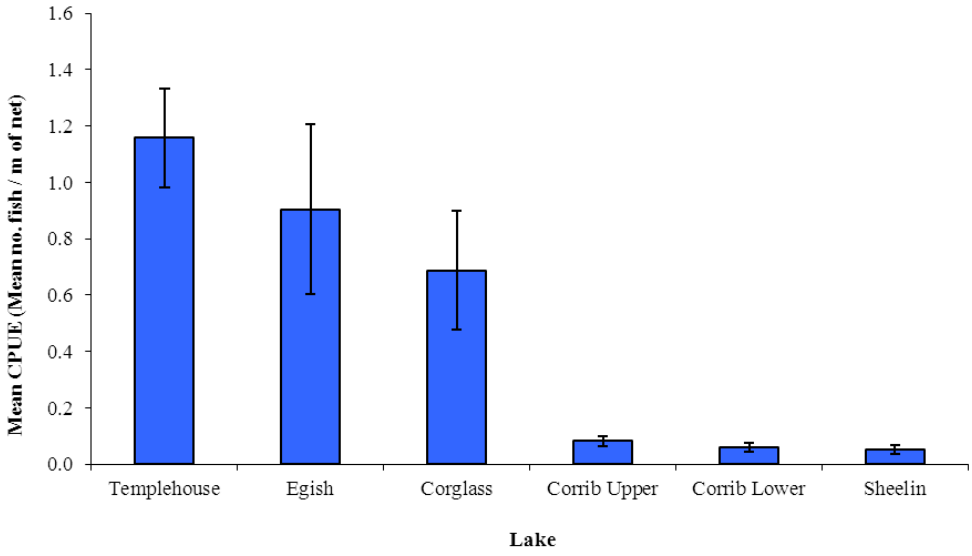

Fig. 1.4. Mean (±S.E.) roach CPUE in six lakes surveyed during 2011

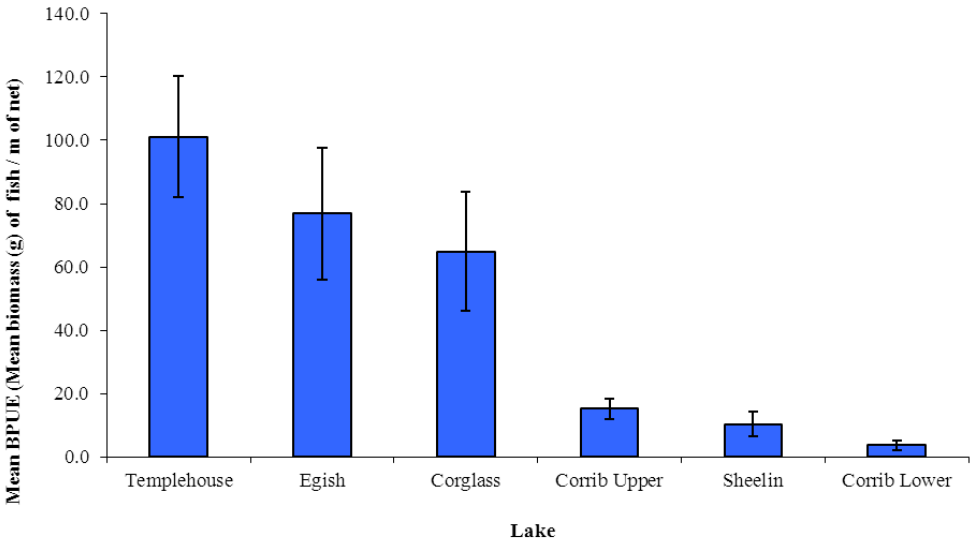

Fig. 1.5. Mean (±S.E.) roach BPUE in six lakes surveyed during 2011

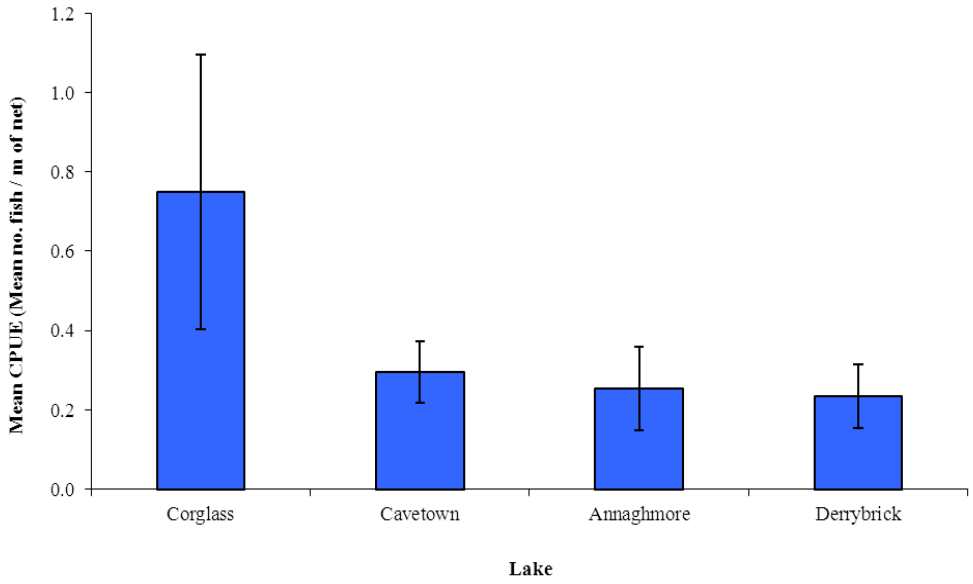

Fig. 1.6. Mean (±S.E.) perch CPUE in four lakes surveyed during 2011

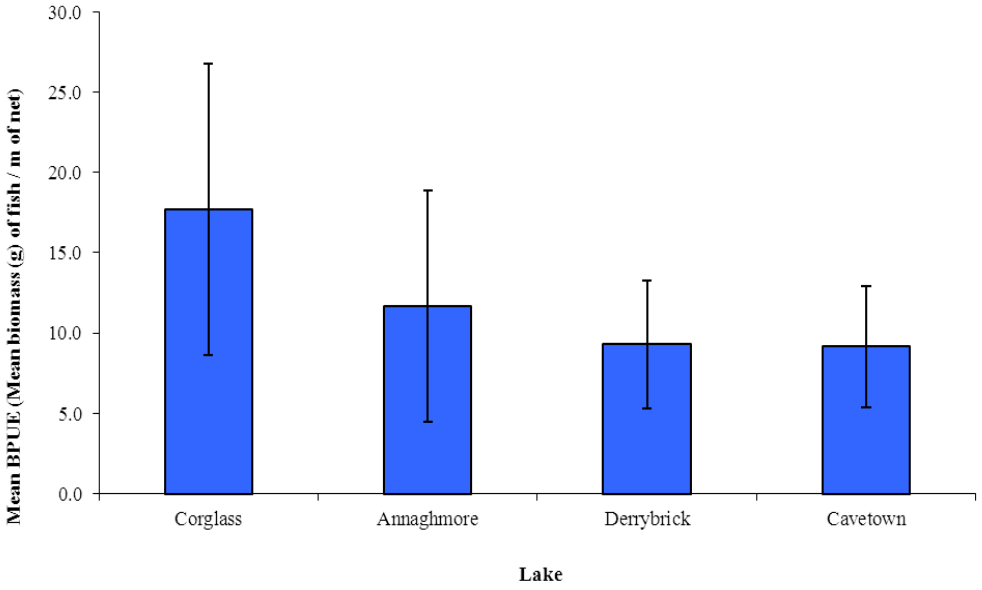

Fig. 1.7. Mean (±S.E.) perch BPUE in four lakes surveyed during 2011

1.3.3 Length frequency distributions

Perch captured during the 2011 survey ranged in length from 3.2cm to 24.6cm (mean = 10.2cm) (Fig.1.8). Perch captured during the 2008 survey had lengths ranging from 4.1cm to 22.9cm (Fig.1.8).

Roach captured during the 2011 survey ranged in length from 5.4cm to 29.0cm (mean = 14.4cm) (Fig. 1.9). Roach captured during the 2008 survey ranged in length from 6.0cm to 28.5cm (Fig. 1.9).

Roach x bream hybrids captured during the 2011 survey ranged in length from 12.0cm to 37.1cm, pike ranged in length from 10.0cm to 72.4cm, tench ranged in length from 37.2cm to 48.2cm and eels ranged from 54.2cm to 61.1cm. One rudd was recorded at 27.4cm.

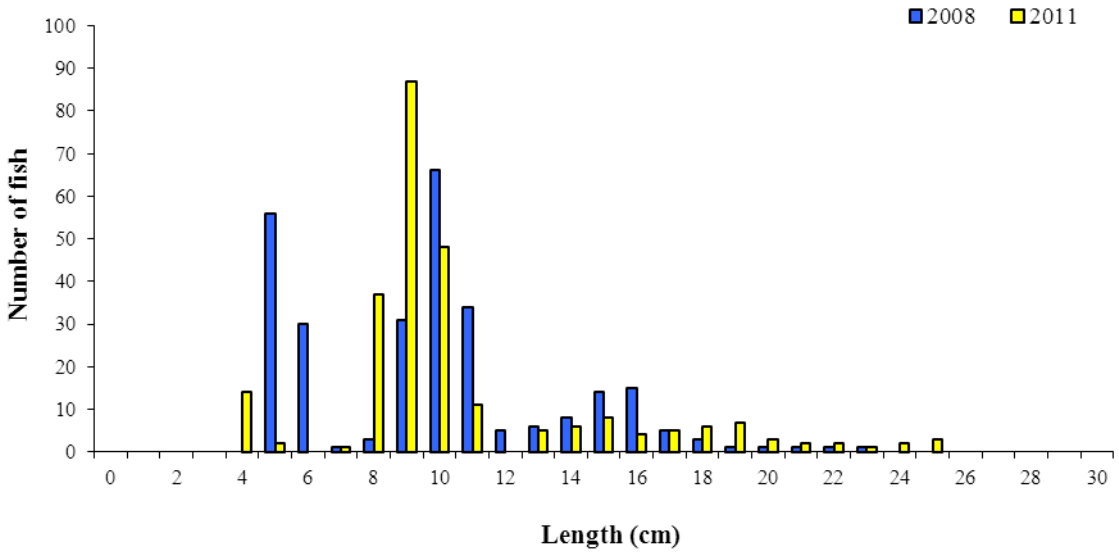

Fig. 1.8. Length frequency of perch captured on Corglass Lough, 2008 and 2011

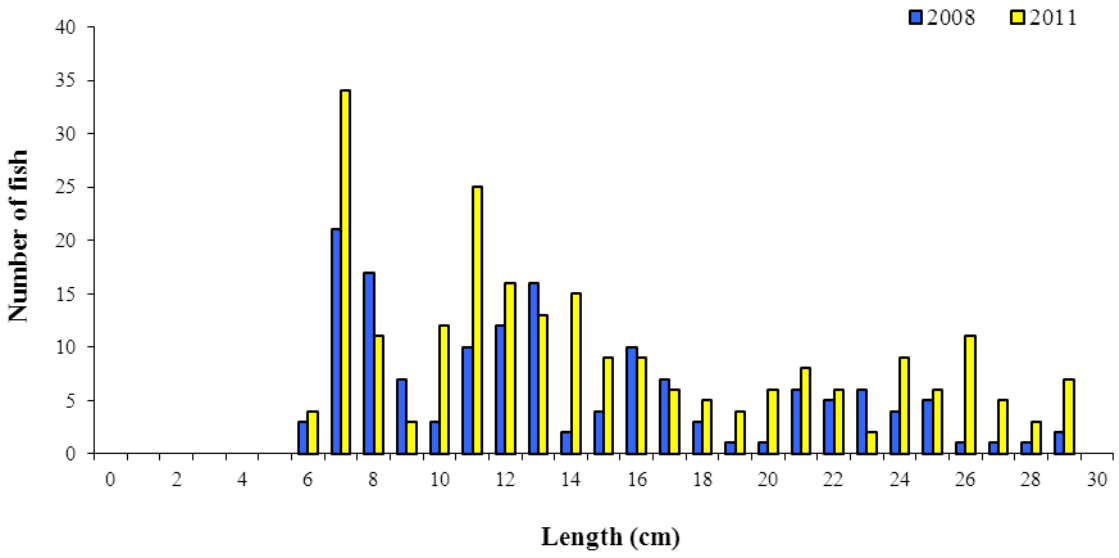

Fig. 1.9. Length frequency of roach captured on Corglass Lough, 2008 and 2011

1.3.4 Fish age and growth

Six age classes of perch were present, ranging from 0+ to 5+, with a mean L1 of 6.1cm (Table 1.3). In the 2008 survey, perch also ranged in age from 0+ to 5+ with a mean L1 of 6.5cm.

Nine age classes of roach were present, ranging from 1+ to 9+, with a mean L1 of 2.2cm (Table 1.4). In the 2008 survey, roach also ranged from 1+ to 9+ with a mean L1 of 3.9cm.

Five age classes of pike were present, ranging from 0+ to 6+ and six age classes of roach x bream hybrids were present ranging from 2+ to 9+. One rudd was aged at 8+.

Table 1.3. Mean (±SE) perch length (cm) at age for Corglass Lough, June 2011

	L_1	L_2	L_3	L_4	L_5
Mean	6.1 (0.1)	10.5 (0.2)	15.1 (0.3)	19.2 (0.5)	23.4 (0.4)
N	60	42	34	14	4
Range	4.2-7.4	7.2-13.1	10.2-18.2	16.1-22.2	22.2-24.1

Table 1.4. Mean (±SE) roach length (cm) at age for Corglass Lough, June 2011

	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9
Mean	2.2 (0.1)	5.8 (0.1)	10.3 (0.2)	14.9 (0.3)	18.6 (0.3)	22.0 (0.4)	24.1 (0.3)	26.0 (0.3)	27.9 (0.2)
N	95	93	87	62	42	28	16	6	5
Range	1.2-4.0	3.2-9.2	5.3-14.9	10.3-20.4	13.4-24.3	17.9-26.4	22.5-26.4	25.1-27.4	27.4-28.5

1.4 Summary

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

Although there were slight differences in the mean perch CPUE and BPUE between 2011 and 2008, these differences were not statistically significant. The mean perch CPUE and BPUE in Corglass Lough was similar to the other lakes assessed, with no statistically significant differences being found between lakes. Perch ranged in age from 0+ to 5+, with 0+ and 1+ fish being captured indicating reproductive success in recent years. The dominant age class of perch was 3+.

Although the mean roach CPUE and BPUE was higher in 2011 than in 2008, these differences were not statistically significant. The mean roach CPUE and BPUE in Corglass Lough was significantly higher than three other similar lakes surveyed during 2011; Upper Lough Corrib, Lough Sheelin and Lower

Lough Corrib. Roach ranged in age from 1+ to 9+, with 1+ fish being captured indicating reproductive success in in recent years.

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.*, 2012). Using the FIL2 classification tool, Corglass Lough has been assigned an ecological status of Poor/Bad based on the fish populations present. The ecological status assigned to the lake based on the 2008 survey data was Moderate.

In the 2007 to 2009 surveillance monitoring reporting period, the EPA assigned Corglass Lough an overall ecological status of Moderate, based on all monitored physico-chemical and biological elements, including fish. This status classification will be revised at the end of 2012.

1.5 References

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Inland Fisheries Ireland
Swords Business Campus,
Swords,
Co. Dublin,
Ireland.

Web: www.fisheriesireland.ie
Email: info@fisheriesireland.ie
Tel: +353 1 8842 600
Fax: +353 1 8360 060