National Research Survey Programme
Lakes 2018

Corrinshigo Lough

IFI/2019/1-4461

Iascach Intíre Éireann
Inland Fisheries Ireland

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**Fish Stock Survey of Corrinshigo Lough,
September 2018**

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ACKNOWLEDGEMENTS

1.1 Introduction

Corrinshigo Lough (Malones Lake) is located just outside the town of Castleblayney in Co. Monaghan. The R183 (Castleblayney to Ballybay) road runs adjacent to the southern shore, where access to the lake is gained via a gate. The shore line at this point appears to have been modified (Fig. 1.1, Plate 1.1). The eastern shoreline has been engineered, and large amounts of landfill material were visible at the waters edge (Plate1.2). The lake has a surface area of 2.6ha, mean depth of 5m and maximum depth of 5.7m (IFI data). The lake falls within the Fane (Muckno) Catchment in the Neagh Bann International River Basin District. An overgrown connection drains the north western corner of the lake and connects with Drumillard Lough and subsequently Muckno Lough. The lake is not currently monitored for Water Framework Directive purposes, but falls within the typology class 9 for the purposes of WFD (as designated by the EPA). It is deep (>4m), less than 50ha and has high alkalinity (>100mg/l $CaCO_3$). The lake is surrounded primarily by agricultural pasture. The geology of the area is predominantly sandstone and shale.

Angling is available from stands on the southern shore, and the lake is known to hold stocks of roach, bream, perch, rudd, tench and pike (IFI, 2019). The lake was stocked with 150 tench in 1964. A survey conducted by the Inland Fisheries trust in 1968 failed to record any tench, but bream, rudd, perch and pike were recorded (IFI unpublished archival data).

This report summarises the results of the 2018 fish stock survey (e.g. species composition, abundance and age structure) on the lake.

Plate 1.1. Corrinshigo (Malone's) Lough, September 2018

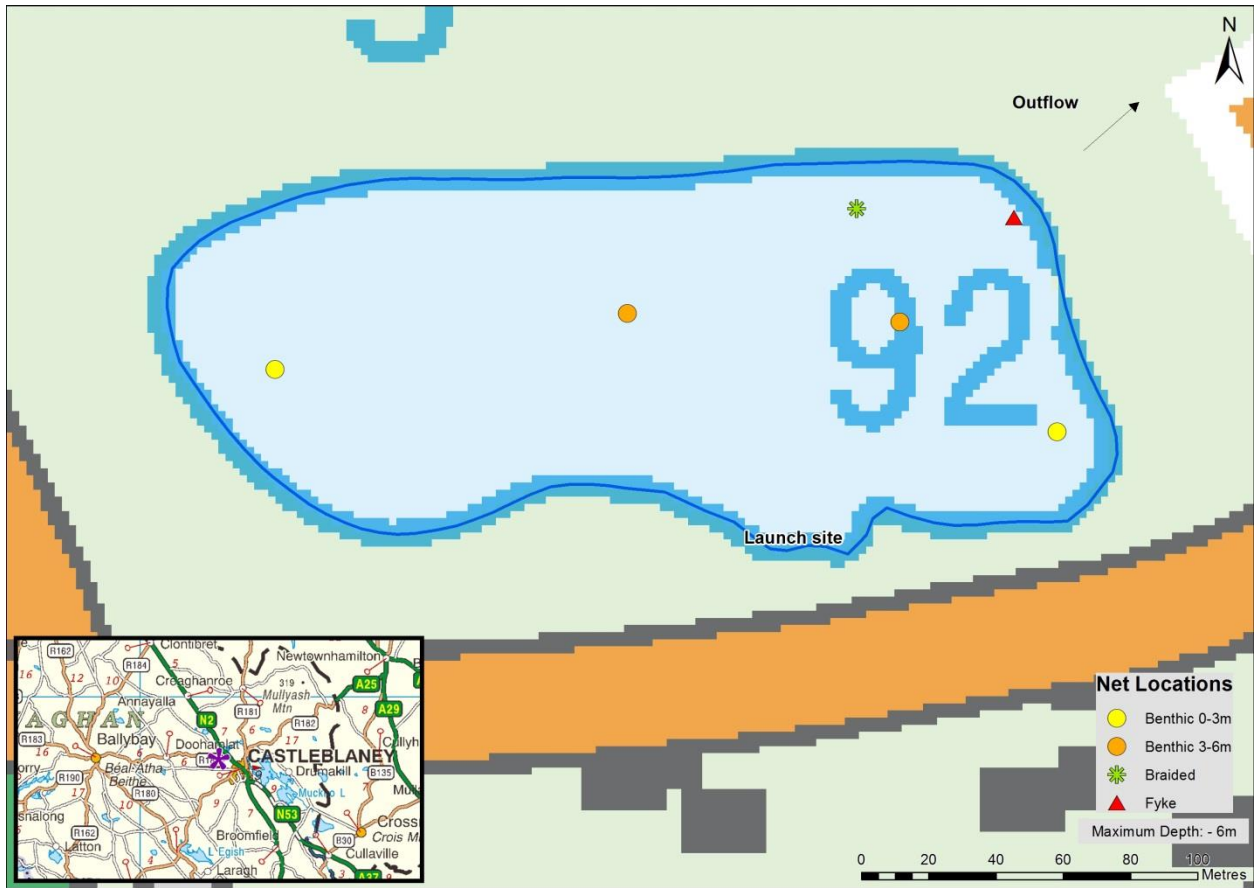Plate 1.2. Eastern shoreline of Corrinshigo (Malone's) Lough, September 2018

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

1.2 Methods

1.2.1 Netting methods

Corrinshigo Lough was surveyed over one night from the 11th to the 12th of September 2018. A total of one set of Dutch fyke nets (Fyke), and four benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (BM CEN) were deployed with two survey gill nets randomly set in each depth zone respectively (i.e. 2 @ 0-2.9m and 2 @ 3-5.9m). The netting effort was supplemented using four-panel benthic braided survey gill nets (4-PBB) at one additional site. The 4-PBB nets are composed of four 27.5m long panels each a different mesh size (55mm, 60mm, 70mm and 90mm knot to knot). 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 also randomised.

All fish apart from perch were measured and weighed on site and scales were removed from roach, bream, bream hybrids and tench. Live fish were returned to the water whenever practical or when the likelihood of their survival was considered to be good. Samples of fish were retained for further analysis. Fish were frozen immediately after the survey and transported back to the IFI laboratory for later dissection.

1.2.2 Fish diet

Total stomach contents were inspected and individual items were counted and identified to the lowest taxonomic level possible. The percentage frequency occurrence (FO) of prey items were calculated to identify key prey items (Amundsen *et al.*, 1996).

$$\mathbf{FO}_i = \left(\frac{N_i}{N}\right) * 100$$

Where:

$\mathbf{FO}_i$ is the percentage frequency of prey item i,

N_i is the number of pike with prey i in their stomach,

N is total number of pike with stomach contents.

1.2.3 Biosecurity - disinfection and decontamination procedures

Procedures are required for disinfection of equipment in order 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.

1.3 Results

1.3.1 Species Richness

A total of five fish species and one type of hybrid were recorded on Corrinshigo Lough in September 2018, with 199 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Roach and perch were the most abundant fish species recorded respectively. Bream, roach x bream hybrids, tench and pike were also recorded.

Table 1.1. Number of each fish species captured by each method during the survey on Corrinshigo Lough, September 2018

Scientific name	Common name	Number of fish captured			
		BM CEN	4-PBB	Fyke	Total
Rutilus rutilus	Roach	82	0	1	83
Perca fluviatilis	Perch	67	0	3	70
Abramis brama	Bream	28	1	0	29
Rutilus rutilus x Abramis brama	Roach x bream hybrid	7	3	0	10
Tinca tinca	Tench	3	1	1	5
Esox lucius	Pike	2	0	0	2

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 2018 survey are summarised in Table 1.2 (Fig. 1.2 and 1.3).

Overall roach was the dominant species in terms of CPUE. Biomass (BPUE) of roach was also high, and was similar to that recorded for tench (Table 1.2). The latter species had the highest BPUE of all fish captured during the survey, albeit only four fish were captured in the survey nets deployed (Fig. 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE (per metre of net) for all fish species captured on Corrinshigo Lough, September 2018

Scientific name	Common name	Mean CPUE (± S.E)	Mean BPUE (± S.E)
Rutilus rutilus	Roach	0.458 (0.244)	20.931 (10.700)
Perca fluviatilis	Perch	0.381 (0.138)	4.587 (1.892)
Abramis brama	Bream	0.157 (0.073)	4.774 (2.262)
Rutilus rutilus x Abramis brama	Roach x bream hybrid	0.044 (0.019)	12.188 (6.617)
Tinca tinca	Tench	0.021 (0.010)	21.592 (12.784)
Esox lucius	Pike	0.011 (0.007)	3.614 (2.457)

Note: Where biomass data was unavailable for an individual fish, this was determined from a length/weight regression for that species (Connor *et al.*, 2017).
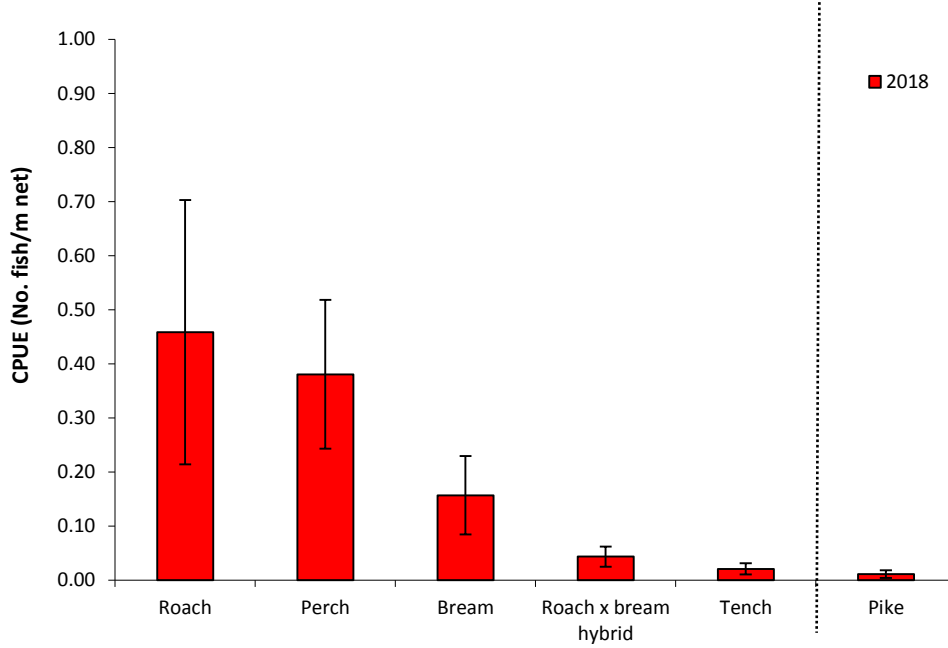
*Eel CPUE and BPUE based on fyke nets only

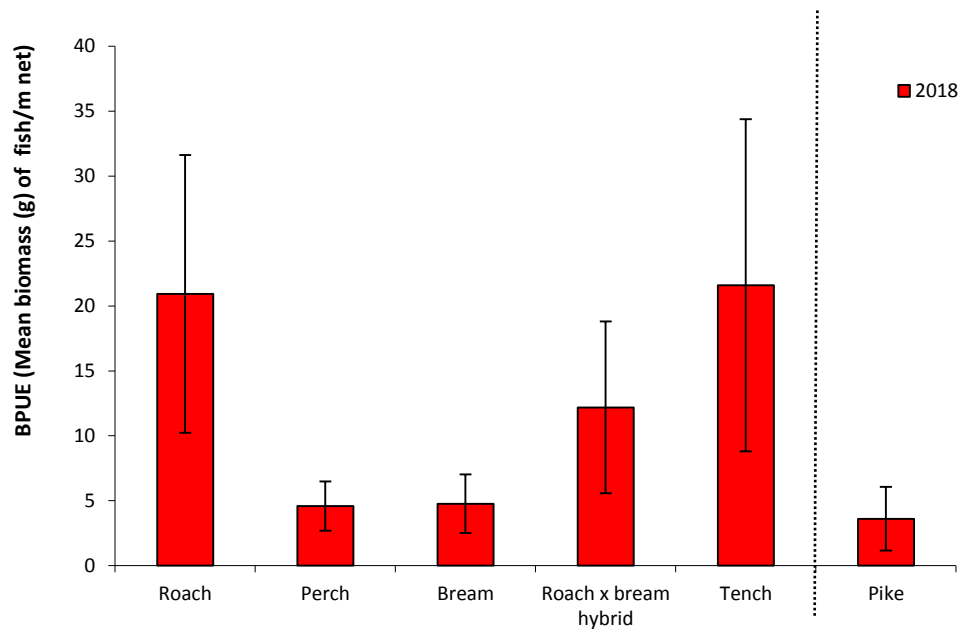**Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Corrinshigo, September 2018**

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Corrinshigo Lough, September 2018

1.3.3 Length frequency distributions and growth

Roach

Roach captured during the 2018 survey ranged in length from 7.0cm to 21.7cm (mean = 13.6cm) (Fig.1.4). Nine age classes, ranging from 1+ to 9+, including all intervening year classes were recorded in the sample (Table 1.3).
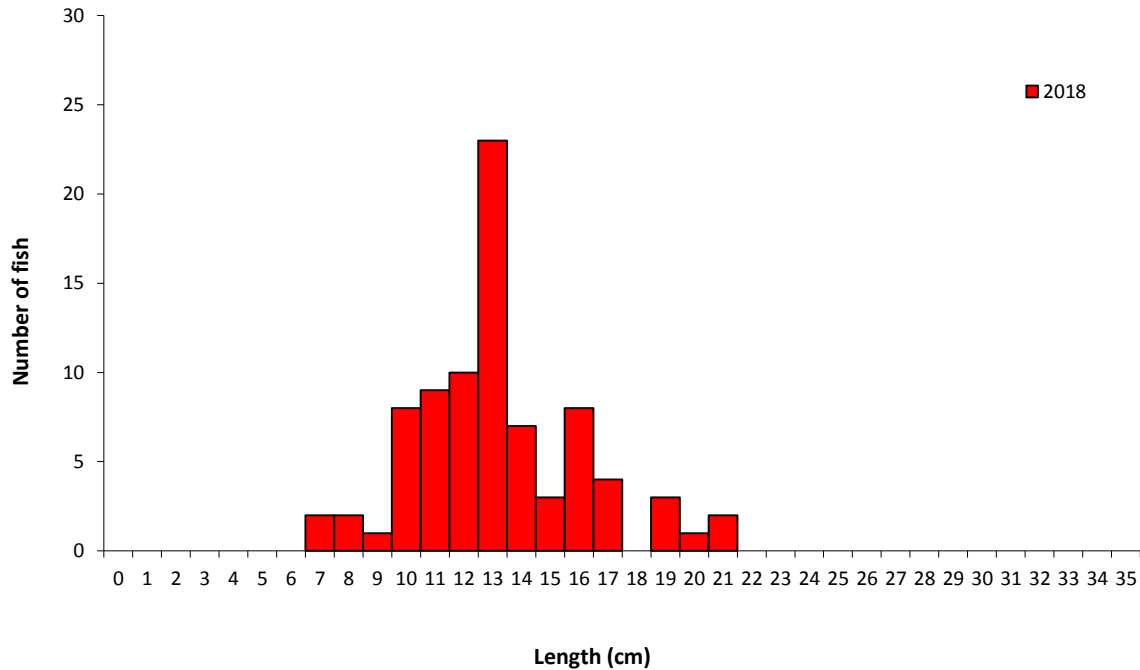

Fig. 1.4. Length frequency of roach captured on Corrinshigo Lough, 2018

Table 1.3. Summary age and length data for a sub-sample of roach captured on Corrinshigo Lough, September 2018. Number of fish and length ranges of all fish aged in the sample is presented

	Age class									
	0+	**1+**	**2+**	**3+**	**4+**	**5+**	**6+**	**7+**	**8+**	**9+**
Mean (cm)	NA	8.2	9.2	12.2	15.1	15.9	16.9	20.0	20.6	21.7
N	NA	2	2	23	3	9	5	3	1	1
Range (cm)	NA	7.8-8.5	8.7-9.6	10.3-14.5	14.3-16.2	13.4-17.0	16.1-17.5	19.1-21.6	20.6	21.7

Perch

Perch captured during the 2018 survey ranged in length from 5.9cm to 18.4cm (mean = 8.9cm) (Fig.1.5) with five age classes present, ranging from 0+ to 4+ with a mean L1 of 5.2cm (Table 1.4). The dominant age class was 0+ (Fig. 1.5).
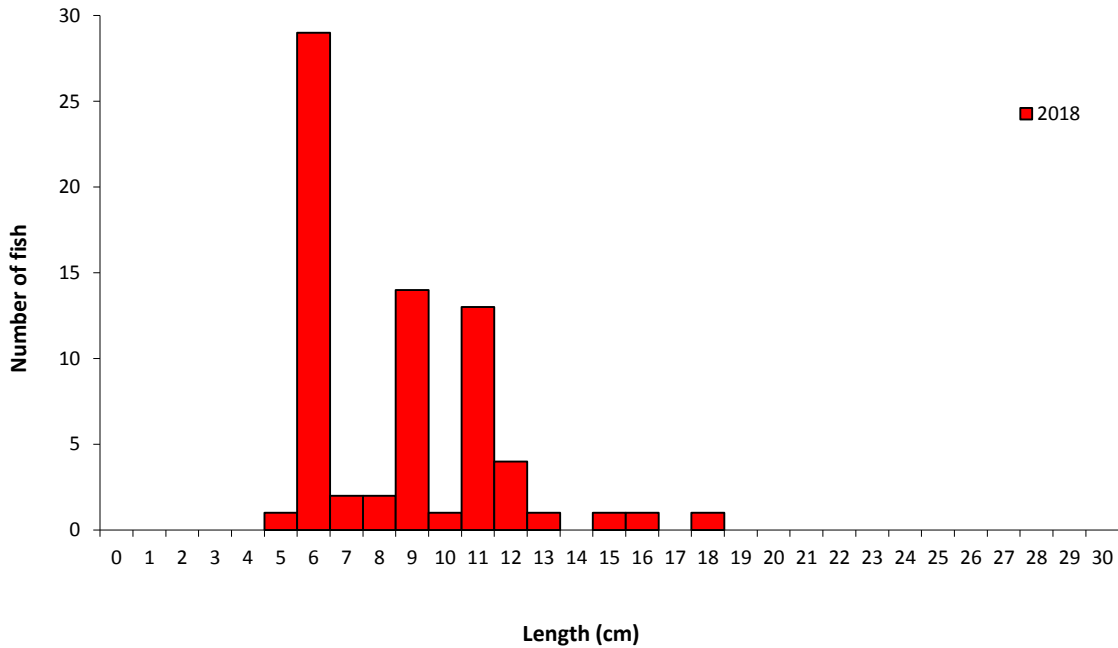
Fig. 1.5. Length frequency of perch captured on Corrinshigo Lough, 2018

Table 1.4. Mean (±S.E.) perch length (cm) at age for Corrinshigo Lough, September 2018

	L_1	L_2	L_3	L_4
Mean (±S.E.)	5.2 (0.1)	8.6 (0.2)	11.0 (0.4)	13.0 (0.8)
N	19	13	3	2
Range	4.2-6.4	7.6-10.0	10.4-11.8	12.2-13.8

Bream

Bream captured during the 2018 survey ranged in length from 4.2cm to 37.4cm (mean = 11.0cm) (Fig.1.6). The population was dominated by younger fish (Table 1.5). Six year classes were recorded in the sample. The largest year class was 1+ and several 0+ fish (i.e. fish that were spawned in 2018) were recorded. All years between 0+ and 4+ were captured. The largest fish, an individual of 37.4cm was aged 7+.
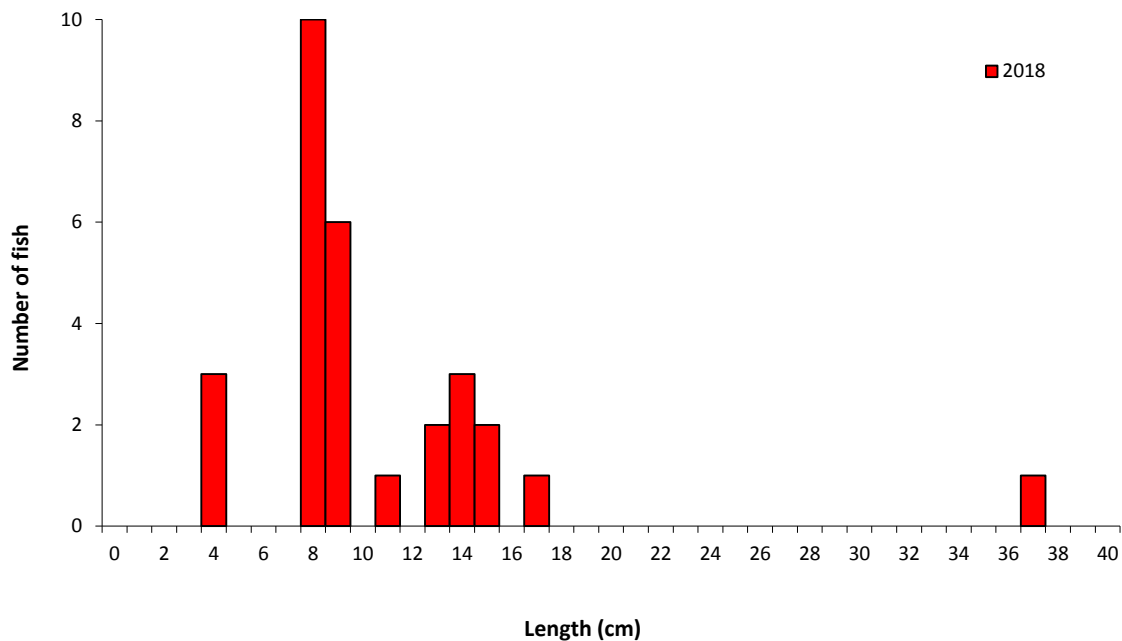

Fig. 1.6. Length frequency of bream captured on Corrinshigo Lough, 2018

Table 1.5. Summary age data from bream captured on Corrinshigo Lough, September 2018. Number of fish and length ranges of all fish aged in the sample is presented

	Age class							
	0+	**1+**	**2+**	**3+**	**4+**	**5+**	**6+**	**7+**
Mean L (cm)	4.5	8.7	12.5	14.2	15.6	-	-	37.4
N	3	7	2	4	3	-	-	7
Range (cm)	4.2-4.8	8.3-9.4	11.6-13.4	13.4-15	14.2-17.7	-	-	37.4

Other fish Species

Roach bream hybrids (n = 10) ranged in length from 8.5cm to 44.3cm (mean = 23.2cm). Four age classes were present ranging from 3+ to 9+, with several year classes absent in the sample. Five tench were captured ranging in length from 28.7cm to 45.3cm (mean = 28.7cm). Two pike, measuring 31.7cm and 40.6cm were also recorded.

1.3.4 Stomach and diet analysis

Perch

Perch initially start to feed on pelagic zooplankton. Once they reach an intermediate size they start feeding on benthic resources eventually moving on to feed on fish once they are large enough (Hjelm *et al.*, 2000). A total of 21 stomachs were examined. Of these 17 (815) were empty. Of the remaining four stomachs containing food, three (75%) contained invertebrates. The remaining stomach contained unidentified digested material.

Pike

Both pike captured were returned alive to the lake, and were not, therefore, available for analysis.

1.4 Summary and ecological status

A total of five fish species and one type of hybrid were recorded on Corrinshigo Lough in the September 2018 survey. Roach and perch were the most abundant fish species captured, together accounting for *c.* 77% of all fish captured. Biomass (BPUE) of roach was high and similar to that recorded for tench. Tench BPUE was also high, despite only four individuals being recorded.

The two most abundant species captured (i.e. roach and perch) have each been recruiting regularly in the lake. No missing year classes were apparent in populations of either species, which are dominated by younger, smaller individuals. The bream population is similarly dominated by younger individuals. The most abundant year class in the sample was 1+ and several young of year (YOY) fish were captured. All year classes between 0+ and 4+ were represented. While regular recruitment was evident in recent years, few older or larger fish were captured, with just one fish greater than 20cm recorded. Relatively few roach x bream hybrids were recorded in the survey. This variety, which requires both parent

species to spawn (Hayden *et al.*, 2010), can frequently occur in greater abundance than one (normally bream) or both parent species in Irish lakes (Hayden *et al*., 2014). However, this does not appear to be the case in Corrinshigo, where both parent species were captured in greater numbers than their hybrid.

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 Interreg funded 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, Corrinshigo Lough has been assigned an ecological status of Poor for 2018 based on the fish populations present.

1.5 References

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