National Research Survey Programme
Lakes 2015

Lough Alewnaghta

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National Research Survey Programme

**Fish Stock Survey of Lough Alewnaghta,
August 2015**

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ACKNOWLEDGEMENTS

1.1 Introduction

Lough Alewnaghta is located north of the town of Whitegate, Co. Clare, close to the western shore of Lough Derg (Plate 1.1, Fig 1.1). It has a surface area of 54ha, a mean depth of <4m and a maximum depth of approximately 4.5m. The Derrainy River is the main stream flowing into the lake. Lough Alewnaghta is connected to Lough Derg by its outflow, which discharges into Lough Derg close to Rinbarra Point on the western shore of the lake (Fig. 1.1).

Lough Alewnaghta is categorised as typology class 6 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and moderate alkalinity (20-100mg/l CaCO3). The geology in the area consists of sandstone and limestone.

This lake was surveyed as part of the Water Framework Directive surveillance monitoring programme in 2009 and 2012 (Kelly *et al.,* 2010 and 2013). During both the 2009 and 2012 surveys, perch were found to be the dominant species present in the lake. Roach, roach x bream hybrids, pike and eels were also captured during these surveys.

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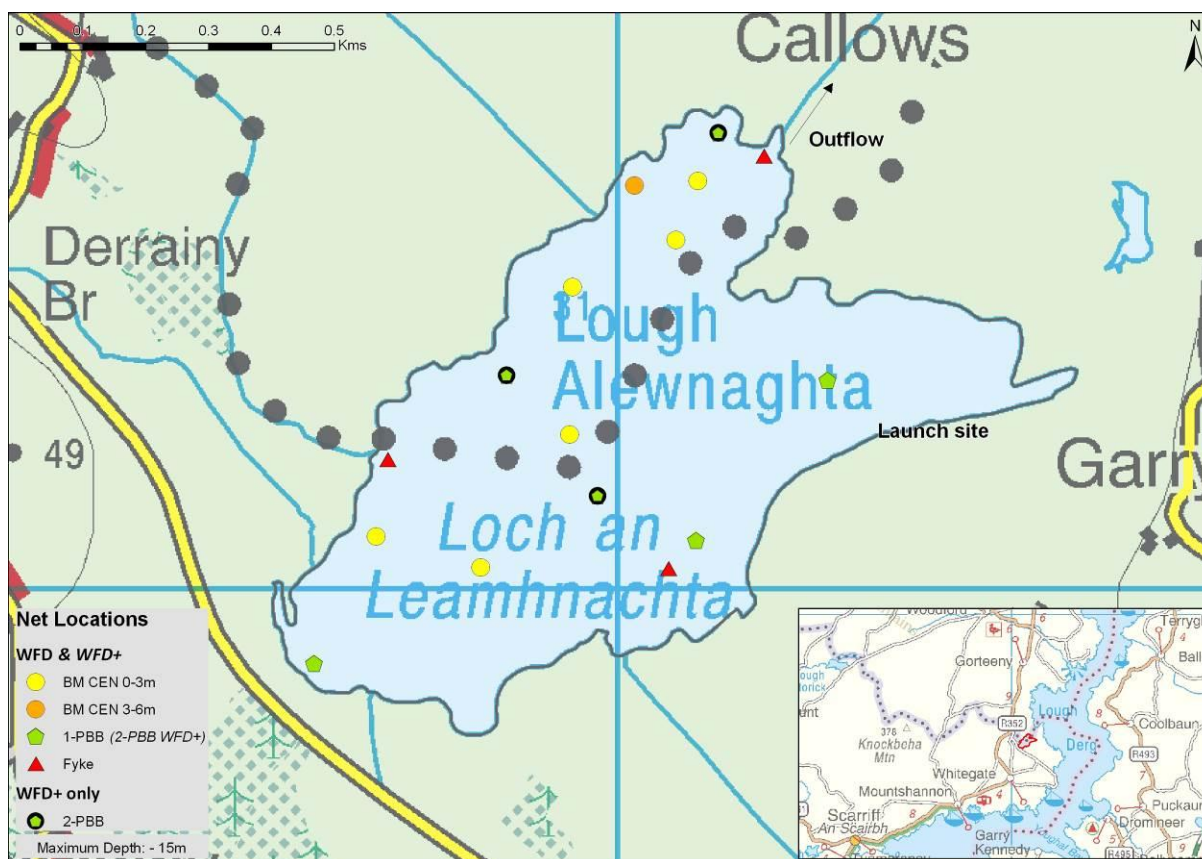
Fig. 1.1. Location map of Lough Alewnaghta showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Lough Alewnaghta was surveyed over two nights between the 24th and the 26th of August 2015. A total of three sets of Dutch fyke nets and seven benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (6 @ 0-2.9m and 1 @ 3-5.9m) were deployed in the lake (10 sites). The netting effort was supplemented using two-panel benthic braided (2-PBB) (63.5mm and 88.9mm mesh knot to knot) survey gill nets.

The nets were deployed in the same locations as randomly chosen in the previous surveys. Site locations for the additional two panel benthic braided survey gill nets were chosen randomly within two depth zones (0-2.9m and 3-5.9m). 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 all roach, roach x bream hybrids, pike, rudd, tench and bream. 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 returned to the laboratory for further analysis.

1.2.2 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 on the IFI NRSP team when moving between water bodies.

1.3 Results

1.3.1 Species Richness

A total of six fish species and one type of hybrid were recorded on Lough Alewnaghta in August 2015, with 1,041 fish being captured in total. 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, roach x bream hybrids, bream, tench, pike and rudd. During the previous survey in 2009 the same species composition was recorded with the exception of bream, which were not captured during the 2009 survey but were captured in the 2012 and 2015 surveys. Tench and rudd were only recorded in the 2015 survey. Eels were not present during the 2015 survey, but were recorded in the other two sampling years (Kelly *et al.,* 2010 and 2013).

Table 1.1. Number of each fish species captured by each gear type during the survey on Lough Alewnaghta, August 2015

Scientific name	Common name	Number of fish captured			
		2-PBB	BM CEN	Fyke	Total
Perca fluviatilis	Perch	0	635	0	635
Rutilus rutilus	Roach	0	290	0	290
Rutilus rutilus x Abramis brama	Roach x Bream hybrid	19	77	0	96
Abramis brama	Bream	7	4	0	11
Esox lucius	Pike	0	3	0	3
Scardinius erythrophthalmus	Rudd	0	1	0	1
Tinca tinca	Tench	5	0	0	5

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 (WFD and WFD+). 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 WFD and WFD+ surveys are summarised in Table 1.2.

Perch was the dominant fish species in terms of abundance and roach x bream hybrid was the dominant species in terms of biomass (Table 1.2).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Lough Alewnaghta, 2015

Scientific name	Common name	Mean CPUE (per metre net)**
Perca fluviatilis	Perch	1.323 (0.515)
Rutilus rutilus	Roach	0.604 (0.283)
Rutilus rutilus x Abramis brama	Roach x Bream hybrid	0.182 (0.054)
Abramis brama	Bream	0.016 (0.006)
Esox lucius	Pike	0.006 (0.003)
Scardinius erythrophthalmus	Rudd	0.002 (0.002)
Tinca tinca	Tench	0.006 (0.005)
		Mean BPUE (per metre net)**
Perca fluviatilis	Perch	10.712 (3.611)
Rutilus rutilus	Roach	15.583 (5.787)
Rutilus rutilus x Abramis brama	Roach x Bream hybrid	51.576 (10.594)
Abramis brama	Bream	16.155 (6.841)
Esox lucius	Pike	5.175 (3.611)
Scardinius erythrophthalmus	Rudd	0.052 (0.052)
Tinca tinca	Tench	10.920 (8.943)

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

**CPUE and BPUE data above for all fish species except eels are not comparable to earlier surveys as an extra panel was added to the 2-PBB to provide additional information on large coarse fish.

1.3.3 Length frequency distributions

Perch

Perch captured during the 2015 survey ranged in length from 5.0cm to 21.2cm (mean = 7.4cm) with six age classes present, ranging from 0+ to 5+ with a mean L1 of 5.8cm (Fig.1.2 and Table 1.3). The dominant age class was 0+ (Fig. 1.2).
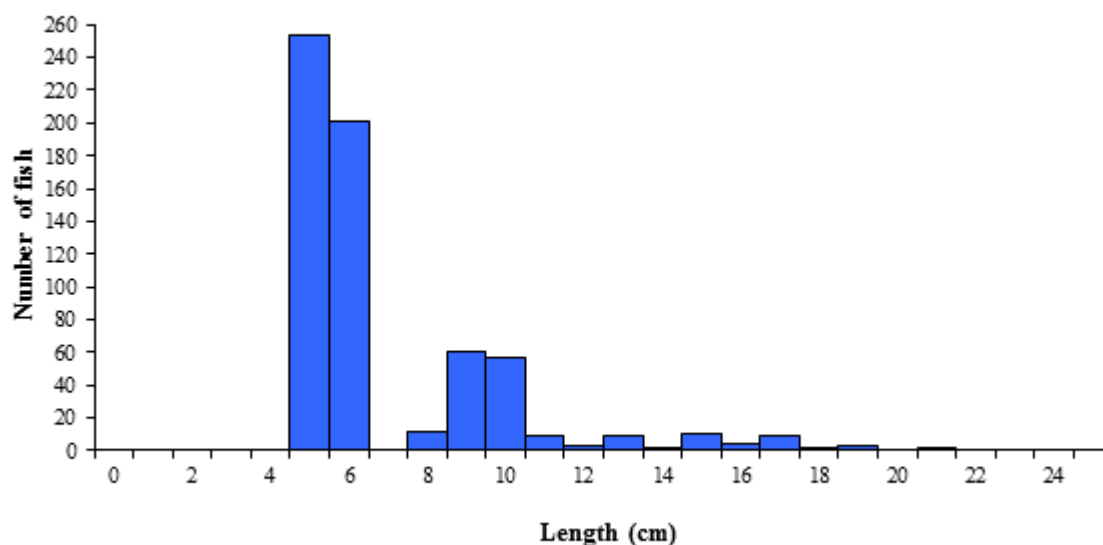
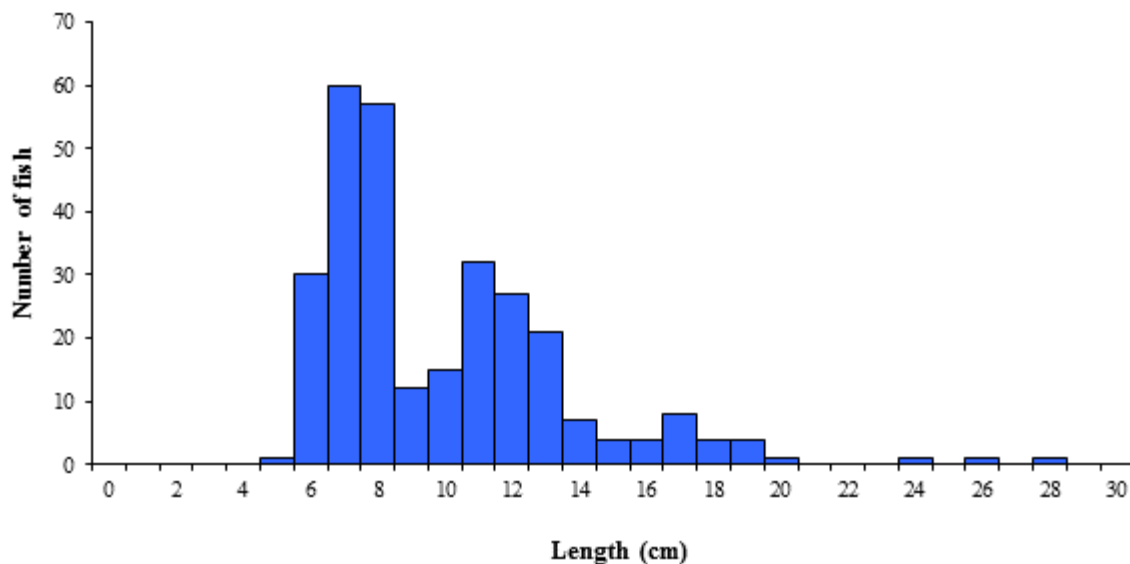**Fig. 1.2. Length frequency of perch captured on Lough Alewnaghta, 2015**

Table 1.3. Mean (±S.E.) perch length (cm) at age for Lough Alewnaghta, August 2015

	L_1	L_2	L_3	L_4	L_5
Mean (±S.E.)	5.8 (0.1)	10.6 (0.4)	16.6 (0.7)	18.1 (0.3)	19.0
N	33	21	9	2	1
Range	4.3-7.5	7.8-15.2	13.5-20.1	17.8-18.4	19.0-19.0

Roach

Roach captured during the 2015 survey ranged in length from 5.4cm to 28.7cm (mean = 10.3cm) with six age classes present, ranging from 2+ to 7+ with a mean L1 of 2.2 cm (Fig.1.3 andTable 1.4). The dominant age class was 2+ (Fig. 1.3).

Fig. 1.3. Length frequency of roach captured on Lough Alewnaghta, 2015

Table 1.4. Mean (±S.E.) roach length (cm) at age for Lough Alewnaghta, August 2015

|	L_1	L_2	L_3	L_4	L_5	L_6	L_7
Mean (±S.E.)	2.2 (0.1)	5.8 (0.2)	10.3 (0.6)	13.5 (0.7)	16.5 (1.1)	23.2 (2.4)	23.6
N	39	39	22	10	5	3	1
Range	1.4-3.3	3.4-9.2	6.9-16.8	10.5-18.2	12.9-20.3	18.6-26.8	23.6-23.6

Other fish species

Bream captured during the 2015 survey ranged in length from 7.7cm to 47.6cm, roach x bream hybrids ranged in length from 6.2cm to 44.2cm, pike ranged from 36.6cm to 38.5cm and tench ranged from 39.5cm to 53.7cm. One rudd was recorded at 11.4cm.

1.3.4 Stomach and diet analysis

Feeding studies provide a good indication of the availability of food items and the angling methods that are likely to be successful. However, the value of stomach content analysis is limited unless undertaken over a long period as diet may change on a daily basis depending on the availability of food items.

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). The food items recorded in a subsample of perch captured during the survey were dominated by unidentified fish remains (Fig 1.4).
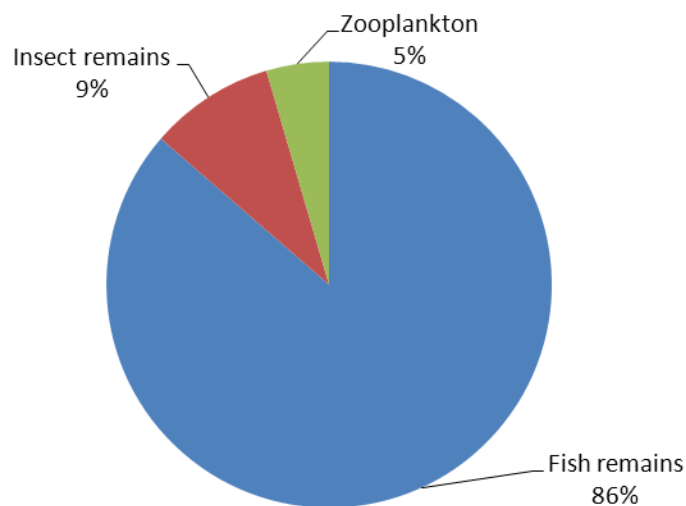
Fig 1.4. Diet of perch captured on Lough Alewnaghta 2015 (% occurrence) n=22

1.4 Summary and ecological status

Perch was the dominant fish species in terms of abundance (CPUE) and roach x bream hybrid was the dominant species in terms of biomass (BPUE) captured in the 2015 survey.

Perch ranged in length from 5.0cm to 21.2cm and ranged in age from 0+ to 5+, indicating reproductive success in each of the previous six years. The dominant age class was 0+.

Roach ranged in length from 5.4cm to 28.7cm and ranged in age from 2+ to 7+, indicating reproductive success in six of the previous eight 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*., 2012). Using the FIL2 classification tool, Lough Alewnaghta has been assigned an ecological status of Bad based on the fish populations present in 2015. The ecological status assigned to the lake based oin 2012 was Bad and was Poor in 2009.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Lough Alewnaghta an overall ecological status of Bad, based on all monitored physico-chemical and biological elements, including fish. This status classification will be revised during 2016.

1.5 References

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