National Research Survey Programme

Lakes 2016

Levally Lough

IFI/2017/1-4370

Iascach Intíre Éireann
Inland Fisheries Ireland

Inland Fisheries Ireland

National Research Survey Programme - Coarse Fish and Pike

Fish Stock Survey of Levally Lough,

September 2016

Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

CITATION: McLoone, P., Connor, L., Coyne, J., Morrissey, E., Corcoran, W., Cierpial, D., Delanty, K., Matson, R., Gordon, P., O' Briain, R., Rocks, K., O' Reilly, S., Puttharee, D., McWeeney, D., Robson S., Buckley, S. and Kelly, F.L. (2017) Fish Stock Survey of Levally Lough, September 2016. National Coarse Fish and Pike Programme, Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

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

ACKNOWLEDGEMENTS

The authors wish to gratefully acknowledge the help and co-operation of all their colleagues in Inland Fisheries Ireland.

The authors would also like to acknowledge the funding provided for the project from the Department of Communications, Climate Action and Environment for 2016.

1.1 Introduction

Levally Lough is situated in the Moy Catchment, draining directly into Lough Conn *via* the Addergoole River. This outfall forms part of the River Moy SAC (002298). Levally Lough is located near the south western shore of Lough Conn approximately 11.5 km west of Foxford in Co. Mayo (Fig. 1.1). The lake is situated at an altitude of 27 m.a.s.l., has a surface area of 121ha, mean depth of 4.9m and maximum depth of 18m. The dominant geology of the surrounding area is sandstone and mudstone. Adjacent land use is predominantly pasture.

The lake is categorised as typology class 8 for the purposes of Water Framework Directive (WFD) monitoring, i.e. deep (> 4m), greater than 50ha and moderately alkaline (> 20mg/l CaCO3). The lake has been assigned a good ecological status (EPA 2014).

The lake was previously surveyed in 1996 by Inland Fisheries Ireland (CFB 1997). On that occasion, perch, pike and trout were captured. The lake supports a pike fishery and adult salmon enter the lake from Lough Conn *via* the Addergoole River.

Plate 1.1 Levally Lough

Plate 1.2 Setting Fyke Nets on Levally Lough, September 2016

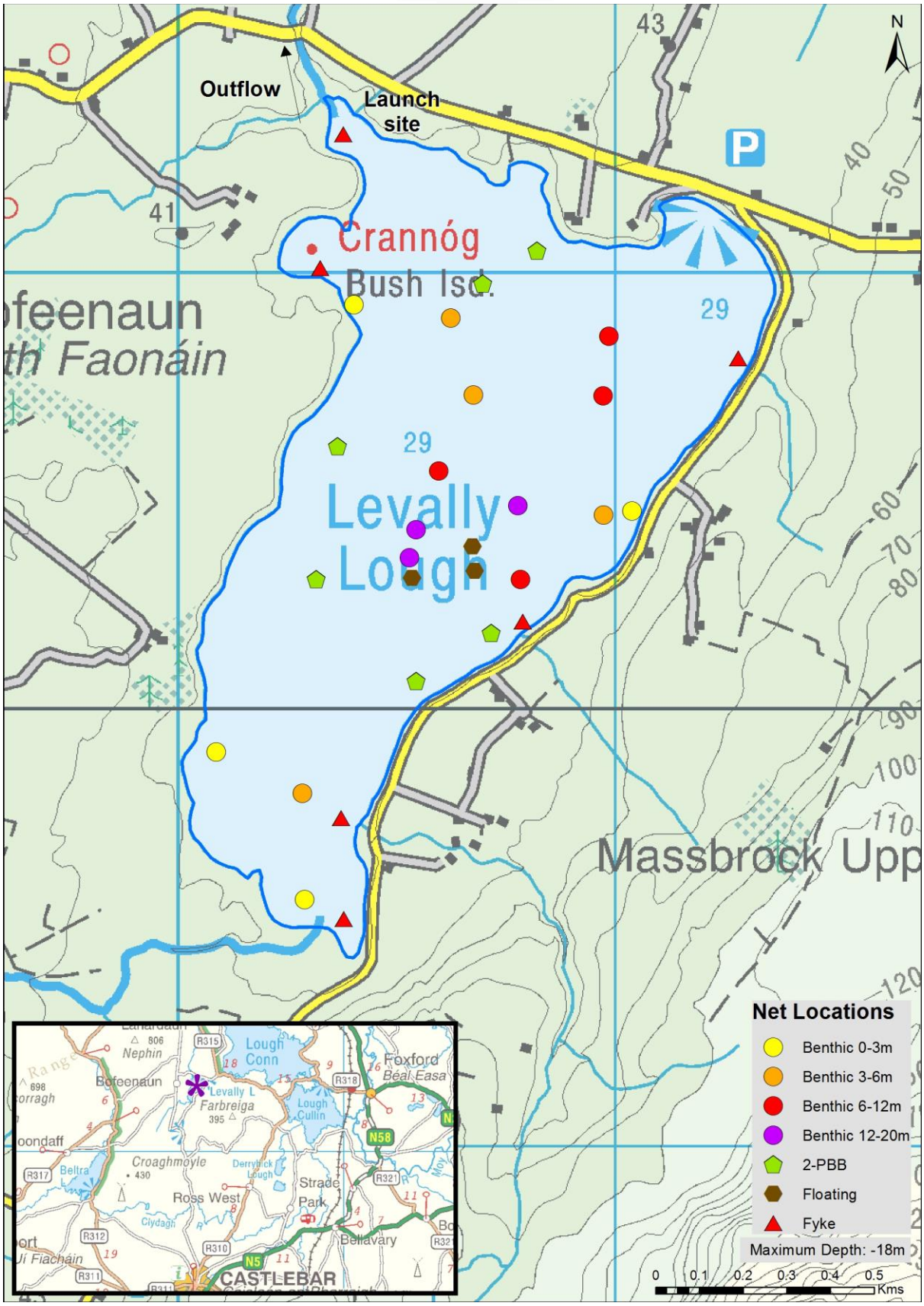

Fig. 1.1 Map of Levally Lough showing the location and depth of the nets set

1.2 Methods

1.2.2 Netting methods

Levally Lough was surveyed over two nights from the 7th to 9th of September 2016. A total of six sets of Dutch fyke nets, 15 benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (4 @ 0-2.9m, 4 @ 3-5.9m and 4 @ 6-11.9m and 3 @ 12-20) (BM CEN) and three floating monofilament multi-mesh (12 panel, 5-55mm mesh size) (FM CEN) CEN standard survey gill nets were deployed in the lake (24 sites). The netting effort was supplemented using six two-panel benthic braided (63.5mm and 88.9mm mesh knot to knot) survey gill nets (2-PBB).

A handheld GPS was used to locate 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 bream, 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. Fish were frozen immediately after the survey and subsequently dissected in the IFI laboratory.

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 (%O) of prey items was then calculated to identify key prey items (Amundsen *et al*., 1996).

$$\%FO_i = (N_i/N) \times 100$$

Where:

$\%O_i$ is the percentage frequency of prey items I,

N_i is the number of a particular species with prey I in their stomach,

N is total number of a particular species with stomach contents

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 four fish species were recorded in Levally Lough in September 2016, with 275 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Roach were the most common fish species recorded, followed by perch and pike respectively. No roach were recorded when the lake was last surveyed in 1996. Perch, pike and brown trout were recorded in the survey nets on that occasion (CFB, 1997).

Table 1.1. Number of each fish species captured by each gear type during the survey on Levally Lough, September 2016

Scientific name	Common name	Number of fish captured				
		2-PBB	BM CEN	FM CEN	Fyke	Total
Rutilus Rutilus	Roach	1	110	-	-	111
Perca fluviatilis	Perch	-	146	4	3	153
Esox lucius	Pike	1	4	-	-	5
Anguilla anguilla	European eel	-	-	-	6	6

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 2016 survey are summarised in Table 1.2.

Roach was the dominant fish species in terms of abundance (CPUE) and biomass (BPUE) (Table 1.2). BPUE recorded for pike was similar to that for roach (Table 1.2 and Figure 1.3). However, this figure was based upon a catch of just five fish.

The mean CPUE and BPUE for all species captured during the 2016 survey is illustrated in Figure 1.2 and 1.3.

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Levally Lough, September 2016

Scientific name	Common name	Mean CPUE (± S.E)	Mean BPUE (± S.E)
Rutilus Rutilus	Roach	0.162 (0.046)	12.398 (3.878)
Perca fluviatilis	Perch	0.119 (0.039)	3.922 (2.036)
Esox lucius	Pike	0.005 (0.003)	12.270 (6.447)
Anguilla anguilla	European eel	0.017 (0.017)	5.586 (2.607)

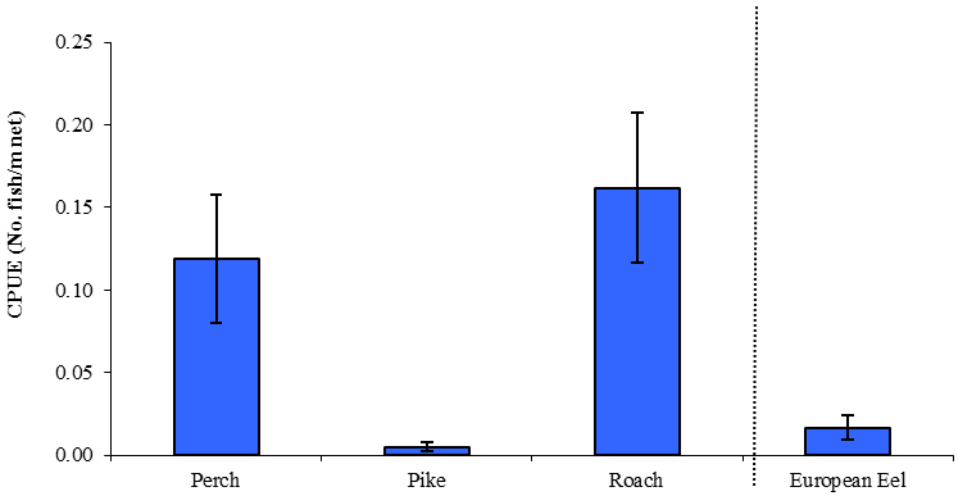

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Levally Lough in September 2016 (Eel CPUE based on fyke nets only)

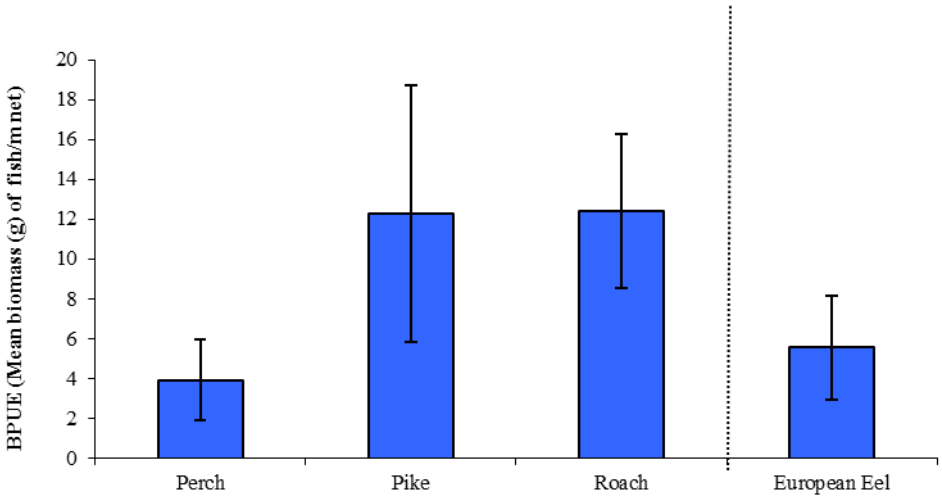

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Levally Lough in September 2016 (Eel BPUE based on fyke nets only)

1.3.3 Length frequency distributions and growth

Roach

Roach captured during the 2016 survey ranged in length from 7.4 to 25.6cm, mean = 15.7cm (Figure 1.4). Roach were aged from 2+ to 10+ years old, and all intervening year classes were represented in the sample. No 1+ fish were recorded. Fish measuring 12 to 14cm in length represented a significant proportion of the fish captured in the nets. Fish of this size are typically 3+ in Levally Lough (Figure 1.5)

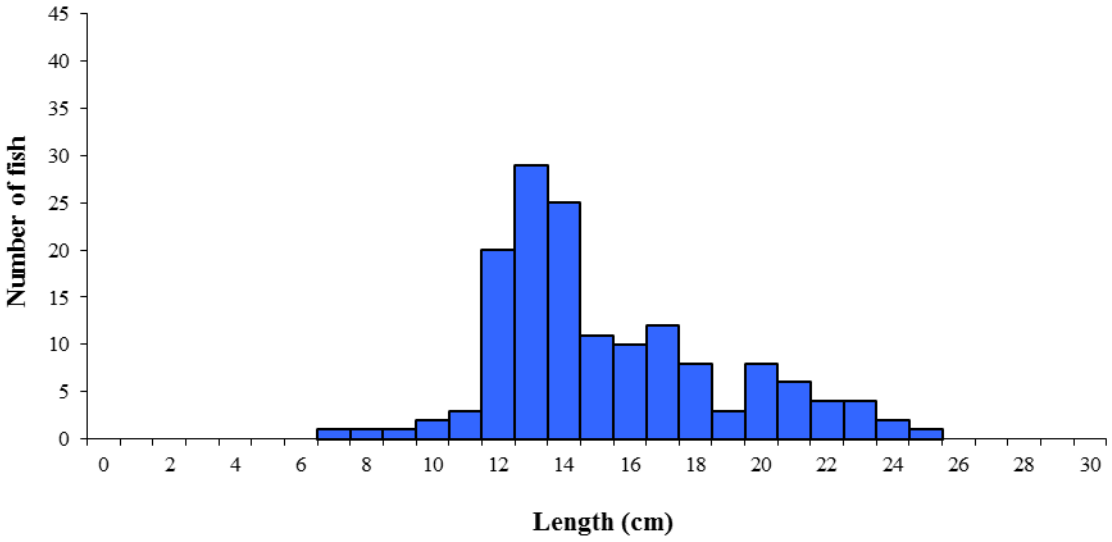

Fig. 1.4. Length frequency of roach captured on Levally Lough in September 2016

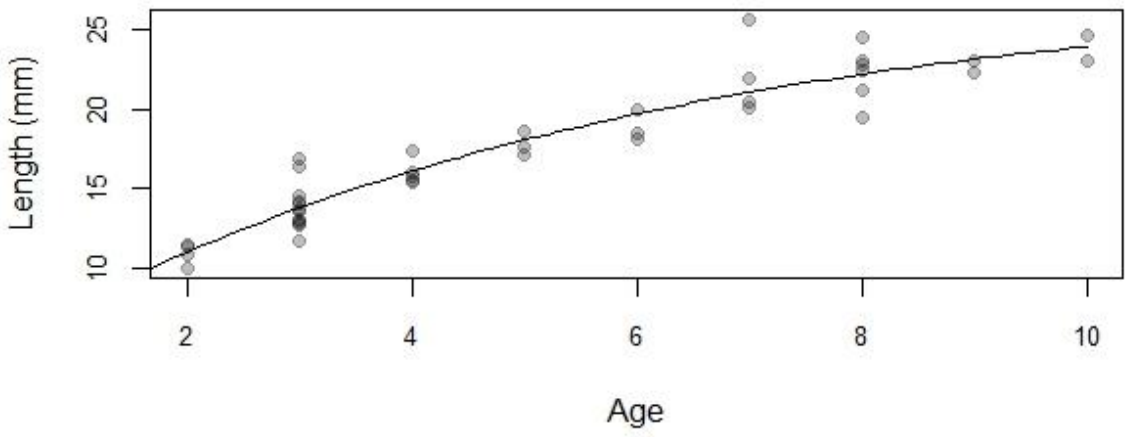

Figure 1.5. Length at age for roach captured on Levally Lough in September 2016

Perch

Perch captured during the 2016 survey ranged in length from 5.5cm to 35.5cm (mean = 10.4cm) (Fig.1.6). Perch were aged from 0+ to 9+ years old, and all intervening year classes were represented in the sample. Young fish dominated the population and the dominant age class was 0+. Several much larger and older fish were also recorded during the survey (Fig. 1.7).

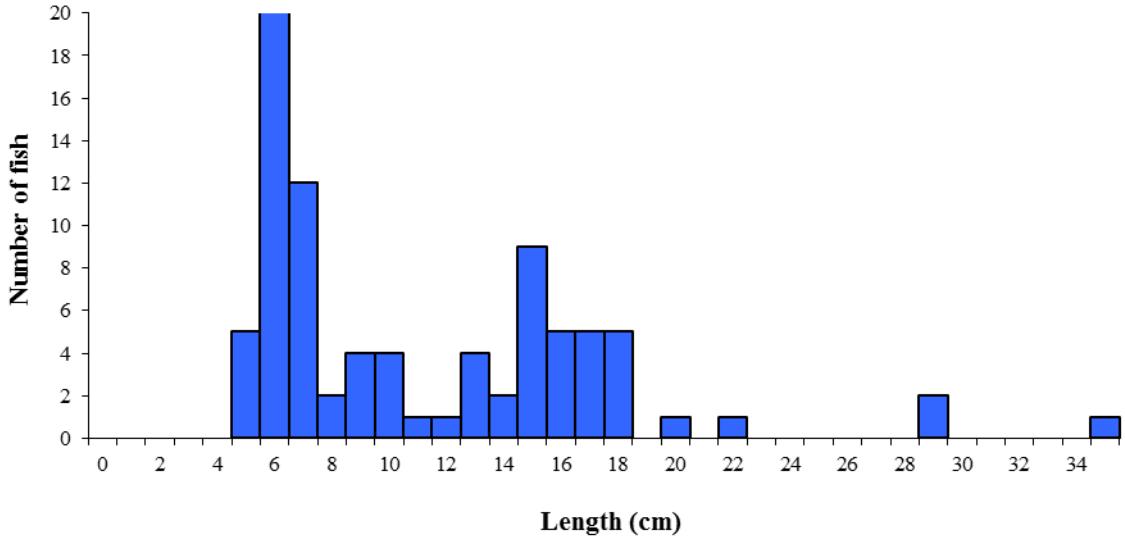

Fig. 1.6. Length frequency of perch captured on Levally Lough in September 2016

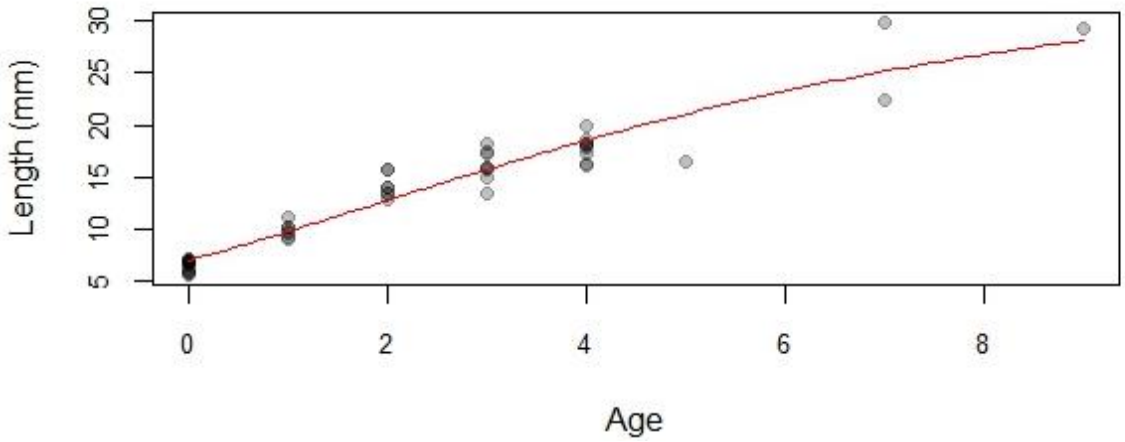

Fig. 1.7. Length at age for perch captured on Levally Lough in September 2016

Pike

Five pike were captured during the 2016 survey. These ranged in length from 57.8cm to 90.3 (mean = 68.9cm). The pike were aged from 3 + to 6 + years old (Figure 1.8)

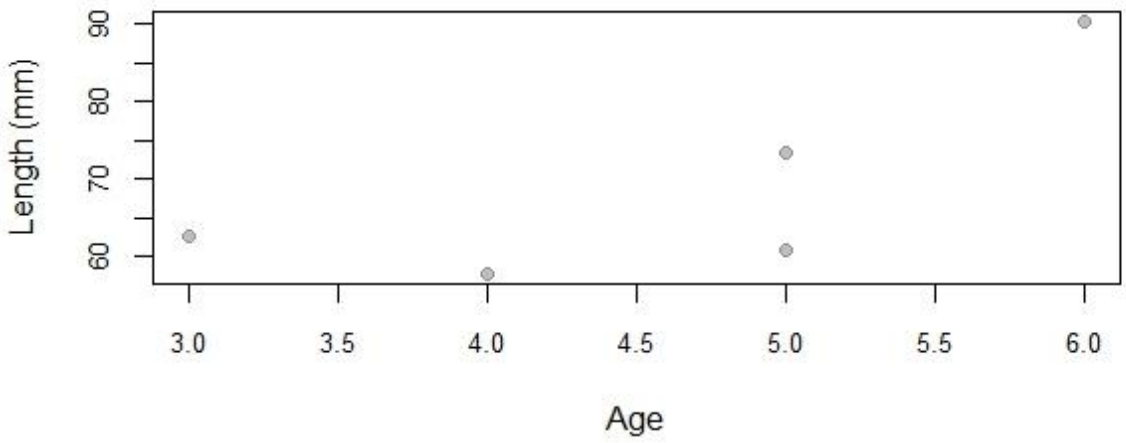

Fig. 1.8. Length at age for pike captured on Levally Lough in September 2016

Eel

Six eels were recorded in the fyke nets. These ranged in length from 41.0cm to 64.0 (mean = 56.0cm).

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

The diet of perch sampled in the September survey is presented in Figure 1.13. A total of 45 stomachs were examined. Of these 19 were found to contain no prey items. Of the 26 stomachs containing food, six (23%).were feeding on fish, five contained invertebrates (19%) and three contained zooplankton (12%). Twelve stomachs (46%) contained unidentified digested material.

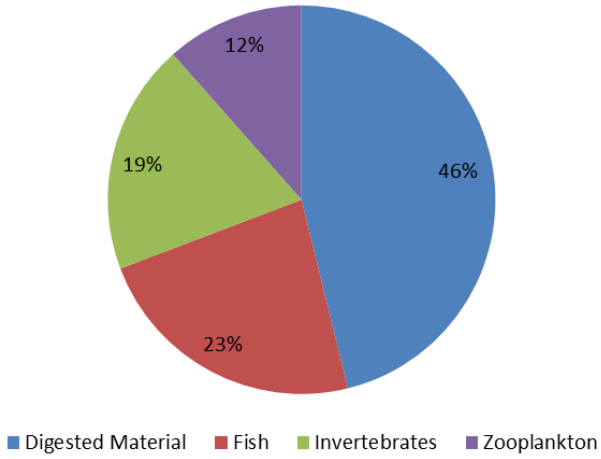

Fig. 1.9 Diet of perch captured on Levally Lough in September 2016 (% occurrence) n=26. Nineteen empty stomachs are not presented.

1.4 Summary and ecological status

Four fish species were recorded during the 2016 survey on Levally Lough. These were roach, perch, pike and eel.

When the lake was last surveyed in 1996, no roach were recorded. This species now dominate the fish community in the lake with respect to both CPUE and BPUE. While all year classes were recorded in the sample, comparatively few 2+ and 1+ fish were captured. This may indicate that recruitment of this species has been limited in the lake in recent years. Perch stocks, however, were strongly dominated by younger year classes, although several very large individuals were captured.

On the previous survey occasion, perch and pike dominated catches (CFB, 1997). Two brown trout were also captured at that time. However, while no brown trout were recorded during the current survey it should be noted that different netting methodologies were used.

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, Levally Lough has been assigned an ecological status of poor for 2016 based on the fish populations present.

In the 2010 to 2015 surveillance monitoring reporting period, the EPA assigned Levally Lough an overall ecological status of Good.

1.5 References

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Inland Fisheries Ireland
3044 Lake Drive,
Citywest Business Campus,
Dublin 24,
Ireland.
D24 Y265

www.fisheriesireland.ie
info@fisheriesireland.ie

+353 1 8842 600