



National Research Survey Programme

Lakes 2015

Lough Gur





Inland Fisheries Ireland
National Research Survey Programme
**Fish Stock Survey of Lough Gur,
October 2015**

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

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1.1 Introduction

Lough Gur is located within the River Maigue catchment approximately 20km south-east of Limerick city, north of Bruff in Co. Limerick (Plate 1.1, Fig. 1.1). It has a surface area of 78ha, a mean depth of 2.4m and a maximum depth of 5.0m. The lake is categorised as typology class 10 (as designated by the EPA for the purposes of the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and high alkalinity (>100mg/l CaCO₃). The lake catchment is relatively small and limited to surface run-off from surrounding hills. It is described as a eutrophic lake with consistently high levels of phosphorus (King and O' Grady, 1994; Lough Gur EMS, 2009). Lough Gur and the surrounding area is internationally and nationally important for migrant wildfowl species and has been designated as a Natural Heritage Area and a Wildfowl Sanctuary (Lough Gur EMS, 2009).

The lake and the adjoining Red Bog possess a diverse range of terrestrial and aquatic habitats for both flora and fauna. The flora of the lake was surveyed in 1989 (King and O' Grady, 1994) and was composed mainly of Hornwort sp. (*Ceratophyllum* sp.) and Fennel pondweed (*Potamogeton pectinatus*) - indicative of nutrient enriched waters.

The lake was previously surveyed by the Inland Fisheries Trust in March 1978 (IFT, unpublished data) and by IFI (previously the Central Fisheries Board) between December 1988 and October 1989 (King and O' Grady, 1994). These surveys revealed that a relatively large stock of fast growing rudd and pike were present in the lake. The lake was also surveyed as part of the Water Framework Directive surveillance monitoring programme in 2009 and 2012 (Kelly *et al.*, 2010 and 2013). During both of these surveys, rudd were found to be the dominant species present in the lake. Perch were captured in the 2012 survey but were not present in the 2009 survey. Pike and eels were captured during both surveys.



Plate 1.1. Lough Gur

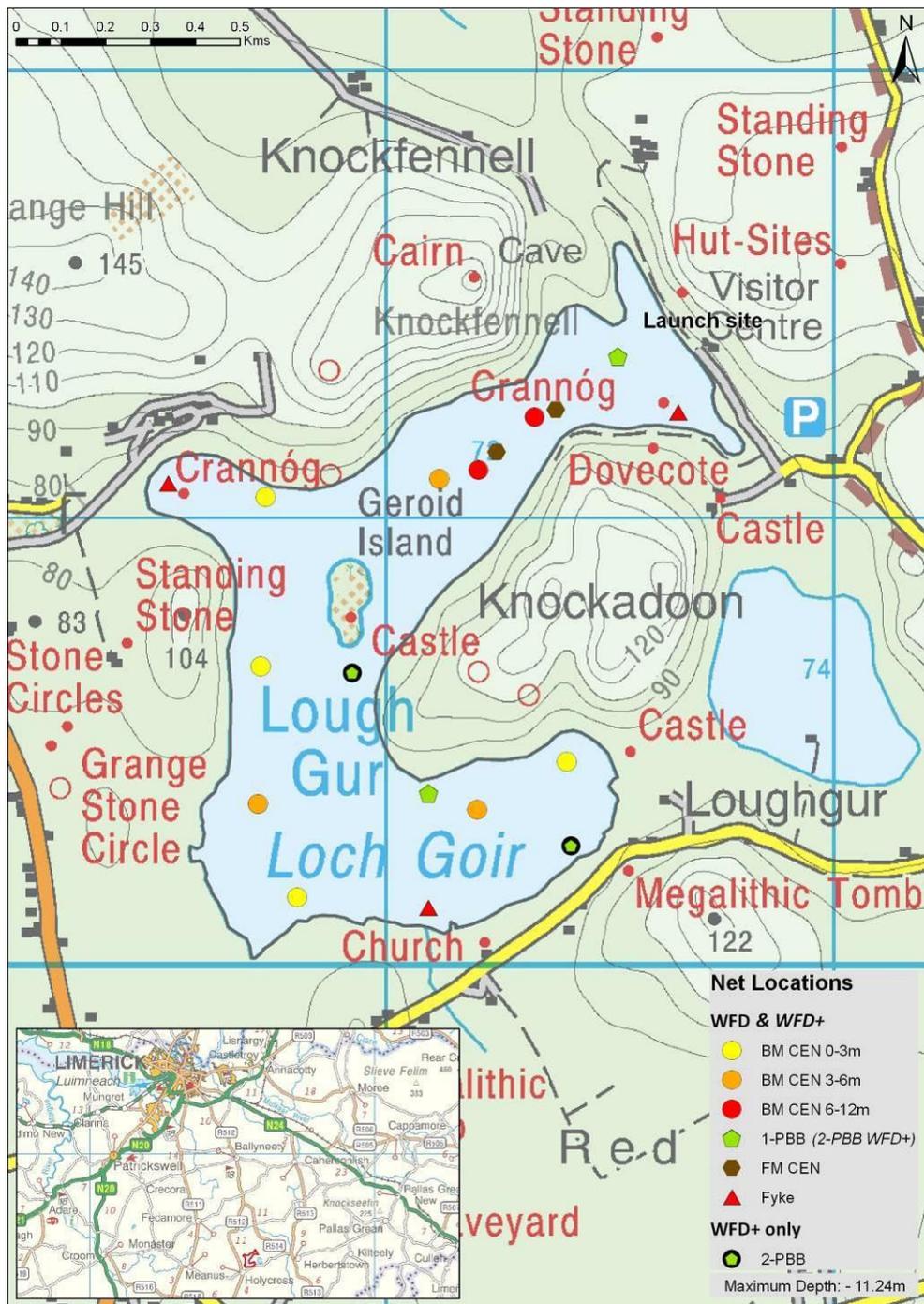


Fig. 1.1. Location map of Lough Gur showing locations and depths of each net (outflow is indicated on map)



1.2 Methods

1.2.2 Netting methods

Lough Gur was surveyed over two nights between the 29th of September and the 1st of October 2015. A total of three sets of Dutch fyke nets and eight benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (BM CEN) (4 @ 0-2.9m, 4 @ 3-5.9m) and two surface monofilament multi-mesh (FM CEN) (12 panel, 5-55mm mesh size) CEN standard survey gill nets were deployed in the lake (13 sites). The netting effort was supplemented using two-panel benthic braided (63.5mm and 88.9mm mesh knot to knot) survey gill nets (2-PBB).

The nets were deployed in the same locations as randomly chosen in the previous surveys. Site locations for additional two-panel benthic braided survey gill nets (2-PBB) were chosen randomly within fixed depth zones (Fig. 1.1). 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 rudd 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 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 four fish species were recorded on Lough Gur in October 2015, with 565 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Rudd was the most abundant fish species recorded, followed by perch, pike and eels. During the previous WFD surveys in 2009 and 2012 the same species composition was recorded with the exception of perch, which were not captured during the 2009 survey but were recorded during the 2012 and 2015 surveys (Kelly *et al.*, 2010 and 2013).



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

Scientific name	Common name	Number of fish captured				
		2-PBB	BM CEN	FM CEN	Fyke	Total
<i>Scardinius erythrophthalmus</i>	Rudd	0	129	233	1	363
<i>Perca fluviatilis</i>	Perch	0	176	10	11	197
<i>Esox lucius</i>	Pike	0	2	2	0	4
<i>Anguilla anguilla</i>	European eel	0	0	0	1	1

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 survey are summarised in Table 1.2. Rudd was the dominant fish species in terms of abundance and biomass (Table 1.2).

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

Scientific name	Common name	Mean CPUE (\pm S.E.)**
<i>Scardinius erythrophthalmus</i>	Rudd	0.711 (0.304)
<i>Perca fluviatilis</i>	Perch	0.375 (0.106)
<i>Esox lucius</i>	Pike	0.008 (0.004)
<i>Anguilla anguilla</i>	European eel	0.006 (0.0060*)
		Mean BPUE (\pm S.E.)**
<i>Scardinius erythrophthalmus</i>	Rudd	27.689 (12.298)
<i>Perca fluviatilis</i>	Perch	16.602 (4.738)
<i>Esox lucius</i>	Pike	9.707 (5.941)
<i>Anguilla anguilla</i>	European eel	0.550 (0.550)*

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 and growth

Rudd

Rudd captured during the 2015 survey ranged in length from 6.1cm to 27.0cm (mean = 12.9cm) (Fig.1.2) with six age classes present, ranging from 0+ to 5+ with a mean L1 of 3.8cm (Table 1.3). The dominant age class was 2+ (Fig. 1.2).

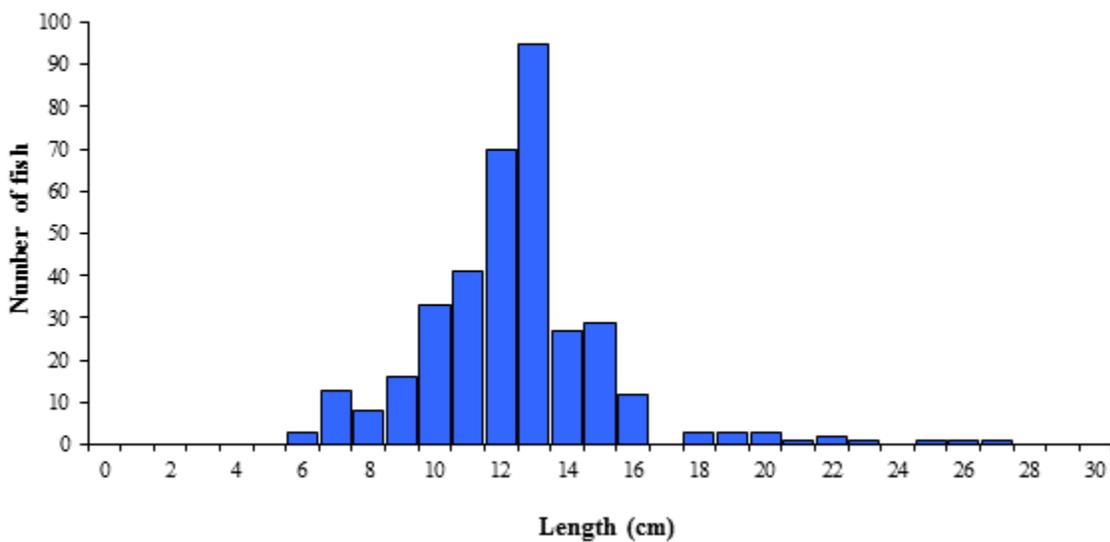


Fig. 1.2. Length frequency of rudd captured on Lough Gur, 2015

Table 1.3. Mean (\pm S.E.) rudd length (cm) at age for Lough Gur, October 2015

	L₁	L₂	L₃	L₄	L₅	L₆	L₇
Mean (\pm S.E.)	3.8 (0.1)	8.4 (0.3)	12.4 (0.4)	16.6 (0.6)	19.1 (0.8)	21.0 (0.5)	24.3 (0.2)
N	46	33	21	12	6	5	2
Range	2.5-6.1	6.1-14.7	9.0-14.7	13.2-19.5	16.6-22.2	19.4-22.6	24.0-24.5

Perch

Perch captured during the 2015 survey ranged in length from 5.5cm to 24.4cm (mean = 13.8cm) (Fig.1.3) with seven age classes present, ranging from 1+ to 7+ with a mean L1 of 7.1cm (Table 1.4). The dominant age class was 2+ (Fig. 1.3).

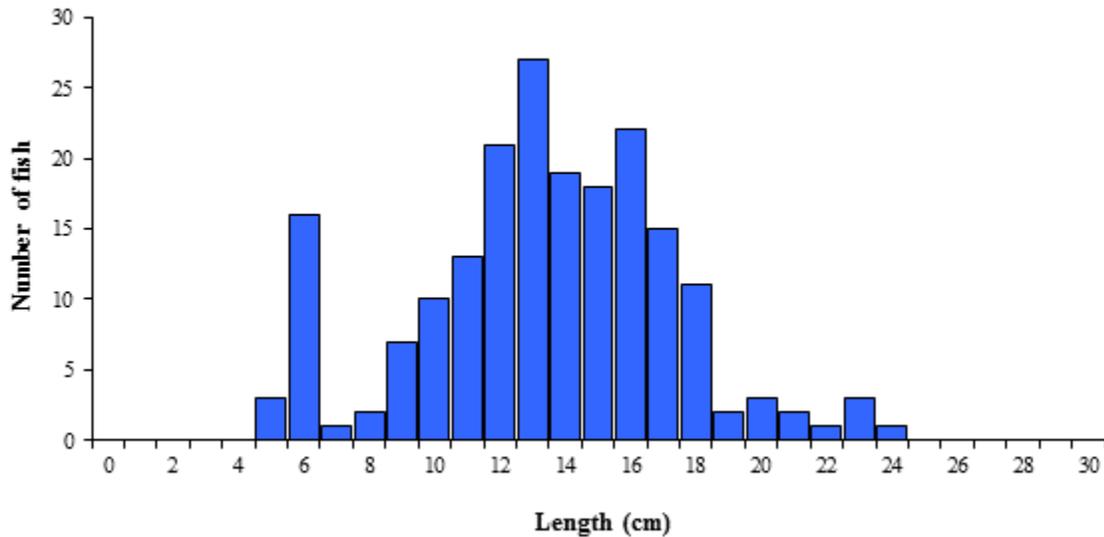


Fig. 1.3. Length frequency of perch captured on Lough Gur, 2015

Table 1.4. Mean (\pm S.E.) perch length (cm) at age for Lough Gur, October 2015

	L ₁	L ₂	L ₃	L ₄	L ₅
Mean (\pm S.E.)	7.1 (0.2)	11.5 (0.5)	16.3 (0.8)	17.6 (1.2)	22.9
N	43	36	17	9	1
Range	4.3-10.2	7.2-17.9	11.6-21.2	13.3-23.8	22.9-22.9

Other fish

One eel was captured during the 2015 survey which measured 41.7cm. Four pike captured ranged in length from 25.8cm to 70.0cm.

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

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 insect remains and zooplankton (Fig 1.4).

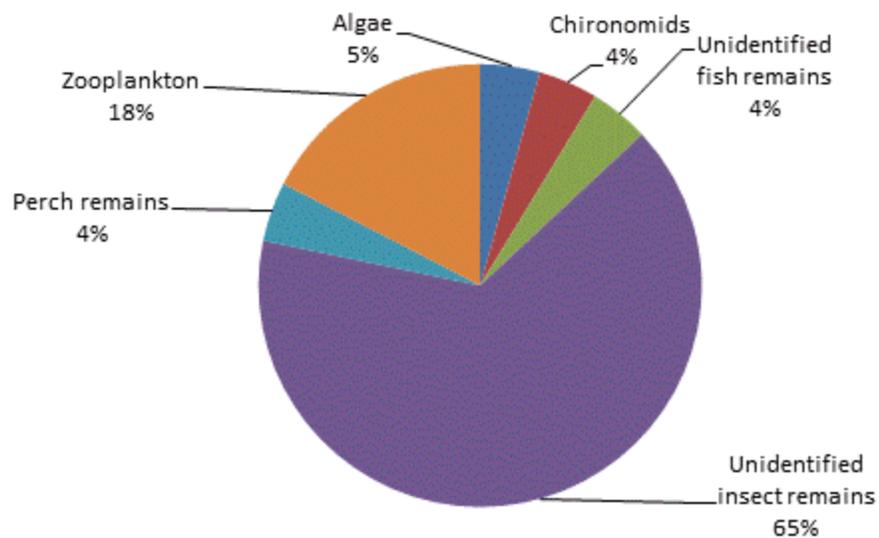


Fig. 1.4. Diet of perch captured on Lough Gur 2015 (% occurrence) n=22

1.4 Summary and ecological status

Rudd was the dominant fish species in terms of abundance (CPUE) and biomass (BPUE) captured in the survey gill nets during the 2015 survey.

Rudd ranged in length from 6.1cm to 27.0cm and ranged in age from 0+ to 5+, indicating reproductive success in each of the previous seven years. The dominant age class was 2+.



Perch ranged in length from 5.5cm to 24.4cm and ranged in age from 1+ to 7+, indicating reproductive success in seven 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.*, 2012b). Using the FIL2 classification tool, Lough Gur has been assigned an ecological status of Bad for 2009 and Poor for 2012 and 2015 based on the fish populations present.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Lough Gur an overall draft ecological status of Poor, 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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