# Lough Brin

## Sampling Fish for the Water Framework Directive - Lakes 2008

The Central and Regional Fisheries Boards

## ACKNOWLEDGEMENTS

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## 1.1 Introduction

Lough Brin (Plate 1.1, Fig. 1.1) is located near Moll's Gap in the Macgillycuddy Reeks, Co. Kerry, six kilometres north-west of Kenmare. The lake is approximately 600m in length and has a surface area of 24ha. The mean depth of the lake is 5.9m and it has a maximum depth of 13m. The lake falls into typology class 3 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4m), less than 50ha and low alkalinity (<20mg/l $CaCO_3$).

Lough Brin forms part of the Killarney National Park, Macgillycuddy's Reeks and Caragh river catchment candidate Special Area of Conservation. This is a large area that encompasses a wide variety of habitats designated under Annex I of the EU Habitats Directive, including blanket bog, alluvial woodlands, alpine heath and both upland and lowland oligotrophic lakes. The site has also been selected for the following species, Killarney fern, slender naiad, freshwater pearl mussel, Kerry slug, marsh fritillary, Killarney shad, Atlantic salmon, brook lamprey, river lamprey, sea lamprey, lesser horseshoe bat and otter; all species listed in Annex II of the EU Habitats Directive (NPWS 2005).

Lough Brin is known for its high trout density. The lake was previously surveyed by the Central Fisheries Board in July 1995, in conjunction with colleagues from the South Western Regional Fisheries Board (CFB, unpublished data). During this survey, 154 brown trout and two sea trout were recorded. The majority of trout captured were two and three years old with only two 4-year old fish being recorded. Lough Brin also receives a run of spring salmon and sea trout.

**Plate 1.1. Lough Brin**

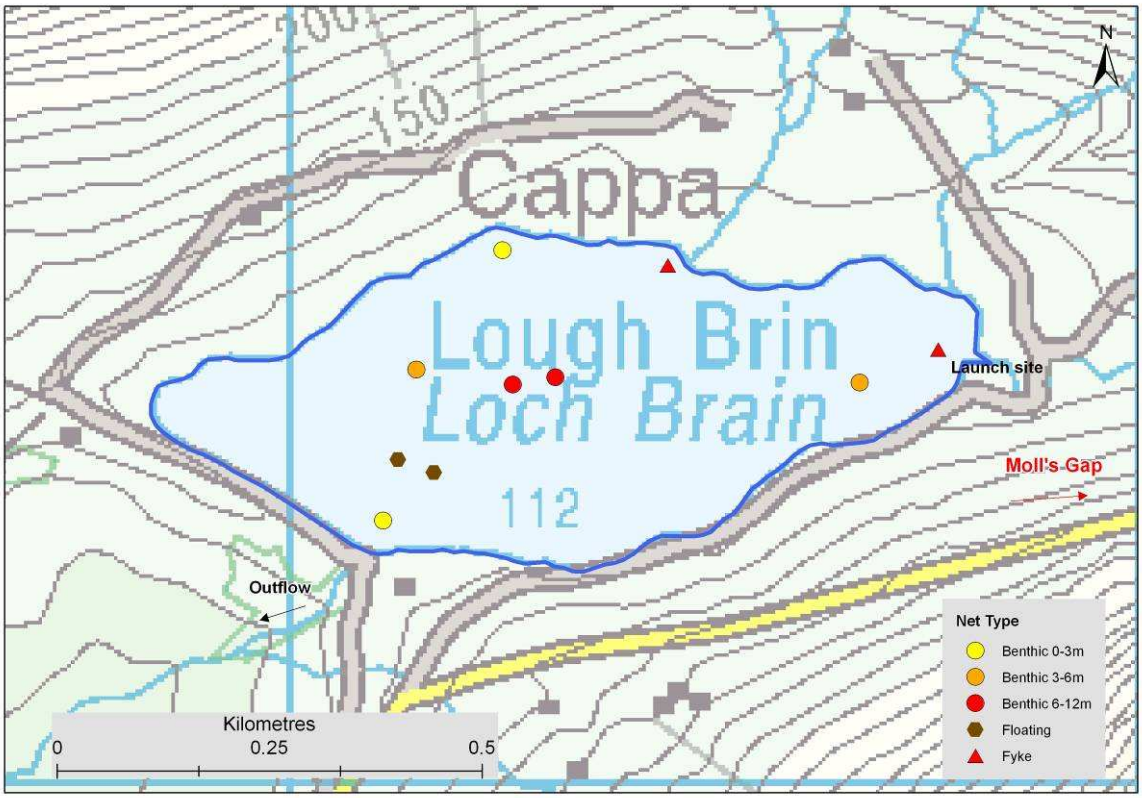


**Fig. 1.1. Location map of Lough Brin showing locations and depths of each net (outflow is indicated on map)**

## 1.2 Methods

The lake was surveyed over one night between the 10th and 11th of September 2008. A total of two sets of Dutch fyke nets, six benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gill nets (2 @ 0-2.9m, 2 @ 3-5.9m and 2 @ 6-11.9m) and two surface floating monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gillnets were deployed randomly in the lake (10 sites). Survey locations were randomly selected using a grid placed over a map of the lake. 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 were measured and weighed and scales were removed from brown and sea trout on site. 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.

## 1.3 Results

### 1.3.1 *Species Richness*

A total of three fish species and sea trout were recorded on Lough Brin in September 2008. A list of the species encountered and numbers captured by each gear type is shown in Table 1.1. A total of 184 fish were recorded during the survey. Brown trout were the most common fish species encountered in the benthic gill nets. Eels and minnow were also recorded during the survey.

**Table 1.1. List of fish species recorded (including numbers captured) during the survey on Lough Brin, September 2008**

| Scientific name | Common name | Number of fish captured | | | |
|---|---|---|---|---|---|
| | | Benthic mono multimesh gill nets | Surface mono multimesh gill nets | Dutch fykes | Total |
| *Salmo trutta* | Brown trout | 94 | 13 | 17 | 124 |
| | Sea trout | 2 | 0 | 0 | 2 |
| *Phoxinus phoxinus* | Minnow | 35 | 0 | 0 | 35 |
| *Anguilla anguilla* | Eel | 0 | 0 | 23 | 23 |

### 1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per metre of net, i.e. mean CPUE. Fish biomass was calculated as the mean weight of fish caught per metre of net, i.e. mean BPUE. A summary of CPUE and BPUE data for each species and gear type is shown in Table 1.2.

**Table 1.2. Mean CPUE (mean number of fish per m of net) and mean BPUE (mean weight of fish per m of net) for all fish species recorded on Lough Brin, September 2008**

| Gear type | Brown trout | Sea trout | Minnow | Eel |
|---|---|---|---|---|
| **Mean CPUE (mean number of fish/m of net)** | | | | |
| Gill nets (all) | 0.446 | 0.008 | 0.146 | - |
| Fyke nets | 0.142 | 0.000 | 0.000 | 0.192 |
| **Mean BPUE (mean weight (g) of fish/m of net)** | | | | |
| Gill nets (all) | 45.402 | 1.267 | 0.6 | - |
| Fyke nets | 13.408 | 0.000 | 0.000 | 33.458 |

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

1.3.3 *Length frequency distributions*

Brown trout ranged in length from 12.0cm to 26.1cm (mean = 20.5cm) (Fig. 1.2). Eels ranged in length from 30.6cm to 54.2cm. Two sea trout captured measured 22.2cm and 26.5cm in length.

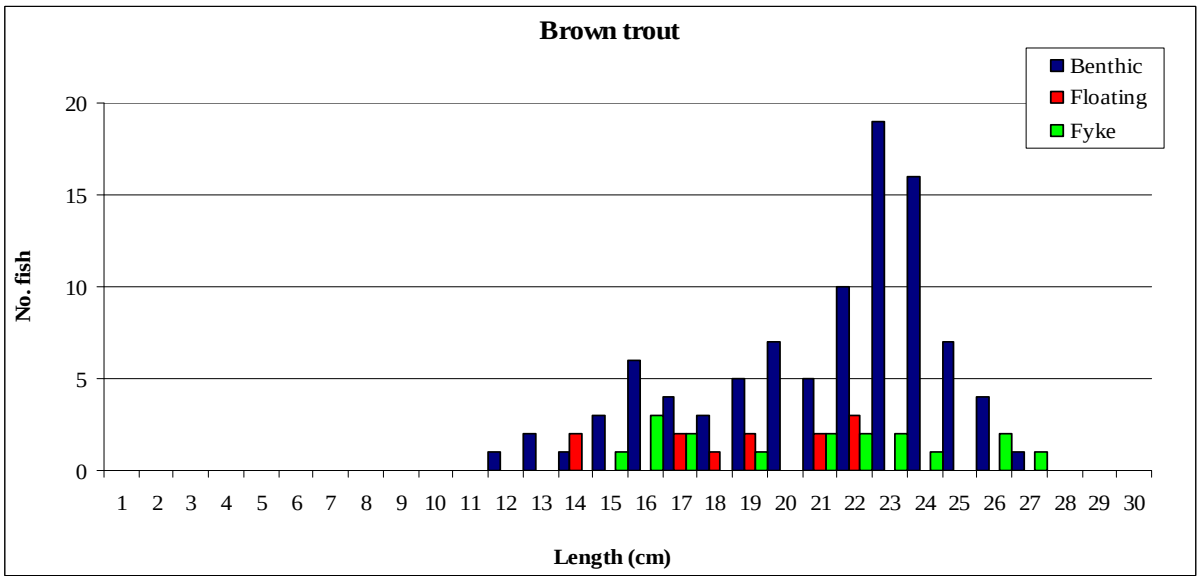


**Fig. 1.2. Length frequency of brown trout captured on Lough Brin, September 2008**

1.3.4 *Fish age and growth*

Brown trout ranged in age from 1+ to 4+. Length frequency and age analysis revealed that 2+ and 3+ were the dominant age groups in the population accounting for almost 75% of those recorded. Mean brown trout L4 was 22.3cm (Table 1.3). Based on a classification of growth in lakes by Kennedy and Fitzmaurice (1971), trout growth in Lough Brin was categorised as very slow (Kelly *et al*., 2009). Sea trout captured were aged at two years.

**Table 1.3. Mean (SD) brown trout length (cm) at age for Lough Brin, September 2008**

| | $L_1$ | $L_2$ | $L_3$ | $L_4$ |
|---|---|---|---|---|
| Mean | 6.1 (1.32) | 14.2 (2.69) | 19.7 (1.71) | 22.3 (0.95) |
| N | 66 | 48 | 26 | 4 |
| Range | 4.0-9.6 | 9.5-19.8 | 16.4-22.2 | 21.1-23.1 |

## 1.4 Summary

Brown trout was the dominant species in Lough Brin followed by minnow, eels and sea trout. The mean CPUE for brown trout in the lake was the second highest of all the lakes sampled in 2008 (Kelly *et al*., 2009). The stomachs of 121 brown trout were examined and a varied diet of molluscs, fish and

invertebrates were recorded. Lough Brin also had one of the highest eel CPUEs when compared to other low alkalinity lakes surveyed in 2008, e.g. Lough Allua, Co. Cork and Lough Barra, Co. Donegal, and also when compared to other moderate and high alkalinity lakes surveyed (Kelly *et al*., 2009).

Brown trout growth was similar to Lough Easky, Co. Sligo but below average in comparison with other low alkalinity lakes surveyed in 2008, e.g. Lough Caragh and Glenbeg Lake, Co. Kerry (Kelly *et al*., 2009).

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 new WFD multimetric fish classification tool has been developed for the island of Ireland (Ecoregion 1) using Agri-Food and Biosciences Institute Northern Ireland (AFBI) and CFB data (Kelly *et al*., 2008). Using this tool and expert opinion Lough Brin has been assigned a draft classification of high status for fish. The EPA has assigned an overall status of good to Lough Brin in an interim draft classification. This is based on physico-chemical parameters and biotic elements such as macroinvertebrates and macrophytes.

### 1.5 References

Kelly, F.L., Harrison, A., Connor, L., Allen, M., Rosell, R. and Champ, T. (2008) *FISH IN LAKES Task 6.9: Classification tool for Fish in Lakes. FINAL REPORT*. Central Fisheries Board, NS Share project.

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