

# Lough Allua



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



The Central and Regional  
Fisheries Boards

## **ACKNOWLEDGEMENTS**

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## **1.1 Introduction**

Lough Allua (Plate 1.1, Fig. 1.1) is a ten kilometre chain of lakes situated near Ballingearry, Co. Cork in the Lee catchment. The lake has a surface area of 138ha, a mean depth of 4m and a maximum depth of 28m. The lake falls into typology class 4 (as designated by the EPA for the Water Framework Directive), i.e. deep (mean depth >4m), larger than 50ha and low alkalinity (<20mg/l CaCO<sub>3</sub>).

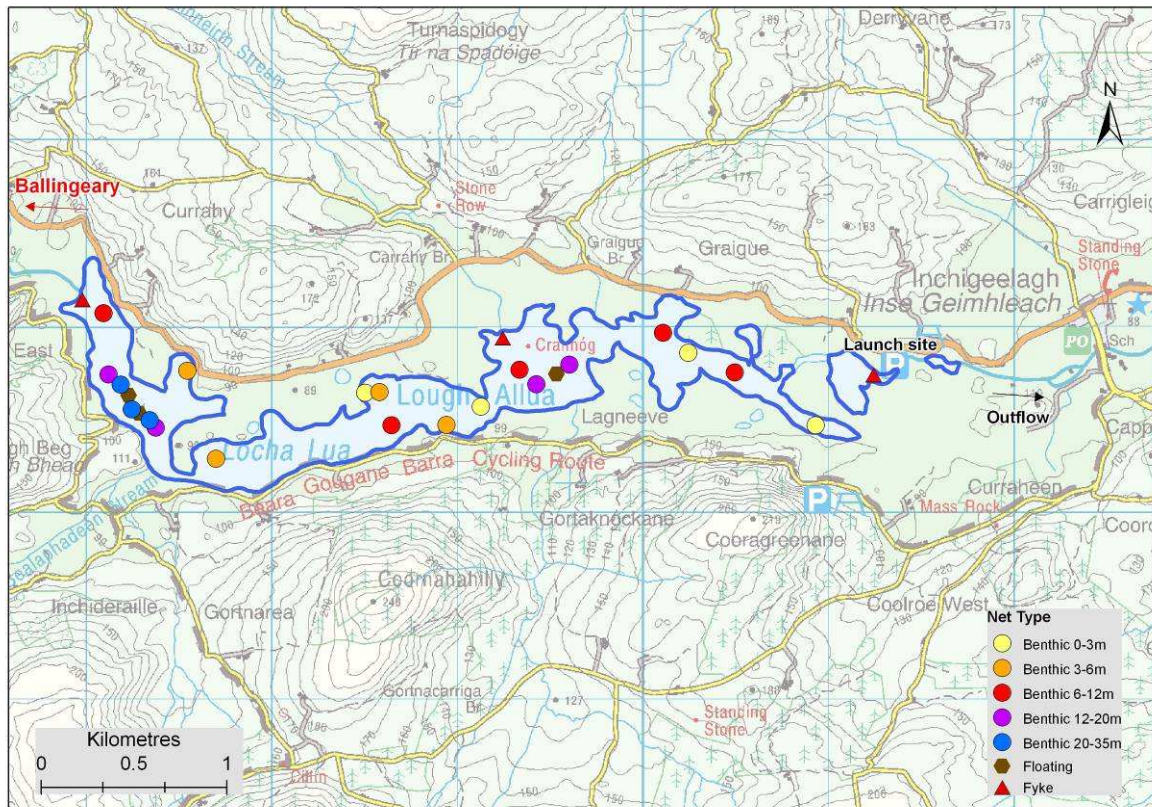
Under the 2009 Cork Development plan, Lough Allua has been proposed as a Natural Heritage Area, indicating the presence of important semi-natural and natural habitats, landforms or geomorphological features, wild plant and animal species or a diversity of these natural attributes (Cork County Council, 2009).

Historically Lough Allua was known for producing good trout, salmon and Arctic char. In the 1830s there was an accidental release of pike from a local privately owned pond and this event and human predation were attributed to the destruction of the char population in the lake (Went, 1945). The lake is now well known for its pike angling, with pike of between 10 and 14kg regularly being caught.

Water quality monitoring is carried out on the lake on a monthly basis by the Southwestern Regional Fisheries Board.



**Plate 1.1. Lough Allua, Co. Cork**



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

## 1.2 Methods

The lake was surveyed over two nights from the 1<sup>st</sup> of September to the 3<sup>rd</sup> of September 2008. A total of three sets of Dutch fyke nets, 20 benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gill nets (4 @ 0-2.9m, 4 @ 3-5.9m, 5 @ 6-11.9m, 4 @ 12-19.9 and 3 @ 20-34.9m) and three surface floating monofilament multi-mesh (12 panel, 5-55mm mesh size) survey gillnets were deployed randomly in the lake (26 sites). Survey locations were randomly selected using a grid placed over the 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 apart from perch were measured and weighed on site and scales were removed from rudd, roach, hybrids, 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 returned to the laboratory for further analysis.

### 1.3 Results

#### 1.3.1 Species Richness

A total of seven fish species and two types of hybrids were recorded on Lough Allua in September 2008. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 206 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets. Eels were also captured during the survey.

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

| Scientific name                    | Common name          | Number of fish captured                |  |                |       |
|------------------------------------|----------------------|--|--|----------------|-------|
|                                    |                      | Benthic mono<br>multimesh gill<br>nets | Surface mono<br>multimesh gill<br>nets | Dutch<br>fykes | Total |
| <i>Perca fluviatilis</i>           | Perch                | 112                                    | 5                                      | 2              | 119   |
| <i>Scardinius erythrophthalmus</i> | Rudd                 | 38                                     | 9                                      | 0              | 47    |
| <i>Rutilus rutilus</i>             | Roach                | 15                                     | 0                                      | 0              | 15    |
| <i>Abramis brama</i>               | Bream                | 13                                     | 0                                      | 0              | 13    |
|                                    | Rudd x Bream hybrid  | 2                                      | 1                                      | 0              | 3     |
| <i>Esox lucius</i>                 | Pike                 | 2                                      | 0                                      | 0              | 2     |
| <i>Gobio gobio</i>                 | Gudgeon              | 2                                      | 0                                      | 0              | 2     |
|                                    | Roach x Bream hybrid | 1                                      | 0                                      | 0              | 1     |
| <i>Anguilla anguilla</i>           | Eel                  | 0                                      | 0                                      | 4              | 4     |

#### 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 Allua, September 2008**

| Gear type   | Rudd  | Perch | Roach | Bream | Gudgeon | RoachxBream | RuddxBream | Pike  | Eel    |
|---|-------|-------|-------|-------|---------|-------------|------------|-------|--------|
| <b>Mean CPUE (mean number of fish/m of net)</b>     |       |       |       |       |         |             |            |       |        |
| Gill nets   | 0.068 | 0.170 | 0.022 | 0.019 | 0.003   | 0.001       | 0.004      | 0.003 | -      |
| Fykes   | 0     | 0.011 | 0     | 0     | 0       | 0           | 0          | 0     | 0.022  |
| <b>Mean BPUE (mean weight (g) of fish/m of net)</b> |       |       |       |       |         |             |            |       |        |
| Gill nets   | 7.572 | 4.083 | 0.974 | 3.122 | 0.021   | 0.112       | 2.309      | 2.826 | -      |
| Fykes   | 0     | 0     | 0     | 0     | 0       | 0           | 0          | 0     | 14.061 |

\* 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

Perch ranged in length from 3.8cm to 19.4cm (mean = 11.4cm) (Fig. 1.2). Rudd ranged in length from 13.7cm to 27.8cm (mean = 19.3cm) (Fig. 1.3). Bream ranged in length from 18.0cm to 29.9cm. Eels ranged from 64.0cm to 75.0cm. Roach ranged from 13.0cm to 18.1cm in length. Rudd x bream hybrids measured from 24.0cm to 39.2cm and one roach x bream hybrid was measured at 16.5cm. A small number of pike measuring 19.6cm and 62.4cm and gudgeon measuring 8.0cm and 9.2cm were also recorded.

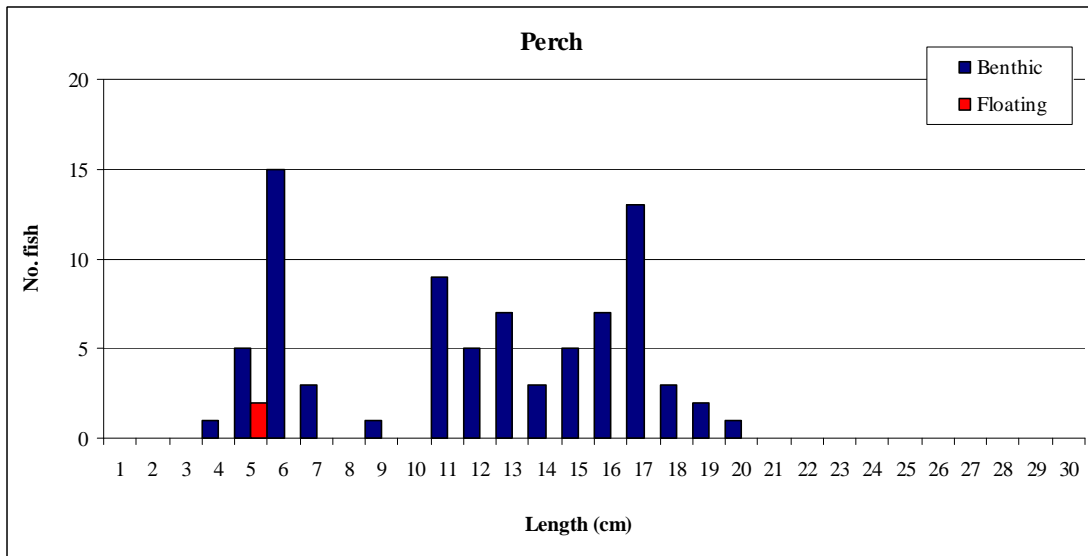


Fig. 1.2. Length frequency of perch captured on Lough Allua, September 2008

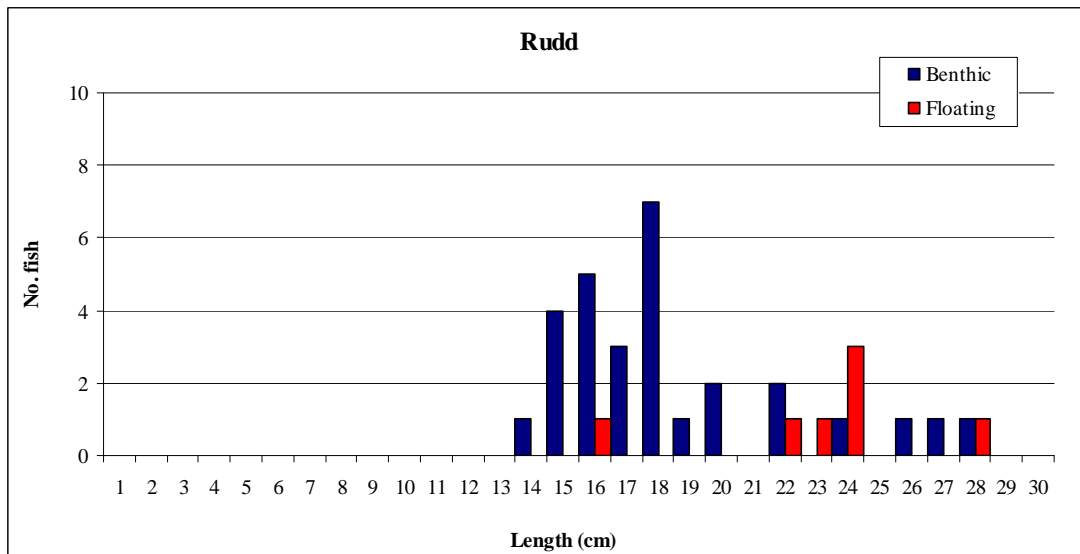


Fig. 1.3. Length frequency of rudd captured on Lough Allua, September 2008

### 2.3.4 Fish age and growth

Perch ranged in age from 0+ to 3+. Mean perch L1 was 5.9cm (Table 1.3). Rudd ranged in age from 3+ to 6+. Bream ranged in age from 4+ to 7+. Rudd x bream hybrids were aged between 5+ and 8+ and the single roach x bream hybrid was 3+. Roach were all 3+ in age and the two pike were 2+ and 5+.

**Table 1.3. Mean (SD) perch length (cm) at age for Lough Allua, September 2008**

|       | <b>L<sub>1</sub></b> | <b>L<sub>2</sub></b> | <b>L<sub>3</sub></b> |
|-------|----------------------|----------------------|----------------------|
| Mean  | 5.9 (0.94)           | 12.4 (1.13)          | 16.4 (0.71)          |
| N     | 39                   | 21                   | 4                    |
| Range | 4-7.8                | 10.3-14.9            | 15.3-16.9            |

## 1.4 Summary

Lough Allua had an atypical species composition when compared to other low alkalinity lakes surveyed for the WFD sampling programme. Little comparison can therefore be made between species growth and CPUE for Lough Allua and other low alkalinity lakes (Kelly *et al.*, 2009). However, Lough Allua had the highest mean CPUE for perch of all the low alkalinity lakes surveyed in 2008 (Kelly *et al.*, 2009). Lough Allua also had a higher CPUE for rudd than Upper lake, Killarney (Kelly *et al.*, 2009). The mean CPUE for roach in the lake was relatively low at only 0.02fish/m<sup>2</sup>. Lough Allua also had the lowest CPUE for eels in comparison with other low alkalinity lakes surveyed (Kelly *et al.*, 2009). Only a small number of pike were captured in the current survey; however, the survey techniques employed are not designed to capture large pike which often break through the fine monofilament nets used.

Perch was the dominant species in Lough Allua, followed by rudd and roach. Growth of perch in the lake was similar to perch in Upper Lake, Killarney but was very slow when compared to Lough Caragh. Rudd had a faster growth rate when compared with Upper Lake, the only other low alkalinity lake in which they occurred.

Lough Allua was the only low alkalinity lake surveyed in 2008 that contained roach (a non-native species). Roach had a relatively low value of L1 and L2 in comparison to roach from moderate and high alkalinity lakes, e.g. Lough O’Flynn and Lough Meelagh. However the L3 was just below average when compared with other moderate and high alkalinity lakes.

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 Northern Ireland (AFBINI) and CFB data (Kelly *et al.*, 2008). Using this tool and expert opinion Lough Allua has been assigned a draft classification of moderate status for fish. The EPA has assigned an overall classification of moderate status to Lough Allua in an interim draft classification. This is based on physico-chemical parameters and biotic elements such as macroinvertebrates, macrophytes and fish.

## **1.5 References**

Cork County Council (2009) <http://www.corkcoco.ie/co/pdf/324758.pdf>

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.

Kelly, F.L., Connor, L., Wightman, G., Matson, R. Morrissey, E., O'Callaghan, R., Feeney, R., Hanna, G. and Rocks, K. (2009) *Sampling fish for the Water Framework Directive – Summary report 2008*. Central and Regional Fisheries Boards report.

Went A.E.J. (1945). The distribution of Irish char (*Salvelinus* spp.). *Biology and Environment. Proceedings of the Royal Irish Academy*, **50B**, 167-89



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