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Sampling Fish for the Water Framework Directive

Lakes 2013

Lough Nambrackmore

Iascach Intíre Éireann
Inland Fisheries Ireland

Water Framework Directive Fish Stock Survey of Lough Nambrackmore, August 2013

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1.1 Introduction

Lough Nambrackmore is located approximately 5.5km north of Roundstone, Co. Galway (Plate 1.1, Fig. 1.1). The lake has a surface area of 10.4ha, mean depth of 2.1m, maximum depth of 10m (WRFB, 2006) and falls into typology class 1 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and low alkalinity (<20mg/l $CaCO_3$).

Lough Nambrackmore is situated within the Connemara Bog Complex candidate SAC, a large site that encompasses a wide range of habitats, including extensive tracts of blanket bog, heath, woodland, lakes, rivers and streams (NPWS, 2005). The Connemara Bog Complex is underlain by various Galway granites, with small areas along the northern boundary made up of schist and gneiss (NPWS, 2005). The SAC has been designated due to the presence of active blanket bog, floating river vegetation, wet and dry heath, alkaline fen, transition mires, lowland oligotrophic lakes, dystrophic lakes, Rhynchosporion, old oak woodlands, *Molinia* meadows and lagoons, all priority habitats on Annex I of the E.U. Habitats Directive (NPWS, 2005).

The SAC is also selected for containing the following species listed on Annex II of the same Directive - Atlantic salmon, otter, the plant slender naiad and the marsh fritillary butterfly. Nine legally protected plant species which are listed on the Irish Red Data Book also occur within this candidate SAC, including bog orchid (*Hammarbya paludosa*) and pale dog-violet (*Viola lactea*) (NPWS, 2005). The SAC is internationally important for cormorants, nationally important for Greenland white-fronted geese and contains nesting sites for golden plover, merlin, choughs and common terns (NPWS, 2005).

The main threats that occur within the Connemara Bog Complex are peat cutting, overgrazing and afforestation. Forestry affects habitat uniformity, lake and river catchments, nesting and feeding habitats for animals, and landscape integrity (NPWS, 2005).

Lough Nambrackmore was previously surveyed in 2007 and 2010 as part of the WFD surveillance monitoring programme (Kelly and Connor, 2007 and Kelly *et al*., 2011). During the 2010 survey brown trout and eels were recorded.

Plate 1.1. Lough Nambrackmore

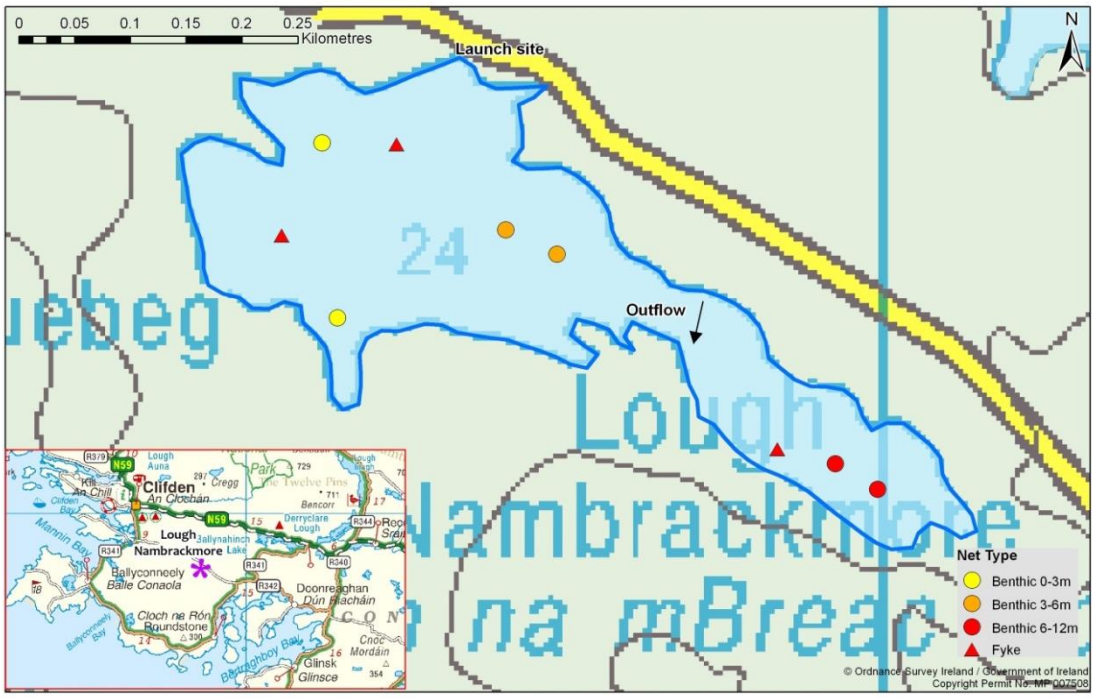

Fig. 1.1. Location map of Lough Nambrackmore showing locations and depths of each net (outflow is indicated on map)

1.2 Methods

Lough Nambrackmore was surveyed over one night on the 19th of August 2013. A total of three sets of Dutch fyke nets, six benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (2 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m) were deployed randomly in the lake (9 sites). Nets were deployed in the same locations as were randomly selected in the previous survey in 2010. 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 on site and scales were removed from all brown trout. 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

One fish species was recorded on Lough Nambrackmore in August 2013, with 17 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Brown trout was the only fish species recorded. During the previous survey in 2010 the same species composition was recorded with the exception of eels, which were not recorded during the 2013 survey but were captured in 2010. During the 2007 survey the same species composition was recorded, although the brown trout in the 2007 survey were stocked fish, in contrast to the wild brown trout captured in 2010 and 2013, therefore the 2007 stocked brown trout are not compared to the 2010 and 2013 wild brown trout in the graphs in this report.

Table 1.1. Number of each fish species captured by each gear type during the survey on Lough Nambrackmore, August 2013

Scientific name	Common name	Number of fish captured		
		Benthic mono multimesh gill nets	Fyke nets	Total
Salmo trutta	Brown trout	17	0	17

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 2010 and 2013 surveys are summarised in Table 1.2. Mean CPUE and BPUE for all species is illustrated in Figure 1.2 and 1.3.

Brown trout was the dominant species in terms of abundance (CPUE) and biomass (BPUE) captured in the survey gill nets.

Although the mean brown trout CPUE and BPUE was higher in 2013 than in 2010, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3).

Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Lough Nambrackmore, 2010 and 2013

Scientific name	Common name	2010	2013
		Mean CPUE	
Salmo trutta	Brown trout (wild)	0.059 (0.025)	0.063 (0.020)
Anguilla anguilla	European eel*	0.011 (0.006)	-
		Mean BPUE	
Salmo trutta	Brown trout (wild)	5.503 (2.175)	6.319 (1.855)
Anguilla anguilla	European eel*	1.055 (0.527)	-

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

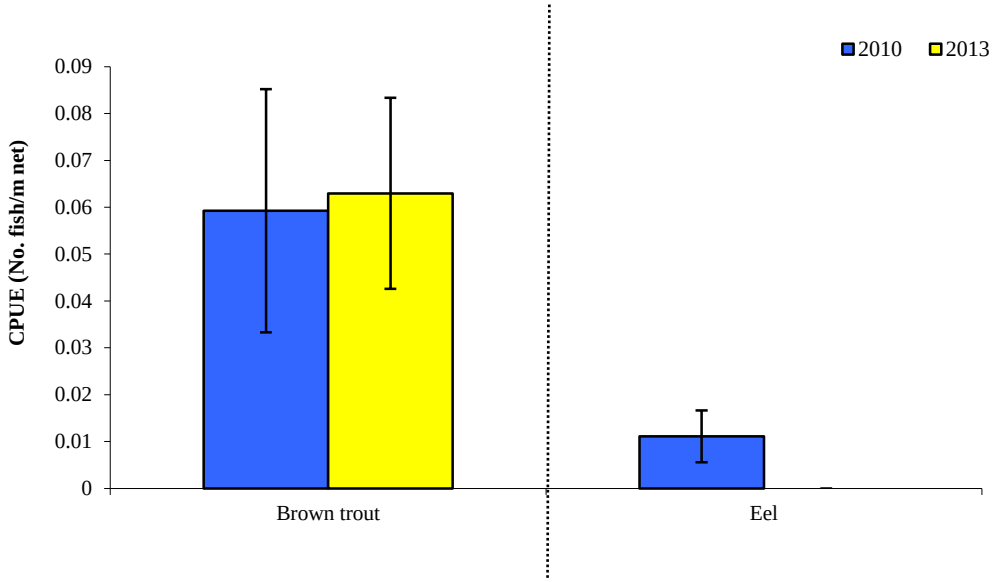

Fig. 1.2. Mean (±S.E.) CPUE for all fish species captured in Lough Nambrackmore (Eel CPUE based on fyke nets only), 2010 and 2013

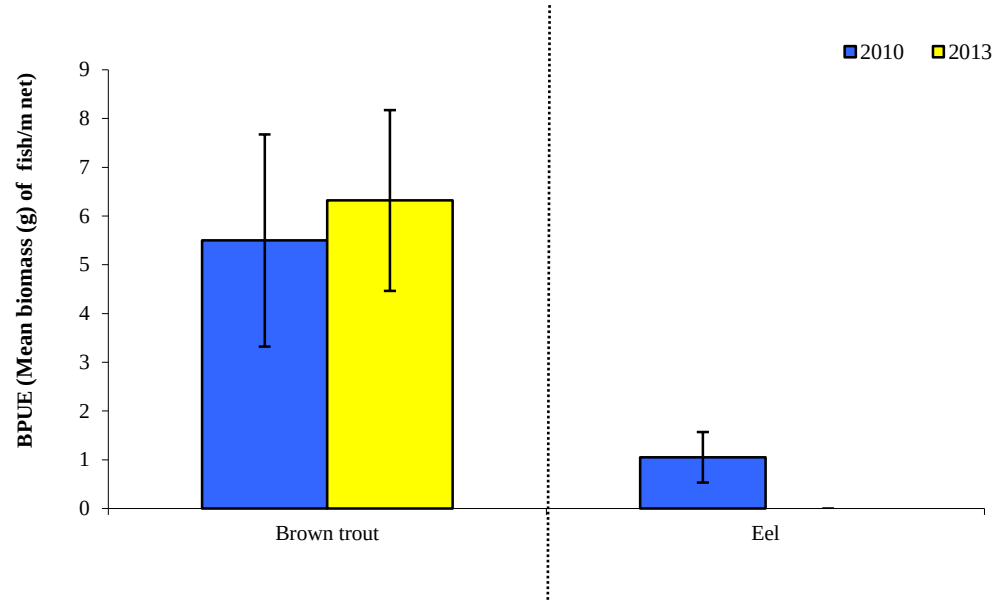

Fig. 1.3. Mean (±S.E.) BPUE for all fish species captured in Lough Nambrackmore (Eel BPUE based on fyke nets only), 2010 and 2013

1.3.3 Length frequency distributions and growth

Brown trout captured during the 2013 survey ranged in length from 13.2cm to 28.7cm (mean = 20.1cm) (Fig. 1.4) with four age classes present, ranging from 1+ to 4+, with a mean L1 of 7.5cm (Table 1.3). The dominant age class was 2+ (Fig 1.4). Mean brown trout L4 in 2013 was 27.5cm indicating a slow rate of growth for brown trout in this lake according to the classification scheme of Kennedy and Fitzmaurice (1971). Brown trout captured during the 2010 survey had a similar length range, age range and dominant age class (Fig. 1.4).

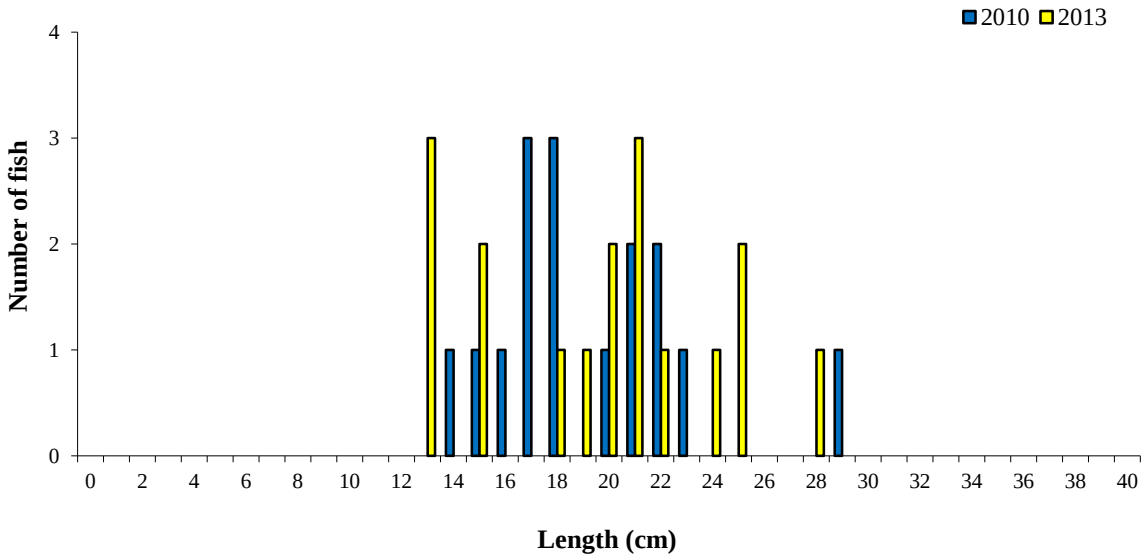

Fig. 1.4. Length frequency of brown trout captured on Lough Nambrackmore, 2010 and 2013

Table 1.3. Mean (±SE) brown trout length (cm) at age for Lough Nambrackmore, August 2013

	L_1	L_2	L_3	L_4
Mean	7.5 (0.3)	14.6 (0.3)	20.9 (0.8)	27.5
N	17	12	6	1
Range	4.6-10.6	11.6-19.7	18.7-24.5	27.5-27.5

1.4 Summary

Brown trout was the dominant species in terms of abundance (CPUE) and biomass (BPUE) captured in the survey gill nets during the 2013 survey.

Although the mean brown trout CPUE and BPUE was higher in 2013 than in 2010, these differences were not statistically significant. Brown trout ranged in age from 1+ to 4+, indicating reproductive success in four of the previous five years. The dominant age class was 2+. Length at age analyses revealed that brown trout in the lake exhibit a slow rate of growth according to the classification scheme of Kennedy and Fitzmaurice (1971).

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 Nambrackmore has been assigned an ecological status of Good based on the fish populations present in 2013. The ecological status assigned to the lake based on the 2010 survey data was High.

In the 2010 to 2012 surveillance monitoring reporting period, the EPA assigned Lough Nambrackmore an overall draft ecological status of Good, based on all monitored physico-chemical and biological elements, including fish.

1.5 References

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