Durnesh Lough

Sampling Fish for the Water Framework Directive - Transitional Waters 2009

The Central and Regional Fisheries Boards

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1. INTRODUCTION

A fish stock survey was conducted on Durnesh Lough as part of the fish monitoring programme for the Water Framework Directive (WFD), between the 29th and the 30th of September 2009 by staff from the Central Fisheries Board (CFB) and the Northern Regional Fisheries Board (NRFB).

Durnesh Lough is classified as a lagoon, covering an area of 0.70km^2 and is located on Ireland's north-west coast, approximately 10.5km south-west of Donegal town (Fig. 1.1, Plate 1.1). The lagoon formerly had a natural outlet to the sea but the outlet is now an artificial channel and pipe running under the sand dunes which appears to allow a certain amount of seawater to enter. It receives freshwater from a number of small local streams that drain the surrounding agricultural land (NPWS, 1999).

This water body lies within the Durnesh Lough SAC and is classed as a sedimentary lagoon, a habitat listed in Annex I of the EU Habitats Directive. Otter, an Annex II listed species, is also present (NPWS, 1999).

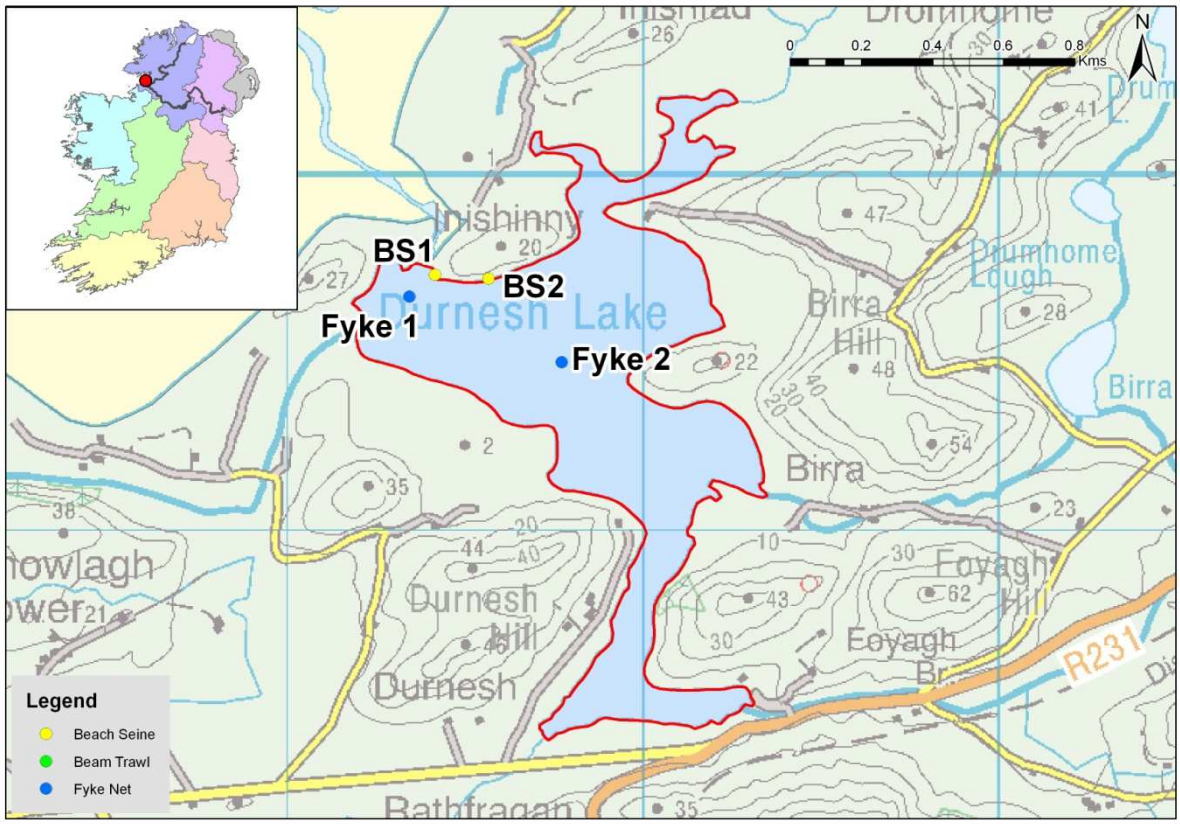

Fig 1.1. Location map of Durnesh Lough indicating sample sites, September 2009

Plate 1.1. Hauling a beach seine on Durnesh Lough, September 2009

2. METHODS

Current work in the UK and ROI indicates the need for a multi-method (beach seine, fyke net and beam trawl) approach to sampling fish in estuaries and these procedures are now the standard CFB methodology for fish stock surveys in transitional waters for the WFD monitoring program.

Beach seining is conducted using a 30m x 3m net (10mm mesh size) to capture fish in littoral areas. The bottom of the net has a weighted lead line to increase sediment disturbance and catch efficiency. Fyke nets (15m in length with a 0.8m diameter front hoop, joined by an 8m leader with a 10mm square mesh) are used to sample benthic fish in the littoral areas. Beam trawls are used for sampling benthic fish in the littoral and open waters, where bed type is suitable. The beam trawl measures 1.5m x 0.5m, with a 10mm mesh bag, decreasing to 5mm mesh in the cod end. The trawl is attached to a 20m tow rope and towed by boat. Trawls are conducted along transects of 100 – 200m in length.

Sample sites are selected to represent the range of geographical and habitat ranges within the water body, based on such factors as exposure/orientation, shoreline slope, and substrate type. A handheld GPS is used to mark the precise location of each site.

All nets are processed on-site by identifying the species present and counting the total numbers caught in each. Length measurements are recorded for each species using a representative sub-sample of 30 fish, while scales are only collected for certain species, such as salmon and sea trout. Unidentified specimens were retained for subsequent identification in the laboratory.

A total of two beach seines and two fyke nets were deployed in Durnesh Lough in September 2009. Beam trawls could not be conducted due to a substrate comprised mainly of weed and other organic detritus.

3. RESULTS

A total of six fish species (sea trout are included as a separate 'variety' of trout) were recorded in Durnesh Lough in September 2009 (Table 3.1). Sand goby was the most abundant species captured, followed by flounder and rudd (Table 3.1).

Flounder ranged in length from 2.5cm to 22.5cm (Fig. 3.1). A single sea trout (measuring 19.9cm in length) was captured in a seine net. The presence of rudd suggests a strong influence from freshwater on this system.

Salinity values taken at each beach seine site ranged from 6.0ppt to 6.1ppt.

Table 3.1. Number of each species captured by each gear type in Lough Durnesh, September 2009

Scientific name	Common Name	Beach seine (2)	Fyke net (2)	Beam trawl (0)	Total
Pomatoschistus minutus	Sand goby	425	-	-	425
Platichthys flesus	Flounder	37	82	-	119
Scardinius erythrophthalmus	Rudd	-	28	-	28
Anguilla anguilla	Eel	-	6	-	6
Gasterosteus aculeatus	Three-spined stickleback	4	-	-	4
Salmo trutta	Sea trout	1	-	-	1

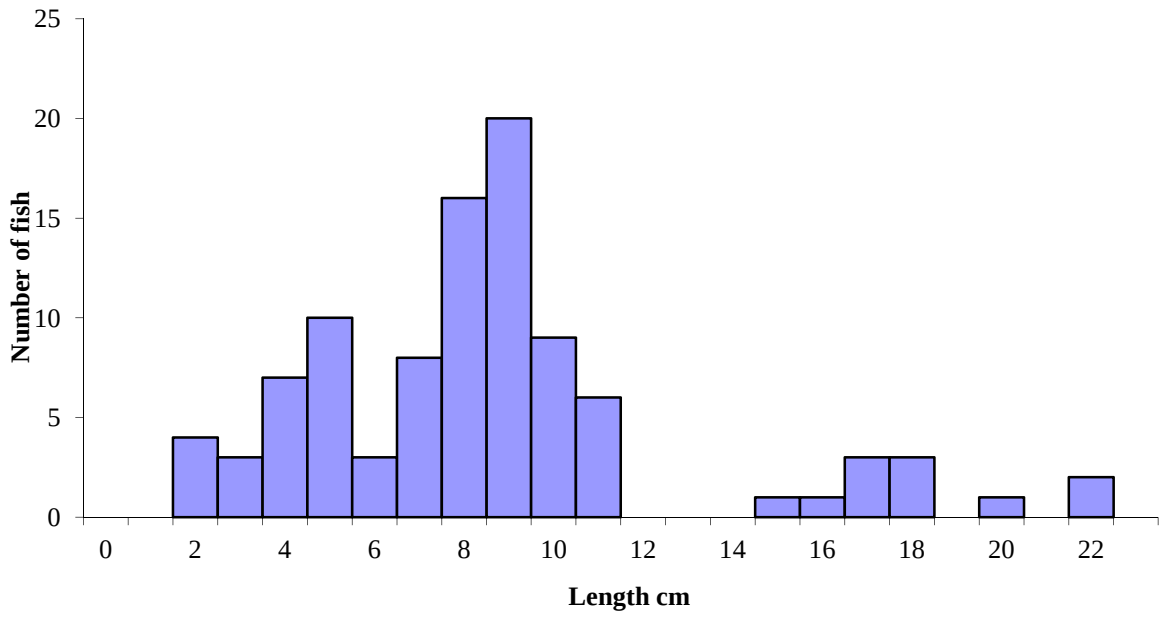

Fig. 3.1. Length frequency distribution of a sub-sample of flounder captured in Durnesh Lough, September 2009 (n = 97)

4. SUMMARY

A total of six fish species (sea trout are included as a separate 'variety' of trout) were recorded in Durnesh Lough, which is the lowest species richness of all WFD transitional water bodies surveyed in the NRFB during 2009. The high proportion of freshwater species present at this site suggests that there is a strong freshwater influence on the system, and sea water access is limited through a narrow artificial channel and pipe. Species of angling importance were present, such as flounder and sea trout. Rudd were also captured in the lagoon, these are not a ubiquitous species in Co. Donegal and the source of these is currently unknown, but may have been introduced to the lagoon accidentally or illegally by anglers. Species richness and distribution among all transitional water bodies surveyed during 2009 can be seen in the 2009 WFD summary report (Kelly *et al*., 2010).

An essential step in the WFD monitoring process is the classification of the status of transitional waters, which in turn will assist in identifying the objectives that must be set in the individual River Basin Management Plans.

A new WFD fish classification tool, Transitional Fish Classification Index or TFCI, has been developed for the island of Ireland (Ecoregion 1) using Northern Ireland Environment Agency (NIEA) and CFB data. This is a multi-metric tool based on similar tools developed in South Africa and the UK (Harrison and Whitfield, 2004; Coates *et al.*, 2007). The TFCI is still undergoing further development in order to make it fully WFD compliant and to account for differences in estuary typologies; however, at this stage it has been used, along with expert opinion, to provide draft ecological status classifications for each transitional water body surveyed for the WFD.

Using this approach, Durnesh Lough has been assigned a draft ecological status classification of "Moderate" based on the fish populations present.

The EPA have assigned Durnesh Lough an overall interim draft classification of "Good" status, based on general physico-chemical elements, phytoplankton, fish and macroalgal growths.

5. REFERENCES

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