

LOUGHS AGENCY OF THE FOYLE CARLINGFORD AND IRISH LIGHTS COMMISSION



# Stillwater Status Report: Lough Mourne, County Donegal

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## Stillwater Fish Stock Survey

Loughs Agency of the Foyle Carlingford and Irish Lights Commission

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A lake fish stock assessment was conducted to record fish species composition and abundance of Lough Mourne, County Donegal during the summer of 2010.

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Land owners and angling associations are also gratefully acknowledged for their co-operation.

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## **EXECUTIVE SUMMARY**

A Water Framework Directive compliant stillwater fish stock assessment was carried out on Lough Mourne in June 2010. The Loughs Agency commenced a small rolling programme of lake fish surveys in 2010 to gain a better understanding of fish composition and abundance of the standing waterbodies within the Foyle and Carlingford areas. The information collected can be used for many purposes ranging from formal Water Framework Directive classification, baseline survey for use in the scrutiny of any future proposals and for contributing towards the sustainable development of the angling amenity.

Lough Mourne is the proposed location for an impounding reservoir to supply drinking water for the central Donegal area. Lough Mourne is currently utilised as a public water supply with a small impounding structure at the outflow. The current proposal for a larger impoundment will significantly alter the size and structure of Lough Mourne.

The 2010 fish stock assessment noted the presence of four fish species in Lough Mourne, Roach, Eels, Pike and Trout with a total of 271 individual fish captured during the survey. Roach were the most common fish species encountered dominating the catch in the multi-mesh benthic gill nets while Eels dominated the catch in the fyke nets.

It is anticipated that this survey report could significantly contribute towards the future sustainable development of angling initiatives, infrastructure and development plans for Lough Mourne through highlighting the species and their relative abundance to fishery and water resource managers. Potential exists for a well-managed mixed fishery to be established with the owner of the fishing rights.

If access to the Fish in Lakes 2 Water Framework Directive classification tool was available a WFD compliant classification could also be derived for Lough Mourne and provided to the Environmental Protection Agency for national reporting purposes.

## 1.0 INTRODUCTION

Lough Mourne is located approximately 8km south-west of Ballybofey, Co. Donegal in the Derg catchment. The lake is located at an altitude of 165.5 metres above sea level and its principal dimensions are;

- Length: 1.9km long, maximum width 560 metres
- Surface area: 66.5 hectares
- Mean depth: 3.9 metres, maximum depth: 11.9 metres

During the summer water levels can recede substantially, exposing a foreshore of sand and shingle and revealing dense growths of aquatic macrophytes in the shallows at the southern end of the lake. The underlying geology of the area consists of metamorphic rocks of the Ballybofey Succession within the Argyll Group of the Dalradian era (Johnson, 2010).

Lough Mourne does not appear to have been assigned into a typology class by the EPA for the Water Framework Directive. However using data on depth and area from the bathymetric survey by AFBI, and alkalinity (CaCO<sub>3</sub>) measurements provided by Donegal County Council, the lake falls on the boundary of Type 2 (low alkalinity, shallow and large) and Type 4 (low alkalinity, deep and large). For comparison purposes it is assumed that the average depth under normal conditions is >4m, classing it as a Type 4 water. Lough Mourne has been classed as 2a (i.e. expected to meet good status by 2015, pending further investigation) in the WFD Characterisation Report.

The south – western shore of the lake lies adjacent to Croaghonagh Bog Special Area of Conservation (SAC) which features blanket bog as a priority habitat on Annex I of the EU Habitats Directive. In addition the site supports a range of bird species, particularly Greenland White-fronted Goose, which feed here in winter, Golden Plover and Red Grouse which breed on site. Merlin, Hen Harrier and Peregrine Falcon feed over the site. Otter and Irish Hare also frequent the site.

Lough Mourne discharges into the Mourne Beg River, one of the principal tributaries of the River Derg. In Northern Ireland both the Derg and Mourne Beg rivers are designated as part of the River Foyle and Tributaries SAC, with Atlantic salmon as the Annex II species selected as the primary reason for designation of the site. The Lough was known to contain populations of brown trout and pike,



and is fished by local people for pike although there is no organised angling in the form of a club or association.



Fig 1. Lough Mourne, top image looking south towards Barnesmore Gap, bottom image looking north towards Ballybofey.

## 2.0 METHODS

Lough Mourne was surveyed over one night on the 22<sup>nd</sup> of June 2010 following the methodology outlined in the Water Framework Directive compliant NS Share Methods Manual for systematic surveying of lakes for fish (NSSHARE, 2008). Prior to the commencement of the fish survey a bathymetric survey was conducted to obtain accurate depth data. A total of 19 nets were set as summarised in Figure 2.

Net type	No. Deployed	Water depth (m)
Dutch fyke nets (chain of 3)	3	0 – 2.9
Multi-mesh gill nets	4	0 – 2.9
Multi-mesh gill nets	4	3 – 5.9
Multi-mesh gill nets	4	6 – 11.9
Floating gill nets	4	6 – 11.9

Fig 2. Details of survey nets deployed

Following the survey methodology net locations were chosen within randomly selected 50m X 50m grid squares overlaid on the bathymetric map of the lough within each depth stratum. A handheld Trimble Geo XT GPS was used to record the precise location of each net. The location and depth of each net is shown in Figure 4.

Any fish which were alive and in good condition were measured and released live after removal from the nets, this included all eels. All other fish were removed from the nets and identified and measured on site.



Fig 3. Multi-mesh gill net deployed on Lough Mourne, 2010

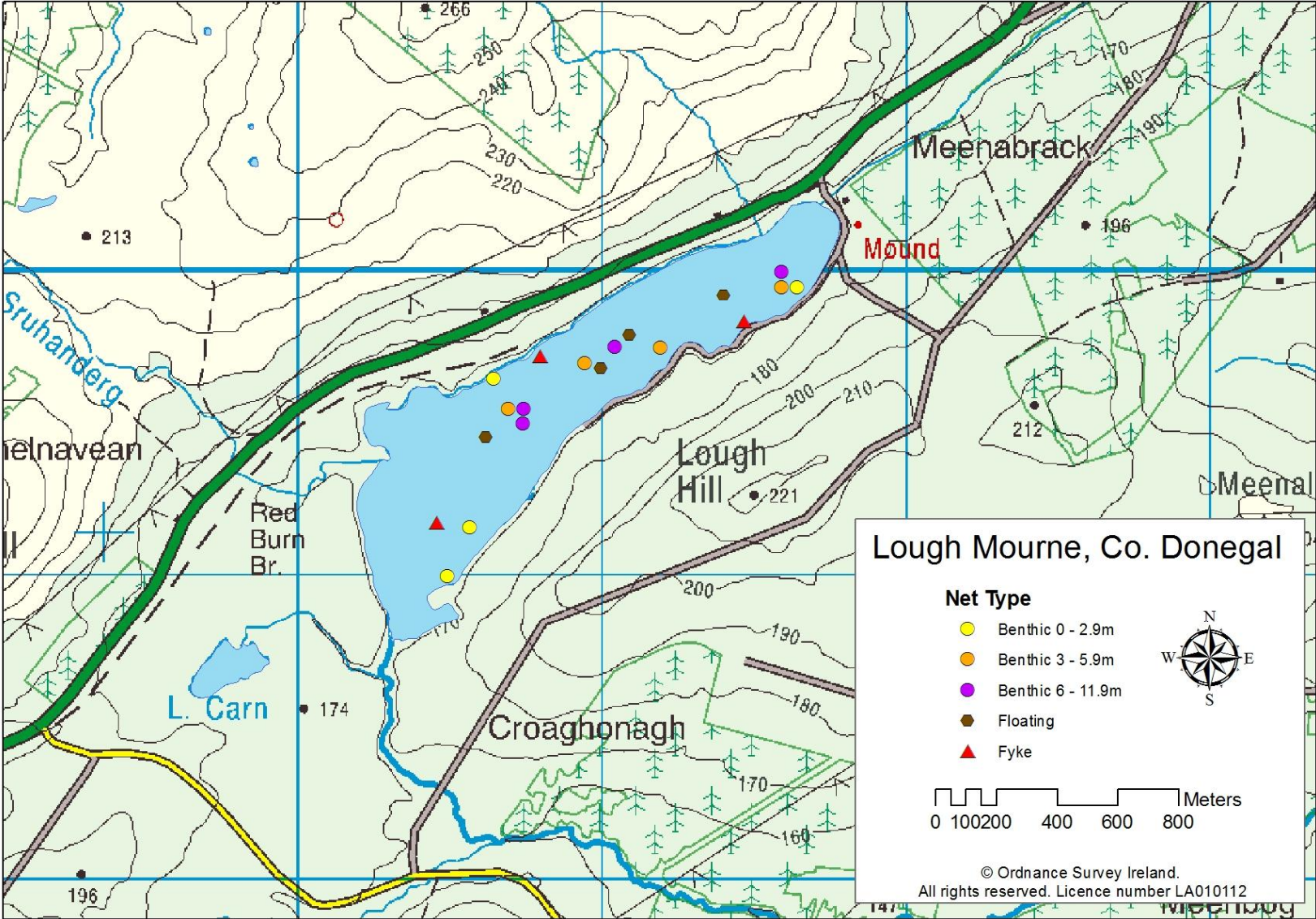


Fig 4. Lough Mourne net locations

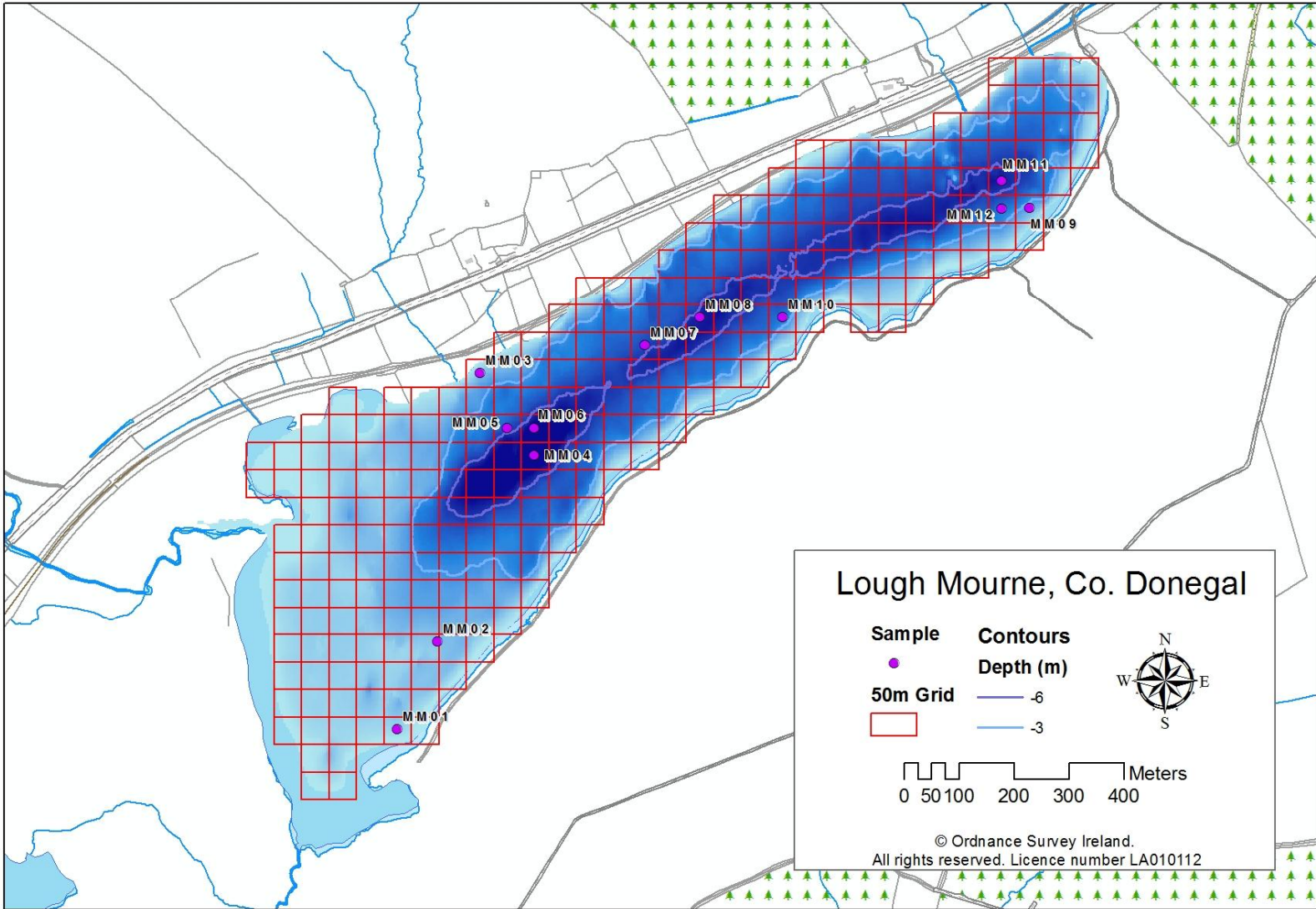


Fig 5. Lough Mourne 50 metre grids and location of multi-mesh gill nets deployed during the survey

### 3.0 RESULTS

#### 3.1 SPECIES RICHNESS

Four fish species were recorded on Lough Mourne in June 2010 with a total of 271 individual fish captured during the survey. A list of species captured by gear type is provided in Figure 6. Roach were the most common fish species encountered in the benthic gill nets. Eels were captured in the fyke nets.

Common name	Scientific name	Benthic gill nets	Surface gill nets	Fyke nets	Total
Brown trout	<i>Salmo trutta</i>	2	0	0	2
Pike	<i>Esox lucius</i>	8	0	1	9
Roach	<i>Rutilus rutilus</i>	246	0	1	247
Eel	<i>Anguilla anguilla</i>	0	0	13	13

Fig 6. Number of each fish species captured by each gear type during the survey of Lough Mourne, June 2010.



### 3.2 FISH ABUNDANCE

Fish abundance, mean catch per unit effort (CPUE) was calculated as the mean number of fish caught per metre of net. Fish biomass, mean biomass per unit effort (BPUE) was calculated as the mean weight of fish caught per metre of net. For all fish species except eel, CPUE/BPUE is based on all nets including fyke nets, whereas eel CPUE/BPUE is based on fyke nets only. Weights were not available from those fish which were released alive. In such cases, weights were calculated from the length weight relationship of recorded fish. A summary of CPUE and BPUE data for each species is shown in Figure 7.

Roach were the dominant fish species both in terms of abundance and biomass.

Common name	Scientific Name	2010 CPUE	2010 BPUE
Brown trout	<i>Salmo trutta</i>	<b>0.003</b> (0.002)	<b>0.37</b> (0.255)
Pike	<i>Esox lucius</i>	<b>0.015</b> (0.004)	<b>2.5</b> (0.829)
Roach	<i>Rutilus rutilus</i>	<b>0.433</b> (0.130)	<b>28.353</b> (6.862)
Eel	<i>Anguilla anguilla</i>	<b>0.144</b> (0.029)	<b>33.432</b> (5.019)

Fig 7. Mean ( $\pm$  S.E.) CPUE and BPUE for all fish species recorded on Lough Mourne, 2010.



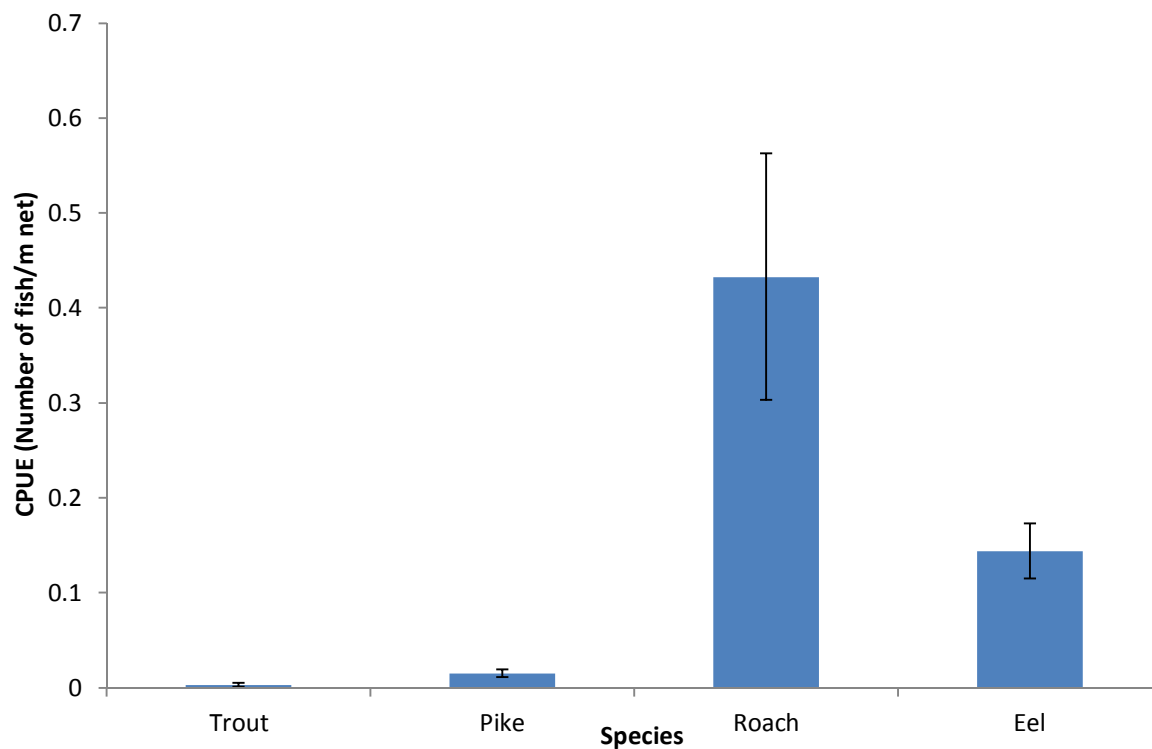


Fig 8. Mean ( $\pm$  S.E.) CPUE for all fish species captured in Lough Mourne (Eel CPUE based on Fyke nets only).

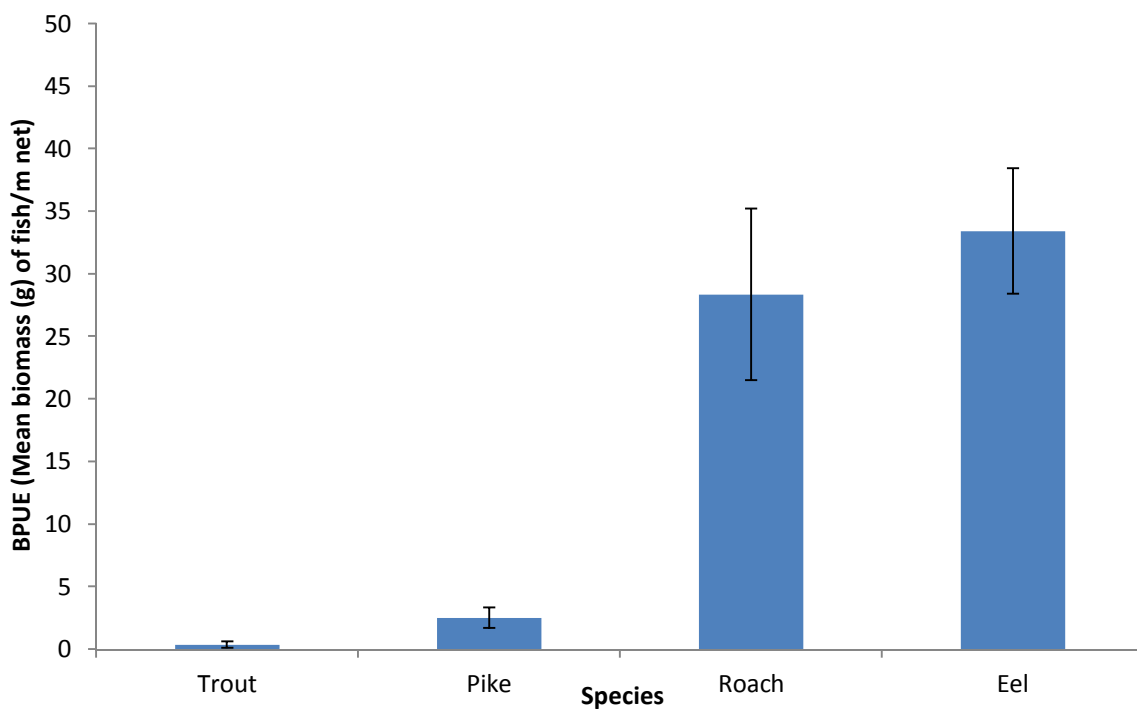


Fig 9. Mean ( $\pm$  S.E.) BPUE for all fish species captured in Lough Mourne (Eel BPUE based on Fyke nets only).

### 3.3 LENGTH FREQUENCY DISTRIBUTION

247 Roach were captured during the 2010 survey, lengths ranged from 5cm to 28.4cm (mean length = 13.4cm). 13 Eels were captured during the survey, lengths ranged from 36cm to 61.5cm (mean length = 46.5cm). 9 Pike were captured during the survey, lengths ranged from 19.5cm to 31.6cm (mean length = 27.8cm). 2 Brown trout were captured during the 2010 survey. They were both of similar length, 20.5cm and 22cm respectively.

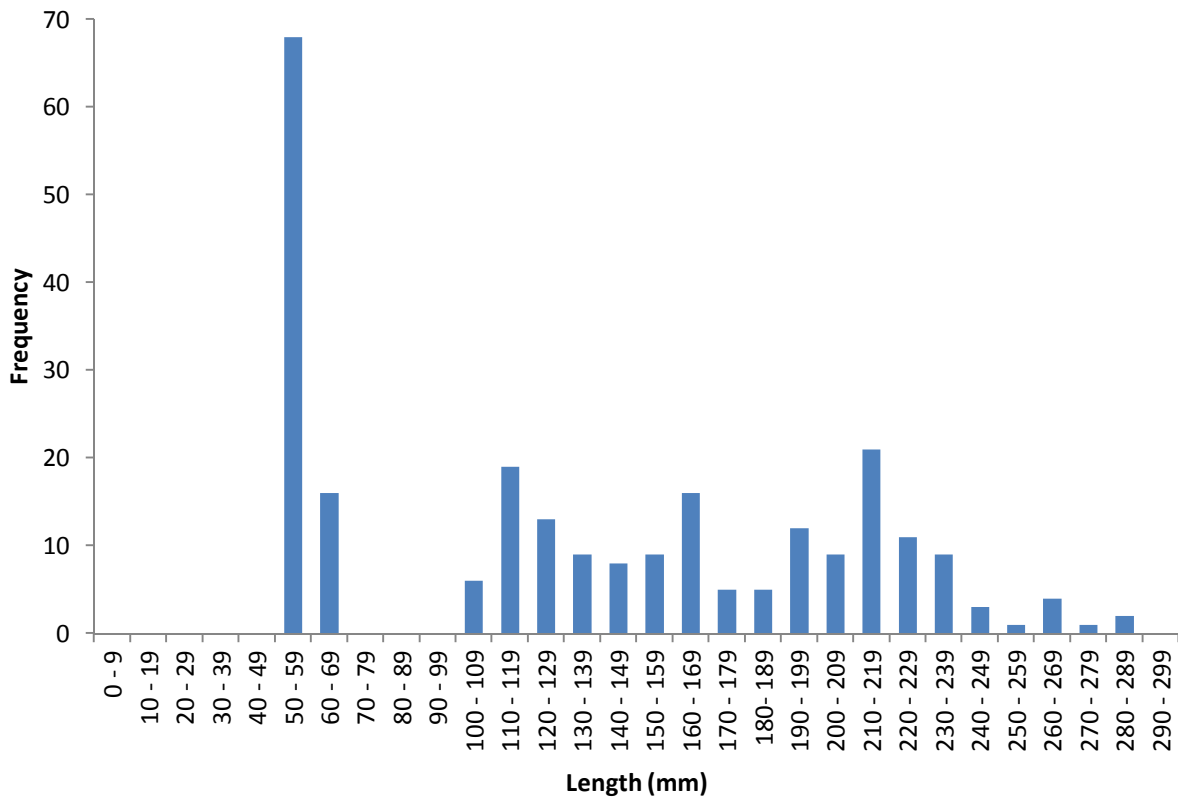


Fig 10. Length frequency of captured Roach, Lough Mourne 2010 (N=247)



Fig 11. Roach from Lough Mourne 2010.



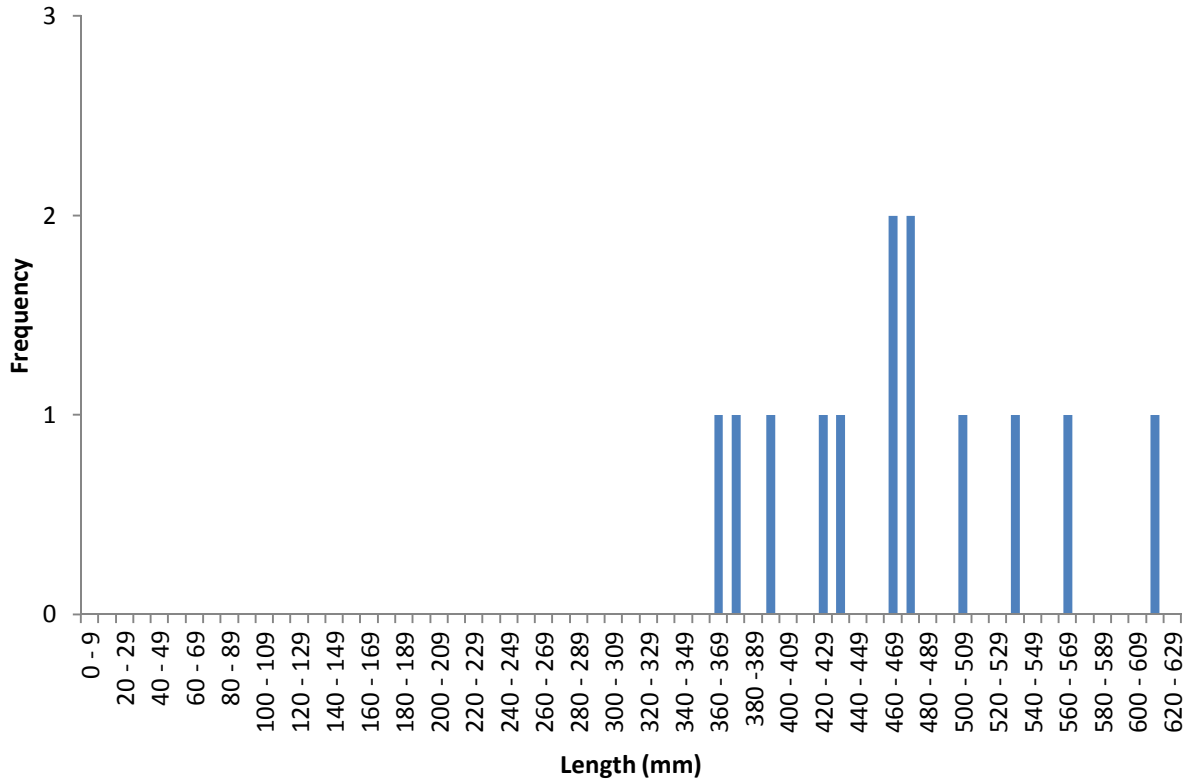


Fig 12. Length frequency of captured Eels, Lough Mourne 2010 (N=13)

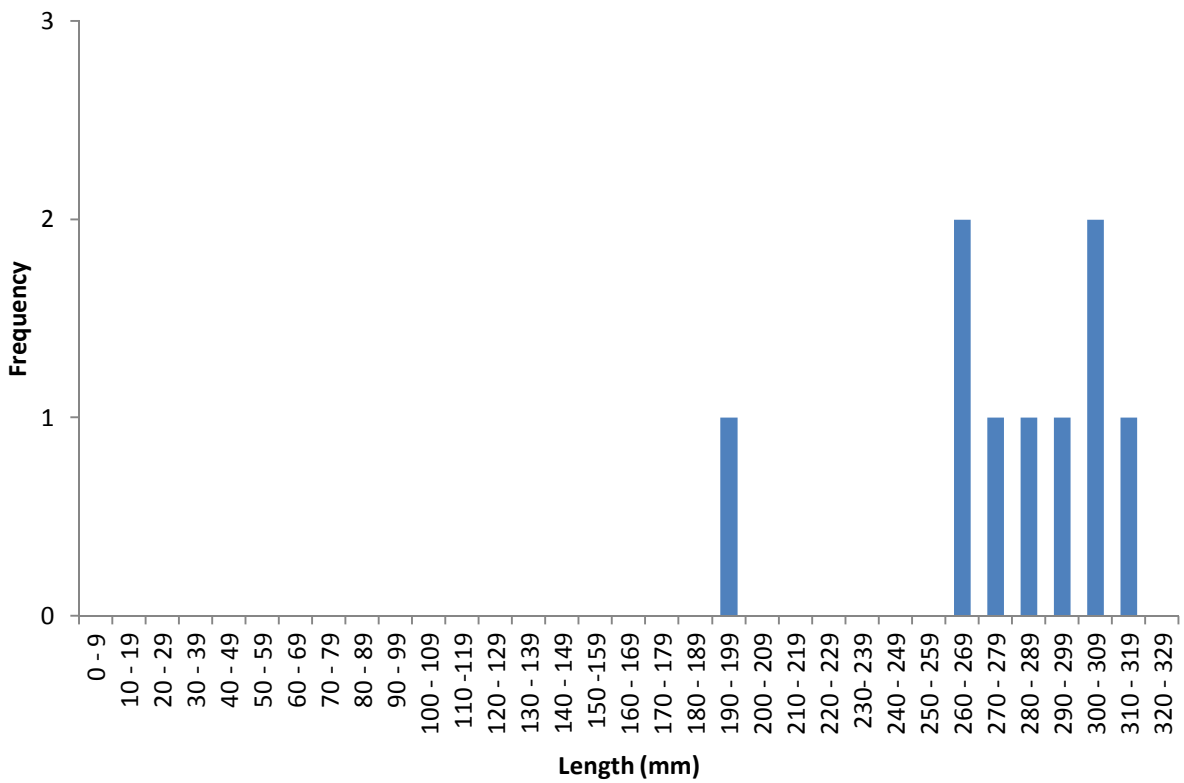


Fig 13. Length frequency of captured Pike, Lough Mourne 2010 (N=9)



Fig 14. Pike from Lough Mourne, 2010

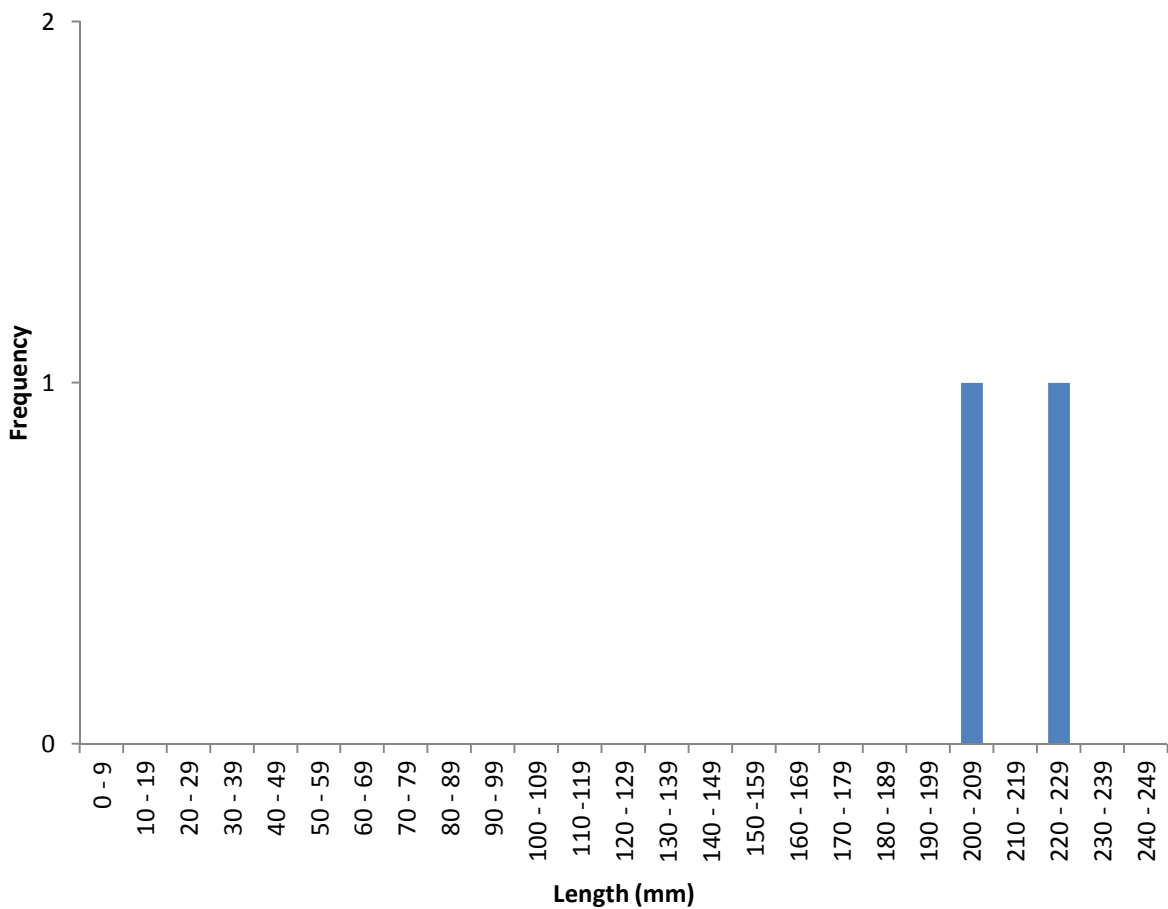


Fig 15. Length frequency of captured Trout, Lough Mourne 2010 (N=2)

### 3.4 FISH AGE AND GROWTH

Ten age classes of Roach were recorded during the survey. Length frequency and age analysis by scale reading revealed that 0+ fry were the dominant age category of the Roach in the lough at the time of sampling and accounted for 39% of the population by number. Two age classes of Pike were recorded during the survey. All Eels were released so no age analysis was conducted.

#### 4.0 DISCUSSION

Roach were the dominant species in Lough Mourne during the 2010 survey, with Eels, Pike and Brown trout also present.

Data on Roach growth rates has not been presented in this report as this would require further examination and measurement of annual growth from the scale samples collected

Whilst it was generally known that Pike and Brown Trout were present in Lough Mourne, the presence of Roach had not been reported. This is all the more surprising given the apparent abundance of the stock relative to the other species. Roach are a non-native species in Ireland and have become widely distributed since their introduction to the Foyle area in the late 1800's. It is assumed that at some stage Roach may have been used as live bait for Pike fishing in Lough Mourne (live baiting is illegal within the Foyle and Carlingford areas), and a small number may have escaped and established a breeding population. The presence of at least 10 year classes would suggest that the stock has been resident for a considerable time.

This water body is utilised as a public water supply for the north central Donegal region. Water abstraction is managed by Donegal County Council. An impounding structure incorporating a "V" north weir is in place on the outflow to the Mournebeg River. There are well developed plans to significantly increase the impounded area to supply increasing demand for drinking water. Potential exists for a well-managed mixed fishery to be established with the owner of the fishing rights.



Fig 16. Lough Mourne lake survey

The Lough Mourne survey of 2010 will act as a baseline survey against which future temporal surveys can be compared. It will also be used to compare other stillwaters within the Foyle and Carlingford areas against. By commencing a rolling programme of stillwater fish surveys following a standard survey protocol a growing data set incorporating valuable information on species richness, growth rates and abundance will be created. This survey marks the first step in delivering standardised stillwater fish surveys across the Foyle and Carlingford areas in a co-ordinated manner.

## **5.0 RECOMMENDATIONS**

- Repeat survey every 5 years.
- Compare results against any future surveys in the Foyle area to ascertain comparative growth rates across and within a range of stillwaters of the Foyle and Carlingford areas.
- Communicate findings internally to colleagues and externally to stakeholders
- Continue to conduct stillwater fish surveys temporally and spatially within the Foyle and Carlingford areas.

## **6.0 REFERENCES**

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