

# National Research Survey Programme

## Lakes 2019

### Lough Glenawough

IFI/2020/1-4504



Iascach Intíre Éireann  
Inland Fisheries Ireland



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National Research Survey Programme

**Fish Stock Survey of Lough Glenawough,  
September 2019**

Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24.

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Cover photo: Aerial view of Lough Shindilla © Inland Fisheries Ireland

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## 1.1 Introduction

Lough Glenawough is located in the Erriff River catchment approximately 17km northeast of Leenaun village, Co. Galway. The lake is situated in a remote part of the catchment between the Party and Maumtrasna mountain ranges and is surrounded by steep slopes on three sides (Plate 1.1, Fig. 1.1).

The lake has a surface area of 73ha and a maximum depth of 61m and has been characterised as typology class 4 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and low alkalinity (<20mg/l CaCO<sub>3</sub>).

Lough Glenawough is located in the Mweelrea/Sheeffry/Erriff Complex SAC, an area of scenic hills in south Mayo. The western limit of the SAC is at Dooaghtry, south of Kinnadoohy, County Mayo. The southern margin is bounded by Killary Harbour and the Erriff River, including Lough Glenawough. The Aille River, part of the Lough Mask catchment, forms the eastern limit, and to the north the boundary includes the Sheeffry Hills and the Mweelrea Mountains (NPWS, 2005). The Mweelrea/Sheeffry/Erriff Complex SAC contains active blanket bog, lagoons, machair, decalcified dunes and petrifying springs - all priority habitats on Annex I of the E.U. Habitats Directive. The site was also selected for containing many species listed on Annex II of the same Directive – e.g. freshwater pearl mussel, Atlantic salmon, otter, the snails *Vertigo angustior* and *V. geyeri*, the plant slender naiad and the liverwort petalwort (NPWS, 2005).

The River Erriff system is a state owned migratory salmonid fishery which is managed by Inland Fisheries Ireland (IFI). The fishery is comprised of the River Erriff, its tributaries and a number of small lakes, including Tawnyard, Derrintin and Glenawough. Tawnyard Lough holds a stock of brown trout and gets a run of sea trout and salmon (O' Reilly, 2007). Salmon angling is carried out along the lower 10km of the River Erriff main channel while Tawnyard Lough is the principal sea trout fishery. Glenawough Lough is brown trout fishing only, but is rarely fished as access is by foot over rough boggy ground. A waterfall on the Cross river, approximately 700m upstream of Derrinkee Bridge, prevents the upstream movement of salmon and sea trout (Gargan *pers comm*, 2020).

The Erriff system has been designated by IFI as the National Salmonid Index Catchment (NSIC) and is also one of IFI's index catchments for long-term climate change monitoring. A dedicated research station, managed by IFI, with fish counting and trapping facilities is located at Aasleagh Falls near the mouth of the fishery which flows into Killary Harbour fjord. A downstream wolf-type trap has been in operation on the Black River downstream of Tawnyard Lough since 1985.

This report summarises the results of the 2019 fish stock survey carried out on the lake.



**Plate 1.1. Lough Glenawough**

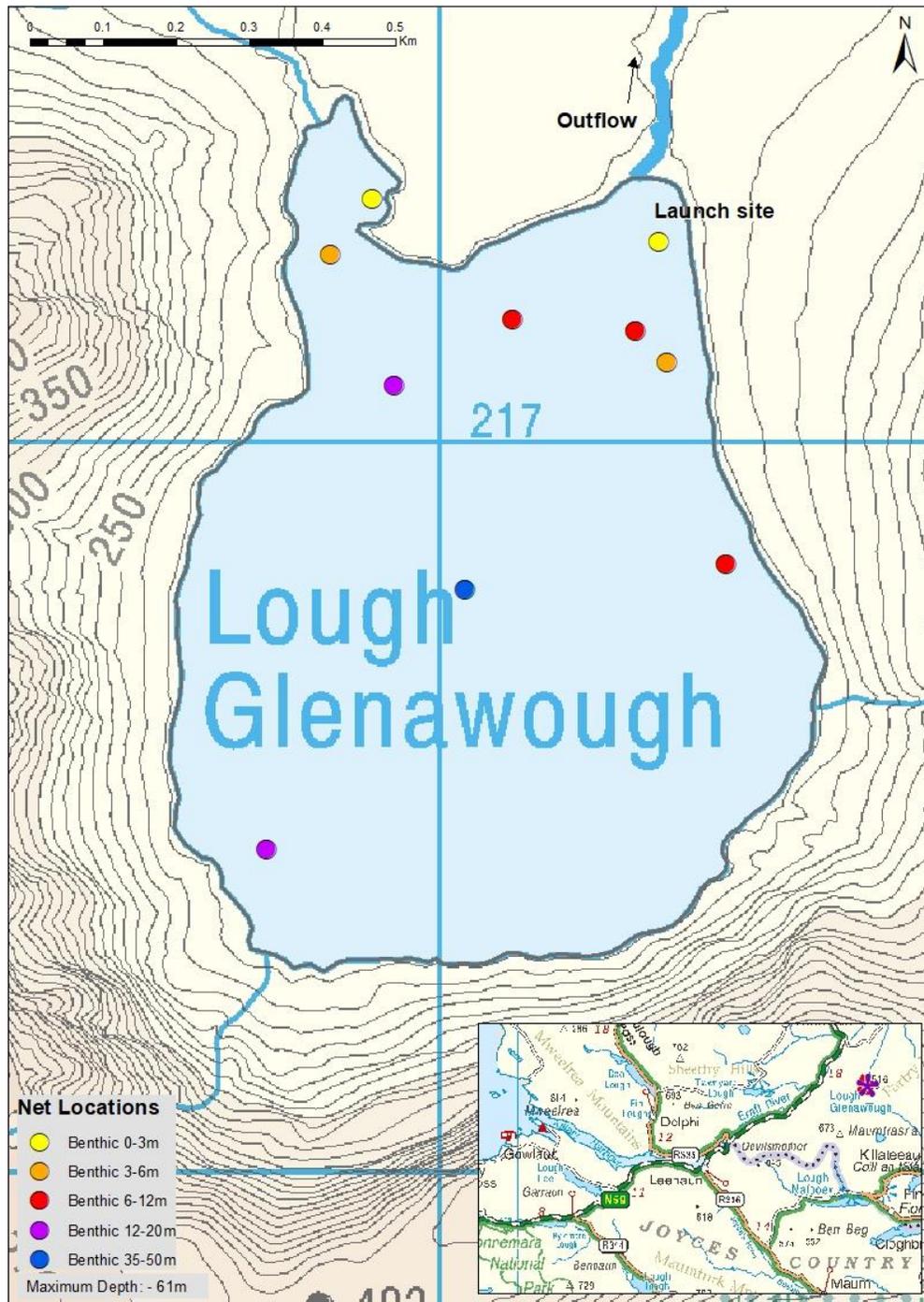


Fig. 1.1. Location map of Lough Glenawough showing net locations and depths of each net (outflow is indicated on map)



## 1.2 Methods

### 1.2.1 Netting methods

Lough Glenawough was surveyed over one night from the 4<sup>th</sup> to the 5<sup>th</sup> of September 2019. A total of ten benthic monofilament multi-mesh (12 panel, 5-55mm mesh size) CEN standard survey gill nets (BM CEN) (2 @ 0-2.9m, 2 @ 3-5.9m, 3 @ 6-11.9m, 2 @ 12-19.9m and 1 @ 20-34.9m) were deployed in the lake (10 sites). 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 and Arctic char. 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 retained for further analysis. Fish were frozen immediately after the survey and transported back to the IFI laboratory for later dissection

*(Note: it was not possible to undertake a full quantitative survey on the lake due to weather conditions and poor access limiting the amount of equipment the team could transport to the lake).*

### 1.2.2 Fish diet

Total stomach contents were inspected and individual items were counted and identified to the lowest taxonomic level possible. The percentage frequency occurrence (%FO) of prey items were then calculated to identify key prey items (Amundsen *et al.*, 1996).

$$\%FO_i = (N_i / N) \times 100$$

Where:

%FO<sub>i</sub> is the percentage frequency of prey item i,

N<sub>i</sub> is the number of a particular species with prey i in their stomach,

N is total number of a particular species with stomach contents.

### 1.2.3 Biosecurity - disinfection and decontamination procedures

Procedures are required for disinfection of equipment in order to prevent dispersal of alien species and other organisms to uninfected waters. A standard operating procedure was compiled by Inland Fisheries Ireland for this purpose (Caffrey, 2010) and is followed by staff in IFI when moving between water bodies.



## 1.3 Results

### 1.3.1 Species Richness

A total of two fish species were recorded in Lough Glenawough in September 2019, with 68 fish being captured. The number of each species captured is shown in Table 1.1. Brown trout was the most common fish species recorded, followed by Arctic char.

**Table 1.1. Number of each fish species captured during the survey on Lough Glenawough, September 2019**

Scientific name	Common name	Number of fish captured
<i>Salmo trutta</i>	Brown trout	58
<i>Salvelinus alpinus</i>	Arctic char	10

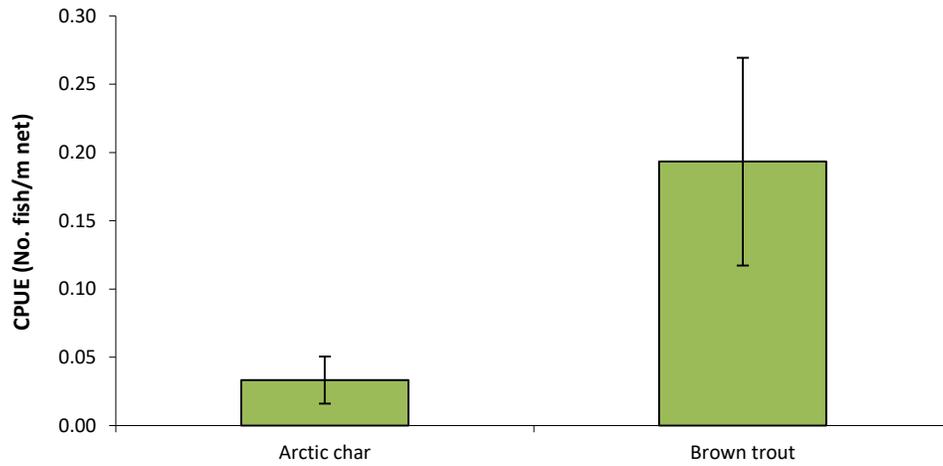
### 1.3.2 Fish abundance

Fish abundance (mean CPUE) and biomass (mean BPUE) were calculated as the mean number/weight of fish caught per metre of net. Mean CPUE and BPUE for all fish species captured in the 2019 survey are summarised in Table 1.2 and illustrated in Figures 1.2 and 1.3. Brown trout were the most abundant species in terms of abundance (CPUE) and biomass (BPUE) in Lough Glenawough during the 2019 survey.

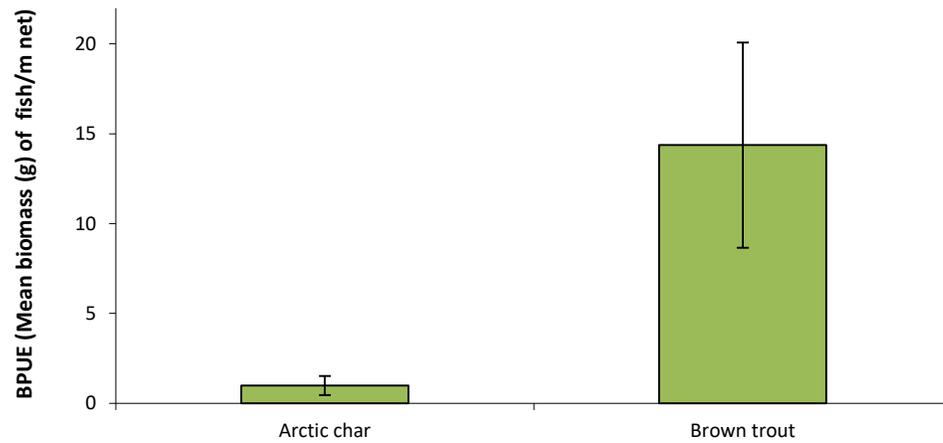
**Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Lough Glenawough, 2019**

Scientific name	Common name	Mean CPUE ( $\pm$ S.E)
<i>Salmo trutta</i>	Brown trout	0.193 (0.076)
<i>Salvelinus alpinus</i>	Arctic char	0.033 (0.017)
<b>Mean BPUE (<math>\pm</math> S.E)</b>		
<i>Salmo trutta</i>	Brown trout	14.369 (5.705)
<i>Salvelinus alpinus</i>	Arctic char	0.993 (0.5330)

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 (Connor *et al.*, 2017).



**Fig. 1.2.** Mean ( $\pm$ S.E.) CPUE for all fish species captured in Lough Glenawough, 2019

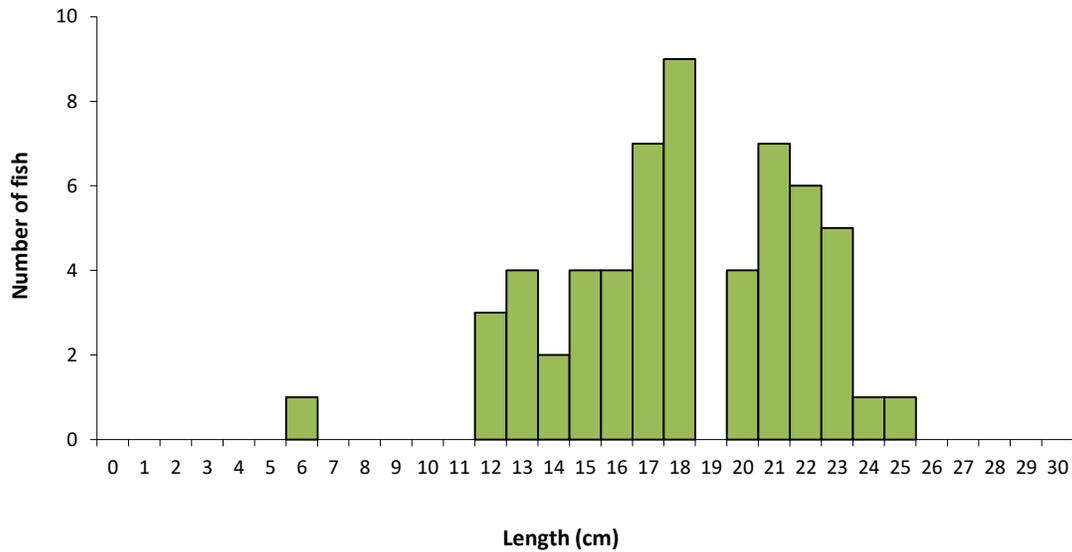


**Fig. 1.3.** Mean ( $\pm$ S.E.) BPUE for all fish species captured in Lough Glenawough, 2019

### 1.3.3 Length frequency distributions and growth

#### Brown trout

Brown trout captured during the 2019 survey ranged in length from 6.6cm to 25.0cm (mean = 18.4cm). Four age classes were present, ranging from 0+ to 3+, with a mean L1 of 6.9cm. The dominant age class was 2+ (Table 1.3, Fig 1.4.).



**Fig. 1.4. Length frequency of brown trout captured on Lough Glenawough, 2019**

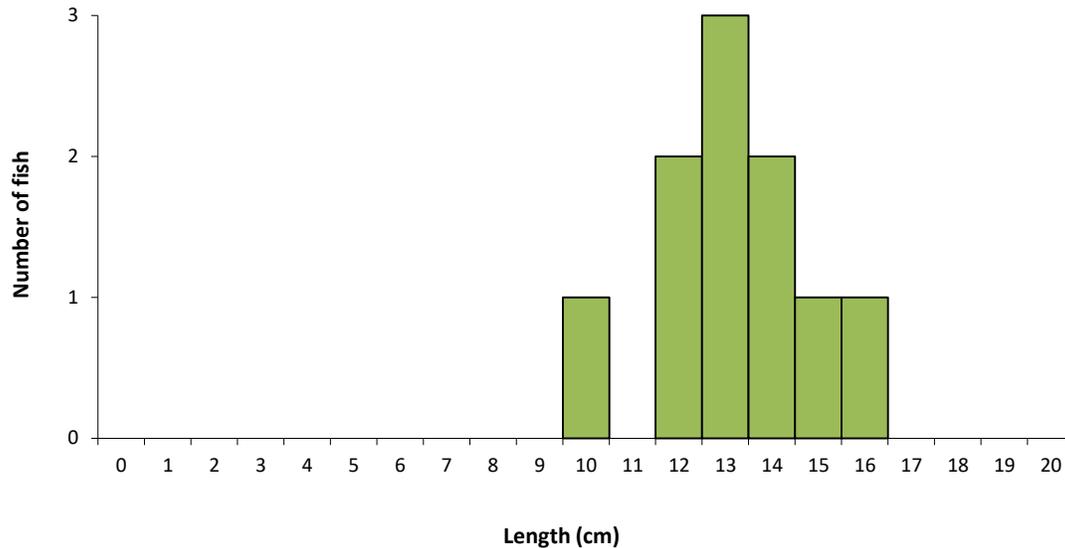
**Table 1.3. Mean ( $\pm$ S.E.) brown trout length (cm) at age for Lough Glenawough, September 2019**

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>
Mean ( $\pm$ S.E.)	6.9 (0.2)	14.7 (0.4)	19.3 (0.5)
N	35	28	10
Range	4.0-9.3	10.8-20.2	16.7-21.7



### **Arctic char**

Arctic char captured during the 2019 survey ranged in length from 10.6cm to 16.5cm (mean = 13.6cm) (Fig. 1.5). Four age classes were present, ranging from 3+ to 6+. The dominant age class was 4+.



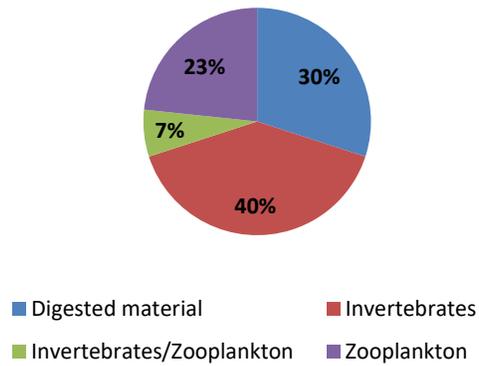
**Fig. 1.5. Length frequency of Arctic char captured on Lough Glenawough, 2019**

### ***1.3.4 Stomach and diet analysis***

Dietary analysis studies provide a good indication of the availability of food items and the angling methods that are likely to be successful. However, the value of stomach content analysis is limited unless undertaken over a long period as diet may change on a daily basis depending on the availability of food items. The stomach contents of a sub-sample of perch and brown trout captured during the survey were examined and are presented below.

### **Brown trout**

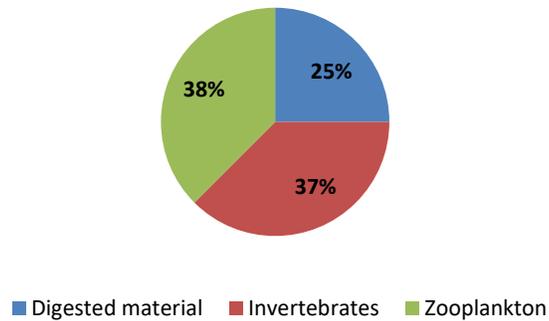
Adult trout usually feed principally on crustaceans (*Asellus* sp. and *Gammarus* sp.), insects (principally chironomid larvae and pupae) and molluscs (snails) (Kennedy and Fitzmaurice, 1971; O'Grady, 1981). A total of 39 stomachs were examined. Of these nine were found to contain no prey items. Of the remaining 30 stomachs containing food, 40% contained invertebrates, 30% contained digested material, 23% contained zooplankton and 7% contained invertebrates/zooplankton (Fig. 1.6).



**Fig 1.6. Diet of brown trout (n=30) captured on Lough Glenawough, 2019 (% FO)**

### **Arctic char**

A total of ten Arctic char stomachs were examined. Of these two were found to contain no prey items. Of the remaining eight stomachs containing food, 38% contained zooplankton, 37% contained invertebrates and 25% contained unidentified digested material (Fig. 1.7).



**Fig 1.7. Diet of Arctic char (n=8) captured on Lough Glenawough, 2019 (% FO)**



#### 1.4 Summary and ecological status

Two fish species were recorded in Lough Glenawough in September 2019, i.e. brown trout and Arctic char. Brown trout was the dominant species in terms of both abundance (CPUE) and biomass (BPUE) captured in the survey gill nets during the 2019 survey.

Brown trout ranged in length from 6.6cm to 25.0cm. Four age classes were present ranging from 0+ to 3+, indicating reproductive success in each of the previous four years.

Arctic char ranged from 10.6cm to 16.5cm in length. Four age classes were present ranging from 3+ to 6+.

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 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.*, 2012b). Using the FIL2 classification tool, Lough Glenawough has been assigned an ecological status of High for 2019 based on the fish populations present.



## 1.5 References

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