

# National Research Survey Programme

## Lakes 2017

### Corglass Lough

IFI/2018/1-4410



Iascach Iníre Éireann  
Inland Fisheries Ireland



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National Research Survey Programme

**Fish Stock Survey of Corglass Lough,  
August 2017**

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

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Cover photo: Netting survey on Lough Derravaragh © Inland Fisheries Ireland

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## 1.1 Introduction

Corglass Lough is situated in the Erne catchment, north of Killeshandra, Co. Cavan (Plate 1.1, Fig. 1.1). The lake has a surface area of 34ha and is relatively shallow, with a mean depth of 1.6m and a maximum depth of 6m. The lake is categorised as typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (mean depth <4m), less than 50ha and high alkalinity (>100mg/l CaCO<sub>3</sub>). Corglass Lough is located within the Lough Oughter and its associated loughs Special Area of Conservation (NPWS, 2002). The geology of the area is predominantly Lower Carboniferous Limestone.

The lake is a popular coarse fishery and has historically held a good stock of coarse fish species, including rudd, roach, perch, bream, pike, tench, roach x bream hybrids and roach x rudd hybrids (M. Fitzpatrick, *pers. comm.*). The lake has also been long-lined for eels in the past by commercial eel fishermen. Zebra mussels are present in the lake and are thought to have colonised post 2003 (M. Fitzpatrick, *pers. comm.*).

Corglass lake was previously surveyed in July 2005 by Inland Fisheries Ireland (formerly the Central and Northern Regional Fisheries Boards) for the NS Share “Fish in Lakes Project”, with six species (plus two hybrids) being captured – perch, pike, roach, bream, tench, eels, roach x bream hybrids and roach x rudd hybrids (Kelly *et al.*, 2007). Corglass Lough was also surveyed in 2008, 2011 and 2014 as part of the Water Framework Directive surveillance monitoring programme (Kelly *et al.*, 2009, 2012a, 2015a and 2015b). During the 2014 survey, perch and roach were found to be the dominant species present in the lake. Pike, tench, roach x bream hybrids and eels were also captured during the survey.

This report summarises the results of the 2017 fish stock survey carried out on the lake as part of the Water Framework Directive surveillance monitoring programme and IFI’s national coarse fish and pike research programme.



Plate 1.1. Corglass Lough

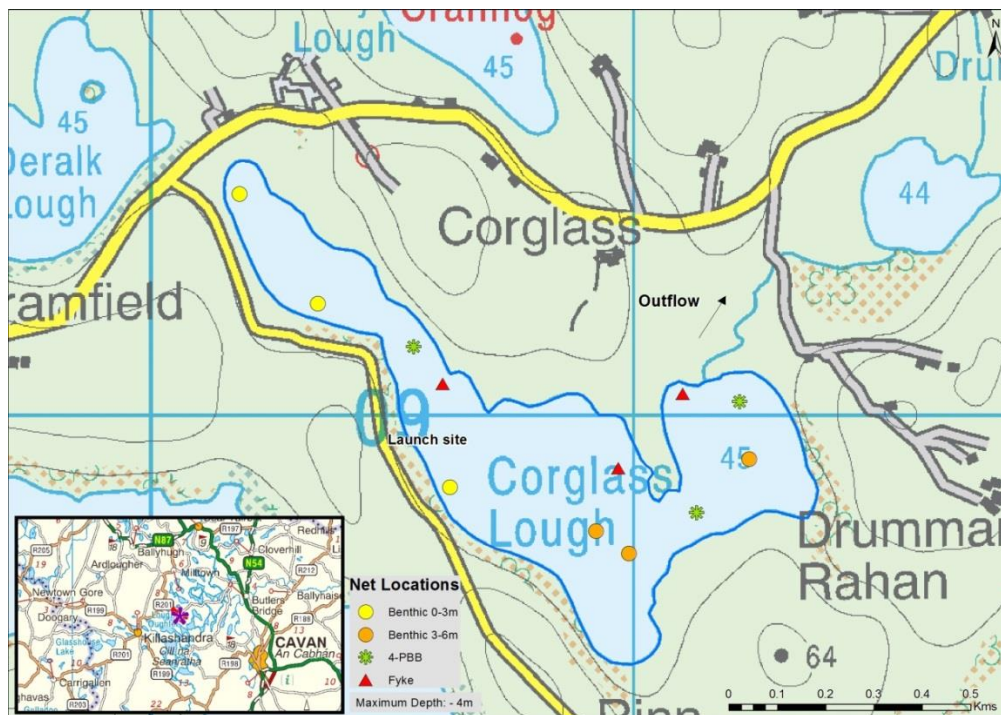


Fig. 1.1. Location map of Corglass Lough showing locations and depths of each net (outflow is indicated on map)



## 1.2 Methods

### 1.2.1 Netting methods

Corglass Lough was surveyed over two nights from the 14<sup>th</sup> to the 16<sup>th</sup> of August 2017. A total of three sets of Dutch fyke nets (Fyke) and six benthic monofilament multi-mesh (BM CEN) (12 panel, 5-55mm mesh size) CEN standard survey gill nets (3 @ 0-2.9m and 3 @ 3-5.9m) were deployed in the lake (nine sites). The netting effort was supplemented using three four-panel benthic braided survey gill nets (4-PBB) at three additional sites (Fig. 1.1). The 4-PBB nets are composed of four 27.5m long panels each a different mesh size (55mm, 60mm, 70mm and 90mm knot to knot). Nets were deployed in the same locations as were randomly selected in the previous survey. 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 all roach, pike, tench and roach x bream hybrids. 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.

### 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 six fish species and one type of hybrid were recorded on Corglass Lough in August 2017, with 689 fish being captured. The number of each species captured by each gear type is shown in Table 1.1. Perch was the most common fish species recorded, followed by roach. Tench, pike, bream, roach x bream hybrids and eels were also recorded. During the previous surveys in 2008, 2011 and 2014 the same species composition was recorded, with the exception of bream which were only recorded in 2008 and 2017, rudd which were only recorded in 2011 and tench which were not recorded in 2008 (Kelly *et al.*, 2009, 2012a, 2015a and 2015b).

**Table 1.1. Number of each fish species captured by each gear type during the survey on Corglass Lough, August 2017**

Scientific name	Common name	Number of fish captured			
		BM CEN	4-PBB	Fyke	Total
<i>Perca fluviatilis</i>	Perch	449	0	0	449
<i>Rutilus rutilus</i>	Roach	208	0	0	208
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	7	10	0	17
<i>Tinca tinca</i>	Tench	3	3	1	7
<i>Esox lucius</i>	Pike	4	0	1	5
<i>Abramis brama</i>	Bream	1	0	0	1
<i>Anguilla anguilla</i>	European eel	0	0	2	2

### 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 2017 survey are summarised in Table 1.2.



Perch was the dominant fish species in terms of abundance (CPUE) and roach was the dominant fish species in terms of biomass (BPUE) captured during the 2017 survey (Table 1.2).

**Table 1.2. Mean (S.E.) CPUE and BPUE for all fish species captured on Corglass Lough, 2017**

Scientific name	Common name	Mean CPUE ( $\pm$ S.E) **
<i>Perca fluviatilis</i>	Perch	1.247 (0.453)
<i>Rutilus rutilus</i>	Roach	0.578 (0.216)
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	0.027 (0.011)
<i>Esox lucius</i>	Pike	0.013 (0.006)
<i>Tinca tinca</i>	Tench	0.012 (0.006)
<i>Abramis brama</i>	Bream	0.003 (0.003)
<i>Anguilla anguilla</i>	European eel*	0.011 (0.006)
		<b>Mean BPUE (<math>\pm</math> S.E) **</b>
<i>Perca fluviatilis</i>	Perch	22.420 (10.064)
<i>Rutilus rutilus</i>	Roach	35.063 (11.606)
<i>Rutilus rutilus x Abramis brama</i>	Roach x bream hybrid	18.040 (12.687)
<i>Esox lucius</i>	Pike	20.383 (16.810)
<i>Tinca tinca</i>	Tench	16.991 (9.386)
<i>Abramis brama</i>	Bream	8.611 (8.611)
<i>Anguilla anguilla</i>	European eel*	3.867 (2.298)

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).

\*Eel CPUE and BPUE based on fyke nets only

\*\*CPUE and BPUE data above for all fish species except eels are not comparable to earlier surveys as extra panels were added to the 1-PBB to provide additional information on large fish.

The mean CPUE and BPUE (excluding the 55mm, 70mm and 90mm mesh panels of each 4-PBB) for all species captured in the 2008, 2011, 2014 and 2017 surveys are illustrated in Figures 1.2 and 1.3. Although the mean perch, roach and hybrids CPUE and BPUE fluctuated slightly over the four sampling occasions, these differences were not statistically significant (Table 1.2; Fig 1.2 and 1.3).



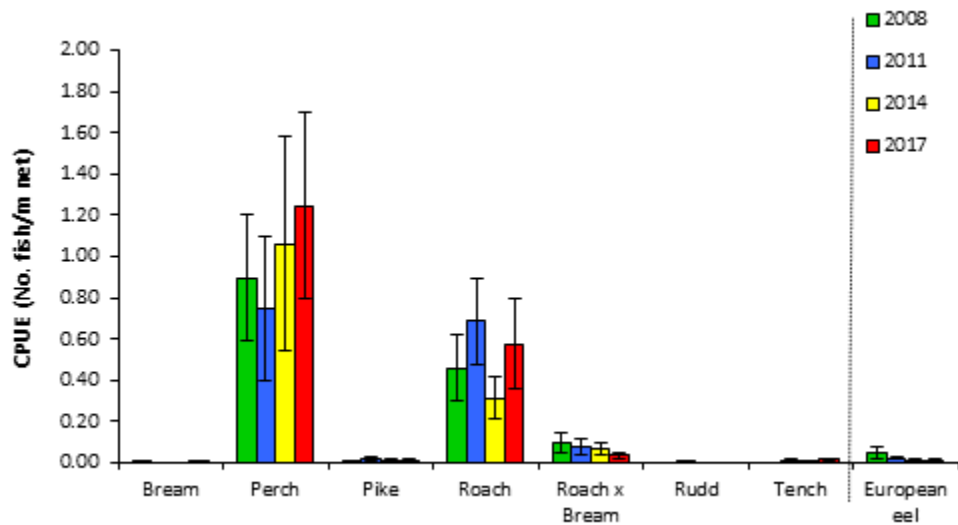


Fig. 1.2. Mean ( $\pm$ S.E.) CPUE for all fish species captured in Corglass Lough (Eel CPUE based on fyke nets only), 2008, 2011, 2014 and 2017 (CPUE excludes the 55mm, 70mm and 90mm mesh panel of 4-PBB for comparison purposes)

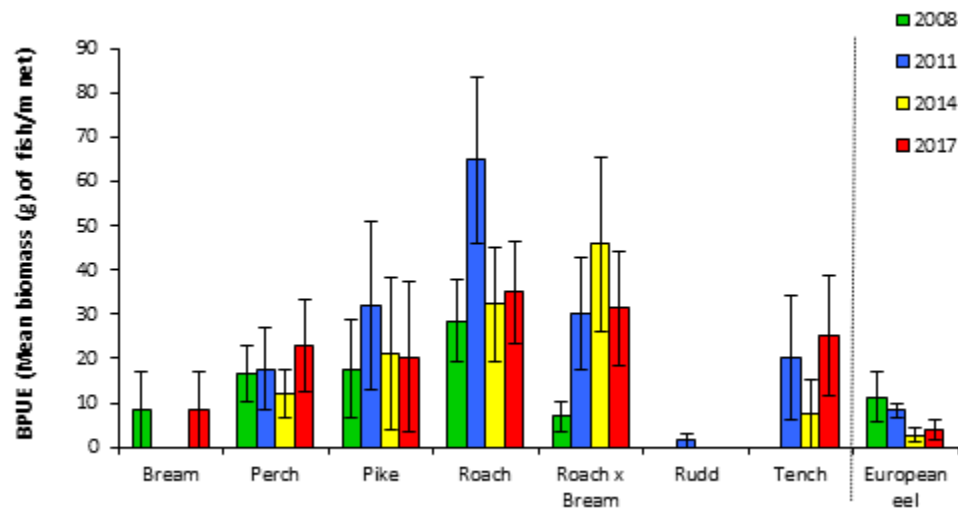


Fig. 1.3. Mean ( $\pm$ S.E.) BPUE for all fish species captured in Corglass Lough (Eel BPUE based on fyke nets only), 2008, 2011, 2014 and 2017 (BPUE excludes the 55mm, 70mm and 90mm mesh panel of 4-PBB for comparison purposes)



### 1.3.3 Length frequency distributions and growth

#### Perch

Perch captured during the 2017 survey ranged in length from 4.0cm to 32.0cm (mean = 8.9cm) (Fig.1.4) with six age classes present, ranging from 0+ to 5+ with a mean L1 of 6.1cm (Table 1.3). The dominant age class was 1+ (Fig. 1.4). Perch captured during the 2008, 2011 and 2014 surveys had a similar length and age range with larger fish recorded in 2011 and 2017 (Fig.1.4).

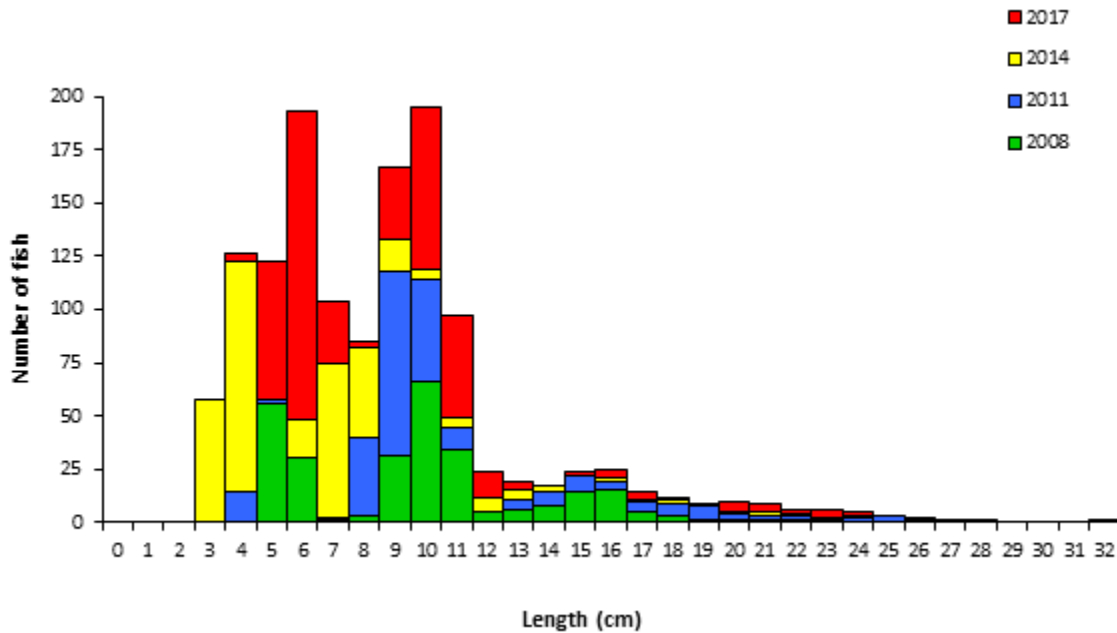


Fig. 1.4. Length frequency of perch captured on Corglass Lough, 2008, 2011, 2014 and 2017

Table 1.3. Mean ( $\pm$ S.E.) perch length (cm) at age for Corglass Lough, August 2017

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>5</sub>
Mean ( $\pm$ S.E.)	6.1 (0.1)	10.0 (0.2)	14.5 (0.4)	18.7 (0.6)	19.9 (1.9)
N	42	27	15	15	4
Range	5.0-8.0	7.3-12.8	10.6-17.0	14.6-22.3	16.2-25.0



## Roach

Roach captured during the 2017 survey ranged in length from 6.4cm to 30.9cm (mean = 13.1cm) (Fig.1.5) with nine age classes present, ranging from 1+ to 9+ with a mean L1 of 2.9cm (Table 1.4). The dominant age class was 2+ (Fig. 1.5). Roach captured during the 2008, 2011 and 2014 surveys had a similar length and age range (Fig.1.5).

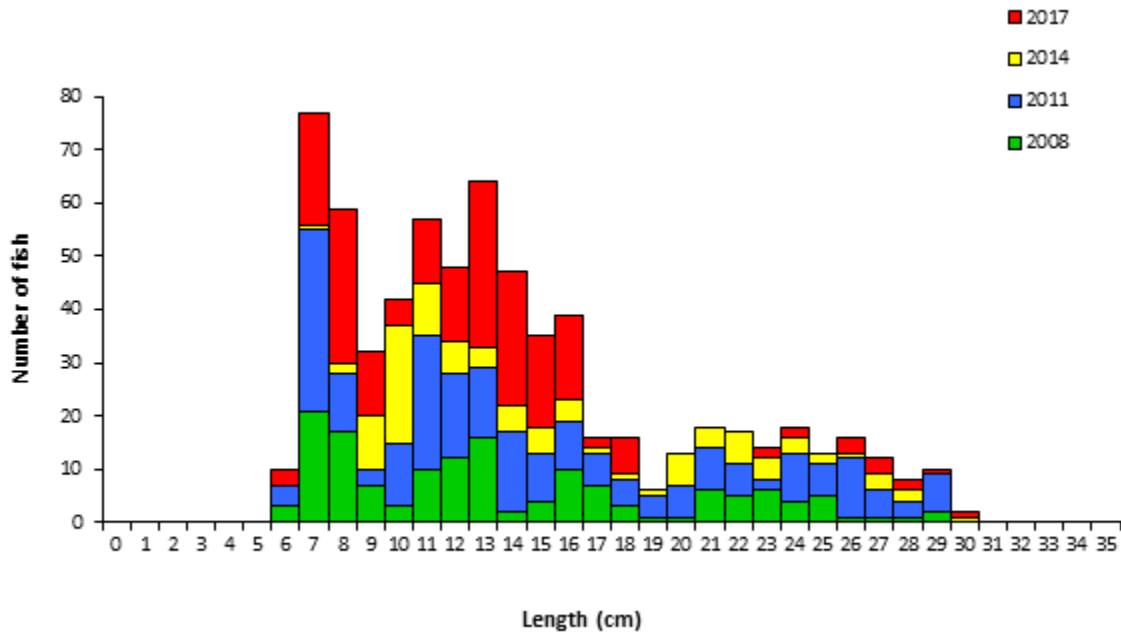


Fig. 1.5. Length frequency of roach captured on Corglass Lough, 2008, 2011, 2014 and 2017

Table 1.4. Mean ( $\pm$ S.E.) roach length (cm) at age for Corglass Lough, August 2017

	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	L <sub>5</sub>	L <sub>6</sub>	L <sub>7</sub>	L <sub>8</sub>	L <sub>9</sub>
Mean	2.9	6.4	10.6	14.9	18.9	21.8	24.6	26.5	29.7
( $\pm$ S.E.)	(0.1)	(0.2)	(0.2)	(0.3)	(0.4)	(0.4)	(0.7)	(0.8)	
N	53	43	32	22	15	14	7	4	1
Range	1.9-4.0	5.0-9.4	8.1-13.2	11.9-18.2	16.9-21.4	19.6-24.7	22.1-28.3	24.5-28.0	29.7-29.7

## Other fish species

Two eels were captured during the 2017 survey and were measured at 49.0cm and 63.5cm. One bream at 55.6cm was recorded, aged 11+ and tench captured ranged in length from 30.0cm to 51.3cm. Roach



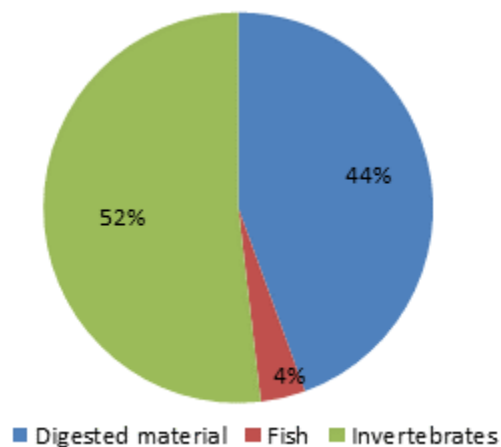
x bream hybrids ranged in length from 11.4cm to 40.2cm (3+ to 12+) and pike ranged in length from 30.5cm to 92.0cm, with four age classes present ranging from 1+ to 8+.

### **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 subsample of perch captured during the survey were examined and are presented below.

#### **Perch**

Perch initially start to feed on pelagic zooplankton. Once they reach an intermediate size they start feeding on benthic resources eventually moving on to feed on fish once they are large enough (Hjelm *et al.*, 2000). A total of 43 stomachs were examined. Of these 16 were found to contain no prey items. Of the remaining 27 stomachs containing food, 52% contained invertebrates, 44% unidentified digested material and 4% fish (Fig. 1.6).



**Fig 1.6. Diet of perch (n=27) captured on Corglass Lough, 2017 (% FO)**



#### 1.4 Summary and ecological status

A total of six fish species and one type of hybrid were recorded on Corglass Lough in August 2017. Perch was the dominant fish species in terms of abundance and roach was the dominant fish species in terms of biomass captured during the 2017 survey.

Perch captured during the 2017 survey ranged in length from 4.0cm to 32.0cm, with six age classes present, ranging from 0+ to 5+, indicating reproductive success in each of the previous six years. The dominant age class was 1+.

Roach captured during the 2017 survey ranged in length from 6.4cm to 30.9cm, with nine age classes present, ranging from 1+ to 9+, indicating reproductive success in nine of the previous ten years. The dominant age class was 2+.

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, Corglass Lough has been assigned an ecological status of Bad for 2017 based on the fish populations present. In previous years the lake was assigned a fish status of Moderate in 2008 and Bad in 2011 and 2014.

In the 2010 to 2015 surveillance monitoring reporting period, the EPA assigned Corglass Lough an overall ecological status of Bad.



## 1.5 References

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