

Lough Sheelin Fish Stock Survey

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Lough Sheelin Fish Stock Survey, 2022

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1. Introduction

Lough Sheelin is situated in counties Cavan, Meath and Westmeath in the Inny catchment of the Shannon system. It is seven kilometres long and has a surface area of 1,900 hectares. It is a relatively shallow lake with a mean depth of 4.4m, a maximum depth of 15m, and 51% of the lake is less than 5m in depth (Champ pers. comm.). The geology of the catchment is predominantly Carboniferous limestone, but Silurian/Ordovician formations underlie the western and northern drainage basin. The lake is eutrophic and is categorised as typology class 12 (as designated by the EPA for the Water Framework Directive - WFD), i.e., deep (>4m), greater than 50ha and high alkalinity (>100 mg/l CaCO₃).

In the 1960s and 1970s L. Sheelin was one of Ireland's top brown trout angling lakes, managed and developed by the Inland Fisheries Trust (IFT) (now Inland Fisheries Ireland). Phosphorus originating from intensive agricultural developments has caused progressive enrichment of L. Sheelin since the early 1970s (Champ, 1998 and 2003). This has resulted in the trout population diminishing and the fish stock becoming dominated by cyprinids (O'Grady and Delanty, 2001). The water quality in the lake and the catchment was monitored on a continuous basis by Inland Fisheries Ireland (previously the Shannon Regional Fisheries Board and the Central Fisheries Board (CFB)) from the 1970s to 2015 (Champ, 1979, 1991, 1993, 1998; Duggan and Champ, 1992; Kerins *et al.*, 2007). Kerins *et al.*, 2007 showed a modest decrease in the total phosphorus loadings to the lake between 1998 and 2005, suggesting that the phosphorus losses from the catchment are slowly declining; however, more recent data (2006 to 2022) indicates a slight increase in total phosphorus loadings to L. Sheelin (EPA - https://www.catchments.ie/data/#/waterbody/IE_SH_26_709?k=c6pp05).

Zebra mussels (*Dreissena polymorpha*), an invasive species in Ireland, were first noted in L. Sheelin during 2003 and it is thought they were introduced to the lake in 2000 and 2001. Large populations of the mussel have been evident in the lake since 2004 (O'Grady *et al.*, 2008).

The fish population in L. Sheelin has been surveyed regularly since the late 1970s by Inland Fisheries Ireland (formerly IFT and CFB) using a gill netting technique that was developed in the late 1970s (O'Grady, 1981) to assess trout stocks (trout > 19.8cm in length) on selected brown trout lake fisheries. This work has proved to be an effective management tool in illustrating the fluctuations in fish stocks over time (O'Grady and Delanty, 2001). Roach, a non-native invasive species, were introduced into the lake during the 1970s and their population has fluctuated dramatically since that time.

L. Sheelin currently holds stocks of brown trout (*Salmo trutta* L.), pike (*Esox lucius* L.), perch (*Perca fluviatilis* L.), roach (*Rutilus rutilus* L.), bream (*Abramis brama* L.), roach/bream hybrids, tench (*Tinca tinca* L.), 3-spined stickleback (*Gasterosteus aculeatus*) and eels (*Anguilla anguilla*).

Using the WFD FIL2 classification tool, L. Sheelin was assigned a fish status of Moderate in 2008, 2011 and 2014, based on the fish populations recorded in the lake during WFD surveillance monitoring fish stock survey (Kelly *et al.*, 2008, 2011 & 2014). A status of Good was assigned in 2017 and the current fish status is Good also (Connor *et al.*, 2017, McLoone *et al.*, 2022). Overall ecological status for L. Sheelin, as assigned by the EPA, is Moderate, based on all monitored physico-chemical and biological elements, including fish. This WFD status of Moderate covers the reporting periods of 2007-2009, 2010-2015 and the current reporting period of 2016-2021 (<https://gis.epa.ie/EPAMaps/>).

2. Material and Methods

A long-term spring monitoring programme of L. Sheelin fish stocks was conducted from the late 1970s until 2015 as part of IFI's brown trout programme. The lake is also surveyed as part of the WFD lake monitoring programme. These WFD fish stock summer surveys occur on a 3-year cycle and commenced in 2008. Under advice from IFI Research Section, the annual L. Sheelin spring surveys ceased in 2015 as Water Framework Directive monitoring surveys of the lake were considered sufficient to support both programmes.

Long-term sampling programmes are an important aspect of assessing the presence, distribution, ecology and status of fish populations. Such programmes can provide empirical information on population and community dynamics, shifts in life history processes, and anthropogenic pressure-state relationships. The L. Sheelin spring surveys are an example of such long-term ecological monitoring datasets (> 35 yrs), which are rare and valuable. Thus, it was proposed to restart the L. Sheelin spring monitoring programme in 2022 with the aim of adding to this standardised fish stock time series at regular intervals in the future.

In 2022 the L. Sheelin Spring fish stock survey was once again undertaken, the results of which are presented here.

Sampling method for the spring surveys is different to the WFD summer surveys. The long-term spring surveys follow the sampling methodology of O'Grady (1981). All annual surveys have been carried out at the same time of year (March) to ensure that the results of the surveys are comparable. The distribution of the sampling sites in the 2022 survey are illustrated (Fig. 1).

The field-work element of the L. Sheelin fish stock survey commenced on March 21st and concluded on March 25th, 2022. The survey sampling involved the use of gill nets following a standard technique designed to monitor fish stocks in managed Irish brown trout lake fisheries. The survey nets used have been standardised since this type of survey commenced (O'Grady, 1981 and 1983). Each gang of nets contains equal lengths of panel every ½ inch mesh size from 2 inches to 5 inches inclusively (stretched mesh measurements). The total length of a survey net is 210m. The individual panels, within each survey net, are arranged randomly.

The survey nets in question are capable of catching trout $\geq 19.8\text{cm}$ in length in proportion to their abundance (O'Grady, 1981 and 1983). Experience has shown that these nets can capture samples of perch $\geq 14\text{cm}$, roach $\geq 16\text{cm}$, roach x bream hybrids $\geq 12\text{cm}$ and bream $\geq 12\text{cm}$. The smallest mesh panel in these survey nets (2") is physically capable of capturing small pike ($\geq 25\text{cm}$). However, pike $\leq 35\text{cm}$ are rarely captured in such surveys. This is most likely because the smaller pike ($\leq 35\text{cm}$) live in the "body" of the charophyte beds, below the level at which the gill nets are fishing. Charophyte beds are extensive areas of Stoneworts which are macroscopic green algae which commonly occur in limestone lakes where they become encrusted with a limescale covering making them quite brittle to touch.

The number of trout, or indeed any fish species, captured for a particular netting effort (catch per unit effort or CPUE) reflects the relative density of that fish present in the lake. CPUE values for each fish species are calculated by dividing the total number of that fish species caught by the total number of survey nets set.

A total of 40 sampling locations were surveyed (Fig. 1). These locations were a sub-sample of the sites originally chosen for the early 1980s surveys, whereby the lake was divided into a numbered grid system of squares each 250m x 250m. Sites were then selected using a random number generator. Garmin GPS units pre-loaded with the netting site co-ordinates were used to locate the sampling sites.

Since 1999 to 2015 the same 30 sites have been sampled (sites 1 to 30 on location map). On this occasion an additional 10 sites (sites 31 to 40 on location map) were surveyed (again chosen from the original sites of the 1980s) to ensure adequate numbers of trout would be recorded. Greater numbers of trout captured can provide improved opportunities for statistical analysis and fisheries management modelling.

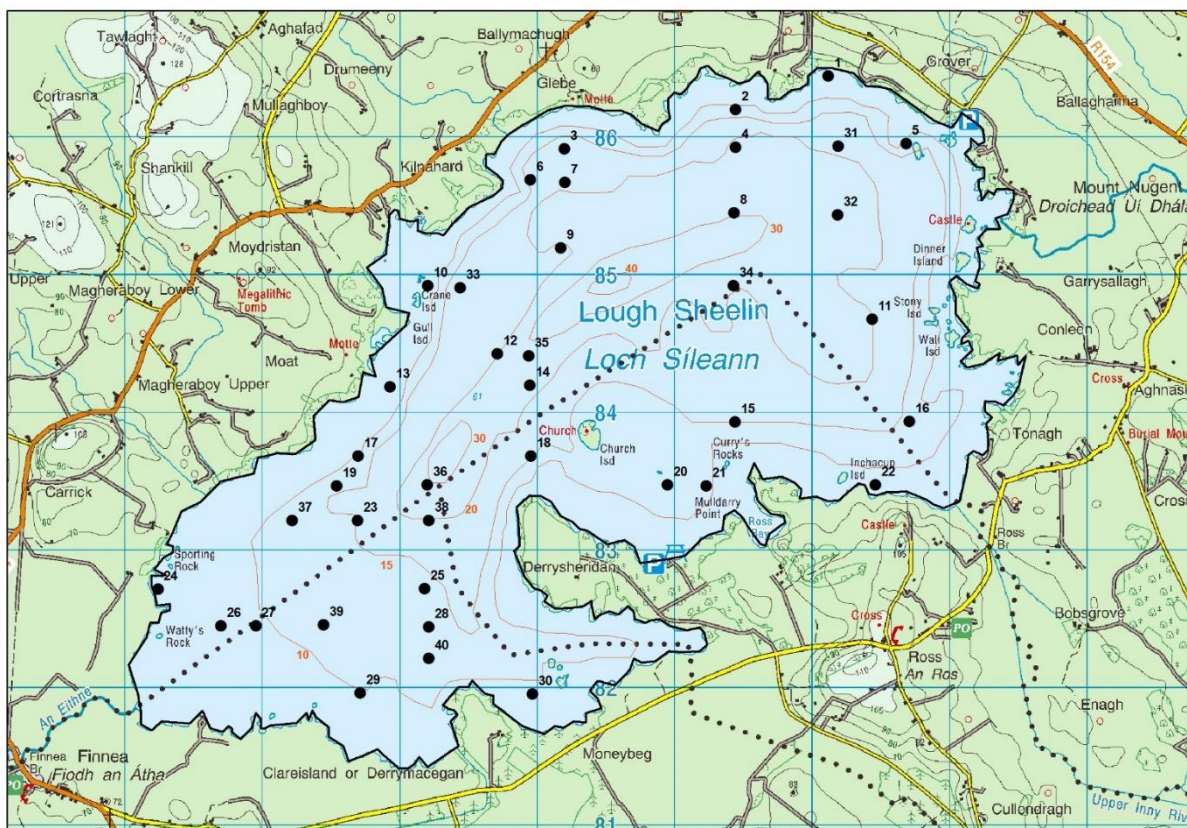


Figure 1. The sampling locations for the Lough Sheelin survey.

A total of 2 boats with a 2-man crew on board were required to undertake the survey over a four-day period.

All sets of survey nets were fished over-night; in general nets were set at each site in the morning and lifted the following morning. All fish taken in the survey nets, which were alive, in good condition and had a high chance of survival, were released back into the lake. The lengths of all released fish and their capture location were recorded. A set of scale samples were also taken from both trout and pike and, where possible, fish weight was recorded.

3. Results

Five fish species were recorded during the survey and included, roach, perch, pike, brown trout and tench, along with hybrids of roach/bream. In total 760 fish were processed. Survey catch per unit effort (CPUE) values for each species are provided in Table 1. Roach were the dominant species, representing 41.8% of the total survey catch (Table 1).

Distribution patterns illustrated for the four most abundant fish species (Figures 3, 5, 7 and 9) indicate they are widespread and commonly occurring around the lake (at the time of the survey).

Table 1. Fish species recorded, total numbers of each species and CPUE values, Lough Sheelin March 2022.

| Fish Species | Total numbers recorded | |
|------------------------------|-------------------------------|------------------|
| | 2022 | CPUE 2022 |
| Roach | 318 | 7.95 |
| Pike | 183 | 4.58 |
| Perch | 169 | 4.23 |
| Trout | 81 | 2.03 |
| Tench | 2 | 0.05 |
| Roach x Bream hybrids | 7 | 0.18 |

Trout

Trout recorded ranged in length between 20.7 and 78cm with the majority (72.8%) being between 40 and 60cm (Fig. 2) and almost half (49.3%) between 44 and 52cm. The population structure appears to be dominated by older adults, though some recruitment of younger adults is evident. Twelve trout were available for dietary examination, most of which were found to be feeding on asellus (freshwater louse). Gammarus (freshwater shrimp), snails and caddis (sedges) larvae were also present in the trout stomachs.

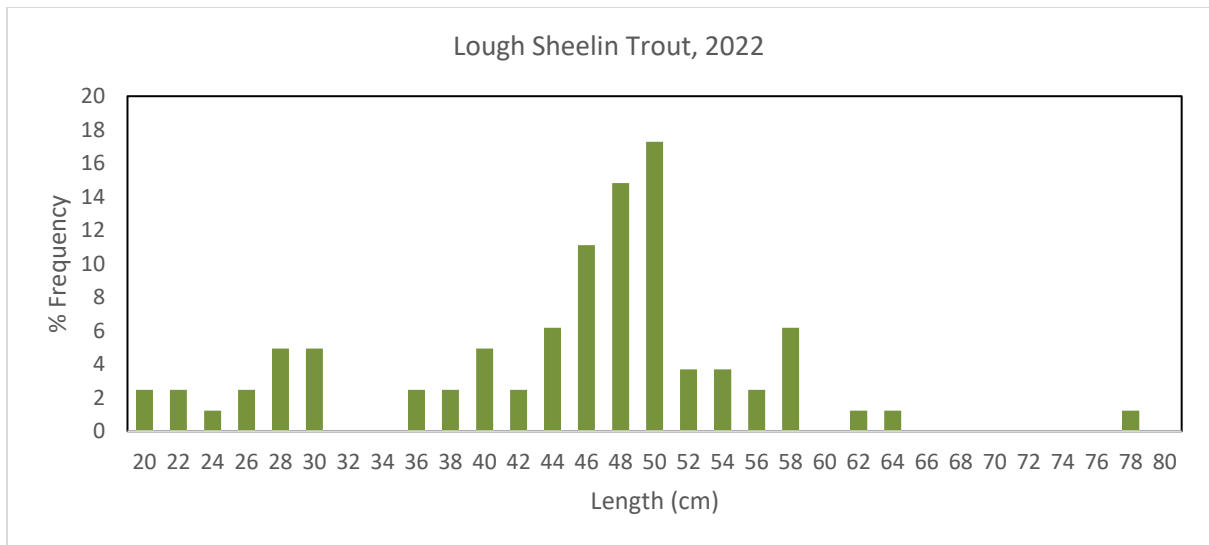


Figure 2. Lough Sheelin Trout length frequency distribution, March 2022

Trout were recorded at 30 of the sampling points (40 in total). Total number of trout recorded per gang of nets ranged from 0 to 8. Their distribution across all sites sampled are illustrated below (Fig. 3).



Figure 3. Distribution of Brown Trout taken during 2022 survey and CPUE values

Pike

Pike lengths ranged between 25.8 to 105cm with 54.6% of the sample recorded having lengths between 50 to 80cm (Fig. 4). The length frequency in Figure 4 illustrates a relatively stable population of pike can be found in the lake with sufficient recruitment to sustain a population of older adults indicated by relatively good numbers of small pike between 25 and 49 cm (35.5% of the pike population). Fish less than 25 cm, in length, are typically not recorded using the survey nets employed in the spring stock assessments. Their absence from Figure 4 does not suggest they are absent from the lake.

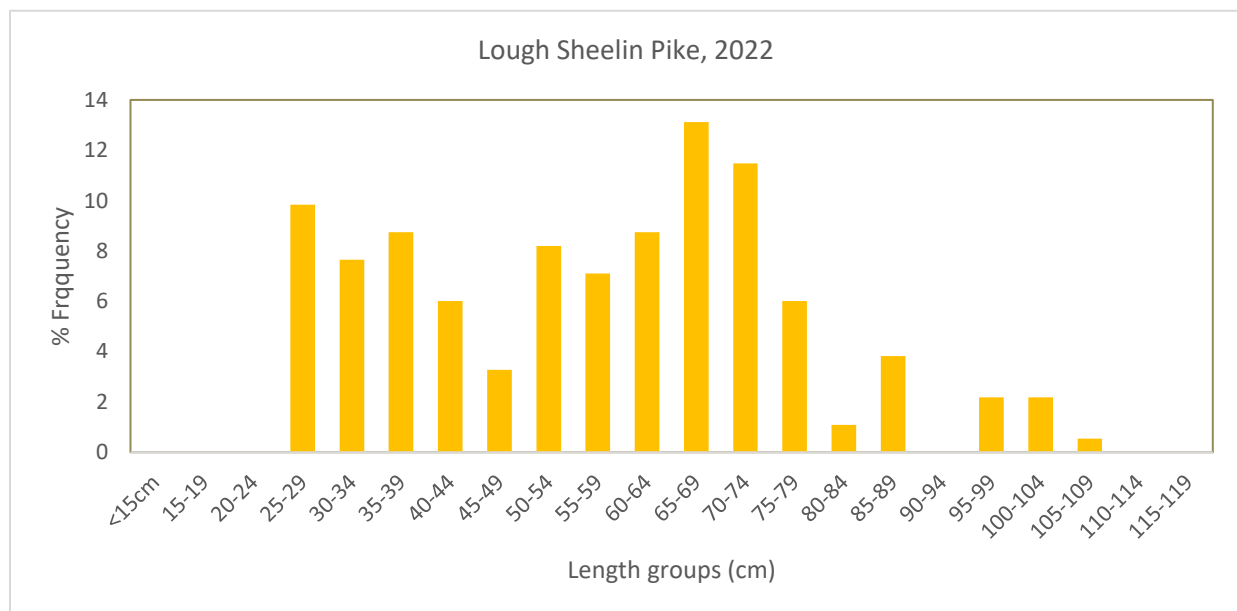


Figure 4. Lough Sheelin Pike length frequency distribution, March 2022

Of the 48 pike available for dietary examination 23 were found to contain no food items. The remaining 25 fish contained a mixture of food items, including fish, asellus, snails and gammarus. Zebra mussels were present in three of the samples. Thirteen of the stomach samples contained fish items, of either perch, roach, trout or unidentified fish remains.

Pike were widespread across the lake. Only four netting sites did not record pike (Fig. 5). Total number of pike recorded per gang of nets ranged from 0 to 23. Greater numbers of pike were recorded in nets sampled from the southern half of the lake.

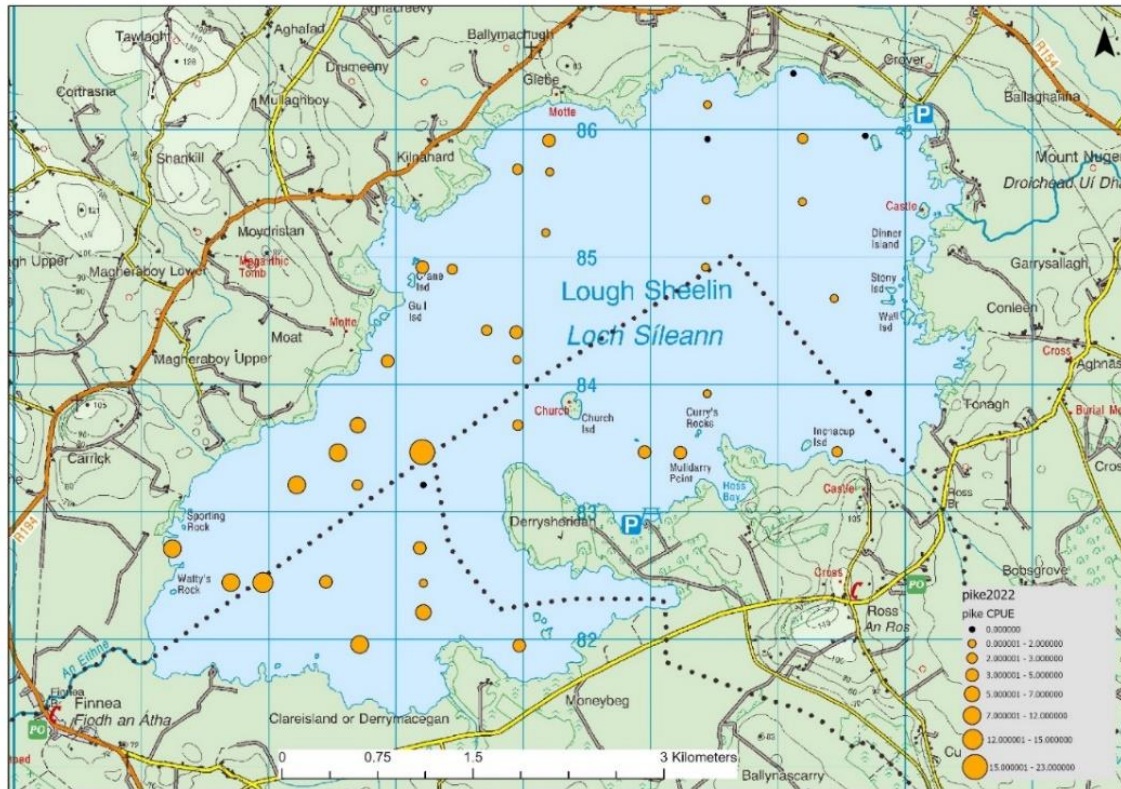


Figure 5. Distribution of Pike taken during 2022 survey and CPUE values

Roach

Roach lengths ranged between 14.5 and 35.3cm and 67.3% of the population sampled were between 15 and 25cm (Figure 6). The current population structure reflects a typical population whereby the majority of the population are young fish with declining numbers of older adults present.

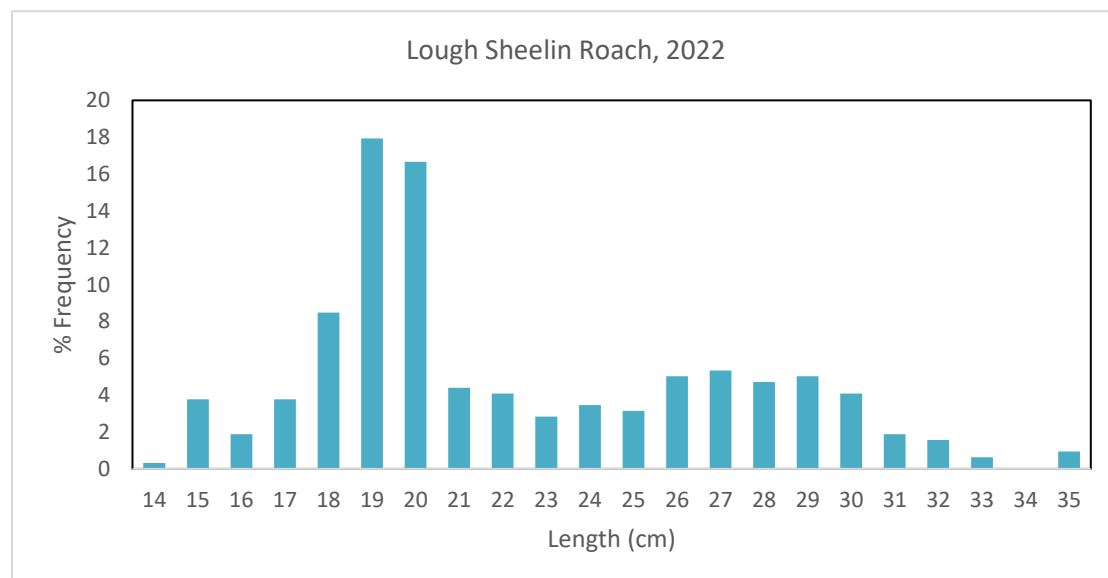


Figure 6. Lough Sheelin Roach length frequency distribution, March 2022

Roach displayed a widespread distribution pattern with only 3 sites not recording any specimens. Total number of roach per gang of nets ranged from 0 to 44. Good numbers were noted at several locations (Fig. 7).

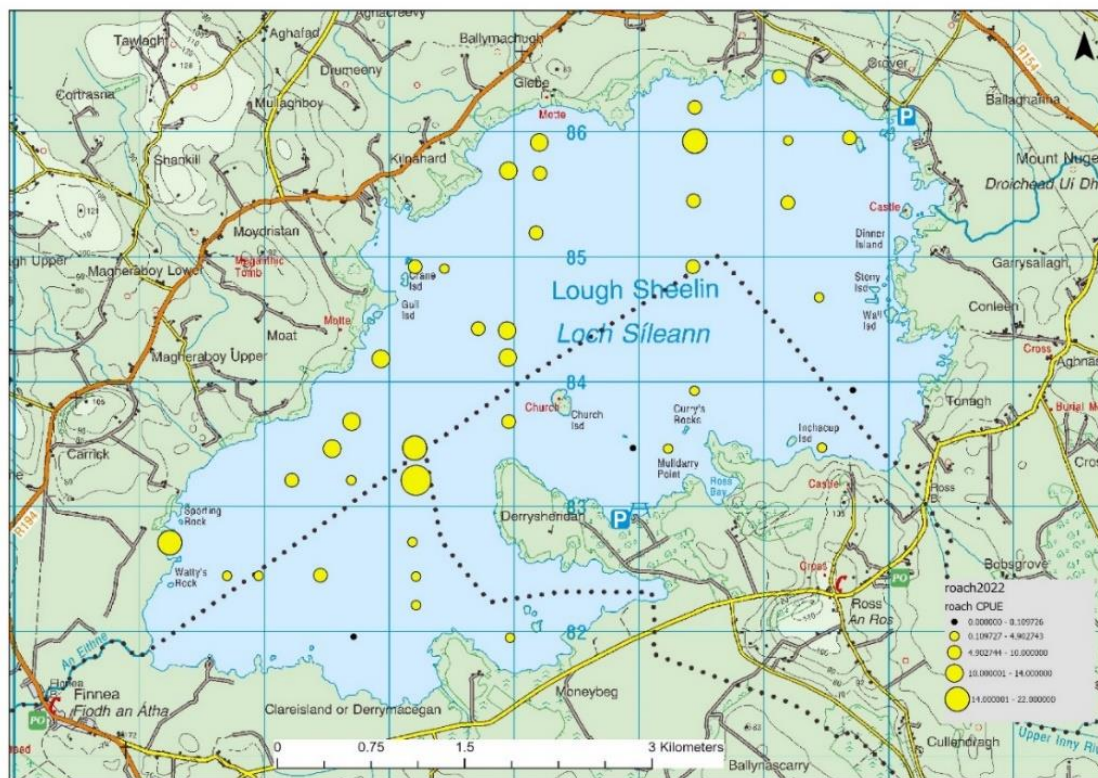


Figure 7. Distribution of Roach taken during 2022 survey and CPUE values

Perch

Perch lengths ranged between 16 and 36cm (Figure 6). L. Sheelin perch populations have fluctuated greatly over the years. The current population structure, comprising relatively fewer small fish, indicates an older population is present with recruitment of younger fish somewhat limited.

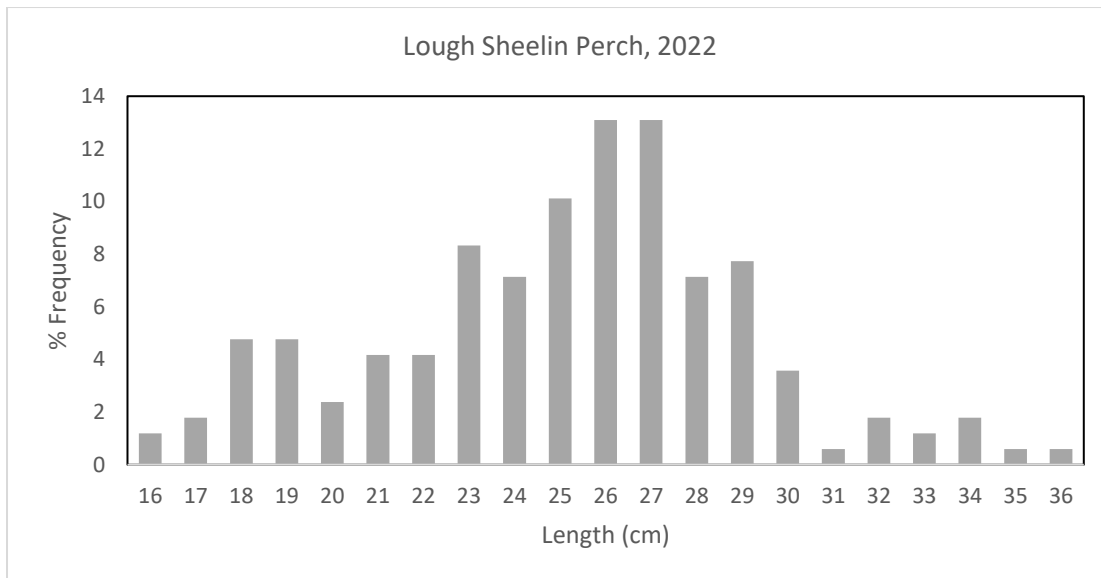


Figure 8. Lough Sheelin Perch length frequency distribution, March 2022

Perch were recorded at 36 of the 40 sites sampled (Fig. 9). Total number of perch per gang of nets set ranged from 0 to 21.



Figure 9. Distribution of Perch taken during 2022 survey and CPUE values

Other Fish Species

Two adult tench were also recorded during the course of this survey along with 7 roach x bream hybrids.

4. Lough Sheelin Fish Stock Survey CPUE values 1978 to 2022

The fluctuations in fish stocks over this period are reviewed here in relation to trout, pike, roach and perch populations. No annual fish stock surveys took place in 1991, 1997, 1998 and 2016 through to 2021. Detailed L. Sheelin spring survey reports by O’Grady & Delanty, 2001 and O’Grady 2012 are also available.

Data presented here for the 2022 survey represent only that generated from the original 30 net locations used in previous survey years (1999 to 2015) (Appendix I & II).

Trout Populations

Considerable fluctuations have been recorded in the levels of the trout stock in L. Sheelin from 1978 to date (Fig. 10 & Appendix I).

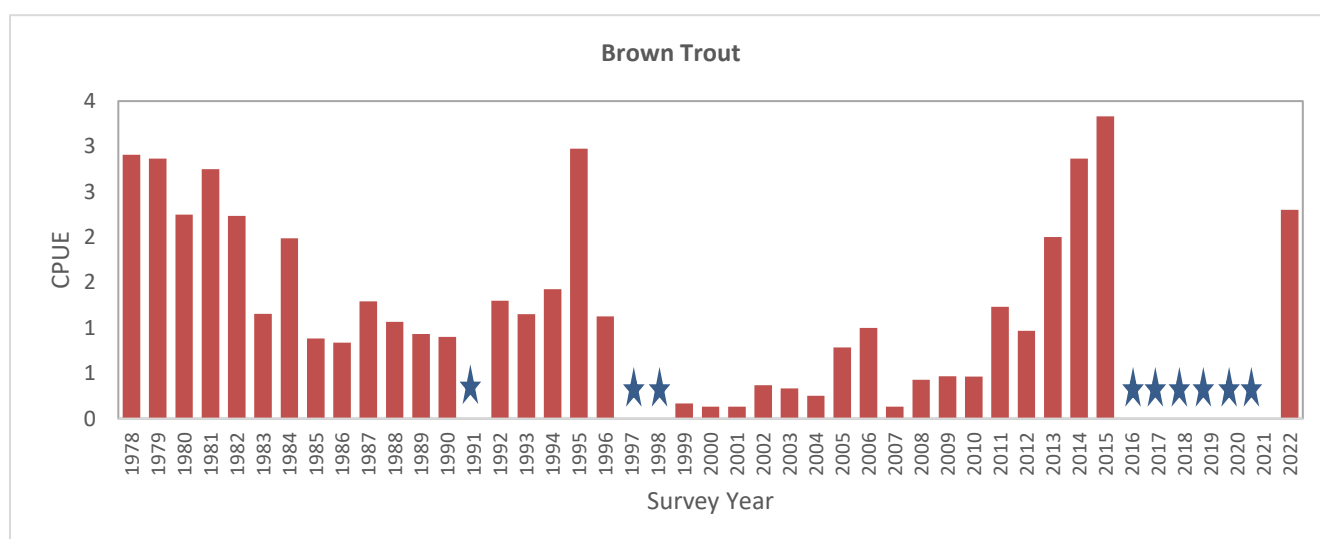


Figure 10. Annual Brown Trout CPUE values 1978 – 2022 (* no surveys carried out in these years)

CPUE values for trout in annual surveys have ranged between 0.13 and 3.33. Relatively high CPUE values were noted from 1978 to 1984, in the mid-nineties (1994 and 1995) and more recently since 2013. In the intervening years poor CPUE values were noted – the lowest CPUE of 0.13 was recorded in 2000, 2001 and again in 2007 (Fig. 10 & Appendix I). The value for the 2022 survey is lower than that recorded in 2014 and 2015 and may indicate that the trout population is undergoing a period of decline.

Population structure as indicated by the trout length frequency distribution for L. Sheelin 2022 is similar to that of the 2015 L. Sheelin survey (Fig. 11). Thus, while the CPUE’s for those two periods differ, population composition has remained relatively unchanged.

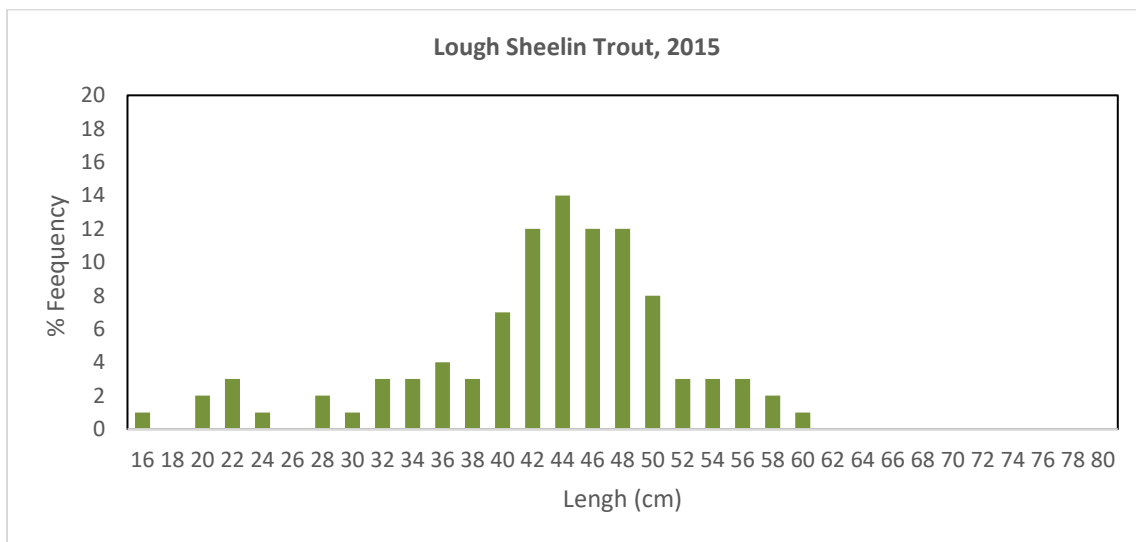
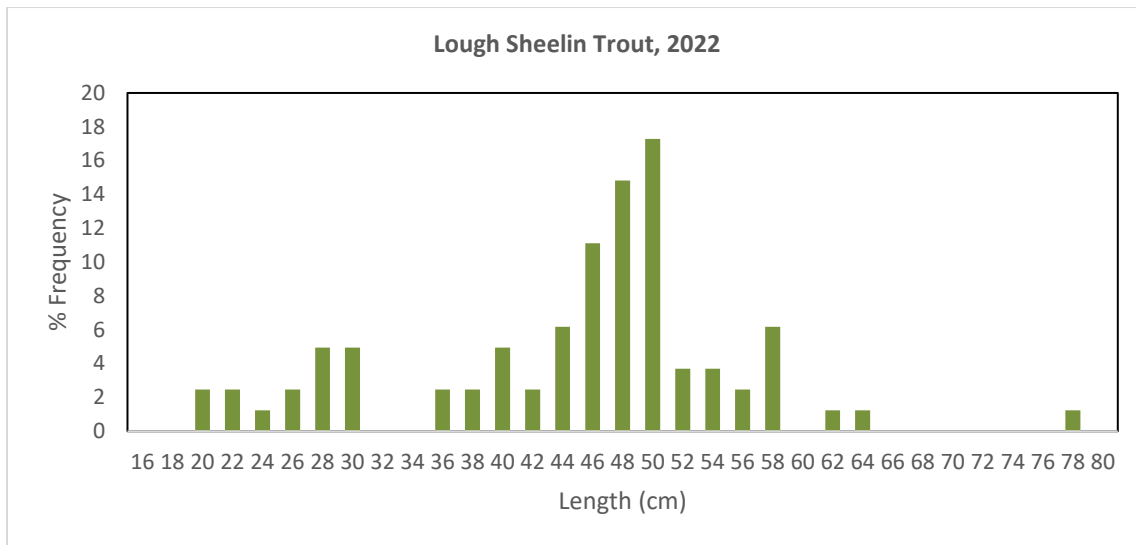


Figure 11. Trout length frequencies, Lough Sheelin 2022 and 2015

Pike Populations

There have been substantial fluctuations in the size of pike stocks in L. Sheelin over the monitoring period (1978 to 2022) (Fig. 12 and Appendix I). The lowest CPUE values for pike were recorded in 1978 and 1979 (0.49 in both years). The highest values were noted in more recent years, in particular 2003 and 2004 when CPUE values of 4.9 and 5.5 were recorded respectively.

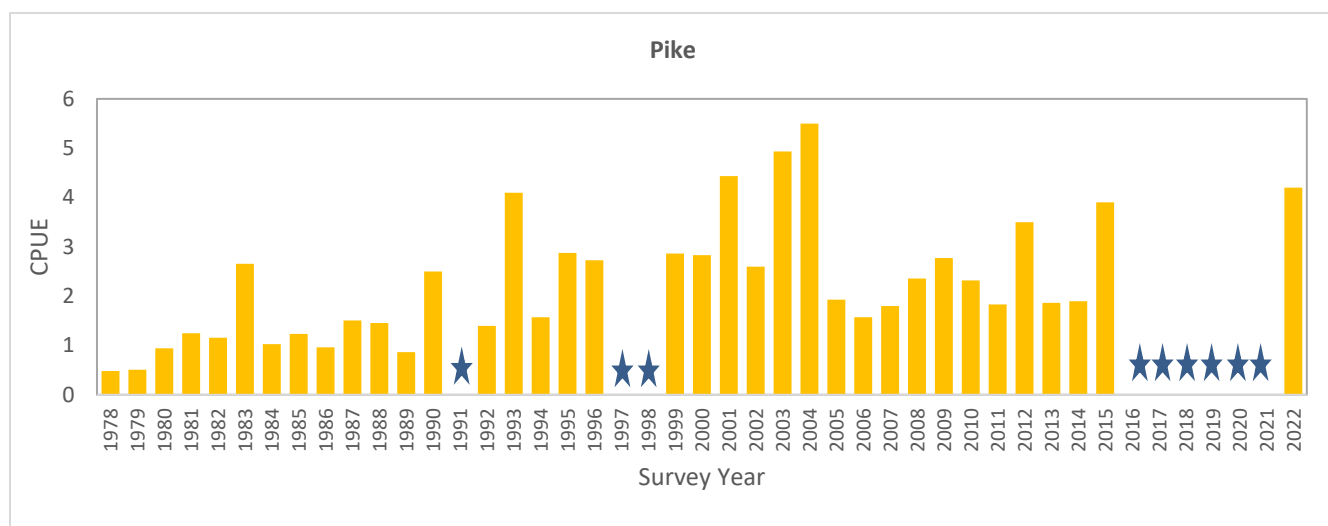
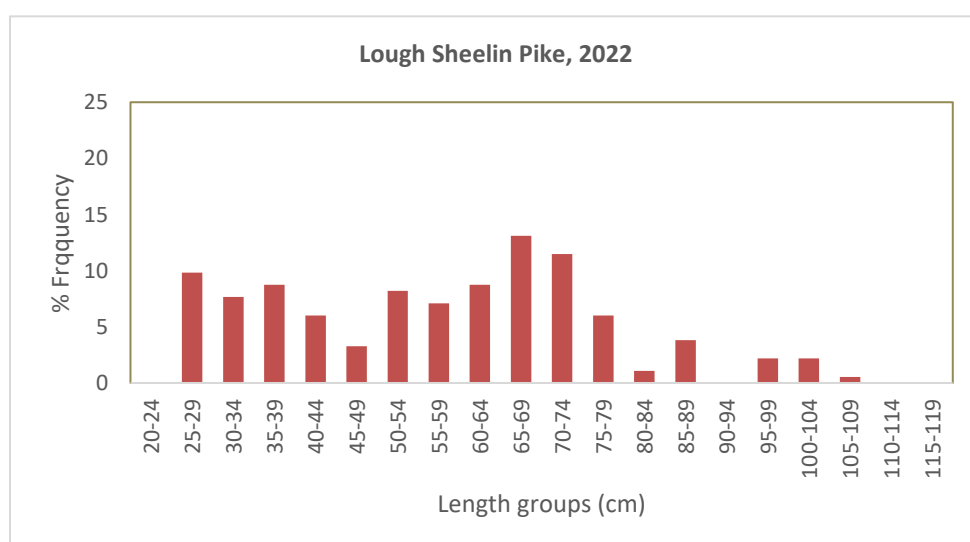


Figure 12. Annual Pike CPUE values 1978 – 2022 (* no surveys carried out in these years)

Current population structure, as evident from length frequency plots, differs slightly from that of the 2015 survey (Fig. 13). However the abundance of fish <50cm is similar across both survey periods as is the abundance of fish ranging in length between 50 and 80cm.



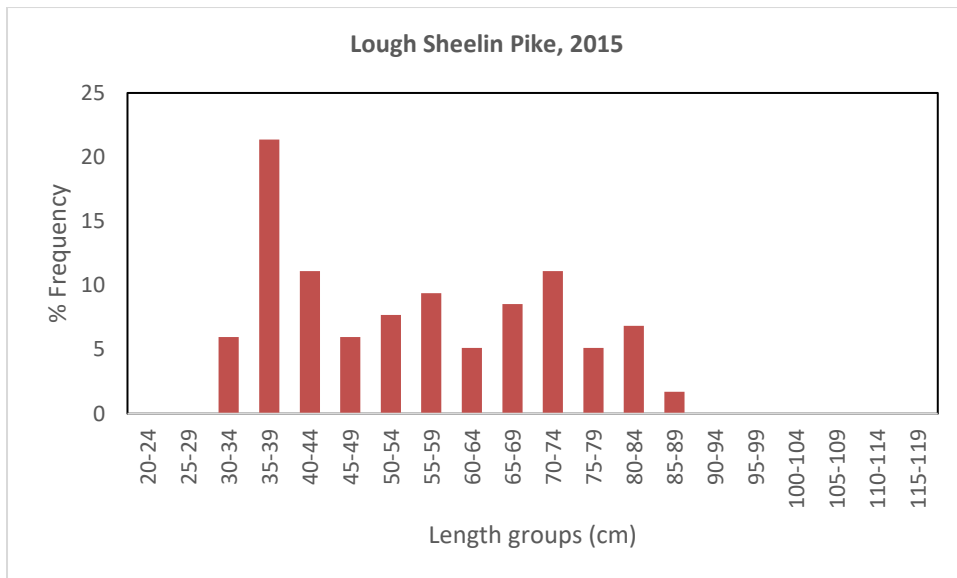


Figure 13. Pike length frequencies, Lough Sheelin 2022 and 2015

Roach Population

Roach are not an indigenous species in Irish waters. They were most likely introduced, by anglers using roach as live bait, to L. Sheelin in the early 1970's. No roach were caught in the initial fish stock surveys on L. Sheelin (1978 and 1979). A few roach were captured in the surveys from 1980 onwards to 1984. Thereafter (1985 to 1990) there was an exponential expansion in the roach population. Roach stocks showed signs of a collapse during the period 1992 to 1996 but rose again to a peak in 2003. Roach numbers declined again in 2005 and, with the exception of 2008 and 2012, have remained low but stable (Fig. 14 and Appendix I).

The extreme abundance fluctuations, as noted, in the roach population of L. Sheelin is not unusual in a western European context. Researchers studying this phenomenon have concluded that the success of individual year-classes of roach is temperature dependent. Studies have shown that survival probability especially of 0+ fish is positively related to growth with growth rate being mainly a function of food availability and temperature (Mooij, 1996; Mehner *et al.*, 1998).

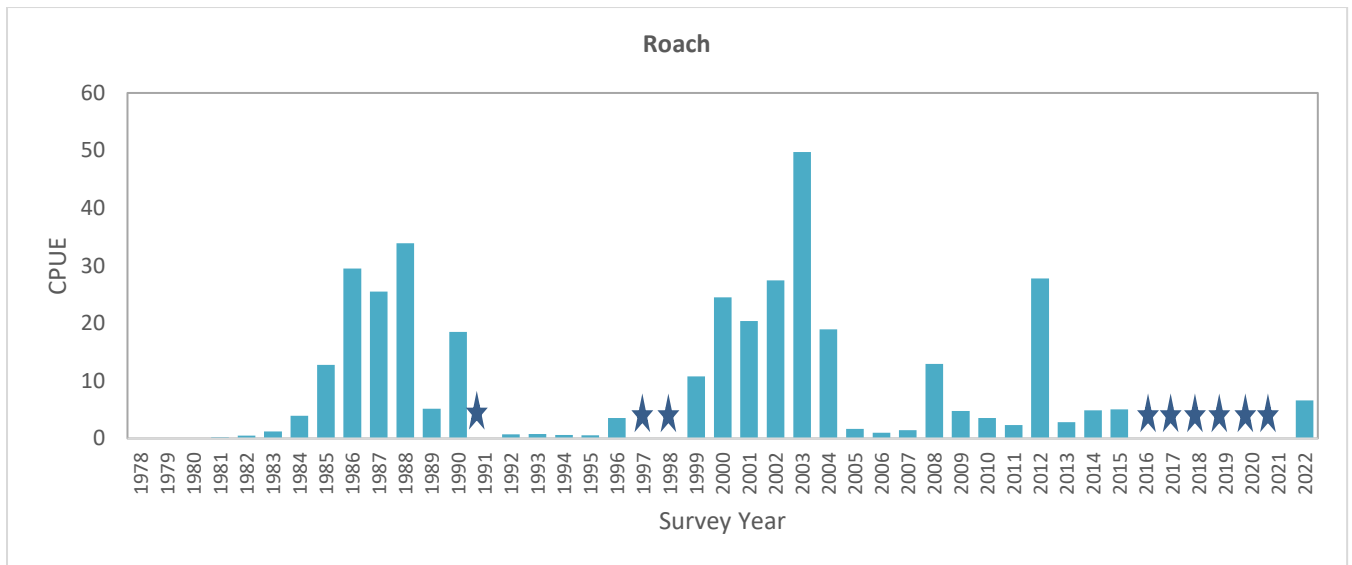


Figure 14. Annual Roach CPUE values 1978 – 2022 (* no surveys carried out in these years)

Perch Populations

Perch stocks, as measured in the annual surveys, have fluctuated over the survey period of 1978 to 2022 (Fig. 15). Between 1978 and 2007 perch CPUE values varied between 0.61 and 10.37. Greater variation is noted for the period 2007 to 2022 (CPUE's ranging from 2.13 to 31.2). The population has been reasonably stable since 2013. It is interesting to note the spike in perch abundance observed in 2012 coincided with a spike in roach abundance (Fig. 15 and Appendix I) and in both cases populations declined sharply in subsequent years.

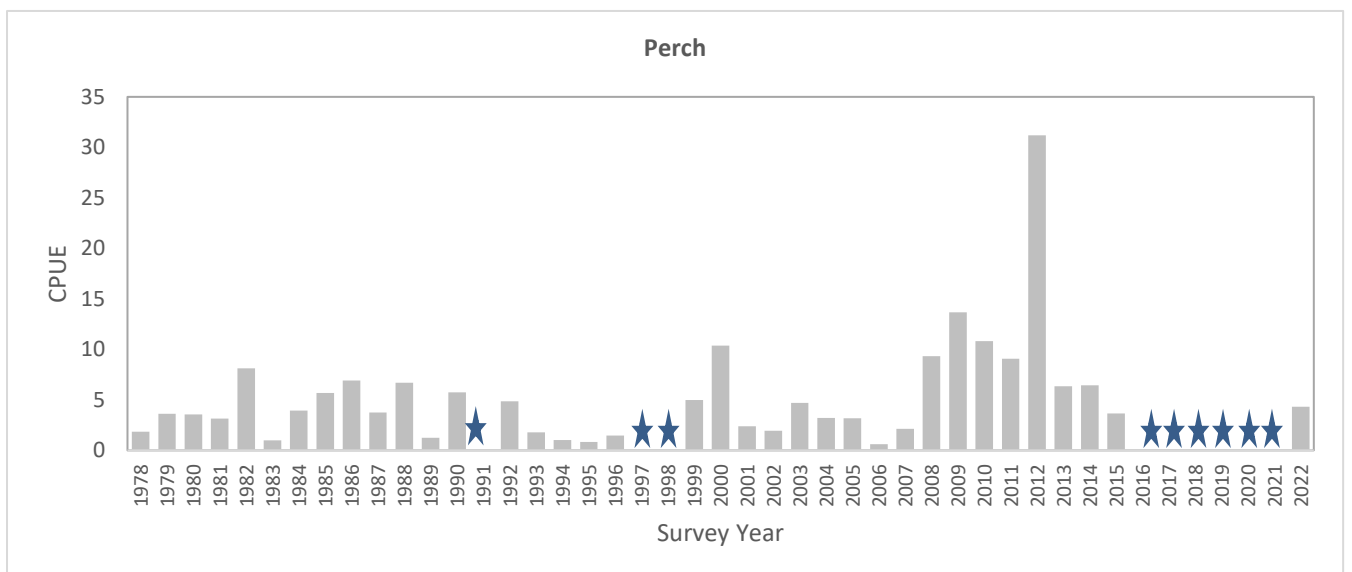


Figure 15. Annual Perch CPUE values 1978 – 2022 (* no surveys carried out in these years)

5. Summary

The L. Sheelin catchment is a system that has experienced many ecological changes over the period 1970s to date. Water quality issues have been an ongoing concern, events like drainage schemes (and the continued maintenance of such drainage schemes) along with the introduction of invasive species like roach and zebra mussel have taken place. Reduced areas of the important and productive charophyte beds, in particular for trout, also occurred. Various mitigation measures have been implemented over the years to overcome such pressures including water quality monitoring and management, stream habitat enhancement programmes, trout stocking programmes and pike stock management programmes. The 2015 L. Sheelin fish stock survey indicated that brown trout stocks were at levels seen in the late 1970s and early 1980s, prior to many of the ecosystem pressures that arose in later years. Trout population structure in 2015 represented a relatively balanced and healthy stock.

The 2022 spring fish stock survey of L. Sheelin presented an opportunity to update and review the long-term fish stock survey dataset that IFI holds (1978 to 2022). While there has been a 7-year gap since the last full spring survey, changes over that period were explored in terms of CPUE data and population structure. The L. Sheelin spring monitoring survey provides an opportunity to collect additional data on population size, age and growth rates as well as distribution patterns, for trout and pike in particular. Current surveys of L. Sheelin are data limited for these species, due to small sample sizes, in respect to these elements of the population structure. The numbers of trout and pike recorded in the spring surveys provide well-resolved population length structures from which valuable insights into recruitment success, cohort strength, and likely population trajectories can be inferred. Exploring if the changes noted in CPUE values, for all fish species, are indicative of declining lake conditions or not would require further monitoring.

This survey indicates the trout population is dominated by older fish in the 40 to 60cm range (72%). Although there are younger fish present (23.5% trout between 20 to 30cm) this cohort of trout is less than one would expect in a relatively stable population and could suggest a slight decline in recruitment. The extent of any decline will become more evident over the next year or two as this cohort reaches angling size (> 30cm).

The pike stock structure suggests a stable population is present with adequate recruitment evident. While the population is dominated by older fish in the 50 to 90cm category (60%), the study suggests reasonably good numbers of younger fish are present (35.5%) and should sustain a stable population for the next number of years.

Roach were the dominant fish species present. However roach CPUE values remain relatively low (for L. Sheelin) and population structure stable. Good numbers of younger fish were recorded with a strong year class (17 to 20cm, comprising 43% of the total) coming through which will likely maintain a healthy population of roach within the lake for the next few years.

From the results of the 2022 fish stock survey of L. Sheelin shows trout CPUE to be slightly less than that noted in 2015 and 2014. Though it should be noted that the brown trout 2022 CPUE is still healthier than those recorded between 1996 and 2013. Pike CPUE noted in 2022 is the highest value recorded since 2004. Similarly, the CPUE value obtained, in 2022, for roach are greater than those

recorded since 2012. Perch 2022 CPUE value, while higher than the 2015 value, is still lower than those recorded between 2008 and 2014.

The WFD over-all ecological status of Moderate for L. Sheelin, remains unchanged since 2007. Fish status has fluctuated between Moderate and Good and is currently Good (McLoone *et. al*, 2022).

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Appendices

Appendix I. Lough Sheelin CPUE values all survey years.

| Survey Year | Wild Trout | Farmed trout | Pike | Perch | Roach | Rudd | Bream | Tench | Roach x Bream Hybrid | Rudd x Bream Hybrid | Rudd x Roach Hybrid |
|-------------------|------------|--------------|------|-------|-------|------|-------|-------|----------------------|---------------------|---------------------|
| 1978 | 2.91 | 3.68 | 0.48 | 1.86 | 0.00 | | 0.02 | | | | |
| 1979 | 2.87 | 2.07 | 0.51 | 3.63 | 0.00 | 0.01 | | | | 0.01 | |
| 1980 | 2.25 | 0.69 | 0.94 | 3.57 | 0.04 | 0.15 | 0.08 | | | | |
| 1981 | 2.75 | 0.53 | 1.25 | 3.16 | 0.23 | 0.09 | | | | | 0.01 |
| 1982 | 2.24 | 0.67 | 1.16 | 8.12 | 0.51 | 0.16 | | | | | |
| 1983 | 1.15 | 0.29 | 2.65 | 1.00 | 1.24 | | | 0.01 | | | |
| 1984 | 1.99 | 0.33 | 1.03 | 3.95 | 3.96 | 0.15 | 0.03 | | | | |
| 1985 | 0.88 | 0.11 | 1.24 | 5.67 | 12.76 | 0.04 | 0.01 | | | | 0.03 |
| 1986 | 0.84 | 0.10 | 0.96 | 6.93 | 29.51 | | 0.61 | | | | |
| 1987 | 1.29 | 0.16 | 1.51 | 3.76 | 25.48 | 0.03 | | | 2.61 | | |
| 1988 | 1.07 | 0.23 | 1.45 | 6.68 | 33.91 | | | | | | |
| 1989 | 0.93 | 0.10 | 0.86 | 1.24 | 5.14 | | | | 0.79 | | |
| 1990 | 0.90 | 0.40 | 2.50 | 5.75 | 18.48 | | 0.03 | | 1.28 | | |
| 1991 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 1992 | 1.30 | 0.10 | 1.40 | 4.88 | 0.73 | 0.03 | 0.13 | | 1.60 | | |
| 1993 | 1.15 | 0.35 | 4.10 | 1.80 | 0.80 | 0.08 | 0.03 | | 1.68 | | |
| 1994 | 1.43 | 0.35 | 1.58 | 1.03 | 0.63 | 0.03 | 0.03 | | 0.13 | | |
| 1995 | 2.98 | 0.15 | 2.88 | 0.83 | 0.55 | | | | 0.28 | | |
| 1996 | 1.13 | 0.20 | 2.73 | 1.48 | 3.58 | 0.03 | | | 0.28 | | |
| 1997 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 1998 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 1999 | 0.17 | | 2.87 | 5.00 | 10.77 | | 0.47 | | 0.83 | | 0.07 |
| 2000 | 0.13 | | 2.83 | 10.37 | 24.50 | 0.03 | 0.07 | | 2.30 | | |
| 2001 | 0.13 | | 4.43 | 2.40 | 20.37 | | | | 2.00 | | |
| 2002 | 0.37 | 0.37 | 2.60 | 1.93 | 27.47 | | 0.07 | 0.03 | 1.33 | | |
| 2003 | 0.33 | 0.07 | 4.93 | 4.70 | 49.73 | | 0.20 | | 5.33 | | |
| 2004 | 0.25 | | 5.50 | 3.21 | 18.96 | | 0.07 | | 6.68 | | |
| 2005 | 0.79 | 0.18 | 1.93 | 3.18 | 1.68 | | 0.04 | | 1.96 | | |
| 2006 | 1.00 | | 1.57 | 0.61 | 1.00 | | 0.11 | 0.04 | 2.75 | | |
| 2007 | 0.13 | | 1.80 | 2.13 | 1.47 | | | | 1.23 | | |
| 2008 | 0.43 | 0.21 | 2.36 | 9.32 | 12.93 | | 0.79 | | 1.04 | | |
| 2009 | 0.47 | 0.77 | 2.77 | 13.67 | 4.80 | | 1.10 | 0.03 | 1.37 | | |
| 2010 | 0.46 | | 2.32 | 10.82 | 3.57 | | 0.43 | | 0.61 | | |
| 2011 | 1.23 | 0.90 | 1.83 | 9.07 | 2.33 | | | | 0.43 | | |
| 2012 | 0.97 | 0.23 | 3.50 | 31.20 | 27.77 | | 0.07 | | 2.27 | | |
| 2013 | 2.00 | 0.03 | 1.87 | 6.33 | 2.83 | | | | 0.17 | | |
| 2014 | 2.87 | | 1.90 | 6.43 | 4.90 | | | | 0.23 | | |
| 2015 | 3.33 | | 3.90 | 3.66 | 5.03 | | 0.03 | | 0.13 | | |
| 2016 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2017 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2018 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2019 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2020 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2021 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| 2022 | 2.30 | | 4.20 | 4.33 | 6.63 | | | 0.07 | 0.13 | | |
| NS - not surveyed | | | | | | | | | | | |

Appendix II. Lough Sheelin 2022 survey results, full 40 sites sampled, and the original 30 sites sampled.

| | Full survey 40 nets | Original 30 nets | CPUE /40 nets | CPUE / 30 nets |
|---------------------|------------------------------------|-----------------------------|--------------------------|---------------------------|
| Brown Trout | 81 | 69 | 2.03 | 2.30 |
| Pike | 183 | 126 | 4.58 | 4.2 |
| Roach | 318 | 199 | 7.95 | 6.63 |
| Perch | 169 | 130 | 4.23 | 4.33 |
| Roach/bream hybrids | 7 | 4 | 0.18 | 0.13 |
| Tench | 2 | 2 | 0.05 | 0.07 |

A series of three overlapping, wavy, dotted lines in a light grey color that span across the middle of the page, partially overlapping the dark blue background and the white background.

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