

Wyre Forest Study Group

Fish Sampling Day at Unclys Reservoir

Saturday 16th April 2011

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Objectives

To undertake an investigation of the fish community in Unclys Reservoir (GR:SO761751) as part of a wider programme of recording biodiversity in the Wyre Forest.

Site description

Unclys Reservoir is an on-line pond of approximately 0.2 ha. in extent, surrounded by mature broad leaved woodland and formed by damming a small stream. The age of the pond is not known but seems to have been a water supply or irrigation reservoir that has probably been in existence for at least 100 years. Some repairs to the dam structure were made in 2003 using metal sheet piling, but sections of the original stone lining are clearly visible around the margins of the lake and at the overflow structure.

The southern apex of the lake where the inflowing stream enters is very shallow with a deep silt bed, and encroaching emergent vegetation, and the southern half of the lake is almost totally covered by a bed of *Potamogeton natans*. The lake deepens gradually towards the dam with the deepest point at approximately 3 metres, just a few metres out from the central part of the dam wall.

Approach

There were limited options for sampling the lake; the southern half is occluded by macrophytes and thick silt and so could not be netted; electric fishing was not practical due to the requirement for at least three trained personnel. The deep area close to the dam wall was too deep for the nets available and was steep sided, hence the decision was made to make a single haul of a seine net in the one area of the lake with modest depth and a fairly even bed.

Methods

A 35 m x 3 m plain-walled seine with stretched mesh approximately 12 mm was laid along middle third of the eastern shore of the lake and ropes attached to the net headrope were walked across the lake to the western bank, and a single haul to the western bank was made (see photos 4, 5 and 6). Fish were counted, identified, and sub-samples measured and scales taken for ageing; all fish were returned to the water after sampling. The operation took place around midday.

Fished were aged at the Environment Agency's Bampton Fisheries Laboratories by experienced scale readers, the methodology is based upon observing the patterns of concentric rings in the scale structure under low-power microscopy.

Results

The net was hauled without any major obstructions being encountered. A total of 597 fish were caught. 426 were counted and identified only. 171 were measured and identified and scales were taken from 53 of these.

The catch was comprised of (see photos 1, 2, and 3):

7 Gudgeon
24 Perch
564 Roach

The length frequency histograms of the fish measured are shown below. Fish lengths are in centimetres.

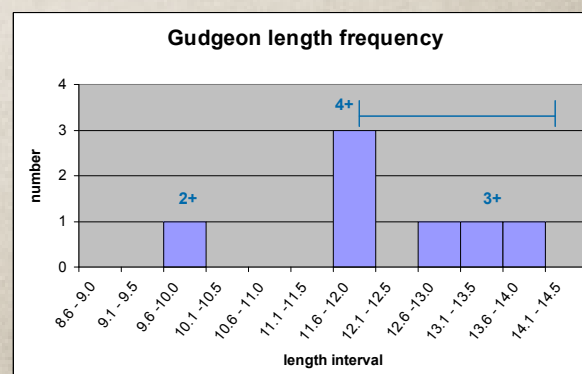
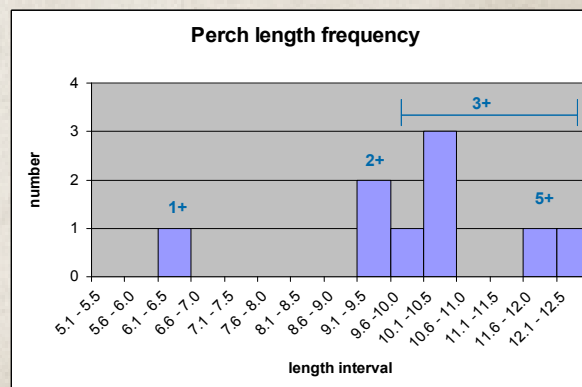
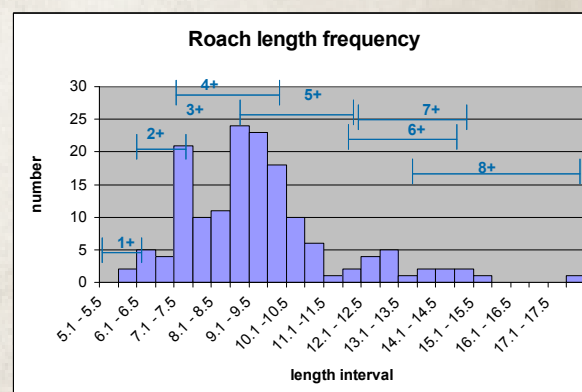


Figure 1 a – c Length frequency histograms for Roach, Perch and Gudgeon.

The notations above the histogram bars indicate the ages of the fish in a particular length category. Looking at the figure above for Gudgeon, it can be seen that the fish between 9.5 and 10 cm in length was aged 2+, whilst the group between 12.6 and 14.5 cm were a mixture of 3+ and 5+ fish. The '+' notation means that the fish is n years old plus a number of months – most coarse fish species hatch in April to July and hence the fish aged as, for instance, 2+ in this sample would be nearly three years old. A typical scale as seen by the scale reader is shown below. This fish is a Perch, three years old.

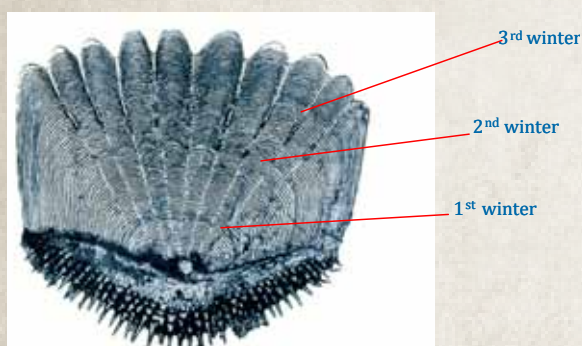


Figure 2. A Perch scale showing annuli (growth rings).

Discussion

Despite the limitations of the sampling approach the operation was successful and the catch appeared to be fairly representative of the fish population thought to inhabit the lake, this being based on visual observation of fish in the lake and occasional conversations with anglers at the water's edge. However we cannot be sure that all species and sizes of fish actually present in the water were sampled. The shallow, macrophyte rich area extending out from the inflow and the deep area next to the dam wall could not be sampled and other fish species may well have been present there.

In particular, there is a small population of Fully Scaled Carp (*Cyprinus carpio*). These fish can often be seen on the surface on warm evenings. They are thought to be of the original 'wild' strain that were introduced to Britain in the early Middle Ages. These are quite different in form from the now-ubiquitous Common, Mirror and Leather Carp which are regularly stocked into lakes for angling. Carp of any variety are notoriously difficult to net and even if any were present in the area encircled by the net, they would very likely have escaped.

Eel *Anguilla anguilla* are also likely to be present in the lake but again these are difficult to capture by seine-netting and are very seldom seen even in waters where they are known to be present.

The Roach and Perch caught were generally very small and the results from the fish ageing showed that this was because they were very slow-growing.

Figure 3 below shows the growth rate – measured as length at the end of each growth year – for the Roach from Unclys were classed as very slow-growing, achieving only 68% of the average length-for-age for Roach from the UK. Whilst the Perch sample was quite small, these again were exceedingly slow-growing: the largest were just under 13 cm but were five years old, yet in many waters Perch would achieve this length by the end of their second year.

Reasons for the slow growth probably relate to high fish density – almost 600 of these fish were taken in a single haul of a seine net, generally this method is reckoned to be no more than 30% efficient, and the area swept out during the netting operation amounted to approximately a fifth of the lake's area, this strongly suggests that population density of Roach in the lake is high.

The poor fish growth may also be related to poor biological productivity and consequent paucity of the food items required for fast growth of fish particularly beyond their juvenile stages. However from the limited sampling done on the day it is not possible to elucidate this. An indication of the lake's productivity would require corroborative evidence from analysis of water chemistry and the community composition of aquatic invertebrates and plants.

Conclusions

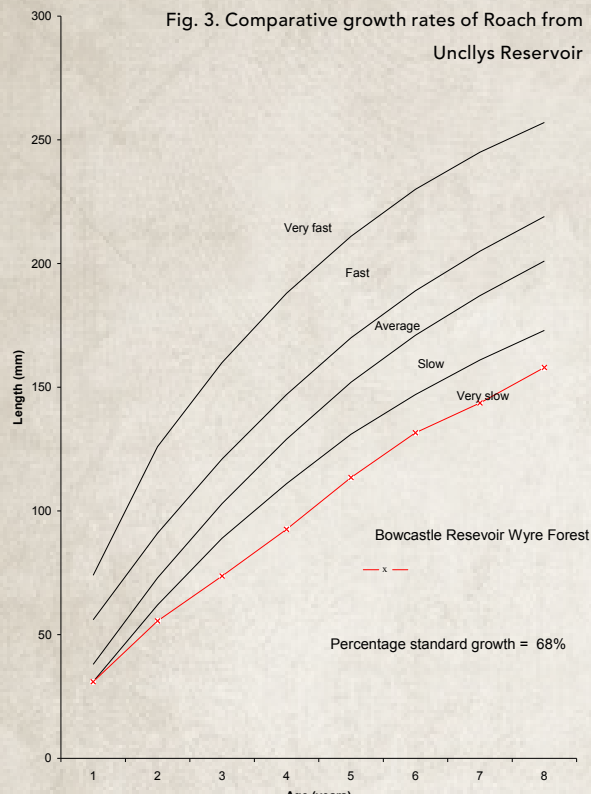
In terms of the conservation value of the fish population of Unclys Reservoir, our sample did not indicate elements that are rare, unusual, or threatened. However the carp population is worthy of further investigation in order to ascertain whether they are of the true 'wild' strain, whether they are breeding and whether special measures to conserve them should be taken.

Recommendations

Samples of water for chemical analysis should be taken during different seasons of the year.

Sampling of invertebrates from the weeds and margins of the lake, and from the bottom-silt, should be taken in order to characterise the community composition.

Further efforts should be made to obtain a sample of carp from the water in order to establish their genetics, growth and if possible, reproductive status.



Graph to show the growth of roach in Bowcastle Reservoir compared to the standard growth of roach in 'southern' rivers (Fisheries Technical Services unpublished data)

Photo 1. Perch, Unclys Reservoir, 16 April 2011

R. Winnall



Photo 2. Gudgeon, Unclys Reservoir, 16 April 2011

R. Winnall



Photo 3. Roach, Unclys Reservoir, 16 April 2011

R. Winnall



Photo 4. Unclys Reservoir, 16 April 2011

Rosemary Winnall



Photo 5. Unclys Reservoir, 16 April 2011

Rosemary Winnall



Photo 6. Unclys Reservoir, 16 April 2011

Rosemary Winnall