A ge of ENLIGHTENMENT

Dennis Moss questions our assumptions about how long trout live.

Caught by Cathal McNaughton in July 2007, this fish weighed 1lb 8oz

Nearly two years later Cathal landed the same fish at 2lb 9oz

On September 13 1952, Richard Walker made history when he caught a record carp of 44lb from Redmire Pool. A great angler, Walker not only made history that day, but he sowed a seed that left a legacy of specimen groups scattered throughout the country. Groups of anglers committed to the capture of large fish, anglers who diligently recorded information in a quest for personal bests or possibly a record. By recording information, a data bank was created. The best waters for producing the biggest fish became known; it was an age of enlightenment. Today the specimen groups have all but disappeared, and in their place we have a band of specialist fishermen who often target known specimens from well-documented waters.

What has the above got to do with trout you may ask? Well, with all the anecdotal and photographic evidence compiled by specialist coarse anglers, we now not only know the weight range of the targeted fish, but we also have a good idea of their age. Before these records were compiled, we were led to believe that the lifespan of some of our coarse fish was much shorter. The ageing of coarse fish was one area where fishery science has been found wanting. Too much emphasis was placed on scale readings, and thus the age and the potential lifespan of some of our fish was not fully appreciated. If such an anomaly applied to coarse fish, then couldn't the same error apply to trout where the evidence for ageing is based on scale readings?

This is not to say that all scale readings have been misread and as a consequence the age of the fish miscalculated, but it does beg the question: has too much emphasis been placed on a parameter that could be questionable? Is it not possible that there could be a grey area when it comes to calculating the maximum age of some our trout populations, especially the Irish lough fish which supposedly live fast and die young? In Lough Corrib for example, I have been told by Inland Fishery Ireland staff, that they have never recorded a trout older than six years in survey samples. This observation may be correct; I have no data to disprove it, yet I find it difficult to accept that in a multi-spawning species, a whole year class just topples off the edge at six years.

Through observations made from scale readings we were led to believe that carp died at around 17 to 18 years. Walker's fish, Clarissa, lived for 40 years (20 in an aquarium in London Zoo). Another famous Redmire fish first caught by Eddie Price in 1959 lived for 50 years. During its lifetime this carp, from the same stocking as Clarissa, was caught nine times. Chris Yates caught it weighing 38lb in 1973 and again in 1980 at 51lb 6oz, a weight which toppled Walker's long standing record of 28 years.

These carp and many others have been recorded by anglers and is irrefutable evidence which proves that carp live for 50 years or more. But not only have we found that carp are longer lived, but from specialist fish records, we now also know that other species such as barbel and chub live longer and that they survive being caught and released many times.

Unlike the coarse angler, we trout anglers have no such data pool to call on. A vast pool of authentic records of trout which have been caught and returned over a number of years just does not exist. Most Irish fish are killed - end of story - and those anglers that do take a photograph and then return their catch, record them purely as a record of the occasion. Very few will compare photographs with previous captures. So the evidence, both anecdotal and photographic, is limited, but occasionally we get lucky and something comes along that makes you sit back and say: 'Yes, that is interesting'. This year has indeed been an interesting one for me; evidence has fed through which makes me more convinced that perhaps some of our trout do live longer than scale-reading currently suggests. Compiling this evidence, to support a theory that this is the case, is essential if we are to raise the question about longevity. I'm going to list three pieces of evidence below which support this theory: 1. Anecdotal (Ireland), 2. Photographic (Northern Ireland), and 3. Photographic (UK).

Caught by Trevor Ashton in 2004 weighing 3lb 2oz...

...and again seven years later and weighing virtually the same

> "I have always held a belief that some of our trout live longer than is generally accepted."

1. Anecdotal evidence (Ireland)

In July I was sharing a boat with Brendan Smith on Lough Arrow, when he told me an interesting story concerning a friend (Albert Shaw) who caught some trout from a local hill lough and then stocked them in his garden pond. That was 10 years ago and there are currently trout surviving from that stocking. Albert had no knowledge of the age of the trout when he caught them. They were typical, small, fly-caught hill lough fish. However, if we assume that the trout when stocked were at least two-plus years, then that would make the survivors of that stocking a minimum of 12 years old. What is also interesting, is these small hill lough trout with their weight capped by an impoverished environment have grown to about 2lb.

2. Photographic (Northern Ireland)

Early this year I received an email from Cathal McNaughton about my book *Irish Rise* and the chapter on recaptures. After reading the chapter, Cathal said that he looked through his file of photographs and made some remarkable discoveries - discoveries he wanted to share with me. Cathal has an eye for detail, he records his fish photographically and then returns them, but most important of all he also fishes smaller hill loughs (17 acres in extent) which increases the probability of

a recapture. He has authentic records of eight different trout which have been recaptured. One he caught three times spanning a period of three seasons. Although the time period between captures may not be that long, Cathal's recaptures provide good evidence that brown trout survive being caught on rod and line when released, and with time I feel certain that he will build up a larger even more comprehensive record of recaptures which span a greater time scale.

3. Photographic (UK)

In November, I was sent an email by WTT Conservation Officer Andy Thomas, attached to which were two photographs of a brown trout caught from a small chalkstream. They were of the same fish caught by the same angler Trevor Ashton. The trout, first caught in 2004 weighing 3lb 2oz, was caught again in 2011 weighing 2oz more. For a small river this is a remarkable fish and what is even more remarkable is it has held condition for seven years. A big fish for a small river, it begs the question, 'how old was this trout when it was first caught'? Five or six years - older perhaps? The minimum age for the trout has to be 12 years.

I have always held a belief that some of our trout, especially the Irish brown trout, live longer than is generally accepted. And I don't always think that it is the biggest trout that are the oldest. When I lived in England, my house backed onto the River Windrush in Oxfordshire. At the bottom of the garden there was a pool which held a shoal of 30 to 40 chub. Some of the shoal fish would move in and out of the pool, and some were resident (I fed them well). A few of the resident fish became very recognisable. Over a period spanning 12 to 14 years, the weight of those chub didn't vary much and the biggest fish would have been no more than about 3¼lb. If coarse fish are capable of surviving for long periods without growth, then would it be unreasonable to apply this trait (even if it is for a shorter time scale) to brown trout? Or do we just accept that the fishery science is correct and that they all die as soon as growth ceases? Rare evidence such as Trevor Ashton's trout begs the question, if a brown trout on a small river in England can survive for seven years without growth is such a feat possible on an Irish lough? I believe it is, and I can't help thinking that some of the Irish lough populations of brown trout are made up of a wider range of age groups than we have been led to believe. Trevor's fish also proves that the story doesn't end if we practice catch and release - shouldn't we be doing more to preserve these treasures - big trout with long term survival characteristics?

SCALE READING AND FISH AGEING

Tim Jacklin

Being able to determine the age of fish lies at the heart of fishery science and management. It gives insights into the age-structure of a fish population, how quickly they grow, at what age and how often they spawn and, for sea trout and salmon, how long they have spent in the sea and freshwater. Combined with data on fish abundance it gives a measure of mortality rate – the fall in numbers of a given age group of fish over time.

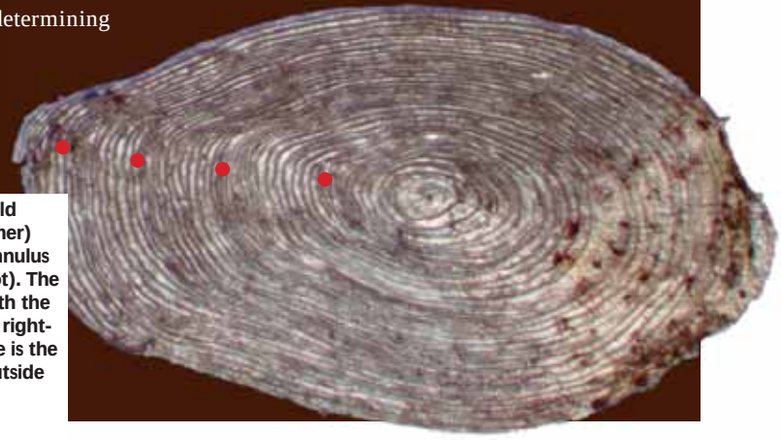
The idea that fish can be aged from scales (or other bony structures) has been around since the 17th century and relies on rings (circuli) being laid down as the fish grows. The rate at which circuli are laid down varies seasonally, so they are widely spaced in summer and closer together in winter, forming dark bands (annuli) which are counted to give the age of the fish. The spacing of the annuli can also be used to back-calculate the length of the fish at earlier ages (and thus its growth rate).

Like all animals, as trout get older their rate of growth slows; but unlike birds and mammals that reach a certain adult size then stop, trout can continue to grow throughout their lives. When they become sexually mature can depend upon their age or reaching a minimum size, but they usually continue to grow and can breed several times. Once the fish reach sexual maturity (at around 3 or 4 years old) there is a marked decrease in average annual growth rate, as the fish invest energy in gonad production and reproductive activity (spawning migrations, redd cutting). There can be absorption of scale material at this time which is replaced during renewed growth after spawning, leaving a scar known as a spawning mark (more common in sea trout and salmon than brown trout).

In older fish, the slowing of growth and absorption / renewal of tissue at the scale edge can make determining the age very difficult. This does create something of a grey area when it comes to determining the age of the oldest fish in a population. Fisheries science tends to focus on describing the characteristics of whole populations rather than individuals and there is often a general assumption that maximum age in a population corresponds to the maximum number of annuli counted.

The underestimation of maximum age may in itself not be significant if the older fish represent a very small fraction of the population, or have reached senescence. But what if those fish have reached equilibrium, not growing but sustaining their size and condition and continuing to contribute their genes to subsequent generations? It is wrong to think that selectively killing off larger trout by angling will remove "big trout genes" from the population and lower the average size of individuals; bigger trout are likely to already have spawned at least once and passed on fast-growing genes, plus remaining "small" is a huge disadvantage in terms of survival. The vast majority of trout that die are small (less than 6 inches), so even in heavily-fished waters, natural mortality (and hence selection) greatly exceeds that exerted by angling.

There are however implications for practical fishery management with the underestimation of maximum age. If a reasonable proportion of fish reach their maximum size, yet continue to survive for a number of years, protecting that section of the population with regulations like catch-and-release or slot limits could greatly increase the number of specimen fish available to catch and improve the angling quality. The effect of reduced mortality on a long-lived fish population compounds with time – see the article on page 13 for more on this.



Scale from a 4-year-old plus (in its fifth summer) brown trout (each annulus indicated by a red dot). The small, lighter area with the black blotches to the right-hand-side of the scale is the area visible on the outside of the fish