

Scale Report: 2015-2018

Scale samples have been taken from rod caught adult salmon across the river Dee. Looking at the scales under a microscope we can gain a greater understanding of each individual salmon's life history. We can tell how long the fish has spent in the river before its migration, how many winters it spent at sea, when it returned to the river and if it has spawned.

- 2015- Total rod catch 2430, 113 scale packets, 5% of rod catch
- 2016- Total rod catch 3703, 125 scale packets, 3% of rod catch
- 2017- Total rod catch 4051, 97 scale packets, 2% of rod catch
- 2018- Total rod catch taken from Fish Dee 3320, 97 scale packets, 3% of rod catch

Scale information from the past four years have been combined to create one large sample to use for a more robust analysis.

Freshwater Age

All samples were studied to find the age at which salmon left the river.

Looking at the river as a whole, 68% of juvenile salmon spent 2 years in the river before smolting and migrating to sea with 32% staying in the river for 3 years before migrating to sea.

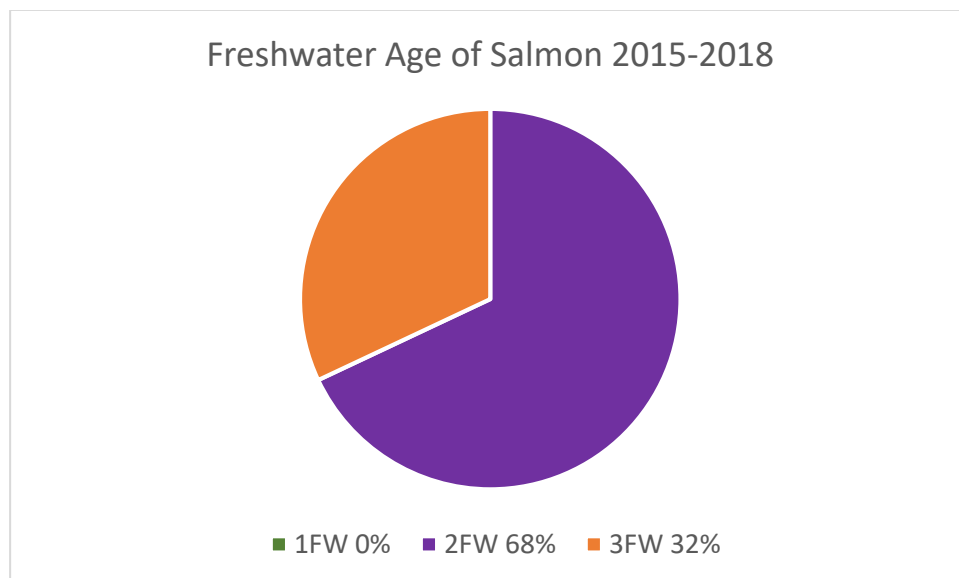


Figure 1. Fresh water age (years) of juvenile salmon in the river Dee before smolting.

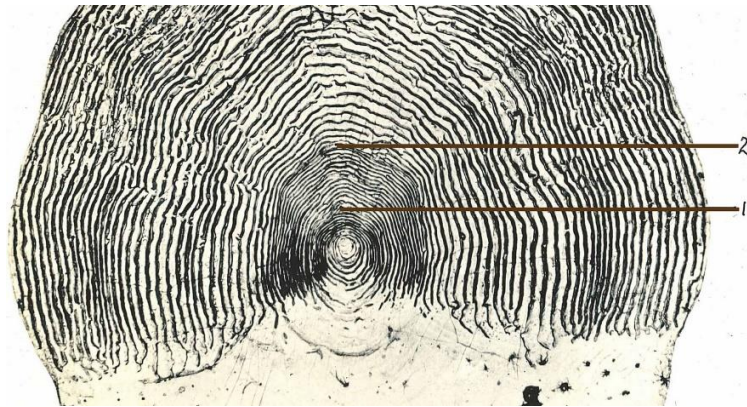


Figure 2. This is a zoomed in image of a salmon scale showing the river ages in the centre.

The centre of the scale is where the river age is read by counting the winters. The tight bands of the scale which look darker represent a winter in the river. Between the winter bands lies the area of summer growth. As the fish feeds and grows the bands become further apart. This salmon, like most juveniles in the Dee, stayed 2 winters before migrating to the sea.

The Dee produces many 2-year-old smolts. Looking at each end of the Dee separately, 57% of upper Dee smolts and 80% of lower Dee smolts are 2 years old.

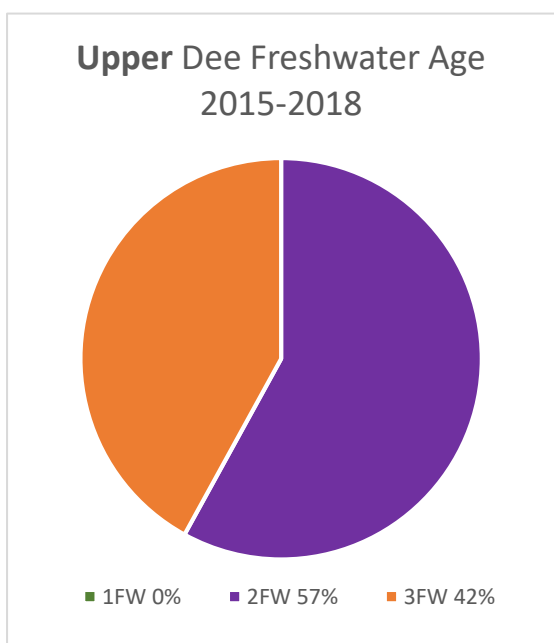


Figure 3. Upper Dee average fresh water age of juvenile salmon.

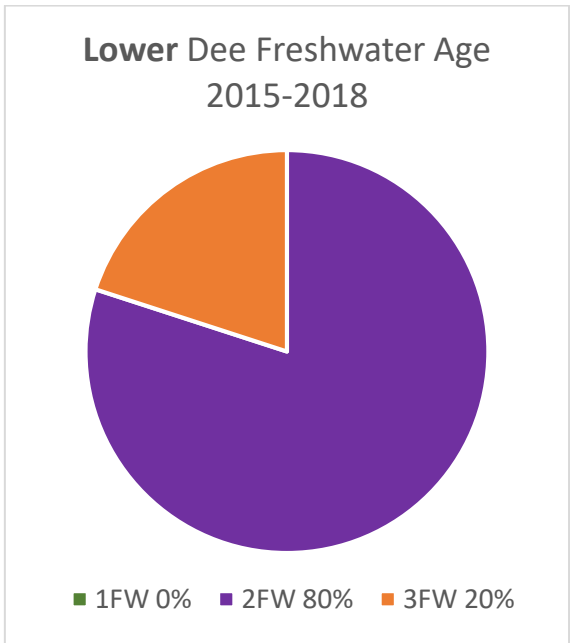


Figure 4. Lower Dee average fresh water age of juvenile salmon.

The scales read showed that the upper river, above Aboyne, produces more than double the proportion of 3-year old smolts than the lower Dee. The upper river environment can be more challenging to juvenile fish as colder water temperature negatively affects food availability which can impact growth resulting in more fish staying for an extra year to be ready for migration.

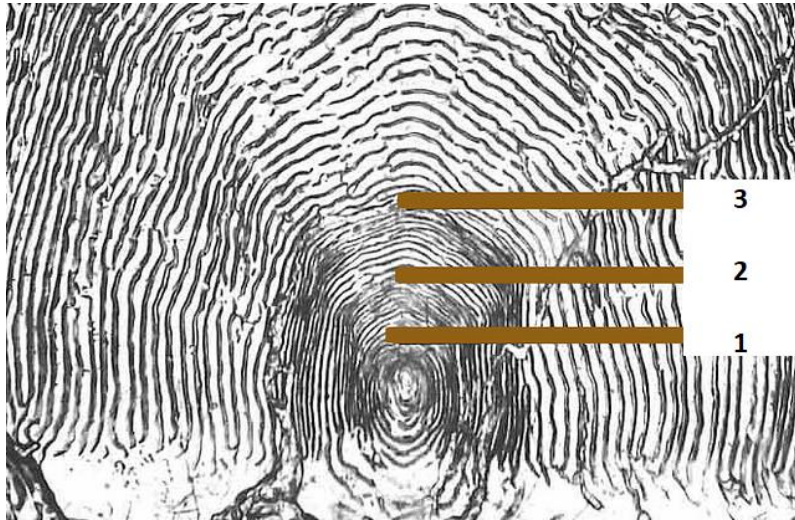


Figure 5. This salmon spent 3 years in the river, like many juveniles from the upper Dee.

Time at Sea

The scale data shows that most smolts, after leaving the river, spend 2 winters (years) at sea feeding before making their journey back to the river to spawn. The graph below displays combined sea ages of spring and summer/autumn salmon.

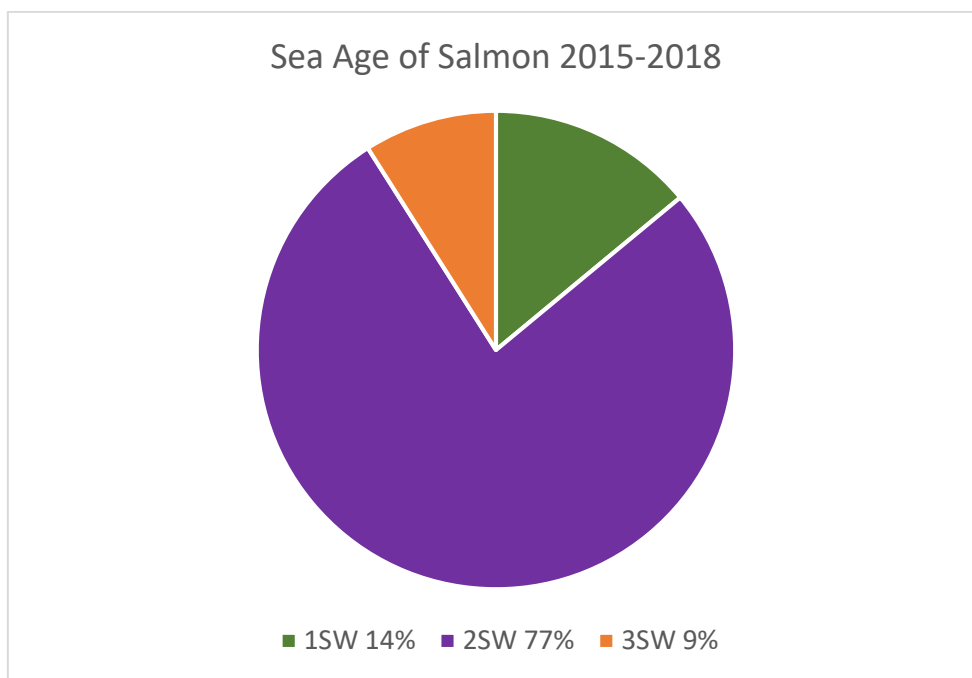


Figure 6. Sea age of Dee salmon read from scales taken upon their return to the river.

The scales read from the past 4 years show that 14% of returning adults were grilse (1 sea winter fish) 77% of returning adults spent 2 winters at sea, and 9% endured 3 winters at sea.

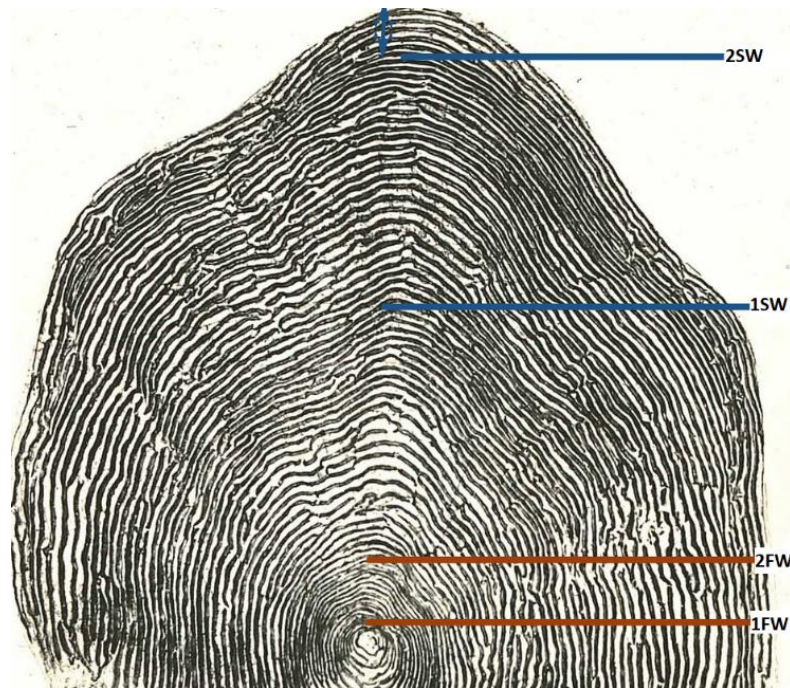


Figure 7. This scale shows a 2 sea winter salmon with some summer growth around the edge (age 2.2+).

89% of spring salmon and 61% of summer salmon are 2 sea winter fish. 35% of summer catches are 1 sea winter fish. 11% of fish caught in the spring are 3 sea winter, as are 4% of summer catches.

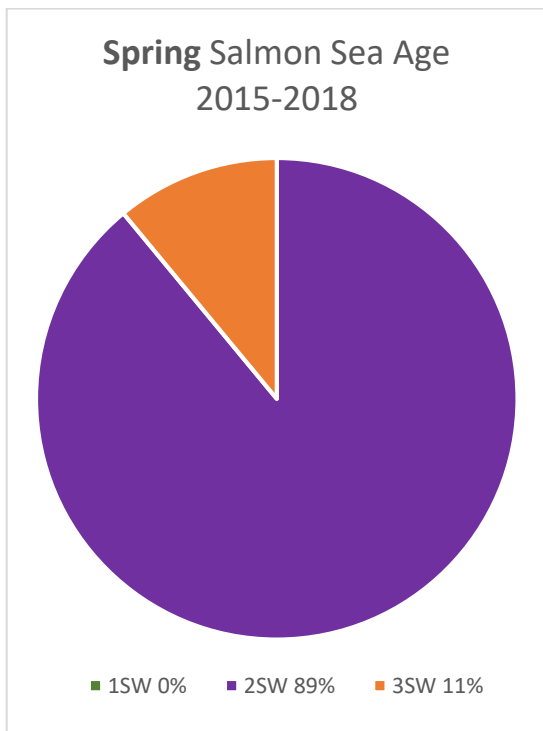


Figure 8. Spring fish ages.

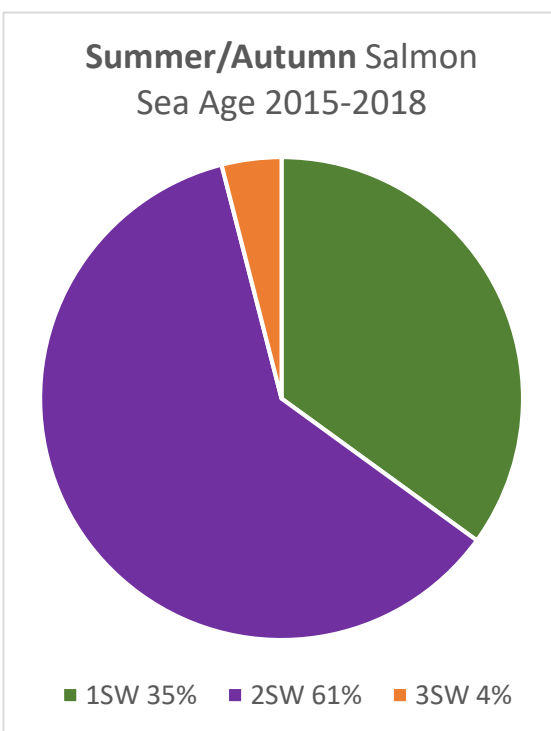


Figure 9. Summer/Autumn fish ages.

Kelts

86% of kelts are 2 sea winter fish, 8% of kelts are 3 sea winter fish and 7% of the sample size were repeat spawners to the Dee.

Kelt scales are very difficult to read due to the erosion around the edge of the scale- some winters can be missed as they are simply not there. Some of the unreadable scales could have been spring fish.

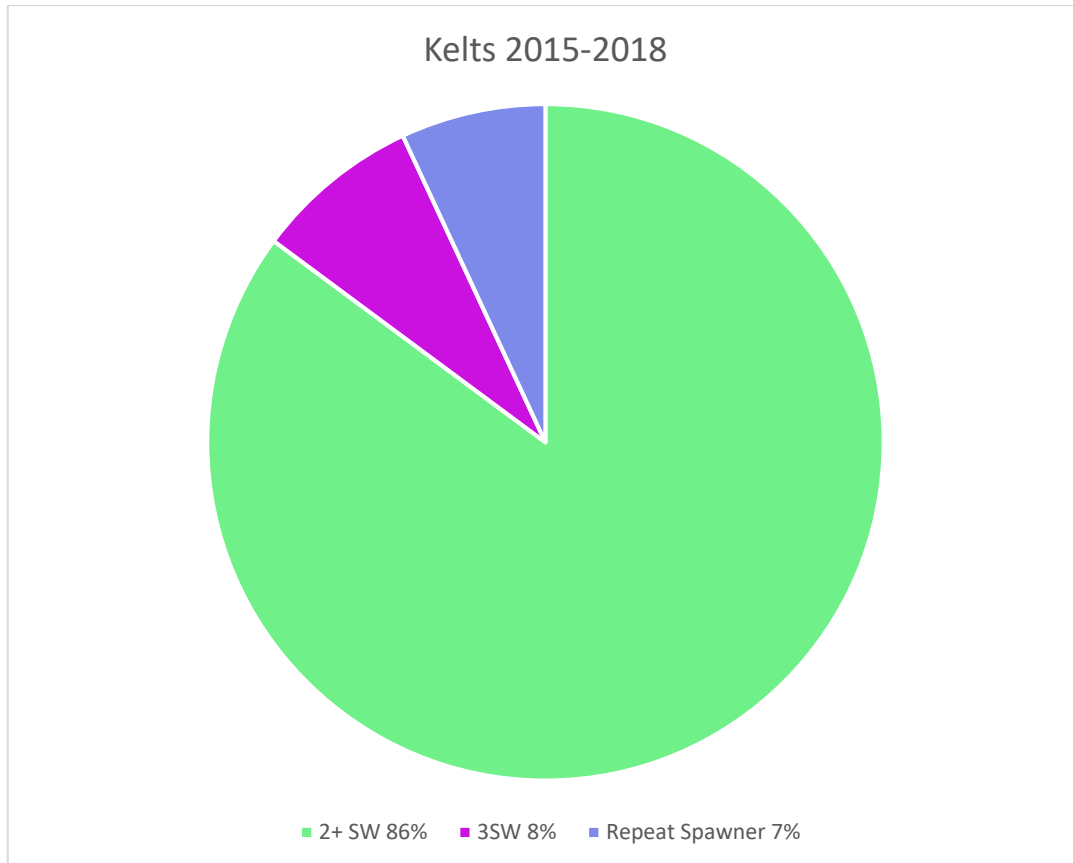


Figure 10. Kelt sea ages.

Length and Weight

Length and weight information from the scale envelopes is used to monitor the condition of the adults upon their return to the river. The table below displays the combined average length and weight of adult salmon caught in 2015-2018.

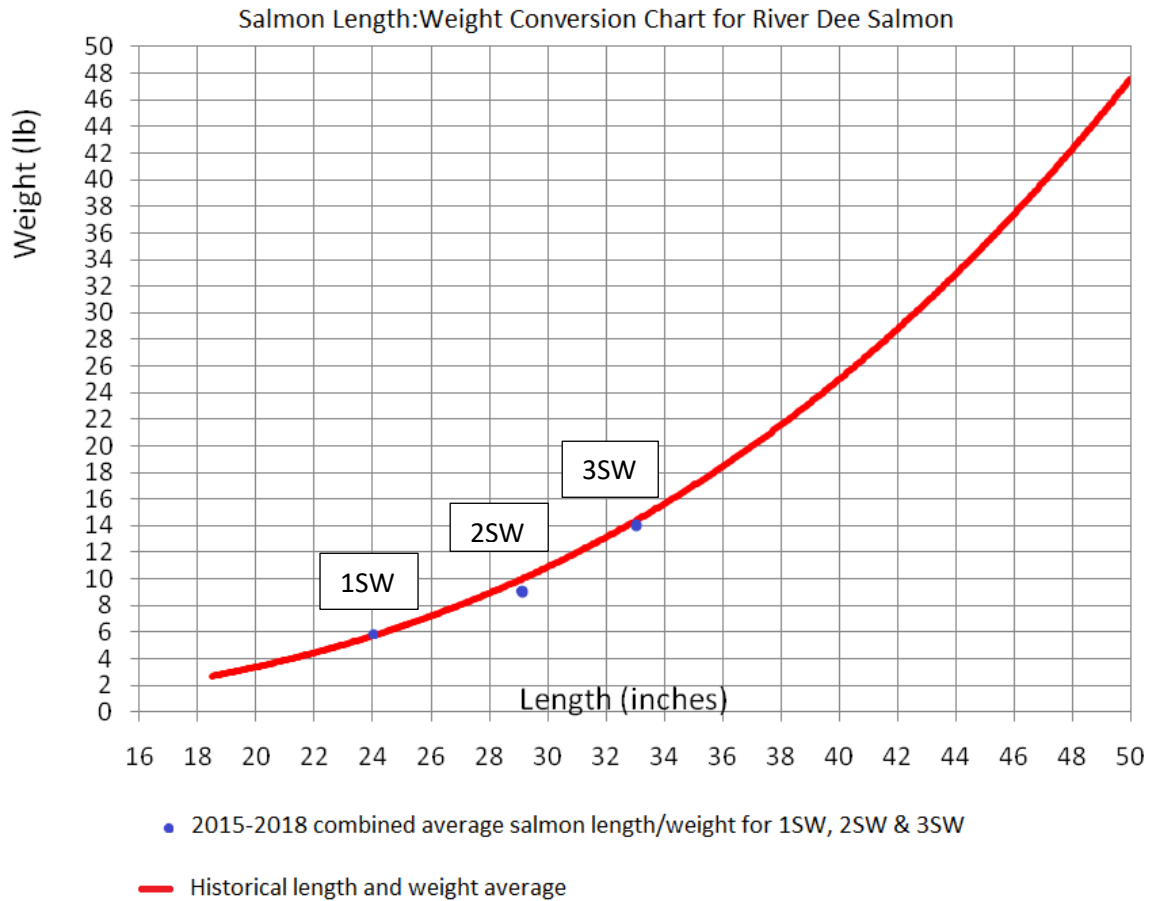


Figure 11. Dee salmon length and weight graph displaying 2015-2018 scale packet information

The points plotted on the graph shows the combined average length and weight for salmon caught in 2015-2018. The red line shows the Dee salmon expected average.

The first blue point on the graph at 24" and 6lb lies on the red line which marks the average expected length and weight of a 1 sea winter salmon. The 2 sea winter salmon that were recorded averaged 29" and 9lb, this falls slightly below the mean line. 3 sea winter salmon length averaged 33" and weighed 14lb on average which follows the Dee average.

Sea Trout

21 sea trout were scaled in 2015 which was 2% of the rod catch, and 2 sea trout were scaled in 2017 which was 0.1% of the rod catch. No sea trout were scaled in 2016 and 2018. Out of the 21 scaled sea trout in 2015, 1 was a previous spawner and there were 9 1 sea winter fish. Both scaled sea trout in 2017 were previous spawners which left the Dee as 2 year old smolts and returned after 2 winters at sea.

Brown Trout

7 brown trout were scaled during the last 4 years, 4 in 2015 and 3 in 2017. Unfortunately, the scales proved too impossible to read due to severe erosion or being replacement scales; replacement scales grow faster than usual to repair scale damage, this means that they do not show the true age of the fish.

Scale Reading

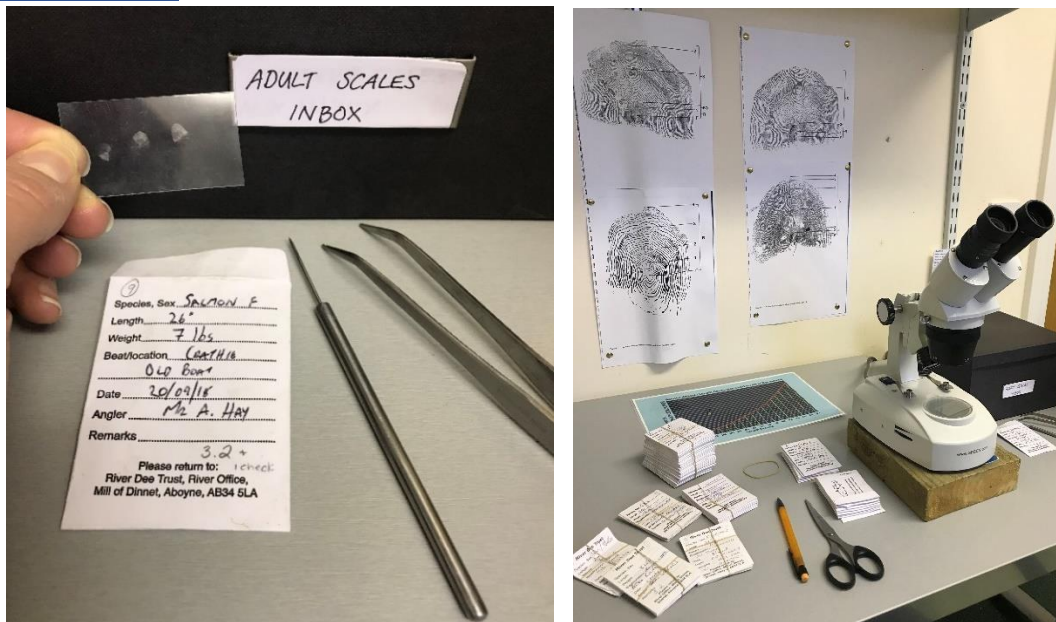


Figure 12. Salmon scales from the packet are pressed on plastic acetate, ready for reading under the microscope.

Thank You

With thanks and appreciation to all the ghillies and anglers that took part and for your continued support to carry on the scale reading project.

More scale packets are available on request.