



The diversity of trout, *salmo trutta*, and what their scales can tell us:

Trout (*Salmo Trutta*) exist in many different forms in Scotland’s rivers, lochs and coastal seas; each form has adapted to fulfil an ecological niche within the diverse and productive environment in Scotland. We tend to refer to these different life strategies by using distinct names such as brown trout, sea trout, ferox and slob, - but their actual behaviour is probably not as distinct as our classification would suggest.



Each form will likely exhibit a whole range of behaviours from simple resident brown trout to full marine migrating sea trout, and indeed, slob trout are really just a halfway adaption between the two, feeding in the estuary but not migrating fully to sea. These different varieties of trout often exist together in any given catchment, each fulfilling an important role in the environment and each as valuable as the next. Due to their migratory nature and ability to adapt to different environments, especially in their appearance or camouflage, it is often difficult to distinguish between them on appearance alone. In fact, I have had many a fish be labelled a sea trout at the riverside by both biologists and anglers only to be



proven as a brown trout in the lab by scale reading and vice versa. Through reading the scales of these fish we can not only count how old they are but also determine whether they have been to sea, if they have spawned and even work out how fast they were

growing which will give some inference of on what and where they have been feeding. Scale reading is one method for determining if an individual fish is a brown trout or a sea trout and also helps us understand the behaviour of a whole population. This information is very important in helping us improve our management to protect these local trout populations and their habitats.

What is a scale and how do we read it?

Trout have scales all over their skin for protection; these protein plates overlaid with calcium are embedded in the skin and some can be easily removed without causing lasting damage to the fish. When viewed under a microscope the scales reveal series of concentric rings not dissimilar to rings on a tree. However, unlike a tree, the rings are not laid down annually but continually. The rings will be laid down further apart when a fish is growing faster and closer together during periods of slow growth. Typically, there is more food and faster growth in the summer but winter rings are closer together as growth slows; these marks are called “winter checks”. Winter checks can be counted to reveal how old a trout is. Similarly, when a trout goes to sea there is far more food available and it grows faster and the rings are distinctly further apart and this is called “marine growth”. The rigours of

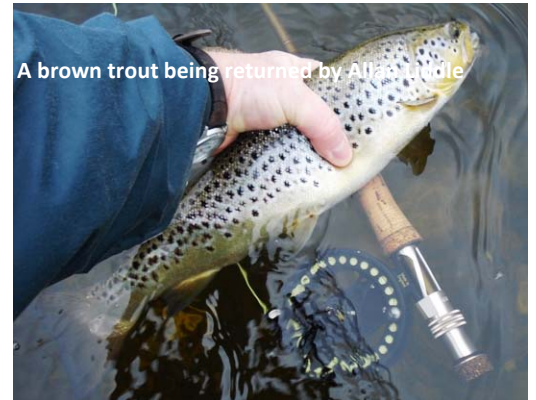


Scale from a 75cm Spey (Livet) sea trout that had spawned 5 times!

spawning can result in a trout having to dig into its nutrient reserves leading to erosion of the scale which leaves incomplete or cut over rings on the scale that are read as “spawning marks”. Read under a microscope by a professional, the scale can reveal a huge amount of information about that trout: smolt age, sea age, total age spawning marks and growth rate. If enough samples are collected, this can all be combined together to not only work out the life history of an individual trout but also the characteristics of that entire population.

What you can do to help.... collect scales!

We are looking for scales from all forms of trout: sea, brown, ferox, slob and even finnock – just no rainbows! Although the trophy fish can tell the most interesting story, we need to collect scales from a whole range of sizes so that we have data on the entire population. If you are interested in taking part please contact Marcus Walters for your scale collection pack then follow the instructions in the box below. The top 10 anglers who collect the most scales by the end of the season will be entered into a prize draw to win an Orvis Reel & Line.



A brown trout being returned by Allan Liddle

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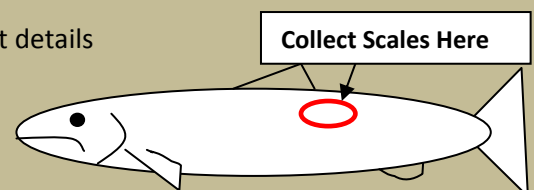


A Deveron, Blackwater brown trout

Collecting Scales

1. Collecting scales causes no lasting harm to the fish and the scales will be replaced.
2. Please handle and release fish according to the RAFTS / ASFB Catch & Release Guide
3. Collect scales from the area shown in the diagram. If they are missing take them from the other side
4. Remove excess mucus from the area using the back of a knife.
5. Run the blade of a knife gently back against the scales to lift and remove +/- 10 scales.
6. Insert the blade into a **scale envelope** (not plastic bag) and pinch the packet against the blade so the scales are left in the packet as the blade is withdrawn. Don't seal the envelope!
7. Clean the blade between samples
8. Record the details on the outside of the packet (where caught, length, weight, condition etc)
9. Please store all packets in a warm place to dry and return all sea trout scale samples to: Marcus Walters, C/O KSFT, Dornoch Road, Bonar Bridge, Sutherland, IV24 3EB
10. To be included in the competition please include your contact details

Contact Marcus Walters for a scale collection kit



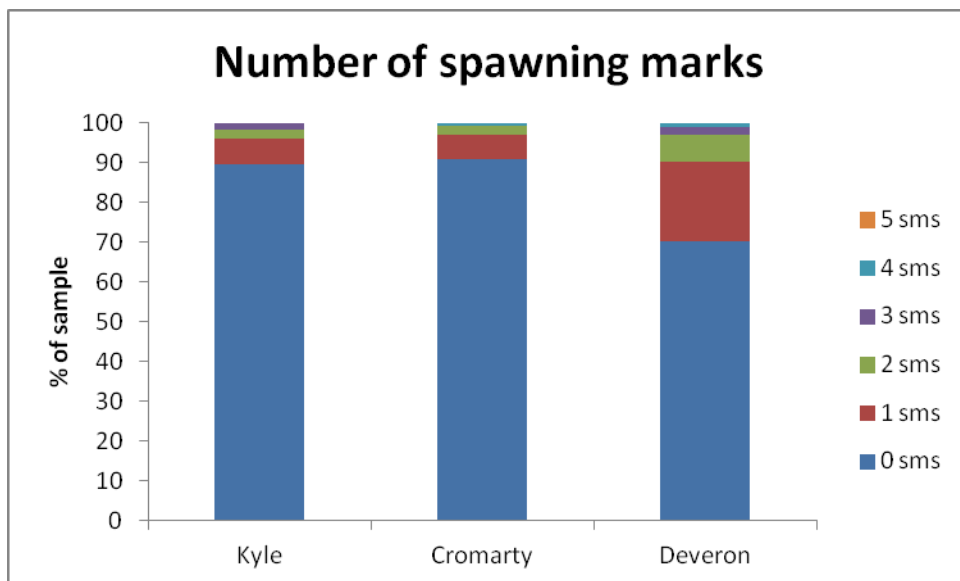
Mob: 07500602216;

Email: marcus@morayfirhtrout.org;

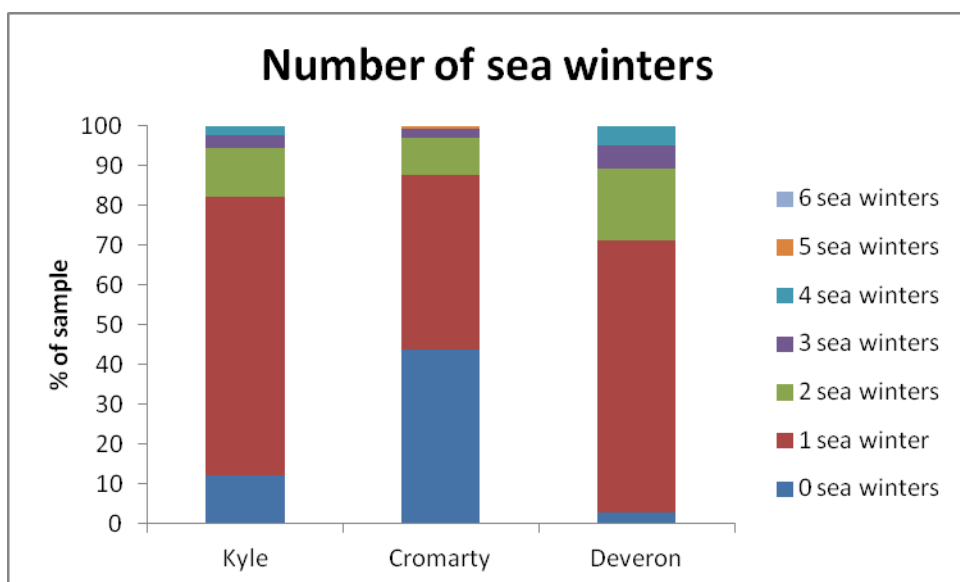
Web: www.morayfirhtrout.org

The MFTI is supported by local Fisheries Trusts, Boards and Angling Associations and funded by:

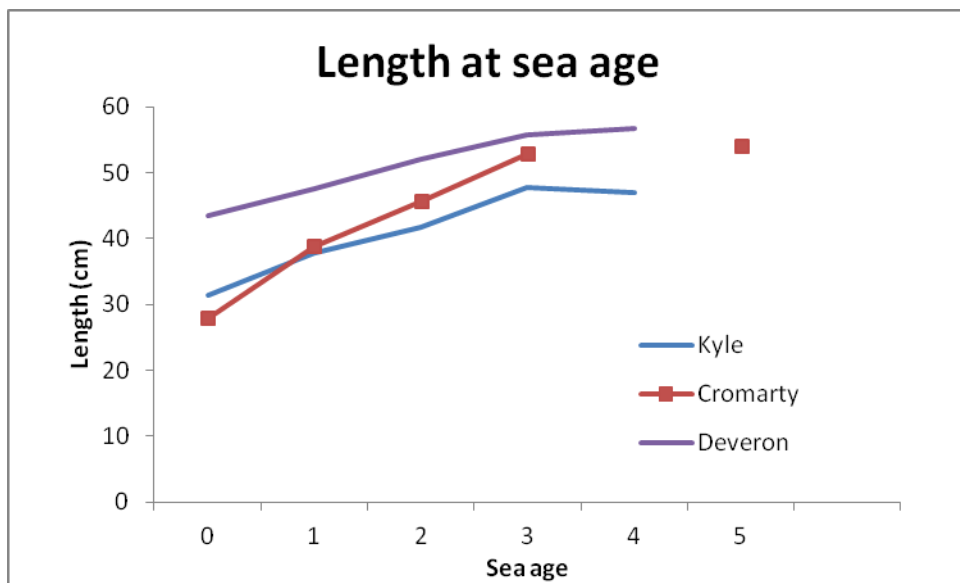
Once your scale envelopes reach us they will be compiled with other collections and sent to a professional scale reader. The results from your own collections will then be returned to you. It can take a few months after the end of the season to get all the scales read so if you have a particularly interesting fish please send it directly to me and I will do my best to get it read quickly. The results from all scales will then be compiled and can be compared with historical collections and collections from other catchments (see below):



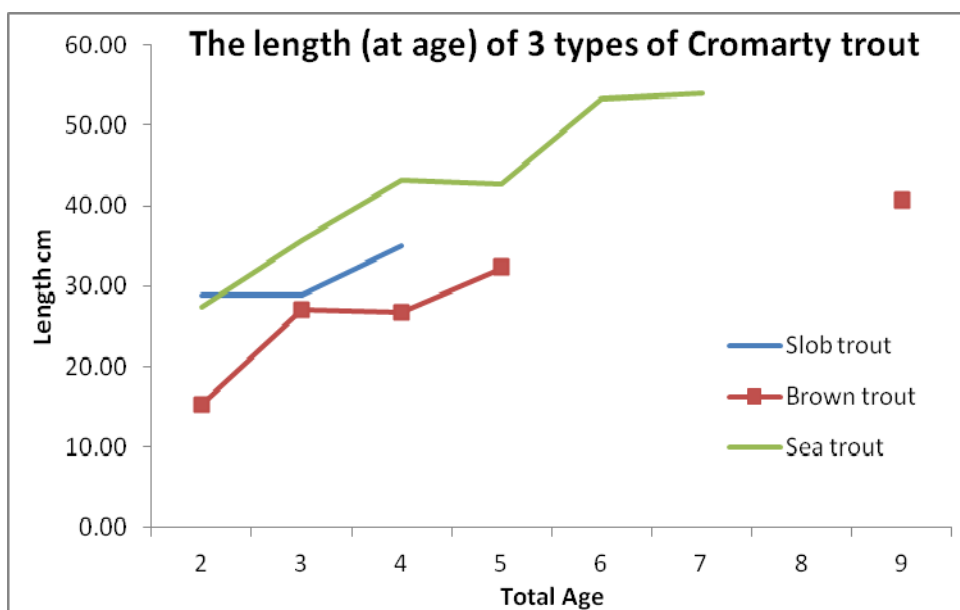
Graph 1. Spawning Marks. This graph shows the number of times that sea trout from the Kyle, Cromarty and Deveron samples have previously spawned. The majority have not spawned before and are being caught as maiden fish (blue) while the Deveron sample includes more fish on their second (red) and third (green) spawning runs. Trout that have spawned more than 3 times are very rare.



Graph 2. Number of sea winters. This graph shows the number winters the sea trout have caught at sea before being caught. The obvious difference between the three samples shows that far more of the Cromarty trout are being caught as finnock (blue) before spending a full winter at sea. The Deveron and Kyle have a larger proportion of trout having spent one or more winters at sea.



Graph 3. Length at sea age. This graph shows the average length of sea trout from the Kyle, Cromarty and Deveron collections at different sea ages (number of winters spent at sea). The graph shows that at any given age the Deveron (purple) sea trout are larger, implying they are accessing better food sources at sea. The Kyle and Deveron fish are smaller, perhaps because they are feeding closer to shore in the Inner Firths.



Graph 4. The relative length of 3 types of trout from the Cromarty Firth. Sea trout (green) grow the quickest and are the largest due to the plentiful food supplies at sea. The slob trout (blue) are feeding in the estuary but are not as big as the sea trout. The brown trout (red) are smallest feeding in the river mainly on invertebrates rather than fish. This illustrates the different ecological niches these trout are using within the Cromarty ecosystem,

Trout (*salmo trutta*) have many different names depending on their life history type:

Brown trout: Trout that don't migrate to sea, they stay in fresh water in our rivers and lochs. Although often thought of as resident they can still migrate a long way within a river. Varied in appearance but typically brown and spotty.

Sea trout: Trout that migrate to sea to feed. Some migrate far like those from the Tweed that migrate to the Wadden Sea. Others stay closer to home in our firths, estuaries and sea lochs. They are silvery in the sea but become coloured once they return to the river. **Finnock** are sea trout returning to the river in the same year as their first sea migration.

Slob trout: Trout that migrate to the estuary to feed in this productive brackish environment. They can become semi silvered like sea trout but often look more like brown trout.

Ferox trout: 'Ferox are long-lived, late-maturing, piscivorous (feed on fish) brown trout which in Britain and Ireland, are often present in large, deep glacier-formed lakes containing Arctic Charr or whitefish species' (**Campbell 1979**).