



River Conon sea trout scale collection report

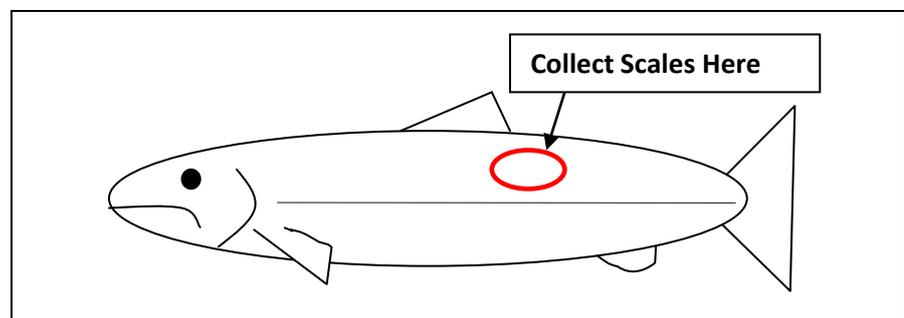
Marcus Walters & Dr Andy Walker 2011

1. Scale Collection

Over the last 4 fishing seasons (2008-2011) the MFSTP has recruited volunteer anglers and ghillies to collect scales from sea trout in the Moray Firth area. Local Fisheries Trusts and Boards have also contributed scales they have collected during routine fieldwork and the MFSTP has undertaken various sampling strategies to further increase the collection effort. Volunteers were supplied with a detailed protocol explaining how to take scales from the flank between the trailing edge of the dorsal fin and the lateral line (See diagram), by scraping with the point of a knife or with forceps. They were also supplied with MFSTP scale collection envelopes which required details of date, location and method of capture, body length (mm) from tip of nose to fork of tail, weight (g), sex and any other supplementary information. Scales are deposited inside by gentle finger pressure upon the outsides of the packets as the knife or forceps is withdrawn and then left to air dry.

SEA TROUT
Name.....
Length.....
(Tick if accurately measured)
Weight.....
Date.....
Place.....
Sex.....
Remarks.....

Moray Firth
Sea Trout Project



Scale Envelope and diagram of where to collect scales.

2. Scale Reading Method

Using low-power microscopy, the dry scales with complete centres are pressed between two thin celluloid strips. This creates a "finger print" impression of the scales in the celluloid from the circular growth ridges (cerculi) and the image of the permanent impression can then be projected onto a scale reading screen. From the pattern of cerculi key aspects of sea trout life history can be determined; age at smolt migration, age at first spawning, overall age, number of SMs and growth performance, especially at sea. Each of these biological aspects may vary from stock to stock and may change over time.

As reading sea trout scales is complex and requires a lot of experience the MFSTP used Dr Andy Walker to read the scale collections. Results were validated by repeated blind readings and repeated readings by independent scale reading experts. Due to the complex movements of sea trout to and from the sea, especially at the finnock (0+ sea winters) stage average growth patterns may only become clearer by reading scales from many fish, requiring large samples to be made available.

3. Scale results and Analysis

Due to the range of methods and different sources used to collect scales a degree of caution has to be adopted when comparing results within and between scale collections. Each capture method will involve some bias in size selection, capture efficiency, seasonal timing, and location. However, the coverage and number of scales collected across the Moray Firth region would not have been feasible using only one method and the results provided are essential to better understanding the life history of Moray Firth sea trout.

4. The River Conon Scales

The MFSTP has collected 60 sets of sea trout scales from anglers, ghillies and netmen on the Conon and Cromarty Firth during the period 2008 to 2011. The results of the scale reading and analysis are shown in Figures 1-7.

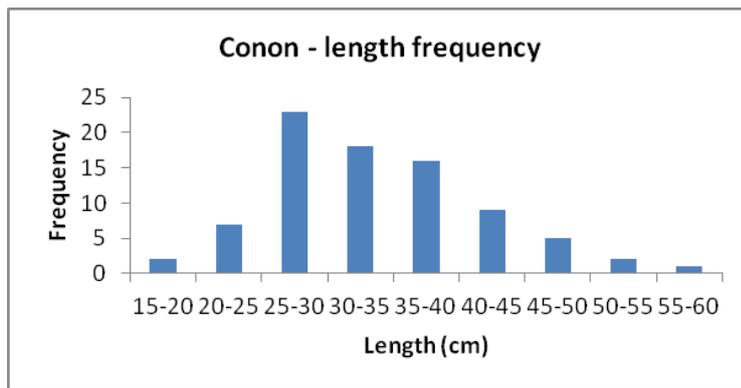


Figure 1, Conon sea trout length frequency distribution. The average length was 33.2 cm with the largest being 58cm and the smallest 17cm.

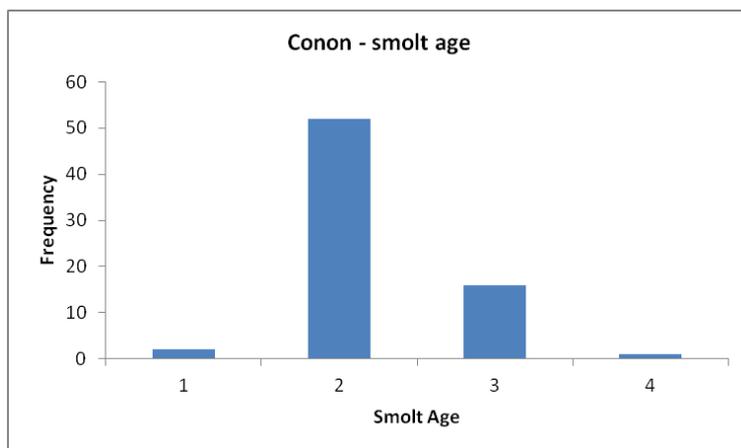


Figure 2, Conon sea trout smolt age. The majority, (73%) of the Conon sea trout sample smolted at 2 years old and 22q% at 3 years old. This has changed from the 1920s when G.H. Nall found the majority smolted at 3 years old.

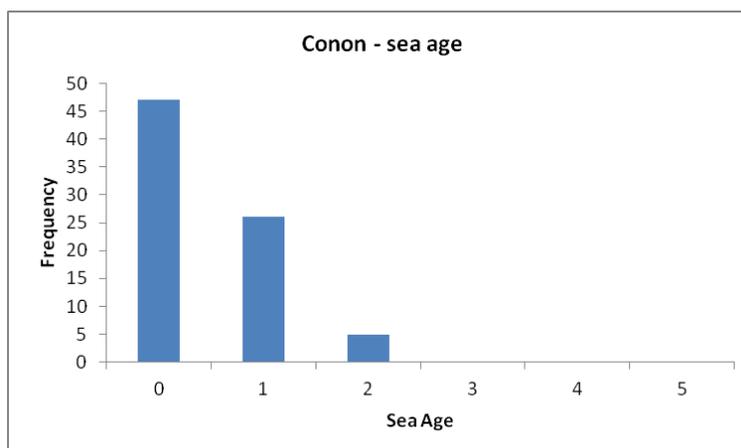


Figure 3, Conon sea trout sea age. 60 % of the sea trout in the collection had a sea age of zero while 33% have been at sea for 1 year and only 5 fish had spent 2 years at sea before being caught in the river. The fish with a sea age of "0" had not spent a full year at sea before being caught they may be immature or returning as finnock.

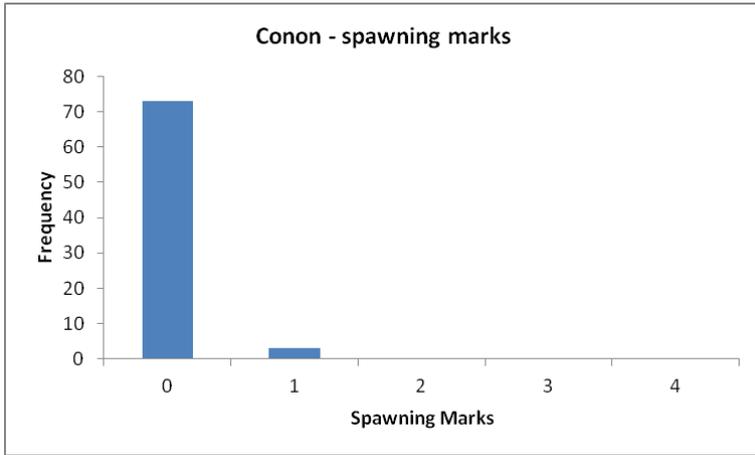


Figure 4, Conon sea trout spawning marks. The majority of the sea trout had not spawned before (96%). Only 3 fish had spawned once already.

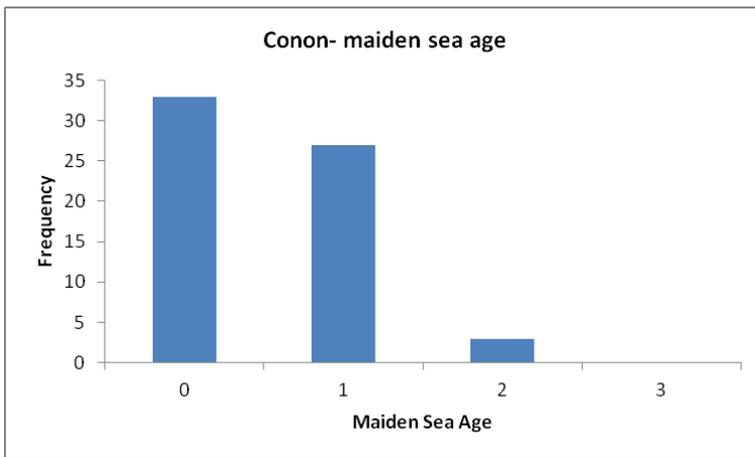


Figure 5, Conon sea trout maiden sea age. The majority of trout (52.4%) in the collection have spent less than one year at sea after smolting before returning to the river as maiden fish having not spawned before. 42.9% have spent 1 year at sea and 3 fish have spent 2 years at sea before returning for the first time.

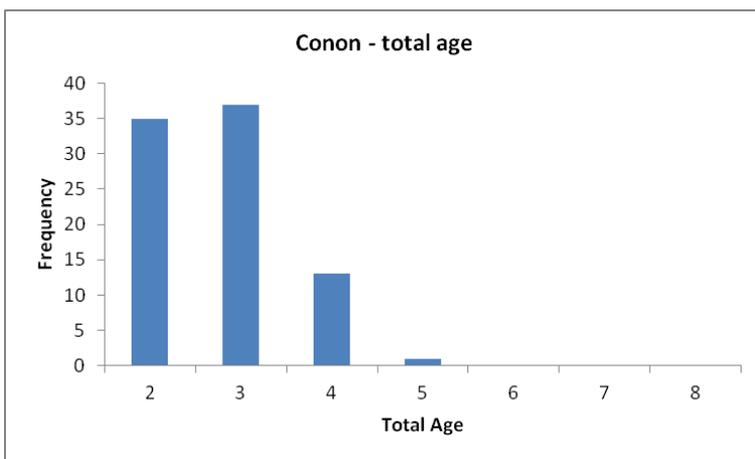


Figure 6, Conon sea trout total age. The majority of sea trout in the collection (83.7%) had a total age of 2 or 3 years. They smolted at 2 or 3 years old (Fig 2), been at sea for less than a year (Fig 3) before returning to the river for the first time when they were caught. The 4 year old fish have smolted at 3 and spent 1 year at sea or smolted at 2 and spent 2 years at sea.

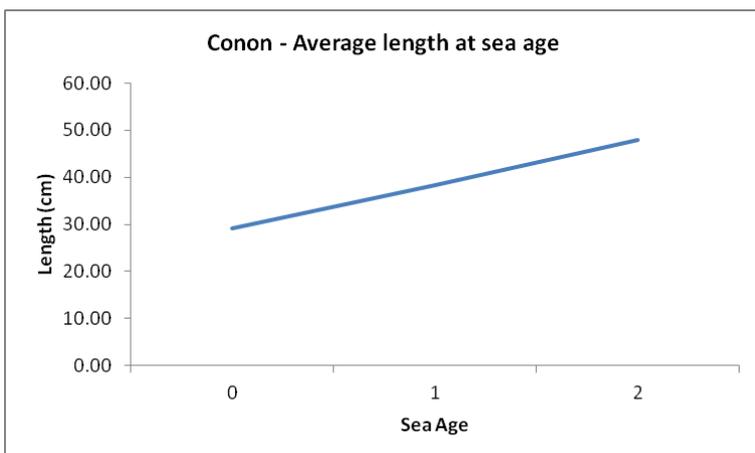


Figure 7, Conon average length at sea age. The average length of sea trout at sea age is a good a measure of the growth rate of fish and an indicator of growth at sea. This can be compared with other populations.

Summary:

This collection of scales came from trout on average 33.2 cm long, typically having smolted and left the river at 2 years old before going to feed in the Cromarty Firth / sea. The majority were caught as finnock before they had spent a whole year at sea but it is not possible to determine whether they were returning to spawn or not. Very few of the trout had previously spawned and the majority spawn after a year or less at sea.