RESTRICTED

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

Serial No.2061
(B.g.14)

ICES/ICNAF Salmon Doc.68/16
(also ICNAF Res.Doc.68/73)

ANNUAL MEETING - JUNE 1968

A PROPOSED METHOD OF TABULATING SCALE INTERPRETATIONS AND AGE CLASSES OF ATLANTIC SALMON (Salmo salar L.)

by

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Varying methods for designating ages of Atlantic salmon (Salmo salar L.) are available. Roman and arabic numerals, subscripts and superscripts, and combinations of these have frequently led to confusion on the part of the workers in the field of salmon biology. Confusion has existed not only between organizations but within agencies.

In an effort to combat this confusion we undertook a revision of existing methods of tabulating salmon ages. It was felt the tabulation method should be adaptable to the symbols readily available on a standard typewriter. In addition, the method should indicate the following: (1) a clear separation of fluvial and marine growth periods; (2) spawning marks on the scales of repeat spawners; (3) growth prior to migration as a smolt, growth after spawning marks, and growth prior to entrance or capture; and (4) total age of the fish.

With the above requirements in mind we chose the following symbols and definitions.

(1) Whole numbers (arabic) are used to indicate years, or winters, of life either before or after migration from the stream, and for years at sea in which no spawning occurred.

(:) A colon is used to separate fluvial and marine growth periods.

(,) A comma is used to separate years of marine growth from years in which spawning takes place. It can be used to represent the annulus.

(+) A plus is used to indicate growth after the annulus, or before or after the spawning mark during any one year of life.

(S) Use of the capital letter 'S' denotes that spawning has occurred and a spawning mark is present on the scales. The letter represents a whole year of life if enclosed by commas.

The application of these symbols to the tabulation of age classes can perhaps be more clearly understood by examples. Using the terms for Atlantic salmon life stages proposed by Allan (1965), ages would be tabulated and interpreted as follows:

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Term	Age	Interpretation
Parr	2,+	A two-winter parr. Scale interpretation indicates growth following the second annulus, and this is shown by the plus sign. The comma is used to indicate the annulus.
Smolt	3:	A three-winter fish migrating downstream as a smolt, The colon is used here to designate the smolt migration. Use of a plus sign before the colon would indicate additional growth prior to migration and would be synonymous with the 'B' -type smolt defined by Went (1938).
Post-smolt	2:+	A fish captured during the first year at sea. This example indicates the fish migrated as a two-year-old smolt. The plus sign indicates growth after migration.
Salmon	3,+:1,+	Adult salmon captured after one winter at sea (grilse). Age designation shows this fish migrated as a three-year-old smolt. The plus before the colon denotes some growth after the annulus and prior to migration. The plus after the first complete year at sea indicates growth after annulus formation and prior to capture. Capture could be either in fresh or salt water.
2nd time Spawner	2:2,S,1,+	Adult salmon with spawning mark on scales. This fish is six winters old. It migrated as a two-year-old smolt and spent two winters at sea before returning to spawn. It spent a full year on the spawning migration. After spawning it returned to the sea for another full year of feeding. Scales indicate no sea growth after 2nd sea annulus or after the spawning mark. The plus denotes growth at sea following the last annulus and prior to capture.

Year class and year of smolt migration can be determined rapidly from the designations. For example, let us take a fish aged by scale interpretation and tabulated as 3:2,S,+. If the fish had been captured in the summer of 1965, it can be seen that it had spawned in the fall of 1964. Summer growth in 1965 after annulus formation is apparent on the scales. Reading the age designation from right to left we see this fish was a smolt in the spring of 1962 and had spent three winters in the stream. Therefore, this fish is assigned to the 1959 year class.

This method is adaptable to all age classes encountered by the salmon fisheries biologist and gives a more accurate symbolic picture of scale interpretation than many existing methods. The above approach will not increase the accuracy of age determinations for this depends upon a knowledge of local populations that can be gained by experience only.

Universal adoption of the above suggested method of age designation or some other standardized approach would do much to eliminate the current confusion amongst salmon biologists.

Literature Cited

Allan, I.R.H. 1965 Statement and revised terminology list for Atlantic salmon (Salmo salar L.). ICES, Salmon and Trout Comm., No. 28, 6pp.

Went, A.E.J. 1938 Salmon of the River Shannon. Proc. Roy. Irish Acad., 44, B. 11.