The Abundance of the Barents Sea Herring
of the 1959 Year Class in the Norwegian Sea

by

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Summary

The present paper deals with the abundance of the Barents Sea herring of the 1959 year class as compared with the herring of the 1950 year class.

In the 1959 year class the Barents Sea herring form a greater part both in the year class itself and in the total stock in the Norwegian Sea in comparison with the 1950 year class.

The peculiarities in the growth rate and in the scale structure specified by habitats of the Atlanto-Scandian herring during their first years of life make it possible to separate an adult stock of the Norwegian Sea herring into two groups : Norwegian herring and Barents Sea herring. (Table 1).

A similar analysis and determination of the abundance of the Barents Sea herring was carried out for the first time for the 1950 year class (Seliverstova, 1968).

The Barents Sea herring of the 1950 year class differed clearly from the Norwegian herring by their growth rate, due to different environmental conditions during their first years of life.

In herring of the 1959 year class which grew up in the western Barents Sea the growth rate proved to be similar to that of herring from the northeastern areas of the Norwegian Sea and this is due to the same environmental conditions in both areas (Seliverstova, 1970).

While separating the herring of the 1959 year class into Norwegian and Barents Sea herring by comparison of their growth rates, the specimens with the C-growth type (scale formulas are N 3 + 1, N 3 + 2) were not attributed to any contingent , their growth rate being similar to that of both the Barents Sea herring and the Norwegian herring. This is why the method of

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estimation of the probability of disagreement between the experimental curves was used (Dlin, 1958).

This method clearly showed a difference between the herring of type C (N 3 + 1, N 3 + 2) and the Norwegian ones and an identity with the Barents Sea herring; it also confirmed the author's conclusions obtained when using the comparative method as to whether fish of the 1959 year class with other growth types and scale formulas belonged to one or another contingent.

The reliability of this mathematical method was checked for herring of the 1950 year class and the results proved to be similar to those obtained by the method of comparison for the growth rates.

An examination of the herring of the 1959 year class showed that the given year class includes specimens with both the southern and northern types of scales and those with natural marks on scales of the northern type (N') or, to put it differently, "marked" herring. Herring with natural marks on scales or "marked" herring have an abnormally high increment during their second year of life (Seliverstova, 1970) as compared to other herring.

Usual and "marked" herring with the northern type of scales enter the Norwegian and Barents Seas contingents. The abundance of these groups in the 1959 year class is shown in Figure 2.

As it is evident from Table 3, in the 1959 year class the Barents Sea specimens form a greater part both in the year class itself and in the total stock of herring in the Norwegian Sea when compared with those of the 1950 year class.

References

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Table 1   Growth types and scale formulas of the Atlanto-Scandian herring of the 1950 and 1959 year classes

Growth type	Scale Formula			
	Norwegian herring		Barents Sea herring	
	1950	1959	1950	1959
A	N 2 + 1 N 2 + 2	N 2 + 1 N 2 + 2	N 6 + 0 N 6 + 1	N 3 + 0 N 3 + 1 N 3 + 2
B	N 2 + 1 N 2 + 2	N 2 + 1 N 2 + 2		
C	N 3 + 1 N 3 + 2	N 3 + 0	N 6 + 0 N 6 + 1	N 3 + 1 N 3 + 2
B-C	N 2 + 1 N 2 + 2 N 3 + 1 N 3 + 2	N 2 + 2 N 3 + 1		
D			N 4 + 1 N 4 + 2 N 6 + 0 N 6 + 1	N 4 + 0 N 4 + 1 N 4 + 2
C-D			N 4 + 1 N 4 + 2 N 6 + 0 N 6 + 1	N 4 + 0 N 4 + 1 N 4 + 2

Table 2   Abundance of herring with different types of scales in the 1959 year class in the Norwegian Sea in 1962-1966.

Age	Abundance of herring of the 1959 year class	Herring with scale types incl.		
		S	II + II'	
			Norwegian herring	Barents Sea herring
3	$\frac{46.8}{1.6}$	$\frac{8.3(17.7)}{0.3}$	$\frac{25.1(53.6)}{0.8}$	$\frac{13.4(28.7)}{0.5}$
4	$\frac{66.3}{3.2}$	$\frac{5.2(7.8)}{0.3}$	$\frac{27.8(41.9)}{1.3}$	$\frac{33.2(50.3)}{1.6}$
5	$\frac{66.7}{5.6}$	$\frac{7.3(10.9)}{0.6}$	$\frac{19.3(28.9)}{1.6}$	$\frac{40.2(60.2)}{3.4}$
6	$\frac{63.9}{5.1}$	$\frac{6.7(10.5)}{0.5}$	$\frac{15.9(24.8)}{1.3}$	$\frac{41.3(64.7)}{3.3}$
7	$\frac{56.0}{3.2}$	$\frac{4.5(8.0)}{0.2}$	$\frac{11.9(21.1)}{0.7}$	$\frac{39.6(70.9)}{2.3}$

Note :   in the numerator = %
in the denominator = mill.t.
in brackets = a portion of herring in the 1959 year class.

Table 3   Abundance of the Barents Sea herring in the 1950 and 1959 year classes in the Norwegian Sea.

Age	Total abundance of year classes		Abundance of Barents Sea herring	
	1950	1959	1950	1959
3		$\frac{46.8}{1.6}$		$\frac{13.4(28.7)}{0.5}$
4	$\frac{21.9}{2.7}$	$\frac{66.3}{3.2}$	$\frac{0.8(3.5)}{0.1}$	$\frac{33.2(50.3)}{1.6}$
5	$\frac{31.9}{4.4}$	$\frac{66.7}{5.6}$	$\frac{2.7(8.4)}{0.4}$	$\frac{40.2(60.2)}{3.4}$
6	$\frac{35.4}{4.3}$	$\frac{63.9}{5.1}$	$\frac{7.4(21.0)}{0.9}$	$\frac{41.3(64.7)}{3.3}$
7	$\frac{39.2}{3.7}$	$\frac{56.0}{3.2}$	$\frac{13.9(35.4)}{1.3}$	$\frac{39.6(70.9)}{2.3}$
8	$\frac{39.2}{2.6}$		$\frac{12.8(32.5)}{0.8}$	

Note: in the numerator = %
in the denominator = mill.t.
in brackets = a portion of the Barents Sea herring in the
1950 and 1959 year class.