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1986 5Ze Haddock Age Comparisons  
by two Canadian Agers

by

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## Abstract

An alternate age reader for the 5Ze haddock stock was assigned in 1987, and a new preparation technique was employed. Comparative readings of 1986 commercial and research survey samples were completed. Results indicate an average of 76% agreement for commercial samples, and 92% agreement for research survey samples. The new reader tended to over-age 19.6% relative to the former reader. Ages from 1986 and 1987 samples confirmed the predominance of the same year-classes, and no significant differences in age interpretation were disclosed by the new age reader.

## Résumé

Un autre technicien a été affecté en 1987 à la détermination de l'âge des aiglefin du stock de 5Ze et une nouvelle technique de préparation a été utilisée. Des lectures comparatives des échantillons de 1986 des prises commerciales et des relevés de recherche ont été réalisées. Les résultats obtenus indiquent une correspondance moyenne de 76 % pour les échantillons commerciaux et de 92 % pour les échantillons des relevés. Le nouveau lecteur avait tendance à surestimer l'âge de 19,6 % par rapport au précédent. Les âges déterminés à partir des échantillons de 1986 et 1987 ont confirmé la prédominance des mêmes classes d'âge et aucun écart appréciable entre les interprétations des âges n'a été démontré par le nouveau lecteur.

## INTRODUCTION

A recent personnel change in Canadian agers for the NAFO Subdivision 5Ze haddock stock necessitated comparative readings with former readers, and a general re-evaluation of preparation techniques and interpretation of ageing material. Good historical consistency of haddock age data was maintained by a single ager (R.Thurber) for a twenty year period. Subsequent to his retirement in 1982, a series of readers assumed responsibility for this work; Nelson in 1983, McFarlane from 1984-86, and Strong in 1987. Comparability of McFarlane's ages with U.S. ages for 5Ze haddock was tested in 1986 (Waiwood et al 1986).

Training of the new incumbent (Strong) has relied mainly upon his background in reading pollock, since the standards for interpretation and appearance of growth ring structures are very similar among gadid species. In addition, comparative readings of 1986 haddock samples were performed, and results are summarized in this report.

## METHODS

Commercial and survey cruise otolith samples were prepared for reading by McFarlane using the traditional technique of breaking each specimen through the focus, and viewing the cross-section with reflected light. The anterior ends were mounted in plasticene, immersed in ethanol as an optical medium, and viewed with a Wild 5 stereoscope at 25X.

Two separate ageing comparisons were made of 5Ze haddock. In both cases, samples were re-aged by Strong with only length information available for each specimen at the time it was aged. The first ageing comparison was based on samples collected from unit areas 5Zej and 5Zem from the May 1986 research survey by the RV "Alfred Needler" (N059). The second comparison was done using 1986 samples from the commercial stern trawl and long-line fisheries in unit area 5Zej.

As a general comparison of the data produced by the two agers, the spring 1986 Georges Bank survey (N059 aged by McFarlane) is compared with the spring 1987 Georges Bank survey (N077 aged by Strong). It should be noted that different preparation techniques were used for the two surveys; the latter employing sectioning methods as described by Strong et al 1985.

## RESULTS AND DISCUSSION

The first ageing comparison, using research survey data,

indicated an overall agreement of 92% (Figure 1). It should be noted that half of the disagreements were at age 8 and over, suggesting differences in interpretation of marginal annuli in older fish, a normal problem due to close ring spacing. One specimen was rejected due to a suspicious length recording. The three remaining disagreements of one year do not suggest any trends of underageing or overageing, or any fundamental differences in interpretation.

The second comparisons, using commercial samples, are summarized in Table 1, and in Figures 2 to 7. The overall agreement between the the two readers was 76% for the 6 samples examined. This level is heavily influenced by one sample of particularly low agreement (55% in sample 860270), (Figure 2). It is immediately evident that almost half of those fish aged three by McFarlane were interpreted as age four by Strong.

The trend for Strong to overage relative to McFarlane is evident in Table 1 (19.6%), and with the exception of sample 860270, it seems to occur mainly with the older fish. If the poor sample is excluded from the results, agreement improves to over 80%, and percentage overaged to 15%.

The source of disagreement for sample 860270 may be the result of problems in sample preparation. It was generally noted by Strong that many of the specimens were broken too far to the anterior end of the otolith, thus making the first annulus small or even vestigial in appearance. When this occurs, it is easy to confuse the second annulus as a large first annulus, a typical characteristic of 5Ze fish.

The overall results of the Strong/McFarlane comparative readings for both commercial and survey data of 1986 concur that the 1983 year-class is strong relative to adjacent year-classes, as reported in the 1986 assessment (Gavaris and Waiwood 1987). This result is further supported by data from the 1987 survey of NAFO Subdivision 5Ze in March (N077), in which ageing by Strong results in a preponderance of four year old fish. The progression of the 1983 year-class can be seen when mean numbers at age per tow are compared for N059 (Mc Farlane) and N077 (Strong) in Figure 8.

#### CONCLUSIONS

Results indicate that no substantial differences in interpretation exist between the two readers; and that different preparation techniques have had little impact on the historical consistency of the 5Ze haddock age data produced in St Andrews.

## LITERATURE CITED

Gavaris, S., and K.G. Waiwood. 1987. Assessment of haddock in NAFO division 5Z. CAFSAC Res.Doc 86/87.

Strong, M., J. J. Hunt and R. K. Robicheau. 1985. A new method of preparing gadoid otoliths. CAFSAC Res. Doc. 85/70

Waiwood, K.G., J. Penttila, N. Mc Farlane, N. Munroe, and S. Gavaris. 1986. 1986 Canada/U.S.A. age comparisons for 5Z haddock. CAFSAC Res.Doc. 86/86.

Table 1. Results of comparative readings of 1986 commercial haddock samples from unit area 5Zj between Strong and Mc Farlane.

Sample	n	% agree	% Strong over Mc Farlane	% Strong under Mc Farlane
860270	31	55	42	3
860289	35	71	22	7
860291	31	77	19	4
860443	20	95	5	0
860470	32	84	13	3
860581	35	74	17	9
mean	30.7	76.0	19.6	4.3

## Age Comparisons of Strong versus McFarlane

Figure 1

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1	26												
	2		4											
	3			38	1									
	4				10	1								
	5					1								
	6					1	4							
	7							4	1					
	8								2					
	9													
	10													
	11									1		2		
	12											1		
	13												1	

1986 March 5Z survey of Georges Bank (N059)

Agreement 93%

n 98

## Age Comparisons of Strong versus McFarlane

Figure 2

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1													
	2		2											
	3			10	8									
	4				1	3								
	5					2								
	6						1		1					
	7								1					
	8							1	1					
	9													
	10													
	11													
	12													
	13													

Sample 860270 Area 5Zj Haddock

Agree 55%

Over 42%

Under 3%

n 31



Age Comparisons of Strong versus McFarlane

Figure 3

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1	1												
	2		2											
	3			15	1									
	4				3	1	1							
	5					1								
	6							1						
	7						1	1	2					
	8							1	2	1				
	9										1			
	10													
	11													
	12													
	13													

Sample 860289 Area 5Zj Haddock  
 Agree 71%  
 Over 22%  
 Under 7%  
 n 35

Age Comparisons of Strong versus McFarlane

Figure 4

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1													
	2													
	3		1	16	2									
	4													
	5					4								
	6						2	2	1					
	7											1		
	8								2					
	9													
	10													
	11													
	12													
	13													

Sample 860291 Area 5Zj Haddock  
 Agree 77%  
 Over 19%  
 Under 4%  
 n 31

Age Comparisons of Strong versus McFarlane

Figure 5

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1	3	1											
	2		1											
	3			15										
	4													
	5													
	6													
	7													
	8													
	9													
	10													
	11													
	12													
	13													

Sample 860443 Area 5Zj Haddock  
 Agree 95%  
 Over 5%  
 Under 0%  
 n 20

Age Comparisons of Strong versus McFarlane

Figure 6

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1													
	2													
	3			15	1									
	4				3	1	1							
	5					2		1						
	6					1	1							
	7							2						
	8								2					
	9													
	10										1			
	11											1		
	12													
	13													

Sample 860470 Area 5Zj Haddock  
 Agree 84%  
 Over 13%  
 Under 3%  
 n 32

Age Comparisons of Strong versus McFarlane

Figure 7

		Strong												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Mc Farlane	1													
	2													
	3			11	2									
	4													
	5					3	1							
	6						3	1						
	7						1	2						
	8								6	1				
	9									1				
	10									1			1	
	11										1			
	12													
	13													

Sample 860581 Area 5Zj Haddock  
 Agree 74%  
 Over 17%  
 Under 9%  
 n 35

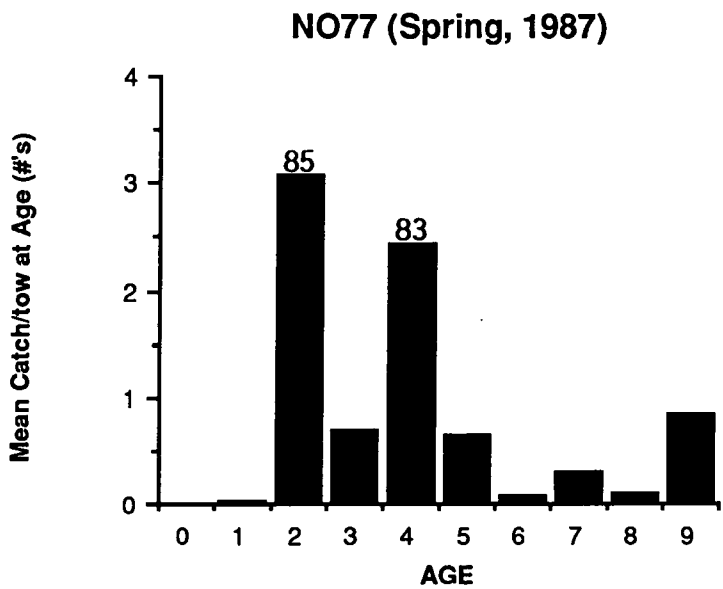
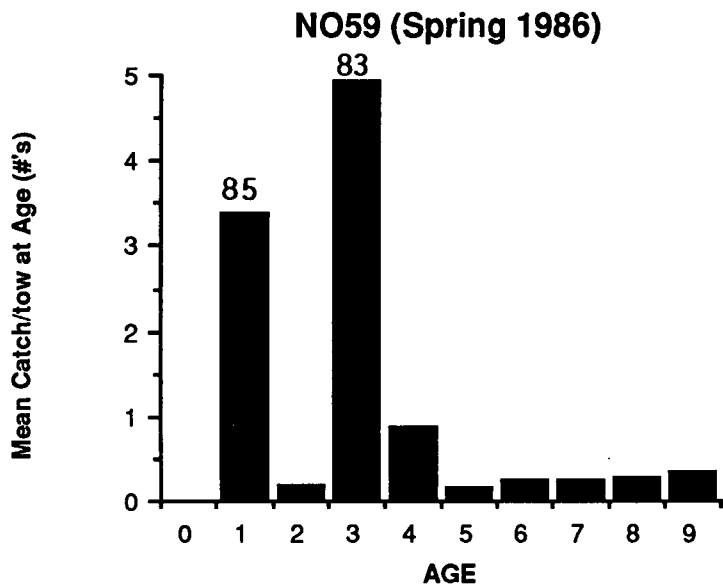


Figure 8. Stratified mean catch per tow at age (numbers) for haddock from DFO surveys on Georges Bank.