

Northwest Atlantic



Fisheries Organization

Serial No. N2734

NAFO SCR Doc. 96/58

SCIENTIFIC COUNCIL MEETING - JUNE 1996

Age Structure of Roughhead Grenadier (*Macrourus berglax*) on Flemish Cap, 1995

by

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We present in this paper the age-length keys and the total biomass estimated by the swept area method. The relationship between total length and anal-fin length of *Macrourus berglax* on Flemish Cap, 1995 is also analyzed. The data are compared to those obtained in previous years.

### INTRODUCTION

The depth range for *Macrourus berglax* is of 200-1400 m. (Snelgrove and Haedrich, 1984). The individuals sampled in this survey were caught in depths less than 720 m. The otoliths were read by sexes. The maximum age for females was of 15 years old (30-32 cm AFL), and of 10 years old for the males (19-21 cm AFL).

### MATERIAL AND METHODS.

The otoliths were broken through the nucleus and read with light directed to the concave surface (Casas, 1994). The standard measure for Roundnose and Roughhead grenadiers is the anal-fin length (AFL) (Savvatimsky, 1986). Both total and anal-fin length were measured in 383 samples in order to analyze the relationship between the two (Atkinson, 1991).

### RESULTS.

Table 1 shows total biomass estimated by the swept area method from 1989. The biomass increase from 1989 to 1993 and decrease from 1994. The age-length keys by sexes are shown in Table 2. The age reading in larger fish (>9 years old) is more complicated since many rings are presented and they lie close to each other. The table 3 shows the age composition by sex of *Macrourus berglax* in 1995. Figure 1 shows anal-fin length distribution of Roughhead grenadier from 1993. The relatively abundant of 1986 and 1987 year-classes are identified with anal-fin length of 18,5-20 cm AFL in 1995 (8 and 9 years old). Figure 3 shows the mean anal-fin length by age in 1994 and 1995 for males and females. For both, the mean anal-fin lengths were similar between 4 and 10 years. Perhaps due to the small number of otoliths read, in females over 10 years and males under 4, the mean length by age varies with respect to 1994.

Figure 2 shows the relationship between anal-fin and total length on Flemish Cap, 1995. The relationship of all data was highly significant. The ratio of anal-fin length and total length changes with increasing fish size (Atkinson, D.B.,1991). The linear regression should not be used for conversions and was as it follows:

$$TL = 4,47 + AFL * 2,364$$

TL = total length

AFL = anal-fin length.

### REFERENCES

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Table1- Biomass swept area method estimates in Flemish Cap, 1989-1995

Years	Biomass (tons)
1989	1024
1990	1014
1991	1587
1992	1878
1993	3757
1994	2350
1995	1855

Table 2- Anal fin length-age by sex of *Macrourus berglax*, 1995

**Females**

Length (cm)	Age class													
	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5	1													
6	2													
7	3	2												
8		2	1											
9		7	3											
10		3	21	2										
11			6	8										
12			4	28	4									
13			1	14	7									
14				3	3									
15				3	6	2								
16				2	8	3								
17					3	7								
18						9	5	1						
19						2	12	8						
20							12	6	2					
21							3	6	6					
22								3	6	1				
23								1						
24									2	2				
25										2	1	1		
26											3			
27										1	1	2		
28												1	1	
29														
30														1
31														1
32														1
total	6	14	36	60	31	23	32	25	16	6	5	4	1	3

**Males**

Length (cm)	Age class													
	2	3	4	5	6	7	8	9	10	11	12	13	14	15
6	1													
7	1	2												
8	2	2												
9		4	4											
10		4	11	1										
11		2	9	13										
12				20	5									
13			1	5	6									
14				5	5									
15					9	1								
16				1	8	4								
17					4	19	1							
18					1	12	16	1						
19						4	16	8	1					
20							3	7	2					
21							1	2	2					
total	4	14	25	45	38	40	37	18	5					

Table 3- Age composition by sex of *Macrourus berglax*, 1995

Age class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	total
males		20	92	190	360	324	385	343	162	41						1917
females		38	104	247	443	259	180	240	192	111	39	33	27	7	22	1942
total		173	235	490	879	625	596	602	364	157	39	33	27	7	22	4249

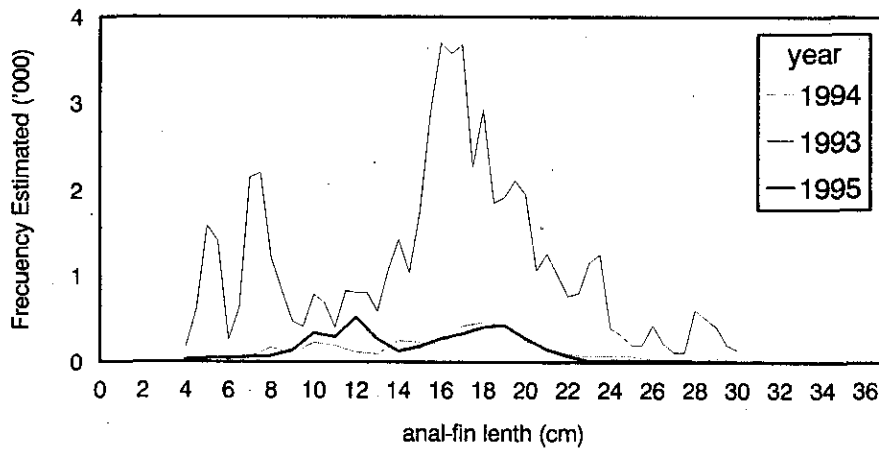


Fig 1- Anal-fin length distributions of Roughhead grenadier, 1993-95

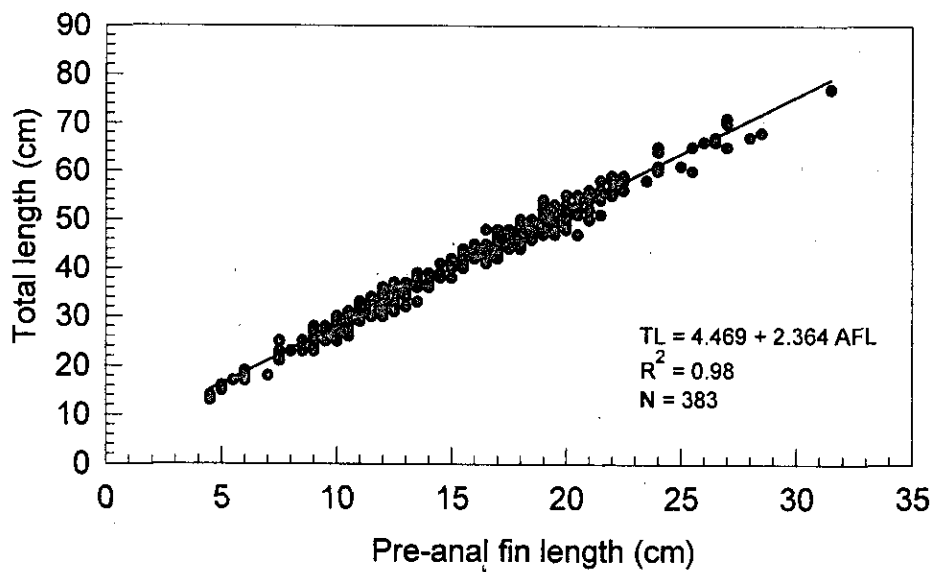


Fig.2 - Data points and derived relationship between total length and anal-fin length for Roughhead grenadier, Flemish Cap 1995.

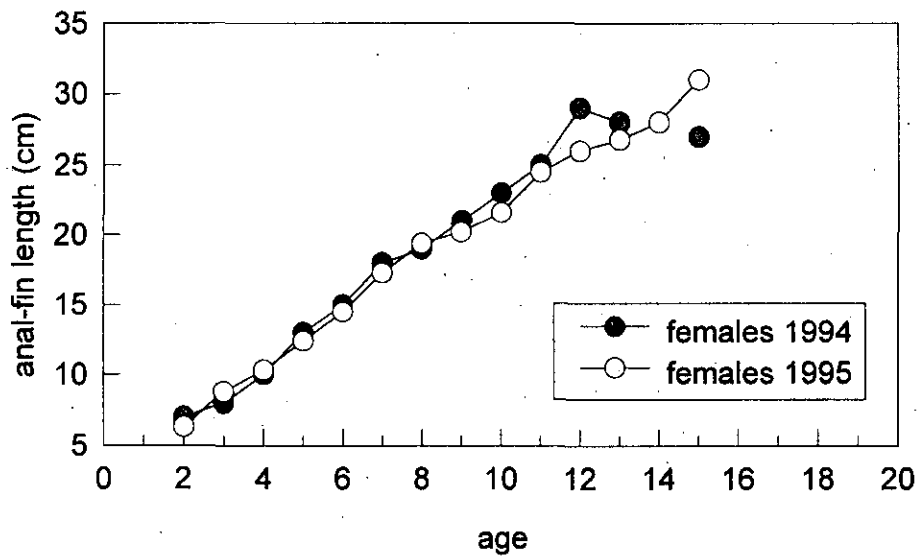
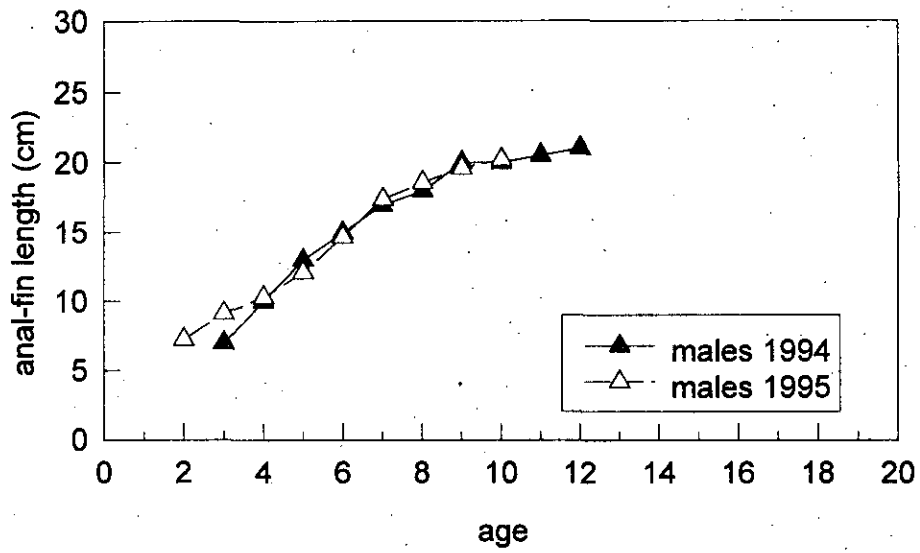


Fig.2- Mean anal-fin length (cm) by age, males and females 1994 and 1995.