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Calculation of catches and discards of juvenile fish in the various NAFO fisheries

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Abstract

The paper presents compiled information on catches and discards of juveniles in directed fisheries and by-catches in other fisheries for 21 stock units of fish groups in the NAFO Regulatory Area based on an inquiry among designated experts.

Introduction

The Fisheries Commission at its Annual Meeting in 1999 posed the following request to the Scientific Council: "The Scientific Council is requested to compile and review all information on catches and/or discards of juvenile fish in the various NAFO fisheries. The Scientific Council is requested to describe and evaluate the effectiveness of additional technical management measures aiming at reducing catches of juvenile fish and male shrimp in the various NAFO fisheries". The answer of this request was given in the Scientific Council Report from the June Meeting in 2000 with a table with information on catches and discards of juvenile, Tab. 1. This paper describes the way the values for catches and discards in weight and numbers in this table were calculated. Juveniles are defined as immature and calculated as fish smaller than L_{50} (using a knife-edge maturity ogive).

Rows in the table, Tab. 1, are divided by stock units and where information is available by fleet target species for the part that deals with by-catch in other fisheries. The columns, designated with a capital letter and a column name, are grouped into three generic headings with information on "Size limits", "Catches in directed fishery" and "By-catches in other fisheries". The eight columns under each of the two headings: "Catches in directed fishery" and "By-catches in other fisheries" are largely the same: Total (by-)catch in weight and numbers (columns C, D and K, L), (by-)catches of juveniles in weight and numbers (E, F and M, N), discarded (by-)catch in weight and numbers (G, H and O, P), discarded (by-)catches of juveniles in weight and numbers (I, J and Q, R).

Total catch in weight (C) are from the catch statistics including all reported discards in the directed fishery. Total catch in numbers (D) are the number of fish corresponding to the catch in column C. Catches of juveniles in weight (E) is the weight of the fish in the size distribution of catches less than L_{50} . Catches of juveniles in numbers (F) are the number of fish corresponding to the catch in column E. Discarded catch in weight (G) are all reported discarded catches. Discarded catch in numbers (H) are the number of fish corresponding to the catch in column G. Discarded juveniles in weight (I) is the weight of the discarded fish in the size distribution of catches less than L_{50} . Discarded juveniles in numbers (J) are the number of fish corresponding to the catch in column I.

The by-catches in other fisheries are calculated for each fleet. Total by-catch in weight (K) are from the by-catch statistics including all reported discarded by-catches. Total by-catch in numbers (L) are the number of fish corresponding to the catch in column K. Juveniles in by-catches in weight (M) is the weight of the fish in the size distribution of by-catches less than L_{50} . Juveniles in by-catches in numbers (N) are the number of fish corresponding to the catch in column M. Discarded by-catch in weight (O) are all reported discarded by-catches. Discarded by-catch in numbers (P) are the number of fish corresponding to the catch in column O. Discarded juveniles in by-catches in weight (Q) is the weight of the discarded fish in the size distribution of by-catches less than L_{50} . Discarded juveniles in by-catches in numbers (R) are the number of fish corresponding to the catch in column Q.

A graphical representation of the entities in column C through R is shown in Fig. 1.

Table 1 Overview of catch, bycatch, discard, bycatch of juveniles, discards of juveniles of relevant fish species and squid in the NAFO regulatory area for 1999 if not otherwise stated. The letters C., D., E., etc. in the columns refer to text and graphs in Figure 1.

Stocks	Size limits		Catches in directed fishery								By-catch in other fisheries								
	A Length of 50% mature female (L50), cm	B Minimum landing size, cm	C Total catch, t	D Total catch in numbers (000)	E Catch of juveniles, t	F Catch of juveniles in numbers (000)	G Discarded catch, t	H Discarded catch in numbers (000)	I Discarded juveniles, t	J Discarded juveniles in numbers (000)	K Fleet	L Total bycatch, t	M Total bycatch in numbers (000)	N Juveniles in bycatch, t	O Juveniles in bycatch in numbers (000)	P Discarded by-catches, t	Q Discarded by-catches in numbers (000)	R Discarded juveniles in by-catch, t	S Discarded juveniles in by-catch in numbers (000)
American plaice in Div. 3LNO	33	25	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	163	N/A	N/A	N/A	N/A	N/A	N/A	N/A
											Yellowtail flounder	252	N/A	N/A	N/A	N/A	N/A	N/A	N/A
											Skate/Greenland halibut	1,243	N/A	N/A	N/A	N/A	N/A	N/A	N/A
											TOTAL	1,658	2,098	84	338	N/A	N/A	N/A	N/A
American plaice in Div. 3M	34	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut/Redfish	255	200	1	3	N/A	N/A	N/A	N/A
CapeLIN in Div. 3NO	14-36	N/A	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cod (Div. 2J3K1)	about 43	N/A	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cod in Div. 3M	43-47	45	253 2)	189 2)	13 2)	14 2)	N/A	N/A	N/A	N/A	Redfish	3	2	0	0	N/A	N/A	N/A	N/A
Cod in Div. 3NO	N/A	41	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Skate	504	N/A	N/A	N/A	N/A	N/A	N/A	N/A
											Other	325	N/A	N/A	N/A	N/A	N/A	N/A	N/A
											TOTAL	829	98	16	15	N/A	N/A	N/A	N/A
Eelsoberanchs	55	None	16,274	N/A	-500	N/A	433	N/A	N/A	N/A		-662 2)	N/A	N/A	N/A	117	N/A	N/A	N/A
Greenland halibut in Div. 1A, Inshore	N/A	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greenland halibut in SA 0-1	52	None	9,667	6,195	5,290	5,838	-0	-0	-0	-0	Shrimp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Greenland halibut in SA 2-3R1, HHO	74.1, 81.2	35	24,232	23,202	21,973	23,806	N/A	N/A	N/A	N/A	Shrimp	85	N/A	85	N/A	N/A	N/A	N/A	N/A
Other finfish in SA 1	N/A	None	4,803	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shrimp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Redfish in Div. 3LN	28-30	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	2,300	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Redfish in Div. 3M	29	8	1900	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shrimp	55	1,434	55	1,434	N/A	N/A	N/A	N/A
Redfish in SA 1	25	None	98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shrimp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roughhead grenadier in SA 2+3	26	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	7,052	13,078	5,149	12,568	N/A	N/A	N/A	N/A
Roughnose grenadier in SA 0+1	N/A	None	30	N/A	N/A	N/A	-0	-0	-0	-0	Shrimp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roughnose grenadier in SA 2+3	N/A	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	83	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Squid in SA 3+4	N/A	None	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Silver hake	294	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Witch flounder (Div. 2J3K1)	40	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Witch flounder in Div. 3NO	44-46	None	NDF	NDF	NDF	NDF	NDF	NDF	NDF	NDF	Greenland halibut	800	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Yellowtail flounder in Div. 3LNO	34	25	5,413	N/A	N/A	0	N/A	N/A	N/A	N/A	Greenland halibut	96	N/A	N/A	6%	N/A	N/A	N/A	N/A
											Greenland halibut/Redfish	300	N/A	N/A	7%	N/A	N/A	N/A	N/A
											Skate	752	N/A	N/A	17%	N/A	N/A	N/A	N/A
											TOTAL	1,148	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: Not available, NDF: No directed fishery, NCP: non-contracting parties.
 1) All data for 1998 2) NCP 3) Canada bycatches <50 t 4) 0.1% for Canada

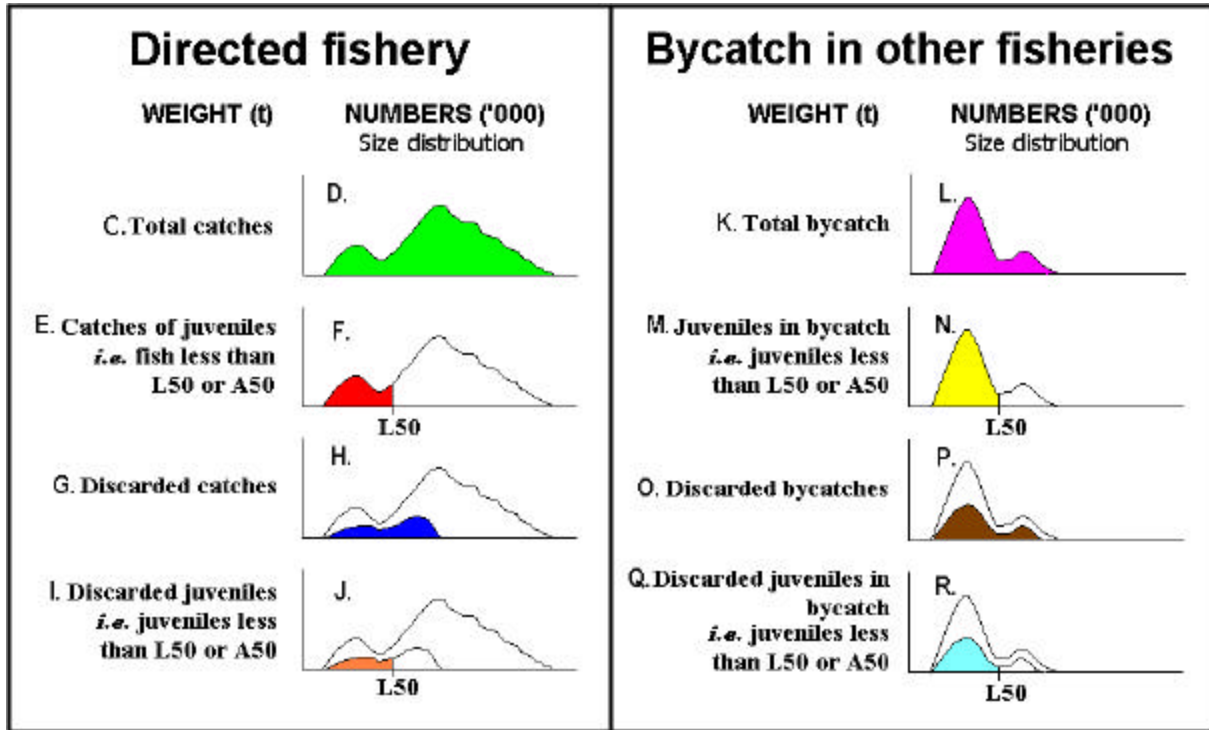


Figure 1 Graphic representation of statistics captured in Table 1. The letters C., D., E., *etc.* refer to the columns in Tab. 1.