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(A.c.4)ICNAF Res.Doc. 72/63ANNUAL MEETING - JUNE 1972Efficiency of Sampling

by

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In order to assess the adequacy of sampling the various fish stocks for length and age by the countries fishing in the Northwest Atlantic, the Statistics and Sampling Subcommittee recommended in 1970 that tables be prepared showing for each species, division, country and gear the number of fish sampled for length and age in relation to total catch (*Redbook* 1970, Pt. I, p.71). Data for the years 1969 and 1970 are presented in the Appendix to *Sampling Yearbook*, Volume 15.

Tables A and B present summaries of the 1969 and 1970 data in terms of the sampling efficiency by country and subarea. The "sampling efficiency" is defined as the ratio of "number measured" to "product of the catch in '000 tons times 200". Sampling efficiency values less than 1.0 indicate that the minimum ICNAF sampling requirement (200 length measurements for each 1000 tons of a species caught) has not been carried out.

Table A. Summary of sampling in relation to catch for 1969 by species, country, gear and subarea.

Species	Country	Gear	Catch ('000 tons) by Subarea with sampling efficiency in parentheses						Total	
			1	2	3	4	5	6		
Cod	Can (M)	OT	-	-	3(-)	56(0.9)	5(0.9)	-	64 (0.8)	
		LL	-	-	-	15(0.7)	1(-)	-	16 (0.7)	
		HL	-	-	-	12(-)	-	-	12 (-)	
		GN	-	-	-	13(0.1)	-	-	13 (0.1)	
		Oth	-	-	-	10(0.3)	-	-	10 (0.3)	
		Total	-	-	3(-)	106(0.6)	6(0.8)	-	115 (0.6)	
	Can (N)	OT	-	+	24(1.2)	9(-)	-	-	33 (0.9)	
		LL	-	+	14(2.1)	4(-)	-	-	18 (1.6)	
		HL	-	+	12(0.9)	2(-)	-	-	14 (0.8)	
		GN	-	2(1.5)	26(2.3)	11(1.7)	-	-	39 (2.1)	
		Oth	-	3(5.1)	65(1.1)	7(1.6)	-	-	75 (1.3)	
		Total	-	5(3.7)	141(1.4)	33(0.9)	-	-	179 (1.4)	
	Den (G)	Mix	24(4.9) ¹	-	-	-	-	-	24 (4.9) ¹	
	Den (F)	Mix	18(-)	2(-)	19(-)	-	-	-	39 (-)	
	Fr (M)	OT	25(-)	30(-)	33(-)	17(-)	-	-	105 (-)	
	Fr (SP)	OT	-	-	1(61.)	1(39.)	-	-	2 (50.)	
		Oth	-	-	1(14.)	-	-	-	1 (14.)	
	Ger (FR)	OT	79(0.9) ²	72(-)	+	+	+	-	151 (0.5) ²	
	Norway	OT	3(-)	3(-)	-	-	-	-	6 (-)	
		LL	15(0.4) ³	4(-)	26(-)	-	-	-	45 (0.1) ³	
	Poland	OT	+	62(1.3)	14(-)	+	+	+	77 (1.0)	
	Portugal	OT	13(1.2)	66(0.1)	61(0.1)	2(-)	-	-	142 (0.2)	
		DV	2(-)	-	38(-)	-	-	-	40 (-)	
	Romania	OT	-	3(-)	-	-	-	-	3 (-)	
	Spain	OT	2(-)	33(-)	31(-)	4(-)	-	-	70 (-)	
		PT	22(-)	-	140(0.6)	41(0.5)	14(-)	-	217 (0.5)	
	USSR	OT	-	131(2.8) ³	57(1.1) ³	3(-)	+	-	191 (2.2) ³	
UK	OT	1(8.7)	2(12.)	3(2.0)	-	-	-	6 (6.5)		
USA	OT	+	+	+	+	22(0.9)	+	22 (0.9)		
	Oth	-	-	-	-	3(-)	+	3 (-)		
Non-m A	OT	...	...	...	...	...	-	55 (-)	
	TOTAL		204(0.9)	413(1.2)	568(0.8)	207(0.7)	45(0.5)	+	1490 (0.9)	
Haddock	Can (M)	OT	-	-	+	33(2.7)	4(0.9)	-	37 (2.5)	
		Oth	-	-	-	4(0.3)	+	-	4 (0.3)	
	Can (N)	OT	-	-	2(3.0)	+	-	-	2 (3.0)	
	Fr (SP)	OT	-	-	1(67.)	+ ⁴	-	-	1 (67.)	
	Spain	PT	-	-	2(-)	2(-)	1(-)	-	5 (-)	
	USA	OT	-	-	-	2(-)	18(3.7)	-	20 (3.3)	
		Oth	-	-	-	-	1(-)	-	1 (-)	
		TOTAL	-	-	5(15.)	41(2.2)	24(2.9)	-	70 (3.4)	
	Redfish	Can (M)	OT	-	-	+	63(0.5)	+	-	63 (0.5)
		Can (N)	OT	-	-	9(-)	23(0.4)	-	-	32 (0.3)
Fr (SP)		OT	-	-	1(54.)	2(83.)	-	-	3 (73.)	
Ger (FR)		OT	4(-)	+	-	+	-	-	4 (-)	
Japan		OT	-	-	1(-)	+	+	-	1 (-)	
Poland		OT	-	1(4.1)	6(3.5)	7(0.4)	+	-	14 (2.0)	
USSR		OT	+	5(1.4)	70(0.4)	2(-)	-	-	77 (0.5)	
USA		OT	-	-	+	13(0.8)	12(1.4)	-	25 (1.1)	
Non-m A		OT	...	...	...	...	...	-	9 (-)
		TOTAL		4(-)	6(1.8)	87(1.2)	110(1.2)	12(1.4)	-	228 (1.1)

Continued

Table A. (continued)

Species	Country	Gear	Catch ('000 tons) by Subarea with sampling efficiency in parentheses						Total
			1	2	3	4	5	6	
S. hake	Ger (FR)	OT	-	-	-	-5	-5	-	-
	USSR	OT	-	-	-	46(0.6)	67(4.5)	7(2.4)	120 (2.9)
	USA	OT	-	-	-	-	20(0.6)	3(-)	23 (0.5)
	Non-m	OT	-	-	-	-	1(-)	+	1 (-)
	TOTAL		-	-	-	46(0.6)	88(3.5)	10(1.7)	144 (2.5)
Herring	Can (M)	-	-	-	-	311(1.4)	8(2.9)	-	319 (1.4)
	Can (N)	-	-	-	145(0.4)	18(0.6)	-	-	163 (0.4)
	Ger (FR)	-	-	-	-	23(0.3)	73(0.6)	-	96 (0.5)
	Iceland	-	-	-	-	-	13(-)	-	13 (-)
	Japan	-	-	-	-	-	1(-)	-	1 (-)
	Norway	-	-	-	-	-	1(-)	-	1 (-)
	Poland	-	-	-	-	5(1.2)	32(2.6)	13(-)	50 (1.8)
	USSR	-	-	-	-	66(1.5)	100(4.3)	38(0.7)	204 (2.7)
	USA	-	-	-	-	-6	31(3.0)	1(-)	32 (2.9)
	Non-m A	-	-	-	-	...	...	...	87 (0.6)
	Non-m B	-	-	-	-	...	...	...	1 (-)
	TOTAL		-	-	145(0.4)	423(1.3)	259(2.6)	52(0.5)	967 (1.4)
American Plaice	Can (M)	-	-	-	7(0.2)	15(0.1)	+	-	22 (0.1)
	Can (N)	-	-	-	64(0.4)	2(-)	-	-	66 (0.4)
	Den (G)	-	-7	-	-	-	-	-	-
	Fr (SP)	-	-	-	-8	-	-	-	-
	Poland	-	-	1(21.) ⁹	1(8.5) ⁹	-	+	-	2 (15.) ⁹
	USSR	-	-	2(-) ¹⁰	17(-) ¹⁰	5(-) ¹⁰	-	-	24 (-) ¹⁰
	USA	-	-	-	-	+	3(-)	-	3 (-)
	TOTAL		-	3(7.0)	89(0.4)	22(0.1)	3(-)	-	117 (0.5)
Yellowtail	Can (M)	-	-	-	5(0.4)	3(0.3)	+	-	8 (0.4)
	Can (N)	-	-	-	6(1.7)	-	-	-	6 (1.7)
	USSR	-	-	-	3(-) ¹⁰	6(-) ¹⁰	19(-)	-	28 (-)
	USA	-	-	-	-	+	33(3.1)	4(-)	37 (2.8)
	TOTAL		-	-	14(0.9)	9(0.1)	52(2.0)	4(-)	79 (1.5)
Witch	Can (M)	-	-	-	+	9(0.4)	+	-	9 (0.4)
	Can (N)	-	-	-	4(-)	2(-)	-	-	6 (-)
	Fr (SP)	-	-	-	+11	+11	-	-	+11
	Ger (FR)	-	-	-	-12	-	-	-	-12
	Poland	-	-	-	-13	-	-	-	-13
	USSR	-	-	5(-) ¹⁰	12(-) ¹⁰	3(-) ¹⁰	1(-)	-	21 (-) ¹⁰
	USA	-	-	-	-	+	3(-)	-	3 (-)
	TOTAL		-	5(-)	16(1.9)	14(0.3)	4(-)	-	39 (0.9)

Continued

Table A. (continued)

- ¹ Research samples included; value is 3.2 for commercial samples only.
- ² Research samples included; values are 0.2 and 0.1 for commercial samples only.
- ³ Based on research samples.
- ⁴ Insignificant catch; 831 length measurements.
- ⁵ Research samples (161 length measurements in 4W, 734 in 5Ze).
- ⁶ No catches reported; 17240 length measurements.
- ⁷ No catches reported; 2525 length measurements.
- ⁸ Insignificant catch; 1710 length measurements.
- ⁹ Catches reported as Flounders (NK).
- ¹⁰ Catches reported as Flounders (NK) and allocated to species in proportion to 1970 catches.
- ¹¹ Insignificant catch; 3749 length measurements.
- ¹² Research samples (431 measurements); no catch reported.
- ¹³ No catch reported; 2216 length measurements.

Table B. Summary of sampling in relation to catch for 1970 by species, country, gear and subarea.

Species	Country	Gear	Catch ('000 tons) by Subarea with sampling efficiency in parentheses						Total
			1	2	3	4	5	6	
Cod	Can (M)	OT	-	-	6(0.5)	53(0.9)	3(-)	-	62 (0.8)
		LL	-	-	+	17(0.5)	1(-)	-	18 (0.5)
		HL	-	-	-	9(-)	-	-	9 (-)
		GN	-	-	-	12(-)	-	-	12 (-)
		Oth	-	-	-	9(1.0)	-	-	9 (1.0)
		Total	-	-	6(0.5)	100(0.6)	4(-)	-	110 (0.6)
	Can (N)	OT	-	-	20(0.8)	12(-)	-	-	32 (0.5)
		LL	-	-	14(3.8)	5(3.5)	-	-	19 (3.7)
		HL	-	+	9(1.7)	2(-)	-	-	11 (1.4)
		GN	-	1(-)	27(2.7)	4(3.4)	-	-	32 (2.7)
Oth		-	1(-)	52(2.5)	5(3.3)	-	-	58 (2.5)	
	Total	-	2(-)	122(2.3)	28(1.7)	-	-	152 (2.2)	
Den (F)	NK	8(-)	+	9(-)	8(-)	-	-	25 (-)	
Den (G)	NK	20(3.9) ¹	-	-	-	-	-	20 (3.9)	
Fr (M)	OT	5(3.4) ²	16(-)	11(-)	34(-)	-	-	66 (0.2)	
Fr (SP)	OT	-	-	1(8.2)	+() ³	-	-	1 (8.2)	
	Oth	-	-	1(-)	-	-	-	1 (-)	
Ger (FR)	OT	41(1.8) ⁴	50(-)	12(-)	-	-	-	103 (0.7) ⁴	
Japan	OT	-	-	+() ⁵	+	+	-	+() ⁵	
Norway	OT	-	3(-)	1(-)	-	-	-	4 (-)	
	LL	+	-	34(-)	-	-	-	34 (-)	
	GN	6(-)	-	-	-	-	-	6 (-)	
Poland	OT	-	36(1.4)	13(5.6)	+	1(-)	-	50 (2.4)	
Portugal	OT	3(-)	42(0.1)	66(0.3)	21(0.2)	-	-	132 (0.2)	
	DV	5(-)	-	25(-)	+	-	-	30 (-)	
Romania	OT	-	3(-)	1(-)	-	+	-	4 (-)	
Spain	OT	1(-)	11(2.7)	18(1.4)	18(0.8)	-	-	48 (1.4)	
	PT	17(-)	+	147(-)	48(-)	7(-)	-	219 (-)	
USSR	OT	1(61.) ²	50(3.1) ²	60(0.0) ²	3(-)	+	-	114 (1.6) ²	
UK	OT	3(3.1)	3(2.1)	+	-	-	-	6 (2.6)	
USA	OT	+	1(-)	+	1(-)	18(1.3)	+	20 (1.2)	
	Oth	-	-	-	-	4(-)	+	4 (-)	
Non-m A	OT	4(-)	8(-)	+	...	5(-) ⁶	-	17 (-)	
TOTAL			114(2.1)	225(1.1)	528(0.8)	262(0.5)	39(0.6)	-	1168 (0.9)

Continued

Table B. (Continued)

Species	Country	Gear	Catch ('000 tons) by Subarea with sampling efficiency in parentheses						Total
			1	2	3	4	5	6	
Haddock	Can (M)	OT	-	-	1(1.0)	17(2.6)	2(3.3)	-	20 (2.6)
		Oth	-	-	-	5(0.6)	-	-	5 (0.6)
	Can (N)	OT	-	-	2(2.5)	+	-	-	2 (2.5)
	Fr (SP)	OT	-	-	1(8.8) ⁷	+	-	-	1 (8.8) ⁷
	Spain	PT	-	-	3(-)	3(-)	1(-)	-	7 (-)
	USSR	OT	-	-	+	1(-)	+	-	1 (-)
	USA	OT	-	-	-	2(-)	9(4.4)	-	11 (3.6)
		Oth	-	-	-	-	1(-)	-	1 (-)
TOTAL			-	-	7(2.1)	28(1.7)	13(3.6)	-	43 (2.3)
Redfish	Can (M)	OT	-	-	1(-)	64(0.6)	+	-	65 (0.6)
	Can (N)	OT	-	-	11(-)	31(0.2)	-	-	42 (0.1)
	Den (G)	OT	+(-) ⁹	-	-	-	-	-	-
	Fr (SP)	OT	-	-	1(-)	+	-	-	1 (-)
	Ger (FR)	OT	4(-)	+	+	-	-	-	4 (-)
	Japan	OT	-	-	3(7.3) ⁸	1(6.5) ⁸	-	-	4 (7.1)
	Poland	OT	-	2(-)	4(-)	-	-	-	6 (-)
	Romania	OT	-	1(-)	+	-	-	-	1 (-)
	USSR	OT	+	4(-)	58(0.1)	14(-)	-	-	76 (0.1)
	USA	OT	-	-	-	9(1.6)	16(0.7)	-	25 (2.1)
	Non-m A	OT	+	4(-)	6(-)	-	-	-	10 (-)
	TOTAL			4(-)	11(-)	84(0.3)	119(0.6)	16(0.7)	-	234 (0.6)
S. Hake	Japan	-	-	-	-	+() ¹⁰	+() ¹⁰	+	+ (-) ¹⁰
	USSR	-	-	-	-	169(4.4)	29(10.)	3(0.7)	201 (5.2)
	USA	-	-	-	-	-	19(0.6)	2(-)	21 (0.6)
	TOTAL			-	-	-	169(4.4)	48(6.3)	5(0.4)	222 (4.8)
Herring	Can (M)	-	-	-	-	315(1.4)	5(7.9)	-	320 (1.6)
	Can (N)	-	-	-	135(0.8)	23(0.5)	-	-	158 (0.8)
	Den (G)	-	+() ¹¹	-	-	-	-	-	+ (-)
	Ger (FR)	-	-	-	-	6(-)	88(1.6)	+	94 (1.5)
	Fr (SP)	-	-	-	- ¹²	- ¹²	-	-	-
	Japan	-	-	-	-	+() ¹³	1(2.0)	+	1 (2.0)
	Poland	-	-	-	-	1(5.8)	55(1.0)	16(1.5)	72 (1.2)
	Romania	-	-	-	-	-	1(-)	-	1 (-)
	USSR	-	-	-	-	72(4.4)	39(4.0)	22(1.0)	133 (3.7)
	USA	-	-	-	-	-() ¹⁴	30(1.7)	1(-)	31 (1.2)
	Non-m A	-	-	-	-	...	39(2.5)	...	39 (2.5)
	TOTAL			-	-	135(0.8)	417(1.9)	258(2.0)	39(1.2)	849 (1.7)
American Plaice	Can (M)	-	-	-	9(0.6)	15(0.2)	+	-	24 (0.4)
	Can (N)	-	-	-	61(0.6)	2(-)	-	-	63 (0.6)
	Fr (SP)	-	-	-	1(3.1)	+() ¹⁵	-	-	1 (3.1)
	Romania	-	+	1(-)	+	1(-)	-	-	2 (-)
	USSR	-	+	2(-)	17(-)	2(-)	1(-)	-	22 (-)
	USA	-	-	-	-	+	3(-)	-	3 (-)
	TOTAL			+	2(-)	89(0.5)	19(0.2)	5(-)	-

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Table B. (Continued)

Species	Country	Gear	Catch ('000 tons) by Subarea with sampling efficiency in parentheses						Total
			1	2	3	4	5	6	
Yellowtail	Can (M)	-	-	-	3(0.7)	1(-)	+	-	4 (0.5)
	Can (N)	-	-	-	20(0.3)	+	-	-	20 (0.3)
	USSR	-	-	-	3(-)	3(-)	3(-)	+	9 (-)
	USA	-	-	-	-	-	32(4.4)	4(-)	36 (3.9)
	TOTAL	-	-	-	26(0.3)	4(-)	35(4.0)	4(-)	69 (2.1)
Witch	Can (M)	-	-	-	1(-)	7(1.1)	-	-	8 (1.0)
	Can (N)	-	-	-	7(-)	2(-)	-	-	9 (-)
	Fr (SP)	-	-	-	+(-) ¹⁶	-	-	-	-
	Poland	-	-	1(-)	2(-)	-	-	-	3 (-)
	USSR	-	-	4(-)	12(-)	1(-)	-	-	17 (-)
	USA	-	-	-	-	+	3(-)	-	3 (-)
	TOTAL	-	-	5(-)	22(-)	10(0.8)	3(-)	-	40 (0.2)

¹ Research samples included; value is 2.9 for commercial samples.

² Based on research samples.

³ Research samples (4322 length measurements).

⁴ Research samples included; values are 0.2 and 0.1 for commercial samples only.

⁵ Exploratory samples (637 length measurements).

⁶ Catch reported taken in 4V-5Z.

⁷ Includes research samples; value is 4.8 for commercial samples.

⁸ Japanese samples reported as "Exploratory and Commercial".

⁹ Research samples (4420 length measurements).

¹⁰ Exploratory samples (1300 length measurements).

¹¹ Research samples (2478 length measurements).

¹² No landings reported, 569 and 977 length measurements (research) reported for Subareas 3 and 4 respectively.

¹³ Exploratory samples (100 length measurements).

¹⁴ No landings reported, 9560 herring were measured.

¹⁵ Research samples (3600 length measurements).

¹⁶ Research samples (1664 length measurements).