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Revised estimates of fishing mortality

and stock size for ICNAF Division 2J cod

by

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Estimates of fishing mortality (F) and stock size were presented at the 1971 ICNAF Annual Meeting (Res. Doc. 71/10) for Division 2J cod during the 1959-68 period. These estimates have been updated by inclusion in the virtual population analyses of the 1970 data on numbers caught at each age from the 1970 age and length sampling. The revised estimates of F are presented in Table 1 and of stock size in Table 2. Only the years 1965-68 are shown since the estimates for 1959-64 were not appreciably altered from those presented at the Annual Meeting.

Updating the estimates had very little effect on the average F-estimates for the fully recruited age groups 8-13 in the years 1965-67 but the estimates for the recruiting age groups 4-7 increased from an average of 0.20 to 0.26 in 1966 and from 0.12 to 0.23 in 1967. However, in 1968, the average estimates of F for both the recruiting ages 4-7 and the fully recruited ages 8-13 were significantly changed, increasing from 0.12 to 0.29 for the former and 0.44 to 0.69 for the latter. These revised estimates for 1968 seem to be more realistic than the previous ones, which were based on numbers present at the beginning of 1968 and the catch in 1968, since they do reflect the increase in catch from 241,000 tons in 1967 to 367,000 tons in 1968 which the previous estimates did not do.

Estimates of stock size were not significantly altered for 1965 and years prior to this but for 1966-68 the estimates for ages 5-7 were greatly reduced because of the increase in revised estimates of F for these ages. The extent of the decrease in numbers of cod greater than age 7 was not appreciably altered by the revision but the extent of the increased recruitment previously indicated for 1966-68 from the year-classes during the early 1960's seems to have been greatly overestimated; the increase previously having been reported as 117% between 1959-63 and 1964-68 is now reduced to about 20% resulting in an average stock size in the latter period being about equal to that in the former period instead of about 60% higher as reported previously.

Table 1. Revised estimates of fishing mortality (F) for Division 2J cod, 1965-68.

Age	1965 Previous F	1965 Revised F	1966 Previous F	1966 Revised F	1967 Previous F	1967 Revised F	1968 Previous F*	1968 Revised F
3	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.01	< 0.01	< 0.01
4	0.013	0.02	0.031	0.06	0.021	0.07	0.021	0.05
5	0.053	0.07	0.10	0.16	0.075	0.17	0.050	0.17
6	0.22	0.24	0.20	0.29	0.17	0.30	0.16	0.41
7	0.49	0.45	0.46	0.54	0.22	0.37	0.25	0.54
8	0.68	0.71	0.59	0.52	0.37	0.48	0.34	0.76
9	0.91	0.82	0.56	0.62	0.48	0.40	0.46	0.71
10	0.89	0.89	0.48	0.40	0.43	0.51	0.44	0.73
11	0.63	0.68	0.45	0.45	0.48	0.36	0.49	0.62
12	0.71	0.65	0.28	0.32	0.42	0.42	0.50	0.84
13	1.13	0.77	0.60	0.51	0.41	0.50	0.40	0.47
Av. 4-13	0.57	0.53	0.38	0.46	0.31	0.36	0.31	0.53
Av. 8-13	0.82	0.75	0.49	0.47	0.43	0.45	0.44	0.69
Av. 4-7	0.19	0.20	0.20	0.26	0.12	0.23	0.12	0.29

* Estimated from numbers present at beginning of 1968 and catch in 1968.

Table 2. Revised estimates of number of fish present in the stock at the beginning of the year $(X10^{-6})$, Division 2J cod, 1965-68.

Age	1965 Previous	1965 Revised	1966 Previous	1966 Revised	1967 Previous	1967 Revised	1968 Previous	1968 Revised
4	542	368	973	493	2179	707	1324	616
5	279	202	452	298	800	380	1747	541
6	191	183	220	158	341	206	628	263
7	98	104	127	113	149	97	233	123
8	111	107	49	54	67	54	100	55
9	50	53	46	43	23	26	38	27
10	18	18	17	19	22	19	12	11
11	12	11	6	6	9	11	11	9
12	6	6	5	5	3	3	4	5
13	4	5	2	3	3	3	2	2
14	4	5	1	2	1	1	2	1
15	3	3	1	1	-	-	1	-
4+	776	697	926	702	1418	800	2778	1037
5+	497	495	474	404	618	420	1031	496
5-7	568	489	799	569	1290	683	2722	927
7+	208	208	127	133	128	117	170	110

	1959-63 Previous	1959-63 Revised	1964-68 Previous	1964-68 Revised
5-7	2748	2757	5971	3261
8-15	1340	1343	806	745
5-15	4088	4100	6777	4006

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