

Northwest Atlantic



Fisheries Organization

Serial No. N2592

NAFO SCR Doc. 95/75

SCIENTIFIC COUNCIL MEETING - JUNE 1995

1995 Assessment of Cod From Division 3M: Revised Extended Survivors Analysis

by

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Extended survivors analysis was carried out in several ways. A number of trials indicated that whatever the formulation with regard to the tuning fleets used and the ages at which catchability were set, there was little difference in the fit of the model.

The diagnostics and output from the chosen run are presented below. Summary data are presented in Figures 1 and 2.

Catch data for 7 years. 1988 to 1994. Ages 1 to 8.

Fleet	First year	Last year	First age	Last age	Alpha	Beta
EU-SURV	1988	1994	1	7	0.5	0.6

Time series weights :

Tapered time weighting applied
Power = 3 over 20 years

Catchability analysis :

Catchability dependent on stock size for ages < 3

Regression type = C
Minimum of 5 points used for regression
Survivor estimates shrunk to the population mean for ages < 3
Catchability independent of age for ages >= 3

Terminal population estimation :

Survivor estimates shrunk towards the mean F
of the final 5 years or the 5 oldest ages.
S.E. of the mean to which the estimates are shrunk = .500
Minimum standard error for population
estimates derived from each fleet = .300

Prior weighting not applied
 Tuning converged after 12 iterations
 Regression weights

	0.921	0.954	0.976	0.99	0.997	1	1
Fishing mortalities							
Age	1988	1989	1990	1991	1992	1993	1994
1	0	0	0	0	0	0	0
2	0.058	0.006	0.016	0.029	0.367	0.036	0.118
3	0.406	0.386	0.367	0.53	1.116	0.671	0.554
4	0.518	0.811	0.886	0.666	1.391	1.867	1.094
5	0.492	1.19	1.244	0.843	1.493	1.392	1.299
6	0.583	0.741	1.144	0.635	1.488	2.414	1.323
7	0.436	0.721	0.771	0.545	1.229	1.283	0.949

XSA population numbers (Thousands)

Age	1988	1989	1990	1991	1992	1993	1994 1 Jan '95	
1	11800	21200	26600	70700	102000	14800	3990	0
2	68800	9640	17300	21700	57900	83500	12100	3270
3	84700	53200	7850	14000	17300	32800	66000	8820
4	30500	46200	29600	4450	6720	4640	13700	31000
5	3980	14900	16800	9990	1870	1370	587	3770
6	1040	1990	3710	3970	3520	345	279	131
7	985	473	777	967	1720	651	25	61
8+	502	435	237	198	720	318	323	110
B 1+	78261	93838	79765	84584	109726	59910	67564	
B 2+	74609	86644	69408	46399	54635	53542	65170	53559
B 3+	67521	85651	66463	42791	40393	35166	62612	52869
B 4+	41426	67519	63778	35884	31922	13653	21439	47365
B 5+	20734	28705	38736	32076	22666	8047	4384	8894

Taper weighted geometric mean of the VPA populations:

Age	1	2	3	4	5	6	7
	22500	28300	29000	13200	3890	1390	512

Standard error of the weighted Log(VPA populations) :

	1.1074	0.8816	0.8842	0.9706	1.3017	1.1425	1.4068
Log catchability residuals.							

Fleet : EU-SURV

Age	1988	1989	1990	1991	1992	1993	1994
1	-0.15	0.54	-1.52	0.93	0.01	-0.42	0.61
2	-0.05	0.44	-0.09	0.29	-0.26	0.22	-0.55
3	-0.48	0.71	-0.28	0.43	-0.64	0.26	0
4	-0.71	0.54	-0.1	-0.44	-0.4	-0.45	0.15
5	-0.83	0.91	0.57	0.02	-0.88	0.72	-0.43
6	-1.19	-0.01	0.72	-0.45	-0.17	0.65	-0.37
7	-0.98	-0.72	-0.43	-1.02	-1.39	0.48	-2.67

Mean log catchability and standard error of ages with catchability independent of year class strength and constant w.r.t. time

Age	3	4	5	6	7
Mean Log q	-2.2272	-2.2272	-2.2272	-2.2272	-2.2272
S.E.(Log q)	0.4958	0.4794	0.7438	0.6688	1.4274

Regression statistics :

Ages with q dependent on year class strength

Age	Slope	t-value	Intercept	RSquare	No Pts	Reg s.e	Mean Log q
1	0.85	0.457	3.95	0.64	7	0.91	-2.84
2	0.77	1.263	4.11	0.87	7	0.38	-2.31

Ages with q independent of year class strength and constant w.r.t. time.

Age	Slope	t-value	Intercept	RSquare	No Pts	Reg s.e	Mean Q
3	0.93	0.301	2.8	0.79	7	0.5	-2.23
4	0.82	1.315	3.73	0.91	7	0.33	-2.43
5	0.79	1.193	3.51	0.87	7	0.56	-2.21
6	0.99	0.038	2.38	0.75	7	0.72	-2.33
7	0.69	1.84	4.13	0.88	7	0.57	-3.19

Figure 1. Trends in catch and fishing mortality: Cod 3m

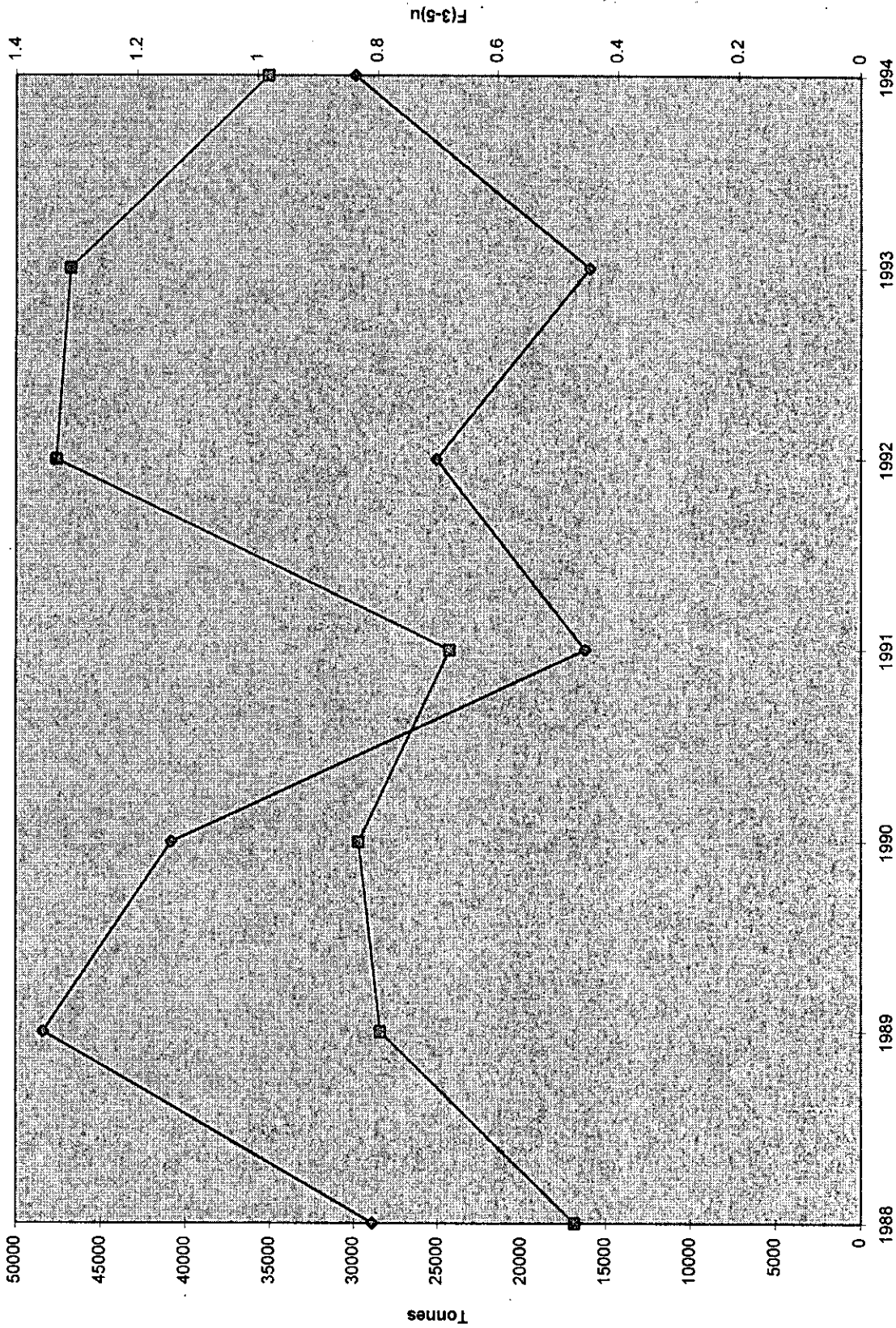


Figure 2. Stock Biomass from EU surveys and VPA

