



ANNUAL MEETING - JUNE 1975

Stock Records for Some Species Considered at 1974 Assessment Meetings

compiled by  
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At the request of the Chairman of the Assessments Subcommittee, stock records prepared by assessment scientists for consideration by the Subcommittee at the 1974 Annual Meeting have been compiled as an aid for those who will be doing assessments for the Subcommittee in 1975. The following stock records are included:

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SPECIES : Cod  
 STOCK AREA : Div. 1A-D  
 MSY (W) : 325,000 tons<sup>1</sup>  
 $F_{MAX}$  : 0.56<sup>2</sup>       $F_{OPT}$  : 0.35<sup>2</sup>

REFERENCE : Horsted (Res.Doc. 73/107, 74/86)  
 LAST YEAR OF DATA : 1972 and partly 1973  
 SPAWN. STOCK AT MSY (W) : 830,000 tons (age 6+)<sup>2</sup>  
 METHOD : VPA

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1965	1966	1967	1968	1969	1970	1971	1972			
STOCK	3	0.58	0.09	137829	112533	41101	68936	56817	45659	125618	20699			
	4	1.08	0.27	269467	100077	91818	32136	53051	45920	37338	102602			
	5	1.94	0.64	163236	171612	76634	62547	20032	32416	35253	28356			
	6	2.80	1.00	22370	91354	102498	38330	27994	11425	18596	20729			
	7	3.60		13360	11888	43156	41542	13691	12123	6532	8763			
	8	3.98		32466	6656	5857	18564	13484	4041	5258	3587			
	9	4.63		2966	16339	3711	2899	8251	4151	2075	1547			
	10	5.48		1092	1366	9176	1584	999	3140	2557	973			
	11	6.23		763	587	598	3656	663	398	2001	1036			
	12			3769	330	298	225	1184	397	271	970			
	13			431	1868	204	185	39	471	278	161			
	14			36	305	819	51	123	20	292	203			
	15+			171	150	53	258	6	34	41	105			
	Number (000)				647785	514915	375870	270655	196378	160161	236068	189626		
	Weight (tons)				978676	935641	821850	574859	367404	275236	321230	310218		
CATCH	3			14163	350	1678	3756	662	49	272	14			
	4			54481	5876	14021	6982	12257	2597	2453	7095			
	5			47115	42294	27246	25957	5542	8846	9054	8834			
	6			7166	35344	47457	19852	12078	3142	7219	9802			
	7			4780	4327	18762	23071	8069	5222	1963	3344			
	8			11430	1937	2117	7769	7749	1376	3104	1068			
	9			1187	4680	1627	1543	4053	936	811	1049			
	10			343	582	4320	710	470	633	1184	331			
	11			330	204	297	2034	162	61	746	781			
	12			1359	14	65	164	558	52	68	649			
	13			53	795	130	32	14	104	27	126			
	14			13	108	378	31	60	7	105	48			
	15+			171	150	53	258	6	34	41	105			
	Number (000)				145239	96721	118204	92159	51680	23059	27047	33246		
	Weight (tons)				296204	290545	343728	279539	144331	62447	76448	86649		
Fishing Effort (f)														
F (mean of ages 6-14)				0.47	0.48	0.68	0.85	0.64	0.35	0.52	0.95			
TAC (tons)														
Recruitment Prospects :      See overleaf														
Comments :      See overleaf														

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SPECIES : Cod (continued)  
 STOCK AREA : Div. 1A-D  
 MSY (W) : 325,000 tons<sup>1</sup>  
 $F_{MAX}$  : 0.56<sup>2</sup>       $F_{OPT}$  : 0.35<sup>2</sup>

REFERENCE : Horsted (Res.Doc. 73/107, 74/86)  
 LAST YEAR OF DATA : 1972 and partly 1973  
 SPAWN. STOCK AT MSY (W) : 830,000 tons (age 6+)<sup>2</sup>  
 METHOD : VPA

	Age Group	$\bar{W}$ (kg) <sup>3</sup>	Part. Recr.	1973	1974	1975							
				STOCK	3	0.58	0.09						
4	1.28	0.27	24561		16000	16000							
5	1.72	0.64	51265		18000	12720							
6	2.51	1.00	10039		30448	11976							
7	3.52		5398		4980	17567							
8	4.66		2745		2681	2873							
9	5.07		1299		1363	1547							
10	5.68		222		645	786							
11	6.37		328		110	372							
12	8.65		106		163	63							
13	9.58		144		53	94							
14	9.60		14		71	30							
15+	9.60		12		7	41							
Number (000)					96133	74521	64069						
Weight (tons)													
CATCH	3												
	4			1463	1328	1328							
	5			12792	2274	2286							
	6			3610	8197	3228							
	7			1941	1341	4729							
	8			987	722	774							
	9			467	367	416							
	10			80	174	212							
	11			118	30	100							
	12			38	44	17							
	13			52	14	25							
	14			5	19	8							
	15+			12	2	11							
	Number (000)				21565	14512	13134						
	Weight (tons)				48828	39711	38400						
Fishing Effort (f)													
F (mean of ages 6-14)				0.50	0.35	0.35							
TAC (tons)				* <sup>4</sup>	* <sup>4</sup>								
Recruitment Prospects : 1970-73 year-classes are all very poor, probably in the order of $100 \times 10^6$ specimens at recruitment (age 3).													
Comments : <sup>1</sup> Rough estimate by 1960. <sup>2</sup> Data from Horsted, 1973 (Res.Doc. 73/107); $M = 0.20$ for all age-groups. <sup>3</sup> Note change in mean weights after 1972. <sup>4</sup> TACs recommended by STACRES for SA 1 as a whole were 102,000 tons in 1973 and 80,000 tons in 1974 (actual TAC for 1974 is 107,000 tons).													

SPECIES : Cod  
 STOCK AREA : Div. 1E-F  
 MSY (W) : 150,000 tons<sup>1</sup>  
 F<sub>MAX</sub> : 0.65<sup>2</sup> F<sub>OPT</sub> : 0.45<sup>2</sup>

REFERENCE : Horsted (Res.Doc. 73/107, 74/86)  
 LAST YEAR OF DATA : 1972 and partly 1973  
 SPAWN. STOCK AT MSY (W) : 350,000 tons (age 6+)  
 METHOD : VPA

		Age Group	W̄ (kg)	Part. Recr.	1965	1966	1967	1968	1969	1970	1971	1972			
STOCK		3	0.41	0.01	69018	119426	45715	18230	21015	7353	32402	545			
		4	0.82	0.08	92826	56507	96712	37384	14918	17206	6020	26529			
		5	1.27	0.41	38736	73790	44462	78215	29710	12086	13932	4870			
		6	1.88	0.67	6893	26907	42599	33506	54386	21469	8547	10399			
		7	2.68	1.00	13413	3947	17892	30919	18483	30742	14585	5143			
		8	3.25		13903	5255	1479	7830	12323	7602	14430	7568			
		9	3.90		3916	6525	1259	564	3672	4855	2904	5209			
		10	5.02		512	1398	2761	583	247	1982	1883	1010			
		11	6.23		500	178	410	1190	309	139	864	786			
		12			1351	222	61	243	579	155	27	437			
		13			164	500	110	20	152	288	82	11			
		14			67	97	199	48	10	85	123	38			
		15+			105	97	32	45	2	7	15	17			
	Number (000)					241299	294752	253659	208732	155804	103962	95799	62545		
	Weight (tons)					279163	306539	312222	323539	272578	213495	166339	119639		
CATCH		3				1180	49	8				1			
		4			2447	1996	1070	994	142	171	66	2944			
		5			5336	19836	3211	10713	3167	1496	1118	952			
		6			1889	4597	14391	9972	15355	3323	2064	2218			
		7			5110	1588	5800	11520	6595	8763	3274	737			
		8			3965	3018	583	2236	4662	2989	6054	1482			
		9			1662	2232	369	182	731	1874	1266	1611			
		10			223	707	917	123	43	647	657	293			
		11			158	79	55	314	75	88	207	173			
		12			552	56	28	23	146	33	10	60			
		13			22	186	36	5	27	97	24	4			
		14			24	31	75	11	2	20	29	9			
		15+			105	97	32	45	2	7	15	15			
	Number (000)					21493	35715	26616	36146	30947	19508	14784	10501		
	Weight (tons)					64137	77661	85751	114001	70476	53550	43837	23970		
Fishing Effort (f)															
F (mean of ages 7-14)					0.52	0.65	0.49	0.36	0.28	0.56	0.48	0.33			
TAC (tons)															
Recruitment Prospects :					See overleaf										
Comments :					See overleaf										

SPECIES : Cod (Continued)

REFERENCE : Horsted (Res.Doc. 73/107, 74/86)

STOCK AREA : Div. 1E-F

LAST YEAR OF DATA : 1972 and partly 1973

MSY (W) : 150,000 tons<sup>1</sup>

SPAWN. STOCK AT MSY (W) : 350,000 tons (age 6+)

F<sub>MAX</sub> : 0.65<sup>2</sup>      F<sub>OPT</sub> : 0.45<sup>2</sup>

METHOD : VPA

		Age Group	W (kg)	Part. Recr.	1973	1974	1975							
STOCK		3	0.41	0.01										
		4	0.82	0.08	12280	8179								
		5	1.27	0.41	11616	10044	6460							
		6	1.88	0.67	1989	2748	6841							
		7	2.68	1.00	4569	1165	1694							
		8	3.25		2111	1951	523							
		9	3.90		2877	902	877							
		10	5.02		1642	1230	405							
		11	6.23			702	553							
		12					315							
		13				819								
		14					350							
		15						157						
	Number (000)					37902	27271	17825						
	Weight (tons)													
CATCH		3												
		4			8	262	261							
		5			1958	1535	987							
		6			516	1934	1620							
		7			1539	361	1454							
		8			711	604	162							
		9			969	279	272							
		10			553	381	126							
		11			111	217	171							
		12			97		98							
		13			61									
		14			-	108								
		15+			7		49							
Number (000)					6530	5681	5200							
Weight (tons)					18174	13590	12619							
Fishing Effort (f)														
mean of ages 7-14)					0.50	0.45	0.45							
TAC (tons)						*	*							

Recruitment Prospects : 1970-73 year-classes all very poor, probably in order of  $100 \times 10^6$  fish at recruitment (age 3)

- Comments :
- <sup>1</sup> Rough estimate by 1960.
  - <sup>2</sup> Data from Horsted, 1973 (Res.Doc. 73/107);  $M = 0.20$  for all age-groups and 0.15 added for age 7 and over to account for emigration.
  - <sup>3</sup> TACs recommended by STACRES for SA 1 as a whole were 102,000 tons in 1973 and 80,000 tons in 1974 (actual TAC for 1974 is 107,000 tons).

SPECIES : Cod  
 STOCK AREA : 2J+3KL  
 MSY (W) : 550,000  
 F<sub>MAX</sub> : 0.35      F<sub>OPT</sub> : 0.20

REFERENCE : R. Wells (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

		Age Group	W (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975	
STOCK		4	0.55	0.34	580.8	579.8	604.6	509.7	1053.5	656.0	500.0	508.0	
		5	0.88	0.87	654.3	470.8	482.7	418.7	358.5	764.0	465.8	372.1	
		6	1.23	1.09	374.5	397.1	322.8	330.1	256.1	189.1	556.6	298.8	
		7	1.66	1.18	188.9	205.0	196.1	183.8	183.3	143.4	101.0	334.5	
		8	2.12	1.07	80.8	96.1	82.3	89.6	101.6	99.1	86.3	59.0	
		9	2.64	0.96	48.3	42.0	38.0	43.9	57.1	57.4	60.0	51.6	
		10	3.18	0.84	23.1	24.9	19.9	22.2	26.0	31.4	34.7	37.3	
		11	3.73	0.74	15.4	13.5	12.5	13.0	14.3	15.8	19.3	22.4	
		12	4.15	1.00	9.7	8.6	5.5	6.9	8.7	9.0	9.6	12.8	
		13+	6.06	1.00	14.0	12.8	7.4	9.6	11.5	11.2	12.2	13.4	
			Number (10 <sup>6</sup> )			1989.8	1850.6	1771.9	1627.4	1635.4	1976.5	1845.5	1709.9
			Weight (000 tons)			2235.9	2119.3	1970.5	1871.7	2107.8	2129.4	2174.7	2127.4
	CATCH		4			91.6	38.1	57.2	69.0	79.8	48.6	41.5	50.3
		5			199.0	96.4	77.3	92.1	116.6	85.7	91.8	86.5	
		6			145.0	153.4	94.0	94.4	76.2	58.8	135.3	86.3	
		7			80.9	100.6	78.8	55.7	56.0	33.6	26.6	103.2	
		8			37.9	49.3	26.9	24.1	29.6	23.4	21.3	17.5	
		9			22.4	18.4	10.0	11.3	11.8	13.0	13.2	13.2	
		10			7.6	11.5	3.6	4.3	6.4	7.5	6.8	8.6	
		11			5.4	6.0	1.9	2.1	3.0	3.7	3.3	4.6	
		12			3.4	4.2	1.1	1.2	1.7	2.1	2.2	3.4	
		13+			5.0	6.1	1.4	3.2	4.4	2.7	2.8	3.6	
		Number (10 <sup>6</sup> )			598.2	484.0	352.1	357.4	385.2	279.2	345.3	377.2	
		Weight (000 tons)			806.9	748.4	516.2	432.1	452.6	354.0	450.0	534.9	
		Fishing Effort (f)											
		Fishing Mortality (F)			0.68	0.57	0.35	0.31	0.37	0.30	0.29	0.35	
		TAC (tons)			-	-	-	-	-	665500	656700	550000	
Recruitment Prospects : 1970 and 1971 year-classes poorer than average.													
Comments : (1) 1974 and 1975 age compositions average of (a) that using 1971-72 recruitment pattern and (b) that using 1968-73 recruitment pattern (2) Stock size in 1975 average of (a) and (b) (3) Partial recruitment average of (a) and (b)													

SPECIES : Cod  
 STOCK AREA : 3NO  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : 0.20 F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : A.T. Pinhorn, 1974 (WP # 19)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Virtual population

	Age Group	W (kg)	Part. Recr.	1973	1974 (a)	1975 (a)	(b) 1974	(b) 1975					
STOCK	4	1.07	48	118300	(82000)	(92000)	(82000)	(92000)					
	5	1.71	71	86100	81700	(60100)	81700	(58100)					
	6	2.97	123	25400	54900	57000	54900	54100					
	7	3.75	88	8600	13500	34000	13500	31100					
	8	5.00	115	2000	5200	9000	5200	8500					
	9	6.00	75	1900	1100	3300	1100	3000					
	10	6.90	100		1200	800	1200	700					
	11	7.80	100			800		700					
	Number (000) (4-11)				242300	239600	257000	239600	248200				
	Weight (tons) (4-11)				402900	482000	574600	482000	545883				
	CATCH	4			16800	7800	(7900)	(9800)	(7900)				
5				17300	10900	(7200)	14100	6900					
6				8100	12200	11500	15500	10900					
7				2100	2200	5100	2800	4700					
8				600	1100	1700	1400	1600					
9				400	200	400	200	400					
10					200	100	300	100					
11						100		100					
Number (000) (4-11)				45300	34600	34000	44100	32600					
Weight (tons) (4-11)				84900	79800	86400	101400	82100					
Fishing Effort (f)													
Fishing Mortality (F)				0.35	0.23	0.20	0.30	0.20					
TAC (tons)				103500	100100	85000							
Recruitment Prospects : 1969-71 year-classes poorer than 1968 year-class													
Comments : Recruitment estimates for 1970 and 1971 year-classes average of Canada N surveys and USSR surveys. (a) assuming 1974 catch = 80,000 tons. (b) assuming 1974 catch = 100,000													



SPECIES : Cod  
 STOCK AREA : Subdivision 3Ps \*  
 MSY (W) : 60,000 tons  
 F<sub>MAX</sub> : 0.30 F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : A.T. Pinhorn, 1974 (WP #20)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Virtual population

	Age Group	W (kg)	Part. Recr.	1973	1974(a)	1975(a)		1974(b)	1975(b)				
STOCK	2	0.08	2	(119300)									
	3	0.28	5	(74000)	(97100)			(97100)					
	4	0.69	35	49500	(55000)	(78000)		(55000)	(78000)				
	5	1.08	65	69700	36300	(40300)		36300	(39100)				
	6	1.68	63	25500	46700	24300		47600	22900				
	7	2.40	100	16500	17300	31600		17300	29800				
	8	3.21	100	9300	10000	10500		10000	9500				
	9	4.10	100	8500	5600	6100		5600	5500				
	10	5.08	100	2100	5200	3400		5200	3100				
	11	6.03	100	800	1300	3200		1300	2900				
	11+	8.58	100	400	500	1100		700	1000				
	Number (000) (4-11 <sup>+</sup> )				182300	178100	198500		178100	191800			
Weight (tons) (4-11 <sup>+</sup> )				275500	290700	318700		290700	300900				
CATCH	2			(600)									
	3			(1000)	(1300)			(1700)					
	4			4700	(5200)	(7400)		(6500)	(7400)				
	5			11500	6000	(6600)		7600	(6500)				
	6			4000	7300	3800		9500	3600				
	7			3900	4100	7500		5200	7000				
	8			2200	2400	2500		3000	2200				
	9			2000	1300	1400		1700	1300				
	10			500	1200	800		1600	700				
	11			200	300	800		400	700				
	11+			100	100	300		200	200				
	Number (000) (4-11 <sup>+</sup> )				29100	27900	31100		35700	29600			
Weight (tons) (4-11 <sup>+</sup> )				51600	54000	61800		70000	56900				
Fishing Effort (f)													
Fishing Mortality (F)				0.30	0.30	0.30		0.40	0.30				
TAC (tons)				70500	70000								
Recruitment Prospects : 1971 year-class better than 1970 year-class													
Comments : No commercial sampling data available from the offshore fishery for 1971 and 1972. (a) Assuming 1974 catch $\hat{=}$ 55,000 tons, (b) Assuming 1974 catch $\hat{=}$ 70,000 tons. * Using average of USSR and Canada (N) recruitment estimates. 1970 and 1971 classes from Canada (N) surveys adjusted for stratified-random effects													

SPECIES : Cod  
 STOCK AREA : Subdivision 3Pa\*  
 MSY (W) : 60,000 tons  
 $F_{MAX}$  : 0.30       $F_{OPT}$  : \_\_\_\_\_

REFERENCE : A.T. Pinhorn, 1974 (WP #20)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : virtual population

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1973	1974 (a)	1975 (a)		1974 (b)	1975 (b)				
STOCK	2	0.08	2	(53000)									
	3	0.28	5	(25000)	(43000)			(43000)					
	4	0.69	35	49500	20000	(34000)		(20000)	(34000)				
	5	1.08	65	69700	36300	(14700)		36300	(14200)				
	6	1.68	63	25500	46700	24300		46700	22900				
	7	2.40	100	16500	17300	31600		17300	29800				
	8	3.21	100	9300	10000	10500		10000	9500				
	9	4.10	100	8500	5600	6100		5600	5500				
	10	5.08	100	2100	5200	3400		5200	3100				
	11	6.03	100	800	1300	3200		1300	2900				
	11+	8.58	100	400	700	1200		700	1100				
	Number (000) (4-11 <sup>+</sup> )				182300	143100	129000		141300	122900			
	Weight (tons) (4-11 <sup>+</sup> )				275500	268300	261600		268300	244500			
CATCH	2	0.08		(300)									
	3	0.28		(300)	(600)			(800)					
	4	0.69		4700	(1900)	(3200)		(2400)	(3100)				
	5	1.08		11500	6000	(2400)		7600	(2300)				
	6	1.68		4000	7300	3800		9500	3600				
	7	2.40		3900	4100	7500		5200	7000				
	8	3.21		2200	2400	2500		3000	2200				
	9	4.10		2000	1300	1400		1700	1300				
	10	5.08		500	1200	800		1600	700				
	11	6.03		200	300	800		400	700				
	11+	8.58		100	200	300		200	300				
	Number (000) (4-11 <sup>+</sup> )				29100	24700	22700		31600	21200			
	Weight (tons) (4-11 <sup>+</sup> )				51600	52600	54400		67200	50200			
Fishing Effort (f)													
Fishing Mortality (F)				0.30	0.30	0.30		0.40	0.30				
TAC (tons)				70500	70000								

Recruitment Prospects : 1971 year-class better than 1970 year-class

Comments : No commercial sampling data available from the offshore fishery for 1971 and 1972  
 (a) Assuming 1974 catch = 55,000 tons (b) Assuming 1974 catch = 70,000 tons.

\* Using Canada (N) Survey results unadjusted for stratified-random effects on 1970 and 1971 year-classes.

SPECIES : Cod  
 STOCK AREA : 4T - 4 Vn (Spring)  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : Halliday (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort analysis

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975			
STOCK		3			99760	63968	64056	108500	69245	62626	60000	60000			
		4			89983	81396	52076	52421	88830	55298	50916	48635			
		5			35310	66306	62175	39564	40678	59794	41295	38099			
		6			19070	21593	42949	37358	25775	23056	38241	26331			
		7			11616	11384	14447	24374	22495	14595	13490	22285			
		8			4974	6872	7044	8034	14411	10746	7914	7330			
		9			4175	2918	3693	4043	4255	7159	5695	4215			
		10			1611	2737	1559	1717	2191	2244	3882	2973			
		11			2287	926	1530	619	905	1143	1173	2027			
		12			1890	1059	566	738	365	332	595	612			
		13			509	916	611	138	213	184	155	311			
	Number (000)					271185	260075	250706	277506	269363	237177	223356	212818		
	Weight (tons)														
CATCH		3	0.39		310	327	26	2	1541	378	541	541			
		4	0.64		8140	4936	3395	2476	14294	4396	3978	3800			
		5	0.91		8086	12530	14972	7313	11326	11878	8313	7670			
		6	1.25		4674	3571	11925	8941	7193	5982	10046	6917			
		7	1.60		2916	2516	4194	6127	8479	4492	4140	6840			
		8	2.10		1276	2136	1905	2567	5128	3455	2525	2338			
		9	3.20		753	917	1444	1237	1370	2204	1884	1395			
		10	4.52		434	785	727	554	719	740	1285	984			
		11	5.39		899	212	569	156	452	380	388	671			
		12	5.65		698	283	360	432	127	130	197	203			
		13	5.81		259	292	239	42	92	63	51	103			
	Number (000)					28445	28505	39840	29847	50721	34098	33350	31461		
	Weight (tons)					46551	47512	66601	57215	67733	50543	50400	48700		
										49550	calculated				
F (Age 5-13)					0.42	0.33	0.56	0.44	0.51	0.42	0.41	0.41			
TAC (tons)											63,000				
Recruitment Prospects :															
Comments :															



SPECIES : Cod  
 STOCK AREA : Div 4 Va-W  
 MSY (W) : (60,000)  
 $F_{MAX}$  : (0.45)       $F_{OPT}$  : \_\_\_\_\_

REFERENCE : Halliday, Canada (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort analysis

Nos. x 10<sup>-3</sup>

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975			
				STOCK	2			76720	56907	88288	65545	-	-	
3			77820		62742	46590	72284	52397	-					
4			54009		61563	50213	38071	48627	39472					
5			33868		34899	41875	35954	23976	28634					
6			18693		15623	19065	23759	21424	10545					
7			6408		7489	7183	10567	16201	8888					
8			2287		1967	4262	2857	6425	9829					
9			2488		879	1146	2117	1334	3323					
10			1095		1141	468	415	1307	727					
11			450		501	449	193	127	615					
12			546		142	319	167	26	6					
Number (000) Age 4+					119844	124204	124980	114100	119467	102039				
Weight (tons)														
CATCH	2			79	-	-	1400	3609	4758					
	3			2379	1277	81	11664	3787	10995					
	4			10300	9426	5699	7951	12354	6644					
	5			13379	10508	11631	8855	10040	9041					
	6			8637	6198	5572	3593	9563	3762					
	7			3624	2066	3341	2461	3797	3074					
	8			1098	513	1517	1111	2141	3797					
	9			990	278	578	471	404	1222					
	10			437	537	210	235	503	290					
	11			251	101	221	146	109	337					
	12			371	34	171	80	8	3					
	Number (000)				41,545	30,938	29,021	37,967	46,315	43,923				
	Weight (tons)				80,446	50,200	61,775	54,263	61,645	53,540				
Fishing Effort (f)														
Fishing Mortality (F)				0.82	0.43	0.65	0.48	0.49	0.59					
TAC (tons) Ages 5-12														
Recruitment Prospects :														
Comments : Spanish samples (in 1971 and 1973) and Soviet samples in 1973 indicate substantial quantities of age 2 and 3 cod caught.														

SPECIES : Cod

REFERENCE : R G Halliday (Canada) May 1974

STOCK AREA : Div 4Vs-W

LAST YEAR OF DATA : 1973

MSY (W) : \_\_\_\_\_

SPAWN. STOCK AT MSY (W) : \_\_\_\_\_

F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : \_\_\_\_\_

METHOD : Research vessel survey population estimates (X10<sup>-3</sup>)

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1970	1971	1972	1973				
STOCK		1			1480	1539	6210	16128				
		2			16388	7680	9657	122779				
		3			5250	35664	9635	104965				
		4			7669	8027	33848	59948				
		5			3735	15803	5571	22524				
		6			1217	5771	6111	1870				
		7			1502	3459	1688	2907				
		8			462	1475	547	901				
		9			104	638	495	431				
		9+			711	471	153	910				
		Number (000)			38,518	80,527	73,915	333,363				
		Weight (tons)										
CATCH		Z										
		ages 5+			-0.42	1.12	0.73			Mean=	0.48	
		Z										
	ages 6+				-0.41	1.41	0.56			Mean=	0.52	
		Number (000)										
		Weight (tons)										
		Fishing Effort (f)										
		Fishing Mortality (F)										
		TAC (tons)										
Recruitment Prospects :												
Comments :												

SPECIES : Cod  
 STOCK AREA : Div. 4X (Offshore)  
 MSY (W) : 15,000  
 F<sub>MAX</sub> : 0.35 F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : Halliday (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort analysis

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975			
				STOCK	2	0.62		9541	5651	6094	5343	5000	5000	5000
3	1.23		6290		7805	4593	4502	4279	3895	4069	4053			
4	1.21		4544		4048	5464	2070	3193	2374	2739	2867			
5	2.40		6973		2356	2477	1945	1254	1464	1267	1459			
6	3.13		2643		2737	745	893	801	417	574	515			
7	3.88		643		907	737	409	239	455	164	233			
8	6.18		350		314	214	432	146	92	196	67			
9	1.66		490		184	89	121	87	73	39	80			
10	7.33		66		290	36	28	34	34	29	16			
Number (000)					31,540	24,292	20,449	15,743	15,033	13,804	14,076	14,289		
Weight (tons)														
CATCH	2			7	37	538	106	226	25	45	45			
	3			1217	1024	1868	545	1248	499	515	513			
	4			1508	925	2794	487	1271	754	874	915			
	5			3285	1308	1255	875	674	700	585	673			
	6			1389	1662	222	543	221	199	265	238			
	7			234	584	189	209	115	197	76	108			
	8			114	186	60	295	51	41	91	31			
	9			123	126	49	72	41	35	18	37			
	10			32	234	5	23	17	20	13	7			
	Number (000)				7,909	6,086	6,980	3,155	3,864	2,471	2,481	2,567		
	Weight (tons)				17,765	19,058	9,225	8,821	7,332	(6914)	5,457	5,490		
F(Age 5-10)				0.61	1.33	0.50	1.20	0.67	(5619) 0.75	Calculated 0.70	ed catch 0.70			
TAC (tons)														
Recruitment Prospects :														
Comments :														

SPECIES : Cod  
 STOCK AREA : Div. 4X (Offshore)  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : R.G. Halliday (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Research vessel survey population  
 estimates

		Age Group	$\bar{W}$ (kg)	Part. Recr.		1970	1971	1972	1973				
STOCK		1				891	286	19	74				
		2				1,588	7,604	1,320	2,040				
		3				2,660	4,265	2,871	1,188				
		4				4,375	574	1,988	1,972				
		5				1,935	1,465	413	696				
		6				2,610	638	414	218				
		7				1,148	855	95	101				
		8				578	28	385	59				
		9				202	-	214	116				
		9+				126	-	204	81				
		Number (000)				16,112	15,715	7,923	6,543				
		Weight (tons)											
CATCH		Z ages 5+				1.47	0.82	0.97	(Mean = 1.09)				
		Number (000)											
		Weight (tons)											
		Fishing Effort (f)											
		Fishing Mortality (F)											
		TAC (tons)											
Recruitment Prospects :													
Comments :													



SPECIES : Haddock  
 STOCK AREA : Div. 4W  
 MSY (W) : 25,000 (Div. 4W)  
 $F_{MAX}$  : 0.50       $F_{OPT}$  : \_\_\_\_\_

REFERENCE : Halliday, (May 1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Research Vessel Survey Population

Estimates

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975		
STOCK		0				-	-	-	123	-				
		1				2330	6151	3689	2626	1432				
		2				4529	1779	8936	491	3008				
		3				7465	3656	2858	1313	788				
		4				6638	2973	3888	865	1104				
		5				3332	1108	1491	988	543				
		6				3366	959	796	414	920				
		7				1336	901	360	237	167				
		8				216	354	599	125	83				
		9				427	125	30	102	81				
	10+				-	-	86	-	49	-				
Number (000)						29,640	18,094	22,647	7,333	8,126				
Weight (tons)							18,160	15,460	7,140	8,700				
CATCH							<u>69/70</u>	<u>70/71</u>	<u>71/72</u>	<u>72/73</u>				
		F (age 5+)			-	-	1.07	0.48	1.06	0.23	Mean = 0.71			
		F (age 6+)			-	-	1.09	0.70	1.05	0.83	Mean = 0.92			
Number (000)														
Weight (tons)						9,370	7,296	10,378	3,108	3144*				
Fishing Effort (f)														
Fishing Mortality (F)														
TAC (tons)						-	-	-	4,000	4,000	NIL			
Recruitment Prospects : No improvement over recent low levels.														
Comments : Stock estimates from commercial catch data have not been updated, thus are not available for this meeting. * Preliminary														

SPECIES : Haddock  
 STOCK AREA : Div. 4X  
 MSY (W) : -  
 F<sub>MAX</sub> : (0.50)      F<sub>OPT</sub> : -

REFERENCE : Halliday (Res. Doc. 74/91)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : -  
 METHOD : Cohort analysis

Paper no. X 10<sup>-6</sup>      Catch X 10<sup>-3</sup>

	Age Group	W̄ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975		
				STOCK	2			15.9	7.6	13.5	-	-	(50.0)
3			7.3		12.4	6.2	10.1	-	(1.2)	38.2	20.1		
4			6.7		5.7	8.4	4.4	6.8	(13.2)	0.9	27.4		
5			55.8		4.4	2.9	5.5	2.9	3.9	8.8	0.6		
6			16.3		29.9	2.1	2.0	3.2	1.9	2.2	4.8		
7			2.1		9.1	14.3	1.3	1.3	2.0	1.1	1.2		
8			1.9		1.1	4.5	7.6	1.0	1.0	1.1	0.6		
9			1.9		1.1	0.5	2.0	3.2	0.8	0.5	0.6		
10			0.8		0.9	0.7	0.3	0.7	1.6	0.4	0.3		
11			0.3		0.4	0.6	0.5	0.1	0.1	0.7	0.2		
Number (10 <sup>6</sup> )					109.0	72.6	53.7	33.2	19.2	75.7	79.0	57.3	
Weight (tons)				-	-	-	-	-	68,669	73,600	67,900		
CATCH	2	0.51		665	10	1055	788	22	3054	448	27		
	3	0.75		297	2016	724	1617	3434	112	4226	2381		
	4	1.20		1164	1968	1502	788	1841	2232	184	5911		
	5	1.76		17448	1621	379	1422	509	1062	2644	161		
	6	2.13		4684	11243	524	404	645	528	674	1391		
	7	2.43		713	3220	4536	69	90	599	325	354		
	8	2.71		518	455	1863	3316	57	323	337	171		
	9	2.65		672	249	133	1020	1166	259	148	178		
	10	3.48		190	194	96	163	512	618	114	78		
	11	3.50		131	172	175	181	26	55	222	60		
	12	3.50		65	94	27	146	193	14	20	117		
	Number (000)									8842	9348	10829	
Weight (tons)									12,700	13,100	14,900		
Fishing Effort (f)													
Fishing Mortality (F)									0.41	0.40	0.50		
TAC (tons)						18,000	18,000	9,000	9,000	0			
Recruitment Prospects :													
Comments :													

SPECIES : Silver Hake

REFERENCE : Halliday 1974 WP #9

STOCK AREA : Div. 4VWX

LAST YEAR OF DATA : 1973

MSY (W) : -

SPAWN. STOCK AT MSY (W) :                     

F<sub>MAX</sub> : (1.0)      F<sub>OPT</sub> : (0.6)

METHOD : Virtual population analysis

		Age Group	W (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975		
STOCK		1			3584	3147	3884	3648	1935	(3500)	(3500)	(3500)		
		2			1881	2172	1888	2218	2127	1051	2058	2104		
		3			416	1129	1303	1089	1280	1190	571	1102		
		4			102	374	643	537	451	593	226	156		
		5			34	74	154	133	156	189	32	47		
		6			13	20	21	26	48	52	9	8		
			Number (10 <sup>6</sup> )							5997	6575	6391	6917	
		Weight (000t)							685	708	559	636		
CATCH		1	.062		585	14034	149395	99320	158690	83145	23000	27416		
		2	.095		5043	11809	59013	79316	129743	86237	190000	188146		
		3	.151		6663	76757	350498	281038	240609	672938	255000	493155		
		4	.214		3173	98657	349164	229755	111399	464648	122000	84284		
		5	.319		1303	32573	92601	44783	57208	161870	15000	21447		
		6	.478		707	6344	8786	4747	11291	36728	1000	2681		
		7			270	441	2296	1682	1841	11884	-	-		
		8			95	217	2188	1453	408	3534	-	-		
		9			-	-	90	975	101	902	-	-		
		10			-	-	2	-	21	438	-	-		
			Number (000)			17839	240832	1014033	743064	703311	1522324	606000	817000	
		Weight (tons)			3447	46323	169045	128653	114048	248000	89000	120000		
		Fishing Effort (f)												
		Fishing Mortality (F)										> 1.0		
		TAC (tons)									100000			
Recruitment Prospects :														
Comments :														



SPECIES : Am. Plaice (Male)  
 STOCK AREA : Div. 3LN(0)  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.50

REFERENCE : Pitt. T.K. (Res Doc. 74/73)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

	Age Group	W (kg)	Part. Recr.	1971	1972	1973	1974	1975						
				STOCK	7	0.315	0.10	73400	59400	56800	(64000)	(64000)		
8	0.350	0.26	49500		54500	43500	41600	(47400)						
9	0.455	0.52	35200		33500	37800	31100	28500						
10	0.609	0.66	21500		20500	20000	27000	18100						
11	0.724	1.00	14800		11200	10000	12200	14800						
12	0.800	1.00	3100		8500	4200	4300	6000						
13	0.906	1.00	2100		1400	4200	1800	1900						
14	0.998	1.00	800		1000	500	1800	800						
15	1.133	1.00	500		400	400	200	800						
Number (000)					201800	190400	177400	184000	182300					
Weight (tons)					86300	83100	77900	81200	79700					
CATCH	7	0.315	0.10		3800	3100	2900	2800	2800					
	8	0.350	0.26		5700	5300	3200	4500	5100					
	9	0.455	0.52		7900	7000	2800	7000	5800					
	10	0.609	0.66		6300	7000	3900	7300	4500					
	11	0.724	1.00		3400	5200	3900	4600	5200					
	12	0.800	1.00	1300	2800	1700	1500	2100						
	13	0.906	1.00	800	1000	1700	700	700						
	14	0.998	1.00	200	500	200	700	300						
	15	1.133	1.00		100	100	100	300						
	Number (000)				29400	32000	20400	29200	26800					
	Weight (tons)				15000	17800	11700	16100	14800					
	Fishing Effort (f)				169.2	132.1	106.2							
	F (Fully recruited)				0.43	0.61	0.58	0.55	0.50					
	TAC (tons) Male & Fem.						52,000 <sup>1</sup>	52,000 <sup>1</sup>	48,000 <sup>2</sup>					
	Recruitment Prospects :													
	Comments : Assessment made for Div. 3LN with estimated amounts added for Div. 3Ø													
1. 8,000 tons to be added for Div. 3Ø (Total = 60,000) 2. 12,000 tons to be added for Div. 3Ø (Total = 60,000)														
(see overleaf)														

SPECIES : Am. Plaice (Female)  
 STOCK AREA : Div. 3LN(0)  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : \_\_\_\_\_  $F_{OPT}$  : 0.45

REFERENCE : Pitt, T.K. (Res Doc. 74/73)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1971	1972	1973	1974	1975					
STOCK		8	0.351	0.01	125800	79900	110500	(105000)	(105000)					
		9	0.471	0.11	88500	100000	63500	87900	(83500)					
		10	0.615	0.18	58200	67600	78500	49000	68500					
		11	0.745	0.24	45200	41400	51800	60700	37000					
		12	0.878	0.37	44700	31600	29800	38100	44400					
		13	1.114	0.44	16600	31500	21900	22100	26000					
		14	1.199	0.49	14900	10200	21600	14600	14600					
		15	1.357	0.64	9700	9200	5400	14300	9400					
		16	1.499	1.00	5400	5100	5900	3000	8600					
		17	1.799	1.00	3200	2600	2600	3100	1500					
		18	1.990	1.00	1600	1800	800	1400	1600					
		19	2.030	1.00	700	700	1000	400	600					
	20	2.130	1.00	300	200	300	500	200						
	21	2.200	1.00		100	400	200							
Number (000)					414800	381900	394000	400300	400900					
Weight (tons)					263200	253100	258000	263800	264500					
CATCH		8	0.351	0.01	3400	2100	3000	2800	2800					
		9	0.471	0.11	5400	3700	3300	3900	3700					
		10	0.615	0.18	6900	3900	3900	3400	4800					
		11	0.745	0.24	6100	4600	4800	6000	3500					
		12	0.878	0.37	5700	4400	2600	5900	6200					
		13	1.114	0.44	3800	4700	3700	3800	4400					
		14	1.199	0.49	3300	3200	3700	2800	2600					
		15	1.357	0.64	3100	1800	1600	3500	2200					
		16	1.499	1.00	2100	1700	2000	1100	2800					
		17	1.799	1.00	900	1500	800	1100	500					
		18	1.990	1.00	700	500	400	500	500					
		19	2.030	1.00	400	300	200	100	400					
	20	2.130	1.00	100	100	100	200	100						
	21	2.200	1.00	40	40	100								
Number (000)					41900	32500	30200	35100	34500					
Weight (tons)					37200	30800	27700	32200	31700					
Fishing Effort (f)					(see males)									
Fishing Mortality (F)					0.61	0.51	0.45	0.48	0.45					
TAC (tons)					see for males									
Recruitment Prospects : See males														
Comments :  See males														

SPECIES : Yellowtail  
 STOCK AREA : Div. 3LNO  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : \_\_\_\_\_  $F_{OPT}$  : 0.60

REFERENCE : Pitt, T.K. (Res. Doc. 74/73)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

	Age Group	W (kg)	Part. Recr.	1971	1972	1973	1974 <sup>a</sup>	1975 <sup>a</sup>	1974 <sup>b</sup>	1975 <sup>b</sup>			
				STOCK	4								
5	0.305	0.33	115300		132900	(130000)	(130000)	(130000)	(130000)	(130000)			
6	0.452	0.53	98400		82100	93700	(80700)	(80700)	(80700)	(79100)			
7	0.610	1.00	38900		47900	50300	50400	43400	50400	38900			
8	0.724	1.00	9600		14000	11400	22000	20500	23300	16800			
9	0.842	1.00	4400		3700	2000	4700	9000	4700	7700			
10	1.030	1.00	800		1800	800	800	1900	800	1500			
11	1.130	1.00	600		300	900	300	300	300	300			
Number (000)					268000	282700	289100	288900	285800	290200	274300		
Weight (tons)					115500	122300	124400	127900	127300	128900	119700		
CATCH	4	0.192			200	1800	3500	3500	3500	3500	3500		
	5	0.305	0.33	3900	5600	20900	20900	20900	22800	20400			
	6	0.452	0.53	28900	12300	23000	19300	19300	24600	18800			
	7	0.610	1.00	19700	29000	16100	19900	17200	19900	15400			
	8	0.724	1.00	5500	12100	4500	8700	8100	10700	6600			
	9	0.842	1.00	4300	2400	800	1800	3800	1800	3000			
	10	1.030	1.00	400	800	300	300	700	300	600			
	11	1.103	1.00	500	200	300	100	100	100	100			
	Number (000)				63400	64200	69400	74500	73600	83700	68400		
	Weight (tons)				34900	37100	31800	36100	36200	40600	32800		
	Fishing Effort (f)				87.8	102.9	73.5						
Fishing Mortality (F)				0.71	0.97	0.60	0.60	0.60	0.80	0.60			
TAC (tons)						50,000	40,000	35,000	40,000	32,000			
Recruitment Prospects : Recruitment assessed to be average for previous few years at age 5. Research vessel surveys, however, indicate fewer 3 & 4 year old fish in 1973 than 1972.													
Comments : (a) Assuming TAC of 40,000 tons not taken in 1974. (b) Assuming TAC of 40,000 tons taken in 1974.													

SPECIES : Pollock

REFERENCE : R.G. Halliday (May 1974)

STOCK AREA : Div. 4VWX

LAST YEAR OF DATA : 1973

MSY (W) : -

SPAWN. STOCK AT MSY (W) : -

F<sub>MAX</sub> : - F<sub>OPT</sub> : -

METHOD : Research vessel survey population estimates (x 10<sup>-3</sup>)

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975		
STOCK	1					35	-	51	-				
	2					8867	3631	465	1998				
	3					2136	3023	986	1859				
	4					1326	837	6146	5649				
	5					967	194	1905	2075				
	6					953	89	551	330				
	7					766	158	157	76				
	8					494	54	272	191				
	9					106	36	227	290				
	10					-	111	177	11				
	11					266	-	61	128				
	12					66	-	29	56				
	13+					-	-	125	-				
	Unk.					135	-	51	69				
Number (000)						16,117	8,133	11,203	12,732				
Weight (tons)						29,830	9,500	28,080	28,770				
CATCH													
Number (000)													
Weight (tons)				17,623	15,221	11,795	12,072	20,206	(29,990)				
Fishing Effort (f)													
Comm. catch/effort				60.5	50.4	49.1	45.5	145.3	162.9	(kg/hr Can.0.T)			
TA (tons)													
Recruitment Prospects :													
Comments :													



SPECIES : Mackerel (Hypothesis 1)<sup>1</sup>  
 STOCK AREA : 5Z + 6  
 MSY (W) : 260,000 tons  
 $F_{MAX}$  : 0.9       $F_{OPT}$  : 0.3

REFERENCE : Mackerel Working Group (1974)  
 LAST YEAR OF DATA : 1973 catch  
 SPAWN. STOCK AT MSY (W) : 340,000 tons  
 METHOD : VPA

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1967	1968	1969	1970	1971	1972	1973	1974	1975
STOCK	0					3137	1368	1983				
	1	.095	0.25			2082	2322	1011	1468	(1450)	(2320)	
	2	.175	0.50			4243	1428	1607	663	1052	850	1267
	3	.266	0.90			1378	2996	1033	951	427	497	343
	4	.350	1.00			358	950	1919	676	465	141	123
	5	.432				125	248	554	965	313	140	31
	6	.506				113	88	150	214	364	94	31
	7	.564				88	79	53	72	65	110	21
	8	.615				48	61	48	27	25	20	24
	9	.659				25	33	28	26	13	8	4
10+	.693								13	10	7	4
Number (millions) <sup>2</sup>						6378	5883	5392	3607	2734	1867	1848
Weight (000 t) <sup>3</sup>						1195	1352	1340	1011	714	451	365
CATCH	0					2.7	2.9	1.1	10.9			
	1					133.4	131.3	100.4	41.4	87.2	531	
	2					171.3	28.9	278.0	74.3	332.9	340	
	3					82.6	349.4	104.2	278.4	209.1	294	
	4					20.0	174.0	530.6	217.8	243.6	88	
	5					6.2	39.7	227.8	407.4	163.9	88	
	6					5.5	13.9	45.5	109.0	190.9	59	
	7					4.8	12.5	13.7	32.7	34.1	69	
	8					2.5	19.6	10.7	8.5	13.0	13	
	9					1.6	18.0	9.1	13.1	6.6	5	
10+					0.9	9.0	4.8	8.9	5.3	4		
Number (millions)						431.5	799.2	1325.9	1202.4	1286.6	1491	
Weight (000 t)						108.3	199.8	348.7	386.0	371.8	303	
Fishing Effort (f)												
Fishing Mortality (F)				(Ages 5-9)		0.067	0.42	0.44	0.73	0.90	1.22 <sup>4</sup>	
TAC (000 t)										450	304	
Recruitment Prospects : 1973 ( ): recruitment at age 1 (1972 year-class) equals 25% of 1967 year-class 1974 ( ): recruitment at age 1 (1973 year-class) equals 40% of 1967 year-class												
Comments : <sup>1</sup> $F_{1973} = 0.9$ , and partial recruitment at 0.25, 0.50 and 0.90 for ages 1 to 3 respectively. <sup>2</sup> Age 2 and older fish. <sup>3</sup> Corrected on basis of Fig. 1 in Mackerel Working Group Report (Redbook 1974, page 34). <sup>4</sup> Assuming that TAC will be taken in 1974.												

SPECIES : Mackerel (Hypothesis 2)<sup>1</sup>  
 STOCK AREA : 5Z + 6  
 MSY (W) : 328,000 tons  
 $F_{MAX}$  : 1.5       $F_{OPT}$  : 0.4

REFERENCE : Mackerel Working Group (1974)  
 LAST YEAR OF DATA : 1973 catch  
 SPAWN. STOCK AT MSY (W) : 463,000 tons  
 METHOD : VPA

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1967	1968	1969	1970	1971	1972	1973	1974	1975	
STOCK	0					5956	4327	6256					
	1	.095	0.10			2936	4410	3203	4634	(1790)	(2860)		
	2	.175	0.30			5239	2060	3154	2287	3399	1274	2040	
	3	.266	0.40			1558	3734	1501	2097	1628	2233	842	
	4	.350	0.60			425	1083	2465	1022	1311	1027	1421	
	5	.432	1.00			159	297	652	1370	572	764	606	
	6	.506				133	112	186	287	667	210	387	
	7	.564				94	93	71	99	119	245	106	
	8	.615				62	66	58	41	45	44	124	
	9	.659				44	44	32	34	23	17	22	
	10+	.693							16	18	14	16	
	Number (millions) <sup>2</sup>						7714	7489	8119	7253	7782	5828	5564
	Weight (000 t) <sup>3</sup>						1434	1680	1880	1783	1804	1485	1403
CATCH	0					2.7	2.9	1.1	10.9				
	1					133.4	131.3	100.4	41.4	87.2	92		
	2					171.3	28.9	278.0	74.3	332.9	119		
	3					82.6	349.4	104.2	278.4	209.1	273		
	4					20.0	174.0	530.6	217.8	243.6	182		
	5					6.2	39.7	227.8	407.4	163.9	211		
	6					5.5	13.9	45.5	109.0	190.9	58		
	7					4.8	12.5	13.7	32.7	34.1	68		
	8					2.5	19.6	10.7	8.5	13.0	12		
	9					1.6	18.0	9.1	13.1	6.6	5		
	10+					0.9	9.0	4.8	8.9	5.3	4		
	Number (millions)						431.5	799.2	1325.9	1202.4	1286.6	1024	
	Weight (000 t)						108.3	199.8	348.7	386.0	371.8	301	
Fishing Effort (f)													
Fishing Mortality (F)				(Ages 5-9)		0.05	0.31	0.34	0.47	0.40	0.38 <sup>4</sup>		
TAC (000 t)										450	304		

Recruitment Prospects : 1973 ( ) : recruitment at age 1 (1972 year-class) equals 25% of 1967 year-class  
 1974 ( ) : recruitment at age 1 (1973 year-class) equals 40% of 1967 year-class

Comments : <sup>1</sup>  $F_{1973} = 0.4$ , and partial recruitment at 0.10, 0.30, 0.40 and 0.6 for ages 1 to 4 respectively.  
<sup>2</sup> Age 2 and older.  
<sup>3</sup> Corrected on basis of Fig. 1 in Mackerel Working Group Report (Redbook 1974, page 34).  
<sup>4</sup> Assuming that TAC will be taken in 1974.

SPECIES : Herring  
 STOCK AREA : Div. 4XW(b)  
 MSY (W) : -  
 F<sub>MAX</sub> : 0.50 F<sub>OPT</sub> : -

REFERENCE : Miller & Halliday (Res. Doc. 74/13)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : -  
 METHOD : Cohort analysis

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975		
STOCK		1			515	518	503	-	-	-				
		2			1989	409	424	411	-	(388)	(548)	(548)		
		3			709	953	275	271	327	(2627)	299	435		
		4			642	506	486	212	165	237	1565	231		
		5			667	468	370	228	132	62	142	859		
		6			246	304	278	155	114	67	32	79		
		7			155	138	184	147	89	45	39	12		
		8			58	48	69	66	72	40	22	20		
											31	21	8	
										8	15	8		
Number (10 <sup>6</sup> )										3,503	2681	2200		
Weight (000t)										422.0	373.0	336.0		
CATCH		1	-		13852	5	448	4626	7732	1	-	-		
		2	.031		746145	65549	83808	11105	647970	20505	14800	14686		
		3	.114		78899	325057	14819	62611	35408	650221	14800	48162		
		4	.159		64045	51952	188539	46175	82118	57480	470580	46543		
		5	.227		267965	115750	163076	80192	56397	21127	41640	308809		
		6	.270		70183	71446	89144	41890	58906	17996	15300	28360		
		7	.299		87767	48659	93908	53092	43546	16102	13020	4371		
		8	.334		31258	18837	32846	21031	39860	13155	11640	7139		
		9	.360		15277	6194	13428	9732	23034	11901	9540	2809		
		10	.386		5635	2789	7300	4215	9315	5520	8640	3040		
	Number (000)				1381026	706238	687316	334669	1004286	814008	599960	463919		
Weight (tons)									109178	105102	96980			
Fishing Effort (f)														
Fishing Mortality (F)												0.50		
TAC (tons)								55,000	90,000	90,000				
Recruitment Prospects : 1972 and 1973 year classes assumed approx. 500 X 10 <sup>6</sup> fish at age 2.														
Comments : Approx. 15,000 tons caught by weirs, gillnets etc. to be subtracted from W <sub>c</sub> to obtain TAC recommendation in 1975.														

SPECIES : Herring

REFERENCE : Herring Working Group (1974)

STOCK AREA : Div. 5Y

LAST YEAR OF DATA : 1973

MSY (W) : 50,000-60,000 tons

SPAWN. STOCK AT MSY (W) : 100,000-120,000 tons

F<sub>MAX</sub> : - F<sub>OPT</sub> : 0.32 (M = 0.20)

METHOD : VPA

	Age Group	W (kg)	Part. Recr.	1969	1970	1971	1972	1973		1974		1975		
								(1)	(2)	(1)	(2)	(1)	(2)	
STOCK	3	.155	.06	297	203	151	59	446 <sup>1</sup>	594 <sup>2</sup>	59 <sup>3</sup>	59 <sup>3</sup>	150 <sup>4</sup>	150 <sup>4</sup>	
	4	.180	.53	185	208	158	103	26	26	283 <sup>1</sup>	404 <sup>2</sup>	46	46	
	5	.220	.49	119	146	146	109	50	50	15	15	162 <sup>1</sup>	250 <sup>3</sup>	
	6	.240	.65	92	88	103	89	54	54	31	31	9	10	
	7	.275	1.00	83	55	48	51	35	35	32	32	16	18	
	8	.300	1.00	75	44	21	16	17	17	14	14	13	15	
	9	.320	.84	35	42	15	3	5	5	7	7	6	7	
	10+	.340	.70	9	22	13	4	3	3	4	4	4	5	
	Number (millions) <sup>5</sup>				598	605	497	375	190	190	386	507	256	351
	Weight (000 t) <sup>5</sup>				141	140	114	85	46	46	79	100	58	79
CATCH	3			39	9	23	17	19		3	1			
	4			6	26	23	37	6		78	90			
	5			10	18	34	40	10		4	3			
	6			22	27	37	42	13		10	8			
	7			27	27	26	27	14		14	12			
	8			21	23	16	9	7		6	5			
	9			11	28	11	1	2		3	2			
	10+			4	17	11	2	1		1	1			
	Number (millions)				141	316	180	177	72		119	122 <sup>6</sup>		
	Weight (000 t)				33	46	43	40	16		25	25 <sup>6</sup>		
Fishing Effort (f)														
F (Age 3 & older) <sup>7</sup>				0.156	0.334	0.429	0.603	0.156(0.128)		0.360	(0.281)			
TAC (tons)														
Recruitment Prospects : <sup>1</sup> 1970 year-class assumed equal to 150% of 1966 year-class.														
<sup>2</sup> 1970 year-class assumed equal to 200% of 1966 year-class.														
<sup>3</sup> 1971 year-class assumed equal to 1969 year-class.														
<sup>4</sup> 1972 year-class assumed to be 150 million fish.														
Comments :														
<sup>5</sup> Number and weight for age 4 and older.														
<sup>6</sup> Assuming that 1974 TAC is taken with 2 assumptions on 1970 year-class size, but with same selection factors on F for both assumptions.														
<sup>7</sup> Fishing mortality is weighted average over age-groups by stock size.														

SPECIES : Herring  
 STOCK AREA : 5Z & 6  
 MSY (W) : 250,000  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.32(M=0.20)

REFERENCE : Herring Working Group(1974)  
 LAST YEAR OF DATA : 1973  
 SPAWN. STOCK AT MSY (W) : 500,000 tons  
 METHOD : V.P. analysis

		Age Group	$\bar{W}$ (kg)	Part. Recr. (1974)	1969	1970	1971	1972	1973	1974	1975	1976			
STOCK		3	.155	123	1627	1012	565	559	3234 <sup>1</sup>	559 <sup>2</sup>	(800) <sup>3</sup>	(800) <sup>3</sup>			
		4	.180	314	1143	1291	715	239	431	1724 <sup>1</sup>	320 <sup>2</sup>	479			
		5	.220	257	735	745	649	333	118	118	820 <sup>1</sup>	136 <sup>2</sup>			
		6	.240	100	591	351	365	238	119	39	62	352 <sup>1</sup>			
		7	.275		361	232	177	142	82	68	27	40			
		8	.300		295	125	106	53	45	47	47	17			
		9	.320		152	67	56	41	11	26	32	30			
		9+	.340		47	35	43	33	25	6	22	32			
		Age 4 & older			(10 <sup>6</sup> )	3324	2846	2111	1079	831	2028	1382	1085		
		Age 4 & older			(10 <sup>6</sup> )	762	643	472	253	180	389	301	237		
	Age 3 & older			N <sub>B</sub> (10 <sup>6</sup> ) W <sub>B</sub> (10 <sup>3</sup> )	4951 1014	3858 799	2676 560	1638 339	4065 681	2587 476	2180 425	1885 351			
CATCH		2				13	13	28	10						
		3	.155		46	125	333	35	1026	97	195				
		4	.180		210	451	276	110	266	661	187				
		5	.220		277	270	285	214	64	39	359				
		6	.240		278	122	176	158	33	6	13				
		7	.275		189	93	104	100	23	10	6				
		8	.300		191	52	50	45	12	7	10				
		9	.320		110	30	14	29	3	4	7				
		9+	.340		24	18	22	21	5	1	5				
		Age 3 & older			N <sub>C</sub> (10 <sup>6</sup> ) W <sub>C</sub> (10 <sup>3</sup> )	1325 306	1161 247	1260 263	712 174	1432 199	825 150	759 150			
Fishing Effort (f)															
Fishing Mortality (F) <sup>4</sup>					.42	.41	.74	.80	0.51	.405	.635				
TAC (000 tons)															
Recruitment Prospects :															
1) 1970 year-class assumed equal to 200% of the 1966 year-class at age 3.															
2) 1971 year-class assumed equal to size of 1969 year-class at age 3.															
3) 1972 and 1973 year classes assumed equal to approximately 1/2 of the 1966 year class at age 3.															
4) Weighted by stock in numbers.															
Comments :															
1976 stock size depends on the TAC for 1975, 150,000 tons is shown in this table.															

