



Serial No. 3765  
(G.a.)

ICNAF Summ. Doc. 76/VI/8

ANNUAL MEETING - JUNE 1976

Stock Records for Some Species Considered at 1975 Assessments Meetings

compiled by

ICNAF Secretariat

At the request of the Chairman of the Assessments Subcommittee, stock records prepared by assessment scientists for consideration at 1975 Meetings of the Subcommittee have been compiled as an aid for those who will be doing assessments for the Subcommittee at the April 1976 Meeting. The following stock records have been received in accordance with the Secretariat's request to designated scientists in October 1975:

<u>Species</u>	<u>Stock area</u>	<u>Page</u>
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	1E-F .....	4
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SPECIES : GOD  
 STOCK AREA : 1A - 1D  
 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.Docs. 70/107, 74/86, 75/31)  
 LAST YEAR OF DATA : 1973 and partly 1974  
 SPAWN. STOCK AT MSY (W) : 830 000 tons (age 6+)<sup>2)</sup>  
 METHOD : VPA

	Age Group	$\bar{W}$ <sup>3)</sup> (kg)	Part. Recr.	1973	1974	1975	1976		1974	1975	1976			
					(a)	(a)	(a)		(b)	(b)	(b)			
STOCK	3	0.65	0.09	4447	20000	20000	30000		20000	20000	30000			
	4	0.99	0.27	27252	15796	16083	16083		15938	16082	16082			
	5	1.68	0.64	62597	23427	12253	12475		24068	12363	12475			
	6	2.77	1.00	7745	34669	16876	8826		47837	17338	8906			
	7	3.84		5943	3804	23240	11312		5357	32066	11622			
	8	4.72		4279	2919	2550	15578		4111	3591	21494			
	9	5.34		1712	2102	1957	1709		2960	2755	2407			
	10	5.34		665	842	1409	1311		1184	1984	1847			
	11	5.48		379	326	564	944		460	794	1330			
	12	5.39		747	186	219	378		262	308	532			
	13	8.70		308	366	125	147		516	176	207			
	14	10.00		137	151	246	84		213	346	118			
	15+	10.00		53	68	102	165		95	143	232			
	Number (000)				116264	104657	95621	99013		123001	107946	107252		
	Weight (tons)				231157	216304	224329	224901		275330	275538	265298		
Spawn. stock (tons)														
CATCH	3			127	324	324	485		324	324	485			
	4			2242	753	767	767		760	767	767			
	5			11245	2557	1337	1361		2626	1349	1361			
	6			2085	5715	2782	1455		7885	2858	1468			
	7			1600	627	3831	1865		883	5286	1916			
	8			1152	481	420	2568		678	592	3543			
	9			461	347	323	282		488	454	397			
	10			179	139	232	216		195	327	305			
	11			102	54	93	156		76	131	219			
	12			201	31	36	62		43	51	88			
	13			83	61	21	24		85	29	34			
	14			37	25	41	14		35	57	19			
	15+			34	11	17	27		16	24	38			
	Number (000)				19548	11123	10222	9282		14094	12247	10640		
	Weight (tons)				45504	29698	32034	31140		39351	40464	37800		
Fishing Effort (f)														
Fishing Mortality (F)														
TAC (tons)					4)	4)			4)	4)				

For the years 1965-72, use Figures on pages 11 and 12 of Res.Doc. 75/31

Recruitment Prospects : Year-classes 1969-72 are very poor, but 1973 seems to be better than previously expected. 1974 poor, 1975 probably better (medium ?)

Comments : 1) Rough estimate by 1960.  
 2) Data from Horsted, 1973 (Res.Doc. 73/107),  $M = 0.20$  for all age groups.  
 3) Based on 1974 figures. For earlier years see Res.Doc. 73/107 and 74/56.  
 4) TAC's recommended by STACHES for SA1 as a whole were 102 000 tons in 1973, 80 000 tons in 1974, 55 000 for 1975 and 45 000 for 1976. TAC set by the Commission: 1973 no regulation, 1974: 107 000 tons, 1975: 60 000 and 1976: 45 100  
 a) Forecast based on 1973 statistics assuming  $F_{1973} = 0.40$ ,  $F_{1974-76} = 0.20$   
 b) " " " " " " "  $F_{1973} = 0.30$ ,  $F_{1974-76} = 0.20$

COD

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

REFERENCE : Horsted (Res. Docs. 73/107, 74/86, 75/31)  
 LAST YEAR OF DATA : 1973 and partly 1974  
 SPAWN. STOCK AT MSY (W) : 350 000 tons (age 6+)<sup>2)</sup>  
 METHOD : VPA

	Age Group	$\bar{W}_3$ (kg)	Part. Recr.	1973	1974 (a)	1975 (a)	1976 (a)		1974 (b)	1975 (b)	1976 (b)			
STOCK	3	0.65	0.01	1263	5000	5000	10000		5000	5000	10000		For the years 1965-72, use figures on pages 14 and 15 of Res.Doc. 75/31	
	4	0.99	0.08	2396	4077	4086	4086		4081	4086	4086			
	5	1.68	0.41	43250	6473	3285	3292		6525	3289	3292			
	6	2.77	0.67	5242	25947	4882	2478		35354	4921	2480			
	7	3.84	1.00	3993	2868	18580	3496		3963	25316	3524			
	8	4.72		1009	1687	1654	10720		2378	2287	14606			
	9	5.34		2948	426	973	955		601	1372	1319			
	10	5.34		1487	1246	246	562		1756	347	792			
	11	5.48		250	626	719	142		883	1013	200			
	12	5.39		143	106	361	415		149	509	585			
	13	8.70		40	60	61	208		85	86	294			
	14	10.00		4	17	35	35		24	49	50			
	15+	10.00		20	2	10	20		2	14	28			
	Number (000)				60945	48534	39892	36407		60802	48288	41255		
	Weight (tons)				103054	122648	118865	100434		161857	153309	124273		
Spawn. stock (tons)														
CATCH	3			4	9	9	18		9	9	18			
	4			60	59	59	59		59	59	59			
	5			5133	463	235	235		466	235	235			
	6			980	2956	556	282		4028	561	283			
	7			1005	441	2858	538		610	3894	542			
	8			254	260	255	1649		366	352	2247			
	9			742	66	150	147		93	211	203			
	10			373	192	38	86		270	53	122			
	11			63	96	111	22		136	156	31			
	12			36	16	56	64		23	78	90			
	13			10	9	9	32		13	13	45			
	14			-	3	5	5		4	8	8			
	15+			10	1	2	3		1	2	4			
	Number (000)				8670	4569	4341	3140		6076	5631	3886		
	Weight (tons)				17438	14046	16233	13169		19029	21527	16835		
Fishing Effort (f)														
Fishing Mortality (F)				0.35	0.20	0.20	0.20		0.20	0.20	0.20			
TAC (tons)					4)	4)			4)	4)				
Recruitment Prospects : Year-classes 1969-72 are very poor, but 1973 seems to be relatively good, probably resulting from spawning off East Greenland. 1974 and 1975 have not yet shown any signs of being more than poor in these divisions.														
Comments : see footnotes for cod, Divs. 1A - 1D.														

SPECIES : Cod  
 STOCK AREA : 2J3KL  
 MSY (W) : 550,000  
 $F_{MAX}$  : 0.35       $F_{OPT}$  : 0.20

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

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1969	1970	1971	1972	1973	1974	1975	1976			
STOCK		4	.55	.34	699.8	704.2	744.2	649.5	252.9	159.5	(450.0)	(430.0)			
		5	.88	.87	554.0	538.7	524.9	547.0	460.0	170.4	118.1	(317.1)			
		6	1.23	1.09	438.6	366.9	371.4	346.9	343.0	291.6	107.6	65.5			
		7	1.66	1.18	219.3	221.7	216.0	219.2	215.5	227.5	171.6	54.0			
		8	2.12	1.07	97.1	89.7	110.9	126.8	129.2	144.6	131.3	82.7			
		9	2.64	0.96	41.1	35.5	49.3	69.1	77.2	81.3	86.0	66.5			
		10	3.18	0.84	24.6	17.3	20.1	30.2	46.0	50.5	49.8	43.6			
		11	3.73	0.74	14.6	9.8	10.9	12.6	19.0	30.8	32.2	27.9			
		12	4.15	1.00	13.2	6.5	6.4	7.0	7.6	12.1	20.3	18.9			
		13	6.06	1.00	5.9	7.0	4.3	4.1	4.3	4.3	7.3	10.6			
		13+	6.06	1.00	10.2	5.1	11.2	11.6	5.3	5.1	5.7	6.8			
			Number (millions)			2118.	2002.	2069.	2024.	1560.	1177.	1180.	1,124.		
			Weight (000 t)			2375.	2156.	2276.	2347.	2108.	1877.	1716.	1,463.		
		Spawn. stock (000 t)			1233.	1069.	1177.	1295.	1353.	1460.	1300.	907.			
CATCH		4	.55		38.1	57.2	69.0	79.8	40.7	13.8	57.0	44.2			
		5	.88		96.4	77.3	92.1	116.6	94.5	35.5	34.8	77.0			
		6	1.23		153.4	94.0	94.4	76.2	59.2	74.7	38.1	18.9			
		7	1.66		100.6	78.8	55.7	56.0	35.3	61.3	64.6	16.6			
		8	2.12		49.3	26.9	24.1	29.6	27.3	36.1	45.7	23.8			
		9	2.64		18.4	10.0	11.3	11.8	14.2	18.6	29.9	17.5			
		10	3.18		11.5	3.6	4.3	6.4	7.6	10.2	14.4	10.0			
		11	3.73		6.0	1.9	2.1	3.0	3.8	5.5	8.2	5.8			
		12	4.15		4.2	1.1	1.2	1.7	2.2	2.9	6.7	5.1			
		13	6.06		2.8	4.8	1.1	1.4	1.2	1.0	2.4	2.8			
		13+	6.06		3.3	9.5	2.1	3.0	1.2	1.2	1.9	1.8			
			Number (millions)			484.	352.	357.	385.	291.	265.	304.	224.		
			Weight (000 t)			748.	516.	432.	452.	355.	352.	522.	343.		
		Fishing Effort (f)			727.	539.	454.	492.	394.	436.					
		Fishing Mortality (F)			.67	.33	.28	.31	.27	.30	.45	.35			
		TAC (tons)													
Recruitment Prospects :															
Fair to poor															
Comments : The catch estimated for 1976 was reduced by a factor of 12% (to 300,000 tons) to compensate for the discrepancy between catch reported and catch calculated using age/weight data.															

SPECIES : Cod  
 STOCK AREA : 3NO  
 MSY (W) : 120,000  
 $F_{MAX}$  : .25       $F_{OPT}$  : \_\_\_\_\_

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

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1974	1975	1976						
	STOCK	4	1.07	.49	36.2	90.0	90.0					
5		1.71	.71	30.5	21.1	55.7						
6		2.97	1.23	20.6	15.0	11.5						
7		3.75	.89	5.2	7.1	6.0						
8		5.0	1.16	3.9	2.3	3.5						
9		6.0	.76	2.1	1.4	1.0						
10		6.9	1.00	1.3	1.0	.7						
11					.5	.5						
11+						.2						
Number (millions)				100.	138.	169.						
Weight (000 t)				212.	234.	283.						
Spawn. stock (000 t)				106.	91.	95.						
CATCH	4			9.5	20.0	9.2						
	5			10.9	6.5	8.3						
	6			10.9	7.0	2.8						
	7			2.2	2.6	1.1						
	8			2.0	1.0	.8						
	9			.8	.5	.2						
	10			.6	.4	.1						
	11				.2	.1						
	11+											
	Number (millions)				37.	38.	.23					
Weight (000 t)				88.	75.	.43						
Fishing Effort (f)				98.								
Fishing Mortality (F)				.7	.6	.25						
TAC (tons)												
Recruitment Prospects :												
Comments :												

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

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

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1969	1970	1971	1972	1973	1974	1975	1976		
STOCK		2	.08	2										
		3	.28	5										
		4	.69	35	74.7	56.7	38.3	64.3	51.9	58.1	43.0	75.0		
		5	1.08	65	60.9	54.7	39.1	25.6	48.2	38.2	40.1	30.6		
		6	1.68	63	26.7	39.4	33.2	24.3	16.8	29.1	24.4	25.3		
		7	2.40	100	14.1	15.4	23.5	20.6	16.7	10.2	19.4	15.6		
		8	3.21	100	5.4	7.4	6.9	11.9	12.8	10.2	5.9	10.6		
		9	4.10	100	1.7	2.8	3.9	2.8	7.4	8.5	5.9	3.2		
		10	5.08	100	1.7	.7	1.7	2.0	1.6	4.2	4.9	3.2		
		11	6.03	100	.5	.8	.4	.9	1.3	.8	2.3	2.7		
		11+	8.58	100	.7	.7				.8	.5	1.3		
	Number (millions)					186.	178.	147.	152.	156.	160.	146.	168.	
Weight (000 t)					238.	251.	230.	227.	243.	255.	247.	256.		
Spawn. stock (000 t)					125.	145.	148.	143.	158.	167.	166.	160.		
CATCH		4	.69		7.1	8.1	6.4	4.9	4.7	5.5	5.1	7.1		
		5	1.08		11.6	12.9	8.6	4.6	11.5	6.3	8.4	5.0		
		6	1.68		7.2	9.8	7.3	3.6	4.0	4.8	4.9	4.0		
		7	2.40		4.6	6.4	8.2	4.6	3.9	2.4	5.8	3.7		
		8	3.21		1.8	2.5	3.1	2.6	2.2	2.4	1.8	2.5		
		9	4.10		.8	.7	1.3	.8	2.0	2.0	1.8	.8		
		10	5.08		.7	.2	.5	.5	.5	1.0	1.5	.8		
		11	6.03		.1	.2	.1	.2	.2	.2	.7	.6		
		11+	8.58		.2	.1				.2	.2	.3		
	Number (millions)					34.	41.	36.	22.	29.	25.	30.	25.	
Weight (000 t)					63.	76.	64.	44.	53.	47.	61.	48.		
Fishing Effort (f)					36.	52.	47.	39.	53.	64.				
Fishing Mortality (F)					.48	.42	.47	.31	.29	.30	.30	.30		
TAC (tons)														
Recruitment Prospects :														
Comments :														

Cod (Division 5Y)

Reference: Redbook 1975, page 40.

MSY (tons): ?

F<sub>max</sub>: 0.3

F<sub>opt</sub>: 0.2

Method: Historical catches

Catches (tons): 8,261, 7,662, 6,917, 6,146, 7,764 (1970-74)

Fish. Mort.(F): 0.4-0.6 (1970-74 average)

TACs (tons): 10,000, 10,000, 10,000, 8,000 (1973-76)

Recruitment prospects: US autumn bottom trawl surveys indicate a declining trend in abundance has been consistent since 1968

COD (Division 5Z)

Reference: Redbook 1975, page 40

MSY (tons): 32,500

F<sub>max</sub>: 0.3

F<sub>opt</sub>: 0.2

Method: General Production Model

Catches (tons): 25,209, 27,695, 24,630, 28,540, 26,710 (1970-74)

Fish.effort (f): 21,125, 27,695, 24,630, 23,783, 26,710 (1970-74 days fished)

TACs (tons): 35,000, 35,000, 35,000, 35,000, (1973-76)

Recruitment Prospects: Recruitment steady from 1963 to 1971; the 1971 year-class is the strongest since 1963, but more recent year-classes seem to be less abundant.



SPECIES : Haddock  
 STOCK AREA : SA 5  
 MSY (W) : 47,000  
 $F_{MAX}$  : 0.5       $F_{OPT}$  : \_\_\_\_\_

REFERENCE : Res.Doc. 75/46  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Catch equation

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975	1976
				STOCK	1	0.7						
2	1.1	.43										
3	1.8	.68										
4	3.4	1.00										
5	3.2	1.00										
6	3.6	1.00										
7	4.2	1.00										
8	3.9	1.00										
9	4.0	1.00										
10	4.2	1.00										
11	5.4	1.00										
12+	5.6	1.00										
Number (000) <sup>1</sup>				70000	36000	24000	23000	12000	20000	42000	48000	48000
Weight (tons)				11200	72000	57600	52900	32400	32000	67200	76800	76800
Spawn. stock (tons)												
CATCH												
	Number (000)			24885	11073	4697	4654	2118	3313	2931		
	Weight (tons)			39816	22147	11274	10705	5719	5302	4690		
	Fishing Effort (f) <sup>2</sup>			11337	7856	5449	5456	2835	4859	6131		
Fishing Mortality (F)			0.50	0.41	0.24	0.25	0.21	0.20	0.08			
TAC (tons)			-	-	12000	12000	6000	6000	0	6000 <sup>3</sup>	6000 <sup>3</sup>	

Recruitment Prospects : Poor through 1976

Comments  
 1 Beginning in 1968, assuming  $M = 0.2$   $F = 0.5$  and mean weight of 1.6 kg per fish.  
 2 US standard days fished  
 3 Allocated for incidental catch only, with no directed fishery.

REDFISH (Subarea 2 & Division 3K)

Reference: Res. Doc. 74/5, 74/79, WP 75/IV/35.

MSY: 40,000-45,000 tons

Method: General Production Study

Catches (tons): 19,000, 20,000, 39,000, 30,000 (1971-74)

TACs (tons): 30,000, 30,000, 30,000 (1974-76)

Comments: Catch per day fished (vessels of >1800 tons) declined from 40 tons in 1958 to 13 tons by 1961, increased to 20 tons per day in 1962 and 1963 but thereafter decreased to 12-15 tons per day during 1966-71. Stock considered to have been depressed by heavy fishing in the late 1950's - early 1960's. TAC's of 30,000 tons established for 1974, 1975 and 1976 to permit the stock to recover toward the MSY level.

REDFISH (Division 3M)

Reference: Res. Doc. 74/78, WP 75/IV/35.

MSY: 13,000-17,000 tons

F<sub>opt</sub>: 0.20-0.25

Method: General Production and Yield per Recruit

Catches (tons): 8,000, 42,000, 22,000, 35,000 (1971-74)

Fishing Mort. (F): 0.8 to 1.0 (1971-74)

TACs (tons): 40,000, 16,000, 16,000 (1974-76)

Recruitment Prospects: Uncertain

Comments: 1974 TAC was precautionary; 1975 and 1976 TAC's based on maintaining the catch at the level of the estimated maximum sustainable yield and approximately the level of the long-term average catch. Average level of fishing mortality during 1963-73, when catches averaged approximately 13,000 tons, is estimated to have been at or beyond  $F_{0.1}$  for the average recruitment levels during this period.

REDFISH (Division 3L and 3N)

Reference: Res. Doc. 73/88, 74/79, WP 75/IV/35

MSY: (tons) 20,000

Method: General Production Study

Catches (tons): 34,000, 29,000, 33,000, 22,000 (1971-74)

TAC (tons): 28,000, 20,000, 20,000 (1974-76)

Recruitment Prospects: Unknown

Comments: 1974 TAC was precautionary; 1975 and 1976 TAC's established at the level of the estimated maximum sustainable yield. Virtually no commercial length or age data available for this stock since 1967.

REDFISH (Division 30)

References: Res. Doc. 73/88, 74/79, WP 75/IV/35.

MSY (tons): 16,000

Method: General Production Study

Catches (tons): 20,000, 16,000, 9,000, 13,000 (1971-74)

TACs (tons): 16,000, 16,000, 16,000 (1974-76)

Recruitment Prospects: Unknown

Comments: 1974-76 TAC's established at the level of the estimated MSY. Virtually no commercial length or age data available for this stock since 1968.

REDFISH (Division 3P)

Reference: Res. Doc. 73/88, 74/80, 75/137

MSY (tons): 20,000-23,000

F<sub>opt</sub>: 0.15-0.20

Method: General Production and Yield per Recruit Studies

Catches (tons): 27,500, 26,000, 18,000, 22,000 (1971-74)

Fish. Mort.(F): 0.2-0.3 (1973-74)

TACs (tons): 25,000, 25,000, 18,000 (1974-76)

Recruitment Prospects: A number of moderately good year-classes (1964-66) have begun to enter the fishery but survey data indicate that these year-classes are probably only one-half as abundant as those of the mid- and late- 1950's, which supported the fishery during 1965-74.

Comments: 1974 and 1975 TAC's of 25,000 tons were above MSY level. Decrease to 18,000 tons in 1976 was recommended on the basis of revised MSY estimate and continued decline in catch per unit effort. Catch per unit effort of the standard vessel category exhibited a steady decline from more than 0.9 tons per hour in 1965 to less than 0.5 tons per hour in 1974.

REDFISH (Subarea 5)

References: Res. Doc. 75/59

MSY (tons): 16,000-18,000

Catches (tons): 10,864, 6,777, 12,454, 16,741, 20,039, 19,095, 17,360, 10,486 (1967-74)

Fish effort(f): 876, 461, 1086, 1,773, 2,862, 3,350, 3,275, 2,097 (1967-74, based on total catch divided by US catch/effort index as days fished.)

TACs (tons): 30,000, 30,000, 25,000, 17,000 (1973-76)

Recruitment Prospects: Slight improvement

SILVER HAKE

SPECIES : Silver hake  
 STOCK AREA : 5Y  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : 0.60      F<sub>OPT</sub> : (M = 0.4)

REFERENCE : E.O. Anderson  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1970	1971	1972	1973	1974	1975	1976	1977		
STOCK		0			140659	1403430	231474	336880	(1065800)	(448752)	(448752)			
		1			70612	83460	308127	97802	174031	(580843)	(264138)			
		2			54874	32544	34472	46774	23873	38832	(231477)			
		3			40976	31996	12093	12945	10064	5946	15475			
		4			28622	19194	10172	2331	1738	1664	2370			
		5			14866	10124	4347	1500	903	529	663			
		6			9848	5086	3437	588	551	199	211			
		7			4755	2602	1796	186	50	119	79			
		8			2683	1131	920	212	43	9	47			
		9			932	477	405	174	63	11	4			
		10			490	252	204	80	70	21	4			
		11			351	132	132	69	9	20	8			
		12			25	-	42	-	-	4	8			
Number (000)					369693	1590428	607621	499541	1277195	1076949	963237			
Weight (tons)					46981	43848	33293	26637	31186	4'982	69997			
Spawn. stock (tons)														
CATCH		0	.012	25	13372	806339	71611	64233	165673	45283				
		1	.056	100	18411	26828	205899	52959	99146	197468				
		2	.192	100	5915	12188	12735	27152	12768	13202				
		3	.260	100	10294	14207	7390	8974	6534	2021				
		4	.366	100	11378	10849	6859	826	803	566				
		5	.409	100	6133	4211	3007	570	517	180				
		6	.384	100	5069	2026	2806	451	319	68				
		7	.797	100	2614	1034	1287	104	31	40				
		8	.922	100	1695	444	567	100	23	3				
		9	1.119	100	472	144	244	59	27	4				
		10	1.220	100	249	46	86	58	34	7				
		11	1.057	100	128	58	74	24	3	7				
		12	1.057	100	2	-	18	-	-	1				
Number (000)					75732	878374	312583	155510	285878	258849				
Weight (tons)					12858	19674	19199	12191	12414	15025				
Fishing Effort (f) <sup>1</sup>					1486	973	932	901	831					
Fishing Mort (F) <sup>2</sup>					.420	.627	1.406	1.087	1.100	.52				
TAC (tons)								10000	10000	15000	10000			
<p><b>Recruitment Prospects :</b> 1975 and 1976 year-classes are taken to be the average size of the 1969-73 year-classes; the 1974 year-class determined from survey age 0 <i>versus</i> stock stock size at age 0 relationship.</p>														
<p><b>Comments :</b> 1 International effort expressed in US days fished                  2 Age 1 and older.</p>														

SILVER HAKE

SPECIES : Silver hake  
 STOCK AREA : 5Ze  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : 0.45      F<sub>OPT</sub> : (M = 0.4)

REFERENCE : E.O. Anderson  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1970	1971	1972	1973	1974	1975	1976	1977		
STOCK		0			704091	1881480	1353116	1541894	1592163	1206894	1206894	1206894		
		1			362105	471695	1038985	899650	1029033	1049269	795241	801757		
		2			574402	194644	311698	606246	582523	669395	685473	525918		
		3			348016	363032	112713	149176	215246	261744	304989	375256		
		4			193689	206514	154899	22426	38224	59846	74393	130357		
		5			84772	99265	60763	8913	5461	8529	17010	31797		
		6			35016	45075	23070	3897	3882	1171	2424	7270		
		7			23001	20111	13083	1683	1375	349	333	1036		
		8			10599	12776	6402	1469	432	28	99	142		
		9			3742	6016	2433	891	728	57	8	42		
		10			682	2282	1054	220	498	362	16	3		
		11			26	439	996	68	107	224	103	7		
		12+			24	-	90	51	39	45	64	44		
Number (000)					2340165	3303329	3079302	3236584	3469711	3257913	3087046	3080524		
Weight (tons)					233968	244953	208283	258281	279412	308042	306573	320271		
Spawn. stock (tons)														
CATCH		0	.012	2	667	275053	8324	3541	22175	16933	8915			
		1	.087	3	59561	5534	111446	25332	25091	21995	8793			
		2	.175	45	27083	21946	74306	239967	160386	178981	104264			
		3	.239	100	33049	110386	67920	78362	106843	127780	92452			
		4	.299	100	37924	98098	125534	12161	21775	29216	22551			
		5	.386	100	14558	55310	48584	2610	3176	4164	5156			
		6	.324	100	4155	21647	18119	1554	2947	572	735			
		7	.461	100	3269	8918	9490	882	1209	170	101			
		8	.953	100	1346	7849	4394	319	301	14	30			
		9	1.090	100	279	3822	1845	123	157	28	2			
		10	1.187	100	22	666	843	50	137	177	5			
		11	1.299	100	13	261	817	8	33	109	31			
		12+	.789	100	12	-	50	7	16	22	19			
Number (000)					181938	609490	471672	364916	374246	380161	243055			
Weight (tons)					26057	75160	78842	62503	64265	74997	50325			
Fishing Effort (f) <sup>1</sup>					1046	4128	8951	2753	4413					
Fishing Mort. (F) <sup>2</sup>					.180	.685	2.009	.926	.946	.858	.450			
TAC (tons)								80000	80000	80000 <sup>3</sup>	50000			
Recruitment Prospects : 1974 equals 1971-73 mean; 1975-76 equals 1969-73 mean.														
Comments : <sup>1</sup> International effort expressed in US days fished <sup>2</sup> F = 0.938, if 1975 catch = 80,000 tons (assuming USA takes 11,100 tons) <sup>3</sup> F = 0.858, if 1975 catch = 75,000 tons (assuming USA takes only 6,100 tons)														

SILVER HAKE

SPECIES : Silver hake  
 STOCK AREA : 5Zw + 6  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : 0.45       $F_{OPT}$  : (M = 0.4)

REFERENCE : E.D. Anderson  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : VPA

		Age Group	W (kg)	Part. Recr.	1970	1971	1972	1973	1974	1975	1976	1977		
STOCK		0			-	-	-	-	-	-	-	-		
		1			338361	394224	776624	800575	(801416)	(995528)	(536695)	(536695)		
		2			249603	202323	258408	501193	(485234)	(164102)	(496470)	(307332)		
		3			121968	158827	108047	150596	198823	192411	(52294)	(223972)		
		4			71441	73803	66981	35141	42050	73143	55403	(22351)		
		5			38345	30780	28738	5920	4757	10369	21061	23680		
		6			19940	11903	14370	2893	1124	1284	2986	9002		
		7			19405	9303	5055	1133	1234	122	370	1276		
		8			8501	9711	1713	305	371	252	35	158		
		9			3431	3880	2395	146	197	125	73	15		
		10			1099	1630	499	-	33	12	36	31		
		11			175	576	215	-	-	10	3	15		
		12+			208	91	-	-	-	-	3	1		
Number (000)					872477	897051	1263045	1497902	1035239	1437031	1165429	1124530		
Weight (tons)					104907	105057	140207	222611	180491	123676	183860	183552		
Spawn. stock (tons)														
CATCH		0	.020	-	-	-	-	110	10	-	-	-		
		1	.099	35	30246	7279	23885	63433	46875	212140	64798			
		2	.179	88	10454	34162	27948	171559	166197	72700	135564			
		3	.229	100	9814	49294	46942	74512	75408	92989	15852			
		4	.336	100	21344	25953	50994	24306	22628	35349	16794			
		5	.433	100	17401	7792	21342	3642	2413	5011	6384			
		6	.589	100	5056	3649	11152	881	821	621	905			
		7	.621	100	4094	5796	4074	489	735	59	112			
		8	1.155	100	2265	5225	1313	9	156	122	11			
		9	.888	100	833	2721	739	82	158	60	22			
		10	1.315	100	199	1135	95	-	16	6	11			
		11	1.315	100	33	247	41	-	-	5	1			
		12+	1.315	100	63	43	-	-	-	-	1			
Number (000)					101802	143296	188525	339023	315417	419062	240455			
Weight (tons)					18276	27850	35045	65115	61277	69967	43370			
Fishing Effort (f) <sup>1</sup>					2386	5742	5634	13651	13622					
Fishing Mort. (F) <sup>2</sup>					0.321	0.537	1.386	1.009	0.684	0.845	0.450			
TAC (tons)								80000	80000	80000 <sup>3</sup>	43000			
Recruitment Prospects : 1973 and 1974 year-classes determined from relationship between survey young-of year index and stock size at age 1 (1969-72); 1975 year-class equals the mean for the 1968-72 year-classes.														
Comments : USSR catches with mesh = 40 mm; 50% selection factor = 4.2; $l_c$ = 16.8 cm; $t_c$ = 1.25 yr.														
<sup>1</sup> International effort expressed as US days fished.														
<sup>2</sup> For age 3 and older.														
<sup>3</sup> $F = 1.020$ , if 1975 catch = 80,000 tons; $F = 0.845$ , if 1975 catch = 70,000 tons (assuming that USA takes only 8,900 tons instead of 18,900 tons).														

SPECIES : RED HAKE

REFERENCE : Res.Doc. 75/82

STOCK AREA : 5Ze

LAST YEAR OF DATA : 1974

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

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

F<sub>MAX</sub> : 0.7 F<sub>OPT</sub> : \_\_\_\_\_

METHOD : VPA

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975	1976
				STOCK	1			-	-	-	-	-
2			140.0		189.6	270.1	267.0	206.3	192.0	( )		
3			39.6		75.5	102.3	148.6	138.8	92.7	68.5		
4			12.9		22.9	51.3	63.7	90.2	62.4	57.2		
5			4.4		3.8	3.1	33.0	38.6	26.6	29.2		
6			4.9		0.2	0.2	3.3	29.2	14.4	12.0		
Number (millions)					201.8	292.0	427.0	515.6	503.1	388.1		
Weight (tons)												
Spawn. stock (tons)												
CATCH	1			-	-	-	-	-	-	-		
	2	.103		2.3	0.9	0.1	10.4	27.7	13.7	8.9		
	3	.152		4.6	3.1	5.0	15.1	38.3	31.1	14.7		
	4	.220		6.1	15.3	1.7	7.4	43.1	28.6	12.3		
	5	.280		3.7	3.2	0.2	4.3	20.8	12.5	6.3		
	6	.373		2.1	0.1	-	1.4	12.4	6.1	2.6		
	Number (millions)				18.8	22.6	7.0	38.6	142.3	92.0	44.8	
Weight (tons)				5,059	4,288	1,915	11,975	39,366	24,666	9,500		26,200
Fishing Effort (f)												
Fishing Mortality (F)										0.7		0.7 <sup>2</sup>
TAC (tons)										20,000 <sup>1</sup>	20,000 <sup>1</sup>	26,000
Recruitment Prospects :												
Comments : 1 5Z (E69°) 2 Assumed M <sub>age 2</sub> = 0.6 M <sub>age 3-6</sub> = 0.4												
Stock numbers from Res. Doc. 75/82; catch numbers from V.A. Rikhter (W.P. 75/48)												

RED HAKE

SPECIES : Red hake

REFERENCE : V.A. Rikhter (from W.P. 75/48)

STOCK AREA : 5Zw + 6

LAST YEAR OF DATA : 1974

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

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

F<sub>MAX</sub> : 0.7 F<sub>OPT</sub> : \_\_\_\_\_

METHOD : \_\_\_\_\_

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975	1976
				STOCK	1							
2												
3												
4												
5												
6												
Number (000)												
Weight (tons)												
Spawn. stock (tons)												
CATCH	1	-		-	-	-	-	-	-	-		
	2	.121		9.4	21.2	0.6	123.2	104.6	3.0	23.4		
	3	.173		10.6	87.2	28.6	59.2	93.4	20.6	24.2		
	4	.230		21.5	64.5	9.0	23.5	32.0	53.8	29.0		
	5	.336		14.8	18.1	0.6	10.2	11.9	26.4	3.9		
	6	.486		3.3	0.4	0.1	0.9	5.5	11.5	3.2		
	Number (millions)				59.6	191.4	38.9	217.0	247.4	115.3	83.7	
Weight (tons)				15,162	50,518	10,322	27,694	36,471	41,486	23,551		
Fishing Effort (f)												
Fishing Mortality (F)												0.7 <sup>2</sup>
TAC (tons)									40,000 <sup>1</sup>	50,000 <sup>1</sup>	45,000 <sup>1</sup>	16,000 <sup>1</sup>
Recruitment Prospects :												
Comments :												
<ol style="list-style-type: none"> <li>1 5Z(W69°) + 6</li> <li>2 Assumed</li> </ol>												



SPECIES : American Plaice  
 STOCK AREA : 3LN (Ø)  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : Pitt, Assessments Working Paper, No. 56, 1975.  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort Analysis

	Age Group	W̄ (kg)	Part. Recr.	1972	1973	1974	1975	1976						
				STOCK	Separate calculations for Divs. 3L and 3M Male and Female. Div. 3Ø assessment from yield per recruit model.									
Number (000)														
Weight (tons)														
Spawn. stock (tons)														
CATCH														
	Number (000)													
	Weight (tons)													
Fishing Effort (f)														
Fishing Mortality (F)														
TAC (tons) *				60,000 <sup>1</sup>	60,000 <sup>1</sup>	60,000 <sup>2</sup>	60,000 <sup>2</sup>	47,000 <sup>2</sup>						
Recruitment Prospects :														
Comments : *1 includes approval 8,000 for Division 3Ø 2 " " 12,000 " " 3Ø														

SPECIES : Am. Plaice (1) Div. 3L(Male)  
 STOCK AREA : Plaice 3LNO  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.60

REFERENCE : \_\_\_\_\_  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort Analysis

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1972	1973	1974	1975	1976					
STOCK		6	0.203	0.01	40,300	32,000	41,000	(40,000)	(40,000)					
		7	0.279	0.10	22,400	21,800	24,700	30,400	31,000					
		8	0.336	0.23	17,800	15,300	16,400	18,100	22,300					
		9	0.434	0.43	13,400	11,300	10,400	11,100	12,300					
		10	0.588	0.66	10,600	6,300	6,900	6,300	6,700					
		11	0.701	1.00	7,000	3,500	3,000	3,600	3,300					
		12	0.891	1.25	3,900	1,900	900	1,300	1,500					
		13	1.004	1.30	1,500	1,000	600	300	500					
		14	1.093	1.30	700	300	300	200	100					
		15	1.209	1.30	300	150	60	100	80					
Number (000)					117,900	93,600	103,200	111,400	117,700					
Weight (tons)					43,500	32,000	32,900	35,600	37,900					
Spawn. stock (tons)					38,700	26,600	24,600	28,500	30,800					
CATCH		6			100	200	800	200	200					
		7			200	700	2,000	1,600	1,600					
		8			2,000	2,700	2,000	2,100	2,500					
		9			4,700	2,200	2,200	2,200	2,500					
		10			5,300	2,300	2,000	1,800	2,000					
		11			4,100	2,200	1,200	1,500	1,300					
		12			2,200	1,100	400	600	700					
		13			1,000	600	200	200	200					
		14			500	200	50	100	60					
		15			100	60	+	50	40					
Number (000)					20,200	11,000	10,100	10,100	11,100					
Weight (tons)					11,410	6,400	4,900	5,100	5,500					
Fishing Effort (f)(000 hrs)					74.3	41.3	41.3							
Fishing Mortality (F)					1.08	1.05	0.65	0.70	60					
TAC (tons)														
Recruitment Prospects :														
Comments :														

SPECIES : Am. Plaice (2) Div. 3L(Female)

REFERENCE : \_\_\_\_\_

STOCK AREA : Plaice 3LNO

LAST YEAR OF DATA : \_\_\_\_\_

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

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

F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.50

METHOD : Cohort analysis

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1972	1973	1974	1975	1976						
				STOCK	7	0.270	0.02	48,200	78,300	60,000	(60,000)	60,000		
8	0.326	0.07	49,400		39,200	63,600	47,600	(48,500)						
9	0.459	0.13	32,700		39,700	39,000	50,000	37,400						
10	0.584	0.19	20,600		24,800	30,100	30,100	38,000						
11	0.729	0.25	14,000		14,700	18,200	22,100	22,200						
12	0.861	0.38	10,600		8,700	10,000	13,000	15,800						
13	1.033	0.48	7,600		6,000	5,700	6,700	8,600						
14	1.087	0.60	6,300		2,900	3,100	3,600	4,200						
15	1.364	0.85	3,300		3,100	900	1,800	2,100						
16	1.575	1.00	2,100		1,300	500	500	900						
17	1.807	1.18	1,800		400	200	300	200						
18	2.062	1.43	800		200	70	100	100						
19	2.311	1.40	400		200	20	30	40						
20	2.398	1.40	300		140	10	10	10						
Number (000)					198,100	228,500	231,400	235,800	238,300					
Weight (tons)					104,500	105,600	106,200	114,400	119,800					
Spawn. stock (tons)					60,600	50,200	50,400	59,800	66,800					
CATCH	7				400	600	1,700	700	700					
	8				900	1,400	2,200	1,700	1,700					
	9				2,100	2,600	1,900	3,200	2,400					
	10			2,400	2,400	2,700	2,700	3,400						
	11			3,000	2,200	2,100	2,600	2,600						
	12			3,000	1,600	1,700	2,200	2,700						
	13			3,700	2,000	1,200	1,400	1,800						
	14			2,300	1,600	800	900	1,100						
	15			1,500	2,200	300	600	700						
	16			1,500	1,000	200	200	400						
	17			1,400	300	80	100	100						
	18			500	200	30	50	60						
	19			200	200	10	10	20						
	20			100	50	+	+	+						
	Number (000)				23,000	18,300	15,000	16,400	17,700					
	Weight (tons)				22,530	16,000	10,000	11,500	13,000					
	Fishing Effort (f)					As for males								
	Fishing Mortality (F)				1.15	1.28	0.50	0.65	0.55					
	TAC (tons)													
	Recruitment Prospects :													
Comments :														

SPECIES : Am Plaice (3) Div. 3N (Male)  
 STOCK AREA : Plaice 3LN0  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.50

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

	Age Group	W̄ (kg)	Part. Recr.	1972	1973	1974	1975	1976						
				STOCK	6	0.229	0.03	50,000	50,000	36,000	(35,000)	(35,000)		
7	0.349	0.12	18,300		38,100	38,500	27,000	(27,000)						
8	0.441	0.25	12,700		13,700	28,900	27,400	19,800						
9	0.570	0.62	8,300		7,700	8,500	19,400	18,800						
10	0.714	0.89	5,300		4,500	3,800	4,600	11,100						
11	0.823	1.00	3,000		2,700	2,100	1,700	2,300						
12	0.990	1.43	2,000		1,300	900	900	800						
13	1.074	1.30	600		1,000	200	300	400						
14	1.166	1.30	500		400	80	100	100						
Number (000)					100,700	119,600	118,000	116,400	115,200					
Weight (tons)					37,600	43,600	44,700	46,600	48,000					
Spawn. stock (tons)					36,700	42,400	41,100	45,700	47,100					
CATCH	6				900	500	200	500	500					
	7				700	900	2,900	1,400	1,400					
	8				2,500	2,400	3,600	2,900	2,100					
	9			2,300	2,600	2,400	4,600	4,500						
	10			1,700	1,600	1,400	1,500	3,500						
	11			1,200	1,400	900	600	800						
	12			500	1,000	400	400	400						
	13			100	900	70	100	200						
	14			10	200	20	30	50						
	Number (000)				9,900	11,400	11,900	12,000	13,300					
	Weight (tons)				5,679	7,400	6,200	6,600	7,200					
	Fishing Effort (f)				57.9	64.5	76.0							
	Fishing Mortality (F)				0.44	1.39	0.58	0.70	0.50					
	TAC (tons)													
	Recruitment Prospects :													
Comments :														

SPECIES : Am. Plaice (4) Div. 3N (Female)  
 STOCK AREA : Plaice 3LNØ  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : \_\_\_\_\_  $F_{OPT}$  : 0.45

REFERENCE : \_\_\_\_\_  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort Analysis

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1972	1973	1974	1975	1976						
				STOCK	6	0.229	0.02	71,700	71,700	64,000	(64,000)	(64,000)		
7	0.349	0.04	34,400		57,800	58,600	51,000	(52,000)						
8	0.424	0.07	34,500		27,400	47,000	46,300	41,000						
9	0.543	0.11	34,300		27,100	21,900	36,900	36,700						
10	0.724	0.16	16,700		26,700	21,500	16,900	28,700						
11	0.993	0.20	16,700		12,300	20,400	16,100	12,900						
12	1.109	0.32	10,100		12,200	9,500	15,000	12,100						
13	1.285	0.44	6,400		7,000	8,200	6,500	10,600						
14	1.514	0.53	3,800		4,400	4,300	5,300	4,300						
15	1.778	0.57	1,500		2,300	2,600	2,600	3,400						
16	2.051	1.00	600		900	1,100	1,600	1,700						
17	2.400	0.78	500		300	300	500	800						
18	2.698	1.09	200		300	100	200	300						
19	2.884	1.09	40		60	90	50	100						
20	3.024	1.00	60		20	10	50	20						
Number (000)					231,500	250,300	259,500	262,900	268,600					
Weight (tons)					121,500	131,200	138,400	143,100	149,800					
Spawn. stock (tons)					73,900	70,300	82,200	100,100	102,200					
CATCH	6				1,000	50	1,500	800	500					
	7				800	400	1,800	1,200	800					
	8				1,280	1,600	1,600	1,900	1,200					
	9			1,600	700	1,200	2,300	1,600						
	10			1,500	1,600	1,600	1,500	1,800						
	11			1,600	1,600	1,900	1,300	1,000						
	12			1,300	2,000	1,400	1,800	1,500						
	13			1,000	1,700	1,500	1,100	1,700						
	14			900	1,100	900	1,000	800						
	15			300	900	600	500	700						
	16			300	500	400	500	600						
	17			100	100	100	100	200						
	18			100	160	40	70	100						
	19			10	50	30	20	30						
	20			30	10	+	10	10						
	Number (000)				11,800	10,400	14,900	11,800	12,600					
	Weight (tons)				11,900	12,000	12,900	15,900	12,500					
	Fishing Effort (f)													
	Fishing Mortality (F)				0.54	0.77	0.50	0.65	0.45					
	TAC (tons)													
	Recruitment Prospects :													
Comments :														

YELLOWTAIL

SPECIES : Yellowtail

REFERENCE : Pitt, Assessments Sub-Committee Working Paper

STOCK AREA : 3LNØ

LAST YEAR OF DATA : 1974 #57, 1975.

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

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

F<sub>MAX</sub> : \_\_\_\_\_ F<sub>OPT</sub> : 0.60

METHOD : \_\_\_\_\_

	Age Group	W̄ (kg)	Part. Recr.	1973	1974	1975	(1) 1976	(2) 1976					
				STOCK	4	0.192	0.05	70,300	(70,000)	(70,000)	(70,000)	(70,000)	
5	0.305	0.33	72,900		49,000	(49,800)	(49,600)	(50,000)					
6	0.450	0.53	55,400		36,200	19,600	24,700	30,200					
7	0.610	1.00	29,100		21,700	11,700	3,600	10,500					
8	0.724	1.00	7,300		6,500	6,700	2,300	4,800					
9	0.842	1.00	1,300		1,600	2,800	2,000	2,700					
10	1.030	1.00	500		300	500	400	1,100					
Number (000)					236,800	185,300	161,100	152,600	169,300				
Weight (tons)					85,300	64,300	47,459	45,640	56,000				
Spawn. stock (tons)					49,800	36,500	26,700	20,000	27,500				
CATCH	4	0.192		3,500	2,400	(3) 3,500	(4) 3,800	(5) 2,100	(6) 2,100				
	5	0.305		21,000	19,800	20,400	14,300	7,800	7,800				
	6	0.450		23,000	18,100	18,800	13,200	4,700	7,200				
	7	0.610		18,100	11,200	15,400	7,700	4,600	4,200				
	8	0.724		4,500	2,400	6,600	3,500	2,600	1,900				
	9	0.842		800	900	3,000	2,005	1,100	1,100				
	10	1.030		300	130	600	400	200	200				
	Number (000)				71,200	54,900	68,300	44,600	23,100	24,300			
	Weight (tons)				32,700	24,100	32,700	20,400	10,500	11,100			
	Fishing Effort (f)												
Fishing Mortality (F)				1.20	0.77		1.44	0.60	0.60				
TAC (tons)				50,000	40,000	35,000			9,000				
Recruitment Prospects :													
Comments : (1) stock at beginning of 1976 assuming 20,400 tons removed in 1975 (2) stock at beginning of 1976 assuming 10,500 tons removed in 1975 (3) catch assuming 32,700 taken in 1975 (4) catch assuming 29,400 taken in 1975 (5) catch assuming 10,500 taken in 1975 (6) projected TAC for 1976 at F <sub>0.1</sub> with assumption (5)													

YELLOWTAIL

SPECIES : Yellowtail flounder  
 STOCK AREA : 5 (E69°)  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : 0.75-0.80       $F_{OPT}$  : about 0.3

REFERENCE : Res.Doc. (1976 Mtg)  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : \_\_\_\_\_

		Age Group	$\bar{W}$ (kg)	Part. Recr.		1970	1971	1972	1973	1974	1975		
STOCK		1	.003			69393	65026	52053	53212	59864	51103		
		2	.154			61904	54834	52804	42185	43198	48939		
		3	.358			47082	40127	39834	37962	28820	29898		
		4	.521			19732	19149	20389	19136	16129	11635		
		5	.696			5981	5332	7478	7046	6079	5516		
		6	.846			1893	1757	1874	2175	2349	2079		
		7	.965			666	479	465	573	501	804		
		8	1.061			264	240	116	181	221	172		
		9	1.131			109	101	77	46	83	76		
		10	1.172			-	21	46	31	3	29		
		11	1.213			-	-	5	27	16	1		
		Number (000)				207024	187066	175141	162574	157263	150252		
		Weight (tons)				43687	39034	40749	38525	32605	31133		
		Spawn. stock (tons)				33946	30394	32461	31869	25774	23443		
CATCH		1				2198	480	477	410	82			
		2				11729	5614	5877	6358	6088			
		3				21723	13907	15052	16731	13398			
		4				12199	9189	10833	10780	8635			
		5				3534	2797	4444	3841	3548			
		6				1208	1098	1081	1446	1372			
		7				342	312	224	279	293			
		8				129	135	54	72	129			
		9				77	41	36	40	49			
		10				46	14	11	10	2			
		11				6	1	3	16	9			
		Number (000)				53191	33594	38091	39983	33603			
		Weight (tons)				21285	15511	17559	16657	16014			
		Fishing Effort (f)											
		Fishing Mortality (F)											
		TAC (tons)					16000	16000	16000	16000	16000	16000	
Recruitment Prospects :													
Comments :													

YELLOWTAIL

SPECIES : Yellowtail Flounder  
 STOCK AREA : Southern New England  
 MSY (W) : \_\_\_\_\_  
 F<sub>MAX</sub> : .75-.80      F<sub>OPT</sub> : \_\_\_\_\_

REFERENCE : \_\_\_\_\_  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : General production model

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1965	1966	1867	1968	1969	1970	1971	1972	1973	1974	1975
STOCK		2	.159												
		3	.324												
		4	.510												
		5	.679												
		6	.812												
		7	.915												
		8	1.006												
		Number (000)													
	Weight (tons)														
	Spawn. stock (tons)														
CATCH		1			1295	968	1797	1452	1046	4656	3275	1725	149	106	
		2			29514	24224	33904	25808	21592	10593	6851	6266	744	234	
		3			19242	23374	33149	33393	34679	13665	5466	8752	7320	6215	
		4			8474	8420	6796	13886	29052	24130	17794	1762	7214	5780	
		5			6299	2678	996	853	6738	6369	4523	8587	2290	1755	
		6			2889	1987	352	207	841	1246	873	1822	1515	1429	
		7			465	564	346	87	269	118	220	429	589	258	
		8			25	78	48	37	164	23	17	120	113	358	
		9			-	6	4	45	73	9	7	22	386	309	
		10			-	-	-	4	24	4	-	14	-	-	
		11			-	-	-	-	81	1	23	79	95	-	
		Number (000)				68202	62300	77391	75684	94217	60815	39028	29517	19982	16444
	Weight (tons)				27800	23600	25800	28000	35600	22493	12199	13240	7819	8065	
Fishing Effort (F)															
Fishing Mortality (F)															
TAC (tons)											13,000	10,000	10,000	10,000	4,000
<p>Recruitment Prospects : US autumn survey pre-recruit indices indicate a drastic decline in abundance since 1969; the 1974 index was the lowest value observed.</p>															
<p>Comments : Catch data are for the southern New England portion of the SA5(W69°) stock complex. Catches for 1971-74 in SA5(W69°)+6 were 14815, 14885, 9516 and 10341 respectively.</p> <p>TACs for 1971-74 were for the Cape Cod and the southern New England stocks; the TACs for 1975 and 1976 also include SA6.</p>															



HERRING

SPECIES : Herring  
 STOCK AREA : 5Y  
 MSY (W) : 50,000-60,000  
 $F_{MAX}$  : None       $F_{OPT} = 0.38 (M = 0.2)$

REFERENCE : Herring Working Group Reports  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : 100,000-120,000  
 METHOD : V.P.A. Analysis

		Age Group	$\bar{W}$ (kg)	Part. Recr.	1967	1968	1969	1970	1971	1972	1973	1974	1975 <sup>M</sup>
STOCK		2			257	326	181	138	78	674	80		
		3	.155	.171	199	228	267	147	110	64	533	(64)	(64)
		4	.180	.475	179	163	171	183	112	69	37	420	39
		5	.220	.708	169	144	117	132	126	71	23	25	287
		6	.240	.871	164	132	91	87	94	73	23	10	14
		7	.275	1.00	93	122	81	55	47	44	22	7	3
		8	.300	1.00	17	69	75	43	21	15	11	6	3
		9	.32	1.00	9	15	40	42	14	3	4	3	2
		9+	.34	1.00	-	7	13	28	16	3	2	2	2
			Number (millions) <sup>2</sup>			633	652	588	572	430	278	122	473
		Weight (000 tons) <sup>2</sup>			147	145	149	130	95	60	30	85	76
		Spawn. stock <sup>3</sup>			192	190	196	163	115	80	147	95	86
CATCH		2			-	1	2	3	1	21	2	4	
		3	.155		-	18	39	9	23	17	19	15	
		4	.180		3	17	6	26	23	37	6	63	
		5	.220		7	29	10	18	34	40	10	7	
		6	.240		13	29	22	27	37	42	13	5	
		7	.275		8	28	27	27	26	27	14	4	
		8	.300		1	18	21	23	16	9	7	3	
		9	.320		-	3	17	28	11	1	2	1	
		9+	.340		-	4	4	16	11	2	1	1	
			Number (000) <sup>3</sup>			33644	147838	140621	175602	180488	178132	71621	99233
		Weight (000.t) <sup>3</sup>			8	35	33	46	43	42	16	18	
		Fishing Effort (f)											
		Fishing Mort (F) <sup>4</sup>			.046	.202	.204	.325	.481	.853	.162	.234	
		TAC (000 tons)								30	25	25	15
Recruitment Prospects :					Recruitment of 1974 and 1975 year-classes at age 3 assumed equal to 1969 year-class at age 3								
Comments :					1 Stock size calculated from $N_{i+1} = N_i e^{-Z_i}$ 2 For age 4 and older 3 For age 3 and older 4 Average $F_s$ weighted over year-classes by stock size in number.								

HERRING

SPECIES : Herring  
 STOCK AREA : 5Z + 6  
 MSY (W) : 225,000  
 F<sub>MAX</sub> : None F<sub>OPT</sub> : 0.38 (M = 0.2)

REFERENCE : Herring Working Group Reports  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : 500,000  
 METHOD : VPA

		Age Group	W (kg) <sup>1</sup>	Part. Recr.	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975 <sup>2</sup>
STOCK		3	.165	.136	1834	1220	1438	1523	959	672	619	3252	(550)	(550)
		4	.191	.714	1281	1490	993	1130	1206	672	250	476	1693	414
		5	.234	1.00	1880	1017	1165	748	735	580	301	105	149	841
		6	.255	1.00	1879	1378	735	650	361	357	217	53	28	60
		7	.293	1.00	268	1285	902	391	281	185	133	35	13	11
		8	.319	1.00	51	160	709	347	149	146	58	18	8	5
		8+	.340	1.00	51	44	138	276	111	76	73	6	4	5
					5410	5374	4642	3542	2843	2016	1032	693	1895	1336
					1187	1391	1263	912	647	452	289	118	386	298
		No. (age 4+)	(millions)		5410	5374	4642	3542	2843	2016	1032	693	1895	1336
	Wt. (age 4+)	(000 t)		1187	1391	1263	912	647	452	289	118	386	298	
	Number (millions) <sup>3</sup>			7244	6594	6080	5065	3802	2688	1651	3895	2445	1886	
	Weight (000 tons) <sup>3</sup>			1468	1603	1514	1171	801	555	403	541	480	389	
	Spawn. stock tons													
CATCH		2			0.3	1.8	2.5	-	12.6	12.9	28.0	10.0	1.9	
		3	.165		12.8	6.9	52.1	45.5	125.4	332.5	35.0	1026.0	39.9	
		4	.191		34.6	60.6	72.0	210.8	450.5	275.5	110.0	266.0	608.9	
		5	.234		178.0	108.0	336.0	277.1	270.3	284.6	214.0	64.0	68.6	
		6	.255		280.1	250.7	233.4	278.1	122.3	175.8	158.0	33.0	12.9	
		7	.293		65.1	379.2	432.9	188.5	92.9	103.9	100.0	23.0	6.1	
		8	.319		13.6	49.4	336.6	190.5	51.6	50.4	45.0	12.0	3.5	
		8+	.340		2.0	21.3	28.4	133.3	47.3	35.7	50.0	8.0	2.1	
		Number (millions) <sup>3</sup>			587	876	1491	1324	1160	1258	684	1422	742	
		Weight (000 tons) <sup>3</sup>			143	218	373	306	246	261	165	198	146	
	Fishing Effort (f)													
	Fishing Mort (F) <sup>4</sup>			.10	.16	.36	.37	.42	.78	.87	.54	.42		
	TAC (000 tons)										150	150	150	

Recruitment Prospects : 1974 and 1975 recruitment at age 3 assumed as in 1973 assessments.

Comments :

- <sup>1</sup> Mean weights are for 1975; these are different from those used for older year-classes (see Summ. Doc. 75/19, page 20).
- <sup>2</sup> Stock size calculated from  $N_{i+1} = N_i e^{-Z_i}$  <sup>3</sup> For age 3 and older.
- <sup>4</sup> F's are weighted over year-classes by stock size in number.

MACKEREL

SPECIES : Mackerel  
 STOCK AREA : Subareas 3-5 and Stat. Area 6  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : 0.7<sup>1</sup>       $F_{OPT}$  : 0.3<sup>1</sup>

REFERENCE : Report of Assessment Subcommittee 1975  
 LAST YEAR OF DATA : 1974- catch  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : Cohort analysis, Starting with 1974

Catch in 1975 and stock size for 1975 and -76 projected

Stock size in 1974.

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1968	1969	1970	1971	1972	1973	1974	1975	1976
				STOCK	0			4175.8	3942.1	1863.0	2709.6	2609.8
1	0.095	Partial recruitment as in Redbook 1975, p. 51.	7398.1		3097.1	2934.6	1370.0	2039.9	1921.9	(3700.0)	(2500.0)	(2500.0)
2	0.175		2373.1		5397.8	2175.1	2051.6	929.1	1475.8	1342.2	(2644.1)	(1632.8)
3	0.266		680.6		1673.4	3837.0	1582.2	1273.4	623.1	790.2	774.4	(1380.3)
4	0.350		202.5		455.1	1154.3	2493.2	1077.4	698.5	261.1	358.6	305.5
5	0.432		175.8		136.9	314.8	692.9	1365.1	605.3	296.5	106.2	131.9
6	0.506		141.5		118.0	94.8	196.0	314.5	644.4	293.2	120.5	39.1
7	0.564		62.6		97.0	81.6	57.2	103.9	136.4	293.5	119.2	44.3
8	0.615		87.3		45.3	66.5	48.4	30.4	45.5	65.7	119.3	43.9
9	0.659		3.2		57.6	30.9	30.8	26.4	15.2	20.7	26.7	43.9
10+	0.693		-		2.3	31.4	19.1	20.6	12.6	8.4	11.7	14.1
Number <sup>10<sup>6</sup></sup> (000) <sup>2</sup>				11 124	111 081	10721	8542	7180	6179	7071	6781	6136
Weight (tons) <sup>1000</sup> <sup>2,3</sup>				1330.6	1715.8	1969.2	1871.8	1590.9	1293.0	1153.3	1084.6	971
Spawn. stock (tons)												
CATCH	0			2.2	3.2	3.2	1.1	11.0	0.3	5.1		
	1			94.5	139.5	143.0	101.2	41.8	95.3	101.9	256.5	
	2			99.0	189.9	34.7	288.7	76.3	356.3	258.1	680.5	
	3			57.4	99.9	408.9	110.7	287.7	237.1	267.7	317.6	
	4			15.3	26.1	190.2	566.2	226.5	261.3	103.3	158.7	
	5			14.3	7.8	43.6	234.7	432.7	182.9	117.3	47.0	
	6			9.2	6.8	15.2	48.6	114.2	217.1	116.0	53.3	
	7			1.3	6.3	14.1	14.1	37.2	41.6	116.1	52.7	
	8			8.3	3.1	21.7	11.1	8.6	15.3	26.0	52.8	
	9			0.1	13.3	19.3	9.8	13.5	7.4	8.2	11.8	
	10+				0.9	12.9	9.7	13.4	6.7	3.3	5.2	
Number <sup>10<sup>6</sup></sup> (000) <sup>2</sup>				301.6	496.8	906.8	1395.9	1262.9	1424.3	1123.0	1636.1	
Weight (tons) <sup>1000</sup>				80.8	131.8	230.6	373.0	409.7	419.3	336.2	355.1	
Fishing Effort (f)												
Fishing Mortality (F) <sup>4</sup>				0.087	0.087	0.238	0.346	0.408	0.494	0.600	0.7	
TAC (tons)									450 <sup>5</sup>	55 <sup>6</sup> 304 <sup>5</sup>	70 <sup>7</sup> 285 <sup>5</sup>	56 <sup>7</sup> 254 <sup>5</sup>

Recruitment Prospects :

Comments : 1) Natural mortality is assumed to be 0.3.  $F_{max}$  and  $F_{opt}$  are calculated for partial recruitment as in Hypothesis (1), Redbook 1974, p. 35. This partial recruitment pattern is similar to what was estimated for 1975 and 1976 in Redbook 1975, p. 51.

- 2) Age 1 and older fish
- 3) Determined using the mean weight at age data and adjusted by the procedure described in Redbook 1974, p. 34.
- 4) Weighted  $\bar{F}$  age 4+
- 5) Subarea 5 + Stat. Area 6.
- 6) Div. 4 VWX
- 7) Subareas 3-4.

SQUID-LOLIGO

SPECIES : Squid (*Loligo pealei*)  
 STOCK AREA : SA 5 and 6  
 MSY (W) : \_\_\_\_\_  
 $F_{MAX}$  : \_\_\_\_\_  $F_{OPT}$  : \_\_\_\_\_

REFERENCE : See Comments  
 LAST YEAR OF DATA : 1974  
 SPAWN. STOCK AT MSY (W) : \_\_\_\_\_  
 METHOD : \_\_\_\_\_

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
STOCK													
	Number (000)												
	Weight (tons) <sup>1</sup>			36550	66286	84098	40714	25075	35412	88781	86840		
Spawn. stock (tons)													
CATCH													
	Number (000)												
	Weight (tons) <sup>2</sup>			1679	4993	9057	36184	16747	36789	42940	39027		
Fishing Effort (f)													
Fishing Mortality (F)													
TAC (tons) <sup>3</sup>											71000	71000	44000
Recruitment Prospects :													
Comments : 1 Minimum biomass estimate based on USA bottom trawl survey (Res. Doc. 75/60, Table 8). 2 Catches for 1967-73 estimated as in Res. Doc. 75/60; catch for 1974 from Summ. Doc. 75/32 (Rev. 11 July 1975) with squid (NS) catches prorated. 3 TACs for 1974 and 1975 are for <i>Loligo</i> and <i>Illex</i> combined.													

SQUID-ILLEX

SPECIES : Squid (*Illex illecebrosus*)

REFERENCE : See Comments

STOCK AREA : 5 + 6

LAST YEAR OF DATA : 1974

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

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

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

METHOD : \_\_\_\_\_

	Age Group	$\bar{W}$ (kg)	Part. Recr.	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
				STOCK									
Number (000)													
Weight (tons) <sup>1</sup>				6461	5966	2529	18806	10812	12016	9138	18201		
Spawn. stock (tons)													
CATCH													
Number (000)													
Weight (tons) <sup>2</sup>				990	1745	866	701	5439	11913	13696	16537		
Fishing Effort (f)													
Fishing Mortality (F)													
TAC (tons) <sup>3</sup>											71000	71000	30000
Recruitment Prospects :													
Comments : <sup>1</sup> Minimum biomass estimate based on USA bottom trawl survey (Res. Doc. 75/60, Table 8). <sup>2</sup> Catch for 1967-73 estimated as in Res. Doc. 75/60; catch for 1974 from Summ. Doc. 75/32 (Rev. 11 July 1975) with squid (NS) catches pro-rated. <sup>3</sup> TACs for 1974 and 1975 are for both <i>Loligo</i> and <i>Illex</i> .													

FLOUNDERS<sup>1</sup> (SA 5+6)

Catches (tons): 28,101, 22,523, 30,443, 25,076, 27,590, 23,527, 21,726,  
21,517 (1967-74)

TACs (tons): 25,000, 25,000, 25,000, 25,000 (1973-76)

Recruitment Prospects: Surveys indicate a steady decline in biomass since 1969.

<sup>1</sup> All flounders, except yellowtail

OTHER FINFISH<sup>1</sup> (SA 5 + 6)

Catches (tons): 116,428, 155,484, 215,166, 123,204, 156,412, 168,260,  
154,614, 130,717 (1967-74)

TACs (tons): 150,000<sup>2</sup>, 150,000, 150,000 (1974-76)

<sup>1</sup> Except menhaden, billfishes and large sharks.

<sup>2</sup> 1974 TAC includes 25,000 tons for Argentine.