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Status of Fisheries and Research Carried out in Subarea 5 and Statistical Area 6 in 1972

by

M. D. Grosslein, V. C. Anthony and R. C. Hennemuth
Northeast Fisheries Center
National Marine Fisheries Service
Woods Hole, Mass., 02543, U.S.A.

Reports on research in these areas were submitted by Canada, Fed.Rep. Germany, Japan, Poland, USSR, UK and USA. Research documents containing information on status and management of resources or environmental conditions are: Res.Doc. 73/2, 6, 8-12, 14-19, 21-24, 25, 27, 28, 31, 42, 49, 62, 64, 65, 78, 82, 84, 96-99, 104, 113, 115, and Summ.Doc. 73/5, 13-15, 20, 22, 26, 27, 31.

1. Status of the Fisheries

Catches of major species in Subarea 5 and Statistical Area 6 for 1971 and 1972, are shown in Tables 1-7 by country. Total catch of all species in Subarea 5 and Statistical Area 6 was 1,990,000 tons in 1972, which represents an increase of only 3% above the 1971 catch; and catches of finfish alone (exclusive of menhaden) increased from 1,119,822 tons to 1,136,538 tons. Quotas were exceeded for all species under regulation (i.e. haddock, yellowtail flounder, and herring) in 1972. The combined catches of red hake, argentine, dogfish, skates, and squid more than doubled from 1971 to 1972 (73,200 tons to 179,800 tons) while catches of mackerel increased from 348,000 to 386,000 tons, yellowtail flounder from 31,300 to 38,500 tons, and menhaden from 240,000 to 329,000 tons. Mackerel catches have been increasing steadily since 1964, and, in Subarea 5 alone, the 1972 catch of 200,516 tons was 73% greater than the 1971 catch of 116,440 tons. Declines in catches were noted for cod, haddock, pollock, herring, ocean pout, alewives and butterfish.

Assessments

Assessments of several of the main species were reviewed or reported.

Haddock

The 1972 year-class was again very poor, the ninth successive year of poor production. The stock is now so low that by-catches alone would exceed the annual

surplus yield. The large 1963 year-class is now virtually gone, and the spawning stock is extremely low. It is again advised to reduce catches to minimal levels.

Cod

There is some evidence of increased abundance of young fish ($<$ 37 cm), but the exploited stock in 1974 is expected to be at about the same abundance as in 1972. No change in 1973 TAC is advised either in Div. 5Y or 5Z (10,000 tons, 35,000 tons respectively.)

Redfish

Stock density has remained rather constant over the last 6 years. The 1973 TAC (30,000 tons) was set in relation to landings and effort during the previous period of more intensive fishery, and no change is recommended for 1974.

Yellowtail

The southern New England stock (West of 69°W) apparently declined, the recruitment index for 1973 (age 1+ fish in 1972) decreased from 1972. Fishing mortality in 1972 was again somewhat higher than recommended for this stock. The Georges Bank stock (East of 69°W) was at about the same density in 1972 as in 1971.

The TAC's for 1974 are advised to be the same as in 1973. This will not permit the stock density in southern New England to increase, but should prevent the fishing mortality from increasing. Landings from Statistical Area 6 have increased again in 1972, and because of a possible relation to the Div. 5ZW stock, this stock should be assessed.

Silver hake

The 1971 year-class was good, and is expected to increase stock size in 1973-74 in all divisions. Stock size increased in Div. 5Y in 1972, but remained the same in Subdiv. 5Ze and 5Zw - Statistical Area 6. The TAC's for 1974 were recommended to be the same as for 1973.

Red hake

The Subdiv. 5Zw - Statistical Area 6 stock increased in 1972 while that in Subdiv. 5Ze decreased. A new assessment by the USSR estimated a yield in 1974 for the Subdiv. 5Zw - Statistical Area 6 stock of 50,000 tons assuming the 1972 year-class was average and a 50% exploitation rate. A TAC of 50,000-70,000 tons for Subarea 5 - Statistical Area 6 was advised.

Sea herring

Stocks in Div. 5Y and 5Z - Statistical Area 6 declined in 1972. TAC's for 1973 were set in January at the same level as for 1972 in Div. 5Z - Statistical Area 6, and at 25,000 tons in Div. 5Y (versus 30,000 tons in 1972). A good recruitment from the 1970 year-class is predicted.

Mackerel

An ad hoc working group assessed the status of the mackerel stocks in Subarea 5 and Statistical Area 6. Different measures of the vital statistics and recruitment were available, and the range of probable values was included. In order to keep the fishing mortality at about the same level as in 1971-72, near $F_{0.1}$, a catch of 245,000 tons for 1974 was advised by the Assessment Subcommittee but not all scientists agreed with this figure (see Assessment Subcommittee Report p.45, para.1).

Other Species

TAC's for pollock in 1973 in Subarea 5 plus Div. 4X (50,000 tons) and for other flounders in Subarea 5 and Statistical Area 6 (25,000 tons) were not changed. It was noted that the TAC for pollock of 50,000 tons probably should apply to Div. 4VWX plus Subarea 5.

Squid (Loligo pealei)

Japanese scientists presented a first assessment of the potential yield of squid in Subarea 5 and Statistical Area 6. The analysis was based on their commercial fishery data and indicated a potential of from 50,000-80,000 tons.

Finfish Biomass

Research Documents 73/8 and 73/10 assessed the status of the total finfish biomass in Subarea 5 and Statistical Area 6. Groundfish surveys indicated an overall decline in biomass of the ICNAF category groundfish and flounders, and sea herring, of about 65% from 1963 to 1971 (Res.Doc. 73/8). Fishing effort was estimated to have increased between four to six times during that decade, while landings tripled. Estimates of overall maximum sustained yield from production models ranged from 800,000 tons to 950,000 tons depen ding on assumptions used in the calculations.

Mixed Fishery Problems

Several documents were prepared which analyzed data concerning the variability in catchability and the problem of by-catch (Res.Doc. 73/9, 15, 18, 99, 110). The mixed species aspect of fisheries in the area has significant

implications with regard to species-quota regulations. The studies have shown that some adjustment of quotas for directed fisheries is required to prevent excessive catches of other species.

2. Research Carried Out

a) Canada: selectivity studies on scallop dredges and repeat of underwater camera survey on Georges Bank: early life history studies on swordfish in Caribbeanæ tagging experiments and studies of length composition for small bluefin tuna.

b) UK: continuous plankton recorder surveys were continued.

c) USSR: age and/or length composition studies of red hake, silver hake, yellowtail, argentine, sea herring, mackerel, squid, alewife, Atlantic saury; egg and larval surveys for red and silver hake, sea herring, and other zoo-plankton; feeding studies on silver hake and herring larvæ, and adult stages of demersal species; studies of zooplankton communities; trawl comparison experiments and joint groundfish survey with USA in Subarea 5 and Statistical Area 6; environmental studies (temperature, salinity, oxygen, nutrients, phytoplankton) on Georges Bank.

d) Poland: age-length composition for herring and mackerel; environmental studies (temperature, salinity, oxygen, nutrients) on Georges Bank and in Gulf of Maine; larval herring survey.

e) Japan: length composition of cod, silver hake, herring, mackerel, argentine, butterfish and squid - first approximation to biomass of squid (Loligo pealei).

f) Fed. Rep. Germany: age-length compositions and maturity categories of herring catches; autumn larval herring survey and associated hydrographic studies.

g) Bulgaria: age and length compositions of mackerel.

h) USA: length and age compositions for catches of haddock, yellowtail and sea herring, and population studies on these species as well as mackerel, red and silver hake, redfish, squid and cod and total finfish biomass; studies of relation between total effort and total catch; feeding studies on juvenile haddock and groundfish species in general; autumn surveys for larval herring and groundfish and spring surveys for groundfish and juvenile herring; studies of spawning sea herring in Gulf of Maine with divers, and monitoring of spawning for cod, haddock and pollock in Subarea 5; laboratory studies on respiration, energy utilization,

growth and mortality of cod and haddock embryos; development of prototype of density gradient fractionation system for automatic sorting of fish eggs and larvae and other components of plankton samples; gear studies on lobster pots and bottom trawls; environmental studies on research vessel cruises, Coast Guard vessels and shore stations.

Hydrography and Plankton

USSR studies on Georges Bank from June - October indicates lower water temperatures in the 0-50 m layer as compared with 1971, whereas in deeper layers (0-100m, 100m - bottom) were about the same or higher than those in 1971. Plankton sampling was conducted by USSR and USA for fish eggs and larvae, and for zooplankton, during groundfish surveys, larval herring surveys and other research cruises. Preliminary results of the larval herring surveys are summarised in Res.Doc. 73/115.

Table 1 Comparison of catches from Subarea 5 between 1971 and 1972 by country and species

Country	Cod		Haddock		Redfish		Halibut		Silver Hake		Amer. Plaice		Green-land Halibut		Summer flounder		Winter flounder		Witch		Yellowtail		Subtotal	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria	10	74	3		15	15		8	1,393	3,347											131	561	1,552	4,005
Canada (M)	3,098	2,598	1,715	632	269	124	38	37			40	22		2			62	8	31	13	105	9	5,358	3,445
Cuba		2							265	828[1]													265	830
Denmark (F)																								
France (M)																								
Germany (FR)	4	17	4			3																	8	20
Germany (DR)	-	127		5	1	127				218													1	477
Japan	20	96	10		4	15			103	192	2										3	3	142	306
Poland	155	174	1		84	1			136	15	1								1				378	190
Romania	6	14	225			14			390		499		22									32	1,142	60
Spain	7,619	6,700	1,336	1,097																			8,955	7,797
USSR	1,270	1,834	374	141	3,394	5,639			81,515	94,151	340	439			843	393	1,946	2,517	2,713	2,530	925	4,818	93,320	112,462
USA	23,175	19,704	8,500	7,771	16,267	13,161	81	63	13,332	8,036	2,170	1,794			162	166	10,435	7,979	3,158	2,918	22,341	24,206	99,621	82,798
Total	35,357	31,341	12,168	6,646	20,034	19,099	119	108	97,134	106,787	3,052	2,255	22	2	1,005	559	12,443	10,504	5,903	5,461	23,505	29,629	210,742	212,390

[1] a portion of catch may be of red hakes

Table 2 Comparison of catches from Subarea 5 between 1971 and 1972 by country and species

Country	Flounders (NS)		Angler		Cusk		Ocean pout		Pollock		Red Hake		Sandeels		Sculpins		Scup		Searobins		White hake		Sub total	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria											1,366	1,508					1	23					1,367	1,531
Canada(M)	16	1			1,040	774			1,636	1,366											100	37	2,792	2,178
Cuba		117																					-	117
Germany(FR)									633	469												358	633	827
Germany(DR)						1			5,963	4,781	97	1						18		15			6,060	4,816
Japan	4	3							5	4	7	186									109	156	125	349
Poland									1	8							82	401					83	409
Romania																				29			-	29
Spain			5	9					184	79												21	188	109
USSR			3,644	4,092			3,553	975	1,163	1,943	25,353	56,629			1,095	4,217	193	314		283			35,001	67,553
USA		31	88	191	783	923	2,678	1,929	4,727	5,233	2,783	1,711			863	645	641	474	47		2,668	2,888	15,227	14,075
Total	20	152	3,737	4,292	1,823	1,698	6,231	2,904	14,312	12,983	29,606	60,035	0		1,958	4,862	917	1,230	374		2,873	3,463	61,477	91,913

Table 3 Comparison of catches from Subarea 5 between 1971 and 1972 by country and species

Country	Wolffish		Groundfish (NS)		Herring		Mackerel		Menhaden		Atlantic sturg		Butterfish		Bluefin tuna		Pelagics (NS)		Alewife		Sub total	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria					3,939	2,239	1,632	7,452					1	96				2	513	366	6,085	10,155
Canada (M)	98	36	75	48	28,381	11,691		1							424						28,978	11,776
Cuba							145	9													145	9
France (M)						500															-	500
Germany (FR)			3		56,467	30,634	1,175	758								1	48	27			57,694	31,419
Germany (DR)					17,426	46,729	7,090	25,374				12		7					2,585	1,152	27,101	73,274
Japan			1,239	243	2,434	8,159	272	209					973	1,396			26	235			4,944	3,242
Poland			47		69,083	41,224	43,682	61,486							2	6			1,406	1,481	114,220	104,197
Romania			24		887	2,060	1,774	515									4		95		2,784	2,575
Spain							3	6													3	6
USSR					63,903	43,764	59,074	103,686			2,144	3,415	400	435					9,014	4,645	134,535	155,945
USA	189	249	2,890	2,570	33,890	40,473	1,593	1,020	6,355	8,962			419	133	1,123	372			1,005	1,057	47,464	54,836
Total	287	285	4,278	2,861	276,410	220,473	116,440	200,516	6,355	8,962	2,144	3,427	1,793	2,067	1,550	378	78	264	14,618	8,701	423,953	447,934

Table 4. Comparison of catches from Subarea 5 between 1971 and 1972, by country and species.

Country	Argentine		Dogfishes		Sharks		Skates		Sturgeons		Other fish		Lobster		Shrimp		Squid		Sub-total		Total	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria	2										1,500	4,352					80	480	1,582	4,832	10,586	20,523
Canada(M)							2	3					101	203		8	1		104	214	37,232	17,613
Cuba											740	586						14	740	600	1,150	1,556
Denmark(F)						260													-	260	-	260
France(M)																					-	500
Germany(FR)																		63	-	63	58,335	32,329
Germany(DR)			195	357			3				545	54							743	411	33,905	78,978
Japan	5,398	97			64							759	2				4,661	7,862	10,125	8,718	15,336	12,615
Poland											8,971	3,996						5,042	8,971	9,038	123,652	113,834
Romania					40						1,060	29						28	1,100	57	5,026	2,721
Spain												206		1			256	3,872	256	4,079	9,482	11,991
USSR	1,893	32,610		12,486	7,795		5,000	7,957			8,691	11,925					5,659	6,381	29,038	71,359	291,894	407,319
USA					13	17	741	779			3,142		13,466	9,409	11,127	11,013	711	466	29,200	21,684	191,512	173,393
Total	7,293	32,707	195	12,843	7,912	277	5,746	8,739	0	0	24,649	21,907	13,569	9,613	11,127	11,021	11,368	24,208	81,859	121,315	778,030	873,632

Table 5. Comparison of catches from Statistical Area 6 between 1971 and 1972, by country and species.

Country	Cod		Haddock		Redfish		Silver hake		Amer. plaice		Summer flounder		Winter flounder		Yellowtail		Flounder NS		Pollock		Red hake		Sub-total	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria		2					621	196							125	12					1,218	6	1,964	216
Canada(M)																								
Denmark(F)																								
France(M)																								
Germany(FR)																								
Germany(DR)		3																	886	23		40	886	66
Japan		4					49	90							7	2	28	10			7	203	91	309
Poland	101	97				4	12	1		2													113	104
Romania							42	168								43						43	42	254
Spain		3																					-	3
USSR		52				2	7,061	7,735			61		114	14	829	61					8,285	14,704	16,350	22,568
USA	383	266		1		1	2,989	277		1	2,308	3,106	1,406	484	6,867	8,774	921	1,316	5	1	821	818	15,700	15,045
Total	484	427	0	1	0	7	10,774	8,467	0	3	2,369	3,106	1,520	498	7,828	8,892	949	1,326	891	24	10,331	15,814	35,146	38,565

Table 6. Comparison of catches from Statistical Area 6 between 1971 and 1972, by country and species.

Country	Witch		Ocean pout		Sand eels		Sculpins		Soup		Searobins		White hake		Wolf-fishes		Ground-fish (NS)		Herring		Mackerel		Subtotal	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria			2						160	61									612	116	26,875	16,104	27,649	16,281
Canada(M)																								
Denmark(F)																								
France (M)																								
Germany(FR)																					1,620	14	1,620	
Germany(DR)									133	207		31							3,278	2,073	62,083	54,567	65,494	56,878
Japan					[illegible]						20		105	328			485	282	32	2	753	895	[illegible],395	2,072
Poland									108	234							57		[illegible],242	8,368	68,612	80,513	88,019	89,115
Romania										12									11	97	2,747	2,003	2,758	2,112
Spain																					47		47	0
USSR	124	35	186	92			443	2,337	372	359	792	3,489							[illegible],355	4,564	68,754	30,371	88,024	41,247
USA	62	26	[illegible],448	438			293	[illegible]00	2,516	2,977	110	6	51	13		40	10	103	1,423	521	813	976	6,726	5,200
Total	186	61	[illegible],636	530	0	565	736	2,437	3,289	3,850	922	3,526	156	341	0	40	552	385	41,953	15,741	232,304	185,443	281,734	212,919

Table 7. Comparison of catches from Statistical Area 6 between 1971 and 1972, by country and species.

Country	Butterfish		Tunas (MS)		Bluefin Tuna		Pelagics (MS)		Alewife		Dogfish		Sharks		Skates		Other fish		Lobster		Shrimp		Squid		Sub-total		Total	
	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72	71	72
Bulgaria		18						6	526	146							4,132	2,564					10	19	4,668	2,753	34,281	19,250
Canada(M)					486	165																			486	165	486	165
Denmark(F)																												
France(M)																												
Germany(FR)							1	23								2												
Germany(DR)		25							5,794	2,371	559	322			215		22	19					399		1	424	1,621	438
Japan		2,265					228						76					791	25	10			5,941	10,829	6,568	2,737	72,948	59,681
Poland						1			819	407							7,183	2,875						386	6,270	13,895	7,756	16,276
Romania		3														37	886	169						39	8,002	3,669	96,134	92,888
Spain																		16					3,941	3,790	886	248	3,686	2,614
USSR		1,413							2,275	2,048		8,364	2,997				3,731	5,406					479	595	3,941	3,806	3,988	3,809
USA		547		299	1,251	299			11,799	10,609			89	116	159	83	2,449	24,102	1,904	1,772	2,415	4	471	748	9,482	17,826	113,858	81,641
Total	0	4,271	0	299	1,737	465	229	29	21,213	15,581	559	8,686	3,162	116	374	122	18,403	35,942	1,929	1,782	2,415	4	10,842	16,805	60,838	84,102	377,718	335,586