STATUS OF THE INTERNATIONAL FISHERIES

OFF THE MIDDLE ATLANTIC COAST

U. S. DEPT. OF COMMERCE
LIBRARY
NMFS
WOODS HOLE, MASS.

Prepared for the

US-USSR BILATERAL NEGOTIATIONS

30 November - 11 December 1970

Washington, D. C.

National Marine Fisheries Service
Biological Laboratory
Woods Hole, Massachusetts 02543

Laboratory Reference No. 70-7

TABLE SECTION

SUBAREA 6 FINFISH LANDINGS (000's METRIC TONS)

SPECIES	1963	1964	1965	1966	1967	1968	1969
Menhaden:	286.6	215.8	231.5	136.0	122.4	163.6	109.3
U. S.	286.6	215.8	231.5	136.0	122.4	163.6	109.3
Foreign	-	-	-	-	-	-	-
Silver Hake:	7.0	19.9	21.0	96.2	28.1	18.4	11.2
U. S.	2.8	3.0	3.3	3.3	4.4	3.4	4.1
Foreign	4.2	16.9	17.7	92.9	23.7	15.0	7.1
Red Hake:	1.4	9.0	12.4	26.3	15.6	2.2	4.9
U. S.	0.7	0.6	0.6	0.6	0.6	0.4	0.8
Foreign	0.7	8.4	11.8	25.7	15.0	1.8	4.1
Scup:	15.8	13.5	11.8	8.7	6.1	4.5	5.0
U. S.	14.5	13.0	11.1	8.2	5.6	4.0	4.7
Foreign	1.3	0.5	0.7	0.5	0.5	0.5	0.3
Yellowtail:	3.1	2.8	3.3	2.2	5.3	3.3	4.3
U. S.	3.1	2.8	3.3	2.2	5.3	3.3	4.3
Foreign	-	-	-	-	-	-	-
Fluke:	1.9	1.7	2.0	4.2	3.4	2.7	1.8
U. S.	1.9	1.7	2.0	4.2	3.4	2.7	1.8
Foreign	-	-	-	-	-	-	-
Other Flounder:	2.7	2.3	3.2	2.9	3.4	2.1	3.5
U. S.	2.7	2.3	3.2	2.9	3.4	2.1	2.6
Foreign	-	-	-	-	-	-	0.9
Herring:	0.7	0.4	2.2	5.8	3.8	29.2	52.4
U. S.	0.1	0.2	0.3	3.1	0.6	0.2	1.5
Foreign	0.6	0.2	1.9	2.8	3.2	29.0	50.9
Mackerel:	0.4	0.5	0.6	2.0	6.8	8.9	43.1
U. S.	0.1	0.4	0.5	0.8	0.7	0.9	0.5
Foreign	0.3	0.1	0.1	1.2	6.1	8.0	42.6

SUBAREA 6 FINFISH LANDINGS (000's METRIC TONS)

SPECIES	1963	1964	1965	1966	1967	1968	1969
Butterfish:	1.9	1.9	2.4	2.0	2.5	1.4	3.6
U. S.	1.8	1.6	2.4	2.0	1.7	1.1	2.0
Foreign	0.1	0.3	0.0	0.0	0.8	0.3	1.6
Alewife:	19.4	16.1	23.2	21.2	23.0	24.7	34.4
U. S.	19.4	16.1	23.2	21.2	22.2	23.6	24.0
Foreign	-	-	-	-	1.0	1.1	10.4
Total:	396.3	373.0	390.7	333.9	246.5	293.7	302.8
U. S.	388.4	343.0	356.2	202.4	198.8	226.9	176.2
Foreign	7.9	30.0	34.5	131.5	47.7	66.8*	126.6

*0.8 not spec.

SUBAREA 6 FINFISH LANDINGS (000's METRIC TONS)

Country	1963	1964	1965	1966	1967	1968 1/	1969
United States	388.4	343.0	356.2	202.4	198.8	226.9	176.2
U.S.S.R.	7.9	28.2	33.4	131.0	47.1	52.7*	107.3
Poland	-	-	-	-	-	12.5**	19.6**
Canada	-	1.8	1.1	0.5	0.6	0.8	0.6
Non-mem.	-	-	-	-	-	-	

* Sea Robin = 7.8

** Herring Dominant 1968, herring and mackerel dominant 1969.

1/ Others; Germany 0.4 herring

Annual Nominal Catch by Species, Country and Year in the Region Southward of the ICNAF Convention Area to the Latitude of Cape Hatteras, 1963-1966

Metric tons round fresh

	1963				1964				1965				1966				
Species	Canada	USSR	USA	Total	Canada	USSR	USA	Total	Canada	USSR	USA	Total	Canada	USSR	Norway	USA	Total
ALL SPECIES	70	7,932	703,202	711,204	1,766	28,177	689,392	719,335	28,252	33,430	739,535	801,217	23,618	131,075	868	638,803	794,364
Cod			1,040	1,040			413	413			274	274		75		196	271
HADDOCK			41	41			22	22			6	6		107		13	120
REDFISH																	
HALIBUT														35			35
SILVER HAKE		4,191	2,775	6,966		16,889	2,984	19,873		17,728	3,299	21,027		92,924		3,277	96,201
FLOUNDERS			7,689	7,689			6,811	6,811			8,537	8,537				9,452	9,452
Atlantic			7,676	7,676			6,806	6,806			8,505	8,505				9,396	9,396
Various			13	13			5	5			32	32				56	56
OTHER GROUNDFISH		2,793	46,368	49,161		9,735	74,499	84,234		13,553	59,606	73,159	4	31,266		30,559	61,829
Scup		1,231	14,525	15,756		459	13,038	13,497		718	11,069	11,787		566		8,154	8,720
King Whiting			129	129			109	109			212	212				96	96
Tilefish			33	33			69	69			30	30				63	63
Pollock		113	3	116		2	2	4			2	2				48	48
White Hake			56	56			27	27			22	22				32	32
Red Hake		770	668	1,438		8,372	601	8,973		11,745	624	12,369		25,722		590	26,312
Sea Robins						147		147						1,279			1,279
John Dorries						2		2									
Wolffishes														70			70
Angler														1,689			1,689
Groundfish (not specified)		619	30,954	31,633		753	60,653	61,406		1,090	47,647	48,737	4	1,940		21,576	23,520
HERRING		544	117	661		191	221	412		1,913	330	2,243		2,767		3,084	5,851

Annual Nominal Catch by Species, Country and Year in the Region Southward of the ICNAF Convention Area to the Latitude of Cape Hatteras, 1963-1966

T-3(cont.)

Metric tons round fresh

Species	1963 Canada	1963 USSR	1963 USA	1963 Total	1964 Canada	1964 USSR	1964 USA	1964 Total	1965 Canada	1965 USSR	1965 USA	1965 Total	1966 Canada	1966 USSR	1966 Norway	1966 USA	1966 Total
OTHER PELAGIC FISH	70	404	293,187	293,661	1,766	410	222,279	224,455	1,117	70	237,715	238,902	397	1,252		141,155	142,804
Menhaden			286,622	286,622			215,776	215,776			231,458	231,458				136,046	136,046
Mackerel		293	118	411		94	380	474		53	531	584		1,252		821	2,073
Bluefin Tuna			1,552	1,552			1,917	1,917			948	948				242	242
Skipjack			940	940			505	505			4	4				10	10
Bonito			45	45			12	12			45	45				10	10
Yellowfin Tuna			207	207			126	126									
Little Tuna			5	5			2	2			10	10				8	8
Other Tuna	66		1	67	898		71	969	291		36	327	30			50	80
Swordfish	4		192	196	868		724	1,592	826		869	1,695	367			427	794
King Mackerel			5	5			18	18			6	6				8	8
Spanish Mackerel			62	62			34	34			55	55				77	77
Butterfish		111	1,830	1,941	316		1,630	1,946		17	2,366	2,383				2,010	2,010
Amber Jacks			15	15			5	5			3	3				4	4
Bluefish			1,150	1,150			780	780			1,068	1,068				1,218	1,218
Harvest Fish			55	55			79	79			160	160				86	86
Mullet			313	313			149	149			90	90				58	58
Silversides			75	75			71	71			66	66				80	80
OTHER FISH			37,136	37,136		952	35,744	36,696		166	46,393	46,559	52	2,601	868	39,100	42,621
Sharks			313	313			682	682			393	393	52	2,601	868	403	3,924
Skates			8	8			13	13			23	23				12	12
Carp			344	344			344	344			309	309				326	326
Catfish			1,495	1,495			1,393	1,393			1,276	1,276				665	665
Yellow Perch			69	69			101	101			136	136				95	95
Other Freshwater			13	13			17	17			12	12				22	22
Sturgeons			22	22			30	30			39	39				44	44
American Eel			392	392			379	379			605	605				498	498
Smelt							2	2			1	1					
Alewifes			19,359	19,359			16,138	16,138			23,197	23,197				21,178	21,178
American Shad			2,189	2,189			2,328	2,328			2,644	2,644				2,161	2,161
Gizzard Shad			12	12			39	39			65	65				7	7
Hickory Shad			135	135			129	129			103	103				23	23

continued-

Annual Nominal Catch by Species, Country and Year in the Region Southward of the ICNAF Convention Area to the Latitude of Cape Hatteras, 1963-1966

T-3(cont.)

Metric tons round fresh

	1963				1964				1965				1966				
Species	Canada	USSR	USA	Total	Canada	USSR	USA	Total	Canada	USSR	USA	Total	Canada	USSR	Norway	USA	Total
Conger			1,474	1,474			2,649	2,649			5,819	5,819				3,799	3,799
Black Drum			167	167			56	56			84	84				229	229
Red Drum			15	15			12	12			49	49				6	6
Croacker			304	304			418	418			881	881				716	716
Gray Weakfish			1,002	1,002			1,219	1,219			1,554	1,554				903	903
Spotted Weakfish			58	58			47	47			60	60				20	20
Blk Sea Bass			3,803	3,803			3,332	3,332			3,656	3,656				1,606	1,606
Striped Bass			3,955	3,955			3,606	3,606			3,205	3,205				3,733	3,733
Spot			750	750			1,615	1,615			894	894				644	644
White Perch			943	943			676	676			969	969				1,378	1,378
Sheepshead			86	86			308	308			158	158				392	392
Argentines						952		952		166		166					
Other O.F.			228	228			211	211			261	261				240	240
SHELLFISH Etc.			314,849	314,849			346,419	346,419	27,135*		383,375	410,510	23,165	48		413,267	436,480
Blue Crab			37,234	37,234			44,395	44,395			47,707	47,707				50,201	50,201
North.Lobster			737	737			1,003	1,003			1,110	1,110				1,051	1,051
Shrimp			713	713			692	692			730	730				360	360
Rock Crab			10	10			20	20			27	27				32	32
Horseshoe Crab			91	91			161	161			96	96				60	60
Conchs			1,772	1,772			1,076	1,076			994	994				1,977	1,977
Bar(Surf) Clam			127,295	127,295			125,794	125,794			145,436	145,436				148,712	148,712
Hard Clam			33,116	33,116			35,742	35,742			36,335	36,335				38,921	38,921
Razor Clam			16	16			12	12			10	10				4	4
Softshell Clam			12,649	12,649			15,178	15,178			14,719	14,719				14,084	14,084
Com. Mussel(Sea)			157	157			267	267			625	625				282	282
Eastern Oyster			89,536	89,536			108,074	108,074			101,892	101,892				102,607	102,607
Bay Scallop			2,393	2,393			4,113	4,113			3,757	3,757				1,860	1,860
Sea Scallop			8,108	8,108			8,989	8,989	27,135*		29,023	56,158	23,165			52,063	75,201
Squid			905	905			752	752			774	774		48		980	1,028
Turtles			109	109			151	151			140	140				95	95
Terrapins			8	8												5	5

*Sought in Florida waters

Stratified mean catch (pounds) per standard haul for research vessel surveys in the Mid-Atlantic

(Cape Hatteras to Hudson Canyon; sampling strata 1-4, 61-76 combined)

SPECIES	Oct.'67 U.S.	Oct.'67 USSR	Mar.'68 U.S.	Oct.'68 U.S.	Oct.'68 USSR	Mar.'69 U.S.	Oct.'69 U.S.	Oct.'69 USSR	Mar.'70 U.S.	Sep.'70 U.S.	Sep.'70 USSR
Sea herring	0	0	17.3	0	0	14.3	6.9	0	1.3	0	0
Mackerel	1.7	1.3	27.0	0.2	0.02	0.3	0	0.1	8.1	.02	0
Alewife	0	0	8.1	0	0	6.9	0	0	9.3	0	0
Butterfish	7.6	16.0	2.4	30.6	12.1	0.4	10.7	219.8	1.8	8.6	34.1
Red hake	0.8	12.6	2.1	2.8	8.8	1.6	2.0	20.0	1.0	1.0	4.6
Silver hake	4.8	37.1	12.6	3.3	37.8	6.0	1.0	21.7	2.1	1.0	8.6
Yellowtail	13.0	15.0	23.9	18.9	23.8	19.5	13.9	19.8	15.8	14.3	2.5
Blackback	4.0	10.2	5.4	2.6	1.3	0.3	1.6	6.5	0.7	0.6	0
Fluke	3.1	1.8	0.4	2.6	0.6	0.5	1.2	3.4	0.3	0.9	0
Scup	4.8	4.8	8.0	1.3	3.7	1.4	13.2	15.0	10.6	0.2	0

Stratified mean catch (pounds) per standard haul on research vessel surveys from Cape Hatteras to Cape Cod (sampling strata 1-12, 61-76 combined)

SPECIES	Oct.'67		Mar.'68	Oct.'68		Mar.'69	Oct.'69		Mar.'70	Oct.'70	
	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR
Sea herring	0.6	0.2	18.7	0.1	1.0	9.9	0	0.1	2.9	0	0
Mackerel	1.3	1.7	17.8	0.4	0.2	0.2	4.6	17.0	7.3	0.04	0.2
Alewife	1.7	0.4	6.6	0.1	0.2	5.2	0	0.2	6.7	0.2	0.04
Butterfish	6.3	11.1	6.0	23.2	36.7	8.8	11.8	161.8	1.5	6.7	24.2
Red hake	3.4	29.2	3.3	6.2	11.2	2.2	6.2	32.5	3.2	4.8	10.0
Silver hake	6.2	50.8	10.8	6.9	60.8	5.8	2.9	60.0	3.0	3.2	15.4
Yellowtail	17.8	16.5	29.5	19.0	19.9	21.6	18.6	23.0	17.9	16.3	11.9
Blackback	3.5	7.8	0.9	2.5	4.9	3.9	2.2	8.3	1.7	2.9	1.2
Fluke	2.2	1.2	0.4	1.7	0.4	0.4	1.1	2.5	0.2	0.6	0.2
Scup	3.4	4.0	5.2	1.2	4.2	0.9	10.4	11.5	7.0	0.2	0.6

Stratified mean catch (pounds, log scale) per standard haul on research vessel surveys from Cape Hatteras to Cape Cod (sampling strata 1-12, 61-76 combined)

	Oct. '67		Mar. '68	Oct. '68		Mar. '69	Oct. '69		Mar. '70	Sep.-Oct. '70	
SPECIES	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR
Sea herring	0.19	0.08	1.46	0.07	0.20	0.77	.00	0.04	0.61		
Mackerel	0.19	0.21	0.77	0.10	0.11	0.04	0.14	0.47	0.64		
Alewife	0.35	0.11	0.84	0.06	0.11	0.99	0.01	0.13	0.51		
Butterfish	0.75	0.57	0.27	0.96	1.12	0.22	0.96	1.70	0.24		
Red hake	0.70	1.59	0.69	0.67	1.36	0.49	0.79	1.54	0.80	0.80	1.07
Silver hake	1.17	2.24	1.15	1.38	2.69	1.01	0.78	2.35	0.78	0.96	1.63
Yellowtail	1.71	1.41	2.19	1.57	1.29	1.96	1.52	1.44	1.87	1.33	0.81
Blackback	0.78	1.04	0.28	0.60	0.44	0.44	0.51	0.92	0.35		
Fluke	0.41	0.31	0.12	0.38	0.15	0.11	0.35	0.55	0.10		
Scup	0.44	0.73	0.14	0.24	0.38	0.01	0.64	0.77	0.36		

Stratified mean catch (numbers, log scale) per standard haul on research vessel surveys from Cape Hatteras to Cape Cod (sampling strata 1-12, 61-76 combined

	Oct. '67		Mar. '68	Oct. '68		Mar. '69	Oct. '69		Mar. '70	Sep.-Oct. '70	
SPECIES	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR
Sea herring	0.31	0.14	2.19	0.17	0.28	1.36	.01	0.08	1.19		
Mackerel	0.35	0.43	1.38	0.13	0.12	0.13	0.19	0.61	0.85		
Alewife	0.55	0.19	1.79	0.12	0.20	1.84	0.05	0.17	0.91		
Butterfish	1.73	1.29	0.57	2.16	2.29	0.48	2.34	3.19	0.60		
Red hake	0.95	1.99	0.93	0.91	1.73	0.89	1.03	1.82	1.36	1.14	1.49
Silver hake	2.11	3.09	2.51	2.52	3.67	1.80	1.98	2.87	1.97	2.16	2.63
Yellowtail	2.08	1.80	2.58	1.97	1.56	2.45	1.84	1.72	2.23	1.49	1.03
Blackback	0.93	1.21	0.40	0.77	0.53	0.56	0.61	1.08	0.38		
Fluke	0.32	0.27	0.08	0.29	0.13	0.09	0.23	0.36	0.07		
Scup	0.79	1.22	0.21	0.52	0.73	0.03	1.15	1.23	0.73		

Recent Trends in Yellowtail Flounder-Subarea 6

There are three types of information available to evaluate the status of the yellowtail flounder population in Subarea 6. There are the commercial landings, the abundance indexes from the survey cruises, and the length frequency distributions from the survey cruises.

The commercial catch has remained high the past three years relative to catches in the middle 1960'd (table 1). The industrail catch increased considerably in 1969 over 1968. The U. S. food landings through August in 1970 when compared with the corresponding values for 1969 show an increase from 1900 to 2300 MT.

The abundance indexes for survey cruises in terms of both numbers and weights were down considerably in fall 1970 for both Soviet and U. S. cruises (table 1).

The percent length frequency distributions have changed drastically since the current series of U. S. survey cruises began in 1963 (figure 1). Prior to 1968 the length frequency curves showed a strong bimodality. The first mode which represents age 1+ recruits was much reduced in 1967 compared to previous years and virtually non-existent in 1969 and 1970. In the earliest years there was also a greater relative porportion of larger fish without second modes, i.e. those close to 40 cm.

Thus there seems to be a reduction in adult stock and in recruitment.

Current information supports the conclusion that increases in fishing effort at this time might have a detrimental affect on the stocks. The relation of S. A. 6 stocks to those in Southern New England waters is not known, but it is probable that some degree of exchange does take place.

Table 1.--Yellowtail Flounder Removals (MT) Subarea 6

Year	U.S. Food	Est. Discard	Industrial	Total	Standard days fished
1963	2100	500	600	3200	600
1964	1600	800	600	3000	500
1965	1700	600	600	2900	600
1966	1600	600	700	2900	900
1967	2500	1800	300	4600	1000
1968	2500	1100	200	3800	800
1969	2400	500	1000	3900	800

Stratified mean catch per standard haul of yellowtail flounder on research vessel surveys in southern New England (strata 5, 6, 9, 10) and mid-Atlantic area (strata 1, 2, 73, 74)

	Oct. '67		Mar. '68	Oct. '68		Mar. '69	Oct. '69		Mar. '70	Oct. '70	
	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR	U.S.	U.S.	USSR
STRATA 5, 6, 9, 10											
POUNDS											
linear	30.98	22.23	46.47	22.18	14.59	29.43	31.73	33.49	25.83	23.84	33.65
ln trans.	2.52	1.97	3.32	2.15	1.55	2.39	2.13	1.79	2.52	2.15	2.12
NUMBERS											
linear	57.67	40.07	78.58	40.24	21.33	57.16	54.75	62.74	42.42	38.77	46.96
ln trans.	2.92	2.31	3.81	2.52	1.77	2.91	2.45	2.02	2.89	2.51	2.51
STRATA 1, 2, 73, 74											
POUNDS											
linear	23.93	31.56	48.65	42.09	53.39	40.35	27.46	43.23	33.77	32.20	5.59
ln trans.	2.32	2.02	2.71	2.67	2.49	2.90	2.29	2.48	2.89	1.85	0.63
NUMBERS											
linear	64.95	86.01	115.18	114.19	127.34	89.67	56.27	102.98	65.50	64.20	9.00
ln trans.	2.96	2.66	3.29	3.37	3.03	3.61	2.82	3.01	3.44	2.44	0.93

Figure I.--Yellowtail flounder U. S. fall cruises percentage length frequency. Strata 1 and 2.

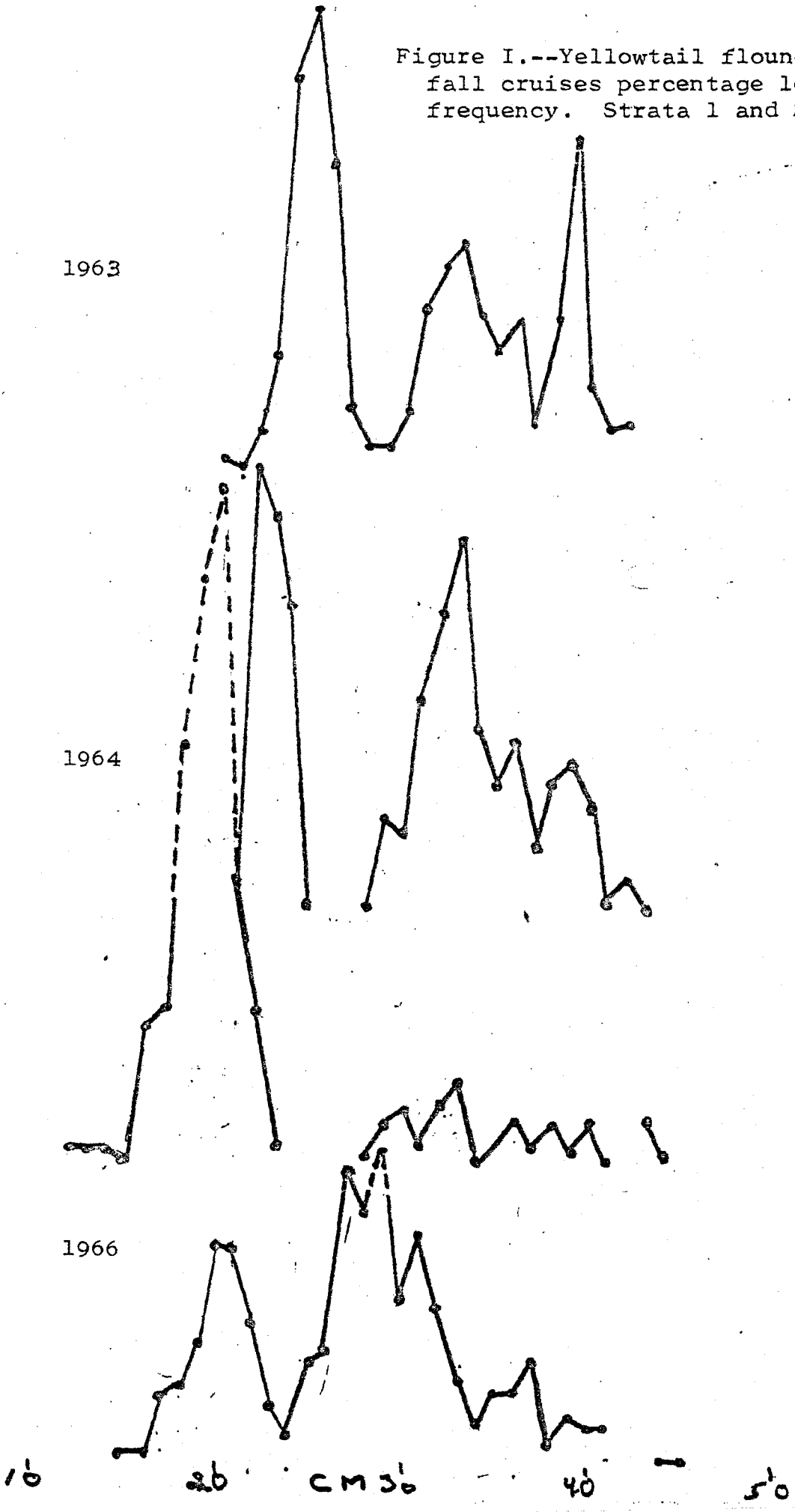
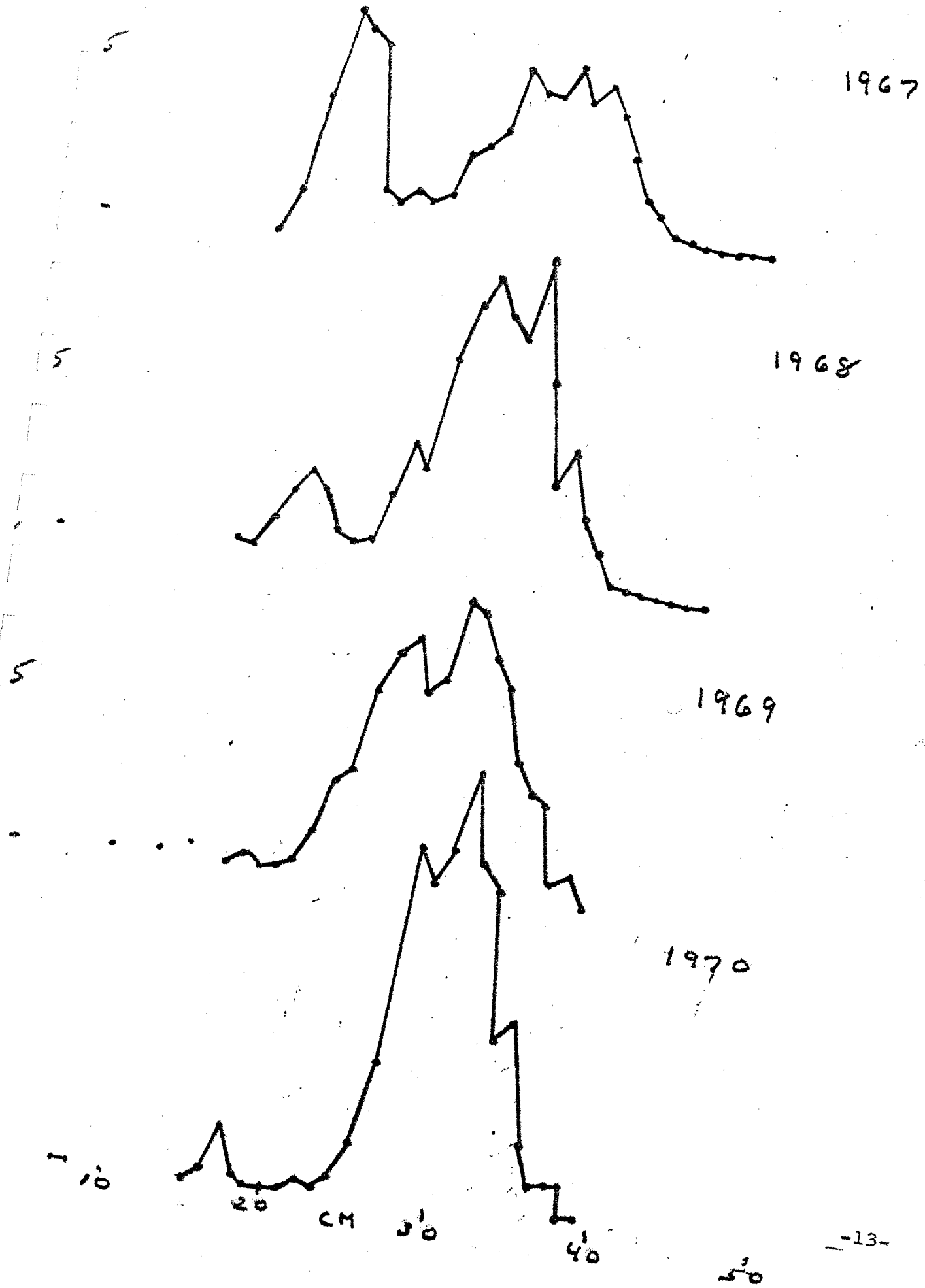
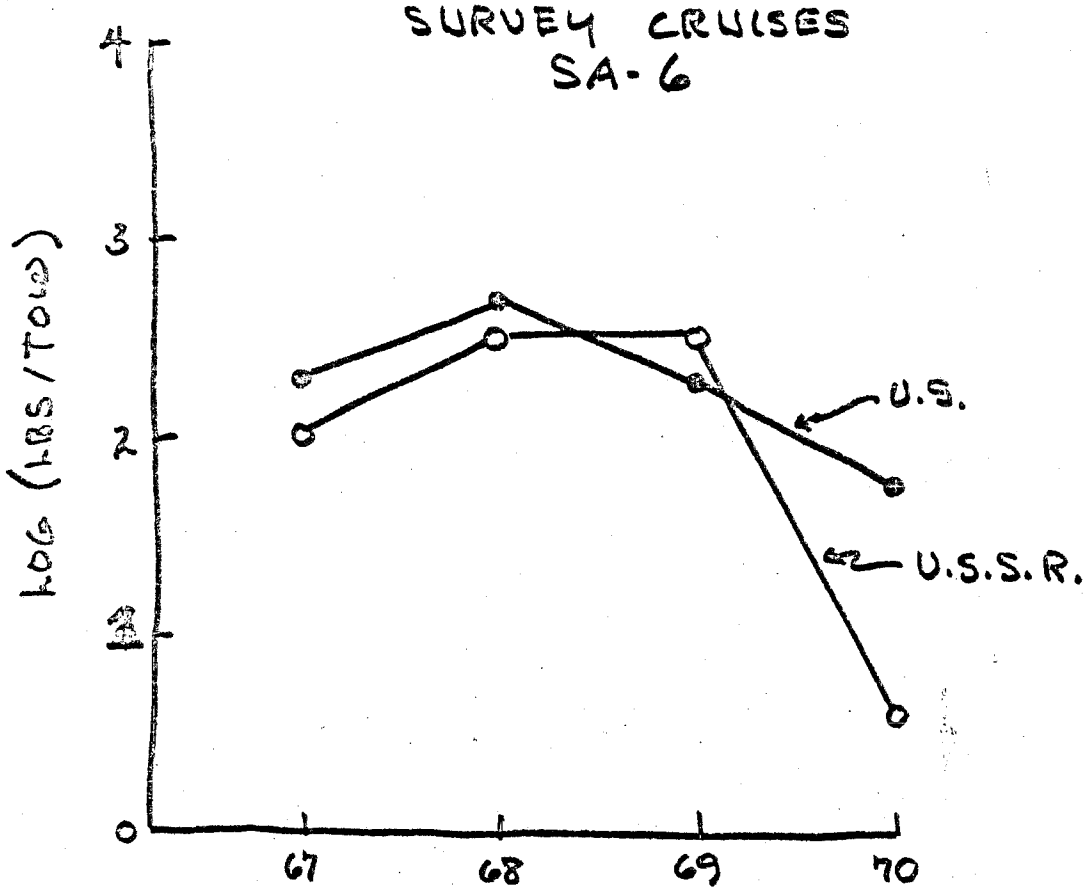
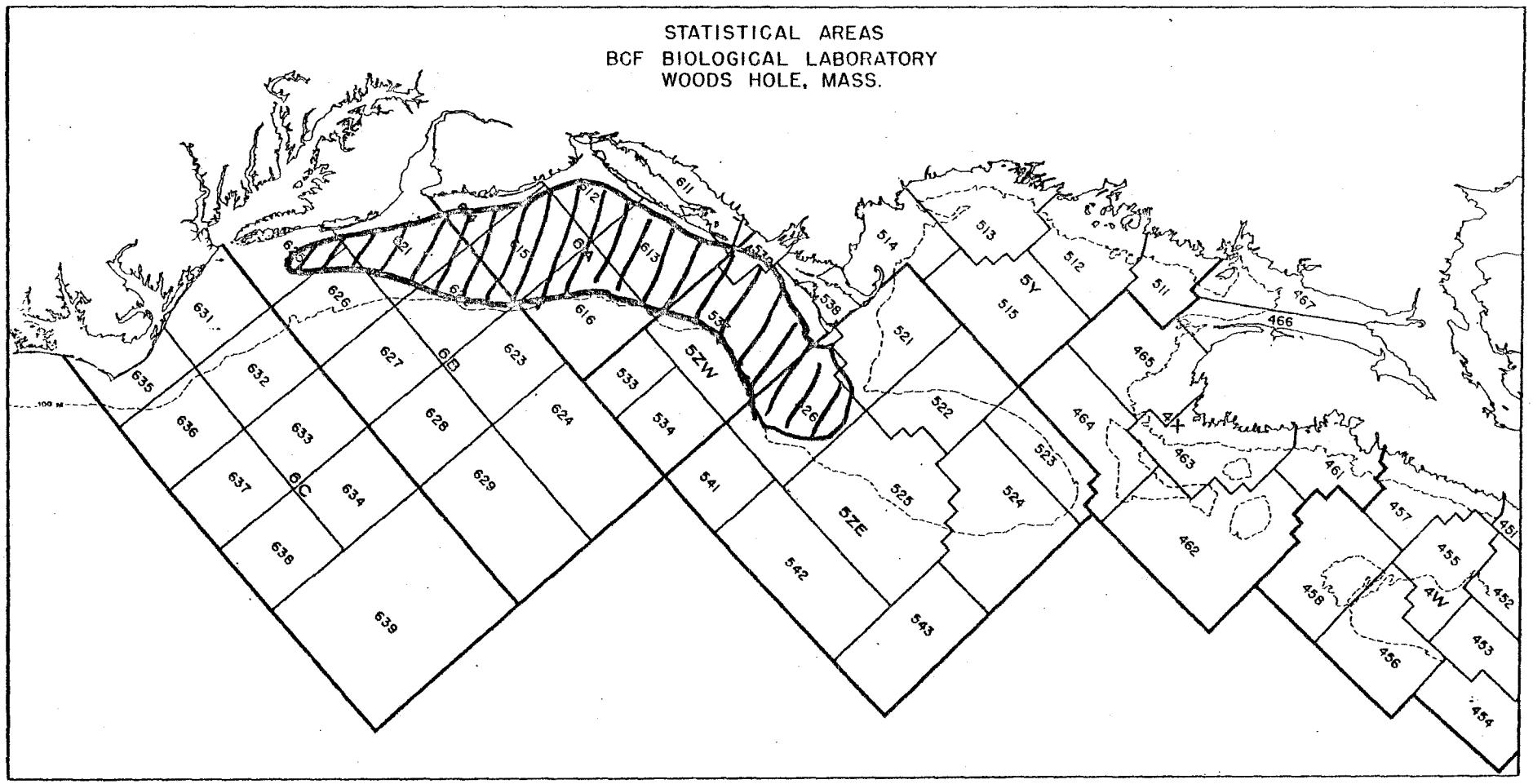


Figure I.--continued



YELLOWTAIL FLOUNDER
SURVEY CRUISES
SA-6





YELLOWTAIL FLOUNDER

Sea Herring

The catch of sea herring increased from 29,000 to about 57,000 metric tons from 1968 to 1969. The catches in 1970 will probably increase again. The USSR and Poland were the main countries in 1969.

The stocks of herring in S.A. 6 and Division 5Z (southern New England and Georges Bank) belong to one stock with the primary spawning on Georges Bank in September-October, and generally southward movement thereafter. The USSR has now extended its fishery south to Cape Hatteras in February-April. The fish are distributed throughout S.A. 6 in the winter, generally from 20 to 50 fathoms.

The Assessment Sub-committee of ICNAF has reported that the abundance of this stock has decreased to 70-90 percent of its 1961-62 abundance level. This is reflected in the catch-per-unit effort of the USSR fishing fleet, and in the data provided by the USSR from their egg surveys. The position of the sub-committee, accepted by the USSR is as follows:

"The information describes the effects of a rapid and intense exploitation of a virgin population, leading to a 70-90 percent decline in spawning stock density. Part of this decline may be attributed to poor recruitment since the entry

of the 1960-61 year classes in 1963 and 1964. The important question is the effect of stock reduction on recruitment. It is not possible with the evidence at hand to specify the stock-recruit relation. It has been concluded from studies of other herring populations that a very small spawning stock may cause sustained low recruitment. Studies of other herring fisheries also imply that the total mortality for Georges Bank is such that no increase in yield-per-recruit would result from further increase in fishing intensity."

The substance of the advice is to reduce fishing intensity. This must be done in both S. A. 5 and 6. With continued low recruitment, a reduction in catch of 30-50 percent may be required. Thus some limitation of USSR (and Polish) catches in S. A. 6 would be desirable if limitation in ICNAF is to be effective.

Both mackerel and river herring are likely to be mixed with the sea herring catches. Extention of the closed area southward would be effective in limiting the herring fisheries; it would probably also restrict the mackerel fishery.

<u>The basic position may be based on demonstrated over fishing of the stock. It is in the U. S. interest to start conservation measures to rebuild this stock</u>.

TRENDS IN SEA HERRING FISHERY - GEORGES BANK AND MID-ATLANTIC
Taken from ICNAF Assess. Sub-Com. (Anthony)

YEAR	TONS/HR. - USSR Med.	TONS/HR. - USSR Large	TONS PER DAY	TOTAL LAND (000's MT)	TOTAL EFFORT (000's HRS) Med. Units	TOTAL EFFORT (000's HRS) Lge. Units
1961	-	-	3.2	68	-	-
1962	1.2	1.2	3.4	152	130	127
1963	1.8	1.1	7.2	97	55	92
1964	1.0	0.7	6.7	131	130	196
1965	(0.3)*	(0.2)*	5.3	43	-	-
1966	(0.1)*	0.9	4.0	142	-	154
1967	0.8	0.7	3.1	219	266	325
1968	0.6	0.6	2.4	373	583	574
1969**	0.4	0.5	1.8	343	854	700

*Not representative
**Preliminary

TRENDS IN MID-ATLANTIC SEA HERRING FISHERY
Based on USSR Statistical Reports

YEAR	Tons/Day-USSR Med. Trawl	Total Land 000's MT	Total Effort Med. Days	Tows/Day 5Ze	Tows/Day 5Zw
1966	14.0	3	198		
1967	4.6	3	689		
1968	9.0	16	1790		
1969	3.4	38	11084	3.4	1.3

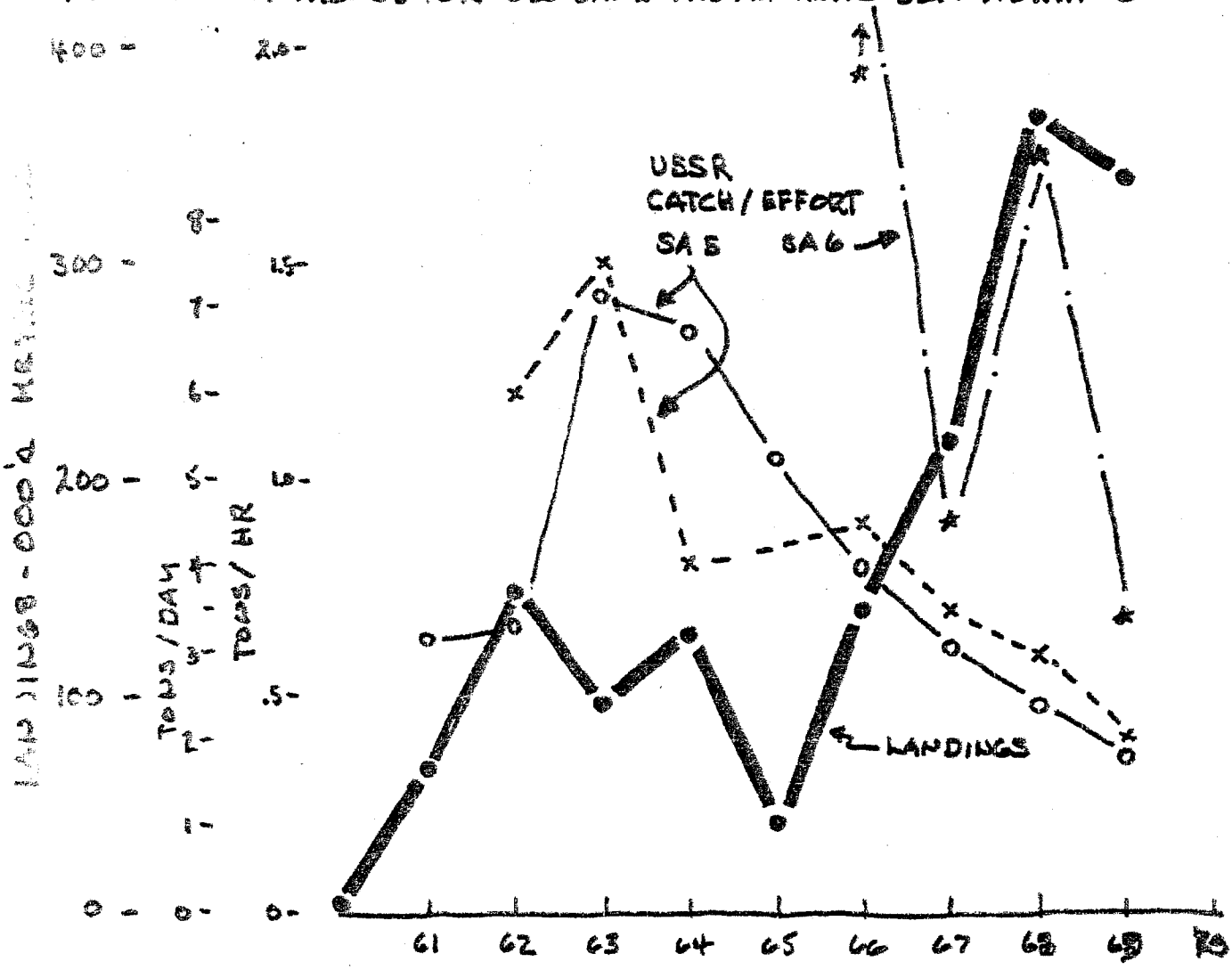
Table --Sea Herring Landings- Georges Bank and Mid Atlantic Stock (000's M.T.).

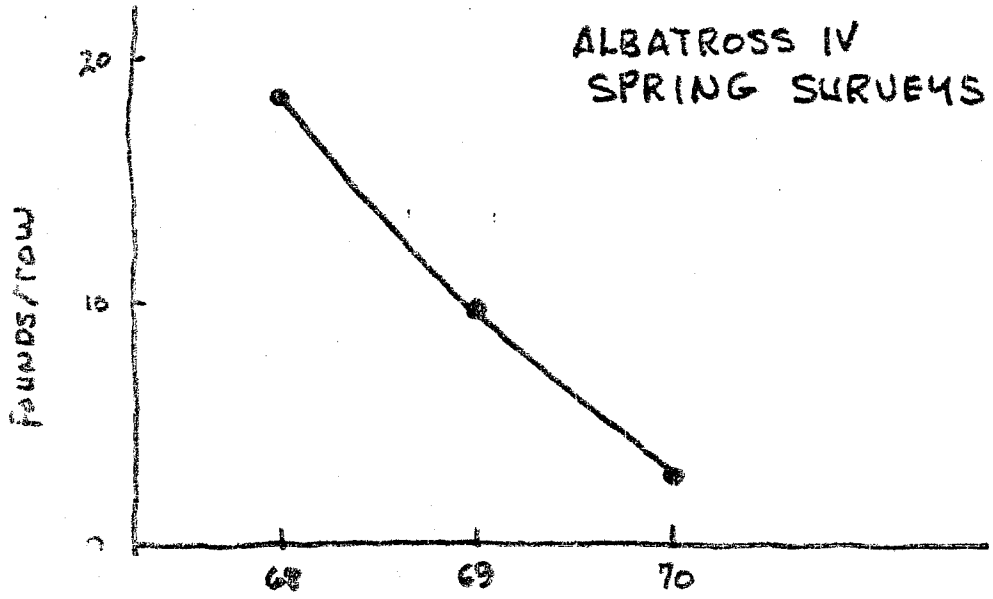
5Z (GEO & SNE)	61	62	63	64	65	66	67	68	69*
US	+	+	+	+	1	1	1	1	2
CAN	0	0	0	0	0	0	1	14	1
USSR	68	151	97	131	36	117	124	127	100
POL	0	+	0	0	1	14	38	64	31
W. GERM	0	0	0	0	0	0	28	71	62
ROM	0	0	0	0	0	0	1	2	(8)
ICE	0	0	0	0	0	0	0	+	13
NON MEM	0	0	0	0	2	4	21	67	(68)
TOTAL	68	151	97	131	41	136	214	346	285
S.A. 6									
US	0	0	+	+	+	3	1	+	2
CAN									0
USSR			+	+	2	3	3	16	38
POL								12	13
W. GERM								+	0
ROM									(2)
ICE	0	0	0	0	0	0	0	0	0
NON MEM							1	1	(2)
TOTAL			+	+	2	6	5	29	57

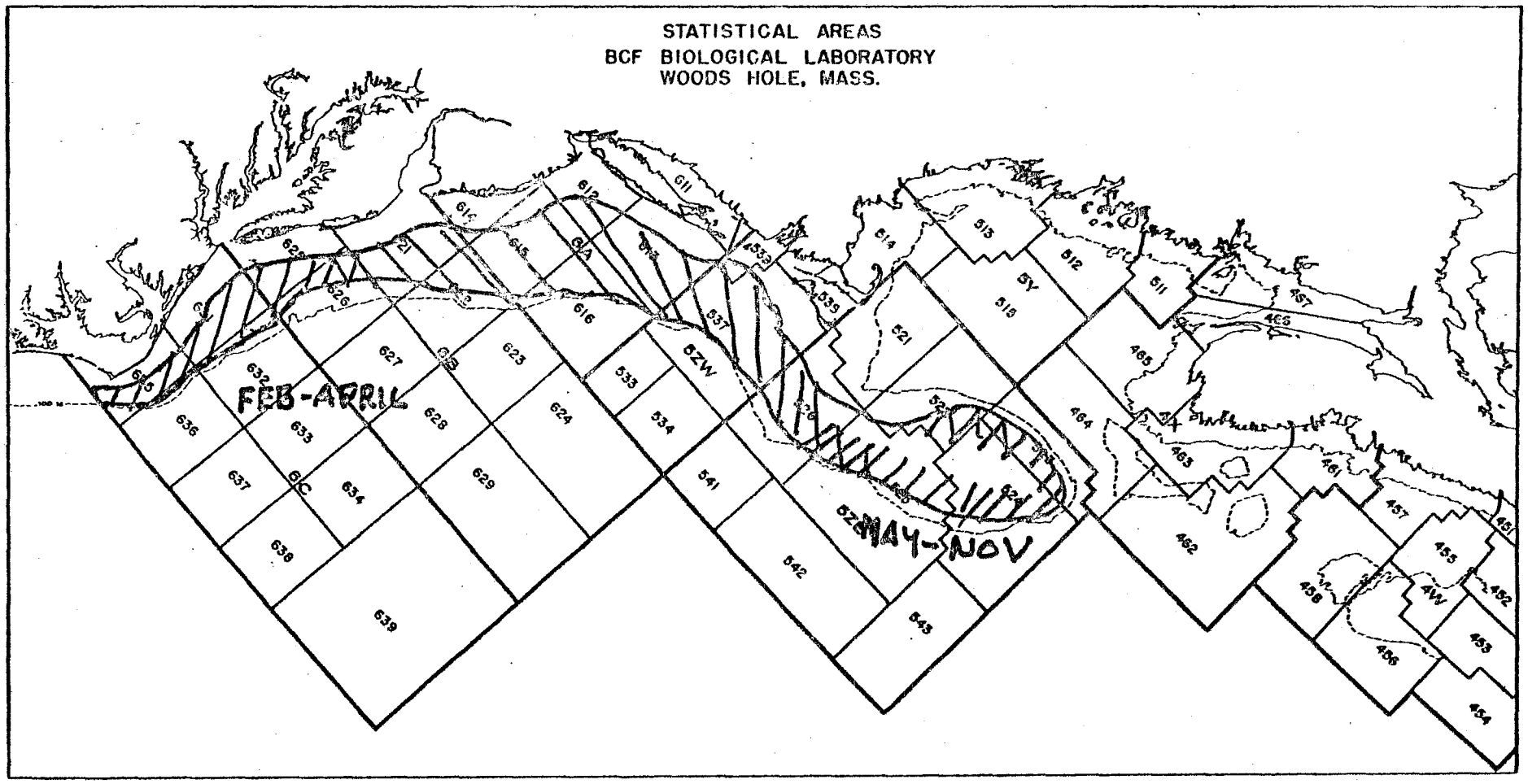
Table --(cont'd)

5Z & S.A. 6	61	62	63	64	65	66	67	68	69*
US	+	+	+	+	1	4	1	+	3
CAN	0	0	0	0	0	0	1	14	1
USSR	68	151	97	131	38	120	127	143	138
POL	0	+	0	+	1	14	38	75	45
W. GERM	0	0	0	0	0	0	28	71	62
ROM	0	0	0	0	0	0	1	2	(10)
ICE	0	0	0	0	0	0	0	0	13
NON MEM	0	0	0	0	2	4	22	68	(70)
TOTAL	68	151	97	131	42	142	218	373	343

FIGURE ____. TRENDS FOR GEO BANK-MID ATLANTIC SEA HERRING







SEA HERRING DISTRIBUTION

River Herring

Landings of river herring (alewives and blueback) have trended upward from the late 1950's to the mid-1960's, stabilized at about 20,000 tons from 1965-1969. U. S. landings dropped sharply in 1970 to about 13,000 tons. The USSR took about 10,000 tons in 1969. The landings per pound net in the Virginia fishery also dropped by about 50 percent from 1969 to 1970. The research vessel surveys indicate a similar pattern.

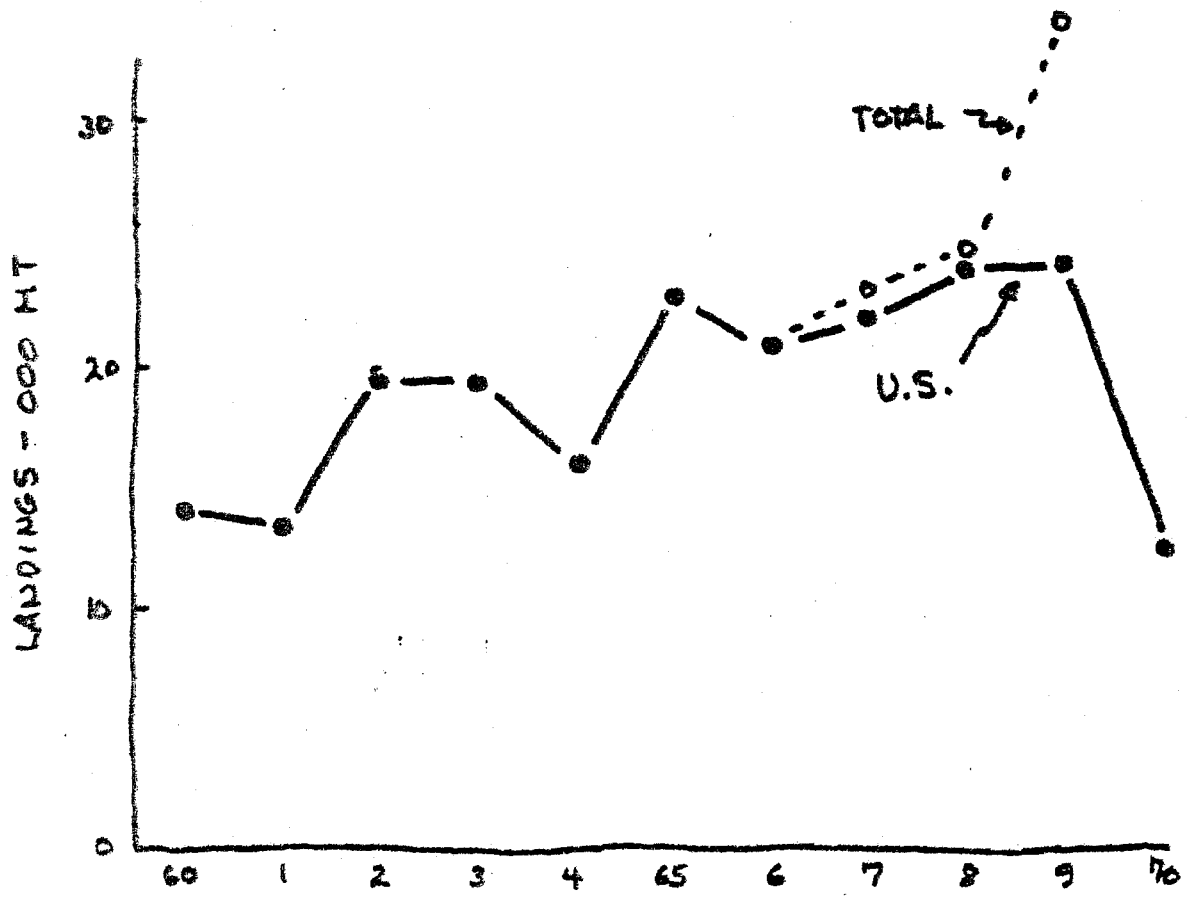
The estimates of total mortality for the Potomac and Rappahannock Rivers indicate some increase in the 1967-1969 period, but a lesser total mortality in 1970.

It is not possible at this time to evaluate the changes in abundance in relation to fishing effort. The necessary statistics are not adequate for this purpose. The reduction in abundance for 1970 for alewives (not for blueback) seems real. This indicates that we should restrict catches at least to prevent increase above 25,000 metric tons until the fishery status can be evaluated.

S. A. 6 RIVER HERRING LANDINGS (000 MT)

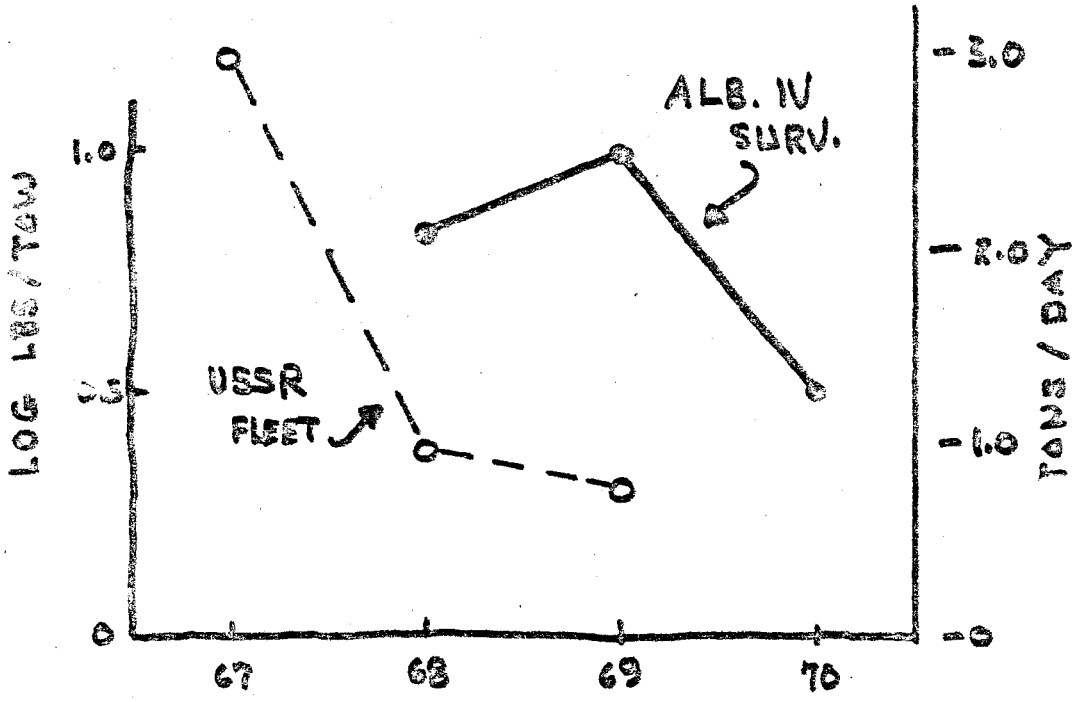
YEAR	U. S.	USSR	TOTAL
1960	14.4		
1961	13.6		
1962	19.1		
1963	19.4		
1964	16.1		
1965	23.2		
1966	21.2	-	
1967	22.2	1.0	23.2
1968	23.6	1.1	24.7
1969*	24.3	10.4	34.7
1970*	12.6	N.A.	N.A.

*Preliminary: 6 mo's, N.C., Va., Md.



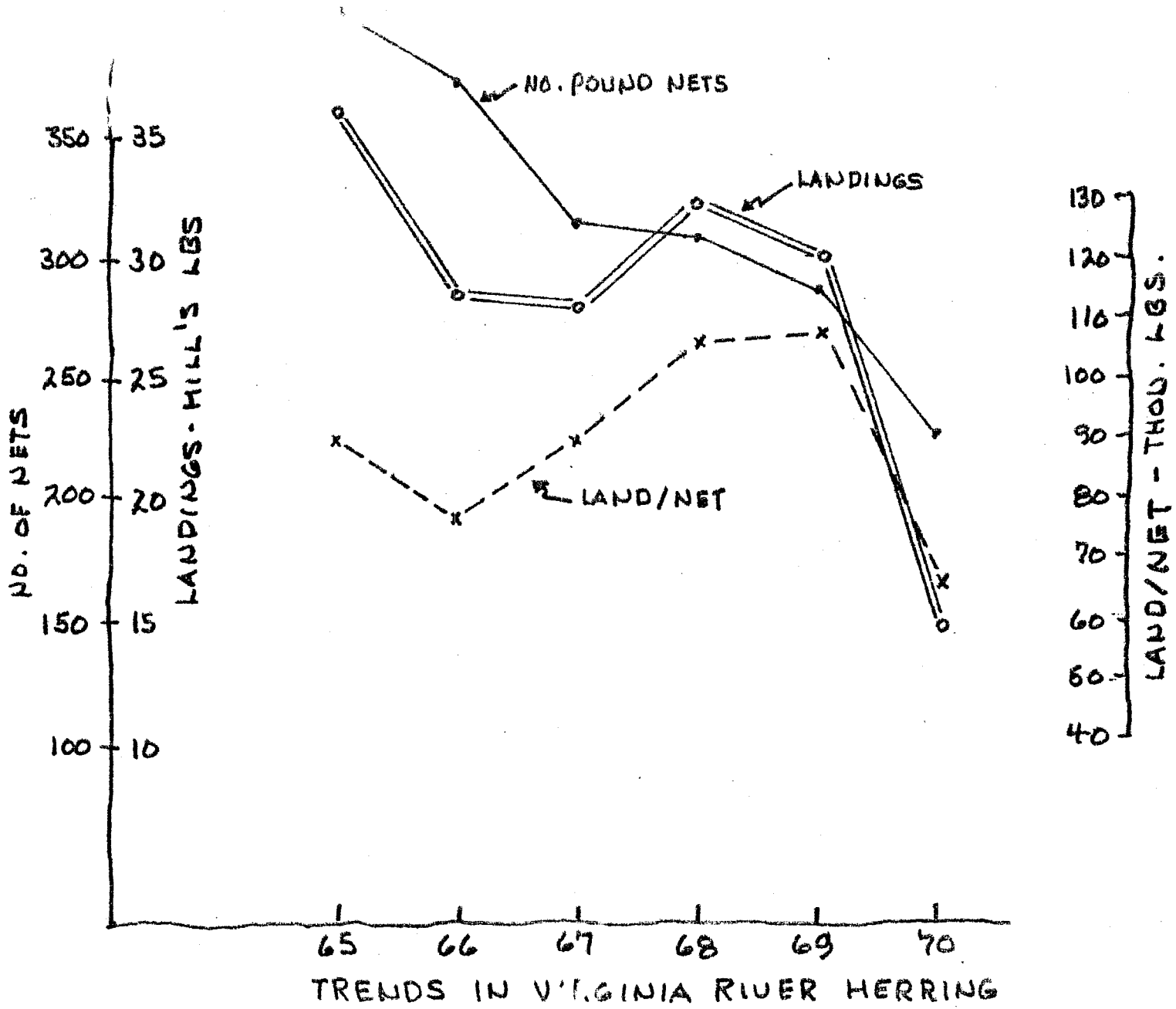
DATE SUBJECT SHEET NO. OF
CD. BY DATE JOB NO.

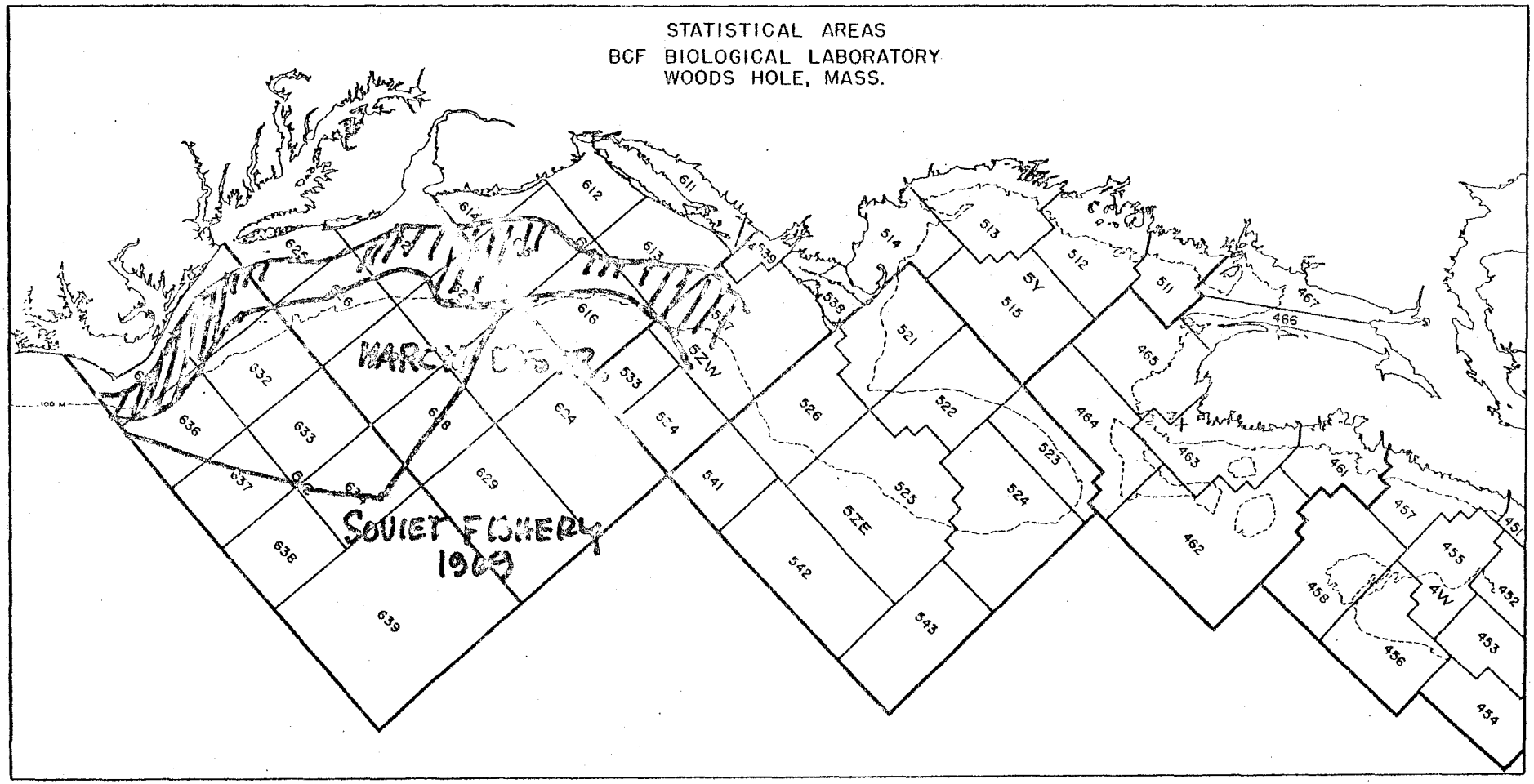
ALEWIFE - MID ATLANTIC



DATE _____ SUBJECT _____ SHEET NO. _____

BY _____ DATE _____ JOB NO. _____




STATISTICAL AREAS
BCF BIOLOGICAL LABORATORY
WOODS HOLE, MASS.
SOVIET FISHERY
1969
100 M
611
612
613
614
616
625
632
633
636
637
638
639
629
624
533
534
5ZW
539
538
541
542
543
526
525
5ZE
521
522
523
524
514
513
512
511
5Y
515
464
465
466
467
463
462
461
457
455
4W
452
453
454
456
458
451

ALEWIFE

SILVER HAKE

This species apparently forms one population from Martha's Vineyard down through the Mid-Atlantic. The stock is distributed mainly from 50-100 f in the winter, but moves inshore from April to December.

The landings (SA 6 + 5 Zw) increased in 1963 with the advent of the U.S.S.R. fishery, peaked in 1965 at about 300,000 metric tons, and decreased to about 75,000 tons in 1968-69. SA 6 landings peaked in 1966 at 100,000 tons.

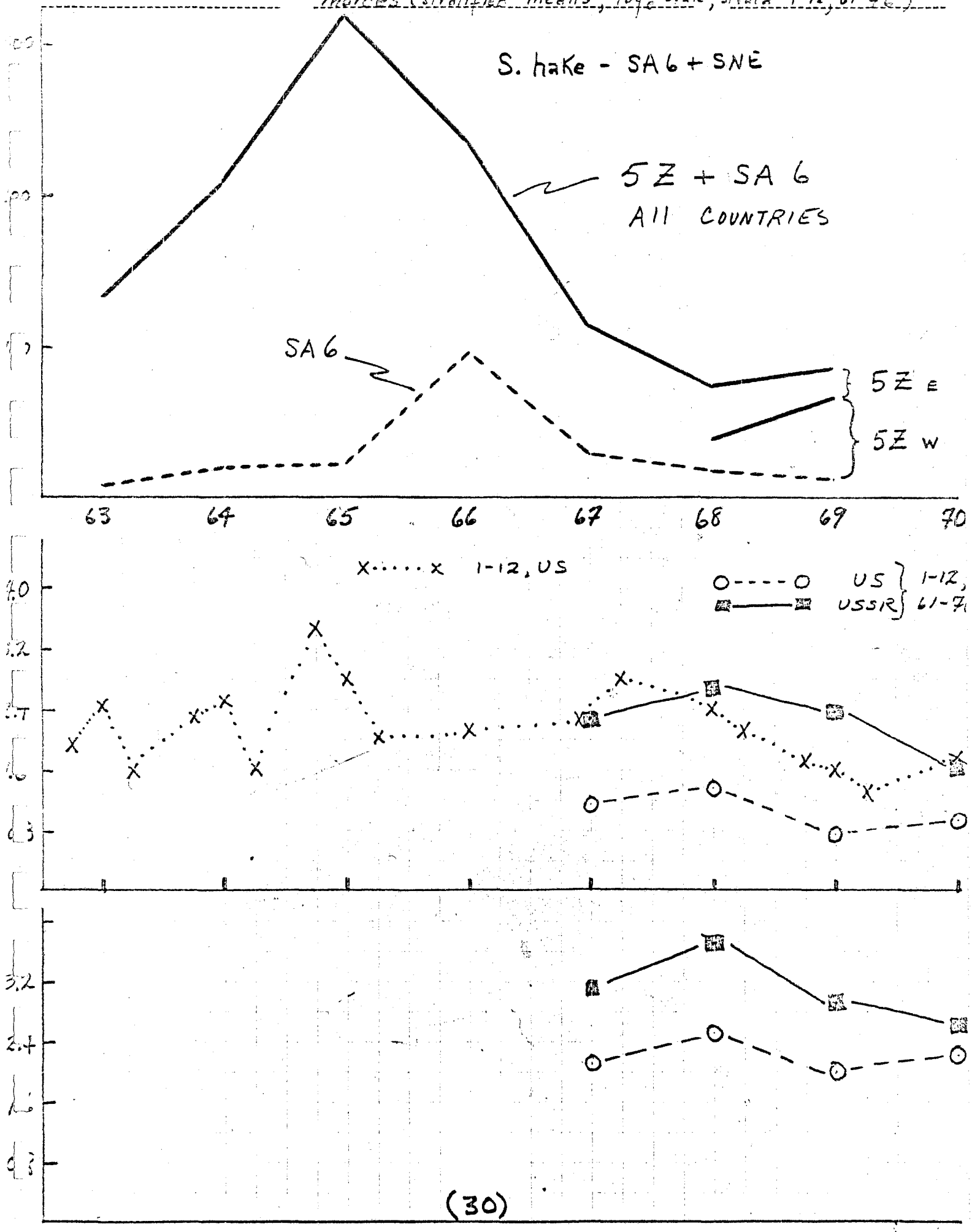
The relative abundance, as measured by research vessel surveys has remained at about the same level from 1963-1966, but has shown a distinct trend downwards since 1967. Recruitment was particularly good in 1963, 1966 and 1968, and good in the other years, as well.

The decreased availability to the U. S. inshore fishery in S. N. E. in 1965-66 could well have been caused by the heavy fishery by the Soviets during March and April. However, the population at large has not shown adverse effects from the fishery, and yields between 100,000 and 200,000 tons per year may be sustainable.

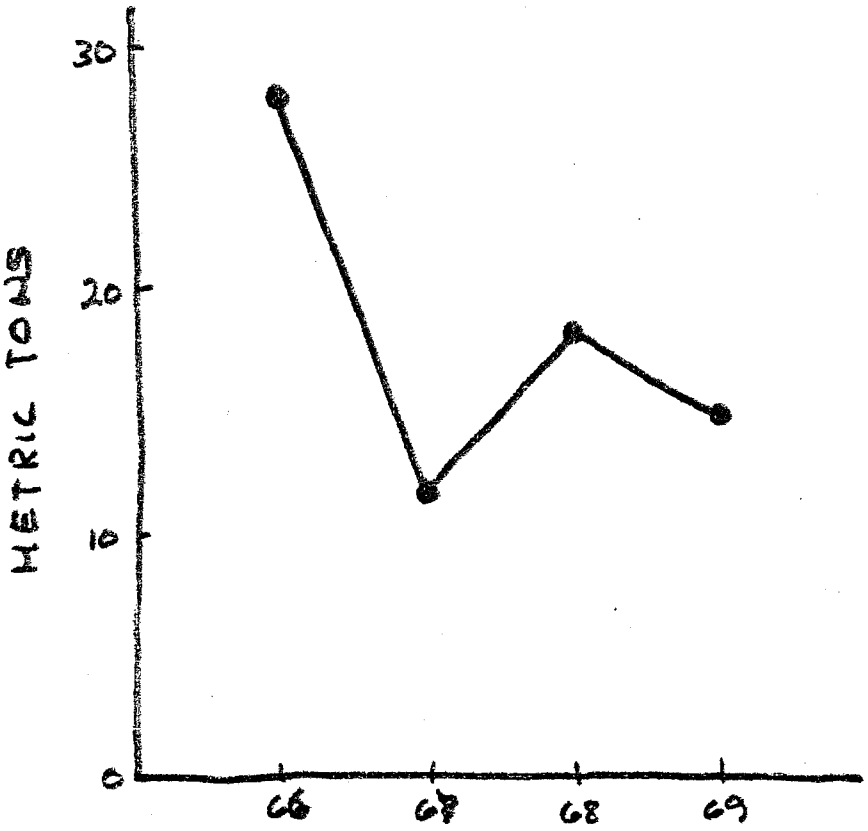
The closed areas in sa 6 and sa5 Zw are effective in reducing the Soviet fishery; they would be more effective if extended through April. <u>Justification for this must be based on effects on U. S. inshore availability rather than overfishing.</u>

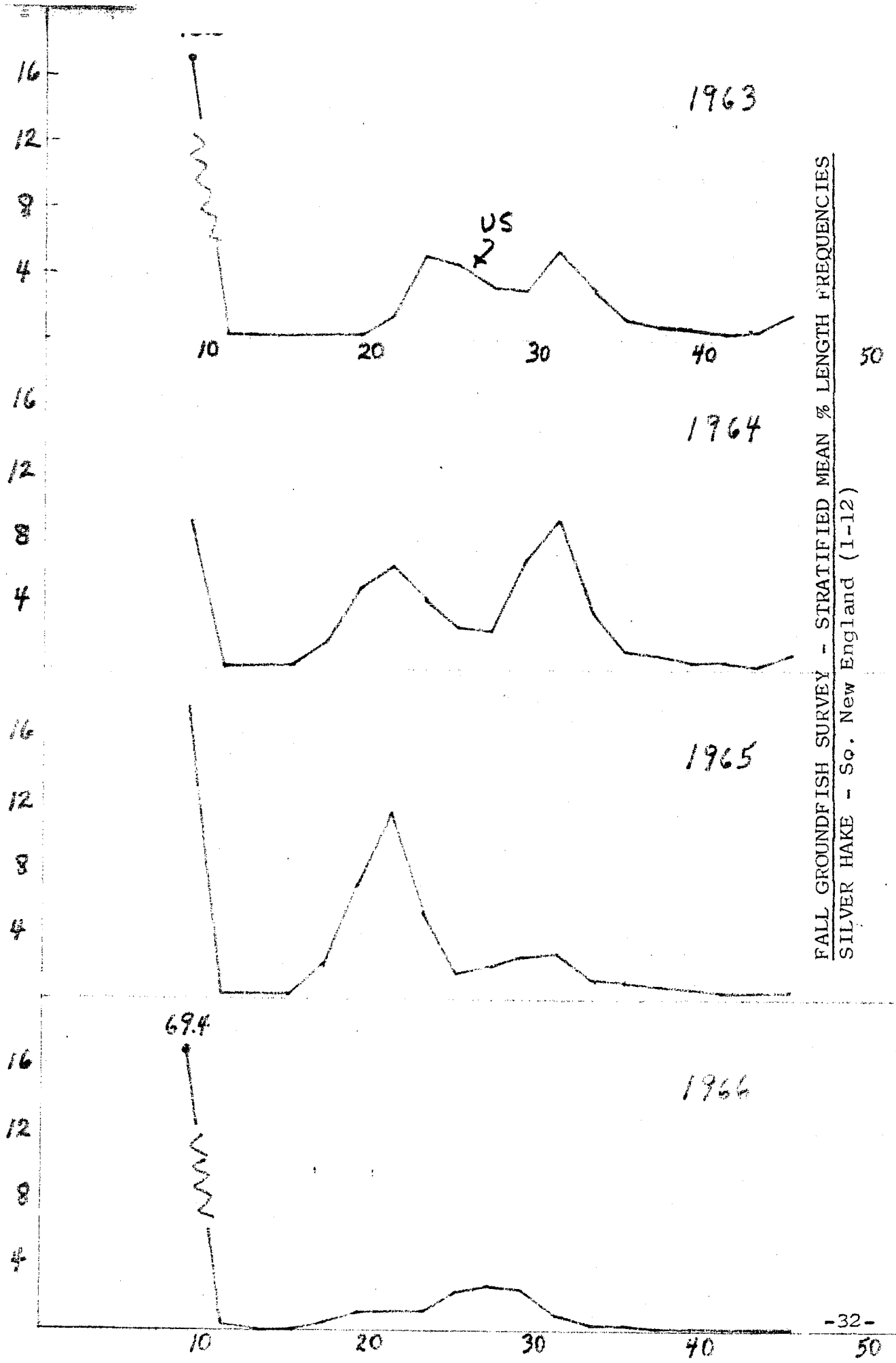
The U. S. S. R. scientists have stated that stocks in 1970 would be lower, but increase in 1971-72 because of good 1968-69 year classes. This generally agrees with our data.

indices (stratified means, $\log_e$ scale, strata 1-12, 61-96)

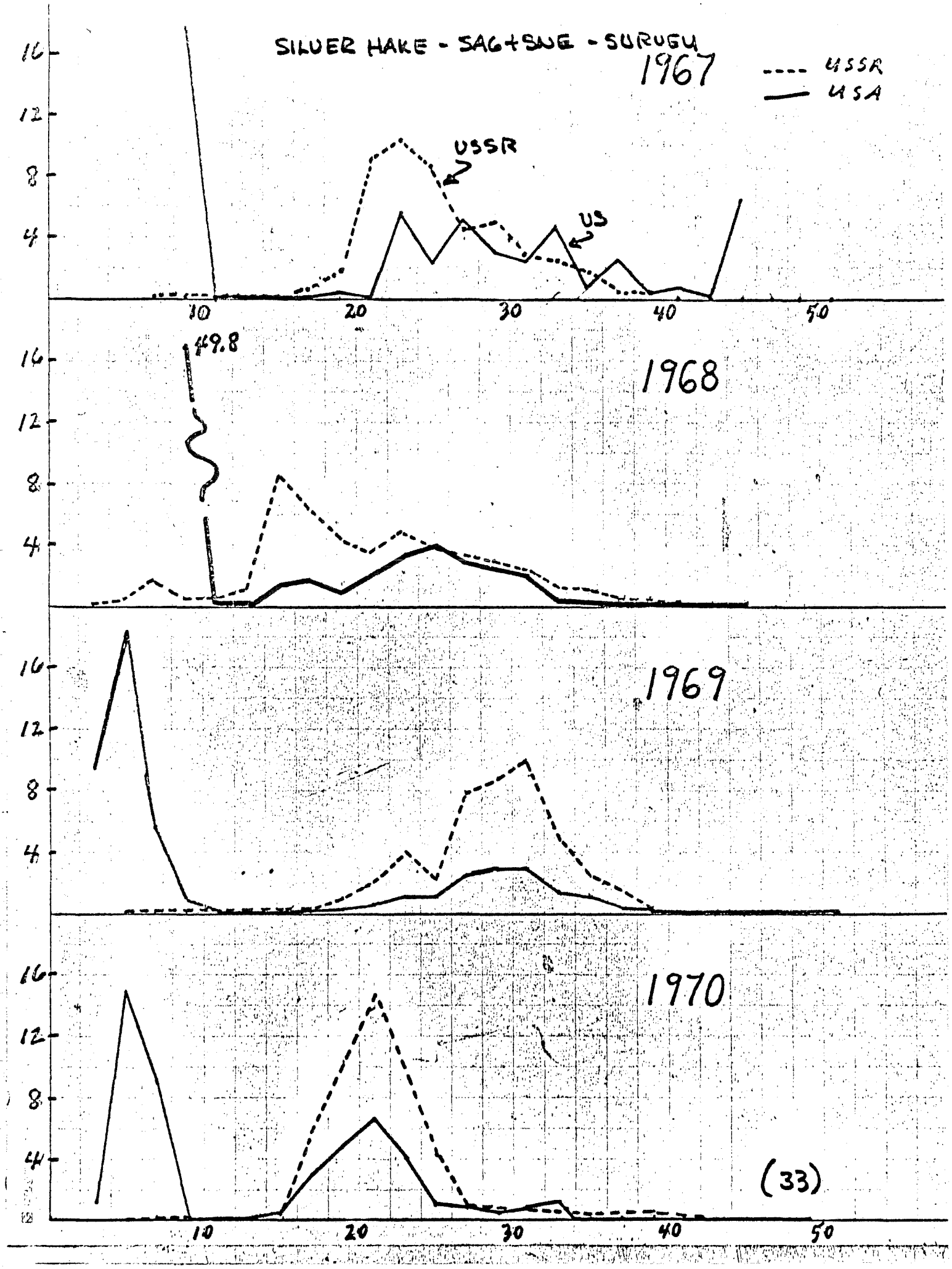


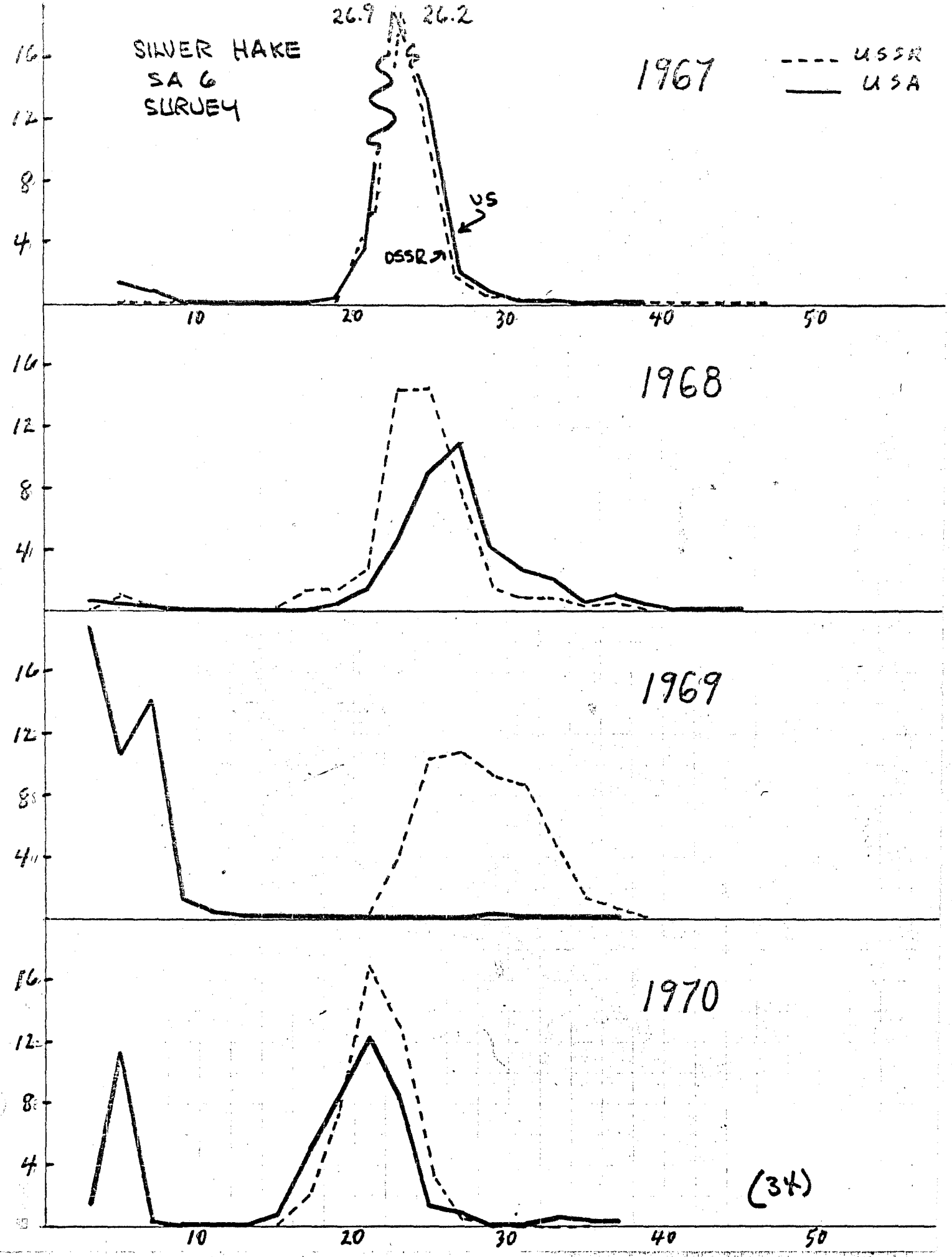
Silver Hake - USSR CATCH/DAY



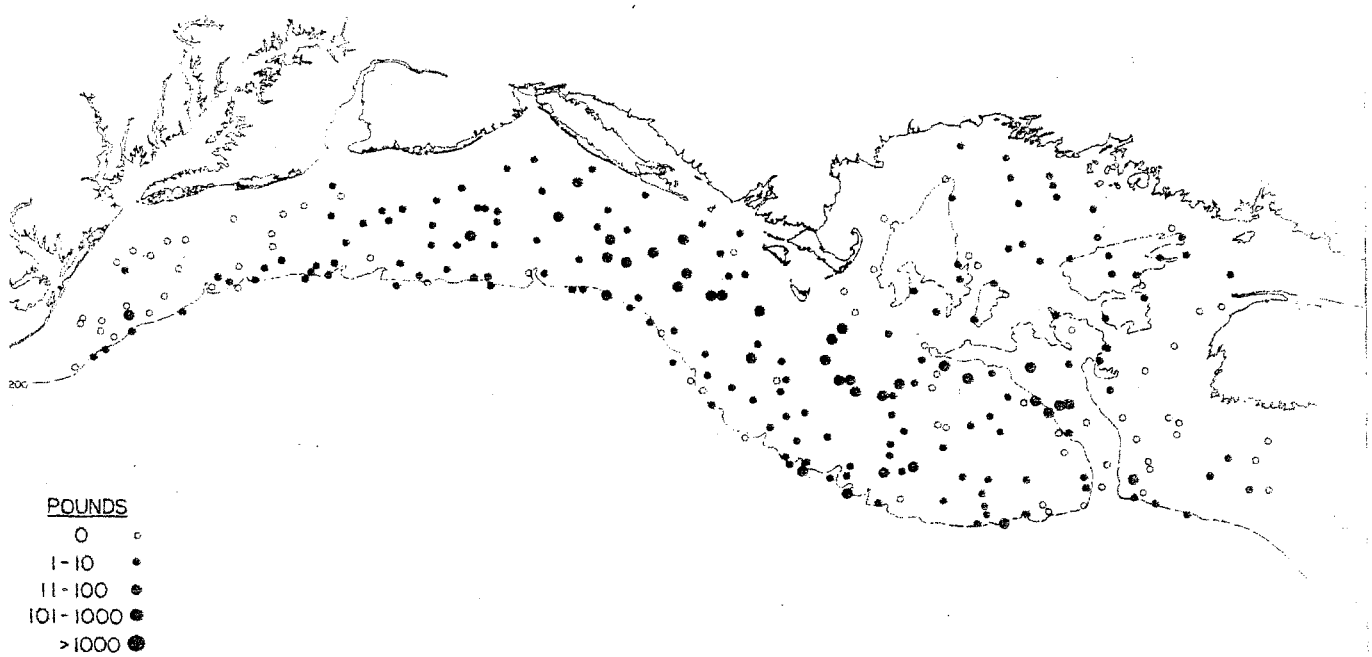


FALL GROUNDFISH SURVEY - STRATIFIED MEAN % LENGTH FREQUENCIES
SILVER HAKE - So. New England (1-12)

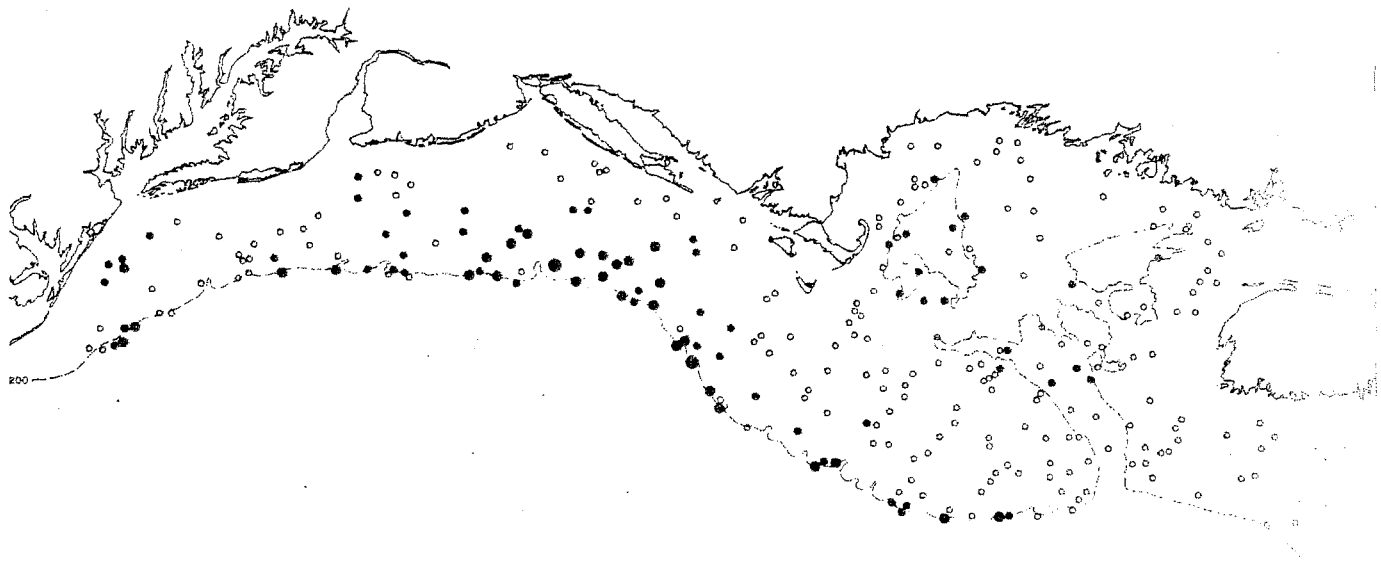

SILVER HAKE - SAG+SNE - SURUGU
1967
USSR
USA
USSR
US
1968
49.8
1969
1970
(33)
16
12
8
4
10
20
30
40
50


SILVER HAKE
SA 6
SURVEY
26.9
26.2
1967
USSR
USA
US
USSR
1968
1969
1970
(34)
16
12
8
4
10
20
30
40
50

OCTOBER-NOVEMBER



MARCH-APRIL 1968



SILVER HAKE

RED HAKE

The population is probably continuous from Cape Cod waters south through the Mid-Atlantic. The seasonal distribution is between 50-100 fathoms in winter with an inshore migration in April-May which is most pronounced off Long Island and SNE.

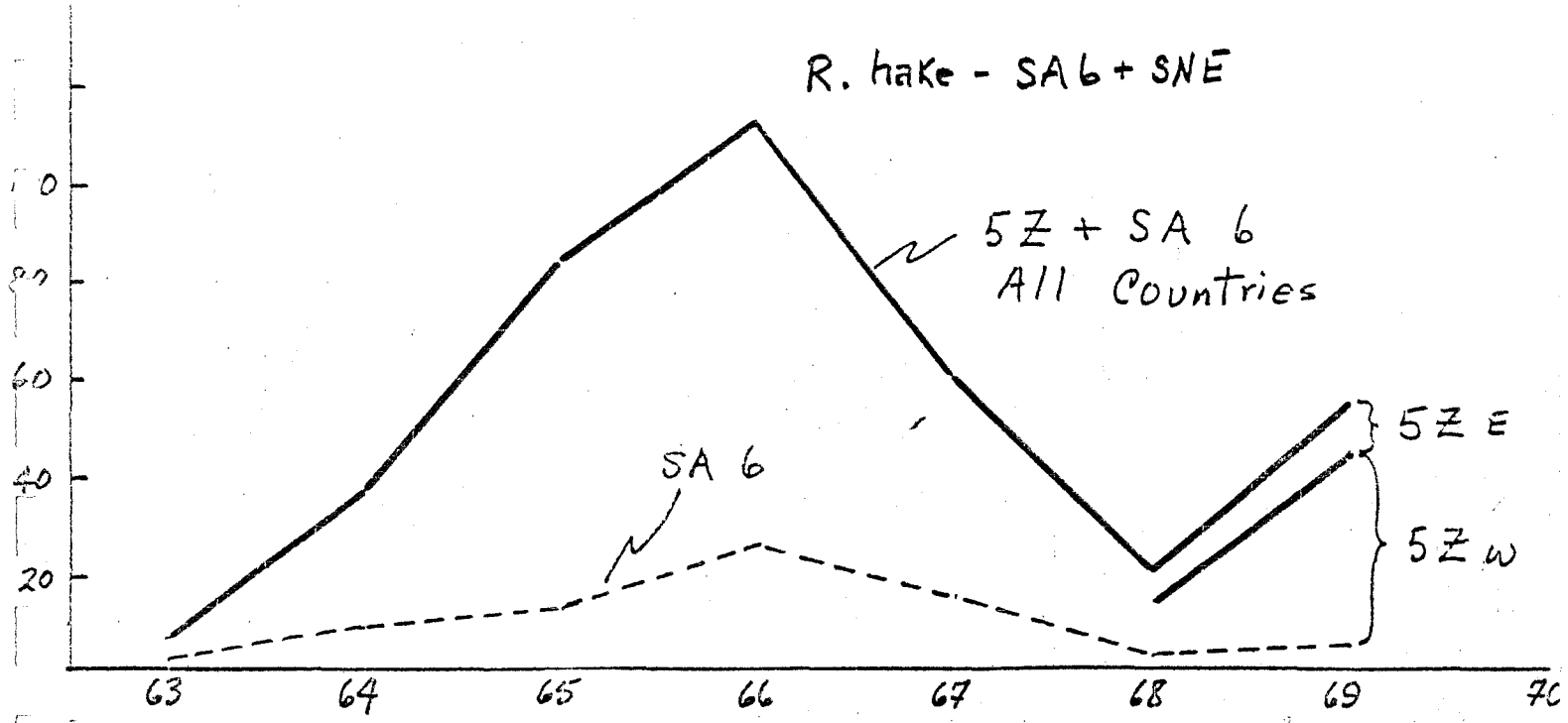
Landings increased from 8,000 tons in 1965 to about 100,000 tons in 1966 (28,000 in SA 6) and dropped to 15,000 by 1968. In 1969 they increased to 45,000 metric tons.

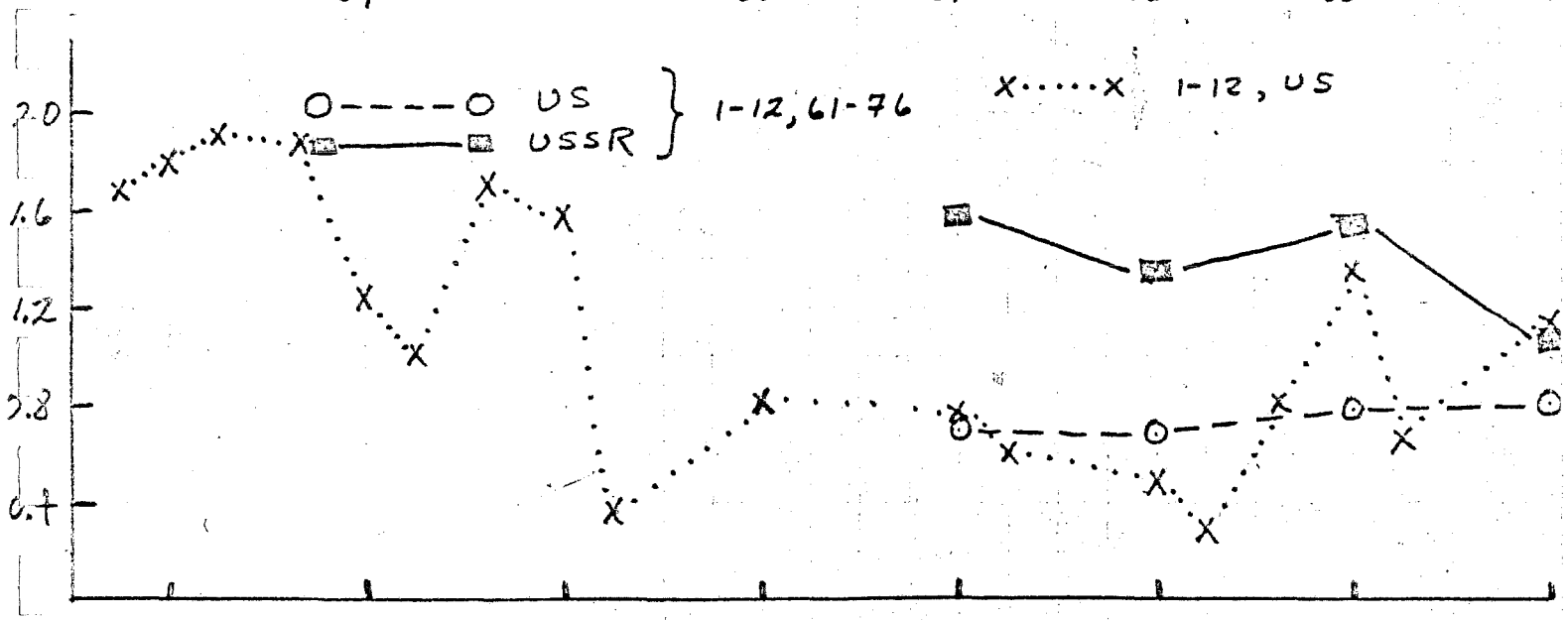
The abundance measured by research vessels indicates a significant drop after 1965 with little or no recovery to date. Length frequencies indicate very good recruitment in 1966, but poor recruitment since.

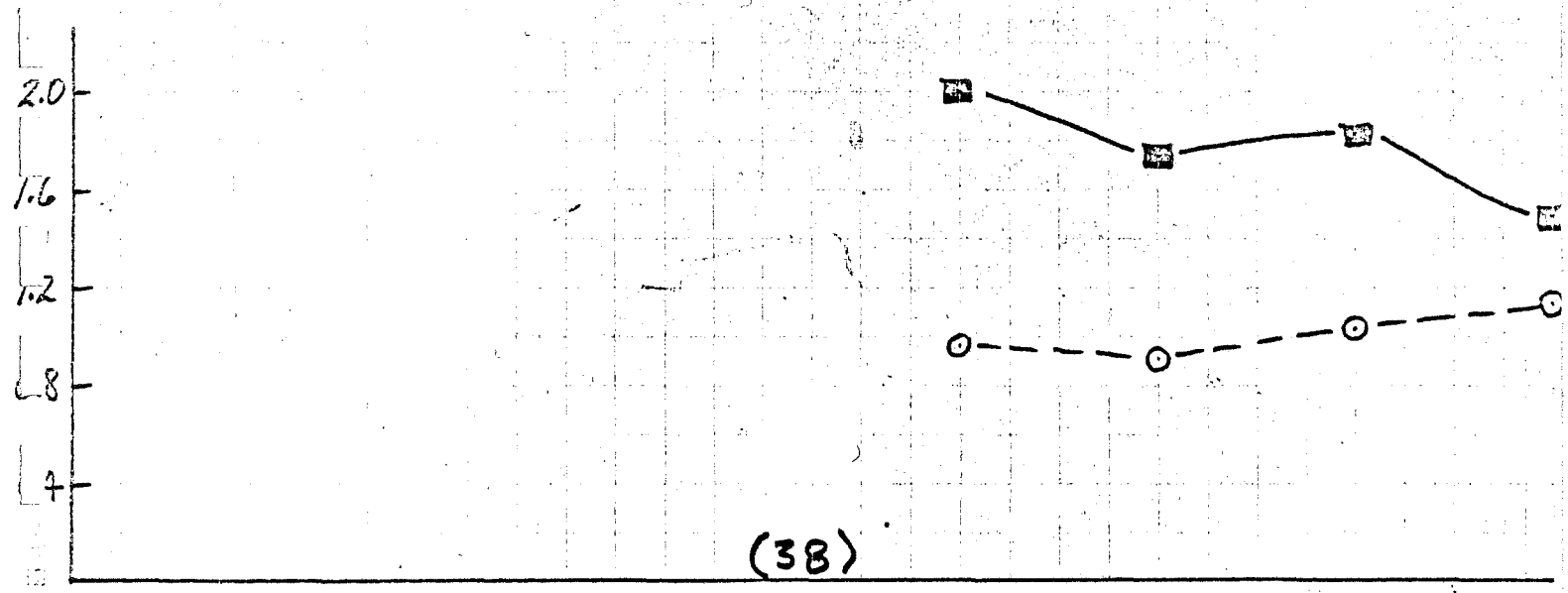
The evidence suggests that removals of 100,000 tons may exceed the stock's productivity. The effect of environmental changes, if any, are not known. Continuation of the present limitation of about 17,000 metric tons (1967 landings) in SA 6 is advisable. Extention of the closed area through April would reduce effects of fishing on inshore availability. The poor recruitment in 1968-70 may mean a continued reduction in population abundance even with restricted catchs.

The U.S.S.R. scientists have predicted a slight increase in stock size for 1970-71 based on improved recruitment. This does not seem to be substantiated by the data at hand.

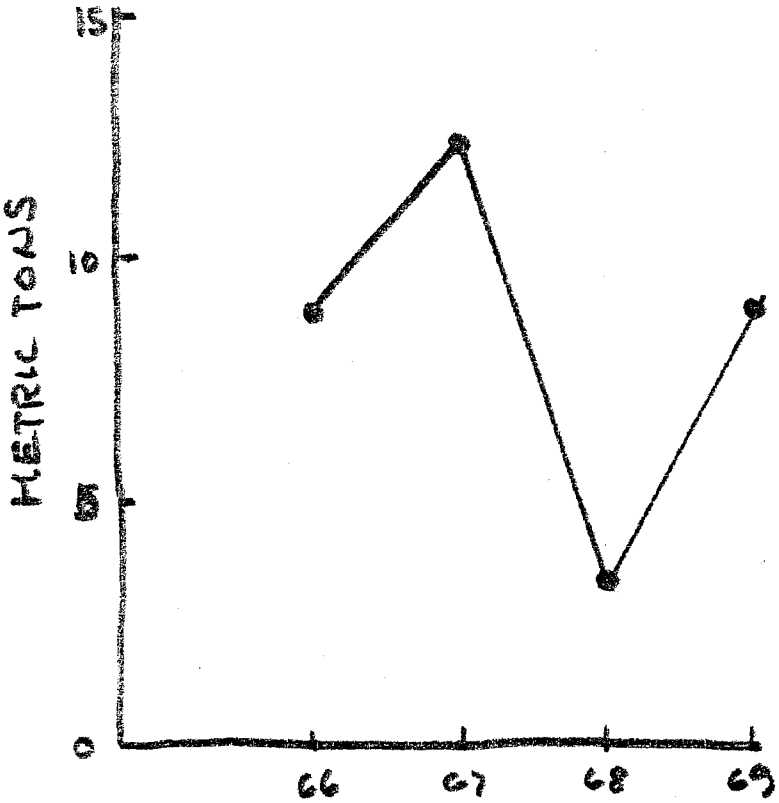
(stratified means, $\log_e$ scale, strata 1-12, 61-76)

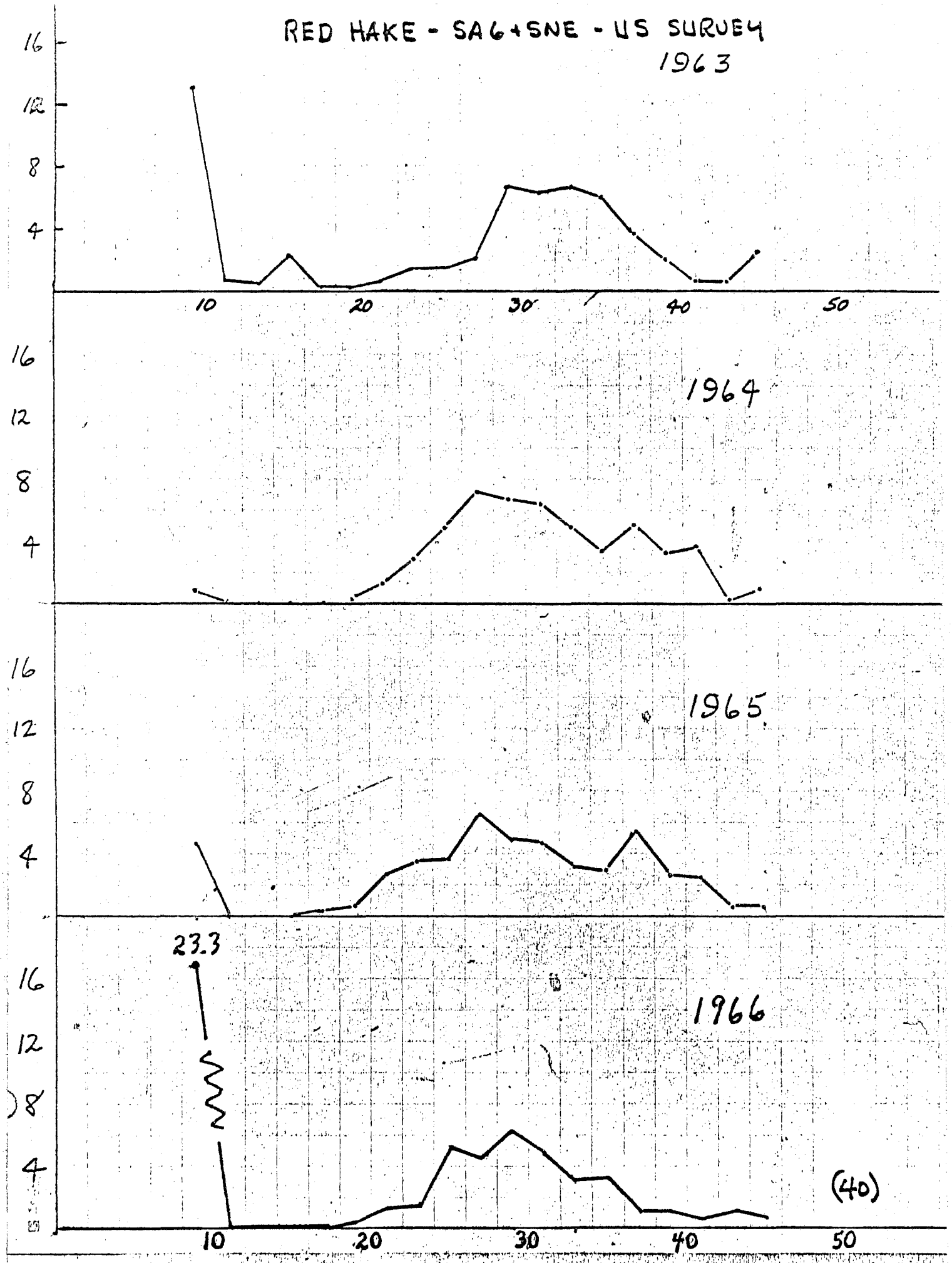


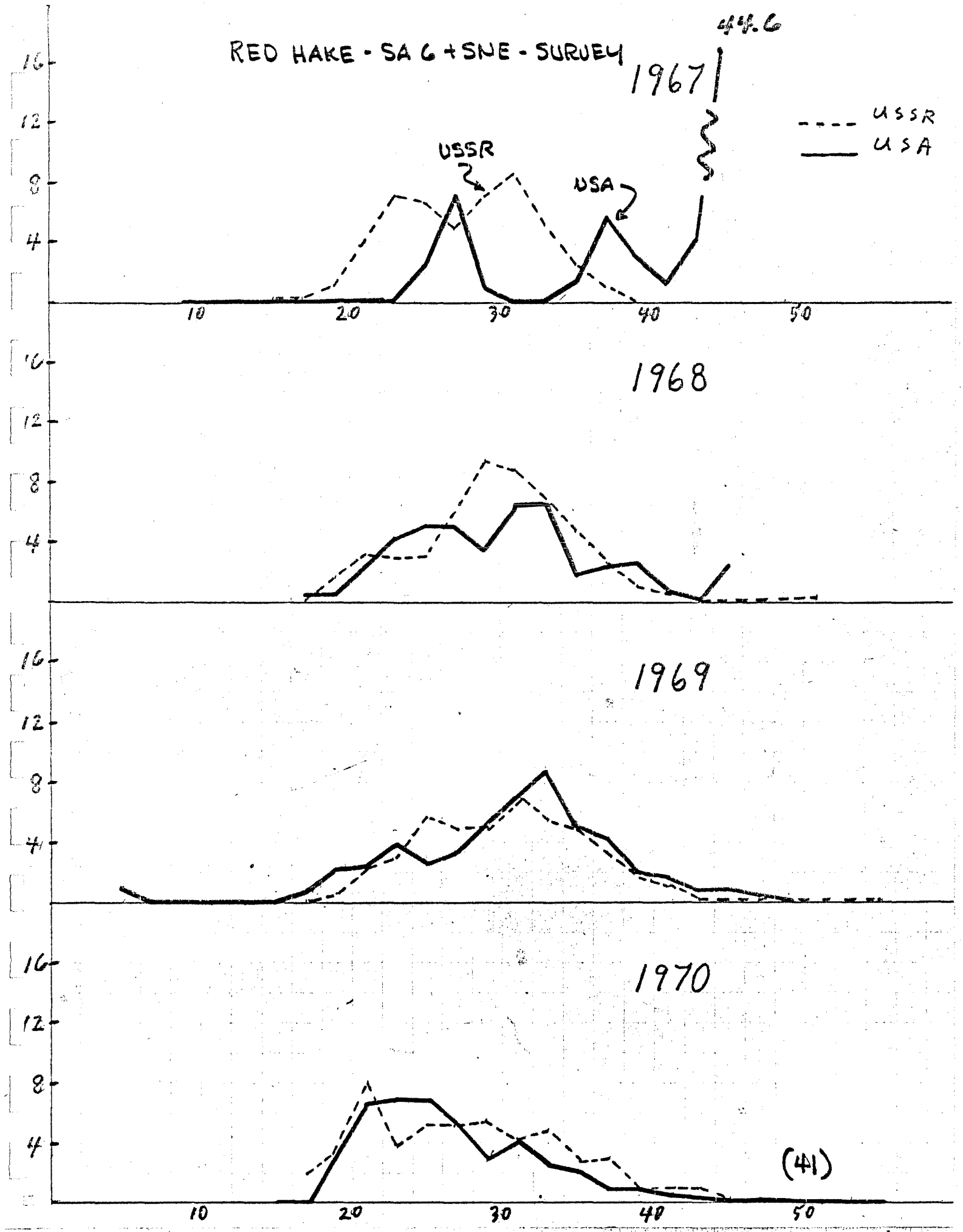


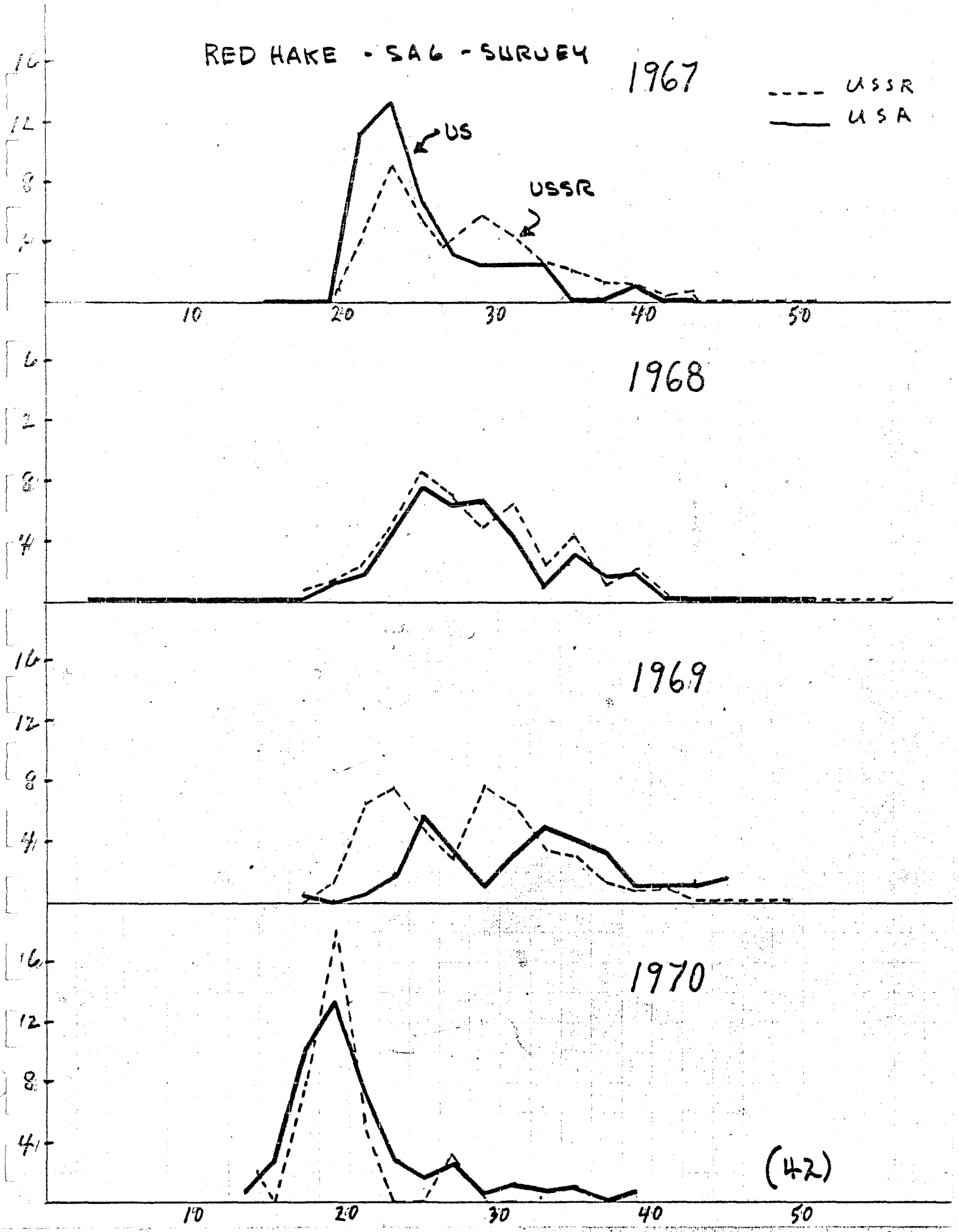


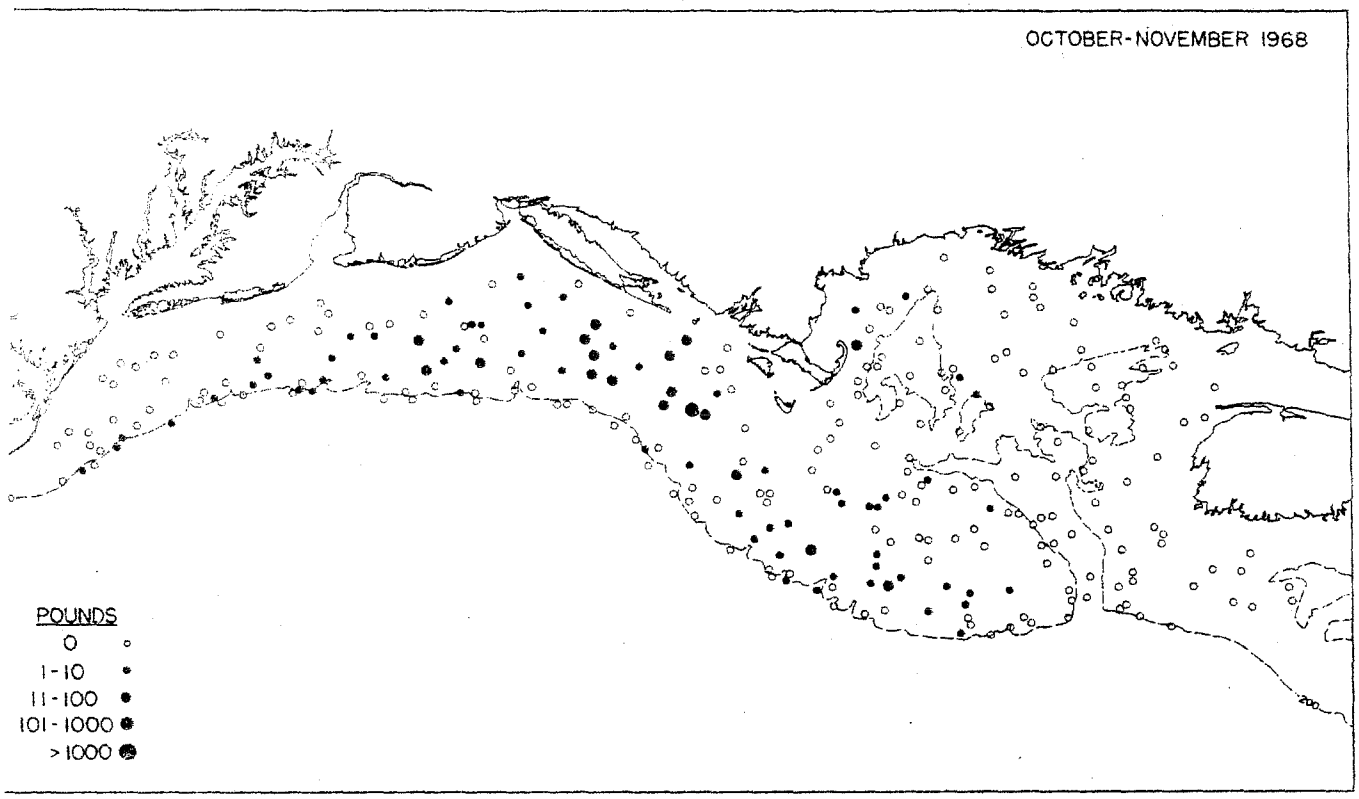
RED HAKE - USSR CATCH/DAY

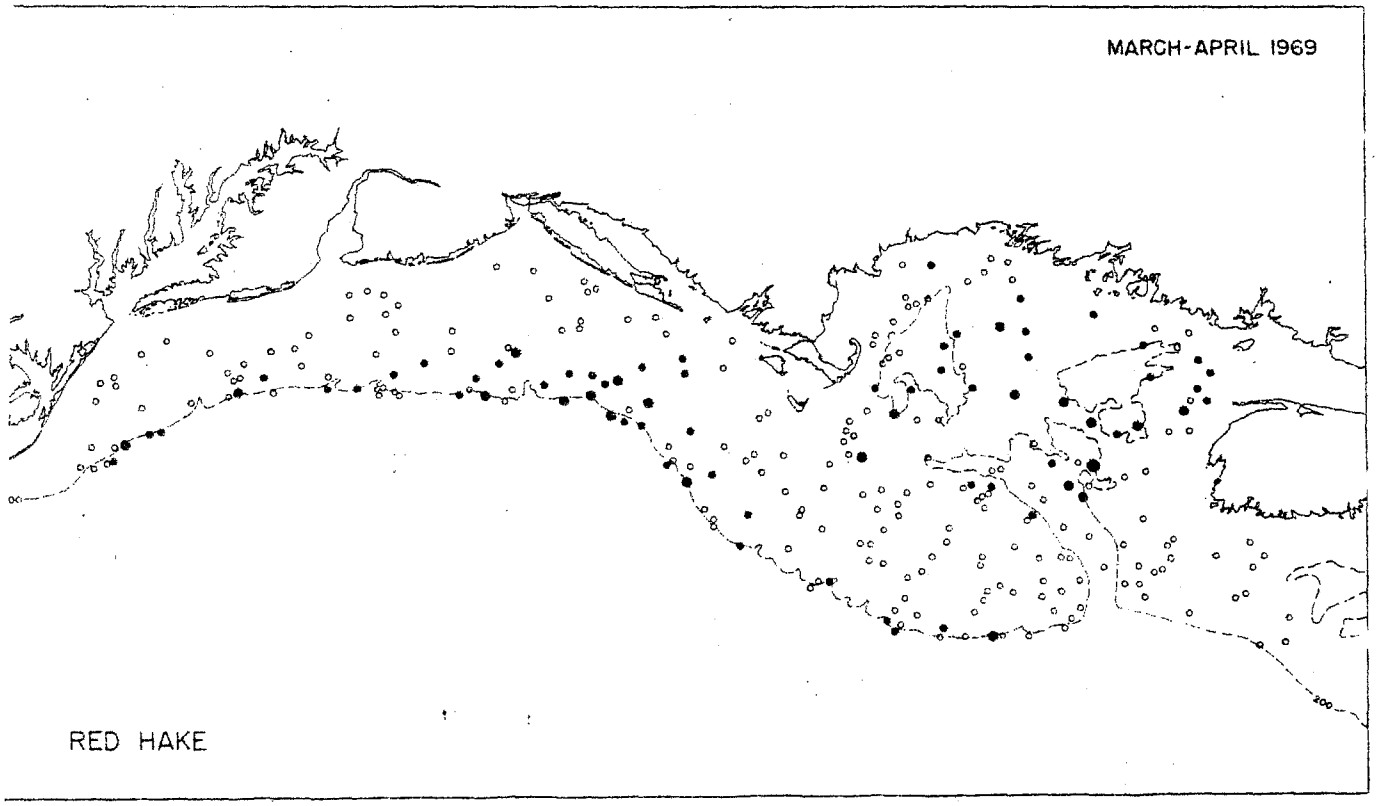



RED HAKE - SA6+SNE - US SURVEY
1963
1964
1965
1966
23.3
16
12
8
4
10
20
30
40
50
(40)

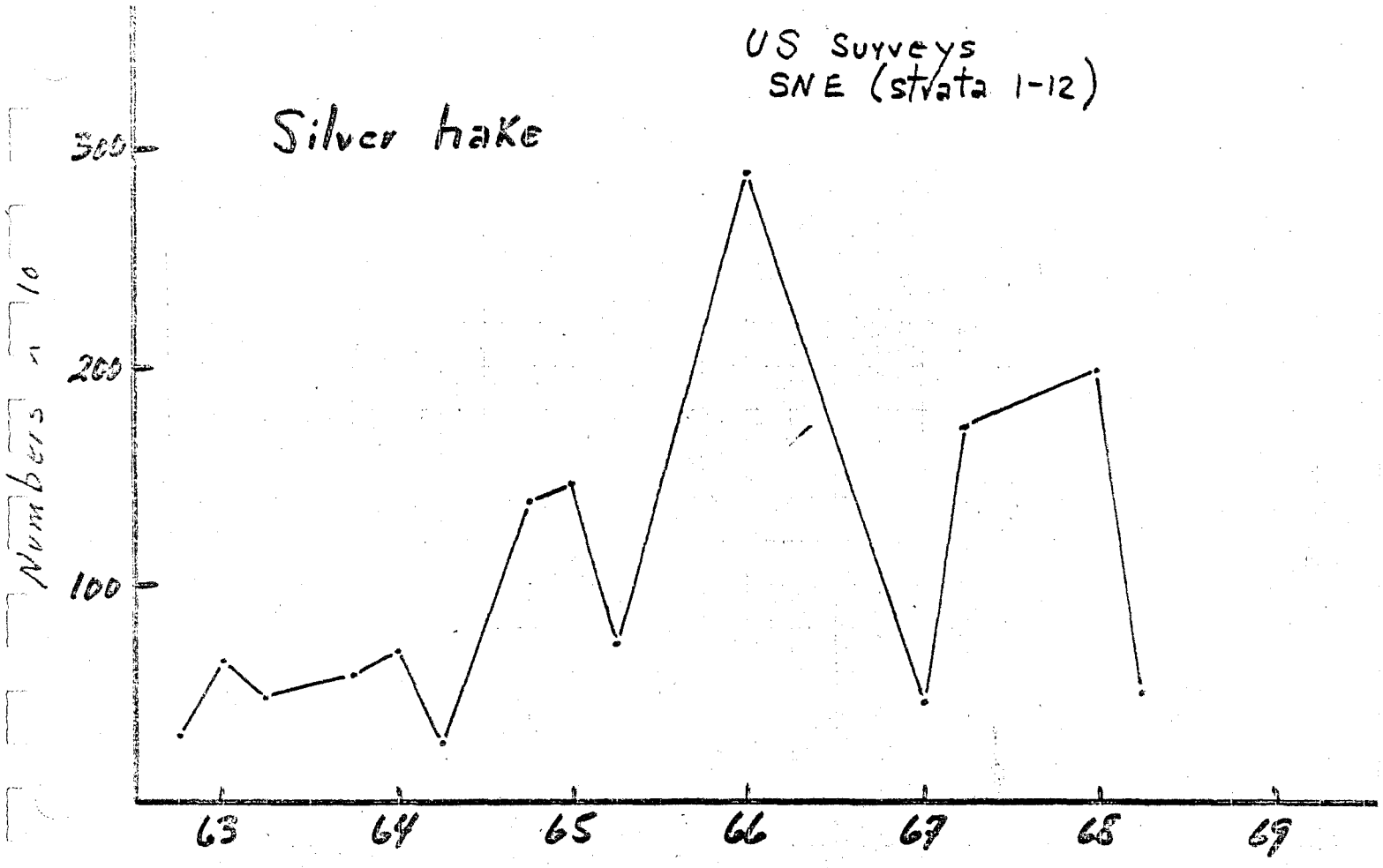

RED HAKE - SA 6 + SNE - SURVEY
44.6
1967
USSR
USA
USSR
USA
1968
1969
1970
16
12
8
4
10
20
30
40
50
(41)

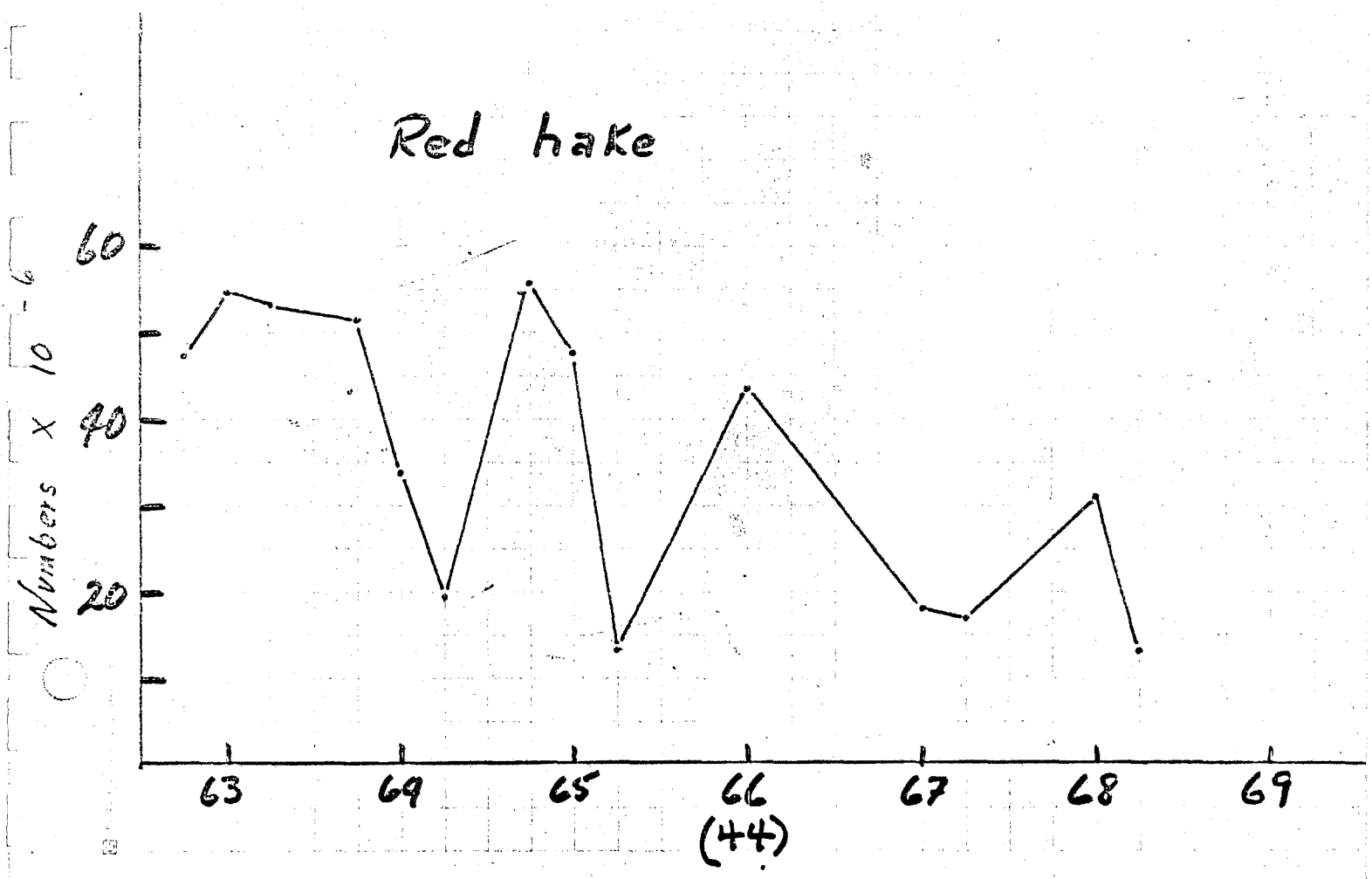

RED HAKE - SAG - SURVEY
1967
USSR
USA
US
USSR
1968
1969
1970
10
20
30
40
50
(42)


OCTOBER-NOVEMBER 1968
POUNDS
0
1-10
11-100
101-1000
>1000

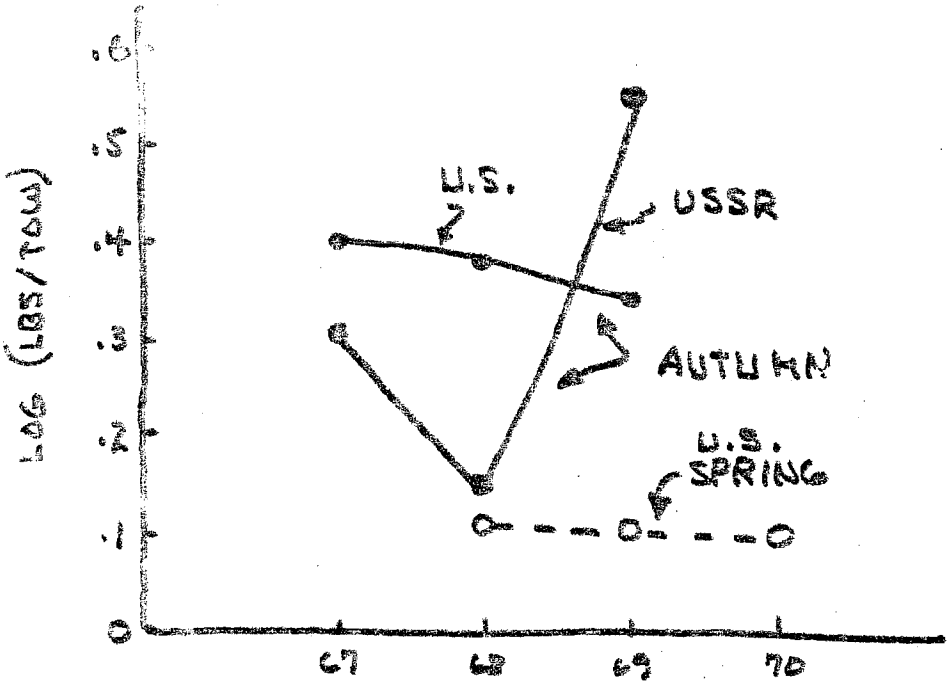

MARCH-APRIL 1969
RED HAKE

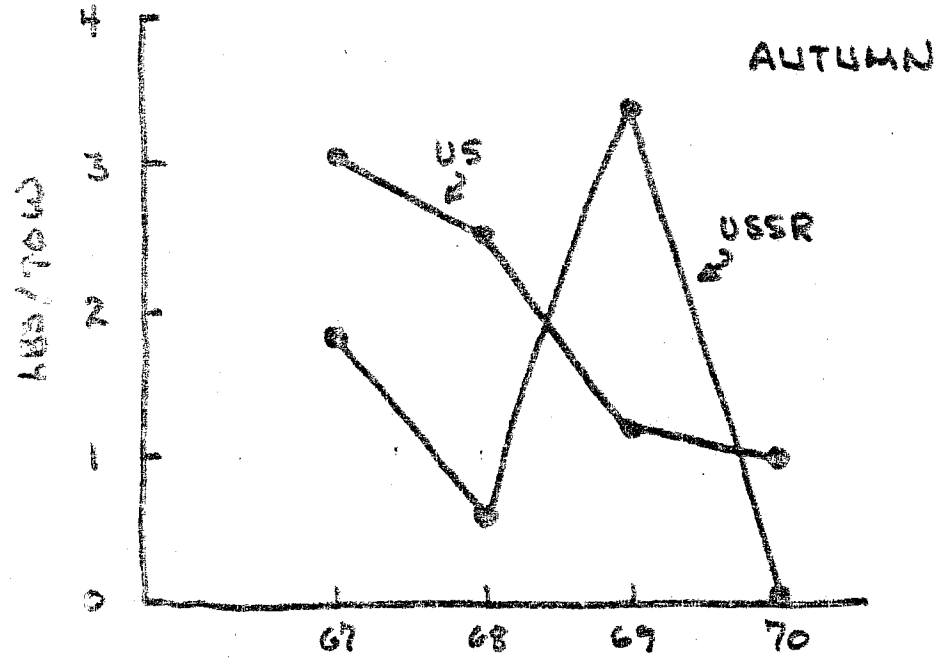
US Surveys
SNE (strata 1-12)



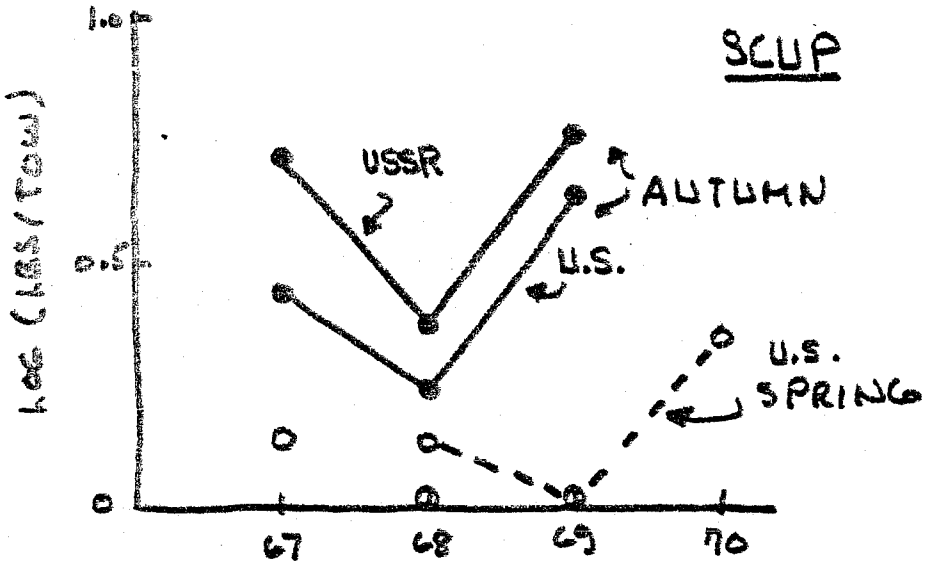


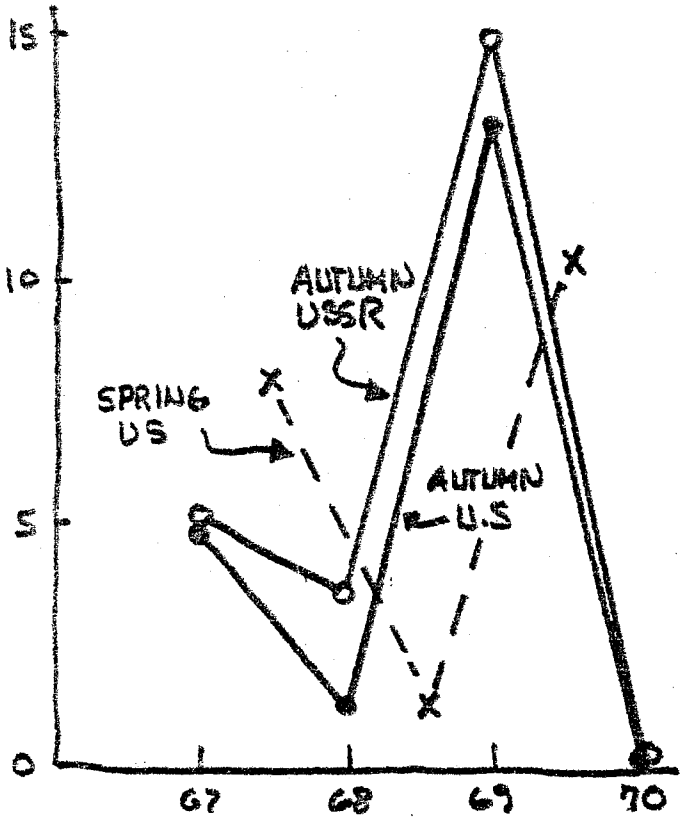
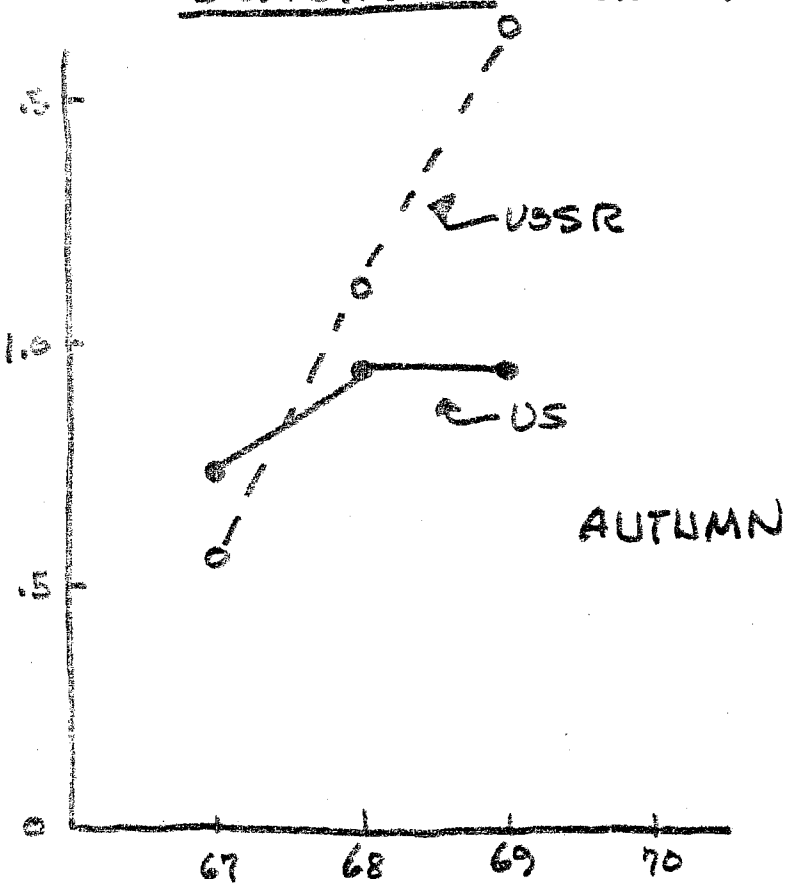
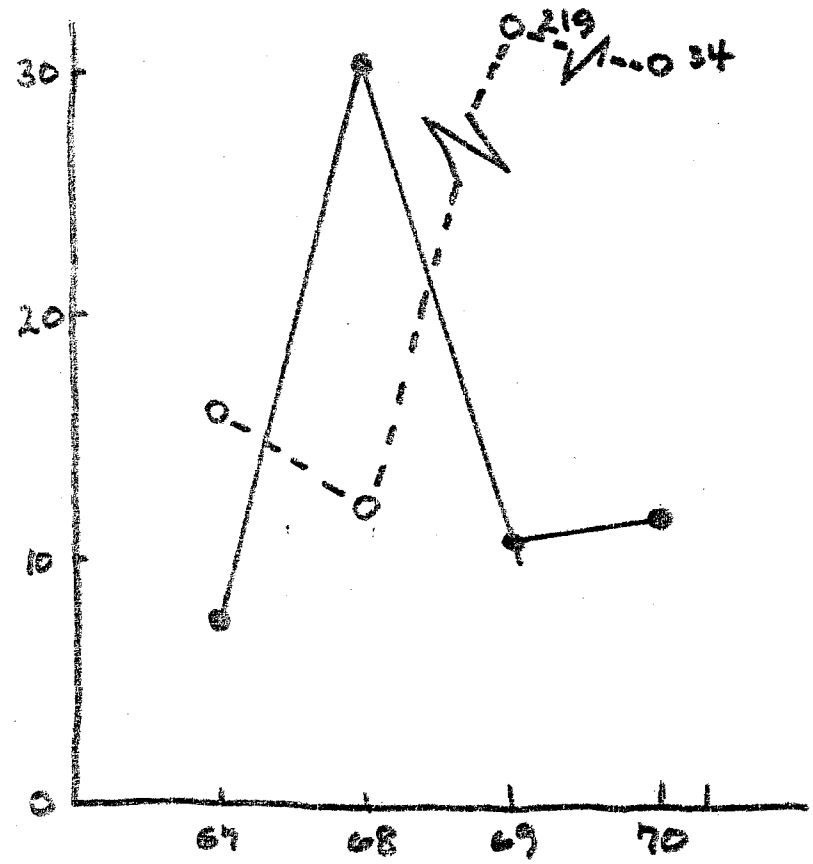
FLUKE - SURVEY CATCH/TOW





SURVEY - CATCH / TOW





BUTTERFISH - SURVEY CRUISES