INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

Document No. 6

ANNUAL MEETING - JUNE 1955

Report of the Scientific Advisers to Panel 5

15 December 1954.

The Scientific Advisers to Panel 5 held a meeting at St. Andrews, N.B., on December 6, 1954. The following were present:

Canada	Spain	United States	ICNAF
J. L. Hart	A. Rojo	L. Walford (Chairman)	E. M. Poulsen
W. R. Martin		H. Graham	R. S. Keir
F. D. McCracken		C. Taylor	
A. C. Kohler		J. Clark	
J. E. Paloheimo		A. Jensen	
L. M. Lauzier		J. P. Wise	
Y. Jean			

Dr. Poulsen gave a graphic tabulation of groundfish catch statistics, broken down by sub-divisions of Subareas 3, 4 and 5. (Appendix 1).

United States biologists reported on results of the mesh regulation in Subarea 5 as indicated by comparisons between catches of vessels licenced to fish with small-meshed nets and those fishing with regulation gear. Owing to an extraordinarily large year-class coming into the fishery this past season, the licenced vessels made the larger catches which were dominated by small scrod. However, with the rapid growth of these fish, the advantage is again passing to the fleet using regulation gear, as had been reported in previous meetings. (Appendix 2)

By June 30, United States biologists will have accumulated one and one-half years of these observations. They report increasing difficulty in obtaining vessels willing to fish with small-meshed gear, and are exploring methods of getting the essential biological data by other means. These will be reported upon at the next meeting. The group agreed that so far (i.e. up to December, 1954), results of these analyses look so promising that it may not be necessary to continue licencing vessels for small-mesh fishing at the expiration of the six months ending June 30, 1955. However, the group could not give a definite opinion until the March meeting in St. John's, at which time it will examine such further evidence as the United States biologists will have prepared. They suggested the following lines of evidence:

1. Measurement of abundance at recruitment by sizes as well as by ages. This is desirable because gear selection and culling at sea depend on sizes rather than ages and because growth rate varies from one year-class to another. This method might give a more accurate index of abundance at recruitment than the method now used.

2. Study of error involved in estimating year-class strength.

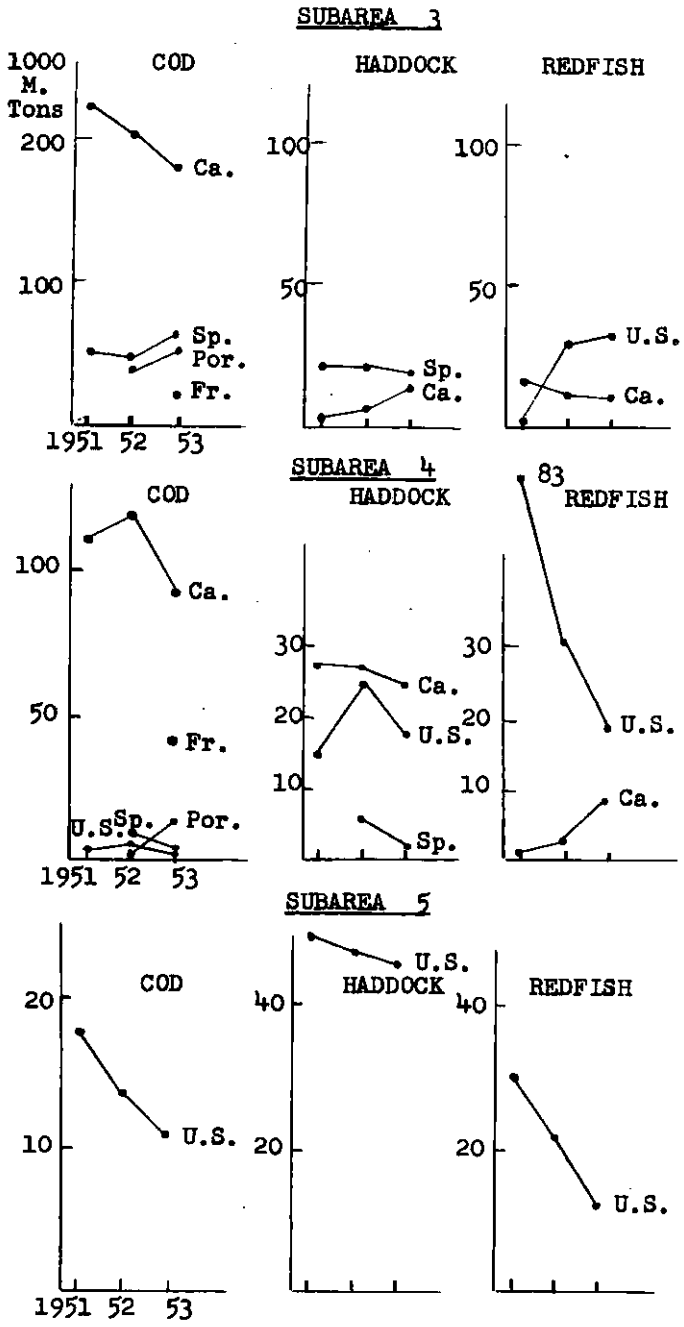
3. Calculation from mesh selectivity data of the theoretical size composition of a year-class whose size composition has been independently estimated by catches of a research vessel and by back calculations of growth from scale rings.

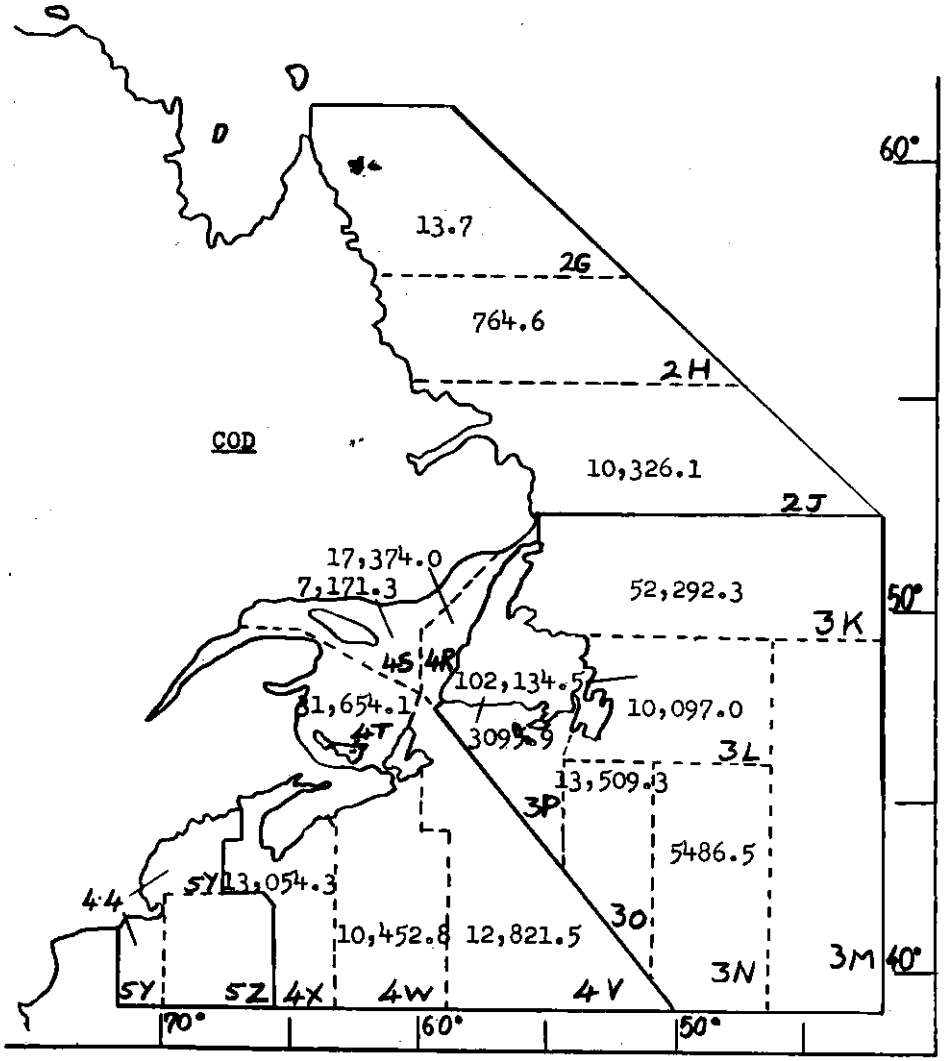
A preliminary report on the escape of silver hake through trawl meshes was given and is attached. (Appendix 3)

In discussing the question of exempting from the mesh regulation small vessels which make only incidental catches of haddock while fishing for other species, the group reaffirmed its opinion expressed in p.3, Document No. 15 for the Annual Meeting-June 1954 (Guide to I.C.N.A.F. Publications Ser. No. 185). Because pertinent information covering the whole United States coast is still incomplete, United States biologists have undertaken a special study of vessels operating in the Gulf of Maine. They will report on the results of this study before the next meeting of the group in March.

--ooOoo--

Appendix 1

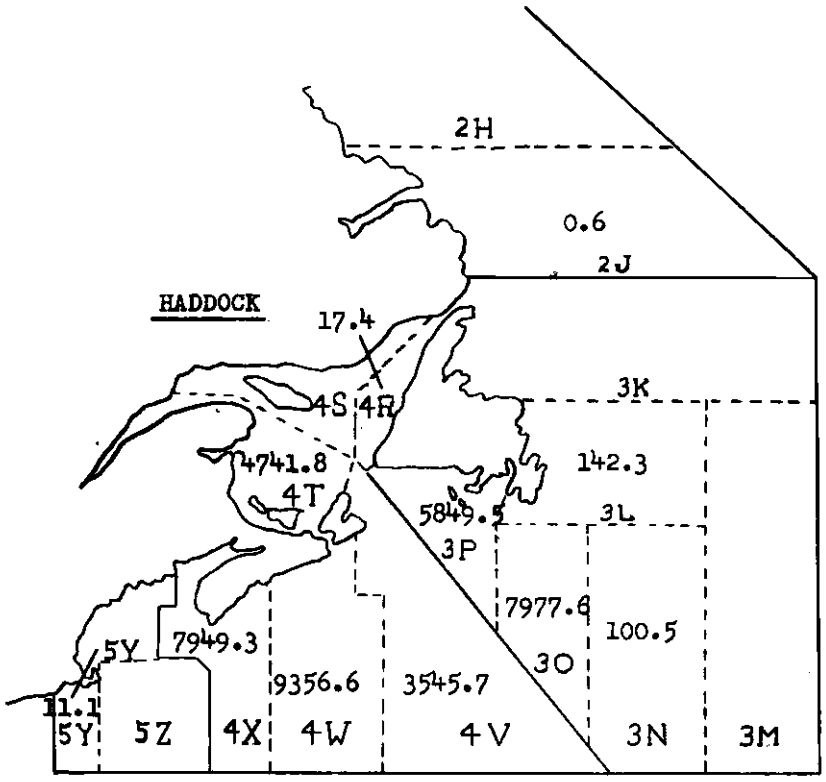

SUBAREA 3
1000 M. Tons
COD
HADDOCK
REDFISH
200
100
Ca.
Sp.
Por.
Fr.
100
50
Sp.
Ca.
100
50
U.S.
Ca.
1951 52 53
SUBAREA 4
COD
HADDOCK
83
REDFISH
100
50
Ca.
Fr.
U.S.
Sp.
Por.
30
20
10
Ca.
U.S.
Sp.
30
20
10
U.S.
Ca.
1951 52 53
SUBAREA 5
20
10
COD
U.S.
40
20
U.S.
HADDOCK
40
20
REDFISH
U.S.
1951 52 53



CANADA AND NEWFOUNDLAND

COD LANDINGS 1953

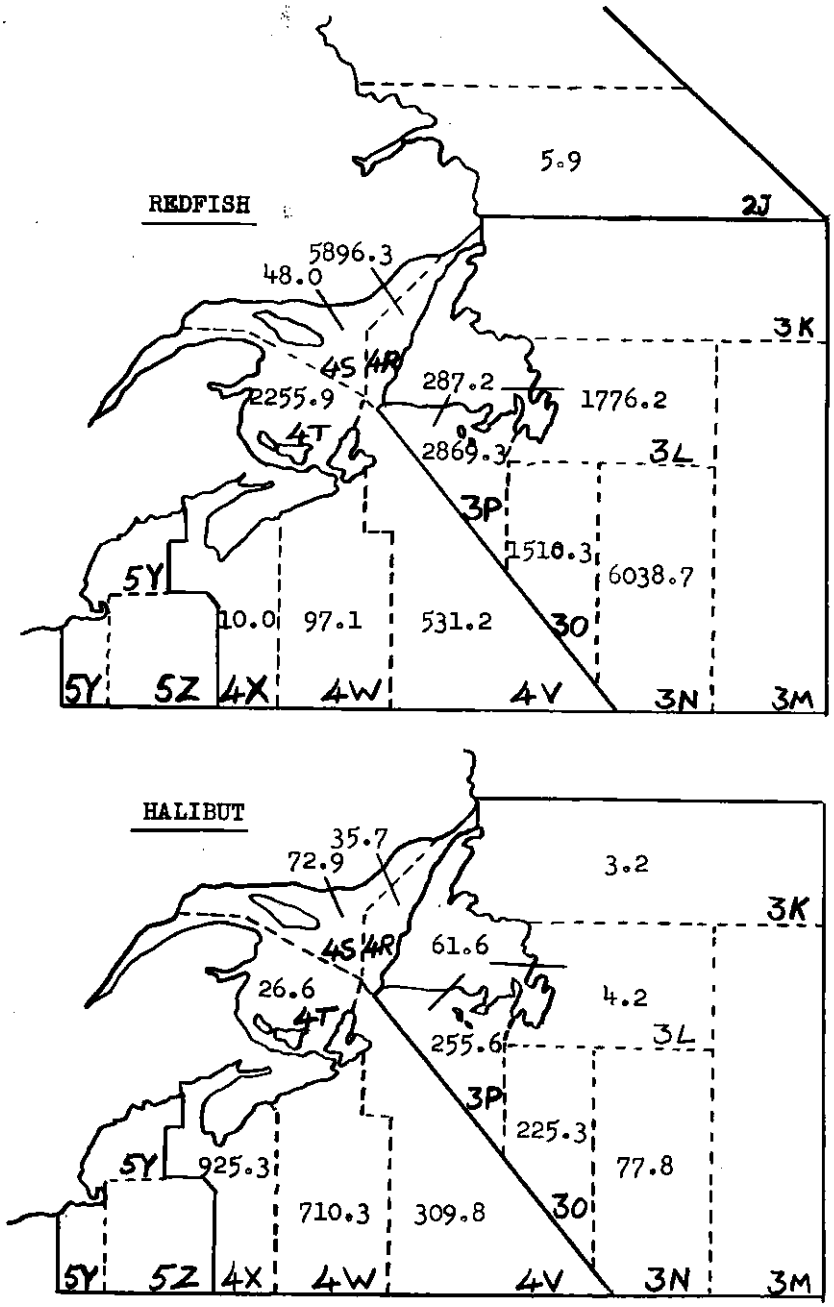
METRIC TONS, ROUND, FRESH



CANADA AND NEWFOUNDLAND

HADDOCK LANDINGS 1953

METRIC TONS, ROUND, FRESH

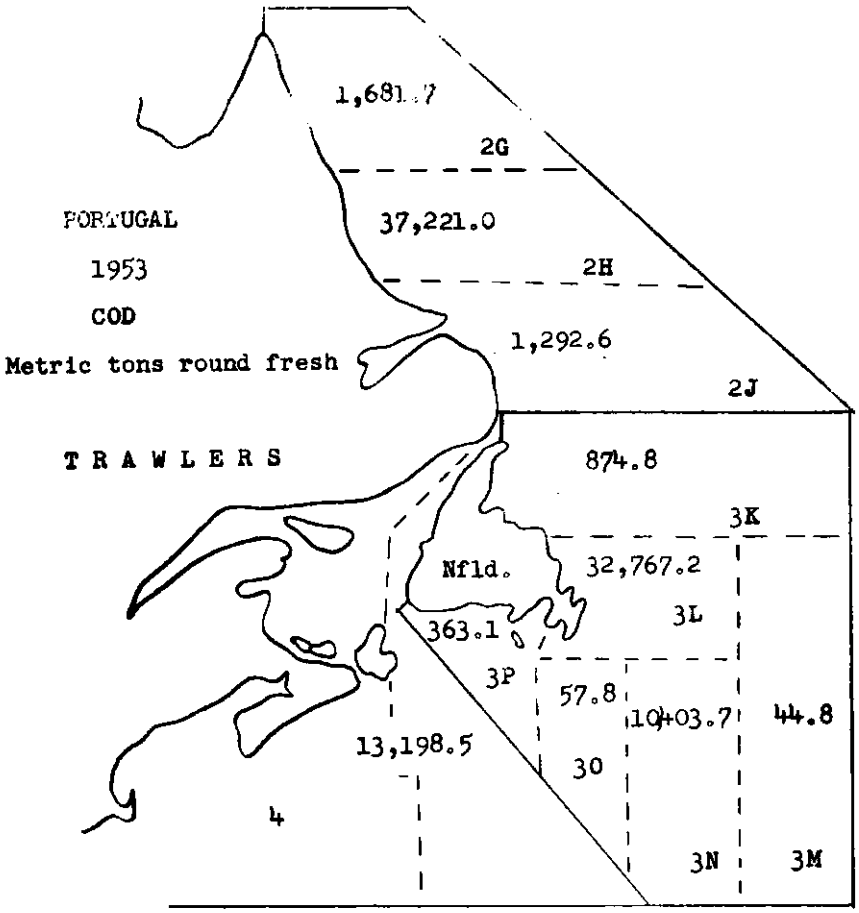


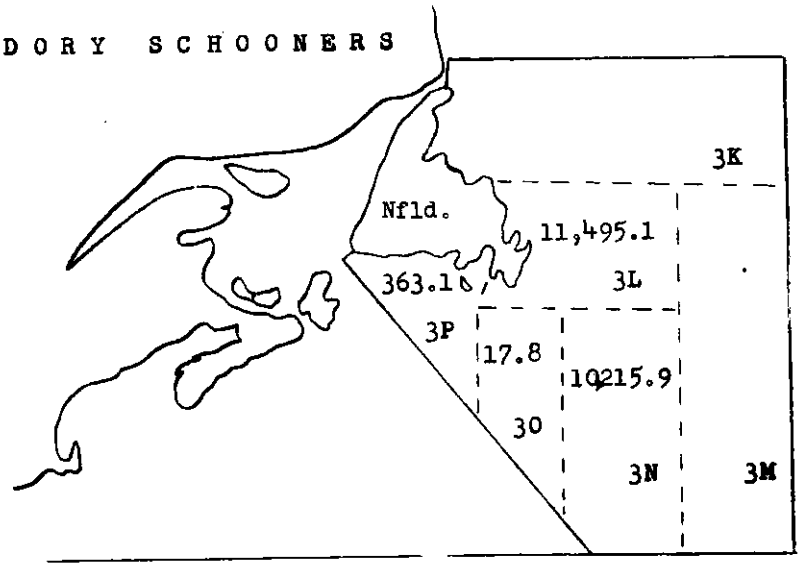
CANADA AND NEWFOUNDLAND

LANDINGS 1953

METRIC TONS, ROUND, FRESH

REDFISH - HALIBUT


1,681.7
2G
PORTUGAL
37,221.0
1953
2H
COD
1,292.6
Metric tons round fresh
2J
TRAWLERS
874.8
3K
Nfld.
32,767.2
3L
363.1
3P
57.8
10403.7
44.8
13,198.5
30
4
3N
3M


DORY SCHOONERS
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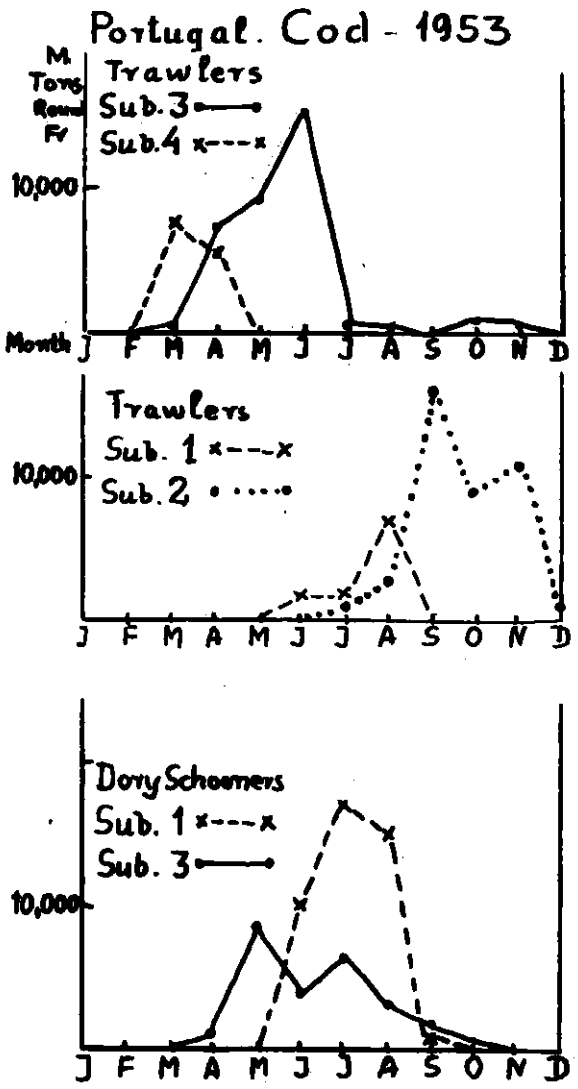
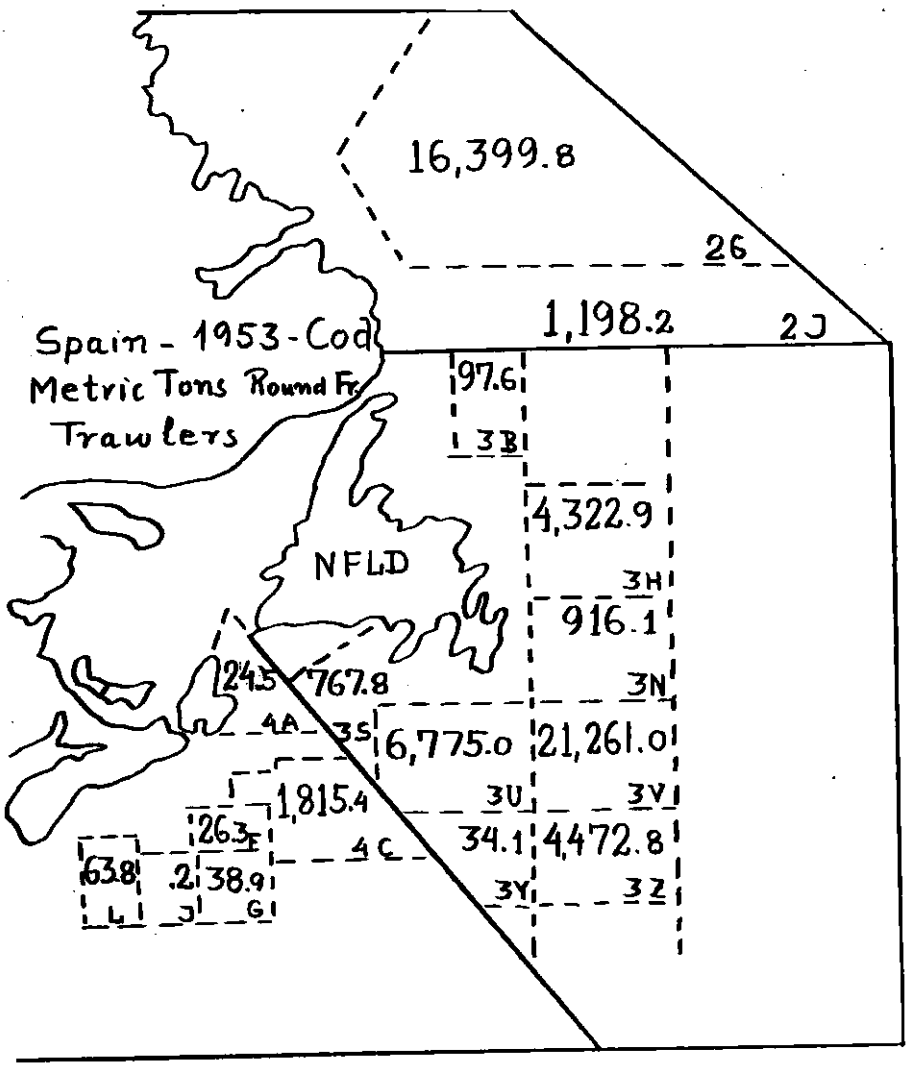
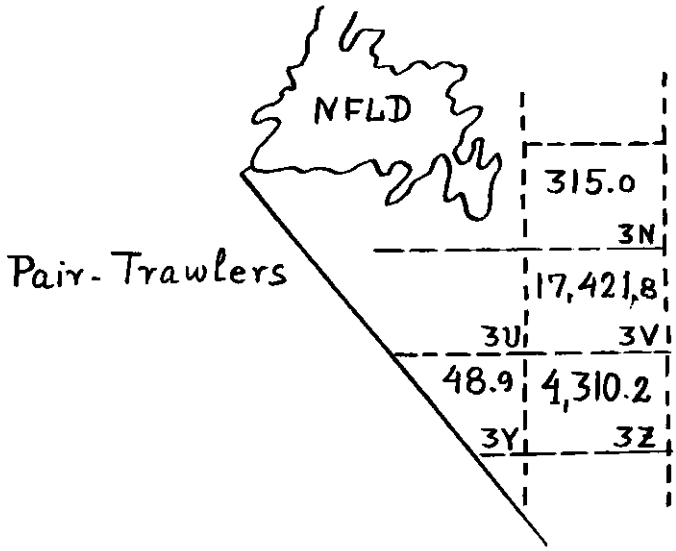
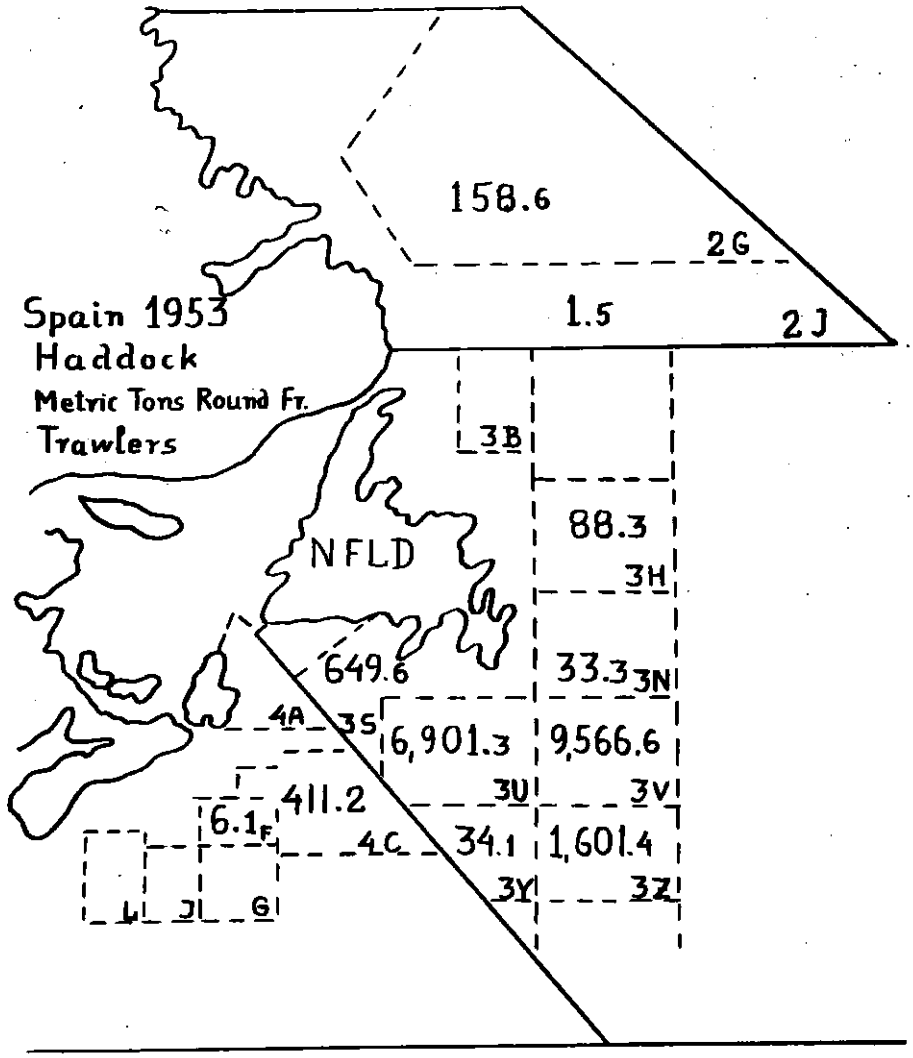
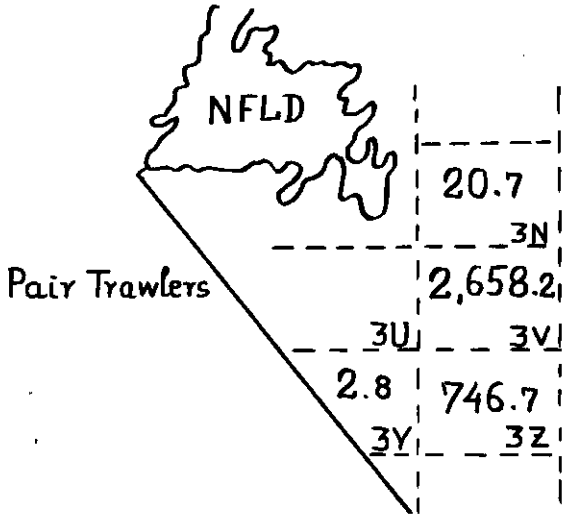
Nfld.
11,495.1
363.1
3L
3P
17.8
10215.9
30
3N
3M

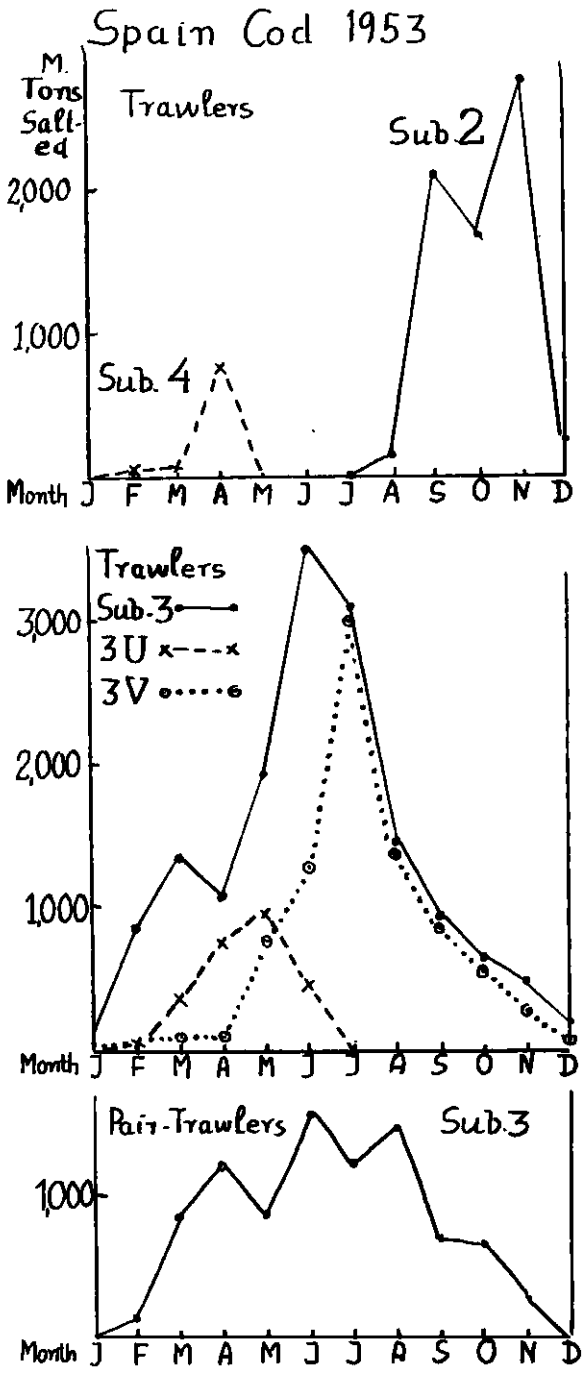

Portugal. Cod - 1953
M. Tons Round Fr
Trawlers
Sub. 3
Sub. 4
10,000
Month
J F M A M J J A S O N D
Trawlers
Sub. 1
Sub. 2
10,000
J F M A M J J A S O N D
Dory Schooners
Sub. 1
Sub. 3
10,000
J F M A M J J A S O N D

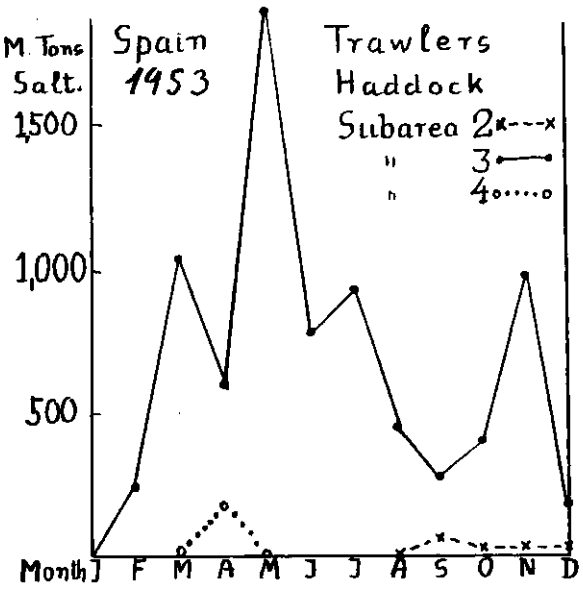

16,399.8
26
1,198.2
2J
Spain - 1953 - Cod
Metric Tons Round Fr.
Trawlers
97.6
3B
4,322.9
NFLD
3H
916.1
245
767.8
3N
4A
3S
6,775.0
21,261.0
1,815.4
3U
3V
263
4C
34.1
4,472.8
638
2
38.9
3Y
3Z
L
J
G

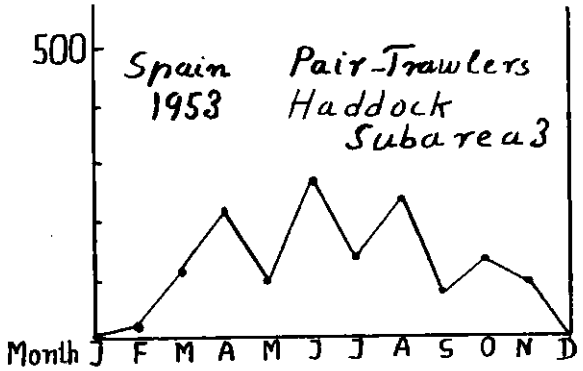

NFLD
315.0
3N
Pair - Trawlers
17,421.8
3U
3V
48.9
4,310.2
3Y
3Z

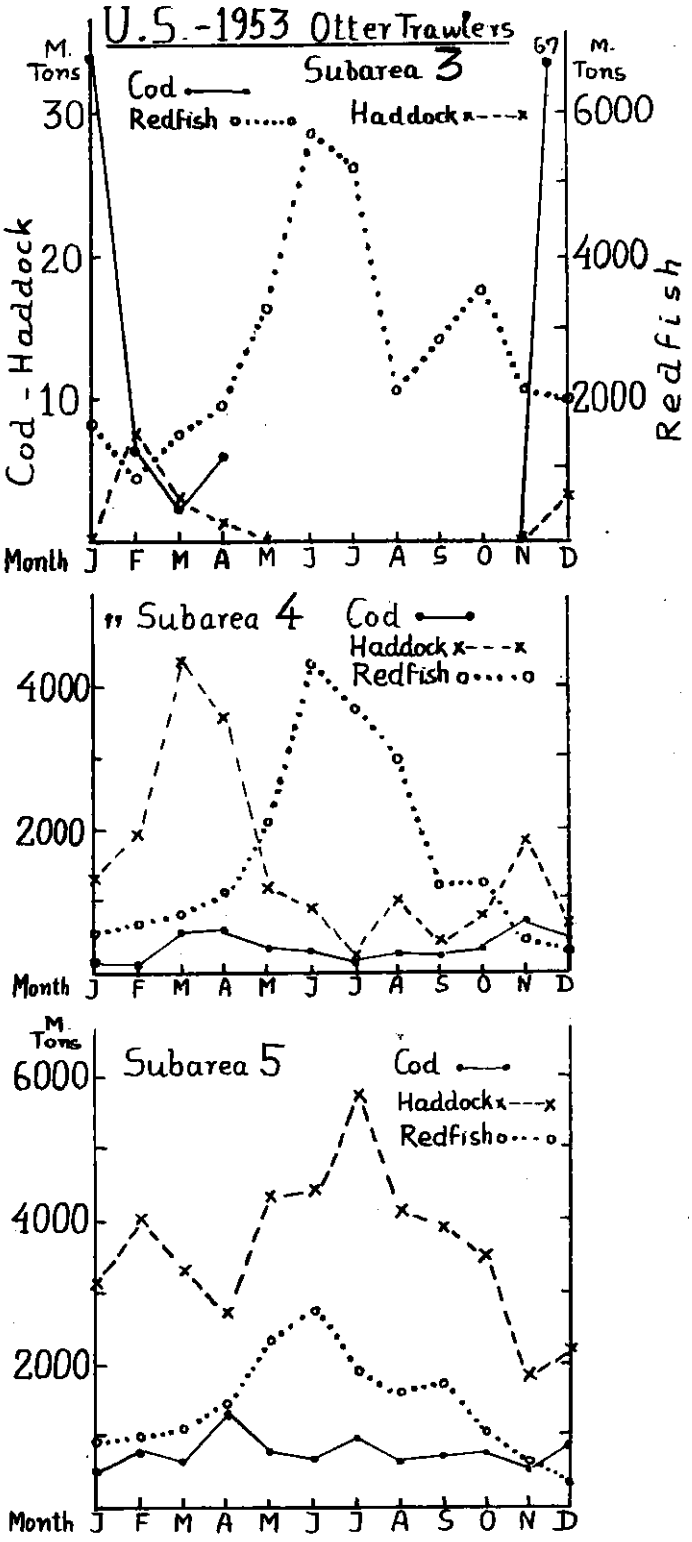

Spain 1953
Haddock
Metric Tons Round Fr.
Trawlers
158.6
2G
1.5
2J
3B
NFLD
88.3
3H
649.6
33.3
3N
4A
3S
6,901.3
9,566.6
411.2
3U
3V
6.1
F
4C
34.1
1,601.4
3Y
3Z
L
J
G

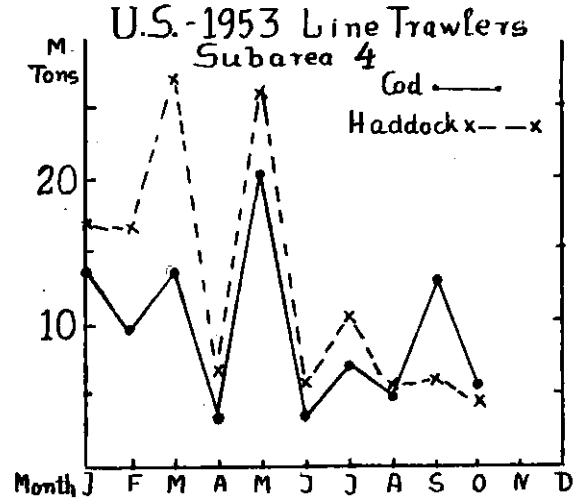

NFLD
20.7
3N
Pair Trawlers
2,658.2
3U
3V
2.8
746.7
3Y
3Z

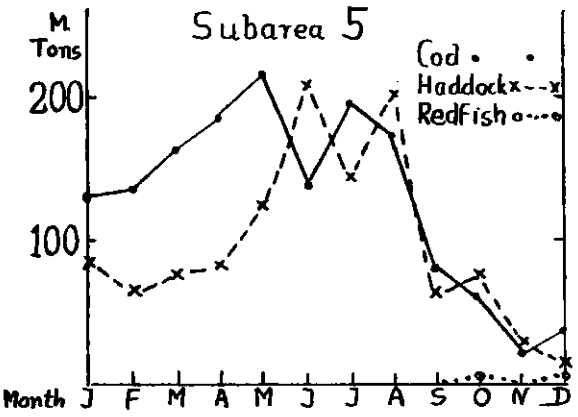

Spain Cod 1953
M. Tons Salled
Trawlers
Sub 2
2,000
1,000
Sub. 4
Month J F M A M J J A S O N D
Trawlers
Sub-3
3U
3V
3,000
2,000
1,000
Month J F M A M J J A S O N D
Pair-Trawlers
Sub.3
1,000
Month J F M A M J J A S O N D

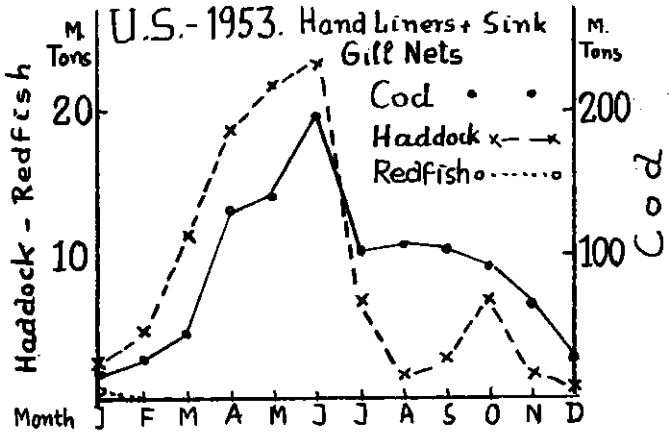

M. Tons
Salt.
1,500
1,000
500
Spain
1953
Trawlers
Haddock
Subarea 2
" 3
" 4
Month J F M A M J J A S O N D


500
Spain
1953
Pair-Trawlers
Haddock
Subarea 3
Month J F M A M J J A S O N D


U.S.-1953 Otter Trawlers
Subarea 3
Cod
Redfish
Haddock
M. Tons
Cod - Haddock
Redfish
67
30
20
10
6000
4000
2000
Month J F M A M J J A S O N D
" Subarea 4
Cod
Haddock
Redfish
4000
2000
Month J F M A M J J A S O N D
M. Tons
Subarea 5
Cod
Haddock
Redfish
6000
4000
2000
Month J F M A M J J A S O N D


U.S.-1953 Line Trawlers
Subarea 4
M. Tons
Cod
Haddock
20
10
Month J F M A M J J A S O N D


Subarea 5
M. Tons
Cod
Haddock
Redfish
200
100
Month J F M A M J J A S O N D


U.S.-1953. Hand Liners + Sink Gill Nets
M. Tons
Haddock - Redfish
Cod
Cod
Haddock
Redfish
20
10
200
100
Month J F M A M J J A S O N D

Appendix 2

Meeting of Group of Advisers to Panel 5

St.Andrews, N.B., 6 December, 1954

Table 1. Groundfish Landings from Georges Bank by Boston Trawlers April - June, 1954, Compared with same period, 1953.

	1953	1954	% Change
Total landings of haddock for 3-month period by all vessels, pounds ***	17,509,000	19,043,000	+8.8

	Landings of haddock Pounds per trip			Landings of all groundfish Pounds per trip		
	1953	1954	% Change	1953	1954	% Change
Group A*	66.2	102.5	+54.8	80.3	113.3	+41.1
Group B**	62.5	81.1	+29.8	78.6	96.2	+22.4

Table 2. Groundfish Landings from Nova Scotian Banks by Boston Trawlers - April-June 1954, Compared with same period, 1953

	1953	1954	% Change
Total landings of haddock for 3-month period by all vessels, pounds ***	8,755,000	10,319,000	+17.9

	Landings of haddock Pounds per trip			Landings of all groundfish Pounds per trip		
	1953	1954	% Change	1953	1954	% Change
Group A*	73.1	125.0	+71.0	94.7	158.2	+67.0
Group B**	103.4	110.2	+ 6.6	132.2	146.9	+11.1

*Group A - 6 large otter trawlers licensed to fish with small mesh.
**Group B - 34 large otter trawlers using regulation gear.
***Partially estimated.

Appendix 3

Meeting of Groups of Advisers to Panel 5
St. Andrews, N.B., 6 December 1954

PRELIMINARY REPORT ON THE ESCAPE OF SILVER HAKE THROUGH TRAWL MESHES

By

John R. Clark, North Atlantic Fishery Investigations,
U.S. Fish and Wildlife Service, Woods Hole, Mass.

30 November, 1954.

Introduction

Experiments have recently been conducted by the U.S. Fish and Wildlife Service to obtain information on the escape of various sizes of silver hake through cod-ends of different materials and mesh sizes. Information was also collected on the escape of silver hake through the forward parts of the net. The data must be considered as only preliminary. A complete paper will be published later.

Method

Shrimp twine covers were used to determine the percentages of each size of silver hake escaping from the cod-ends. The shrimp twine loosely covered the exposed surfaces of the cod-end and terminated in a cod-end of its own, in which the "escapees" were trapped. The number of each size of silver hake in the cod-end and in the cover was tabulated to determine the percentage of each size retained.

To determine the proportion of the various sizes escaping through the forward part of the net, alternate tows were made with nets of 2½ inch and 3½ inch mesh. Both nets were constructed of 24 thread cotton. 2" cotton cod-ends were used on both nets. The "internal" measurements referred to are taken with a flat wedge-shaped gauge and are the important dimension as regards fish escape.

Results

The data for the nine cod-ends tested are presented in Tables 1-9. A typical selection curve, in which fish size is plotted against percentage retention, is shown in Figure 1. From these selection curves the 50% points for each cod-end have been derived and are tabulated in Table 10 and plotted in Figure 2. The standard method of describing the selective effect of nets is by use of the 50% point, which is that size of fish of which 50% are retained by the net and 50% escape.

The results of the alternate paired tow test are presented in Table 11. The catches of each net and the percentages that the 3½ inch mesh net catch was of the 2½ inch mesh net for each size of fish are shown. These results are plotted as a selection curve in Figure 3.

The 3½ inch mesh measured 3-1/16 inches internally and the 2½ mesh measured 2¼ inches internally.

TABLE 1.--Selection of silver hake by a 3½ inch mesh cotton cod-end. 50% point at 20.8 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	3.5	9	7	-	7	0
.01	-	4.7	12	127	28	155	18.1
.02	-	5.9	15	387	130	517	25.1
.05	-	7.1	18	438	235	673	35.0
.08	-	8.3	21	165	223	388	57.5
.11	91	9.5	24	141	486	627	77.5
.16	62	10.6	27	169	990	1159	85.4
.22	45	11.8	30	100	1175	1275	92.2
.32	31	13.0	33	22	778	800	97.3
.44	23	14.2	36	3	288	291	99.1
.59	17	15.4	39	-	135	135	100.0
.76	13	16.5	42	-	50	50	100.0
.98	10	17.7	45	-	18	18	100.0
1.1	9	18.9	48	-	14	14	100.0
1.3	8	20.1	51	-	2	2	100.0
1.5	7	21.3	54	-	6	6	100.0
1.7	6	22.5	57	-	5	5	100.0

TABLE 2.--Selection of silver hake by a 2¾ inch mesh cotton cod-end. 50% point at 19.5 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	2.3	6	6	-	6	0
-	-	3.5	9	9	6	15	40
.01	-	4.7	12	139	42	181	23
.02	-	5.9	15	327	126	453	28
.05	-	7.1	18	113	79	192	41
.08	-	8.3	21	28	99	127	78
.11	91	9.5	24	9	221	230	96
.16	62	10.6	27	-	397	397	100
.22	45	11.8	30	-	651	651	100
.32	31	13.0	33	-	744	744	100
.44	23	14.2	36	-	518	518	100
.59	17	5.4	39	-	339	339	100
.76	13	16.5	42	-	172	172	100
.98	10	17.7	45	-	44	44	100
1.1	9	18.9	48	-	29	29	100
1.3	8	20.1	51	-	10	10	100
1.5	7	21.3	54	-	-	-	-
1.7	6	22.5	57	-	-	-	-
2.0	5	23.6	60	-	-	-	-
2.3	4	24.8	63	-	-	-	-
2.7	4	26.0	66	-	3	3	100

TABLE 3.--Selection of silver hake by a 4½ inch mesh cotton cod-end. 50% point at 32.4 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	2.3	6	10	3	13	23
-	-	3.5	9	8	0	8	0
.01	-	4.7	12	114	20	134	15
.02	-	5.9	15	379	33	412	8
.05	-	7.1	18	341	51	392	13
.08	-	8.3	21	264	86	350	24.6
.11	91	9.5	24	297	136	433	31
.16	62	10.6	27	504	239	743	32
.22	45	11.8	30	596	477	1073	44
.32	31	13.0	33	457	509	966	53
.44	23	14.2	36	209	471	680	69
.59	17	15.4	39	111	433	544	79
.76	13	16.5	42	25	275	300	91
.98	10	17.7	45	3	56	59	95
1.1	9	18.9	48	6	37	43	86
1.3	8	20.1	51	0	33	33	100
1.5	7	21.3	54	0	27	27	100
1.7	6	22.5	57	0	6	6	100
2.0	5	23.6	60	-	-	-	-
2.3	4	24.8	63	-	-	-	-
2.7	4	26.0	66	-	-	-	-

TABLE 4.--Selection of silver hake by a 2 inch mesh cotton cod-end. 50% point at 9.8 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	1.1	3	18	-	18	0
-	-	2.3	6	11	-	11	0
-	-	3.5	9	8	6	14	43
.01	-	4.7	12	-	2	2	100
.02	-	5.9	15	-	5	5	100
.05	-	7.1	18	-	13	13	100
.08	-	8.3	21	-	14	14	100
.11	91	9.5	24	-	24	24	100
.16	62	10.6	27	-	40	40	100
.22	45	11.8	30	-	52	52	100
.32	31	13.0	33	-	40	40	100
.44	23	14.2	36	-	16	16	100
.59	17	15.4	39	-	5	5	100
.76	13	16.5	42	-	2	2	100
.98	10	17.7	45	-	-	-	-
1.1	9	18.9	48	-	1	1	100
1.3	8	20.1	51	-	1	1	100

TABLE 5.--Selection of silver hake by a 4½ inch mesh nylon cod-end. 50% point at 38.7 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	3.5	9	2	-	2	0
.01	-	4.7	12	104	5	109	5
.02	-	5.9	15	263	31	294	11
.05	-	7.1	18	120	26	146	18
.08	-	8.3	21	101	8	109	8
.11	91	9.5	24	122	26	148	18
.16	62	10.6	27	276	84	368	23
.22	45	11.8	30	440	172	612	28
.32	31	13.0	33	432	224	656	34
.44	23	14.2	36	333	249	582	43
.59	17	15.4	39	207	263	470	56
.76	13	16.5	42	98	138	236	59
.98	10	17.7	45	34	74	108	69
1.1	9	18.9	48	6	36	42	86
1.3	8	20.1	51	-	13	13	100
1.5	7	21.3	54	-	6	6	100
1.7	6	22.5	57	-	10	10	100
2.0	5	23.6	60	-	9	9	100

TABLE 6.--Selection of silver hake by a 3½ inch mesh nylon cod-end. 50% point at 29.6 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	3.5	9	15	1	16	6.2
.01	-	4.7	12	222	19	241	8.0
.02	-	5.9	15	283	46	329	14.0
.05	-	7.1	18	174	35	209	16.7
.08	-	8.3	21	164	49	213	23.0
.11	91	9.5	24	220	112	332	34.0
.16	62	10.6	27	471	357	828	43.1
.22	45	11.8	30	707	804	1511	53.2
.32	31	13.0	33	390	867	1257	68.9
.44	23	14.2	36	124	510	634	80.5
.59	17	15.4	39	28	292	320	91.2
.76	13	16.5	42	9	154	163	94.5
.98	10	17.7	45	2	48	50	96.0
1.1	9	18.9	48	-	35	35	100.0
1.3	8	20.1	51	-	8	8	100.0
1.5	7	21.3	54	-	7	7	100.0
1.7	6	22.5	57	-	8	8	100.0
2.0	5	23.6	60	-	3	3	100.0
2.3	4	24.8	63	-	1	1	100.0

TABLE 7.--Selection of silver hake by a 2-½ inch mesh nylon cod-end. 50% point at 17.5 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	2.3	6	7	-	7	-
-	-	3.5	9	32	3	35	8
.01	-	4.7	12	18	-	18	-
.02	-	5.9	15	60	39	99	39
.05	-	7.1	18	62	81	143	56
.08	-	8.3	21	23	108	131	82
.11	91	9.5	24	9	93	102	91
.16	62	10.6	27	4	213	217	98
.22	45	11.8	30	1	321	322	99
.32	31	13.0	33	-	219	219	100
.44	23	14.2	36	-	303	303	100
.59	17	15.4	39	-	342	342	100
.76	13	16.5	42	-	225	225	100
.98	10	17.7	45	-	96	96	100
1.1	9	18.9	48	-	36	36	100
1.3	8	20.1	51	-	30	30	100
1.5	7	21.3	54	-	6	6	100

TABLE 8.--Selection of silver hake by a 4 inch mesh manila cod-end. 50% point at 28.4 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	2.3	6	8	-	8	-
-	-	3.5	9	35	-	35	-
.01	-	4.7	12	827	51	878	6
.02	-	5.9	15	1668	198	1866	11
.05	-	7.1	18	1025	155	1180	13
.08	-	8.3	21	703	222	925	24
.11	91	9.5	24	935	414	1349	31
.16	62	10.6	27	997	740	1737	43
.22	45	11.8	30	708	1263	1971	64
.32	31	13.0	33	337	1136	1473	78
.44	23	14.2	36	156	1098	1254	88
.59	17	15.4	39	23	605	628	96
.76	13	16.5	42	1	332	333	99
.98	10	17.7	45	4	120	124	97
1.1	9	18.9	48	-	48	48	100
1.3	8	20.1	51	-	26	26	100
1.5	7	21.3	54	-	1	1	100
1.7	6	22.5	57	-	-	-	-
2.0	5	23.6	60	-	1	1	100

TABLE 9.--Selection of silver hake by a 3 inch mesh manila cod-end. 50% point at 16.7 cm.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in Cover	Fish in Cod-End	Total Caught	Percentage Retained
-	-	2.3	6	31	-	31	0
-	-	3.5	9	75	15	90	16
.01	-	4.7	12	57	21	78	27
.02	-	5.9	15	183	132	315	42
.05	-	7.1	18	140	255	395	64
.08	-	8.3	21	51	252	303	83
.11	91	9.5	24	7	228	235	97
.16	62	10.6	27	-	393	393	100
.22	45	11.8	30	-	540	540	100
.32	31	13.0	33	-	488	488	100
.44	23	14.2	36	-	336	336	100
.59	17	15.4	39	-	252	252	100
.76	13	16.5	42	-	162	162	100
.98	10	17.7	45	-	51	51	100
1.1	9	18.9	48	-	30	30	100
1.3	8	20.1	51	-	30	30	100
1.5	7	21.3	54	-	21	21	100
1.7	6	22.5	57	-	12	12	100

TABLE 10.-- Mesh sizes and 50% points

Type	Makers 1/ Size Inches	Used Internal Size Inches	50% Point
Cotton 72 thread	4-1/2	3-13/16	32.4
Cotton 72 thread	3-1/2	2-15/16	20.8
Cotton 72 thread	2-3/4	2-5/16	19.5
Cotton 72 thread	2	1-1/2	9.8
Nylon 400/3 ply	4-1/4	4-1/16	38.7
Nylon 400/3 ply	3-1/2	3-3/16	29.6
Nylon 400/3 ply	2-1/2	2-1/8	17.5
Manila 750/4 ply	4	3-11/16	28.4
Manila 750/4 ply	3	2-1/2	16.7

1/ Knot center to knot center stretch measurement, of new netting

TABLE 11.--Comparison of sizes of silver hake caught by 2½ inch and 3½ inch mesh cotton nets.

Dressed Weight lb.	Count per 10 lbs.	Length Inches	Length Cms.	Fish in 2½" Net	Fish in 3½" Net	Total Fish	Percent "Retained" by 3½
-	-	2.3	6	27	-	27	0
-	-	3.5	9	243	81	324	33.3
.01	-	4.7	12	75	25	100	33.3
.02	-	5.9	15	516	253	769	49.2
.05	-	7.1	18	645	352	997	54.6
.08	-	8.3	21	369	247	616	67.0
.11	91	9.5	24	321	158	479	49.3
.16	62	10.6	27	501	257	758	51.3
.22	45	11.8	30	681	383	1064	56.2
.32	31	13.0	33	549	298	847	54.2
.44	23	14.2	36	363	199	562	54.8
.59	17	15.4	39	219	171	390	78.0
.76	13	16.5	42	132	105	237	79.8
.98	10	17.7	45	57	42	99	73.8
1.1	9	18.9	48	24	19	43	79.0
1.3	8	20.1	51	9	31	40	100.0
1.5	7	21.3	54	15	12	27	79.8
1.7	6	22.5	57	-	7	7	100.0
2.0	5	23.6	60	3	3	6	100.0

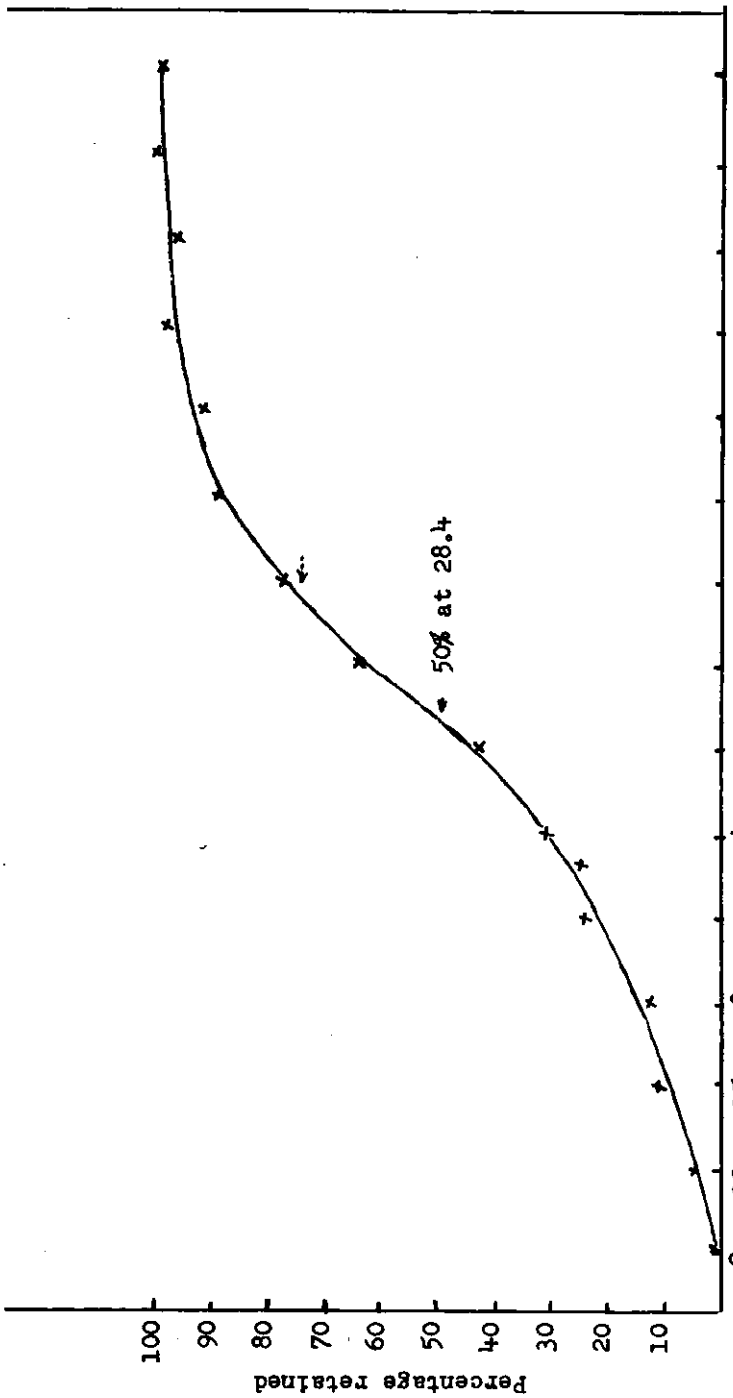


Figure 1. Typical selection curve. Percentage of silver hake of each size retained by 4 inch mesh manila cod-end.

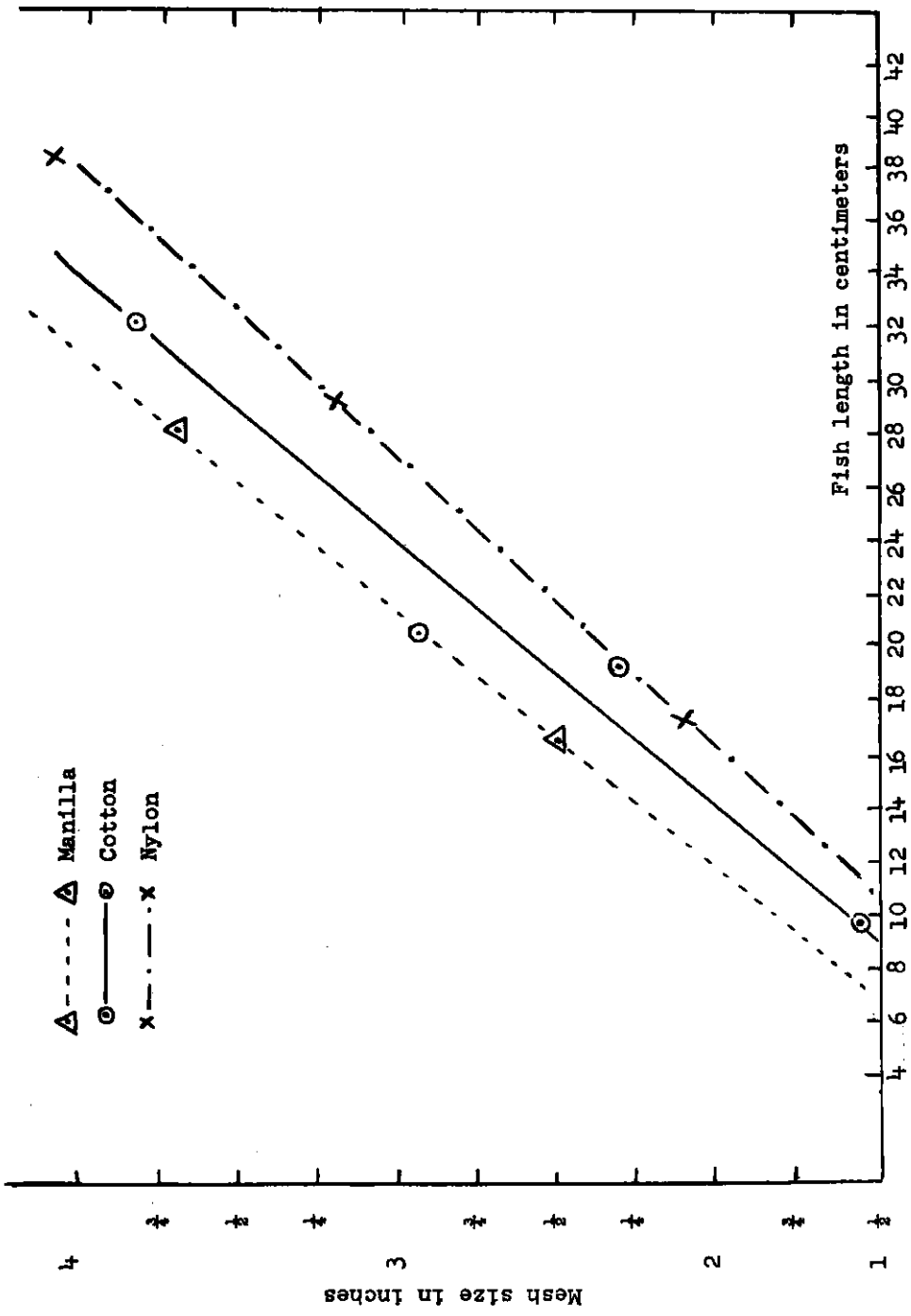


Figure 2. 50% points for each size (internal) and type of cod-end mesh.

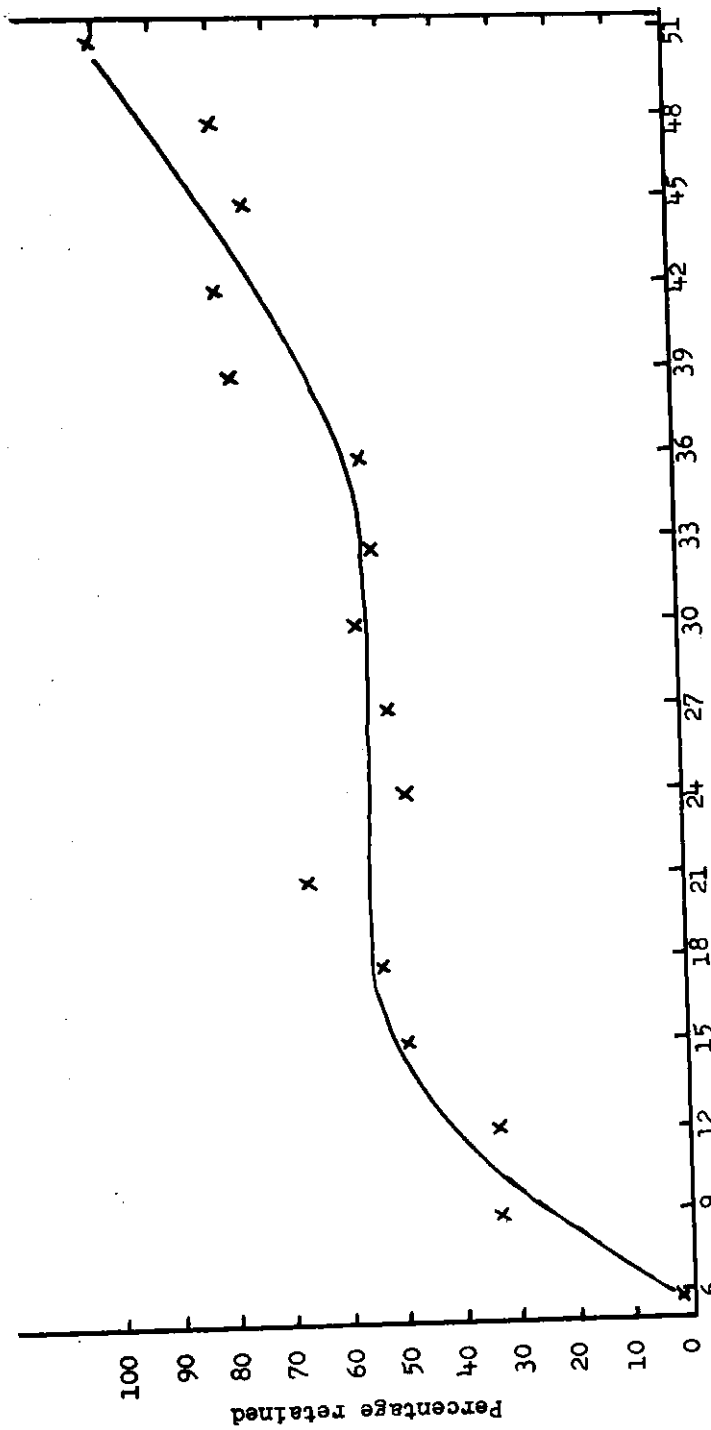


Figure 3. Percentage of silver hake of each size retained by 3½ inch mesh cotton net.