

ARE THE SMALL HADDOCK OF SUBAREA 5
ADEQUATELY PROTECTED?

The minimum mesh size regulation for haddock in Subarea 5 was designed to benefit the haddock fishery through decreasing the capture of small fish. The effectiveness of the regulation depends upon the degree to which the taking of haddock, with small mesh nets, has been reduced.

In order to know precisely how effective the present regulation is in protecting small fish, it would be necessary to have information on the size distribution of the catches as well as landings of all vessels taking haddock. It is important to have the discard records since haddock returned to the sea are probably seldom in viable condition.

Unfortunately, such a complete record is not now available. However, we can obtain considerable information on the catch of small haddock by deduction from the information which is now at hand. First of all we can examine the landings of haddock by category of vessel certification.

Under present U. S. regulations haddock taken by unlicensed vessels using small mesh nets may be landed in amounts not in excess of 5,000 pounds per trip. This is the so-called trip exemption. The 10% annual exemption permits landing of haddock taken with small mesh in amounts greater than 5,000 pounds per trip provided that the vessel's landings of haddock for a year do not exceed 10% of the vessel's total landings. Such vessels must carry a 10% annual exemption certificate. Large vessels fishing primarily for haddock

use 4-1/2 inch mesh nets and carry a cod-haddock registration certificate. These vessels are referred to as registered cod-haddock vessels.

The landings of haddock in the U. S. in 1960 and 1961 are tabulated by certification category in Table 1. Assuming that registered vessels use large mesh (4-1/2 inch or greater), and non-registered vessels use smaller mesh; apparently 90% of the landings were from vessels using large mesh. In these statistics, however, the entire catch of the cod-haddock registered vessel is allocated to the registered category whether or not it suspended the registration for part of the year. It should be explained that some vessels carrying a cod-haddock registration certificate (and, hence, using large mesh) have the certificate suspended temporarily so that they can use a small mesh net to fish redfish and whiting or other species for a limited period. Some vessels have their cod-haddock certificate suspended more than once a year. Frequently they take out an annual exemption certificate during the period their cod-haddock certificate is in suspension; they can then bring in a few trips of haddock with small mesh and stay within the law. Thus the amount of haddock taken with small mesh is probably considerably greater than that indicated in Table 1.

The number of vessels issued cod-haddock certificates increased from 58 in 1960 to 179 in 1961. The number of suspensions increased from 58 in 1960 to 101 in 1961. Thus the amount of haddock landed with small mesh in 1961 was probably considerably greater than in 1960. In table 2, the 176* vessels which received cod-haddock

*Data on catch of 3 of the 179 vessels was not available at the time of this compilation.

Table 1.--Analysis of haddock landings by type of certificate, 1960 and 1961,
all subareas

Fleet	1960		1961	
	000's lbs.	%	000's lbs.	%
1. Registered cod-haddock vessels ^{1/}	91,600	90.0	107,200	91.0
2. Non-registered cod-haddock vessels	10,400	10.0	10,400	9.0
a. Annually exempted vessels ^{2/}	3,000	3.0	4,200 ^{3/}	3.5
b. Other landings (mostly under trip exemption)	7,400	7.0	6,200	5.5
Total	102,000	100.0	117,400	100.0

^{1/} If vessel held registration certificate for any part of year, its total annual landings were included here.

^{2/} For period ending September 30.

^{3/} 3.9 million pounds of this was taken in Subarea 5.

Table 2.--Landings of haddock and number of registered vessels grouped by
months of fishing with cod-haddock certificate in effect, 1961

	Number of months certificate in effect							Total
	0	1-2	3-4	5-6	7-8	9-10	11-12	
No. of reg. vessels	7	26	12	9	15	22	85	176
Landings of reg. vessels mill. lbs.	0.3	3.5	1.9	1.9	5.5	12.8	77.8	103.7
Percent of total landings of reg. vessels --		3	2	2	5	12	75	100
Percent of total landings of all vessels --		3	2	2	5	11	66	88

certificates in 1961 are grouped according to the number of months the certificate was in effect, i. e. not suspended. Their landings of haddock are also listed. The landings of haddock of the "full time" haddock boats (11-12 month category) is 77.8 million pounds, or 75% of the total landings of registered vessels (103.7 Million pounds).

We cannot, at the present time, assign the landings of haddock of the "part time" haddock vessels (10 months or less categories) to trips made when the cod-haddock certificate was in effect or suspended. However, the analysis shows that the landings of haddock in 1961 caught by vessels using large mesh is somewhere between 77.8 and 103.7 million pounds, or 66 and 88%, respectively, of the total haddock landings of 117.6 million pounds.

Tables 3 and 4 present 1961 landings by fleets, gear, and port.

Table 3. --Relative landings of haddock, Massachusetts and Maine ports, 1961, from all subareas

Fleet	Gear	All species (000's lbs)	Haddock (000's lbs.)	Percent haddock	No. of trips	Landings per trip (000's lbs.)	
						All species	Haddock
Regis- tered^{1/}							
C & H	Large	83,761	49,065	58.6	821	102.1	59.8
	Med.	155,212	55,879	36.0	3,973	39.0	14.1
	Small	21,647	2,247	10.4	1,258	17.2	1.8
	Total	260,620	107,192	41.1	6,052	43.1	17.7
	Other	14,323	0	0	--	--	--
	Total	274,943	107,192	39.0	--	--	--
Non-regis- tered^{2/}							
C & H	Large	74,085	363	0.5	414	178.9	0.9
	Med.	55,343	3,125	5.6	1,590	34.8	2.0
	Small	82,040	3,623	4.4	11,251	7.3	0.3
	Total	211,467	7,110	3.4	13,255	16.0	0.5
	Other	145,674	3,297	2.3	--	--	--
	Total	357,141	10,407	2.9	--	--	--
Total		632,084	117,599	18.6	--	--	--

^{1/} If vessel held Registration Certificate for any part of year, its annual landings were included here.

^{2/} Includes annually exempted vessels.

Table 4. --Relative landings of haddock, all subareas, 1961. Breakdown by ports.

A. Maine ports							
Fleet	Gear	All species (000's lbs.)	Haddock (000's lbs.)	Percent haddock	No. of trips	Landings per trip (000's lbs.)	
						All species	haddock
Registered							
C & H	Large	3,847	3	0	17	226.3	0.2
	Med.	6,366	350	5.4	142	44.8	2.5
	Small	6,107	312	5.1	472	12.9	0.7
	Total	16,320	665	4.1	631	25.8	1.0
	Other	0	0	0	--	--	--
	Total	16,320	665	4.1	--	--	--
Non-registered							
C & H	Large	50,655	279	0.6	299	169.2	0.9
	Med.	17,897	770	4.3	252	71.0	3.0
	Small	16,087	602	3.7	1,328	12.1	0.4
	Total	84,639	1,651	2.0	1,879	45.0	0.9
	Other	120,000	889	0.7	--	--	--
	Total	204,639	2,540	1.2	--	--	--
Total		220,959	3,205	1.4	--	--	--
B. Boston							
Fleet	Gear	All species (000's lbs.)	Haddock (000's lbs.)	Percent haddock	No. of trips	Landings per trip (000's lbs.)	
						All species	Haddock
Registered							
C & H	Large	67,820	47,602	70.2	690	98.3	68.9
	Med.	46,296	34,912	75.4	918	50.4	38.0
	Small	438	293	66.8	40	11.0	7.3
	Total	114,554	82,808	72.3	1,648	69.7	50.2
	Other	0	0	0	--	--	--
	Total	114,554	82,808	72.3	--	--	--
Non-registered							
C & H	Large	0	0	--	0	--	--
	Med.	129	50	38.8	41	3.1	1.2
	Small	472	189	40.1	85	5.4	2.2
	Total	601	238	39.6	126	4.8	1.9
	Other	1,972	1,045	53.0	--	--	--
	Total	2,573	1,283	49.9	--	--	--
Total		117,127	84,091	71.7	--	--	--

Table 4. (cont.)--Relative landings of haddock, all subareas, 1961. Breakdown by ports.

C. Gloucester							
Fleet	Gear	All species (000's lbs.)	Haddock (000's lbs.)	Percent haddock	No. of trips	Landings per trip (000's lbs.)	
						All species	Haddock
Registered							
C & H	Large	12,094	1,460	12.1	114	106.1	12.8
	Med.	59,369	10,820	18.2	1,506	39.4	7.2
	Small	6,310	628	9.9	214	29.5	2.9
	Total	77,773	12,908	16.6	1,834	42.4	7.1
	Other	12,204	0	0	--	--	--
	Total	89,977	12,908	14.3	--	--	--
Non-registered							
C & H	Large	23,430	84	0.3	115	203.7	0.7
	Med.	16,002	603	3.8	384	41.6	1.6
	Small	22,054	1,146	5.2	3,298	6.7	0.3
	Total	61,486	1,833	3.0	3,797	16.2	0.5
	Other	11,390	266	2.3	--	--	--
	Total	72,876	2,099	2.9	--	--	--
Total		162,853	15,007	9.2	--	--	--

D. New Bedford							
Fleet	Gear	All species (000's lbs.)	Haddock (000's lbs.)	Percent haddock	No. of trips	Landings per trip (000's lbs.)	
						All species	Haddock
Registered							
C & H	Large	0	0	0	0	--	--
	Med.	34,209	9,332	27.3	1,146	29.8	8.1
	Small	8,702	1,013	11.6	515	16.9	2.0
	Total	42,911	10,345	24.1	1,661	25.8	6.2
	Other	2,119	0	0	--	--	--
	Total	45,030	10,345	23.0	--	--	--
Non-registered							
C & H	Large	0	0	0	0	--	--
	Med.	14,991	1,350	9.0	480	31.2	2.8
	Small	17,795	292	1.6	1,318	13.5	0.2
	Total	32,786	1,642	4.6	1,798	18.2	0.9
	Other	3,124	0	0	--	--	--
	Total	35,910	1,642	4.6	--	--	--
Total		80,940	11,987	14.8	--	--	--

Table 4.--Relative landings of haddock, all subareas, 1961. Breakdown by ports
(continued)

E. Cape ports							
Fleet	Gear	All species (000's pounds)	Haddock (000's pounds)	Percent haddock	No. of trips	Landings per trip (000's pounds)	
						All species	Haddock
Registered							
C & H	Large	0	0	0	0	--	--
	Med.	8,972	465	5.2	260	34.5	1.8
	Small	990	1	1.1	17	5.3	0.1
	Total	<u>9,062</u>	<u>466</u>	<u>5.1</u>	<u>277</u>	<u>32.7</u>	<u>1.7</u>
No other							
Non-regis- tered							
C & H	Large	0	0	0	0	--	--
	Med.	6,324	352	5.6	433	14.6	0.8
	Small	25,632	1,394	5.4	5,222	4.9	0.3
	Total	<u>31,956</u>	<u>1,746</u>	<u>5.5</u>	<u>5,655</u>	<u>5.6</u>	<u>0.3</u>
	Other	9,188	1,097	11.9	--	--	--
	Total	<u>41,144</u>	<u>2,843</u>	<u>6.9</u>	<u>--</u>	<u>--</u>	<u>--</u>
Total		<u>50,206</u>	<u>3,309</u>	<u>6.6</u>	<u>--</u>	<u>--</u>	<u>--</u>

The comparative landings by small mesh and large mesh are important management statistics but they do not furnish us with direct information on the quantity of small fish taken from the haddock populations. Adequate length frequencies of the catches are required for this. Lacking these we can examine sizes of fish landed.

Table 5 presents the length of haddock taken by the "haddock fleet" in 1960. "Haddock fleet" consists primarily of the large Boston trawlers that normally carry cod-haddock certificates year-round. In these landings less than 1 percent of the fish are under the 50 percent selection point of the 4-1/2-inch mesh (38 cm.). Furthermore, there is very little discard; the landings represent the catch. As far as this fleet is concerned the small haddock are being adequately protected.

Table 5. -- Sizes of haddock landed by the "haddock fleet", 1960
from Subarea 5 (00's of fish)

Length (cm.)	Scrod	Large	Total
31	20		20
32	84		84
33	125		125
34	421		421
35	1,294		1,294
36	2,688		2,688
37	5,329		5,329
A			
38	8,880		8,880
39	13,816		13,816
40	19,555		19,555
41	23,469		23,469
42	25,556		25,556
43	27,357		27,357
44	25,529	1	25,530
45	22,213	32	22,245
46	18,207	76	18,283
47	15,968	212	16,180
48	12,779	465	13,244
49	11,828	1,036	12,864
50	8,857	2,037	10,894
51	6,988	3,358	10,346
52	5,257	4,987	10,244
53	3,170	6,202	9,372
54	1,795	7,062	8,857
55	780	7,257	8,037
56	482	7,844	8,326
57	120	7,053	7,173
58	96	6,657	6,753
59	39	6,332	6,371
60	9	5,693	5,702
61		5,196	5,196
62		4,510	4,510
63		4,069	4,069
64		3,603	3,603
65		3,041	3,041
66		2,850	2,850
67		2,331	2,331
68		2,189	2,189
69		1,823	1,823
70		1,413	1,413
71		1,257	1,257
72		900	900
73		691	691
74		590	590

Table 5. --Sizes of haddock landed by the "haddock fleet", 1960
 from Subarea 5 (00's of fish) (continued)

Length (cm.)	Scrod	Large	Total
75		434	434
76		286	286
77		147	147
78		97	97
79		65	65
80		68	68
81		31	31
82		7	7
83		5	5
84		8	8
Total	262,711	101,915	364,626

Information on the sizes of haddock caught by small mesh vessels is difficult to obtain and very little is available from direct observation. When the haddock are landed for food, the small fish are culled out and discarded at sea, in which case, of course, the landed catch shows few fish under 38 cm. However, an indication of the discard can be obtained by examining samples of the size composition of haddock which is landed for industrial purposes when industrial fish are in demand. Table 6 presents such a sample. Most of the larger fish have been culled out of this catch and landed for food. Thus, the size of the haddock in the industrial landings compare roughly to the sizes of the haddock discarded at sea by the small mesh groundfish boats fishing for the food fish market.

It will be noted that 98% of the industrial landings of haddock is under 38 cm. Examination of the length figures of haddock taken in the same area by research vessels corroborate the conclusion arrived at by study of the industrial fishery landings.

At the present time it is impossible to estimate the total weight of haddock discarded by the small mesh fleets since various sizes of mesh are used, and the catch of small fish is determined by the size of mesh. However, when the industrial trawl fishery was in operation, sufficient samples were obtained from the industrial landings to allow an estimate of total take of undersized haddock by this fleet and the whiting fleet. During the period 1957-1959 the estimated annual landings of haddock in the industrial landings averaged 3 million pounds. It has been computed that if this fish had been fished with a 4-1/2 inch mesh, they would ultimately have yielded 11 million pounds per year.

Table 6. -- Sizes of haddock landed by Gloucester industrial fishery, 1957-59^{1/}

Length (cm.)	Ipswich Bay number	Stellwagen Bay number	Nausets number	Total	
				Number	Percent
9			4	4	-
9			9	9	1
12	1	5	9	15	1
15	4	30	5	39	3
18	16	29	23	68	5
21	35	28	85	148	12
24	33	41	117	191	15
27	35	84	141	260	21
30	19	142	103	264	21
33	27	78	65	170	14
36	17	12	27	56	4
39	10	3	7	20	2
42	3	1	--	4	-
45		1	--	1	-
48			1	1	-
51			1	1	-
Total				1,251	100

^{1/} From Edwards and Skerry, 1961.

Since the industrial fishery is not now in full operation, this drain on the small haddock is not an immediate problem. However, there are plans for its reactivation. Furthermore, there has been increased fishing under the 10% annual exemption. In the last report year the number of vessels with annual exemption certificates increased from 43 to 73; the number of trips of these vessels in Sub-area 5 from 1,324 to 1,799; and the amount of haddock increased from 2.7 million pounds to 3.9 million pounds.