

# Fishery Economic Trends

by B. Pollard Rountree  
P. Clay  
S. Steinback  
J. Walden

## REGIONAL SUMMARY

The Northeast's commercial oceanic and estuarine fisheries produced domestic landings worth \$961 million dockside in 1997, a increase of just \$1 million over 1996. In 1994, 1995, and 1996 domestic landings totaled \$924 million, \$1.026 billion, and \$960 million respectively. Annual totals of quantity and value for total finfish and shellfish for 1993-1997 are provided at the end of Table 5. Finfish landings brought in \$349 million in 1997, representing 36% of the revenue generated in the region. Shellfish landings brought in \$613 million, accounting for the remaining 64% of revenue.

In 1997, landings decreased to 721 thousand mt, a 4% decrease from 1996 levels and an 11% decrease from the 1995 peak of 811 thousand mt. Finfish landings (531 thousand mt) decreased by 4% from 1996 figures, while shellfish landings (190 thousand mt) declined by 2% in 1997.

Important species of finfish and shellfish landed or raised in the Northeast region are shown in Table 5, along with their quantity, value, and price for the last five years. Landings of finfish, lobster, shrimp, and crab are given in live weight; landings of all other shellfish are expressed in meat weight. The most important species, ranked in terms of 1997 ex-vessel value (first-sale dockside), are American lobster, sea scallop, blue crab, Atlantic salmon, oysters, goosefish, hard clam, surfclam, menhaden, and *Loligo* squid. Seven of the ten most valuable species are invertebrates, and six of the ten species are harvested predominantly inshore (0-3 miles) or are raised.



**Atlantic herring made the greatest absolute gain in landings in 1997.**

**NOAA Fisheries  
NEFSC Photo Archive**

Table 5. Important species landed or raised in the Northeast, their landings (L, thousand mt), ex-vessel values (V, millions of dollars), and prices (P, dollars/lb), 1993-1997[1]

Year	L	V	P	L	V	P	L	V	P	L	V	P	L	V	P	
	<b>American lobster</b>			<b>Sea scallop</b>			<b>Blue crab</b>			<b>Atlantic salmon[2]</b>			<b>Oysters</b>			
1993	26.3	160.4	2.77	7.4	97.9	6.03	57.1	69.5	0.55	6.7	42.6	2.86	4.2	35.9	3.90	
1994	31.7	207.3	2.96	7.6	84.0	5.00	43.1	73.8	0.78	6.1	35.6	2.64	2.8	36.1	5.94	
1995	31.8	214.6	3.06	8.0	91.1	5.16	56.7	101.2	0.81	10.0	56.7	2.56	3.1	38.0	5.48	
1996	32.5	242.8	3.39	7.9	98.2	5.64	37.7	64.3	0.77	10.0	46.2	2.10	2.8	36.9	6.02	
1997	32.3	223.6	3.14	6.0	87.4	6.60	43.0	79.4	0.84	12.2	49.5	1.84	3.2	39.4	5.61	
	<b>Goosefish</b>			<b>Hard clam</b>			<b>Atlantic surfclam</b>			<b>Menhaden</b>			<b>Squid (Loligo)</b>			
1993	18.5	21.7	0.53	4.3	43.6	4.58	33.5	38.2	0.52	317.0	41.9	0.06	22.3	29.6	0.60	
1994	21.1	26.2	0.56	3.5	35.3	4.61	32.4	45.7	0.64	252.3	34.0	0.06	22.6	31.9	0.64	
1995	25.1	36.1	0.65	4.2	42.1	4.50	30.1	45.1	0.68	344.9	45.7	0.06	18.5	23.8	0.58	
1996	25.3	32.3	0.58	3.2	35.1	4.94	28.8	41.3	0.65	283.1	37.9	0.06	12.5	18.6	0.68	
1997	28.8	35.0	0.55	3.0	34.2	5.09	25.6	36.1	0.64	245.4	33.6	0.06	16.2	26.5	0.74	
	<b>Atlantic cod</b>			<b>Sea urchins</b>			<b>Ocean quahog</b>			<b>Bluefin tuna</b>			<b>Winter flounder</b>			
1993	23.0	45.0	0.89	19.2	27.2	0.64	26.2	29.3	0.51	1.0	19.3	8.92	5.3	15.3	1.31	
1994	17.8	36.6	0.93	17.6	33.4	0.86	21.1	18.7	0.40	1.0	19.6	8.72	3.6	11.2	1.41	
1995	13.7	28.6	0.95	15.6	35.7	1.04	23.2	21.7	0.42	0.9	20.4	10.66	4.0	12.7	1.43	
1996	14.3	26.7	0.85	10.1	24.0	1.08	21.1	20.4	0.44	0.9	16.5	8.42	4.8	14.5	1.38	
1997	13.0	24.5	0.86	8.5	20.5	1.09	19.8	19.8	0.45	1.0	16.4	7.40	5.3	15.7	1.34	
	<b>Summer flounder</b>			<b>Silver hake</b>			<b>Atlantic herring</b>			<b>Northern shrimp</b>			<b>American plaice</b>			
1993	4.4	15.3	1.57	17.3	14.0	0.37	49.5	6.5	0.06	2.3	5.2	1.03	5.8	15.0	1.17	
1994	5.0	18.3	1.67	16.0	13.7	0.39	45.2	5.7	0.06	3.7	6.5	0.79	5.1	13.5	1.21	
1995	5.0	20.4	1.86	14.7	14.0	0.43	68.8	8.8	0.06	6.8	13.2	0.88	4.6	13.2	1.29	
1996	4.0	14.3	1.64	16.2	13.6	0.38	87.7	10.9	0.06	9.5	15.1	0.72	4.4	12.3	1.27	
1997	4.1	15.5	1.73	15.6	15.1	0.44	96.9	11.6	0.05	6.4	11.5	0.82	3.9	11.4	1.31	
	<b>Soft clams</b>			<b>Atlantic mackerel</b>			<b>Yellowtail flounder</b>			<b>Striped bass</b>			<b>Penaeid shrimp</b>			
1993	2.1	20.5	4.47	4.7	1.3	0.13	3.6	10.4	1.30	0.6	2.7	2.05	0.0	0.0	3.00	
1994	1.2	12.5	4.80	8.9	2.6	0.13	3.1	8.1	1.19	0.8	3.1	1.81	0.0	0.0	4.93	
1995	1.1	10.7	4.48	8.4	2.7	0.15	1.9	6.0	1.42	1.8	6.2	1.54	0.0	0.0	2.27	
1996	1.0	8.3	3.75	15.8	4.6	0.13	2.4	7.6	1.43	2.1	8.0	1.72	0.0	0.0	2.31	
1997	1.0	9.9	4.31	15.4	9.5	0.28	2.9	9.5	1.50	2.3	7.5	1.46	1.0	7.4	3.23	
	<b>Witch flounder</b>			<b>Scup</b>			<b>Squid (Illex)</b>			<b>Spiny dogfish</b>			<b>Swordfish</b>			
1993	2.6	9.0	1.57	4.4	5.7	0.58	18.0	8.5	0.21	15.8	4.6	0.13	1.5	9.9	2.92	
1994	2.7	9.3	1.58	4.0	5.8	0.66	18.4	10.4	0.26	13.4	4.3	0.15	1.2	8.5	3.09	
1995	2.2	8.4	1.73	2.9	5.8	0.91	14.1	8.1	0.26	16.3	7.1	0.20	1.2	7.7	2.89	
1996	2.1	7.7	1.67	2.7	6.3	1.07	17.0	9.7	0.26	18.2	7.5	0.19	0.8	5.6	3.06	
1997	1.8	6.6	1.69	2.2	6.4	1.32	13.6	6.1	0.20	17.6	5.8	0.15	1.0	5.5	2.60	
	<b>Pollock</b>			<b>Tilefish</b>			<b>Butterfish</b>			<b>Black sea bass</b>			<b>Yellowfin tuna</b>			
1993	5.7	8.4	0.67	1.8	5.0	1.23	4.5	6.8	0.69	1.3	2.9	0.99	0.6	2.6	2.06	
1994	3.7	6.8	0.82	0.8	3.4	1.96	3.6	4.1	0.51	0.8	2.2	1.18	0.6	2.0	1.52	
1995	3.4	6.8	0.92	0.7	2.9	1.98	2.2	2.6	0.55	0.9	2.9	1.50	1.1	3.8	1.64	
1996	3.0	4.5	0.69	1.1	4.2	1.68	3.6	5.2	0.66	1.5	3.6	1.13	0.4	1.9	2.14	
1997	4.3	5.3	0.57	1.8	4.9	1.24	2.8	4.7	0.76	1.2	3.9	1.48	0.9	3.7	1.96	
	<b>Haddock</b>			<b>Skates</b>			<b>White hake</b>			<b>Bigeye Tuna</b>			<b>Weakfish</b>			
1993	0.9	2.7	1.38	12.9	3.0	0.11	7.5	7.2	0.44	0.8	5.9	3.55	1.1	1.9	0.78	
1994	0.3	1.0	1.38	8.8	5.0	0.26	4.7	5.7	0.55	0.8	7.7	4.36	1.1	2.0	0.77	
1995	0.4	1.2	1.33	7.1	3.4	0.22	4.3	6.2	0.65	0.9	8.0	4.19	1.8	2.5	0.62	
1996	0.6	1.5	1.18	14.2	6.3	0.20	3.3	4.6	0.63	0.4	2.8	3.62	1.5	2.6	0.80	
1997	1.5	3.6	1.09	10.5	3.3	0.14	2.2	3.2	0.65	0.5	2.9	2.85	2.4	2.8	0.53	
	<b>Bluefish</b>			<b>Mussels</b>			<b>Red hake</b>			<b>Windowpane</b>			<b>Redfish</b>			
1993	2.8	1.9	0.31	3.0	2.7	0.40	1.7	0.9	0.25	1.7	2.3	0.63	0.8	0.8	0.46	
1994	3.1	1.9	0.28	2.5	1.9	0.35	1.7	0.9	0.25	0.5	0.6	0.52	0.4	0.6	0.62	
1995	2.3	1.8	0.36	3.0	2.5	0.37	1.6	1.0	0.28	0.8	1.0	0.58	0.4	0.6	0.62	
1996	2.7	1.9	0.32	2.6	2.3	0.39	1.1	0.7	0.29	1.0	0.9	0.42	0.3	0.5	0.66	
1997	3.3	2.2	0.30	2.0	1.7	0.38	1.3	0.8	0.28	0.5	0.6	0.51	0.3	0.3	0.54	
	<b>Total Shellfish[3]</b>						<b>Total Finfish[3]</b>				<b>Total[3]</b>					
	L		V		P		L		V		L		V		P	
1993	210.7		542.6		6.03		537.2		344.5		747.9		887.1			
1994	216.7		604.7		5.00		461.4		319.3		678.1		923.9			
1995	223.2		653.2		5.16		587.3		373.2		810.6		1026.4			
1996	194.5		623.9		5.64		555.3		335.8		749.8		959.7			
1997	189.8		612.8		6.60		531.3		348.5		721.1		961.3			

[1] North Carolina landings and price data not included for 1993-1996. [2] Amounts raised and value at first sale [3] Price not meaningful for totals

Several observations can be made from the price and landings data presented in Table 5. First, American lobsters continue to contribute the greatest percentage of the region's ex-vessel revenue. Second, while sea scallop remained the second most valued species in the Northeast in 1997, ex-vessel revenue and landings were still far less than peak values observed during the early 1990s.

Landings of the region's "traditional" groundfish species (cod, haddock, and yellowtail flounder) increased from 17.3 thousand to 17.4 thousand mt in 1997, a mere 100 mt increase over 1996. The value of these traditional groundfish in 1997 was \$37.6 million, 5% more than in 1996 (\$35.8 million). The three "traditional" groundfish species accounted for only 4% of total 1997 catch by value, and just 2% by weight.

Sea urchins, for which no fishery existed prior to 1987, rose to become the ninth most valuable species in 1995, was rated the eleventh most

Table 6. Landings (L, thousands of metric tons, landed weight) and ex-vessel revenue (R, millions of dollars) for Northeast fisheries, by gear type, 1994-1996

Gear Types	1994		1995		1996	
	L	R	L	R	L	R
Pots & traps - lobster	26.3	149.4	32.2	200.9	34.4	239.7
Otter trawl, bottom - fish	123.0	177.3	105.0	168.2	133.2	164.5
Dredge - sea scallop	10.4	85.0	9.9	88.8	9.2	96.8
Dredge - surfclam & ocean quahog	51.6	56.2	52.9	62.5	49.9	58.7
Purse seine - menhaden	247.3	32.4	335.4	43.7	277.9	36.9
Sink gill net	26.2	31.4	29.6	35.8	30.8	34.9
Pots & traps - blue crab	31.3	51.5	21.2	35.8	6.9	24.1
Diving gear	13.4	26.8	12.7	30.2	8.3	20.7
Longline, bottom and pelagic	6.7	28.1	7.3	26.8	5.4	18.7
Otter trawl, bottom - shrimp	3.6	6.2	7.0	12.9	9.2	14.6
Hand line, other	1.1	13.9	1.5	16.5	2.1	14.6
Rakes	1.2	13.0	1.2	15.3	1.1	13.4
Tongs and grabs	1.3	14.9	1.1	13.9	1.1	13.3
Hoes	1.3	12.9	1.1	11.0	0.9	7.8
Purse seine - herring	34.5	4.5	34.6	4.6	55.1	7.0
Otter trawl, bottom - scallop	0.7	5.8	0.8	7.2	0.7	6.6
Unknown <sup>1</sup>	24.6	142.5	44.7	162.3	64.2	128.0
All other gears	48.3	71.4	61.8	56.2	31.3	52.5
<b>Total</b>	<b>652.9</b>	<b>923.2</b>	<b>759.9</b>	<b>992.6</b>	<b>721.7</b>	<b>952.8</b>

<sup>1</sup> Includes oyster dredge

Table 7. Number of identifiable vessels using otter trawls and scallop dredges, and total number of vessels regardless of gear type in the Northeast region by tonnage class (TC) and sub-region, 1991-1996[1]

Year/Subregion	Otter Trawls					Scallop Dredges					All Vessels [2]				
	TC1	TC2	TC3	TC4+	Total	TC1	TC2	TC3	TC4+	Total	TC1	TC2	TC3	TC4+	Total
1991 Northeast [3]		403	483	139	1025	32	114	153	299		808	735	309	1852	
New England		368	339	115	822	29	65	126	220		628	469	241	1338	
Mid-Atlantic & Chesapeake		36	170	34	240	4	72	52	128		192	335	108	635	
1992 Northeast		422	473	117	1012	50	112	148	310		871	722	298	1891	
New England		374	328	93	795	48	62	119	229		681	454	227	1362	
Mid-Atlantic & Chesapeake		51	174	36	261	3	71	50	124		203	333	106	642	
1993 Northeast		435	484	121	1040	69	100	136	305		923	731	285	1939	
New England		341	327	98	766	67	50	110	227		677	452	218	1347	
Mid-Atlantic & Chesapeake		96	189	41	326	2	60	40	102		256	338	104	698	
1994 Northeast	34	502	446	131	1113	2	65	82	131	280	405	1622	673	280	2980
New England	31	419	299	94	843	2	64	29	89	184	389	1387	410	198	2384
Mid-Atlantic & Chesapeake	3	86	184	55	328	0	1	68	85	154	18	274	332	149	773
1995 Northeast	47	606	442	133	1228	3	64	80	134	281	442	1684	646	283	3055
New England	40	488	291	90	909	3	62	36	106	207	387	1395	408	221	2411
Mid-Atlantic & Chesapeake	7	122	190	56	375	0	2	59	71	132	62	349	318	133	862
1996 Northeast	47	624	424	134	1229	9	120	82	132	343	409	1863	607	276	3155
New England	44	510	284	96	934	9	118	43	105	275	379	1572	381	217	2549
Mid-Atlantic & Chesapeake	3	117	182	54	356	0	2	56	56	114	32	352	303	113	800

[1] TC1=less than 5 gross registered tons (grt), TC2=5-50 grt, TC3=51-150 grt, TC4=151+grt

[2] The "All Vessels" columns provide a unique count of vessels regardless of gear used.

[3] Northeast vessels include those that landed at least once in Maine, Massachusetts, New Hampshire, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, or Delaware. New England vessels include those that landed at least once in Maine, Mass, New Hampshire, Rhode Island, or Connecticut. Mid Atl. & Chesapeake vessels include those that landed at least once in New York, New Jersey, Maryland, Virginia, or Delaware. The "Northeast" row eliminates duplication of vessels that landed in both sub-regions.

Table 8. Percentage of total landings by weight attributed to gear type used in harvest of selected species, 1996

GEAR TYPE	Percentage of total landings by weight attributed to gear type used in harvest of selected species, 1996									
	Cod	Yellowtail flounder	Haddock	Other multi- species <sup>1</sup>	Menhaden	Summer flounder	American lobster	Sea scallops	Swordfish	Atlantic herring
Bottom trawl	57.4	87.1	66.3	91.7	0.1	94.9	1.6	8.6	1.9	2.5
Midwater trawl	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	34.6
Hook gear	9.1	0.0	17.0	0.8	0.0	0.0	0.0	0.0	87.7	0.0
Gillnet	29.9	10.8	14.9	7.0	0.2	0.3	0.2	0.0	9.2	0.0
Pots/traps	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Lobster pot	0.2	0.0	0.0	0.0	0.0	0.0	98.2	0.0	0.0	0.0
Scallop dredge	0.0	1.5	0.0	0.1	0.0	1.1	0.0	91.2	0.0	0.0
Other gear	3.4	0.6	1.8	0.4	99.7	3.3	0.0	0.2	0.1	62.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

GEAR TYPE	Percentage of total landings by weight attributed to gear type used in harvest of selected species, 1996							
	Atlantic mackerel	Butter- fish	Loligo	Black sea bass	Scup	Goosefish	Northern shrimp	Bluefin tuna
Bottom trawl	84.9	94.2	94.7	51.1	81.7	51.7	96.2	0.0
Midwater trawl	8.3	2.3	3.6	0.0	0.0	0.0	0.0	0.0
Hook gear	0.0	0.0	0.0	0.1	0.0	0.2	0.0	2.5
Gillnet	1.3	0.7	0.0	0.6	0.3	33.0	0.0	0.0
Pots/traps	1.4	0.7	0.6	38.8	13.1	0.0	3.8	0.0
Lobster pot	0.0	0.0	0.0	2.4	0.3	0.0	0.0	0.0
Scallop dredge	0.0	0.0	0.0	0.0	0.0	15.1	0.0	0.0
Other gear	4.1	2.1	1.1	7.0	4.6	0.0	0.0	97.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> Includes pollock, winter flounder, witch flounder, windowpane, American plaice, redfish, white hake, red hake, whiting, and ocean pout.

valuable in 1996, and the twelfth most valuable in 1997.

Value of farmed Atlantic salmon declined in 1996 by more than \$10 million, but increased in 1997. However, this species retained its standing as the fourth most valuable in both years, continuing to demonstrate the importance of marine aquaculture to the Northeast economy. Atlantic salmon (and steelhead trout) are still being raised at more than 20 sites in Maine.

Relatively few species accounted for most of the landed value in the Northeast in 1997, with the top 10 generating 67% (\$645 million) of the landings value. Lobster and sea scallop remained the two most valuable species in the Northeast region, accounting for 32% of the total value of all species landed. American lobster accounted for the largest revenue gain (in absolute terms) in 1996, while blue crab held this distinction for 1997. *Loligo* squid also made a no-

table gain in 1997, increasing almost \$8 million. Atlantic herring made the greatest absolute gain in landings in 1997. Although menhaden landings fell, they still accounted for 34% of total landings (by weight) but only 3% by value in 1997.

Table 6 provides data for landings and revenue earned by gear type, for 1994-1996. Pots and traps produced the greatest amount of total revenue in 1996, followed by bottom otter trawl and sea scallop dredges. These three gear types accounted for more than half of the region's ex-vessel revenue. Menhaden purse seines and bottom otter trawls account for well more than half of the landings by weight.

Many vessels employ more than one gear type. The ability to change from one fishing method to another is of particular importance in fisheries where different species are harvested, requiring different techniques at various seasons of the year.

Table 7 provides the total number of identifiable vessels (those vessels of known tonnage, excluding under-tonnage vessels for 1991 through 1993) using scallop dredge, otter trawl, and totals for all gears combined, by tonnage class for 1991-1996. Tonnage Class 1 vessels are less than 5 gross registered tons (grt); Tonnage Class 2 vessels range from 5 to 50 grt; Tonnage Class 3 vessels are 51-150 grt; and Tonnage Class 4 vessels are greater than 150 grt.

The total number of vessels appears to have increased during 1994-1996, but this is partly due to the changes that have occurred in our data collection system; since 1994, data for Tonnage Class 1 vessels have been collected and recorded on a per-vessel basis, whereas formerly such data were combined. Thus, total numbers could be included in the table. A substantial increase in the number of Tonnage Class 2 scallop vessels also occurred in New England in 1996,

partly due to activity by part-time scallopers who did not use their permit in 1995 but did so in 1996.

Table 8 provides the percentage of total landings by identifiable gear type for selected species in the Northeast for 1996. This table indicates the variability in harvesting strategies for individual species. For example, summer flounder is taken predominantly with bottom trawls, while goosefish is taken primarily by bottom trawls, gillnets, and scallop dredges.

## DATA COLLECTION CONSIDERATIONS

NMFS has recently made many changes to its data collection, archival, and analysis systems to support the increasingly complex needs of fisheries management. In the Northeast Region, 1993 marked the end of a traditional voluntary method of data collection from vessel owners, operators, and dealers. Regulations implemented in 1994 in several FMPs required mandatory reporting.

Under the voluntary method of data collection, NMFS obtained information on landings through the collection of weighout sales receipts (at the point of first sale) using a network of federal and state port agents located in the Northeast. This information was augmented by interviews with vessel operators when vessels landed, as well as a monthly or annual canvas.

The mandatory reporting system became effective in April 1994 for summer flounder transactions, and in June 1994 for multispecies and scallop transactions. The mandatory reporting system consists of two components, one from dealers and one from the vessel owners and/or operators. The dealer reports contain total landings and revenue information, broken down into market category. Essential data elements on fishing location, gear used, and effort (previously annotated by port agents through interviews) do not exist in the dealer reports and must be extracted from corresponding vessel trip reports.

Dealer reports are assumed to provide accurate totals for landings and revenue; vessel trip reports (VTRs) are used as a subset of the dealer data. The VTR data are still undergoing auditing procedures at various levels and are therefore considered provisional.

## VESSEL PERMITS

In the Northeast, most permits are issued by the NMFS Northeast Regional Office and are required mostly for fisheries that fall under Fishery Management Plans (FMPs) of the New England and Mid-Atlantic Fishery Management Councils. Tuna permits are issued by the NMFS Highly Migratory Species Division Office in Silver Spring, Maryland. The FMPs are for either a single species (*e.g.*, lobster), or for a species complex (*e.g.*, multispecies). When a fishery is under a federal FMP, participants in that fishery must have an appropriate permit. Possession of that permit constitutes acceptance of the regulations contained in the FMP. Possession of a permit triggers the requirement for mandatory reporting by vessels in the sea scallop, multispecies, summer flounder, and surfclam and ocean quahog fisheries.

Permit data help managers evaluate the distribution of vessel owners, complementing data on distribution of vessel landings. Permit data are also the source of vessel characteristics data (*e.g.*, length, tonnage, horsepower). Permit and related data on days-at-sea usage are important for evaluating active and latent fishing effort, capacity, and to some extent levels of capitalization, as well as for tracking and measuring impacts of measures such as limited access and vessel buyouts. Data on landings reported in relation to type of permit also allows evaluation of how effective some regulations are in achieving management goals.

Broadly speaking, Northeast permits allocate fishing privileges under some combination of the following

four categories: commercial versus recreational, and limited access versus open access. Commercial permits allow sale of the catch. Permits for recreational fishing do not; most federal recreational permits are held by party and charter boats, although there is an angler permit for tuna. In addition, unlike all other party/charter permits in the Northeast, tuna party/charter vessels are commercial. These commercial and recreational permits may be either "open access" or "limited access", as described next.

For some fisheries where effort limitations are required, a moratorium is established. In such a case, certain requirements ("qualifying criteria") must be met by the vessel owner in order to acquire a permit. Generally, the vessel must have landed the species covered under the FMP in question during a specified period (usually several years in duration). Sometimes a minimum level of landings of the species is also required. Those who meet these requirements are granted a "limited-access" permit. Once the qualifying criteria are established, and qualified vessels determined (through a lengthy process that includes an appeals period), then no additional vessels can be granted a limited-access permit in that fishery for the life of the moratorium. An "open-access" permit, by contrast, can be acquired by anyone at any time. Some fisheries have both limited- and open-access categories within a single fishery, with open-access permits having much more restrictive regulations.

Between 1994 and 1996, NMFS issued permits under seven northeastern FMPs: Northeast Multispecies; Atlantic Sea Scallop; American Lobster; Summer Flounder; Surfclam and Ocean Quahog; Atlantic Mackerel, Squid, and Butterfish; and Atlantic Tunas. Five of these fisheries are at least partially managed under limited-access arrangements (summer flounder as of 1992, multispecies as of 1994, Atlantic sea scallop as of 1994, American lobster as of 1995, and Atlantic tuna as of 1982).

Under the Multispecies FMP, vessels not qualifying for limited ac-

Table 9. Numbers of unique permitted vessels by fishery management plan permit category and tonnage class, 1994-1996 [1,2,3]

Fishery Management Plan/ Permit Category	Tonnage Class 1			Tonnage Class 2			Tonnage Class 3			Tonnage Class 4			Totals			
	1994	1995	1996	1994	1995	1996	1994	1995	1996	1994	1995	1996	1994	1995	1996	
Multispecies [4]	Limited access	66	70	102	1090	1056	1107	450	437	427	139	132	127	1745	1695	1763
	Open access	867	839	415	1681	1762	877	308	319	227	122	123	114	2978	3043	1633
	Total	933	909	517	2771	2818	1984	758	756	654	261	255	241	4723	4738	3396
Sea Scallop [4]	Limited access	<3	<3	<3	22	16	15	167	170	159	170	163	154	N/A	N/A	N/A
	Open access	179	189	159	1230	1328	1308	454	445	430	110	112	101	1973	2074	1998
	Total	N/A	N/A	N/A	1252	1344	1323	621	615	589	280	275	255	N/A	N/A	N/A
Lobster [5]	Limited access (com)		217	321		1972	2453		465	489		182	201		2836	3464
	Limited access (rec)		3	<3		16	14		<3	<3		0	0		N/A	N/A
	Open access (com)	495			2302			709			296			3802		
	Open access (rec)	62			270			50			0			382		
	Total	557	N/A	N/A	2572	1988	2467	759	N/A	N/A	296	182	201	4184	N/A	N/A
Summer Flounder	Limited access (com)	58	49	41	410	388	358	512	500	480	226	218	207	1206	1155	1086
	Open access charter/party	108	99	67	545	530	448	99	103	93	<3	<3	<3	N/A	N/A	N/A
	Total	166	148	108	955	918	806	611	603	573	N/A	N/A	N/A	N/A	N/A	N/A
Atlantic Mackerel, Squid & Butterfish	Open access (com)	476	449	416	1616	1598	1641	691	662	656	289	276	265	3072	2985	2978
	Open access (rec)	106	91	68	513	467	421	103	105	103	0	0	0	722	663	592
	Total	582	540	484	2129	2065	2062	794	767	759	289	276	265	3794	3648	3570
Bluefin Tuna [4]	Open access (rec)	2297	2908	7887	1019	1399	4419	16	31	126	0	7	30	3332	4345	12462
	Open access (com)	4441	5196	5531	6000	7451	7963	572	856	810	137	217	212	11150	13720	14516
	Limited access (com)	0	0	0	0	0	0	<3	<3	<3	4	4	4	N/A	N/A	N/A
	Total	6738	8104	13418	7019	8850	12382	N/A	N/A	N/A	141	228	246	N/A	N/A	N/A
Surfclam and Ocean Quahog [6]	ONLY surfclam	41	41	28	199	186	182	99	88	92	45	43	41	384	358	343
	open access/com & rec															
	ONLY ocean quahog	10	11	14	102	113	130	16	16	17	3	3	3	131	143	164
	open access com. & rec.															
	BOTH surfclam & ocean quahog	74	71	82	429	459	535	312	317	324	153	156	155	986	1003	1096
open access comm. & rec																
Total	125	123	124	730	758	847	427	421	433	201	202	199	1483	1504	1603	

[1] Vessels with both commercial and recreational permits under a single FMP are listed under commercial only, to avoid double counting.

[2] Tonnage class (TC) 1 vessels are <5 gross registered tons (grt); TC2, 5-50 grt; TC3, 51-150 grt; TC4, 151+ grt.

[3] Where a category contains fewer than three vessels, the exact number is not reported, for purposes of confidentiality. Rows or columns containing such entries show no totals, but are labeled "N/A."

[4] For these FMPs there are also multiple sub-categories within some of the categories listed here.

[5] In 1994 there were two categories for American lobster, open access commercial and open access recreational. In 1995 and 1996 these became limited access commercial and limited access recreational. For years when a given category did not exist, the cell is blank.

[6] These two fisheries are under an ITQ system. Possession of a permit, therefore, does not convey harvest privileges (see text).

cess can still fish both commercially and recreationally under the highly restrictive open-access categories. (Most recreational multispecies vessels are under open-access categories, though a few have qualified for limited-access permits.) There is also a commercial open-access category for sea scallop. Under the Summer Flounder FMP, nonqualifying vessels can fish only under an open-access party/charter category which is noncommercial. Under the American Lobster FMP, all permits are limited access, whether commercial or recreational. For tuna, the small purse-

seine category is closed to new entrants, but all other categories (commercial and recreational) are open access.

Table 9 indicates the distribution of permits in the Northeast, by FMP and category, and by vessel tonnage class, for 1994, 1995, and 1996. By comparing the numbers of vessels over the three-year period one can begin to examine the potential effects of limited access on the number of vessels in the fishery -- one measure of capacity. The size component is important because of concern that smaller vessels may have more diffi-

culty in qualifying for limited-access permits. Figure 10 offers related data on total numbers of permits. These data are not broken out by size, but cover a longer time span (nine years) giving more historical perspective.

Several data considerations in Table 9 should be noted. First, it is not possible to be permitted concurrently under both limited and open access. For FMPs with only open-access or only limited-access categories, however, a vessel can sometimes be permitted as both commercial and recreational. In such cases, the vessel is included solely in the commercial

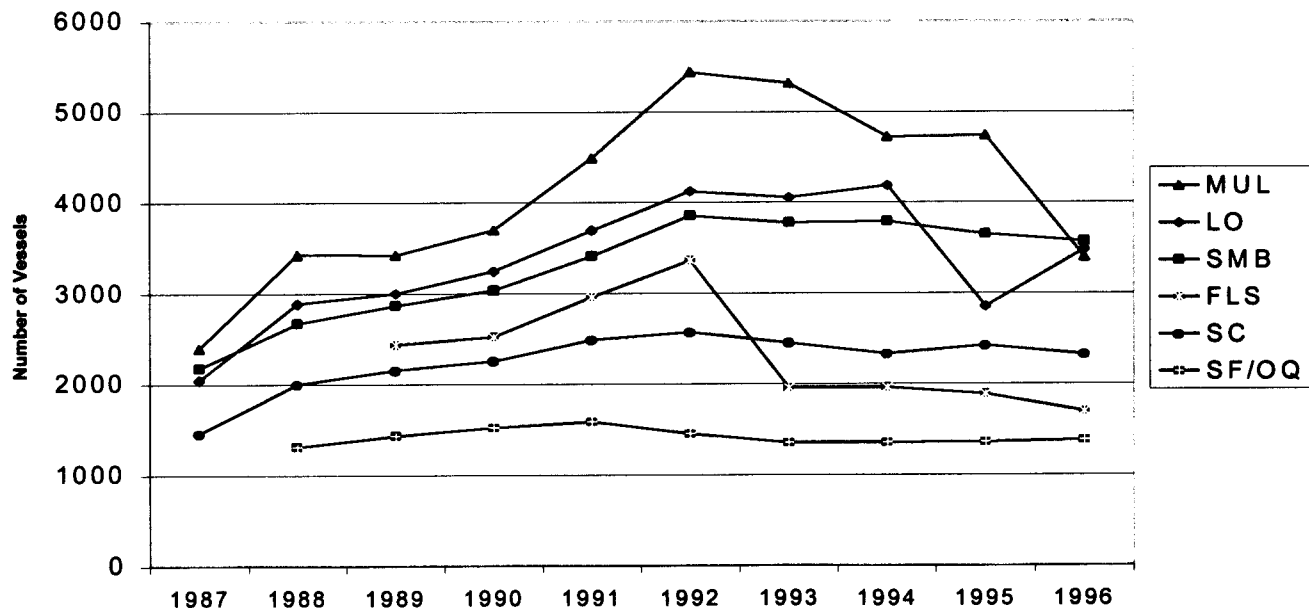


Figure 10. Numbers of unique permitted vessels, 1987-1996: MUL = Multispecies; LO = American Lobster; SMB = Atlantic Mackerel, Squid, and Butterfish; FLS = Summer Flounder; SC = Sea Scallop; SF/OQ = Surfclam & Ocean Quahog.

category. Recreationally permitted vessels are those that have only a recreational permit. This was done to avoid double counting vessels.<sup>1</sup>

It should also be noted that, except for the limited-access category under the Summer Flounder FMP (with its landings requirement), there have always been more permits issued than were actually used. In the past it has been difficult to determine numbers of active permits because the NMFS landings database consolidated landings made by vessels under 5 grt. With the advent of mandatory reporting through logbooks under limited access for the multispecies, sea scallop, and summer flounder fisheries, all vessels with these permits must report total landings, even for trips not landing any of these species. These three FMPs accounted for 70% of all permitted vessels in 1996. This has made it possible to obtain a much

more accurate count of participating vessels.

For Figure 10, 1987 was chosen as the base year. It was the first year that annual permits were issued in the Northeast. Permits obtained in previous years (beginning in the 1970s) were issued in perpetuity, making it difficult to judge annual change.

The most striking features of Table 9 and Figure 10 are the declines in total numbers of permits with the advent of limited access. This trend appears to reflect a number of factors, such as the tendency of fishers to apply for permits whenever the possibility of limited access for a particular fishery is raised (e.g. in 1990 for multispecies). However, not all of these permits will be actively fished. Once limited access is implemented, the number of permits drops because not all of the later entrants will have met the qualifying criteria. It does not usually drop to the level observed prior to limited entry discussions, however, because the fishery may have gained in popularity. Also, not all of those who qualified based on past participation will remain active, yet they retain their permits (unless required to show landings to keep it) because they do not want to lose limited-access status.

This influx of people hoping to qualify for limited entry, combined with the problem of fully identifying active vessels from the commercial landings databases prior to 1994, has made it difficult to judge the true impact of limited entry on numbers of active fishers and vessels. We can make some preliminary assessments, however, noting that some relevant issues are fishery-specific.

For the lobster fishery, there was some confusion among permit holders over who could, or should, apply for limited-access status. Thus, many of those who eventually qualified did not apply until 1996. This accounts for the drop in 1995, when limited entry was implemented, followed by a substantial rise in 1996. For multispecies, the drop was relatively small in 1994 when limited entry came into effect. The larger drop was in 1996, when more restrictive measures were implemented for both limited- and open-access categories, though the most stringent reductions were in open-access categories. For summer flounder, the large decrease likely owes to a combination of the landings requirement and the current state of the resource, rather than to simply the limited entry provisions. For tunas, there has been growth in all

<sup>1</sup> To give a sense of how many vessels would have been double-counted, 1996 data include 45 cases of a vessel holding both a commercial and a recreational summer flounder permit, 20 cases in the lobster fishery; and 197 cases in the squid, Atlantic mackerel, and butterfish fishery. Similarly, vessels in the latter fishery that held both "commercial" and "catcher/processors" permits are counted only once (as commercial). There were 26 such vessels in 1996. These data do not appear in the tables.

the open-access categories from 1994 to 1996<sup>2</sup>, but especially in the recreational or angling category. Some of the increase in commercial open-access categories may owe to groundfishers seeking alternative species.

Surfclam and ocean quahog permits are a special case. Total numbers of surfclam and ocean quahog permit holders show a slight rise between 1994 and 1996. This occurred within the groups of those with ocean quahog only (from 131 to 164) and those with both surfclam and ocean quahog (from 986 to 1096). Numbers of those with only surfclam permits dropped over the period (from 384 to 343). Further, an overall increase appears to occur in numbers of Tonnage Class 2 vessels, while other tonnage categories are stable. However since September 1990, surfclams and ocean quahogs have been managed under individual transferable quotas (ITQs). Only quota-allocation holders may fish under these FMPs. So while it is still possible to acquire and hold a surfclam or ocean quahog permit (neither of which are under a moratorium), a permit conveys no fishing privileges. Therefore, perhaps individuals are holding and acquiring permits on the chance that either the ITQ system will be dismantled or that additional allocations may be granted by the federal government in the future at no cost. Certainly anyone desiring an allocation may buy one from a current allocation holder. Conversely, it is possible to hold an allocation without holding a permit. This is because, unlike permits, allocations are granted solely to persons (individual or corporate) and are not tied to a specific vessel.

In the surfclam and ocean quahog fisheries, the number of ITQ allocations has remained fairly stable.<sup>3</sup>

<sup>2</sup> In 1994, multiple tuna permit categories were allowed. Beginning in 1995, a permit holder was required to choose one category only, according to specific guidelines. To facilitate comparison, 1994 permits were assigned to the category required under the new rules.

<sup>3</sup> Although numbers of allocation holders are similar to the numbers of Tonnage Class 1 permit holders, there is no correlation between these two groups.

Table 10. Number of vessels holding selected fishery management plan permits or permit combinations in the Northeast fisheries, by year, 1994-1996

Permit or Permit Combination <sup>1</sup>	Number of Permits by Year		
	1994	1995	1996
American Lobster Only	457	646	1,083
Multispecies; Atlantic Sea Scallop; American Lobster; Summer Flounder; Atlantic Mackerel, Squid and Butterfish	951	718	743
Multispecies; Atlantic Sea Scallop; American Lobster; Atlantic Mackerel, Squid and Butterfish	790	517	581
Multispecies Only	634	697	570
Multispecies; Summer Flounder; Atlantic Mackerel, Squid and Butterfish	273	546	447
Multispecies; American Lobster	509	418	417
Multispecies; Atlantic Mackerel, Squid and Butterfish	343	539	396
Atlantic Mackerel, Squid and Butterfish Only	146	149	318
Multispecies; Atlantic Sea Scallop; Atlantic Mackerel, Squid and Butterfish	46	391	314
Multispecies; Atlantic Sea Scallop; Summer Flounder; Atlantic Mackerel, Squid and Butterfish	20	273	213
Multispecies; American Lobster; Atlantic Mackerel, Squid and Butterfish	444	193	206

<sup>1</sup> All combinations representing 5% or more of the total number of unique permitted vessels for a given year--excluding permits for tunas and for surfclams and ocean quahogs (see text).

There were 114 surfclam allocation holders in 1994, 113 in 1995, and 115 in 1996. For ocean quahogs there were 70 allocation holders in 1994, 68 in 1995, and 67 in 1996. (These data are not shown in tabular form.)

With respect to impacts of limited entry by vessel size, as noted in the section of this report titled "Fleets and Fish", the majority of the vessels in the Northeast are under 50 grt. For those fisheries with both limited- and open-access commercial categories (*i.e.*, multispecies and sea scallop), the open-access fleet tends to comprise smaller vessels on average than does the limited-access fleet; although there are a few very large open-access vessels. In 1996, 80% of open-access

permitted vessels in the multispecies fishery were small (0-50 grt), while only 68% of those under limited-access permits fell within this range. For the sea scallop fishery in 1996, corresponding figures were 73% and 1% respectively. While some of the disparity in both cases may be related to small vessels having initial difficulty in qualifying for the moratorium (many gained limited-access status later, on appeal), it is more likely that open-access trip limits were sufficiently generous that owners of small vessels did not feel the need to apply for limited-access status. In the lobster fishery, for instance, many Tonnage Class 1 and 2 lobster vessel owners did not initially apply for lim-



ited access in 1995, but subsequently secured limited-access permits when they realized they could not fish outside of state waters without one.

The greater disparity for scallopers than for multispecies vessels owes to three factors. First, in all three years, vessels with scallop permits were larger on average than vessels with multispecies permits, despite the fact that these are overlapping sets, with some vessels holding both permits. (Average tonnages for scallop- and multispecies-permitted vessels in 1996 were 57 grt and 42 grt, respectively). Second, a number of inshore scallopers (which tend to be smaller, especially in Maine) did not apply for limited-access permits, probably because of the permit's requirement that holders follow federal gear regulations in state waters. Third, there was a minimum landing requirement in order to gain limited access under the sea scallop FMP (400 lb of scallop meats or 50 U.S. bushels of shell stock on any trip in the qualifying period). Under the multispecies FMP, the equivalent requirement was simply for landings (as little as one pound) during the qualifying period.

In the multispecies limited-access fleet, the numbers of Tonnage Class 1 and, to a lesser extent, Tonnage Class 2 vessels increased from 1994-1996, while the numbers of Tonnage Class 3 and 4 vessels declined or remained the same. This may be related to more relaxed measures for the smallest vessels (in 1994 and 1995 those less than 45 ft in length, and in 1996 those less than 30 ft in length). Measures granting less restrictive limits to scallop vessels fishing with smaller dredges, however, have not had a similar effect in that fishery.

Another important measure of potential effort, including possible shifts between fisheries in response to regulatory changes or other factors, is the number and variety of permits held by individual vessels. In the Northeast, a given vessel can potentially be permitted simultaneously under all seven FMPs. Table 10 provides information on numbers of vessels holding common combinations

of permits for 1994-1996. Because surfclam and ocean quahog permits do not convey fishing privileges they are not considered. Tuna permits are not considered either because of scale. In 1996, for example, there were more than 26.9 thousand unique vessels with tuna permits included (an exact figure is not provided due to confidentiality considerations in Table 9), but 6,008 otherwise. Further, all of the 6,008 held tuna permits. The total number of unique permitted vessels for this analysis, therefore, was 5,896 in 1994, 5,939 in 1995, and 6,008 in 1996.

A large number of vessels were permitted under only a single FMP (e.g., in 1996, 1,083 held only a lobster permit, 570 held only a multispecies permit, 318 held only an Atlantic mackerel, squid, and butterfish permit). In fact, statistically, the most common (modal) number of permits held by a given vessel in any of the three years is one. For those that did hold more than one permit, the most common group in 1996 was that including those who held all five non-ITQ and non-tuna permits, followed by a combination of multispecies; Atlantic mackerel, squid, and butterfish; American lobster; and Atlantic sea scallop; and finally, the multispecies; summer flounder; and Atlantic mackerel, squid, and butterfish combination. These combinations all include a mix of higher- and lower-value species (see discussions of landings and value earlier) and of fisheries under more and less restrictive regulations, indicating an attempt to balance risks and benefits.

Over the three years considered, the American lobster only category has consistently increased in size, especially in 1996 when lobster limited-access permit applications and appeals were finalized. This is not surprising given the high value of lobster landings in recent years. Numbers of multispecies permits increased from 1994 to 1995, but then dropped steeply in 1996, most likely owing to implementation of stricter rules -- especially in the open-access categories -- and continued low stock levels

for this period. Numbers of those holding only the Atlantic mackerel, squid, and butterfish permit rose precipitously, probably owing to relatively high abundance of these species.

The size of the group with the most potential flexibility (those who held all five permits) dropped nearly 25% from 1994 to 1995, but then increased slightly from 1995 to 1996. Not all fisheries that Northeast vessels engage in, of course, require federal permits at this time. So, these figures cannot be taken as a strong predictor of levels of diversification within the Northeast fleet. Nonetheless, the change from 1994 to 1995 was statistically significant. The initial lessening of diversification in the variety of permits held within this subset of fisheries may be related to limited entry rules and/or to stock conditions. Review of data from the scup and the black sea bass fisheries, which came under limited entry in 1997, will be instructive in this regard.

## FLEETS AND FISH

Tables 11 through 18 present condensed pictures of the activity of known vessels captured by the different data collection systems in effect during 1994-1996. The picture is complicated somewhat by the changes that occurred in our data collection system during these years and the consequent use of multiple databases. Because of this, caution is urged in the interpretation of effort related measures. In the future, these problems will be resolved by explicitly linking the dealer and vessel logbook databases together.

All information relative to individual vessel activity has been aggregated into annual summaries on the basis of gear use, area fished, and tonnage class. Most information concerns effort, landings, and revenue. No cost information is reported. Several caveats are in order concerning categorization of vessels by fleet. In general, if a vessel landed at least

Table 11. Characteristics, activity, and revenue data for New England otter trawl vessels by vessel tonnage class, 1994-1996; data for all trips included, regardless of gear used[1,2]

	Tonnage Class 1			Tonnage Class 2			Tonnage Class 3			Tonnage Class 4		
	1994	1995	1996	1994	1995	1996	1994	1995	1996	1994	1995	1996
Number of vessels	31	40	44	419	488	510	299	291	284	94	90	96
Average age	14	15	15	24	22	21	22	28	36	14	14	15
Average GRT	3	3	3	24	23	23	102	100	100	177	177	179
Average days absent	-	-	-	129	97	108	154	126	128	136	85	143
Average crew size	2.3	2.2	2.3	2.5	2.5	2.4	4.2	4.0	4.2	6.4	6.2	6.4
Revenue per day absent (\$)	-	-	-	488	707	621	1637	2064	2148	4418	6742	4132
Landings per day absent (lb)	-	-	-	738	955	962	2583	3121	3579	7739	12758	8267
Total revenue (\$, millions)	0.8	0.9	1.1	26.4	33.4	34.2	75.4	75.7	78.1	56.5	51.6	56.7

[1] Tonnage Class (TC) 1 vessels, <5 gross registered tons (grt); TC2, 5-50 grt; TC3, 51-150 grt; and TC4, >150 grt

[2] Dash indicates fewer than 10 vessels available on which to base effort estimates

once in a port in a region, its total activity (*i.e.*, all trips regardless of gear used) was ascribed to that particular region, defined as either New England, Mid-Atlantic and Chesapeake, or the entire Northeast. Hence, a vessel's activity may be represented in more than one table. The same multiple representation exists for gear use. For example, if a vessel gillnetted and longlined in the same year, its total activity will be represented in the total activity sections of both tables. Its "primary gear" activity, however, reflects only that activity that occurred while using one gear type (*i.e.*, either gillnetting or longlining). For some, no distinction is made between primary gear activity and total activity because a gear's use constituted the overwhelming majority of the activity of that fleet.

## New England Otter Trawl

In 1996, the total revenue for New England otter trawlers was derived primarily from goosefish (14%), cod (12%), *Loligo* squid and American plaice (both 10%), winter flounder (8%), and witch flounder and lobster (both 6%). The total number of vessels using this gear in New England increased in 1994, 1995 and 1996 for the first time since 1988 (not reported in table), even after allowing for the addition of Tonnage Class 1 vessels to the database (Table 7). In

Table 12. Characteristics, activity, and revenue data for Mid-Atlantic otter trawl vessels, by vessel tonnage class, 1994-1996; data for all trips included, regardless of gear used[1]

	Tonnage Class 2			Tonnage Class 3			Tonnage Class 4		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Number of vessels	86	122	117	184	190	182	55	56	54
Average age	25	24	21	21	41	43	17	17	16
Average grt	30	26	24	104	108	108	180	177	180
Average days absent	125	55	97	149	125	155	142	118	172
Average crew size	2.4	2.2	2.3	4.6	4.7	4.8	7.1	7.5	7.3
Revenue per day absent (\$)	286	1068	574	1291	1822	1569	3161	3846	2722
Landings per day absent (lb)	566	1736	762	3410	3832	3627	8260	8780	6895
Total revenue (\$, million)	3.1	7.2	6.5	35.4	43.3	44.2	24.7	25.4	25.3

[1] Tonnage class (TC) 2 vessels, 5-50 gross registered tons (grt); TC3, 51-150 grt; and TC4, >150 grt; TC1 vessels omitted due to insufficient data

1996, the fleet comprised 934 vessels, with the greatest increase occurring among Tonnage Class 2 vessels, which compose 55% of the total (Table 11). This may be related to Multi-species FMP regulations in effect during 1994-1996, which exempted smaller vessels from certain effort restrictions. Total revenue (in actual dollars) and effort measures increased for all four tonnage classes in 1996.

## Mid-Atlantic Otter Trawl

In 1996, the total revenue for Mid-Atlantic otter trawlers was derived primarily from summer flounder (23%), *Loligo* and *Illex* squid (20% and 9%, respectively), whiting (14%), and scup (5%). The number of

vessels using this gear in the Mid-Atlantic decreased to 356 in 1996, down from a high of 375 in 1995, the highest number since 1988 (Table 7 shows vessel totals since 1991). The increase in vessel numbers since the early 1990s may represent displaced effort from New England in response to tighter effort controls and area closures. The increases in the numbers of vessels in 1995 and 1996 occurred primarily in Tonnage Class 2 (Table 12), with the additions to Tonnage Class 1 being negligible. All tonnage classes exhibited increases in revenue per-day-absent in 1995, that fell again in 1996, despite variations in the average number of days absent from port over the past few years. Average days absent increased in 1996, presumably in an effort to counteract low landings.

### Northeast Scallop Dredge

Table 13 shows the activity of the Northeast sea scallop dredge fleet. A dramatic increase in the number of Tonnage Class 2 vessels is evident, partly owing to part-time scallopers who did not use their permit in 1995 but did so in 1996. Total revenue (in actual dollars) rose over all three years in all size categories of vessels. Among Tonnage Class 2 and 4 vessels, revenue per-day-absent dropped off in 1996 while it rose slightly for Tonnage Class 3. Landings per-day-absent increased in 1996 for Tonnage Class 3 and 4 vessels.

Table 13. Characteristics, activity, and revenue data for Northeast vessels using scallop dredges, by vessel tonnage class, 1994-1996; data for all trips included, regardless of gear used[1]

	Tonnage Class 2			Tonnage Class 3			Tonnage Class 4		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
Number of vessels	65	64	120	82	80	82	131	134	132
Average age	22	21	19	21	44	34	18	18	17
Average grt	23	21	19	120	118	120	181	181	180
Average days absent	73	70	61	195	220	218	198	242	295
Average crew size	2.6	2.5	2.5	7.5	7.6	7.3	9.1	9.1	8.3
Revenue per day absent (\$)	639	665	498	1580	1518	1586	2310	2011	1825
Landings per day absent (lb, live wt)	873	979	848	4499	2714	3865	3784	3191	3671
Total revenue (\$, million)	3.0	3.0	3.6	25.3	26.7	28.4	59.9	65.2	71.1

[1] Tonnage Class (TC) 2 vessels, 5-50 gross registered tons (grt); TC3, 51-150 grt; and TC4, >150 grt; TC1 vessels were omitted due to insufficient data

### Northeast Shrimp Trawl

The northern shrimp fishery is seasonal (winter/spring.) In 1996, 98% of shrimp landings were made by vessels using shrimp trawls and 94% of the fleet consisted of Tonnage Class 2 or 3 vessels. The principal gears used by shrimp vessels during the six month off-season are otter trawls, gillnets, and lobster traps.

Table 14 shows the activity of the shrimp fleet, both in-season (shrimp trawls only) and off-season. Shrimp trawl gear was used during 61% of the days spent at sea, and contributed 45% to the total fleet revenues. In 1996, revenue and landings per-day-absent declined.

Table 14. Characteristics, activity, and revenue data for Northeast vessels using shrimp trawls, by vessel tonnage class 1994 - 1996; data included for all trips and trips using shrimp gear only[1,2]

	Tonnage Class 1			Tonnage Class 2			Tonnage Class 3		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
<b>All Trips</b>									
Number of vessels	8	15	20	202	237	258	36	49	52
Average age	12	15	15	19	18	18	24	24	20
Average grt	3	3	3	22	22	22	77	80	85
Average days absent	-	-	-	37	34	39	-	-	-
Average crew size	2.1	2.3	2.1	2.3	2.4	2.3	3.4	3.2	3.3
Revenue per day absent (\$)	-	-	-	1952	2250	1781	-	-	-
Landings per day absent (lb)	-	-	-	2711	2720	2487	-	-	-
Total revenue (\$, million)	0.5	0.8	0.8	14.6	18.1	17.9	7.5	12.1	13.5
<b>Trips Using Shrimp Trawls Only</b>									
Average days absent	-	-	-	28	-	24	-	-	-
Average crew size	2.1	2.3	2.1	2.3	2.4	2.3	3.4	3.2	3.3
Revenue per day absent (\$)	-	-	-	752	-	1310	-	-	-
Landings per day absent (lb)	-	-	-	971	-	1834	-	-	-

[1] Tonnage Class (TC) 1 vessels, <5 gross registered tons (grt); TC2, 5-50 grt; TC3, 51-150 grt; and TC4, >150 grt

[2] Dash indicates fewer than 10 vessels available on which to base effort estimates

### Northeast Gillnet

This gear category excludes data for trips using large-mesh drift-net gear in the large pelagic fishery. In 1996, total revenue for small-mesh drift and sink gillnets was derived primarily from cod (24%), goosfish (24%), spiny dogfish (16%), and pollock (10%). Gillnet vessels are for the most part Tonnage Class 2 vessels that employ other gear (usually otter trawls and shrimp trawls) for approximately 15% of the year on average.

The number of vessels in this fishery increased from 367 in 1994 to

472 in 1996 (Table 15); this reflects in part changes in reporting systems, as mentioned. For the fleet as a whole, average revenue per-day-absent and landings per-day-absent decreased between 1996 and 1995.

### Hook

This category of gear includes longlines, setlines, and line trawls. In

1996, 83% of the total revenue from these related gears was attributed to swordfish (26%), bigeye tuna (20%), cod (15%), yellowfin tuna (12%), and tilefish (10%).

Participation in this fleet increased from 316 vessels in 1994 to 362 vessels in 1995, before dropping to 278 vessels in 1996 (Table 16). Revenue per-day-absent for Tonnage Class 2 vessels increased over 1995 levels, although total revenue declined for Tonnage Classes 1, 2, and 3.

## Surfclam and Ocean Quahog Dredge

This fishery has stabilized in many respects owing to the individual transferable quota (ITQ) management system implemented in 1991. In 1995, the number of vessels in the fishery declined by 16% (to 100, which includes Tonnage Class 1) after several years of stability, as vessel quotas were further consolidated. In 1996 the number of vessels remained stable (101, including Tonnage Class 1).

The activity summarized in Table 17 is divided between the activity of all vessels in the Northeast region using surfclam/ocean quahog dredges and those vessels landing only in Mid-Atlantic ports. Of the 101 vessels operating in the region in 1996, 47 landed outside the Mid-Atlantic area.

During the last five years, some vessel owners agreed to harvest surfclams owned under another ITQ. These vessels received about half the market price of the catch. The lower price received by these vessels reflected the rental price for capital and labor services to harvest the resource, which was lower than the full market value of the clams. The ITQ owner then received the difference between the rental price and the full fair market value. The revenue for the surfclam fishery, as stated in Table 5,

Table 15. Characteristics, activity, and revenue data for Northeast vessels using gillnets, by vessel tonnage class, 1994-1996; data included for all trips and trips using gillnets only[1,2]

	Tonnage Class 1			Tonnage Class 2			Tonnage Class 3		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
<b>All Trips</b>									
Number of vessels	14	37	25	331	424	394	22	27	53
Average age	17	17	16	19	19	17	16	18	17
Average grt	3	2	3	18	19	20	97	84	80
Average days absent	43	24	55	150	105	121	-	153	165
Average crew size	1.9	1.8	2.3	2.7	2.7	2.7	4.2	3.8	4.0
Revenue per day absent (\$)	448	1439	786	553	874	753	3230	2232	1112
Landings per day absent (lb)	1338	2844	1701	1061	1594	1532	3683	2031	1607
Total revenue (\$, million)	0.3	1.3	1.1	27.5	38.9	35.9	6.9	7.1	9.7
<b>Trips Using Gillnets Only</b>									
Average days absent	38	17	36	140	94	104	-	-	116
Average crew size	1.9	1.8	2.3	2.7	2.7	2.7	4.2	3.8	4.0
Revenue per day absent (\$)	331	1463	661	472	718	632	-	-	402
Landings per day absent (lb)	1170	3358	1988	1000	1485	1488	-	-	694

[1] Tonnage Class (TC) 1 vessels, <5 gross registered tons (grt); TC2, 5-50 grt; TC3, 51-150 grt; TC4 vessels omitted due to insufficient data

[2] Dash indicates fewer than 10 vessels available on which to base effort estimates

was adjusted so that the prices paid to ITQ owners were taken into account. In the case of vessel performance, however, unadjusted revenues are reported, reflecting what vessels actually earned (Table 17).

### Offshore Lobster Traps/Pots

The delineation between offshore and inshore lobster fisheries is not

precise, as many vessels fish both sides of the three-mile line that divides inshore from offshore. Roughly 20% of the lobster revenue in 1996 was from offshore trips, while 80% was from inshore. A small portion of lobsters are taken offshore as bycatch by the otter trawl fleet.

The offshore lobster fleet is dominated by Tonnage Class 2 and 3 vessels. Activity by Tonnage Class 1 and 4 vessels was too limited for inclu-

Table 16. Characteristics, activity, and revenue data for Northeast vessels using hook gear, by vessel tonnage class, 1994-1996; data included for all trips and trips using hook gear only[1,2]

	Tonnage Class 1			Tonnage Class 2			Tonnage Class 3			Tonnage Class 4		
	1994	1995	1996	1994	1995	1996	1994	1995	1996	1994	1995	1996
<b>All Trips</b>												
Number of vessels	58	70	19	184	217	184	61	59	58	13	16	17
Average age	15	14	17	15	16	15	17	17	17	14	14	12
Average GRT	2	2	3	20	20	20	94	95	95	173	168	167
Average days absent	32	12	-	89	62	57	-	-	-	-	-	-
Average crew size	2.2	2.0	2.2	2.5	2.6	2.6	4.6	4.5	5.5	6.2	6.4	5.5
Revenue per day absent (\$)	262	2245	-	839	1240	1371	-	-	-	-	-	-
Landings per day absent (lb)	319	1895	-	934	1617	1983	-	-	-	-	-	-
Total revenue (\$, million)	0.5	1.9	0.3	13.7	16.7	14.4	18.1	14.9	12.8	4.5	5.3	9.8
<b>Trips Using Hook Gear Only</b>												
Average days absent	30	12	-	79	42	44	-	-	-	-	-	-
Average crew size	2.2	2.0	2.2	2.5	2.6	2.6	4.6	4.5	5.5	6.2	6.4	5.5
Revenue per day absent (\$)	122	1632	-	577	945	779	-	-	-	-	-	-
Landings per day absent (lb)	167	1035	-	491	1046	965	-	-	-	-	-	-

[1] Tonnage Class (TC) 1 vessels, <5 grt; TC2, 5-50 grt; TC3, 51-150 grt; and TC4, >150 grt

[2] Dash indicates fewer than 10 vessels available on which to base effort estimates

sion in Table 18. The inshore fleet is dominated by Tonnage Class 1 and 2 vessels.

Total revenue (and landings) of offshore lobster increased in 1996, but revenue per-day-absent fell for the smaller vessels. Both Tonnage Class 2 and 3 vessels relied heavily on offshore lobster pots; it apparently was not worthwhile for these vessels to diversify to other gear types.

### AQUACULTURE

Although aquaculture is growing and has potential for supplementing wild-catch fishery products in many seafood markets, aquacultural activities in the Northeast are mostly experimental. The success of Atlantic salmon farms, however, has sparked interest in raising other species. Salmon production in Maine rose substantially in 1995 (as growers concentrated strictly on Atlantic salmon), while production of steelhead trout declined. The rate of growth of domestic farm-raised salmon in the Northeast has since slowed, owing to the scarcity of high quality sites and the cost of obtaining new farming permits. Almost all of the increase in production in the last several years has been at existing leases, as opposed to additional lease sites.

Considerable effort is being expended to examine the possibility of farm-raising a number of species that are presently available in commercial quantities only through wild harvest. Recent restrictions on traditional fishing practices have greatly increased interest in raising cod, haddock, and summer flounder experimentally in the Northeast. Surfclam, soft-shell clam, mussel, oyster, bay scallop and sea scallop are also emerging as viable species for aquaculture shellfish projects.

### TRADE

Historically, the Northeast region has run a trade deficit in edible fishery products because of the large port of entry in the city of New York and

Table 17. Characteristics, activity, and revenue data for Northeast surfclam and ocean quahog vessels and Mid-Atlantic vessels only, by vessel tonnage class, 1994-1996[1,2]

	Tonnage Class 2			Tonnage Class 3			Tonnage Class 4		
	1994	1995	1996	1994	1995	1996	1994	1995	1996
<b>All Regional Surfclam/Ocean Quahog Vessels</b>									
Number of vessels	35	29	39	59	44	33	24	23	25
Average age	20	20	13	25	23	21	20	20	20
Average grt	20	15	15	104	112	113	176	176	177
Average days absent	31	60	51	80	106	87	-	-	-
Average crew size	2.6	2.5	2.6	4.0	4.0	4.3	4.9	5.0	5.0
Revenue per day absent (\$)	1409	1076	1201	6474	6422	10228	-	-	-
Landings per day absent (lb, live wt)	6524	4316	4433	73826	70176	108811	-	-	-
Total revenue (\$, million)	1.5	1.9	2.4	30.6	30.0	29.4	22.9	21.3	23.2
<b>Mid-Atlantic Surfclam/Ocean Quahog Vessels Only</b>									
Number of vessels	9	3	2	49	36	31	24	22	21
Average days absent	-	-	-	65	109	66	-	-	-
Average crew size	3.0	3.6	3.5	4.0	4.3	4.3	4.9	4.7	5.2
Revenue per day absent (\$)	-	-	-	490	7270	14006	-	-	-
Landings per day absent (lb, live wt)	-	-	-	99727	78042	145290	-	-	-
Total revenue (\$, million)	0.6	0.7	0.4	27.0	28.5	28.7	22.9	20.8	19.9

[1] Tonnage Class (TC) 2 vessels, 5-50 gross registered tons (grt); TC3 vessels, 51-150 grt; and TC4 vessels, > 150 grt; TC1 vessels were omitted due to insufficient data  
 [2] Dash indicates fewer than 10 vessels available on which to base effort estimates

Table 18. Characteristics, activity, and revenue data for Northeast vessels using offshore lobster gear by vessel tonnage class, 1994-1996; data included for all trips and offshore lobster trips only[1]

	Tonnage Class 2			Tonnage Class 3		
	1994	1995	1996	1994	1995	1996
<b>All Trips</b>						
Number of vessels	56	59	81	34	38	38
Average age	20	21	18	15	14	13
Average grt	25	22	22	85	83	91
Average days absent	48	35	35	199	184	221
Average crew size	3.5	2.5	2.6	4.3	4.3	4.3
Revenue per day absent (\$)	1844	2125	2061	1419	1471	1744
Landings per day absent (lb)	948	1282	1304	663	689	830
Total revenue (\$, million)	5.0	4.4	5.8	9.6	10.3	14.6
<b>Offshore Lobster Trips Only</b>						
Average days absent	43	35	33	159	184	212
Average crew size	3.5	2.5	2.6	4.3	4.3	4.3
Revenue per day absent (\$)	1103	982	1477	1619	1361	1269
Landings per day absent (lb)	398	393	532	615	541	501

[1] Tonnage Class (TC) 2 vessels, 5-50 gross registered tons (grt); TC3, 51-150 grt; TC1 and TC4 vessels were omitted due to insufficient data.

the region's proximity to Canadian fishing ports. Between 1994 and 1996, this deficit decreased by \$230.1 million. Imports declined by \$155.2 million (6.6%) in value between 1994 and 1996, while exports increased

\$74.9 million (14%). (See Tables 19 and 20).

Increases in the value of product specific imports during this time (Table 19) include fresh or frozen salmon (\$21.8 million), frozen

groundfish blocks (\$31.8 million), fresh lobster (\$7.1 million), and other lobster products (\$9.0 million). These were offset by decreases in the value of imported fresh or frozen sea herring (\$1.8 million), frozen whole groundfish, halibut and other flatfish (\$2.5 million), ocean perch fillets (\$20.2 million), fresh groundfish and flatfish fillets (\$4.6 million), frozen groundfish and flatfish fillets (\$11 million), canned tuna (\$28.6 million), minced fish (\$12.6 million), crab products (\$10 million), frozen lobster (\$12.7 million), scallops (\$35.6 million), and shrimp products (\$151 million).

Product-specific exports (Table 20) that increased in value between 1994 and 1996 included fresh or frozen herring (\$2.5 million), processed herring products (\$5.7 million), fresh or frozen salmon (\$10.6 million), fresh or frozen cod (\$8.2 million), fresh or frozen mackerel (\$2.6 million), fresh or frozen dogfish (\$8.1 million), fresh or frozen fish fillets (\$9.9 million), fish sticks and portions (\$1.7 million), roe products other than sea urchin roe (\$1.9 million), fresh lobster (\$19.9 million), frozen lobster (\$2.9 million), fresh shellfish (\$2.6 million), and fresh or frozen scallops (\$1.5 million). These were partially offset by decreases in the value of exports of fresh or frozen tuna (\$9.3 million), live sea urchin (\$2.8 million), sea urchin roe (\$7.8 million), frozen shrimp (\$1.4 million), canned shrimp (\$1.1 million), crab products (\$1.8 million), and fresh or frozen squid (\$9.7 million).

Canada has traditionally been the largest fishery trading partner for the New England states. Between 1994 and 1995, however, overall imports into New England increased, while Canadian imports declined (Table 21). This was followed in 1996 by both an increase in overall imports, and an increase in Canadian imports over 1995 levels. Overall Canadian market share dropped from 27% to 22% between 1994 and 1995, and then increased to 24% in 1996. Because Canada closed several major fishing areas and implemented other restric-

Table 19. Value of imported edible fishery products in the northeast, 1994-1996 (millions of dollars)

Product Category	1994	1995	1996
Fresh or frozen sea herring	3.4	1.6	1.6
Fresh whole groundfish, halibut and other flatfish	40.0	35.7	39.9
Frozen whole groundfish, halibut and other flatfish	18.3	20.1	15.8
Fresh or frozen salmon	68.1	70.9	89.9
Frozen groundfish blocks	120.7	157.0	152.5
Other fish fresh or frozen	69.9	71.3	74.9
Ocean perch fillets	61.2	53.6	41.0
Fresh groundfish and flatfish fillets	39.3	35.3	34.7
Frozen groundfish and flatfish fillets	287.2	296.4	276.2
Other fresh or frozen fillets	141.4	147.7	151.0
Salted or dried groundfish	35.2	34.3	35.0
Salted herring	3.8	3.4	3.2
Canned tuna	141.4	123.0	112.8
Canned sardines	29.2	32.2	28.7
Minced fish	25.4	12.1	12.8
Clam products	12.3	11.1	11.6
Crab products	87.1	86.0	77.1
Lobster, fresh	117.4	125.0	124.5
Lobster, frozen	161.7	168.0	149.0
Other lobster products	48.8	56.2	57.8
Scallops	158.4	134.5	122.8
Shrimp products	503.3	440.9	352.3
Squid	19.8	19.3	25.2
Other fishery products	164.7	182.8	212.5
<b>Totals</b>	<b>2,358.0</b>	<b>2,318.4</b>	<b>2,202.8</b>

tive harvesting practices over the last several years, the drop in Canadian imports is not surprising. Among the individual categories, Canadian market share of cod, other finfish, and scallops increased during this time period, while market share of other groundfish and flatfish declined. The Canadian market share of scallops increased, even though the total imports of scallops from Canada declined. This is owing to a general decline in scallop imports between 1994 and 1996.

Table 22 lists the top ten countries (by value) receiving exports of

fishery products from the Northeast region during 1994, 1995, and 1996. Canada was the region's most important trading partner in terms of export value, followed by Japan. Six of the top ten countries belonged to the European Union, and as a block they accounted for more of the total export value than did Japan. Exports to the top ten nations increased in value 7% between 1994 and 1995, and 1% between 1995 and 1996. Together, the top ten nations accounted for 78% of the value of all fishery product exports from the Northeast Region in 1996.

Table 20. Value of exported fishery products (including re-exports)<sup>1</sup> in the Northeast, 1994-1996 (millions of dollars)

Product Category	PROCESSING		
	1994	1995	1996
Fresh or frozen herring	1.1	1.2	3.6
Processed herring products	9.8	11.1	15.5
Fresh or frozen salmon	25.6	36.1	36.2
Fresh or frozen cod	6.1	14.3	14.3
Fresh or frozen mackerel	2.1	2.3	4.7
Fresh or frozen dogfish	20.1	26.6	28.2
Butterfish	3.2	2.2	3.5
Fresh or frozen tuna	23.8	18.4	14.5
Other fish, fresh or frozen	74.2	95.3	96.0
Fresh or frozen fish fillets	22.5	30.0	32.4
Fish sticks & portions	3.1	4.3	4.8
Sea urchin, live	10.7	10.1	7.9
Sea urchin, roe	56.6	53.3	48.8
Other roe products	7.9	10.2	9.8
Shrimp fresh	3.1	2.0	3.2
Shrimp frozen	40.3	43.7	38.9
Shrimp canned	10.0	10.9	8.9
Lobster, fresh	107.7	109.7	127.6
Lobster, frozen	4.8	7.1	7.7
Other lobster products	0.2	0.4	1.0
Crab products	9.6	7.9	7.8
Fresh or frozen squid	22.4	21.1	12.7
Shellfish fresh	5.2	6.5	7.8
Clam products	4.4	4.4	4.7
Fresh or frozen scallops	14.0	15.1	15.5
Other shellfish	5.4	5.7	8.1
Other edible fishery products	40.8	37.8	45.5
<b>Totals</b>	<b>534.7</b>	<b>587.7</b>	<b>609.6</b>

<sup>1</sup> Re-exports consist of commodities of foreign origin which have entered the United States for consumption or into Customs bonded warehouses or U.S. Foreign Trade Zones, and which, at the time of exportation, are in substantially the same condition as when imported (U.S. Census Bureau, Guide to Foreign Trade Statistics, Internet address: <http://www.census.gov/foreign-trade/www/sec2.html>)

Table 21. New England imports of selected fishery products<sup>1</sup> from Canada and all other countries 1994-1996 (thousands of metric tons)

Product	1994		1995		1996	
	Canada	Other	Canada	Other	Canada	Other
Cod	27.3	125.6	23.8	130.7	33.9	105.8
Flatfish <sup>2</sup>	17.1	16.0	12.2	28.3	14.0	15.8
Other groundfish <sup>3</sup>	58.3	185.4	49.9	204.2	44.1	244.5
Other finfish	28.1	44.1	23.6	45.5	31.6	39.4
Scallops	8.6	5.1	6.6	4.8	5.9	2.8
<b>Total</b>	<b>139.4</b>	<b>376.2</b>	<b>116.1</b>	<b>413.5</b>	<b>129.5</b>	<b>408.3</b>

<sup>1</sup> With the exception of scallops, product forms include whole fresh or frozen, frozen blocks, and fresh or frozen fillets. Finfish weights are expressed in live weight equivalents and scallops in meat weight equivalents.

<sup>2</sup> Includes halibut.

<sup>3</sup> Includes cusk, hake, haddock, pollock, and ocean perch.

Fish processors in the Northeast Region use both domestic landings and, increasingly, imported products. Processing is defined as any activity that adds value to raw products, for example, filleting, cooking, bread-ing, canning, or smoking. The most important processed products (by value) are fresh or frozen fish fillets, and breaded, cooked fish.

In 1995, New England plants produced most (92%) of the fresh and frozen fish fillets, steaks, or other processed portions produced in the Northeast, while Mid-Atlantic plants produced 73% of the canned products and 91% of the cured products.

Edible fish product processing of regionally caught species was led by surfclam processors, producing canned products of whole and minced clams, chowder, and juice.

The number of plants and their average annual employment levels (as identified in the annual processed product surveys during 1990-1995) are shown in Table 23.

In New England, the number of employees in processing plants increased in 1995, after two particularly low years in 1993 and 1994. Employment in Mid-Atlantic processing plants declined annually through 1994, but increased in 1995.

The number of processing firms throughout the Northeast region has declined steadily through 1995, reflecting the shrinking supply of fresh domestic fish as well as little substitution of imported product for domestic. The average number of employees per plant has increased, since the number of processing plants in the region is at a new low.

The number of plants and employees in wholesaling establishments in the region (both New England and Mid-Atlantic) showed a dramatic rise in 1995 (61% for number of employees; 42% for number of plants). The number of wholesaling plants in the Mid-Atlantic more than doubled in 1995.

## FOREIGN FISHING AND JOINT VENTURES

Foreign fishing operations within 200 miles of the U.S. coastline came under direct federal control through the passage of the Magnuson Fishery Conservation and Management Act in 1976. Joint venture arrangements started in 1982. Since that time, directed foreign fishing has been phased out; and during 1992-1996, there were no joint ventures within this region.

Internal Waters Processing arrangements have been successful, stable operations for more than 10 years. These programs are administered by the states (Maine, Massachusetts, Rhode Island, New York, and New Jersey in particular) and allow U.S. vessels to fish for herring (and some mackerel) in state waters and offload to foreign ships (Russian) for processing. In 1994, 1995, and 1996, a handful of vessels were involved and about 3,000, 9,000, and 11,000 mt of herring were landed, respectively, in each year under these agreements.

## RECREATIONAL FISHING

Preliminary data collected by the Marine Recreational Fisheries Statistics Survey (MRFSS) indicate that the total number of finfish caught by recreational anglers in the Northeast Region declined to 109.8 million in 1996 (from 110.5 million in 1995; Figure 11). Catches in the Mid-Atlantic decreased slightly (from 88.5 million fish in 1995 to 86.4 million fish in 1996), while catches in New England increased 6% (from 22.0 million fish in 1995 to 23.4 million fish in 1996). Anglers in the Mid-Atlantic accounted for approximately four times the finfish catch of their counterparts in New England.

Striped bass, scup, Atlantic mackerel, bluefish and summer flounder were the most common recreationally caught species in 1996 in New England (Figure 12). Together, these

Table 22. Top ten countries receiving exports of fishery products from the Northeast region, ranked by value of exports 1994-1996 (millions of dollars)

Country	Year		
	1994	1995	1996
Canada	151.4	180.5	189.1
Japan	118.2	106.7	96.7
France <sup>1</sup>	60.0	55.5	57.1
South Korea	19.7	31.6	27.2
Spain <sup>1</sup>	26.4	23.3	26.2
United Kingdom <sup>1</sup>	14.5	19.4	22.6
Italy <sup>1</sup>	23.9	23.3	21.1
Germany <sup>1</sup>	8.7	15.4	17.3
Hong Kong	7.9	9.0	11.6
Belgium <sup>1</sup>	10.8	9.2	8.8
<b>Total</b>	<b>441.5</b>	<b>473.9</b>	<b>477.7</b>

<sup>1</sup>Denotes European Union countries

Table 23. Processing and wholesaling establishments for marine products and their employment levels for 1990-1995<sup>1</sup>

Year/Area	Processing		Wholesaling		Total	
	Plants	Employees	Plants	Employees	Plants	Employees
1990						
New England	247	5,832	689	2,928	936	8,760
Mid-Atlantic <sup>2</sup>	178	6,890	357	2,278	535	9,168
Totals	425	12,722	1,046	5,206	1,471	17,928
1991						
New England	245	5,530	685	2,976	930	8,506
Mid-Atlantic	166	6,776	333	2,158	499	8,934
Totals	411	12,306	1,018	5,134	1,429	17,440
1992						
New England	232	5,367	698	2,912	932	8,279
Mid-Atlantic	171	6,516	364	2,354	529	8,870
Totals	403	11,883	1,062	5,266	1,465	17,149
1993						
New England	221	4,727	670	3,041	891	7,768
Mid-Atlantic	161	6,027	348	2,490	509	8,517
Totals	382	10,754	1,018	5,531	1,400	16,285
1994						
New England	206	4,794	614	3,471	820	8,265
Mid-Atlantic	144	5,036	317	3,056	461	8,092
Totals	350	9,830	931	6,527	1,281	16,357
1995						
New England	194	4,952	625	5,043	819	9,995
Mid-Atlantic	127	5,385	697	5,489	824	10,874
Totals	321	10,337	1,322	10,532	1,643	20,869

<sup>1</sup> Data for 1996 not available

<sup>2</sup> Mid-Atlantic region includes Virginia, Maryland, District of Columbia, Delaware, New Jersey, New York, and Pennsylvania



five species compose roughly 75% (by number) of the total New England recreational catch. Of particular interest is the absence of Atlantic cod in Figure 12. For the first time since 1992, Atlantic cod was not one of the top five most-caught species in New England.

In the Mid-Atlantic, the five most commonly caught recreational species were the same as in 1995. Summer flounder, Atlantic croaker, black sea bass, weakfish, and striped bass were the most commonly caught species, in order, in 1996 (Figure 13). These species accounted for approximately 63% of the total recreational catches in number (up from 59% in 1995).

Recreational fishing effort in the Northeast Region reached a 10-year high in 1996. Approximately 23.3 million trips were taken in 1996, a 5.2% increase from 1995 (22.1 million; see Figure 14). In the Mid-Atlantic, effort increased considerably (from 15.5 million to 16.5 million) to a new high, while effort in New England matched the 10-year high set in 1991 (6.8 million).

Shore fishing trips outnumbered private/rental boat trips for the second consecutive year in New England and accounted for the highest percentage of recreational fishing effort (48% of total fishing trips; Figure 15). Private/rental boat fishing was second (46% of trips), and party/charter boat fishing was third. Effort increased slightly in the shore mode (from 3.1 million trips in 1995 to 3.2 million in 1996). Private/rental fishing increased moderately (from 2.9 million trips to 3.1 million) and party/charter boat fishing trips declined to 0.4 million trips (from 0.5 million trips in 1995).

In the Mid-Atlantic, private/rental boat fishing accounted for the highest percentage of recreational fishing effort (53% of total fishing trips; Figure 16). Shore fishing was second (36% of trips), and party/charter boat fishing was third. Effort increased slightly in the private/rental boat mode (from 8.4 million trips in 1995 to 8.7 million in 1996). Shore fishing reached a 10-year high in 1996.

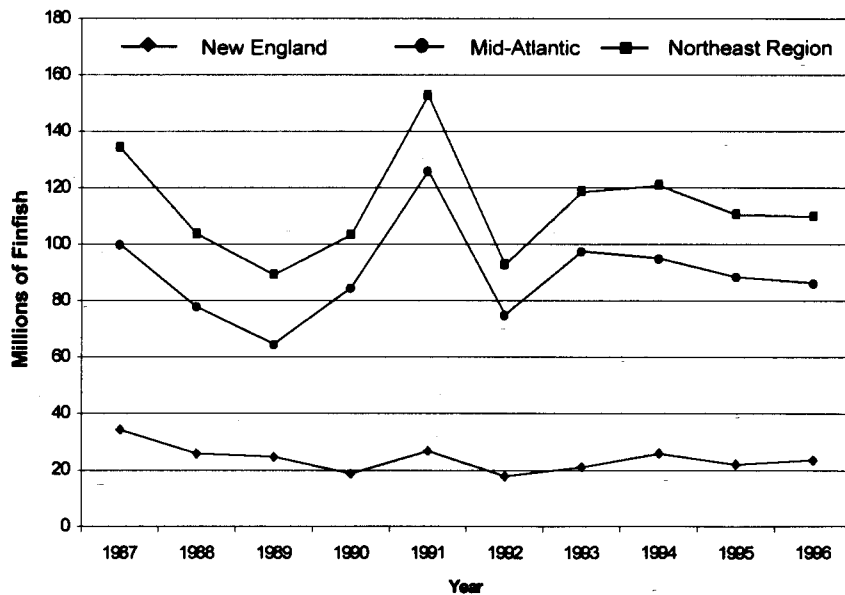


Figure 11. Estimated number of fish caught by recreational fishermen, by subregion.

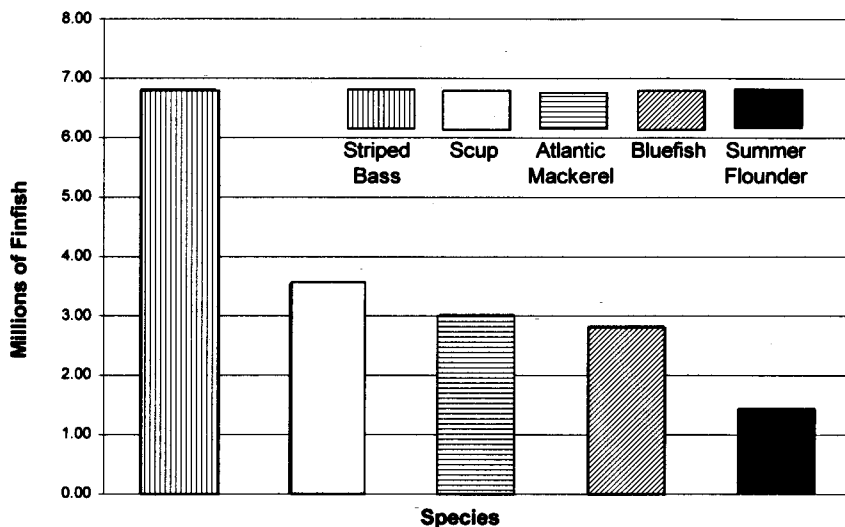


Figure 12. Top five species caught by recreational fishermen in New England in 1996.

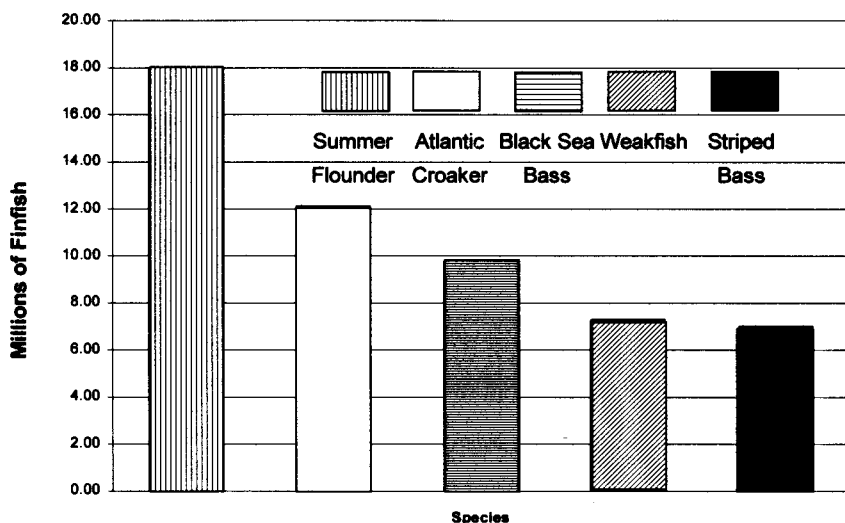


Figure 13. Top five species caught by recreational fishermen in the Mid-Atlantic in 1996.

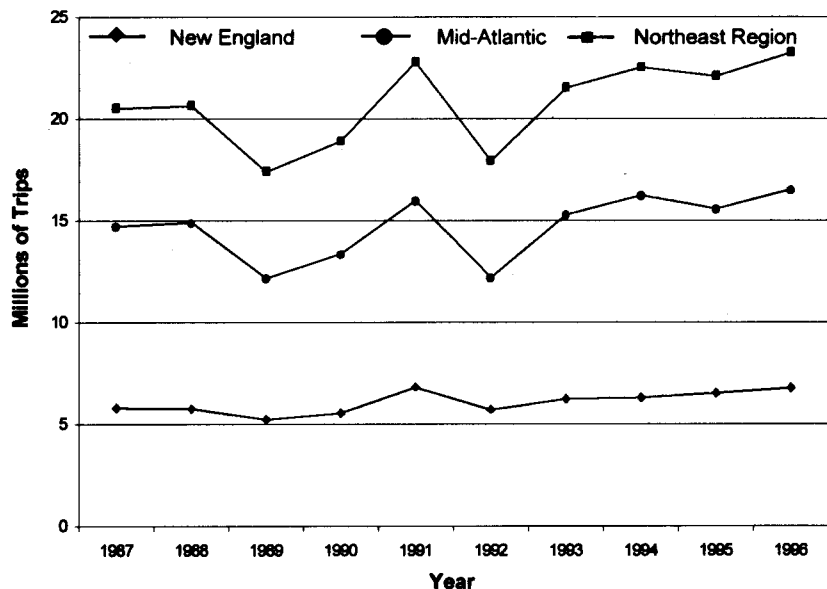


Figure 14. Estimated number of recreational fishing trips by subregion, 1987-1996.

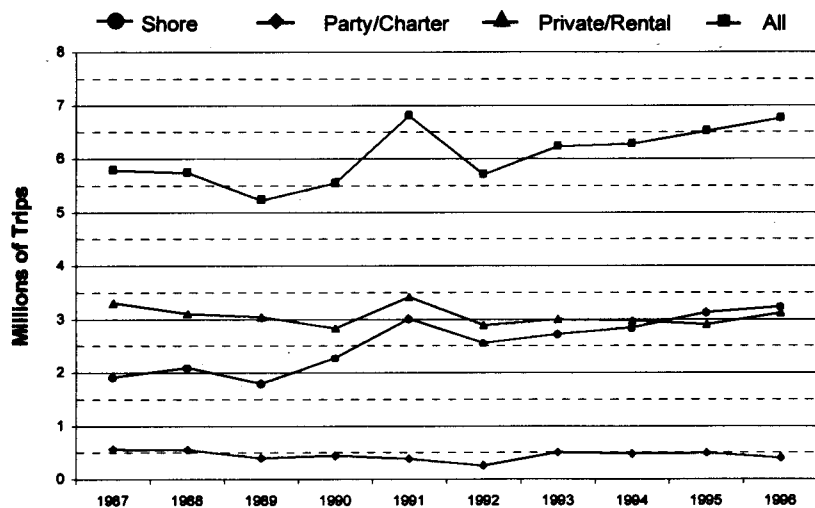


Figure 15. Estimated number of recreational fishing trips by mode in New England, 1987-1996.

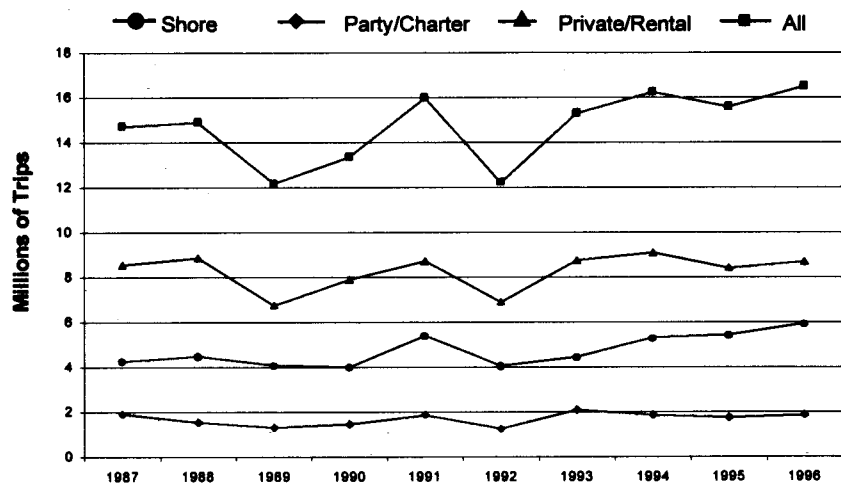


Figure 16. Estimated number of recreational fishing trips by mode in the Mid-Atlantic, 1987-1996.

Approximately 5.9 million trips were taken in 1996, an 8.6% increase from 1995 (5.4 million). Party/charter boat fishing trips increased slightly to 1.9 million trips (from 1.7 million in 1995).

The NMFS has increased efforts to collect marine recreational economic and social data in the Northeast Region in recent years. A comprehensive economic survey of recreational anglers in the Northeast Region was conducted in 1994 in conjunction with the MRFSS and a similar survey is being conducted in 1998. In addition, the MRFSS has recently begun to collect economic information as part of its baseline survey, and economic studies of the party/charter industry have been funded in Maine, Massachusetts, New York, and New Jersey. Over time, social and economic data collected from these studies will help provide a foundation for evaluating marine recreational fisheries and future recreational policies.

### NET NATIONAL BENEFITS

Previous issues of this report have discussed how economics relate to the Magnuson Act of 1976, and presented various economic concepts, including resource rents and the economic value of fish resources based on their ability to grow and reproduce. A recent report, "Our Living Oceans, The Economic Status of U.S. Fisheries" also provides a thorough discussion of this topic.

Many of the fisheries in the Northeast Region are moving toward various types of limited access that could lead to greater fleet efficiency. In the groundfish, summer flounder, lobster, and sea scallop fisheries, moratoria on entry are in place; in the surfclam and ocean quahog fishery, individual transferable quotas have been in effect since 1990.