

Table C1. Landings (calculated live weight, mt) of goosefish as reported in NEFSC weighout data base (1964-1993) and vessel trip reports (1994-2000) (North = SA 511-523, 561; South = SA 524-639 excluding 551-561 plus landings from North Carolina for years 1977-1995); General Canvas database (1964-1989, North = ME, NH, n northern weigh out proportion of MA; South = Southern weigh out proportion of MA, RI-VA); Foreign landings from NAFO database areas 5 and 6. Shaded cells denote suggested source for landings which are used in the total column at the far right (see text for details).

Year	Weigh Out Plus NC			General Canvas			Foreign	Total
	US North	US South	US Total	US North	US South	US Total		
1964	45	19	64	45	61	106	0	106
1965	37	17	54	37	79	115	0	115
1966	299	13	312	299	69	368	2,397	2,765
1967	539	8	547	540	59	598	11	609
1968	451	2	453	449	36	485	2,231	2,716
1969	258	4	262	240	43	283	2,249	2,532
1970	199	12	211	199	53	251	477	728
1971	213	10	223	213	53	266	3,659	3,925
1972	437	24	461	437	65	502	4,102	4,604
1973	710	139	848	708	240	948	6,818	7,766
1974	1,197	101	1,297	1,200	183	1,383	727	2,110
1975	1,853	282	2,134	1,877	417	2,294	2,548	4,842
1976	2,236	428	2,663	2,256	608	2,865	341	3,206
1977	3,137	830	3,967	3,167	1,314	4,481	275	4,756
1978	3,889	1,384	5,273	3,976	2,073	6,049	38	6,087
1979	4,014	3,534	7,548	4,068	4,697	8,765	70	8,835
1980	3,695	4,232	7,927	3,623	6,035	9,658	132	9,790
1981	3,217	2,380	5,597	3,171	4,142	7,313	381	7,694
1982	3,860	3,722	7,582	3,757	4,492	8,249	310	7,892
1983	3,849	4,115	7,964	3,918	4,707	8,624	80	8,044
1984	4,202	3,699	7,901	4,220	4,171	8,391	395	8,296
1985	4,616	4,262	8,878	4,452	4,806	9,258	1,333	10,211
1986	4,327	4,037	8,364	4,322	4,264	8,586	341	8,705
1987	4,960	3,762	8,722	4,995	3,933	8,926	748	9,470
1988	5,066	4,595	9,661	5,033	4,775	9,809	909	10,570
1989	6,391	8,353	14,744	6,263	8,678	14,910	1,178	15,922
1990	5,802	7,204	13,006				1,557	14,563
1991	5,693	9,865	15,558				1,020	16,578
1992	6,923	13,942	20,865				473	21,338
1993	10,645	15,098	25,743				354	26,097
1994	10,950	12,126	23,076				543	23,619
1995	12,032	14,625	26,657				418	27,075
1996	10,762	16,032	26,794				184	26,978
1997	9,794	18,534	28,328				189	28,517
1998	7,367	19,309	26,676				190	26,866
1999	9,260	15,953	25,213				151	25,364
2000	10,689	10,175	20,864				176	21,040

Table C2. U.S. landings of goosefish (calculated live weight) by gear type.

Year	North					South					Regions Combined				
	Trawl	Gill Net	Scallop		Total	Trawl	Gill Net	Scallop		Total	Trawl	Gill Net	Scallop		Total
			Dredge	Other				Dredge	Other				Dredge	Other	
1964	44.93	0.02			44.95	18.99				18.99	63.92	0.02			63.94
1965	36.41	0.20			36.61	16.61				16.61	53.23	0.20			53.43
1966	298.80	0.17		0.05	299.03	12.63			0.08	12.71	311.43	0.17		0.14	311.74
1967	531.85		7.61		539.46	7.58				7.58	539.64		7.61		547.25
1968	447.19		4.11		451.30	2.07				2.07	449.26		4.11		453.37
1969	253.14	1.35	3.98		258.47	4.02				4.02	257.16	1.35	3.98		262.49
1970	198.25	0.32		0.06	198.63	12.16				12.16	210.41	0.32		0.06	210.79
1971	212.57		0.17		212.74	10.11				10.11	222.68		0.17		222.85
1972	426.45	7.74	1.30	1.57	437.06	24.43				24.43	450.87	7.74	1.30	1.57	461.48
1973	660.85	28.68	12.24	7.96	709.73	131.51		4.88	1.00	137.39	793.54	28.68	17.11	8.96	848.29
1974	1059.61	104.95	7.27	24.73	1196.56	98.03			0.10	98.13	1160.09	104.95	7.27	24.82	1297.13
1975	1711.64	122.83	9.51	8.57	1852.55	265.48	0.24	2.16	1.56	269.44	1989.84	123.07	11.67	10.13	2134.71
1976	2031.30	142.96	46.73	14.62	2235.61	333.09		6.97	0.24	340.30	2458.97	142.96	53.70	14.86	2670.49
1977	2736.74	230.22	142.08	27.56	3136.60	508.08		57.11	25.54	590.73	3487.32	230.22	202.46	53.11	3973.11
1978	3254.89	367.96	212.00	54.17	3889.02	604.78	0.14	507.29	25.50	1137.71	4016.02	368.10	774.35	79.66	5238.13
1979	2966.80	393.04	583.69	70.63	4014.16	943.68	6.13	1015.27	16.33	1981.41	3988.97	399.18	2069.76	86.96	6544.87
1980	2525.97	518.24	595.68	55.66	3695.55	1138.82	10.04	1273.50	6.81	2429.17	3723.11	528.28	2275.51	62.47	6589.37
1981	2266.33	460.64	443.42	46.77	3217.16	1100.10	16.03	781.53	105.45	2003.11	3483.30	477.28	1399.19	152.22	5511.99
1982	3039.51	420.92	367.07	32.41	3859.90	1805.81	11.88	1507.13	27.27	3352.09	4998.08	432.80	2060.73	59.68	7551.29
1983	3233.10	313.69	265.70	36.96	3849.45	1818.58	11.38	2118.86	17.16	3965.98	5165.97	325.07	2430.74	55.54	7977.32
1984	3647.80	314.93	196.37	42.84	4201.94	1714.49	15.46	1704.40	17.97	3452.32	5512.58	330.39	1967.53	60.81	7871.31
1985	3982.26	314.52	263.58	55.33	4615.69	1739.05	17.33	2347.22	2.88	4106.48	5756.74	331.85	2610.80	58.21	8757.60
1986	3412.10	326.21	552.69	35.64	4326.64	1841.10	32.11	2068.22	12.15	3953.58	5317.97	358.32	2620.90	47.79	8344.98
1987	3853.06	373.99	695.43	37.57	4960.05	1679.88	26.25	1996.95	3.42	3706.50	5560.79	400.24	2692.39	40.99	8694.41
1988	3553.90	304.08	1171.59	36.23	5065.80	1828.37	58.22	2593.83	3.02	4483.44	5399.48	362.50	3765.42	39.26	9566.66
1989	3428.68	348.65	2584.13	29.72	6391.18	3240.35	16.89	5035.79	3.47	8296.50	6679.05	366.02	7619.92	33.20	14698.19
1990	3297.60	338.43	2140.73	25.20	5801.97	2361.40	32.11	4744.23	4.75	7142.49	5697.44	371.82	6884.97	29.96	12984.19
1991	3298.76	337.64	2033.44	23.73	5693.57	5515.03	362.60	3907.06	15.72	9800.41	8847.11	700.47	5940.50	39.45	15527.53
1992	4329.96	358.97	2210.53	23.89	6923.36	6527.85	977.16	6408.94	10.80	13924.75	10859.54	1336.14	8619.48	34.69	20849.85
1993	5889.87	695.02	4034.08	26.26	10645.23	5986.62	1722.40	7158.01	192.14	15059.17	11878.65	2417.42	11192.09	218.40	25706.56
1994	7573.88	1571.26	1807.84	86.42	11039.40	5233.06	2342.47	3994.91	555.96	12126.40	12707.47	3883.88	5758.86	637.57	22987.78
1995	9257.30	1528.60	1188.90	56.80	12031.60	5725.40	3804.60	4109.40	742.80	14382.20	14982.76	5333.24	5298.25	799.62	26413.87
1996	8436.50	1391.00	889.30	45.00	10761.80	7173.20	4220.40	4362.30	32.70	15788.60	15609.69	5611.39	5251.52	77.67	26550.27
1997	7399.90	1004.00	1344.60	45.20	9793.70	8234.10	5201.80	4894.50	203.50	18533.90	15633.97	6205.74	6239.05	248.67	28327.43
1998	5443.70	905.50	990.40	26.90	7366.50	7831.90	6195.70	5148.00	133.70	19309.30	13275.58	7101.15	6138.46	160.65	26675.84
1999	7002.20	1492.30	739.50	25.80	9259.80	6398.70	6163.90	3339.10	51.80	15953.50	13400.93	7656.17	4078.59	77.58	25213.27
2000	8172.20	2091.90	345.90	79.10	10689.10	4068.60	4015.30	1944.60	146.70	10175.20	12240.80	6107.18	2290.53	225.84	20864.35

Table C3. Landed weight (mt) of goosfish by market category for 1964-2000 for combined assessment areas SA 511-636), NEFSC weightout database and vessel trip reports (1994-2000).

Year	Belly Flaps	Cheeks	Livers	Gutted	Round	Tails Unc.	Tails Large	Tails Small	Tails Peewee	All Tails
1964	0.0	0.0	0.0	0.0	0.0	19.3	0.0	0.0	0.0	19.3
1965	0.0	0.0	0.0	0.0	0.0	16.1	0.0	0.0	0.0	16.1
1966	0.0	0.0	0.0	0.0	0.0	93.9	0.0	0.0	0.0	93.0
1967	0.0	0.0	0.0	0.0	0.0	164.8	0.0	0.0	0.0	164.8
1968	0.0	0.0	0.0	0.0	0.0	136.6	0.0	0.0	0.0	136.6
1969	0.0	0.0	0.0	0.0	0.0	79.1	0.0	0.0	0.0	79.1
1970	0.0	0.0	0.0	0.0	0.0	63.5	0.0	0.0	0.0	63.5
1971	0.0	0.0	0.0	0.0	0.0	67.1	0.0	0.0	0.0	67.1
1972	0.0	0.0	0.0	0.0	0.0	139.0	0.0	0.0	0.0	139.0
1973	0.0	0.0	0.0	0.0	0.0	255.5	0.0	0.0	0.0	255.5
1974	0.0	0.0	0.0	0.0	0.0	390.7	0.0	0.0	0.0	390.7
1975	0.0	0.0	0.0	0.0	0.0	642.8	0.0	0.0	0.0	642.8
1976	0.0	0.0	0.0	0.0	0.0	802.2	0.0	0.0	0.0	802.2
1977	0.0	0.0	0.0	0.0	0.0	1194.4	0.0	0.0	0.0	1194.4
1978	0.0	0.0	0.0	0.0	0.0	1574.5	0.0	0.0	0.0	1574.5
1979	0.0	0.0	0.0	0.0	0.0	2224.7	0.0	0.0	0.0	2224.7
1980	0.0	0.0	0.0	0.0	0.0	2302.4	0.0	0.0	0.0	2302.4
1981	0.0	0.0	0.0	0.0	0.0	1654.2	0.0	0.0	0.0	1654.2
1982	0.0	0.0	10.2	0.0	0.0	2059.8	153.1	53.3	0.0	2266.2
1983	0.0	0.0	11.6	0.0	0.0	2009.9	241.4	138.6	0.0	2390.0
1984	0.0	0.0	25.0	0.0	0.0	2121.6	186.8	44.5	0.0	2352.9
1985	0.0	0.0	28.0	0.0	0.0	2467.0	86.7	73.4	0.0	2627.1
1986	0.0	0.0	36.3	0.0	0.0	2365.4	76.4	52.2	0.0	2494.0
1987	0.0	0.0	54.2	0.0	0.0	2463.7	139.9	6.7	0.0	2610.3
1988	0.0	0.0	112.8	0.0	0.0	2646.3	195.1	34.8	0.0	2876.2
1989	0.0	0.0	146.3	0.0	15.6	3501.8	557.4	360.0	0.0	4419.2
1990	0.0	0.0	179.7	0.0	217.7	2601.8	854.1	377.4	0.0	3833.3
1991	0.0	8.6	270.3	0.0	415.4	2229.1	1661.9	614.1	36.6	4541.6
1992	0.2	3.7	321.5	0.0	386.0	2778.7	1908.1	1293.0	183.3	6163.1
1993	0.0	1.7	459.9	98.2	528.7	3503.2	1933.0	1851.1	262.4	7549.8
1994	0.0	5.3	458.1	1453.6	2044.8	1256.9	2230.7	2063.3	258.0	5808.9
1995	2.3	1.0	500.1	2763.2	2652.6	895.6	2524.6	2424.4	363.5	6208.1
1996	0.4	0.6	571.6	3475.9	1064.3	1086.9	2094.1	3032.1	269.8	6482.9
1997	0.1	0.1	630.7	3210.0	795.2	675.5	3067.7	3295.7	151.6	7190.6
1998	0.0	0.5	607.4	3592.1	581.8	862.3	3013.6	2654.8	95.5	6626.2
1999	0.1	0.2	597.4	5748.1	1131.4	537.2	2388.3	2200.8	153.4	5279.8
2000	0.0	3.7	624.0	6913.2	1091.0	291.3	1579.2	1707.2	4.3	3582.0

Table C4. Landed weight (mt) of goosefish by market category for 1964-2000 for northern assessment area (SA 511-523 and 561), NEFSC weightout database and vessel trip reports (1994-2000).

Year	Belly Flaps	Cheeks	Livers	Gutted	Round	Tails Unc.	Tails Large	Tails Small	Tails Peewee	All Tails
1964	0.0	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	13.5
1965	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	11.0
1966	0.0	0.0	0.0	0.0	0.0	90.1	0.0	0.0	0.0	90.1
1967	0.0	0.0	0.0	0.0	0.0	162.5	0.0	0.0	0.0	162.5
1968	0.0	0.0	0.0	0.0	0.0	135.9	0.0	0.0	0.0	135.9
1969	0.0	0.0	0.0	0.0	0.0	77.8	0.0	0.0	0.0	77.8
1970	0.0	0.0	0.0	0.0	0.0	59.8	0.0	0.0	0.0	59.8
1971	0.0	0.0	0.0	0.0	0.0	64.1	0.0	0.0	0.0	64.1
1972	0.0	0.0	0.0	0.0	0.0	131.6	0.0	0.0	0.0	131.6
1973	0.0	0.0	0.0	0.0	0.0	213.8	0.0	0.0	0.0	213.8
1974	0.0	0.0	0.0	0.0	0.0	360.4	0.0	0.0	0.0	360.4
1975	0.0	0.0	0.0	0.0	0.0	558.0	0.0	0.0	0.0	558.0
1976	0.0	0.0	0.0	0.0	0.0	673.4	0.0	0.0	0.0	673.4
1977	0.0	0.0	0.0	0.0	0.0	944.7	0.0	0.0	0.0	944.7
1978	0.0	0.0	0.0	0.0	0.0	1171.4	0.0	0.0	0.0	1171.4
1979	0.0	0.0	0.0	0.0	0.0	1209.1	0.0	0.0	0.0	1209.1
1980	0.0	0.0	0.0	0.0	0.0	1113.1	0.0	0.0	0.0	1113.1
1981	0.0	0.0	0.0	0.0	0.0	969.0	0.0	0.0	0.0	969.0
1982	0.0	0.0	10.0	0.0	0.0	1145.6	15.0	2.0	0.0	1162.6
1983	0.0	0.0	9.3	0.0	0.0	1152.3	4.8	2.4	0.0	1159.4
1984	0.0	0.0	14.7	0.0	0.0	1261.9	3.7	0.0	0.0	1265.6
1985	0.0	0.0	11.4	0.0	0.0	1385.9	1.6	2.6	0.0	1390.2
1986	0.0	0.0	13.7	0.0	0.0	1302.7	0.3	0.2	0.0	1303.2
1987	0.0	0.0	24.0	0.0	0.0	1491.5	1.7	0.7	0.0	1493.9
1988	0.0	0.0	47.4	0.0	0.0	1516.9	5.6	3.3	0.0	1525.8
1989	0.0	0.0	58.7	0.0	11.2	1464.5	327.0	130.2	0.0	1921.6
1990	0.0	0.0	77.9	0.0	30.3	1173.7	410.7	154.0	0.0	1738.4
1991	0.0	3.3	70.0	0.0	0.3	1013.9	538.6	153.2	9.1	1714.8
1992	0.0	0.7	83.0	0.0	0.1	910.5	589.9	505.4	79.4	2085.3
1993	0.0	0.6	208.3	98.2	350.6	1034.3	867.9	1061.8	102.9	3067.0
1994	0.0	1.4	207.6	532.7	981.3	403.0	1205.7	1074.8	136.2	2819.7
1995	0.0	0.7	176.1	1213.4	1122.0	369.7	1178.6	1015.5	305.6	2869.3
1996	0.3	0.4	196.2	1114.2	756.3	92.5	933.0	1381.5	224.1	2631.0
1997	0.0	0.1	154.6	628.5	247.0	29.0	1142.6	1368.9	119.2	2659.6
1998	0.0	0.1	129.4	558.5	145.5	18.2	1067.2	818.7	79.2	1983.3
1999	0.0	0.1	173.2	1670.7	510.1	28.9	1021.8	871.7	139.4	2061.7
2000	0.0	0.1	287.1	3209.0	906.0	17.3	779.1	1045.7	2.7	1844.8

Table C5. Landed weight (mt) of goosfish by market category for 1964-2000 for southern assessment area (SA 524-636 excluding 561), NEFSC weightout database and vessel trip reports (1994-2000).

Year	Belly Flaps	Cheeks	Livers	Gutted	Round	Tails Unc.	Tails Large	Tails Small	Tails Peewee	All Tails
1964	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	5.7
1965	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0
1966	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	3.8
1967	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	2.3
1968	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.6
1969	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.2
1970	0.0	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	3.7
1971	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0
1972	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.0	0.0	7.4
1973	0.0	0.0	0.0	0.0	0.0	41.7	0.0	0.0	0.0	41.7
1974	0.0	0.0	0.0	0.0	0.0	30.3	0.0	0.0	0.0	30.3
1975	0.0	0.0	0.0	0.0	0.0	84.8	0.0	0.0	0.0	84.8
1976	0.0	0.0	0.0	0.0	0.0	128.8	0.0	0.0	0.0	128.8
1977	0.0	0.0	0.0	0.0	0.0	249.6	0.0	0.0	0.0	249.6
1978	0.0	0.0	0.0	0.0	0.0	403.1	0.0	0.0	0.0	403.1
1979	0.0	0.0	0.0	0.0	0.0	1015.6	0.0	0.0	0.0	1015.6
1980	0.0	0.0	0.0	0.0	0.0	1189.3	0.0	0.0	0.0	1189.3
1981	0.0	0.0	0.0	0.0	0.0	685.0	0.0	0.0	0.0	685.0
1982	0.0	0.0	0.2	0.0	0.0	912.4	138.1	51.3	0.0	1101.8
1983	0.0	0.0	2.3	0.0	0.0	857.7	236.6	136.2	0.0	1230.5
1984	0.0	0.0	10.3	0.0	0.0	859.7	183.1	44.5	0.0	1087.3
1985	0.0	0.0	16.7	0.0	0.0	1081.1	85.1	70.8	0.0	1236.9
1986	0.0	0.0	22.6	0.0	0.0	1062.6	76.1	52.0	0.0	1190.8
1987	0.0	0.0	330.2	0.0	0.0	972.2	138.2	6.0	0.0	1116.4
1988	0.0	0.0	65.4	0.0	0.0	1129.3	189.5	31.5	0.0	1350.4
1989	0.0	0.0	87.6	0.0	4.5	2037.4	230.4	229.8	0.0	2497.5
1990	0.0	0.0	101.8	0.0	187.3	1428.1	443.4	223.4	0.0	2094.9
1991	0.0	5.2	200.2	0.0	415.1	1215.2	1123.3	460.9	27.5	2826.8
1992	0.2	3.0	238.5	0.0	385.9	1868.2	1318.3	787.6	103.9	4077.9
1993	0.0	1.1	251.5	0.0	178.1	2468.9	1065.1	789.3	159.4	4482.8
1994	0.0	3.8	250.5	921.0	1063.5	853.9	1025.0	988.5	121.8	2989.2
1995	2.3	0.3	324.0	1549.8	1530.6	526.0	1346.0	1409.0	57.8	3338.8
1996	0.1	0.3	375.4	2361.7	308.0	994.4	1161.2	1650.6	45.7	3851.9
1997	0.1	0.0	476.1	2581.5	548.1	646.6	1925.2	1926.8	32.4	4531.0
1998	0.0	0.4	478.0	3033.6	436.3	844.1	1946.4	1836.1	16.3	4642.9
1999	0.1	0.1	424.2	4077.4	621.3	508.4	1366.5	1329.1	14.1	3218.0
2000	0.0	3.5	336.9	3704.2	185.0	274.0	800.2	661.4	1.6	1737.2

Table C6. Number of commercial samples and length measurements taken by year, market category, and stock area. Live metric tons are also shown.

Year	Market Category	NORTH				SOUTH				TOTAL			
		Samples	Lengths	live mt	mt/sample	Samples	Lengths	live mt	mt/sample	Samples	Lengths	mt	mt/sample
1996	tails only	1	109	306	306	1	123	3,302	3,302	2	232	3,608	1,804
	tails large	13	1,383	3,097	238	6	618	3,856	643	19	2,001	6,953	366
	tails small	10	1,438	4,588	459	6	609	5,479	913	16	2,047	10,067	629
	tails peewee	9	1,258	744	83	4	415	152	38	13	1,673	896	69
	unclass round	2	252	752	376	-	-	313	-	2	252	1,065	533
	head on, gutted	3	478	1,284	428	7	1,287	2,679	383	10	1,765	3,963	396
	annual total	38	4,918	10,771	-	24	3,052	15,781	-	62	7,970	26,552	428
1997	tails only	-	-	104	-	-	-	2,139	-	-	-	2,243	-
	tails large	12	1,324	3,831	319	12	1,220	6,354	530	24	2,544	10,185	424
	tails small	12	1,262	4,529	377	14	1,451	6,413	458	26	2,713	10,942	421
	tails peewee	9	863	396	44	3	300	108	36	12	1,163	504	42
	unclass round	10	936	243	24	1	98	552	552	11	1,034	795	72
	head on, gutted	1	53	718	718	4	551	2,942	736	5	604	3,660	732
	annual total	44	4,438	9,821	-	34	3,620	18,508	-	78	8,058	28,329	363
1998	tails only	-	-	72	-	-	-	2,789	-	-	-	2,861	-
	tails large	6	713	3,548	591	5	487	6,457	1,291	11	1,200	10,005	910
	tails small	8	877	2,728	341	4	444	6,086	1,522	12	1,321	8,814	735
	tails peewee	1	136	263	263	-	-	54	-	1	136	317	317
	unclass round	-	-	142	-	-	-	440	-	-	-	582	-
	head on, gutted	-	-	659	-	-	-	3,436	-	-	-	4,095	-
	annual total	15	1,726	7,412	-	9	931	19,262	-	24	2,657	26,674	1,111
1999	tails only	-	-	158	-	-	-	1,224	-	-	-	1,382	-
	tails large	6	634	3,436	573	5	480	4,652	930	11	1,114	8,088	735
	tails small	19	1,997	2,926	154	8	814	4,533	567	27	2,811	7,459	276
	tails peewee	-	-	463	-	-	-	48	-	-	-	511	-
	unclass round	-	-	499	-	-	-	633	-	-	-	1,132	-
	head on, gutted	1	115	1,872	1,872	4	254	4,581	1,145	5	369	6,453	1,291
	annual total	26	2,746	9,354	-	17	1,548	15,671	-	43	4,294	25,025	582
2000	tails only	-	-	58	-	1	102	910	910	1	102	967	967
	tails large	6	567	2,587	431	7	667	2,657	380	13	1,234	5,243	403
	tails small	50	5,175	3,472	69	7	748	2,196	314	57	5,923	5,668	99
	tails peewee	-	-	9	-	-	-	5	-	-	-	14	-
	unclass round	16	1,839	906	57	-	-	185	-	16	1,839	1,091	68
	head on, gutted	21	2,095	3,658	174	14	1,175	4,223	302	35	3,270	7,881	225
	annual total	93	9,676	10,689	-	29	2,692	10,175	-	122	12,368	20,865	171

Table C7. Discard ratios (mt discarded / mt kept) of goosfish by gear and half year from fishery observer and VTR databases, northern area.

North			Observer Data				VTR Data			
GEAR	YEAR	HALF	No. Tows	Kept (mt)	Discard (mt)	Disc Ratio	No. Trips	Kept (mt)	Discard (mt)	Disc Ratio
Dredge	1996	1	150	0.680	0.324	0.476	10	2.074	0.696	0.336
		2	309	3.779	1.102	0.292	48	43.741	5.144	0.118
		Total	459	4.460	1.426	0.320	58	45.815	5.841	0.127
	1997	1	139	0.216	0.303	1.405	21	7.664	0.959	0.125
		2	437	9.421	1.210	0.128	31	39.441	3.562	0.090
		Total	576	9.637	1.514	0.157	52	47.105	4.521	0.096
	1998	1	79	0.470	0.061	0.131	21	3.540	1.511	0.427
		2	169	5.929	0.301	0.051	21	21.514	2.028	0.094
		Total	248	6.399	0.362	0.057	42	25.054	3.538	0.141
	1999	1	79	0.469	0.070	0.149	10	1.848	0.739	0.400
		2	28	0.164	0.000	0.000	23	11.530	0.742	0.064
		Total	107	0.633	0.070	0.110	33	13.378	1.481	0.111
	2000	1	2	0.044	0.006	0.140	13	3.180	0.356	0.112
		2	12	0.144	0.022	0.155	18	9.920	2.248	0.227
Total		14	0.188	0.028	0.152	31	13.100	2.604	0.199	
Gillnet	1996	1	70	1.818	0.248	0.136	178	35.861	0.866	0.024
		2	102	2.240	0.305	0.136	335	120.794	2.814	0.023
		Total	172	4.058	0.553	0.136	513	156.655	3.680	0.023
	1997	1	55	1.770	0.068	0.038	109	3.747	0.196	0.052
		2	76	1.430	0.278	0.194	193	16.664	0.519	0.031
		Total	131	3.200	0.345	0.108	302	20.411	0.715	0.035
	1998	1	83	1.098	0.032	0.029	110	10.678	0.613	0.057
		2	160	4.808	0.209	0.044	135	10.422	0.382	0.037
		Total	243	5.906	0.242	0.041	245	21.100	0.995	0.047
	1999	1	80	1.236	0.084	0.068	118	21.803	0.923	0.042
		2	136	5.828	0.072	0.012	274	99.446	6.441	0.065
		Total	216	7.064	0.156	0.022	392	121.249	7.364	0.061
	2000	1	117	3.091	0.106	0.034	141	39.352	2.357	0.060
		2	226	15.921	1.244	0.078	550	283.340	19.810	0.070
Total		343	19.011	1.350	0.071	691	322.692	22.167	0.069	
Trawl	1996	1	388	38.342	7.550	0.197	750	352.498	26.965	0.076
		2	159	3.540	0.467	0.132	1339	348.205	23.180	0.067
		Total	547	41.883	8.017	0.191	2089	700.703	50.146	0.072
	1997	1	212	20.731	2.169	0.105	733	238.566	17.178	0.072
		2	169	14.472	1.112	0.077	1066	228.037	13.476	0.059
		Total	381	35.203	3.281	0.093	1799	466.603	30.654	0.066
	1998	1	86	5.498	0.666	0.121	588	156.483	8.120	0.052
		2	25	1.313	0.115	0.087	913	149.004	7.561	0.051
		Total	111	6.811	0.780	0.115	1501	305.487	15.681	0.051
	1999	1	47	4.042	0.398	0.098	609	268.948	12.686	0.047
		2	205	12.692	0.781	0.062	1207	246.484	21.044	0.085
		Total	252	16.734	1.179	0.070	1816	515.432	33.730	0.065
	2000	1	433	52.684	3.691	0.070	723	320.608	37.027	0.115
		2	479	61.414	5.436	0.089	1502	410.703	59.302	0.144
Total		912	114.098	9.127	0.080	2225	731.311	96.329	0.132	

Table C8. Discard ratios (mt discarded / mt kept) of goosefish by gear and half year from fishery observer and VTR databases, southern area.

South			Observer Data				VTR Data			
GEAR	YEAR	HALF	No. Tows	Kept (mt)	Discard (mt)	Disc Ratio	No. Trips	Kept (mt)	Discard (mt)	Disc Ratio
Dredge	1996	1	1284	12.781	4.117	0.322	107	73.882	10.078	0.136
		2	1270	23.726	4.387	0.185	96	120.084	12.570	0.105
		Total	2554	36.506	8.504	0.233	203	193.966	22.649	0.117
	1997	1	1268	21.852	4.735	0.217	68	49.945	4.450	0.089
		2	709	11.072	3.774	0.341	78	71.017	5.885	0.083
		Total	1977	32.924	8.509	0.258	146	120.962	10.335	0.085
	1998	1	574	11.001	0.525	0.048	64	52.556	5.127	0.098
		2	651	15.453	0.927	0.060	44	38.554	5.596	0.145
		Total	1225	26.454	1.451	0.055	108	91.110	10.723	0.118
	1999	1	373	3.304	1.553	0.470	38	19.313	19.493	1.009
		2	478	6.939	1.148	0.165	51	25.051	4.980	0.199
		Total	851	10.243	2.701	0.264	89	44.364	24.473	0.552
	2000	1	564	12.897	2.706	0.210	40	14.964	3.463	0.231
		2	533	5.331	1.778	0.333	59	37.653	6.109	0.162
		Total	1097	18.228	4.484	0.246	99	52.617	9.572	0.182
Gillnet	1996	1	403	37.871	2.720	0.072	309	204.625	7.884	0.039
		2	45	8.111	0.426	0.053	178	119.753	4.376	0.037
		Total	448	45.981	3.147	0.068	487	324.378	12.260	0.038
	1997	1	508	85.563	6.014	0.070	236	176.233	7.126	0.040
		2	141	25.777	0.381	0.015	93	77.095	1.940	0.025
		Total	649	111.341	6.395	0.057	329	253.328	9.066	0.036
	1998	1	386	77.076	6.185	0.080	149	154.552	3.627	0.023
		2	46	5.930	0.373	0.063	149	161.675	7.605	0.047
		Total	432	83.006	6.558	0.079	298	316.227	11.231	0.036
	1999	1	90	12.193	0.643	0.053	236	273.963	21.121	0.077
		2	28	2.495	0.128	0.051	161	231.345	14.164	0.061
		Total	118	14.688	0.772	0.053	397	505.308	35.285	0.070
	2000	1	97	13.471	1.278	0.095	299	234.134	56.230	0.240
		2	37	6.228	0.322	0.052	111	63.333	5.744	0.091
		Total	134	19.699	1.600	0.081	410	297.467	61.974	0.208
Trawl	1996	1	276	6.422	1.084	0.169	268	139.753	8.706	0.062
		2	156	8.332	0.788	0.095	250	280.312	10.455	0.037
		Total	432	14.754	1.872	0.127	518	420.065	19.161	0.046
	1997	1	380	55.611	1.365	0.025	250	265.586	10.640	0.040
		2	152	24.789	2.153	0.087	177	125.820	4.496	0.036
		Total	532	80.399	3.518	0.044	427	391.406	15.136	0.039
	1998	1	209	4.439	0.480	0.108	194	149.583	3.439	0.023
		2	86	2.809	0.077	0.027	144	74.854	1.786	0.024
		Total	295	7.247	0.556	0.077	338	224.437	5.225	0.023
	1999	1	249	6.237	0.276	0.044	211	108.530	6.824	0.063
		2	77	12.318	1.460	0.119	118	54.879	2.036	0.037
		Total	326	18.556	1.736	0.094	329	163.409	8.859	0.054
	2000	1	344	3.536	2.547	0.720	182	54.788	8.693	0.159
		2	166	10.871	1.213	0.112	157	198.283	13.898	0.070
		Total	510	14.407	3.760	0.261	339	253.071	22.592	0.089

Table C9. Calculation of total catch by stock area, gear, and half year using observer discard ratios.

North	Discard Ratio		Landings Live weight (mt)		Estimated Discards (mt)		Estimated Catch (mt)		Total
	Jan-June	July-Dec	Jan-June	July-Dec	Jan-June	July-Dec	Jan-June	July-Dec	
	North								
Trawls									
1996	0.197	0.132	4411.5	4025.1	868.7	530.9	5280.2	4556.0	9836.2
1997	0.105	0.077	4087.1	3312.9	427.7	254.5	4514.7	3567.4	8082.1
1998	0.121	0.087	3173.5	2270.2	384.1	198.4	3557.6	2468.6	6026.2
1999	0.098	0.062	3958.3	3043.9	389.5	187.4	4347.9	3231.3	7579.2
2000	0.070	0.089	4011.6	4160.6	281.1	368.2	4292.7	4528.9	8821.5
Scallop Dredges									
1996	0.476	0.292	38.9	850.3	18.5	247.9	57.5	1098.2	1155.7
1997	1.405	0.128	210.9	1133.7	296.3	145.7	507.1	1279.4	1786.5
1998	0.131	0.051	263.2	727.2	34.4	36.9	297.6	764.1	1061.7
1999	0.149	0.000	261.7	477.8	39.0	0.0	300.7	477.8	778.5
2000	0.140	0.155	97.9	248.0	13.7	38.5	111.7	286.5	398.1
Gillnets									
1996	0.136	0.136	380.8	1010.2	51.9	137.7	432.6	1147.9	1580.5
1997	0.038	0.194	303.2	700.8	11.6	136.1	314.7	836.9	1151.6
1998	0.029	0.044	262.3	643.2	7.7	28.0	270.0	671.2	941.2
1999	0.068	0.012	349.2	1143.1	23.8	14.1	373.0	1157.2	1530.2
2000	0.034	0.078	383.6	1708.2	13.2	133.5	396.8	1841.7	2238.5
Other									
1996	0.199	0.196	34.2	10.8	6.8	2.1	41.0	12.9	53.9
1997	0.112	0.103	29.7	15.4	3.3	1.6	33.1	17.0	50.1
1998	0.107	0.052	14.3	12.7	1.5	0.7	15.8	13.3	29.1
1999	0.096	0.047	5.2	20.6	0.5	1.0	5.7	21.6	27.3
2000	0.068	0.087	20.9	58.3	1.4	5.0	22.3	63.3	85.6
South									
Trawls									
1996	0.169	0.095	3088.6	4084.6	521.4	386.2	3610.0	4470.7	8080.7
1997	0.025	0.087	3951.7	4282.4	97.0	371.9	4048.7	4654.3	8703.0
1998	0.108	0.027	3977.5	3854.4	429.8	105.2	4407.3	3959.6	8366.9
1999	0.044	0.119	4071.0	2327.7	180.0	275.9	4250.9	2603.6	6854.6
2000	0.720	0.112	2391.5	1677.1	1722.6	187.1	4114.1	1864.2	5978.3
Scallop Dredges									
1996	0.322	0.185	1790.9	2571.4	576.8	475.5	2367.7	3046.9	5414.6
1997	0.217	0.341	2226.9	2667.6	482.5	909.2	2709.5	3576.7	6286.2
1998	0.048	0.060	2492.7	2655.3	118.9	159.2	2611.6	2814.6	5426.1
1999	0.470	0.165	1831.9	1507.2	861.2	249.3	2693.2	1756.5	4449.6
2000	0.210	0.333	1074.4	870.2	225.5	290.2	1299.8	1160.4	2460.2
Gillnets									
1996	0.072	0.053	2770.6	1449.9	199.0	76.2	2969.6	1526.1	4495.7
1997	0.070	0.015	3712.6	1489.2	261.0	22.0	3973.6	1511.2	5484.7
1998	0.080	0.063	4133.3	2062.3	331.7	129.7	4465.0	2192.0	6657.0
1999	0.053	0.051	4375.3	1788.6	230.9	92.0	4606.2	1880.6	6486.8
2000	0.095	0.052	2810.5	1204.8	266.7	62.2	3077.2	1267.0	4344.2
Other									
1996	0.139	0.139	24.8	7.9	3.4	1.1	28.2	9.0	37.2
1997	0.074	0.102	151.3	52.2	11.2	5.3	162.6	57.5	220.1
1998	0.078	0.057	74.4	59.4	5.8	3.4	80.2	62.7	142.9
1999	0.114	0.126	6.8	44.9	0.8	5.7	7.6	50.6	58.2
2000	0.218	0.148	122.4	24.3	26.7	3.6	149.1	27.9	177.1

Table C10. Annual landings, discards and total catch summarized from table C9.

	Reported Landings (live wt mt)	Estimated Discards (mt)	Overall Discard Ratio	Percent of Catch Discarded	Estimated Catch (mt)
North					
1996	10762	1865	0.173	14.8	12626
1997	9794	1277	0.13	11.5	11070
1998	7367	692	0.094	8.6	8058
1999	9260	655	0.071	6.6	9915
2000	10689	855	0.08	7.4	11544
South					
1996	15789	2240	0.142	12.4	18028
1997	18534	2160	0.117	10.4	20694
1998	19309	1284	0.066	6.2	20593
1999	15953	1896	0.119	10.6	17849
2000	10175	2785	0.274	21.5	12960
Total					
1996	26550	4104	0.155	13.4	30655
1997	28327	3437	0.121	10.8	31764
1998	26676	1975	0.074	6.9	28651
1999	25213	2551	0.101	9.2	27764
2000	20864	3639	0.174	14.9	24504

Table C11. Sample size, median CPUE and GLM-estimated CPUE at depth by gear and area. Zones are 20 fathom depth increments starting with 0-20 fa (zone 1) and ending with >180 fa (zone 10).

		Depth Zone									
		1	2	3	4	5	6	7	8	9	10
Dredge											
All Areas	N	749	7798	757	14	3					
	Median	2	2.22	2.39	2.55	1.87					
	LSMEAN	1.85	2.06	2.17	2.25	1.62					
North	N	136	1531	285	3	2					
	Median	1.68	2.22	2.42	2.55	1.94					
	LSMEAN	1.56	1.82	1.97	2.05	1.22					
South	N	613	6267	472	11	1					
	Median	2.03	2.22	2.38	2.55	1.87					
	LSMEAN	1.84	2.04	2.17	2.15	1.72					
Small Mesh Gill Net											
All Areas	N	6560	14190	3831	1639	1407	335	47	50	19	28
	Median	1.54	1.48	1.48	1.62	2	2	1.29	1.32	1.35	1.77
	LSMEAN	1.78	1.67	1.64	1.8	2.06	2.15	1.68	1.51	1.4	2.04
North	N	4391	13377	3800	1624	1361	304	39	44	17	6
	Median	1.48	1.46	1.48	1.62	2	2.06	1.27	1.18	1.29	1.07
	LSMEAN	1.67	1.62	1.61	1.79	2.04	2.19	1.61	1.43	1.25	1.65
South	N	2169	813	31	15	46	31	8	6	2	22
	Median	1.75	1.9	1.77	1.38	2.09	1.48	1.56	1.74	2.23	1.95
	LSMEAN	1.72	1.85	2.03	1.57	2.11	1.53	1.54	1.8	2.15	1.87
Large Mesh Gill Net											
All Areas	N	9093	6197	1043	390	464	179	195	77	5	8
	Median	2.78	2.9	2.83	2.67	3.25	3.07	2.65	2.82	2.81	2.73
	LSMEAN	2.98	3.11	3.1	2.91	3.23	3.1	2.93	2.98	3.12	2.84
North	N	504	1404	615	84	76	14	1			
	Median	2.76	2.66	2.69	2.61	3.11	2.77	2.82			
	LSMEAN	2.86	2.65	2.7	2.66	2.99	2.9	3.36			
South	N	8589	4793	428	306	388	165	194	77	5	8
	Median	2.78	2.98	3.09	2.69	3.26	3.1	2.65	2.82	2.81	2.73
	LSMEAN	2.98	3.17	3.18	2.91	3.21	3.1	2.93	2.98	3.11	2.85
Trawl											
All Areas	N	9942	18945	11257	4782	7958	2763	840	245	100	284
	Median	1.78	1.98	2.08	2.4	2.55	2.72	2.88	3.12	3.21	3.29
	LSMEAN	1.85	1.99	2.16	2.39	2.53	2.67	2.73	2.95	2.9	3.11
North	N	3462	11329	10174	4500	7854	2725	735	104	20	19
	Median	1.82	1.84	2.02	2.41	2.55	2.71	2.83	2.86	2.73	2.7
	LSMEAN	1.84	1.86	2.1	2.39	2.54	2.7	2.73	2.84	2.67	2.71
South	N	6480	7616	1083	282	104	38	105	141	80	265
	Median	1.78	2.22	2.52	2.19	2.47	3.09	3.28	3.27	3.28	3.31
	LSMEAN	1.85	2.15	2.42	2.16	2.34	2.84	3.11	3.04	2.94	3.06

Table C12. Sample size, median CPUE, and GLM-estimated CPUE at depth for directed trawl trips (directed trip defined by goosefish catch at least half of total catch in weight). Zones are 20 fathom depth increments starting with 0-20 fa (zone 1) and ending with >180 fa (zone 10).

		Depth Zone									
		1	2	3	4	5	6	7	8	9	10
Directed Trawl											
All Areas	N	107	804	1035	537	498	255	212	153	73	239
	Median	3.24	3.18	3	3.05	3.26	3.29	3.28	3.3	3.33	3.36
	LSMEAN	3.21	3.1	3.1	3.17	3.19	3.18	3.17	3.22	3.2	3.24
North	N	55	258	816	502	482	232	120	22	3	5
	Median	3.3	3	2.92	3.04	3.24	3.29	3.26	3.27	3.32	3.35
	LSMEAN	3.16	3.07	3.1	3.18	3.18	3.19	3.14	3.13	3.25	3.09
South	N	52	546	219	35	16	23	92	131	70	234
	Median	3.18	3.23	3.2	3.16	3.39	3.22	3.32	3.3	3.33	3.37
	LSMEAN	3.32	3.28	3.26	3.18	3.33	3.3	3.37	3.4	3.38	3.41

Table C13. Sample size and associated reported catch for all trips and only “directed” trips (denoted subset) from VTR database for three gears. A “directed” trip is defined as one in which the catch of goosefish comprises at least half of the total catch for the trip. Data is summed over years 1995-2000.

Trawl						
Area	N (all data)	N (subset)	subset/all	kept mt (all data)	kept mt (subset)	subset/all
All	57,116	3,913	6.90%	23,186	9,558	41%
North	40,922	2,495	6.10%	15,649	3,794	24%
South	16,194	1,418	8.80%	7,537	5,764	76%
Large Mesh Gill Net						
Area	N (all data)	N (subset)	subset/all	kept mt (all data)	kept mt (subset)	subset/all
All	17,651	15,284	86.60%	4,941	4,678	95%
North	2,698	2,286	84.70%	2,471	2,339	95%
South	14,953	12,998	86.90%	14,570	14,083	97%
Small Mesh Gill Net						
Area	N (all data)	N (subset)	subset/all	kept mt (all data)	kept mt (subset)	subset/all
All	28,106	743	2.60%	3,224	765	24%
North	24,963	527	2.10%	1,612	382	24%
South	3,143	216	6.90%	377	124	33%

Table C14 . Estimated parameters (L_{full} and shape parameters) of the vulnerability function and length (cm) at 90%, 75%, 50%, 25%, and 10% vulnerability for goosefish kept by commercial vessels using trawls and scallop dredges, compared with length frequency vulnerability for goosefish distributions obtained from NEFSC scallop, winter and autumn trawl surveys during 1996-1999.

Northern Stock	Trawl catch vs Scallop Survey				Dredge Catch vs Scallop Survey			
	1996	1997	1998	1999	1996	1997	1998	1999
SS	0.0233	0.0158	0.0272	Incomplete	0.0498	0.0099	0.0231	Incomplete
L_{full} (cm)	58.08	40.8	38.72	Survey	49.74	55.54	47.04	Survey
s	291.06	0.83	1.13		6.68	58.57	3.02	
Length (cm) at:								
90% Vulnerability	50.24	40.38	38.23		48.55	52.03	46.25	
75% Vulnerability	45.13	40.11	37.91		47.78	49.73	45.73	
50% Vulnerability	37.99	39.72	37.46		46.7	46.53	45	
25% Vulnerability	29.67	39.28	36.95		45.44	42.8	44.15	
10% Vulnerability	21.46	38.84	36.43		44.19	39.12	43.31	

Southern Stock	Trawl catch vs Scallop Survey				Dredge catch vs Scallop Survey				Trawl Catch vs Winter Survey				Dredge Catch vs Winter Survey			
	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999
SS	0.0091	0.0126	0.0059	0.039	0.0087	0.0088	0.0113	0.0219	0.0068	0.0027	0.0071	0.0104	0.0112	0.0051	0.0067	0.0076
L_{full} (cm)	43.4	43.13	37.59	53.06	47.89	43.16	67.94	53.97	43.04	40.04	48.67	60.22	44.92	40.01	48.9	80.63
s	14.82	5.15	4.96	44.82	35.6	5.14	375.99	76.23	3.09	3.15	31.5	56.72	6.37	2.71	16.53	244.44
Length (cm) at:																
90% Vulnerability	41.63	42.08	36.57	49.99	45.15	42.12	59.04	49.96	42.23	39.22	46.1	56.76	43.76	39.26	47.03	73.45
75% Vulnerability	40.48	41.4	35.9	47.98	43.36	41.44	53.24	47.34	41.71	38.69	44.42	54.5	43	38.76	45.81	68.77
50% Vulnerability	38.87	40.45	34.97	45.18	40.86	40.49	45.11	43.69	40.97	37.95	42.07	51.35	41.94	38.07	44.11	62.22
25% Vulnerability	36.99	39.35	33.88	41.91	37.96	39.39	35.66	39.43	40.11	37.08	39.33	47.68	40.71	37.27	42.13	54.6
10% Vulnerability	35.14	38.25	32.81	38.7	35.08	38.3	26.33	35.23	39.27	36.23	36.63	44.06	39.5	36.48	40.17	47.08

Table C15. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosefish from NEFSC offshore autumn research vessel bottom surveys in the northern management region (strata 20-30, 34-40); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Length						Number of Fish	Number of Nonzero Tows	Number of Tows		
	Raw Index			Smoothed			Raw Index			Smoothed			Ind wt	Min	5%	50%	Mean	95%				Max	
	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%											
1963	3.757	2.161	5.353	2.843			0.801	0.508	1.094	0.568			4.661	11	14	59	58.3	103	111	86	39	90	
1964	1.712	0.896	2.528	2.357			0.392	0.219	0.564	0.451			4.354	21	21	58	59.4	92	102	32	23	87	
1965	2.509	1.350	3.667	2.422			0.347	0.230	0.463	0.394			7.137	28	36	70	71.6	96	110	40	30	88	
1966	3.266	2.102	4.431	2.432	1.628	3.631	0.492	0.331	0.653	0.375	0.258	0.544	6.532	37	48	73	73.1	90	96	55	33	86	
1967	1.283	0.441	2.125	2.002	1.341	2.990	0.189	0.090	0.288	0.297	0.205	0.431	6.799	48	48	69	70.3	91	92	18	14	86	
1968	2.036	0.521	3.552	2.223	1.489	3.320	0.286	0.115	0.457	0.319	0.220	0.463	7.121	11	26	72	71.4	105	106	32	16	86	
1969	3.705	1.781	5.628	2.618	1.753	3.910	0.418	0.277	0.559	0.368	0.254	0.534	8.718	13	41	78	78.8	101	110	39	30	88	
1970	2.237	0.947	3.527	2.442	1.635	3.647	0.395	0.222	0.569	0.391	0.269	0.567	5.754	22	36	67	67.2	90	98	41	21	92	
1971	2.914	1.436	4.391	2.416	1.618	3.607	0.491	0.312	0.670	0.411	0.283	0.596	5.864	15	22	69	67.0	97	101	44	27	94	
1972	1.404	0.651	2.157	2.106	1.410	3.145	0.318	0.195	0.442	0.384	0.264	0.557	4.354	21	21	61	56.9	97	99	29	22	94	
1973	3.114	1.782	4.446	2.412	1.615	3.602	0.514	0.320	0.709	0.406	0.280	0.590	5.992	16	16	58	65.2	109	112	63	29	92	
1974	2.063	1.114	3.011	2.327	1.558	3.475	0.313	0.189	0.436	0.367	0.253	0.533	6.362	13	13	69	64.9	109	111	37	23	97	
1975	1.711	1.003	2.418	2.434	1.630	3.635	0.298	0.178	0.418	0.369	0.254	0.536	5.721	11	11	60	62.9	97	102	40	27	106	
1976	3.387	1.555	5.219	3.227	2.161	4.819	0.422	0.244	0.601	0.429	0.296	0.623	7.620	29	30	71	72.1	106	121	32	24	87	
1977	5.568	3.489	7.646	4.140	2.772	6.183	0.626	0.458	0.794	0.504	0.347	0.731	8.635	21	35	73	71.1	107	119	112	56	126	
1978	5.101	3.487	6.714	4.353	2.915	6.501	0.579	0.429	0.729	0.511	0.352	0.742	8.106	10	24	70	67.6	104	116	146	78	201	
1979	5.133	3.566	6.700	4.114	2.755	6.143	0.474	0.364	0.584	0.477	0.329	0.693	10.233	15	19	77	73.5	103	115	125	78	211	
1980	4.458	2.234	6.682	3.350	2.244	5.003	0.535	0.366	0.703	0.448	0.309	0.650	7.549	6	16	66	63.9	101	111	65	39	97	
1981	1.984	1.183	2.786	2.252	1.508	3.363	0.406	0.288	0.523	0.373	0.257	0.541	4.892	9	13	55	57.5	93	101	46	30	93	
1982	0.936	0.379	1.492	1.648	1.104	2.461	0.142	0.070	0.213	0.293	0.202	0.425	6.606	29	29	71	68.9	97	100	17	14	95	
1983	1.617	0.927	2.308	1.764	1.182	2.635	0.470	0.284	0.656	0.375	0.258	0.544	3.415	13	17	54	53.0	88	96	38	27	82	
1984	3.010	1.413	4.607	2.003	1.341	2.991	0.483	0.353	0.613	0.412	0.284	0.599	5.803	11	26	63	62.7	102	106	36	29	88	
1985	1.441	0.419	2.463	1.729	1.158	2.582	0.369	0.190	0.548	0.408	0.281	0.592	3.985	12	15	55	53.1	101	102	32	23	88	
1986	2.353	1.099	3.608	1.687	1.130	2.520	0.604	0.379	0.829	0.431	0.297	0.626	3.703	19	23	52	53.8	82	100	46	26	90	
1987	0.873	0.256	1.491	1.317	0.882	1.967	0.264	0.116	0.411	0.363	0.250	0.527	3.324	15	15	53	52.2	92	96	22	15	87	
1988	1.525	0.484	2.565	1.355	0.907	2.023	0.313	0.130	0.496	0.379	0.261	0.550	4.870	11	11	53	57.1	92	93	26	17	89	
1989	1.384	0.478	2.290	1.287	0.862	1.922	0.428	0.266	0.590	0.449	0.310	0.652	3.096	9	9	39	40.8	93	96	39	25	87	
1990	1.001	0.439	1.562	1.165	0.780	1.739	0.593	0.383	0.804	0.551	0.380	0.800	1.705	9	10	25	32.3	72	89	55	35	89	
1991	1.235	0.568	1.903	1.166	0.781	1.742	0.576	0.383	0.768	0.643	0.443	0.933	2.067	9	10	31	38.3	83	95	62	33	88	
1992	1.104	0.557	1.651	1.124	0.753	1.679	0.938	0.602	1.274	0.808	0.556	1.172	1.183	9	9	26	33.0	79	86	78	37	86	
1993	1.044	0.343	1.746	1.097	0.735	1.638	0.989	0.691	1.287	0.918	0.632	1.332	1.077	6	9	20	27.1	71	94	103	45	86	
1994	0.973	0.378	1.569	1.107	0.741	1.653	1.351	0.969	1.732	0.991	0.683	1.439	0.668	9	9	19	24.9	55	98	110	51	87	
1995	1.711	0.663	2.759	1.218	0.815	1.818	0.922	0.688	1.155	0.869	0.599	1.262	1.724	10	12	34	39.6	84	91	87	40	93	
1996	1.071	0.498	1.645	1.066	0.713	1.592	0.630	0.407	0.853	0.733	0.505	1.064	1.688	8	11	38	40.3	63	95	51	30	88	
1997	0.669	0.321	1.017	0.929	0.622	1.389	0.498	0.304	0.693	0.684	0.471	0.993	1.335	8	9	35	35.4	70	86	39	27	90	
1998	0.974	0.522	1.425	1.011	0.675	1.515	0.609	0.397	0.820	0.789	0.542	1.150	1.531	10	10	30	35.5	68	77	56	38	104	
1999	0.825	0.303	1.348	1.128	0.742	1.714	1.084	0.737	1.431	1.085	0.735	1.601	0.716	8	8	22	25.7	58	81	111	44	106	
2000	2.495	1.284	3.707	1.552	0.957	2.515	2.398	1.564	3.232	1.492	0.953	2.338	1.032	9	11	25	30.3	70	88	165	43	87	
2001	2.052*	1.151*	2.952*				1.625*	1.217*	2.032*														

* preliminary data

Table C16. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosefish from NEFSC offshore spring research vessel bottom trawl surveys in the northern management region (strata 20-30, 34-40); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Ind wt	Length						Number of Fish	Number of Nonzero Tows	Number of Tows
	Raw Index			Smoothed			Raw Index			Smoothed				Min	5%	50%	Mean	95%	Max			
	Mean	L95%CI	U95%CI	Mean	L95%CI	U95%CI	Mean	L95%CI	U95%CI	Mean	L95%	U95%										
1968	0.973	0.260	1.686	1.187			0.178	0.074	0.283	0.201			5.427	50	51	68	70.4	89	90	13	11	86
1969	1.309	0.141	2.476	1.357			0.186	0.046	0.325	0.219			7.044	33	33	71	71.5	99	100	15	10	87
1970	1.967	0.712	3.221	1.590			0.344	0.216	0.472	0.265			5.709	30	30	62	65.4	98	99	32	22	90
1971	1.021	0.414	1.629	1.614	1.052	2.478	0.158	0.072	0.245	0.269	0.177	0.409	6.366	45	53	69	72.6	99	100	20	15	96
1972	4.644	3.021	6.266	2.230	1.453	3.424	0.643	0.453	0.832	0.391	0.258	0.594	7.064	13	39	74	72.7	100	105	59	38	96
1973	1.908	0.956	2.860	1.882	1.226	2.889	0.435	0.184	0.686	0.407	0.268	0.619	4.313	17	26	68	65.7	99	106	91	36	87
1974	1.476	0.863	2.090	1.573	1.025	2.415	0.438	0.315	0.561	0.406	0.267	0.616	3.391	20	23	58	58.3	97	111	86	41	83
1975	0.934	0.593	1.275	1.373	0.894	2.108	0.339	0.228	0.450	0.384	0.253	0.583	2.760	16	19	53	54.0	87	109	73	36	87
1976	2.826	1.691	3.962	1.552	1.011	2.383	0.673	0.469	0.877	0.394	0.260	0.599	3.759	14	20	60	61.5	95	106	158	52	99
1977	1.012	0.563	1.462	1.173	0.764	1.801	0.259	0.159	0.360	0.283	0.186	0.430	3.594	10	31	66	63.4	93	106	61	37	107
1978	0.626	0.340	0.913	0.979	0.638	1.503	0.141	0.095	0.186	0.216	0.142	0.328	4.014	15	19	73	65.5	89	92	37	30	113
1979	0.893	0.274	1.513	1.104	0.719	1.694	0.144	0.102	0.185	0.219	0.144	0.332	4.652	12	14	67	62.5	100	118	48	40	139
1980	1.622	0.787	2.458	1.434	0.934	2.201	0.379	0.270	0.488	0.294	0.194	0.447	3.748	17	22	43	53.3	98	107	84	38	85
1981	1.744	0.913	2.576	1.715	1.118	2.633	0.376	0.282	0.470	0.333	0.219	0.506	4.444	11	21	52	57.7	95	120	95	42	87
1982	3.015	1.273	4.758	2.029	1.322	3.115	0.346	0.155	0.536	0.348	0.229	0.529	8.594	25	36	61	68.8	105	108	33	22	92
1983	1.587	0.530	2.643	1.840	1.199	2.824	0.418	0.191	0.645	0.365	0.240	0.554	3.663	12	13	49	49.9	96	112	34	22	90
1984	1.696	0.596	2.796	1.842	1.200	2.828	0.328	0.181	0.474	0.349	0.230	0.530	4.732	17	19	62	60.8	93	100	26	19	86
1985	2.113	1.094	3.133	1.951	1.271	2.994	0.346	0.199	0.492	0.347	0.229	0.528	6.122	13	13	68	66.9	104	108	25	21	81
1986	2.165	0.951	3.378	1.957	1.275	3.004	0.340	0.200	0.481	0.347	0.229	0.527	6.244	11	14	63	65.4	109	121	30	22	90
1987	1.728	0.726	2.730	1.834	1.195	2.816	0.245	0.138	0.352	0.352	0.232	0.534	7.052	16	16	66	64.2	99	100	21	16	83
1988	2.111	0.906	3.315	1.790	1.166	2.748	0.610	0.398	0.822	0.454	0.299	0.690	3.343	10	20	49	49.8	89	110	43	26	90
1989	1.631	0.611	2.650	1.563	1.018	2.400	0.625	0.321	0.929	0.481	0.317	0.731	2.590	10	11	40	43.2	80	94	48	24	85
1990	1.005	0.366	1.643	1.327	0.865	2.037	0.282	0.157	0.406	0.427	0.281	0.649	3.587	15	18	47	49.1	106	107	25	17	90
1991	1.827	0.478	3.175	1.358	0.885	2.085	0.592	0.374	0.811	0.502	0.331	0.763	2.723	12	15	35	42.3	78	100	48	28	86
1992	0.890	-0.217	1.997	1.138	0.742	1.748	0.492	0.158	0.825	0.528	0.348	0.802	1.793	16	17	35	40.6	82	101	36	20	83
1993	1.162	0.693	1.630	1.126	0.734	1.728	0.684	0.475	0.893	0.582	0.383	0.885	1.695	10	11	44	41.0	71	90	59	27	87
1994	0.948	0.376	1.520	1.090	0.710	1.674	0.452	0.275	0.629	0.576	0.379	0.875	2.159	10	13	40	41.0	83	89	45	24	88
1995	1.713	0.789	2.638	1.160	0.756	1.781	0.984	0.662	1.305	0.671	0.442	1.020	1.817	15	16	33	39.9	73	97	83	39	88
1996	1.006	0.449	1.563	0.950	0.619	1.458	0.668	0.344	0.992	0.605	0.398	0.919	1.466	15	17	41	43.0	60	70	49	20	82
1997	0.532	0.146	0.918	0.748	0.487	1.148	0.339	0.158	0.520	0.510	0.336	0.775	1.595	9	9	36	39.4	75	89	34	19	89
1998	0.444	0.187	0.701	0.740	0.482	1.137	0.414	0.288	0.540	0.566	0.372	0.860	1.065	11	11	19	31.3	67	78	46	33	115
1999	1.202	0.625	1.780	1.032	0.670	1.591	0.824	0.547	1.102	0.775	0.508	1.181	1.389	9	14	31	35.5	71	97	62	33	87
2000	1.430	0.837	2.023	1.300	0.831	2.035	1.128	0.843	1.413	1.017	0.657	1.575	1.236	15	17	29	34.5	75	87	99	42	89
2001	1.969	0.681	3.257	1.536	0.917	2.574	1.686	1.221	2.151	1.246	0.753	2.062	1.113	9	11	24	31.4	75	86	151	48	91

Table C17. Indices of abundance (number per tow) of goosefish 10-20 cm TL from research surveys.

Year	Northern Area		Southern Area			
	Spring	Autumn	Spring	Autumn	Scallop	Winter
1963		0.12			0.11	
1964		0.00			0.07	
1965		0.00			0.09	
1966		0.00			0.19	
1967		0.00			0.05	
1968	0.00	0.01	0.00	0.02		
1969	0.00	0.01	0.00	0.05		
1970	0.00	0.00	0.00	0.04		
1971	0.00	0.02	0.02	0.06		
1972	0.03	0.00	0.01	0.96		
1973	0.01	0.03	0.05	0.20		
1974	0.01	0.03	0.02	0.02		
1975	0.02	0.02	0.01	0.05		
1976	0.03	0.00	0.01	0.02		
1977	0.01	0.00	0.01	0.04		
1978	0.01	0.02	0.05	0.03		
1979	0.01	0.02	0.05	0.12		
1980	0.01	0.03	0.01	0.03		
1981	0.02	0.02	0.03	0.09		
1982	0.00	0.00	0.09	0.09	0.11	
1983	0.05	0.03	0.00	0.12	0.89	
1984	0.03	0.02	0.00	0.05	0.34	
1985	0.02	0.03	0.00	0.08	0.28	
1986	0.02	0.02	0.01	0.05	0.65	
1987	0.01	0.03	0.01	0.22	1.97	
1988	0.03	0.02	0.03	0.00	0.10	
1989	0.11	0.09	0.01	0.05	0.28	
1990	0.03	0.22	0.01	0.09	0.75	
1991	0.10	0.07	0.02	0.21	1.38	
1992	0.06	0.11	0.02	0.08	0.63	0.15
1993	0.14	0.42	0.02	0.11	1.75	0.19
1994	0.08	0.68	0.02	0.21	1.88	0.25
1995	0.16	0.06	0.01	0.19	0.50	0.06
1996	0.04	0.05	0.01	0.02	0.80	0.08
1997	0.02	0.11	0.01	0.03	0.10	0.16
1998	0.21	0.13	0.06	0.09	0.43	0.07
1999	0.18	0.47	0.02	0.12	1.33	0.20
2000	0.18	0.74	0.03	0.06		0.09
2001	0.56		0.05			0.23

Table C18. Mean length (cm) at age for gosefish caught in NEFSC surveys

NEFSC Fall Offshore Survey											
North											
	Age										
	0	1	2	3	4	5	6	7	8	9	10
1993	9.49	13.02	23.38	31.73	43.5	52.93		73.59	83.5	94	
1994	9.45	14.2	21.79	30.87	42.82	53.36	64	68.85	98		
1995		11.01	24.85	32.89	41.54	54.78	65.36	73.86	85.5	91	
1996	8	12.88	23.85	35.16	42.15	54.19	60.35	82	95		
1997	9.02	12.44	28	34.73	43.26	54.38	67.43		86		
1998		13	25.58	33.18	43.38	51.38	63.39	76.61			
1999	10.37	15.06	26.92	35.98	40.55	56.5	60.08	73.32	79		
2000	10.33	14.9	24.82	34.03	45.28	56.79	66.24	78.47	85.6		
mean	9.4	13.3	24.9	33.6	42.8	54.3	63.8	75.2	87.5	92.5	

NEFSC Fall Offshore Survey											
South											
	Age										
	0	1	2	3	4	5	6	7	8	9	10
1993		16.21	19.85	34.27	43.31	51.54		68			
1994	8.19	14.89	21.13	34.48	44.47	51.97	60.29	68	83		
1995		14.51	21.09	34	40.84	52.15	65				
1996		18	22.58	33.08	44.53	51.84	64.67				
1997	9.53	11	24.83	35.36	47.82	54.37	64.38	71			
1998		14.02	21.92	32.26	45.09	53.96	62.73	72	87		
1999		17.08	25.11	36.09	46.61	55					
2000	5	17.66	22.45	36	45.42	55.74	64.07				
mean	7.6	15.4	22.4	34.4	44.8	53.3	63.5	69.8	85.0		

NEFSC Winter Survey											
South											
	Age										
	0	1	2	3	4	5	6	7	8	9	10
1997		10.81	16.42	25.16	34.28	45.54	54.3	63.66	76.03	91	
1998		10.32	17.36	24.86	35.72	43.17	53.62	64.42	71.98	84	
1999		10.67	16.73	24.91	32.82	43.92	53.6	64.04	76.65	87	
2000			14.37	24.97	34.62	43.53	53.36	63.95	74.29		96
2001		9.66	16.77	26.41	34.43	45.18	53.88	64.92	76.49	82.73	
mean		10.4	16.3	25.3	34.4	44.3	53.8	64.2	75.1	86.2	96.0

NEFSC Spring Survey											
North											
	Age										
	0	1	2	3	4	5	6	7	8	9	10
1995			16.96	25.77	32.91	43.48	53.59	62.84	76.14	97	
1996			15	28.48	34.8	46.09	57.34	64.56			
1997				27.36	32				89		
1998		12.12	16.76	25.1	36.07	45.84	53.74	65.99	78		
1999		9	17.04	26.63	35.5	47.98		63.58	73.81	97	
2000			19.08	25.77	36.51	48.65	56.15	67	75.37	86.03	
mean		10.6	17.0	26.7	35.0	47.1	55.7	65.3	79.0	91.5	

NEFSC Spring Survey											
South											
	Age										
	0	1	2	3	4	5	6	7	8	9	10
1995				25.18	35.75	46.35	55.69	63.7	79.03		
1996		9	16.14	22.88	38.07	46.24	52.57	61.85	79.85		
1997			18	24.25	35.89	45	59		73.5		
1998		12	17.78	25.31	35.95	48.52	57.01	64.84	77		
1999			17.8	24.62	33.71	47.56	53.39	64.54	74.6	94	
2000			15.59	26.35	37.93	46.68	57.74	71	78		
mean		10.5	17.1	24.7	36.3	46.8	55.9	65.6	76.6	94.0	

Table C19. Delta distribution stratified mean number per tow at age, NEFSC
autumn and spring offshore surveys.

Autumn Surveys

North

Age	0	1	2	3	4	5	6	7	8	9	Total
1993	0.149	0.308	0.176	0.104	0.094	0.102	0.000	0.031	0.013	0.012	0.989
1994	0.065	0.560	0.287	0.208	0.086	0.089	0.019	0.024	0.011	0.000	1.351
1995	0.000	0.059	0.163	0.285	0.234	0.092	0.021	0.014	0.054	0.000	0.922
1996	0.012	0.048	0.062	0.152	0.206	0.093	0.034	0.011	0.012	0.000	0.630
1997	0.039	0.094	0.016	0.122	0.136	0.052	0.031	0.000	0.007	0.000	0.498
1998	0.000	0.116	0.150	0.090	0.048	0.052	0.135	0.018	0.000	0.000	0.609
1999	0.192	0.310	0.292	0.179	0.015	0.033	0.020	0.040	0.003	0.000	1.084
2000	0.080	0.703	0.626	0.448	0.271	0.105	0.059	0.062	0.044	0.000	2.398

South

Age	0	1	2	3	4	5	6	7	8	9	Total
1993	0.007	0.060	0.064	0.076	0.062	0.014	0.000	0.007	0.000	0.000	0.290
1994	0.015	0.095	0.295	0.056	0.066	0.036	0.021	0.007	0.008	0.000	0.598
1995	0.000	0.102	0.151	0.120	0.053	0.049	0.017	0.000	0.000	0.000	0.493
1996	0.000	0.007	0.030	0.054	0.059	0.060	0.026	0.000	0.000	0.000	0.235
1997	0.017	0.008	0.041	0.055	0.035	0.105	0.031	0.016	0.000	0.000	0.308
1998	0.000	0.070	0.072	0.037	0.059	0.044	0.034	0.008	0.008	0.000	0.332
1999	0.005	0.101	0.172	0.118	0.040	0.014	0.000	0.000	0.000	0.000	0.450
2000	0.007	0.061	0.118	0.106	0.067	0.023	0.041	0.000	0.000	0.000	0.422

Combined Areas

Age	0	1	2	3	4	5	6	7	8	9	Total
1993	0.066	0.161	0.112	0.087	0.075	0.051	0.000	0.017	0.005	0.005	0.580
1994	0.035	0.284	0.270	0.160	0.059	0.058	0.020	0.014	0.009	0.000	0.910
1995	0.000	0.084	0.140	0.211	0.124	0.056	0.018	0.016	0.016	0.006	0.671
1996	0.005	0.024	0.045	0.093	0.119	0.071	0.032	0.005	0.005	0.000	0.399
1997	0.026	0.044	0.031	0.084	0.076	0.082	0.029	0.012	0.003	0.000	0.387
1998	0.000	0.093	0.112	0.058	0.058	0.043	0.066	0.013	0.004	0.000	0.447
1999	0.081	0.187	0.219	0.139	0.033	0.027	0.008	0.017	0.001	0.000	0.713
2000	0.044	0.320	0.328	0.248	0.153	0.056	0.049	0.025	0.018	0.000	1.242

Spring Surveys

North

Age	0	1	2	3	4	5	6	7	8	9	Total
1995	0.000	0.000	0.153	0.174	0.247	0.110	0.076	0.163	0.053	0.008	0.984
1996	0.000	0.000	0.036	0.014	0.231	0.263	0.059	0.065	0.000	0.000	0.668
1997	0.028	0.000	0.000	0.074	0.197	0.004	0.000	0.024	0.012	0.000	0.339
1998	0.000	0.040	0.162	0.045	0.044	0.045	0.025	0.046	0.008	0.000	0.414
1999	0.000	0.012	0.182	0.194	0.229	0.066	0.000	0.079	0.057	0.004	0.824
2000	0.000	0.000	0.238	0.386	0.254	0.121	0.033	0.012	0.060	0.024	1.128
2001	0.000	0.058	0.505	0.371	0.290	0.207	0.087	0.060	0.071	0.036	1.686

South

Age	0	1	2	3	4	5	6	7	8	9	Total
1995	0.000	0.000	0.000	0.058	0.043	0.014	0.031	0.018	0.032	0.000	0.196
1996	0.000	0.009	0.010	0.013	0.028	0.016	0.036	0.012	0.012	0.000	0.135
1997	0.000	0.000	0.008	0.031	0.052	0.025	0.005	0.000	0.003	0.000	0.124
1998	0.000	0.001	0.041	0.054	0.087	0.042	0.011	0.013	0.005	0.000	0.254
1999	0.000	0.000	0.018	0.073	0.061	0.104	0.024	0.020	0.034	0.001	0.335
2000	0.000	0.000	0.025	0.056	0.077	0.051	0.025	0.006	0.001	0.000	0.242
2001	0.000	0.007	0.018	0.056	0.070	0.039	0.041	0.003	0.000	0.000	0.234

Combined Areas

Age	0	1	2	3	4	5	6	7	8	9	Total
1995	0.000	0.000	0.069	0.100	0.128	0.047	0.056	0.078	0.041	0.003	0.523
1996	0.000	0.005	0.021	0.017	0.108	0.119	0.045	0.034	0.007	0.000	0.356
1997	0.007	0.004	0.005	0.049	0.093	0.013	0.026	0.000	0.017	0.000	0.213
1998	0.000	0.017	0.093	0.048	0.070	0.043	0.017	0.027	0.006	0.000	0.320
1999	0.000	0.005	0.085	0.120	0.128	0.092	0.014	0.044	0.043	0.003	0.535
2000	0.000	0.000	0.121	0.186	0.150	0.080	0.028	0.009	0.025	0.010	0.609
2001	0.000	0.028	0.220	0.180	0.168	0.108	0.061	0.027	0.029	0.015	0.836

Table C20. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosefish from NEFSC offshore autumn research vessel bottom trawl surveys in the southern management region (strata 1-19, 61-76); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Ind wt	Length					Number of Fish	Number of Nonzero Tows	Number of Tows		
	Raw Index			Smoothed			Raw Index			Smoothed				Min	5%	50%	Mean	95%				Max	
	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%											
1963	3.724	1.786	5.663	4.168			1.257	0.745	1.769	1.304			2.926	7	17	53	50.4	91	97	102	36	73	
1964	5.486	3.391	7.581	4.496			1.636	0.907	2.366	1.337			3.467	14	21	53	52.0	86	101	132	34	83	
1965	5.163	2.731	7.594	4.242			1.148	0.778	1.519	1.197			4.199	10	15	59	56.3	91	104	83	39	85	
1966	6.986	4.936	9.037	3.507	2.061	5.969	1.926	1.364	2.488	1.102	0.634	1.915	3.563	7	7	51	49.6	87	98	101	56	87	
1967	1.122	0.588	1.655	1.825	1.072	3.105	0.519	0.324	0.715	0.697	0.401	1.211	2.173	14	19	31	40.6	83	100	98	42	163	
1968	0.850	0.413	1.287	1.317	0.774	2.240	0.399	0.206	0.591	0.537	0.309	0.933	2.131	12	17	45	46.3	75	86	77	39	164	
1969	1.138	0.483	1.793	1.275	0.749	2.169	0.497	0.281	0.714	0.505	0.291	0.878	2.273	10	14	41	45.4	88	96	101	43	163	
1970	1.357	0.512	2.203	1.332	0.782	2.266	0.350	0.235	0.466	0.481	0.277	0.836	3.566	4	13	55	53.3	84	104	58	35	161	
1971	0.786	0.196	1.377	1.374	0.807	2.337	0.282	0.150	0.414	0.567	0.326	0.985	2.813	5	8	39	42.3	95	98	55	28	168	
1972	4.918	3.295	6.541	2.062	1.212	3.509	4.113	1.281	6.944	1.067	0.614	1.856	1.298	12	16	23	31.8	74	99	604	85	161	
1973	1.986	0.994	2.978	1.725	1.014	2.936	1.176	0.857	1.494	0.812	0.467	1.411	1.568	13	14	32	37.7	77	93	280	70	154	
1974	0.710	0.322	1.098	1.314	0.772	2.235	0.218	0.116	0.320	0.482	0.277	0.837	3.277	14	16	54	52.9	81	101	56	26	153	
1975	2.043	1.326	2.759	1.512	0.889	2.573	0.653	0.434	0.871	0.486	0.280	0.845	3.030	8	17	45	46.3	87	105	127	51	158	
1976	1.084	0.539	1.630	1.422	0.836	2.420	0.314	0.189	0.438	0.403	0.232	0.701	3.166	11	11	51	50.7	77	95	60	34	165	
1977	1.873	1.192	2.554	1.605	0.943	2.731	0.372	0.265	0.479	0.395	0.227	0.687	5.024	5	16	55	53.1	95	106	94	50	172	
1978	1.395	0.883	1.906	1.633	0.960	2.779	0.259	0.178	0.340	0.403	0.232	0.700	5.384	13	17	61	56.5	87	101	68	39	219	
1979	2.275	1.278	3.272	1.847	1.085	3.143	0.694	0.483	0.905	0.553	0.318	0.961	2.779	7	16	34	40.5	84	109	182	70	205	
1980	1.868	1.166	2.570	1.816	1.067	3.091	0.726	0.427	1.025	0.652	0.375	1.133	2.664	3	16	34	41.6	85	104	113	42	159	
1981	2.858	0.883	4.834	1.752	1.030	2.982	0.965	0.578	1.352	0.714	0.411	1.241	2.363	6	17	38	40.7	71	99	176	59	146	
1982	0.646	0.350	0.941	1.217	0.715	2.071	0.610	0.373	0.847	0.638	0.367	1.110	1.060	13	15	26	32.5	66	73	98	42	143	
1983	2.150	0.693	3.608	1.294	0.760	2.201	0.776	0.470	1.080	0.589	0.339	1.023	2.304	7	16	45	44.4	72	100	109	49	146	
1984	0.740	0.148	1.332	0.977	0.574	1.663	0.311	0.114	0.508	0.451	0.259	0.784	2.445	5	13	47	45.7	68	93	42	25	146	
1985	1.318	0.752	1.884	0.890	0.523	1.514	0.524	0.356	0.692	0.443	0.255	0.770	2.444	17	17	40	42.0	72	96	100	46	145	
1986	0.552	0.237	0.867	0.622	0.366	1.059	0.325	0.169	0.481	0.389	0.224	0.676	1.681	7	14	34	37.6	68	78	60	33	146	
1987	0.274	0.117	0.432	0.472	0.277	0.802	0.482	0.307	0.657	0.385	0.222	0.670	0.575	12	13	20	25.0	56	61	67	27	132	
1988	0.554	0.210	0.899	0.515	0.302	0.876	0.230	0.097	0.364	0.328	0.189	0.571	2.391	19	27	36	45.1	87	91	27	19	129	
1989	0.625	0.278	0.972	0.535	0.314	0.910	0.382	0.181	0.583	0.356	0.205	0.618	1.646	7	7	42	38.0	57	77	57	23	129	
1990	0.426	0.017	0.834	0.500	0.294	0.851	0.294	0.113	0.474	0.367	0.211	0.638	1.265	9	13	24	33.1	61	81	47	22	136	
1991	0.783	0.206	1.360	0.520	0.306	0.885	0.690	0.245	1.136	0.440	0.253	0.765	1.085	14	15	23	30.8	57	81	106	27	131	
1992	0.312	0.170	0.454	0.412	0.242	0.700	0.342	0.220	0.463	0.390	0.224	0.677	0.919	8	11	30	32.2	54	74	46	21	129	
1993	0.294	0.055	0.532	0.392	0.230	0.667	0.290	0.135	0.445	0.377	0.217	0.655	0.944	10	13	32	30.4	52	68	46	24	130	
1994	0.611	0.175	1.047	0.453	0.266	0.771	0.598	0.344	0.852	0.434	0.250	0.755	0.906	8	12	25	29.2	59	83	85	31	135	
1995	0.386	0.160	0.612	0.429	0.252	0.729	0.493	0.258	0.728	0.403	0.232	0.701	0.777	11	13	25	29.4	54	66	72	29	129	
1996	0.387	0.214	0.560	0.435	0.256	0.740	0.235	0.131	0.338	0.328	0.188	0.569	1.638	18	19	42	42.3	62	68	31	21	131	
1997	0.592	0.325	0.858	0.477	0.280	0.813	0.308	0.186	0.430	0.332	0.191	0.578	1.914	9	9	49	44.6	70	71	43	24	131	
1998	0.500	0.226	0.774	0.453	0.265	0.774	0.332	0.146	0.519	0.355	0.203	0.620	1.525	11	11	36	37.0	68	87	45	20	131	
1999	0.304	0.167	0.441	0.402	0.231	0.701	0.450	0.289	0.612	0.396	0.223	0.706	0.672	12	14	27	29.2	52	55	109	44	106	
2000	0.477	0.261	0.694	0.431	0.227	0.817	0.422	0.270	0.575	0.407	0.209	0.791	1.102	5	15	33	34.3	63	70	64	30	132	
2001	0.708*	0.366*	1.051*				0.383*	0.239*	0.527*														

* preliminary data

Table C21. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosfish from NEFSC offshore spring research vessel bottom trawl surveys in the southern management region (strata 1-19, 61-76); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Ind wt	Length						Number of Fish	Number of Nonzero Tows	Number of Tows
	Raw Index			Smoothed			Raw Index			Smoothed				Min	5%	50%	Mean	95%	Max			
	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%										
1968	1.142	0.552	1.731	1.067			0.211	0.126	0.297	0.216			5.344	21	23	63	62.5	94	95	65	31	150
1969	0.938	0.427	1.448	1.020			0.221	0.138	0.305	0.220			4.064	7	25	47	54.3	91	111	41	31	155
1970	1.005	0.460	1.549	1.031			0.175	0.103	0.247	0.223			5.699	22	22	65	63.9	102	108	40	31	166
1971	0.762	0.313	1.211	1.061	0.679	1.658	0.204	0.104	0.304	0.265	0.173	0.406	3.675	13	16	50	53.3	101	115	42	24	160
1972	1.883	1.161	2.604	1.364	0.873	2.131	0.371	0.272	0.469	0.375	0.244	0.576	5.071	14	22	59	59.1	103	123	79	48	165
1973	1.857	1.494	2.220	1.412	0.903	2.205	1.051	0.854	1.249	0.536	0.349	0.822	1.744	11	19	32	41.1	80	110	589	128	187
1974	1.129	0.728	1.530	1.215	0.778	1.898	0.486	0.368	0.604	0.486	0.317	0.746	2.367	14	21	44	49.1	93	117	201	70	132
1975	0.936	0.562	1.310	1.098	0.703	1.716	0.447	0.326	0.568	0.442	0.288	0.678	2.044	10	22	44	47.6	87	107	169	61	134
1976	1.209	0.833	1.585	1.105	0.707	1.727	0.403	0.307	0.500	0.398	0.259	0.610	2.777	13	22	48	51.5	91	110	259	78	162
1977	1.205	0.754	1.657	1.047	0.670	1.637	0.302	0.232	0.372	0.355	0.231	0.545	3.803	16	21	51	56.8	95	116	173	75	160
1978	0.735	0.512	0.959	0.903	0.578	1.411	0.335	0.265	0.405	0.353	0.230	0.542	2.184	11	17	39	45.9	90	104	196	66	161
1979	0.733	0.441	1.026	0.895	0.573	1.398	0.281	0.164	0.397	0.364	0.237	0.559	2.589	10	14	37	44.4	98	124	125	50	194
1980	0.799	0.494	1.104	1.013	0.649	1.583	0.451	0.354	0.548	0.446	0.291	0.685	1.636	18	21	34	40.8	83	106	346	99	204
1981	1.816	1.145	2.486	1.347	0.862	2.104	0.784	0.540	1.029	0.544	0.354	0.834	2.259	12	22	40	44.6	89	113	345	74	141
1982	2.803	1.584	4.021	1.463	0.937	2.286	0.942	0.657	1.226	0.517	0.337	0.794	2.800	11	14	38	42.4	89	104	251	68	150
1983	0.955	0.421	1.489	1.027	0.658	1.605	0.270	0.176	0.365	0.329	0.215	0.505	3.514	24	24	47	51.8	97	112	55	36	147
1984	0.747	0.223	1.272	0.758	0.485	1.184	0.182	0.090	0.274	0.239	0.156	0.367	4.067	21	21	47	50.9	96	97	35	22	149
1985	0.327	0.089	0.565	0.564	0.361	0.881	0.159	0.072	0.247	0.209	0.136	0.321	2.052	22	22	39	42.3	85	90	31	21	147
1986	0.823	0.342	1.303	0.606	0.388	0.946	0.283	0.125	0.442	0.219	0.143	0.336	2.917	15	24	43	48.7	90	102	65	36	149
1987	0.496	-0.014	1.007	0.529	0.339	0.827	0.108	0.054	0.162	0.194	0.126	0.297	4.612	15	15	59	52.7	102	103	30	21	150
1988	0.427	0.264	0.590	0.483	0.309	0.755	0.440	0.280	0.601	0.253	0.165	0.389	0.971	17	18	30	34.0	61	82	67	33	132
1989	0.365	0.122	0.608	0.480	0.307	0.749	0.202	0.097	0.306	0.229	0.149	0.351	1.807	15	24	41	41.4	69	79	36	18	129
1990	1.005	0.431	1.579	0.572	0.366	0.893	0.205	0.099	0.311	0.224	0.146	0.344	4.861	16	21	53	56.5	86	93	39	23	128
1991	0.582	0.236	0.927	0.466	0.298	0.729	0.319	0.142	0.495	0.234	0.152	0.359	1.819	15	23	33	37.6	69	101	61	31	132
1992	0.210	0.067	0.353	0.328	0.210	0.512	0.177	0.089	0.266	0.198	0.129	0.304	1.235	14	19	28	35.0	69	85	28	17	128
1993	0.264	0.097	0.431	0.310	0.199	0.485	0.195	0.096	0.295	0.180	0.117	0.277	1.319	17	19	38	38.6	56	72	29	18	128
1994	0.321	0.117	0.525	0.328	0.210	0.513	0.114	0.057	0.172	0.156	0.102	0.239	2.866	13	13	41	43.8	91	93	24	18	131
1995	0.526	0.031	1.021	0.352	0.225	0.550	0.196	0.100	0.292	0.166	0.108	0.255	2.637	18	19	38	45.7	80	81	32	20	129
1996	0.284	0.112	0.457	0.288	0.184	0.450	0.135	0.070	0.200	0.158	0.103	0.243	2.083	9	9	44	43.7	80	81	27	20	143
1997	0.132	0.035	0.228	0.237	0.152	0.371	0.124	0.050	0.198	0.168	0.109	0.257	1.064	18	18	37	35.9	58	75	38	14	130
1998	0.282	0.157	0.407	0.291	0.186	0.455	0.254	0.164	0.344	0.217	0.142	0.334	1.110	12	16	35	35.9	64	77	40	30	131
1999	0.629	0.342	0.916	0.363	0.232	0.570	0.335	0.217	0.453	0.254	0.165	0.391	1.899	16	19	41	42.8	74	94	63	32	131
2000	0.293	0.163	0.424	0.314	0.197	0.500	0.242	0.153	0.330	0.246	0.157	0.385	1.222	14	14	38	37.9	61	78	32	25	131
2001	0.244	0.089	0.399	0.284	0.166	0.485	0.234	0.131	0.336	0.241	0.144	0.404	1.098	11	15	34	35.8	57	68	44	26	131

Table C22. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosfish from NEFSC winter flatfish surveys in the southern management region (strata 1-19, 61-76); confidence limits for indices; minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed.

	Biomass			Abundance			Ind wt	Length						No. of Fish	No. Of Nonzero Tows	No. of Tows
	Raw Index			Raw Index				Min	5%	50%	Mean	95%	Max			
	Mean	L95%	U95%	Mean	L95%	U95%										
1992	5.395	3.515	7.275	5.176	3.665	6.687	0.986	11	22	34	36.0	52	95	583	66	110
1993	6.317	4.565	8.070	5.002	3.941	6.062	1.188	9	21	36	37.7	53	98	585	77	109
1994	2.787	1.958	3.617	2.534	1.855	3.212	1.078	8	16	31	35.1	61	78	278	56	82
1995	3.398	2.249	4.457	2.738	1.859	3.617	1.245	19	21	36	37.9	57	101	390	76	123
1996	5.701	4.683	6.720	3.779	3.035	4.523	1.498	10	24	39	41.1	61	100	554	87	123
1997	5.390	3.781	6.998	3.172	2.445	3.900	1.667	10	20	43	42.0	62	91	455	89	119
1998	2.851	2.061	3.641	1.416	1.105	1.726	1.983	10	20	42	44.9	69	103	240	77	134
1999	3.792	2.869	4.715	2.803	2.183	3.423	1.340	10	18	35	38.3	61	87	459	83	138
2000	5.539	4.225	6.854	4.115	3.184	5.047	1.346	11	22	37	38.7	57	96	661	93	124
2001	7.324	4.892	9.755	4.346	3.126	5.565	1.451	8	19	37	40.0	60	84	1042	115	167

Table C23. NEFSC winter offshore survey, delta distribution stratified mean number per tow at age.

South	Age											Total
	0	1	2	3	4	5	6	7	8	9	10	
1997	0.000	0.052	0.111	0.672	0.459	0.800	0.830	0.188	0.043	0.017	0.000	3.172
1998	0.000	0.015	0.049	0.063	0.341	0.492	0.267	0.110	0.059	0.010	0.010	1.416
1999	0.000	0.026	0.143	0.654	0.730	0.534	0.532	0.133	0.044	0.008	0.000	2.803
2000	0.000	0.000	0.041	0.759	1.353	1.357	0.423	0.118	0.046	0.000	0.018	4.115
2001	0.000	0.025	0.189	0.743	1.379	0.982	0.803	0.151	0.060	0.014	0.000	4.346

Table C24. Stratified mean number and length (cm) per tow for goosefish from NEFSC summer scallop surveys in the southern management region (shellfish strata 1-48,55-64,69-70,73-74); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and the total number of tows completed in each year.

	Abundance						Min	5%	50%	Mean	95%	Max	Number of Fish	Number of Nonzero Tows	Number of Tows			
	Raw Index			Smoothed												Length		
	Mean	L95%	U95%	Mean	L95%	U95%										Mean	95%	Max
1984	1.068	0.911	1.225	1.111			6	12	28	30.6	60	82	523	232	389			
1985	1.073	0.921	1.226	1.141			7	10	30	32.8	64	113	594	234	404			
1986	0.934	0.714	1.155	1.221			8	10	16	22.1	53	95	465	203	371			
1987	2.418	1.927	2.909	1.564	1.102	2.219	8	9	13	18.7	51	90	1429	313	433			
1988	1.444	1.182	1.705	1.494	1.053	2.120	7	12	29	30.3	49	97	725	234	435			
1989	1.241	1.078	1.405	1.461	1.029	2.073	6	10	34	33.7	54	101	373	175	352			
1990	1.401	1.222	1.580	1.594	1.123	2.262	6	10	18	25.6	57	94	579	211	342			
1991	2.216	1.935	2.496	1.896	1.336	2.691	7	9	14	21.0	45	94	809	242	323			
1992	1.877	1.608	2.146	2.032	1.432	2.884	5	9	25	27.3	52	97	644	235	324			
1993	2.639	2.387	2.892	2.298	1.619	3.261	8	10	15	22.4	49	79	1012	270	325			
1994	3.095	2.738	3.452	2.366	1.667	3.358	8	10	15	22.5	51	87	1151	271	338			
1995	2.093	1.826	2.361	2.035	1.434	2.888	7	9	28	30.0	58	92	776	252	338			
1996	1.814	1.580	2.048	1.717	1.209	2.438	7	9	24	29.9	59	81	639	227	307			
1997	1.046	0.904	1.188	1.395	0.980	1.987	7	13	33	37.2	65	76	398	204	336			
1998	0.958	0.827	1.089	1.377	0.955	1.985	6	11	22	31.5	63	79	380	188	339			
1999	2.441	2.047	2.835	1.733	1.137	2.642	6	9	17	24.6	60	84	859	250	311			

Table C25. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosefish from NEFSC offshore autumn research vessel bottom trawl surveys in management regions combined (strata 1-30, 34-40, 61-76); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Ind wt	Length					Number of Fish	Number of Nonzero Tows	Number of Tows		
	Raw Index			Smoothed			Raw Index			Smoothed				Min	5%	50%	Mean	95%				Max	
	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%											
1963	3.741	2.492	4.990	3.590			1.022	0.732	1.313	0.944			3.628	7	16	54	53.59	96	111	188	75	163	
1964	3.509	2.424	4.594	3.492			0.985	0.626	1.343	0.895			3.658	14	20	54	53.52	89	102	164	57	170	
1965	3.772	2.465	5.080	3.386			0.728	0.542	0.915	0.795			4.930	10	19	62	60.11	93	110	123	69	173	
1966	5.038	3.886	6.189	3.053	2.113	4.409	1.175	0.894	1.455	0.750	0.493	1.140	4.209	7	8	56	54.73	89	98	156	89	173	
1967	1.189	0.719	1.659	1.965	1.360	2.839	0.380	0.260	0.501	0.523	0.344	0.795	3.144	14	19	41	46.8	91	100	116	57	249	
1968	1.348	0.663	2.033	1.773	1.228	2.562	0.351	0.219	0.484	0.451	0.297	0.686	3.835	11	20	53	54.85	89	106	109	55	250	
1969	2.215	1.323	3.108	1.925	1.332	2.780	0.464	0.325	0.603	0.461	0.303	0.701	4.702	10	17	58	58.03	97	110	140	73	251	
1970	1.727	0.996	2.457	1.900	1.315	2.745	0.369	0.270	0.468	0.469	0.309	0.714	4.552	4	17	58	59.52	90	104	99	56	253	
1971	1.680	0.971	2.388	2.000	1.385	2.889	0.370	0.262	0.477	0.562	0.369	0.854	4.526	5	9	58	56.09	95	101	99	55	262	
1972	3.443	2.449	4.436	2.368	1.639	3.420	2.520	0.876	4.163	0.890	0.585	1.353	1.475	12	16	23	33.14	75	99	633	107	255	
1973	2.460	1.657	3.262	2.179	1.509	3.148	0.898	0.696	1.100	0.700	0.461	1.065	2.672	13	15	36	44.32	92	112	343	99	246	
1974	1.278	0.820	1.735	1.849	1.280	2.670	0.258	0.179	0.337	0.466	0.307	0.709	4.860	13	14	63	59.04	97	111	93	49	250	
1975	1.903	1.392	2.414	2.010	1.391	2.903	0.504	0.367	0.640	0.462	0.304	0.703	3.693	8	17	50	50.39	89	105	167	78	264	
1976	2.051	1.219	2.883	2.267	1.569	3.274	0.359	0.255	0.464	0.432	0.284	0.657	5.359	11	27	62	61.27	94	121	92	58	252	
1977	3.424	2.466	4.382	2.734	1.893	3.949	0.479	0.385	0.572	0.457	0.301	0.696	7.006	5	19	64	62.98	99	119	206	106	298	
1978	2.951	2.211	3.690	2.835	1.962	4.095	0.393	0.315	0.472	0.470	0.309	0.714	7.067	10	18	65	63.36	99	116	214	117	420	
1979	3.446	2.575	4.317	2.861	1.981	4.132	0.604	0.471	0.736	0.543	0.357	0.826	5.193	7	16	47	51.14	97	115	307	148	416	
1980	2.956	1.937	3.976	2.548	1.764	3.680	0.645	0.458	0.833	0.585	0.385	0.889	4.414	3	16	40	49.38	98	111	178	81	256	
1981	2.491	1.297	3.686	2.053	1.421	2.965	0.730	0.500	0.960	0.589	0.388	0.896	2.955	6	17	42	44.64	80	101	222	89	239	
1982	0.767	0.478	1.057	1.453	1.006	2.098	0.413	0.273	0.554	0.515	0.338	0.783	1.859	13	15	32	37.74	75	100	115	56	238	
1983	1.932	1.026	2.838	1.579	1.093	2.280	0.651	0.455	0.847	0.521	0.343	0.792	2.637	7	16	48	46.96	79	100	147	76	228	
1984	1.694	0.940	2.448	1.498	1.037	2.164	0.383	0.257	0.510	0.454	0.298	0.690	4.216	5	13	56	54.67	93	106	78	54	234	
1985	1.370	0.829	1.910	1.308	0.906	1.890	0.459	0.336	0.582	0.443	0.291	0.673	2.962	12	17	44	45.72	88	102	132	69	233	
1986	1.308	0.751	1.866	1.108	0.767	1.600	0.442	0.311	0.573	0.422	0.277	0.642	2.841	7	17	43	46.86	81	100	106	59	236	
1987	0.523	0.251	0.795	0.839	0.581	1.212	0.392	0.272	0.511	0.390	0.256	0.592	1.337	12	14	22	32.64	65	96	99	42	219	
1988	0.957	0.480	1.433	0.873	0.604	1.261	0.265	0.156	0.374	0.358	0.236	0.545	3.607	11	23	46	50.96	89	93	53	36	218	
1989	0.940	0.513	1.367	0.854	0.591	1.233	0.401	0.267	0.536	0.403	0.265	0.613	2.291	7	8	41	39.23	84	96	96	48	216	
1990	0.665	0.331	0.998	0.782	0.542	1.130	0.418	0.281	0.555	0.455	0.299	0.692	1.525	9	10	25	32.62	70	89	102	57	225	
1991	0.971	0.534	1.407	0.800	0.554	1.156	0.643	0.370	0.915	0.544	0.358	0.827	1.447	9	13	27	33.62	69	95	168	60	219	
1992	0.641	0.399	0.883	0.718	0.497	1.037	0.590	0.433	0.746	0.581	0.382	0.883	1.094	8	8	27	32.74	72	86	124	58	215	
1993	0.605	0.282	0.928	0.696	0.482	1.005	0.580	0.427	0.733	0.613	0.403	0.932	1.039	6	9	22	28.1	56	94	149	69	216	
1994	0.761	0.406	1.116	0.741	0.513	1.070	0.910	0.693	1.127	0.672	0.442	1.022	0.761	8	10	21	26.52	56	98	195	82	222	
1995	0.935	0.481	1.389	0.775	0.536	1.119	0.671	0.502	0.839	0.602	0.396	0.915	1.313	10	13	33	35.19	69	91	159	69	222	
1996	0.671	0.412	0.929	0.714	0.494	1.031	0.399	0.288	0.509	0.500	0.329	0.760	1.671	8	14	40	40.97	63	95	82	51	219	
1997	0.624	0.411	0.836	0.685	0.474	0.990	0.387	0.279	0.495	0.484	0.318	0.736	1.605	8	9	40	39.69	70	86	82	51	221	
1998	0.696	0.450	0.943	0.700	0.483	1.015	0.447	0.307	0.587	0.544	0.356	0.830	1.529	10	10	30	36.16	68	87	101	58	235	
1999	0.520	0.289	0.751	0.718	0.489	1.055	0.713	0.541	0.885	0.697	0.450	1.079	0.700	8	9	23	27.05	54	81	220	88	212	
2000	1.314	0.796	1.832	0.916	0.588	1.426	1.242	0.884	1.599	0.879	0.531	1.456	1.047	5	11	25	31.07	65	88	229	73	219	
2001	1.265	0.842	1.689				0.898	0.709	1.086														

Table C26. Stratified mean weight (kg), number, individual fish weight, and length (cm) per tow for goosfish from NEFSC offshore spring research vessel bottom trawl surveys in management regions combined (strata 1-30, 34-40, 61-76); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and total number of tows completed in each year.

	Biomass						Abundance						Ind wt	Length						Number of Fish	Number of Nonzero Tows	Number of Tows
	Raw Index			Smoothed			Raw Index			Smoothed				Min	5%	50%	Mean	95%	Max			
	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%	Mean	L95%	U95%										
1968	1.071	0.617	1.525	1.132			0.198	0.131	0.264	0.213			5.375	21	27	67	65.5	93	95	78	42	236
1969	1.093	0.521	1.666	1.175			0.206	0.130	0.282	0.223			5.177	7	25	67	60.8	99	111	56	41	242
1970	1.408	0.794	2.022	1.280			0.246	0.178	0.314	0.247			5.705	22	25	62	64.8	98	108	72	53	256
1971	0.871	0.506	1.235	1.308	0.907	1.887	0.185	0.117	0.253	0.274	0.189	0.397	4.647	13	20	58	60.3	99	115	62	39	256
1972	3.042	2.242	3.841	1.758	1.219	2.535	0.485	0.387	0.583	0.396	0.273	0.574	6.186	13	22	67	66.6	100	123	138	86	261
1973	1.878	1.427	2.330	1.633	1.132	2.355	0.792	0.637	0.948	0.500	0.345	0.724	2.342	11	20	41	46.8	88	110	680	164	274
1974	1.275	0.928	1.622	1.381	0.958	1.992	0.466	0.380	0.552	0.463	0.319	0.670	2.771	14	22	46	52.7	93	117	287	111	215
1975	0.935	0.675	1.196	1.233	0.855	1.778	0.402	0.318	0.487	0.426	0.294	0.617	2.295	10	21	47	49.9	87	109	242	97	221
1976	1.888	1.364	2.412	1.325	0.919	1.911	0.517	0.414	0.619	0.408	0.281	0.591	3.310	13	21	56	57.0	93	110	417	130	261
1977	1.124	0.801	1.447	1.122	0.778	1.619	0.284	0.224	0.341	0.332	0.229	0.482	3.723	10	23	58	59.3	93	116	234	112	267
1978	0.690	0.513	0.866	0.950	0.659	1.370	0.253	0.208	0.298	0.301	0.208	0.437	2.610	11	17	45	50.5	89	104	233	96	274
1979	0.801	0.490	1.111	0.997	0.691	1.437	0.223	0.153	0.293	0.308	0.212	0.446	3.162	10	14	40	49.3	99	124	173	90	333
1980	1.144	0.751	1.537	1.211	0.840	1.747	0.421	0.348	0.494	0.389	0.269	0.564	2.439	17	21	37	45.6	89	107	430	137	289
1981	1.786	1.263	2.308	1.530	1.061	2.206	0.612	0.465	0.759	0.467	0.322	0.677	2.832	11	22	42	48.0	93	120	440	116	228
1982	2.892	1.875	3.909	1.740	1.207	2.510	0.691	0.508	0.875	0.468	0.323	0.679	4.028	11	17	44	47.9	99	108	284	90	242
1983	1.220	0.679	1.761	1.408	0.976	2.030	0.332	0.222	0.442	0.361	0.249	0.523	3.593	12	19	49	50.8	96	112	89	58	237
1984	1.146	0.593	1.699	1.253	0.869	1.807	0.243	0.161	0.325	0.294	0.203	0.427	4.445	17	20	58	56.5	93	100	61	41	235
1985	1.077	0.627	1.527	1.185	0.822	1.709	0.238	0.158	0.317	0.273	0.188	0.396	4.540	13	21	55	57.3	104	108	56	42	228
1986	1.386	0.805	1.967	1.195	0.829	1.723	0.307	0.198	0.417	0.277	0.191	0.402	4.467	11	20	54	56.5	99	121	95	58	239
1987	1.007	0.495	1.519	1.090	0.756	1.572	0.165	0.110	0.219	0.263	0.182	0.382	6.118	15	15	65	59.8	99	103	51	37	233
1988	1.126	0.617	1.635	1.050	0.728	1.514	0.511	0.382	0.639	0.342	0.236	0.496	2.146	10	19	34	41.8	80	110	110	59	222
1989	0.890	0.444	1.336	0.964	0.668	1.390	0.377	0.237	0.517	0.339	0.234	0.492	2.343	10	11	40	42.6	74	94	84	42	214
1990	1.005	0.577	1.433	0.934	0.648	1.347	0.237	0.156	0.318	0.314	0.216	0.455	4.230	15	18	49	52.8	92	107	64	40	218
1991	1.098	0.503	1.692	0.861	0.597	1.242	0.432	0.295	0.570	0.350	0.241	0.507	2.332	12	15	33	40.3	78	101	109	59	218
1992	0.490	0.027	0.953	0.675	0.468	0.973	0.307	0.160	0.453	0.339	0.234	0.491	1.602	14	17	33	38.7	82	101	64	37	211
1993	0.638	0.420	0.855	0.656	0.455	0.945	0.399	0.294	0.503	0.351	0.242	0.509	1.587	10	12	42	40.3	71	90	88	45	215
1994	0.581	0.315	0.847	0.649	0.450	0.935	0.254	0.174	0.335	0.333	0.230	0.483	2.344	10	13	40	41.8	83	93	69	42	219
1995	1.018	0.538	1.499	0.691	0.479	0.997	0.523	0.378	0.667	0.379	0.262	0.550	1.993	15	16	34	41.2	75	97	115	59	217
1996	0.584	0.332	0.836	0.567	0.393	0.818	0.356	0.217	0.496	0.348	0.240	0.505	1.604	9	15	43	43.2	67	81	76	40	225
1997	0.298	0.128	0.469	0.457	0.317	0.659	0.213	0.127	0.300	0.315	0.217	0.456	1.417	9	11	36	38.2	75	89	72	33	219
1998	0.349	0.220	0.478	0.490	0.340	0.708	0.320	0.246	0.395	0.370	0.255	0.537	1.086	11	12	30	33.4	66	78	86	63	246
1999	0.864	0.573	1.155	0.661	0.457	0.957	0.535	0.402	0.669	0.479	0.330	0.697	1.577	9	15	32	38.2	71	97	125	65	218
2000	0.765	0.507	1.022	0.745	0.508	1.092	0.609	0.480	0.738	0.577	0.392	0.850	1.233	14	16	31	35.3	70	87	131	67	220
2001	0.959	0.418	1.501	0.825	0.531	1.282	0.836	0.634	1.038	0.670	0.428	1.047	1.111	9	12	27	32.0	71	86	195	74	222

Table C27. Stratified mean number and length (cm) per tow for goosefish from NEFSC summer scallop surveys in management regions combined (shellfish strata 1-74); confidence limits for both the raw index and the indices smoothed using an integrated moving average ($\theta = 0.45$); minimum and maximum lengths; number of fish caught, number of positive tows, and the total number of tows completed in each year.

	Abundance						Min	Length				Number of Fish	Number of Nonzero Tows	Number of Tows	
	Raw Index			Smoothed				5%	50%	95%	Max				
	Mean	L95%	U95%	Mean	L95%	U95%									
1984	1.030	0.884	1.176	1.078			6	12	28	31.8	64	115	576	266	475
1985	1.057	0.914	1.201	1.112			7	11	31	34.0	66	113	680	270	489
1986	0.916	0.713	1.120	1.186			8	10	16	24.3	61	97	554	244	469
1987	2.278	1.821	2.736	1.504	1.076	2.103	8	9	13	19.1	53	101	1472	342	529
1988	1.381	1.137	1.625	1.444	1.033	2.018	7	13	29	31.0	52	97	784	272	533
1989	1.267	1.100	1.435	1.428	1.021	1.996	6	10	36	35.1	55	101	456	203	412
1990	1.334	1.170	1.498	1.529	1.094	2.137	6	10	19	26.9	59	94	643	249	426
1991	2.047	1.801	2.292	1.795	1.284	2.509	7	9	14	21.9	49	94	920	290	422
1992	1.800	1.565	2.035	1.929	1.380	2.697	5	9	26	28.5	53	97	779	286	420
1993	2.456	2.229	2.683	2.173	1.555	3.037	8	10	15	22.6	49	79	1166	317	412
1994	2.877	2.562	3.192	2.254	1.612	3.150	8	10	15	23.3	54	93	1342	324	437
1995	2.106	1.856	2.357	1.984	1.419	2.773	7	9	29	31.2	58	92	1017	316	436
1996	1.765	1.551	1.979	1.677	1.199	2.345	7	10	27	31.2	59	81	794	280	401
1997	1.026	0.897	1.156	1.370	0.977	1.921	7	14	35	38.8	66	100	512	258	446
1998	0.956	0.837	1.074	1.359	0.958	1.928	6	11	25	33.4	67	89	483	235	435
1999	2.397	2.010	2.784	1.707	1.141	2.555	6	9	17	24.6	60	84	859	250	312

Table C28. Net dimensions for the monkfish net used on the Mary K.

	Measurements
Backstraps	14'+15'= 29'
Belly	100 meshes deep; Mesh measurements were 6, 6, 6, 6.25, 5.625, 6.25, 6.25, 6, 6, 6, 6.06
Codend	50 meshed deep by 27 across; Mesh measurements were 6.25, 5.75, 5.75, 5.875, 6.25, 5.625, 6, 6, 5.875, 6.06,
Corners	Each 5' from center
Droppers	2 links with shackles
Floats	65 - eight inch center hole floats - orange
Footrope	180' +100' (wing extensions) = 280'
Headrope	148' + 100' (wing extensions) = 248'
Legs	62' top (1/2" cable) and 62' bottom (3" chain)
Square	29.5 meshed deep
Sweep	5" cookies towards wings, 6" cookies in center, wing extensions had chain.
Tickler	Two ticklers both 64' 6" in length. Attached 50 and 54 feet back from the wing (not wing extension)
Twine	green polyethylene (4mm)
Up and Down line	6'
Wing Extensions	100' top and bottom with chain groundgear

Table C29. Summary of tows conducted for mensuration, calibration, gear efficiency and goosefish depth distribution. Total number of tows was 64; some tows collected more than one type of data.

Vessel	Type of Tow	Purpose	Number of tows completed
F/V Drake	Depletion	Efficiency	10
	Net mensuration - net 1	Wingspread estimates	15
	Net mensuration - net 2	Wingspread estimates	13
	Net comparisons (net 1 - net 2)	Calibration between nets	20
	Paired tows with Mary K	Calibration between vessels	16
	Video	Efficiency	6
F/V Mary K	Depletion	Efficiency	3
	Net mensuration	Wingspread estimates	16
	Paired tows with Drake	Calibration between vessels	15
	Repeated tows - Mary K after Drake	Calibration between vessels	7
	Video	Efficiency	4
	Depth transect	Outer depth limits of goosefish	10

Table C30. Results of comparative tows using Drake nets 1 and 2.

Net 1

Tow No.	Depth (fa)	Wingspread (nm)	Inclinometer Tow Distance	Area Swept (nm)	Catch (kg)	Catch (no.)	kg/nm**2	no./nm**2
180	39.8	0.0117513	1.7524663	0.020594	25.5	23	1238.24	1116.84
181	40.7	0.01177581	1.4912492	0.017561	27.8	23	1583.08	1309.74
182	70	0.01237021	1.6933007	0.020946	10.8	7	515.60	334.18
183	70	0.01237021	1.5796918	0.019541	19.8	9	1013.25	460.57
184	101	0.01277208	1.5759697	0.020128	25.6	10	1271.83	496.81
185	102	0.01278288	1.6325243	0.020868	26.2	10	1255.49	479.19
186	132	0.01306549	1.5990526	0.020892	29.5	12	1412.00	574.37
187	144	0.01316086	1.6339408	0.021504	14.6	11	678.94	511.53
190	98.2	0.01274126	1.4441112	0.018400	30.9	9	1679.37	489.14
188	138	0.01311421	1.6211078	0.021260	41.0	18	1928.54	846.68

Net 2

Tow No.	Depth (fa)	Wingspread (nm)	Inclinometer Tow Distance	Area Swept (nm)	Catch (kg)	Catch (no.)	kg/nm**2	no./nm**2
197	40	0.00885085	1.56271998	0.013831	26.5	27	1915.931	1952.081
198	40.9	0.00885815	1.59291377	0.01411	8.9	7	630.7465	496.0927
199	69.4	0.00903163	1.57005312	0.01418	21.8	8	1537.362	564.1696
200	70.5	0.00903679	1.55741445	0.014074	5.9	3	419.2121	213.1587
201	99.9	0.00915114	1.61549678	0.014784	6.7	5	453.2036	338.2117
202	102	0.00915797	1.6239688	0.014872	11.2	7	753.0802	470.6751
203	135	0.00924993	1.6228021	0.015011	17	5	1132.517	333.0933
204	148	0.0092801	1.62810763	0.015109	13.7	6	906.7447	397.1145
205	98	0.00914484	1.61681538	0.014786	13.7	7	926.5821	473.4361
206	137	0.00925476	1.6499683	0.01527	29.8	13	1951.532	851.3394

	ratio net 2: net 1 (kg)	ratio net 2: net 1 (no.)	ratio net 2: net 1 (wingsprd)
	1.55	1.75	0.75
	0.40	0.38	0.75
	2.98	1.69	0.73
	0.41	0.46	0.73
	0.36	0.68	0.72
	0.60	0.98	0.72
	0.80	0.58	0.71
	1.34	0.78	0.71
	0.55	0.97	0.72
	1.01	1.01	0.71
overall	0.84	0.92	0.72

Table C31. Results of paired tow experiments for Drake net 1 and Mary K. A. Assuming inclinometer distances.
 B. Assuming nominal distances for Mary K.

A. Assuming inclinometer distances for all tows.

Mary K Tow No.	Drake Tow No.	Depth (fathoms)	Drake kg caught	Drake no. caught	Drake kg per n mi swept	Drake no. per area swept	Mary K kg caught	Mary K no. caught	Mary K kg per area swept	Mary K no. per area swept	Catch per Area Swept	
											Drake:MK kg	Drake:MK no.
162	178	27	12	10	677.9	564.9	51.9	33	1744.9	1109.5	0.39	0.51
163	179	27	35.9	21	1811.2	1059.5	39.3	26	1335.5	883.5	1.36	1.20
164	180	40	25.5	23	1238.2	1116.8	48.1	34	1501.3	1061.2	0.82	1.05
165	181	40	27.8	23	1583.1	1309.7	22.5	21	702.3	655.5	2.25	2.00
166	182	70	10.8	7	515.6	334.2	9.3	4	256.3	110.2	2.01	3.03
167	183	70	19.8	9	1013.2	460.6	14.8	7	406.5	192.3	2.49	2.40
168	184	100	25.6	10	1271.8	496.8	36.7	14	913.9	348.6	1.39	1.43
169	185	100	26.2	10	1255.5	479.2	57	24	1370.0	576.8	0.92	0.83
170	186	140	29.5	12	1412.0	574.4	33.5	15	767.8	343.8	1.84	1.67
171	187	140	14.6	11	678.9	511.5	52.5	25	1229.8	585.6	0.55	0.87
172	188	140	41	18	1928.5	846.7	36.9	19	881.8	454.1	2.19	1.86
173	189	140	52.9	21	2493.0	989.7	105.1	33	2491.4	782.3	1.00	1.27
174	190	100	30.9	9	1679.4	489.1	47.6	21	1191.5	525.7	1.41	0.93
175	191	40	10.5	6	526.5	300.9	33.7	39	1087.5	1258.6	0.48	0.24
176	192	40	13.3	13	717.5	701.3	20.2	14	630.5	437.0	1.14	1.60
overall											1.14	1.10

B. Assuming nominal distances for Mary K tows.

Mary K station	Drake station	depth (fathoms)	Drake kg caught	Drake no. caught	Drake kg per n mi swept	Drake no. per area swept	Mary K kg caught	Mary K no. caught	Mary K kg per area swept	Mary K no. per area swept	Catch per Area Swept	
											Drake:MK kg	Drake:MK no.
162	178	27	12	10	677.9	564.9	51.9	33	1957.1	1244.4	0.35	0.45
163	179	27	35.9	21	1811.2	1059.5	39.3	26	1497.8	990.9	1.21	1.07
164	180	40	25.5	23	1238.2	1116.8	48.1	34	1713.2	1211.0	0.72	0.92
165	181	40	27.8	23	1583.1	1309.7	22.5	21	801.4	748.0	1.98	1.75
166	182	70	10.8	7	515.6	334.2	9.3	4	303.6	130.6	1.70	2.56
167	183	70	19.8	9	1013.2	460.6	14.8	7	482.2	228.1	2.10	2.02
168	184	100	25.6	10	1271.8	496.8	36.7	14	1129.2	430.7	1.13	1.15
169	185	100	26.2	10	1255.5	479.2	57	24	1694.8	713.6	0.74	0.67
170	186	140	29.5	12	1412.0	574.4	33.5	15	989.1	442.9	1.43	1.30
171	187	140	14.6	11	678.9	511.5	52.5	25	1574.8	749.9	0.43	0.68
172	188	140	41	18	1928.5	846.7	36.9	19	1060.2	545.9	1.82	1.55
173	189	140	52.9	21	2493.0	989.7	105.1	33	3153.1	990.0	0.79	1.00
174	190	100	30.9	9	1679.4	489.1	47.6	21	1468.7	647.9	1.14	0.75
175	191	40	10.5	6	526.5	300.9	33.7	39	1241.0	1436.2	0.42	0.21
176	192	40	13.3	13	717.5	701.3	20.2	14	719.5	498.6	1.00	1.41
overall											0.95	0.93

Table C32. Incidences of goosefish cannibalism from cooperative survey.

Goosefish Predator						Goosefish Prey			
Vessel	Station	Fish ID	Length (cm)	Sex	Weight (g)	Length (cm)	Weight (g)	Other Prey	Notes
Mary K	55	1	63	F	4220		2.5	skate egg purses	well digested goosefish
Mary K	96	14	77	F	9610		1700.0		well digested goosefish
Mary K	179	12	81	F	10430	47	2000.0		well digested goosefish
Mary K	86	10	85	F	9760	45	1000.0		well digested goosefish
Mary K	14	3	86	F	12940	49			partly digested goosefish
Mary K	45	1	93	F	12030		185.0		well digested goosefish
Mary K	38	15	98	F	13870		40.0		goosefish bones; well digested
Mary K	44	1	102	F	17010	47	2200.0		partly digested goosefish
Mary K	11	28	105	F	21320	49			partly digested goosefish
Mary K	11	28	105	F	21320	49			partly digested goosefish

Table C33. Mean length at age in samples from cooperative survey.

A. By management area					B. Entire survey area				
Management Area	Age	Number of Samples	Mean Length (cm)	Standard Error	Age	Number of Samples	Mean Length (cm)	Standard Error	95% Confidence Interval
North	2	64	17.9	0.212	2	66	18.0	0.206	17.6 - 18.4
North	3	174	24.3	0.210	3	263	24.8	0.176	24.5 - 25.2
North	4	230	34.2	0.210	4	442	34.2	0.154	33.9 - 34.5
North	5	213	44.2	0.221	5	421	44.7	0.155	44.3 - 45.0
North	6	148	54.3	0.245	6	376	54.7	0.160	54.4 - 55.0
North	7	79	65.0	0.372	7	249	64.9	0.209	64.5 - 65.3
North	8	52	76.6	0.464	8	202	76.1	0.261	75.6 - 76.6
North	9	32	85.0	0.629	9	99	85.5	0.373	84.8 - 86.2
North	10	2	102.5	0.500	10	7	103.9	1.471	101.0 - 106.7
South	2	2	18.5	0.500					
South	3	89	25.9	0.289					
South	4	212	34.1	0.227					
South	5	208	45.2	0.213					
South	6	228	54.9	0.210					
South	7	170	64.9	0.254					
South	8	150	75.9	0.312					
South	9	67	85.8	0.463					
South	10	5	104.4	2.064					

Table C34. Efficiency assumptions used in estimating biomass from cooperative survey.
 Mary K used the same net throughout.

Vessel	Net	Efficiency Assumption			Source
		Low	Intermediate	High	
Drake	Net 1	0.30	0.47	0.63	depletion experiments, patch model
Drake	Net 2	0.28	0.43	0.58	net calibration tows, net 2 = 0.92(net 1)
Mary K		0.48	0.60	0.71	depletion experiments, Leslie-Davis model

Table C35. Swept area biomass and population number estimates from cooperative survey data under varying assumptions about net efficiencies. Nom=nominal distance assumed. Inc=inclinometer distance assumed.

A. Minimum biomass/numbers

	mt				Thousands			
	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	% Difference Nom-Inc	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	% Difference Nom-Inc
North	31,454	32,589	1,135	3.61	24,183	25,047	864	3.57
South	32,622	39,255	6,633	20.33	19,070	22,617	3,547	18.60
Combined	64,076	71,843	7,767	12.12	43,254	47,664	4,410	10.20

B. Under High Efficiency Assumptions

	mt				Thousands			
	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	Percent Increase	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	Percent Increase
North	51,211	51,211	0	0.0	39,395	39,395	0	0.0
South	46,358	55,493	9,135	19.7	27,035	31,936	4,901	18.1
Combined	97,570	106,705	9,135	9.4	66,430	71,331	4,901	7.4

C. Under Intermediate Efficiency Assumptions

	mt				Thousands			
	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	Percent Increase	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	Percent Increase
North	68,680	68,680	0	0.0	52,834	52,834	0	0.0
South	55,400	66,230	10,830	19.5	32,228	38,037	5,809	18.0
Combined	124,081	134,910	10,829	8.7	85,062	90,870	5,808	6.8

D. Under Low Efficiency Assumptions

	mt				Thousands			
	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	% Difference Nom-Inc	Using Inclinometer Distance for All Tows	Using Nominal Distance for Mary K	Nominal Minus Inclinom	% Difference Nom-Inc
North	107,568	107,568	0	0.0	82,748	82,748	0	0.0
South	70,715	84,306	13,591	19.2	40,925	48,209	7,284	17.8
Combined	178,283	191,873	13,590	7.6	123,673	130,957	7,284	5.9

Table C36. Survey estimates of mean catch rates (kg/tow) and total biomass for cooperative industry and NMFS research trawl surveys.

Adjustment factor refers to procedures for estimating area swept per tow: RAW assumes standard speed and tow duration could be maintained for each tow, NOM uses actual ship speed during tow as measured by GPS and standard tow duration to calculate distance. For the southern region, the reduced strata set from the cooperative survey provides a direct comparison to the NMFS surveys.

Survey	Year	Region	Design-based Estimates				Reduction in Variance				Total			Adjustment Factor
			Mean kg/tow	SE	CV %	degrees of freedom	Allocation	Stratification	Total	Maximum Reduction in Variance	Minimum Swept Area Biomass	Lower Confidence Interval	Upper Confidence Interval	
Coop	2001	All	26.9	1.157	4.3	84.2	12.5	66.0	78.5	86.8	66,390	60,723	72,059	RAW
		North	33.8	2.143	6.3	64.8	2.3	47.2	49.5	63.1	30,851	26,946	34,756	RAW
		South	22.9	1.336	5.8	33.1	15.1	71.4	86.5	92.9	35,539	31,320	39,758	RAW
		South -reduced	19.8	1.335	6.7	30.6	14.9	71.0	85.9	92.7	29,629	25,555	33,703	RAW
Coop	2001	All	26.7	1.169	4.4	84.8	10.9	62.9	73.8	84.0	68,901	62,901	74,901	NOM
		North	33.1	2.075	6.3	66.1	2.9	47.3	50.2	63.2	31,596	27,636	35,555	NOM
		South	22.9	1.399	6.1	36.0	13.5	68.1	81.6	90.5	37,305	32,692	41,918	NOM
		South -reduced	20.3	1.412	7.0	33.6	13.3	67.3	80.6	90.0	31,780	27,282	36,279	NOM
Coop	2001	All	27.9	1.240	4.4	91.9	7.5	62.7	70.2	81.9	61,932	56,466	67,400	INC
		North	37.1	2.327	6.3	66.0	2.9	47.2	50.1	63.2	30,493	26,675	34,311	INC
		South	22.5	1.416	6.3	36.4	8.7	69.5	78.1	88.9	31,439	27,426	35,453	INC
		South -reduced	20.3	1.443	7.1	34.6	8.2	69.0	77.3	88.4	27,348	23,399	31,295	INC
Fall	2000	All	1.4	0.214	15.9	9.9	-33.7	29.7	-4.0	74.3	6,353	4,094	8,612	RAW
		North	2.8	0.652	23.1	7.8	-52.3	9.3	-43.0	50.4	5,038	2,340	7,736	RAW
		South	0.5	0.106	21.4	25.2	-4.6	19.1	14.5	69.3	1,446	808	2,083	RAW
	1997	All	0.7	0.108	15.4	31.0	-15.8	37.8	22.0	75.0	3,322	2,282	4,363	RAW
		North	0.8	0.215	26.5	13.1	-41.2	14.5	-26.6	59.4	1,447	618	2,277	RAW
		South	0.6	0.115	17.9	24.5	-3.1	51.5	48.4	82.6	1,875	1,182	2,568	RAW
Spring	2001	All	0.9	0.204	22.6	17.9	-27.5	14.1	-13.3	75.1	4,253	2,231	6,275	RAW
		North	1.9	0.514	27.0	14.9	-38.0	4.7	-33.3	52.9	3,389	1,434	5,344	RAW
		South	0.3	0.100	33.8	13.9	-12.3	27.9	15.6	81.1	864	237	1,491	RAW
	1987	All	0.9	0.250	28.8	17.5	-54.3	4.9	-49.3	70.4	4,091	1,613	6,569	RAW
		North	1.5	0.511	35.0	11.4	-54.0	6.4	-47.6	55.4	2,607	608	4,606	RAW
		South	0.5	0.255	50.1	6.3	-47.8	-0.3	-48.1	78.8	1,484	-317	3,285	RAW
Winter	2001	South	6.9	0.753	11.0	21.2	-3.6	31.7	28.1	64.9	14,988	11,567	18,409	RAW
	1998	South	3.0	0.408	13.7	25.0	-13.9	21.7	7.9	53.3	6,473	4,645	8,300	RAW

Table C37. Survey estimates of mean catch rates (number/tow) and total number for cooperative industry and NMFS research trawl surveys. Adjustment factor refers to procedures for estimating area swept per tow: RAW assumes standard speed and tow duration could be maintained for each tow, NOM uses actual ship speed during tow as measured by GPS and standard tow duration to calculate distance towed, INC uses actual ship speed during tow and net bottom contact time derived from inclinometer sensor data to estimate tow distance.

Survey	Year	Region	Design-based Estimates				Reduction in Variance					Total			Adjustment Factor
			Mean kg/tow	SE	CV %	Degrees of Freedom	Allocation	Stratification	Total	Maximum Reduction in Variance	Minimum Swept Area Number	Lower Confidence Interval	Upper Confidence Interval		
Coop	2001	All	17.9	0.730	4.1	80.9	9.1	67.4	76.5	85.8	44,037	40,458	47,615	RAW	
		North	25.8	1.376	5.3	77.0	10.1	46.1	56.3	64.6	23,529	21,029	26,029	RAW	
		South	13.2	0.829	6.3	28.3	8.0	75.1	83.1	92.4	20,508	17,874	23,144	RAW	
		South -reduced	12.1	0.845	7.0	26.6	8.2	75.5	83.7	92.8	18,141	15,545	20,737	RAW	
Coop	2001	All	17.8	0.759	4.3	66.6	7.1	64.3	71.5	83.6	46,036	42,124	49,944	NOM	
		North	25.3	1.355	5.4	74.4	11.1	45.4	56.5	64.9	24,154	21,574	26,732	NOM	
		South	13.5	0.904	6.7	25.5	4.5	72.0	76.4	90.1	21,882	18,857	24,906	NOM	
		South -reduced	12.6	0.928	7.4	24.4	5.0	72.2	77.2	90.4	19,673	16,677	22,670	NOM	
Coop	2001	All	18.9	0.805	4.3	79.2	6.3	64.2	70.4	82.7	41,983	38,428	45,539	INC	
		North	28.4	1.513	5.3	74.4	11.1	45.5	56.6	65.0	23,309	20,831	25,787	INC	
		South	13.4	0.917	6.9	28.0	1.4	72.8	74.1	89.2	18,673	16,048	21,301	INC	
		South -reduced	12.7	0.945	7.5	27.3	2.2	73.0	75.2	89.4	17,047	14,435	19,657	INC	
Fall	2000	North	2.8	0.434	15.8	9.1	-41.6	28.3	-13.3	56.4	4,916	3,166	6,667	RAW	
		South	0.4	0.082	18.4	22.2	1.7	21.7	23.4	69.7	1,307	809	1,804	RAW	
	1997	All	0.4	0.058	13.4	27.2	-21.9	35.3	13.4	70.0	2,034	1,476	2,592	RAW	
		North	0.6	0.119	20.4	13.5	-51.0	8.8	-42.2	36.1	1,037	581	1,492	RAW	
Spring	2001	South	0.3	0.058	17.1	16.2	-6.4	51.3	45.0	84.5	998	636	1,359	RAW	
		All	0.9	0.102	11.6	34.5	-15.9	41.9	25.9	69.4	4,130	3,157	5,103	RAW	
		North	1.9	0.252	13.3	27.3	-26.2	27.5	1.3	38.0	3,370	2,448	4,291	RAW	
	1987	South	0.3	0.057	21.8	23.1	-7.8	21.7	13.9	64.2	760	417	1,104	RAW	
All		0.2	0.030	18.0	49.2	-8.4	1.8	-6.7	50.7	778	497	1,060	RAW		
North		0.3	0.063	25.0	24.0	-41.3	3.9	-37.5	33.2	449	217	681	RAW		
Winter	2001	South	0.1	0.029	25.5	40.2	26.8	-3.7	23.1	59.7	329	160	499	RAW	
		All	4.7	0.581	12.3	18.5	-8.7	31.6	22.9	70.8	10,354	7,691	13,017	RAW	
		South	1.6	0.166	10.7	32.9	-6.5	44.3	37.7	66.9	3,372	2,640	4,105	RAW	

Table C38. Bootstrap estimates of precision for average weight per tow (kg) for cooperative monkfish survey and NMFS surveys. Bootstrap estimates are based on 1000 replications. Adjustment factor refers to procedures for estimating area swept per tow. RAW assumes standard speed and tow duration could be maintained for each tow, NOM uses actual ship speed during tow as measured by GPS and standard tow duration to calculate distance towed, INC uses actual ship speed during tow and net bottom contact time derived from inclinometer sensor data to estimate tow distance.

Survey	Year	Region	Original Estimates		Bootstrap Estimates		95% Conf. Interval		Percentiles			Adjustment Factor
			Mean	Variance	Mean	Variance	Lower	Upper	25%-ile	50%-ile	75%-ile	
Coop	2001	All	26.94	1.34	25.88	1.62	23.49	28.53	25.06	25.87	26.72	RAW
		North	33.81	4.59	33.76	4.62	29.78	38.17	32.25	33.70	35.22	RAW
		South	22.89	1.79	21.32	2.52	18.29	24.32	20.19	21.31	22.46	RAW
		South-reduced	19.81	1.78	18.44	2.51	15.41	21.74	17.42	18.45	19.49	RAW
Coop	2001	All	26.69	1.37	25.82	1.59	23.52	28.22	24.97	25.80	26.70	NOM
		North	33.06	4.31	33.13	4.34	28.95	37.30	31.80	33.05	34.47	NOM
		South	22.94	1.96	21.56	2.29	18.75	24.48	20.51	21.47	22.60	NOM
		South-reduced	20.29	2.00	19.06	2.35	16.10	22.08	18.09	19.10	20.04	NOM
Coop	2001	All	27.90	1.54	27.06	1.83	24.46	29.73	26.17	27.01	27.98	INC
		North	37.11	5.42	37.18	5.28	32.74	41.80	35.61	37.16	38.75	INC
		South	22.49	2.01	21.17	2.43	18.38	24.21	20.08	21.09	22.25	INC
		South-reduced	20.30	2.08	19.10	2.36	16.18	22.19	18.07	19.06	20.13	INC
Fall	2000	All	1.38	0.07	1.39	0.07	0.91	1.98	1.21	1.37	1.55	RAW
		North	2.82	0.43	2.81	0.44	1.71	4.21	2.32	2.75	3.28	RAW
		South	0.49	0.01	0.50	0.01	0.29	0.72	0.42	0.49	0.57	RAW
	1997	All	0.71	0.01	0.67	0.01	0.45	0.88	0.59	0.67	0.75	RAW
		North	0.81	0.05	0.80	0.05	0.39	1.25	0.64	0.79	0.95	RAW
		South	0.64	0.01	0.59	0.02	0.37	0.84	0.50	0.58	0.67	RAW
Spring	2001	All	0.90	0.04	0.89	0.04	0.52	1.34	0.73	0.88	1.02	RAW
		North	1.90	0.26	1.91	0.27	1.03	3.01	1.54	1.87	2.23	RAW
		South	0.30	0.01	0.28	0.01	0.11	0.48	0.20	0.27	0.34	RAW
	1987	All	0.87	0.06	0.89	0.06	0.43	1.43	0.71	0.87	1.05	RAW
		North	1.46	0.26	1.45	0.27	0.54	2.58	1.08	1.40	1.79	RAW
		South	0.51	0.06	0.51	0.07	0.14	1.11	0.28	0.51	0.66	RAW
Winter	2001	South	6.86	0.57	6.81	0.57	5.43	8.33	6.29	6.80	7.33	RAW
	1998	South	2.98	0.17	2.87	0.16	2.13	3.72	2.58	2.85	3.12	RAW

Table C39. Bootstrap estimates of precision for average catch per tow (number) for cooperative monkfish survey and NMFS surveys. Bootstrap estimates are based on 1000 replications. Adjustment factor refers to procedures for estimating area swept per tow. RAW assumes standard speed and tow duration could be maintained for each tow, NOM uses actual ship speed during tow as measured by GPS and standard tow duration to calculate distance towed, INC uses actual ship speed during tow and net bottom contact time derived from inclinometer sensor data to estimate tow distance.

Survey	Year	Region	Original Estimates		Bootstrap Estimates		95% Conf. Interval		Percentiles			Adjustment Factor
			Mean	Variance	Mean	Variance	Lower	Upper	25%-ile	50%-ile	75%-ile	
Coop	2001	All	17.87	0.53	17.23	0.56	15.79	18.66	16.69	17.21	17.76	RAW
		North	25.79	1.89	25.77	1.91	23.15	28.47	24.83	25.74	26.71	RAW
		South	13.21	0.69	12.30	0.95	10.31	14.06	11.63	12.34	13.00	RAW
		South-reduced	12.13	0.71	11.21	0.91	9.41	13.04	10.51	11.22	11.89	RAW
Coop	2001	All	17.83	0.58	17.30	0.60	15.73	18.78	16.79	17.31	17.84	NOM
		North	25.27	1.84	25.21	1.94	22.43	27.81	24.25	25.22	26.21	NOM
		South	13.46	0.82	12.66	0.95	10.74	14.53	11.94	12.65	13.33	NOM
		South-reduced	12.56	0.86	11.83	0.95	9.93	13.79	11.18	11.86	12.47	NOM
Coop	2001	All	18.91	0.65	18.40	0.73	16.74	20.05	17.82	18.42	18.93	INC
		North	28.36	2.29	28.22	2.32	25.33	31.46	27.16	28.18	29.21	INC
		South	13.36	0.84	12.62	0.96	10.76	14.61	11.97	12.62	13.27	INC
		South-reduced	12.66	0.89	11.96	1.02	10.04	14.03	11.25	11.95	12.64	INC
Fall	2000	All	1.32	0.03	1.32	0.03	1.01	1.65	1.20	1.31	1.43	RAW
		North	2.76	0.19	2.75	0.17	2.01	3.61	2.44	2.74	3.03	RAW
		South	0.45	0.01	0.45	0.01	0.30	0.62	0.39	0.44	0.50	RAW
	1997	All	0.43	0.00	0.42	0.00	0.31	0.54	0.38	0.42	0.46	RAW
		North	0.58	0.01	0.58	0.01	0.36	0.83	0.50	0.58	0.67	RAW
		South	0.34	0.00	0.32	0.00	0.21	0.43	0.28	0.32	0.36	RAW
Spring	2001	All	0.88	0.01	0.87	0.01	0.68	1.08	0.80	0.87	0.95	RAW
		North	1.89	0.06	1.89	0.07	1.41	2.38	1.71	1.89	2.07	RAW
		South	0.26	0.00	0.25	0.00	0.14	0.36	0.21	0.25	0.29	RAW
	1987	All	0.17	0.00	0.17	0.00	0.11	0.22	0.14	0.17	0.19	RAW
		North	0.25	0.00	0.25	0.00	0.13	0.38	0.21	0.25	0.29	RAW
		South	0.11	0.00	0.11	0.00	0.06	0.17	0.09	0.11	0.13	RAW
Winter	2001	South	4.74	0.34	4.70	0.33	3.66	5.85	4.30	4.67	5.09	RAW
	1998	South	1.55	0.03	1.52	0.03	1.22	1.83	1.40	1.51	1.63	RAW

Table C40. Comparison of bootstrap and parametric confidence intervals to examine potential bias of point estimates for weight per tow (kg). The NOM adjustment factor was used to derive estimates for the cooperative survey.

Survey	Year	Region	Parametric Estimates of Precision and Confidence Intervals						Bootstrap Estimates of Precision and Confidence Intervals						Ratio Boot Length to Parametric Length
			mean	SE	CV %	Lower	Upper	CI Length	Mean	SE	CV %	Lower	Upper	CI Length	
Coop	2001	All	26.7	1.17	4.4	24.4	29.0	4.65	25.8	1.26	4.9	23.5	28.2	4.70	1.01
		North	33.1	2.08	6.3	28.9	37.2	8.29	33.1	2.08	6.3	29.0	37.3	8.35	1.01
		South	22.9	1.40	6.1	20.1	25.8	5.67	21.6	1.51	7.0	18.8	24.5	5.73	1.01
		South -red	20.3	1.41	7.0	17.4	23.2	5.74	19.1	1.53	8.0	16.1	22.1	5.98	1.04
Fall	2000	All	1.4	0.21	15.9	0.9	1.8	0.96	1.4	0.27	19.3	0.9	2.0	1.06	1.11
		North	2.8	0.65	23.1	1.3	4.3	3.02	2.8	0.66	23.5	1.7	4.2	2.51	0.83
		South	0.5	0.11	21.4	0.3	0.7	0.44	0.5	0.11	21.8	0.3	0.7	0.42	0.97
	1997	All	0.7	0.11	15.4	0.5	0.9	0.44	0.7	0.11	16.3	0.4	0.9	0.43	0.97
		North	0.8	0.22	26.5	0.3	1.3	0.93	0.8	0.22	27.3	0.4	1.3	0.86	0.93
		South	0.6	0.12	17.9	0.4	0.9	0.47	0.6	0.12	21.0	0.4	0.8	0.47	0.99
Spring	2001	All	0.9	0.20	22.6	0.5	1.3	0.86	0.9	0.21	23.4	0.5	1.3	0.81	0.95
		North	1.9	0.51	27.0	0.8	3.0	2.19	1.9	0.52	27.2	1.0	3.0	1.99	0.91
		South	0.3	0.10	33.8	0.1	0.5	0.43	0.3	0.10	36.5	0.1	0.5	0.38	0.88
	1987	All	0.9	0.25	28.8	0.3	1.4	1.05	0.9	0.25	28.2	0.4	1.4	1.00	0.95
		North	1.5	0.51	35.0	0.3	2.6	2.24	1.4	0.52	35.6	0.5	2.6	2.05	0.91
		South	0.5	0.25	50.1	-0.1	1.1	1.23	0.5	0.26	50.6	0.1	1.1	0.96	0.78
Winter	2001	South	6.9	0.75	11.0	5.3	8.4	3.13	6.8	0.76	11.1	5.4	8.3	2.89	0.92
	1998	South	3.0	0.41	13.7	2.1	3.8	1.68	2.9	0.40	14.0	2.1	3.7	1.59	0.94

Table C41. Comparison of industry cooperative and NMFS winter trawl survey estimates of monfish biomass and numbers in 2001. For this comparison, the industry survey was restricted to survey strata covered by the NMFS winter survey. Bootstrap estimates are based on 1000 replicates. Estimates of the total are based on the parametric mean and 95% confidence intervals (CI).

Survey	Response Variable	Adjustment Factor	Parametric Estimates				95% Parametric CI		Bootstrap CI		Reduction in Variance			Min Swept Area Estimate (mt or 000's)	Param CI Total	
			mean	SE	CV %	df	Lower	Upper	Lower	Upper	Allocation	Stratification	Total		Lower Bound (mt or 000's)	Upper Bound (mt or 000's)
Coop	Weight	RAW	19.8	1.335	6.7	30.6	17.090	22.539	15.41	21.74	14.9	71.0	85.9	29,629	25,555	33,703
Coop	Weight	NOM	20.3	1.412	7.0	33.6	17.418	23.162	16.1	22.08	13.3	67.3	80.6	31,780	27,282	36,279
Coop	Weight	INC	20.3	1.443	7.1	34.6	17.373	23.236	16.18	22.19	8.2	69.0	77.3	27,348	23,399	31,295
Winter	Weight	std tow	6.9	0.753	11.0	21.2	5.290	8.419	5.432	8.325	-3.6	31.7	28.1	14,988	11,567	18,409
Coop	Number	RAW	12.1	0.845	7.0	26.6	10.396	13.868	9.408	13.043	8.2	75.5	83.7	18,141	15,545	20,737
Coop	Number	NOM	12.6	0.928	7.4	24.4	10.647	14.473	9.934	13.785	5.0	72.2	77.2	19,673	16,677	22,670
Coop	Number	INC	12.7	0.945	7.5	27.3	10.718	14.595	10.04	14.03	2.2	73.0	75.2	17,047	14,435	19,657
Winter	Number	std tow	4.7	0.581	12.3	18.5	3.518	5.953	3.663	5.853	-8.7	31.6	22.9	10,354	7,691	13,017

Table C42. Indices of egg production by goosfish 1967-1999 by region. Egg production index is a function of numbers at length, proportion mature at length, and fecundity at length, pooled over a 5-year interval. Proportion < L99 is proportion of egg production generated by fish smaller than the length at 99% maturity. Maturity rates from NEFSC (1992).

Year	North Spring EPI	North Spring P < L ₉₉	North Autumn EPI	North Autumn P < L ₉₉	South Spring EPI	South Spring P < L ₉₉	South Autumn EPI	South Autumn P < L ₉₉	Combined Spring EPI	Combined Spring P < L ₉₉	Combined Autumn EPI	Combined Autumn P < L ₉₉
1967	-	-	1.46	0.01	-	-	2.18	0.03	-	-	1.80	0.02
1968	-	-	1.23	0.00	-	-	1.86	0.03	-	-	1.51	0.02
1969	-	-	1.46	0.00	-	-	1.48	0.03	-	-	1.42	0.02
1970	-	-	1.41	0.00	-	-	1.11	0.03	-	-	1.20	0.02
1971	-	-	1.37	0.00	-	-	0.53	0.05	-	-	0.88	0.02
1972	1.15	0.01	1.39	0.01	0.63	0.02	0.86	0.04	0.85	0.01	1.08	0.02
1973	1.31	0.01	1.54	0.01	0.72	0.03	0.94	0.04	0.97	0.02	1.19	0.02
1974	1.40	0.01	1.33	0.01	0.77	0.04	0.89	0.04	1.03	0.02	1.08	0.02
1975	1.28	0.01	1.27	0.01	0.76	0.05	0.93	0.05	0.97	0.03	1.07	0.03
1976	1.54	0.01	1.32	0.01	0.81	0.05	0.93	0.04	1.11	0.03	1.09	0.03
1977	1.13	0.01	1.69	0.01	0.74	0.05	0.66	0.04	0.91	0.03	1.09	0.02
1978	0.94	0.02	1.75	0.01	0.64	0.05	0.61	0.03	0.77	0.03	1.09	0.01
1979	0.83	0.01	1.97	0.01	0.58	0.04	0.68	0.03	0.68	0.03	1.22	0.01
1980	0.88	0.01	2.19	0.01	0.54	0.04	0.64	0.03	0.69	0.03	1.29	0.01
1981	0.71	0.02	1.99	0.01	0.58	0.07	0.70	0.05	0.63	0.04	1.24	0.02
1982	0.86	0.01	1.58	0.01	0.63	0.08	0.57	0.07	0.73	0.05	0.99	0.03
1983	0.93	0.01	1.28	0.01	0.63	0.08	0.61	0.08	0.76	0.04	0.89	0.04
1984	1.00	0.02	1.11	0.01	0.62	0.07	0.53	0.09	0.78	0.04	0.77	0.04
1985	1.05	0.01	0.87	0.01	0.57	0.08	0.48	0.10	0.77	0.04	0.65	0.05
1986	1.12	0.01	0.92	0.02	0.48	0.06	0.38	0.09	0.75	0.03	0.60	0.04
1987	1.00	0.01	0.91	0.02	0.33	0.05	0.36	0.08	0.61	0.02	0.59	0.04
1988	1.05	0.01	0.90	0.02	0.26	0.07	0.26	0.07	0.59	0.03	0.53	0.03
1989	1.01	0.02	0.73	0.03	0.20	0.13	0.23	0.12	0.54	0.04	0.44	0.06
1990	0.88	0.02	0.64	0.04	0.26	0.09	0.17	0.15	0.52	0.04	0.36	0.07
1991	0.74	0.03	0.51	0.05	0.22	0.10	0.17	0.16	0.43	0.05	0.31	0.08
1992	0.67	0.05	0.52	0.07	0.18	0.13	0.17	0.17	0.38	0.07	0.32	0.10
1993	0.56	0.08	0.46	0.08	0.17	0.13	0.13	0.23	0.33	0.09	0.27	0.13
1994	0.50	0.08	0.41	0.09	0.18	0.09	0.13	0.19	0.31	0.08	0.25	0.12
1995	0.55	0.09	0.47	0.10	0.14	0.12	0.13	0.19	0.31	0.10	0.27	0.13
1996	0.49	0.12	0.46	0.12	0.12	0.10	0.11	0.18	0.28	0.12	0.26	0.13
1997	0.44	0.13	0.41	0.12	0.12	0.12	0.14	0.14	0.25	0.13	0.25	0.12
1998	0.38	0.13	0.40	0.12	0.12	0.10	0.17	0.11	0.23	0.12	0.27	0.12
1999	0.40	0.12	0.38	0.12	0.15	0.10	0.15	0.10	0.25	0.11	0.25	0.13
2000	0.36	0.12	0.44	0.13	0.13	0.14	0.17	0.13	0.22	0.13	0.28	0.13
2001	0.43	0.10	-	-	0.12	0.17	-	-	0.25	0.12	-	-

Table C43. Beverton-Holt length-based estimates of total instantaneous mortality rate (Z) using NEFSC fall survey data for the northern management region, 1963-2000; approximate upper and lower 95% confidence intervals (minimum variance estimate); mean length, standard deviation and number of fish at length of capture or above.

Year	Total Mortality (Z)			Length > 29		
	Median	L95% CI	U95%	Mean	SD(mean)	n
1963	0.17	0.13	0.21	68.14	2.77	58
1964	0.18	0.13	0.25	65.96	3.99	29
1965	0.13	0.10	0.17	73.44	3.57	29
1966	0.13	0.11	0.15	73.13	2.15	42
1967	0.15	0.12	0.19	70.25	3.05	16
1968	0.11	0.09	0.14	76.71	3.25	22
1969	0.10	0.08	0.12	79.92	2.70	36
1970	0.17	0.13	0.20	67.93	2.62	36
1971	0.15	0.12	0.17	71.26	2.48	42
1972	0.22	0.17	0.30	61.48	3.57	26
1973	0.16	0.12	0.21	68.92	3.43	44
1974	0.13	0.10	0.18	72.52	4.12	26
1975	0.17	0.13	0.22	66.76	3.43	29
1976	0.13	0.10	0.17	73.60	3.57	36
1977	0.14	0.12	0.17	71.85	2.20	78
1978	0.15	0.13	0.17	71.26	1.98	108
1979	0.11	0.09	0.12	78.46	2.01	91
1980	0.16	0.12	0.21	69.07	3.37	47
1981	0.20	0.16	0.25	63.71	2.92	32
1982	0.13	0.10	0.19	72.54	4.34	12
1983	0.27	0.22	0.35	57.14	2.73	34
1984	0.18	0.14	0.22	66.47	3.21	39
1985	0.23	0.17	0.33	60.27	3.90	27
1986	0.22	0.18	0.27	61.48	2.72	43
1987	0.27	0.20	0.39	57.25	3.97	20
1988	0.21	0.16	0.28	62.95	3.80	24
1989	0.28	0.20	0.42	56.47	4.37	23
1990	0.35	0.25	0.55	52.77	3.93	21
1991	0.42	0.30	0.60	50.14	3.21	31
1992	0.42	0.32	0.55	50.00	2.76	35
1993	0.37	0.28	0.55	51.14	3.11	27
1994	0.55	0.39	0.76	46.10	2.75	31
1995	0.59	0.45	0.76	44.99	2.03	66
1996	0.55	0.45	0.69	45.83	1.94	44
1997	0.59	0.45	0.76	45.25	2.17	31
1998	0.42	0.33	0.55	49.84	2.49	34
1999	0.69	0.51	1.03	42.64	2.27	41
2000	0.55	0.39	0.64	47.06	2.01	59

Mean	1970-1979	0.15
	1991-1995	0.47
	1996-2000	0.56

Table C44. Beverton-Holt length-based estimates of total instantaneous mortality rate (Z) using NEFSC fall survey data for the southern management region, 1963-2000; approximate upper and lower 95% confidence intervals (minimum variance estimate); mean length, standard deviation and number of fish at length of capture or above.

Year	Total Mortality (Z)			Length > 29		
	Median	L95% CI	U95%	Mean	SD(mean)	n
1963	0.27	0.24	0.33	59.76	1.97	70
1964	0.33	0.29	0.37	56.62	1.55	117
1965	0.24	0.21	0.29	62.85	2.02	82
1966	0.26	0.23	0.29	61.48	1.54	124
1967	0.37	0.29	0.49	54.05	3.02	48
1968	0.41	0.35	0.49	52.47	1.97	52
1969	0.39	0.32	0.49	52.98	2.38	62
1970	0.26	0.23	0.32	60.87	2.32	46
1971	0.32	0.24	0.44	57.30	3.78	31
1972	0.35	0.30	0.39	55.78	1.30	196
1973	0.57	0.46	0.65	42.72	1.62	112
1974	0.27	0.22	0.37	60.07	3.37	27
1975	0.32	0.27	0.39	56.83	1.95	72
1976	0.35	0.29	0.44	55.39	2.26	45
1977	0.20	0.17	0.25	67.03	2.66	45
1978	0.21	0.18	0.25	66.51	2.33	44
1979	0.35	0.30	0.44	55.25	2.10	80
1980	0.53	0.44	0.71	47.89	1.91	88
1981	0.49	0.44	0.61	48.93	1.52	98
1982	0.71	0.57	0.92	44.23	1.71	41
1983	0.39	0.35	0.46	53.05	1.43	84
1984	0.37	0.30	0.44	54.50	2.18	34
1985	0.44	0.37	0.57	51.22	2.05	53
1986	0.49	0.39	0.65	49.14	2.59	29
1987	0.71	0.49	1.02	44.82	2.89	14
1988	0.57	0.37	0.92	47.66	3.92	26
1989	0.61	0.53	0.71	46.50	1.25	35
1990	0.53	0.39	0.71	48.55	2.82	19
1991	0.57	0.46	0.77	46.92	1.88	35
1992	0.77	0.57	1.02	43.82	2.18	23
1993	0.92	0.71	1.29	41.26	1.91	20
1994	0.65	0.49	0.92	45.18	2.35	29
1995	0.84	0.65	1.14	42.29	1.85	28
1996	0.61	0.46	0.77	46.77	2.09	25
1997	0.46	0.37	0.57	50.78	2.03	33
1998	0.39	0.32	0.53	52.89	2.66	23
1999	1.14	0.84	1.48	39.68	1.51	26
2000	0.65	0.61	0.71	45.38	0.83	41
Mean	1970-1979	0.32				
	1991-1995	0.75				
	1996-2000	0.65				

A. Using landings and exploitable biomass, biomass from inclinometer distances for all nets.										
			100% efficiency		High efficiency		Intermediate Efficiency		Low Efficiency	
	Management Area	Calendar 2000 landings (mt)	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio
	North	10689	27184.5	0.39	40926.5	0.26	53064.5	0.20	80082.5	0.13
	South	10175	23788.5	0.43	31837.5	0.32	37296.5	0.27	46845.5	0.22
	Combined	20864	50973	0.41	72764	0.29	90361	0.23	126928	0.16
B. Using landings and exploitable biomass, biomass from nominal distances for Mary K.										
			100% efficiency		High efficiency		Intermediate Efficiency		Low Efficiency	
	Management Area	Calendar 2000 landings (mt)	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio	Exploitable Biomass midyear	Exploitation ratio
	North	10689	27184.5	0.39	40926.5	0.26	53064.5	0.20	80082.5	0.13
	South	10175	27588.5	0.37	37200.5	0.27	43655.5	0.23	54829.5	0.19
	Combined	20864	54773	0.38	78127	0.27	96720	0.22	134912	0.15
C. Using catch and total biomass, biomass from inclinometer distances for all nets.										
			100% efficiency		High efficiency		Intermediate Efficiency		Low Efficiency	
	Management Area	Calendar 2000 catch (mt)	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio
	North	11544	37226	0.31	56983	0.20	74452	0.16	113340	0.10
	South	12960	39102	0.33	52838	0.25	61880	0.21	77195	0.17
	Combined	24504	76328	0.32	109822	0.22	136333	0.18	190535	0.13
D. Using catch and total biomass, biomass from nominal distances for Mary K										
			100% efficiency		High efficiency		Intermediate Efficiency		Low Efficiency	
	Management Area	Calendar 2000 catch (mt)	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio	Biomass midyear	Exploitation ratio
	North	11544	38361	0.30	56983	0.20	74452	0.16	113340	0.10
	South	12960	45735	0.28	61973	0.21	72710	0.18	90786	0.14
	Combined	24504	84095	0.29	118957	0.21	147162	0.17	204125	0.12

Table C47. Yield per recruit analysis for goosefish, combined areas.

The NEFSC Yield and Stock Size per Recruit Program - PDBYPRC PC Ver. 2.0 Method of Thompson and Bell (1934) 1-Jan-99
Run Date: 1-11-2001, Time: 17:54:27.64
Goosefish 2001
Proportion of F before spawning: 0.417
Proportion of M before spawning: 0.417
Natural Mortality is constant at: 0.2
Initial age is 0; last age is 15
Last age is a TRUE age;
Original age-specific PRs, Mats, and Mean Wts from file C:\ProgramFiles\FACT\goose\ypr_01.dat

Summary of Yield per Recruit Analysis

Slope of the Yield/Recruit Curve at F=0.00: --> 15.0275
 F level at slope=1/10 of the above slope (F0.1): -----> 0.138
 Yield/Recruit corresponding to F0.1: -----> 0.8925
 F level to produce Maximum Yield/Recruit (Fmax): ----->0.197
 Yield/Recruit corresponding to Fmax: -----> 0.9311
 F level at 20% of Max Spawning Potential (F20): -----> 0.295
 SSB/Recruit corresponding to F20: -----> 3.0496

Age-specific input data for Yield per Recruit Analysis

Age	Fish Mort Pattern	Nat Mort Pattern	Proportion Mature	Average Catch	Stock Weights
0	0.0100	1.0000	0.0000	0.016	0.016
1	0.0200	1.0000	0.0000	0.062	0.062
2	0.0500	1.0000	0.0000	0.184	0.184
3	0.2500	1.0000	0.0000	0.420	0.420
4	0.5000	1.0000	0.5000	0.845	0.845
5	0.9000	1.0000	1.0000	1.609	1.609
6	1.0000	1.0000	1.0000	2.703	2.703
7	1.0000	1.0000	1.0000	4.610	4.610
8	1.0000	1.0000	1.0000	7.953	7.953
9	1.0000	1.0000	1.0000	11.855	11.855
10	1.0000	1.0000	1.0000	14.080	14.080
11	1.0000	1.0000	1.0000	17.588	17.588
12	1.0000	1.0000	1.0000	20.456	20.456
13	1.0000	1.0000	1.0000	22.963	22.963
14	1.0000	1.0000	1.0000	25.087	25.087
15	1.0000	1.0000	1.0000	26.844	26.844

Listing of Yield per Recruit Results for:

	FMORT	TOTCTHN	TOTCTHW	TOTSTKN	TOTSTKW	SPNSTKN	SPNSTKW	% MSP
	0.0000	0.0000	0.0000	5.2918	17.1861	1.8669	15.2493	100.00
	0.1000	0.1435	0.8031	4.7328	9.8787	1.3155	8.1912	53.72
F0.1	0.1400	0.1785	0.8925	4.5840	8.1927	1.1722	6.6026	43.30
Fmax	0.2000	0.2202	0.9311	4.3995	6.2981	0.9972	4.8443	31.77
	0.2000	0.2223	0.9310	4.3903	6.2101	0.9886	4.7634	31.24
F20%	0.3000	0.2694	0.8785	4.1720	4.3185	0.7874	3.0496	20.00
	0.3000	0.2714	0.8743	4.1626	4.2465	0.7789	2.9854	19.58
	0.4000	0.3053	0.7821	4.0004	3.1249	0.6352	1.9999	13.11
	0.5000	0.3305	0.6958	3.8779	2.4427	0.5311	1.4177	9.30
	0.6000	0.3504	0.6243	3.7811	2.0030	0.4526	1.0529	6.90
	0.7000	0.3667	0.5669	3.7019	1.7043	0.3912	0.8121	5.33
	0.8000	0.3804	0.5210	3.6353	1.4917	0.3421	0.6457	4.23
	0.9000	0.3922	0.4839	3.5779	1.3344	0.3018	0.5261	3.45
	1.0000	0.4026	0.4536	3.5276	1.2138	0.2684	0.4373	2.87
	1.1000	0.4118	0.4285	3.4828	1.1186	0.2401	0.3694	2.42
	1.2000	0.4201	0.4073	3.4426	1.0416	0.2160	0.3161	2.07
	1.3000	0.4277	0.3892	3.4060	0.9778	0.1951	0.2736	1.79
	1.4000	0.4347	0.3736	3.3724	0.9240	0.1770	0.2390	1.57
	1.5000	0.4411	0.3599	3.3415	0.8780	0.1612	0.2104	1.38
	1.6000	0.4471	0.3477	3.3127	0.8380	0.1472	0.1864	1.22
	1.7000	0.4526	0.3369	3.2858	0.8029	0.1348	0.1662	1.09
	1.8000	0.4579	0.3271	3.2606	0.7717	0.1238	0.1488	0.98
	1.9000	0.4628	0.3182	3.2368	0.7438	0.1139	0.1339	0.88
	2.0000	0.4675	0.3101	3.2143	0.7186	0.1050	0.1210	0.79

Table C48. Monkfish surplus production results using cooperative survey biomass estimate in 2001 for northern for northern, southern, and combined-area monkfish stock units, where B[37] is stock biomass at the start of 2000 (000 mt), B2001 is stock biomass at the start of 2001 (000 mt), BMSP is the biomass that would maximize surplus production (000 mt), BRATIO is the ratio of B2001 to BMSP, H[37] is the exploitation rate in 2000, HMSP is the exploitation rate that would maximize surplus production, K is carrying capacity (000 mt), M is the shape parameter of the production curve, MSP is maximum surplus production (000 mt), qFALL is autumn survey catchability, r is the intrinsic growth rate, sigma2 is process error variance parameter, and tau2FALL is the survey error variance parameter.

Northern monkfish							
node	mean	stdev	10.00%	25.00%	median	75.00%	90.00%
B[37]	80.06	23.71	53.08	63.22	76.65	93.2	111.3
B2001	74.6	23.34	48.28	57.93	71.07	87.31	105.5
BMSP	80.81	29.03	48.82	60.45	75.97	96.06	118.7
BRATIO	1.046	0.2772	0.714	0.8484	1.021	1.215	1.409
H[37]	0.1565	0.04542	0.104	0.1243	0.1505	0.182	0.2158
HMSP	0.1017	0.08304	0.02245	0.04502	0.08178	0.1338	0.2017
HRATIO	3.22	6.102	0.8125	1.179	1.849	3.192	6.09
K	181.9	62.23	111.2	138.4	173.5	216.4	262.6
M	1.524	0.4626	1.11	1.199	1.387	1.7	2.123
MSP	6.588	3.481	2.406	4.179	6.333	8.516	10.71
qFALL	0.01403	0.004963	0.008835	0.01058	0.01307	0.01642	0.02031
r	0.4966	0.462	0.06712	0.1483	0.3356	0.7035	1.22
sigma2	0.005236	0.008127	0.001759	0.002402	0.003594	0.005765	0.009465
tau2FALL	0.1913	0.05254	0.1321	0.1548	0.1841	0.2203	0.2598
Southern monkfish							
node	mean	stdev	10.00%	25.00%	median	75.00%	90.00%
B[34]	65.51	19.36	43.48	51.77	62.81	76.13	90.99
B2001	58.48	19.69	36.11	44.52	55.82	69.29	84.29
BMSP	119.5	46.17	69.61	87.39	111.7	143.1	179.4
BRATIO	0.5984	0.2076	0.3662	0.4508	0.5651	0.711	0.8727
H[34]	0.2147	0.06299	0.1423	0.17	0.206	0.2504	0.2984
HMSP	0.07592	0.08066	0.01207	0.02583	0.05375	0.0985	0.1582
HRATIO	7.601	15.56	1.358	2.137	3.82	7.738	16.17
K	272.4	99.16	163.7	204.3	257.5	324.6	400.3
M	1.518	0.4767	1.095	1.186	1.375	1.697	2.133
MSP	6.815	4.213	1.852	3.585	6.265	9.299	12.29
qFALL	0.004142	0.001575	0.002622	0.003106	0.003793	0.004746	0.006033
r	0.3699	0.4173	0.03463	0.08095	0.2042	0.4979	0.9848
sigma2	0.01526	0.02642	0.002733	0.004195	0.007496	0.01469	0.02968
tau2FALL	0.1613	0.06084	0.095	0.1234	0.1561	0.1946	0.237
Combined monkfish							
node	mean	stdev	10.00%	25.00%	median	75.00%	90.00%
B[37]	161.2	47.43	107.1	127.3	154.6	187.8	223.7
B2001	149.1	48.43	94.13	114.6	142.4	175.5	212.7
BMSP	278.3	124.1	144.2	189.8	254.8	340.7	441.7
BRATIO	0.6487	0.235	0.3873	0.4806	0.6106	0.7716	0.9565
H[37]	0.1665	0.04891	0.1102	0.1316	0.1599	0.1942	0.2311
HMSP	0.07098	0.07207	0.01076	0.02345	0.0496	0.09247	0.1539
HRATIO	6.428	13.77	1.124	1.806	3.201	6.527	13.73
K	637	284.2	334.4	439.7	585.6	777.9	996.4
M	1.52	0.4922	1.087	1.178	1.369	1.704	2.151
qFALL	0.004142	0.001575	0.002622	0.003106	0.003793	0.004746	0.006033
r	0.3699	0.4173	0.03463	0.08095	0.2042	0.4979	0.9848
sigma2	0.01526	0.02642	0.002733	0.004195	0.007496	0.01469	0.02968
tau2FALL	0.1613	0.06084	0.095	0.1234	0.1561	0.1946	0.237

Table C49. Stratified mean catch per tow in weight (kg), 33rd percentile, three-year moving averages, medians, NEFSC offshore autumn research vessel bottom trawl in northern region (survey strata 20-30, 34-40); and southern region (survey strata 1-19, 61-76); means from delta distribution.

	Northern Management/ Assessment Area				Southern Management/ Assessment Area			
	Mean Weight/Tow	33rd Percentile 1963-1994 series	Three-year Moving Average	Median, Three-Year Moving Average 1965-1981	Mean Weight/Tow	33rd Percentile 1963-1994 series	Three-Year Moving Average	Median, Three-Year Moving Average 1965-1981
1963	3.757				3.724			
1964	1.712				5.486			
1965	2.509	1.460	2.659	2.496	5.163	0.750	4.791	1.848
1966	3.266		2.496		6.986		5.878	
1967	1.283		2.353		1.122	1967-1994:	4.423	1967-1981:
1968	2.036		2.195		0.895	0.704	3.001	1.846
1969	3.705		2.341		1.138		1.051	
1970	2.237		2.659		1.357		1.130	
1971	2.914		2.952		0.786		1.094	
1972	1.404		2.185		4.918		2.354	
1973	3.114		2.477		1.986		2.564	
1974	2.063		2.193		0.710		2.538	
1975	1.711		2.296		2.043		1.580	
1976	3.387		2.387		1.084		1.279	
1977	5.568		3.555		1.873		1.667	
1978	5.101		4.685		1.395		1.451	
1979	5.133		5.267		2.275		1.848	
1980	4.458		4.897		1.868		1.846	
1981	1.984		3.859		2.858		2.334	
1982	0.936		2.459		0.646		1.791	
1983	1.617		1.513		2.150		1.885	
1984	3.010		1.855		0.740		1.179	
1985	1.441		2.023		1.318		1.403	
1986	2.353		2.268		0.552		0.870	
1987	0.873		1.556		0.274		0.715	
1988	1.525		1.584		0.554		0.460	
1989	1.384		1.261		0.625		0.485	
1990	1.001		1.303		0.426		0.535	
1991	1.235		1.207		0.783		0.611	
1992	1.102		1.113		0.312		0.507	
1993	1.044		1.127		0.294		0.463	
1994	0.973		1.040		0.611		0.406	
1995	1.711		1.243		0.386		0.430	
1996	1.07		1.252		0.387		0.461	
1997	0.669		1.150		0.592		0.455	
1998	0.974		0.904		0.500		0.493	
1999	0.825		0.823		0.304		0.465	
2000	2.495		1.431		0.477		0.427	
2001	2.052*		1.791*		0.708*		0.496*	

* preliminary data