

Table A2.1. Summary of management of Cape Cod-Gulf of Maine yellowtail flounder.

Year	Comments
1977	FCMA implemented March 1 Groundfish plan adopts quotas for cod, haddock, yellowtail flounder
1982	Interim Groundfish Plan adopted: Georges Bank and Gulf of Maine minimum mesh size of 5 1/8 inches, increasing to 5 1/2 inches in 1983 11 inch minimum size for yellowtail Scallop FMP implemented
1986	Northeast Multispecies FMP adopted: Minimum size for yellowtail flounder: 12 inches Minimum mesh size in GB/GOM: 5 1/2 inch cod end (no minimum size in SNE/MA) Seasonal yellowtail closure, March - May, between 69-30 and 72-30W Small mesh fisheries in GOM/GB area only restricted to specific seasons with limits on landings (not catch) of groundfish and inshore area of GOM
1989	Amendment 2: Yellowtail minimum size increased to 13 inches
1991	Amendment 4: Tightened restrictions on carrying small mesh while in Regulated Mesh Areas Mandated use of selective gear in shrimp fishery, leading to implementation of the Nordmore grate in 1993
1994	Amendment 5 and emergency regulations: DAS limits for most vessels West of 72-30W. Mesh determined by mesh requirements of summer flounder fishery (5 1/2 inch diamond or 6 inch square) GOM/GB mesh of 6 inches (diamond or square) Eliminated seasonal restrictions on small mesh fisheries in Small Mesh Exemption Area of inshore GOM Adopted Nordmore grate requirement into FMP Scallop Amendment 4: adopted permit moratorium, effort control/DAS program, 5.5 inch twine top minimum, and crew limits
1996	Amendment 7 Extended DAS limits to most vessels Limited possession of groundfish by scallop vessels to 300 pounds of regulated multispecies Established criteria for exempted fisheries Established exempted whiting fisheries in GOM/GB in three areas (Small Mesh Areas I and II in inshore GOM, Cultivator Shoals area on GB)
1999	Framework 27: (May 1) Increased square mesh minimum size to 6 1/2 inches in GOM/GB/SNE Regulated mesh areas Framework 29: (June)
	Amendment 9: (November): Revised overfishing definitions
	Scallop Framework 11 mandates 8 inch twine top, authorizes scallop access program for Closed Area II, with yellowtail flounder bycatch limits
2000	Scallop Framework 13: Scallop vessel closed area access programs with yellowtail bycatch limits Adopted management measures for small-mesh multispecies, establishing minimum mesh sizes and trip/possession limits to reduce mortality on silver, red, and offshore hake Framework 35: Established exempted whiting fishery in upper Cape Cod Bay using raised footrope trawl

Table A2.2. Cape Cod – Gulf of Maine yellowtail flounder catch.

	Cape Cod Landings	Cape Cod Discards	Gulf of Maine Landings	Gulf of Maine Discards	Total
1960	1,500	500	39	---	2,039
1961	1,800	600	22	---	2,422
1962	1,900	600	0	---	2,500
1963	3,600	1,000	0	---	4,600
1964	1,851	600	6	---	2,457
1965	1,498	500	8	---	2,006
1966	1,808	300	26	---	2,135
1967	1,542	800	50	---	2,391
1968	1,569	600	13	---	2,181
1969	1,346	300	75	---	1,722
1970	1,185	400	125	---	1,710
1971	1,662	700	56	---	2,418
1972	1,364	300	156	---	1,821
1973	1,662	0	63	---	1,724
1974	2,054	200	104	---	2,358
1975	2,027	0	194	---	2,220
1976	3,587	100	258	---	3,945
1977	3,469	0	252	---	3,722
1978	3,683	400	388	---	4,471
1979	4,163	500	276	---	4,939
1980	5,106	600	461	---	6,167
1981	3,149	600	425	---	4,174
1982	3,150	400	486	---	4,035
1983	1,884	300	324	---	2,509
1984	1,121	20	244	---	1,385
1985	967	77	205	77	1,326
1986	1,041	305	164	62	1,572
1987	1,159	198	194	73	1,624
1988	1,085	283	190	72	1,630
1989	909	390	209	47	1,555
1990	2,984	1,141	238	98	4,461
1991	1,472	405	265	110	2,251
1992	828	637	203	78	1,746
1993	628	90	158	31	907
1994	978	192	321	89	1,580
1995	1,207	233	124	111	1,674
1996	1,064	182	108	51	1,405
1997	1,040	257	74	20	1,392
1998	1,169	259	73	39	1,540
1999	1,089	107	121	40	1,357
2000	2,279	163	133	33	2,609
2001	2,362	447	143	35	2,988

Table A2.3. Samples of Cape Cod yellowtail flounder.

Year	half	trips	unclass. lengths	small lengths	large lengths	ages
1985	1	5	109	304	196	292
	2	12	0	825	543	357
1986	1	4	0	608	206	217
	2	6	0	321	172	240
1987	1	6	0	300	352	353
	2	5	0	284	269	207
1988	1	6	0	477	267	286
	2	5	0	291	364	252
1989	1	6	10	261	314	305
	2	4	97	262	173	200
1990	1	8	536	532	374	339
	2	6	636	429	276	137
1991	1	8	811	501	332	610
	2	7	109	531	242	277
1992	1	4	707	126	254	339
	2	7	136	262	457	268
1993	1	3	170	145	182	177
	2	3	273	244	74	114
1994	1	4	100	261	170	273
	2	3	0	106	144	149
1995	1	4	39	276	201	196
	2	6	998	392	275	157
1996	1	1	2560	0	87	196
	2	12	118	495	640	485
1997	1	7	343	388	483	556
	2	17	317	996	869	634
1998	1	7	4781	0	508	195
	2	6	165	0	600	165
1999	1	4	2501	278	60	49
	2	4	1024	268	116	57
2000	1	46	521	723	2775	903
	2	15	0	566	1057	395
2001	1	8	3502	251	570	192
	2	16	1950	393	774	436

Table A2.4a. Landings at age of Cape Cod yellowtail flounder.

Landings at age (thousands)	age								sum
	1	2	3	4	5	6	7	8+	
1985	5	738	700	522	268	89	3	7	2,332
1986	0	1,998	579	223	32	6	0	1	2,838
1987	0	609	1,786	268	100	29	12	5	2,808
1988	1	802	1,043	625	172	36	0	0	2,679
1989	0	726	989	231	31	3	2	2	1,986
1990	0	692	6,191	416	32	16	7	3	7,357
1991	0	311	903	1,455	249	33	27	1	2,978
1992	0	338	807	514	150	6	5	1	1,821
1993	0	25	684	573	90	24	15	7	1,418
1994	0	87	1,023	650	236	65	38	9	2,109
1995	0	233	1,730	808	152	78	5	0	3,006
1996	0	150	1,097	798	287	11	5	2	2,349
1997	0	481	1,086	702	160	13	0	1	2,443
1998	0	257	1,681	472	141	41	3	0	2,595
1999	0	328	1,134	646	106	43	1	0	2,258
2000	0	942	2,625	1,152	138	18	13	3	4,891
2001	0	807	2,933	1,058	152	24	13	1	4,987
mean	0	518	1,429	594	147	33	8	3	2,732

Landed weight at age (kg)	age							
	1	2	3	4	5	6	7	8+
1985	0.19	0.32	0.37	0.49	0.60	0.73	1.20	1.39
1986		0.32	0.46	0.57	0.73	0.90	---	1.40
1987		0.31	0.42	0.55	0.65	0.81	1.03	1.18
1988	0.11	0.31	0.37	0.53	0.70	0.85	---	---
1989		0.38	0.45	0.65	0.92	1.41	1.24	1.24
1990		0.31	0.41	0.56	0.82	0.90	0.99	1.17
1991		0.35	0.39	0.54	0.74	0.99	1.06	1.01
1992		0.32	0.41	0.53	0.61	0.73	1.53	1.91
1993		0.31	0.38	0.43	0.74	0.95	1.01	1.17
1994		0.29	0.38	0.50	0.62	0.68	1.04	1.11
1995		0.35	0.36	0.43	0.61	0.78	1.11	---
1996		0.32	0.42	0.50	0.53	0.91	1.19	1.18
1997		0.39	0.41	0.47	0.57	0.78	1.30	1.31
1998		0.33	0.41	0.55	0.63	1.00	1.62	---
1999		0.36	0.45	0.56	0.58	0.88	1.62	---
2000		0.38	0.44	0.56	0.61	0.82	0.87	1.12
2001		0.38	0.44	0.59	0.74	1.07	0.92	1.93
mean	0.15	0.33	0.41	0.52	0.67	0.89	1.23	1.28

Table A2.4b. Landings at age of northern Gulf of Maine yellowtail flounder.

Landings at age (thousands)		age							
year	1	2	3	4	5	6	7	8+	sum
1985	1	138	139	112	61	20	1	1	474
1986	0	235	116	49	8	1	0	0	409
1987	0	75	315	41	17	5	2	1	456
1988	0	115	239	119	27	5	0	0	505
1989	0	112	295	55	6	1	0	0	469
1990	0	26	472	56	3	2	0	0	559
1991	0	50	162	263	43	6	7	0	531
1992	0	72	223	130	38	1	1	0	465
1993	0	9	184	150	20	5	3	1	372
1994	0	42	344	200	74	36	11	1	708
1995	0	20	196	90	15	7	0	0	329
1996	0	7	83	93	39	2	1	0	225
1997	0	12	78	66	13	0	0	0	169
1998	0	12	106	31	8	3	0	0	160
1999	0	28	119	85	12	7	0	0	251
2000	0	62	163	70	4	0	0	0	299
2001	0	35	153	100	15	5	0	0	307
mean	0	62	199	101	24	6	2	0	393

Landed weight at age (kg)		age							
year	1	2	3	4	5	6	7	8+	
1985	0.19	0.31	0.37	0.49	0.60	0.72	1.17	1.39	
1986		0.32	0.46	0.58	0.74	0.93		1.40	
1987		0.31	0.41	0.56	0.67	0.86	1.10	1.25	
1988	0.11	0.29	0.33	0.48	0.64	0.76			
1989		0.37	0.41	0.69	0.95	1.41	1.24	1.24	
1990		0.31	0.41	0.54	0.90	0.99	0.99	1.79	
1991		0.34	0.37	0.54	0.76	0.95	1.07	1.53	
1992		0.32	0.40	0.50	0.58	0.80	1.49	1.89	
1993		0.31	0.38	0.42	0.72	0.94	1.00	1.14	
1994		0.28	0.38	0.49	0.60	0.67	1.04	1.12	
1995		0.32	0.34	0.40	0.60	0.80	1.18		
1996		0.31	0.43	0.50	0.53	0.91	1.19	1.19	
1997		0.38	0.40	0.47	0.56	0.93	1.30	1.30	
1998		0.33	0.41	0.54	0.63	1.00	1.62		
1999		0.35	0.42	0.58	0.58	0.85	1.62		
2000		0.37	0.42	0.55	0.59	0.97	0.87	1.06	
2001		0.35	0.41	0.56	0.57	0.69	1.62		
mean	0.15	0.33	0.40	0.52	0.66	0.89	1.23	1.36	

Table A2.5a. Discard estimates for Cape Cod yellowtail flounder, by fishery.

Large-mesh Trawl Fishery							
year	half	observed			total landings (mt)	discards (mt)	discard lengths
		kept (mt)	discard (mt)	d/k			
1998	1	0.1551	0.0095	0.061	355	21.8	6
	2	0.1810	0.0230	0.127	426	54.1	7
1999	1	0.0091	0.0014	0.150	282	42.3	48
	2	2.2226	0.0945	0.043	564	24.0	0
2000	1	10.6743	0.4195	0.039	871	34.2	608
	2	1.1785	0.0431	0.037	1079	39.4	45
2001	1	5.9789	0.6183	0.103	789	81.6	42
	2	6.3832	1.6209	0.254	1311	332.8	890

Gillnet Fishery							
year	half	observed			total landings (mt)	discards (mt)	
		kept (mt)	discard (mt)	d/k			
1998	1	33.6627	0.5355	0.016	360	5.7	5101
	2	1.1959	0.0290	0.024	23	0.5	159
1999	1	16.6555	0.3622	0.022	207	4.5	521
	2	3.3086	0.0174	0.005	36	0.2	5
2000	1	29.5608	0.4748	0.016	295	4.7	426
	2	0.1919	0.0095	0.050	32	1.6	3
2001	1	13.1767	0.1202	0.009	223	2.0	63
	2	1.2431	0.0095	0.008	35	0.3	0

Small-mesh Trawl Fishery							
year	half	observed			total effort	discards (mt)	
		effort (d)	discard (mt)	mt/d			
1998	1	0.0000	0.0000	0.046 *	74	3.4	0
	2	0.0000	0.0000	0.046 *	308	14.0	0
1999	1	0.0000	0.0000	0.046 *	39	1.8	0
	2	0.4583	0.0209	0.046	214	9.7	0
2000	1	0.0000	0.0000	0.009 *	27	0.2	0
	2	9.0417	0.0794	0.009	201	1.8	0
2001	1	0.8125	0.0123	0.015	51	0.8	0
	2	1.0792	0.0014	0.001	121	0.2	0

Scallop Dredge Fishery							
year	half	observed			total effort	discards (mt)	
		effort (d)	discard (mt)	mt/d			
1998	1	0.6250	0.0302	0.048	1019	49.2	19
	2	7.0833	0.5643	0.080	1379	109.8	296
1999	1	2.7917	0.0372	0.013	1092	14.6	23
	2	6.7500	0.0445	0.007	1478	9.7	11
2000	1	0.0000	0.0000	0.045 *	772	34.6	0
	2	0.0000	0.0000	0.045 *	1045	46.8	0
2001	1	0.2583	0.0116	0.045	284	12.7	0
	2	0.0000	0.0000	0.045 *	384	17.2	0

* assumed from adjacent cell

Table A2.5b. Discard estimates for the northern Gulf of Maine yellowtail flounder, by fishery.

Trawl Fishery							
year	half	observed kept	observed discard	d/k	landings	discards	discard lengths
1989	1	0.097	0.010	0.103	121	12	26
	2	0.029	0.005	0.186	45	8	0
1990	1	0.034	0.010	0.294	117	34	8
	2	0.007	0.002	0.265	80	21	0
1991	1	0.273	0.063	0.231	152	35	10
	2	0.122	0.047	0.387	86	33	0
1992	1	0.196	0.055	0.282	129	36	0
	2	0.720	0.017	0.024	56	1	0
1993	1	0.036	0.002	0.050	71	4	0
	2	0.681	0.082	0.120	72	9	2
1994	1	0.000	0.000	0.235	220	52	0
	2	0.000	0.000	0.501	55	28	0
1995	1	0.014	0.006	0.454	70	32	5
	2	0.002	0.006	2.478	26	63	14
1996	1	0.013	0.004	0.311	82	26	11
	2	0.000	0.060	0.501	13	7	147
1997	1	0.003	0.001	0.185	46	9	1
	2	0.000	0.000	0.501	10	5	0
1998	1	0.038	0.012	0.314	45	14	38
	2	0.000	0.000	0.501	17	8	0
1999	1	0.000	0.000	0.235	69	16	0
	2	0.000	0.000	0.501	23	12	0
2000	1	0.660	0.079	0.119	78	9	102
	2	0.186	0.066	0.353	44	15	27
2001	1	0.158	0.039	0.247	103	25	190
	2	0.206	0.041	0.199	32	6	64

Table A2.5b, continued.

Shrimp Fishery

year	half	observed effort	observed discard	d/e	effort	discards	discard lengths
1989	1	11	0.017	0.002	8200	13	18
	2	4	0.014	0.004	1361	5	8
1990	1	19	0.067	0.004	8647	31	83
	2	2	0.003	0.002	1111	2	0
1991	1	35	0.171	0.005	7402	36	222
	2	5	0.020	0.004	566	2	0
1992	1	62	0.322	0.005	7413	39	175
	2	3	0.002	0.001	385	0	2
1993	1	45	0.127	0.003	5666	16	394
	2	1	0.003	0.003	492	1	0
1994	1	35	0.047	0.001	4777	6	86
	2	4	0.010	0.002	1213	3	70
1995	1	34	0.052	0.002	8494	13	212
	2	6	0.008	0.001	1971	3	29
1996	1	13	0.020	0.002	9656	15	88
	2	2	0.004	0.002	2135	4	14
1997	1	6	0.003	0.000	9648	4	9
	2	0	0.000	0.002	1086	3	0
1998	1	0	0.000	0.002	6295	15	0
	2	0	0.000	0.002	311	1	0
1999	1	0	0.000	0.002	3811	9	0
	2	0	0.000	0.002	0	0	0
2000	1	0	0.000	0.002	3382	8	0
	2	0	0.000	0.002	0	0	0
2001	1	2	0.002	0.001	2963	3	0
	2	0	0.000	0.002	0	0	0

Table A2.5b, continued.

Gillnet Fishery

year	half	observed kept	observed discard	d/k	landings	discards	discard lengths
1989	1	0.000	0.000	0.323	25	8	0
	2	0.013	0.004	0.323	2	1	0
1990	1	0.049	0.012	0.249	29	7	0
	2	0.004	0.012	2.878	1	3	0
1991	1	0.074	0.011	0.147	12	2	1
	2	0.069	0.075	1.099	1	1	3
1992	1	0.968	0.095	0.098	11	1	40
	2	0.065	0.026	0.403	1	0	7
1993	1	1.292	0.098	0.076	13	1	31
	2	0.010	0.003	0.308	1	0	1
1994	1	0.662	0.005	0.007	44	0	4
	2	0.222	0.003	0.011	2	0	1
1995	1	2.794	0.015	0.005	27	0	36
	2	0.083	0.001	0.008	1	0	1
1996	1	2.775	0.004	0.001	11	0	3
	2	0.055	0.001	0.026	0	0	1
1997	1	7.112	0.008	0.001	17	0	7
	2	0.067	0.000	0.000	1	0	0
1998	1	0.031	0.002	0.075	11	1	0
	2	0.003	0.000	0.000	0	0	0
1999	1	0.076	0.000	0.000	23	0	0
	2	0.003	0.002	0.500	6	3	0
2000	1	0.267	0.000	0.000	10	0	2
	2	0.002	0.000	0.000	1	0	0
2001	1	0.047	0.007	0.145	6	1	0
	2	0.003	0.000	0.000	2	0	0

Table A2.6a. Discards at age of Cape Cod yellowtail flounder.

	Discards at age (thousands)			age		
	1	2	3	4	5	6
1985	340	184	34	0	0	0
1986	79	1,657	75	26	0	0
1987	14	877	168	0	0	0
1988	360	1,328	177	0	0	0
1989	114	1,405	396	1	0	0
1990	81	2,047	2,501	19	0	0
1991	460	895	561	100	7	0
1992	1,688	3,543	731	29	3	0
1993	138	324	173	30	0	0
1994	60	383	279	49	4	1
1995	453	469	652	50	2	0
1996	7	397	327	94	11	0
1997	1	399	351	117	22	1
1998	56	393	420	46	11	0
1999	11	153	188	22	3	3
2000	3	81	219	76	15	4
2001	19	837	700	26	3	1
mean	228	904	468	40	5	1

	Discarded weight at age (kg)			age		
	1	2	3	4	5	6
1985	0.13	0.15	0.15			
1986	0.10	0.17	0.19	0.18		
1987	0.06	0.19	0.19			
1988	0.12	0.15	0.20			
1989	0.13	0.21	0.25	0.36		
1990	0.08	0.24	0.27	0.33		
1991	0.12	0.19	0.27	0.37	0.54	
1992	0.05	0.11	0.22	0.31	0.36	
1993	0.09	0.15	0.27	0.33	0.63	
1994	0.08	0.20	0.29	0.32	0.38	0.34
1995	0.07	0.16	0.23	0.33	0.48	
1996	0.04	0.15	0.28	0.36	0.50	
1997	0.03	0.21	0.29	0.39	0.54	0.65
1998	0.03	0.23	0.33	0.37	0.46	0.59
1999	0.03	0.25	0.29	0.45	0.48	0.99
2000	0.03	0.29	0.38	0.57	0.61	0.80
2001	0.03	0.26	0.30	0.46	0.80	1.13
mean	0.07	0.19	0.26	0.37	0.53	0.75

Table A2.6b. Discards at age of northern Gulf of Maine yellowtail flounder.

	Discards at age (thousands)		age					sum
	1	2	3	4	5	6	7	
1985	341	185	34	0	0	0	0	560
1986	16	336	15	5	0	0	0	372
1987	5	324	62	0	0	0	0	391
1988	91	336	45	0	0	0	0	472
1989	4	53	132	10	0	0	0	199
1990	3	134	236	2	0	0	0	375
1991	5	116	139	134	0	0	0	394
1992	21	26	200	58	0	0	0	305
1993	21	67	33	43	0	0	0	164
1994	15	22	7	132	53	41	30	300
1995	5	29	175	120	70	0	0	400
1996	0	38	84	92	2	0	0	216
1997	2	20	58	4	0	0	0	84
1998	52	46	92	14	3	0	0	207
1999	6	55	108	17	1	0	0	187
2000	7	58	52	12	0	0	0	130
2001	1	26	26	78	4	0	0	134
mean	35	110	88	43	8	2	2	288

	Discarded weight at age (kg)		age				
	1	2	3	4	5	6	7
1985	0.13	0.15	0.15				
1986	0.10	0.17	0.19	0.18			
1987	0.06	0.19	0.19				
1988	0.12	0.15	0.20				
1989	0.13	0.21	0.24	0.39			
1990	0.09	0.20	0.29	0.41			
1991	0.08	0.22	0.28	0.32			
1992	0.06	0.11	0.27	0.32			
1993	0.08	0.12	0.25	0.30			
1994	0.09	0.12	0.18	0.27	0.31	0.36	0.54
1995	0.04	0.14	0.25	0.32	0.34		
1996		0.10	0.25	0.28	0.43		
1997	0.12	0.09	0.30	0.35			
1998	0.06	0.15	0.26	0.31	0.27		
1999	0.19	0.13	0.24	0.32	0.49		
2000	0.06	0.14	0.33	0.49	0.30		
2001	0.07	0.19	0.23	0.29	0.37		
mean	0.09	0.15	0.24	0.33	0.36	0.36	0.54

Table A2.7a. Indices of Cape Cod – Gulf of Maine yellowtail flounder abundance at age and biomass.

MADMF Spring Survey	age								sum	kg/tow
	1	2	3	4	5	6	7	8+		
1978	2.71	20.69	11.82	1.60	0.63	0.54	0.10	0.13	38.22	10.16
1979	2.63	22.58	13.85	3.68	0.86	0.00	0.17	0.00	43.77	11.38
1980	2.68	17.62	10.10	2.30	0.15	0.00	0.00	0.00	32.85	10.03
1981	5.61	58.83	9.00	2.26	1.59	0.27	0.00	0.00	77.56	16.35
1982	0.69	17.06	17.04	4.45	0.94	0.06	0.04	0.00	40.28	12.85
1983	3.13	8.50	11.51	4.28	0.04	0.17	0.03	0.00	27.66	9.00
1984	0.43	18.13	7.56	2.29	0.85	0.00	0.00	0.00	29.26	7.37
1985	1.97	8.27	7.15	1.52	0.59	0.39	0.05	0.05	19.99	5.21
1986	1.73	15.39	1.74	0.24	0.21	0.04	0.00	0.00	19.36	4.52
1987	2.53	4.95	5.31	0.97	0.27	0.11	0.08	0.00	14.22	3.67
1988	3.10	14.46	2.52	0.60	0.05	0.02	0.00	0.00	20.74	3.83
1989	0.67	22.26	3.18	1.08	0.06	0.00	0.00	0.00	27.25	4.73
1990	0.63	11.77	15.57	0.63	0.14	0.01	0.02	0.01	28.77	6.60
1991	0.06	5.34	3.31	2.15	0.48	0.12	0.05	0.00	11.50	3.32
1992	1.30	11.03	9.71	2.38	1.45	0.03	0.03	0.00	25.94	6.54
1993	0.63	7.99	6.31	1.94	0.23	0.06	0.20	0.03	17.38	4.60
1994	2.67	24.02	7.53	1.49	0.33	0.12	0.00	0.00	36.15	6.23
1995	7.51	14.64	24.96	2.88	1.20	0.02	0.02	0.00	51.22	10.38
1996	1.17	18.03	14.70	6.78	1.74	0.00	0.04	0.00	42.46	9.25
1997	0.52	16.94	12.22	4.04	0.54	0.00	0.00	0.00	34.26	7.55
1998	0.55	4.96	13.50	1.25	0.19	0.02	0.00	0.00	20.46	5.17
1999	0.10	6.34	10.90	1.28	0.08	0.00	0.00	0.00	18.70	5.08
2000	0.83	21.92	33.29	11.28	1.30	0.52	0.00	0.00	69.14	20.37
2001	0.22	10.21	38.20	10.39	1.68	0.00	0.00	0.00	60.71	19.34
2002	0.36	1.29	13.84	5.34	0.26	0.17	0.00	0.00	21.27	7.43
mean	1.78	15.33	12.19	3.08	0.63	0.11	0.03	0.01	33.16	8.44

Table A2.7b.

MADMF Fall Survey

	age									sum	kg/tow
	0	1	2	3	4	5	6	7	8+		
1978	0.04	7.13	7.74	1.45	0.11	0.00	0.01	0.00	0.00	16.48	2.80
1979	0.03	24.11	22.82	1.78	0.06	0.00	0.00	0.00	0.00	48.80	7.33
1980	0.03	26.54	12.38	2.70	0.35	0.00	0.00	0.00	0.00	42.00	5.90
1981	0.00	2.93	6.54	1.54	0.23	0.17	0.00	0.00	0.00	11.41	2.76
1982	0.00	9.58	3.36	5.54	0.30	0.08	0.00	0.00	0.00	18.86	4.20
1983	0.00	9.68	6.68	1.60	0.13	0.00	0.00	0.00	0.00	18.09	3.39
1984	0.04	1.91	3.00	0.86	0.39	0.10	0.02	0.00	0.04	6.37	1.18
1985	0.04	5.70	1.63	1.03	0.00	0.00	0.00	0.00	0.02	8.42	1.17
1986	0.01	2.60	4.95	0.20	0.03	0.01	0.00	0.00	0.00	7.80	1.36
1987	0.44	5.85	2.30	0.49	0.07	0.02	0.00	0.00	0.00	9.17	1.09
1988	0.00	8.96	11.24	2.27	0.15	0.00	0.00	0.00	0.00	22.62	3.71
1989	0.00	2.64	5.22	0.96	0.10	0.00	0.00	0.00	0.00	8.92	1.52
1990	0.00	5.20	11.93	4.84	0.01	0.00	0.00	0.00	0.00	21.98	4.16
1991	0.00	3.76	5.14	5.03	0.86	0.00	0.00	0.00	0.00	14.78	3.23
1992	0.20	7.18	3.62	2.08	0.47	0.20	0.00	0.00	0.00	13.75	2.00
1993	0.00	8.39	7.29	5.80	1.43	0.00	0.00	0.00	0.00	22.91	3.99
1994	0.00	2.36	11.79	1.79	0.15	0.00	0.00	0.00	0.00	16.09	3.27
1995	0.00	8.38	15.16	5.85	0.00	0.00	0.00	0.00	0.00	29.40	5.75
1996	0.01	1.87	3.94	2.18	0.17	0.00	0.00	0.00	0.00	8.17	1.56
1997	0.00	1.01	7.38	1.14	0.16	0.10	0.00	0.00	0.00	9.79	2.10
1998	0.00	7.05	6.74	2.25	0.00	0.00	0.00	0.00	0.00	16.05	2.68
1999	0.15	4.73	11.94	4.10	0.65	0.08	0.00	0.00	0.00	21.66	4.71
2000	0.00	1.36	8.25	3.53	0.22	0.10	0.00	0.03	0.00	13.48	3.46
2001	0.00	0.57	8.06	4.23	0.14	0.00	0.00	0.00	0.00	13.00	3.55
mean	0.04	6.65	7.88	2.63	0.26	0.04	0.00	0.00	0.00	17.50	3.20

Table A2.7c.

NMFS Spring Survey

year	1	2	3	4	5	6	7	8+	sum	kg/tow
1977	0.775	0.329	0.185	0.049	0.093	0.000	0.000	0.000	1.431	0.566
1978	0.000	0.057	0.247	0.036	0.088	0.000	0.000	0.000	0.427	0.209
1979	0.228	0.315	0.748	0.770	0.068	0.021	0.000	0.019	2.169	0.795
1980	0.000	4.150	2.189	0.828	0.167	0.000	0.000	0.000	7.334	2.426
1981	0.041	2.921	2.198	1.143	0.584	0.473	0.179	0.000	7.538	2.468
1982	0.016	1.195	3.009	1.519	0.416	0.232	0.219	0.099	6.705	2.814
1983	1.190	3.203	2.093	1.298	0.092	0.064	0.000	0.000	7.939	2.340
1984	0.039	1.020	0.606	0.394	0.257	0.023	0.032	0.069	2.440	0.809
1985	0.047	0.806	0.865	0.205	0.123	0.043	0.000	0.000	2.089	0.615
1986	0.024	1.786	0.198	0.137	0.100	0.000	0.000	0.000	2.245	0.470
1987	0.062	1.599	2.356	0.637	0.538	0.570	0.611	0.304	6.676	2.971
1988	0.896	3.781	0.922	0.513	0.268	0.097	0.057	0.000	6.533	1.077
1989	0.177	2.179	1.442	0.372	0.274	0.038	0.038	0.038	4.559	0.863
1990	2.285	6.144	0.210	0.000	0.099	0.000	0.000	0.000	8.739	1.948
1991	0.421	3.554	2.834	1.049	0.222	0.000	0.047	0.000	8.128	1.783
1992	0.155	0.915	1.835	0.498	0.018	0.000	0.000	0.000	3.421	0.764
1993	0.064	0.656	1.045	0.563	0.000	0.000	0.000	0.000	2.327	0.501
1994	0.347	2.631	1.578	0.951	0.593	0.208	0.000	0.000	6.308	1.201
1995	0.182	1.040	3.978	2.991	0.432	0.048	0.000	0.000	8.670	2.036
1996	0.015	0.547	1.430	2.009	0.335	0.000	0.000	0.000	4.336	1.108
1997	0.021	0.934	2.025	1.545	0.288	0.000	0.000	0.000	4.813	1.311
1998	0.000	0.748	2.934	0.887	0.144	0.000	0.000	0.000	4.712	1.155
1999	0.018	0.848	3.633	1.853	0.332	0.147	0.000	0.000	6.831	1.977
2000	0.238	3.931	17.630	5.837	0.953	0.715	0.000	0.000	29.305	9.506
2001	0.000	1.201	4.878	1.030	0.216	0.000	0.000	0.000	7.324	2.292
2002	0.015	1.568	7.092	3.271	0.213	0.026	0.000	0.026	12.211	4.554
average	0.279	1.848	2.622	1.169	0.266	0.104	0.046	0.021	6.354	1.868

Table A2.7d.

NMFS Fall Survey

year	1	2	3	4	5	6	7	8+sum	kg/tow	
1977	4.882	9.330	4.987	0.788	0.197	0.053	0.062	0.123	20.421	7.526
1978	0.354	3.540	2.383	0.152	0.168	0.015	0.015	0.015	6.642	2.047
1979	4.003	4.072	1.227	0.306	0.075	0.016	0.000	0.000	9.698	2.596
1980	10.534	8.937	4.115	1.556	0.340	0.000	0.037	0.000	25.518	6.557
1981	1.596	4.965	1.330	0.532	0.266	0.177	0.000	0.000	8.866	1.881
1982	0.572	2.743	2.593	0.313	0.379	0.000	0.000	0.000	6.599	2.056
1983	0.285	0.546	0.312	0.020	0.000	0.000	0.000	0.000	1.162	0.264
1984	0.320	1.124	0.443	0.763	0.546	0.151	0.075	0.075	3.497	1.380
1985	4.609	1.778	1.352	0.068	0.068	0.068	0.000	0.000	7.943	1.583
1986	1.308	3.613	0.297	0.019	0.019	0.000	0.000	0.000	5.257	0.970
1987	0.564	1.357	0.476	0.057	0.049	0.000	0.000	0.000	2.503	0.556
1988	3.128	4.587	0.443	0.134	0.000	0.000	0.000	0.000	8.292	1.126
1989	1.657	5.338	2.008	0.417	0.146	0.066	0.000	0.000	9.631	2.202
1990	3.500	6.201	2.874	0.046	0.010	0.000	0.000	0.000	12.630	2.345
1991	1.840	1.643	1.639	0.332	0.000	0.000	0.000	0.000	5.453	1.202
1992	2.537	2.758	1.878	0.948	0.183	0.142	0.000	0.000	8.447	1.932
1993	4.445	4.507	0.601	0.099	0.000	0.000	0.000	0.000	9.652	1.106
1994	2.472	7.368	2.596	0.824	0.354	0.000	0.000	0.000	13.615	2.701
1995	0.516	0.713	1.068	0.297	0.171	0.000	0.000	0.000	2.765	0.783
1996	1.058	2.907	4.928	1.179	0.133	0.000	0.000	0.000	10.205	2.614
1997	1.049	2.440	2.945	1.223	0.670	0.115	0.000	0.000	8.441	2.277
1998	1.022	2.984	1.197	0.986	0.234	0.000	0.000	0.000	6.422	1.637
1999	4.147	8.090	5.532	1.697	0.698	0.027	0.000	0.000	20.191	5.983
2000	0.955	6.729	4.455	0.260	0.000	0.000	0.000	0.000	12.399	3.472
2001	0.117	3.835	2.231	0.114	0.019	0.000	0.000	0.000	6.316	1.889
average	2.299	4.084	2.156	0.525	0.189	0.033	0.008	0.009	9.303	2.347

Table A2.8. Correlation among indices of abundance at age for Cape Cod – Gulf of Maine yellowtail flounder.

Age-1	MASS_F	MASS_S	NMFS_S		
MASS_F	1.00				
MASS_S	0.07	1.00			
NMFS_S	0.48	-0.10	1.00		

Age-2	MASS_F	MASS_S	NMFS_F	NMFS_S
MASS_F	1.00			
MASS_S	0.33	1.00		
NMFS_F	0.17	0.59	1.00	
NMFS_S	0.16	0.59	0.63	1.00

Age-3	MASS_F	MASS_S	NMFS_F	NMFS_S
MASS_F	1.00			
MASS_S	0.45	1.00		
NMFS_F	0.58	0.37	1.00	
NMFS_S	0.64	0.45	0.54	1.00

Age-4	MASS_F	MASS_S	NMFS_F	NMFS_S
MASS_F	1.00			
MASS_S	0.56	1.00		
NMFS_F	0.69	0.56	1.00	
NMFS_S	0.43	0.48	0.63	1.00

Age-5	MASS_F	MASS_S	NMFS_F	NMFS_S
MASS_F	1.00			
MASS_S	0.00	1.00		
NMFS_F	-0.04	0.28	1.00	
NMFS_S	-0.08	0.50	0.24	1.00

Age-6+	MASS_F	MASS_S	NMFS_F	NMFS_S
MASS_F	1.00			
MASS_S	0.10	1.00		
NMFS_F	-0.01	0.04	1.00	
NMFS_S	-0.44	0.52	0.27	1.00

Table A2.9. Results of virtual population analysis of Cape Cod – Gulf of Maine yellowtail flounder.

Abundance (thousands)						
	age-1	age-2	age-3	age-4	age-5+	sum
1985	12302	3195	1696	1168	814	19175
1986	6030	9451	1489	568	88	17626
1987	8083	4851	3915	509	273	17631
1988	28844	6601	2266	1096	345	39152
1989	11325	23207	3068	495	75	38170
1990	11634	9166	16922	872	111	38705
1991	13071	9449	4883	5349	1008	33760
1992	9639	10281	6495	2401	668	29484
1993	10404	6346	4817	3543	731	25841
1994	7177	8375	4811	2972	1710	25045
1995	6380	5808	6372	2443	745	21748
1996	9625	4809	4076	2725	898	22133
1997	8590	7874	3402	1896	442	22204
1998	10724	7031	5621	1361	504	25241
1999	13439	8682	5117	2522	575	30335
2000	10047	10988	6598	2788	411	30832
2001	1939	8218	7961	2634	447	21199
2002	---	1569	5185	3069	1188	---
average	10544	8106	5261	2134	613	26958

Fishing Mortality						
	age-1	age-2	age-3	age-4	age-5+	age 3-4
1985	0.06	0.56	0.89	0.92	0.92	0.90
1986	0.02	0.68	0.87	0.90	0.90	0.88
1987	0.00	0.56	1.07	1.11	1.11	1.07
1988	0.02	0.57	1.32	1.39	1.39	1.34
1989	0.01	0.12	1.06	1.09	1.09	1.06
1990	0.01	0.43	0.95	0.98	0.98	0.95
1991	0.04	0.17	0.51	0.52	0.52	0.52
1992	0.22	0.56	0.41	0.41	0.41	0.41
1993	0.02	0.08	0.28	0.28	0.28	0.28
1994	0.01	0.07	0.48	0.48	0.48	0.48
1995	0.08	0.15	0.65	0.66	0.66	0.65
1996	0.00	0.15	0.57	0.57	0.57	0.57
1997	0.00	0.14	0.72	0.73	0.73	0.72
1998	0.01	0.12	0.60	0.61	0.61	0.60
1999	0.00	0.07	0.41	0.41	0.41	0.41
2000	0.00	0.12	0.72	0.73	0.73	0.72
2001	0.01	0.26	0.75	0.75	0.75	0.75
average	0.03	0.28	0.72	0.74	0.74	0.73

Table A2.9 continued.

Spawning Stock Biomass (mt)

	age-1	age-2	age-3	age-4	age-5+	sum
1985	0	50	313	359	332	1055
1986	0	131	332	191	43	696
1987	0	65	728	162	115	1070
1988	0	81	331	294	128	834
1989	0	439	559	188	44	1230
1990	0	141	3138	293	60	3633
1991	0	155	1000	2063	591	3810
1992	0	78	1308	931	331	2648
1993	0	72	1149	1216	490	2926
1994	0	132	1087	1028	836	3083
1995	0	88	1159	700	312	2260
1996	0	63	912	928	364	2267
1997	0	164	715	592	177	1647
1998	0	128	1272	514	255	2169
1999	0	192	1319	1095	303	2909
2000	0	277	1567	1058	184	3087
2001	0	174	1777	992	234	3177
average	0	143	1098	741	282	2265

Table A2.10. Yield and biomass per recruit of Cape Cod – Gulf of Maine yellowtail flounder.

The NEFC Yield and Stock Size per Recruit Program - PDBYPRC
 PC Ver.1.2 [Method of Thompson and Bell (1934)] 1-Jan-1992

Run Date: 4-12-2002; Time: 14:49:47.35
 CC_GOM YELLOWTAIL FLOUNDER - 1994-2001 INPUT

Proportion of F before spawning: .4167
 Proportion of M before spawning: .4167
 Natural Mortality is Constant at: .200
 Initial age is: 1; Last age is: 8
 Last age is a PLUS group;
 Original age-specific PRs, Mats, and Mean Wts from file:
 ==> CCGOMYT.DAT

Age-specific Input data for Yield per Recruit Analysis

Age	Fish Mort Pattern	Nat Mort Pattern	Proportion Mature	Average Weights Catch	Stock
1	.0200	1.0000	.0000	.043	.043
2	.2200	1.0000	.0800	.273	.273
3	.9800	1.0000	.8100	.387	.387
4	1.0000	1.0000	1.0000	.501	.501
5	1.0000	1.0000	1.0000	.588	.588
6	1.0000	1.0000	1.0000	.845	.845
7	1.0000	1.0000	1.0000	1.176	1.176
8+	1.0000	1.0000	1.0000	1.328	1.328

Summary of Yield per Recruit Analysis for:
 CC_GOM YELLOWTAIL FLOUNDER - 1994-2001 INPUT

Slope of the Yield/Recruit Curve at F=0.00: -->	3.0044
F level at slope=1/10 of the above slope (F0.1): ----->	.195
Yield/Recruit corresponding to F0.1: ----->	.2205
F level to produce Maximum Yield/Recruit (Fmax): ----->	.437
Yield/Recruit corresponding to Fmax: ----->	.2432
F level at 40 % of Max Spawning Potential (F40): ----->	.174
SSB/Recruit corresponding to F40: ----->	1.1917

Table A2.10 cont.

	FMORT	TOTCTHN	TOTCTHW	TOTSTKN	TOTSTKW	SPNSTKN	SPNSTKW	% MSP
	.000	.00000	.00000	5.5167	3.5367	3.3453	2.9798	100.00
	.100	.23532	.16955	4.3458	2.1815	2.1818	1.6643	55.85
F0.1	.195	.34935	.22052	3.7809	1.5853	1.6236	1.0959	36.78
F40%	.174	.32915	.21343	3.8808	1.6866	1.7221	1.1917	39.99
	.200	.35385	.22197	3.7586	1.5630	1.6017	1.0748	36.07
	.300	.42566	.23872	3.4049	1.2250	1.2549	.7584	25.45
	.400	.47407	.24300	3.1678	1.0191	1.0246	.5688	19.09
Fmax	.437	.48838	.24322	3.0981	.9623	.9573	.5172	17.36
	.500	.50912	.24277	2.9975	.8838	.8607	.4462	14.97
	.600	.53579	.24102	2.8687	.7896	.7383	.3622	12.15
	.700	.55687	.23890	2.7677	.7210	.6436	.3018	10.13
	.800	.57404	.23682	2.6861	.6691	.5682	.2567	8.62
	.900	.58834	.23493	2.6186	.6286	.5067	.2221	7.45
	1.000	.60050	.23325	2.5617	.5962	.4557	.1947	6.53
	1.100	.61099	.23175	2.5128	.5696	.4128	.1725	5.79
	1.200	.62018	.23041	2.4704	.5473	.3762	.1543	5.18
	1.300	.62832	.22919	2.4330	.5284	.3446	.1390	4.67
	1.400	.63560	.22807	2.3998	.5120	.3171	.1261	4.23
	1.500	.64217	.22702	2.3699	.4977	.2929	.1150	3.86
	1.600	.64814	.22604	2.3429	.4851	.2715	.1054	3.54
	1.700	.65361	.22511	2.3182	.4738	.2525	.0970	3.25
	1.800	.65865	.22422	2.2956	.4636	.2355	.0895	3.00
	1.900	.66332	.22337	2.2746	.4544	.2201	.0830	2.78
	2.000	.66766	.22254	2.2552	.4459	.2063	.0771	2.59