

Appendix F. Gulf of Maine cod

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Appendix 1. Commercial landings at age, discard at age, recreational landings at age and total catch at age, 1982-2007 for the Gulf of Maine stock of Atlantic cod.

Year	Total Commercial Landings in Numbers (000's) at Age							Revised LAA 1994+			Jul-08	Total
	1	2	3	4	5	6	7	8	9	10	11+	
1982	30	1380	1633	1143	633	69	91	61	41	4	33	5118
1983	0	866	2357	1058	638	422	47	61	23	9	15	5496
1984	4	446	1240	1500	437	194	74	19	15	11	17	3957
1985	0	407	1445	991	630	128	78	32	4	11	11	3737
1986	0	84	2164	813	250	177	39	24	20	4	8	3583
1987	2	216	595	1109	277	66	51	9	8	8	3	2344
1988	0	160	1443	953	406	43	9	17	1	2	1	3035
1989	0	337	1583	1454	449	81	35	6	3	5	7	3960
1990	0	205	3425	2064	430	157	27	30	10	15	17	6380
1991	0	344	934	4161	851	143	41	30	6	1	1	6512
1992	0	313	530	484	2018	202	62	7	12	3	0	3631
1993	0	76	1487	641	129	457	28	6	2	0	0	2825
1994	0	37	1094	1114	305	69	84	29	7	1	1	2742
1995	18	221	885	1035	222	27	14	18	1	2	0	2443
1996	0	69	513	1744	365	37	4	0	1	0	0	2734
1997	0	79	445	427	801	68	5	3	0	1	0	1829
1998	0	94	396	530	146	176	25	4	0	1	0	1373
1999	0	3	184	176	81	16	22	2	0	2	0	487
2000	0	102	256	501	122	69	11	5	0	0	0	1067
2001	0	46	484	323	212	68	39	6	9	1	0	1187
2002	0	2	115	439	172	106	43	12	4	4	0	898
2003	0	7	48	205	393	124	54	21	9	5	3	870
2004	0	1	156	133	226	178	54	28	15	8	2	799
2005	0	1	40	437	65	181	85	22	13	6	5	856
2006	0	1	120	192	307	22	66	31	11	6	5	761
2007	0	5	101	643	101	187	6	17	8	4	5	1077

Total Commercial Landings in Weight (Tons) at

Age Year	1	2	3	4	5	6	7	8	9	10	11+	Total
1982	24	1595	2717	3160	3019	461	813	608	531	41	613	13582
1983	0	1009	3913	2619	2410	2518	271	643	227	102	269	13981
1984	3	516	2071	4080	1607	1145	603	186	193	152	250	10816
1985	0	513	2523	2816	2814	705	615	363	51	141	152	10693
1986	0	110	3976	2375	1153	1072	296	243	253	54	132	9664
1987	2	283	1001	3641	1340	451	455	88	116	110	40	7527
1988	0	203	2715	2311	2097	295	85	191	11	36	14	7958
1989	0	420	2811	4351	1737	325	323	67	43	87	163	10397
1990	0	219	5794	4687	1834	1200	290	354	153	214	350	15095
1991	0	388	1463	10455	3520	1045	399	369	93	32	17	17781
1992	0	480	1019	1313	6175	1011	594	88	161	49	0	10891
1993	0	99	2809	1611	561	2819	281	79	27	0	0	8286
1994	0	52	2060	3379	1054	440	603	306	68	11	26	7998
1995	5	307	1641	2870	1143	156	150	211	15	31	5	6535
1996	0	106	1139	4098	1295	269	46	6	18	0	0	6978
1997	0	140	997	1320	2539	333	42	30	4	12	2	5420
1998	0	124	813	1527	614	759	132	43	7	16	7	4045
1999	0	4	333	442	300	92	163	24	0	20	0	1379
2000	0	170	643	1828	566	401	71	47	0	0	0	3726
2001	0	85	1205	1087	1034	432	287	50	82	11	9	4282
2002	0	2	296	1457	716	646	292	104	38	45	6	3601
2003	0	13	116	653	1645	664	389	176	97	57	42	3852
2004	0	1	397	478	933	1024	388	258	171	100	27	3776
2005	0	2	86	1319	290	838	530	174	137	73	77	3526
2006	0	2	291	627	1164	107	358	224	102	76	79	3030
2007	0	10	251	2083	402	902	39	116	78	47	65	3993

Total
Commercial
Landings
Mean
Weight (kg)
at Age

Year	1	2	3	4	5	6	7	8	9	10	11+	Average
1982	0.801	1.156	1.664	2.764	4.770	6.739	8.944	9.931	12.922	10.618	18.456	2.654
1983	0.000	1.164	1.660	2.475	3.778	5.962	5.808	10.522	10.089	10.898	17.813	2.544
1984	0.589	1.159	1.670	2.721	3.677	5.898	8.119	9.595	12.889	13.951	15.028	2.731
1985	0.000	1.260	1.746	2.840	4.466	5.525	7.901	11.218	11.420	13.386	14.523	2.861
1986	0.000	1.304	1.837	2.923	4.619	6.067	7.669	10.030	12.463	12.907	16.554	2.698
1987	1.028	1.313	1.684	3.283	4.831	6.824	8.878	10.023	13.752	14.738	14.596	3.212
1988	0.000	1.268	1.881	2.426	5.166	6.767	9.932	11.126	14.960	15.763	20.356	2.622
1989	0.000	1.247	1.776	2.993	3.864	4.872	9.267	11.938	14.806	18.196	21.521	2.626
1990	0.000	1.071	1.692	2.271	4.265	7.645	10.734	11.758	15.015	14.784	20.295	2.366
1991	0.000	1.130	1.568	2.512	4.136	7.309	9.642	12.322	15.547	24.328	21.885	2.731
1992	0.000	1.533	1.922	2.714	3.061	5.000	9.566	12.462	13.449	16.631		2.999
1993	0.000	1.293	1.889	2.513	4.356	6.174	9.999	13.869	17.544			2.933
1994	0.000	1.401	1.882	3.034	3.452	6.324	7.159	10.464	10.362	18.542	20.637	2.915
1995	0.274	1.388	1.854	2.774	5.138	5.837	10.760	11.510	18.893	20.064	20.347	2.675
1996	0.000	1.543	2.220	2.350	3.543	7.347	10.406	14.126	14.929	0.000	0.000	2.551
1997	0.000	1.777	2.242	3.090	3.171	4.880	8.409	11.560	14.726	15.814	21.874	2.964
1998	0.000	1.323	2.055	2.879	4.204	4.321	5.254	11.391	18.893	14.953	20.347	2.947
1999	0.000	1.483	1.809	2.511	3.691	5.712	7.311	10.081	0.000	13.402	0.000	2.837
2000	0.000	1.673	2.513	3.646	4.637	5.813	6.394	8.580	0.000	0.000	0.000	3.488
2001	0.000	1.843	2.491	3.365	4.880	6.359	7.451	8.733	8.789	12.414	24.418	3.605
2002	0.000	1.348	2.569	3.320	4.152	6.066	6.792	8.618	9.589	10.482	14.333	4.013
2003	0.000	1.810	2.415	3.179	4.183	5.343	7.247	8.480	10.295	11.771	12.638	4.426
2004	0.000	1.483	2.550	3.588	4.138	5.742	7.167	9.329	11.688	12.822	12.914	4.723
2005	0.000	1.876	2.185	3.018	4.467	4.622	6.226	7.736	10.355	13.331	14.098	4.120
2006	0.000	2.394	2.430	3.271	3.790	4.789	5.453	7.284	9.245	11.974	15.718	3.980
2007	0.000	1.945	2.493	3.241	3.961	4.827	6.243	6.839	9.625	11.369	14.255	3.703

Total
Commercial

Landings
Mean
Length
(cm) at Age

Year	1	2	3	4	5	6	7	8	9	10	11+	Average
1982	43.2	48.3	53.8	63.4	76.8	86.1	94.6	97.9	107.4	101.0	120.7	59.9
1983	0.0	48.6	53.8	61.4	70.8	82.4	80.5	98.8	97.5	100.0	118.7	59.8
1984	39.0	48.4	54.1	63.4	69.7	81.8	91.5	96.7	106.9	109.6	112.0	61.6
1985	0.0	49.8	55.1	64.6	74.9	80.3	90.8	101.9	103.1	108.2	109.7	62.8
1986	0.0	50.3	55.9	65.0	75.4	82.6	89.9	98.7	105.8	107.5	116.2	61.6
1987	47.0	50.4	54.4	67.8	76.9	86.5	93.8	98.7	109.5	111.7	111.3	65.4
1988	0.0	50.1	56.4	61.1	78.7	86.4	98.6	102.3	113.0	114.8	125.0	61.4
1989	0.0	49.8	55.5	65.7	71.5	76.7	95.8	103.4	112.6	120.4	126.8	61.7
1990	0.0	47.5	54.8	60.0	73.7	90.0	100.9	104.0	111.8	112.6	124.6	59.2
1991	0.0	47.7	52.6	61.8	72.6	88.6	97.2	105.0	113.3	132.5	128.0	62.2
1992	0.0	53.1	56.6	62.9	65.6	77.0	97.3	106.1	109.1	117.0		64.3
1993	0.0	50.5	56.8	61.7	74.2	83.7	98.6	110.0	119.1			63.5
1994	0.0	51.8	56.6	65.8	68.3	83.3	86.8	98.3	100.0	121.2	125.5	63.8
1995	30.4	50.5	56.2	63.7	78.7	78.1	101.1	102.7	122.0	124.4	125.0	61.6
1996	0.0	52.8	59.6	60.4	68.6	88.6	100.0	110.8	112.6	0.0	0.0	61.6
1997	0.0	55.4	59.8	66.0	66.3	76.2	92.3	102.9	112.1	115.0	128.0	64.7
1998	0.0	50.7	58.1	64.4	73.0	73.3	75.8	101.9	122.0	113.0	125.0	64.1
1999	0.0	53.0	55.8	62.0	69.2	78.6	87.6	99.3	0.0	109.0	0.0	62.9
2000	0.0	54.6	61.7	70.1	76.1	82.3	84.3	93.9	0.0	0.0	0.0	68.4
2001	0.0	56.1	62.0	68.1	77.4	84.6	89.2	93.6	94.1	106.2	132.4	68.8
2002	0.0	51.3	62.5	68.0	72.9	83.2	86.1	93.5	96.9	99.3	110.0	71.5
2003	0.0	56.3	61.5	67.0	73.2	79.5	88.2	92.7	98.7	103.5	106.3	73.8
2004	0.0	53.0	62.7	70.1	73.1	81.4	87.8	96.1	103.7	107.1	106.4	75.2
2005	0.0	57.0	59.7	66.1	75.2	75.9	83.3	89.8	99.2	108.1	109.8	71.9
2006	0.0	62.0	61.7	67.9	71.0	76.3	79.7	87.1	94.7	103.6	113.8	71.2
2007	0.0	57.8	62.3	67.9	72.1	77.0	83.7	86.0	96.7	102.6	110.0	70.2

Total Commercial Discards in Numbers (000's) at Age								Revised Discards 1999+				Total
Year	1	2	3	4	5	6	7	8	9	10	11+	
1999	0	6	350	335	155	31	43	4	0	3	0	925
2000	0	27	69	134	33	19	3	1	0	0	0	286
2001	0	15	155	104	68	22	12	2	3	0	0	382
2002	0	1	49	187	74	45	18	5	2	2	0	383
2003	0	2	15	65	125	39	17	7	3	2	1	277
2004	0	0	19	17	28	22	7	3	2	1	0	99
2005	0	0	3	33	5	14	6	2	1	0	0	65
2006	0	0	18	29	46	3	10	5	2	1	1	114
2007	0	1	13	83	13	24	1	2	1	1	1	139

Total Commercial Discards in Weight (Tons) at Age												Total
Year	1	2	3	4	5	6	7	8	9	10	11+	
1999	0	8.229152	632.3211	840.8807	570.5593	175.6108	310.7809	44.92337	0	38.4042	0	2626.099
2000	0	45.69613	172.5082	490.2897	151.7367	107.5641	18.96529	12.59727	0	0	0	992.4665
2001	0	27.26515	387.2823	349.5529	332.4472	138.964	92.24515	16.02044	26.24963	3.653747	2.836484	1375.022
2002	0	0.894573	126.3784	621.6192	305.4864	275.5153	124.4507	44.46742	16.24992	18.99534	2.67322	1541.092
2003	0	4.041596	36.94529	207.3986	522.9986	210.9961	123.682	55.84634	30.87597	17.99572	13.4672	1223.025
2004	0	0.094445	49.38522	59.43709	116.1658	127.4585	48.25518	32.15067	21.24175	12.4877	3.384399	468.9256
2005	0	0.171457	6.598477	100.6273	22.12268	63.95506	40.40933	13.25934	10.42035	5.597503	5.891383	268.328
2006	0	0.362839	43.68574	94.059	174.4595	15.98146	53.74157	33.53138	15.2962	11.3954	11.77911	451.9766
2007	0	1.345042	32.46468	268.9374	51.85083	116.4489	5.086826	14.94985	10.0594	6.010341	8.426732	510.4338

Year	Total Recreational Landings in Numbers (000's) at Age					Revised Recr Catch 1982+							Total
	1	2	3	4	5	6	7	8	9	10	11+		
1982	41	601	787	279	114	8	7	5	0	0	0	0	1842
1983	11	458	561	131	49	31	3	4	2	3	4	1258	
1984	21	356	342	137	33	14	4	0	0	1	1	908	
1985	44	658	743	146	37	5	0	0	0	0	0	1634	
1986	13	102	593	117	27	23	7	6	16	4	51	958	
1987	94	674	726	397	69	25	33	5	6	2	0	2031	
1988	2	389	685	164	23	6	2	1	0	0	0	1273	
1989	4	183	698	262	39	12	6	0	0	0	0	1203	
1990	0	49	701	392	93	20	0	0	0	0	0	1254	
1991	0	94	407	750	80	16	6	0	2	0	0	1355	
1992	0	25	57	48	170	17	3	0	0	0	0	322	
1993	0	52	545	142	10	17	1	0	0	0	0	767	
1994	1	17	394	103	26	2	1	0	0	0	0	543	
1995	0	56	285	157	10	2	0	0	0	0	0	510	
1996	0	21	117	193	19	0	0	0	0	0	0	351	
1997	0	6	51	28	52	3	0	0	0	0	0	140	
1998	0	14	87	64	13	16	1	0	0	0	0	194	
1999	1	14	114	57	37	11	14	1	0	0	0	249	
2000	0	72	209	192	36	11	2	0	0	0	0	523	
2001	0	86	544	259	98	19	9	1	1	0	0	1018	
2002	0	1	95	258	100	52	20	18	4	3	0	551	
2003	0	7	55	172	248	68	33	13	9	4	3	611	
2004	0	0	183	100	156	65	14	6	3	3	1	531	
2005	0	6	92	344	25	70	29	8	5	2	2	584	
2006	0	0	39	61	96	7	22	13	5	3	3	250	
2007	0	2	41	182	26	43	1	4	3	2	2	307	

Total Recreational Landings in Weight (Tons) at

Age Year	1	2	3	4	5	6	7	8	9	10	11+	Total
1982	22	606	1201	676	506	46	41	32	0	0	0	3131
1983	5	398	785	282	168	209	18	37	24	50	82	2056
1984	10	302	481	336	114	61	30	2	0	11	26	1371
1985	21	546	980	340	113	18	2	1	0	0	0	2020
1986	5	99	976	308	108	131	75	84	230	55	1033	3104
1987	18	564	1042	1073	326	204	342	52	64	25	0	3709
1988	1	326	982	345	89	23	15	7	0	0	0	1788
1989	3	203	1117	683	139	75	49	4	0	0	0	2272
1990	0	55	1160	961	357	108	0	0	0	0	0	2642
1991	0	130	605	1492	208	133	55	0	18	1	0	2642
1992	0	46	126	145	566	83	26	1	0	0	0	993
1993	0	53	891	267	28	71	11	0	0	0	0	1321
1994	0	22	630	224	53	7	13	2	1	0	0	953
1995	0	85	462	303	31	3	0	0	0	0	0	884
1996	0	33	212	376	45	2	1	1	2	0	0	672
1997	0	11	101	68	123	9	0	0	0	0	0	311
1998	0	24	186	165	42	49	3	0	0	0	0	470
1999	0	17	223	174	177	67	96	9	0	0	0	764
2000	0	109	404	517	126	56	7	1	0	0	0	1221
2001	0	148	1233	753	422	116	55	9	7	0	0	2744
2002	0	1	215	813	372	277	127	260	42	37	0	2144
2003	0	15	133	495	894	349	264	118	108	47	42	2463
2004	0	0	391	269	444	247	78	57	36	34	15	1572
2005	0	9	183	886	98	294	184	68	53	30	36	1842
2006	0	1	95	196	347	35	124	108	58	44	47	1054
2007	0	4	107	572	98	199	10	34	39	26	34	1124

Year	Total Recreational Landings Mean Weight (kg) at Age											Average
	1	2	3	4	5	6	7	8	9	10	11+	
1982	0.531	1.009	1.526	2.423	4.431	5.686	6.100	7.050	10.522	12.655	16.456	1.700
1983	0.446	0.867	1.399	2.156	3.412	6.831	5.913	8.331	10.808	17.726	18.784	1.635
1984	0.459	0.849	1.408	2.460	3.428	4.476	6.755	6.618	5.621	16.868	17.991	1.510
1985	0.466	0.830	1.320	2.326	3.021	3.370	3.798	4.458	10.522	12.655	16.456	1.236
1986	0.399	0.968	1.646	2.641	4.014	5.740	11.181	13.651	14.756	13.780	20.055	3.240
1987	0.189	0.837	1.435	2.705	4.704	8.009	10.456	10.559	11.344	10.943	16.456	1.826
1988	0.318	0.838	1.434	2.104	3.881	3.669	6.773	7.109	10.522	12.655	16.456	1.405
1989	0.680	1.111	1.601	2.610	3.555	6.351	7.837	9.095	10.522	12.655	16.456	1.888
1990	0.421	1.141	1.656	2.453	3.830	5.508	7.176	8.160	10.522	12.655	16.456	2.107
1991	0.421	1.378	1.485	1.990	2.609	8.450	9.387	8.160	9.387	3.468	16.456	1.950
1992	0.421	1.810	2.205	3.030	3.323	4.827	7.781	2.515	10.522	12.655	16.456	3.087
1993	0.421	1.023	1.636	1.877	2.681	4.207	9.685	8.160	10.522	12.655	16.456	1.722
1994	0.131	1.342	1.601	2.182	2.086	4.300	8.623	8.476	9.095	12.655	16.456	1.755
1995	0.482	1.523	1.620	1.924	3.120	1.798	7.176	5.833	10.522	12.655	16.456	1.734
1996	0.582	1.542	1.808	1.952	2.387	8.127	12.664	12.664	12.664	12.655	16.456	1.915
1997	0.421	1.733	1.992	2.381	2.388	2.806	6.275	6.501	10.522	12.655	16.456	2.224
1998	0.456	1.718	2.151	2.570	3.332	3.140	3.288	6.735	10.522	12.655	16.456	2.423
1999	0.334	1.253	1.958	3.048	4.820	6.032	6.706	8.851	10.522	12.655	16.456	3.070
2000	0.421	1.521	1.929	2.688	3.543	4.898	3.419	4.826	10.522	12.655	16.456	2.334
2001	0.421	1.716	2.266	2.912	4.308	6.000	6.211	6.261	6.966	12.655	16.456	2.695
2002	0.421	1.381	2.265	3.147	3.716	5.357	6.422	14.256	11.036	10.987	16.456	3.890
2003	0.421	2.083	2.402	2.869	3.611	5.159	8.120	9.367	11.555	13.161	13.712	4.031
2004	0.421	1.459	2.140	2.681	2.849	3.780	5.664	9.757	12.265	13.369	14.001	2.960
2005	0.421	1.523	1.990	2.574	3.857	4.187	6.270	8.120	10.685	13.692	15.088	3.154
2006	0.421	2.053	2.409	3.222	3.610	5.054	5.727	8.514	10.601	12.556	15.562	4.217
2007	0.421	2.292	2.617	3.146	3.776	4.634	6.958	8.142	11.376	12.503	14.439	3.661

Total Recreational Landings Mean Length (cm) at Age												
Year	1	2	3	4	5	6	7	8	9	10	11+	Average
1982	36.3	44.8	51.5	60.1	74.4	81.0	83.7	88.7	99.4	104.6	115.5	52.0
1983	34.5	42.8	50.2	57.9	67.4	85.4	80.6	91.6	99.2	118.0	121.0	50.4
1984	34.4	42.3	50.1	60.1	67.4	72.6	84.3	85.6	83.0	116.1	119.4	49.5
1985	35.0	42.0	48.9	59.9	65.5	68.7	72.0	77.0	99.4	104.6	115.5	47.2
1986	34.0	44.3	53.2	62.0	71.5	81.2	101.6	108.7	111.9	110.0	124.1	59.9
1987	25.9	41.8	50.4	62.9	75.2	90.0	99.4	99.6	102.8	101.0	115.5	51.3
1988	32.0	42.4	50.5	57.7	70.1	67.1	85.2	86.6	99.4	104.6	115.5	49.4
1989	40.0	46.6	52.7	61.9	68.3	84.3	91.8	95.0	99.4	104.6	115.5	54.8
1990	33.7	47.3	53.3	60.9	71.0	81.1	86.3	90.3	99.4	104.6	115.5	57.2
1991	33.7	50.6	51.6	56.9	61.6	93.2	98.0	90.3	98.0	71.0	115.5	55.8
1992	33.7	54.9	58.1	64.6	66.7	75.6	89.7	62.0	99.4	104.6	115.5	64.6
1993	33.7	45.2	53.3	55.8	61.8	69.0	98.0	90.3	99.4	104.6	115.5	53.7
1994	23.6	49.3	52.9	58.1	57.4	70.9	93.4	93.0	95.0	104.6	115.5	54.2
1995	36.0	52.1	53.1	55.9	65.5	54.6	86.3	83.0	99.4	104.6	115.5	54.1
1996	38.0	52.3	55.0	56.4	60.0	89.9	107.0	107.0	107.0	104.6	115.5	56.0
1997	33.7	54.5	57.0	60.1	60.0	62.8	85.0	86.0	99.4	104.6	115.5	58.8
1998	35.0	54.2	58.4	61.7	66.9	65.3	67.2	86.0	99.4	104.6	115.5	60.3
1999	33.0	47.9	56.4	65.0	75.6	81.5	84.9	94.0	99.4	104.6	115.5	63.6
2000	33.7	52.1	56.1	62.3	68.2	76.3	67.1	77.0	99.4	104.6	115.5	59.1
2001	33.7	54.1	59.2	64.0	73.6	82.6	83.2	84.0	87.8	104.6	115.5	62.1
2002	33.7	51.1	59.2	66.1	69.6	79.0	83.6	108.7	101.2	101.0	115.5	69.2
2003	33.7	58.0	60.6	64.0	68.5	76.9	90.4	95.1	102.4	107.0	108.9	70.0
2004	33.7	51.6	58.5	62.9	63.9	69.2	78.7	97.0	105.2	108.4	109.9	63.8
2005	33.7	51.6	57.0	61.8	70.4	72.1	81.8	89.9	99.9	108.5	112.1	64.7
2006	33.7	57.2	60.6	66.6	68.9	76.1	79.3	90.4	98.7	105.0	113.4	70.9
2007	33.7	60.1	62.6	66.4	70.0	74.7	85.7	90.5	102.2	105.9	111.1	68.8

Year	Total Catch in Numbers (000's) at Age											Total
	1	2	3	4	5	6	7	8	Revised LAA 1994+			
									9	10	11+	
1982	71.4	1980.9	2420.3	1422.1	747.1	77.1	97.7	65.6	41.0	4.0	33.0	6960.1
1983	11.3	1324.4	2917.6	1189.0	687.2	452.6	50.0	65.4	25.2	11.8	19.4	6754.0
1984	24.7	801.5	1581.5	1636.5	470.1	207.6	78.4	19.3	15.0	11.6	18.4	4864.9
1985	44.3	1064.5	2187.8	1137.1	667.5	133.2	78.5	32.1	4.0	11.0	11.0	5371.0
1986	12.8	186.0	2756.8	929.6	277.0	199.9	45.7	30.2	35.6	8.0	59.5	4541.1
1987	96.3	889.6	1321.0	1505.8	346.4	91.5	83.7	13.9	13.6	10.3	3.0	4375.0
1988	2.4	549.1	2128.0	1117.1	428.8	49.3	11.2	17.9	1.0	2.0	1.0	4308.0
1989	3.8	519.5	2280.6	1715.7	488.0	92.8	41.2	6.4	3.0	5.0	7.0	5163.0
1990	0.0	253.6	4125.6	2455.9	523.3	176.6	27.0	30.0	10.0	15.0	17.0	7634.0
1991	0.0	438.5	1341.1	4910.7	930.6	158.8	46.8	30.0	7.9	1.3	1.0	7866.6
1992	0.0	338.3	587.1	531.9	2188.4	219.1	65.3	7.4	12.0	3.0	0.0	3952.5
1993	0.0	127.8	2031.8	783.0	139.4	473.8	29.2	6.0	2.0	0.0	0.0	3592.0
1994	0.9	54.0	1488.2	1216.6	330.9	71.0	85.7	29.5	6.7	0.6	1.2	3285.3
1995	18.1	277.0	1169.9	1192.0	232.5	28.6	13.9	18.4	0.8	1.6	0.2	2953.2
1996	0.0	90.0	630.7	1936.7	384.3	36.9	4.5	0.5	1.3	0.0	0.0	3085.0
1997	0.0	85.4	495.2	455.5	852.4	71.4	5.0	2.6	0.3	0.7	0.1	1968.6
1998	0.0	107.5	482.4	594.8	158.7	191.4	26.2	3.9	0.4	1.1	0.4	1566.7
1999	1.2	22.1	647.2	568.0	272.6	58.0	79.2	7.9	0.0	4.4	0.0	1660.7
2000	0.0	201.1	534.0	828.3	190.3	98.9	16.1	7.1	0.0	0.0	0.0	1875.8
2001	0.0	147.2	1183.5	685.5	378.0	109.1	59.8	8.9	13.3	1.2	0.5	2587.1
2002	0.0	3.0	259.5	884.3	346.0	203.5	81.0	35.5	9.5	9.4	0.6	1832.4
2003	0.0	16.4	118.6	442.9	766.1	231.4	103.3	39.9	21.7	9.9	7.4	1757.5
2004	0.0	0.9	357.8	249.9	409.6	266.0	74.6	36.9	19.3	11.3	3.5	1429.8
2005	0.0	7.5	134.1	813.8	95.2	265.3	120.9	32.5	19.2	8.1	8.3	1504.9
2006	0.0	1.6	177.4	281.3	449.3	32.5	97.2	48.0	18.2	10.8	8.8	1124.9
2007	0.0	7.9	154.8	907.5	140.4	253.8	8.5	23.3	12.6	6.7	7.5	1523.3

Total Catch in Weight (Tons) at Age												
Year	1	2	3	4	5	6	7	8	9	10	11+	Total
1982	46.0	2201.2	3918.4	3836.2	3524.6	507.1	853.8	640.4	531.0	41.0	613.0	16712.7
1983	5.1	1406.6	4697.6	2901.4	2578.0	2726.9	288.7	679.9	250.6	151.8	350.8	16037.4
1984	12.5	817.8	2551.7	4415.8	1720.6	1206.0	633.0	188.0	193.3	162.9	275.9	12187.3
1985	20.6	1058.9	3503.3	3155.7	2927.2	722.6	616.9	363.7	51.0	141.0	152.0	12712.9
1986	5.1	208.7	4952.0	2682.8	1261.2	1203.5	371.5	327.1	482.7	109.0	1164.8	12768.4
1987	19.8	846.6	2042.5	4714.2	1666.2	654.9	796.9	139.7	180.0	134.7	40.0	11235.5
1988	0.8	529.1	3697.5	2656.3	2185.6	318.3	99.9	197.6	11.0	36.0	14.0	9746.0
1989	2.6	622.7	3928.2	5034.1	1875.8	399.7	371.9	70.7	43.0	87.0	163.0	12668.7
1990	0.0	274.4	6954.4	5648.2	2191.4	1307.9	290.0	354.0	153.0	214.0	350.0	17737.3
1991	0.0	518.2	2067.6	11946.7	3727.6	1178.3	453.8	369.0	111.3	33.0	17.0	20422.5
1992	0.0	525.8	1144.9	1458.3	6741.3	1093.5	619.8	89.0	161.0	49.0	0.0	11883.6
1993	0.0	152.0	3700.4	1877.6	588.9	2889.5	292.3	79.0	27.0	0.0	0.0	9606.6
1994	0.1	74.7	2690.0	3603.4	1107.2	446.1	615.4	307.9	69.6	10.7	25.8	8950.9
1995	5.0	392.0	2102.4	3172.9	1174.5	159.5	150.0	211.5	15.5	31.2	5.0	7419.3
1996	0.0	138.9	1351.8	4474.6	1339.8	271.3	46.4	7.4	19.8	0.0	0.0	7650.1
1997	0.0	151.5	1097.5	1387.3	2662.5	342.1	42.4	29.7	4.3	11.7	2.1	5731.3
1998	0.0	147.6	999.7	1692.7	656.2	808.3	135.8	43.7	6.9	16.4	7.4	4514.7
1999	0.4	29.6	1187.7	1457.0	1047.8	335.1	570.6	78.0	0.0	58.6	0.0	4769.2
2000	0.0	325.4	1219.7	2835.7	843.7	564.7	96.7	60.1	0.0	0.0	0.0	5939.0
2001	0.0	260.3	2825.3	2189.5	1788.6	687.0	434.5	74.5	115.3	15.0	11.7	8400.2
2002	0.0	4.1	637.8	2891.3	1392.9	1198.0	542.8	408.5	96.7	100.3	8.9	7285.6
2003	0.0	31.7	285.7	1354.5	3062.8	1223.8	776.7	349.1	235.5	121.3	97.4	7537.3
2004	0.0	1.3	837.4	805.6	1493.6	1398.9	514.1	347.1	227.5	146.6	46.0	5817.0
2005	0.0	11.8	276.1	2305.7	410.0	1196.1	754.4	255.0	199.9	108.7	118.9	5635.9
2006	0.0	3.6	430.1	917.2	1685.5	157.2	535.7	365.6	175.4	131.0	137.1	4536.1
2007	0.0	16.1	391.1	2924.0	551.3	1217.0	54.4	165.1	127.4	78.5	108.1	5627.8

Total
Catch
Mean
Weight
(kg) at
Age

Year	1	2	3	4	5	6	7	8	9	10	11+	Average
1982	0.644	1.111	1.619	2.698	4.718	6.577	8.740	9.763	12.951	10.250	18.576	2.401
1983	0.446	1.062	1.610	2.440	3.751	6.025	5.775	10.391	9.951	12.855	18.125	2.375
1984	0.506	1.020	1.613	2.698	3.660	5.808	8.070	9.741	12.845	13.987	14.962	2.505
1985	0.466	0.995	1.601	2.775	4.385	5.424	7.859	11.312	12.750	12.818	13.818	2.367
1986	0.399	1.122	1.796	2.886	4.554	6.020	8.120	10.845	13.572	13.640	19.578	2.812
1987	0.206	0.952	1.546	3.131	4.811	7.161	9.521	10.053	13.195	13.132	13.333	2.568
1988	0.318	0.964	1.738	2.378	5.097	6.450	8.919	11.022	11.000	18.000	14.000	2.262
1989	0.680	1.199	1.722	2.934	3.844	4.309	9.018	11.034	14.333	17.400	23.286	2.454
1990	0.416	1.082	1.686	2.300	4.187	7.407	10.741	11.800	15.300	14.267	20.588	2.323
1991	0.416	1.182	1.542	2.433	4.006	7.421	9.689	12.300	14.003	25.672	17.000	2.596
1992	0.416	1.554	1.950	2.741	3.080	4.991	9.489	12.027	13.417	16.333	17.576	3.007
1993	0.416	1.189	1.821	2.398	4.225	6.099	10.022	13.167	13.500	14.785	17.576	2.674
1994	0.132	1.383	1.808	2.962	3.347	6.280	7.185	10.448	10.331	18.542	20.637	2.725
1995	0.274	1.415	1.797	2.662	5.051	5.578	10.760	11.492	18.893	20.064	20.347	2.512
1996	0.588	1.543	2.143	2.310	3.486	7.353	10.426	13.912	14.724	14.785	17.576	2.480
1997	0.416	1.774	2.216	3.046	3.124	4.791	8.405	11.547	14.726	15.814	21.874	2.911
1998	0.417	1.373	2.072	2.846	4.135	4.224	5.177	11.313	18.893	14.953	20.347	2.882
1999	0.334	1.341	1.835	2.565	3.843	5.773	7.201	9.915	12.870	13.402	17.576	2.872
2000	0.416	1.619	2.284	3.423	4.432	5.707	6.013	8.521	12.870	14.785	17.576	3.166
2001	0.416	1.768	2.387	3.194	4.732	6.296	7.266	8.351	8.643	12.414	24.418	3.247
2002	0.416	1.357	2.458	3.269	4.026	5.886	6.702	11.514	10.174	10.662	14.333	3.976
2003	0.416	1.929	2.409	3.058	3.998	5.289	7.522	8.760	10.834	12.269	13.074	4.289
2004	0.416	1.474	2.340	3.224	3.647	5.259	6.889	9.396	11.775	12.944	13.260	4.068
2005	0.416	1.574	2.058	2.833	4.307	4.509	6.239	7.835	10.440	13.428	14.382	3.745
2006	0.416	2.303	2.425	3.261	3.751	4.845	5.514	7.610	9.654	12.162	15.664	4.033
2007	0.416	2.027	2.526	3.222	3.927	4.794	6.362	7.075	10.106	11.721	14.314	3.695

Total

Catch
Mean
Length
(cm) at
Age

Year	1	2	3	4	5	6	7	8	9	10	11+
1982	39.2	47.2	53.0	62.8	76.4	85.6	93.9	97.3	107.4	101.0	120.7
1983	34.5	46.6	53.1	61.0	70.6	82.6	80.5	98.3	97.6	104.3	119.2
1984	35.2	45.7	53.2	63.1	69.5	81.2	91.1	96.5	106.8	110.0	112.6
1985	35.0	45.0	53.0	64.0	74.4	79.8	90.7	101.8	103.1	108.2	109.7
1986	34.0	47.0	55.3	64.6	75.0	82.4	91.6	100.7	108.4	108.7	123.0
1987	26.3	43.9	52.2	66.5	76.6	87.5	96.0	99.0	106.7	109.3	111.3
1988	32.0	44.6	54.5	60.6	78.2	83.9	96.0	101.5	113.0	114.8	125.0
1989	40.0	48.7	54.6	65.1	71.2	77.7	95.2	102.9	112.6	120.4	126.8
1990	33.6	47.5	54.5	60.1	73.2	89.0	100.9	104.0	111.8	112.6	124.6
1991	33.6	48.3	52.3	61.0	71.7	89.1	97.3	105.0	109.6	118.9	128.0
1992	33.6	53.2	56.7	63.1	65.7	76.9	96.9	103.7	109.1	117.0	119.3
1993	33.6	48.4	55.9	60.6	73.3	83.2	98.6	110.0	119.1	110.9	119.3
1994	23.6	51.0	55.6	65.1	67.4	83.0	86.9	98.3	99.9	121.2	125.5
1995	30.4	50.8	55.4	62.6	78.1	76.5	101.1	102.6	122.0	124.4	125.0
1996	38.0	52.7	58.8	60.0	68.2	88.6	100.1	110.2	112.1	110.9	119.3
1997	33.6	55.3	59.5	65.6	65.9	75.6	92.3	102.9	112.1	115.0	128.0
1998	35.0	51.1	58.2	64.1	72.6	72.6	75.5	101.6	122.0	113.0	125.0
1999	33.0	49.8	55.9	62.3	70.1	79.1	87.1	98.6	107.2	109.0	119.3
2000	33.6	53.7	59.5	68.3	74.6	81.6	82.1	93.6	107.2	110.9	119.3
2001	33.6	54.9	60.7	66.6	76.4	84.2	88.3	92.1	93.6	106.2	132.4
2002	33.6	51.3	61.3	67.5	71.9	82.1	85.4	101.3	98.6	99.9	110.0
2003	33.6	57.0	61.1	65.8	71.7	78.7	88.9	93.4	100.3	104.7	107.4
2004	33.6	52.5	60.5	67.2	69.6	78.4	86.1	96.3	103.9	107.4	107.5
2005	33.6	52.5	57.8	64.3	73.9	74.9	83.0	89.8	99.4	108.2	110.5
2006	33.6	60.7	61.5	67.6	70.6	76.3	79.6	87.9	95.9	104.0	113.7
2007	33.6	58.3	62.4	67.6	71.7	76.6	84.1	86.8	98.2	103.6	110.3

Appendix 2. Full VPA Model Output (Terminal Year 2007) for the Gulf of Maine stock of Atlantic cod.

VPA Version 2.7.1

Model ID: GoM Cod 2008 VPA Update GARMIII TY2007 11+

Input File:

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\GMCOD2008_GARM III

Date of Run: 17-JUL-2008

Time of Run: 13:23

Levenburg-Marquardt Algorithm Completed 21 Iterations
Residual Sum of Squares = 279.707

Number of Residuals = 508
Number of Parameters = 9
Degrees of Freedom = 499
Mean Squared Residual = 0.560535
Standard Deviation = 0.748689

Number of Years = 26
Number of Ages = 11
First Year = 1982
Youngest Age = 1
Oldest True Age = 10

Number of Survey Indices Available = 25
Number of Survey Indices Used in Estimate = 23

VPA Classic Method - Auto Estimated Q's

Stock Numbers Predicted in Terminal Year Plus One (2008)

Age	Stock Predicted	Std. Error	CV
2	3936.752	0.173583E+04	0.440929E+00
3	16020.398	0.499998E+04	0.312101E+00
4	3542.738	0.930299E+03	0.262593E+00
5	3970.448	0.103469E+04	0.260597E+00
6	201.340	0.776978E+02	0.385903E+00
7	251.280	0.110401E+03	0.439357E+00
8	29.920	0.163265E+02	0.545679E+00
9	46.873	0.324104E+02	0.691456E+00
10	71.277	0.516470E+02	0.724592E+00

Catchability Values for Each Survey Used in Estimate

INDEX	Catchability	Std. Error	CV
1	0.639060E-04	0.988283E-05	0.154646E+00
2	0.131940E-03	0.141520E-04	0.107261E+00
3	0.225008E-03	0.228294E-04	0.101460E+00
4	0.293998E-03	0.386906E-04	0.131602E+00

5	0.382779E-03	0.641901E-04	0.167695E+00
6	0.566609E-03	0.109588E-03	0.193411E+00
7	0.511812E-03	0.139644E-03	0.272843E+00
8	0.533836E-04	0.687041E-05	0.128699E+00
9	0.113582E-03	0.128656E-04	0.113272E+00
10	0.223833E-03	0.225992E-04	0.100965E+00
11	0.370258E-03	0.463840E-04	0.125275E+00
12	0.478237E-03	0.565335E-04	0.118212E+00
13	0.451154E-03	0.836411E-04	0.185394E+00
14	0.566767E-03	0.129170E-03	0.227906E+00
15	0.710558E-03	0.107424E-03	0.151183E+00
16	0.544643E-03	0.474923E-04	0.871988E-01
17	0.453706E-03	0.562280E-04	0.123930E+00
19	0.122958E-03	0.367937E-04	0.299238E+00
21	0.245830E-05	0.690050E-06	0.280702E+00
22	0.140563E-04	0.164576E-05	0.117084E+00
23	0.231650E-04	0.128111E-05	0.553035E-01
24	0.229116E-04	0.123947E-05	0.540979E-01
25	0.218712E-04	0.246650E-05	0.112774E+00

-- Non-Linear Least Squares Fit --

Default Tolerances Used

Scaled Gradient Tolerance = 6.055454E-06
Scaled Step Tolerance = 3.666853E-11
Relative Function Tolerance = 3.666853E-11
Absolute Function Tolerance = 4.930381E-32

VPA Method Options

- Catchability Values Estimated as an Analytic Function of N
- Pope Approximation Used in Cohort Solution
- Plus Group Backward Calculation Method Used
- Rivard Weights Used for JAN-1 Biomass
- Rivard Weights Used for SSB Biomass
- Rivard Weights Calculation Used 3 Years for Terminal Year Plus One

- Heincke Rule Used in F-Oldest Calculation
- F-Oldest Calculation in Years Prior to Terminal Year
Uses Stock Sizes in Ages 5 to 9
- Calculation of Population of Age 1 In Year 2008
= Set to Zero

Stock Estimates

Age 2
Age 3
Age 4
Age 5
Age 6
Age 7
Age 8
Age 9
Age 10

Full F in Terminal Year = 0.6492
F in Oldest True Age in Terminal Year = 0.4888

Full F Calculated Using Classic Method

Age	Input Partial Recruitment	Calc Partial Recruitment	Fishing Mortality	Used In Full F	Comments
1	0.000	0.000	0.0000	NO	Stock Estimate in T+1
2	0.002	0.001	0.0004	NO	Stock Estimate in T+1
3	0.162	0.060	0.0388	NO	Stock Estimate in T+1
4	0.682	0.290	0.1880	NO	Stock Estimate in T+1
5	0.900	0.754	0.4892	NO	Stock Estimate in T+1
6	1.000	1.000	0.6492	YES	Stock Estimate in T+1
7	0.826	0.352	0.2288	NO	Stock Estimate in T+1
8	0.733	0.572	0.3714	NO	Stock Estimate in T+1
9	0.772	0.229	0.1484	NO	Stock Estimate in T+1
10	0.753	0.753	0.4888		Input PR * Full F

Catch At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	71.4	11.3	24.7	44.3	12.8
2	1980.9	1324.4	801.5	1064.5	186.0
3	2420.3	2917.6	1581.5	2187.8	2756.8
4	1422.1	1189.0	1636.5	1137.1	929.6
5	747.1	687.2	470.1	667.5	277.0
6	77.1	452.6	207.6	133.2	199.9
7	97.7	50.0	78.4	78.5	45.7
8	65.6	65.4	19.3	32.1	30.2
9	41.0	25.2	15.0	4.0	35.6
10	4.0	11.8	11.6	11.0	8.0
11	33.0	19.4	18.4	11.0	59.5
AGE	1987	1988	1989	1990	1991
1	96.3	2.4	3.8	0.0	0.0
2	889.6	549.1	519.5	253.6	438.5
3	1321.0	2128.0	2280.6	4125.6	1341.1
4	1505.8	1117.1	1715.7	2455.9	4910.7
5	346.4	428.8	488.0	523.3	930.6
6	91.5	49.3	92.8	176.6	158.8
7	83.7	11.2	41.2	27.0	46.8
8	13.9	17.9	6.4	30.0	30.0
9	13.6	1.0	3.0	10.0	7.9
10	10.3	2.0	5.0	15.0	1.3
11	3.0	1.0	7.0	17.0	1.0
AGE	1992	1993	1994	1995	1996
1	0.0	0.0	0.9	18.1	0.0
2	338.3	127.8	54.0	277.0	90.0
3	587.1	2031.8	1488.2	1169.9	630.7
4	531.9	783.0	1216.6	1192.0	1936.7
5	2188.4	139.4	330.9	232.5	384.3
6	219.1	473.8	71.0	28.6	36.9
7	65.3	29.2	85.7	13.9	4.5
8	7.4	6.0	29.5	18.4	0.5
9	12.0	2.0	6.7	0.8	1.3
10	3.0	0.0	0.6	1.6	0.0
11	0.0	0.0	1.2	0.2	0.0

Catch At Age - Input Data

AGE	1997	1998	1999	2000	2001
1	0.0	0.0	1.2	0.0	0.0
2	85.4	107.5	22.1	201.1	147.2
3	495.2	482.4	647.2	534.0	1183.5
4	455.5	594.8	568.0	828.3	685.5
5	852.4	158.7	272.6	190.3	378.0
6	71.4	191.4	58.0	98.9	109.1
7	5.0	26.2	79.2	16.1	59.8
8	2.6	3.9	7.9	7.1	8.9
9	0.3	0.4	0.0	0.0	13.3
10	0.7	1.1	4.4	0.0	1.2
11	0.1	0.4	0.0	0.0	0.5
AGE	2002	2003	2004	2005	2006
1	0.0	0.0	0.0	0.0	0.0
2	3.0	16.4	0.9	7.5	1.6
3	259.5	118.6	357.8	134.1	177.4
4	884.3	442.9	249.9	813.8	281.3
5	346.0	766.1	409.6	95.2	449.3
6	203.5	231.4	266.0	265.3	32.5
7	81.0	103.3	74.6	120.9	97.2
8	35.5	39.9	36.9	32.5	48.0
9	9.5	21.7	19.3	19.2	18.2
10	9.4	9.9	11.3	8.1	10.8
11	0.6	7.4	3.5	8.3	8.8
AGE	2007				
1	0.0				
2	7.9				
3	154.8				
4	907.5				
5	140.4				
6	253.8				
7	8.5				
8	23.3				
9	12.6				
10	6.7				
11	7.5				

Weight At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.6440	0.4460	0.5060	0.4660	0.3990
2	1.1110	1.0620	1.0200	0.9950	1.1220
3	1.6190	1.6100	1.6130	1.6010	1.7960
4	2.6980	2.4400	2.6980	2.7750	2.8860
5	4.7180	3.7510	3.6600	4.3850	4.5540
6	6.5770	6.0250	5.8080	5.4240	6.0200
7	8.7400	5.7750	8.0700	7.8590	8.1200
8	9.7630	10.3910	9.7410	11.3120	10.8450
9	12.9510	9.9510	12.8450	12.7500	13.5720
10	10.2500	12.8550	13.9870	12.8180	13.6400
11	18.5760	18.1250	14.9620	13.8180	19.5780
AGE	1987	1988	1989	1990	1991
1	0.2060	0.3180	0.6800	0.4160	0.4160
2	0.9520	0.9640	1.1990	1.0820	1.1820
3	1.5460	1.7380	1.7220	1.6860	1.5420
4	3.1310	2.3780	2.9340	2.3000	2.4330
5	4.8110	5.0970	3.8440	4.1870	4.0060
6	7.1610	6.4500	4.3090	7.4070	7.4210
7	9.5210	8.9190	9.0180	10.7410	9.6890
8	10.0530	11.0220	11.0340	11.8000	12.3000
9	13.1950	11.0000	14.3330	15.3000	14.0030
10	13.1320	18.0000	17.4000	14.2670	25.6720
11	13.3330	14.0000	23.2860	20.5880	17.0000
AGE	1992	1993	1994	1995	1996
1	0.4160	0.4160	0.1320	0.2740	0.5880
2	1.5540	1.1890	1.3830	1.4150	1.5430
3	1.9500	1.8210	1.8080	1.7970	2.1430
4	2.7410	2.3980	2.9620	2.6620	2.3100
5	3.0800	4.2250	3.3470	5.0510	3.4860
6	4.9910	6.0990	6.2800	5.5780	7.3530
7	9.4890	10.0220	7.1850	10.7600	10.4260
8	12.0270	13.1670	10.4480	11.4920	13.9120
9	13.4170	13.5000	10.3310	18.8930	14.7240
10	16.3330	14.7850	18.5420	20.0640	14.7850
11	17.5760	17.5760	20.6370	20.3470	17.5760

Weight At Age - Input Data

AGE	1997	1998	1999	2000	2001
1	0.4160	0.4170	0.3340	0.4160	0.4160
2	1.7740	1.3730	1.3410	1.6190	1.7680
3	2.2160	2.0720	1.8350	2.2840	2.3870
4	3.0460	2.8460	2.5650	3.4230	3.1940
5	3.1240	4.1350	3.8430	4.4320	4.7320
6	4.7910	4.2240	5.7730	5.7070	6.2960
7	8.4050	5.1770	7.2010	6.0130	7.2660
8	11.5470	11.3130	9.9150	8.5210	8.3510
9	14.7260	18.8930	12.8700	12.8700	8.6430
10	15.8140	14.9530	13.4020	14.7850	12.4140
11	21.8740	20.3470	17.5760	17.5760	24.4180
AGE	2002	2003	2004	2005	2006
1	0.4160	0.4160	0.4160	0.4160	0.4160
2	1.3570	1.9290	1.4740	1.5740	2.3030
3	2.4580	2.4090	2.3400	2.0580	2.4250
4	3.2690	3.0580	3.2240	2.8330	3.2610
5	4.0260	3.9980	3.6470	4.3070	3.7510
6	5.8860	5.2890	5.2590	4.5090	4.8450
7	6.7020	7.5220	6.8890	6.2390	5.5140
8	11.5140	8.7600	9.3960	7.8350	7.6100
9	10.1740	10.8340	11.7750	10.4400	9.6540
10	10.6620	12.2690	12.9440	13.4280	12.1620
11	14.3330	13.0740	13.2600	14.3820	15.6640
AGE	2007				
1	0.4160				
2	2.0270				
3	2.5260				
4	3.2220				
5	3.9270				
6	4.7940				
7	6.3620				
8	7.0750				
9	10.1060				
10	11.7210				
11	14.3140				

JAN-1 Weights at Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.5015	0.2949	0.3608	0.3003	0.2583
2	0.9229	0.8270	0.6745	0.7096	0.7231
3	1.3188	1.3374	1.3088	1.2779	1.3368
4	2.2882	1.9876	2.0842	2.1157	2.1495
5	4.1750	3.1812	2.9884	3.4396	3.5549
6	7.0188	5.3316	4.6675	4.4555	5.1379
7	8.0156	6.1630	6.9729	6.7561	6.6365
8	9.6703	9.5298	7.5003	9.5545	9.2321
9	12.9993	9.8566	11.5530	11.1444	12.3906
10	11.5216	12.9029	11.7977	12.8315	13.1875
11	18.5760	18.1250	14.9620	13.8180	19.5780
AGE	1987	1988	1989	1990	1991
1	0.0952	0.1638	0.5391	0.2468	0.2152
2	0.6163	0.4456	0.6175	0.8578	0.7012
3	1.3170	1.2863	1.2884	1.4218	1.2917
4	2.3713	1.9174	2.2582	1.9901	2.0253
5	3.7262	3.9948	3.0234	3.5049	3.0354
6	5.7106	5.5705	4.6865	5.3360	5.5742
7	7.5708	7.9918	7.6267	6.8032	8.4715
8	9.0350	10.2441	9.9203	10.3156	11.4941
9	11.9624	10.5159	12.5689	12.9931	12.8544
10	13.3502	15.4114	13.8347	14.3000	19.8187
11	13.3330	14.0000	23.2860	20.5880	17.0000
AGE	1992	1993	1994	1995	1996
1	0.2461	0.2282	0.0403	0.1155	0.3385
2	0.8040	0.7033	0.7585	0.4322	0.6502
3	1.5182	1.6822	1.4662	1.5765	1.7414
4	2.0559	2.1624	2.3225	2.1938	2.0374
5	2.7375	3.4030	2.8330	3.8680	3.0463
6	4.4715	4.3342	5.1510	4.3208	6.0943
7	8.3915	7.0725	6.6198	8.2203	7.6260
8	10.7949	11.1777	10.2328	9.0868	12.2349
9	12.8464	12.7422	11.6631	14.0497	13.0080
10	15.1232	14.0844	15.8214	14.3973	16.7133
11	17.5760	17.5760	20.6370	20.3470	17.5760

JAN-1 Weights at Age - Input Data

AGE	1997	1998	1999	2000	2001
1	0.2290	0.2325	0.1517	0.2018	0.2303
2	1.0213	0.7558	0.7478	0.7354	0.8576
3	1.8491	1.9172	1.5873	1.7501	1.9658
4	2.5549	2.5113	2.3054	2.5062	2.7009
5	2.6863	3.5490	3.3071	3.3717	4.0246
6	4.0867	3.6326	4.8858	4.6832	5.2824
7	7.8614	4.9803	5.5152	5.8918	6.4395
8	10.9722	9.7512	7.1645	7.8332	7.0862
9	14.3132	14.7702	12.0664	11.2963	8.5818
10	15.2593	14.8391	15.9124	13.7943	12.6399
11	21.8740	20.3470	17.5760	17.5760	24.4180
AGE	2002	2003	2004	2005	2006
1	0.1932	0.2210	0.2139	0.1768	0.1885
2	0.7513	0.8958	0.7831	0.8092	0.9788
3	2.0846	1.8080	2.1246	1.7417	1.9537
4	2.7934	2.7416	2.7869	2.5747	2.5906
5	3.5860	3.6152	3.3395	3.7264	3.2598
6	5.2776	4.6145	4.5854	4.0552	4.5681
7	6.4958	6.6539	6.0362	5.7281	4.9862
8	9.1466	7.6622	8.4069	7.3468	6.8905
9	9.2175	11.1688	10.1562	9.9043	8.6971
10	9.5996	11.1725	11.8421	12.5744	11.2682
11	14.3330	13.0740	13.2600	14.3820	15.6640
AGE	2007	2008			
1	0.1885	0.1846			
2	0.9183	0.9021			
3	2.4119	2.0358			
4	2.7952	2.6535			
5	3.5785	3.5216			
6	4.2406	4.2879			
7	5.5519	5.4221			
8	6.2459	6.8277			
9	8.7696	9.1237			
10	10.6374	11.4933			
11	14.3140	14.7867			

SSB Weight At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.5015	0.2949	0.3608	0.3003	0.2583
2	0.9229	0.8270	0.6745	0.7096	0.7231
3	1.3188	1.3374	1.3088	1.2779	1.3368
4	2.2882	1.9876	2.0842	2.1157	2.1495
5	4.1750	3.1812	2.9884	3.4396	3.5549
6	7.0188	5.3316	4.6675	4.4555	5.1379
7	8.0156	6.1630	6.9729	6.7561	6.6365
8	9.6703	9.5298	7.5003	9.5545	9.2321
9	12.9993	9.8566	11.5530	11.1444	12.3906
10	11.5216	12.9029	11.7977	12.8315	13.1875
11	18.5760	18.1250	14.9620	13.8180	19.5780
AGE	1987	1988	1989	1990	1991
1	0.0952	0.1638	0.5391	0.2468	0.2152
2	0.6163	0.4456	0.6175	0.8578	0.7012
3	1.3170	1.2863	1.2884	1.4218	1.2917
4	2.3713	1.9174	2.2582	1.9901	2.0253
5	3.7262	3.9948	3.0234	3.5049	3.0354
6	5.7106	5.5705	4.6865	5.3360	5.5742
7	7.5708	7.9918	7.6267	6.8032	8.4715
8	9.0350	10.2441	9.9203	10.3156	11.4941
9	11.9624	10.5159	12.5689	12.9931	12.8544
10	13.3502	15.4114	13.8347	14.3000	19.8187
11	13.3330	14.0000	23.2860	20.5880	17.0000
AGE	1992	1993	1994	1995	1996
1	0.2461	0.2282	0.0403	0.1155	0.3385
2	0.8040	0.7033	0.7585	0.4322	0.6502
3	1.5182	1.6822	1.4662	1.5765	1.7414
4	2.0559	2.1624	2.3225	2.1938	2.0374
5	2.7375	3.4030	2.8330	3.8680	3.0463
6	4.4715	4.3342	5.1510	4.3208	6.0943
7	8.3915	7.0725	6.6198	8.2203	7.6260
8	10.7949	11.1777	10.2328	9.0868	12.2349
9	12.8464	12.7422	11.6631	14.0497	13.0080
10	15.1232	14.0844	15.8214	14.3973	16.7133
11	17.5760	17.5760	20.6370	20.3470	17.5760

SSB Weight At Age - Input Data

AGE	1997	1998	1999	2000	2001
1	0.2290	0.2325	0.1517	0.2018	0.2303
2	1.0213	0.7558	0.7478	0.7354	0.8576
3	1.8491	1.9172	1.5873	1.7501	1.9658
4	2.5549	2.5113	2.3054	2.5062	2.7009
5	2.6863	3.5490	3.3071	3.3717	4.0246
6	4.0867	3.6326	4.8858	4.6832	5.2824
7	7.8614	4.9803	5.5152	5.8918	6.4395
8	10.9722	9.7512	7.1645	7.8332	7.0862
9	14.3132	14.7702	12.0664	11.2963	8.5818
10	15.2593	14.8391	15.9124	13.7943	12.6399
11	21.8740	20.3470	17.5760	17.5760	24.4180
AGE	2002	2003	2004	2005	2006
1	0.1932	0.2210	0.2139	0.1768	0.1885
2	0.7513	0.8958	0.7831	0.8092	0.9788
3	2.0846	1.8080	2.1246	1.7417	1.9537
4	2.7934	2.7416	2.7869	2.5747	2.5906
5	3.5860	3.6152	3.3395	3.7264	3.2598
6	5.2776	4.6145	4.5854	4.0552	4.5681
7	6.4958	6.6539	6.0362	5.7281	4.9862
8	9.1466	7.6622	8.4069	7.3468	6.8905
9	9.2175	11.1688	10.1562	9.9043	8.6971
10	9.5996	11.1725	11.8421	12.5744	11.2682
11	14.3330	13.0740	13.2600	14.3820	15.6640
AGE	2007				
1	0.1885				
2	0.9183				
3	2.4119				
4	2.7952				
5	3.5785				
6	4.2406				
7	5.5519				
8	6.2459				
9	8.7696				
10	10.6374				
11	14.3140				

Natural Mortality - Input Data

AGE	1982	1983	1984	1985	1986
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
8	0.2000	0.2000	0.2000	0.2000	0.2000
9	0.2000	0.2000	0.2000	0.2000	0.2000
10	0.2000	0.2000	0.2000	0.2000	0.2000
11	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	1987	1988	1989	1990	1991
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
8	0.2000	0.2000	0.2000	0.2000	0.2000
9	0.2000	0.2000	0.2000	0.2000	0.2000
10	0.2000	0.2000	0.2000	0.2000	0.2000
11	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	1992	1993	1994	1995	1996
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
8	0.2000	0.2000	0.2000	0.2000	0.2000
9	0.2000	0.2000	0.2000	0.2000	0.2000
10	0.2000	0.2000	0.2000	0.2000	0.2000
11	0.2000	0.2000	0.2000	0.2000	0.2000

Natural Mortality - Input Data

AGE	1997	1998	1999	2000	2001
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
8	0.2000	0.2000	0.2000	0.2000	0.2000
9	0.2000	0.2000	0.2000	0.2000	0.2000
10	0.2000	0.2000	0.2000	0.2000	0.2000
11	0.2000	0.2000	0.2000	0.2000	0.2000

AGE	2002	2003	2004	2005	2006
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
8	0.2000	0.2000	0.2000	0.2000	0.2000
9	0.2000	0.2000	0.2000	0.2000	0.2000
10	0.2000	0.2000	0.2000	0.2000	0.2000
11	0.2000	0.2000	0.2000	0.2000	0.2000

AGE	2007
1	0.2000
2	0.2000
3	0.2000
4	0.2000
5	0.2000
6	0.2000
7	0.2000
8	0.2000
9	0.2000
10	0.2000
11	0.2000

Proportion of Natural Mortality Before Spawning = 0.1667
 Proportion of Fishing Mortality Before Spawning = 0.1667

Maturity - Input Data

AGE	1982	1983	1984	1985	1986
1	0.1100	0.0700	0.0100	0.0100	0.0700
2	0.3200	0.2600	0.2100	0.3600	0.5900
3	0.6400	0.6100	0.8500	0.9600	0.9700
4	0.8700	0.8800	0.9900	1.0000	1.0000
5	0.9600	0.9700	1.0000	1.0000	1.0000
6	0.9900	0.9900	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	1987	1988	1989	1990	1991
1	0.0300	0.0400	0.0700	0.3000	0.1000
2	0.3900	0.4200	0.3500	0.5100	0.2600
3	0.9300	0.9200	0.8100	0.7200	0.5300
4	1.0000	0.9900	0.9700	0.8600	0.7900
5	1.0000	1.0000	1.0000	0.9400	0.9200
6	1.0000	1.0000	1.0000	0.9700	0.9700
7	1.0000	1.0000	1.0000	0.9900	0.9900
8	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	1992	1993	1994	1995	1996
1	0.0600	0.0600	0.0100	0.0000	0.0300
2	0.1900	0.2200	0.1900	0.1500	0.3300
3	0.4700	0.5700	0.8200	0.9300	0.9000
4	0.7800	0.8700	0.9900	1.0000	0.9900
5	0.9300	0.9700	1.0000	1.0000	1.0000
6	0.9800	0.9900	1.0000	1.0000	1.0000
7	0.9900	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000

Maturity - Input Data

AGE	1997	1998	1999	2000	2001
1	0.0100	0.0600	0.0900	0.1400	0.0900
2	0.1600	0.3600	0.3400	0.3900	0.2800
3	0.7900	0.8200	0.7200	0.7100	0.6100
4	0.9900	0.9700	0.9300	0.9100	0.8600
5	1.0000	1.0000	0.9800	0.9700	0.9600
6	1.0000	1.0000	1.0000	0.9900	0.9900
7	1.0000	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	2002	2003	2004	2005	2006
1	0.1900	0.1500	0.1300	0.0300	0.1200
2	0.4100	0.3800	0.3000	0.1100	0.3200
3	0.6800	0.6700	0.5500	0.3400	0.6300
4	0.8600	0.8700	0.7700	0.6900	0.8600
5	0.9500	0.9600	0.9000	0.9000	0.9600
6	0.9800	0.9900	0.9600	0.9800	0.9900
7	0.9900	1.0000	0.9900	0.9900	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000
9	1.0000	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000	1.0000
11	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	2007				
1	0.0800				
2	0.3400				
3	0.7600				
4	0.9500				
5	0.9900				
6	1.0000				
7	1.0000				
8	1.0000				
9	1.0000				
10	1.0000				
11	1.0000				

Input Partial Recruitment

AGE

1	0.0000
2	0.0021
3	0.1618
4	0.6821
5	0.9004
6	1.0000
7	0.8264
8	0.7333
9	0.7720
10	0.7530

Input F-Plus Ratio

YEAR

1982	1.0000
1983	1.0000
1984	1.0000
1985	1.0000
1986	1.0000
1987	1.0000
1988	1.0000
1989	1.0000
1990	1.0000
1991	1.0000
1992	1.0000
1993	1.0000
1994	1.0000
1995	1.0000
1996	1.0000
1997	1.0000
1998	1.0000
1999	1.0000
2000	1.0000
2001	1.0000
2002	1.0000
2003	1.0000
2004	1.0000
2005	1.0000
2006	1.0000
2007	1.0000

SURVEY - INPUT DATA

INDEX	1	2	3	4	5
SURVEY TAG	WHSpr	WHSpr	WHSpr	WHSpr	WHSpr
AGE	2	3	4	5	6
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1982	1.0065	0.4764	0.6554	0.9877	0.0873
1983	0.9486	0.9968	0.4647	0.4042	0.2118
1984	1.3120	1.0226	0.8233	0.2118	0.0467
1985	0.2308	0.6617	0.6625	0.6617	0.1031
1986	0.2478	0.7540	0.2369	0.0912	0.0349
1987	0.4602	0.1991	0.2307	0.0744	0.0000
1988	0.9234	0.8229	0.2179	0.2535	0.0915
1989	0.6048	0.7230	0.6001	0.0908	0.0627
1990	0.2076	1.3654	0.6370	0.1020	0.0321
1991	0.0678	0.2339	1.7167	0.2993	0.0200
1992	0.2255	0.2424	0.2819	1.3281	0.2264
1993	0.4965	0.7993	0.3343	0.0906	0.4842
1994	0.3156	0.3875	0.2150	0.0942	0.0493
1995	0.1792	1.1161	0.3717	0.1454	0.0283
1996	0.0215	0.5927	1.3307	0.4032	0.0593
1997	0.1316	0.3991	0.2643	0.8756	0.2424
1998	0.2236	0.3301	0.5166	0.1415	0.4210
1999	0.3443	0.7133	0.3445	0.3150	0.1337
2000	0.7247	0.4385	0.4570	0.1071	0.1006
2001	0.3234	0.7161	0.4972	0.3539	0.0635
2002	0.0453	0.5244	1.6012	0.6142	0.3619
2003	0.8305	0.0630	0.7077	1.0889	0.3946
2004	0.0446	0.2213	0.1181	0.1908	0.2316
2005	0.7265	0.1014	0.6076	0.0154	0.1498
2006	0.2300	0.4300	0.0600	0.2000	0.0200
2007	3.4500	2.9300	4.4800	0.5000	0.8400
2008	1.0986	3.2112	1.3566	0.9393	0.0584

SURVEY - INPUT DATA

INDEX	6	7	8	9	10
SURVEY TAG	WHSpr	WHSpr	WHAut	WHAut	WHAut
AGE	7	8	2	3	4
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1982	0.1120	0.0000	0.6179	0.4188	0.5394
1983	0.0680	0.0160	0.8426	3.3527	2.2748
1984	0.1000	0.0000	0.3168	0.9155	0.8277
1985	0.0910	0.0520	0.4323	0.4258	0.6307
1986	0.0380	0.0000	0.5256	0.9567	0.6094
1987	0.0660	0.0080	0.3920	0.4010	0.6565
1988	0.0650	0.0000	0.5782	1.3796	0.5921
1989	0.0140	0.0000	1.9375	2.3134	0.9896
1990	0.0180	0.0000	0.1495	2.4065	1.5017
1991	0.0180	0.0000	0.0447	0.1868	1.8293
1992	0.0690	0.0000	0.1435	0.1390	0.2233
1993	0.0550	0.0230	0.2910	0.4458	0.1400
1994	0.1270	0.0270	0.1977	0.5678	0.3602
1995	0.0000	0.0110	0.2071	0.8831	0.8260
1996	0.0000	0.0000	0.0680	0.2845	1.2284
1997	0.1200	0.0000	0.1242	0.3826	0.1883
1998	0.0230	0.0370	0.2968	0.0855	0.1769
1999	0.2730	0.0000	0.0966	0.3203	0.1147
2000	0.0240	0.0220	0.4307	0.3672	0.5857
2001	0.0980	0.0550	0.5326	0.9837	0.3936
2002	0.1640	0.0570	0.0340	0.1410	0.7524
2003	0.3210	0.1030	0.2691	0.0805	0.3637
2004	0.0140	0.0140	0.4546	0.1976	0.1848
2005	0.1297	0.0142	0.5700	0.1700	0.5400
2006	0.1314	0.0729	0.1533	0.3806	0.0796
2007	0.0652	0.0384	1.2514	0.5802	1.0331
2008	0.0806	0.0000	0.1456	0.8310	0.3840

SURVEY - INPUT DATA

INDEX	11	12	13	14	15
SURVEY TAG	WHAut	WHAut	WHAut	WHAut	MASpr
AGE	5	6	7	8	2
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1982	0.4047	0.1205	0.0760	0.0290	7.1700
1983	1.0892	0.2092	0.0000	0.0000	14.6100
1984	0.1970	0.2270	0.2100	0.0000	5.1500
1985	0.3871	0.2140	0.1630	0.0790	2.7700
1986	0.2482	0.1820	0.0750	0.0000	11.6800
1987	0.3417	0.0727	0.0410	0.0000	4.7100
1988	0.2429	0.0751	0.0000	0.0000	6.3500
1989	0.4434	0.0990	0.0650	0.0330	20.5100
1990	0.2926	0.1605	0.0330	0.0000	5.4500
1991	0.5978	0.2589	0.0520	0.0100	2.6900
1992	0.6334	0.0811	0.0000	0.0230	5.1300
1993	0.0355	0.3498	0.1040	0.0080	6.1100
1994	0.0336	0.0000	0.0300	0.0000	4.0700
1995	0.0854	0.0511	0.0000	0.0450	1.9200
1996	0.3252	0.0821	0.0110	0.0000	0.5200
1997	0.5421	0.0616	0.0000	0.0000	0.9800
1998	0.1728	0.1402	0.0000	0.0000	0.8300
1999	0.1923	0.0387	0.0310	0.0000	2.3900
2000	0.2433	0.1320	0.0160	0.0060	7.0200
2001	0.5071	0.1343	0.0100	0.0000	4.5000
2002	0.4690	0.3368	0.1220	0.0840	0.2600
2003	2.7972	1.0958	0.6270	0.0510	12.7000
2004	0.5287	0.4498	0.0730	0.0770	1.5600
2005	0.2400	0.2500	0.1680	0.0680	7.1500
2006	0.4495	0.0221	0.0923	0.0824	3.6700
2007	0.2475	0.2857	0.0339	0.0496	3.3600
2008	0.5283	0.0226	0.0690	0.0000	0.0000

SURVEY - INPUT DATA

INDEX	16	17	18	19	20
SURVEY TAG	MASpr	MASpr	MAAut	MAAut	MAAut
AGE	3	4	1	2	3
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1982	2.4100	0.8700	1.4500	6.2000	1.2500
1983	2.8600	1.5000	4.5900	1.1400	0.3100
1984	2.0700	0.7000	1.2700	0.2800	0.1000
1985	2.2700	0.4500	10.3000	0.1600	0.0700
1986	1.2300	0.6800	2.6500	0.1900	0.0200
1987	2.9600	0.2200	1.8000	0.5500	0.3700
1988	2.4500	1.4500	311.7200	1.4000	0.0200
1989	8.7600	1.0600	5.5300	3.1000	0.2400
1990	14.7500	2.3100	3.9400	0.0200	0.1000
1991	1.5700	3.6600	7.8100	4.2200	0.3100
1992	3.6700	0.7500	5.0400	2.0000	0.3600
1993	2.5500	0.9000	26.4200	0.9900	0.0400
1994	1.7500	0.4900	49.4300	1.5300	0.3600
1995	2.7600	0.7800	40.0100	5.3600	3.4500
1996	1.0800	1.4900	2.9300	0.8000	0.4100
1997	0.9300	0.1700	6.9000	0.0800	0.0100
1998	0.7000	0.7500	1.4300	0.0300	0.0000
1999	2.3100	0.7800	3.2700	0.6400	0.3200
2000	2.8900	2.2000	7.3300	0.5900	0.0700
2001	4.9700	3.5200	0.0500	0.4000	0.1700
2002	1.2300	1.4100	49.1900	0.0100	0.1300
2003	0.2800	1.4300	0.9600	1.0900	0.1300
2004	2.5800	0.4600	120.1700	1.6000	0.1400
2005	0.5700	2.0700	44.6700	9.9400	0.9200
2006	3.3800	0.5400	39.4700	0.6100	0.2400
2007	1.8400	1.7500	2.0800	4.3500	0.4200
2008	0.0000	0.0000	7.6100	0.1600	0.1300

SURVEY - INPUT DATA

INDEX	21	22	23	24	25
SURVEY TAG	CM_CPE	CM_CPE	CM_CPE	CM_CPE	CM_CPE
AGE	2	3	4	5	6
TIME	MEAN	MEAN	MEAN	MEAN	MEAN
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	0	0	0	0	0
1982	0.0743	0.0738	0.0450	0.0217	0.0027
1983	0.0477	0.1099	0.0422	0.0209	0.0123
1984	0.0331	0.0448	0.0442	0.0118	0.0055
1985	0.0137	0.0423	0.0289	0.0179	0.0036
1986	0.0041	0.0688	0.0226	0.0066	0.0043
1987	0.0074	0.0186	0.0260	0.0057	0.0018
1988	0.0146	0.0492	0.0242	0.0093	0.0015
1989	0.0170	0.0637	0.0397	0.0106	0.0023
1990	0.0110	0.1595	0.0782	0.0122	0.0051
1991	0.0194	0.0404	0.1355	0.0217	0.0039
1992	0.0149	0.0173	0.0138	0.0515	0.0052
1993	0.0027	0.0500	0.0232	0.0041	0.0140
1994	0.0000	0.0000	0.0000	0.0000	0.0000
1995	0.0000	0.0000	0.0000	0.0000	0.0000
1996	0.0000	0.0000	0.0000	0.0000	0.0000
1997	0.0000	0.0000	0.0000	0.0000	0.0000
1998	0.0000	0.0000	0.0000	0.0000	0.0000
1999	0.0000	0.0000	0.0000	0.0000	0.0000
2000	0.0000	0.0000	0.0000	0.0000	0.0000
2001	0.0000	0.0000	0.0000	0.0000	0.0000
2002	0.0000	0.0000	0.0000	0.0000	0.0000
2003	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.0000

Additional Output Files

Population File

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\G

Auxilliary File

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\G

Covariance File

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\G

Residuals File

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\G

Log File

C:\ALLWORK\ASSESS\GARMIIIAUG2008WG\ASSMT_MTG\GOMCOD\VPA\FINALS\G

Estimation Results

JAN-1 Population Numbers

AGE	1982	1983	1984	1985	1986
1	7857.	7929.	10674.	6679.	10260.
2	11123.	6368.	6481.	8717.	5428.
3	5520.	7314.	4015.	4581.	6174.
4	3128.	2329.	3348.	1856.	1771.
5	1767.	1274.	831.	1261.	491.
6	226.	771.	421.	255.	428.
7	260.	116.	222.	157.	88.
8	140.	124.	49.	111.	58.
9	71.	55.	42.	23.	62.
10	10.	21.	22.	21.	15.
11	79.	35.	36.	21.	113.
=====					
Total	30180.	26336.	26143.	23683.	24888.
=====					
AGE	1987	1988	1989	1990	1991
1	12744.	24612.	4254.	4135.	6975.
2	8388.	10347.	20148.	3480.	3386.
3	4276.	6063.	7974.	16026.	2620.
4	2560.	2306.	3038.	4465.	9388.
5	609.	734.	877.	935.	1434.
6	151.	185.	213.	276.	292.
7	170.	41.	107.	90.	66.
8	31.	63.	24.	50.	49.
9	20.	13.	35.	14.	14.
10	18.	4.	10.	26.	2.
11	5.	2.	13.	30.	2.
=====					
Total	28973.	44369.	36694.	29528.	24228.
=====					
AGE	1992	1993	1994	1995	1996
1	6340.	9123.	3180.	3805.	3545.
2	5711.	5191.	7469.	2603.	3099.
3	2375.	4369.	4134.	6066.	1880.
4	931.	1414.	1739.	2038.	3908.
5	3243.	281.	449.	323.	590.
6	332.	675.	104.	68.	54.
7	96.	73.	124.	21.	30.
8	12.	19.	34.	24.	5.
9	13.	3.	10.	1.	3.
10	4.	0.	1.	2.	0.
11	0.	0.	2.	0.	0.
=====					
Total	19057.	21148.	17245.	14951.	13113.

JAN-1 Population Numbers

AGE	1997	1998	1999	2000	2001
1	5245.	4458.	7847.	4016.	1187.
2	2902.	4294.	3650.	6424.	3288.
3	2455.	2299.	3419.	2969.	5077.
4	969.	1562.	1446.	2213.	1947.
5	1447.	381.	741.	670.	1063.
6	135.	414.	168.	360.	376.
7	11.	46.	166.	85.	205.
8	20.	4.	14.	64.	55.
9	3.	14.	0.	4.	46.
10	1.	2.	11.	0.	4.
11	0.	1.	0.	0.	2.
=====					
Total	13190.	13477.	17462.	16805.	13250.
AGE	2002	2003	2004	2005	2006
1	4953.	1681.	10966.	6713.	23910.
2	972.	4055.	1377.	8979.	5496.
3	2559.	793.	3305.	1126.	7344.
4	3086.	1860.	542.	2382.	801.
5	974.	1726.	1122.	218.	1214.
6	528.	484.	720.	548.	92.
7	209.	248.	187.	349.	209.
8	114.	98.	110.	86.	176.
9	37.	61.	44.	56.	41.
10	25.	22.	30.	19.	29.
11	2.	16.	9.	19.	23.
=====					
Total	13459.	11046.	18414.	20495.	39336.
AGE	2007	2008			
1	4808.	0.			
2	19576.	3937.			
3	4498.	16020.			
4	5852.	3543.			
5	401.	3970.			
6	587.	201.			
7	46.	251.			
8	83.	30.			
9	101.	47.			
10	17.	71.			
11	21.	19.			
=====					
Total	35992.	28090.			

Fishing Mortality Calculated

AGE	1982	1983	1984	1985	1986
1	0.0101	0.0016	0.0026	0.0074	0.0014
2	0.2192	0.2612	0.1470	0.1450	0.0386
3	0.6628	0.5814	0.5714	0.7503	0.6802
4	0.6981	0.8305	0.7769	1.1299	0.8676
5	0.6295	0.9064	0.9811	0.8800	0.9766
6	0.4723	1.0461	0.7862	0.8605	0.7259
7	0.5377	0.6505	0.4954	0.8028	0.8481
8	0.7294	0.8727	0.5657	0.3866	0.8646
9	1.0140	0.7010	0.4948	0.2139	1.0200
10	0.6088	0.9342	0.8265	0.8317	0.8523
11	0.6088	0.9342	0.8265	0.8317	0.8523
AGE	1987	1988	1989	1990	1991
1	0.0084	0.0001	0.0010	0.0000	0.0000
2	0.1247	0.0604	0.0289	0.0840	0.1545
3	0.4177	0.4909	0.3799	0.3348	0.8343
4	1.0499	0.7667	0.9783	0.9361	0.8630
5	0.9906	1.0384	0.9547	0.9634	1.2635
6	1.1023	0.3485	0.6584	1.2250	0.9179
7	0.7884	0.3576	0.5545	0.4021	1.5057
8	0.6852	0.3761	0.3568	1.0760	1.1140
9	1.4099	0.0904	0.0981	1.7050	0.9720
10	0.9568	0.7939	0.8422	0.9642	1.2033
11	0.9568	0.7939	0.8422	0.9642	1.2033
AGE	1992	1993	1994	1995	1996
1	0.0000	0.0000	0.0003	0.0053	0.0000
2	0.0677	0.0276	0.0080	0.1251	0.0326
3	0.3191	0.7214	0.5072	0.2397	0.4631
4	0.9977	0.9473	1.4838	1.0395	0.7934
5	1.3696	0.7941	1.6866	1.5888	1.2721
6	1.3085	1.4954	1.4035	0.6248	1.4090
7	1.4079	0.5791	1.4467	1.3241	0.1825
8	1.1311	0.4254	3.4380	1.9107	0.1292
9	8.8324	1.1807	1.2844	6.1427	0.6870
10	1.3641	1.1501	1.6321	1.3635	1.1851
11	1.3641	1.1501	1.6321	1.3635	1.1851

Fishing Mortality Calculated

AGE	1997	1998	1999	2000	2001
1	0.0000	0.0000	0.0002	0.0000	0.0000
2	0.0331	0.0281	0.0067	0.0352	0.0507
3	0.2522	0.2638	0.2347	0.2216	0.2979
4	0.7331	0.5461	0.5695	0.5337	0.4927
5	1.0524	0.6167	0.5220	0.3769	0.4994
6	0.8742	0.7161	0.4791	0.3620	0.3864
7	0.7168	0.9838	0.7526	0.2337	0.3888
8	0.1523	6.4333	0.9591	0.1311	0.1957
9	0.1066	0.0314	0.2164	0.0002	0.3866
10	1.0156	0.6873	0.5515	0.3465	0.4486
11	1.0156	0.6873	0.5515	0.3465	0.4486
AGE	2002	2003	2004	2005	2006
1	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0034	0.0045	0.0007	0.0009	0.0003
3	0.1189	0.1807	0.1274	0.1411	0.0271
4	0.3808	0.3053	0.7125	0.4741	0.4914
5	0.4985	0.6741	0.5164	0.6606	0.5260
6	0.5550	0.7507	0.5245	0.7653	0.4948
7	0.5582	0.6163	0.5806	0.4825	0.7225
8	0.4224	0.5975	0.4648	0.5426	0.3577
9	0.3310	0.4983	0.6597	0.4716	0.6789
10	0.5163	0.6793	0.5218	0.6406	0.5272
11	0.5163	0.6793	0.5218	0.6406	0.5272
AGE	2007				
1	0.0000				
2	0.0004				
3	0.0388				
4	0.1880				
5	0.4892				
6	0.6492				
7	0.2288				
8	0.3714				
9	0.1484				
10	0.4888				
11	0.4888				

Average Fishing Mortality For Ages 5- 7

Year Average F N Weighted Biomass Wtd Catch Wtd

1982	0.5465	0.6031	0.5896	0.6066
1983	0.8677	0.9426	0.9506	0.9488
1984	0.7543	0.8523	0.7919	0.8772
1985	0.8478	0.8698	0.8641	0.8702
1986	0.8502	0.8588	0.8383	0.8695
1987	0.9605	0.9719	0.9537	0.9778
1988	0.5815	0.8761	0.8204	0.9533
1989	0.7225	0.8662	0.8154	0.8839
1990	0.8635	0.9800	0.9711	1.0061
1991	1.2290	1.2161	1.1983	1.2252
1992	1.3620	1.3651	1.3643	1.3652
1993	0.9562	1.2385	1.2349	1.3016
1994	1.5123	1.5992	1.5540	1.6032
1995	1.1792	1.4161	1.3970	1.4752
1996	0.9545	1.2348	1.1860	1.2724
1997	0.8811	1.0350	1.0243	1.0369
1998	0.7722	0.6858	0.6925	0.6928
1999	0.5846	0.5508	0.5638	0.5605
2000	0.3242	0.3611	0.3550	0.3645
2001	0.4249	0.4598	0.4506	0.4648
2002	0.5373	0.5233	0.5298	0.5244
2003	0.6804	0.6834	0.6816	0.6848
2004	0.5405	0.5252	0.5285	0.5256
2005	0.6362	0.6564	0.6361	0.6736
2006	0.5811	0.5512	0.5613	0.5572
2007	0.4557	0.5685	0.5686	0.5845

Back Calculated Partial Recruitment

AGE	1982	1983	1984	1985	1986
1	0.0100	0.0015	0.0026	0.0065	0.0014
2	0.2162	0.2497	0.1498	0.1283	0.0378
3	0.6537	0.5557	0.5824	0.6641	0.6669
4	0.6884	0.7939	0.7918	1.0000	0.8506
5	0.6208	0.8665	1.0000	0.7789	0.9575
6	0.4658	1.0000	0.8013	0.7616	0.7116
7	0.5303	0.6218	0.5050	0.7105	0.8314
8	0.7194	0.8342	0.5766	0.3422	0.8477
9	1.0000	0.6700	0.5043	0.1893	1.0000
10	0.6004	0.8930	0.8424	0.7361	0.8356
11	0.6004	0.8930	0.8424	0.7361	0.8356
AGE	1987	1988	1989	1990	1991
1	0.0059	0.0001	0.0010	0.0000	0.0000
2	0.0884	0.0582	0.0296	0.0493	0.1026
3	0.2962	0.4727	0.3883	0.1964	0.5541
4	0.7446	0.7384	1.0000	0.5490	0.5731
5	0.7026	1.0000	0.9758	0.5650	0.8392
6	0.7818	0.3356	0.6730	0.7185	0.6096
7	0.5592	0.3444	0.5668	0.2358	1.0000
8	0.4860	0.3622	0.3647	0.6311	0.7399
9	1.0000	0.0871	0.1003	1.0000	0.6455
10	0.6786	0.7645	0.8608	0.5655	0.7992
11	0.6786	0.7645	0.8608	0.5655	0.7992
AGE	1992	1993	1994	1995	1996
1	0.0000	0.0000	0.0001	0.0009	0.0000
2	0.0077	0.0184	0.0023	0.0204	0.0232
3	0.0361	0.4824	0.1475	0.0390	0.3287
4	0.1130	0.6335	0.4316	0.1692	0.5631
5	0.1551	0.5310	0.4906	0.2587	0.9028
6	0.1481	1.0000	0.4082	0.1017	1.0000
7	0.1594	0.3872	0.4208	0.2156	0.1295
8	0.1281	0.2845	1.0000	0.3111	0.0917
9	1.0000	0.7896	0.3736	1.0000	0.4875
10	0.1544	0.7691	0.4747	0.2220	0.8411
11	0.1544	0.7691	0.4747	0.2220	0.8411

Back Calculated Partial Recruitment

AGE	1997	1998	1999	2000	2001
1	0.0000	0.0000	0.0002	0.0000	0.0000
2	0.0314	0.0044	0.0070	0.0660	0.1016
3	0.2396	0.0410	0.2448	0.4153	0.5965
4	0.6966	0.0849	0.5938	1.0000	0.9866
5	1.0000	0.0959	0.5442	0.7062	1.0000
6	0.8307	0.1113	0.4995	0.6782	0.7738
7	0.6812	0.1529	0.7847	0.4378	0.7784
8	0.1447	1.0000	1.0000	0.2457	0.3918
9	0.1013	0.0049	0.2256	0.0005	0.7741
10	0.9651	0.1068	0.5751	0.6493	0.8982
11	0.9651	0.1068	0.5751	0.6493	0.8982
AGE	2002	2003	2004	2005	2006
1	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0061	0.0060	0.0010	0.0012	0.0004
3	0.2129	0.2407	0.1788	0.1844	0.0374
4	0.6822	0.4067	1.0000	0.6195	0.6801
5	0.8931	0.8980	0.7248	0.8632	0.7280
6	0.9943	1.0000	0.7361	1.0000	0.6848
7	1.0000	0.8209	0.8148	0.6305	1.0000
8	0.7566	0.7959	0.6523	0.7090	0.4951
9	0.5929	0.6637	0.9258	0.6162	0.9396
10	0.9249	0.9049	0.7324	0.8370	0.7296
11	0.9249	0.9049	0.7324	0.8370	0.7296
AGE	2007				
1	0.0000				
2	0.0007				
3	0.0597				
4	0.2896				
5	0.7536				
6	1.0000				
7	0.3524				
8	0.5722				
9	0.2286				
10	0.7530				
11	0.7530				

JAN-1 Biomass

AGE	1982	1983	1984	1985	1986
1	3940.	2338.	3851.	2006.	2650.
2	10265.	5266.	4372.	6186.	3925.
3	7279.	9782.	5255.	5854.	8253.
4	7157.	4629.	6978.	3928.	3807.
5	7379.	4053.	2484.	4336.	1746.
6	1589.	4111.	1967.	1137.	2199.
7	2081.	712.	1546.	1062.	586.
8	1354.	1183.	370.	1057.	532.
9	924.	545.	491.	256.	762.
10	110.	273.	265.	272.	200.
11	1468.	629.	533.	293.	2210.
Total	43548.	33522.	28112.	26386.	26871.
AGE	1987	1988	1989	1990	1991
1	1213.	4031.	2294.	1021.	1501.
2	5170.	4611.	12442.	2985.	2374.
3	5631.	7799.	10274.	22786.	3384.
4	6071.	4421.	6861.	8887.	19014.
5	2269.	2931.	2651.	3278.	4352.
6	865.	1031.	997.	1475.	1629.
7	1284.	329.	816.	613.	563.
8	280.	647.	234.	519.	567.
9	238.	134.	446.	175.	181.
10	243.	61.	132.	377.	40.
11	71.	28.	312.	614.	26.
Total	23334.	26023.	37458.	42729.	33630.
AGE	1992	1993	1994	1995	1996
1	1560.	2082.	128.	439.	1200.
2	4591.	3651.	5665.	1125.	2015.
3	3606.	7350.	6061.	9564.	3274.
4	1914.	3057.	4039.	4471.	7962.
5	8877.	957.	1271.	1249.	1798.
6	1484.	2925.	536.	294.	329.
7	802.	519.	820.	172.	227.
8	130.	214.	345.	217.	56.
9	170.	41.	119.	12.	38.
10	66.	0.	13.	33.	0.
11	0.	0.	33.	6.	0.
Total	23202.	20795.	19031.	17583.	16899.

JAN-1 Biomass

AGE	1997	1998	1999	2000	2001
1	1201.	1037.	1190.	810.	273.
2	2964.	3246.	2730.	4724.	2820.
3	4540.	4408.	5426.	5195.	9981.
4	2475.	3923.	3333.	5547.	5259.
5	3888.	1352.	2450.	2258.	4277.
6	553.	1503.	823.	1686.	1987.
7	85.	230.	913.	503.	1321.
8	223.	42.	101.	500.	392.
9	47.	211.	0.	50.	393.
10	18.	36.	181.	0.	46.
11	4.	18.	0.	0.	37.
Total	15999.	16006.	17147.	21274.	26787.
AGE	2002	2003	2004	2005	2006
1	957.	372.	2346.	1187.	4507.
2	730.	3632.	1078.	7265.	5379.
3	5334.	1434.	7022.	1962.	14348.
4	8620.	5100.	1510.	6133.	2074.
5	3493.	6242.	3748.	811.	3957.
6	2787.	2235.	3303.	2223.	420.
7	1359.	1651.	1130.	1999.	1041.
8	1042.	751.	922.	630.	1215.
9	343.	683.	449.	559.	355.
10	245.	245.	360.	235.	325.
11	23.	214.	125.	276.	368.
Total	24934.	22558.	21993.	23280.	33992.
AGE	2007	2008			
1	906.	0.			
2	17977.	3551.			
3	10849.	32614.			
4	16359.	9401.			
5	1435.	13982.			
6	2491.	863.			
7	255.	1362.			
8	518.	204.			
9	886.	428.			
10	180.	819.			
11	304.	283.			
Total	52161.	63509.			

Mean Biomass

AGE	1982	1983	1984	1985	1986
1	4564.	3203.	4889.	2811.	3708.
2	10094.	5418.	5586.	7336.	5418.
3	5987.	8172.	4514.	4734.	7373.
4	5569.	3547.	5766.	2849.	3142.
5	5667.	2891.	1785.	3380.	1315.
6	1084.	2656.	1556.	853.	1681.
7	1605.	449.	1290.	780.	444.
8	890.	791.	336.	947.	385.
9	533.	363.	393.	240.	482.
10	67.	162.	196.	170.	128.
11	1007.	376.	333.	183.	1367.
Total	37067.	28028.	26644.	24281.	25443.
AGE	1987	1988	1989	1990	1991
1	2370.	7093.	2621.	1559.	2630.
2	6819.	8781.	21592.	3278.	3370.
3	4932.	7609.	10420.	20928.	2517.
4	4576.	3514.	5237.	6138.	14065.
5	1713.	2144.	1999.	2314.	3016.
6	606.	919.	615.	1091.	1306.
7	1026.	281.	677.	727.	309.
8	207.	529.	199.	335.	338.
9	130.	122.	440.	92.	116.
10	141.	45.	103.	222.	28.
11	42.	18.	194.	363.	14.
Total	22561.	31056.	44098.	37048.	27708.
AGE	1992	1993	1994	1995	1996
1	2390.	3440.	380.	942.	1889.
2	7786.	5520.	9326.	3144.	4266.
3	3613.	5199.	5358.	8820.	2946.
4	1488.	2016.	2491.	3110.	5723.
5	5039.	753.	675.	759.	1077.
6	855.	1982.	325.	258.	197.
7	451.	511.	436.	116.	258.
8	80.	187.	94.	114.	54.
9	20.	23.	55.	3.	28.
10	36.	0.	7.	24.	0.
11	0.	0.	15.	3.	0.
Total	21758.	19631.	19164.	17294.	16438.

Mean Biomass

AGE	1997	1998	1999	2000	2001
1	1978.	1685.	2375.	1514.	448.
2	4593.	5272.	4422.	9267.	5142.
3	4377.	3812.	5088.	5532.	9546.
4	1919.	3133.	2587.	5368.	4487.
5	2578.	1077.	2028.	2256.	3617.
6	398.	1144.	706.	1571.	1792.
7	59.	140.	768.	417.	1127.
8	198.	7.	83.	463.	382.
9	42.	241.	0.	52.	300.
10	11.	24.	107.	0.	33.
11	2.	12.	0.	0.	27.
=====					
Total	16154.	16548.	18164.	26440.	26901.
AGE	2002	2003	2004	2005	2006
1	1867.	634.	4135.	2531.	9015.
2	1193.	7074.	1838.	12803.	11470.
3	5386.	1589.	6595.	1964.	15933.
4	7652.	4466.	1146.	4910.	1885.
5	2822.	4602.	2922.	628.	3238.
6	2182.	1653.	2695.	1585.	321.
7	983.	1276.	895.	1578.	752.
8	976.	592.	753.	474.	1029.
9	294.	477.	349.	429.	262.
10	194.	179.	280.	170.	249.
11	17.	142.	89.	186.	261.
=====					
Total	23566.	22683.	21698.	27259.	44415.
AGE	2007				
1	1813.				
2	35957.				
3	10108.				
4	15629.				
5	1138.				
6	1898.				
7	238.				
8	447.				
9	862.				
10	144.				
11	220.				
=====					
Total	68452.				

Spawning Stock Biomass

AGE	1982	1983	1984	1985	1986
1	419.	158.	37.	19.	179.
2	3063.	1268.	866.	2102.	2226.
3	4035.	5238.	3928.	4797.	6913.
4	5361.	3431.	5870.	3147.	3186.
5	6169.	3270.	2040.	3621.	1435.
6	1406.	3307.	1669.	952.	1885.
7	1840.	618.	1377.	898.	492.
8	1160.	989.	326.	959.	446.
9	755.	469.	437.	239.	622.
10	96.	226.	223.	229.	168.
11	1283.	521.	449.	247.	1854.
Total	25587.	19494.	17223.	17211.	19406.
AGE	1987	1988	1989	1990	1991
1	35.	156.	155.	296.	145.
2	1910.	1854.	4192.	1452.	582.
3	4725.	6394.	7555.	15007.	1509.
4	4929.	3725.	5469.	6324.	12582.
5	1861.	2384.	2187.	2538.	3137.
6	696.	941.	864.	1128.	1311.
7	1089.	300.	719.	549.	420.
8	241.	587.	213.	420.	456.
9	182.	128.	424.	128.	148.
10	200.	52.	111.	310.	32.
11	58.	24.	262.	506.	21.
Total	15926.	16546.	22151.	28657.	20342.
AGE	1992	1993	1994	1995	1996
1	91.	121.	1.	0.	35.
2	834.	773.	1040.	160.	640.
3	1554.	3593.	4418.	8266.	2639.
4	1223.	2196.	3020.	3637.	6680.
5	6355.	786.	928.	927.	1406.
6	1131.	2183.	410.	256.	252.
7	607.	456.	623.	133.	213.
8	104.	193.	188.	153.	53.
9	38.	32.	93.	4.	32.
10	51.	0.	9.	26.	0.
11	0.	0.	24.	5.	0.
Total	11988.	10334.	10755.	13566.	11949.

Spawning Stock Biomass

AGE	1997	1998	1999	2000	2001
1	12.	60.	104.	110.	24.
2	456.	1125.	897.	1771.	757.
3	3326.	3345.	3634.	3438.	5603.
4	2098.	3361.	2727.	4467.	4030.
5	3155.	1180.	2129.	1990.	3654.
6	463.	1290.	735.	1519.	1784.
7	73.	189.	779.	468.	1198.
8	210.	14.	84.	473.	367.
9	45.	203.	0.	49.	357.
10	15.	31.	159.	0.	41.
11	3.	15.	0.	0.	33.
Total	9856.	10814.	11246.	14285.	17848.
AGE	2002	2003	2004	2005	2006
1	176.	54.	295.	34.	523.
2	289.	1334.	313.	773.	1665.
3	3440.	902.	3657.	630.	8704.
4	6729.	4079.	999.	3782.	1590.
5	2953.	5179.	2993.	632.	3366.
6	2408.	1889.	2810.	1855.	371.
7	1186.	1441.	982.	1767.	893.
8	939.	658.	826.	557.	1108.
9	314.	608.	389.	500.	307.
10	217.	211.	319.	204.	288.
11	21.	185.	111.	239.	326.
Total	18673.	16539.	13693.	10974.	19139.
AGE	2007				
1	70.				
2	5911.				
3	7924.				
4	14568.				
5	1267.				
6	2162.				
7	237.				
8	471.				
9	836.				
10	161.				
11	271.				
Total	33877.				

Catch Biomass

AGE	1982	1983	1984	1985	1986
1	46.	5.	12.	21.	5.
2	2201.	1407.	818.	1059.	209.
3	3918.	4697.	2551.	3503.	4951.
4	3837.	2901.	4415.	3155.	2683.
5	3525.	2578.	1721.	2927.	1261.
6	507.	2727.	1206.	722.	1203.
7	854.	289.	633.	617.	371.
8	640.	680.	188.	363.	328.
9	531.	251.	193.	51.	483.
10	41.	152.	162.	141.	109.
11	613.	352.	275.	152.	1165.
=====					
Total	16713.	16037.	12173.	12711.	12768.
AGE	1987	1988	1989	1990	1991
1	20.	1.	3.	0.	0.
2	847.	529.	623.	274.	518.
3	2042.	3698.	3927.	6956.	2068.
4	4715.	2656.	5034.	5649.	11948.
5	1667.	2186.	1876.	2191.	3728.
6	655.	318.	400.	1308.	1178.
7	797.	100.	372.	290.	453.
8	140.	197.	71.	354.	369.
9	179.	11.	43.	153.	111.
10	135.	36.	87.	214.	33.
11	40.	14.	163.	350.	17.
=====					
Total	11237.	9747.	12597.	17739.	20424.
AGE	1992	1993	1994	1995	1996
1	0.	0.	0.	5.	0.
2	526.	152.	75.	392.	139.
3	1145.	3700.	2691.	2102.	1352.
4	1458.	1878.	3604.	3173.	4474.
5	6740.	589.	1108.	1174.	1340.
6	1094.	2890.	446.	160.	271.
7	620.	293.	616.	150.	47.
8	89.	79.	308.	211.	7.
9	161.	27.	69.	15.	19.
10	49.	0.	11.	32.	0.
11	0.	0.	25.	4.	0.
=====					
Total	11881.	9607.	8952.	7419.	7648.

Catch Biomass

AGE	1997	1998	1999	2000	2001
1	0.	0.	0.	0.	0.
2	151.	148.	30.	326.	260.
3	1097.	1000.	1188.	1220.	2825.
4	1387.	1693.	1457.	2835.	2189.
5	2663.	656.	1048.	843.	1789.
6	342.	808.	335.	564.	687.
7	42.	136.	570.	97.	435.
8	30.	44.	78.	60.	74.
9	4.	8.	0.	0.	115.
10	11.	16.	59.	0.	15.
11	2.	8.	0.	0.	12.
=====					
Total	5731.	4517.	4765.	5946.	8401.
AGE	2002	2003	2004	2005	2006
1	0.	0.	0.	0.	0.
2	4.	32.	1.	12.	4.
3	638.	286.	837.	276.	430.
4	2891.	1354.	806.	2305.	917.
5	1393.	3063.	1494.	410.	1685.
6	1198.	1224.	1399.	1196.	157.
7	543.	777.	514.	754.	536.
8	409.	350.	347.	255.	365.
9	97.	235.	227.	200.	176.
10	100.	121.	146.	109.	131.
11	9.	97.	46.	119.	138.
=====					
Total	7281.	7538.	5818.	5637.	4540.
AGE	2007				
1	0.				
2	16.				
3	391.				
4	2924.				
5	551.				
6	1217.				
7	54.				
8	165.				
9	127.				
10	79.				
11	107.				
=====					
Total	5631.				

Catch Numbers

AGE	1982	1983	1984	1985	1986
1	71.4	11.3	24.7	44.3	12.8
2	1980.9	1324.4	801.5	1064.5	186.0
3	2420.3	2917.6	1581.5	2187.8	2756.8
4	1422.1	1189.0	1636.5	1137.1	929.6
5	747.1	687.2	470.1	667.5	277.0
6	77.1	452.6	207.6	133.2	199.9
7	97.7	50.0	78.4	78.5	45.7
8	65.6	65.4	19.3	32.1	30.2
9	41.0	25.2	15.0	4.0	35.6
10	4.0	11.8	11.6	11.0	8.0
11	33.0	19.4	18.4	11.0	59.5
=====					
Total	6960.2	6753.9	4864.6	5371.0	4541.1
AGE	1987	1988	1989	1990	1991
1	96.3	2.4	3.8	0.0	0.0
2	889.6	549.1	519.5	253.6	438.5
3	1321.0	2128.0	2280.6	4125.6	1341.1
4	1505.8	1117.1	1715.7	2455.9	4910.7
5	346.4	428.8	488.0	523.3	930.6
6	91.5	49.3	92.8	176.6	158.8
7	83.7	11.2	41.2	27.0	46.8
8	13.9	17.9	6.4	30.0	30.0
9	13.6	1.0	3.0	10.0	7.9
10	10.3	2.0	5.0	15.0	1.3
11	3.0	1.0	7.0	17.0	1.0
=====					
Total	4375.1	4307.8	5163.0	7634.0	7866.7
AGE	1992	1993	1994	1995	1996
1	0.0	0.0	0.9	18.1	0.0
2	338.3	127.8	54.0	277.0	90.0
3	587.1	2031.8	1488.2	1169.9	630.7
4	531.9	783.0	1216.6	1192.0	1936.7
5	2188.4	139.4	330.9	232.5	384.3
6	219.1	473.8	71.0	28.6	36.9
7	65.3	29.2	85.7	13.9	4.5
8	7.4	6.0	29.5	18.4	0.5
9	12.0	2.0	6.7	0.8	1.3
10	3.0	0.0	0.6	1.6	0.0
11	0.0	0.0	1.2	0.2	0.0
=====					
Total	3952.5	3593.0	3285.3	2953.0	3084.9

Catch Numbers

AGE	1997	1998	1999	2000	2001
1	0.0	0.0	1.2	0.0	0.0
2	85.4	107.5	22.1	201.1	147.2
3	495.2	482.4	647.2	534.0	1183.5
4	455.5	594.8	568.0	828.3	685.5
5	852.4	158.7	272.6	190.3	378.0
6	71.4	191.4	58.0	98.9	109.1
7	5.0	26.2	79.2	16.1	59.8
8	2.6	3.9	7.9	7.1	8.9
9	0.3	0.4	0.0	0.0	13.3
10	0.7	1.1	4.4	0.0	1.2
11	0.1	0.4	0.0	0.0	0.5
=====					
Total	1968.6	1566.8	1660.6	1875.8	2587.0
AGE	2002	2003	2004	2005	2006
1	0.0	0.0	0.0	0.0	0.0
2	3.0	16.4	0.9	7.5	1.6
3	259.5	118.6	357.8	134.1	177.4
4	884.3	442.9	249.9	813.8	281.3
5	346.0	766.1	409.6	95.2	449.3
6	203.5	231.4	266.0	265.3	32.5
7	81.0	103.3	74.6	120.9	97.2
8	35.5	39.9	36.9	32.5	48.0
9	9.5	21.7	19.3	19.2	18.2
10	9.4	9.9	11.3	8.1	10.8
11	0.6	7.4	3.5	8.3	8.8
=====					
Total	1832.3	1757.6	1429.8	1504.9	1125.1
AGE	2007				
1	0.0				
2	7.9				
3	154.8				
4	907.5				
5	140.4				
6	253.8				
7	8.5				
8	23.3				
9	12.6				
10	6.7				
11	7.5				
=====					
Total	1523.0				

Surplus Production

Average Adjustment Factor (Delta) = 1.0000

Year	Biomass	Delta Biomass	Catch Biomass	Surplus Production
1982	43548.026	-10025.750	16713.307	6687.557
1983	33522.276	-5409.948	16037.051	10627.104
1984	28112.328	-1726.717	12173.486	10446.769
1985	26385.612	485.726	12711.449	13197.175
1986	26871.338	-3537.308	12768.471	9231.163
1987	23334.030	2688.560	11236.780	13925.340
1988	26022.590	11435.443	9746.789	21182.231
1989	37458.032	5271.009	12597.429	17868.438
1990	42729.041	-9098.808	17738.869	8640.060
1991	33630.233	-10428.550	20423.898	9995.348
1992	23201.683	-2406.842	11880.954	9474.111
1993	20794.841	-1764.240	9606.844	7842.605
1994	19030.601	-1447.956	8951.516	7503.559
1995	17582.645	-683.721	7418.520	6734.799
1996	16898.923	-899.757	7648.280	6748.523
1997	15999.167	6.556	5731.013	5737.569
1998	16005.723	1141.654	4516.532	5658.186
1999	17147.377	4126.627	4764.652	8891.279
2000	21274.004	5513.172	5945.694	11458.866
2001	26787.176	-1853.416	8401.230	6547.813
2002	24933.760	-2375.296	7280.581	4905.285
2003	22558.464	-565.860	7538.329	6972.469
2004	21992.604	1287.872	5817.528	7105.401
2005	23280.477	10711.086	5637.061	16348.146
2006	33991.562	18168.941	4540.123	22709.064
2007	52160.503	11348.568	5631.217	16979.785
2008	63509.071			

Summary of Survey Indices Used in the Estimate

INDEX	Survey Tag	Age	Time	Type	Catchability	Std. Error	CV
1	WHSpr	2	JAN-1	NUMBER	0.6391E-04	0.9883E-05	0.1546E+00
2	WHSpr	3	JAN-1	NUMBER	0.1319E-03	0.1415E-04	0.1073E+00
3	WHSpr	4	JAN-1	NUMBER	0.2250E-03	0.2283E-04	0.1015E+00
4	WHSpr	5	JAN-1	NUMBER	0.2940E-03	0.3869E-04	0.1316E+00
5	WHSpr	6	JAN-1	NUMBER	0.3828E-03	0.6419E-04	0.1677E+00
6	WHSpr	7	JAN-1	NUMBER	0.5666E-03	0.1096E-03	0.1934E+00
7	WHSpr	8	JAN-1	NUMBER	0.5118E-03	0.1396E-03	0.2728E+00
8	WHAut	2	JAN-1	NUMBER	0.5338E-04	0.6870E-05	0.1287E+00
9	WHAut	3	JAN-1	NUMBER	0.1136E-03	0.1287E-04	0.1133E+00
10	WHAut	4	JAN-1	NUMBER	0.2238E-03	0.2260E-04	0.1010E+00
11	WHAut	5	JAN-1	NUMBER	0.3703E-03	0.4638E-04	0.1253E+00
12	WHAut	6	JAN-1	NUMBER	0.4782E-03	0.5653E-04	0.1182E+00
13	WHAut	7	JAN-1	NUMBER	0.4512E-03	0.8364E-04	0.1854E+00
14	WHAut	8	JAN-1	NUMBER	0.5668E-03	0.1292E-03	0.2279E+00
15	MASpr	2	JAN-1	NUMBER	0.7106E-03	0.1074E-03	0.1512E+00
16	MASpr	3	JAN-1	NUMBER	0.5446E-03	0.4749E-04	0.8720E-01
17	MASpr	4	JAN-1	NUMBER	0.4537E-03	0.5623E-04	0.1239E+00
19	MAAut	2	JAN-1	NUMBER	0.1230E-03	0.3679E-04	0.2992E+00
21	CM_CPE	2	MEAN	NUMBER	0.2458E-05	0.6900E-06	0.2807E+00
22	CM_CPE	3	MEAN	NUMBER	0.1406E-04	0.1646E-05	0.1171E+00
23	CM_CPE	4	MEAN	NUMBER	0.2317E-04	0.1281E-05	0.5530E-01
24	CM_CPE	5	MEAN	NUMBER	0.2291E-04	0.1239E-05	0.5410E-01
25	CM_CPE	6	MEAN	NUMBER	0.2187E-04	0.2466E-05	0.1128E+00

Survey Index: 1 Tag: WHSpr AGE = 2
 Time = JAN-1 Type = NUMBER
 Catchability = 0.639060E-04 % Variance Contribution = 6.0022
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.100650E+01	0.710799E+00	0.347845E+00
1983	0.948600E+00	0.406955E+00	0.846285E+00
1984	0.131200E+01	0.414194E+00	0.115297E+01
1985	0.230800E+00	0.557076E+00	-0.881151E+00
1986	0.247800E+00	0.346899E+00	-0.336413E+00
1987	0.460200E+00	0.536073E+00	-0.152610E+00
1988	0.923400E+00	0.661229E+00	0.333963E+00
1989	0.604800E+00	0.128761E+01	-0.755643E+00
1990	0.207600E+00	0.222378E+00	-0.687655E-01
1991	0.678000E-01	0.216374E+00	-0.116045E+01
1992	0.225500E+00	0.364946E+00	-0.481430E+00
1993	0.496500E+00	0.331710E+00	0.403323E+00
1994	0.315600E+00	0.477323E+00	-0.413717E+00
1995	0.179200E+00	0.166337E+00	0.744872E-01
1996	0.215000E-01	0.198014E+00	-0.222029E+01
1997	0.131600E+00	0.185482E+00	-0.343192E+00
1998	0.223600E+00	0.274436E+00	-0.204860E+00
1999	0.344300E+00	0.233272E+00	0.389310E+00
2000	0.724700E+00	0.410507E+00	0.568365E+00
2001	0.323400E+00	0.210131E+00	0.431157E+00
2002	0.453000E-01	0.621130E-01	-0.315648E+00
2003	0.830500E+00	0.259133E+00	0.116469E+01
2004	0.446000E-01	0.879742E-01	-0.679310E+00
2005	0.726500E+00	0.573787E+00	0.235981E+00
2006	0.230000E+00	0.351219E+00	-0.423332E+00
2007	0.345000E+01	0.125103E+01	0.101441E+01
2008	0.109860E+01	0.251582E+00	0.147402E+01

Survey Index: 2 Tag: WHSpr AGE = 3
 Time = JAN-1 Type = NUMBER
 Catchability = 0.131940E-03 % Variance Contribution = 2.8875
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.476400E+00	0.728272E+00	-0.424417E+00
1983	0.996800E+00	0.965009E+00	0.324129E-01
1984	0.102260E+01	0.529782E+00	0.657637E+00
1985	0.661700E+00	0.604445E+00	0.905019E-01
1986	0.754000E+00	0.814568E+00	-0.772658E-01
1987	0.199100E+00	0.564175E+00	-0.104156E+01
1988	0.822900E+00	0.799946E+00	0.282904E-01
1989	0.723000E+00	0.105215E+01	-0.375184E+00
1990	0.136540E+01	0.211448E+01	-0.437363E+00

1991	0.233900E+00	0.345620E+00	-0.390447E+00
1992	0.242400E+00	0.313398E+00	-0.256884E+00
1993	0.799300E+00	0.576498E+00	0.326764E+00
1994	0.387500E+00	0.545448E+00	-0.341891E+00
1995	0.111610E+01	0.800395E+00	0.332491E+00
1996	0.592700E+00	0.248098E+00	0.870866E+00
1997	0.399100E+00	0.323968E+00	0.208567E+00
1998	0.330100E+00	0.303334E+00	0.845609E-01
1999	0.713300E+00	0.451059E+00	0.458304E+00
2000	0.438500E+00	0.391672E+00	0.112936E+00
2001	0.716100E+00	0.669891E+00	0.667046E-01
2002	0.524400E+00	0.337622E+00	0.440328E+00
2003	0.630000E-01	0.104634E+00	-0.507337E+00
2004	0.221300E+00	0.436067E+00	-0.678277E+00
2005	0.101400E+00	0.148600E+00	-0.382182E+00
2006	0.430000E+00	0.969003E+00	-0.812483E+00
2007	0.293000E+01	0.593492E+00	0.159673E+01
2008	0.321120E+01	0.211373E+01	0.418189E+00

Survey Index: 3 Tag: WHSpr AGE = 4
Time = JAN-1 Type = NUMBER
Catchability = 0.225008E-03 % Variance Contribution = 2.5836
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.655400E+00	0.703819E+00	-0.712760E-01
1983	0.464700E+00	0.524085E+00	-0.120261E+00
1984	0.823300E+00	0.753380E+00	0.887512E-01
1985	0.662500E+00	0.417720E+00	0.461208E+00
1986	0.236900E+00	0.398528E+00	-0.520139E+00
1987	0.230700E+00	0.576066E+00	-0.915104E+00
1988	0.217900E+00	0.518778E+00	-0.867439E+00
1989	0.600100E+00	0.683671E+00	-0.130380E+00
1990	0.637000E+00	0.100474E+01	-0.455718E+00
1991	0.171670E+01	0.211239E+01	-0.207415E+00
1992	0.281900E+00	0.209529E+00	0.296690E+00
1993	0.334300E+00	0.318050E+00	0.498311E-01
1994	0.215000E+00	0.391268E+00	-0.598755E+00
1995	0.371700E+00	0.458588E+00	-0.210066E+00
1996	0.133070E+01	0.879362E+00	0.414264E+00
1997	0.264300E+00	0.217998E+00	0.192599E+00
1998	0.516600E+00	0.351519E+00	0.385006E+00
1999	0.344500E+00	0.325315E+00	0.573012E-01
2000	0.457000E+00	0.498022E+00	-0.859616E-01
2001	0.497200E+00	0.438150E+00	0.126431E+00
2002	0.160120E+01	0.694378E+00	0.835492E+00
2003	0.707700E+00	0.418570E+00	0.525175E+00
2004	0.118100E+00	0.121949E+00	-0.320709E-01
2005	0.607600E+00	0.536011E+00	0.125362E+00
2006	0.600000E-01	0.180179E+00	-0.109961E+01
2007	0.448000E+01	0.131685E+01	0.122438E+01
2008	0.135660E+01	0.797144E+00	0.531701E+00

Survey Index: 4 Tag: WHSpr AGE = 5

Time = JAN-1 Type = NUMBER
 Catchability = 0.293998E-03 % Variance Contribution = 4.3467
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.987700E+00	0.519630E+00	0.642261E+00
1983	0.404200E+00	0.374612E+00	0.760188E-01
1984	0.211800E+00	0.244348E+00	-0.142951E+00
1985	0.661700E+00	0.370595E+00	0.579702E+00
1986	0.912000E-01	0.144370E+00	-0.459325E+00
1987	0.744000E-01	0.179037E+00	-0.878139E+00
1988	0.253500E+00	0.215680E+00	0.161567E+00
1989	0.908000E-01	0.257798E+00	-0.104352E+01
1990	0.102000E+00	0.274954E+00	-0.991631E+00
1991	0.299300E+00	0.421518E+00	-0.342417E+00
1992	0.132810E+01	0.953406E+00	0.331464E+00
1993	0.906000E-01	0.826501E-01	0.918379E-01
1994	0.942000E-01	0.131944E+00	-0.336956E+00
1995	0.145400E+00	0.949236E-01	0.426416E+00
1996	0.403200E+00	0.173484E+00	0.843345E+00
1997	0.875600E+00	0.425507E+00	0.721628E+00
1998	0.141500E+00	0.112034E+00	0.233500E+00
1999	0.315000E+00	0.217813E+00	0.368937E+00
2000	0.107100E+00	0.196910E+00	-0.608983E+00
2001	0.353900E+00	0.312421E+00	0.124663E+00
2002	0.614200E+00	0.286360E+00	0.763072E+00
2003	0.108890E+01	0.507578E+00	0.763274E+00
2004	0.190800E+00	0.329950E+00	-0.547717E+00
2005	0.154000E-01	0.639780E-01	-0.142417E+01
2006	0.200000E+00	0.356917E+00	-0.579186E+00
2007	0.500000E+00	0.117918E+00	0.144462E+01
2008	0.939300E+00	0.116730E+01	-0.217316E+00

Survey Index: 5 Tag: WHSpr AGE = 6
 Time = JAN-1 Type = NUMBER
 Catchability = 0.382779E-03 % Variance Contribution = 6.5351
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.873000E-01	0.866418E-01	0.756783E-02
1983	0.211800E+00	0.295150E+00	-0.331842E+00
1984	0.467000E-01	0.161312E+00	-0.123959E+01
1985	0.103100E+00	0.976474E-01	0.543368E-01
1986	0.349000E-01	0.163853E+00	-0.154648E+01
1987	N/A	0.579545E-01	N/A
1988	0.915000E-01	0.708719E-01	0.255464E+00
1989	0.627000E-01	0.813926E-01	-0.260923E+00
1990	0.321000E-01	0.105784E+00	-0.119255E+01
1991	0.200000E-01	0.111846E+00	-0.172139E+01
1992	0.226400E+00	0.127010E+00	0.578037E+00
1993	0.484200E+00	0.258344E+00	0.628205E+00

1994	0.493000E-01	0.398210E-01	0.213530E+00
1995	0.283000E-01	0.260400E-01	0.832277E-01
1996	0.593000E-01	0.206587E-01	0.105447E+01
1997	0.242400E+00	0.518259E-01	0.154270E+01
1998	0.421000E+00	0.158347E+00	0.977847E+00
1999	0.133700E+00	0.644584E-01	0.729578E+00
2000	0.100600E+00	0.137766E+00	-0.314404E+00
2001	0.635000E-01	0.143989E+00	-0.818698E+00
2002	0.361900E+00	0.202110E+00	0.582556E+00
2003	0.394600E+00	0.185413E+00	0.755288E+00
2004	0.231600E+00	0.275722E+00	-0.174380E+00
2005	0.149800E+00	0.209851E+00	-0.337097E+00
2006	0.200000E-01	0.352258E-01	-0.566047E+00
2007	0.840000E+00	0.224846E+00	0.131798E+01
2008	0.584000E-01	0.770687E-01	-0.277382E+00

Survey Index: 6 Tag: WHSpr AGE = 7
Time = JAN-1 Type = NUMBER
Catchability = 0.566609E-03 % Variance Contribution = 8.0244
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.112000E+00	0.147101E+00	-0.272622E+00
1983	0.680000E-01	0.654754E-01	0.378336E-01
1984	0.100000E+00	0.125658E+00	-0.228392E+00
1985	0.910000E-01	0.890640E-01	0.215047E-01
1986	0.380000E-01	0.500514E-01	-0.275465E+00
1987	0.660000E-01	0.960915E-01	-0.375647E+00
1988	0.650000E-01	0.233256E-01	0.102484E+01
1989	0.140000E-01	0.606162E-01	-0.146550E+01
1990	0.180000E-01	0.510645E-01	-0.104272E+01
1991	0.180000E-01	0.376623E-01	-0.738287E+00
1992	0.690000E-01	0.541349E-01	0.242628E+00
1993	0.550000E-01	0.415969E-01	0.279308E+00
1994	0.127000E+00	0.701825E-01	0.593088E+00
1995	N/A	0.118593E-01	N/A
1996	N/A	0.168957E-01	N/A
1997	0.120000E+00	0.611869E-02	0.297614E+01
1998	0.230000E-01	0.262033E-01	-0.130392E+00
1999	0.273000E+00	0.937761E-01	0.106856E+01
2000	0.240000E-01	0.483830E-01	-0.701095E+00
2001	0.980000E-01	0.116258E+00	-0.170841E+00
2002	0.164000E+00	0.118570E+00	0.324362E+00
2003	0.321000E+00	0.140611E+00	0.825446E+00
2004	0.140000E-01	0.106071E+00	-0.202505E+01
2005	0.129700E+00	0.197780E+00	-0.421929E+00
2006	0.131400E+00	0.118308E+00	0.104954E+00
2007	0.652000E-01	0.260288E-01	0.918257E+00
2008	0.806000E-01	0.142377E+00	-0.568982E+00

Survey Index: 7 Tag: WHSpr AGE = 8
Time = JAN-1 Type = NUMBER
Catchability = 0.511812E-03 % Variance Contribution = 5.5891
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	N/A	0.716573E-01	N/A
1983	0.160000E-01	0.635433E-01	-0.137913E+01
1984	N/A	0.252670E-01	N/A
1985	0.520000E-01	0.566227E-01	-0.851666E-01
1986	N/A	0.295134E-01	N/A
1987	0.800000E-02	0.158516E-01	-0.683828E+00
1988	N/A	0.323025E-01	N/A
1989	N/A	0.120637E-01	N/A
1990	N/A	0.257487E-01	N/A
1991	N/A	0.252609E-01	N/A
1992	N/A	0.617975E-02	N/A
1993	0.230000E-01	0.979461E-02	0.853662E+00
1994	0.270000E-01	0.172403E-01	0.448589E+00
1995	0.110000E-01	0.122153E-01	-0.104793E+00
1996	N/A	0.233333E-02	N/A
1997	N/A	0.104113E-01	N/A
1998	0.370000E-01	0.220955E-02	0.281813E+01
1999	N/A	0.724529E-02	N/A
2000	0.220000E-01	0.326741E-01	-0.395540E+00
2001	0.550000E-01	0.283257E-01	0.663565E+00
2002	0.570000E-01	0.582846E-01	-0.222870E-01
2003	0.103000E+00	0.501770E-01	0.719173E+00
2004	0.140000E-01	0.561498E-01	-0.138897E+01
2005	0.142000E-01	0.438969E-01	-0.112860E+01
2006	0.729000E-01	0.902784E-01	-0.213810E+00
2007	0.384000E-01	0.424809E-01	-0.100996E+00
2008	N/A	0.153132E-01	N/A

Survey Index: 8 Tag: WHAut AGE = 2
Time = JAN-1 Type = NUMBER
Catchability = 0.533836E-04 % Variance Contribution = 4.1570
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.617900E+00	0.593763E+00	0.398469E-01
1983	0.842600E+00	0.339948E+00	0.907700E+00
1984	0.316800E+00	0.345995E+00	-0.881533E-01
1985	0.432300E+00	0.465351E+00	-0.736728E-01
1986	0.525600E+00	0.289781E+00	0.595416E+00
1987	0.392000E+00	0.447806E+00	-0.133099E+00
1988	0.578200E+00	0.552354E+00	0.457300E-01
1989	0.193750E+01	0.107560E+01	0.588523E+00
1990	0.149500E+00	0.185762E+00	-0.217172E+00
1991	0.447000E-01	0.180747E+00	-0.139713E+01
1992	0.143500E+00	0.304856E+00	-0.753505E+00
1993	0.291000E+00	0.277092E+00	0.489726E-01
1994	0.197700E+00	0.398729E+00	-0.701532E+00
1995	0.207100E+00	0.138949E+00	0.399096E+00
1996	0.680000E-01	0.165410E+00	-0.888921E+00

1997	0.124200E+00	0.154942E+00	-0.221156E+00
1998	0.296800E+00	0.229249E+00	0.258249E+00
1999	0.966000E-01	0.194862E+00	-0.701715E+00
2000	0.430700E+00	0.342915E+00	0.227929E+00
2001	0.532600E+00	0.175532E+00	0.110995E+01
2002	0.340000E-01	0.518858E-01	-0.422685E+00
2003	0.269100E+00	0.216466E+00	0.217651E+00
2004	0.454600E+00	0.734888E-01	0.182228E+01
2005	0.570000E+00	0.479310E+00	0.173289E+00
2006	0.153300E+00	0.293389E+00	-0.649104E+00
2007	0.125140E+01	0.104504E+01	0.180205E+00
2008	0.145600E+00	0.210158E+00	-0.366997E+00

Survey Index: 9 Tag: WHAut AGE = 3
Time = JAN-1 Type = NUMBER
Catchability = 0.113582E-03 % Variance Contribution = 3.2202
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.418800E+00	0.626938E+00	-0.403454E+00
1983	0.335270E+01	0.830735E+00	0.139521E+01
1984	0.915500E+00	0.456067E+00	0.696831E+00
1985	0.425800E+00	0.520341E+00	-0.200514E+00
1986	0.956700E+00	0.701227E+00	0.310658E+00
1987	0.401000E+00	0.485674E+00	-0.191576E+00
1988	0.137960E+01	0.688639E+00	0.694831E+00
1989	0.231340E+01	0.905753E+00	0.937707E+00
1990	0.240650E+01	0.182027E+01	0.279189E+00
1991	0.186800E+00	0.297530E+00	-0.465475E+00
1992	0.139000E+00	0.269791E+00	-0.663173E+00
1993	0.445800E+00	0.496283E+00	-0.107275E+00
1994	0.567800E+00	0.469552E+00	0.189989E+00
1995	0.883100E+00	0.689026E+00	0.248160E+00
1996	0.284500E+00	0.213577E+00	0.286737E+00
1997	0.382600E+00	0.278890E+00	0.316172E+00
1998	0.855000E-01	0.261127E+00	-0.111649E+01
1999	0.320300E+00	0.388297E+00	-0.192513E+00
2000	0.367200E+00	0.337173E+00	0.853095E-01
2001	0.983700E+00	0.576681E+00	0.534032E+00
2002	0.141000E+00	0.290644E+00	-0.723340E+00
2003	0.805000E-01	0.900753E-01	-0.112388E+00
2004	0.197600E+00	0.375392E+00	-0.641725E+00
2005	0.170000E+00	0.127923E+00	0.284370E+00
2006	0.380600E+00	0.834173E+00	-0.784692E+00
2007	0.580200E+00	0.510912E+00	0.127176E+00
2008	0.831000E+00	0.181962E+01	-0.783754E+00

Survey Index: 10 Tag: WHAut AGE = 4
Time = JAN-1 Type = NUMBER
Catchability = 0.223833E-03 % Variance Contribution = 2.5584
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.539400E+00	0.700144E+00	-0.260829E+00
1983	0.227480E+01	0.521348E+00	0.147323E+01
1984	0.827700E+00	0.749446E+00	0.993165E-01
1985	0.630700E+00	0.415539E+00	0.417253E+00
1986	0.609400E+00	0.396447E+00	0.429933E+00
1987	0.656500E+00	0.573058E+00	0.135936E+00
1988	0.592100E+00	0.516069E+00	0.137435E+00
1989	0.989600E+00	0.680101E+00	0.375060E+00
1990	0.150170E+01	0.999498E+00	0.407100E+00
1991	0.182930E+01	0.210136E+01	-0.138650E+00
1992	0.223300E+00	0.208435E+00	0.688890E-01
1993	0.140000E+00	0.316389E+00	-0.815330E+00
1994	0.360200E+00	0.389225E+00	-0.774982E-01
1995	0.826000E+00	0.456194E+00	0.593677E+00
1996	0.122840E+01	0.874770E+00	0.339506E+00
1997	0.188300E+00	0.216860E+00	-0.141214E+00
1998	0.176900E+00	0.349683E+00	-0.681443E+00
1999	0.114700E+00	0.323616E+00	-0.103724E+01
2000	0.585700E+00	0.495422E+00	0.167398E+00
2001	0.393600E+00	0.435862E+00	-0.101991E+00
2002	0.752400E+00	0.690752E+00	0.854870E-01
2003	0.363700E+00	0.416385E+00	-0.135280E+00
2004	0.184800E+00	0.121312E+00	0.420907E+00
2005	0.540000E+00	0.533212E+00	0.126500E-01
2006	0.796000E-01	0.179239E+00	-0.811704E+00
2007	0.103310E+01	0.130997E+01	-0.237443E+00
2008	0.384000E+00	0.792982E+00	-0.725158E+00

Survey Index: 11 Tag: WHAut AGE = 5
Time = JAN-1 Type = NUMBER
Catchability = 0.370258E-03 % Variance Contribution = 3.9388
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.404700E+00	0.654418E+00	-0.480600E+00
1983	0.108920E+01	0.471783E+00	0.836679E+00
1984	0.197000E+00	0.307730E+00	-0.446019E+00
1985	0.387100E+00	0.466724E+00	-0.187056E+00
1986	0.248200E+00	0.181818E+00	0.311227E+00
1987	0.341700E+00	0.225478E+00	0.415710E+00
1988	0.242900E+00	0.271626E+00	-0.111776E+00
1989	0.443400E+00	0.324668E+00	0.311669E+00
1990	0.292600E+00	0.346275E+00	-0.168426E+00
1991	0.597800E+00	0.530856E+00	0.118765E+00
1992	0.633400E+00	0.120071E+01	-0.639567E+00
1993	0.355000E-01	0.104089E+00	-0.107571E+01
1994	0.336000E-01	0.166169E+00	-0.159848E+01
1995	0.854000E-01	0.119546E+00	-0.336355E+00
1996	0.325200E+00	0.218485E+00	0.397724E+00
1997	0.542100E+00	0.535880E+00	0.115407E-01
1998	0.172800E+00	0.141094E+00	0.202706E+00

1999	0.192300E+00	0.274311E+00	-0.355207E+00
2000	0.243300E+00	0.247987E+00	-0.190795E-01
2001	0.507100E+00	0.393460E+00	0.253728E+00
2002	0.469000E+00	0.360639E+00	0.262726E+00
2003	0.279720E+01	0.639239E+00	0.147610E+01
2004	0.528700E+00	0.415537E+00	0.240850E+00
2005	0.240000E+00	0.805733E-01	0.109147E+01
2006	0.449500E+00	0.449498E+00	0.419220E-05
2007	0.247500E+00	0.148504E+00	0.510796E+00
2008	0.528300E+00	0.147009E+01	-0.102342E+01

Survey Index: 12 Tag: WHAut AGE = 6
Time = JAN-1 Type = NUMBER
Catchability = 0.478237E-03 % Variance Contribution = 3.2474
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.120500E+00	0.108249E+00	0.107218E+00
1983	0.209200E+00	0.368755E+00	-0.566843E+00
1984	0.227000E+00	0.201540E+00	0.118962E+00
1985	0.214000E+00	0.121999E+00	0.561964E+00
1986	0.182000E+00	0.204715E+00	-0.117612E+00
1987	0.727000E-01	0.724073E-01	0.403470E-02
1988	0.751000E-01	0.885462E-01	-0.164703E+00
1989	0.990000E-01	0.101691E+00	-0.268141E-01
1990	0.160500E+00	0.132165E+00	0.194241E+00
1991	0.258900E+00	0.139739E+00	0.616666E+00
1992	0.811000E-01	0.158684E+00	-0.671232E+00
1993	0.349800E+00	0.322771E+00	0.804195E-01
1994	N/A	0.497516E-01	N/A
1995	0.511000E-01	0.325339E-01	0.451501E+00
1996	0.821000E-01	0.258107E-01	0.115715E+01
1997	0.616000E-01	0.647504E-01	-0.498781E-01
1998	0.140200E+00	0.197835E+00	-0.344366E+00
1999	0.387000E-01	0.805332E-01	-0.732830E+00
2000	0.132000E+00	0.172122E+00	-0.265404E+00
2001	0.134300E+00	0.179897E+00	-0.292311E+00
2002	0.336800E+00	0.252513E+00	0.288028E+00
2003	0.109580E+01	0.231651E+00	0.155401E+01
2004	0.449800E+00	0.344482E+00	0.266762E+00
2005	0.250000E+00	0.262184E+00	-0.475867E-01
2006	0.221000E-01	0.440105E-01	-0.688851E+00
2007	0.285700E+00	0.280919E+00	0.168753E-01
2008	0.226000E-01	0.962883E-01	-0.144940E+01

Survey Index: 13 Tag: WHAut AGE = 7
Time = JAN-1 Type = NUMBER
Catchability = 0.451154E-03 % Variance Contribution = 5.1610
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.760000E-01	0.117127E+00	-0.432526E+00
1983	N/A	0.521337E-01	N/A
1984	0.210000E+00	0.100053E+00	0.741407E+00
1985	0.163000E+00	0.709158E-01	0.832257E+00
1986	0.750000E-01	0.398527E-01	0.632299E+00
1987	0.410000E-01	0.765114E-01	-0.623868E+00
1988	N/A	0.185726E-01	N/A
1989	0.650000E-01	0.482647E-01	0.297687E+00
1990	0.330000E-01	0.406593E-01	-0.208720E+00
1991	0.520000E-01	0.299880E-01	0.550447E+00
1992	N/A	0.431041E-01	N/A
1993	0.104000E+00	0.331209E-01	0.114423E+01
1994	0.300000E-01	0.558817E-01	-0.622040E+00
1995	N/A	0.944275E-02	N/A
1996	0.110000E-01	0.134530E-01	-0.201304E+00
1997	N/A	0.487191E-02	N/A
1998	N/A	0.208640E-01	N/A
1999	0.310000E-01	0.746677E-01	-0.879061E+00
2000	0.160000E-01	0.385242E-01	-0.878698E+00
2001	0.100000E-01	0.925683E-01	-0.222536E+01
2002	0.122000E+00	0.944096E-01	0.256378E+00
2003	0.627000E+00	0.111959E+00	0.172281E+01
2004	0.730000E-01	0.844571E-01	-0.145784E+00
2005	0.168000E+00	0.157479E+00	0.646722E-01
2006	0.923000E-01	0.942010E-01	-0.203867E-01
2007	0.339000E-01	0.207250E-01	0.492075E+00
2008	0.690000E-01	0.113366E+00	-0.496513E+00

Survey Index: 14 Tag: WHAut AGE = 8
Time = JAN-1 Type = NUMBER
Catchability = 0.566767E-03 % Variance Contribution = 3.3797
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.290000E-01	0.793514E-01	-0.100659E+01
1983	N/A	0.703661E-01	N/A
1984	N/A	0.279800E-01	N/A
1985	0.790000E-01	0.627025E-01	0.231047E+00
1986	N/A	0.326824E-01	N/A
1987	N/A	0.175536E-01	N/A
1988	N/A	0.357710E-01	N/A
1989	0.330000E-01	0.133590E-01	0.904319E+00
1990	N/A	0.285135E-01	N/A
1991	0.100000E-01	0.279732E-01	-0.102866E+01
1992	0.230000E-01	0.684329E-02	0.121223E+01
1993	0.800000E-02	0.108463E-01	-0.304381E+00
1994	N/A	0.190914E-01	N/A
1995	0.450000E-01	0.135269E-01	0.120198E+01
1996	N/A	0.258387E-02	N/A
1997	N/A	0.115292E-01	N/A
1998	N/A	0.244679E-02	N/A
1999	N/A	0.802324E-02	N/A
2000	0.600000E-02	0.361824E-01	-0.179681E+01
2001	N/A	0.313671E-01	N/A

2002	0.840000E-01	0.645428E-01	0.263488E+00
2003	0.510000E-01	0.555646E-01	-0.857210E-01
2004	0.770000E-01	0.621788E-01	0.213791E+00
2005	0.680000E-01	0.486102E-01	0.335674E+00
2006	0.824000E-01	0.999719E-01	-0.193304E+00
2007	0.496000E-01	0.470422E-01	0.529461E-01
2008	N/A	0.169574E-01	N/A

Survey Index: 15 Tag: MASpr AGE = 2
Time = JAN-1 Type = NUMBER
Catchability = 0.710558E-03 % Variance Contribution = 5.3115
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.717000E+01	0.790323E+01	-0.973656E-01
1983	0.146100E+02	0.452485E+01	0.117212E+01
1984	0.515000E+01	0.460534E+01	0.111781E+00
1985	0.277000E+01	0.619402E+01	-0.804737E+00
1986	0.116800E+02	0.385710E+01	0.110796E+01
1987	0.471000E+01	0.596049E+01	-0.235465E+00
1988	0.635000E+01	0.735207E+01	-0.146526E+00
1989	0.205100E+02	0.143166E+02	0.359490E+00
1990	0.545000E+01	0.247258E+01	0.790355E+00
1991	0.269000E+01	0.240582E+01	0.111650E+00
1992	0.513000E+01	0.405776E+01	0.234474E+00
1993	0.611000E+01	0.368821E+01	0.504785E+00
1994	0.407000E+01	0.530725E+01	-0.265432E+00
1995	0.192000E+01	0.184947E+01	0.374282E-01
1996	0.520000E+00	0.220168E+01	-0.144315E+01
1997	0.980000E+00	0.206234E+01	-0.744044E+00
1998	0.830000E+00	0.305140E+01	-0.130193E+01
1999	0.239000E+01	0.259370E+01	-0.817915E-01
2000	0.702000E+01	0.456434E+01	0.430489E+00
2001	0.450000E+01	0.233641E+01	0.655462E+00
2002	0.260000E+00	0.690622E+00	-0.976910E+00
2003	0.127000E+02	0.288125E+01	0.148338E+01
2004	0.156000E+01	0.978167E+00	0.466761E+00
2005	0.715000E+01	0.637981E+01	0.113973E+00
2006	0.367000E+01	0.390514E+01	-0.621009E-01
2007	0.336000E+01	0.139099E+02	-0.142066E+01
2008	N/A	0.279729E+01	N/A

Survey Index: 16 Tag: MASpr AGE = 3
Time = JAN-1 Type = NUMBER
Catchability = 0.544643E-03 % Variance Contribution = 1.7670
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.241000E+01	0.300628E+01	-0.221075E+00
1983	0.286000E+01	0.398352E+01	-0.331343E+00
1984	0.207000E+01	0.218692E+01	-0.549455E-01

1985	0.227000E+01	0.249512E+01	-0.945583E-01
1986	0.123000E+01	0.336250E+01	-0.100567E+01
1987	0.296000E+01	0.232889E+01	0.239797E+00
1988	0.245000E+01	0.330214E+01	-0.298484E+00
1989	0.876000E+01	0.434324E+01	0.701575E+00
1990	0.147500E+02	0.872850E+01	0.524649E+00
1991	0.157000E+01	0.142671E+01	0.957073E-01
1992	0.367000E+01	0.129369E+01	0.104269E+01
1993	0.255000E+01	0.237976E+01	0.690935E-01
1994	0.175000E+01	0.225159E+01	-0.252019E+00
1995	0.276000E+01	0.330400E+01	-0.179902E+00
1996	0.108000E+01	0.102414E+01	0.531105E-01
1997	0.930000E+00	0.133733E+01	-0.363243E+00
1998	0.700000E+00	0.125215E+01	-0.581537E+00
1999	0.231000E+01	0.186195E+01	0.215622E+00
2000	0.289000E+01	0.161680E+01	0.580805E+00
2001	0.497000E+01	0.276528E+01	0.586277E+00
2002	0.123000E+01	0.139369E+01	-0.124940E+00
2003	0.280000E+00	0.431926E+00	-0.433466E+00
2004	0.258000E+01	0.180007E+01	0.359965E+00
2005	0.570000E+00	0.613413E+00	-0.734015E-01
2006	0.338000E+01	0.400001E+01	-0.168420E+00
2007	0.184000E+01	0.244991E+01	-0.286285E+00
2008	N/A	0.872540E+01	N/A

Survey Index: 17 Tag: MASpr AGE = 4
Time = JAN-1 Type = NUMBER
Catchability = 0.453706E-03 % Variance Contribution = 3.5692
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.870000E+00	0.141918E+01	-0.489343E+00
1983	0.150000E+01	0.105676E+01	0.350253E+00
1984	0.700000E+00	0.151912E+01	-0.774803E+00
1985	0.450000E+00	0.842292E+00	-0.626879E+00
1986	0.680000E+00	0.803591E+00	-0.166998E+00
1987	0.220000E+00	0.116158E+01	-0.166391E+01
1988	0.145000E+01	0.104606E+01	0.326529E+00
1989	0.106000E+01	0.137855E+01	-0.262766E+00
1990	0.231000E+01	0.202597E+01	0.131201E+00
1991	0.366000E+01	0.425942E+01	-0.151669E+00
1992	0.750000E+00	0.422495E+00	0.573897E+00
1993	0.900000E+00	0.641316E+00	0.338873E+00
1994	0.490000E+00	0.788953E+00	-0.476302E+00
1995	0.780000E+00	0.924698E+00	-0.170173E+00
1996	0.149000E+01	0.177315E+01	-0.173979E+00
1997	0.170000E+00	0.439571E+00	-0.950001E+00
1998	0.750000E+00	0.708803E+00	0.564961E-01
1999	0.780000E+00	0.655965E+00	0.173187E+00
2000	0.220000E+01	0.100421E+01	0.784254E+00
2001	0.352000E+01	0.883486E+00	0.138234E+01
2002	0.141000E+01	0.140014E+01	0.701462E-02
2003	0.143000E+01	0.844005E+00	0.527271E+00
2004	0.460000E+00	0.245898E+00	0.626310E+00

2005	0.207000E+01	0.108081E+01	0.649835E+00
2006	0.540000E+00	0.363314E+00	0.396302E+00
2007	0.175000E+01	0.265530E+01	-0.416941E+00
2008	N/A	0.160736E+01	N/A

Survey Index: 19 Tag: MAAut AGE = 2
Time = JAN-1 Type = NUMBER
Catchability = 0.122958E-03 % Variance Contribution = 22.4734
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
------	----------	-----------	----------

1982	0.620000E+01	0.136761E+01	0.151149E+01
1983	0.114000E+01	0.782999E+00	0.375653E+00
1984	0.280000E+00	0.796927E+00	-0.104597E+01
1985	0.160000E+00	0.107184E+01	-0.190196E+01
1986	0.190000E+00	0.667449E+00	-0.125644E+01
1987	0.550000E+00	0.103143E+01	-0.628782E+00
1988	0.140000E+01	0.127223E+01	0.956991E-01
1989	0.310000E+01	0.247741E+01	0.224188E+00
1990	0.200000E-01	0.427865E+00	-0.306308E+01
1991	0.422000E+01	0.416314E+00	0.231615E+01
1992	0.200000E+01	0.702172E+00	0.104672E+01
1993	0.990000E+00	0.638224E+00	0.439016E+00
1994	0.153000E+01	0.918390E+00	0.510401E+00
1995	0.536000E+01	0.320039E+00	0.281828E+01
1996	0.800000E+00	0.380988E+00	0.741845E+00
1997	0.800000E-01	0.356876E+00	-0.149536E+01
1998	0.300000E-01	0.528027E+00	-0.286795E+01
1999	0.640000E+00	0.448825E+00	0.354836E+00
2000	0.590000E+00	0.789833E+00	-0.291699E+00
2001	0.400000E+00	0.404302E+00	-0.106976E-01
2002	0.100000E-01	0.119508E+00	-0.248080E+01
2003	0.109000E+01	0.498583E+00	0.782162E+00
2004	0.160000E+01	0.169266E+00	0.224629E+01
2005	0.994000E+01	0.110399E+01	0.219764E+01
2006	0.610000E+00	0.675761E+00	-0.102381E+00
2007	0.435000E+01	0.240704E+01	0.591780E+00
2008	0.160000E+00	0.484055E+00	-0.110702E+01

Survey Index: 21 Tag: CM_CPE AGE = 2
Time = MEAN Type = NUMBER
Catchability = 0.245830E-05 % Variance Contribution = 3.7184
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.743000E-01	0.223352E-01	0.120195E+01
1983	0.477000E-01	0.125412E-01	0.133591E+01
1984	0.331000E-01	0.134627E-01	0.899610E+00
1985	0.137000E-01	0.181238E-01	-0.279829E+00
1986	0.410000E-02	0.118717E-01	-0.106317E+01
1987	0.740000E-02	0.176086E-01	-0.866906E+00

1988	0.146000E-01	0.223933E-01	-0.427740E+00
1989	0.170000E-01	0.442708E-01	-0.957113E+00
1990	0.110000E-01	0.744697E-02	0.390088E+00
1991	0.194000E-01	0.700807E-02	0.101821E+01
1992	0.149000E-01	0.123165E-01	0.190425E+00
1993	0.270000E-02	0.114122E-01	-0.144143E+01
1994	N/A	0.165774E-01	N/A
1995	N/A	0.546252E-02	N/A
1996	N/A	0.679601E-02	N/A
1997	N/A	0.636459E-02	N/A
1998	N/A	0.943961E-02	N/A
1999	N/A	0.810664E-02	N/A
2000	N/A	0.140715E-01	N/A
2001	N/A	0.714947E-02	N/A
2002	N/A	0.216199E-02	N/A
2003	N/A	0.901510E-02	N/A
2004	N/A	0.306613E-02	N/A
2005	N/A	0.199960E-01	N/A
2006	N/A	0.122433E-01	N/A
2007	N/A	0.436076E-01	N/A
2008	N/A	0.000000E+00	N/A

Survey Index: 22 Tag: CM_CPE AGE = 3
Time = MEAN Type = NUMBER
Catchability = 0.140563E-04 % Variance Contribution = 0.6469
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.738000E-01	0.519778E-01	0.350541E+00
1983	0.109900E+00	0.713423E-01	0.432082E+00
1984	0.448000E-01	0.393360E-01	0.130068E+00
1985	0.423000E-01	0.415634E-01	0.175677E-01
1986	0.688000E-01	0.577049E-01	0.175861E+00
1987	0.186000E-01	0.448396E-01	-0.879930E+00
1988	0.492000E-01	0.615373E-01	-0.223750E+00
1989	0.637000E-01	0.850584E-01	-0.289154E+00
1990	0.159500E+00	0.174475E+00	-0.897392E-01
1991	0.404000E-01	0.229452E-01	0.565723E+00
1992	0.173000E-01	0.260461E-01	-0.409160E+00
1993	0.500000E-01	0.401303E-01	0.219891E+00
1994	N/A	0.416566E-01	N/A
1995	N/A	0.689939E-01	N/A
1996	N/A	0.193218E-01	N/A
1997	N/A	0.277652E-01	N/A
1998	N/A	0.258572E-01	N/A
1999	N/A	0.389707E-01	N/A
2000	N/A	0.340461E-01	N/A
2001	N/A	0.562158E-01	N/A
2002	N/A	0.307978E-01	N/A
2003	N/A	0.927102E-02	N/A
2004	N/A	0.396172E-01	N/A
2005	N/A	0.134136E-01	N/A
2006	N/A	0.923518E-01	N/A
2007	N/A	0.562457E-01	N/A

2008 N/A 0.000000E+00 N/A

Survey Index: 23 Tag: CM_CPE AGE = 4
 Time = MEAN Type = NUMBER
 Catchability = 0.231650E-04 % Variance Contribution = 0.1443
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.450000E-01	0.478168E-01	-0.607149E-01
1983	0.422000E-01	0.336756E-01	0.225646E+00
1984	0.442000E-01	0.495054E-01	-0.113356E+00
1985	0.289000E-01	0.237841E-01	0.194823E+00
1986	0.226000E-01	0.252171E-01	-0.109574E+00
1987	0.260000E-01	0.338541E-01	-0.263964E+00
1988	0.242000E-01	0.342353E-01	-0.346903E+00
1989	0.397000E-01	0.413480E-01	-0.406733E-01
1990	0.782000E-01	0.618167E-01	0.235096E+00
1991	0.135500E+00	0.133920E+00	0.117317E-01
1992	0.138000E-01	0.125736E-01	0.930706E-01
1993	0.232000E-01	0.194789E-01	0.174818E+00
1994	N/A	0.194817E-01	N/A
1995	N/A	0.270618E-01	N/A
1996	N/A	0.573865E-01	N/A
1997	N/A	0.145917E-01	N/A
1998	N/A	0.255037E-01	N/A
1999	N/A	0.233620E-01	N/A
2000	N/A	0.363291E-01	N/A
2001	N/A	0.325446E-01	N/A
2002	N/A	0.542248E-01	N/A
2003	N/A	0.338284E-01	N/A
2004	N/A	0.823436E-02	N/A
2005	N/A	0.401443E-01	N/A
2006	N/A	0.133912E-01	N/A
2007	N/A	0.112368E+00	N/A
2008	N/A	0.000000E+00	N/A

Survey Index: 24 Tag: CM_CPE AGE = 5
 Time = MEAN Type = NUMBER
 Catchability = 0.229116E-04 % Variance Contribution = 0.1381
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
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1982	0.217000E-01	0.275207E-01	-0.237626E+00
1983	0.209000E-01	0.176589E-01	0.168507E+00
1984	0.118000E-01	0.111738E-01	0.545269E-01
1985	0.179000E-01	0.176601E-01	0.134932E-01
1986	0.660000E-02	0.661394E-02	-0.211032E-02
1987	0.570000E-02	0.815593E-02	-0.358279E+00
1988	0.930000E-02	0.963858E-02	-0.357593E-01
1989	0.106000E-01	0.119158E-01	-0.117011E+00
1990	0.122000E-01	0.126640E-01	-0.373282E-01

1991	0.217000E-01	0.172514E-01	0.229419E+00
1992	0.515000E-01	0.374843E-01	0.317659E+00
1993	0.410000E-02	0.408155E-02	0.450955E-02
1994	N/A	0.462407E-02	N/A
1995	N/A	0.344415E-02	N/A
1996	N/A	0.707689E-02	N/A
1997	N/A	0.189098E-01	N/A
1998	N/A	0.596659E-02	N/A
1999	N/A	0.120896E-01	N/A
2000	N/A	0.116604E-01	N/A
2001	N/A	0.175142E-01	N/A
2002	N/A	0.160594E-01	N/A
2003	N/A	0.263716E-01	N/A
2004	N/A	0.183585E-01	N/A
2005	N/A	0.334331E-02	N/A
2006	N/A	0.197757E-01	N/A
2007	N/A	0.664047E-02	N/A
2008	N/A	0.000000E+00	N/A

Survey Index: 25 Tag: CM_CPE AGE = 6
Time = MEAN Type = NUMBER
Catchability = 0.218712E-04 % Variance Contribution = 0.6002
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.270000E-02	0.360420E-02	-0.288849E+00
1983	0.123000E-01	0.964092E-02	0.243583E+00
1984	0.550000E-02	0.586004E-02	-0.634079E-01
1985	0.360000E-02	0.343923E-02	0.456871E-01
1986	0.430000E-02	0.610563E-02	-0.350596E+00
1987	0.180000E-02	0.185134E-02	-0.281215E-01
1988	0.150000E-02	0.311688E-02	-0.731367E+00
1989	0.230000E-02	0.312149E-02	-0.305403E+00
1990	0.510000E-02	0.322153E-02	0.459384E+00
1991	0.390000E-02	0.384759E-02	0.135296E-01
1992	0.520000E-02	0.374652E-02	0.327830E+00
1993	0.140000E-01	0.710875E-02	0.677731E+00
1994	N/A	0.113347E-02	N/A
1995	N/A	0.101323E-02	N/A
1996	N/A	0.586834E-03	N/A
1997	N/A	0.181507E-02	N/A
1998	N/A	0.592501E-02	N/A
1999	N/A	0.267336E-02	N/A
2000	N/A	0.602197E-02	N/A
2001	N/A	0.622466E-02	N/A
2002	N/A	0.810640E-02	N/A
2003	N/A	0.683689E-02	N/A
2004	N/A	0.112083E-01	N/A
2005	N/A	0.769048E-02	N/A
2006	N/A	0.145083E-02	N/A
2007	N/A	0.865748E-02	N/A
2008	N/A	0.000000E+00	N/A

Retrospective Summary

Average Fishing Mortality

Ages = 5 - 7

	1982	1983	1984	1985	1986
2000	0.5465	0.8677	0.7543	0.8478	0.8502
2001	0.5465	0.8677	0.7543	0.8478	0.8502
2002	0.5465	0.8677	0.7543	0.8478	0.8502
2003	0.5465	0.8677	0.7543	0.8478	0.8502
2004	0.5465	0.8677	0.7543	0.8478	0.8502
2005	0.5465	0.8677	0.7543	0.8478	0.8502
2006	0.5465	0.8677	0.7543	0.8478	0.8502
2007	0.5465	0.8677	0.7543	0.8478	0.8502
	1987	1988	1989	1990	1991
2000	0.9605	0.5815	0.7225	0.8636	1.2294
2001	0.9605	0.5815	0.7225	0.8636	1.2293
2002	0.9605	0.5815	0.7225	0.8635	1.2291
2003	0.9605	0.5815	0.7225	0.8635	1.2291
2004	0.9605	0.5815	0.7225	0.8635	1.2290
2005	0.9605	0.5815	0.7225	0.8635	1.2290
2006	0.9605	0.5815	0.7225	0.8635	1.2290
2007	0.9605	0.5815	0.7225	0.8635	1.2290
	1992	1993	1994	1995	1996
2000	1.3627	0.9571	1.5425	1.2239	0.9161
2001	1.3625	0.9573	1.5339	1.2157	0.9634
2002	1.3622	0.9561	1.5204	1.1878	0.9567
2003	1.3622	0.9560	1.5177	1.1824	0.9581
2004	1.3620	0.9562	1.5125	1.1795	0.9547
2005	1.3620	0.9562	1.5129	1.1805	0.9547
2006	1.3620	0.9562	1.5126	1.1798	0.9544
2007	1.3620	0.9562	1.5123	1.1792	0.9545
	1997	1998	1999	2000	2001
2000	0.8377	0.7034	0.9794	0.6104	
2001	0.9143	0.8529	0.8262	0.4132	0.5330
2002	0.8658	0.7592	0.6060	0.3896	0.4672
2003	0.8847	0.7648	0.6037	0.3519	0.4961
2004	0.8827	0.7733	0.5875	0.3281	0.4329
2005	0.8822	0.7751	0.5902	0.3273	0.4269
2006	0.8812	0.7724	0.5870	0.3253	0.4212
2007	0.8811	0.7722	0.5846	0.3242	0.4249
	2002	2003	2004	2005	2006

2000					
2001					
2002	0.4124				
2003	0.5813	0.6681			
2004	0.5697	0.7016	0.5905		
2005	0.5559	0.7256	0.6259	0.7789	
2006	0.5399	0.6962	0.5950	0.6406	0.5204
2007	0.5373	0.6804	0.5405	0.6362	0.5811

2007

2000	
2001	
2002	
2003	
2004	
2005	
2006	
2007	0.4557

Spawning Stock Biomass

	1982	1983	1984	1985	1986
2000	25587.	19494.	17223.	17211.	19406.
2001	25587.	19494.	17223.	17211.	19406.
2002	25587.	19494.	17223.	17211.	19406.
2003	25587.	19494.	17223.	17211.	19406.
2004	25587.	19494.	17223.	17211.	19406.
2005	25587.	19494.	17223.	17211.	19406.
2006	25587.	19494.	17223.	17211.	19406.
2007	25587.	19494.	17223.	17211.	19406.

	1987	1988	1989	1990	1991
2000	15926.	16545.	22151.	28655.	20339.
2001	15926.	16545.	22151.	28655.	20340.
2002	15926.	16545.	22151.	28657.	20341.
2003	15926.	16546.	22151.	28657.	20342.
2004	15926.	16546.	22151.	28657.	20342.
2005	15926.	16546.	22151.	28657.	20342.
2006	15926.	16546.	22151.	28657.	20342.
2007	15926.	16546.	22151.	28657.	20342.

	1992	1993	1994	1995	1996
2000	11980.	10322.	10777.	13478.	11705.
2001	11981.	10317.	10715.	13398.	11662.
2002	11986.	10329.	10755.	13618.	11931.
2003	11986.	10329.	10746.	13549.	11943.

2004	11988.	10333.	10754.	13559.	11945.
2005	11988.	10333.	10754.	13560.	11938.
2006	11988.	10334.	10754.	13563.	11945.
2007	11988.	10334.	10755.	13566.	11949.

1997	1998	1999	2000	2001
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2000	9131.	9363.	9755.	14042.	
2001	9324.	10068.	10821.	15431.	21475.
2002	9657.	10652.	11773.	16946.	24018.
2003	9717.	10561.	10951.	14173.	18544.
2004	9843.	10759.	11163.	14180.	17858.
2005	9838.	10781.	11189.	14139.	17624.
2006	9848.	10813.	11253.	14254.	17787.
2007	9856.	10814.	11246.	14285.	17848.

2002	2003	2004	2005	2006
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2000					
2001					
2002	28693.				
2003	20609.	19609.			
2004	18896.	17307.	15989.		
2005	18427.	16431.	14089.	11691.	
2006	18623.	16760.	14633.	12359.	23403.
2007	18673.	16539.	13693.	10974.	19139.

2007

2000	
2001	
2002	
2003	
2004	
2005	
2006	
2007	33877.

Total Population Numbers

1982	1983	1984	1985	1986
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2000	30180.	26336.	26143.	23683.	24887.
2001	30180.	26336.	26143.	23683.	24888.
2002	30180.	26336.	26143.	23683.	24888.
2003	30180.	26336.	26143.	23683.	24888.
2004	30180.	26336.	26143.	23683.	24888.
2005	30180.	26336.	26143.	23683.	24888.
2006	30180.	26336.	26143.	23683.	24888.
2007	30180.	26336.	26143.	23683.	24888.

	1987	1988	1989	1990	1991
2000	28973.	44369.	36693.	29511.	24213.
2001	28973.	44369.	36692.	29517.	24218.
2002	28973.	44369.	36694.	29523.	24223.
2003	28973.	44369.	36694.	29524.	24224.
2004	28973.	44369.	36694.	29528.	24228.
2005	28973.	44369.	36694.	29528.	24228.
2006	28973.	44369.	36694.	29528.	24228.
2007	28973.	44369.	36694.	29528.	24228.
	1992	1993	1994	1995	1996
2000	19138.	21034.	17098.	14371.	12093.
2001	19048.	20992.	17068.	14585.	12614.
2002	19056.	21210.	17252.	14746.	12884.
2003	19053.	21133.	17279.	14801.	12935.
2004	19057.	21141.	17245.	14946.	13064.
2005	19057.	21143.	17237.	14941.	13090.
2006	19057.	21146.	17242.	14946.	13107.
2007	19057.	21148.	17245.	14951.	13113.
	1997	1998	1999	2000	2001
2000	12119.	13858.	20971.	23393.	17455.
2001	13018.	14774.	21508.	21509.	16376.
2002	13744.	15306.	23309.	23087.	17810.
2003	13035.	13170.	18732.	18600.	14407.
2004	13154.	13306.	17668.	17029.	13255.
2005	13184.	13334.	17312.	16718.	13046.
2006	13237.	13419.	17396.	16748.	13203.
2007	13190.	13477.	17462.	16805.	13250.
	2002	2003	2004	2005	2006
2000					
2001	11067.				
2002	26285.	19865.			
2003	17077.	17114.	12418.		
2004	15583.	14068.	32769.	25539.	
2005	14224.	12041.	21034.	20889.	15743.
2006	14567.	12623.	21874.	23736.	45200.
2007	13459.	11046.	18414.	20495.	39336.
	2007	2008			
2000					
2001					
2002					
2003					
2004					
2005					

2006	35989.	
2007	35992.	28090.

Age 1 Population

	1982	1983	1984	1985	1986
2000	7857.	7929.	10674.	6679.	10260.
2001	7857.	7929.	10674.	6679.	10260.
2002	7857.	7929.	10674.	6679.	10260.
2003	7857.	7929.	10674.	6679.	10260.
2004	7857.	7929.	10674.	6679.	10260.
2005	7857.	7929.	10674.	6679.	10260.
2006	7857.	7929.	10674.	6679.	10260.
2007	7857.	7929.	10674.	6679.	10260.

	1987	1988	1989	1990	1991
2000	12744.	24612.	4253.	4119.	6975.
2001	12744.	24612.	4253.	4125.	6975.
2002	12744.	24612.	4254.	4130.	6975.
2003	12744.	24612.	4255.	4131.	6975.
2004	12744.	24612.	4254.	4135.	6975.
2005	12744.	24612.	4254.	4135.	6975.
2006	12744.	24612.	4254.	4135.	6975.
2007	12744.	24612.	4254.	4135.	6975.

	1992	1993	1994	1995	1996
2000	6432.	8943.	3126.	3345.	3000.
2001	6338.	8975.	3131.	3583.	3345.
2002	6343.	9185.	3137.	3593.	3484.
2003	6339.	9110.	3227.	3627.	3490.
2004	6340.	9116.	3185.	3800.	3500.
2005	6340.	9117.	3177.	3802.	3529.
2006	6340.	9121.	3179.	3802.	3542.
2007	6340.	9123.	3180.	3805.	3545.

	1997	1998	1999	2000	2001
2000	5009.	5716.	11044.	7729.	0.
2001	5482.	5896.	10831.	5406.	461.
2002	5987.	5834.	12196.	5510.	603.
2003	5236.	4278.	9369.	4770.	875.
2004	5249.	4317.	8193.	4071.	1008.
2005	5258.	4321.	7814.	4052.	1054.
2006	5298.	4362.	7828.	4013.	1187.
2007	5245.	4458.	7847.	4016.	1187.

	2002	2003	2004	2005	2006
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2000					
2001	0.				
2002	14045.	0.			
2003	7623.	4786.	0.		
2004	7073.	2963.	22845.	0.	
2005	5884.	2050.	12772.	4959.	0.
2006	6099.	2351.	13136.	7120.	27113.
2007	4953.	1681.	10966.	6713.	23910.
	2007	2008			

2000		
2001		
2002		
2003		
2004		
2005		
2006	0.	
2007	4808.	0.

In the Retrospective Analysis
The Following Survey Indices Have Predicted
Index Value Set to Zero in Terminal Year + 1

21	CM_CPE	2
22	CM_CPE	3
23	CM_CPE	4
24	CM_CPE	5
25	CM_CPE	6

Plus Group Diagnostic Report

Calculation Method Selected = Backward

Year	Population Backward	Population Forward	F Forward	F Backward	Ratio
1982	79.	79.	0.608762	0.608767	1.000008
1983	35.	39.	0.766578	0.934198	1.218659
1984	36.	22.	2.291808	0.826495	0.360630
1985	21.	13.	2.078124	0.831755	0.400243
1986	113.	73.	2.078124	0.852354	0.410155
1987	5.	6.	0.850480	0.956793	1.125004
1988	2.	8.	0.154090	0.793893	5.152153
1989	13.	9.	2.078124	0.842203	0.405271
1990	30.	21.	2.078124	0.964334	0.464041
1991	2.	8.	0.141677	1.203395	8.493906
1992	0.	6.	0.000172	1.364201	7931.037707
1993	0.	6.	0.000179	1.151373	6429.218887
1994	2.	5.	0.302683	1.679343	5.548194
1995	0.	3.	0.072010	1.408175	19.555209
1996	0.	3.	0.000384	1.075723	2801.841399
1997	0.	2.	0.047990	1.074636	22.392985
1998	1.	2.	0.227801	0.769676	3.378726
1999	0.	2.	0.000490	0.810592	1655.235816
2000	0.	5.	0.000221	0.640350	2892.159780
2001	0.	4.	N/A	N/A	

Warning **** Infeasible Mass Balance in Plus Group

- Year = 1986
- Year = 1989
- Year = 1990
- Year = 1994
- Year = 1997

Bootstrap Summary Report

Number of Bootstrap Repetitions Requested = 1000
 Number of Bootstrap Repetitions Completed = 1000
 Bootstrap Output Variable: Stock Estimates (2008)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
N 2	3937.	4778.	3549.	0.7428
N 3	16020.	17071.	6345.	0.3717
N 4	3543.	3648.	986.	0.2703
N 5	3970.	4078.	1050.	0.2575
N 6	201.	214.	80.	0.3741
N 7	251.	270.	126.	0.4652
N 8	30.	34.	19.	0.5717
N 9	47.	56.	45.	0.7909
N 10	71.	86.	70.	0.8079

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
N 2	841.	115.	21.3697	3095.	1.1466
N 3	1050.	203.	6.5570	14970.	0.4239
N 4	105.	31.	2.9687	3438.	0.2868
N 5	107.	33.	2.6968	3863.	0.2718
N 6	13.	3.	6.5231	188.	0.4263
N 7	19.	4.	7.4963	232.	0.5406
N 8	4.	1.	13.6268	26.	0.7521
N 9	9.	1.	20.1704	37.	1.1906
N 10	15.	2.	21.1718	56.	1.2418

	LOWER 80. % CI	UPPER 80. % CI
N 2	1677.	8603.
N 3	10069.	25149.
N 4	2521.	4978.
N 5	2832.	5454.
N 6	124.	328.
N 7	121.	439.
N 8	12.	60.
N 9	9.	110.
N 10	8.	179.

Bootstrap Output Variable: Catchability Estimates

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
Q 1	0.639060E-04	0.647586E-04	0.101782E-04	0.1572
Q 2	0.131940E-03	0.133998E-03	0.145121E-04	0.1083
Q 3	0.225008E-03	0.225360E-03	0.233256E-04	0.1035
Q 4	0.293998E-03	0.295308E-03	0.383110E-04	0.1297
Q 5	0.382779E-03	0.386695E-03	0.603680E-04	0.1561
Q 6	0.566609E-03	0.571598E-03	0.110028E-03	0.1925
Q 7	0.511812E-03	0.524087E-03	0.139158E-03	0.2655
Q 8	0.533836E-04	0.535169E-04	0.726587E-05	0.1358
Q 9	0.113582E-03	0.114677E-03	0.129450E-04	0.1129
Q 10	0.223833E-03	0.223325E-03	0.225948E-04	0.1012
Q 11	0.370258E-03	0.372882E-03	0.441525E-04	0.1184
Q 12	0.478237E-03	0.480790E-03	0.575817E-04	0.1198
Q 13	0.451154E-03	0.460422E-03	0.853109E-04	0.1853
Q 14	0.566767E-03	0.586741E-03	0.137955E-03	0.2351
Q 15	0.710558E-03	0.715248E-03	0.110880E-03	0.1550
Q 16	0.544643E-03	0.546052E-03	0.476591E-04	0.0873
Q 17	0.453706E-03	0.455707E-03	0.552238E-04	0.1212
Q 19	0.122958E-03	0.128903E-03	0.390116E-04	0.3026
Q 21	0.245830E-05	0.251662E-05	0.718337E-06	0.2854
Q 22	0.140563E-04	0.141456E-04	0.162997E-05	0.1152
Q 23	0.231650E-04	0.232271E-04	0.126746E-05	0.0546
Q 24	0.229116E-04	0.229085E-04	0.120903E-05	0.0528
Q 25	0.218712E-04	0.220098E-04	0.250055E-05	0.1136

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
Q 1	0.8525E-06	0.3230E-06	1.3340	0.6305E-04	0.1614
Q 2	0.2058E-05	0.4635E-06	1.5600	0.1299E-03	0.1117
Q 3	0.3524E-06	0.7377E-06	0.1566	0.2247E-03	0.1038
Q 4	0.1310E-05	0.1212E-05	0.4455	0.2927E-03	0.1309
Q 5	0.3917E-05	0.1913E-05	1.0232	0.3789E-03	0.1593
Q 6	0.4988E-05	0.3483E-05	0.8803	0.5616E-03	0.1959
Q 7	0.1227E-04	0.4418E-05	2.3983	0.4995E-03	0.2786
Q 8	0.1332E-06	0.2298E-06	0.2496	0.5325E-04	0.1364
Q 9	0.1096E-05	0.4108E-06	0.9645	0.1125E-03	0.1151
Q 10	-0.5082E-06	0.7147E-06	-0.2270	0.2243E-03	0.1007
Q 11	0.2624E-05	0.1399E-05	0.7086	0.3676E-03	0.1201
Q 12	0.2554E-05	0.1823E-05	0.5339	0.4757E-03	0.1211
Q 13	0.9268E-05	0.2714E-05	2.0543	0.4419E-03	0.1931
Q 14	0.1997E-04	0.4408E-05	3.5242	0.5468E-03	0.2523
Q 15	0.4690E-05	0.3509E-05	0.6600	0.7059E-03	0.1571
Q 16	0.1409E-05	0.1508E-05	0.2587	0.5432E-03	0.0877
Q 17	0.2001E-05	0.1747E-05	0.4410	0.4517E-03	0.1223
Q 19	0.5945E-05	0.1248E-05	4.8350	0.1170E-03	0.3334
Q 21	0.5832E-07	0.2279E-07	2.3723	0.2400E-05	0.2993
Q 22	0.8937E-07	0.5162E-07	0.6358	0.1397E-04	0.1167
Q 23	0.6213E-07	0.4013E-07	0.2682	0.2310E-04	0.0549
Q 24	-0.3153E-08	0.3823E-07	-0.0138	0.2291E-04	0.0528
Q 25	0.1386E-06	0.7920E-07	0.6336	0.2173E-04	0.1151

	LOWER 80. % CI	UPPER 80. % CI
Q 1	0.528038E-04	0.777431E-04
Q 2	0.116065E-03	0.153541E-03
Q 3	0.195847E-03	0.256823E-03
Q 4	0.251091E-03	0.347007E-03
Q 5	0.311452E-03	0.463932E-03
Q 6	0.435944E-03	0.713003E-03
Q 7	0.363137E-03	0.705006E-03
Q 8	0.448692E-04	0.627867E-04
Q 9	0.991114E-04	0.131147E-03
Q 10	0.195500E-03	0.251712E-03
Q 11	0.317280E-03	0.430807E-03
Q 12	0.407507E-03	0.551218E-03
Q 13	0.359008E-03	0.576648E-03
Q 14	0.425972E-03	0.768331E-03
Q 15	0.581905E-03	0.849728E-03
Q 16	0.486698E-03	0.606425E-03
Q 17	0.386956E-03	0.528414E-03
Q 19	0.842248E-04	0.174946E-03
Q 21	0.167670E-05	0.346849E-05
Q 22	0.121995E-04	0.162474E-04
Q 23	0.216791E-04	0.248333E-04
Q 24	0.213895E-04	0.245191E-04
Q 25	0.190392E-04	0.252692E-04

Bootstrap Output Variable: Fishing Mortality (2007)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AGE 1	0.0000	0.0000	0.000000	0.7193
AGE 2	0.0004	0.0005	0.000180	0.3776
AGE 3	0.0388	0.0403	0.010717	0.2657
AGE 4	0.1880	0.1940	0.047462	0.2446
AGE 5	0.4892	0.5077	0.151260	0.2979
AGE 6	0.6492	0.7011	0.268324	0.3827
AGE 7	0.2288	0.2890	0.246963	0.8546
AGE 8	0.3714	0.5913	0.645212	1.0911
AGE 9	0.1484	0.3630	0.603834	1.6637
AGE 10	0.4888	0.5279	0.202048	0.3827
AGE 11	0.4888	0.5279	0.202048	0.3827

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AGE 1	0.000000	0.000000	25.9547	0.0000	1.2235
AGE 2	0.000031	0.000006	6.9738	0.0004	0.4343
AGE 3	0.001556	0.000342	4.0140	0.0372	0.2880
AGE 4	0.006058	0.001513	3.2227	0.1819	0.2609
AGE 5	0.018527	0.004819	3.7875	0.4706	0.3214
AGE 6	0.051977	0.008643	8.0070	0.5972	0.4493
AGE 7	0.060197	0.008039	26.3126	0.1686	1.4650
AGE 8	0.219925	0.021557	59.2126	0.1515	4.2591
AGE 9	0.214574	0.020266	144.6129	-0.0662	-9.1219
AGE 10	0.039139	0.006508	8.0070	0.4497	0.4493
AGE 11	0.039139	0.006508	8.0070	0.4497	0.4493

	LOWER 80. % CI	UPPER 80. % CI
AGE 1	0.000000	0.000001
AGE 2	0.000284	0.000710
AGE 3	0.027715	0.053995
AGE 4	0.140155	0.254509
AGE 5	0.325552	0.702242
AGE 6	0.420262	1.058058
AGE 7	0.120909	0.499303
AGE 8	0.174605	1.208743
AGE 9	0.061730	0.855144
AGE 10	0.316457	0.796718
AGE 11	0.316457	0.796718

Bootstrap Output Variable: Average F (2007) AGES 5 - 7

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AVG F	0.4557	0.4993	0.136083	0.2726
N WTD	0.5685	0.5810	0.147049	0.2531
B WTD	0.5686	0.5816	0.150324	0.2584
C WTD	0.5845	0.6250	0.178702	0.2859

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AVG F	0.043567	0.004519	9.5605	0.4121	0.3302
N WTD	0.012503	0.004667	2.1994	0.5560	0.2645
B WTD	0.013043	0.004772	2.2939	0.5556	0.2706
C WTD	0.040489	0.005794	6.9270	0.5440	0.3285

	LOWER 80. % CI	UPPER 80. % CI
AVG F	0.355693	0.669985
N WTD	0.411017	0.781374
B WTD	0.408325	0.786745
C WTD	0.428986	0.863827

Bootstrap Output Variable: Biomass

JAN-1 Biomass (2008) Mean Biomass & SSB (2007)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
JAN-1	64636.	68657.	14733.	0.2146
MEAN	68452.	72310.	15634.	0.2162
SSB	33877.	35256.	5061.	0.1435

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
JAN-1	4021.	483.	6.2205	60615.	0.2431
MEAN	3857.	509.	5.6350	64595.	0.2420
SSB	1379.	166.	4.0692	32499.	0.1557

	LOWER 80. % CI	UPPER 80. % CI
JAN-1	51410.	87543.
MEAN	54179.	91739.
SSB	29133.	41747.

Plus Group Diagnostic Report

Calculation Method Selected = Backward

Year	Population Backward	Population Forward	F Forward	F Backward	Ratio
1982	79.	79.	0.608762	0.608767	1.000008
1983	35.	39.	0.766578	0.934197	1.218659
1984	36.	22.	2.291801	0.826494	0.360631
1985	21.	13.	2.078124	0.831750	0.400241
1986	113.	73.	2.078124	0.852346	0.410152
1987	5.	6.	0.850463	0.956784	1.125015
1988	2.	8.	0.154087	0.793888	5.152224
1989	13.	9.	2.078124	0.842174	0.405257
1990	30.	21.	2.078124	0.964190	0.463971
1991	2.	8.	0.141642	1.203272	8.495139
1992	0.	6.	0.000172	1.364055	7932.243093
1993	0.	6.	0.000179	1.150044	6423.409462
1994	2.	5.	0.302595	1.631834	5.392807
1995	0.	3.	0.071812	1.363187	18.982625
1996	0.	3.	0.000379	1.184958	3124.512926
1997	0.	2.	0.047392	1.015233	21.422228
1998	1.	2.	0.221488	0.685785	3.096259
1999	0.	2.	0.000451	0.550581	1221.900183
2000	0.	7.	0.000150	0.346290	2312.462606
2001	2.	6.	0.095719	0.448343	4.683963
2002	2.	6.	0.109135	0.513022	4.700795
2003	17.	17.	0.631774	0.663032	1.049475
2004	9.	17.	0.257924	0.519155	2.012819
2005	19.	26.	0.439374	0.648994	1.477087
2006	24.	21.	0.595954	0.524603	0.880275
2007	22.	24.	0.426115	0.470989	1.105310
2008	21.	23.	N/A	N/A	

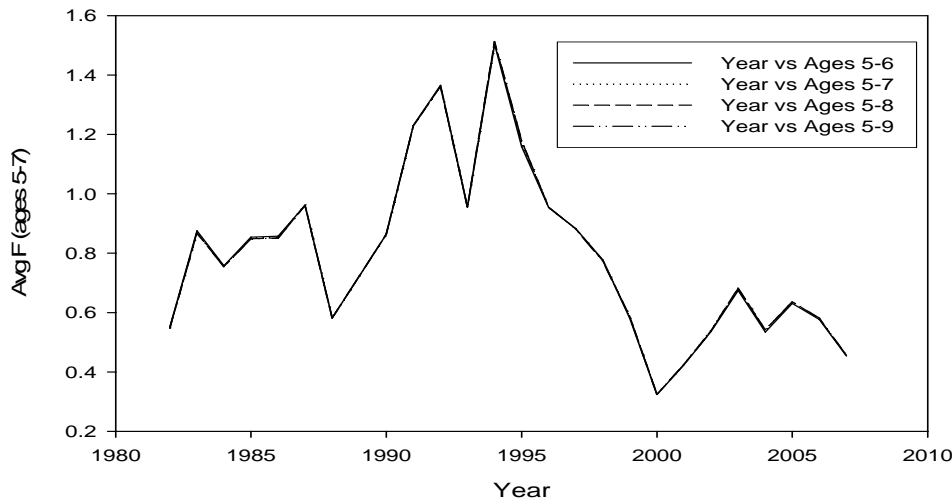
Warning **** Infeasible Mass Balance in Plus Group

Year = 1986
 Year = 1989
 Year = 1990
 Year = 1994
 Year = 1997
 Year = 2001

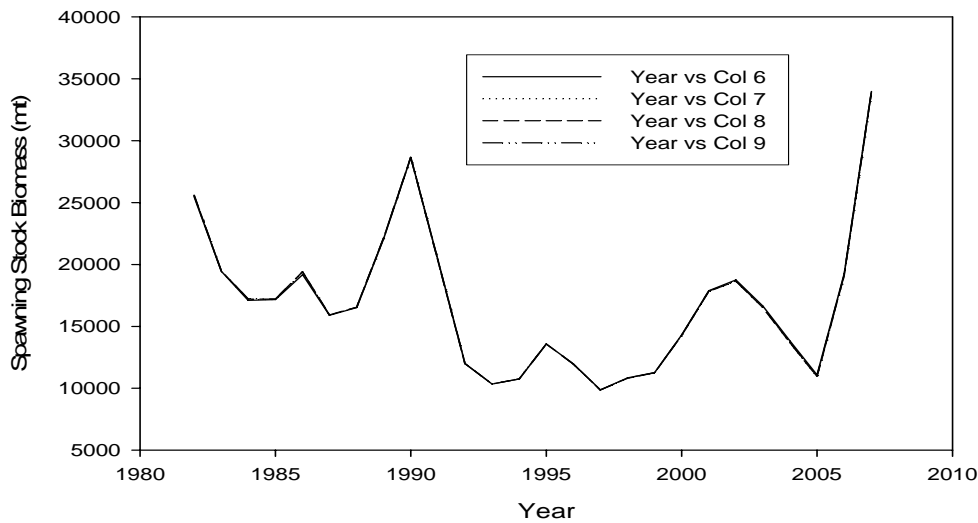
Appendix 3. F on Oldest True Age Explorations for the Gulf of Maine stock of Atlantic cod.

In the 11 plus VPA formulation, F on the oldest true age (age 10) was estimated in a series of trial VPAs using ages 5-6, 5-7, 5-8, and 5-9 as a basis for computing F on age 10. An additional exploration was conducted using ages 8-9. The following graphics show the impact on the average F (ages 5-7), spawning stock biomass, and F on age 10.

2D Graph 2

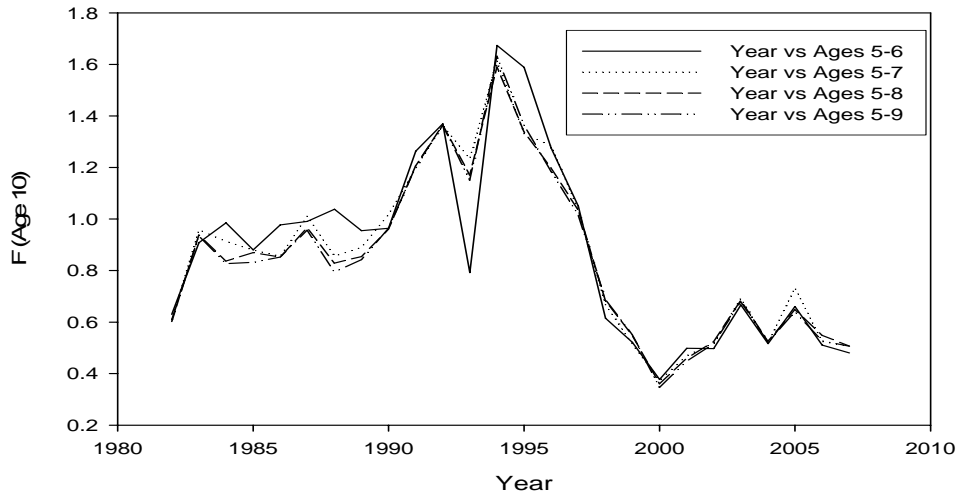


2D Graph 4



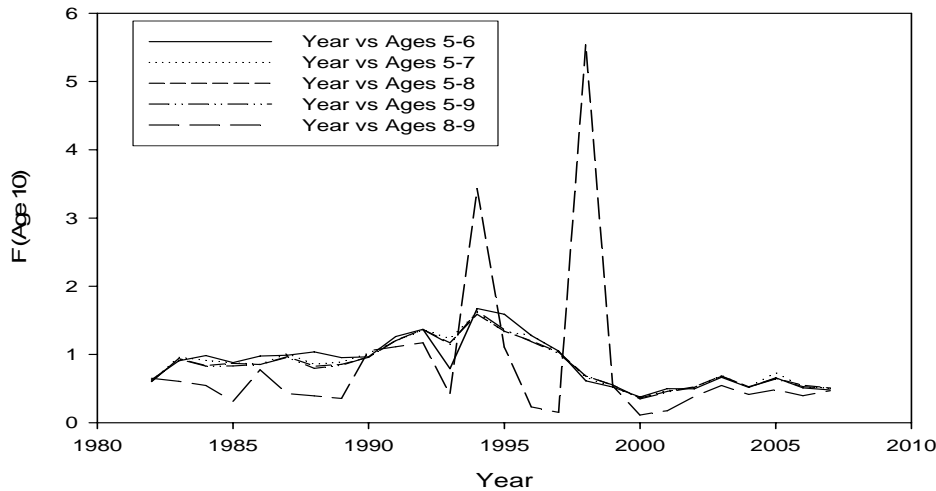
In each trial, the average F on the fully recruited ages (5-7) and the spawning stock biomass were not appreciably affected by the choice of age range.

2D Graph 3



The F on the oldest (age 10), however, was directly affected by the choice of age range. The age 5-6 range caused F to deviate from the other ranges, especially in 1993. Overall, the age range did not substantially affect the estimate of F on the oldest true age.

2D Graph 5



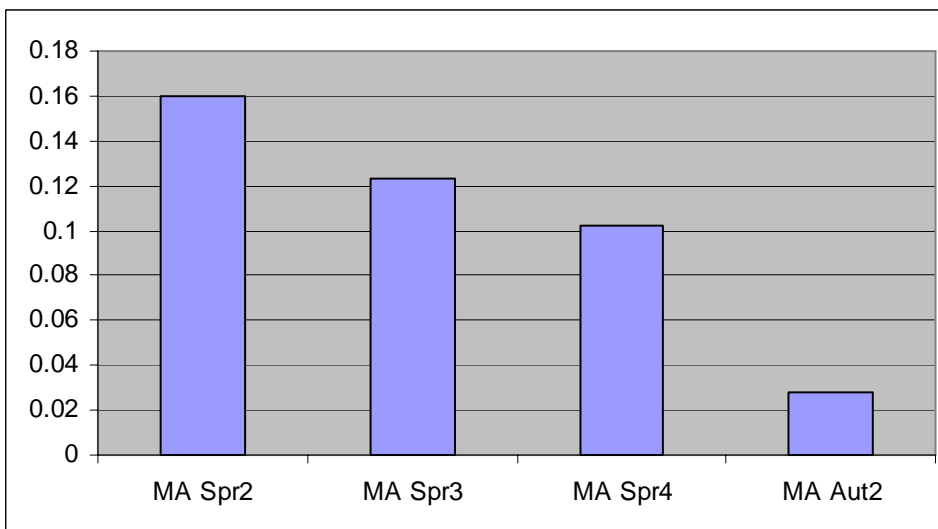
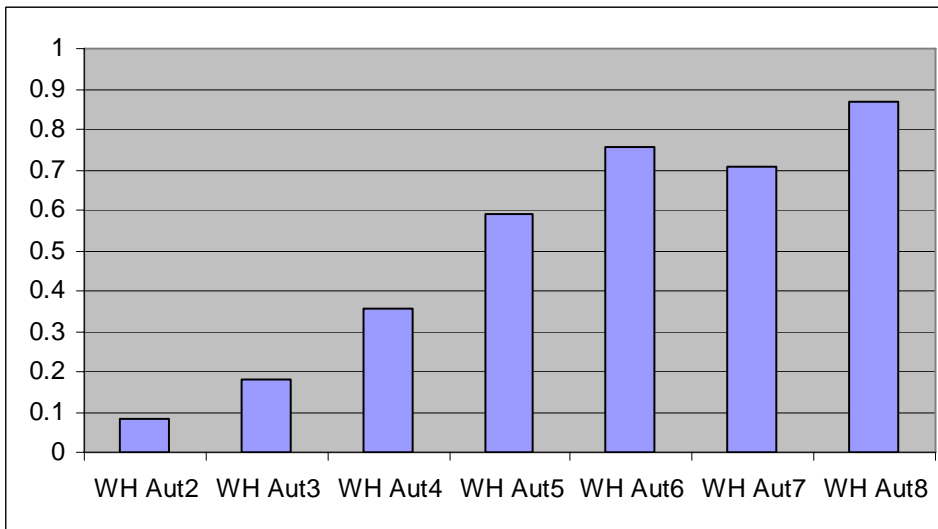
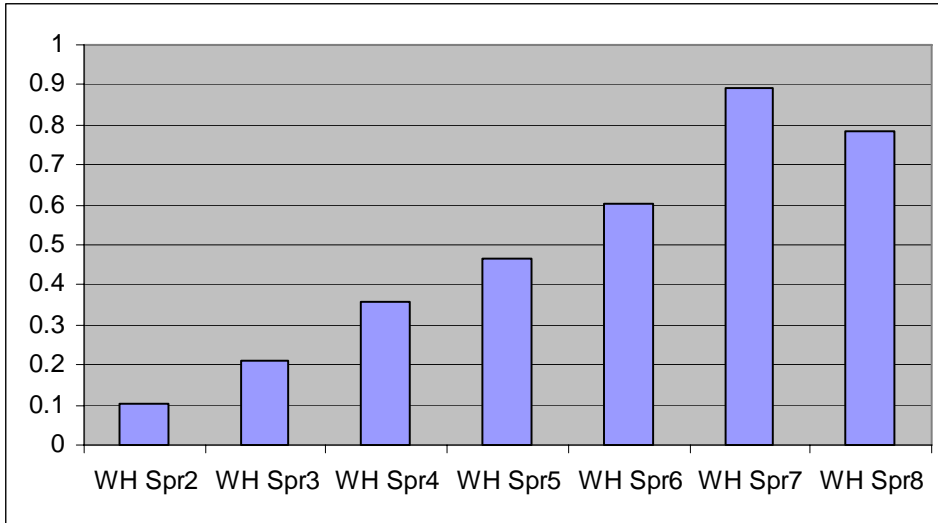
When ages 8-9 were included in the analysis, the estimate of F on age 10 was generally lower than the estimates obtained from the other age ranges, sometimes as much as 80-90% lower (1996 and 1997). In other cases (1994 and 1998), the estimates are as much as 2-6 times higher (1994 and 1998). The estimates of F on ages 8 and 9 are highly variable, especially during the 1990s.

Appendix 4. Swept area survey Q analyses for the Gulf of Maine stock of Atlantic cod.

Index	Index #	q	se	Q	CV	2 Std	NEFSC	
WH Spr2	1	0.000064	0.1547	0.10224	0.1547	0.031633	Area (sq mi) A	17892
WH Spr3	2	0.000132	0.1065	0.21087	0.1065	0.044915	Area Swept a	0.0112
WH Spr4	3	0.000225	0.1026	0.359438	0.1026	0.073757	Exp Fact	1597500
WH Spr5	4	0.000293	0.1308	0.468068	0.1308	0.122446	Exp Fact	
WH Spr6	5	0.000378	0.1666	0.603855	0.1666	0.201204	(1000s)	1597.5
WH Spr7	6	0.000557	0.1964	0.889808	0.1964	0.349516	MADMF	
WH Spr8	7	0.000491	0.2765	0.784373	0.2765	0.433758	Area (sq mi) A	869
WH Aut2	8	0.000053	0.1286	0.084668	0.1286	0.021776	Area Swept a	0.00385
WH Aut3	9	0.000113	0.1128	0.180518	0.1128	0.040725	Exp Fact	225714.3
WH Aut4	10	0.000224	0.1012	0.35784	0.1012	0.072427	Exp Fact	
WH Aut5	11	0.000369	0.1239	0.589478	0.1239	0.146073	(1000s)	225.7143
WH Aut6	12	0.000473	0.1185	0.755618	0.1185	0.179081		
WH Aut7	13	0.000442	0.1875	0.706095	0.1875	0.264786		
WH Aut8	14	0.000545	0.2305	0.870638	0.2305	0.401364		
MA Spr2	15	0.00071	0.1511	0.160257	0.1511	0.04843		
MA Spr3	16	0.000544	0.0868	0.122789	0.0868	0.021316		
MA Spr4	17	0.000453	0.1231	0.102249	0.1231	0.025174		
MA Aut2	19	0.000123	0.2996	0.027763	0.2996	0.016636		

Survey catchabilities (qs) obtained from the VPA (calibrated with number/per tow at age) were expanded on the basis of minimum swept area population numbers using the area of the strata used in the assessment ($A = 17,892$ sq mi) and the footprint of a standard tow ($a = 0.0112$ sq mi) for the NEFSC survey and the strata used in the assessment ($A = 869$ sq mi) and the footprint of a standard tow ($a = 0.00385$ sq mi) for the MA DMF survey. The expansion factor: $(A/a * 1/1000)$ converts survey qs from a kg/tow basis to a swept area basis (Q).

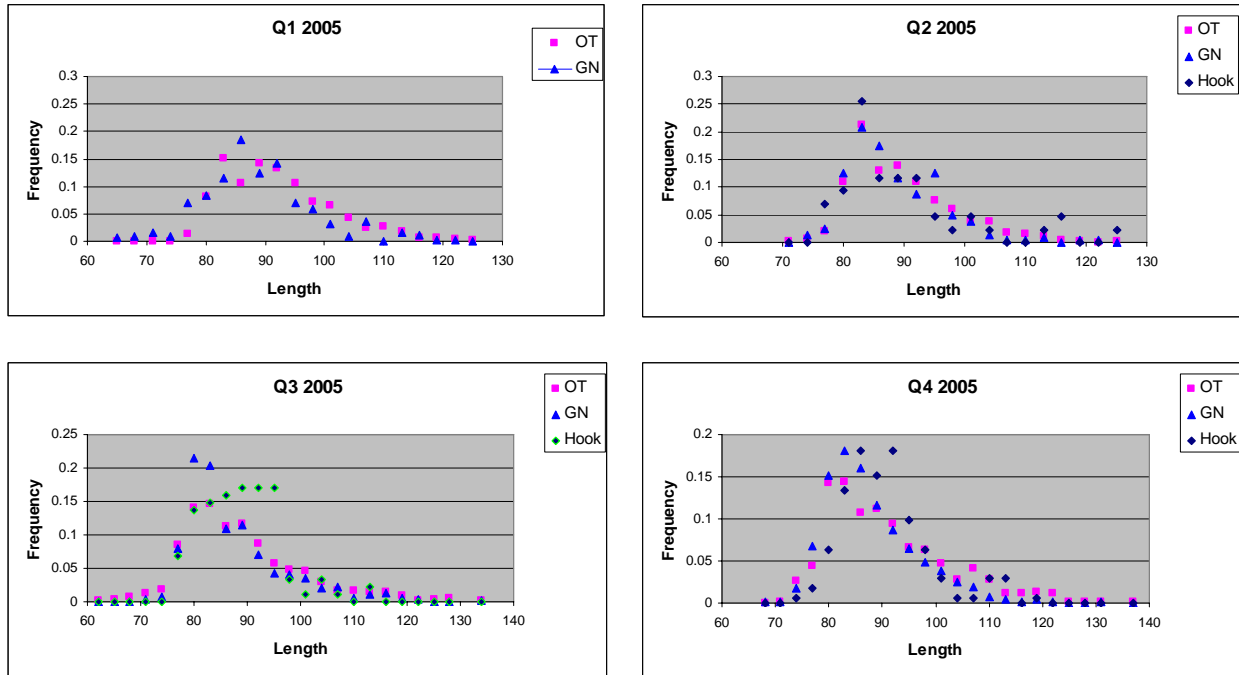
As the figures below show, the NEFSC survey Qs start at about 10% at age 2, increase through age 5 or 6 and then level off at about 70-90%. The MA DMF spring Qs show a continuously declining trend from age 2 to age 4, reflecting the movement of fish out of the survey area as they grow older



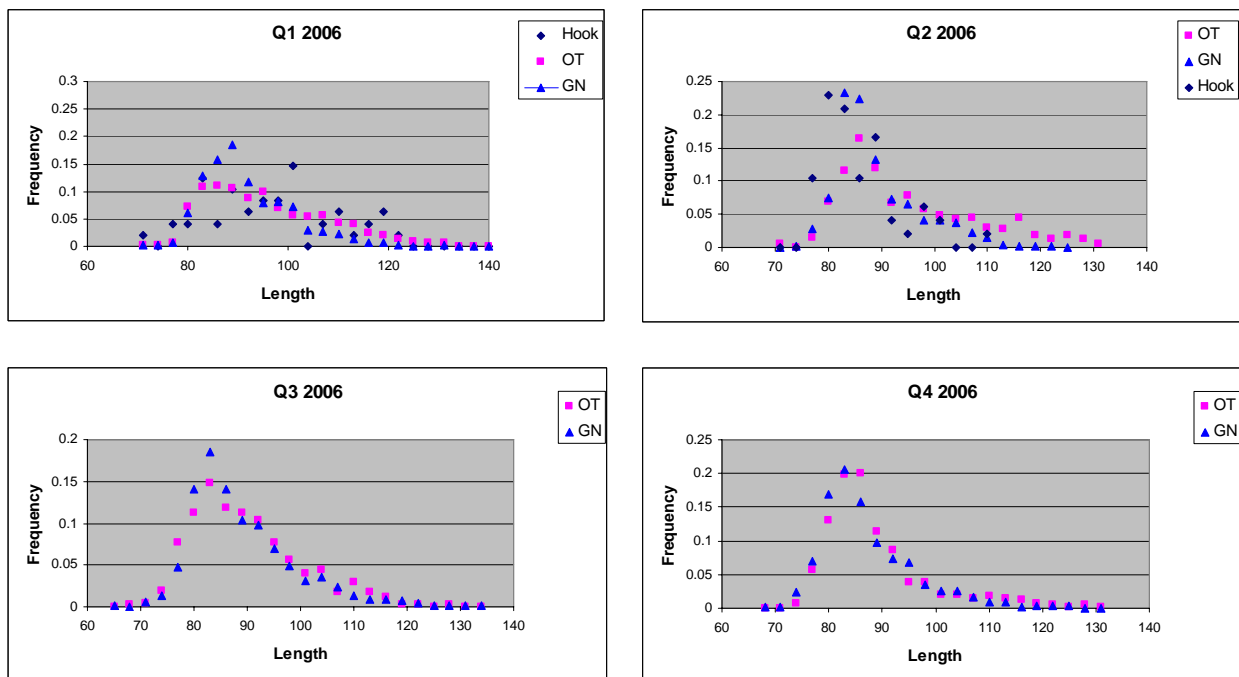
Appendix 5. Length frequency of landed large cod by major gear and quarter, 2005-2007 for the Gulf of Maine stock of Atlantic cod.

Commercial port samples collected in 2005, 2006 and 2007 were used to construct length frequency plots of landed large cod by major gear type (hooks, trawls and gillnets) and quarter. The dominant length modes coincide for all 3 gear types. Although the proportions are low for the largest fish, trawls and gillnets are capable of capturing fish as large as 135+ cm (51+ in). Hook gear tends to take somewhat smaller cod, although some catches out to 125 cm have been recorded.

2005



2006



2007

