

## Appendix H. Gulf of Maine – Georges Bank American plaice by Loretta O'Brien, Jay Burnett , and Michele Traver

Appendix H. Table H1. Bootstrapped estimates of mean landings in numbers, with standard deviation (Stdev) and coefficient of variation (CV), and average length and weight with 5% confidence intervals (5% CI, 95% CI) at age

YEAR	Gulf of Maine											Georges Bank										
	Age	Mean Catch	Stdev	CV	Length			Weight			Age	Mean Catc	Stdev	CV	Length			Weight				
					Average	5% CI	95% CI	Average	5% CI	95% CI					Average	5% CI	95% CI	Average	5% CI	95% CI		
2003	4	121373	61040.49	0.50	35.935	35.192	36.798	0.395	0.369	0.427	4	18324	20691.28	1.13	36.763	0	38	0.424	0	0.472		
	5	641249	59791.17	0.09	37.209	36.855	37.636	0.446	0.431	0.464	5	95926	45619.39	0.48	37.112	36.25	38.867	0.44	0.405	0.524		
	6	724331	53850.96	0.07	39.264	38.903	39.652	0.536	0.521	0.554	6	318260	74368.41	0.23	41.076	40.163	42.034	0.623	0.572	0.677		
	7	380708	40874.67	0.11	42.01	41.396	42.71	0.675	0.644	0.711	7	288011	46336.09	0.16	43.184	42.58	43.783	0.735	0.7	0.77		
	8	275690	27778.66	0.10	44.97	44.172	45.769	0.846	0.801	0.89	8	209754	44891.03	0.21	45.621	44.814	46.823	0.89	0.837	0.976		
	9	122912	12307	0.10	47.639	46.561	48.505	1.027	0.962	1.083	9	119416	29827.97	0.25	46.264	44.52	48.63	0.956	0.84	1.122		
	10	88951	12092.29	0.14	47.993	46.897	49.036	1.059	0.992	1.133	10	52166	23966.4	0.46	49.596	46.576	54.747	1.21	0.986	1.61		
	11	46010	8141.45	0.18	49.486	47.62	51.042	1.176	1.07	1.294	11	19747	10464.62	0.53	51.556	47.925	57.123	1.356	1.063	1.865		
	12	13087	3331.84	0.25	52.212	50.354	54.114	1.401	1.25	1.572	12	10070	7117	0.71	54.375	52.929	59	1.586	1.444	2.058		
	13	5403	3727.05	0.69	53.254	49.221	58	1.513	1.226	1.95	13	1616	1787.39	1.11	54	0	54	1.531	0	1.531		
	14	2163	993.67	0.46	52.853	51.474	55.727	1.445	1.313	1.733	14	1871	1860.87	0.99	55.385	0	62	1.672	0	2.43		
	15	605	420.95	0.70	57	0	66	1.896	0	2.995	15	1244	882.28	0.71	59.372	0	62	2.109	0	2.43		
	2004	3										3	8676	7026.83	0.81	34.4	32.742	35	0.34	0.288	0.359	
		4	63995	16941.22	0.26	36.961	36.106	37.793	0.433	0.4	0.466	4	77740	26973.58	0.35	37.365	36.265	38.249	0.449	0.406	0.489	
		5	312148	38419.34	0.12	37.515	37.13	37.859	0.456	0.441	0.471	5	157236	23926.21	0.15	38.688	37.867	39.451	0.512	0.474	0.548	
6		539603	32973.76	0.06	39.501	39.113	40.072	0.548	0.531	0.576	6	269574	39632.04	0.15	39.956	39.172	40.788	0.574	0.537	0.614		
7		273875	34504.72	0.13	41.719	41.205	42.34	0.661	0.634	0.693	7	146571	18649.88	0.13	43.56	42.408	44.758	0.766	0.699	0.84		
8		206459	27493.88	0.13	44.173	43.558	45.564	0.802	0.767	0.883	8	116892	22875.12	0.20	44.437	43.224	46.124	0.839	0.764	0.951		
9		109896	13118.82	0.12	46.79	45.914	47.751	0.971	0.915	1.033	9	57978	12151.3	0.21	48.857	47.59	50.728	1.142	1.043	1.285		
10		44927	9013.48	0.20	47.124	45.686	48.912	1.002	0.907	1.123	10	33243	13130.16	0.40	47.467	45.171	51.179	1.033	0.866	1.33		
11		26445	4645.92	0.18	48.78	46.766	50.84	1.148	1.009	1.293	11	21298	8875.66	0.42	49.45	46.929	54.633	1.204	0.987	1.649		
12		6113	1745.55	0.29	52.374	50.921	53.89	1.401	1.275	1.535	12	10408	8710.93	0.84	48.177	0	57	1.083	0	1.852		
13		4385	1772.16	0.40	52.575	50.651	54.711	1.424	1.261	1.617												
14		1683	957.72	0.57	54.348	51.706	56.824	1.582	1.365	1.828	14	577	995.45	1.72								
15		235	156.49	0.67	55.389	52	59.31	1.684	1.349	2.095												
2005		3										3	2760	2391.39	0.87	37	0	37	0.432	0	0.432	
		4	55806	20451.62	0.37	36.289	35.602	36.974	0.408	0.383	0.434	4	130609	17945.66	0.14	36.411	35.906	36.809	0.413	0.393	0.429	
	5	337958	35010.32	0.10	38.137	37.861	38.389	0.483	0.471	0.494	5	250463	31662.41	0.13	38.265	37.725	38.877	0.491	0.469	0.516		
	6	349848	32468.56	0.09	39.754	39.349	40.228	0.561	0.542	0.582	6	204810	21103.92	0.10	40.108	39.444	40.875	0.582	0.55	0.618		
	7	212722	22920.28	0.11	42.096	41.465	42.747	0.684	0.653	0.719	7	154143	26025.59	0.17	42.725	41.689	44.044	0.722	0.665	0.793		
	8	96617	13459.16	0.14	44.783	44.085	45.645	0.835	0.793	0.887	8	63540	10143.65	0.16	46.092	45.343	47.016	0.918	0.867	0.98		
	9	56631	9150.59	0.16	46.844	45.418	48.088	0.975	0.889	1.055	9	36807	8431.68	0.23	46.41	44.456	48.94	0.956	0.833	1.115		
	10	31525	7026.8	0.22	47.158	45.569	49.044	1.004	0.899	1.113	10	9804	2914.52	0.30	51.113	50.144	52.221	1.303	1.224	1.391		
	11	18296	4313.46	0.24	50.301	49.361	51.396	1.219	1.149	1.311	11	5806	1646.54	0.28	52.676	50.285	55.113	1.438	1.233	1.658		
	12	7425	3516.19	0.47	47.159	44.475	52.678	1.021	0.828	1.426	12	6978	2315.46	0.33	51.058	48.998	52.862	1.289	1.126	1.434		
	13	3627	1629.78	0.45	52.346	50.838	54.022	1.387	1.254	1.548	13	2649	1191.04	0.45	51.74	49.373	55.338	1.352	1.156	1.662		
	14	1726	1165.54	0.68	53.764	51.684	55.97	1.517	1.328	1.734	14	567	433.41	0.76	56.831	0	59	1.819	0	2.058		
	15	776	1029.15	1.33	53	0	53	1.438	0	1.438	15	399	410.71	1.03	53	0	53	1.438	0	1.438		

Appendix H. Table H1 continued. Bootstrapped estimates of mean landings in numbers, with standard deviation (Stdev) and coefficient of variation (CV), and average length and weight with confidence intervals (5% CI, 95% CI) , at age, for American plaice, 2003-2007

<b>2006</b>	3										3	2245	2277.92	1.01	34	0	34	0.326	0	0.326
	4	71243	16414.63	0.23	36.724	36.159	37.275	0.424	0.402	0.446	4	85354	13899.22	0.16	37.062	36.675	37.469	0.438	0.421	0.456
	5	257796	31417.66	0.12	37.652	37.319	38.061	0.463	0.449	0.481	5	230286	24587.07	0.11	38.567	38.106	38.956	0.504	0.484	0.52
	6	214990	29231.96	0.14	39.389	38.957	39.838	0.541	0.522	0.563	6	176564	24138.32	0.14	41.226	40.618	41.985	0.637	0.607	0.675
	7	169875	33267.54	0.20	40.963	40.134	42.414	0.623	0.581	0.695	7	110260	18343.21	0.17	43.607	43.025	44.278	0.766	0.733	0.807
	8	99224	11534.42	0.12	44.564	43.78	45.276	0.82	0.776	0.863	8	69859	9452.87	0.14	45.456	44.533	46.303	0.891	0.836	0.946
	9	57051	10638.29	0.19	45.294	43.935	46.697	0.873	0.795	0.96	9	32295	4884.53	0.15	47.742	46.688	48.916	1.052	0.974	1.139
	10	41034	8842.36	0.22	46.686	45.493	48.189	0.962	0.885	1.062	10	10804	2363.07	0.22	50.963	49.869	52.152	1.287	1.19	1.393
	11	15437	5075.82	0.33	48.746	46.396	51.251	1.114	0.953	1.3	11	9489	2366.06	0.25	51.758	49.492	53.948	1.37	1.18	1.559
	12	7427	3635.37	0.49	51.835	50.449	53.689	1.349	1.235	1.517	12	2435	1214.19	0.50	54.873	51.455	60.208	1.67	1.324	2.24
	13	2115	1232.96	0.58	52.624	50.943	55.97	1.42	1.267	1.755	13	1415	657.83	0.46	54.657	51.294	58.351	1.623	1.302	2.012
	14	1185	606.09	0.51	54.461	53.18	55.375	1.577	1.455	1.665	14	308	234.67	0.76	54.631	0	56	1.595	0	1.729
	15	1989	2080.71	1.05	53.723	52	57.571	1.515	1.349	1.897	15	147	200.46	1.36						
<b>2007</b>	3										3	18293	13455.03	0.74	35.637	0	36.165	0.382	0	0.401
	4	73360	27600.5	0.38	37.192	36.63	38.324	0.444	0.421	0.492	4	182533	27657.49	0.15	35.672	35.436	35.992	0.385	0.376	0.397
	5	372751	57933.98	0.16	37.876	37.168	38.341	0.473	0.445	0.492	5	212803	34719.88	0.16	37.691	37.236	38.239	0.466	0.447	0.489
	6	282839	43098.41	0.15	39.315	38.537	40.15	0.543	0.508	0.582	6	125986	16895.72	0.13	40.225	39.447	41.152	0.586	0.55	0.633
	7	137063	24917.26	0.18	41.992	40.667	43.253	0.679	0.615	0.745	7	55387	14026.68	0.25	41.37	40.248	43.731	0.649	0.591	0.77
	8	80369	21578.32	0.27	44.114	41.481	46.185	0.803	0.664	0.917	8	27632	7709.54	0.28	46.448	44.885	48.447	0.949	0.849	1.082
	9	53043	14383.79	0.27	45.787	42.303	47.785	0.921	0.724	1.038	9	13474	3491.69	0.26	51.897	49.407	54.074	1.368	1.153	1.565
	10	20473	3930.33	0.19	49.334	48.17	50.71	1.15	1.065	1.257	10	9638	4832.51	0.50	46.441	42.171	52.138	0.973	0.718	1.369
	11	10467	2530.08	0.24	50.483	49.382	51.683	1.241	1.15	1.337	11	3546	1241.23	0.35	52.964	52.1	54.586	1.449	1.364	1.608
	12	2665	1054.52	0.40	51.743	50.123	54.159	1.342	1.201	1.559	12	3182	1559.82	0.49	54.495	51.814	56.699	1.592	1.357	1.809
	13	1258	661.55	0.53	53.578	51.185	57.148	1.511	1.29	1.865	13	5371	2798.47	0.52	56.667	54	62	1.83	1.531	2.43
	14	1155	925.83	0.80	51.733	49	56	1.342	1.106	1.729	14	955	565.83	0.59	58.906	57.211	60	2.051	1.857	2.177
	15										15	1019	668.75	0.66	58.198	53	61.9	1.998	1.438	2.417

**Appendix H. Table H2. VPA output and diagnostics for GB-GB American plaice.**

VPA Version 2.7.1

Model ID: American Plaice Gulf of Maine-Georges Bank 2007 Base Run

Input File: C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.DAT

Date of Run: 20-JUL-2008

Time of Run: 13:47

Levenburg-Marquardt Algorithm Completed 9 Iterations

Residual Sum of Squares = 300.043

Number of Residuals = 743  
 Number of Parameters = 10  
 Degrees of Freedom = 733  
 Mean Squared Residual = 0.409336  
 Standard Deviation = 0.639793

Number of Years = 28  
 Number of Ages = 11  
 First Year = 1980  
 Youngest Age = 1  
 Oldest True Age = 10

Number of Survey Indices Available = 30  
 Number of Survey Indices Used in Estimate = 27

VPA Classic Method - Auto Estimated Q's

Stock Numbers Predicted in Terminal Year Plus One (2008)

Age	Stock Predicted	Std. Error	CV
1	42084.333	0.274534E+05	0.652342E+00
2	19084.898	0.559295E+04	0.293056E+00
3	34216.404	0.749229E+04	0.218968E+00
4	23147.560	0.423645E+04	0.183019E+00
5	15758.500	0.259021E+04	0.164369E+00
6	7052.158	0.113337E+04	0.160712E+00
7	6866.112	0.105831E+04	0.154136E+00
8	1632.210	0.330953E+03	0.202763E+00
9	1801.068	0.358493E+03	0.199044E+00
10	2375.051	0.443839E+03	0.186875E+00

Catchability Values for Each Survey Used in Estimate

INDEX	Catchability	Std. Error	CV
1	0.756315E-02	0.142550E-02	0.188479E+00
2	0.117776E+00	0.131015E-01	0.111241E+00
3	0.237083E+00	0.226727E-01	0.956320E-01
4	0.345291E+00	0.278629E-01	0.806939E-01
5	0.332013E+00	0.234096E-01	0.705080E-01
6	0.270544E+00	0.198359E-01	0.733185E-01

7	0.239287E+00	0.222962E-01	0.931778E-01
8	0.178071E+00	0.243164E-01	0.136554E+00
9	0.183208E+00	0.279889E-01	0.152771E+00
11	0.106649E+00	0.124861E-01	0.117077E+00
12	0.299685E+00	0.259527E-01	0.865999E-01
13	0.454693E+00	0.396251E-01	0.871469E-01
14	0.545345E+00	0.407639E-01	0.747489E-01
15	0.521424E+00	0.446796E-01	0.856877E-01
16	0.460618E+00	0.447785E-01	0.972141E-01
17	0.328359E+00	0.416616E-01	0.126878E+00
18	0.310350E+00	0.441360E-01	0.142214E+00
20	0.421847E-01	0.102605E-01	0.243227E+00
21	0.234209E+00	0.370230E-01	0.158077E+00
22	0.318789E+00	0.249546E-01	0.782794E-01
23	0.228953E+00	0.182832E-01	0.798555E-01
24	0.128202E+00	0.126938E-01	0.990135E-01
26	0.265599E+00	0.400073E-01	0.150631E+00
27	0.341196E+00	0.393301E-01	0.115271E+00
28	0.271214E+00	0.304525E-01	0.112282E+00
29	0.140295E+00	0.194801E-01	0.138851E+00
30	0.542392E-01	0.102775E-01	0.189484E+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
- Catch Equation 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 5 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 6 to 9
- Calculation of Population of Age 1 In Year 2008  
= Stock Estimate

Stock Estimates

Age	1
Age	2
Age	3
Age	4
Age	5
Age	6
Age	7

Age 8  
 Age 9  
 Age 10

Full F in Terminal Year = 0.0646

F in Oldest True Age in Terminal Year = 0.0646

Full F Calculated Using Classic Method

Age	Input Partial Recruitment	Calc Partial Recruitment	Fishing Mortality	Used In Full F	Comments
1	0.000	0.067	0.0075	NO	Stock Estimate in T+1
2	0.050	0.055	0.0063	NO	Stock Estimate in T+1
3	0.050	0.077	0.0087	NO	Stock Estimate in T+1
4	0.250	0.298	0.0336	NO	Stock Estimate in T+1
5	0.760	0.869	0.0981	NO	Stock Estimate in T+1
6	1.000	0.576	0.0650	YES	Stock Estimate in T+1
7	1.000	1.000	0.1129	YES	Stock Estimate in T+1
8	1.000	0.486	0.0548	YES	Stock Estimate in T+1
9	1.000	0.227	0.0256	YES	Stock Estimate in T+1
10	1.000	0.572	0.0646		Input PR * Full F

Catch At Age - Input Data

AGE	1980	1981	1982	1983	1984
1	5.2	5.1	9.6	14.5	2.5
2	98.9	981.8	603.2	662.8	370.5
3	1071.7	2191.8	3348.1	1478.2	990.6
4	2671.5	5055.3	4574.0	5176.8	2422.1
5	3938.7	5337.2	4503.1	4917.9	6031.2
6	3933.3	3648.1	3598.6	3913.0	3244.4
7	3632.0	2400.8	3297.0	2270.2	1935.6
8	1185.4	1581.6	2037.6	1272.1	580.3
9	1138.6	645.1	1256.1	701.2	273.8
10	849.9	439.8	736.7	449.6	307.2
11	1380.4	620.9	717.4	911.4	768.9
AGE	1985	1986	1987	1988	1989
1	64.8	59.3	38.5	313.5	15.5
2	157.8	638.7	589.6	785.5	2275.0
3	1217.4	738.0	1840.5	1839.5	2605.8
4	1336.4	2284.0	1439.2	1833.4	2517.3
5	2404.6	1700.0	2282.3	1597.4	1521.9
6	2872.0	1476.5	1336.9	1444.4	827.2
7	2228.2	1307.1	895.0	552.8	835.5
8	1081.3	631.5	542.9	270.3	534.5
9	438.1	254.9	187.2	177.1	195.6
10	267.1	104.8	61.6	88.2	103.6
11	181.9	99.9	59.9	55.3	118.0

AGE	1990	1991	1992	1993	1994
1	0.0	0.4	9.6	21.8	58.2
2	1094.4	255.2	244.5	280.6	885.8
3	4725.5	1030.8	861.7	421.6	406.9
4	3606.7	5997.5	1604.6	1774.5	1710.6
5	1971.8	4865.9	5810.5	2382.2	2840.7
6	696.0	1260.9	2649.2	2578.6	1341.7
7	367.2	326.5	848.7	1384.1	1158.2
8	404.1	165.8	190.7	264.9	597.0
9	193.0	201.6	131.2	286.6	234.7
10	96.1	97.0	117.6	151.2	149.7
11	161.0	104.1	93.5	124.8	290.5

Catch At Age - Input Data

AGE	1995	1996	1997	1998	1999
1	45.3	12.5	14.7	37.2	4.2
2	2433.7	1149.7	636.1	85.5	216.3
3	1572.9	1257.3	336.9	348.7	169.0
4	2359.5	3732.1	2317.2	866.1	1136.2
5	3294.4	2712.5	3615.0	2859.4	1674.7
6	1854.2	1506.3	1716.5	2603.7	2352.1
7	654.6	566.3	633.9	1071.4	1388.6
8	588.5	242.6	182.1	317.9	488.4
9	210.3	126.4	84.9	59.5	149.7
10	52.6	36.8	66.3	56.8	42.3
11	49.6	68.3	116.2	154.5	79.0

AGE	2000	2001	2002	2003	2004
1	2.7	0.0	1.1	11.9	6.1
2	303.0	91.7	12.9	689.2	140.0
3	442.2	413.8	108.7	45.5	226.2
4	797.2	958.8	771.8	297.1	440.3
5	1650.5	2296.8	1449.5	1238.0	923.9
6	2223.8	2198.0	1810.7	1275.1	1195.3
7	1755.2	1579.0	1191.3	743.8	508.0
8	567.3	911.8	516.1	557.3	364.4
9	138.2	293.4	283.1	278.7	195.3
10	69.8	56.3	161.4	153.9	77.3
11	19.8	51.8	177.2	119.0	73.8

AGE	2005	2006	2007
1	34.3	28.4	160.0
2	283.5	83.4	237.7
3	106.5	114.0	223.7
4	434.2	477.6	596.4

5	989.7	768.1	806.2
6	766.8	535.7	511.0
7	442.2	353.5	216.3
8	177.3	191.2	112.5
9	97.2	99.4	68.3
10	42.3	59.9	33.4
11	48.8	43.5	30.8

Weight At Age - Input Data

AGE	1980	1981	1982	1983	1984
1	0.0300	0.0320	0.0180	0.0130	0.0040
2	0.0760	0.1080	0.1150	0.0330	0.0450
3	0.1540	0.1680	0.2300	0.1850	0.1610
4	0.2670	0.3160	0.2900	0.3780	0.3030
5	0.4090	0.4420	0.4180	0.5300	0.5240
6	0.6530	0.7780	0.5640	0.6700	0.6300
7	0.8290	0.8850	0.9600	0.8230	0.8880
8	1.0390	0.9780	1.1380	1.0420	1.1870
9	1.1830	1.1300	1.1960	1.2380	1.1330
10	1.3740	1.2540	1.5520	1.4460	1.3690
11	1.8950	1.5510	1.9010	1.6800	1.9580
AGE	1985	1986	1987	1988	1989
1	0.0180	0.0160	0.0130	0.0160	0.0090
2	0.0580	0.0420	0.0460	0.0460	0.0350
3	0.0840	0.1380	0.1310	0.1590	0.1050
4	0.2090	0.2290	0.2340	0.2840	0.2410
5	0.3310	0.3840	0.4090	0.4490	0.3620
6	0.5340	0.5870	0.6090	0.6410	0.4540
7	0.8470	0.8420	0.8920	0.8800	0.6970
8	1.1670	1.1740	1.1730	1.2310	0.8010
9	1.3770	1.4910	1.4830	1.3960	1.3270
10	1.6650	1.7470	1.7320	1.7170	1.4620
11	2.1280	2.1940	2.2840	2.2380	1.9260
AGE	1990	1991	1992	1993	1994
1	0.0110	0.0040	0.0060	0.0030	0.0040
2	0.0380	0.0270	0.0320	0.0310	0.0260
3	0.1200	0.1100	0.1140	0.2280	0.1890
4	0.2540	0.3030	0.3200	0.3680	0.3600
5	0.4010	0.4450	0.5010	0.4890	0.4600
6	0.5540	0.6780	0.7270	0.6340	0.6080
7	0.7170	0.9580	0.9250	0.9440	0.7940
8	0.8760	1.1570	1.2400	1.2340	1.0830
9	1.0880	1.2740	1.3190	1.3940	1.2890
10	1.3050	1.5410	1.6400	1.5770	1.4240
11	1.6960	1.8130	2.0070	2.3130	2.4240

Weight At Age - Input Data

AGE	1995	1996	1997	1998	1999
1	0.0060	0.0030	0.0060	0.0130	0.0080
2	0.0270	0.0370	0.0210	0.0300	0.0190
3	0.1280	0.0990	0.1460	0.1010	0.0830
4	0.3050	0.3170	0.3470	0.2450	0.2510
5	0.4890	0.4950	0.4200	0.3480	0.3970
6	0.6650	0.6350	0.6010	0.4980	0.5130
7	0.9050	0.8840	0.8070	0.7860	0.6850
8	1.1550	1.2030	1.1270	1.0310	0.8720
9	1.0990	1.3900	1.3360	1.3500	1.1090
10	2.1040	1.5810	1.5700	1.4630	1.4580
11	1.9200	2.2270	2.4250	3.2930	1.9080
AGE	2000	2001	2002	2003	2004
1	0.0130	0.0110	0.0020	0.0270	0.0050
2	0.0190	0.0190	0.0350	0.0240	0.0190
3	0.1850	0.0750	0.1360	0.0950	0.0750
4	0.3240	0.3170	0.2960	0.2820	0.2420
5	0.4640	0.4300	0.4150	0.3830	0.3740
6	0.5720	0.5220	0.5060	0.5300	0.4860
7	0.7630	0.6960	0.6690	0.6830	0.6470
8	1.0070	0.8350	0.8840	0.8200	0.7820
9	1.0940	1.0450	1.0430	0.9500	0.9720
10	1.4110	1.4540	1.2240	1.1060	1.0090
11	1.8640	1.5290	1.4460	1.2430	1.2070
AGE	2005	2006	2007		
1	0.0090	0.0100	0.0080		
2	0.0170	0.0330	0.0330		
3	0.0700	0.1100	0.1720		
4	0.2910	0.2930	0.3160		
5	0.3990	0.4160	0.4300		
6	0.5070	0.5220	0.5150		
7	0.6410	0.6210	0.6440		
8	0.8480	0.8230	0.8250		
9	0.9460	0.9220	0.9810		
10	1.0730	0.9830	1.0230		
11	1.2800	1.2960	1.5110		

JAN-1 Weights at Age - Input Data

AGE	1980	1981	1982	1983	1984
1	0.0158	0.0169	0.0133	0.0070	0.0011



2	0.0511	0.0569	0.0607	0.0244	0.0242
3	0.1075	0.1130	0.1576	0.1459	0.0729
4	0.2075	0.2206	0.2207	0.2949	0.2368
5	0.2965	0.3435	0.3634	0.3920	0.4451
6	0.5609	0.5641	0.4993	0.5292	0.5778
7	0.7632	0.7602	0.8642	0.6813	0.7713
8	0.9963	0.9004	1.0036	1.0002	0.9884
9	1.1490	1.0835	1.0815	1.1869	1.0865
10	1.2749	1.2180	1.3243	1.3151	1.3019
11	1.8950	1.5510	1.9010	1.6800	1.9580
AGE	1985	1986	1987	1988	1989
<hr/>					
1	0.0118	0.0094	0.0069	0.0108	0.0044
2	0.0152	0.0275	0.0271	0.0245	0.0237
3	0.0615	0.0895	0.0742	0.0855	0.0695
4	0.1834	0.1387	0.1797	0.1929	0.1958
5	0.3167	0.2833	0.3060	0.3241	0.3206
6	0.5290	0.4408	0.4836	0.5120	0.4515
7	0.7305	0.6705	0.7236	0.7321	0.6684
8	1.0180	0.9972	0.9938	1.0479	0.8396
9	1.2785	1.3191	1.3195	1.2797	1.2781
10	1.3735	1.5510	1.6070	1.5957	1.4286
11	2.1280	2.1940	2.2840	2.2380	1.9260
AGE	1990	1991	1992	1993	1994
<hr/>					
1	0.0070	0.0014	0.0026	0.0010	0.0015
2	0.0185	0.0172	0.0113	0.0136	0.0088
3	0.0648	0.0647	0.0555	0.0854	0.0765
4	0.1633	0.1907	0.1876	0.2048	0.2865
5	0.3109	0.3362	0.3896	0.3956	0.4114
6	0.4478	0.5214	0.5688	0.5636	0.5453
7	0.5705	0.7285	0.7919	0.8284	0.7095
8	0.7814	0.9108	1.0899	1.0684	1.0111
9	0.9335	1.0564	1.2353	1.3147	1.2612
10	1.3160	1.2948	1.4455	1.4422	1.4089
11	1.6960	1.8130	2.0070	2.3130	2.4240

JAN-1 Weights at Age - Input Data

AGE	1995	1996	1997	1998	1999
1	0.0024	0.0011	0.0027	0.0108	0.0052
2	0.0104	0.0149	0.0079	0.0134	0.0157
3	0.0577	0.0517	0.0735	0.0461	0.0499
4	0.2401	0.2014	0.1853	0.1891	0.1592
5	0.4196	0.3886	0.3649	0.3475	0.3119
6	0.5531	0.5572	0.5454	0.4573	0.4225
7	0.7418	0.7667	0.7159	0.6873	0.5841
8	0.9576	1.0434	0.9981	0.9121	0.8279
9	1.0910	1.2671	1.2678	1.2335	1.0693
10	1.6468	1.3182	1.4773	1.3981	1.4030
11	1.9200	2.2270	2.4250	3.2930	1.9080
AGE	2000	2001	2002	2003	2004
1	0.0108	0.0062	0.0006	0.0322	0.0027
2	0.0123	0.0157	0.0196	0.0069	0.0226
3	0.0593	0.0377	0.0508	0.0577	0.0424
4	0.1640	0.2422	0.1490	0.1958	0.1516
5	0.3413	0.3733	0.3627	0.3367	0.3248
6	0.4765	0.4921	0.4665	0.4690	0.4314
7	0.6256	0.6310	0.5909	0.5879	0.5856
8	0.8305	0.7982	0.7844	0.7407	0.7308
9	0.9767	1.0258	0.9332	0.9164	0.8928
10	1.2509	1.2612	1.1310	1.0740	0.9791
11	1.8640	1.5290	1.4460	1.2430	1.2070
AGE	2005	2006	2007	2008	
1	0.0047	0.0055	0.0035	0.0097	
2	0.0092	0.0172	0.0182	0.0148	
3	0.0365	0.0432	0.0753	0.0510	
4	0.1477	0.1432	0.1864	0.1650	
5	0.3107	0.3479	0.3550	0.3350	
6	0.4355	0.4564	0.4629	0.4510	
7	0.5581	0.5611	0.5798	0.5745	
8	0.7407	0.7263	0.7158	0.7309	
9	0.8601	0.8842	0.8985	0.8904	
10	1.0213	0.9643	0.9712	1.0020	
11	1.2800	1.2960	1.5110	1.3074	

SSB Weight At Age - Input Data

AGE	1980	1981	1982	1983	1984
1	0.0158	0.0169	0.0133	0.0070	0.0011
2	0.0511	0.0569	0.0607	0.0244	0.0242
3	0.1075	0.1130	0.1576	0.1459	0.0729
4	0.2075	0.2206	0.2207	0.2949	0.2368
5	0.2965	0.3435	0.3634	0.3920	0.4451
6	0.5609	0.5641	0.4993	0.5292	0.5778
7	0.7632	0.7602	0.8642	0.6813	0.7713
8	0.9963	0.9004	1.0036	1.0002	0.9884
9	1.1490	1.0835	1.0815	1.1869	1.0865
10	1.2749	1.2180	1.3243	1.3151	1.3019
11	1.8950	1.5510	1.9010	1.6800	1.9580
AGE	1985	1986	1987	1988	1989
1	0.0118	0.0094	0.0069	0.0108	0.0044
2	0.0152	0.0275	0.0271	0.0245	0.0237
3	0.0615	0.0895	0.0742	0.0855	0.0695
4	0.1834	0.1387	0.1797	0.1929	0.1958
5	0.3167	0.2833	0.3060	0.3241	0.3206
6	0.5290	0.4408	0.4836	0.5120	0.4515
7	0.7305	0.6705	0.7236	0.7321	0.6684
8	1.0180	0.9972	0.9938	1.0479	0.8396
9	1.2785	1.3191	1.3195	1.2797	1.2781
10	1.3735	1.5510	1.6070	1.5957	1.4286
11	2.1280	2.1940	2.2840	2.2380	1.9260
AGE	1990	1991	1992	1993	1994
1	0.0070	0.0014	0.0026	0.0010	0.0015
2	0.0185	0.0172	0.0113	0.0136	0.0088
3	0.0648	0.0647	0.0555	0.0854	0.0765
4	0.1633	0.1907	0.1876	0.2048	0.2865
5	0.3109	0.3362	0.3896	0.3956	0.4114
6	0.4478	0.5214	0.5688	0.5636	0.5453
7	0.5705	0.7285	0.7919	0.8284	0.7095
8	0.7814	0.9108	1.0899	1.0684	1.0111
9	0.9335	1.0564	1.2353	1.3147	1.2612
10	1.3160	1.2948	1.4455	1.4422	1.4089
11	1.6960	1.8130	2.0070	2.3130	2.4240

SSB Weight At Age - Input Data

AGE	1995	1996	1997	1998	1999
1	0.0024	0.0011	0.0027	0.0108	0.0052
2	0.0104	0.0149	0.0079	0.0134	0.0157
3	0.0577	0.0517	0.0735	0.0461	0.0499
4	0.2401	0.2014	0.1853	0.1891	0.1592
5	0.4196	0.3886	0.3649	0.3475	0.3119
6	0.5531	0.5572	0.5454	0.4573	0.4225
7	0.7418	0.7667	0.7159	0.6873	0.5841
8	0.9576	1.0434	0.9981	0.9121	0.8279
9	1.0910	1.2671	1.2678	1.2335	1.0693
10	1.6468	1.3182	1.4773	1.3981	1.4030
11	1.9200	2.2270	2.4250	3.2930	1.9080
AGE	2000	2001	2002	2003	2004
1	0.0108	0.0062	0.0006	0.0322	0.0027
2	0.0123	0.0157	0.0196	0.0069	0.0226
3	0.0593	0.0377	0.0508	0.0577	0.0424
4	0.1640	0.2422	0.1490	0.1958	0.1516
5	0.3413	0.3733	0.3627	0.3367	0.3248
6	0.4765	0.4921	0.4665	0.4690	0.4314
7	0.6256	0.6310	0.5909	0.5879	0.5856
8	0.8305	0.7982	0.7844	0.7407	0.7308
9	0.9767	1.0258	0.9332	0.9164	0.8928
10	1.2509	1.2612	1.1310	1.0740	0.9791
11	1.8640	1.5290	1.4460	1.2430	1.2070
AGE	2005	2006	2007		
1	0.0047	0.0055	0.0035		
2	0.0092	0.0172	0.0182		
3	0.0365	0.0432	0.0753		
4	0.1477	0.1432	0.1864		
5	0.3107	0.3479	0.3550		
6	0.4355	0.4564	0.4629		
7	0.5581	0.5611	0.5798		
8	0.7407	0.7263	0.7158		
9	0.8601	0.8842	0.8985		
10	1.0213	0.9643	0.9712		
11	1.2800	1.2960	1.5110		

Natural Mortality - Input Data

AGE	1980	1981	1982	1983	1984
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	1985	1986	1987	1988	1989
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	1990	1991	1992	1993	1994
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	1995	1996	1997	1998	1999
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	2000	2001	2002	2003	2004
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	2005	2006	2007		
1	0.2000	0.2000	0.2000		
2	0.2000	0.2000	0.2000		
3	0.2000	0.2000	0.2000		
4	0.2000	0.2000	0.2000		
5	0.2000	0.2000	0.2000		
6	0.2000	0.2000	0.2000		
7	0.2000	0.2000	0.2000		
8	0.2000	0.2000	0.2000		
9	0.2000	0.2000	0.2000		
10	0.2000	0.2000	0.2000		
11	0.2000	0.2000	0.2000		

Proportion of Natural Mortality Before Spawning = 0.2500  
 Proportion of Fishing Mortality Before Spawning = 0.2500

Maturity - Input Data

AGE	1980	1981	1982	1983	1984
1	0.0100	0.0100	0.0100	0.0100	0.0200
2	0.0400	0.0500	0.0500	0.0500	0.0700
3	0.1500	0.1800	0.1700	0.1700	0.2100
4	0.4500	0.4600	0.4300	0.4400	0.5000
5	0.8000	0.7700	0.7400	0.7600	0.7900
6	0.9500	0.9300	0.9100	0.9300	0.9300
7	0.9900	0.9800	0.9700	0.9800	0.9800
8	1.0000	1.0000	0.9900	1.0000	0.9900
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	1985	1986	1987	1988	1989
1	0.0300	0.0200	0.0100	0.0100	0.0100
2	0.1000	0.0700	0.0500	0.0500	0.0400
3	0.2600	0.2400	0.2400	0.2500	0.2200
4	0.5500	0.5600	0.6500	0.6900	0.6600
5	0.8000	0.8400	0.9200	0.9400	0.9300
6	0.9300	0.9600	0.9900	0.9900	0.9900
7	0.9800	0.9900	1.0000	1.0000	1.0000
8	0.9900	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	1990	1991	1992	1993	1994
1	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0200	0.0200	0.0200	0.0200	0.0200
3	0.1500	0.1500	0.1500	0.1300	0.1300
4	0.6200	0.6000	0.6000	0.5700	0.5700
5	0.9400	0.9300	0.9200	0.9200	0.9200
6	0.9900	0.9900	0.9900	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

Maturity - Input Data

AGE	1995	1996	1997	1998	1999
1	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0200	0.0200	0.0200	0.0200	0.0200
3	0.1300	0.1400	0.1200	0.1400	0.1500
4	0.5600	0.5600	0.5600	0.5800	0.5500
5	0.9200	0.9100	0.9200	0.9200	0.9000
6	0.9900	0.9900	0.9900	0.9900	0.9800
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	2000	2001	2002	2003	2004
1	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0200	0.0200	0.0200	0.0300	0.0200
3	0.1600	0.1600	0.1500	0.1500	0.1300
4	0.5900	0.6200	0.5900	0.5400	0.5400
5	0.9200	0.9400	0.9200	0.8800	0.9000
6	0.9900	0.9900	0.9900	0.9800	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	2005	2006	2007		
1	0.0100	0.0100	0.0100		
2	0.0300	0.0300	0.0400		
3	0.1800	0.1800	0.2000		
4	0.5700	0.5700	0.5900		
5	0.8900	0.8900	0.9000		
6	0.9800	0.9800	0.9800		
7	1.0000	1.0000	1.0000		
8	1.0000	1.0000	1.0000		
9	1.0000	1.0000	1.0000		
10	1.0000	1.0000	1.0000		
11	1.0000	1.0000	1.0000		



Input Partial Recruitment

AGE

1	0.0000
2	0.0500
3	0.0500
4	0.2500
5	0.7600
6	1.0000
7	1.0000
8	1.0000
9	1.0000
10	1.0000

Input F-Plus Ratio

YEAR

1980	1.0000
1981	1.0000
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	spr_us	spr_us	spr_us	spr_us	spr_us
AGE	1	2	3	4	5
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1980	1333.6100	10935.5800	13484.2500	9038.8900	8683.2600
1981	385.2600	10165.0500	12476.6400	10253.9600	7734.9200
1982	88.9100	3111.7500	5304.7900	9394.5200	6312.4100
1983	592.7100	10905.9400	9868.6900	13276.8000	7823.8300
1984	29.6400	1037.2500	1659.6000	2667.2100	3823.0100
1985	88.9100	948.3400	2904.3000	2548.6700	2163.4100
1986	29.6400	1363.2400	1007.6100	2993.2100	1748.5100
1987	266.7200	1807.7800	2933.9400	2044.8600	1511.4200
1988	592.7100	2933.9400	2489.4000	2252.3100	918.7100
1989	148.1800	4712.0800	3763.7400	2548.6700	1452.1500
1990	0.0000	1689.2400	7853.4600	3022.8400	1600.3300
1991	88.9100	2104.1400	4830.6200	6905.1200	2726.4900
1992	177.8100	1007.6100	3408.1100	2607.9400	3171.0200
1993	977.9800	2489.4000	3437.7400	4682.4400	1807.7800
1994	88.9100	4237.9100	3378.4700	3319.2000	2222.6800
1995	88.9100	5838.2400	9513.0600	6816.2100	3289.5600
1996	59.2700	1392.8800	5749.3300	9779.7900	3882.2800
1997	29.6400	2519.0400	4919.5300	7468.2000	6075.3200
1998	177.8100	563.0800	3022.8400	3319.2000	3615.5600
1999	237.0900	1215.0600	1541.0600	3348.8400	2341.2200
2000	88.9100	5660.4200	7349.6600	6579.1300	4741.7100
2001	0.0000	2098.2100	10876.3100	9987.2400	4297.1800
2002	297.8400	1024.5100	2911.1200	6964.3900	4931.6800
2003	132.7700	2247.2800	798.9800	2088.7300	3676.0100
2004	1074.2900	2567.6400	6001.8200	5303.0100	3930.2900
2005	578.7900	2303.2900	3087.4500	3647.8600	2707.8200
2006	2258.2400	4799.8000	5080.7500	5042.5200	2480.5100
2007	726.0800	11092.0600	8227.7600	4780.5400	3017.2100
2008	318.2900	1728.9500	6066.1300	8426.0300	4146.9300

SURVEY - INPUT DATA

INDEX	6	7	8	9	10
SURVEY TAG	spr_us	spr_us	spr_us	spr_us	us0aut
AGE	6	7	8	9 - 11	1
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1980	4771.3500	3378.4700	770.5300	1944.1029	0.0000
1981	5008.4400	4178.6400	2281.9500	3082.1143	0.0000
1982	3941.5500	2726.4900	1481.7900	2044.8643	8.8900
1983	3497.0100	1718.8700	948.3400	1541.0571	0.0000
1984	1718.8700	651.9900	296.3600	266.7214	177.8100
1985	2548.6700	1363.2400	1244.7000	859.4357	59.2700
1986	859.4400	622.3500	296.3600	237.0857	59.2700
1987	740.8900	503.8100	207.4500	296.3571	296.3600
1988	681.6200	355.6300	29.6400	325.9929	29.6400
1989	859.4400	474.1700	88.9100	266.7214	0.0000
1990	503.8100	177.8100	118.5400	148.1786	148.1800
1991	444.5400	207.4500	118.5400	148.1786	29.6400
1992	1274.3400	325.9900	118.5400	118.5429	29.6400
1993	1333.6100	503.8100	237.0900	237.0857	59.2700
1994	681.6200	296.3600	88.9100	148.1786	29.6400
1995	1303.9700	651.9900	88.9100	355.6286	118.5400
1996	1570.6900	592.7100	148.1800	59.2714	29.6400
1997	1155.7900	266.7200	29.6400	88.9071	29.6400
1998	2015.2300	474.1700	177.8100	88.9071	29.6400
1999	1896.6900	1215.0600	503.8100	118.5429	29.6400
2000	2548.6700	1778.1400	444.5400	296.3571	59.2700
2001	2222.6800	1096.5200	503.8100	474.1714	88.9100
2002	1515.5700	988.6500	579.9700	645.4659	59.2700
2003	1892.2400	653.4700	303.7700	554.7806	144.0300
2004	3370.1700	1020.0600	290.4300	611.0884	98.9800
2005	1470.2300	702.9600	342.8900	48.8989	28.7500
2006	958.4200	881.9600	317.9900	170.7017	0.0000
2007	966.4200	406.9000	207.7500	120.0246	77.6500
2008	1886.3100	642.2100	253.0900	362.1484	56.3100

SURVEY - INPUT DATA

INDEX	11	12	13	14	15
SURVEY TAG	us1aut	us2aut	us3aut	us4aut	us5aut
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
1980	0.0000	0.0000	0.0000	0.0000	0.0000
1981	4682.4400	6608.7600	8060.9100	8416.5400	4534.2600
1982	1303.9700	7823.8300	6401.3100	7349.6600	6401.3100
1983	592.7100	2696.8500	4889.8900	3763.7400	1689.2400
1984	1481.7900	2993.2100	5986.4100	8653.6300	4030.4600
1985	651.9900	6638.4000	4623.1700	3585.9200	3171.0200
1986	2696.8500	2459.7600	7823.8300	3111.7500	2341.2200
1987	1511.4200	4326.8100	2578.3100	4237.9100	1392.8800
1988	1570.6900	3763.7400	2933.9400	1274.3400	2044.8600
1989	8416.5400	8801.8100	7082.9400	2311.5900	1392.8800
1990	1422.5100	13187.8900	8475.8100	2904.3000	563.0800
1991	5067.7100	6697.6700	22197.1500	8564.7200	1748.5100
1992	1392.8800	7320.0200	5986.4100	4712.0800	2163.4100
1993	1926.3200	3645.1900	5482.6100	3793.3700	2311.5900
1994	5038.0700	6934.7600	10283.5900	6756.9400	3111.7500
1995	11350.4800	22315.6900	8327.6400	5067.7100	3852.6400
1996	1481.7900	11261.5700	11320.8400	7408.9300	2667.2100
1997	1600.3300	2400.4900	5927.1400	8120.1900	2756.1200
1998	1066.8900	3141.3900	4593.5400	5512.2400	3082.1100
1999	5126.9800	1778.1400	5571.5100	5956.7800	5275.1600
2000	5927.1400	6519.8600	6075.3200	6312.4100	4741.7100
2001	1392.8800	8594.3600	11587.5600	6756.9400	4000.8200
2002	1185.4300	3615.5600	9809.4200	7823.8300	4326.8100
2003	2955.8700	2270.6900	3864.2000	9955.8200	5120.1600
2004	2077.7600	6697.3800	3726.6900	5206.4000	5147.7200
2005	2081.6100	2845.9200	3533.7600	2917.0400	2172.8900
2006	2041.0100	4876.8500	2141.1800	3464.1200	2209.9400
2007	6052.8000	7517.9900	7742.3300	7619.6400	4186.9300
2008	3187.0200	10214.2500	8386.3100	6491.4100	2508.9600

SURVEY - INPUT DATA

INDEX	16	17	18	19	20
SURVEY TAG	us6aut	us7aut	us8paut	us8aut	spr_ma
AGE	7	8	9 - 11	9	1
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1980	0.0000	0.0000	0.0000	0.0000	0.0000
1981	3022.8400	2756.1200	4119.3643	1689.2400	0.0000
1982	4267.5400	1748.5100	3259.9286	1570.6900	1622.2300
1983	1422.5100	889.0700	1452.1500	503.8100	436.0600
1984	2015.2300	1007.6100	1333.6071	503.8100	485.7600
1985	1511.4200	355.6300	503.8071	296.3600	4871.2000
1986	1215.0600	563.0800	325.9929	148.1800	6113.8500
1987	1244.7000	474.1700	563.0786	325.9900	7763.1900
1988	740.8900	296.3600	325.9929	118.5400	18407.0700
1989	296.3600	207.4500	148.1786	0.0000	1823.3100
1990	296.3600	59.2700	266.7214	59.2700	1746.4900
1991	740.8900	355.6300	414.9000	207.4500	474.4700
1992	859.4400	118.5400	237.0857	177.8100	1852.2800
1993	889.0700	207.4500	355.6286	148.1800	2619.9000
1994	2370.8600	325.9900	355.6286	118.5400	2621.0000
1995	1185.4300	740.8900	563.0786	385.2600	122.1900
1996	651.9900	118.5400	148.1786	88.9100	516.7600
1997	1155.7900	207.4500	325.9929	118.5400	349.8200
1998	948.3400	118.5400	118.5429	29.6400	639.4000
1999	3200.6600	355.6300	237.0857	148.1800	305.0100
2000	2400.4900	592.7100	88.9071	88.9100	779.2800
2001	2222.6800	977.9800	592.7143	414.9000	15.8200
2002	1570.6900	1215.0600	1185.4286	592.7100	1414.3600
2003	1573.0600	1170.3100	1655.4510	853.8000	1163.5700
2004	2621.2800	1033.9900	923.7452	395.3400	3727.9600
2005	1472.9000	566.9300	430.6069	271.7600	1504.7400
2006	1259.5200	432.9800	678.6579	298.7300	1070.9400
2007	1677.0900	1305.7500	734.6694	487.8000	571.6200
2008	1239.3700	442.1600	120.0246	65.7900	0.0000

SURVEY - INPUT DATA

INDEX	21	22	23	24	25
SURVEY TAG	spr_ma	spr_ma	spr_ma	spr_ma	ma0aut
AGE	2	3	4	5	1
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1980	0.0000	0.0000	0.0000	0.0000	0.0000
1981	0.0000	0.0000	0.0000	0.0000	0.0000
1982	11127.3900	7534.9900	3872.5600	1129.6800	0.0000
1983	4238.5700	5065.5000	4848.6000	2309.0700	38.4100
1984	6199.7100	4816.9700	2388.1500	1048.3500	291.4600
1985	3877.0800	5472.1900	2146.4000	851.7800	24.8500
1986	24914.0500	6079.9600	3260.2700	641.6600	0.0000
1987	3899.6700	3567.5400	881.1500	397.6500	51.9700
1988	14362.8000	4032.9700	1970.1700	347.9400	54.2200
1989	28752.7200	10160.3800	2708.9800	684.5900	0.0000
1990	5732.0200	12812.8800	3723.4400	774.9600	6.7800
1991	4514.2200	7855.8200	4288.2800	732.0400	18.0700
1992	2498.2700	7677.1300	3387.2900	1676.9500	9.0400
1993	4288.4400	3633.7000	2069.4000	779.1000	0.0000
1994	11876.5300	4998.7200	1611.3600	876.3600	0.0000
1995	7828.7800	11216.3800	2332.7500	712.9400	0.0000
1996	935.9700	3371.2500	7092.5200	1429.3200	0.0000
1997	1799.0700	3151.8400	3894.1300	2758.4900	20.7900
1998	978.3100	2586.9800	1701.3000	2017.6200	0.0000
1999	2632.1600	2632.1600	3413.9100	1710.3400	36.1500
2000	12768.4400	7875.5900	4513.7200	3002.8800	0.0000
2001	1073.2000	5356.9600	3847.7000	1070.9400	6.7800
2002	937.6400	2433.3400	4200.1700	1339.8100	0.0000
2003	10140.0400	2797.1000	4127.8700	4026.1900	38.4100
2004	2675.0900	7661.5200	2952.9900	1281.0600	0.0000
2005	4753.7100	5180.7300	1861.7200	1084.5000	0.0000
2006	12252.5500	7907.7900	3210.5600	1116.1300	0.0000
2007	11021.2000	9688.1700	3563.0200	1683.2300	0.0000
2008	0.0000	0.0000	0.0000	0.0000	15.8200

SURVEY - INPUT DATA

INDEX	26	27	28	29	30
SURVEY TAG	malaut	ma2aut	ma3aut	ma4aut	ma5aut
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

---

1980	0.0000	0.0000	0.0000	0.0000	0.0000
1981	0.0000	0.0000	0.0000	0.0000	0.0000
1982	0.0000	0.0000	0.0000	0.0000	0.0000
1983	2991.4000	3492.9800	2309.0700	1154.5400	257.5700
1984	11787.1200	4288.2800	2263.8900	1875.2800	314.0500
1985	709.4400	2991.4000	964.7500	413.4600	173.9700
1986	13775.3700	2135.1000	3210.5600	352.4600	31.6300
1987	9324.4100	9055.5500	2727.0600	1197.4700	88.1200
1988	10474.4300	3298.6800	677.8100	117.4900	51.9700
1989	19346.9700	9326.6700	3158.6000	302.7600	101.6700
1990	13004.9200	27620.7800	7010.8200	526.4300	29.3700
1991	7227.7200	3208.3000	4545.8500	887.9300	47.4500
1992	5438.3000	20415.6500	9048.7700	2600.5300	264.3500
1993	10467.3800	2935.9800	6731.6300	2495.1300	311.2300
1994	17217.8500	8314.0200	3973.6900	1547.9600	386.2600
1995	8294.1200	17919.8900	2431.8500	656.6200	351.7600
1996	2675.3900	9990.4700	5632.1500	952.1700	204.5200
1997	3672.1500	4348.6300	6225.6400	3155.1900	313.4000
1998	3075.2900	6345.1200	4045.9200	2325.4500	329.7300
1999	7808.3800	1382.7300	3117.9300	1604.1500	849.5200
2000	6604.1300	7358.7600	4656.5600	2390.4100	643.9200
2001	1414.3600	5799.8000	4387.6900	1357.8800	675.5500
2002	680.0700	3323.5300	6961.1100	2049.2500	603.2500
2003	8881.5800	2117.0300	2661.5400	3361.9400	840.4800
2004	5417.9600	7473.9900	3217.3400	1712.6000	903.7500
2005	13560.7300	4315.3900	2250.3300	1425.6600	619.0700
2006	9358.3000	12318.0800	3330.3100	2632.1600	953.4500
2007	3278.3400	10198.7900	4699.4900	2458.1900	933.1200
2008	1796.2000	5542.2300	4347.0200	2444.6400	630.3600

Additional Output Files

Population File C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.PP2  
 Auxilliary File C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.AUX  
 Covariance File C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.CV  
 Residuals File C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.RSD  
 Log File C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.LOG

Bootstrap Files

Bootstrap Stock Numbers C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.BSN  
 Bootstrap Fishing Mortality C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.BSF  
 Bootstrap Biomass C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.BSB  
 Bootstrap Catchability C:\LOB\AP\ASSESS\_2008\VPA\B\_11P\_F69\_SV+\_9-11\B11P\_SV+\_BOOT.BSQ

Estimation Results

JAN-1 Population Numbers

AGE	1980	1981	1982	1983	1984
1	50300.	26027.	20849.	24666.	15520.
2	39477.	41178.	21304.	17061.	20182.
3	32635.	32231.	32827.	16898.	13370.
4	24065.	25752.	24412.	23858.	12502.
5	19254.	17295.	16536.	15870.	14878.
6	13955.	12221.	9371.	9494.	8582.
7	9947.	7894.	6732.	4451.	4273.
8	4678.	4891.	4309.	2570.	1621.
9	3006.	2765.	2586.	1709.	970.
10	2776.	1441.	1684.	996.	772.
11	4509.	2035.	1640.	2019.	1932.
=====					
Total	204602.	173729.	142248.	119593.	94601.
AGE	1985	1986	1987	1988	1989
1	19012.	23602.	41613.	53494.	20981.
2	12704.	15507.	19270.	34035.	43514.
3	16189.	10259.	12120.	15245.	27156.
4	10053.	12156.	7733.	8265.	10824.
5	8056.	7027.	7897.	5037.	5118.
6	6785.	4438.	4225.	4417.	2691.
7	4121.	2987.	2310.	2260.	2321.
8	1770.	1390.	1278.	1090.	1354.
9	807.	489.	574.	561.	649.
10	548.	271.	173.	302.	300.
11	373.	258.	169.	189.	342.
=====					
Total	80418.	78384.	97362.	124895.	115250.
AGE	1990	1991	1992	1993	1994
1	21648.	22668.	25137.	39653.	38756.
2	17164.	17722.	18557.	20571.	32445.
3	33573.	13065.	14279.	14973.	16589.
4	19884.	23231.	9767.	10913.	11878.



5	6599.	13034.	13632.	6552.	7337.
6	2825.	3633.	6314.	5966.	3230.
7	1461.	1687.	1844.	2800.	2580.
8	1152.	866.	1088.	752.	1058.
9	630.	581.	560.	719.	379.
10	356.	342.	295.	340.	332.
11	597.	368.	235.	281.	644.
=====					
Total	105888.	97197.	91707.	103521.	115228.

JAN-1 Population Numbers

AGE	1995	1996	1997	1998	1999
1	26619.	24201.	21348.	16743.	26464.
2	31678.	21753.	19803.	17465.	13674.
3	25764.	23741.	16772.	15639.	14222.
4	13215.	19675.	18303.	13428.	12489.
5	8184.	8695.	12750.	12897.	10212.
6	3464.	3753.	4686.	7193.	7988.
7	1445.	1185.	1725.	2299.	3557.
8	1077.	598.	465.	844.	926.
9	335.	358.	273.	218.	407.
10	102.	88.	180.	147.	125.
11	96.	163.	315.	400.	233.
=====					
Total	111979.	104210.	96620.	87273.	90296.

AGE	2000	2001	2002	2003	2004
1	16173.	12409.	28387.	22483.	36846.
2	21663.	13239.	10159.	23239.	18396.
3	11000.	17462.	10756.	8306.	18404.
4	11491.	8607.	13923.	8708.	6759.
5	9201.	8689.	6182.	10703.	6862.
6	6853.	6047.	5051.	3759.	7647.
7	4429.	3617.	2982.	2513.	1934.
8	1669.	2056.	1550.	1376.	1390.
9	323.	858.	868.	806.	628.
10	199.	141.	440.	457.	410.
11	56.	129.	483.	353.	392.
=====					
Total	83058.	73255.	80782.	82703.	99669.

AGE	2005	2006	2007	2008
1	42696.	51397.	23487.	42084.
2	30161.	34926.	42054.	19085.
3	14935.	24438.	28519.	34216.
4	14864.	12132.	19905.	23148.
5	5137.	11777.	9502.	15758.
6	4785.	3315.	8949.	7052.
7	5185.	3228.	2232.	6866.
8	1128.	3846.	2324.	1632.
9	811.	763.	2976.	1801.

10	339.	576.	536.	2375.
11	391.	418.	543.	828.
=====				
Total	120431.	146816.	141027.	154846.

Fishing Mortality Calculated

AGE	1980	1981	1982	1983	1984
1	0.0001	0.0002	0.0005	0.0006	0.0002
2	0.0028	0.0266	0.0317	0.0438	0.0205
3	0.0369	0.0779	0.1191	0.1013	0.0852
4	0.1304	0.2430	0.2306	0.2722	0.2394
5	0.2546	0.4127	0.3548	0.4148	0.5851
6	0.3697	0.3963	0.5445	0.5983	0.5335
7	0.5100	0.4054	0.7628	0.8104	0.6816
8	0.3258	0.4373	0.7247	0.7748	0.4973
9	0.5349	0.2959	0.7537	0.5946	0.3705
10	0.4087	0.4071	0.6493	0.6781	0.5707
11	0.4087	0.4071	0.6493	0.6781	0.5707
AGE	1985	1986	1987	1988	1989
1	0.0038	0.0028	0.0010	0.0065	0.0008
2	0.0138	0.0465	0.0343	0.0258	0.0594
3	0.0865	0.0826	0.1828	0.1425	0.1117
4	0.1582	0.2313	0.2288	0.2792	0.2948
5	0.3962	0.3087	0.3810	0.4269	0.3944
6	0.6204	0.4531	0.4257	0.4434	0.4108
7	0.8867	0.6494	0.5510	0.3126	0.5007
8	1.0857	0.6844	0.6237	0.3177	0.5650
9	0.8925	0.8369	0.4418	0.4248	0.4006
10	0.7573	0.5506	0.4920	0.3857	0.4745
11	0.7573	0.5506	0.4920	0.3857	0.4745
AGE	1990	1991	1992	1993	1994
1	0.0001	0.0001	0.0004	0.0006	0.0017
2	0.0729	0.0160	0.0146	0.0152	0.0306
3	0.1683	0.0909	0.0688	0.0315	0.0274
4	0.2224	0.3331	0.1993	0.1970	0.1725
5	0.3968	0.5248	0.6263	0.5072	0.5504
6	0.3153	0.4779	0.6130	0.6384	0.6046
7	0.3228	0.2391	0.6969	0.7732	0.6732
8	0.4845	0.2362	0.2141	0.4868	0.9492
9	0.4092	0.4778	0.2974	0.5723	1.1144
10	0.3509	0.3719	0.5723	0.6629	0.6770
11	0.3509	0.3719	0.5723	0.6629	0.6770

Fishing Mortality Calculated

AGE	1995	1996	1997	1998	1999
-----	------	------	------	------	------

---

1	0.0019	0.0006	0.0008	0.0025	0.0002
2	0.0884	0.0600	0.0361	0.0054	0.0176
3	0.0697	0.0601	0.0224	0.0249	0.0132
4	0.2185	0.2338	0.1501	0.0737	0.1056
5	0.5797	0.4182	0.3724	0.2790	0.1989
6	0.8726	0.5774	0.5121	0.5042	0.3898
7	0.6819	0.7357	0.5143	0.7097	0.5565
8	0.9011	0.5856	0.5589	0.5306	0.8535
9	1.1376	0.4881	0.4173	0.3564	0.5153
10	0.8280	0.6102	0.5157	0.5487	0.4638
11	0.8280	0.6102	0.5157	0.5487	0.4638
AGE	2000	2001	2002	2003	2004

---

1	0.0002	0.0001	0.0001	0.0006	0.0002
2	0.0155	0.0077	0.0014	0.0333	0.0084
3	0.0453	0.0265	0.0112	0.0061	0.0137
4	0.0795	0.1308	0.0630	0.0383	0.0745
5	0.2197	0.3425	0.2976	0.1362	0.1604
6	0.4392	0.5070	0.4980	0.4643	0.1886
7	0.5677	0.6474	0.5737	0.3922	0.3398
8	0.4653	0.6619	0.4536	0.5846	0.3391
9	0.6301	0.4688	0.4419	0.4755	0.4169
10	0.4848	0.5748	0.5135	0.4601	0.2320
11	0.4848	0.5748	0.5135	0.4601	0.2320
AGE	2005	2006	2007		

---

1	0.0009	0.0006	0.0075
2	0.0104	0.0026	0.0063
3	0.0079	0.0052	0.0087
4	0.0327	0.0444	0.0336
5	0.2379	0.0746	0.0981
6	0.1939	0.1957	0.0650
7	0.0987	0.1285	0.1129
8	0.1899	0.0564	0.0548
9	0.1415	0.1546	0.0256
10	0.1479	0.1216	0.0646
11	0.1479	0.1216	0.0646

Average Fishing Mortality For Ages 4- 9

Year	Average F	N Weighted	Biomass Wtd	Catch Wtd
1980	0.3542	0.2857	0.3574	0.3426
1981	0.3651	0.3445	0.3700	0.3607
1982	0.5619	0.4192	0.5377	0.4957
1983	0.5775	0.4378	0.5078	0.4949
1984	0.4846	0.4753	0.5203	0.5211
1985	0.6733	0.4839	0.6563	0.6261
1986	0.5273	0.3613	0.4841	0.4202

1987	0.4420	0.3706	0.4353	0.4014
1988	0.3674	0.3563	0.3699	0.3690
1989	0.4277	0.3704	0.4148	0.3857
1990	0.3585	0.2832	0.3242	0.3035
1991	0.3815	0.3997	0.4089	0.4187
1992	0.4412	0.4831	0.5238	0.5567
1993	0.5292	0.4413	0.5407	0.5267
1994	0.6774	0.4234	0.5271	0.5427
1995	0.7319	0.4687	0.5852	0.5869
1996	0.5065	0.3444	0.4206	0.3936
1997	0.4208	0.2920	0.3629	0.3551
1998	0.4090	0.2813	0.3652	0.4018
1999	0.4366	0.2654	0.3545	0.3667
2000	0.4002	0.2779	0.3675	0.3856
2001	0.4597	0.3773	0.4477	0.4600
2002	0.3880	0.2628	0.3720	0.4026
2003	0.3485	0.2049	0.2815	0.3467
2004	0.2532	0.1759	0.2180	0.2162
2005	0.1491	0.1090	0.1357	0.1683
2006	0.1090	0.0803	0.0929	0.1051
2007	0.0650	0.0575	0.0611	0.0713

Average Fishing Mortality For Ages 5- 9

Year	Average F	N Weighted	Biomass Wtd	Catch Wtd
1980	0.3990	0.3593	0.3962	0.3836
1981	0.3896	0.4025	0.3975	0.4044
1982	0.6281	0.5357	0.6078	0.5783
1983	0.6386	0.5537	0.5955	0.5831
1984	0.5336	0.5726	0.5677	0.5776
1985	0.7763	0.6359	0.7329	0.6954
1986	0.5865	0.4580	0.5375	0.5006
1987	0.4847	0.4379	0.4705	0.4487
1988	0.3851	0.4040	0.3894	0.4098
1989	0.4543	0.4377	0.4546	0.4442
1990	0.3857	0.3787	0.3829	0.3841
1991	0.3912	0.4779	0.4466	0.4941
1992	0.4896	0.6013	0.5723	0.6163
1993	0.5956	0.6001	0.6173	0.6116
1994	0.7784	0.6277	0.6750	0.6453
1995	0.8346	0.6966	0.7340	0.7185
1996	0.5610	0.4935	0.5198	0.5092
1997	0.4750	0.4225	0.4409	0.4313
1998	0.4760	0.4001	0.4365	0.4429
1999	0.5028	0.3518	0.4048	0.4157
2000	0.4644	0.3793	0.4174	0.4241
2001	0.5255	0.4771	0.5076	0.5034
2002	0.4530	0.4300	0.4485	0.4525
2003	0.4106	0.2806	0.3297	0.3691
2004	0.2890	0.2131	0.2359	0.2357
2005	0.1724	0.1754	0.1636	0.1921
2006	0.1219	0.0993	0.1007	0.1200
2007	0.0713	0.0758	0.0689	0.0844

Average Fishing Mortality For Ages 6- 9

Year	Average F	N Weighted	Biomass Wtd	Catch Wtd
1980	0.4351	0.4231	0.4305	0.4350
1981	0.3838	0.3961	0.3931	0.3990
1982	0.6965	0.6657	0.6941	0.6770
1983	0.6945	0.6746	0.6844	0.6845
1984	0.5207	0.5605	0.5572	0.5701
1985	0.8713	0.7791	0.8240	0.8040
1986	0.6559	0.5708	0.6136	0.5894
1987	0.5106	0.4915	0.5081	0.5009
1988	0.3746	0.3902	0.3788	0.3986
1989	0.4693	0.4694	0.4755	0.4758
1990	0.3829	0.3590	0.3749	0.3690
1991	0.3577	0.3874	0.3709	0.4175
1992	0.4554	0.5665	0.5310	0.6009
1993	0.6177	0.6595	0.6557	0.6667
1994	0.8354	0.7060	0.7481	0.7261
1995	0.8983	0.8479	0.8548	0.8568
1996	0.5967	0.6046	0.6040	0.6103
1997	0.5006	0.5120	0.5103	0.5128
1998	0.5252	0.5481	0.5559	0.5585
1999	0.5788	0.4731	0.5034	0.4986
2000	0.5256	0.4900	0.4976	0.4961
2001	0.5713	0.5700	0.5765	0.5776
2002	0.4918	0.5084	0.5035	0.5115
2003	0.4791	0.4635	0.4692	0.4701
2004	0.3211	0.2442	0.2639	0.2665
2005	0.1560	0.1485	0.1454	0.1616
2006	0.1338	0.1254	0.1164	0.1495
2007	0.0646	0.0629	0.0588	0.0722

Back Calculated Partial Recruitment

AGE	1980	1981	1982	1983	1984
1	0.0002	0.0005	0.0007	0.0008	0.0003
2	0.0052	0.0609	0.0416	0.0540	0.0300
3	0.0689	0.1781	0.1562	0.1250	0.1249
4	0.2437	0.5556	0.3023	0.3359	0.3513
5	0.4759	0.9438	0.4651	0.5119	0.8585
6	0.6911	0.9062	0.7138	0.7383	0.7828
7	0.9533	0.9270	1.0000	1.0000	1.0000
8	0.6091	1.0000	0.9500	0.9561	0.7297
9	1.0000	0.6767	0.9881	0.7338	0.5437
10	0.7640	0.9309	0.8512	0.8367	0.8374
11	0.7640	0.9309	0.8512	0.8367	0.8374
AGE	1985	1986	1987	1988	1989
1	0.0035	0.0033	0.0016	0.0146	0.0014
2	0.0127	0.0555	0.0550	0.0581	0.1050
3	0.0797	0.0987	0.2931	0.3214	0.1977
4	0.1457	0.2764	0.3669	0.6297	0.5218
5	0.3650	0.3688	0.6110	0.9628	0.6981
6	0.5714	0.5413	0.6825	1.0000	0.7271
7	0.8167	0.7759	0.8836	0.7051	0.8861
8	1.0000	0.8177	1.0000	0.7165	1.0000
9	0.8221	1.0000	0.7084	0.9579	0.7091
10	0.6975	0.6579	0.7889	0.8698	0.8398
11	0.6975	0.6579	0.7889	0.8698	0.8398
AGE	1990	1991	1992	1993	1994
1	0.0002	0.0002	0.0006	0.0008	0.0015
2	0.1504	0.0305	0.0210	0.0196	0.0274
3	0.3473	0.1733	0.0988	0.0408	0.0246
4	0.4590	0.6346	0.2859	0.2548	0.1548
5	0.8190	1.0000	0.8987	0.6559	0.4939
6	0.6508	0.9105	0.8796	0.8257	0.5426
7	0.6662	0.4556	1.0000	1.0000	0.6041
8	1.0000	0.4501	0.3073	0.6296	0.8518
9	0.8446	0.9104	0.4268	0.7401	1.0000
10	0.7243	0.7086	0.8211	0.8573	0.6075
11	0.7243	0.7086	0.8211	0.8573	0.6075

Back Calculated Partial Recruitment

AGE	1995	1996	1997	1998	1999
1	0.0017	0.0008	0.0014	0.0035	0.0002
2	0.0777	0.0816	0.0645	0.0076	0.0206
3	0.0612	0.0818	0.0401	0.0351	0.0155
4	0.1921	0.3178	0.2685	0.1039	0.1237
5	0.5096	0.5685	0.6663	0.3932	0.2330
6	0.7671	0.7848	0.9163	0.7105	0.4567
7	0.5994	1.0000	0.9202	1.0000	0.6520
8	0.7922	0.7959	1.0000	0.7476	1.0000
9	1.0000	0.6634	0.7467	0.5021	0.6038
10	0.7279	0.8293	0.9228	0.7731	0.5434
11	0.7279	0.8293	0.9228	0.7731	0.5434
AGE	2000	2001	2002	2003	2004
1	0.0003	0.0002	0.0002	0.0010	0.0004
2	0.0247	0.0116	0.0024	0.0569	0.0202
3	0.0719	0.0400	0.0195	0.0104	0.0327
4	0.1262	0.1977	0.1099	0.0656	0.1787
5	0.3486	0.5174	0.5187	0.2330	0.3846
6	0.6969	0.7659	0.8680	0.7941	0.4525
7	0.9009	0.9781	1.0000	0.6708	0.8151
8	0.7385	1.0000	0.7905	1.0000	0.8134
9	1.0000	0.7084	0.7701	0.8133	1.0000
10	0.7693	0.8685	0.8950	0.7870	0.5565
11	0.7693	0.8685	0.8950	0.7870	0.5565
AGE	2005	2006	2007		
1	0.0037	0.0031	0.0668		
2	0.0438	0.0135	0.0554		
3	0.0332	0.0264	0.0770		
4	0.1376	0.2268	0.2977		
5	1.0000	0.3812	0.8694		
6	0.8148	1.0000	0.5759		
7	0.4147	0.6567	1.0000		
8	0.7981	0.2880	0.4859		
9	0.5948	0.7903	0.2271		
10	0.6215	0.6213	0.5722		
11	0.6215	0.6213	0.5722		

JAN-1 Biomass

AGE	1980	1981	1982	1983	1984
1	795.	440.	277.	173.	17.
2	2017.	2343.	1293.	416.	488.
3	3508.	3642.	5174.	2465.	975.
4	4993.	5681.	5388.	7036.	2960.
5	5709.	5941.	6009.	6221.	6622.
6	7827.	6894.	4679.	5024.	4958.
7	7591.	6001.	5817.	3032.	3296.
8	4661.	4403.	4325.	2571.	1602.
9	3453.	2996.	2796.	2029.	1054.
10	3540.	1755.	2230.	1310.	1005.
11	8545.	3156.	3117.	3393.	3784.
=====					
Total	52640.	43252.	41105.	33670.	26761.
AGE	1985	1986	1987	1988	1989
1	224.	222.	287.	578.	92.
2	193.	426.	522.	834.	1031.
3	996.	918.	899.	1303.	1887.
4	1844.	1686.	1390.	1594.	2119.
5	2551.	1991.	2417.	1632.	1641.
6	3589.	1956.	2043.	2262.	1215.
7	3010.	2003.	1671.	1655.	1551.
8	1802.	1386.	1270.	1142.	1136.
9	1032.	645.	758.	717.	830.
10	753.	420.	279.	482.	429.
11	794.	566.	385.	424.	658.
=====					
Total	16788.	12220.	11921.	12623.	12591.
AGE	1990	1991	1992	1993	1994
1	152.	32.	65.	40.	58.
2	318.	305.	210.	280.	286.
3	2176.	845.	792.	1279.	1269.
4	3247.	4430.	1832.	2235.	3403.
5	2052.	4382.	5311.	2592.	3019.
6	1265.	1894.	3591.	3362.	1761.
7	833.	1229.	1461.	2320.	1830.
8	900.	789.	1185.	804.	1070.
9	588.	614.	692.	945.	477.
10	469.	443.	426.	491.	468.
11	1012.	666.	471.	650.	1562.
=====					
Total	13010.	15630.	16037.	14997.	15203.



JAN-1 Biomass

AGE	1995	1996	1997	1998	1999
1	64.	27.	58.	181.	138.
2	329.	324.	156.	234.	215.
3	1487.	1227.	1233.	721.	710.
4	3173.	3962.	3391.	2539.	1988.
5	3434.	3379.	4653.	4482.	3185.
6	1916.	2091.	2556.	3290.	3375.
7	1072.	909.	1235.	1580.	2078.
8	1032.	624.	464.	770.	766.
9	366.	454.	346.	269.	435.
10	167.	116.	266.	206.	175.
11	184.	364.	765.	1317.	445.
Total	13224.	13477.	15122.	15588.	13509.
AGE	2000	2001	2002	2003	2004
1	175.	77.	17.	724.	99.
2	266.	208.	199.	160.	416.
3	652.	658.	546.	479.	780.
4	1885.	2085.	2075.	1705.	1025.
5	3140.	3244.	2242.	3604.	2229.
6	3266.	2976.	2356.	1763.	3299.
7	2771.	2282.	1762.	1478.	1133.
8	1386.	1641.	1216.	1019.	1016.
9	315.	880.	810.	739.	560.
10	249.	178.	497.	491.	402.
11	105.	198.	698.	439.	473.
Total	14210.	14426.	12419.	12600.	11432.
AGE	2005	2006	2007	2008	
1	201.	283.	82.	408.	
2	277.	601.	765.	282.	
3	545.	1056.	2148.	1745.	
4	2195.	1737.	3710.	3819.	
5	1596.	4097.	3373.	5279.	
6	2084.	1513.	4143.	3181.	
7	2893.	1811.	1294.	3945.	
8	835.	2793.	1663.	1193.	
9	697.	675.	2674.	1604.	
10	346.	556.	520.	2380.	
11	500.	542.	820.	1082.	
Total	12171.	15664.	21193.	24918.	

Mean Biomass

AGE	1980	1981	1982	1983	1984
1	1368.	755.	340.	291.	56.
2	2716.	3979.	2187.	500.	815.
3	4475.	4728.	6464.	2699.	1873.
4	5472.	6574.	5752.	7188.	3065.
5	6328.	5716.	5305.	6283.	5401.
6	6947.	7161.	3727.	4382.	3831.
7	5904.	5241.	4149.	2306.	2522.
8	3780.	3537.	3200.	1711.	1385.
9	2518.	2463.	1993.	1460.	837.
10	2857.	1355.	1761.	959.	737.
11	6401.	2366.	2100.	2258.	2638.
=====					
Total	48765.	43874.	36978.	30035.	23161.
AGE	1985	1986	1987	1988	1989
1	310.	342.	490.	773.	171.
2	663.	577.	790.	1401.	1342.
3	1182.	1233.	1319.	2052.	2450.
4	1766.	2261.	1472.	1865.	2058.
5	2009.	2115.	2450.	1680.	1397.
6	2472.	1913.	1913.	2088.	914.
7	2129.	1695.	1449.	1556.	1163.
8	1162.	1083.	1021.	1047.	758.
9	676.	454.	628.	582.	648.
10	587.	332.	217.	393.	319.
11	511.	398.	278.	321.	479.
=====					
Total	13467.	12404.	12026.	13759.	11698.
AGE	1990	1991	1992	1993	1994
1	216.	82.	137.	108.	140.
2	571.	430.	534.	574.	753.
3	3370.	1247.	1427.	3047.	2804.
4	4120.	5456.	2577.	3315.	3570.
5	1993.	4126.	4648.	2297.	2374.
6	1223.	1789.	3142.	2561.	1349.
7	816.	1308.	1126.	1690.	1366.
8	731.	812.	1104.	671.	681.
9	513.	538.	582.	698.	271.
10	357.	402.	337.	360.	315.
11	778.	508.	328.	435.	1040.
=====					
Total	14687.	16698.	15942.	15756.	14665.

Mean Biomass

AGE	1995	1996	1997	1998	1999
1	145.	66.	116.	197.	192.
2	743.	709.	370.	474.	233.
3	2891.	2069.	2196.	1415.	1063.
4	3293.	5060.	5359.	2878.	2701.
5	2779.	3210.	4077.	3566.	3343.
6	1413.	1657.	2015.	2571.	3096.
7	869.	680.	995.	1187.	1709.
8	754.	498.	367.	618.	499.
9	203.	360.	272.	225.	322.
10	134.	95.	202.	151.	133.
11	115.	249.	546.	927.	325.
Total	13339.	14655.	16515.	14209.	13617.
AGE	2000	2001	2002	2003	2004
1	191.	124.	51.	550.	167.
2	370.	227.	322.	497.	316.
3	1805.	1172.	1319.	713.	1243.
4	3248.	2323.	3624.	2185.	1430.
5	3487.	2884.	2021.	3481.	2155.
6	2896.	2263.	1840.	1456.	3079.
7	2359.	1698.	1389.	1295.	967.
8	1228.	1150.	1006.	782.	840.
9	240.	654.	668.	557.	455.
10	203.	142.	385.	370.	336.
11	76.	138.	499.	321.	384.
Total	16103.	12775.	13124.	12208.	11373.
AGE	2005	2006	2007		
1	348.	466.	170.		
2	462.	1043.	1254.		
3	944.	2430.	4427.		
4	3859.	3154.	5609.		
5	1660.	4284.	3533.		
6	2005.	1429.	4049.		
7	2873.	1708.	1234.		
8	792.	2792.	1692.		
9	650.	593.	2614.		
10	307.	484.	481.		
11	422.	464.	721.		
Total	14322.	18848.	25784.		

Spawning Stock Biomass

AGE	1980	1981	1982	1983	1984
1	8.	4.	3.	2.	0.
2	77.	111.	61.	20.	32.
3	496.	612.	812.	389.	191.
4	2069.	2339.	2080.	2751.	1326.
5	4076.	3925.	3871.	4054.	4299.
6	6449.	5523.	3535.	3827.	3839.
7	6293.	5055.	4436.	2308.	2591.
8	4086.	3755.	3398.	2015.	1332.
9	2874.	2646.	2203.	1663.	913.
10	3040.	1508.	1803.	1052.	829.
11	7339.	2711.	2521.	2724.	3121.
=====					
Total	36807.	28190.	24722.	20805.	18474.
=====					
AGE	1985	1986	1987	1988	1989
1	6.	4.	3.	5.	1.
2	18.	28.	25.	39.	39.
3	241.	205.	196.	299.	384.
4	927.	848.	811.	976.	1236.
5	1758.	1472.	1923.	1312.	1315.
6	2719.	1595.	1730.	1906.	1032.
7	2248.	1604.	1385.	1456.	1302.
8	1293.	1111.	1033.	1003.	939.
9	785.	498.	645.	614.	714.
10	593.	348.	234.	416.	362.
11	625.	469.	324.	366.	556.
=====					
Total	11215.	8183.	8310.	8393.	7881.
=====					
AGE	1990	1991	1992	1993	1994
1	0.	0.	0.	0.	0.
2	6.	6.	4.	5.	5.
3	298.	118.	111.	157.	156.
4	1811.	2326.	995.	1154.	1767.
5	1661.	3400.	3974.	1998.	2302.
6	1101.	1583.	2901.	2699.	1426.
7	731.	1101.	1167.	1819.	1471.
8	759.	707.	1069.	677.	803.
9	505.	518.	611.	779.	344.
10	408.	384.	352.	396.	376.
11	882.	578.	388.	524.	1255.
=====					
Total	8162.	10722.	11572.	10208.	9905.

Spawning Stock Biomass

AGE	1995	1996	1997	1998	1999
1	0.	0.	0.	0.	0.
2	6.	6.	3.	4.	4.
3	181.	161.	140.	95.	101.
4	1600.	1991.	1740.	1375.	1013.
5	2600.	2635.	3710.	3658.	2595.
6	1451.	1705.	2118.	2731.	2854.
7	860.	719.	1033.	1259.	1720.
8	783.	513.	384.	642.	589.
9	262.	382.	296.	234.	364.
10	129.	95.	222.	171.	148.
11	142.	297.	640.	1092.	377.
Total	8014.	8503.	10285.	11261.	9764.
AGE	2000	2001	2002	2003	2004
1	0.	0.	0.	0.	0.
2	5.	4.	4.	5.	8.
3	98.	100.	78.	68.	96.
4	1037.	1190.	1146.	867.	517.
5	2601.	2662.	1822.	2916.	1833.
6	2756.	2469.	1959.	1463.	2964.
7	2287.	1846.	1452.	1274.	990.
8	1174.	1323.	1032.	837.	888.
9	256.	745.	690.	624.	480.
10	210.	146.	416.	416.	361.
11	89.	163.	584.	372.	424.
Total	10512.	10648.	9183.	8843.	8560.
AGE	2005	2006	2007		
1	2.	3.	1.		
2	8.	17.	29.		
3	93.	181.	408.		
4	1181.	932.	2065.		
5	1273.	3405.	2818.		
6	1851.	1343.	3800.		
7	2685.	1668.	1197.		
8	758.	2620.	1561.		
9	640.	618.	2527.		
10	317.	513.	487.		
11	458.	500.	768.		
Total	9266.	11799.	15659.		

Catch Biomass

AGE	1980	1981	1982	1983	1984
1	0.	0.	0.	0.	0.
2	8.	106.	69.	22.	17.
3	165.	368.	770.	273.	159.
4	713.	1597.	1326.	1957.	734.
5	1611.	2359.	1882.	2606.	3160.
6	2568.	2838.	2030.	2622.	2044.
7	3011.	2125.	3165.	1868.	1719.
8	1232.	1547.	2319.	1326.	689.
9	1347.	729.	1502.	868.	310.
10	1168.	552.	1143.	650.	421.
11	2616.	963.	1364.	1531.	1506.
=====					
Total	14439.	13184.	15571.	13724.	10758.
=====					
AGE	1985	1986	1987	1988	1989
1	1.	1.	1.	5.	0.
2	9.	27.	27.	36.	80.
3	102.	102.	241.	292.	274.
4	279.	523.	337.	521.	607.
5	796.	653.	933.	717.	551.
6	1534.	867.	814.	926.	376.
7	1887.	1101.	798.	486.	582.
8	1262.	741.	637.	333.	428.
9	603.	380.	278.	247.	260.
10	445.	183.	107.	151.	151.
11	387.	219.	137.	124.	227.
=====					
Total	7306.	4796.	4309.	3839.	3535.
=====					
AGE	1990	1991	1992	1993	1994
1	0.	0.	0.	0.	0.
2	42.	7.	8.	9.	23.
3	567.	113.	98.	96.	77.
4	916.	1817.	513.	653.	616.
5	791.	2165.	2911.	1165.	1307.
6	386.	855.	1926.	1635.	816.
7	263.	313.	785.	1307.	920.
8	354.	192.	236.	327.	647.
9	210.	257.	173.	400.	303.
10	125.	149.	193.	238.	213.
11	273.	189.	188.	289.	704.
=====					
Total	3927.	6057.	7032.	6118.	5624.

Catch Biomass

AGE	1995	1996	1997	1998	1999
1	0.	0.	0.	0.	0.
2	66.	43.	13.	3.	4.
3	201.	124.	49.	35.	14.
4	720.	1183.	804.	212.	285.
5	1611.	1343.	1518.	995.	665.
6	1233.	957.	1032.	1297.	1207.
7	592.	501.	512.	842.	951.
8	680.	292.	205.	328.	426.
9	231.	176.	113.	80.	166.
10	111.	58.	104.	83.	62.
11	95.	152.	282.	509.	151.
=====					
Total	5540.	4828.	4633.	4384.	3930.
=====					
AGE	2000	2001	2002	2003	2004
1	0.	0.	0.	0.	0.
2	6.	2.	0.	17.	3.
3	82.	31.	15.	4.	17.
4	258.	304.	228.	84.	107.
5	766.	988.	602.	474.	346.
6	1272.	1147.	916.	676.	581.
7	1339.	1099.	797.	508.	329.
8	571.	761.	456.	457.	285.
9	151.	307.	295.	265.	190.
10	98.	82.	198.	170.	78.
11	37.	79.	256.	148.	89.
=====					
Total	4581.	4800.	3764.	2803.	2023.
=====					
AGE	2005	2006	2007		
1	0.	0.	1.		
2	5.	3.	8.		
3	7.	13.	38.		
4	126.	140.	188.		
5	395.	320.	347.		
6	389.	280.	263.		
7	283.	220.	139.		
8	150.	157.	93.		
9	92.	92.	67.		
10	45.	59.	34.		
11	62.	56.	47.		
=====					
Total	1556.	1338.	1226.		

Catch Numbers

AGE	1980	1981	1982	1983	1984
1	5.2	5.1	9.6	14.5	2.5
2	98.9	981.8	603.2	662.8	370.5
3	1071.7	2191.8	3348.1	1478.2	990.6
4	2671.5	5055.3	4574.0	5176.8	2422.1
5	3938.7	5337.2	4503.1	4917.9	6031.2
6	3933.3	3648.1	3598.6	3913.0	3244.4
7	3632.0	2400.8	3297.0	2270.2	1935.6
8	1185.4	1581.6	2037.6	1272.1	580.3
9	1138.6	645.1	1256.1	701.2	273.8
10	849.9	439.8	736.7	449.6	307.2
11	1380.4	620.9	717.4	911.4	768.9
=====					
Total	19905.6	22907.5	24681.4	21767.7	16927.1
AGE	1985	1986	1987	1988	1989
1	64.8	59.3	38.5	313.5	15.5
2	157.8	638.7	589.6	785.5	2275.0
3	1217.4	738.0	1840.5	1839.5	2605.8
4	1336.4	2284.0	1439.2	1833.4	2517.3
5	2404.6	1700.0	2282.3	1597.4	1521.9
6	2872.0	1476.5	1336.9	1444.4	827.2
7	2228.2	1307.1	895.0	552.8	835.5
8	1081.3	631.5	542.9	270.3	534.5
9	438.1	254.9	187.2	177.1	195.6
10	267.1	104.8	61.6	88.2	103.6
11	181.9	99.9	59.9	55.3	118.0
=====					
Total	12249.6	9294.7	9273.6	8957.4	11549.9
AGE	1990	1991	1992	1993	1994
1	0.0	0.4	9.6	21.8	58.2
2	1094.4	255.2	244.5	280.6	885.8
3	4725.5	1030.8	861.7	421.6	406.9
4	3606.7	5997.5	1604.6	1774.5	1710.6
5	1971.8	4865.9	5810.5	2382.2	2840.7
6	696.0	1260.9	2649.2	2578.6	1341.7
7	367.2	326.5	848.7	1384.1	1158.2
8	404.1	165.8	190.7	264.9	597.0
9	193.0	201.6	131.2	286.6	234.7
10	96.1	97.0	117.6	151.2	149.7
11	161.0	104.1	93.5	124.8	290.5
=====					
Total	13315.8	14305.7	12561.8	9670.9	9674.0



Catch Numbers

AGE	1995	1996	1997	1998	1999
1	45.3	12.5	14.7	37.2	4.2
2	2433.7	1149.7	636.1	85.5	216.3
3	1572.9	1257.3	336.9	348.7	169.0
4	2359.5	3732.1	2317.2	866.1	1136.2
5	3294.4	2712.5	3615.0	2859.4	1674.7
6	1854.2	1506.3	1716.5	2603.7	2352.1
7	654.6	566.3	633.9	1071.4	1388.6
8	588.5	242.6	182.1	317.9	488.4
9	210.3	126.4	84.9	59.5	149.7
10	52.6	36.8	66.3	56.8	42.3
11	49.6	68.3	116.2	154.5	79.0
Total	13115.6	11410.8	9719.8	8460.7	7700.5
AGE	2000	2001	2002	2003	2004
1	2.7	0.0	1.1	11.9	6.1
2	303.0	91.7	12.9	689.2	140.0
3	442.2	413.8	108.7	45.5	226.2
4	797.2	958.8	771.8	297.1	440.3
5	1650.5	2296.8	1449.5	1238.0	923.9
6	2223.8	2198.0	1810.7	1275.1	1195.3
7	1755.2	1579.0	1191.3	743.8	508.0
8	567.3	911.8	516.1	557.3	364.4
9	138.2	293.4	283.1	278.7	195.3
10	69.8	56.3	161.4	153.9	77.3
11	19.8	51.8	177.2	119.0	73.8
Total	7969.7	8851.4	6483.8	5409.5	4150.6
AGE	2005	2006	2007		
1	34.3	28.4	160.0		
2	283.5	83.4	237.7		
3	106.5	114.0	223.7		
4	434.2	477.6	596.4		
5	989.7	768.1	806.2		
6	766.8	535.7	511.0		
7	442.2	353.5	216.3		
8	177.3	191.2	112.5		
9	97.2	99.4	68.3		
10	42.3	59.9	33.4		
11	48.8	43.5	30.8		
Total	3422.8	2754.7	2996.3		

Surplus Production

Average Adjustment Factor (Delta) = 1.0000

Year	Biomass	Delta Biomass	Catch Biomass	Surplus Production
1980	52640.218	-9388.332	14438.521	5050.189
1981	43251.887	-2146.978	13184.160	11037.182
1982	41104.909	-7434.662	15571.310	8136.649
1983	33670.247	-6908.762	13723.817	6815.055
1984	26761.485	-9973.316	10758.293	784.978
1985	16788.169	-4568.418	7305.689	2737.271
1986	12219.751	-299.043	4796.441	4497.398
1987	11920.708	702.752	4309.415	5012.167
1988	12623.460	-32.184	3839.044	3806.860
1989	12591.276	419.175	3535.290	3954.464
1990	13010.451	2619.375	3926.749	6546.124
1991	15629.826	406.972	6057.404	6464.377
1992	16036.798	-1039.888	7031.703	5991.815
1993	14996.910	206.181	6117.735	6323.916
1994	15203.091	-1979.560	5624.494	3644.934
1995	13223.531	253.672	5540.118	5793.789
1996	13477.203	1644.821	4827.751	6472.572
1997	15122.024	465.966	4632.705	5098.671
1998	15587.990	-2078.878	4384.243	2305.364
1999	13509.112	701.117	3930.338	4631.456
2000	14210.229	215.765	4580.812	4796.577
2001	14425.995	-2006.746	4799.699	2792.953
2002	12419.249	181.206	3763.717	3944.923
2003	12600.455	-1168.929	2802.821	1633.892
2004	11431.526	739.219	2023.203	2762.422
2005	12170.745	3493.289	1556.197	5049.486
2006	15664.034	5528.882	1338.464	6867.345
2007	21192.915	3724.808	1225.713	4950.521
2008	24917.724			

Summary of Survey Indices Used in the Estimate

INDEX	Survey Tag	Age	Time	Type	Catchability	Std. Error	CV
1	spr_us	1	JAN-1	NUMBER	0.7563E-02	0.1425E-02	0.1885E+00
2	spr_us	2	JAN-1	NUMBER	0.1178E+00	0.1310E-01	0.1112E+00
3	spr_us	3	JAN-1	NUMBER	0.2371E+00	0.2267E-01	0.9563E-01
4	spr_us	4	JAN-1	NUMBER	0.3453E+00	0.2786E-01	0.8069E-01
5	spr_us	5	JAN-1	NUMBER	0.3320E+00	0.2341E-01	0.7051E-01
6	spr_us	6	JAN-1	NUMBER	0.2705E+00	0.1984E-01	0.7332E-01
7	spr_us	7	JAN-1	NUMBER	0.2393E+00	0.2230E-01	0.9318E-01
8	spr_us	8	JAN-1	NUMBER	0.1781E+00	0.2432E-01	0.1366E+00
9	spr_us	9 - 11	JAN-1	NUMBER	0.1832E+00	0.2799E-01	
0.1528E+00							
11	us1aut	2	JAN-1	NUMBER	0.1066E+00	0.1249E-01	0.1171E+00
12	us2aut	3	JAN-1	NUMBER	0.2997E+00	0.2595E-01	0.8660E-01
13	us3aut	4	JAN-1	NUMBER	0.4547E+00	0.3963E-01	0.8715E-01
14	us4aut	5	JAN-1	NUMBER	0.5453E+00	0.4076E-01	0.7475E-01
15	us5aut	6	JAN-1	NUMBER	0.5214E+00	0.4468E-01	0.8569E-01
16	us6aut	7	JAN-1	NUMBER	0.4606E+00	0.4478E-01	0.9721E-01
17	us7aut	8	JAN-1	NUMBER	0.3284E+00	0.4166E-01	0.1269E+00
18	us8paut	9 - 11	JAN-1	NUMBER	0.3104E+00	0.4414E-01	
0.1422E+00							
20	spr_ma	1	JAN-1	NUMBER	0.4218E-01	0.1026E-01	0.2432E+00
21	spr_ma	2	JAN-1	NUMBER	0.2342E+00	0.3702E-01	0.1581E+00
22	spr_ma	3	JAN-1	NUMBER	0.3188E+00	0.2495E-01	0.7828E-01
23	spr_ma	4	JAN-1	NUMBER	0.2290E+00	0.1828E-01	0.7986E-01
24	spr_ma	5	JAN-1	NUMBER	0.1282E+00	0.1269E-01	0.9901E-01
26	malaut	2	JAN-1	NUMBER	0.2656E+00	0.4001E-01	0.1506E+00
27	ma2aut	3	JAN-1	NUMBER	0.3412E+00	0.3933E-01	0.1153E+00
28	ma3aut	4	JAN-1	NUMBER	0.2712E+00	0.3045E-01	0.1123E+00
29	ma4aut	5	JAN-1	NUMBER	0.1403E+00	0.1948E-01	0.1389E+00
30	ma5aut	6	JAN-1	NUMBER	0.5424E-01	0.1028E-01	0.1895E+00

Survey Index: 1 Tag: spr\_us AGE = 1  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.756315E-02 % Variance Contribution = 8.3115  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.133361E+04	0.380428E+03	0.125435E+01
1981	0.385260E+03	0.196844E+03	0.671508E+00
1982	0.889100E+02	0.157682E+03	-0.572957E+00
1983	0.592710E+03	0.186551E+03	0.115600E+01
1984	0.296400E+02	0.117378E+03	-0.137628E+01
1985	0.889100E+02	0.143789E+03	-0.480721E+00
1986	0.296400E+02	0.178505E+03	-0.179549E+01
1987	0.266720E+03	0.314726E+03	-0.165505E+00
1988	0.592710E+03	0.404585E+03	0.381845E+00
1989	0.148180E+03	0.158681E+03	-0.684651E-01
1990	N/A	0.163726E+03	N/A
1991	0.889100E+02	0.171442E+03	-0.656623E+00

1992	0.177810E+03	0.190111E+03	-0.668933E-01
1993	0.977980E+03	0.299900E+03	0.118204E+01
1994	0.889100E+02	0.293118E+03	-0.119295E+01
1995	0.889100E+02	0.201323E+03	-0.817288E+00
1996	0.592700E+02	0.183035E+03	-0.112757E+01
1997	0.296400E+02	0.161459E+03	-0.169513E+01
1998	0.177810E+03	0.126626E+03	0.339476E+00
1999	0.237090E+03	0.200148E+03	0.169384E+00
2000	0.889100E+02	0.122320E+03	-0.319012E+00
2001	N/A	0.938545E+02	N/A
2002	0.297840E+03	0.214693E+03	0.327348E+00
2003	0.132770E+03	0.170040E+03	-0.247413E+00
2004	0.107429E+04	0.278671E+03	0.134938E+01
2005	0.578790E+03	0.322916E+03	0.583547E+00
2006	0.225824E+04	0.388719E+03	0.175948E+01
2007	0.726080E+03	0.177635E+03	0.140793E+01
2008	0.318290E+03	0.318290E+03	-0.109231E-07

Survey Index: 2 Tag: spr\_us AGE = 2  
Time = JAN-1 Type = NUMBER  
Catchability = 0.117776E+00 % Variance Contribution = 3.3489  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.109356E+05	0.464939E+04	0.855286E+00
1981	0.101650E+05	0.484972E+04	0.740035E+00
1982	0.311175E+04	0.250912E+04	0.215253E+00
1983	0.109059E+05	0.200935E+04	0.169150E+01
1984	0.103725E+04	0.237689E+04	-0.829220E+00
1985	0.948340E+03	0.149625E+04	-0.456004E+00
1986	0.136324E+04	0.182634E+04	-0.292452E+00
1987	0.180778E+04	0.226955E+04	-0.227481E+00
1988	0.293394E+04	0.400852E+04	-0.312075E+00
1989	0.471208E+04	0.512491E+04	-0.839833E-01
1990	0.168924E+04	0.202145E+04	-0.179537E+00
1991	0.210414E+04	0.208722E+04	0.807461E-02
1992	0.100761E+04	0.218559E+04	-0.774304E+00
1993	0.248940E+04	0.242280E+04	0.271159E-01
1994	0.423791E+04	0.382127E+04	0.103489E+00
1995	0.583824E+04	0.373093E+04	0.447772E+00
1996	0.139288E+04	0.256196E+04	-0.609398E+00
1997	0.251904E+04	0.233227E+04	0.770346E-01
1998	0.563080E+03	0.205696E+04	-0.129556E+01
1999	0.121506E+04	0.161047E+04	-0.281730E+00
2000	0.566042E+04	0.255134E+04	0.796879E+00
2001	0.209821E+04	0.155923E+04	0.296893E+00
2002	0.102451E+04	0.119648E+04	-0.155170E+00
2003	0.224728E+04	0.273696E+04	-0.197127E+00
2004	0.256764E+04	0.216666E+04	0.169802E+00
2005	0.230329E+04	0.355227E+04	-0.433248E+00
2006	0.479980E+04	0.411338E+04	0.154330E+00
2007	0.110921E+05	0.495296E+04	0.806243E+00
2008	0.172895E+04	0.224774E+04	-0.262409E+00

Survey Index: 3 Tag: spr\_us AGE = 3

Time = JAN-1                      Type = NUMBER  
 Catchability = 0.237083E+00    % Variance Contribution = 2.4750  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.134842E+05	0.773728E+04	0.555472E+00
1981	0.124766E+05	0.764154E+04	0.490259E+00
1982	0.530479E+04	0.778270E+04	-0.383294E+00
1983	0.986869E+04	0.400620E+04	0.901524E+00
1984	0.165960E+04	0.316979E+04	-0.647089E+00
1985	0.290430E+04	0.383806E+04	-0.278776E+00
1986	0.100761E+04	0.243220E+04	-0.881215E+00
1987	0.293394E+04	0.287334E+04	0.208708E-01
1988	0.248940E+04	0.361427E+04	-0.372849E+00
1989	0.376374E+04	0.643833E+04	-0.536856E+00
1990	0.785346E+04	0.795968E+04	-0.134352E-01
1991	0.483062E+04	0.309748E+04	0.444385E+00
1992	0.340811E+04	0.338533E+04	0.670620E-02
1993	0.343774E+04	0.354975E+04	-0.320623E-01
1994	0.337847E+04	0.393298E+04	-0.151973E+00
1995	0.951306E+04	0.610827E+04	0.443023E+00
1996	0.574933E+04	0.562855E+04	0.212323E-01
1997	0.491953E+04	0.397641E+04	0.212832E+00
1998	0.302284E+04	0.370770E+04	-0.204215E+00
1999	0.154106E+04	0.337180E+04	-0.782976E+00
2000	0.734966E+04	0.260792E+04	0.103610E+01
2001	0.108763E+05	0.414002E+04	0.965886E+00
2002	0.291112E+04	0.255015E+04	0.132386E+00
2003	0.798980E+03	0.196917E+04	-0.902032E+00
2004	0.600182E+04	0.436330E+04	0.318835E+00
2005	0.308745E+04	0.354092E+04	-0.137040E+00
2006	0.508075E+04	0.579383E+04	-0.131335E+00
2007	0.822776E+04	0.676145E+04	0.196277E+00
2008	0.606613E+04	0.811214E+04	-0.290641E+00

Survey Index: 4 Tag: spr\_us AGE = 4  
 Time = JAN-1                      Type = NUMBER  
 Catchability = 0.345291E+00    % Variance Contribution = 1.7622  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.903889E+04	0.830944E+04	0.841436E-01
1981	0.102540E+05	0.889194E+04	0.142519E+00
1982	0.939452E+04	0.842908E+04	0.108439E+00
1983	0.132768E+05	0.823792E+04	0.477270E+00
1984	0.266721E+04	0.431673E+04	-0.481466E+00
1985	0.254867E+04	0.347115E+04	-0.308913E+00
1986	0.299321E+04	0.419737E+04	-0.338111E+00
1987	0.204486E+04	0.267030E+04	-0.266863E+00
1988	0.225231E+04	0.285387E+04	-0.236718E+00
1989	0.254867E+04	0.373729E+04	-0.382788E+00
1990	0.302284E+04	0.686585E+04	-0.820364E+00
1991	0.690512E+04	0.802138E+04	-0.149847E+00
1992	0.260794E+04	0.337243E+04	-0.257074E+00

1993	0.468244E+04	0.376823E+04	0.217213E+00
1994	0.331920E+04	0.410132E+04	-0.211585E+00
1995	0.681621E+04	0.456286E+04	0.401355E+00
1996	0.977979E+04	0.679351E+04	0.364350E+00
1997	0.746820E+04	0.631975E+04	0.166974E+00
1998	0.331920E+04	0.463647E+04	-0.334229E+00
1999	0.334884E+04	0.431238E+04	-0.252875E+00
2000	0.657913E+04	0.396786E+04	0.505675E+00
2001	0.998724E+04	0.297188E+04	0.121211E+01
2002	0.696439E+04	0.480759E+04	0.370614E+00
2003	0.208873E+04	0.300692E+04	-0.364360E+00
2004	0.530301E+04	0.233387E+04	0.820748E+00
2005	0.364786E+04	0.513229E+04	-0.341412E+00
2006	0.504252E+04	0.418901E+04	0.185442E+00
2007	0.478054E+04	0.687306E+04	-0.363056E+00
2008	0.842603E+04	0.799264E+04	0.528041E-01

Survey Index: 5 Tag: spr\_us AGE = 5  
Time = JAN-1 Type = NUMBER  
Catchability = 0.332013E+00 % Variance Contribution = 1.3454  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.868326E+04	0.639246E+04	0.306278E+00
1981	0.773492E+04	0.574210E+04	0.297921E+00
1982	0.631241E+04	0.549009E+04	0.139573E+00
1983	0.782383E+04	0.526919E+04	0.395297E+00
1984	0.382301E+04	0.493968E+04	-0.256261E+00
1985	0.216341E+04	0.267479E+04	-0.212186E+00
1986	0.174851E+04	0.233289E+04	-0.288345E+00
1987	0.151142E+04	0.262198E+04	-0.550881E+00
1988	0.918710E+03	0.167219E+04	-0.598917E+00
1989	0.145215E+04	0.169937E+04	-0.157214E+00
1990	0.160033E+04	0.219087E+04	-0.314090E+00
1991	0.272649E+04	0.432740E+04	-0.461953E+00
1992	0.317102E+04	0.452597E+04	-0.355778E+00
1993	0.180778E+04	0.217528E+04	-0.185059E+00
1994	0.222268E+04	0.243607E+04	-0.916715E-01
1995	0.328956E+04	0.271718E+04	0.191158E+00
1996	0.388228E+04	0.288701E+04	0.296202E+00
1997	0.607532E+04	0.423319E+04	0.361278E+00
1998	0.361556E+04	0.428197E+04	-0.169167E+00
1999	0.234122E+04	0.339061E+04	-0.370337E+00
2000	0.474171E+04	0.305474E+04	0.439704E+00
2001	0.429718E+04	0.288491E+04	0.398464E+00
2002	0.493168E+04	0.205267E+04	0.876537E+00
2003	0.367601E+04	0.355353E+04	0.338868E-01
2004	0.393029E+04	0.227814E+04	0.545353E+00
2005	0.270782E+04	0.170544E+04	0.462320E+00
2006	0.248051E+04	0.391023E+04	-0.455133E+00
2007	0.301721E+04	0.315465E+04	-0.445452E-01
2008	0.414693E+04	0.523203E+04	-0.232431E+00

Survey Index: 6 Tag: spr\_us AGE = 6  
Time = JAN-1 Type = NUMBER

Catchability = 0.270544E+00 % Variance Contribution = 1.4548  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.477135E+04	0.377550E+04	0.234096E+00
1981	0.500844E+04	0.330621E+04	0.415321E+00
1982	0.394155E+04	0.253537E+04	0.441234E+00
1983	0.349701E+04	0.256866E+04	0.308525E+00
1984	0.171887E+04	0.232169E+04	-0.300628E+00
1985	0.254867E+04	0.183571E+04	0.328141E+00
1986	0.859440E+03	0.120067E+04	-0.334358E+00
1987	0.740890E+03	0.114305E+04	-0.433603E+00
1988	0.681620E+03	0.119500E+04	-0.561426E+00
1989	0.859440E+03	0.727961E+03	0.166033E+00
1990	0.503810E+03	0.764223E+03	-0.416661E+00
1991	0.444540E+03	0.982912E+03	-0.793479E+00
1992	0.127434E+04	0.170812E+04	-0.292967E+00
1993	0.133361E+04	0.161406E+04	-0.190866E+00
1994	0.681620E+03	0.873917E+03	-0.248514E+00
1995	0.130397E+04	0.937269E+03	0.330198E+00
1996	0.157069E+04	0.101532E+04	0.436312E+00
1997	0.115579E+04	0.126774E+04	-0.924492E-01
1998	0.201523E+04	0.194614E+04	0.348838E-01
1999	0.189669E+04	0.216114E+04	-0.130526E+00
2000	0.254867E+04	0.185412E+04	0.318164E+00
2001	0.222268E+04	0.163607E+04	0.306415E+00
2002	0.151557E+04	0.136653E+04	0.103514E+00
2003	0.189224E+04	0.101694E+04	0.620961E+00
2004	0.337017E+04	0.206887E+04	0.487962E+00
2005	0.147023E+04	0.129467E+04	0.127161E+00
2006	0.958420E+03	0.896867E+03	0.663790E-01
2007	0.966420E+03	0.242123E+04	-0.918432E+00
2008	0.188631E+04	0.190792E+04	-0.113911E-01

Survey Index: 7 Tag: spr\_us AGE = 7  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.239287E+00 % Variance Contribution = 2.3496  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.337847E+04	0.238017E+04	0.350251E+00
1981	0.417864E+04	0.188898E+04	0.793947E+00
1982	0.272649E+04	0.161077E+04	0.526305E+00
1983	0.171887E+04	0.106507E+04	0.478622E+00
1984	0.651990E+03	0.102256E+04	-0.450039E+00
1985	0.136324E+04	0.986091E+03	0.323871E+00
1986	0.622350E+03	0.714833E+03	-0.138546E+00
1987	0.503810E+03	0.552688E+03	-0.925947E-01
1988	0.355630E+03	0.540781E+03	-0.419123E+00
1989	0.474170E+03	0.555414E+03	-0.158149E+00
1990	0.177810E+03	0.349555E+03	-0.675946E+00
1991	0.207450E+03	0.403746E+03	-0.665895E+00
1992	0.325990E+03	0.441362E+03	-0.303000E+00

1993	0.503810E+03	0.670045E+03	-0.285145E+00
1994	0.296360E+03	0.617267E+03	-0.733727E+00
1995	0.651990E+03	0.345702E+03	0.634451E+00
1996	0.592710E+03	0.283605E+03	0.737121E+00
1997	0.266720E+03	0.412728E+03	-0.436589E+00
1998	0.474170E+03	0.550117E+03	-0.148565E+00
1999	0.121506E+04	0.851151E+03	0.355959E+00
2000	0.177814E+04	0.105982E+04	0.517466E+00
2001	0.109652E+04	0.865436E+03	0.236663E+00
2002	0.988650E+03	0.713604E+03	0.326013E+00
2003	0.653470E+03	0.601381E+03	0.830681E-01
2004	0.102006E+04	0.462899E+03	0.790107E+00
2005	0.702960E+03	0.124059E+04	-0.568040E+00
2006	0.881960E+03	0.772309E+03	0.132762E+00
2007	0.406900E+03	0.534038E+03	-0.271900E+00
2008	0.642210E+03	0.164297E+04	-0.939347E+00

Survey Index: 8 Tag: spr\_us AGE = 8  
Time = JAN-1 Type = NUMBER  
Catchability = 0.178071E+00 % Variance Contribution = 5.0464  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.770530E+03	0.832982E+03	-0.779340E-01
1981	0.228195E+04	0.870858E+03	0.963306E+00
1982	0.148179E+04	0.767316E+03	0.658107E+00
1983	0.948340E+03	0.457665E+03	0.728575E+00
1984	0.296360E+03	0.288573E+03	0.266284E-01
1985	0.124470E+04	0.315146E+03	0.137361E+01
1986	0.296360E+03	0.247546E+03	0.179978E+00
1987	0.207450E+03	0.227514E+03	-0.923218E-01
1988	0.296400E+02	0.194078E+03	-0.187914E+01
1989	0.889100E+02	0.241024E+03	-0.997272E+00
1990	0.118540E+03	0.205114E+03	-0.548315E+00
1991	0.118540E+03	0.154225E+03	-0.263162E+00
1992	0.118540E+03	0.193682E+03	-0.490965E+00
1993	0.237090E+03	0.133950E+03	0.570971E+00
1994	0.889100E+02	0.188411E+03	-0.751002E+00
1995	0.889100E+02	0.191837E+03	-0.769023E+00
1996	0.148180E+03	0.106508E+03	0.330211E+00
1997	0.296400E+02	0.827966E+02	-0.102726E+01
1998	0.177810E+03	0.150362E+03	0.167669E+00
1999	0.503810E+03	0.164833E+03	0.111727E+01
2000	0.444540E+03	0.297265E+03	0.402415E+00
2001	0.503810E+03	0.366025E+03	0.319497E+00
2002	0.579970E+03	0.275994E+03	0.742597E+00
2003	0.303770E+03	0.244961E+03	0.215172E+00
2004	0.290430E+03	0.247538E+03	0.159799E+00
2005	0.342890E+03	0.200778E+03	0.535209E+00
2006	0.317990E+03	0.684847E+03	-0.767176E+00
2007	0.207750E+03	0.413809E+03	-0.689069E+00
2008	0.253090E+03	0.290649E+03	-0.138373E+00

Survey Index: 9 Tag: spr\_us AGE = 9 - 11  
Time = JAN-1 Type = NUMBER



Catchability = 0.183208E+00 % Variance Contribution = 6.3162  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	0.194410E+04	0.188545E+04	0.306341E-01
1981	0.308211E+04	0.114337E+04	0.991640E+00
1982	0.204486E+04	0.108259E+04	0.635979E+00
1983	0.154106E+04	0.865628E+03	0.576769E+00
1984	0.266721E+03	0.673151E+03	-0.925764E+00
1985	0.859436E+03	0.316619E+03	0.998578E+00
1986	0.237086E+03	0.186478E+03	0.240106E+00
1987	0.296357E+03	0.167865E+03	0.568405E+00
1988	0.325993E+03	0.192786E+03	0.525296E+00
1989	0.266721E+03	0.236615E+03	0.119771E+00
1990	0.148179E+03	0.289978E+03	-0.671386E+00
1991	0.148179E+03	0.236523E+03	-0.467629E+00
1992	0.118543E+03	0.199584E+03	-0.520960E+00
1993	0.237086E+03	0.245565E+03	-0.351397E-01
1994	0.148179E+03	0.248250E+03	-0.516019E+00
1995	0.355629E+03	0.976208E+02	0.129280E+01
1996	0.592714E+02	0.111673E+03	-0.633448E+00
1997	0.889071E+02	0.140730E+03	-0.459251E+00
1998	0.889071E+02	0.140119E+03	-0.454898E+00
1999	0.118543E+03	0.140073E+03	-0.166889E+00
2000	0.296357E+03	0.105911E+03	0.102896E+01
2001	0.474171E+03	0.206744E+03	0.830086E+00
2002	0.645466E+03	0.328047E+03	0.676817E+00
2003	0.554781E+03	0.296155E+03	0.627691E+00
2004	0.611088E+03	0.261937E+03	0.847139E+00
2005	0.488989E+02	0.282185E+03	-0.175281E+01
2006	0.170702E+03	0.322110E+03	-0.634976E+00
2007	0.120025E+03	0.742816E+03	-0.182275E+01
2008	0.362148E+03	0.916722E+03	-0.928750E+00

Survey Index: 11 Tag: uslaut AGE = 2  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.106649E+00 % Variance Contribution = 3.4536  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.421014E+04	N/A
1981	0.468244E+04	0.439154E+04	0.641395E-01
1982	0.130397E+04	0.227207E+04	-0.555279E+00
1983	0.592710E+03	0.181952E+04	-0.112162E+01
1984	0.148179E+04	0.215233E+04	-0.373302E+00
1985	0.651990E+03	0.135489E+04	-0.731447E+00
1986	0.269685E+04	0.165380E+04	0.489008E+00
1987	0.151142E+04	0.205513E+04	-0.307291E+00
1988	0.157069E+04	0.362981E+04	-0.837666E+00
1989	0.841654E+04	0.464073E+04	0.595326E+00
1990	0.142251E+04	0.183048E+04	-0.252153E+00
1991	0.506771E+04	0.189003E+04	0.986297E+00
1992	0.139288E+04	0.197911E+04	-0.351272E+00
1993	0.192632E+04	0.219391E+04	-0.130074E+00

1994	0.503807E+04	0.346025E+04	0.375682E+00
1995	0.113505E+05	0.337845E+04	0.121184E+01
1996	0.148179E+04	0.231992E+04	-0.448280E+00
1997	0.160033E+04	0.211193E+04	-0.277393E+00
1998	0.106689E+04	0.186263E+04	-0.557243E+00
1999	0.512698E+04	0.145832E+04	0.125723E+01
2000	0.592714E+04	0.231030E+04	0.942163E+00
2001	0.139288E+04	0.141192E+04	-0.135774E-01
2002	0.118543E+04	0.108344E+04	0.899618E-01
2003	0.295587E+04	0.247838E+04	0.176186E+00
2004	0.207776E+04	0.196196E+04	0.573449E-01
2005	0.208161E+04	0.321667E+04	-0.435204E+00
2006	0.204101E+04	0.372476E+04	-0.601559E+00
2007	0.605280E+04	0.448503E+04	0.299775E+00
2008	0.318702E+04	0.203538E+04	0.448403E+00

Survey Index: 12 Tag: us2aut AGE = 3  
Time = JAN-1 Type = NUMBER  
Catchability = 0.299685E+00 % Variance Contribution = 1.8896  
Residual = LN(Observed) - LN(Predicted)

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

---

1980	N/A	0.978030E+04	N/A
1981	0.660876E+04	0.965928E+04	-0.379523E+00
1982	0.782383E+04	0.983772E+04	-0.229050E+00
1983	0.269685E+04	0.506403E+04	-0.630078E+00
1984	0.299321E+04	0.400677E+04	-0.291639E+00
1985	0.663840E+04	0.485150E+04	0.313583E+00
1986	0.245976E+04	0.307442E+04	-0.223053E+00
1987	0.432681E+04	0.363204E+04	0.175035E+00
1988	0.376374E+04	0.456862E+04	-0.193797E+00
1989	0.880181E+04	0.813837E+04	0.783679E-01
1990	0.131879E+05	0.100614E+05	0.270590E+00
1991	0.669767E+04	0.391537E+04	0.536850E+00
1992	0.732002E+04	0.427922E+04	0.536841E+00
1993	0.364519E+04	0.448705E+04	-0.207788E+00
1994	0.693476E+04	0.497147E+04	0.332830E+00
1995	0.223157E+05	0.772115E+04	0.106133E+01
1996	0.112616E+05	0.711476E+04	0.459225E+00
1997	0.240049E+04	0.502638E+04	-0.739028E+00
1998	0.314139E+04	0.468671E+04	-0.400066E+00
1999	0.177814E+04	0.426212E+04	-0.874199E+00
2000	0.651986E+04	0.329654E+04	0.681980E+00
2001	0.859436E+04	0.523319E+04	0.496085E+00
2002	0.361556E+04	0.322351E+04	0.114775E+00
2003	0.227069E+04	0.248913E+04	-0.918491E-01
2004	0.669738E+04	0.551542E+04	0.194169E+00
2005	0.284592E+04	0.447589E+04	-0.452819E+00
2006	0.487685E+04	0.732369E+04	-0.406615E+00
2007	0.751799E+04	0.854680E+04	-0.128258E+00
2008	0.102142E+05	0.102541E+05	-0.389800E-02

Survey Index: 13 Tag: us3aut AGE = 4  
Time = JAN-1 Type = NUMBER  
Catchability = 0.454693E+00 % Variance Contribution = 1.9136

Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.109422E+05	N/A
1981	0.806091E+04	0.117093E+05	-0.373354E+00
1982	0.640131E+04	0.110998E+05	-0.550420E+00
1983	0.488989E+04	0.108480E+05	-0.796814E+00
1984	0.598641E+04	0.568445E+04	0.517571E-01
1985	0.462317E+04	0.457095E+04	0.113605E-01
1986	0.782383E+04	0.552726E+04	0.347481E+00
1987	0.257831E+04	0.351636E+04	-0.310293E+00
1988	0.293394E+04	0.375809E+04	-0.247564E+00
1989	0.708294E+04	0.492141E+04	0.364094E+00
1990	0.847581E+04	0.904124E+04	-0.645796E-01
1991	0.221972E+05	0.105629E+05	0.742618E+00
1992	0.598641E+04	0.444096E+04	0.298622E+00
1993	0.548261E+04	0.496216E+04	0.997398E-01
1994	0.102836E+05	0.540078E+04	0.644006E+00
1995	0.832764E+04	0.600856E+04	0.326396E+00
1996	0.113208E+05	0.894597E+04	0.235442E+00
1997	0.592714E+04	0.832211E+04	-0.339374E+00
1998	0.459354E+04	0.610549E+04	-0.284538E+00
1999	0.557151E+04	0.567871E+04	-0.190585E-01
2000	0.607532E+04	0.522504E+04	0.150772E+00
2001	0.115876E+05	0.391350E+04	0.108550E+01
2002	0.980942E+04	0.633083E+04	0.437912E+00
2003	0.386420E+04	0.395964E+04	-0.243974E-01
2004	0.372669E+04	0.307333E+04	0.192758E+00
2005	0.353376E+04	0.675841E+04	-0.648426E+00
2006	0.214118E+04	0.551626E+04	-0.946342E+00
2007	0.774233E+04	0.905073E+04	-0.156143E+00
2008	0.838631E+04	0.105250E+05	-0.227157E+00

Survey Index: 14 Tag: us4aut AGE = 5  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.545345E+00 % Variance Contribution = 1.4078  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.104999E+05	N/A
1981	0.841654E+04	0.943162E+04	-0.113869E+00
1982	0.734966E+04	0.901769E+04	-0.204535E+00
1983	0.376374E+04	0.865486E+04	-0.832708E+00
1984	0.865363E+04	0.811362E+04	0.644354E-01
1985	0.358592E+04	0.439345E+04	-0.203101E+00
1986	0.311175E+04	0.383187E+04	-0.208168E+00
1987	0.423791E+04	0.430671E+04	-0.161045E-01
1988	0.127434E+04	0.274663E+04	-0.767948E+00
1989	0.231159E+04	0.279129E+04	-0.188568E+00
1990	0.290430E+04	0.359860E+04	-0.214352E+00
1991	0.856472E+04	0.710794E+04	0.186440E+00
1992	0.471208E+04	0.743409E+04	-0.455946E+00
1993	0.379337E+04	0.357299E+04	0.598518E-01

1994	0.675694E+04	0.400134E+04	0.523941E+00
1995	0.506771E+04	0.446308E+04	0.127049E+00
1996	0.740893E+04	0.474203E+04	0.446222E+00
1997	0.812019E+04	0.695319E+04	0.155153E+00
1998	0.551224E+04	0.703331E+04	-0.243687E+00
1999	0.595678E+04	0.556921E+04	0.672766E-01
2000	0.631241E+04	0.501753E+04	0.229579E+00
2001	0.675694E+04	0.473858E+04	0.354832E+00
2002	0.782383E+04	0.337160E+04	0.841788E+00
2003	0.995582E+04	0.583681E+04	0.533972E+00
2004	0.520640E+04	0.374194E+04	0.330284E+00
2005	0.291704E+04	0.280126E+04	0.405016E-01
2006	0.346412E+04	0.642271E+04	-0.617382E+00
2007	0.761964E+04	0.518164E+04	0.385607E+00
2008	0.649141E+04	0.859382E+04	-0.280564E+00

Survey Index: 15 Tag: us5aut AGE = 6  
Time = JAN-1 Type = NUMBER  
Catchability = 0.521424E+00 % Variance Contribution = 1.8500  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.727658E+04	N/A
1981	0.453426E+04	0.637211E+04	-0.340269E+00
1982	0.640131E+04	0.488646E+04	0.270035E+00
1983	0.168924E+04	0.495061E+04	-0.107523E+01
1984	0.403046E+04	0.447463E+04	-0.104543E+00
1985	0.317102E+04	0.353799E+04	-0.109505E+00
1986	0.234122E+04	0.231408E+04	0.116608E-01
1987	0.139288E+04	0.220302E+04	-0.458455E+00
1988	0.204486E+04	0.230314E+04	-0.118942E+00
1989	0.139288E+04	0.140301E+04	-0.724719E-02
1990	0.563080E+03	0.147290E+04	-0.961566E+00
1991	0.174851E+04	0.189438E+04	-0.801280E-01
1992	0.216341E+04	0.329209E+04	-0.419838E+00
1993	0.231159E+04	0.311081E+04	-0.296948E+00
1994	0.311175E+04	0.168431E+04	0.613827E+00
1995	0.385264E+04	0.180641E+04	0.757416E+00
1996	0.266721E+04	0.195684E+04	0.309702E+00
1997	0.275612E+04	0.244333E+04	0.120463E+00
1998	0.308211E+04	0.375083E+04	-0.196363E+00
1999	0.527516E+04	0.416520E+04	0.236245E+00
2000	0.474171E+04	0.357346E+04	0.282862E+00
2001	0.400082E+04	0.315323E+04	0.238072E+00
2002	0.432681E+04	0.263374E+04	0.496425E+00
2003	0.512016E+04	0.195997E+04	0.960257E+00
2004	0.514772E+04	0.398736E+04	0.255425E+00
2005	0.217289E+04	0.249524E+04	-0.138328E+00
2006	0.220994E+04	0.172854E+04	0.245686E+00
2007	0.418693E+04	0.466647E+04	-0.108436E+00
2008	0.250896E+04	0.367716E+04	-0.382273E+00

Survey Index: 16 Tag: us6aut AGE = 7  
Time = JAN-1 Type = NUMBER  
Catchability = 0.460618E+00 % Variance Contribution = 2.3812

Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.458173E+04	N/A
1981	0.302284E+04	0.363621E+04	-0.184746E+00
1982	0.426754E+04	0.310066E+04	0.319423E+00
1983	0.142251E+04	0.205022E+04	-0.365526E+00
1984	0.201523E+04	0.196839E+04	0.235164E-01
1985	0.151142E+04	0.189818E+04	-0.227848E+00
1986	0.121506E+04	0.137602E+04	-0.124404E+00
1987	0.124470E+04	0.106390E+04	0.156952E+00
1988	0.740890E+03	0.104098E+04	-0.340066E+00
1989	0.296360E+03	0.106915E+04	-0.128304E+01
1990	0.296360E+03	0.672879E+03	-0.819991E+00
1991	0.740890E+03	0.777193E+03	-0.478368E-01
1992	0.859440E+03	0.849604E+03	0.115108E-01
1993	0.889070E+03	0.128981E+04	-0.372072E+00
1994	0.237086E+04	0.118821E+04	0.690802E+00
1995	0.118543E+04	0.665462E+03	0.577379E+00
1996	0.651990E+03	0.545928E+03	0.177541E+00
1997	0.115579E+04	0.794484E+03	0.374847E+00
1998	0.948340E+03	0.105895E+04	-0.110322E+00
1999	0.320066E+04	0.163843E+04	0.669619E+00
2000	0.240049E+04	0.204011E+04	0.162667E+00
2001	0.222268E+04	0.166593E+04	0.288331E+00
2002	0.157069E+04	0.137366E+04	0.134038E+00
2003	0.157306E+04	0.115763E+04	0.306646E+00
2004	0.262128E+04	0.891061E+03	0.107900E+01
2005	0.147290E+04	0.238808E+04	-0.483255E+00
2006	0.125952E+04	0.148666E+04	-0.165803E+00
2007	0.167709E+04	0.102800E+04	0.489444E+00
2008	0.123937E+04	0.316265E+04	-0.936808E+00

Survey Index: 17 Tag: us7aut AGE = 8  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.328359E+00 % Variance Contribution = 4.0561  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.153600E+04	N/A
1981	0.275612E+04	0.160584E+04	0.540175E+00
1982	0.174851E+04	0.141491E+04	0.211696E+00
1983	0.889070E+03	0.843924E+03	0.521131E-01
1984	0.100761E+04	0.532121E+03	0.638465E+00
1985	0.355630E+03	0.581122E+03	-0.491070E+00
1986	0.563080E+03	0.456470E+03	0.209900E+00
1987	0.474170E+03	0.419531E+03	0.122429E+00
1988	0.296360E+03	0.357876E+03	-0.188612E+00
1989	0.207450E+03	0.444443E+03	-0.761931E+00
1990	0.592700E+02	0.378226E+03	-0.185339E+01
1991	0.355630E+03	0.284387E+03	0.223553E+00
1992	0.118540E+03	0.357144E+03	-0.110289E+01
1993	0.207450E+03	0.247001E+03	-0.174503E+00
1994	0.325990E+03	0.347426E+03	-0.636850E-01

1995	0.740890E+03	0.353744E+03	0.739280E+00
1996	0.118540E+03	0.196398E+03	-0.504891E+00
1997	0.207450E+03	0.152675E+03	0.306578E+00
1998	0.118540E+03	0.277264E+03	-0.849721E+00
1999	0.355630E+03	0.303949E+03	0.157032E+00
2000	0.592710E+03	0.548150E+03	0.781554E-01
2001	0.977980E+03	0.674942E+03	0.370862E+00
2002	0.121506E+04	0.508927E+03	0.870245E+00
2003	0.117031E+04	0.451703E+03	0.952000E+00
2004	0.103399E+04	0.456454E+03	0.817693E+00
2005	0.566930E+03	0.370230E+03	0.426110E+00
2006	0.432980E+03	0.126284E+04	-0.107043E+01
2007	0.130575E+04	0.763054E+03	0.537204E+00
2008	0.442160E+03	0.535951E+03	-0.192371E+00

Survey Index: 18 Tag: us8paut AGE = 9 - 11  
Time = JAN-1 Type = NUMBER  
Catchability = 0.310350E+00 % Variance Contribution = 5.0959  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.319391E+04	N/A
1981	0.411936E+04	0.193683E+04	0.754644E+00
1982	0.325993E+04	0.183387E+04	0.575274E+00
1983	0.145215E+04	0.146635E+04	-0.973354E-02
1984	0.133361E+04	0.114030E+04	0.156595E+00
1985	0.503807E+03	0.536345E+03	-0.625832E-01
1986	0.325993E+03	0.315890E+03	0.314807E-01
1987	0.563079E+03	0.284359E+03	0.683180E+00
1988	0.325993E+03	0.326575E+03	-0.178326E-02
1989	0.148179E+03	0.400820E+03	-0.995095E+00
1990	0.266721E+03	0.491215E+03	-0.610678E+00
1991	0.414900E+03	0.400665E+03	0.349110E-01
1992	0.237086E+03	0.338091E+03	-0.354892E+00
1993	0.355629E+03	0.415981E+03	-0.156754E+00
1994	0.355629E+03	0.420530E+03	-0.167629E+00
1995	0.563079E+03	0.165367E+03	0.122525E+01
1996	0.148179E+03	0.189172E+03	-0.244236E+00
1997	0.325993E+03	0.238393E+03	0.312953E+00
1998	0.118543E+03	0.237358E+03	-0.694295E+00
1999	0.237086E+03	0.237280E+03	-0.821011E-03
2000	0.889071E+02	0.179411E+03	-0.702089E+00
2001	0.592714E+03	0.350220E+03	0.526151E+00
2002	0.118543E+04	0.555703E+03	0.757625E+00
2003	0.165545E+04	0.501679E+03	0.119387E+01
2004	0.923745E+03	0.443715E+03	0.733254E+00
2005	0.430607E+03	0.478015E+03	-0.104446E+00
2006	0.678658E+03	0.545647E+03	0.218145E+00
2007	0.734669E+03	0.125831E+04	-0.538107E+00
2008	0.120025E+03	0.155291E+04	-0.256019E+01

Survey Index: 20 Tag: spr\_ma AGE = 1  
Time = JAN-1 Type = NUMBER  
Catchability = 0.421847E-01 % Variance Contribution = 12.8161  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.212190E+04	N/A
1981	N/A	0.109793E+04	N/A
1982	0.162223E+04	0.879498E+03	0.612205E+00
1983	0.436060E+03	0.104052E+04	-0.869694E+00
1984	0.485760E+03	0.654696E+03	-0.298457E+00
1985	0.487120E+04	0.802006E+03	0.180398E+01
1986	0.611385E+04	0.995642E+03	0.181492E+01
1987	0.776319E+04	0.175544E+04	0.148667E+01
1988	0.184071E+05	0.225664E+04	0.209886E+01
1989	0.182331E+04	0.885067E+03	0.722746E+00
1990	0.174649E+04	0.913208E+03	0.648399E+00
1991	0.474470E+03	0.956248E+03	-0.700819E+00
1992	0.185228E+04	0.106038E+04	0.557793E+00
1993	0.261990E+04	0.167274E+04	0.448671E+00
1994	0.262100E+04	0.163492E+04	0.471964E+00
1995	0.122190E+03	0.112291E+04	-0.221811E+01
1996	0.516760E+03	0.102091E+04	-0.680867E+00
1997	0.349820E+03	0.900566E+03	-0.945604E+00
1998	0.639400E+03	0.706279E+03	-0.994797E-01
1999	0.305010E+03	0.111636E+04	-0.129748E+01
2000	0.779280E+03	0.682258E+03	0.132963E+00
2001	0.158200E+02	0.523489E+03	-0.349924E+01
2002	0.141436E+04	0.119749E+04	0.166453E+00
2003	0.116357E+04	0.948424E+03	0.204447E+00
2004	0.372796E+04	0.155433E+04	0.874816E+00
2005	0.150474E+04	0.180112E+04	-0.179787E+00
2006	0.107094E+04	0.216815E+04	-0.705336E+00
2007	0.571620E+03	0.990786E+03	-0.550024E+00
2008	N/A	0.177532E+04	N/A

Survey Index: 21 Tag: spr\_ma AGE = 2  
Time = JAN-1 Type = NUMBER  
Catchability = 0.234209E+00 % Variance Contribution = 5.4133  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.924579E+04	N/A
1981	N/A	0.964415E+04	N/A
1982	0.111274E+05	0.498964E+04	0.802045E+00
1983	0.423857E+04	0.399580E+04	0.589824E-01
1984	0.619971E+04	0.472669E+04	0.271277E+00
1985	0.387708E+04	0.297544E+04	0.264689E+00
1986	0.249140E+05	0.363187E+04	0.192568E+01
1987	0.389967E+04	0.451323E+04	-0.146121E+00
1988	0.143628E+05	0.797134E+04	0.588789E+00
1989	0.287527E+05	0.101914E+05	0.103719E+01
1990	0.573202E+04	0.401986E+04	0.354820E+00
1991	0.451422E+04	0.415065E+04	0.839682E-01
1992	0.249827E+04	0.434627E+04	-0.553719E+00
1993	0.428844E+04	0.481799E+04	-0.116435E+00
1994	0.118765E+05	0.759898E+04	0.446551E+00
1995	0.782878E+04	0.741933E+04	0.537176E-01

1996	0.935970E+03	0.509471E+04	-0.169438E+01
1997	0.179907E+04	0.463796E+04	-0.947005E+00
1998	0.978310E+03	0.409048E+04	-0.143059E+01
1999	0.263216E+04	0.320258E+04	-0.196151E+00
2000	0.127684E+05	0.507360E+04	0.922925E+00
2001	0.107320E+04	0.310069E+04	-0.106098E+01
2002	0.937640E+03	0.237932E+04	-0.931205E+00
2003	0.101400E+05	0.544272E+04	0.622213E+00
2004	0.267509E+04	0.430862E+04	-0.476635E+00
2005	0.475371E+04	0.706405E+04	-0.396093E+00
2006	0.122525E+05	0.817987E+04	0.404058E+00
2007	0.110212E+05	0.984947E+04	0.112403E+00
2008	N/A	0.446985E+04	N/A

Survey Index: 22 Tag: spr\_ma AGE = 3  
Time = JAN-1 Type = NUMBER  
Catchability = 0.318789E+00 % Variance Contribution = 1.3275  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.104038E+05	N/A
1981	N/A	0.102750E+05	N/A
1982	0.753499E+04	0.104648E+05	-0.328464E+00
1983	0.506550E+04	0.538684E+04	-0.615069E-01
1984	0.481697E+04	0.426219E+04	0.122362E+00
1985	0.547219E+04	0.516077E+04	0.585937E-01
1986	0.607996E+04	0.327040E+04	0.620085E+00
1987	0.356754E+04	0.386357E+04	-0.797162E-01
1988	0.403297E+04	0.485985E+04	-0.186504E+00
1989	0.101604E+05	0.865716E+04	0.160109E+00
1990	0.128129E+05	0.107028E+05	0.179944E+00
1991	0.785582E+04	0.416496E+04	0.634548E+00
1992	0.767713E+04	0.455201E+04	0.522677E+00
1993	0.363370E+04	0.477309E+04	-0.272742E+00
1994	0.499872E+04	0.528839E+04	-0.563316E-01
1995	0.112164E+05	0.821334E+04	0.311615E+00
1996	0.337125E+04	0.756830E+04	-0.808685E+00
1997	0.315184E+04	0.534680E+04	-0.528511E+00
1998	0.258698E+04	0.498548E+04	-0.656038E+00
1999	0.263216E+04	0.453382E+04	-0.543759E+00
2000	0.787559E+04	0.350668E+04	0.809098E+00
2001	0.535696E+04	0.556679E+04	-0.384219E-01
2002	0.243334E+04	0.342900E+04	-0.343004E+00
2003	0.279710E+04	0.264780E+04	0.548531E-01
2004	0.766152E+04	0.586701E+04	0.266866E+00
2005	0.518073E+04	0.476122E+04	0.844431E-01
2006	0.790779E+04	0.779055E+04	0.149371E-01
2007	0.968817E+04	0.909163E+04	0.635516E-01
2008	N/A	0.109078E+05	N/A

Survey Index: 23 Tag: spr\_ma AGE = 4  
Time = JAN-1 Type = NUMBER  
Catchability = 0.228953E+00 % Variance Contribution = 1.3815  
Residual = LN(Observed) - LN(Predicted)



Year	Observed	Predicted	Residual
1980	N/A	0.550978E+04	N/A
1981	N/A	0.589601E+04	N/A
1982	0.387256E+04	0.558910E+04	-0.366903E+00
1983	0.484860E+04	0.546235E+04	-0.119189E+00
1984	0.238815E+04	0.286231E+04	-0.181111E+00
1985	0.214640E+04	0.230163E+04	-0.698238E-01
1986	0.326027E+04	0.278316E+04	0.158222E+00
1987	0.881150E+03	0.177061E+04	-0.697850E+00
1988	0.197017E+04	0.189232E+04	0.403144E-01
1989	0.270898E+04	0.247810E+04	0.890815E-01
1990	0.372344E+04	0.455257E+04	-0.201044E+00
1991	0.428828E+04	0.531877E+04	-0.215356E+00
1992	0.338729E+04	0.223617E+04	0.415265E+00
1993	0.206940E+04	0.249862E+04	-0.188478E+00
1994	0.161136E+04	0.271948E+04	-0.523361E+00
1995	0.233275E+04	0.302551E+04	-0.260032E+00
1996	0.709252E+04	0.450460E+04	0.453942E+00
1997	0.389413E+04	0.419046E+04	-0.733410E-01
1998	0.170130E+04	0.307432E+04	-0.591691E+00
1999	0.341391E+04	0.285942E+04	0.177238E+00
2000	0.451372E+04	0.263099E+04	0.539763E+00
2001	0.384770E+04	0.197058E+04	0.669149E+00
2002	0.420017E+04	0.318779E+04	0.275798E+00
2003	0.412787E+04	0.199381E+04	0.727714E+00
2004	0.295299E+04	0.154753E+04	0.646160E+00
2005	0.186172E+04	0.340309E+04	-0.603183E+00
2006	0.321056E+04	0.277762E+04	0.144851E+00
2007	0.356302E+04	0.455735E+04	-0.246133E+00
2008	N/A	0.529971E+04	N/A

Survey Index: 24 Tag: spr\_ma AGE = 5  
Time = JAN-1 Type = NUMBER  
Catchability = 0.128202E+00 % Variance Contribution = 2.1238  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.246836E+04	N/A
1981	N/A	0.221723E+04	N/A
1982	0.112968E+04	0.211992E+04	-0.629446E+00
1983	0.230907E+04	0.203463E+04	0.126532E+00
1984	0.104835E+04	0.190739E+04	-0.598518E+00
1985	0.851780E+03	0.103284E+04	-0.192735E+00
1986	0.641660E+03	0.900816E+03	-0.339242E+00
1987	0.397650E+03	0.101244E+04	-0.934550E+00
1988	0.347940E+03	0.645692E+03	-0.618293E+00
1989	0.684590E+03	0.656190E+03	0.423694E-01
1990	0.774960E+03	0.845976E+03	-0.876800E-01
1991	0.732040E+03	0.167097E+04	-0.825324E+00
1992	0.167695E+04	0.174764E+04	-0.412908E-01
1993	0.779100E+03	0.839957E+03	-0.752107E-01
1994	0.876360E+03	0.940655E+03	-0.707994E-01
1995	0.712940E+03	0.104920E+04	-0.386390E+00
1996	0.142932E+04	0.111478E+04	0.248542E+00
1997	0.275849E+04	0.163459E+04	0.523291E+00

1998	0.201762E+04	0.165343E+04	0.199069E+00
1999	0.171034E+04	0.130924E+04	0.267247E+00
2000	0.300288E+04	0.117955E+04	0.934442E+00
2001	0.107094E+04	0.111397E+04	-0.393936E-01
2002	0.133981E+04	0.792612E+03	0.524950E+00
2003	0.402619E+04	0.137215E+04	0.107644E+01
2004	0.128106E+04	0.879674E+03	0.375892E+00
2005	0.108450E+04	0.658533E+03	0.498859E+00
2006	0.111613E+04	0.150988E+04	-0.302165E+00
2007	0.168323E+04	0.121813E+04	0.323401E+00
2008	N/A	0.202028E+04	N/A

Survey Index: 26 Tag: malaut AGE = 2  
Time = JAN-1 Type = NUMBER  
Catchability = 0.265599E+00 % Variance Contribution = 4.9154  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.104850E+05	N/A
1981	N/A	0.109367E+05	N/A
1982	N/A	0.565838E+04	N/A
1983	0.299140E+04	0.453134E+04	-0.415275E+00
1984	0.117871E+05	0.536019E+04	0.788009E+00
1985	0.709440E+03	0.337423E+04	-0.155945E+01
1986	0.137754E+05	0.411863E+04	0.120736E+01
1987	0.932441E+04	0.511811E+04	0.599850E+00
1988	0.104744E+05	0.903970E+04	0.147311E+00
1989	0.193470E+05	0.115573E+05	0.515218E+00
1990	0.130049E+05	0.455863E+04	0.104831E+01
1991	0.722772E+04	0.470694E+04	0.428886E+00
1992	0.543830E+04	0.492878E+04	0.983756E-01
1993	0.104674E+05	0.546373E+04	0.650133E+00
1994	0.172178E+05	0.861743E+04	0.692160E+00
1995	0.829412E+04	0.841371E+04	-0.143156E-01
1996	0.267539E+04	0.577753E+04	-0.769882E+00
1997	0.367215E+04	0.525957E+04	-0.359271E+00
1998	0.307529E+04	0.463871E+04	-0.411037E+00
1999	0.780838E+04	0.363180E+04	0.765469E+00
2000	0.660413E+04	0.575359E+04	0.137871E+00
2001	0.141436E+04	0.351625E+04	-0.910719E+00
2002	0.680070E+03	0.269821E+04	-0.137815E+01
2003	0.888158E+04	0.617218E+04	0.363927E+00
2004	0.541796E+04	0.488608E+04	0.103328E+00
2005	0.135607E+05	0.801081E+04	0.526387E+00
2006	0.935830E+04	0.927617E+04	0.881444E-02
2007	0.327834E+04	0.111696E+05	-0.122585E+01
2008	0.179620E+04	0.506892E+04	-0.103746E+01

Survey Index: 27 Tag: ma2aut AGE = 3  
Time = JAN-1 Type = NUMBER  
Catchability = 0.341196E+00 % Variance Contribution = 2.8785  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.111350E+05	N/A

1981	N/A	0.109972E+05	N/A
1982	N/A	0.112004E+05	N/A
1983	0.349298E+04	0.576547E+04	-0.501132E+00
1984	0.428828E+04	0.456177E+04	-0.618247E-01
1985	0.299140E+04	0.552350E+04	-0.613271E+00
1986	0.213510E+04	0.350027E+04	-0.494327E+00
1987	0.905555E+04	0.413513E+04	0.783858E+00
1988	0.329868E+04	0.520144E+04	-0.455412E+00
1989	0.932667E+04	0.926565E+04	0.656400E-02
1990	0.276208E+05	0.114551E+05	0.880135E+00
1991	0.320830E+04	0.445771E+04	-0.328893E+00
1992	0.204157E+05	0.487196E+04	0.143281E+01
1993	0.293598E+04	0.510858E+04	-0.553880E+00
1994	0.831402E+04	0.566010E+04	0.384502E+00
1995	0.179199E+05	0.879064E+04	0.712224E+00
1996	0.999047E+04	0.810025E+04	0.209736E+00
1997	0.434863E+04	0.572261E+04	-0.274564E+00
1998	0.634512E+04	0.533589E+04	0.173230E+00
1999	0.138273E+04	0.485249E+04	-0.125543E+01
2000	0.735876E+04	0.375316E+04	0.673294E+00
2001	0.579980E+04	0.595807E+04	-0.269225E-01
2002	0.332353E+04	0.367002E+04	-0.991685E-01
2003	0.211703E+04	0.283391E+04	-0.291643E+00
2004	0.747399E+04	0.627939E+04	0.174157E+00
2005	0.431539E+04	0.509587E+04	-0.166243E+00
2006	0.123181E+05	0.833813E+04	0.390229E+00
2007	0.101988E+05	0.973066E+04	0.469878E-01
2008	0.554223E+04	0.116745E+05	-0.745009E+00

Survey Index: 28 Tag: ma3aut AGE = 4  
Time = JAN-1 Type = NUMBER  
Catchability = 0.271214E+00 % Variance Contribution = 2.7312  
Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.652678E+04	N/A
1981	N/A	0.698431E+04	N/A
1982	N/A	0.662075E+04	N/A
1983	0.230907E+04	0.647060E+04	-0.103042E+01
1984	0.226389E+04	0.339064E+04	-0.403936E+00
1985	0.964750E+03	0.272646E+04	-0.103889E+01
1986	0.321056E+04	0.329689E+04	-0.265328E-01
1987	0.272706E+04	0.209743E+04	0.262511E+00
1988	0.677810E+03	0.224161E+04	-0.119608E+01
1989	0.315860E+04	0.293551E+04	0.732484E-01
1990	0.701082E+04	0.539289E+04	0.262373E+00
1991	0.454585E+04	0.630051E+04	-0.326416E+00
1992	0.904877E+04	0.264893E+04	0.122847E+01
1993	0.673163E+04	0.295982E+04	0.821690E+00
1994	0.397369E+04	0.322144E+04	0.209866E+00
1995	0.243185E+04	0.358397E+04	-0.387818E+00
1996	0.563215E+04	0.533607E+04	0.540023E-01
1997	0.622564E+04	0.496395E+04	0.226475E+00
1998	0.404592E+04	0.364178E+04	0.105235E+00
1999	0.311793E+04	0.338722E+04	-0.828407E-01

2000	0.465656E+04	0.311662E+04	0.401528E+00
2001	0.438769E+04	0.233431E+04	0.631086E+00
2002	0.696111E+04	0.377619E+04	0.611622E+00
2003	0.266154E+04	0.236183E+04	0.119467E+00
2004	0.321734E+04	0.183317E+04	0.562507E+00
2005	0.225033E+04	0.403124E+04	-0.582997E+00
2006	0.333031E+04	0.329032E+04	0.120808E-01
2007	0.469949E+04	0.539855E+04	-0.138677E+00
2008	0.434702E+04	0.627794E+04	-0.367552E+00

Survey Index: 29 Tag: ma4aut AGE = 5  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.140295E+00 % Variance Contribution = 4.1766  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.270119E+04	N/A
1981	N/A	0.242638E+04	N/A
1982	N/A	0.231989E+04	N/A
1983	0.115454E+04	0.222655E+04	-0.656750E+00
1984	0.187528E+04	0.208731E+04	-0.107116E+00
1985	0.413460E+03	0.113026E+04	-0.100564E+01
1986	0.352460E+03	0.985786E+03	-0.102850E+01
1987	0.119747E+04	0.110794E+04	0.777058E-01
1988	0.117490E+03	0.706598E+03	-0.179411E+01
1989	0.302760E+03	0.718086E+03	-0.863649E+00
1990	0.526430E+03	0.925774E+03	-0.564512E+00
1991	0.887930E+03	0.182858E+04	-0.722405E+00
1992	0.260053E+04	0.191249E+04	0.307309E+00
1993	0.249513E+04	0.919186E+03	0.998607E+00
1994	0.154796E+04	0.102938E+04	0.407978E+00
1995	0.656620E+03	0.114817E+04	-0.558820E+00
1996	0.952170E+03	0.121993E+04	-0.247807E+00
1997	0.315519E+04	0.178878E+04	0.567518E+00
1998	0.232545E+04	0.180939E+04	0.250925E+00
1999	0.160415E+04	0.143273E+04	0.113010E+00
2000	0.239041E+04	0.129081E+04	0.616196E+00
2001	0.135788E+04	0.121905E+04	0.107856E+00
2002	0.204925E+04	0.867376E+03	0.859757E+00
2003	0.336194E+04	0.150158E+04	0.806003E+00
2004	0.171260E+04	0.962650E+03	0.576078E+00
2005	0.142566E+04	0.720650E+03	0.682237E+00
2006	0.263216E+04	0.165231E+04	0.465633E+00
2007	0.245819E+04	0.133303E+04	0.611973E+00
2008	0.244464E+04	0.221084E+04	0.100524E+00

Survey Index: 30 Tag: ma5aut AGE = 6  
 Time = JAN-1 Type = NUMBER  
 Catchability = 0.542392E-01 % Variance Contribution = 7.7781  
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1980	N/A	0.756920E+03	N/A
1981	N/A	0.662836E+03	N/A
1982	N/A	0.508296E+03	N/A

1983	0.257570E+03	0.514970E+03	-0.692816E+00
1984	0.314050E+03	0.465457E+03	-0.393467E+00
1985	0.173970E+03	0.368026E+03	-0.749272E+00
1986	0.316300E+02	0.240714E+03	-0.202950E+01
1987	0.881200E+02	0.229161E+03	-0.955725E+00
1988	0.519700E+02	0.239575E+03	-0.152820E+01
1989	0.101670E+03	0.145943E+03	-0.361485E+00
1990	0.293700E+02	0.153213E+03	-0.165186E+01
1991	0.474500E+02	0.197056E+03	-0.142381E+01
1992	0.264350E+03	0.342448E+03	-0.258846E+00
1993	0.311230E+03	0.323591E+03	-0.389476E-01
1994	0.386260E+03	0.175205E+03	0.790556E+00
1995	0.351760E+03	0.187906E+03	0.627010E+00
1996	0.204520E+03	0.203553E+03	0.473886E-02
1997	0.313400E+03	0.254158E+03	0.209523E+00
1998	0.329730E+03	0.390167E+03	-0.168299E+00
1999	0.849520E+03	0.433270E+03	0.673311E+00
2000	0.643920E+03	0.371717E+03	0.549443E+00
2001	0.675550E+03	0.328003E+03	0.722504E+00
2002	0.603250E+03	0.273965E+03	0.789330E+00
2003	0.840480E+03	0.203879E+03	0.141645E+01
2004	0.903750E+03	0.414770E+03	0.778828E+00
2005	0.619070E+03	0.259558E+03	0.869237E+00
2006	0.953450E+03	0.179806E+03	0.166821E+01
2007	0.933120E+03	0.485413E+03	0.653534E+00
2008	0.630360E+03	0.382503E+03	0.499553E+00

**Appendix H. Table H3. Bootstrap summary report for BASE VPA.**

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 1	42084.	65284.	71615.	1.0970	
N 2	19085.	20537.	8568.	0.4172	
N 3	34216.	35707.	9150.	0.2562	
N 4	23148.	23598.	4586.	0.1943	
N 5	15758.	15998.	2621.	0.1638	
N 6	7052.	7115.	1162.	0.1634	
N 7	6866.	6927.	998.	0.1440	
N 8	1632.	1649.	316.	0.1920	
N 9	1801.	1831.	351.	0.1916	
N 10	2375.	2401.	446.	0.1858	
			NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate	
N 1	23200.	2381.	55.1265	18885.	3.7922

N 2	1452.	275.	7.6088	17633.	0.4859
N 3	1491.	293.	4.3571	32726.	0.2796
N 4	451.	146.	1.9463	22697.	0.2020
N 5	239.	83.	1.5193	15519.	0.1689
N 6	63.	37.	0.8873	6990.	0.1663
N 7	61.	32.	0.8814	6806.	0.1466
N 8	16.	10.	1.0063	1616.	0.1959
N 9	30.	11.	1.6734	1771.	0.1981
N 10	26.	14.	1.0773	2349.	0.1899

	LOWER 80. % CI	UPPER 80. % CI
N 1	10757.	144356.
N 2	11236.	31673.
N 3	24756.	47556.
N 4	18153.	30140.
N 5	12816.	19328.
N 6	5679.	8659.
N 7	5690.	8264.
N 8	1257.	2058.
N 9	1392.	2310.
N 10	1848.	2985.

Bootstrap Output Variable: Catchability Estimates

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
Q 1	0.756315E-02	0.770774E-02	0.144252E-02	0.1872
Q 2	0.117776E+00	0.118771E+00	0.127091E-01	0.1070
Q 3	0.237083E+00	0.239087E+00	0.227411E-01	0.0951
Q 4	0.345291E+00	0.346650E+00	0.280943E-01	0.0810
Q 5	0.332013E+00	0.331733E+00	0.233815E-01	0.0705
Q 6	0.270544E+00	0.270522E+00	0.199042E-01	0.0736
Q 7	0.239287E+00	0.241399E+00	0.213392E-01	0.0884
Q 8	0.178071E+00	0.178580E+00	0.247282E-01	0.1385
Q 9	0.183208E+00	0.185229E+00	0.276103E-01	0.1491
Q 11	0.106649E+00	0.107148E+00	0.123519E-01	0.1153
Q 12	0.299685E+00	0.299161E+00	0.263101E-01	0.0879
Q 13	0.454693E+00	0.457009E+00	0.395940E-01	0.0866
Q 14	0.545345E+00	0.549657E+00	0.421753E-01	0.0767
Q 15	0.521424E+00	0.520937E+00	0.449762E-01	0.0863
Q 16	0.460618E+00	0.462973E+00	0.460468E-01	0.0995
Q 17	0.328359E+00	0.331775E+00	0.424902E-01	0.1281
Q 18	0.310350E+00	0.313354E+00	0.455381E-01	0.1453
Q 20	0.421847E-01	0.436443E-01	0.107612E-01	0.2466
Q 21	0.234209E+00	0.237316E+00	0.384314E-01	0.1619
Q 22	0.318789E+00	0.320039E+00	0.252073E-01	0.0788
Q 23	0.228953E+00	0.228867E+00	0.178809E-01	0.0781
Q 24	0.128202E+00	0.129252E+00	0.124536E-01	0.0964
Q 26	0.265599E+00	0.269927E+00	0.388474E-01	0.1439
Q 27	0.341196E+00	0.342865E+00	0.398068E-01	0.1161
Q 28	0.271214E+00	0.272847E+00	0.304749E-01	0.1117
Q 29	0.140295E+00	0.141027E+00	0.192814E-01	0.1367
Q 30	0.542392E-01	0.551007E-01	0.103137E-01	0.1872

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
Q 1	0.1446E-03	0.4585E-04	1.9119	0.7419E-02	0.1944
Q 2	0.9957E-03	0.4031E-03	0.8454	0.1168E+00	0.1088
Q 3	0.2003E-02	0.7219E-03	0.8450	0.2351E+00	0.0967
Q 4	0.1359E-02	0.8895E-03	0.3937	0.3439E+00	0.0817
Q 5	-0.2807E-03	0.7394E-03	-0.0845	0.3323E+00	0.0704
Q 6	-0.2239E-04	0.6294E-03	-0.0083	0.2706E+00	0.0736
Q 7	0.2112E-02	0.6781E-03	0.8826	0.2372E+00	0.0900
Q 8	0.5089E-03	0.7821E-03	0.2858	0.1776E+00	0.1393
Q 9	0.2021E-02	0.8755E-03	1.1031	0.1812E+00	0.1524
Q 11	0.4990E-03	0.3909E-03	0.4679	0.1061E+00	0.1164
Q 12	-0.5239E-03	0.8322E-03	-0.1748	0.3002E+00	0.0876
Q 13	0.2316E-02	0.1254E-02	0.5094	0.4524E+00	0.0875
Q 14	0.4312E-02	0.1341E-02	0.7907	0.5410E+00	0.0780
Q 15	-0.4867E-03	0.1422E-02	-0.0933	0.5219E+00	0.0862
Q 16	0.2356E-02	0.1458E-02	0.5114	0.4583E+00	0.1005
Q 17	0.3416E-02	0.1348E-02	1.0402	0.3249E+00	0.1308
Q 18	0.3004E-02	0.1443E-02	0.9680	0.3073E+00	0.1482
Q 20	0.1460E-02	0.3434E-03	3.4600	0.4073E-01	0.2642
Q 21	0.3107E-02	0.1219E-02	1.3268	0.2311E+00	0.1663
Q 22	0.1250E-02	0.7981E-03	0.3921	0.3175E+00	0.0794
Q 23	-0.8653E-04	0.5654E-03	-0.0378	0.2290E+00	0.0781
Q 24	0.1049E-02	0.3952E-03	0.8186	0.1272E+00	0.0979
Q 26	0.4328E-02	0.1236E-02	1.6297	0.2613E+00	0.1487
Q 27	0.1669E-02	0.1260E-02	0.4893	0.3395E+00	0.1172
Q 28	0.1633E-02	0.9651E-03	0.6022	0.2696E+00	0.1130
Q 29	0.7314E-03	0.6102E-03	0.5213	0.1396E+00	0.1382
Q 30	0.8614E-03	0.3273E-03	1.5882	0.5338E-01	0.1932

	LOWER	UPPER
	80. % CI	80. % CI
Q 1	0.592635E-02	0.973937E-02
Q 2	0.102788E+00	0.135353E+00
Q 3	0.210345E+00	0.269494E+00
Q 4	0.312310E+00	0.385463E+00
Q 5	0.302428E+00	0.362163E+00
Q 6	0.246814E+00	0.297561E+00
Q 7	0.213922E+00	0.269274E+00
Q 8	0.148702E+00	0.212379E+00
Q 9	0.152209E+00	0.219613E+00
Q 11	0.918104E-01	0.122527E+00
Q 12	0.266269E+00	0.332966E+00
Q 13	0.406826E+00	0.510527E+00
Q 14	0.496418E+00	0.604570E+00
Q 15	0.464128E+00	0.577613E+00
Q 16	0.404882E+00	0.523305E+00
Q 17	0.279897E+00	0.384030E+00
Q 18	0.258180E+00	0.376934E+00
Q 20	0.309468E-01	0.586785E-01
Q 21	0.190101E+00	0.288070E+00
Q 22	0.288129E+00	0.353768E+00
Q 23	0.206341E+00	0.251690E+00
Q 24	0.113929E+00	0.146198E+00
Q 26	0.222215E+00	0.322941E+00
Q 27	0.293258E+00	0.396187E+00
Q 28	0.234032E+00	0.311780E+00
Q 29	0.118008E+00	0.166817E+00
Q 30	0.427027E-01	0.689150E-01



Bootstrap Output Variable: Fishing Mortality (2007)

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AGE 1	0.0075	0.0083	0.003652	0.4410
AGE 2	0.0063	0.0064	0.001608	0.2520
AGE 3	0.0087	0.0088	0.001683	0.1903
AGE 4	0.0336	0.0340	0.005419	0.1596
AGE 5	0.0981	0.0996	0.015321	0.1538
AGE 6	0.0650	0.0657	0.009321	0.1418
AGE 7	0.1129	0.1203	0.155959	1.2962
AGE 8	0.0548	0.0559	0.010728	0.1919
AGE 9	0.0256	0.0262	0.004954	0.1888
AGE 10	0.0646	0.0670	0.039266	0.5857
AGE 11	0.0646	0.0670	0.039266	0.5857

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AGE 1	0.000736	0.000118	9.7528	0.0068	0.5364
AGE 2	0.000127	0.000051	2.0251	0.0061	0.2625
AGE 3	0.000150	0.000053	1.7285	0.0085	0.1970
AGE 4	0.000354	0.000172	1.0543	0.0332	0.1630
AGE 5	0.001507	0.000487	1.5357	0.0966	0.1586
AGE 6	0.000724	0.000296	1.1142	0.0643	0.1450
AGE 7	0.007448	0.004937	6.5992	0.1054	1.4794
AGE 8	0.001052	0.000341	1.9177	0.0538	0.1994
AGE 9	0.000607	0.000158	2.3687	0.0250	0.1979
AGE 10	0.002458	0.001244	3.8056	0.0621	0.6320
AGE 11	0.002458	0.001244	3.8056	0.0621	0.6320

	LOWER 80. % CI	UPPER 80. % CI
AGE 1	0.004546	0.012777
AGE 2	0.004500	0.008627
AGE 3	0.006669	0.011067
AGE 4	0.027473	0.041134
AGE 5	0.080179	0.120161
AGE 6	0.054207	0.077782
AGE 7	0.090534	0.144093
AGE 8	0.042854	0.070363
AGE 9	0.020429	0.032789
AGE 10	0.057349	0.074650
AGE 11	0.057349	0.074650

Bootstrap Output Variable: Average F (2007) AGES 6 - 9

	NLLS Estimate	Bootstrap Mean	Bootstrap Std Error	C.V. For NLLS Soln.
AVG F	0.0646	0.0670	0.039266	0.5857
N WTD	0.0629	0.0629	0.006226	0.0989
B WTD	0.0588	0.0588	0.005666	0.0964
C WTD	0.0722	0.0745	0.037699	0.5058

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
AVG F	0.002458	0.001244	3.8056	0.0621	0.6320
N WTD	0.000008	0.000197	0.0125	0.0629	0.0989
B WTD	-0.000040	0.000179	-0.0677	0.0589	0.0962
C WTD	0.002358	0.001194	3.2662	0.0698	0.5399

	LOWER 80. % CI	UPPER 80. % CI
AVG F	0.057349	0.074650
N WTD	0.055657	0.070912
B WTD	0.051933	0.066022
C WTD	0.063608	0.083727

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	24918.	25522.	1924.	0.0754
MEAN	25784.	26150.	1859.	0.0711
SSB	15659.	15815.	1128.	0.0713

	Bias Estimate	Bias Std. Error	Per Cent Bias	NLLS Estimate Corrected For Bias	C.V. For Corrected Estimate
JAN-1	604.	64.	2.4253	24313.	0.0792
MEAN	366.	60.	1.4200	25418.	0.0731
SSB	156.	36.	0.9938	15503.	0.0728

	LOWER 80. % CI	UPPER 80. % CI
JAN-1	23116.	27952.
MEAN	23776.	28602.
SSB	14382.	17229.

Plus Group Diagnostic Report

Calculation Method Selected = Backward

Year	Population Backward	Population Forward	F Forward	F Backward	Ratio
1980	4509.	4509.	0.408676	0.408673	0.999992
1981	2035.	3964.	0.189078	0.407096	2.153053
1982	1640.	3472.	0.257504	0.649320	2.521596
1983	2019.	2917.	0.419029	0.678075	1.618207
1984	1933.	1985.	0.550844	0.570704	1.036052
1985	373.	1294.	0.168017	0.757274	4.507116
1986	258.	1106.	0.104786	0.550632	5.254830
1987	169.	943.	0.072554	0.492033	6.781583
1988	189.	805.	0.078711	0.385659	4.899662
1989	342.	777.	0.182671	0.474510	2.597627
1990	597.	683.	0.299398	0.350873	1.171930
1991	368.	620.	0.204128	0.371846	1.821630
1992	235.	607.	0.185578	0.572218	3.083446
1993	281.	549.	0.287051	0.662789	2.308960
1994	645.	481.	1.063442	0.676688	0.636318
1995	96.	274.	0.221655	0.827379	3.732734
1996	164.	216.	0.424547	0.608911	1.434258
1997	316.	155.	1.637405	0.514499	0.314216
1998	402.	189.	2.078124	0.545921	0.262699
1999	234.	96.	2.078124	0.461173	0.221918
2000	57.	65.	0.404322	0.476097	1.177520
2001	132.	138.	0.527333	0.559539	1.061073
2002	497.	216.	2.078124	0.494489	0.237950
2003	363.	227.	0.843471	0.445250	0.527878
2004	452.	326.	0.285708	0.197950	0.692839
2005	444.	519.	0.109412	0.128863	1.177783
2006	452.	658.	0.075662	0.111961	1.479752
2007	531.	955.	0.036202	0.066081	1.825331
2008	834.	1181.	N/A	N/A	

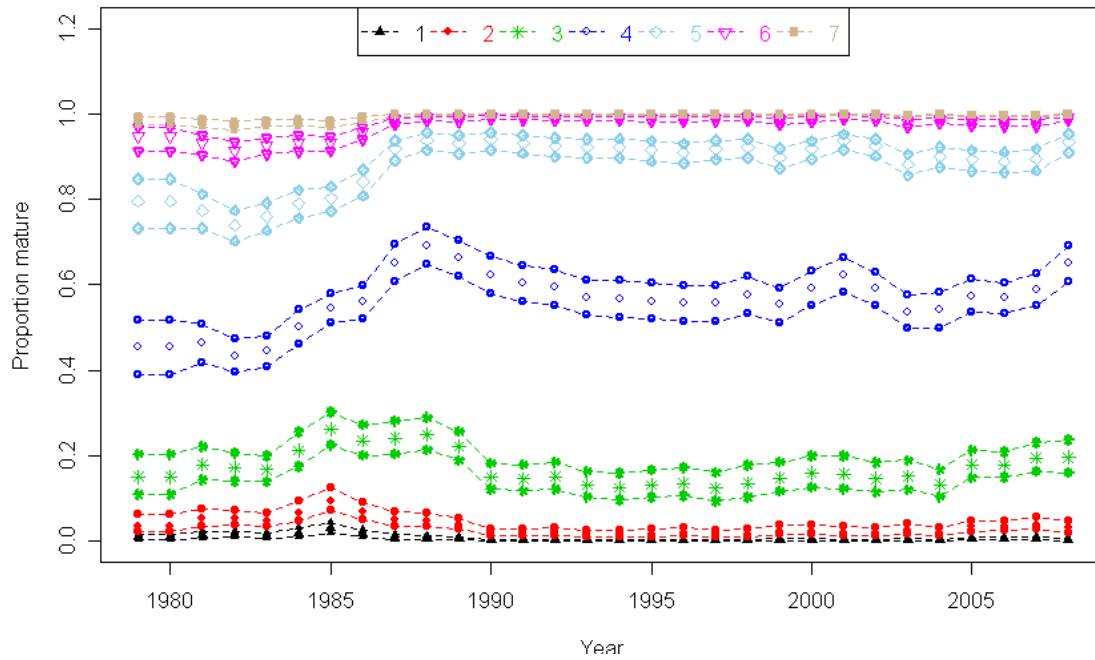
Warning \*\*\*\* Infeasible Mass Balance in Plus Group

Year = 1994

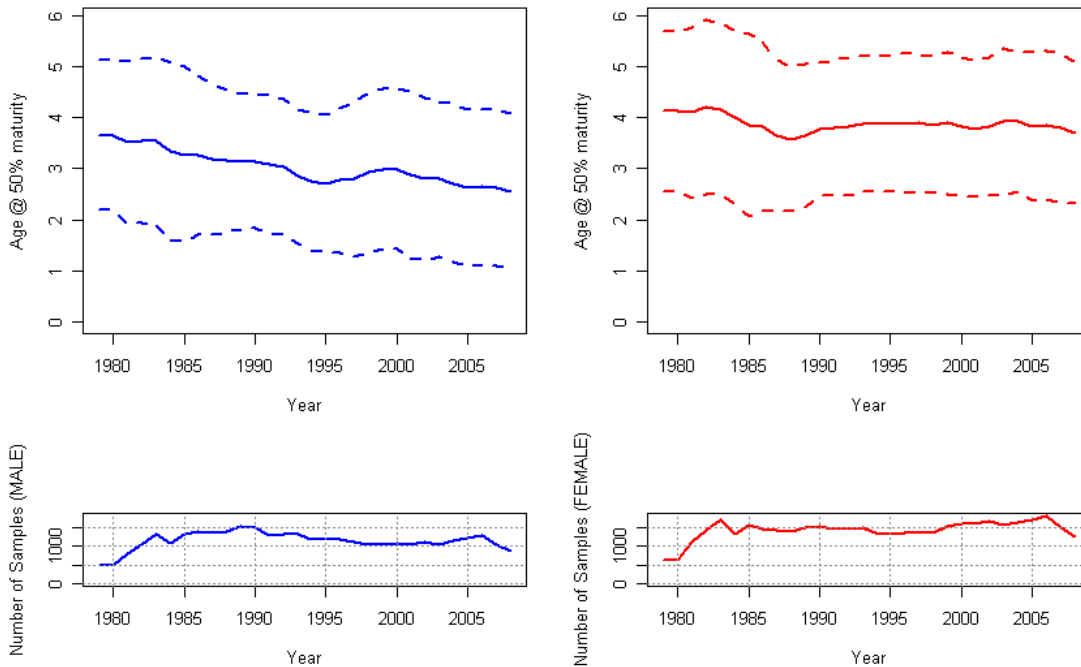
Year = 1997

Year = 2002

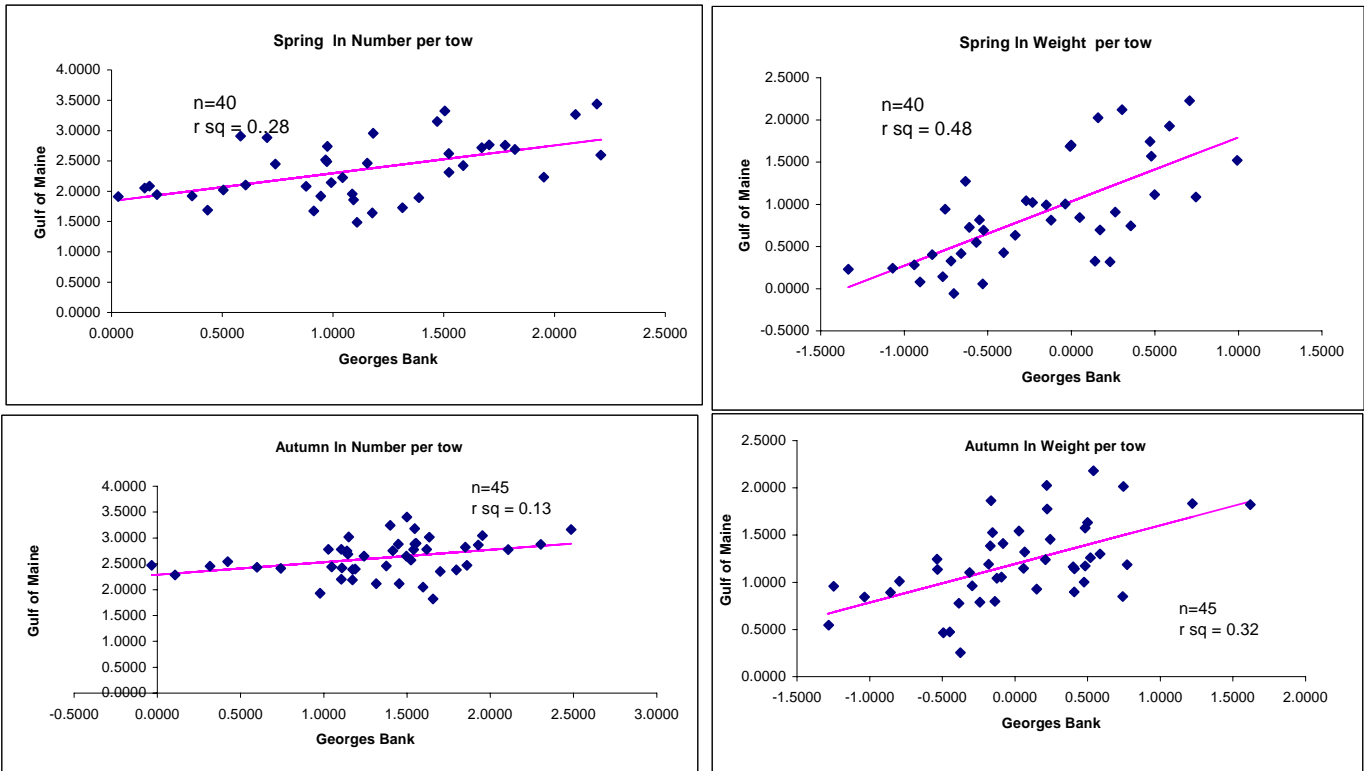
**FEMALE Am.plaice GM-GB maturity at age w/ 95% CI**



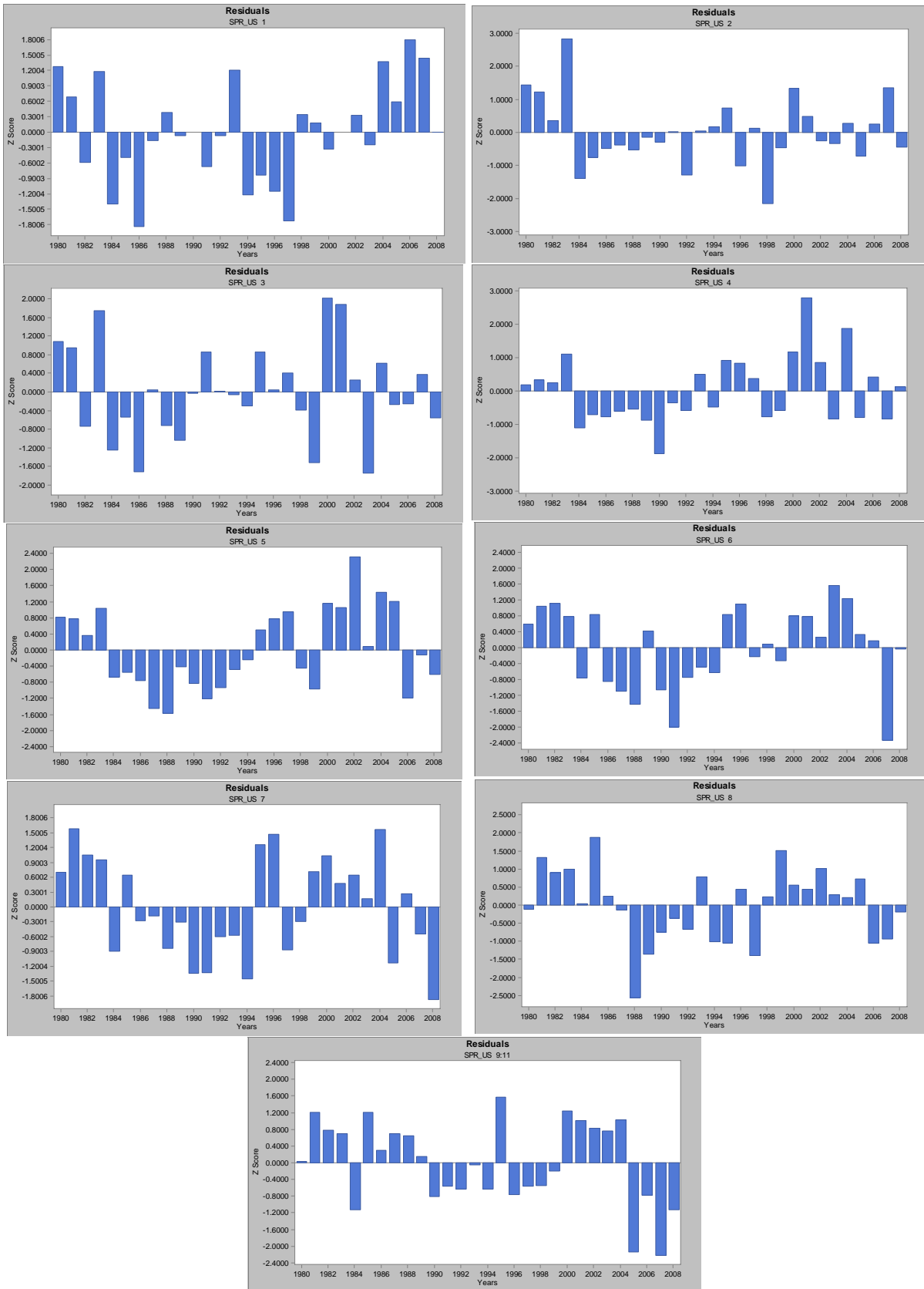
**MALE Am.plaice GM-GB at 50% maturity (5 yr window)    FEMALE Am.plaice GM-GB at 50% maturity (5 yr window)**



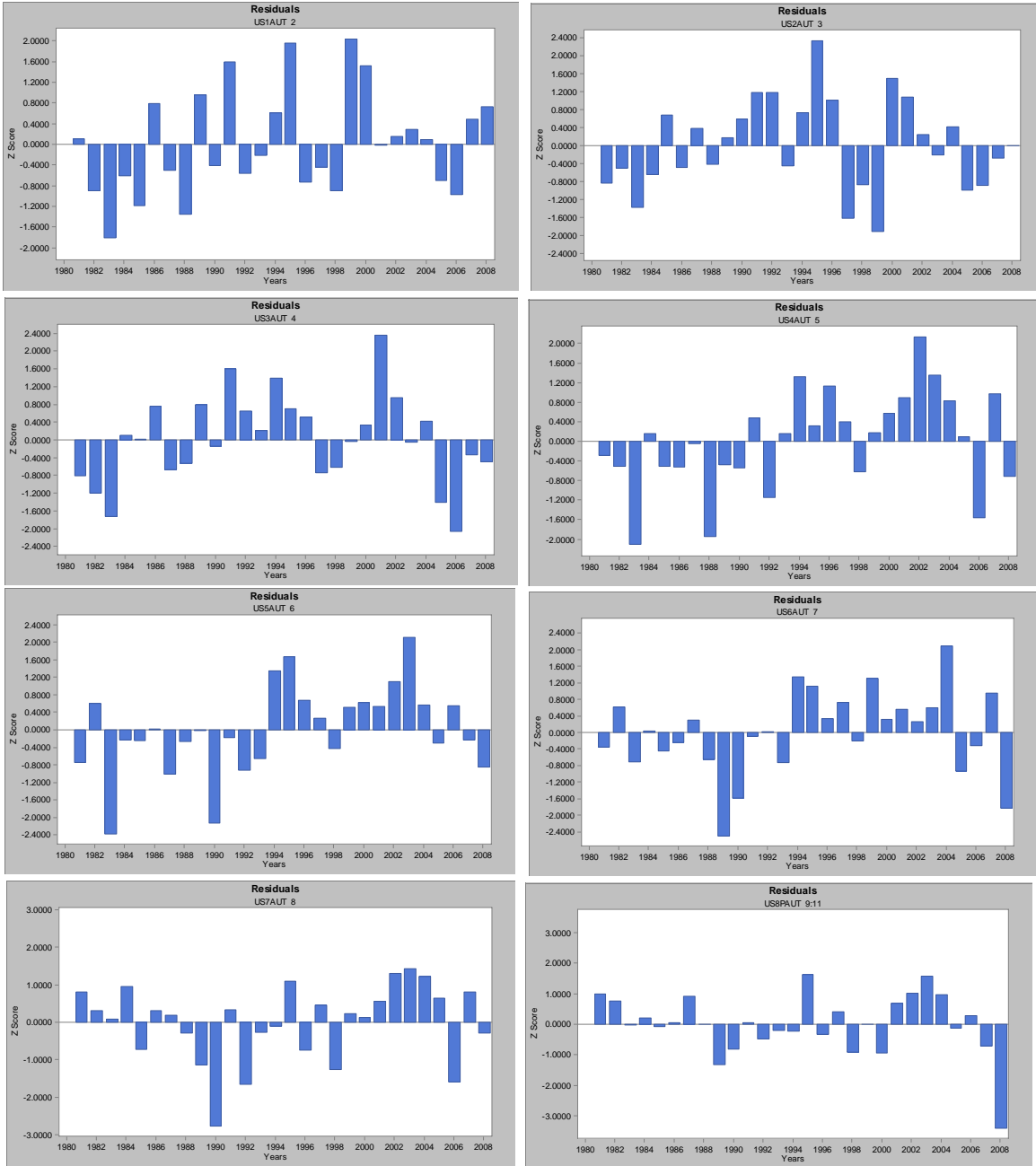
Appendix H. Figure H1. Proportion mature at age with 95% confidence intervals for female Gulf of Maine-Georges Bank American plaice using a 5-year moving window for ages 1-7 (upper panel), median age at maturity (A50) for males (middle left panel) and females (middle right panel) with 95% confidence intervals, and number of samples in the combined 5-year moving average for males (lower left panel) and females (lower right panel).



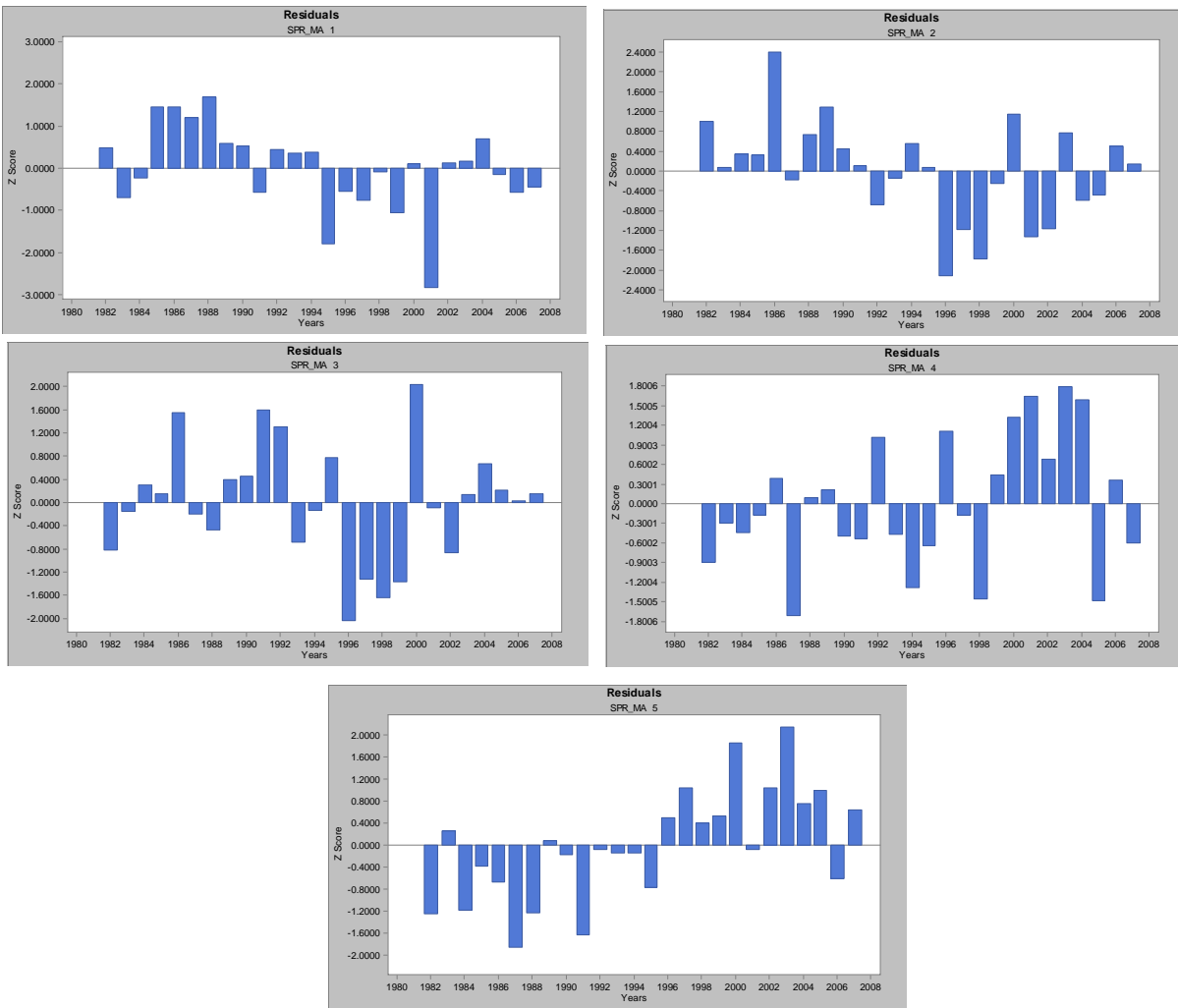
Appendix H. Figure H2. Regression of Georges Bank and Gulf of Maine spring and autumn NEFSC research survey ln(mean number per tow) and ln(mean weight per tow) for American plaice.



Appendix H. Figure H3a. Base VPA residuals for ages 1-9+ for NEFSC spring surveys, 1980-2008.

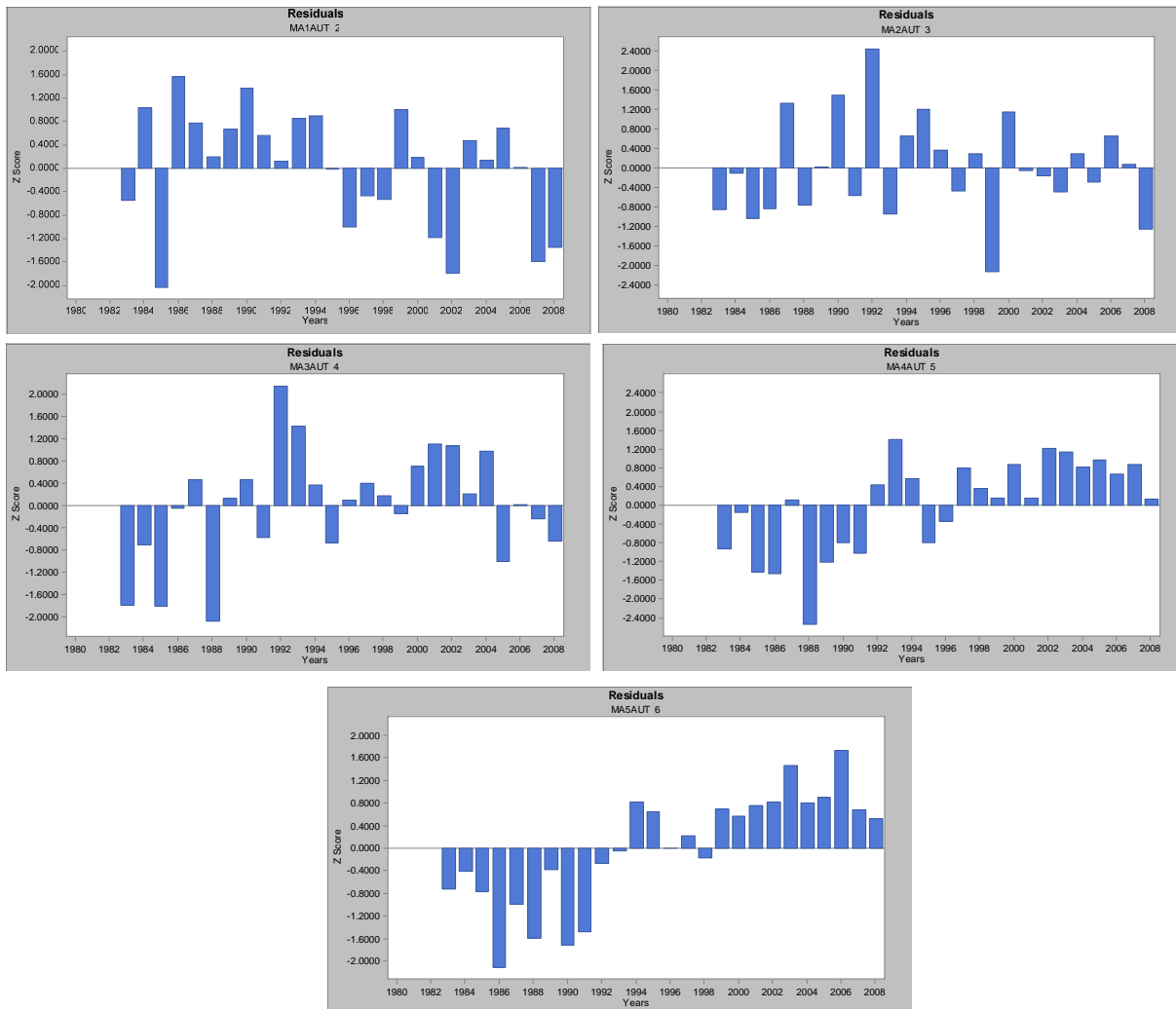


Appendix H. Figure H3b. Base VPA residuals for ages 2-9+ for NEFSC autumn surveys, 1981-2008.



Appendix H. Figure H3c. Base VPA residuals for ages 1-5 for MA Division of Marine Fisheries spring surveys, 1982-2007.





Appendix H. Figure H3d. Base VPA residuals for ages 2-6 for MA Division of Marine Fisheries autumn surveys, 1983-2008.