

Appendix 3. Full VPA Output for Gulf of Maine Cod

VPA Version 2.3.1

Model ID: GoM Cod 2005 VPA Update GARMII w/Rev Survey Indices Run

Input File: C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.DAT
Date of Run: 08-NOV-2005 Time of Run: 13:49

Levenburg-Marquardt Algorithm Completed 6 Iterations
Residual Sum of Squares = 165.848

Number of Residuals = 382
Number of Parameters = 5
Degrees of Freedom = 377
Mean Squared Residual = 0.439914
Standard Deviation = 0.663260

Number of Years = 23
Number of Ages = 7
First Year = 1982
Youngest Age = 1
Oldest True Age = 6

Number of Survey Indices Available = 21
Number of Survey Indices Used in Estimate = 18

VPA Classic Method - Auto Estimated Q's

Stock Numbers Predicted in Terminal Year Plus One (2005)

Age	Stock Predicted	Std. Error	CV
2	18051.358	0.612618E+04	0.339375E+00
3	2052.179	0.527079E+03	0.256839E+00
4	3597.430	0.811616E+03	0.225610E+00
5	173.805	0.621311E+02	0.357476E+00
6	737.451	0.193160E+03	0.261929E+00

Catchability Values for Each Survey Used in Estimate

INDEX	Catchability	Std. Error	CV
1	0.540727E-04	0.837665E-05	0.154915E+00
2	0.119324E-03	0.119116E-04	0.998256E-01
3	0.213271E-03	0.185151E-04	0.868151E-01
4	0.286265E-03	0.351416E-04	0.122759E+00
5	0.385326E-03	0.668847E-04	0.173579E+00
6	0.512569E-04	0.653308E-05	0.127458E+00
7	0.114621E-03	0.142845E-04	0.124624E+00
8	0.235486E-03	0.249146E-04	0.105801E+00
9	0.377789E-03	0.497063E-04	0.131572E+00
10	0.542803E-03	0.663712E-04	0.122275E+00
11	0.802556E-03	0.953070E-04	0.118754E+00
12	0.622564E-03	0.592625E-04	0.951910E-01
13	0.493316E-03	0.696618E-04	0.141211E+00
15	0.269618E-03	0.827514E-04	0.306920E+00
18	0.142705E-04	0.171375E-05	0.120090E+00
19	0.241124E-04	0.141021E-05	0.584847E-01
20	0.246504E-04	0.112758E-05	0.457428E-01
21	0.256380E-04	0.743155E-06	0.289865E-01

-- Non-Linear Least Squares Fit --

Default Tolerances Used

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

VPA Method Options

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

- Heincke Rule Used in F-Oldest Calculation
- F-Oldest Calculation in Years Prior to Terminal Year
Uses Stock Sizes in Ages 4 to 6
- Calculation of Population of Age 1 In Year 2005
= Geometric Mean of First Age Populations
Year Range Applied = 1982 to 2004

Stock Estimates

Age 2
Age 3
Age 4
Age 5
Age 6

Full F in Terminal Year = 0.5781

F in Oldest True Age in Terminal Year = 0.5781

Full F Calculated Using Classic Method

Age	Input Partial Recruitment	Calc Partial Recruitment	Fishing Mortality	Used In Full F	Comments
1	0.000	0.000	0.0000	NO	Stock Estimate in T+1
2	0.053	0.001	0.0004	NO	Stock Estimate in T+1
3	0.421	0.088	0.0690	NO	Stock Estimate in T+1
4	1.000	1.000	0.7801	YES	Stock Estimate in T+1
5	1.000	0.482	0.3760	YES	Stock Estimate in T+1
6	1.000	0.741	0.5781		Input PR * Full F

Catch At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	88.0	14.0	24.0	49.0	26.0
2	1995.0	1337.0	813.0	989.0	208.0
3	2350.0	2896.0	1572.0	2111.0	2750.0
4	1386.0	1184.0	1636.0	1122.0	929.0
5	717.0	685.0	469.0	665.0	275.0
6	75.0	448.0	205.0	133.0	197.0
7	242.0	169.0	142.0	137.0	190.0
AGE	1987	1988	1989	1990	1991
1	41.0	6.0	5.0	7.0	5.0
2	907.0	520.0	530.0	294.0	447.0
3	1418.0	2140.0	2284.0	4195.0	1349.0
4	1525.0	1149.0	1698.0	2373.0	4948.0
5	330.0	434.0	485.0	488.0	946.0
6	79.0	51.0	91.0	167.0	151.0
7	97.0	34.0	61.0	105.0	85.0
AGE	1992	1993	1994	1995	1996
1	0.0	1.0	1.0	0.0	0.0
2	350.0	152.0	49.0	287.0	89.0
3	600.0	1998.0	1488.0	1233.0	716.0
4	526.0	787.0	1258.0	1348.0	1955.0
5	2184.0	140.0	319.0	206.0	368.0
6	216.0	481.0	74.0	14.0	45.0
7	86.0	39.0	88.0	34.0	10.0
AGE	1997	1998	1999	2000	2001
1	0.0	0.0	1.0	0.0	0.0
2	61.0	112.0	16.0	194.0	121.0
3	498.0	505.0	580.0	540.0	1065.0
4	469.0	627.0	550.0	856.0	643.0
5	893.0	182.0	270.0	198.0	375.0
6	72.0	214.0	81.0	97.0	102.0
7	8.0	11.0	109.0	23.0	84.0
AGE	2002	2003	2004		
1	0.0	0.0	0.0		
2	2.0	14.0	1.0		
3	276.0	111.0	284.0		
4	863.0	430.0	227.0		
5	334.0	786.0	372.0		
6	214.0	240.0	250.0		
7	135.0	189.0	139.0		

Weight At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.5680	0.4290	0.5000	0.3670	0.4230
2	1.0780	1.0630	1.0090	1.0180	1.0240
3	1.5890	1.6100	1.6230	1.6210	1.7990
4	2.6830	2.4420	2.6970	2.7820	2.8840
5	4.7310	3.7490	3.6460	4.4050	4.5530
6	6.5870	6.0070	5.8150	5.4510	6.0200
7	11.3140	9.9410	10.2960	9.6860	11.7110
AGE	1987	1988	1989	1990	1991
1	0.3170	0.1670	0.6000	0.1430	0.2000
2	1.0110	0.9870	1.1850	1.0170	1.1340
3	1.5410	1.7590	1.7170	1.6550	1.5160
4	3.1160	2.3810	2.9320	2.2820	2.4660
5	4.7390	5.0780	3.8370	4.1930	4.0240
6	6.9240	6.2940	4.2420	7.5810	7.2380
7	10.2890	10.6760	11.9020	13.5620	11.1060
AGE	1992	1993	1994	1995	1996
1	0.3904	0.3904	0.3904	0.3904	0.3904
2	1.5310	1.1320	1.4290	1.6240	1.6520
3	1.9150	1.8270	1.8350	1.8340	2.0750
4	2.7220	2.4180	3.0560	2.6520	2.3300
5	3.0600	4.2430	3.3070	5.0290	3.5820
6	5.0000	6.0850	6.0810	7.1430	7.4120
7	10.5930	10.9740	9.8980	13.3670	10.6570
AGE	1997	1998	1999	2000	2001
1	0.3904	0.6250	0.3460	0.3904	0.3904
2	1.7360	1.3480	1.1880	1.4980	1.8040
3	2.2030	2.1050	1.8140	2.2610	2.4220
4	2.9590	2.9230	2.7440	3.4320	3.2510
5	3.1400	4.1100	4.1430	4.3850	4.8330
6	4.5530	4.0980	5.7580	5.6910	6.4960
7	8.7380	9.5280	7.7060	6.9940	7.8910
AGE	2002	2003	2004		
1	0.3904	0.3904	0.3904		
2	1.3600	1.9680	1.5250		
3	2.4060	2.4090	2.3950		
4	3.3170	3.0750	3.3130		
5	4.0590	4.0600	3.7720		
6	5.8970	5.3130	5.3570		
7	8.4120	8.6780	8.7380		

JAN-1 Weights at Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.4152	0.2797	0.3504	0.2197	0.2736
2	0.8821	0.7770	0.6579	0.7134	0.6130
3	1.2818	1.3174	1.3135	1.2789	1.3533
4	2.2697	1.9699	2.0838	2.1249	2.1622
5	4.1986	3.1715	2.9839	3.4468	3.5590
6	5.5824	5.3310	4.6691	4.4581	5.1496
7	11.3140	9.9410	10.2960	9.6860	11.7110
AGE	1987	1988	1989	1990	1991
1	0.1797	0.0627	0.4609	0.0508	0.0723
2	0.6540	0.5594	0.4449	0.7812	0.4027
3	1.2562	1.3335	1.3018	1.4004	1.2417
4	2.3676	1.9155	2.2710	1.9794	2.0202
5	3.6969	3.9778	3.0226	3.5063	3.0303
6	5.6147	5.4614	4.6412	5.3934	5.5090
7	10.2890	10.6760	11.9020	13.5620	11.1060
AGE	1992	1993	1994	1995	1996
1	0.2293	0.2041	0.1914	0.1898	0.1851
2	0.5534	0.6648	0.7469	0.7962	0.8031
3	1.4736	1.6725	1.4413	1.6189	1.8357
4	2.0314	2.1519	2.3629	2.2060	2.0672
5	2.7470	3.3984	2.8278	3.9203	3.0821
6	4.4855	4.3151	5.0795	4.8602	6.1053
7	10.5930	10.9740	9.8980	13.3670	10.6570
AGE	1997	1998	1999	2000	2001
1	0.2101	0.4533	0.1663	0.1816	0.2092
2	0.8232	0.7254	0.8617	0.7199	0.8392
3	1.9077	1.9116	1.5637	1.6389	1.9048
4	2.4779	2.5376	2.4034	2.4951	2.7112
5	2.7048	3.4873	3.4799	3.4688	4.0727
6	4.0384	3.5872	4.8647	4.8557	5.3371
7	8.7380	9.5280	7.7060	6.9940	7.8910
AGE	2002	2003	2004	2005	
1	0.1739	0.1975	0.1975	0.1896	
2	0.7287	0.8765	0.7716	0.7923	
3	2.0834	1.8100	2.1710	2.0215	
4	2.8344	2.7200	2.8251	2.7932	
5	3.6326	3.6697	3.4057	3.5694	
6	5.3386	4.6439	4.6636	4.8820	
7	8.4120	8.6780	8.7380	8.6093	

SSB Weight At Age - Input Data

AGE	1982	1983	1984	1985	1986
1	0.4152	0.2797	0.3504	0.2197	0.2736
2	0.8821	0.7770	0.6579	0.7134	0.6130
3	1.2818	1.3174	1.3135	1.2789	1.3533
4	2.2697	1.9699	2.0838	2.1249	2.1622
5	4.1986	3.1715	2.9839	3.4468	3.5590
6	5.5824	5.3310	4.6691	4.4581	5.1496
7	11.3140	9.9410	10.2960	9.6860	11.7110
AGE	1987	1988	1989	1990	1991
1	0.1797	0.0627	0.4609	0.0508	0.0723
2	0.6540	0.5594	0.4449	0.7812	0.4027
3	1.2562	1.3335	1.3018	1.4004	1.2417
4	2.3676	1.9155	2.2710	1.9794	2.0202
5	3.6969	3.9778	3.0226	3.5063	3.0303
6	5.6147	5.4614	4.6412	5.3934	5.5090
7	10.2890	10.6760	11.9020	13.5620	11.1060
AGE	1992	1993	1994	1995	1996
1	0.2293	0.2041	0.1914	0.1898	0.1851
2	0.5534	0.6648	0.7469	0.7962	0.8031
3	1.4736	1.6725	1.4413	1.6189	1.8357
4	2.0314	2.1519	2.3629	2.2060	2.0672
5	2.7470	3.3984	2.8278	3.9203	3.0821
6	4.4855	4.3151	5.0795	4.8602	6.1053
7	10.5930	10.9740	9.8980	13.3670	10.6570
AGE	1997	1998	1999	2000	2001
1	0.2101	0.4533	0.1663	0.1816	0.2092
2	0.8232	0.7254	0.8617	0.7199	0.8392
3	1.9077	1.9116	1.5637	1.6389	1.9048
4	2.4779	2.5376	2.4034	2.4951	2.7112
5	2.7048	3.4873	3.4799	3.4688	4.0727
6	4.0384	3.5872	4.8647	4.8557	5.3371
7	8.7380	9.5280	7.7060	6.9940	7.8910
AGE	2002	2003	2004		
1	0.1739	0.1975	0.1975		
2	0.7287	0.8765	0.7716		
3	2.0834	1.8100	2.1710		
4	2.8344	2.7200	2.8251		
5	3.6326	3.6697	3.4057		
6	5.3386	4.6439	4.6636		
7	8.4120	8.6780	8.7380		

Natural Mortality - Input Data

AGE	1982	1983	1984	1985	1986
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	1987	1988	1989	1990	1991
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	1992	1993	1994	1995	1996
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	1997	1998	1999	2000	2001
1	0.2000	0.2000	0.2000	0.2000	0.2000
2	0.2000	0.2000	0.2000	0.2000	0.2000
3	0.2000	0.2000	0.2000	0.2000	0.2000
4	0.2000	0.2000	0.2000	0.2000	0.2000
5	0.2000	0.2000	0.2000	0.2000	0.2000
6	0.2000	0.2000	0.2000	0.2000	0.2000
7	0.2000	0.2000	0.2000	0.2000	0.2000
AGE	2002	2003	2004		
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		

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

Maturity - Input Data

AGE	1982	1983	1984	1985	1986
1	0.0700	0.0700	0.0700	0.0400	0.0400
2	0.2600	0.2600	0.2600	0.4800	0.4800
3	0.6100	0.6100	0.6100	0.9500	0.9500
4	0.8800	0.8800	0.8800	1.0000	1.0000
5	0.9700	0.9700	0.9700	1.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	1987	1988	1989	1990	1991
1	0.0400	0.0400	0.0400	0.1100	0.1100
2	0.4800	0.4800	0.4800	0.2800	0.2800
3	0.9500	0.9500	0.9500	0.5600	0.5600
4	1.0000	1.0000	1.0000	0.8100	0.8100
5	1.0000	1.0000	1.0000	0.9300	0.9300
6	1.0000	1.0000	1.0000	0.9800	0.9800
7	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	1992	1993	1994	1995	1996
1	0.1100	0.1100	0.0400	0.0400	0.0400
2	0.2800	0.2800	0.3800	0.3800	0.3800
3	0.5600	0.5600	0.8900	0.8900	0.8900
4	0.8100	0.8100	0.9900	0.9900	0.9900
5	0.9300	0.9300	1.0000	1.0000	1.0000
6	0.9800	0.9800	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	1997	1998	1999	2000	2001
1	0.0400	0.0400	0.0400	0.0400	0.0400
2	0.3800	0.3800	0.3800	0.3800	0.3800
3	0.8900	0.8900	0.8900	0.8900	0.8900
4	0.9900	0.9900	0.9900	0.9900	0.9900
5	1.0000	1.0000	1.0000	1.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000
AGE	2002	2003	2004		
1	0.0400	0.0400	0.0400		
2	0.3800	0.3800	0.3800		
3	0.8900	0.8900	0.8900		
4	0.9900	0.9900	0.9900		
5	1.0000	1.0000	1.0000		
6	1.0000	1.0000	1.0000		
7	1.0000	1.0000	1.0000		

Input Partial Recruitment

AGE

1	0.0000
2	0.0530
3	0.4210
4	1.0000
5	1.0000
6	1.0000

Input F-Plus Ratio

YEAR

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

SURVEY - INPUT DATA

INDEX	1	2	3	4	5
SURVEY TAG	WHSpr	WHSpr	WHSpr	WHSpr	WHSpr
AGE	2	3	4	5	6
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1

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

SURVEY - INPUT DATA

INDEX	6	7	8	9	10
SURVEY TAG	WHAut	WHAut	WHAut	WHAut	WHAut
AGE	2	3	4	5	6
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1

1982	0.6179	0.4188	0.5394	0.4047	0.1205
1983	0.8426	3.3527	2.2748	1.0892	0.2092
1984	0.3168	0.9155	0.8277	0.1970	0.2270
1985	0.4323	0.4258	0.6307	0.3871	0.2140
1986	0.5256	0.9567	0.6094	0.2482	0.1820
1987	0.3920	0.4010	0.6565	0.3417	0.0727
1988	0.5782	1.3796	0.5921	0.2429	0.0751
1989	1.9375	2.3134	0.9896	0.4434	0.0990
1990	0.1495	2.4065	1.5017	0.2926	0.1605
1991	0.0447	0.1868	1.8293	0.5978	0.2589
1992	0.1435	0.1390	0.2233	0.6334	0.0811
1993	0.2910	0.4458	0.1400	0.0355	0.3498
1994	0.1977	0.5678	0.3602	0.0336	0.0000
1995	0.2071	0.8831	0.8260	0.0854	0.0511
1996	0.0680	0.2845	1.2284	0.3252	0.0821
1997	0.1242	0.3826	0.1883	0.5421	0.0616
1998	0.2968	0.0855	0.1769	0.1728	0.1402
1999	0.0966	0.3203	0.1147	0.1923	0.0387
2000	0.4307	0.3672	0.5857	0.2433	0.1320
2001	0.5326	0.9837	0.3936	0.5071	0.1343
2002	0.0340	0.1410	0.7524	0.4690	0.3368
2003	0.2691	0.0805	0.3637	2.7972	1.0958
2004	0.4546	0.1976	0.1848	0.5287	0.4498
2005	0.6513	0.1678	0.5809	0.2311	0.2534

SURVEY - INPUT DATA

INDEX	11	12	13	14	15
SURVEY TAG	MASpr	MASpr	MASpr	MAAut	MAAut
AGE	2	3	4	1	2
TIME	JAN-1	JAN-1	JAN-1	JAN-1	JAN-1
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	1	1	1	1
1982	7.0600	3.4180	1.1470	2.0180	5.6520
1983	18.5720	5.3310	0.5010	4.6670	2.3460
1984	5.4080	2.2710	0.8650	1.3080	0.6510
1985	3.8220	2.7940	0.6920	12.2960	0.3440
1986	3.2220	0.8870	0.4260	2.8320	0.4190
1987	6.9970	2.2680	0.2570	2.4780	1.1500
1988	11.3560	2.5110	1.3700	389.5840	2.3860
1989	25.2600	6.5800	0.4580	4.5710	20.4900
1990	6.8900	17.7700	2.6400	2.9710	2.7000
1991	3.5600	2.5400	5.0300	9.3700	9.1300
1992	6.3500	3.5800	0.6500	4.6500	4.2000
1993	7.7600	3.6000	1.4500	24.3000	2.0100
1994	5.6700	2.4600	0.5200	49.9200	3.3200
1995	1.3600	3.8900	1.2000	33.4900	14.1300
1996	0.6500	1.1500	2.0000	2.5600	0.6400
1997	1.2500	1.0500	0.2200	7.5900	0.1500
1998	1.8000	0.9900	1.0600	2.0200	0.0200
1999	3.5700	3.4600	1.2000	2.6100	1.0400
2000	7.1200	2.8500	2.6000	6.3400	0.9800
2001	2.7800	4.8100	3.6300	0.0400	0.5400
2002	0.4410	1.6420	2.3790	44.5200	0.0600
2003	9.3380	0.3660	1.7140	0.9900	2.5000
2004	2.0490	3.3500	0.6080	112.7900	3.6600
2005	9.3633	0.6751	2.5750	39.2200	14.3800

SURVEY - INPUT DATA

INDEX	16	17	18	19	20
SURVEY TAG	MAAut	CM_CPE	CM_CPE	CM_CPE	CM_CPE
AGE	3	2	3	4	5
TIME	JAN-1	MEAN	MEAN	MEAN	MEAN
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	1	0	0	0	0
1982	7.2900	0.0743	0.0738	0.0450	0.0217
1983	1.0050	0.0477	0.1099	0.0422	0.0209
1984	0.1000	0.0331	0.0448	0.0442	0.0118
1985	0.0220	0.0137	0.0423	0.0289	0.0179
1986	0.0180	0.0041	0.0688	0.0226	0.0066
1987	0.8330	0.0074	0.0186	0.0260	0.0057
1988	0.0200	0.0146	0.0492	0.0242	0.0093
1989	0.6790	0.0170	0.0637	0.0397	0.0106
1990	0.3500	0.0110	0.1595	0.0782	0.0122
1991	1.7400	0.0194	0.0404	0.1355	0.0217
1992	0.8100	0.0149	0.0173	0.0138	0.0515
1993	0.1100	0.0027	0.0500	0.0232	0.0041
1994	0.6100	0.0000	0.0000	0.0000	0.0000
1995	6.3700	0.0000	0.0000	0.0000	0.0000
1996	0.5400	0.0000	0.0000	0.0000	0.0000
1997	0.0200	0.0000	0.0000	0.0000	0.0000
1998	0.0000	0.0000	0.0000	0.0000	0.0000
1999	0.6200	0.0000	0.0000	0.0000	0.0000
2000	0.2800	0.0000	0.0000	0.0000	0.0000
2001	0.2700	0.0000	0.0000	0.0000	0.0000
2002	0.3000	0.0000	0.0000	0.0000	0.0000
2003	0.3000	0.0000	0.0000	0.0000	0.0000
2004	0.3300	0.0000	0.0000	0.0000	0.0000
2005	1.5000	0.0000	0.0000	0.0000	0.0000

INDEX	21				
SURVEY TAG	CM_CPE				
AGE	6	NUMBERS	NUMBERS	NUMBERS	NUMBERS
TIME	MEAN	NUMBERS	NUMBERS	NUMBERS	NUMBERS
TYPE	NUMBERS	NUMBERS	NUMBERS	NUMBERS	NUMBERS
RETRO FLAG	0				

1982	0.0027
1983	0.0123
1984	0.0055
1985	0.0036
1986	0.0043
1987	0.0018
1988	0.0015
1989	0.0023
1990	0.0051
1991	0.0039
1992	0.0052
1993	0.0140
1994	0.0000
1995	0.0000
1996	0.0000
1997	0.0000
1998	0.0000
1999	0.0000
2000	0.0000
2001	0.0000
2002	0.0000
2003	0.0000
2004	0.0000
2005	0.0000

Additional Output Files

Population File C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.PP
 Auxilliary File C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.AU
 Covariance File C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.CV
 Residuals File C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.RS
 Log File C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.LO

Bootstrap Files

Bootstrap Stock Numbers
 C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.BS
 Bootstrap Fishing Mortality
 C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.BS
 Bootstrap Biomass
 C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.BS
 Bootstrap Catchability
 C:\ALLWORK\ASSESS\AUG2005WG\GOMCOD\UPDATEVPA\GMCOD2005_RECR_3.BS

Estimation Results

JAN-1 Population Numbers

AGE	1982	1983	1984	1985	1986
1	7769.	7539.	10464.	7004.	10162.
2	10891.	6281.	6160.	8545.	5690.
3	5359.	7112.	3933.	4307.	6101.
4	3026.	2262.	3202.	1797.	1616.
5	1796.	1223.	780.	1142.	456.
6	170.	822.	382.	214.	333.
7	548.	310.	264.	221.	321.
=====					
Total	29559.	25548.	25185.	23231.	24680.
AGE	1987	1988	1989	1990	1991
1	12538.	25205.	4301.	4031.	7056.
2	8296.	10228.	20630.	3517.	3294.
3	4471.	5972.	7904.	16411.	2613.
4	2507.	2377.	2953.	4404.	9640.
5	483.	673.	907.	881.	1459.
6	125.	97.	158.	303.	280.
7	153.	64.	106.	191.	158.
=====					
Total	28573.	44616.	36958.	29738.	24500.
AGE	1992	1993	1994	1995	1996
1	6657.	9624.	3515.	3686.	3504.
2	5773.	5451.	7878.	2877.	3018.
3	2292.	4410.	4325.	6406.	2096.
4	919.	1334.	1802.	2195.	4129.
5	3416.	276.	380.	337.	577.
6	338.	820.	100.	22.	90.
7	135.	67.	119.	54.	20.
=====					
Total	19530.	21981.	18119.	15578.	13433.
AGE	1997	1998	1999	2000	2001
1	5906.	5096.	7785.	4404.	1030.
2	2868.	4836.	4172.	6373.	3606.
3	2390.	2293.	3858.	3401.	5042.
4	1068.	1506.	1421.	2634.	2296.
5	1612.	450.	666.	665.	1382.
6	140.	511.	204.	301.	366.
7	16.	26.	274.	71.	301.
=====					
Total	14000.	14719.	18380.	17850.	14022.
AGE	2002	2003	2004	2005	
1	7042.	3063.	22048.	6306.	
2	843.	5766.	2508.	18051.	
3	2843.	688.	4708.	2052.	
4	3165.	2078.	463.	3597.	
5	1298.	1810.	1312.	174.	
6	792.	761.	771.	737.	
7	500.	599.	346.	513.	
=====					
Total	16482.	14764.	32155.	31431.	

Fishing Mortality Calculated

AGE	1982	1983	1984	1985	1986
1	0.0126	0.0021	0.0025	0.0078	0.0028
2	0.2262	0.2682	0.1577	0.1369	0.0412
3	0.6628	0.5979	0.5830	0.7801	0.6894
4	0.7057	0.8642	0.8315	1.1709	1.0083
5	0.5819	0.9646	1.0915	1.0322	1.0968
6	0.6578	0.8983	0.8774	1.1147	1.0271
7	0.6578	0.8983	0.8774	1.1147	1.0271
AGE	1987	1988	1989	1990	1991
1	0.0036	0.0003	0.0013	0.0019	0.0008
2	0.1288	0.0578	0.0288	0.0969	0.1625
3	0.4316	0.5043	0.3847	0.3320	0.8451
4	1.1156	0.7639	1.0093	0.9050	0.8376
5	1.4077	1.2483	0.8945	0.9471	1.2611
6	1.1573	0.8524	0.9812	0.9119	0.8840
7	1.1573	0.8524	0.9812	0.9119	0.8840
AGE	1992	1993	1994	1995	1996
1	0.0000	0.0001	0.0003	0.0000	0.0000
2	0.0694	0.0313	0.0069	0.1168	0.0331
3	0.3415	0.6947	0.4784	0.2392	0.4741
4	1.0012	1.0559	1.4756	1.1357	0.7408
5	1.2263	0.8202	2.6326	1.1232	1.2198
6	1.1742	1.0113	1.6027	1.1341	0.7886
7	1.1742	1.0113	1.6027	1.1341	0.7886
AGE	1997	1998	1999	2000	2001
1	0.0000	0.0000	0.0001	0.0000	0.0000
2	0.0238	0.0259	0.0042	0.0342	0.0378
3	0.2617	0.2789	0.1817	0.1929	0.2658
4	0.6641	0.6162	0.5584	0.4451	0.3703
5	0.9477	0.5922	0.5943	0.3987	0.3566
6	0.8249	0.6106	0.5697	0.4355	0.3651
7	0.8249	0.6106	0.5697	0.4355	0.3651
AGE	2002	2003	2004		
1	0.0000	0.0000	0.0000		
2	0.0026	0.0027	0.0004		
3	0.1135	0.1963	0.0690		
4	0.3587	0.2597	0.7801		
5	0.3346	0.6537	0.3760		
6	0.3516	0.4242	0.5781		
7	0.3516	0.4242	0.5781		

Average Fishing Mortality For Ages 4- 5

Year	Average F	N Weighted	Biomass Wtd	Catch Wtd
1982	0.6438	0.6596	0.6409	0.6635
1983	0.9144	0.8994	0.9109	0.9010
1984	0.9615	0.8824	0.8987	0.8894
1985	1.1015	1.1170	1.1005	1.1193
1986	1.0525	1.0278	1.0364	1.0285
1987	1.2616	1.1627	1.1831	1.1675
1988	1.0061	0.8708	0.9432	0.8967
1989	0.9519	0.9824	0.9760	0.9838
1990	0.9260	0.9120	0.9160	0.9121
1991	1.0493	0.8932	0.9159	0.9055
1992	1.1138	1.1786	1.1890	1.1826
1993	0.9381	1.0155	0.9978	1.0203
1994	2.0541	1.6770	1.7086	1.7096
1995	1.1295	1.1341	1.1330	1.1341
1996	0.9803	0.7995	0.8234	0.8167
1997	0.8059	0.8347	0.8406	0.8500
1998	0.6042	0.6107	0.6092	0.6108
1999	0.5764	0.5699	0.5729	0.5702
2000	0.4219	0.4357	0.4330	0.4364
2001	0.3635	0.3652	0.3638	0.3653
2002	0.3466	0.3516	0.3503	0.3519
2003	0.4567	0.4432	0.4726	0.5144
2004	0.5781	0.4814	0.4675	0.5291

Back Calculated Partial Recruitment

AGE	1982	1983	1984	1985	1986
1	0.0179	0.0021	0.0023	0.0066	0.0026
2	0.3205	0.2780	0.1445	0.1169	0.0376
3	0.9392	0.6198	0.5341	0.6662	0.6286
4	1.0000	0.8958	0.7617	1.0000	0.9193
5	0.8246	1.0000	1.0000	0.8815	1.0000
6	0.9321	0.9312	0.8038	0.9520	0.9365
7	0.9321	0.9312	0.8038	0.9520	0.9365
AGE	1987	1988	1989	1990	1991
1	0.0026	0.0002	0.0013	0.0020	0.0006
2	0.0915	0.0463	0.0285	0.1024	0.1289
3	0.3066	0.4040	0.3812	0.3505	0.6701
4	0.7924	0.6120	1.0000	0.9555	0.6642
5	1.0000	1.0000	0.8863	1.0000	1.0000
6	0.8221	0.6829	0.9721	0.9628	0.7010
7	0.8221	0.6829	0.9721	0.9628	0.7010
AGE	1992	1993	1994	1995	1996
1	0.0000	0.0001	0.0001	0.0000	0.0000
2	0.0566	0.0296	0.0026	0.1028	0.0272
3	0.2785	0.6579	0.1817	0.2106	0.3887
4	0.8165	1.0000	0.5605	1.0000	0.6073
5	1.0000	0.7768	1.0000	0.9890	1.0000
6	0.9575	0.9577	0.6088	0.9985	0.6465
7	0.9575	0.9577	0.6088	0.9985	0.6465
AGE	1997	1998	1999	2000	2001
1	0.0000	0.0000	0.0002	0.0000	0.0000
2	0.0251	0.0421	0.0071	0.0769	0.1021
3	0.2761	0.4526	0.3057	0.4335	0.7179
4	0.7008	1.0000	0.9395	1.0000	1.0000
5	1.0000	0.9609	1.0000	0.8959	0.9630
6	0.8704	0.9909	0.9586	0.9786	0.9861
7	0.8704	0.9909	0.9586	0.9786	0.9861
AGE	2002	2003	2004		
1	0.0000	0.0000	0.0000		
2	0.0073	0.0041	0.0006		
3	0.3165	0.3002	0.0884		
4	1.0000	0.3973	1.0000		
5	0.9328	1.0000	0.4820		
6	0.9803	0.6488	0.7410		
7	0.9803	0.6488	0.7410		

JAN-1 Biomass

AGE	1982	1983	1984	1985	1986
1	3226.	2109.	3666.	1539.	2780.
2	9607.	4880.	4052.	6096.	3488.
3	6870.	9369.	5165.	5509.	8257.
4	6868.	4455.	6673.	3819.	3495.
5	7541.	3880.	2328.	3935.	1624.
6	948.	4381.	1782.	956.	1715.
7	6200.	3082.	2722.	2140.	3761.
Total	41259.	32155.	26390.	23994.	25120.
AGE	1987	1988	1989	1990	1991
1	2253.	1580.	1982.	205.	510.
2	5426.	5722.	9178.	2747.	1326.
3	5616.	7963.	10289.	22982.	3245.
4	5936.	4554.	6706.	8718.	19476.
5	1785.	2676.	2740.	3089.	4421.
6	700.	528.	734.	1637.	1541.
7	1576.	688.	1261.	2587.	1749.
Total	23292.	23711.	32891.	41966.	32269.
AGE	1992	1993	1994	1995	1996
1	1527.	1964.	673.	700.	649.
2	3195.	3624.	5884.	2291.	2424.
3	3378.	7375.	6234.	10371.	3847.
4	1867.	2870.	4259.	4841.	8536.
5	9383.	940.	1074.	1323.	1779.
6	1518.	3540.	506.	109.	549.
7	1427.	730.	1173.	726.	213.
Total	22294.	21043.	19803.	20360.	17995.
AGE	1997	1998	1999	2000	2001
1	1241.	2310.	1295.	800.	215.
2	2361.	3508.	3595.	4588.	3026.
3	4560.	4384.	6032.	5575.	9604.
4	2647.	3822.	3414.	6571.	6226.
5	4359.	1570.	2317.	2308.	5627.
6	563.	1835.	992.	1461.	1952.
7	135.	251.	2114.	499.	2376.
Total	15867.	17679.	19759.	21802.	29026.
AGE	2002	2003	2004	2005	
1	1225.	605.	4354.	1196.	
2	614.	5054.	1935.	14302.	
3	5922.	1246.	10221.	4148.	
4	8970.	5651.	1308.	10048.	
5	4716.	6642.	4468.	620.	
6	4228.	3532.	3595.	3600.	
7	4202.	5198.	3023.	4416.	
Total	29876.	27928.	28904.	38331.	

Mean Biomass

AGE	1982	1983	1984	1985	1986
1	3975.	2928.	4736.	2321.	3890.
2	9560.	5331.	5225.	7385.	5177.
3	5705.	7889.	4426.	4451.	7270.
4	5340.	3399.	5389.	2721.	2706.
5	5895.	2709.	1597.	2891.	1164.
6	751.	2996.	1359.	650.	1155.
7	4162.	1870.	1666.	1190.	2166.
Total	35389.	27123.	24398.	21610.	23529.
AGE	1987	1988	1989	1990	1991
1	3596.	3814.	2337.	522.	1279.
2	7148.	8899.	21852.	3094.	3133.
3	5108.	7540.	10275.	21063.	2458.
4	4345.	3632.	5023.	6083.	14794.
5	1138.	1804.	2115.	2198.	3086.
6	473.	377.	393.	1388.	1236.
7	862.	426.	740.	1562.	1068.
Total	22670.	26492.	42735.	35911.	27054.
AGE	1992	1993	1994	1995	1996
1	2356.	3405.	1244.	1304.	1240.
2	7748.	5509.	10170.	4005.	4447.
3	3389.	5324.	5763.	9508.	3164.
4	1456.	1836.	2672.	3212.	6235.
5	5568.	735.	417.	941.	1104.
6	920.	2894.	281.	88.	423.
7	776.	423.	543.	401.	135.
Total	22212.	20127.	21090.	19458.	16747.
AGE	1997	1998	1999	2000	2001
1	2090.	2887.	2441.	1558.	364.
2	4462.	5834.	4483.	8511.	5789.
3	4217.	3836.	5817.	6360.	9763.
4	2116.	3010.	2732.	6661.	5689.
5	3010.	1278.	1904.	2196.	5121.
6	397.	1436.	819.	1267.	1815.
7	85.	172.	1474.	369.	1815.
Total	16377.	18452.	19671.	26922.	30356.
AGE	2002	2003	2004		
1	2492.	1084.	7801.		
2	1038.	10271.	3465.		
3	5871.	1369.	9886.		
4	8042.	5121.	978.		
5	4082.	4943.	3762.		
6	3589.	3006.	2869.		
7	3230.	3867.	2101.		
Total	28344.	29660.	30863.		

Spawning Stock Biomass

AGE	1982	1983	1984	1985	1986
1	218.	143.	248.	59.	108.
2	2327.	1174.	993.	2766.	1608.
3	3629.	5004.	2765.	4444.	6763.
4	5197.	3283.	4945.	3039.	2858.
5	6421.	3099.	1821.	3204.	1308.
6	822.	3648.	1489.	768.	1397.
7	5374.	2566.	2275.	1719.	3065.
Total	23987.	18916.	14536.	16000.	17107.
AGE	1987	1988	1989	1990	1991
1	87.	61.	77.	22.	54.
2	2465.	2631.	4241.	732.	350.
3	4802.	6727.	8867.	11778.	1527.
4	4767.	3878.	5481.	5874.	13270.
5	1365.	2102.	2283.	2373.	3223.
6	559.	443.	602.	1333.	1261.
7	1257.	578.	1036.	2150.	1460.
Total	15302.	16419.	22587.	24261.	21144.
AGE	1992	1993	1994	1995	1996
1	162.	209.	26.	27.	25.
2	855.	976.	2160.	826.	886.
3	1728.	3558.	4955.	8578.	3060.
4	1238.	1886.	3189.	3836.	7224.
5	6880.	737.	670.	1061.	1404.
6	1183.	2835.	375.	87.	465.
7	1135.	597.	869.	581.	180.
Total	13182.	10797.	12243.	14996.	13244.
AGE	1997	1998	1999	2000	2001
1	48.	89.	50.	31.	8.
2	864.	1284.	1320.	1677.	1105.
3	3758.	3602.	5038.	4647.	7909.
4	2269.	3303.	2979.	5842.	5604.
5	3600.	1376.	2030.	2089.	5128.
6	475.	1603.	872.	1314.	1776.
7	114.	219.	1859.	449.	2163.
Total	11128.	11475.	14149.	16049.	23694.
AGE	2002	2003	2004		
1	47.	23.	168.		
2	226.	1857.	711.		
3	5002.	1038.	8697.		
4	8090.	5182.	1100.		
5	4314.	5761.	4059.		
6	3856.	3183.	3157.		
7	3833.	4685.	2656.		
Total	25369.	21729.	20549.		

Catch Biomass

AGE	1982	1983	1984	1985	1986
1	50.	6.	12.	18.	11.
2	2151.	1421.	820.	1007.	213.
3	3734.	4663.	2551.	3422.	4947.
4	3719.	2891.	4412.	3121.	2679.
5	3392.	2568.	1710.	2929.	1252.
6	494.	2691.	1192.	725.	1186.
7	2738.	1680.	1462.	1327.	2225.
Total	16278.	15920.	12160.	12549.	12514.
AGE	1987	1988	1989	1990	1991
1	13.	1.	3.	1.	1.
2	917.	513.	628.	299.	507.
3	2185.	3764.	3922.	6943.	2045.
4	4752.	2736.	4979.	5415.	12202.
5	1564.	2204.	1861.	2046.	3807.
6	547.	321.	386.	1266.	1093.
7	998.	363.	726.	1424.	944.
Total	10976.	9902.	12504.	17394.	20598.
AGE	1992	1993	1994	1995	1996
1	0.	0.	0.	0.	0.
2	536.	172.	70.	466.	147.
3	1149.	3650.	2730.	2261.	1486.
4	1432.	1903.	3844.	3575.	4555.
5	6683.	594.	1055.	1036.	1318.
6	1080.	2927.	450.	100.	334.
7	911.	428.	871.	454.	107.
Total	11791.	9675.	9021.	7893.	7946.
AGE	1997	1998	1999	2000	2001
1	0.	0.	0.	0.	0.
2	106.	151.	19.	291.	218.
3	1097.	1063.	1052.	1221.	2579.
4	1388.	1833.	1509.	2938.	2090.
5	2804.	748.	1119.	868.	1812.
6	328.	877.	466.	552.	663.
7	70.	105.	840.	161.	663.
Total	5793.	4777.	5006.	6030.	8026.
AGE	2002	2003	2004		
1	0.	0.	0.		
2	3.	28.	2.		
3	664.	267.	680.		
4	2863.	1322.	752.		
5	1356.	3191.	1403.		
6	1262.	1275.	1339.		
7	1136.	1640.	1215.		
Total	7283.	7724.	5391.		

Catch Numbers

AGE	1982	1983	1984	1985	1986
1	88.0	14.0	24.0	49.0	26.0
2	1995.0	1337.0	813.0	989.0	208.0
3	2350.0	2896.0	1572.0	2111.0	2750.0
4	1386.0	1184.0	1636.0	1122.0	929.0
5	717.0	685.0	469.0	665.0	275.0
6	75.0	448.0	205.0	133.0	197.0
7	242.0	169.0	142.0	137.0	190.0
Total	6853.0	6733.0	4861.0	5206.0	4575.0
AGE	1987	1988	1989	1990	1991
1	41.0	6.0	5.0	7.0	5.0
2	907.0	520.0	530.0	294.0	447.0
3	1418.0	2140.0	2284.0	4195.0	1349.0
4	1525.0	1149.0	1698.0	2373.0	4948.0
5	330.0	434.0	485.0	488.0	946.0
6	79.0	51.0	91.0	167.0	151.0
7	97.0	34.0	61.0	105.0	85.0
Total	4397.0	4334.0	5154.0	7629.0	7931.0
AGE	1992	1993	1994	1995	1996
1	0.0	1.0	1.0	0.0	0.0
2	350.0	152.0	49.0	287.0	89.0
3	600.0	1998.0	1488.0	1233.0	716.0
4	526.0	787.0	1258.0	1348.0	1955.0
5	2184.0	140.0	319.0	206.0	368.0
6	216.0	481.0	74.0	14.0	45.0
7	86.0	39.0	88.0	34.0	10.0
Total	3962.0	3598.0	3277.0	3122.0	3183.0
AGE	1997	1998	1999	2000	2001
1	0.0	0.0	1.0	0.0	0.0
2	61.0	112.0	16.0	194.0	121.0
3	498.0	505.0	580.0	540.0	1065.0
4	469.0	627.0	550.0	856.0	643.0
5	893.0	182.0	270.0	198.0	375.0
6	72.0	214.0	81.0	97.0	102.0
7	8.0	11.0	109.0	23.0	84.0
Total	2001.0	1651.0	1607.0	1908.0	2390.0
AGE	2002	2003	2004		
1	0.0	0.0	0.0		
2	2.0	14.0	1.0		
3	276.0	111.0	284.0		
4	863.0	430.0	227.0		
5	334.0	786.0	372.0		
6	214.0	240.0	250.0		
7	135.0	189.0	139.0		
Total	1824.0	1770.0	1273.0		

Surplus Production

Average Adjustment Factor (Delta) = 1.0000

Year	Biomass	Delta Biomass	Catch Biomass	Surplus Production
1982	41259.363	-9104.261	16277.522	7173.261
1983	32155.101	-5764.971	15920.355	10155.384
1984	26390.130	-2396.578	12160.046	9763.468
1985	23993.552	1126.324	12549.410	13675.734
1986	25119.875	-1827.772	12513.581	10685.809
1987	23292.104	419.261	10975.911	11395.172
1988	23711.365	9179.238	9902.101	19081.339
1989	32890.602	9075.122	12504.203	21579.325
1990	41965.724	-9697.121	17394.131	7697.010
1991	32268.604	-9974.321	20598.402	10624.081
1992	22294.283	-1251.467	11790.660	10539.193
1993	21042.815	-1239.488	9674.657	8435.169
1994	19803.327	556.214	9021.290	9577.505
1995	20359.541	-2364.386	7892.760	5528.374
1996	17995.155	-2128.399	7946.164	5817.766
1997	15866.756	1812.271	5792.501	7604.773
1998	17679.028	2080.334	4776.532	6856.866
1999	19759.362	2042.608	5005.636	7048.244
2000	21801.970	7224.358	6030.463	13254.821
2001	29026.328	850.122	8025.918	8876.040
2002	29876.450	-1948.180	7282.631	5334.451
2003	27928.270	975.937	7723.623	8699.561
2004	28904.207	9426.874	5390.772	14817.646
2005	38331.081			

Summary of Survey Indices Used in the Estimate

INDEX	Survey Tag	Age	Time	Type	Catchability	Std. Error	CV
1	WHSpr	2	JAN-1	NUMBER	0.5407E-04	0.8377E-05	0.1549E+00
2	WHSpr	3	JAN-1	NUMBER	0.1193E-03	0.1191E-04	0.9983E-01
3	WHSpr	4	JAN-1	NUMBER	0.2133E-03	0.1852E-04	0.8682E-01
4	WHSpr	5	JAN-1	NUMBER	0.2863E-03	0.3514E-04	0.1228E+00
5	WHSpr	6	JAN-1	NUMBER	0.3853E-03	0.6688E-04	0.1736E+00
6	WHAut	2	JAN-1	NUMBER	0.5126E-04	0.6533E-05	0.1275E+00
7	WHAut	3	JAN-1	NUMBER	0.1146E-03	0.1428E-04	0.1246E+00
8	WHAut	4	JAN-1	NUMBER	0.2355E-03	0.2491E-04	0.1058E+00
9	WHAut	5	JAN-1	NUMBER	0.3778E-03	0.4971E-04	0.1316E+00
10	WHAut	6	JAN-1	NUMBER	0.5428E-03	0.6637E-04	0.1223E+00
11	MASpr	2	JAN-1	NUMBER	0.8026E-03	0.9531E-04	0.1188E+00
12	MASpr	3	JAN-1	NUMBER	0.6226E-03	0.5926E-04	0.9519E-01
13	MASpr	4	JAN-1	NUMBER	0.4933E-03	0.6966E-04	0.1412E+00
15	MAAut	2	JAN-1	NUMBER	0.2696E-03	0.8275E-04	0.3069E+00
18	CM_CPE	3	MEAN	NUMBER	0.1427E-04	0.1714E-05	0.1201E+00
19	CM_CPE	4	MEAN	NUMBER	0.2411E-04	0.1410E-05	0.5848E-01
20	CM_CPE	5	MEAN	NUMBER	0.2465E-04	0.1128E-05	0.4574E-01
21	CM_CPE	6	MEAN	NUMBER	0.2564E-04	0.7432E-06	0.2899E-01

Survey Index: 1 Tag: WHSpr AGE = 2
 Time = JAN-1 Type = NUMBER
 Catchability = 0.540727E-04 % Variance Contribution = 7.9876
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.100650E+01	0.588932E+00	0.535923E+00
1983	0.948600E+00	0.339625E+00	0.102715E+01
1984	0.131200E+01	0.333063E+00	0.137098E+01
1985	0.230800E+00	0.462060E+00	-0.694144E+00
1986	0.247800E+00	0.307693E+00	-0.216481E+00
1987	0.460200E+00	0.448589E+00	0.255534E-01
1988	0.923400E+00	0.553076E+00	0.512567E+00
1989	0.604800E+00	0.111553E+01	-0.612191E+00
1990	0.207600E+00	0.190165E+00	0.877210E-01
1991	0.678000E-01	0.178095E+00	-0.965753E+00
1992	0.225500E+00	0.312145E+00	-0.325149E+00
1993	0.496500E+00	0.294730E+00	0.521523E+00
1994	0.315600E+00	0.426006E+00	-0.299978E+00
1995	0.179200E+00	0.155572E+00	0.141391E+00
1996	0.215000E-01	0.163179E+00	-0.202680E+01
1997	0.131600E+00	0.155104E+00	-0.164331E+00
1998	0.223600E+00	0.261472E+00	-0.156467E+00
1999	0.344300E+00	0.225601E+00	0.422746E+00
2000	0.724700E+00	0.344607E+00	0.743353E+00
2001	0.323400E+00	0.194963E+00	0.506078E+00
2002	0.453000E-01	0.455832E-01	-0.623149E-02
2003	0.830500E+00	0.311760E+00	0.979795E+00
2004	0.446000E-01	0.135595E+00	-0.111194E+01
2005	0.726500E+00	0.976085E+00	-0.295312E+00

Survey Index: 2 Tag: WHSpr AGE = 3
 Time = JAN-1 Type = NUMBER
 Catchability = 0.119324E-03 % Variance Contribution = 3.3168
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.476400E+00	0.639506E+00	-0.294438E+00
1983	0.996800E+00	0.848640E+00	0.160915E+00
1984	0.102260E+01	0.469254E+00	0.778960E+00
1985	0.661700E+00	0.513974E+00	0.252639E+00
1986	0.754000E+00	0.728034E+00	0.350450E-01
1987	0.199100E+00	0.533459E+00	-0.985575E+00
1988	0.822900E+00	0.712549E+00	0.143986E+00
1989	0.723000E+00	0.943112E+00	-0.265776E+00
1990	0.136540E+01	0.195824E+01	-0.360598E+00
1991	0.233900E+00	0.311833E+00	-0.287573E+00
1992	0.242400E+00	0.273506E+00	-0.120733E+00
1993	0.799300E+00	0.526172E+00	0.418109E+00
1994	0.387500E+00	0.516085E+00	-0.286555E+00
1995	0.111610E+01	0.764385E+00	0.378525E+00
1996	0.592700E+00	0.250089E+00	0.862870E+00
1997	0.399100E+00	0.285211E+00	0.335983E+00
1998	0.330100E+00	0.273645E+00	0.187565E+00
1999	0.713300E+00	0.460314E+00	0.437992E+00
2000	0.438500E+00	0.405871E+00	0.773246E-01
2001	0.716100E+00	0.601664E+00	0.174121E+00
2002	0.524400E+00	0.339181E+00	0.435722E+00
2003	0.630000E-01	0.821403E-01	-0.265294E+00
2004	0.221300E+00	0.561752E+00	-0.931541E+00
2005	0.101400E+00	0.244875E+00	-0.881673E+00

Survey Index: 3 Tag: WHSpr AGE = 4
 Time = JAN-1 Type = NUMBER
 Catchability = 0.213271E-03 % Variance Contribution = 2.5085
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.655400E+00	0.645324E+00	0.154926E-01
1983	0.464700E+00	0.482320E+00	-0.372160E-01
1984	0.823300E+00	0.682988E+00	0.186843E+00
1985	0.662500E+00	0.383318E+00	0.547155E+00
1986	0.236900E+00	0.344746E+00	-0.375170E+00
1987	0.230700E+00	0.534676E+00	-0.840542E+00
1988	0.217900E+00	0.506991E+00	-0.844456E+00
1989	0.600100E+00	0.629732E+00	-0.481973E-01
1990	0.637000E+00	0.939334E+00	-0.388402E+00
1991	0.171670E+01	0.205603E+01	-0.180374E+00
1992	0.281900E+00	0.195992E+00	0.363477E+00
1993	0.334300E+00	0.284446E+00	0.161496E+00
1994	0.215000E+00	0.384401E+00	-0.581048E+00
1995	0.371700E+00	0.468058E+00	-0.230505E+00
1996	0.133070E+01	0.880613E+00	0.412842E+00
1997	0.264300E+00	0.227794E+00	0.148641E+00
1998	0.516600E+00	0.321258E+00	0.475025E+00
1999	0.344500E+00	0.302982E+00	0.128422E+00
2000	0.457000E+00	0.561669E+00	-0.206229E+00
2001	0.497200E+00	0.489719E+00	0.151606E-01
2002	0.160120E+01	0.674917E+00	0.863918E+00
2003	0.707700E+00	0.443074E+00	0.468283E+00
2004	0.118100E+00	0.987786E-01	0.178651E+00
2005	0.607600E+00	0.767227E+00	-0.233266E+00

Survey Index: 4 Tag: WHSpr AGE = 5
 Time = JAN-1 Type = NUMBER
 Catchability = 0.286265E-03 % Variance Contribution = 5.0158
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.987700E+00	0.514157E+00	0.652851E+00
1983	0.404200E+00	0.350172E+00	0.143485E+00
1984	0.211800E+00	0.223362E+00	-0.531492E-01
1985	0.661700E+00	0.326807E+00	0.705442E+00
1986	0.912000E-01	0.130623E+00	-0.359262E+00
1987	0.744000E-01	0.138226E+00	-0.619431E+00
1988	0.253500E+00	0.192571E+00	0.274900E+00
1989	0.908000E-01	0.259539E+00	-0.105025E+01
1990	0.102000E+00	0.252221E+00	-0.905334E+00
1991	0.299300E+00	0.417618E+00	-0.333121E+00
1992	0.132810E+01	0.977825E+00	0.306173E+00
1993	0.906000E-01	0.791392E-01	0.135245E+00
1994	0.942000E-01	0.108740E+00	-0.143539E+00
1995	0.145400E+00	0.965857E-01	0.409057E+00
1996	0.403200E+00	0.165209E+00	0.892224E+00
1997	0.875600E+00	0.461358E+00	0.640734E+00
1998	0.141500E+00	0.128853E+00	0.936312E-01
1999	0.315000E+00	0.190638E+00	0.502195E+00
2000	0.107100E+00	0.190498E+00	-0.575881E+00
2001	0.353900E+00	0.395521E+00	-0.111191E+00
2002	0.614200E+00	0.371624E+00	0.502438E+00
2003	0.108890E+01	0.518162E+00	0.742635E+00
2004	0.190800E+00	0.375536E+00	-0.677128E+00
2005	0.154000E-01	0.497543E-01	-0.117273E+01

Survey Index: 5 Tag: WHSpr AGE = 6
 Time = JAN-1 Type = NUMBER
 Catchability = 0.385326E-03 % Variance Contribution = 9.1926
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.873000E-01	0.654394E-01	0.288225E+00
1983	0.211800E+00	0.316640E+00	-0.402123E+00
1984	0.467000E-01	0.147077E+00	-0.114721E+01
1985	0.103100E+00	0.826356E-01	0.221259E+00
1986	0.349000E-01	0.128301E+00	-0.130189E+01
1987	N/A	0.480727E-01	N/A
1988	0.915000E-01	0.372748E-01	0.898022E+00
1989	0.627000E-01	0.609055E-01	0.290376E-01
1990	0.321000E-01	0.116926E+00	-0.129269E+01
1991	0.200000E-01	0.107816E+00	-0.168469E+01
1992	0.226400E+00	0.130407E+00	0.551644E+00
1993	0.484200E+00	0.316146E+00	0.426294E+00
1994	0.493000E-01	0.384035E-01	0.249776E+00
1995	0.283000E-01	0.861526E-02	0.118933E+01
1996	0.593000E-01	0.346190E-01	0.538206E+00
1997	0.242400E+00	0.537624E-01	0.150602E+01
1998	0.421000E+00	0.197090E+00	0.758975E+00
1999	0.133700E+00	0.785465E-01	0.531908E+00
2000	0.100600E+00	0.115956E+00	-0.142057E+00
2001	0.635000E-01	0.140905E+00	-0.797045E+00
2002	0.361900E+00	0.305139E+00	0.170602E+00
2003	0.394600E+00	0.293097E+00	0.297368E+00
2004	0.231600E+00	0.296997E+00	-0.248710E+00
2005	0.149800E+00	0.284159E+00	-0.640234E+00

Survey Index: 6 Tag: WHAut AGE = 2
 Time = JAN-1 Type = NUMBER
 Catchability = 0.512569E-04 % Variance Contribution = 5.4071
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.617900E+00	0.558264E+00	0.101495E+00
1983	0.842600E+00	0.321939E+00	0.962131E+00
1984	0.316800E+00	0.315719E+00	0.341819E-02
1985	0.432300E+00	0.437999E+00	-0.130957E-01
1986	0.525600E+00	0.291670E+00	0.588917E+00
1987	0.392000E+00	0.425229E+00	-0.813664E-01
1988	0.578200E+00	0.524275E+00	0.979035E-01
1989	0.193750E+01	0.105744E+01	0.605544E+00
1990	0.149500E+00	0.180262E+00	-0.187116E+00
1991	0.447000E-01	0.168820E+00	-0.132886E+01
1992	0.143500E+00	0.295891E+00	-0.723655E+00
1993	0.291000E+00	0.279382E+00	0.407426E-01
1994	0.197700E+00	0.403822E+00	-0.714223E+00
1995	0.207100E+00	0.147471E+00	0.339570E+00
1996	0.680000E-01	0.154682E+00	-0.821863E+00
1997	0.124200E+00	0.147027E+00	-0.168725E+00
1998	0.296800E+00	0.247856E+00	0.180213E+00
1999	0.966000E-01	0.213853E+00	-0.794709E+00
2000	0.430700E+00	0.326662E+00	0.276487E+00
2001	0.532600E+00	0.184811E+00	0.105844E+01
2002	0.340000E-01	0.432094E-01	-0.239698E+00
2003	0.269100E+00	0.295525E+00	-0.936700E-01
2004	0.454600E+00	0.128534E+00	0.126323E+01
2005	0.651300E+00	0.925256E+00	-0.351100E+00

Survey Index: 7 Tag: WHAut AGE = 3
 Time = JAN-1 Type = NUMBER
 Catchability = 0.114621E-03 % Variance Contribution = 5.1693
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.418800E+00	0.614299E+00	-0.383088E+00
1983	0.335270E+01	0.815189E+00	0.141410E+01
1984	0.915500E+00	0.450757E+00	0.708542E+00
1985	0.425800E+00	0.493715E+00	-0.147989E+00
1986	0.956700E+00	0.699337E+00	0.313357E+00
1987	0.401000E+00	0.512432E+00	-0.245206E+00
1988	0.137960E+01	0.684463E+00	0.700915E+00
1989	0.231340E+01	0.905938E+00	0.937503E+00
1990	0.240650E+01	0.188105E+01	0.246342E+00
1991	0.186800E+00	0.299541E+00	-0.472214E+00
1992	0.139000E+00	0.262725E+00	-0.636634E+00
1993	0.445800E+00	0.505432E+00	-0.125542E+00
1994	0.567800E+00	0.495742E+00	0.135713E+00
1995	0.883100E+00	0.734255E+00	0.184582E+00
1996	0.284500E+00	0.240232E+00	0.169130E+00
1997	0.382600E+00	0.273969E+00	0.333975E+00
1998	0.855000E-01	0.262858E+00	-0.112310E+01
1999	0.320300E+00	0.442170E+00	-0.322437E+00
2000	0.367200E+00	0.389873E+00	-0.599138E-01
2001	0.983700E+00	0.577948E+00	0.531837E+00
2002	0.141000E+00	0.325811E+00	-0.837558E+00
2003	0.805000E-01	0.789025E-01	0.200436E-01
2004	0.197600E+00	0.539610E+00	-0.100460E+01
2005	0.167800E+00	0.235222E+00	-0.337759E+00

Survey Index: 8 Tag: WHAut AGE = 4
 Time = JAN-1 Type = NUMBER
 Catchability = 0.235486E-03 % Variance Contribution = 3.7257
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.539400E+00	0.712544E+00	-0.278385E+00
1983	0.227480E+01	0.532561E+00	0.145195E+01
1984	0.827700E+00	0.754132E+00	0.930835E-01
1985	0.630700E+00	0.423247E+00	0.398875E+00
1986	0.609400E+00	0.380656E+00	0.470578E+00
1987	0.656500E+00	0.590370E+00	0.106173E+00
1988	0.592100E+00	0.559801E+00	0.560940E-01
1989	0.989600E+00	0.695327E+00	0.352918E+00
1990	0.150170E+01	0.103718E+01	0.370092E+00
1991	0.182930E+01	0.227020E+01	-0.215933E+00
1992	0.223300E+00	0.216408E+00	0.313516E-01
1993	0.140000E+00	0.314075E+00	-0.807989E+00
1994	0.360200E+00	0.424442E+00	-0.164116E+00
1995	0.826000E+00	0.516813E+00	0.468913E+00
1996	0.122840E+01	0.972342E+00	0.233760E+00
1997	0.188300E+00	0.251523E+00	-0.289497E+00
1998	0.176900E+00	0.354722E+00	-0.695749E+00
1999	0.114700E+00	0.334542E+00	-0.107044E+01
2000	0.585700E+00	0.620175E+00	-0.571944E-01
2001	0.393600E+00	0.540730E+00	-0.317586E+00
2002	0.752400E+00	0.745220E+00	0.958863E-02
2003	0.363700E+00	0.489227E+00	-0.296497E+00
2004	0.184800E+00	0.109068E+00	0.527304E+00
2005	0.580900E+00	0.847145E+00	-0.377294E+00

Survey Index: 9 Tag: WHAut AGE = 5
 Time = JAN-1 Type = NUMBER
 Catchability = 0.377789E-03 % Variance Contribution = 5.7618
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.404700E+00	0.678542E+00	-0.516800E+00
1983	0.108920E+01	0.462128E+00	0.857356E+00
1984	0.197000E+00	0.294774E+00	-0.403006E+00
1985	0.387100E+00	0.431293E+00	-0.108106E+00
1986	0.248200E+00	0.172386E+00	0.364500E+00
1987	0.341700E+00	0.182419E+00	0.627628E+00
1988	0.242900E+00	0.254139E+00	-0.452317E-01
1989	0.443400E+00	0.342518E+00	0.258148E+00
1990	0.292600E+00	0.332861E+00	-0.128918E+00
1991	0.597800E+00	0.551138E+00	0.812705E-01
1992	0.633400E+00	0.129045E+01	-0.711647E+00
1993	0.355000E-01	0.104441E+00	-0.107909E+01
1994	0.336000E-01	0.143506E+00	-0.145185E+01
1995	0.854000E-01	0.127466E+00	-0.400503E+00
1996	0.325200E+00	0.218029E+00	0.399814E+00
1997	0.542100E+00	0.608863E+00	-0.116142E+00
1998	0.172800E+00	0.170049E+00	0.160483E-01
1999	0.192300E+00	0.251589E+00	-0.268739E+00
2000	0.243300E+00	0.251404E+00	-0.327665E-01
2001	0.507100E+00	0.521977E+00	-0.289149E-01
2002	0.469000E+00	0.490439E+00	-0.446977E-01
2003	0.279720E+01	0.683828E+00	0.140867E+01
2004	0.528700E+00	0.495601E+00	0.646495E-01
2005	0.231100E+00	0.656616E-01	0.125834E+01

Survey Index: 10 Tag: WHAut AGE = 6
 Time = JAN-1 Type = NUMBER
 Catchability = 0.542803E-03 % Variance Contribution = 4.5616
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.120500E+00	0.921834E-01	0.267870E+00
1983	0.209200E+00	0.446045E+00	-0.757130E+00
1984	0.227000E+00	0.207185E+00	0.913361E-01
1985	0.214000E+00	0.116407E+00	0.608881E+00
1986	0.182000E+00	0.180736E+00	0.697072E-02
1987	0.727000E-01	0.677191E-01	0.709727E-01
1988	0.751000E-01	0.525083E-01	0.357848E+00
1989	0.990000E-01	0.857966E-01	0.143141E+00
1990	0.160500E+00	0.164712E+00	-0.259052E-01
1991	0.258900E+00	0.151878E+00	0.533361E+00
1992	0.811000E-01	0.183702E+00	-0.817631E+00
1993	0.349800E+00	0.445350E+00	-0.241498E+00
1994	N/A	0.540983E-01	N/A
1995	0.511000E-01	0.121362E-01	0.143759E+01
1996	0.821000E-01	0.487672E-01	0.520880E+00
1997	0.616000E-01	0.757341E-01	-0.206567E+00
1998	0.140200E+00	0.277637E+00	-0.683243E+00
1999	0.387000E-01	0.110647E+00	-0.105051E+01
2000	0.132000E+00	0.163345E+00	-0.213062E+00
2001	0.134300E+00	0.198490E+00	-0.390664E+00
2002	0.336800E+00	0.429844E+00	-0.243932E+00
2003	0.109580E+01	0.412881E+00	0.976080E+00
2004	0.449800E+00	0.418374E+00	0.724263E-01
2005	0.253400E+00	0.400290E+00	-0.457221E+00

Survey Index: 11 Tag: MASpr AGE = 2
 Time = JAN-1 Type = NUMBER
 Catchability = 0.802556E-03 % Variance Contribution = 4.6938
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.706000E+01	0.874104E+01	-0.213584E+00
1983	0.185720E+02	0.504077E+01	0.130410E+01
1984	0.540800E+01	0.494338E+01	0.898297E-01
1985	0.382200E+01	0.685798E+01	-0.584639E+00
1986	0.322200E+01	0.456683E+01	-0.348818E+00
1987	0.699700E+01	0.665804E+01	0.496561E-01
1988	0.113560E+02	0.820886E+01	0.324533E+00
1989	0.252600E+02	0.165570E+02	0.422415E+00
1990	0.689000E+01	0.282246E+01	0.892461E+00
1991	0.356000E+01	0.264331E+01	0.297728E+00
1992	0.635000E+01	0.463292E+01	0.315268E+00
1993	0.776000E+01	0.437444E+01	0.573204E+00
1994	0.567000E+01	0.632286E+01	-0.108982E+00
1995	0.136000E+01	0.230903E+01	-0.529345E+00
1996	0.650000E+00	0.242194E+01	-0.131535E+01
1997	0.125000E+01	0.230209E+01	-0.610672E+00
1998	0.180000E+01	0.388081E+01	-0.768257E+00
1999	0.357000E+01	0.334841E+01	0.640807E-01
2000	0.712000E+01	0.511472E+01	0.330786E+00
2001	0.278000E+01	0.289368E+01	-0.400783E-01
2002	0.441000E+00	0.676553E+00	-0.427967E+00
2003	0.933800E+01	0.462719E+01	0.702142E+00
2004	0.204900E+01	0.201252E+01	0.179622E-01
2005	0.936330E+01	0.144872E+02	-0.436470E+00

Survey Index: 12 Tag: MASpr AGE = 3
 Time = JAN-1 Type = NUMBER
 Catchability = 0.622564E-03 % Variance Contribution = 3.0159
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.341800E+01	0.333657E+01	0.241128E-01
1983	0.533100E+01	0.442771E+01	0.185657E+00
1984	0.227100E+01	0.244829E+01	-0.751697E-01
1985	0.279400E+01	0.268162E+01	0.410543E-01
1986	0.887000E+00	0.379845E+01	-0.145450E+01
1987	0.226800E+01	0.278328E+01	-0.204730E+00
1988	0.251100E+01	0.371766E+01	-0.392414E+00
1989	0.658000E+01	0.492061E+01	0.290603E+00
1990	0.177700E+02	0.102169E+02	0.553464E+00
1991	0.254000E+01	0.162696E+01	0.445450E+00
1992	0.358000E+01	0.142699E+01	0.919793E+00
1993	0.360000E+01	0.274525E+01	0.271060E+00
1994	0.246000E+01	0.269263E+01	-0.903563E-01
1995	0.389000E+01	0.398811E+01	-0.249087E-01
1996	0.115000E+01	0.130482E+01	-0.126303E+00
1997	0.105000E+01	0.148806E+01	-0.348686E+00
1998	0.990000E+00	0.142772E+01	-0.366127E+00
1999	0.346000E+01	0.240165E+01	0.365112E+00
2000	0.285000E+01	0.211760E+01	0.297037E+00
2001	0.481000E+01	0.313913E+01	0.426752E+00
2002	0.164200E+01	0.176965E+01	-0.748646E-01
2003	0.366000E+00	0.428560E+00	-0.157797E+00
2004	0.335000E+01	0.293089E+01	0.133653E+00
2005	0.675100E+00	0.127761E+01	-0.637888E+00

Survey Index: 13 Tag: MASpr AGE = 4
 Time = JAN-1 Type = NUMBER
 Catchability = 0.493316E-03 % Variance Contribution = 6.6369
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.114700E+01	0.149270E+01	-0.263435E+00
1983	0.501000E+00	0.111565E+01	-0.800589E+00
1984	0.865000E+00	0.157982E+01	-0.602336E+00
1985	0.692000E+00	0.886653E+00	-0.247867E+00
1986	0.426000E+00	0.797431E+00	-0.626956E+00
1987	0.257000E+00	0.123676E+01	-0.157117E+01
1988	0.137000E+01	0.117272E+01	0.155486E+00
1989	0.458000E+00	0.145663E+01	-0.115701E+01
1990	0.264000E+01	0.217277E+01	0.194775E+00
1991	0.503000E+01	0.475580E+01	0.560553E-01
1992	0.650000E+00	0.453349E+00	0.360310E+00
1993	0.145000E+01	0.657950E+00	0.790189E+00
1994	0.520000E+00	0.889157E+00	-0.536445E+00
1995	0.120000E+01	0.108266E+01	0.102897E+00
1996	0.200000E+01	0.203694E+01	-0.183034E-01
1997	0.220000E+00	0.526911E+00	-0.873404E+00
1998	0.106000E+01	0.743101E+00	0.355193E+00
1999	0.120000E+01	0.700826E+00	0.537818E+00
2000	0.260000E+01	0.129920E+01	0.693767E+00
2001	0.363000E+01	0.113277E+01	0.116457E+01
2002	0.237900E+01	0.156115E+01	0.421258E+00
2003	0.171400E+01	0.102487E+01	0.514260E+00
2004	0.608000E+00	0.228484E+00	0.978707E+00
2005	0.257500E+01	0.177467E+01	0.372234E+00

Survey Index: 15 Tag: MAAut AGE = 2
 Time = JAN-1 Type = NUMBER
 Catchability = 0.269618E-03 % Variance Contribution = 31.3532
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.565200E+01	0.293655E+01	0.654775E+00
1983	0.234600E+01	0.169344E+01	0.325947E+00
1984	0.651000E+00	0.166073E+01	-0.936501E+00
1985	0.344000E+00	0.230393E+01	-0.190173E+01
1986	0.419000E+00	0.153423E+01	-0.129791E+01
1987	0.115000E+01	0.223677E+01	-0.665269E+00
1988	0.238600E+01	0.275776E+01	-0.144801E+00
1989	0.204900E+02	0.556230E+01	0.130392E+01
1990	0.270000E+01	0.948205E+00	0.104644E+01
1991	0.913000E+01	0.888019E+00	0.233033E+01
1992	0.420000E+01	0.155643E+01	0.992692E+00
1993	0.201000E+01	0.146959E+01	0.313151E+00
1994	0.332000E+01	0.212416E+01	0.446588E+00
1995	0.141300E+02	0.775719E+00	0.290227E+01
1996	0.640000E+00	0.813649E+00	-0.240061E+00
1997	0.150000E+00	0.773385E+00	-0.164014E+01
1998	0.200000E-01	0.130375E+01	-0.417727E+01
1999	0.104000E+01	0.112490E+01	-0.784695E-01
2000	0.980000E+00	0.171829E+01	-0.561530E+00
2001	0.540000E+00	0.972130E+00	-0.587921E+00
2002	0.600000E-01	0.227288E+00	-0.133187E+01
2003	0.250000E+01	0.155450E+01	0.475135E+00
2004	0.366000E+01	0.676106E+00	0.168887E+01
2005	0.143800E+02	0.486698E+01	0.108337E+01

Survey Index: 18 Tag: CM_CPE AGE = 3
 Time = MEAN Type = NUMBER
 Catchability = 0.142705E-04 % Variance Contribution = 1.1478
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.738000E-01	0.512376E-01	0.364885E+00
1983	0.109900E+00	0.699259E-01	0.452135E+00
1984	0.448000E-01	0.389163E-01	0.140794E+00
1985	0.423000E-01	0.391810E-01	0.765948E-01
1986	0.688000E-01	0.576703E-01	0.176461E+00
1987	0.186000E-01	0.472994E-01	-0.933336E+00
1988	0.492000E-01	0.611694E-01	-0.217753E+00
1989	0.637000E-01	0.854027E-01	-0.293194E+00
1990	0.159500E+00	0.181622E+00	-0.129881E+00
1991	0.404000E-01	0.231355E-01	0.557461E+00
1992	0.173000E-01	0.252573E-01	-0.378408E+00
1993	0.500000E-01	0.415867E-01	0.184242E+00
1994	N/A	0.448143E-01	N/A
1995	N/A	0.739850E-01	N/A
1996	N/A	0.217581E-01	N/A
1997	N/A	0.273194E-01	N/A
1998	N/A	0.260048E-01	N/A
1999	N/A	0.457627E-01	N/A
2000	N/A	0.401391E-01	N/A
2001	N/A	0.575218E-01	N/A
2002	N/A	0.348210E-01	N/A
2003	N/A	0.811069E-02	N/A
2004	N/A	0.589052E-01	N/A
2005	N/A	0.000000E+00	N/A

Survey Index: 19 Tag: CM_CPE AGE = 4
 Time = MEAN Type = NUMBER
 Catchability = 0.241124E-04 % Variance Contribution = 0.2722
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.450000E-01	0.479914E-01	-0.643601E-01
1983	0.422000E-01	0.335634E-01	0.228985E+00
1984	0.442000E-01	0.481757E-01	-0.861294E-01
1985	0.289000E-01	0.235870E-01	0.203147E+00
1986	0.226000E-01	0.226224E-01	-0.991411E-03
1987	0.260000E-01	0.336209E-01	-0.257051E+00
1988	0.242000E-01	0.367856E-01	-0.418754E+00
1989	0.397000E-01	0.413056E-01	-0.396474E-01
1990	0.782000E-01	0.642782E-01	0.196049E+00
1991	0.135500E+00	0.144659E+00	-0.654064E-01
1992	0.138000E-01	0.128976E-01	0.676245E-01
1993	0.232000E-01	0.183131E-01	0.236534E+00
1994	N/A	0.210818E-01	N/A
1995	N/A	0.291996E-01	N/A
1996	N/A	0.645212E-01	N/A
1997	N/A	0.172440E-01	N/A
1998	N/A	0.248263E-01	N/A
1999	N/A	0.240106E-01	N/A
2000	N/A	0.467972E-01	N/A
2001	N/A	0.421974E-01	N/A
2002	N/A	0.584631E-01	N/A
2003	N/A	0.401581E-01	N/A
2004	N/A	0.711843E-02	N/A
2005	N/A	0.000000E+00	N/A

Survey Index: 20 Tag: CM_CPE AGE = 5
 Time = MEAN Type = NUMBER
 Catchability = 0.246504E-04 % Variance Contribution = 0.1665
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.217000E-01	0.307160E-01	-0.347470E+00
1983	0.209000E-01	0.178120E-01	0.159879E+00
1984	0.118000E-01	0.107991E-01	0.886351E-01
1985	0.179000E-01	0.161778E-01	0.101159E+00
1986	0.660000E-02	0.630230E-02	0.461550E-01
1987	0.570000E-02	0.592016E-02	-0.378968E-01
1988	0.930000E-02	0.875919E-02	0.599108E-01
1989	0.106000E-01	0.135847E-01	-0.248087E+00
1990	0.122000E-01	0.129214E-01	-0.574517E-01
1991	0.217000E-01	0.189030E-01	0.137993E+00
1992	0.515000E-01	0.448547E-01	0.138154E+00
1993	0.410000E-02	0.427151E-02	-0.409796E-01
1994	N/A	0.311110E-02	N/A
1995	N/A	0.461182E-02	N/A
1996	N/A	0.759740E-02	N/A
1997	N/A	0.236295E-01	N/A
1998	N/A	0.766357E-02	N/A
1999	N/A	0.113275E-01	N/A
2000	N/A	0.123425E-01	N/A
2001	N/A	0.261187E-01	N/A
2002	N/A	0.247880E-01	N/A
2003	N/A	0.300085E-01	N/A
2004	N/A	0.245821E-01	N/A
2005	N/A	0.000000E+00	N/A

Survey Index: 21 Tag: CM_CPE AGE = 6
 Time = MEAN Type = NUMBER
 Catchability = 0.256380E-04 % Variance Contribution = 0.0669
 Residual = LN(Observed) - LN(Predicted)

Year	Observed	Predicted	Residual
1982	0.270000E-02	0.292324E-02	-0.794400E-01
1983	0.123000E-01	0.127862E-01	-0.387668E-01
1984	0.550000E-02	0.599045E-02	-0.854185E-01
1985	0.360000E-02	0.305898E-02	0.162851E+00
1986	0.430000E-02	0.491745E-02	-0.134174E+00
1987	0.180000E-02	0.175006E-02	0.281341E-01
1988	0.150000E-02	0.153392E-02	-0.223584E-01
1989	0.230000E-02	0.237785E-02	-0.332886E-01
1990	0.510000E-02	0.469544E-02	0.826492E-01
1991	0.390000E-02	0.437936E-02	-0.115925E+00
1992	0.520000E-02	0.471637E-02	0.976202E-01
1993	0.140000E-01	0.121939E-01	0.138118E+00
1994	N/A	0.118377E-02	N/A
1995	N/A	0.316503E-03	N/A
1996	N/A	0.146300E-02	N/A
1997	N/A	0.223784E-02	N/A
1998	N/A	0.898503E-02	N/A
1999	N/A	0.364509E-02	N/A
2000	N/A	0.570987E-02	N/A
2001	N/A	0.716189E-02	N/A
2002	N/A	0.156052E-01	N/A
2003	N/A	0.145064E-01	N/A
2004	N/A	0.137326E-01	N/A
2005	N/A	0.000000E+00	N/A

Retrospective Summary

Average Fishing Mortality
Ages = 4 - 5

	1982	1983	1984	1985	1986
1996	0.6438	0.9144	0.9615	1.1015	1.0525
1997	0.6438	0.9144	0.9615	1.1015	1.0525
1998	0.6438	0.9144	0.9615	1.1015	1.0525
1999	0.6438	0.9144	0.9615	1.1015	1.0525
2000	0.6438	0.9144	0.9615	1.1015	1.0525
2001	0.6438	0.9144	0.9615	1.1015	1.0525
2002	0.6438	0.9144	0.9615	1.1015	1.0525
2003	0.6438	0.9144	0.9615	1.1015	1.0525
2004	0.6438	0.9144	0.9615	1.1015	1.0525
	1987	1988	1989	1990	1991
1996	1.2616	1.0061	0.9518	0.9256	1.0482
1997	1.2616	1.0061	0.9519	0.9259	1.0491
1998	1.2616	1.0061	0.9519	0.9260	1.0494
1999	1.2616	1.0061	0.9519	0.9260	1.0494
2000	1.2616	1.0061	0.9519	0.9260	1.0494
2001	1.2616	1.0061	0.9519	0.9260	1.0493
2002	1.2616	1.0061	0.9519	0.9260	1.0493
2003	1.2616	1.0061	0.9519	0.9260	1.0493
2004	1.2616	1.0061	0.9519	0.9260	1.0493
	1992	1993	1994	1995	1996
1996	1.1094	0.9289	1.9486	0.9135	0.5827
1997	1.1126	0.9359	2.0331	1.0809	0.8719
1998	1.1139	0.9384	2.0568	1.1358	0.9942
1999	1.1140	0.9385	2.0580	1.1390	1.0046
2000	1.1140	0.9385	2.0578	1.1383	1.0027
2001	1.1139	0.9383	2.0557	1.1334	0.9898
2002	1.1137	0.9380	2.0529	1.1267	0.9736
2003	1.1137	0.9380	2.0534	1.1277	0.9761
2004	1.1138	0.9381	2.0541	1.1295	0.9803
	1997	1998	1999	2000	2001
1996					
1997	0.6107				
1998	0.8272	0.6429			
1999	0.8630	0.6929	0.7697		
2000	0.8575	0.6844	0.7457	0.6610	
2001	0.8252	0.6350	0.6263	0.4951	0.4440
2002	0.7923	0.5838	0.5441	0.3827	0.3244
2003	0.7972	0.5912	0.5549	0.3963	0.3344
2004	0.8059	0.6042	0.5764	0.4219	0.3635
	2002	2003	2004		
1996					
1997					
1998					
1999					
2000					
2001					
2002	0.2883				
2003	0.3054	0.3797			
2004	0.3466	0.4567	0.5781		

Spawning Stock Biomass

	1982	1983	1984	1985	1986
1996	23987.	18916.	14536.	16000.	17107.
1997	23987.	18916.	14536.	16000.	17107.
1998	23987.	18916.	14536.	16000.	17107.
1999	23987.	18916.	14536.	16000.	17107.
2000	23987.	18916.	14536.	16000.	17107.
2001	23987.	18916.	14536.	16000.	17107.
2002	23987.	18916.	14536.	16000.	17107.
2003	23987.	18916.	14536.	16000.	17107.
2004	23987.	18916.	14536.	16000.	17107.
	1987	1988	1989	1990	1991
1996	15303.	16421.	22592.	24271.	21163.
1997	15302.	16420.	22588.	24263.	21148.
1998	15302.	16419.	22587.	24260.	21143.
1999	15302.	16419.	22587.	24260.	21143.
2000	15302.	16419.	22587.	24260.	21143.
2001	15302.	16419.	22587.	24260.	21143.
2002	15302.	16419.	22587.	24261.	21144.
2003	15302.	16419.	22587.	24261.	21144.
2004	15302.	16419.	22587.	24261.	21144.
	1992	1993	1994	1995	1996
1996	13239.	11019.	13357.	17646.	16193.
1997	13193.	10846.	12519.	15914.	14457.
1998	13180.	10791.	12205.	14876.	13048.
1999	13180.	10789.	12194.	14828.	12903.
2000	13180.	10789.	12198.	14840.	12929.
2001	13181.	10794.	12222.	14925.	13109.
2002	13182.	10800.	12258.	15047.	13341.
2003	13182.	10799.	12252.	15027.	13305.
2004	13182.	10797.	12243.	14996.	13244.
	1997	1998	1999	2000	2001
1996					
1997	11252.				
1998	10436.	9241.			
1999	10419.	9834.	10942.		
2000	10476.	10094.	11802.	14309.	
2001	10852.	10918.	12998.	15144.	24799.
2002	11326.	11884.	15018.	17569.	27189.
2003	11252.	11735.	14707.	17026.	25752.
2004	11128.	11475.	14149.	16049.	23694.
	2002	2003	2004		
1996					
1997					
1998					
1999					
2000					
2001					
2002	30524.				
2003	28157.	24211.			
2004	25369.	21729.	20549.		

Total Population Numbers

	1982	1983	1984	1985	1986
1996	29559.	25548.	25185.	23231.	24681.
1997	29559.	25548.	25185.	23231.	24680.
1998	29559.	25548.	25185.	23231.	24680.
1999	29559.	25548.	25185.	23231.	24680.
2000	29559.	25548.	25185.	23231.	24680.
2001	29559.	25548.	25185.	23231.	24680.
2002	29559.	25548.	25185.	23231.	24680.
2003	29559.	25548.	25185.	23231.	24680.
2004	29559.	25548.	25185.	23231.	24680.
	1987	1988	1989	1990	1991
1996	28575.	44629.	36974.	29762.	24578.
1997	28573.	44618.	36962.	29743.	24526.
1998	28573.	44615.	36958.	29738.	24496.
1999	28573.	44615.	36958.	29737.	24496.
2000	28573.	44615.	36958.	29737.	24496.
2001	28573.	44615.	36958.	29738.	24498.
2002	28573.	44616.	36959.	29738.	24501.
2003	28573.	44616.	36959.	29738.	24501.
2004	28573.	44616.	36958.	29738.	24500.
	1992	1993	1994	1995	1996
1996	20357.	24061.	20322.	15640.	11657.
1997	19629.	22764.	19200.	15517.	11756.
1998	19521.	21859.	18042.	15249.	12161.
1999	19510.	21851.	17898.	15201.	12525.
2000	19512.	21858.	17918.	15222.	12618.
2001	19523.	21920.	18041.	15398.	13193.
2002	19536.	22023.	18176.	15702.	13626.
2003	19534.	22007.	18156.	15653.	13564.
2004	19530.	21981.	18119.	15578.	13433.
	1997	1998	1999	2000	2001
1996	13233.				
1997	8324.	11124.			
1998	10082.	10970.	13850.		
1999	11644.	12581.	18447.	20352.	
2000	12305.	13782.	19856.	20451.	21776.
2001	13036.	13861.	20451.	19796.	15227.
2002	14645.	15455.	20598.	20276.	15717.
2003	14377.	15268.	19649.	19001.	14950.
2004	14000.	14719.	18380.	17850.	14022.
	2002	2003	2004	2005	
1996					
1997					
1998					
1999					
2000					
2001	16305.				
2002	23327.	23811.			
2003	17627.	17606.	18986.		
2004	16482.	14764.	32155.	31431.	

Age 2 Population

	1982	1983	1984	1985	1986
1996	10891.	6281.	6160.	8545.	5691.
1997	10891.	6281.	6160.	8545.	5690.
1998	10891.	6281.	6160.	8545.	5690.
1999	10891.	6281.	6160.	8545.	5690.
2000	10891.	6281.	6160.	8545.	5690.
2001	10891.	6281.	6160.	8545.	5690.
2002	10891.	6281.	6160.	8545.	5690.
2003	10891.	6281.	6160.	8545.	5690.
2004	10891.	6281.	6160.	8545.	5690.
	1987	1988	1989	1990	1991
1996	8296.	10230.	20640.	3521.	3303.
1997	8296.	10229.	20632.	3518.	3295.
1998	8296.	10228.	20630.	3517.	3294.
1999	8296.	10228.	20630.	3517.	3293.
2000	8296.	10228.	20630.	3517.	3293.
2001	8296.	10228.	20630.	3517.	3294.
2002	8296.	10228.	20630.	3517.	3294.
2003	8296.	10228.	20630.	3517.	3294.
2004	8296.	10228.	20630.	3517.	3294.
	1992	1993	1994	1995	1996
1996	5821.	6075.	9027.	3288.	1587.
1997	5791.	5514.	8453.	3238.	2243.
1998	5770.	5446.	7784.	2896.	2800.
1999	5770.	5437.	7785.	2783.	2858.
2000	5770.	5438.	7790.	2795.	2861.
2001	5771.	5446.	7834.	2854.	2923.
2002	5774.	5454.	7909.	2896.	3081.
2003	5773.	5453.	7897.	2890.	3055.
2004	5773.	5451.	7878.	2877.	3018.
	1997	1998	1999	2000	2001
1996	1377.				
1997	1536.	1316.			
1998	2047.	2480.	3728.		
1999	2377.	3515.	3998.	7875.	
2000	2439.	3994.	4539.	8222.	4704.
2001	2792.	4208.	4115.	8641.	3802.
2002	2943.	5235.	4343.	7696.	4113.
2003	2925.	5057.	4369.	7044.	3703.
2004	2868.	4836.	4172.	6373.	3606.
	2002	2003	2004	2005	
1996					
1997					
1998					
1999					
2000					
2001	526.				
2002	605.	10199.			
2003	827.	6061.	4129.		
2004	843.	5766.	2508.	18051.	

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

18	CM_CPE	3
19	CM_CPE	4
20	CM_CPE	5
21	CM_CPE	6

Plus Group Diagnostic Report

Calculation Method Selected = Backward

Year	Population Backward	Population Forward	F Forward	F Backward	Ratio
1982	548.	548.	0.657781	0.657781	1.000000
1983	310.	304.	0.924619	0.898299	0.971535
1984	264.	373.	0.538636	0.877362	1.628860
1985	221.	308.	0.664082	1.114702	1.678562
1986	321.	232.	2.078124	1.027096	0.494242
1987	153.	99.	5.000000	1.157331	0.231466
1988	64.	42.	2.078124	0.852419	0.410187
1989	106.	75.	2.078124	0.981163	0.472139
1990	191.	128.	2.078124	0.911853	0.438787
1991	158.	101.	2.310247	0.883999	0.382642
1992	135.	103.	2.226390	1.174176	0.527390
1993	67.	95.	0.597492	1.011323	1.692614
1994	119.	287.	0.409493	1.602830	3.914180
1995	54.	172.	0.244175	1.134386	4.645782
1996	20.	116.	0.099334	0.789256	7.945450
1997	15.	120.	0.076470	0.826884	10.813197
1998	26.	141.	0.090062	0.613165	6.808252
1999	272.	331.	0.446613	0.575490	1.288564
2000	71.	267.	0.099790	0.440404	4.413326
2001	294.	355.	0.300927	0.375241	1.246950
2002	492.	416.	0.439039	0.358456	0.816457
2003	564.	665.	0.373193	0.457262	1.225270
2004	422.	746.	0.229082	0.446782	1.950315
2005	619.	884.	N/A	N/A	