

Appendix 3. Full listing of final ADAPT VPA calibration for Gulf of Maine cod including:

Estimates of 2001 N for ages 2-6 using:

NEFSC spring and autumn surveys for ages 2-6,

Massachusetts DMF spring surveys for ages 2-4 and autumn surveys for age 2, and

USA commercial LPUE indices through 1993 for ages 3-6.

Fisheries Assessment Toolbox GoM Cod 2001 Disc Option 2 with Recr. Run Number 1 6/27/2001 3:59:33PM
 FACT Version 1.5.0
 GoM Cod 2001 Disc Option 2/Recr Run 1982 - 2001
 Input Parameters and Options Selected

 Natural mortality is a matrix below
 Oldest age (not in the plus group) is 6
 For all years prior to the terminal year (19), backcalculated
 stock sizes for the following ages used to estimate
 total mortality (Z) for age 6 : 4 5 6
 This method for estimating F on the oldest age is generally used when a
 flat-topped partial recruitment curve is thought to be characteristic of the stock.
 F for age 7 + is then calculated from the following
 ratios of F[age 7 +] to F[age 6]

1982	1
1983	1
1984	1
1985	1
1986	1
1987	1
1988	1
1989	1
1990	1
1991	1
1992	1
1993	1
1994	1
1995	1
1996	1
1997	1
1998	1
1999	1
2000	1

Stock size of the 7 + group is then calculated using
 the following method: CATCH EQUATION

Partial recruitment estimate for 2001

1	0.0001
2	0.053
3	0.421
4	1
5	1
6	1

Objective function is $\text{Sum } w * (\text{LOG}(\text{OBS}) - \text{LOG}(\text{PRED})) ** 2$
 Indices normalized (by dividing by mean observed value)
 before tuning to VPA stock sizes
 Downweighting is None or Uniform
 Biomass estimates (other than SSB) reflect mean stock sizes.
 SSB calculated as in the NEFSC projection program
 (see note below SSB table for description of the algorithm).
 Initial estimates of parameters for the Marquardt algorithm
 and lower and upper bounds on the parameter estimates:

Par.	Initial Est	Lower Bnd	Upper Bnd
N 2	3.00E+03	0.00E+00	1.00E+06
N 3	3.00E+03	0.00E+00	1.00E+06
N 4	5.00E+02	0.00E+00	1.00E+06
N 5	5.00E+02	0.00E+00	1.00E+06
N 6	5.00E+02	0.00E+00	1.00E+06
q WHSpr2	1.00E-02	0.00E+00	1.00E+00
q WHSpr3	1.00E-02	0.00E+00	1.00E+00
q WHSpr4	1.00E-02	0.00E+00	1.00E+00
q WHSpr5	1.00E-02	0.00E+00	1.00E+00
q WHSpr6	1.00E-02	0.00E+00	1.00E+00
q WHAut2	1.00E-02	0.00E+00	1.00E+00
q WHAut3	1.00E-02	0.00E+00	1.00E+00
q WHAut4	1.00E-02	0.00E+00	1.00E+00
q WHAut5	1.00E-02	0.00E+00	1.00E+00

q	WHAut6	1.00E-02	0.00E+00	1.00E+00
q	MASpr2	1.00E-02	0.00E+00	1.00E+00
q	MASpr3	1.00E-02	0.00E+00	1.00E+00
q	MASpr4	1.00E-02	0.00E+00	1.00E+00
q	MAAut2	1.00E-02	0.00E+00	1.00E+00
q	CM_CPE3	1.00E-02	0.00E+00	1.00E+00
q	CM_CPE4	1.00E-02	0.00E+00	1.00E+00
q	CM_CPE5	1.00E-02	0.00E+00	1.00E+00
q	CM_CPE6	1.00E-02	0.00E+00	1.00E+00

The following indices of abundance are available

1	WHSpr2
2	WHSpr3
3	WHSpr4
4	WHSpr5
5	WHSpr6
6	WHAut2
7	WHAut3
8	WHAut4
9	WHAut5
10	WHAut6
11	MASpr2
12	MASpr3
13	MASpr4
14	MAAut1
15	MAAut2
16	MAAut3
17	CM_CPE2
18	CM_CPE3
19	CM_CPE4
20	CM_CPE5
21	CM_CPE6

The Indices that will be used in this run are:

1	WHSpr2
2	WHSpr3
3	WHSpr4
4	WHSpr5
5	WHSpr6
6	WHAut2
7	WHAut3
8	WHAut4
9	WHAut5
10	WHAut6
11	MASpr2
12	MASpr3
13	MASpr4
14	MAAut2
15	CM_CPE3
16	CM_CPE4
17	CM_CPE5
18	CM_CPE6

Obs Indices (before transvba.formation) by index and year; with Index means

	1982	1983	1984	1985	1986	1987	1988
WHSpr2	1.02	0.98	1.03	0.24	0.33	0.64	1.05
WHSpr3	0.52	0.83	1.15	0.62	0.65	0.49	0.63
WHSpr4	0.69	0.64	0.74	0.67	0.39	0.30	0.36
WHSpr5	0.86	0.36	0.19	0.68	0.07	0.13	0.22
WHSpr6	0.12	0.18	0.05	0.10	0.05	0.01	0.09
WHAut2	0.62	0.70	1.66	0.38	0.38	0.30	0.60
WHAut3	0.38	3.14	0.98	0.42	0.91	0.49	1.32
WHAut4	0.55	2.47	0.85	0.57	0.76	0.65	0.60
WHAut5	0.47	1.17	0.14	0.40	0.21	0.33	0.26
WHAut6	0.09	0.25	0.26	0.22	0.22	0.09	0.06

MASpr2	7.06	18.57	5.41	3.82	3.22	7.00	11.36
MASpr3	3.42	5.33	2.27	2.79	0.89	2.27	2.51
MASpr4	1.15	0.50	0.87	0.69	0.43	0.26	1.37
MAAut2	5.65	2.35	0.65	0.34	0.42	1.15	2.39
CM_CPE3	0.07	0.11	0.04	0.04	0.07	0.02	0.05
CM_CPE4	0.05	0.04	0.04	0.03	0.02	0.03	0.02
CM_CPE5	0.02	0.02	0.01	0.02	0.01	0.01	0.01
CM_CPE6	0.00	0.01	0.01	0.00	0.00	0.00	0.00
	1989	1990	1991	1992	1993	1994	1995
WHSpr2	0.65	0.19	0.21	0.23	0.50	0.32	0.18
WHSpr3	0.79	1.33	0.36	0.24	0.80	0.39	1.12
WHSpr4	0.63	0.63	1.48	0.28	0.33	0.21	0.37
WHSpr5	0.09	0.17	0.27	1.31	0.09	0.10	0.15
WHSpr6	0.08	0.03	0.02	0.22	0.48	0.05	0.03
WHAut2	1.95	0.42	0.03	0.14	0.29	0.20	0.21
WHAut3	2.25	2.39	0.37	0.14	0.45	0.57	0.88
WHAut4	0.96	1.36	1.64	0.22	0.14	0.36	0.83
WHAut5	0.53	0.29	0.62	0.63	0.04	0.03	0.09
WHAut6	0.11	0.17	0.28	0.08	0.33	0.00	0.05
MASpr2	25.26	6.89	3.56	6.35	7.76	5.67	1.36
MASpr3	6.58	17.77	2.54	3.58	3.60	2.46	3.89
MASpr4	0.46	2.64	5.03	0.65	1.45	0.52	1.20
MAAut2	20.49	2.70	9.13	4.20	2.01	3.32	14.13
CM_CPE3	0.06	0.16	0.04	0.02	0.05	0.00	0.00
CM_CPE4	0.04	0.08	0.14	0.01	0.02	0.00	0.00
CM_CPE5	0.01	0.01	0.02	0.05	0.00	0.00	0.00
CM_CPE6	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	1996	1997	1998	1999	2000	2001	Average
WHSpr2	0.02	0.13	0.22	0.34	0.73	0.00	0.474
WHSpr3	0.59	0.40	0.33	0.71	0.44	0.00	0.651
WHSpr4	1.33	0.26	0.52	0.34	0.46	0.00	0.559
WHSpr5	0.40	0.88	0.14	0.32	0.11	0.00	0.343
WHSpr6	0.06	0.24	0.42	0.13	0.10	0.00	0.129
WHAut2	0.07	0.12	0.30	0.10	0.43	0.53	0.471
WHAut3	0.28	0.38	0.09	0.32	0.36	0.98	0.855
WHAut4	1.23	0.19	0.16	0.12	0.59	0.39	0.732
WHAut5	0.33	0.54	0.18	0.19	0.24	0.51	0.361
WHAut6	0.08	0.06	0.15	0.04	0.13	0.13	0.147
MASpr2	0.65	1.25	1.80	3.57	7.12	0.00	6.720
MASpr3	1.15	1.05	0.99	3.46	2.85	0.00	3.653
MASpr4	2.00	0.22	1.06	1.20	2.60	0.00	1.278
MAAut2	0.64	0.15	0.02	1.04	0.98	0.54	3.615
CM_CPE3	0.00	0.00	0.00	0.00	0.00	0.00	0.062
CM_CPE4	0.00	0.00	0.00	0.00	0.00	0.00	0.044
CM_CPE5	0.00	0.00	0.00	0.00	0.00	0.00	0.016
CM_CPE6	0.00	0.00	0.00	0.00	0.00	0.00	0.005

Catch at age (thousands) -

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	1982	1983	1984	1985	1986	1987	1988
1	88	14	24	49	26	41	06
2	1995	1337	813	989	208	907	520
3	2350	2896	1572	2111	2750	1418	2140
4	1386	1184	1636	1122	929	1525	1149
5	717	685	469	665	275	330	434
6	75	448	205	133	197	79	51
7	242	169	142	137	190	97	34
1+	6853	6733	4861	5206	4575	4397	4334
	1989	1990	1991	1992	1993	1994	1995
1	05	07	05	00	01	01	00
2	530	294	447	350	152	57	279
3	2284	4195	1349	600	1998	1380	1152
4	1698	2373	4948	526	787	1228	1324
5	485	488	946	2184	140	315	204
6	91	167	151	216	481	74	14
7	61	105	85	86	39	88	34
1+	5154	7629	7931	3962	3598	3143	3007
	1996	1997	1998	1999	2000		
1	00	00	00	01	00		
2	86	61	110	08	97		
3	688	494	485	563	485		
4	1943	466	616	566	934		
5	368	894	180	267	211		
6	46	72	211	78	96		
7	10	08	11	104	25		
1+	3141	1995	1613	1587	1848		

CAA Summary for ages 4 - 7

	1982	1983	1984	1985	1986	1987	1988
	2420	2486	2452	2057	1591	2031	1668
	1989	1990	1991	1992	1993	1994	1995
	2335	3133	6130	3012	1447	1705	1576
	1996	1997	1998	1999	2000		
	2367	1440	1018	1015	1266		

Weight at age (mid year) in kg -

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	1982	1983	1984	1985	1986	1987	1988
1	0.568	0.429	0.500	0.367	0.423	0.317	0.167
2	1.078	1.063	1.009	1.018	1.024	1.011	0.987
3	1.589	1.610	1.623	1.621	1.799	1.541	1.759
4	2.683	2.442	2.697	2.782	2.884	3.116	2.381
5	4.731	3.749	3.646	4.405	4.553	4.739	5.078
6	6.587	6.007	5.815	5.451	6.020	6.924	6.294
7	11.314	9.941	10.296	9.686	11.711	10.289	10.676

	1989	1990	1991	1992	1993	1994	1995
1	0.600	0.143	0.171	0.468	1.000	0.468	0.468
2	1.185	1.017	1.134	1.531	1.132	1.368	1.620
3	1.717	1.655	1.516	1.915	1.827	1.861	1.851
4	2.932	2.282	2.466	2.722	2.418	3.086	2.667
5	3.837	4.193	4.024	3.060	4.243	3.324	5.064
6	4.242	7.581	7.238	5.000	6.085	6.068	7.143
7	11.902	13.562	11.106	10.593	10.974	9.864	13.382

	1996	1997	1998	1999	2000		
1	0.468	0.468	0.468	0.331	0.468		
2	1.651	1.721	1.336	1.250	1.600		
3	2.093	2.202	2.109	1.841	2.274		
4	2.335	2.966	2.937	2.776	3.310		
5	3.590	3.140	4.133	4.100	4.291		
6	7.391	4.556	4.128	5.736	5.811		
7	10.900	8.875	9.909	7.702	7.307		

January 1 Biomass Weights -

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	1982	1983	1984	1985	1986	1987	1988
1	0.415	0.280	0.350	0.220	0.274	0.180	0.063
2	0.882	0.777	0.658	0.713	0.613	0.654	0.559
3	1.282	1.317	1.313	1.279	1.353	1.256	1.334
4	2.270	1.970	2.084	2.125	2.162	2.368	1.915
5	4.199	3.172	2.984	3.447	3.559	3.697	3.978
6	5.582	5.331	4.669	4.458	5.150	5.615	5.461
7	11.314	9.941	10.296	9.686	11.711	10.289	10.676

	1989	1990	1991	1992	1993	1994	1995
1	0.461	0.051	0.057	0.301	0.855	0.252	0.249
2	0.445	0.781	0.403	0.512	0.728	1.170	0.871
3	1.302	1.400	1.242	1.474	1.672	1.451	1.591
4	2.271	1.979	2.020	2.031	2.152	2.374	2.228
5	3.023	3.506	3.030	2.747	3.398	2.835	3.953
6	4.641	5.393	5.509	4.486	4.315	5.074	4.873
7	11.902	13.562	11.106	10.593	10.974	9.864	13.382

	1996	1997	1998	1999	2000		
1	0.244	0.277	0.286	0.151	0.301		
2	0.879	0.897	0.791	0.765	0.728		
3	1.841	1.907	1.905	1.568	1.686		
4	2.079	2.492	2.543	2.420	2.469		
5	3.094	2.708	3.501	3.470	3.451		
6	6.118	4.044	3.600	4.869	4.881		
7	10.900	8.875	9.909	7.702	7.307		

SSB Weights -

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	1982	1983	1984	1985	1986	1987	1988
1	0.415	0.280	0.350	0.220	0.274	0.180	0.063
2	0.882	0.777	0.658	0.713	0.613	0.654	0.559
3	1.282	1.317	1.313	1.279	1.353	1.256	1.334
4	2.270	1.970	2.084	2.125	2.162	2.368	1.915
5	4.199	3.172	2.984	3.447	3.559	3.697	3.978
6	5.582	5.331	4.669	4.458	5.150	5.615	5.461
7	11.314	9.941	10.296	9.686	11.711	10.289	10.676

	1989	1990	1991	1992	1993	1994	1995
1	0.461	0.051	0.057	0.301	0.855	0.252	0.249
2	0.445	0.781	0.403	0.512	0.728	1.170	0.871
3	1.302	1.400	1.242	1.474	1.672	1.451	1.591
4	2.271	1.979	2.020	2.031	2.152	2.374	2.228
5	3.023	3.506	3.030	2.747	3.398	2.835	3.953
6	4.641	5.393	5.509	4.486	4.315	5.074	4.873
7	11.902	13.562	11.106	10.593	10.974	9.864	13.382

	1996	1997	1998	1999	2000		
1	0.244	0.277	0.286	0.151	0.301		
2	0.879	0.897	0.791	0.765	0.728		
3	1.841	1.907	1.905	1.568	1.686		
4	2.079	2.492	2.543	2.420	2.469		
5	3.094	2.708	3.501	3.470	3.451		
6	6.118	4.044	3.600	4.869	4.881		
7	10.900	8.875	9.909	7.702	7.307		

Computed (Rivard) from midyear weights: Jan 1 Weights - D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2

	1982	1983	1984	1985	1986	1987	1988
1	0.415	0.280	0.350	0.220	0.274	0.180	0.063
2	0.882	0.777	0.658	0.713	0.613	0.654	0.559
3	1.282	1.317	1.313	1.279	1.353	1.256	1.334
4	2.270	1.970	2.084	2.125	2.162	2.368	1.915
5	4.199	3.172	2.984	3.447	3.559	3.697	3.978
6	5.582	5.331	4.669	4.458	5.150	5.615	5.461
7	11.314	9.941	10.296	9.686	11.711	10.289	10.676

	1989	1990	1991	1992	1993	1994	1995
1	0.461	0.051	0.057	0.301	0.855	0.252	0.249
2	0.445	0.781	0.403	0.512	0.728	1.170	0.871
3	1.302	1.400	1.242	1.474	1.672	1.451	1.591
4	2.271	1.979	2.020	2.031	2.152	2.374	2.228
5	3.023	3.506	3.030	2.747	3.398	2.835	3.953
6	4.641	5.393	5.509	4.486	4.315	5.074	4.873
7	11.902	13.562	11.106	10.593	10.974	9.864	13.382

	1996	1997	1998	1999	2000	2001	
1	0.244	0.277	0.286	0.151	0.301	0.226	
2	0.879	0.897	0.791	0.765	0.728	0.728	
3	1.841	1.907	1.905	1.568	1.686	3.518	
4	2.079	2.492	2.543	2.420	2.469	3.067	
5	3.094	2.708	3.501	3.470	3.451	4.438	
6	6.118	4.044	3.600	4.869	4.881	5.335	
7	10.900	8.875	9.909	7.702	7.307	7.307	

	Percent Mature (females)-		D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2				
	1982	1983	1984	1985	1986	1987	1988
1	07	07	07	04	04	04	04
2	26	26	26	48	48	48	48
3	61	61	61	95	95	95	95
4	88	88	88	100	100	100	100
5	97	97	97	100	100	100	100
6	100	100	100	100	100	100	100
7	100	100	100	100	100	100	100
	1989	1990	1991	1992	1993	1994	1995
1	04	11	11	11	11	04	04
2	48	28	28	28	28	38	38
3	95	56	56	56	56	89	89
4	100	81	81	81	81	99	99
5	100	93	93	93	93	100	100
6	100	98	98	98	98	100	100
7	100	100	100	100	100	100	100
	1996	1997	1998	1999	2000		
1	04	04	04	04	04		
2	38	38	38	38	38		
3	89	89	89	89	89		
4	99	99	99	99	99		
5	100	100	100	100	100		
6	100	100	100	100	100		
7	100	100	100	100	100		

	Natural Mortality		D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2				
	1982	1983	1984	1985	1986	1987	1988
1	.200	.200	.200	.200	.200	.200	.200
2	.200	.200	.200	.200	.200	.200	.200
3	.200	.200	.200	.200	.200	.200	.200
4	.200	.200	.200	.200	.200	.200	.200
5	.200	.200	.200	.200	.200	.200	.200
6	.200	.200	.200	.200	.200	.200	.200
7	.200	.200	.200	.200	.200	.200	.200
	1989	1990	1991	1992	1993	1994	1995
1	.200	.200	.200	.200	.200	.200	.200
2	.200	.200	.200	.200	.200	.200	.200
3	.200	.200	.200	.200	.200	.200	.200
4	.200	.200	.200	.200	.200	.200	.200
5	.200	.200	.200	.200	.200	.200	.200
6	.200	.200	.200	.200	.200	.200	.200
7	.200	.200	.200	.200	.200	.200	.200
	1996	1997	1998	1999	2000		
1	.200	.200	.200	.200	.200		
2	.200	.200	.200	.200	.200		
3	.200	.200	.200	.200	.200		
4	.200	.200	.200	.200	.200		
5	.200	.200	.200	.200	.200		
6	.200	.200	.200	.200	.200		
7	.200	.200	.200	.200	.200		

Sex Ratio (Percent Female) - D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2

	1982	1983	1984	1985	1986	1987	1988
1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	1989	1990	1991	1992	1993	1994	1995
1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	1996	1997	1998	1999	2000		
1	0.5	0.5	0.5	0.5	0.5		
2	0.5	0.5	0.5	0.5	0.5		
3	0.5	0.5	0.5	0.5	0.5		
4	0.5	0.5	0.5	0.5	0.5		
5	0.5	0.5	0.5	0.5	0.5		
6	0.5	0.5	0.5	0.5	0.5		
7	0.5	0.5	0.5	0.5	0.5		

pF is 0.1667
 pM is 0.1667

Residual Sum of Squares from Marquardt Algorithm

Number	1	
RSS		3841.08182267621
Lambda		1.00E-02
Number	2	
RSS		2949.80886853128
Lambda		1.00E-03
Number	3	
RSS		2304.85287637757
Lambda		1.00E-01
Number	4	
RSS		1867.60304194049
Lambda		1.00E-02
Number	5	
RSS		1681.66672827415
Lambda		1.00E+00
Number	6	
RSS		1353.39506527357
Lambda		1.00E-01
Number	7	
RSS		1227.33205557647
Lambda		1.00E+01
Number	8	
RSS		1011.42576852553
Lambda		1.00E+00
Number	9	
RSS		923.043627741624
Lambda		1.00E+02
Number	10	
RSS		774.624621215427
Lambda		1.00E+01
Number	11	
RSS		206.654780765569
Lambda		1.00E+00
Number	12	
RSS		142.175379643045
Lambda		1.00E+02
Number	13	
RSS		134.241386475573
Lambda		1.00E+01
Number	14	
RSS		134.03251483151
Lambda		1.00E+00
Number	15	
RSS		134.032264575886
Lambda		1.00E+02
Number	16	
RSS		134.032266304909
Lambda		1.00E+01
Number	17	
RSS		134.032264681567
Lambda		1.00E+00

Number 18
 RSS 134.032264576869
 Lambda 1.00E-01

 Number 19
 RSS 134.032264575887
 Lambda 1.00E-02

 Number 20
 RSS 134.032264575886
 Lambda 1.00E-03

RESULTS

 Approximate Statistics Assuming Linearity Near Solution
 Sum of Squares: 134.032264575886
 Mean Square Residuals: 0.45281

	PAR.	EST.	STD. ERR.	T-STATISTIC	C.V.
N 2	4.63E+03	2.27E+03	2.04E+00	0.49	
N 3	6.31E+03	1.99E+03	3.18E+00	0.31	
N 4	2.02E+03	5.89E+02	3.44E+00	0.29	
N 5	8.03E+02	3.30E+02	2.43E+00	0.41	
N 6	1.76E+02	8.79E+01	2.01E+00	0.50	
q WHSpr2	1.27E-04	2.00E-05	6.37E+00	0.16	
q WHSpr3	2.16E-04	3.37E-05	6.40E+00	0.16	
q WHSpr4	3.97E-04	6.19E-05	6.42E+00	0.16	
q WHSpr5	9.15E-04	1.43E-04	6.40E+00	0.16	
q WHSpr6	3.19E-03	4.98E-04	6.41E+00	0.16	
q WHAut2	1.15E-04	1.78E-05	6.45E+00	0.16	
q WHAut3	1.58E-04	2.42E-05	6.53E+00	0.15	
q WHAut4	3.36E-04	5.14E-05	6.55E+00	0.15	
q WHAut5	9.88E-04	1.52E-04	6.49E+00	0.15	
q WHAut6	3.99E-03	6.41E-04	6.23E+00	0.16	
q MASpr2	1.24E-04	1.95E-05	6.37E+00	0.16	
q MASpr3	1.80E-04	2.81E-05	6.40E+00	0.16	
q MASpr4	3.34E-04	5.21E-05	6.42E+00	0.16	
q MAAut2	6.87E-05	1.07E-05	6.45E+00	0.16	
q CM_CPE3	2.32E-04	4.54E-05	5.12E+00	0.20	
q CM_CPE4	5.53E-04	1.08E-04	5.12E+00	0.20	
q CM_CPE5	1.52E-03	2.98E-04	5.12E+00	0.20	
q CM_CPE6	5.00E-03	9.76E-04	5.12E+00	0.20	

Catchability Estimates in Original Units

	Estimate	Std.Err.	C.V.
q WHSpr2	6.04E-05	9.48E-06	0.16
q WHSpr3	1.40E-04	2.19E-05	0.16
q WHSpr4	2.22E-04	3.46E-05	0.16
q WHSpr5	3.14E-04	4.91E-05	0.16
q WHSpr6	4.13E-04	6.44E-05	0.16
q WHAut2	5.41E-05	8.39E-06	0.16
q WHAut3	1.35E-04	2.07E-05	0.15
q WHAut4	2.46E-04	3.76E-05	0.15
q WHAut5	3.56E-04	5.49E-05	0.15
q WHAut6	5.88E-04	9.45E-05	0.16
q MASpr2	8.32E-04	1.31E-04	0.16
q MASpr3	6.58E-04	1.03E-04	0.16
q MASpr4	4.27E-04	6.66E-05	0.16
q MAAut2	2.48E-04	3.85E-05	0.16
q CM_CPE3	1.43E-05	2.79E-06	0.20
q CM_CPE4	2.41E-05	4.71E-06	0.20
q CM_CPE5	2.46E-05	4.81E-06	0.20
q CM_CPE6	2.59E-05	5.05E-06	0.20

CORRELATION BETWEEN PARAMETERS ESTIMATED

1	0.04	0.03	0.02	0.01	-0.01	0	0	0	0	-0.17	-0.01	-0.01	0	0	-0.01	0	0	-0.17	0	0	0	0
0.04	1	0.04	0.03	0.02	-0.11	-0.01	0	0	0	-0.11	-0.11	-0.01	-0.01	-0.01	-0.11	-0.01	0	-0.11	0	0	0	0
0.03	0.04	1	0.04	0.03	-0.09	-0.08	0	0	0	-0.09	-0.09	-0.1	-0.01	-0.01	-0.09	-0.08	0	-0.09	0	0	0	0
0.02	0.03	0.04	1	-0.01	-0.07	-0.06	-0.08	-0.02	-0.05	-0.07	-0.07	-0.08	-0.15	-0.04	-0.07	-0.06	-0.08	-0.07	0	0	0	0
0.01	0.02	0.03	-0.01	1	-0.04	-0.04	-0.06	-0.12	-0.09	-0.04	-0.04	-0.06	-0.12	-0.25	-0.04	-0.04	-0.06	-0.04	0	0	0	0
-0.01	-0.11	-0.09	-0.07	-0.04	1	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0	0	0	0
0	-0.01	-0.08	-0.06	-0.04	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	0	0	0
0	0	0	-0.08	-0.06	0.01	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0	0	0	0
0	0	0	-0.02	-0.12	0.01	0.01	0.01	1	0.01	0.01	0.01	0.01	0.02	0.03	0.01	0.01	0.01	0.01	0	0	0	0
0	0	0	-0.05	-0.09	0.01	0.01	0.01	0.01	1	0.01	0.01	0.01	0.02	0.03	0.01	0.01	0.01	0.01	0	0	0	0
-0.17	-0.11	-0.09	-0.07	-0.04	0.02	0.01	0.01	0.01	0.01	1	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0	0	0	0
-0.01	-0.11	-0.09	-0.07	-0.04	0.02	0.01	0.01	0.01	0.01	0.02	1	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0	0	0	0
-0.01	-0.01	-0.1	-0.08	-0.06	0.02	0.02	0.01	0.01	0.01	0.02	0.02	1	0.02	0.02	0.02	0.02	0.01	0.02	0	0	0	0
0	-0.01	-0.01	-0.15	-0.12	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	1	0.04	0.02	0.01	0.02	0.02	0	0	0	0
0	-0.01	-0.01	-0.04	-0.25	0.01	0.01	0.02	0.03	0.03	0.01	0.01	0.02	0.04	1	0.01	0.01	0.02	0.01	0	0	0	0
-0.01	-0.11	-0.09	-0.07	-0.04	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.01	1	0.01	0.01	0.02	0	0	0	0
0	-0.01	-0.08	-0.06	-0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	1	0.01	0.01	0.01	0	0	0	0
0	0	0	-0.08	-0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	1	0.01	0	0	0	0
-0.17	-0.11	-0.09	-0.07	-0.04	0.02	0.01	0.01	0.01	0.01	0.05	0.02	0.02	0.02	0.01	0.02	0.01	0.01	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

CORRELATION BETWEEN PARAMETERS ESTIMATED (SYMBOLIC FORM)

N 2	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
N 3	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
N 4	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
N 5	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
N 6	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
WHSpr	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.	.
WHSpr	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.	.
WHSpr	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.	.
WHSpr	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.	.
WHAut	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.	.
WHAut	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.	.
WHAut	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.	.
WHAut	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.	.
WHAut	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.	.
MASpr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.	.
MASpr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.	.
MASpr	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.	.
MAAut	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.	.
CM_CPE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*	.
CM_CPE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*
CM_CPE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*
CM_CPE	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	*

SYMBOLS: = LARGE NEGATIVE CORRELATION whenever -1 <= R < -L
 - MODERATE NEGATIVE CORRELATION whenever -L <= R < -M
 . SMALL CORRELATION whenever -M <= R <= +M
 + MODERATE POSITIVE CORRELATION whenever +M < R <= +L
 * LARGE POSITIVE CORRELATION whenever +L < R <= +1

Where R is the estimated correlation, M is, 0.25 and L is 0.5

Summary of Residuals

WHSpr

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	1.019	0.657	0.765		0.327	1		0.438	0.651	10891	
1983	0.978	0.379	0.724		-0.224	1		0.948	1.408	6281	
1984	1.033	0.372	0.779		-0.243	1		1.022	1.519	6160	
1985	0.238	0.516	-0.689		0.084	1		-0.773	-1.149	8545	
1986	0.330	0.343	-0.362		-0.322	1		-0.040	-0.059	5690	
1987	0.638	0.501	0.297		0.055	1		0.242	0.360	8296	
1988	1.053	0.617	0.798		0.264	1		0.534	0.794	10228	
1989	0.649	1.245	0.314		0.965	1		-0.651	-0.968	20625	
1990	0.190	0.212	-0.914		-0.803	1		-0.111	-0.165	3518	
1991	0.209	0.198	-0.819		-0.872	1		0.053	0.078	3286	
1992	0.230	0.345	-0.723		-0.317	1		-0.406	-0.604	5720	
1993	0.500	0.317	0.053		-0.403	1		0.456	0.678	5249	
1994	0.316	0.461	-0.406		-0.028	1		-0.377	-0.561	7635	
1995	0.180	0.164	-0.968		-1.060	1		0.092	0.136	2721	
1996	0.020	0.167	-3.166		-1.041	1		-2.124	-3.157	2773	
1997	0.132	0.149	-1.279		-1.156	1		-0.123	-0.183	2473	
1998	0.224	0.234	-0.750		-0.704	1		-0.046	-0.068	3885	
1999	0.344	0.222	-0.321		-0.758	1		0.437	0.649	3683	
2000	0.725	0.472	0.425		-0.005	1		0.430	0.639	7817	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.505

WHSpr

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.516	0.753	-0.233		0.145	1		-0.377	-0.561	5359	
1983	0.833	0.999	0.246		0.428	1		-0.181	-0.270	7112	
1984	1.147	0.552	0.566		-0.165	1		0.731	1.086	3933	
1985	0.622	0.605	-0.046		-0.074	1		0.028	0.042	4307	
1986	0.647	0.857	-0.006		0.274	1		-0.281	-0.417	6101	
1987	0.486	0.628	-0.293		-0.037	1		-0.256	-0.380	4471	
1988	0.633	0.838	-0.028		0.253	1		-0.281	-0.418	5971	
1989	0.790	1.110	0.193		0.533	1		-0.340	-0.505	7903	
1990	1.327	2.304	0.712		1.263	1		-0.552	-0.820	16406	
1991	0.355	0.367	-0.607		-0.573	1		-0.033	-0.050	2614	
1992	0.240	0.321	-0.998		-0.708	1		-0.291	-0.432	2286	
1993	0.800	0.613	0.206		-0.060	1		0.266	0.395	4367	
1994	0.387	0.584	-0.520		-0.109	1		-0.412	-0.612	4160	
1995	1.120	0.871	0.542		0.290	1		0.252	0.374	6200	
1996	0.590	0.277	-0.099		-0.853	1		0.755	1.122	1975	
1997	0.399	0.308	-0.490		-0.749	1		0.259	0.386	2192	
1998	0.330	0.277	-0.680		-0.856	1		0.177	0.263	1969	
1999	0.713	0.433	0.091		-0.409	1		0.500	0.743	3081	
2000	0.438	0.422	-0.397		-0.433	1		0.036	0.054	3008	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.15

WHSpr

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.694	0.672	0.216		0.184	1		0.032	0.047	3026	
1983	0.641	0.503	0.137		-0.107	1		0.243	0.361	2262	
1984	0.741	0.712	0.282		0.241	1		0.040	0.060	3202	
1985	0.665	0.399	0.173		-0.336	1		0.510	0.758	1797	
1986	0.387	0.359	-0.368		-0.442	1		0.074	0.111	1616	
1987	0.300	0.557	-0.623		-0.004	1		-0.619	-0.920	2507	
1988	0.355	0.528	-0.454		-0.057	1		-0.398	-0.591	2377	
1989	0.632	0.656	0.122		0.160	1		-0.038	-0.056	2953	
1990	0.627	0.979	0.115		0.560	1		-0.445	-0.662	4404	
1991	1.477	2.142	0.971		1.343	1		-0.372	-0.552	9637	
1992	0.280	0.204	-0.692		-1.007	1		0.315	0.468	920	
1993	0.330	0.295	-0.527		-0.639	1		0.111	0.166	1328	

1994	0.213	0.393	-0.965	-0.353	1	-0.612	-0.909	1767
1995	0.370	0.479	-0.413	-0.154	1	-0.259	-0.385	2157
1996	1.330	0.896	0.867	0.472	1	0.395	0.586	4033
1997	0.264	0.221	-0.750	-0.928	1	0.177	0.264	995
1998	0.517	0.300	-0.078	-0.624	1	0.546	0.811	1348
1999	0.344	0.261	-0.486	-0.763	1	0.277	0.411	1174
2000	0.457	0.447	-0.202	-0.223	1	0.021	0.032	2013
2001	0.000	0.000	0	0	0	0.000	0.000	00

Partial Variance: 0.131

WHSpr

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.864	0.564	0.924	0.496	1	0.427	0.427	0.635	1796		
1983	0.357	0.384	0.040	0.112	1	-0.072	-0.072	-0.108	1223		
1984	0.190	0.245	-0.591	-0.337	1	-0.253	-0.253	-0.377	780		
1985	0.677	0.358	0.680	0.043	1	0.637	0.637	0.946	1142		
1986	0.074	0.143	-1.534	-0.874	1	-0.660	-0.660	-0.981	456		
1987	0.128	0.151	-0.986	-0.817	1	-0.169	-0.169	-0.250	483		
1988	0.217	0.211	-0.458	-0.486	1	0.028	0.028	0.041	673		
1989	0.090	0.284	-1.338	-0.187	1	-1.151	-1.151	-1.710	907		
1990	0.167	0.276	-0.720	-0.216	1	-0.504	-0.504	-0.749	881		
1991	0.268	0.458	-0.247	0.288	1	-0.535	-0.535	-0.795	1459		
1992	1.310	1.071	1.340	1.138	1	0.202	0.202	0.300	3413		
1993	0.090	0.087	-1.338	-1.373	1	0.035	0.035	0.052	277		
1994	0.095	0.118	-1.284	-1.069	1	-0.215	-0.215	-0.320	375		
1995	0.150	0.105	-0.827	-1.181	1	0.354	0.354	0.526	336		
1996	0.400	0.178	0.154	-0.654	1	0.808	0.808	1.201	568		
1997	0.876	0.484	0.938	0.345	1	0.592	0.592	0.880	1544		
1998	0.142	0.123	-0.882	-1.024	1	0.142	0.142	0.210	393		
1999	0.315	0.171	-0.085	-0.694	1	0.609	0.609	0.905	546		
2000	0.107	0.141	-1.165	-0.890	1	-0.274	-0.274	-0.408	449		
2001	0.000	0.000	0	0	0	0.000	0.000	0.000	00		

Partial Variance: 0.263

WHSpr

Tuned to: 1-Jan and number

For ages: 6

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.117	0.070	-0.100	-0.612	1	0.512	0.512	0.760	170		
1983	0.181	0.339	0.336	0.965	1	-0.629	-0.629	-0.934	822		
1984	0.053	0.158	-0.892	0.198	1	-1.090	-1.090	-1.620	382		
1985	0.095	0.089	-0.309	-0.379	1	0.070	0.070	0.104	214		
1986	0.046	0.138	-1.034	0.061	1	-1.095	-1.095	-1.628	333		
1987	0.011	0.052	-2.465	-0.920	1	-1.544	-1.544	-2.295	125		
1988	0.087	0.040	-0.397	-1.175	1	0.778	0.778	1.156	97		
1989	0.077	0.065	-0.519	-0.684	1	0.165	0.165	0.245	158		
1990	0.032	0.125	-1.397	-0.032	1	-1.365	-1.365	-2.029	303		
1991	0.024	0.116	-1.685	-0.113	1	-1.571	-1.571	-2.335	280		
1992	0.220	0.140	0.531	0.077	1	0.454	0.454	0.675	338		
1993	0.480	0.338	1.311	0.960	1	0.351	0.351	0.522	818		
1994	0.047	0.041	-1.013	-1.141	1	0.129	0.129	0.192	100		
1995	0.030	0.009	-1.461	-2.638	1	1.177	1.177	1.749	22		
1996	0.060	0.037	-0.768	-1.244	1	0.476	0.476	0.708	90		
1997	0.242	0.055	0.626	-0.862	1	1.489	1.489	2.212	132		
1998	0.421	0.188	1.180	0.374	1	0.806	0.806	1.198	455		
1999	0.134	0.066	0.035	-0.680	1	0.715	0.715	1.062	159		
2000	0.101	0.085	-0.248	-0.421	1	0.174	0.174	0.258	206		
2001	0.000	0.000	0	0	0	0.000	0.000	0.000	00		

Partial Variance: 0.89

WHAut

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.619	0.589	0.273		0.223	1		0.049	0.074	10891	
1983	0.700	0.340	0.396		-0.327	1		0.723	1.074	6281	
1984	1.660	0.333	1.259		-0.347	1		1.606	2.387	6160	
1985	0.384	0.462	-0.205		-0.019	1		-0.185	-0.275	8545	
1986	0.378	0.308	-0.220		-0.426	1		0.205	0.305	5690	
1987	0.301	0.449	-0.448		-0.049	1		-0.399	-0.593	8296	
1988	0.599	0.553	0.240		0.160	1		0.079	0.118	10228	
1989	1.951	1.116	1.421		0.862	1		0.559	0.831	20625	
1990	0.416	0.190	-0.125		-0.907	1		0.782	1.162	3518	
1991	0.029	0.178	-2.788		-0.975	1		-1.813	-2.694	3286	
1992	0.142	0.309	-1.200		-0.421	1		-0.779	-1.157	5720	
1993	0.290	0.284	-0.486		-0.507	1		0.021	0.031	5249	
1994	0.198	0.413	-0.867		-0.132	1		-0.735	-1.092	7635	
1995	0.210	0.147	-0.808		-1.164	1		0.355	0.528	2721	
1996	0.070	0.150	-1.907		-1.145	1		-0.762	-1.132	2773	
1997	0.120	0.134	-1.368		-1.259	1		-0.109	-0.161	2473	
1998	0.297	0.210	-0.462		-0.808	1		0.346	0.514	3885	
1999	0.097	0.199	-1.581		-0.861	1		-0.720	-1.069	3683	
2000	0.431	0.423	-0.089		-0.108	1		0.019	0.029	7817	
2001	0.533	0.250	0.123		-0.632	1		0.755	1.122	4630	

Partial Variance: 0.568

WHAut

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.382	0.725	-0.806		-0.165	1		-0.641	-0.952	5359	
1983	3.142	0.962	1.301		0.118	1		1.184	1.759	7112	
1984	0.977	0.532	0.133		-0.475	1		0.608	0.904	3933	
1985	0.421	0.583	-0.709		-0.384	1		-0.325	-0.483	4307	
1986	0.910	0.825	0.062		-0.036	1		0.098	0.145	6101	
1987	0.490	0.605	-0.557		-0.347	1		-0.210	-0.312	4471	
1988	1.324	0.808	0.437		-0.057	1		0.494	0.735	5971	
1989	2.245	1.069	0.965		0.223	1		0.742	1.103	7903	
1990	2.391	2.219	1.028		0.954	1		0.075	0.111	16406	
1991	0.367	0.354	-0.846		-0.883	1		0.037	0.055	2614	
1992	0.142	0.309	-1.795		-1.017	1		-0.778	-1.156	2286	
1993	0.450	0.591	-0.642		-0.370	1		-0.272	-0.404	4367	
1994	0.569	0.563	-0.407		-0.419	1		0.011	0.017	4160	
1995	0.880	0.839	0.029		-0.020	1		0.048	0.072	6200	
1996	0.280	0.267	-1.116		-1.163	1		0.047	0.070	1975	
1997	0.380	0.296	-0.811		-1.059	1		0.248	0.369	2192	
1998	0.086	0.266	-2.297		-1.166	1		-1.131	-1.680	1969	
1999	0.320	0.417	-0.983		-0.719	1		-0.264	-0.392	3081	
2000	0.363	0.407	-0.857		-0.743	1		-0.114	-0.169	3008	
2001	0.984	0.854	0.140		-0.002	1		0.142	0.211	6312	

Partial Variance: 0.281

WHAut

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.549	0.746	-0.288		0.018	1		-0.306	-0.455	3026	
1983	2.473	0.557	1.217		-0.273	1		1.490	2.214	2262	
1984	0.852	0.789	0.151		0.075	1		0.077	0.114	3202	
1985	0.565	0.443	-0.260		-0.503	1		0.244	0.362	1797	
1986	0.763	0.398	0.041		-0.609	1		0.650	0.966	1616	
1987	0.654	0.618	-0.113		-0.170	1		0.057	0.085	2507	
1988	0.600	0.586	-0.199		-0.223	1		0.024	0.036	2377	
1989	0.960	0.728	0.271		-0.007	1		0.277	0.412	2953	
1990	1.356	1.085	0.616		0.393	1		0.223	0.331	4404	
1991	1.643	2.375	0.808		1.176	1		-0.368	-0.547	9637	
1992	0.221	0.227	-1.198		-1.173	1		-0.025	-0.037	920	
1993	0.140	0.327	-1.655		-0.805	1		-0.849	-1.262	1328	
1994	0.363	0.435	-0.702		-0.520	1		-0.182	-0.270	1767	

1995	0.830	0.532	0.125	-0.320	1	0.446	0.662	2157
1996	1.230	0.994	0.518	0.305	1	0.213	0.317	4033
1997	0.190	0.245	-1.349	-1.095	1	-0.255	-0.379	995
1998	0.160	0.332	-1.521	-0.791	1	-0.730	-1.085	1348
1999	0.115	0.289	-1.851	-0.929	1	-0.922	-1.370	1174
2000	0.590	0.496	-0.216	-0.390	1	0.174	0.258	2013
2001	0.394	0.499	-0.620	-0.384	1	-0.236	-0.350	2024

Partial Variance: 0.299

WHAut

Tuned to: 1-Jan and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.474	0.640	0.274		0.574	1		-0.300	-0.446	1796	
1983	1.167	0.436	1.175		0.190	1		0.985	1.464	1223	
1984	0.139	0.278	-0.953		-0.260	1		-0.693	-1.030	780	
1985	0.399	0.407	0.101		0.121	1		-0.019	-0.029	1142	
1986	0.209	0.163	-0.545		-0.797	1		0.251	0.373	456	
1987	0.333	0.172	-0.079		-0.740	1		0.660	0.981	483	
1988	0.257	0.240	-0.339		-0.408	1		0.070	0.104	673	
1989	0.528	0.323	0.381		-0.110	1		0.491	0.730	907	
1990	0.294	0.314	-0.204		-0.139	1		-0.065	-0.097	881	
1991	0.623	0.520	0.547		0.366	1		0.181	0.270	1459	
1992	0.632	1.216	0.561		1.216	1		-0.654	-0.972	3413	
1993	0.040	0.099	-2.199		-1.296	1		-0.903	-1.342	277	
1994	0.032	0.134	-2.422		-0.991	1		-1.430	-2.126	375	
1995	0.090	0.120	-1.388		-1.104	1		-0.284	-0.422	336	
1996	0.330	0.202	-0.089		-0.577	1		0.489	0.726	568	
1997	0.540	0.550	0.404		0.423	1		-0.019	-0.028	1544	
1998	0.182	0.140	-0.684		-0.946	1		0.263	0.390	393	
1999	0.192	0.195	-0.630		-0.617	1		-0.013	-0.020	546	
2000	0.243	0.160	-0.395		-0.813	1		0.419	0.622	449	
2001	0.507	0.286	0.341		-0.231	1		0.572	0.850	803	

Partial Variance: 0.347

WHAut

Tuned to: 1-Jan and number

For ages: 6

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.089	0.100	-0.505		-0.389	1		-0.116	-0.172	170	
1983	0.248	0.484	0.520		1.188	1		-0.668	-0.992	822	
1984	0.264	0.225	0.583		0.421	1		0.162	0.240	382	
1985	0.220	0.126	0.400		-0.156	1		0.556	0.826	214	
1986	0.218	0.196	0.391		0.284	1		0.107	0.159	333	
1987	0.086	0.073	-0.539		-0.697	1		0.158	0.235	125	
1988	0.061	0.057	-0.882		-0.952	1		0.069	0.103	97	
1989	0.110	0.093	-0.293		-0.461	1		0.168	0.249	158	
1990	0.174	0.179	0.166		0.191	1		-0.026	-0.038	303	
1991	0.278	0.165	0.634		0.110	1		0.524	0.779	280	
1992	0.079	0.199	-0.624		0.300	1		-0.924	-1.373	338	
1993	0.330	0.481	0.806		1.183	1		-0.377	-0.561	818	
1994	0.000	0.000	0		0		1	0.000	0.000	00	
1995	0.050	0.013	-1.081		-2.415	1		1.334	1.982	22	
1996	0.080	0.053	-0.611		-1.021	1		0.410	0.609	90	
1997	0.060	0.078	-0.899		-0.639	1		-0.260	-0.386	132	
1998	0.149	0.268	0.011		0.597	1		-0.587	-0.872	455	
1999	0.039	0.093	-1.330		-0.456	1		-0.873	-1.298	159	
2000	0.132	0.121	-0.110		-0.198	1		0.088	0.130	206	
2001	0.134	0.104	-0.095		-0.350	1		0.255	0.379	176	

Partial Variance: 0.301

MASpr

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	7.060	9.066	0.049		0.299	1		-0.250	-0.372	10891	
1983	18.572	5.228	1.017		-0.251	1		1.268	1.884	6281	
1984	5.408	5.127	-0.217		-0.271	1		0.053	0.079	6160	
1985	3.822	7.113	-0.564		0.057	1		-0.621	-0.923	8545	
1986	3.222	4.737	-0.735		-0.350	1		-0.385	-0.573	5690	
1987	6.997	6.905	0.040		0.027	1		0.013	0.020	8296	
1988	11.356	8.514	0.525		0.237	1		0.288	0.428	10228	
1989	25.260	17.168	1.324		0.938	1		0.386	0.574	20625	
1990	6.890	2.928	0.025		-0.831	1		0.856	1.272	3518	
1991	3.560	2.735	-0.635		-0.899	1		0.264	0.392	3286	
1992	6.350	4.761	-0.057		-0.345	1		0.288	0.428	5720	
1993	7.760	4.369	0.144		-0.430	1		0.574	0.854	5249	
1994	5.670	6.355	-0.170		-0.056	1		-0.114	-0.170	7635	
1995	1.360	2.265	-1.598		-1.087	1		-0.510	-0.758	2721	
1996	0.650	2.308	-2.336		-1.069	1		-1.267	-1.883	2773	
1997	1.250	2.058	-1.682		-1.183	1		-0.499	-0.741	2473	
1998	1.800	3.233	-1.317		-0.732	1		-0.586	-0.870	3885	
1999	3.570	3.065	-0.632		-0.785	1		0.152	0.226	3683	
2000	7.120	6.507	0.058		-0.032	1		0.090	0.134	7817	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.347

MASpr

Tuned to: 1-Jan and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	3.418	3.524	-0.066		-0.036	1		-0.031	-0.046	5359	
1983	5.331	4.677	0.378		0.247	1		0.131	0.195	7112	
1984	2.271	2.586	-0.475		-0.345	1		-0.130	-0.193	3933	
1985	2.794	2.833	-0.268		-0.254	1		-0.014	-0.020	4307	
1986	0.887	4.012	-1.415		0.094	1		-1.509	-2.243	6101	
1987	2.268	2.940	-0.477		-0.217	1		-0.259	-0.386	4471	
1988	2.511	3.927	-0.375		0.072	1		-0.447	-0.664	5971	
1989	6.580	5.197	0.589		0.353	1		0.236	0.351	7903	
1990	17.770	10.789	1.582		1.083	1		0.499	0.742	16406	
1991	2.540	1.719	-0.363		-0.754	1		0.390	0.580	2614	
1992	3.580	1.503	-0.020		-0.888	1		0.868	1.290	2286	
1993	3.600	2.871	-0.015		-0.241	1		0.226	0.336	4367	
1994	2.460	2.736	-0.395		-0.289	1		-0.106	-0.158	4160	
1995	3.890	4.077	0.063		0.110	1		-0.047	-0.070	6200	
1996	1.150	1.299	-1.156		-1.034	1		-0.122	-0.181	1975	
1997	1.050	1.442	-1.247		-0.930	1		-0.317	-0.471	2192	
1998	0.990	1.295	-1.305		-1.037	1		-0.269	-0.399	1969	
1999	3.460	2.026	-0.054		-0.589	1		0.535	0.795	3081	
2000	2.850	1.978	-0.248		-0.613	1		0.365	0.543	3008	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.252

MASpr

Tuned to: 1-Jan and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	1.147	1.292	-0.108		0.011	1		-0.119	-0.177	3026	
1983	0.501	0.966	-0.937		-0.280	1		-0.656	-0.975	2262	
1984	0.865	1.367	-0.390		0.067	1		-0.458	-0.680	3202	
1985	0.692	0.767	-0.614		-0.510	1		-0.103	-0.154	1797	
1986	0.426	0.690	-1.099		-0.616	1		-0.483	-0.717	1616	
1987	0.257	1.070	-1.604		-0.177	1		-1.427	-2.120	2507	
1988	1.370	1.015	0.069		-0.231	1		0.300	0.446	2377	
1989	0.458	1.261	-1.026		-0.014	1		-1.013	-1.505	2953	
1990	2.640	1.880	0.725		0.386	1		0.339	0.504	4404	
1991	5.030	4.114	1.370		1.169	1		0.201	0.299	9637	
1992	0.650	0.393	-0.676		-1.180	1		0.504	0.749	920	
1993	1.450	0.567	0.126		-0.813	1		0.939	1.395	1328	
1994	0.520	0.755	-0.899		-0.527	1		-0.372	-0.553	1767	

1995	1.200	0.921	-0.063	-0.328	1	0.265	0.393	2157
1996	2.000	1.722	0.448	0.298	1	0.150	0.222	4033
1997	0.220	0.425	-1.760	-1.102	1	-0.658	-0.978	995
1998	1.060	0.575	-0.187	-0.798	1	0.611	0.908	1348
1999	1.200	0.501	-0.063	-0.936	1	0.873	1.298	1174
2000	2.600	0.859	0.710	-0.397	1	1.107	1.645	2013
2001	0.000	0.000	0	0	0	0.000	0.000	00

Partial Variance: 0.472

MAAut

Tuned to: 1-Jan and number

For ages: 2

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	5.652	2.703	0.447		-0.291	1		0.738	1.096	10891	
1983	2.346	1.559	-0.432		-0.841	1		0.409	0.607	6281	
1984	0.651	1.529	-1.714		-0.861	1		-0.854	-1.269	6160	
1985	0.344	2.121	-2.352		-0.533	1		-1.819	-2.703	8545	
1986	0.419	1.412	-2.155		-0.940	1		-1.215	-1.806	5690	
1987	1.150	2.059	-1.145		-0.563	1		-0.582	-0.866	8296	
1988	2.386	2.538	-0.415		-0.354	1		-0.062	-0.092	10228	
1989	20.490	5.119	1.735		0.348	1		1.387	2.061	20625	
1990	2.700	0.873	-0.292		-1.421	1		1.129	1.678	3518	
1991	9.130	0.815	0.927		-1.489	1		2.416	3.590	3286	
1992	4.200	1.420	0.150		-0.935	1		1.085	1.612	5720	
1993	2.010	1.303	-0.587		-1.021	1		0.434	0.644	5249	
1994	3.320	1.895	-0.085		-0.646	1		0.561	0.833	7635	
1995	14.130	0.675	1.363		-1.678	1		3.041	4.519	2721	
1996	0.640	0.688	-1.731		-1.659	1		-0.072	-0.108	2773	
1997	0.150	0.614	-3.182		-1.773	1		-1.409	-2.094	2473	
1998	0.020	0.964	-5.197		-1.322	1		-3.875	-5.759	3885	
1999	1.040	0.914	-1.246		-1.375	1		0.129	0.192	3683	
2000	0.980	1.940	-1.305		-0.622	1		-0.683	-1.015	7817	
2001	0.540	1.149	-1.901		-1.146	1		-0.755	-1.122	4630	

Partial Variance: 2.382

CM_CPE

Tuned to: mean and number

For ages: 3

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.074	0.051	0.182		-0.181	1		0.364	0.540	3590	
1983	0.110	0.070	0.580		0.130	1		0.451	0.670	4900	
1984	0.045	0.039	-0.318		-0.456	1		0.139	0.206	2727	
1985	0.042	0.039	-0.376		-0.450	1		0.074	0.110	2746	
1986	0.069	0.058	0.111		-0.063	1		0.174	0.259	4041	
1987	0.019	0.047	-1.196		-0.261	1		-0.934	-1.389	3314	
1988	0.049	0.061	-0.224		-0.004	1		-0.219	-0.326	4286	
1989	0.064	0.086	0.035		0.329	1		-0.295	-0.438	5984	
1990	0.160	0.182	0.953		1.084	1		-0.131	-0.195	12723	
1991	0.040	0.023	-0.420		-0.976	1		0.556	0.827	1622	
1992	0.017	0.025	-1.267		-0.892	1		-0.375	-0.557	1764	
1993	0.050	0.041	-0.208		-0.404	1		0.196	0.291	2873	
1994	0.000	0.000	0		0	1		0.000	0.000	00	
1995	0.000	0.000	0		0	1		0.000	0.000	00	
1996	0.000	0.000	0		0	1		0.000	0.000	00	
1997	0.000	0.000	0		0	1		0.000	0.000	00	
1998	0.000	0.000	0		0	1		0.000	0.000	00	
1999	0.000	0.000	0		0	1		0.000	0.000	00	
2000	0.000	0.000	0		0	1		0.000	0.000	00	
2001	0.000	0.000	0		0	0		0.000	0.000	00	

Partial Variance: 0.178

CM_CPE

Tuned to: mean and number

For ages: 4

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.045	0.048	0.032		0.096	1		-0.064	-0.096	1990	
1983	0.042	0.034	-0.034		-0.262	1		0.227	0.338	1392	
1984	0.044	0.048	0.013		0.100	1		-0.087	-0.129	1998	
1985	0.029	0.024	-0.410		-0.614	1		0.204	0.303	978	
1986	0.023	0.023	-0.659		-0.656	1		-0.003	-0.004	938	
1987	0.026	0.034	-0.518		-0.260	1		-0.258	-0.383	1394	
1988	0.024	0.037	-0.590		-0.170	1		-0.420	-0.624	1526	
1989	0.040	0.041	-0.095		-0.054	1		-0.041	-0.061	1713	
1990	0.078	0.064	0.583		0.388	1		0.195	0.290	2665	
1991	0.136	0.145	1.134		1.199	1		-0.065	-0.097	5996	
1992	0.014	0.013	-1.151		-1.217	1		0.066	0.098	535	
1993	0.023	0.018	-0.630		-0.874	1		0.245	0.364	754	
1994	0.000	0.000	0		0		1	0.000	0.000	00	
1995	0.000	0.000	0		0		1	0.000	0.000	00	
1996	0.000	0.000	0		0		1	0.000	0.000	00	
1997	0.000	0.000	0		0		1	0.000	0.000	00	
1998	0.000	0.000	0		0		1	0.000	0.000	00	
1999	0.000	0.000	0		0		1	0.000	0.000	00	
2000	0.000	0.000	0		0		1	0.000	0.000	00	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.043

CM_CPE

Tuned to: mean and number

For ages: 5

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.022	0.031	0.293		0.642	1		-0.348	-0.518	1246	
1983	0.021	0.018	0.259		0.097	1		0.162	0.241	723	
1984	0.012	0.011	-0.316		-0.404	1		0.088	0.131	438	
1985	0.018	0.016	0.103		0.001	1		0.103	0.153	656	
1986	0.007	0.006	-0.894		-0.942	1		0.048	0.071	256	
1987	0.006	0.006	-1.039		-1.005	1		-0.034	-0.051	240	
1988	0.009	0.009	-0.551		-0.613	1		0.062	0.092	355	
1989	0.011	0.014	-0.423		-0.174	1		-0.249	-0.370	551	
1990	0.012	0.013	-0.282		-0.224	1		-0.058	-0.086	524	
1991	0.022	0.019	0.294		0.156	1		0.138	0.206	767	
1992	0.051	0.045	1.158		1.019	1		0.139	0.207	1816	
1993	0.004	0.004	-1.379		-1.329	1		-0.051	-0.075	174	
1994	0.000	0.000	0		0		1	0.000	0.000	00	
1995	0.000	0.000	0		0		1	0.000	0.000	00	
1996	0.000	0.000	0		0		1	0.000	0.000	00	
1997	0.000	0.000	0		0		1	0.000	0.000	00	
1998	0.000	0.000	0		0		1	0.000	0.000	00	
1999	0.000	0.000	0		0		1	0.000	0.000	00	
2000	0.000	0.000	0		0		1	0.000	0.000	00	
2001	0.000	0.000	0		0		0	0.000	0.000	00	

Partial Variance: 0.026

CM_CPE

Tuned to: mean and number

For ages: 6

Year	Obs.	Pred.	Ln Scd.	Obs.	Ln Scd.	Pred.	Wt.	Wt. Res.	Std. Res.	Pred. Stk.	Sze.
1982	0.003	0.003	-0.669		-0.567	1		-0.102	-0.152	113	
1983	0.012	0.013	0.867		0.904	1		-0.037	-0.055	494	
1984	0.006	0.006	0.065		0.146	1		-0.081	-0.121	231	
1985	0.004	0.003	-0.360		-0.533	1		0.173	0.257	117	
1986	0.004	0.005	-0.190		-0.056	1		-0.134	-0.200	189	
1987	0.002	0.002	-1.073		-1.093	1		0.020	0.030	67	
1988	0.001	0.002	-1.259		-1.216	1		-0.043	-0.063	59	
1989	0.002	0.002	-0.807		-0.781	1		-0.026	-0.038	92	
1990	0.005	0.005	-0.015		-0.099	1		0.084	0.125	181	
1991	0.004	0.004	-0.273		-0.168	1		-0.105	-0.155	169	
1992	0.005	0.005	0.003		-0.104	1		0.106	0.158	180	
1993	0.014	0.012	0.992		0.848	1		0.144	0.214	467	
1994	0.000	0.000	0		0		1	0.000	0.000	00	

1995	0.000	0.000	0	0	1	0.000	0.000	00
1996	0.000	0.000	0	0	1	0.000	0.000	00
1997	0.000	0.000	0	0	1	0.000	0.000	00
1998	0.000	0.000	0	0	1	0.000	0.000	00
1999	0.000	0.000	0	0	1	0.000	0.000	00
2000	0.000	0.000	0	0	1	0.000	0.000	00
2001	0.000	0.000	0	0	0	0.000	0.000	00

Partial Variance: 0.011

Partial variance (and proportion of total) by index

Index	Partial Variance	Proportion
WHSpr 2	0.505	0.068
WHSpr 3	0.15	0.02
WHSpr 4	0.131	0.018
WHSpr 5	0.263	0.035
WHSpr 6	0.89	0.119
WHAut 2	0.568	0.076
WHAut 3	0.281	0.038
WHAut 4	0.299	0.04
WHAut 5	0.347	0.047
WHAut 6	0.301	0.04
MASpr 2	0.347	0.047
MASpr 3	0.252	0.034
MASpr 4	0.472	0.063
MAAut 2	2.382	0.32
CM_CPE 3	0.178	0.024
CM_CPE 4	0.043	0.006
CM_CPE 5	0.026	0.004
CM_CPE 6	0.011	0.001

Standardized residuals by index and year; with row/column/grand means

	1982	1983	1984	1985	1986	1987	1988
WHSpr2	0.651	1.408	1.519	-1.149	-0.059	0.360	0.794
WHSpr3	-0.561	-0.270	1.086	0.042	-0.417	-0.380	-0.418
WHSpr4	0.047	0.361	0.060	0.758	0.111	-0.920	-0.591
WHSpr5	0.635	-0.108	-0.377	0.946	-0.981	-0.250	0.041
WHSpr6	0.760	-0.934	-1.620	0.104	-1.628	-2.295	1.156
WHAut2	0.074	1.074	2.387	-0.275	0.305	-0.593	0.118
WHAut3	-0.952	1.759	0.904	-0.483	0.145	-0.312	0.735
WHAut4	-0.455	2.214	0.114	0.362	0.966	0.085	0.036
WHAut5	-0.446	1.464	-1.030	-0.029	0.373	0.981	0.104
WHAut6	-0.172	-0.992	0.240	0.826	0.159	0.235	0.103
MASpr2	-0.372	1.884	0.079	-0.923	-0.573	0.020	0.428
MASpr3	-0.046	0.195	-0.193	-0.020	-2.243	-0.386	-0.664
MASpr4	-0.177	-0.975	-0.680	-0.154	-0.717	-2.120	0.446
MAAut2	1.096	0.607	-1.269	-2.703	-1.806	-0.866	-0.092
CM_CPE3	0.540	0.670	0.206	0.110	0.259	-1.389	-0.326
CM_CPE4	-0.096	0.338	-0.129	0.303	-0.004	-0.383	-0.624
CM_CPE5	-0.518	0.241	0.131	0.153	0.071	-0.051	0.092
CM_CPE6	-0.152	-0.055	-0.121	0.257	-0.200	0.030	-0.063
Col Avg	-0.008	0.493	0.073	-0.104	-0.347	-0.457	0.071

	1989	1990	1991	1992	1993	1994	1995
WHSpr2	-0.968	-0.165	0.078	-0.604	0.678	-0.561	0.136
WHSpr3	-0.505	-0.820	-0.050	-0.432	0.395	-0.612	0.374
WHSpr4	-0.056	-0.662	-0.552	0.468	0.166	-0.909	-0.385
WHSpr5	-1.710	-0.749	-0.795	0.300	0.052	-0.320	0.526
WHSpr6	0.245	-2.029	-2.335	0.675	0.522	0.192	1.749
WHAut2	0.831	1.162	-2.694	-1.157	0.031	-1.092	0.528
WHAut3	1.103	0.111	0.055	-1.156	-0.404	0.017	0.072
WHAut4	0.412	0.331	-0.547	-0.037	-1.262	-0.270	0.662
WHAut5	0.730	-0.097	0.270	-0.972	-1.342	-2.126	-0.422
WHAut6	0.249	-0.038	0.779	-1.373	-0.561	0.000	1.982
MASpr2	0.574	1.272	0.392	0.428	0.854	-0.170	-0.758
MASpr3	0.351	0.742	0.580	1.290	0.336	-0.158	-0.070
MASpr4	-1.505	0.504	0.299	0.749	1.395	-0.553	0.393
MAAut2	2.061	1.678	3.590	1.612	0.644	0.833	4.519
CM_CPE3	-0.438	-0.195	0.827	-0.557	0.291	0.000	0.000
CM_CPE4	-0.061	0.290	-0.097	0.098	0.364	0.000	0.000
CM_CPE5	-0.370	-0.086	0.206	0.207	-0.075	0.000	0.000
CM_CPE6	-0.038	0.125	-0.155	0.158	0.214	0.000	0.000
Col Avg	0.050	0.076	-0.008	-0.017	0.128	-0.441	0.665

	1996	1997	1998	1999	2000	2001	
WHSpr2	-3.157	-0.183	-0.068	0.649	0.639	0.000	
WHSpr3	1.122	0.386	0.263	0.743	0.054	0.000	
WHSpr4	0.586	0.264	0.811	0.411	0.032	0.000	
WHSpr5	1.201	0.880	0.210	0.905	-0.408	0.000	
WHSpr6	0.708	2.212	1.198	1.062	0.258	0.000	
WHAut2	-1.132	-0.161	0.514	-1.069	0.029	1.122	
WHAut3	0.070	0.369	-1.680	-0.392	-0.169	0.211	
WHAut4	0.317	-0.379	-1.085	-1.370	0.258	-0.350	
WHAut5	0.726	-0.028	0.390	-0.020	0.622	0.850	
WHAut6	0.609	-0.386	-0.872	-1.298	0.130	0.379	
MASpr2	-1.883	-0.741	-0.870	0.226	0.134	0.000	
MASpr3	-0.181	-0.471	-0.399	0.795	0.543	0.000	
MASpr4	0.222	-0.978	0.908	1.298	1.645	0.000	
MAAut2	-0.108	-2.094	-5.759	0.192	-1.015	-1.122	
CM_CPE3	0.000	0.000	0.000	0.000	0.000	0.000	
CM_CPE4	0.000	0.000	0.000	0.000	0.000	0.000	
CM_CPE5	0.000	0.000	0.000	0.000	0.000	0.000	
CM_CPE6	0.000	0.000	0.000	0.000	0.000	0.000	
Col Avg	-0.064	-0.094	-0.460	0.152	0.197	0.182	

Percent of total sum of squares by index and year; with row/column sums							
	1982	1983	1984	1985	1986	1987	1988
WHSpr2	0.143	0.670	0.779	0.446	0.001	0.044	0.213
WHSpr3	0.106	0.025	0.399	0.001	0.059	0.049	0.059
WHSpr4	0.001	0.044	0.001	0.194	0.004	0.286	0.118
WHSpr5	0.136	0.004	0.048	0.302	0.325	0.021	0.001
WHSpr6	0.195	0.295	0.887	0.004	0.895	1.779	0.452
WHAut2	0.002	0.390	1.924	0.026	0.032	0.119	0.005
WHAut3	0.306	1.045	0.276	0.079	0.007	0.033	0.182
WHAut4	0.070	1.657	0.004	0.044	0.315	0.002	0.000
WHAut5	0.067	0.724	0.358	0.000	0.047	0.325	0.004
WHAut6	0.010	0.333	0.019	0.231	0.009	0.019	0.004
MASpr2	0.047	1.199	0.002	0.288	0.111	0.000	0.062
MASpr3	0.001	0.013	0.013	0.000	1.699	0.050	0.149
MASpr4	0.011	0.321	0.156	0.008	0.174	1.519	0.067
MAAut2	0.406	0.125	0.544	2.468	1.102	0.253	0.003
CM_CPE3	0.099	0.152	0.014	0.004	0.023	0.651	0.036
CM_CPE4	0.003	0.039	0.006	0.031	0.000	0.050	0.132
CM_CPE5	0.091	0.020	0.006	0.008	0.002	0.001	0.003
CM_CPE6	0.008	0.001	0.005	0.022	0.013	0.000	0.001
++	1.701	7.054	5.442	4.156	4.817	5.202	1.489
	1989	1990	1991	1992	1993	1994	1995
WHSpr2	0.316	0.009	0.002	0.123	0.155	0.106	0.006
WHSpr3	0.086	0.227	0.001	0.063	0.053	0.126	0.047
WHSpr4	0.001	0.148	0.103	0.074	0.009	0.279	0.050
WHSpr5	0.988	0.189	0.214	0.030	0.001	0.035	0.093
WHSpr6	0.020	1.391	1.842	0.154	0.092	0.012	1.033
WHAut2	0.233	0.457	2.452	0.453	0.000	0.403	0.094
WHAut3	0.411	0.004	0.001	0.452	0.055	0.000	0.002
WHAut4	0.057	0.037	0.101	0.000	0.538	0.025	0.148
WHAut5	0.180	0.003	0.025	0.319	0.608	1.527	0.060
WHAut6	0.021	0.000	0.205	0.637	0.106	0.000	1.327
MASpr2	0.111	0.546	0.052	0.062	0.246	0.010	0.194
MASpr3	0.042	0.186	0.114	0.562	0.038	0.008	0.002
MASpr4	0.765	0.086	0.030	0.190	0.657	0.103	0.052
MAAut2	1.435	0.951	4.353	0.878	0.140	0.235	6.899
CM_CPE3	0.065	0.013	0.231	0.105	0.029	0.000	0.000
CM_CPE4	0.001	0.028	0.003	0.003	0.045	0.000	0.000
CM_CPE5	0.046	0.003	0.014	0.014	0.002	0.000	0.000
CM_CPE6	0.000	0.005	0.008	0.008	0.015	0.000	0.000
++	4.780	4.283	9.752	4.127	2.791	2.870	10.009
	1996	1997	1998	1999	2000	2001	++
WHSpr2	3.367	0.011	0.002	0.142	0.138	0.000	6.675
WHSpr3	0.425	0.050	0.023	0.186	0.001	0.000	1.986
WHSpr4	0.116	0.023	0.222	0.057	0.000	0.000	1.732
WHSpr5	0.487	0.262	0.015	0.277	0.056	0.000	3.484
WHSpr6	0.169	1.653	0.484	0.381	0.023	0.000	11.762
WHAut2	0.433	0.009	0.089	0.386	0.000	0.426	7.932
WHAut3	0.002	0.046	0.954	0.052	0.010	0.015	3.931
WHAut4	0.034	0.048	0.398	0.634	0.022	0.041	4.179
WHAut5	0.178	0.000	0.051	0.000	0.131	0.244	4.853
WHAut6	0.125	0.050	0.257	0.569	0.006	0.049	3.976
MASpr2	1.198	0.186	0.256	0.017	0.006	0.000	4.592
MASpr3	0.011	0.075	0.054	0.214	0.100	0.000	3.329
MASpr4	0.017	0.323	0.278	0.569	0.914	0.000	6.240
MAAut2	0.004	1.481	11.206	0.012	0.348	0.426	33.268
CM_CPE3	0.000	0.000	0.000	0.000	0.000	0.000	1.421
CM_CPE4	0.000	0.000	0.000	0.000	0.000	0.000	0.340
CM_CPE5	0.000	0.000	0.000	0.000	0.000	0.000	0.209
CM_CPE6	0.000	0.000	0.000	0.000	0.000	0.000	0.089
++	6.566	4.218	14.290	3.498	1.755	1.200	100.000

STOCK NUMBERS (Jan 1) in thousands -

D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2

	1982	1983	1984	1985	1986	1987	1988
1	7769	7539	10464	7004	10161	12538	25198
2	10891	6281	6160	8545	5690	8296	10228
3	5359	7112	3933	4307	6101	4471	5971
4	3026	2262	3202	1797	1616	2507	2377
5	1796	1223	780	1142	456	483	673
6	170	822	382	214	333	125	97
7	541	305	260	216	315	150	63
1+	29552	25543	25180	23227	24674	28569	44607
	1989	1990	1991	1992	1993	1994	1995
1	4302	4021	6992	6411	9327	3325	3386
2	20625	3518	3286	5720	5249	7635	2721
3	7903	16406	2614	2286	4367	4160	6200
4	2953	4404	9637	920	1328	1767	2157
5	907	881	1459	3413	277	375	336
6	158	303	280	338	818	100	22
7	104	188	155	132	65	116	53
1+	36951	29721	24421	19219	21430	17478	14876
	1996	1997	1998	1999	2000	2001	
1	3020	4745	4498	9549	5656	00	
2	2773	2473	3885	3683	7817	4630	
3	1975	2192	1969	3081	3008	6312	
4	4033	995	1348	1174	2013	2024	
5	568	1544	393	546	449	803	
6	90	132	455	159	206	176	
7	19	14	23	209	53	102	
1+	12480	12095	12571	18399	19200	14048	

FISHING MORTALITY -

D:\ASSESS\GMcod\gmcod2001\gmcod2001_recr_2.2

	1982	1983	1984	1985	1986	1987	1988
1	0.01	0.00	0.00	0.01	0.00	0.00	0.00
2	0.23	0.27	0.16	0.14	0.04	0.13	0.06
3	0.66	0.60	0.58	0.78	0.69	0.43	0.50
4	0.71	0.86	0.83	1.17	1.01	1.12	0.76
5	0.58	0.96	1.09	1.03	1.10	1.41	1.25
6	0.67	0.92	0.90	1.16	1.06	1.20	0.87
7	0.67	0.92	0.90	1.16	1.06	1.20	0.87
	1989	1990	1991	1992	1993	1994	1995
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.10	0.16	0.07	0.03	0.01	0.12
3	0.38	0.33	0.84	0.34	0.70	0.46	0.23
4	1.01	0.91	0.84	1.00	1.06	1.46	1.13
5	0.89	0.95	1.26	1.23	0.82	2.62	1.11
6	1.01	0.94	0.91	1.22	1.05	1.70	1.17
7	1.01	0.94	0.91	1.22	1.05	1.70	1.17

	1996	1997	1998	1999	2000
1	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.03	0.00	0.01
3	0.49	0.29	0.32	0.23	0.20
4	0.76	0.73	0.70	0.76	0.72
5	1.26	1.02	0.71	0.78	0.73
6	0.83	0.92	0.72	0.78	0.73
7	0.83	0.92	0.72	0.78	0.73

Average F for 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	0.50	0.65	0.64	0.78	0.71	0.78	0.62
2,7	0.59	0.76	0.74	0.91	0.83	0.92	0.72
2,6	0.57	0.72	0.71	0.86	0.78	0.86	0.69
4,5	0.64	0.91	0.96	1.10	1.05	1.26	1.01

	1989	1990	1991	1992	1993	1994	1995
1,7	0.62	0.59	0.70	0.73	0.67	1.14	0.71
2,7	0.72	0.69	0.82	0.85	0.79	1.32	0.82
2,6	0.67	0.64	0.80	0.77	0.73	1.25	0.75
4,5	0.95	0.93	1.05	1.11	0.94	2.04	1.12

	1996	1997	1998	1999	2000
1,7	0.60	0.56	0.46	0.48	0.44
2,7	0.70	0.65	0.53	0.56	0.52
2,6	0.67	0.60	0.50	0.51	0.48
4,5	1.01	0.88	0.70	0.77	0.73

Average F weighted by N for 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	0.33	0.40	0.29	0.36	0.30	0.24	0.14
2,7	0.44	0.56	0.50	0.51	0.50	0.42	0.33
2,6	0.44	0.56	0.49	0.50	0.49	0.42	0.33
4,5	0.66	0.90	0.88	1.12	1.03	1.16	0.87

	1989	1990	1991	1992	1993	1994	1995
1,7	0.21	0.37	0.53	0.36	0.27	0.34	0.31
2,7	0.24	0.43	0.75	0.54	0.48	0.42	0.41
2,6	0.23	0.43	0.75	0.53	0.48	0.41	0.40
4,5	0.98	0.91	0.89	1.18	1.02	1.66	1.13

	1996	1997	1998	1999	2000
1,7	0.39	0.26	0.18	0.13	0.14
2,7	0.52	0.43	0.29	0.26	0.20
2,6	0.52	0.43	0.29	0.25	0.19
4,5	0.82	0.91	0.70	0.77	0.72

Average F for weighted by Catch for 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	0.53	0.65	0.66	0.79	0.78	0.71	0.60
2,7	0.53	0.65	0.67	0.79	0.78	0.71	0.60
2,6	0.53	0.64	0.66	0.78	0.77	0.70	0.60
4,5	0.66	0.90	0.89	1.12	1.03	1.17	0.90
	1989	1990	1991	1992	1993	1994	1995
1,7	0.62	0.56	0.85	0.96	0.81	1.12	0.69
2,7	0.62	0.56	0.85	0.96	0.81	1.12	0.69
2,6	0.62	0.56	0.85	0.96	0.81	1.11	0.69
4,5	0.98	0.91	0.91	1.18	1.03	1.70	1.13
	1996	1997	1998	1999	2000		
1,7	0.74	0.74	0.54	0.57	0.55		
2,7	0.74	0.74	0.54	0.57	0.55		
2,6	0.74	0.74	0.54	0.56	0.54		
4,5	0.84	0.92	0.70	0.77	0.72		

Biomass Weighted F

	1982	1983	1984	1985	1986	1987	1988
	0.47	0.60	0.51	0.59	0.54	0.49	0.38
	1989	1990	1991	1992	1993	1994	1995
	0.30	0.49	0.78	0.53	0.40	0.44	0.41
	1996	1997	1998	1999	2000		
	0.50	0.40	0.32	0.30	0.23		

BACKCALCULATED PARTIAL RECRUITMENT

	1982	1983	1984	1985	1986	1987	1988
1	0.02	0.00	0.00	0.01	0.00	0.00	0.00
2	0.32	0.28	0.14	0.12	0.04	0.09	0.05
3	0.94	0.62	0.53	0.67	0.63	0.31	0.40
4	1.00	0.90	0.76	1.00	0.92	0.79	0.61
5	0.82	1.00	1.00	0.88	1.00	1.00	1.00
6	0.95	0.96	0.82	0.99	0.97	0.85	0.70
7	0.95	0.96	0.82	0.99	0.97	0.85	0.70
	1989	1990	1991	1992	1993	1994	1995
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.10	0.13	0.06	0.03	0.00	0.10
3	0.38	0.35	0.67	0.28	0.66	0.17	0.20
4	1.00	0.96	0.66	0.81	1.00	0.56	0.97
5	0.88	1.00	1.00	1.00	0.77	1.00	0.95
6	1.00	0.99	0.72	1.00	0.99	0.65	1.00
7	1.00	0.99	0.72	1.00	0.99	0.65	1.00
	1996	1997	1998	1999	2000		
1	0.00	0.00	0.00	0.00	0.00		
2	0.03	0.03	0.04	0.00	0.02		
3	0.39	0.28	0.44	0.29	0.27		
4	0.60	0.71	0.98	0.97	0.98		
5	1.00	1.00	0.98	0.99	1.00		
6	0.66	0.90	1.00	1.00	0.99		
7	0.66	0.90	1.00	1.00	0.99		

MEAN BIOMASS (using catch mean weights at age)

	1982	1983	1984	1985	1986	1987	1988
1	3975	2928	4736	2321	3890	3596	3813
2	9560	5331	5225	7385	5177	7148	8899
3	5705	7889	4426	4451	7270	5108	7540
4	5340	3399	5389	2721	2706	4345	3632
5	5895	2709	1597	2891	1164	1138	1804
6	747	2966	1346	640	1139	464	373
7	4089	1821	1624	1148	2097	829	415

1+ 35312 27044 24343 21557 23444 22628 26477

	1989	1990	1991	1992	1993	1994	1995
1	2338	521	1083	2719	8453	1410	1436
2	21846	3095	3125	7675	5302	9429	3772
3	10275	21056	2459	3378	5250	5676	9327
4	5022	6083	14785	1457	1824	2660	3177
5	2114	2197	3085	5558	737	416	946
6	389	1374	1224	902	2841	272	87
7	718	1519	1040	745	408	510	387

1+ 42702 35845 26800 22434 24814 20372 19133

	1996	1997	1998	1999	2000		
1	1281	2013	1908	2864	2399		
2	4080	3806	4632	4167	11260		
3	2992	3822	3242	4619	5647		
4	6054	1922	2606	2093	4358		
5	1074	2800	1068	1429	1252		
6	417	362	1230	580	779		
7	132	77	152	1023	252		

1+ 16028 14802 14838 16775 25946 00

Summaries for ages 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	35312	27044	24343	21557	23444	22628	26477
2,7	31337	24116	19607	19236	19554	19032	22663
2,6	27247	22295	17983	18088	17456	18202	22248
4,5	11235	6108	6986	5612	3870	5483	5437

	1989	1990	1991	1992	1993	1994	1995
1,7	42702	35845	26800	22434	24814	20372	19133
2,7	40364	35325	25717	19715	16361	18962	17696
2,6	39646	33805	24677	18970	15953	18452	17309
4,5	7137	8280	17870	7016	2561	3076	4123

	1996	1997	1998	1999	2000		
1,7	16028	14802	14838	16775	25946		
2,7	14747	12789	12930	13911	23547		
2,6	14615	12712	12778	12888	23296		
4,5	7127	4721	3674	3522	5610		

Catch BIOMASS (using catch mean weights)

	1982	1983	1984	1985	1986	1987	1988
1	50	06	12	18	11	13	01
2	2162	1430	824	1011	214	921	515
3	3782	4717	2580	3472	5012	2205	3802
4	3768	2937	4480	3187	2728	4847	2775
5	3431	2613	1744	2984	1277	1602	2253
6	500	2737	1212	740	1209	559	326
7	2738	1680	1462	1327	2225	998	363

1+ 16431 16120 12314 12738 12675 11144 10034

	1989	1990	1991	1992	1993	1994	1995
1	03	01	01	00	01	01	00
2	629	300	509	537	172	78	454
3	3953	6993	2077	1158	3699	2592	2144
4	5070	5505	12391	1458	1939	3886	3603
5	1892	2082	3891	6828	603	1090	1054
6	393	1288	1111	1103	2982	462	102
7	726	1424	944	911	428	868	455

1+ 12666 17592 20925 11995 9825 8977 7811

	1996	1997	1998	1999	2000
1	00	00	00	00	00
2	142	105	147	10	156
3	1454	1095	1030	1042	1108
4	4602	1401	1833	1594	3134
5	1351	2859	754	1111	918
6	345	334	883	454	566
7	109	71	109	801	183

1+ 8003 5865 4756 5012 6064

Summaries for ages 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	16431	16120	12314	12738	12675	11144	10034
2,7	16381	16114	12302	12720	12664	11131	10033
2,6	13643	14434	10840	11393	10439	10133	9670
4,5	7199	5551	6224	6170	4005	6449	5027

	1989	1990	1991	1992	1993	1994	1995
1,7	12666	17592	20925	11995	9825	8977	7811
2,7	12663	17591	20924	11995	9824	8976	7811
2,6	11937	16167	19980	11084	9396	8108	7356
4,5	6961	7587	16283	8286	2542	4976	4656

	1996	1997	1998	1999	2000
1,7	8003	5865	4756	5012	6063
2,7	8003	5865	4756	5011	6063
2,6	7894	5794	4647	4210	5881
4,5	5952	4260	2587	2704	4051

Jan 1 BIOMASS (using Jan 1 mean weights)

	1982	1983	1984	1985	1986	1987	1988
1	3224	2111	3662	1541	2784	2257	1587
2	9606	4880	4053	6093	3488	5426	5717
3	6871	9367	5164	5509	8255	5615	7966
4	6869	4455	6674	3819	3495	5937	4552
5	7542	3880	2328	3935	1624	1785	2676
6	948	4381	1782	956	1715	701	528
7	6122	3030	2678	2097	3690	1543	678

1+ 41181 32104 26341 23950 25051 23263 23705

	1989	1990	1991	1992	1993	1994	1995
1	1983	205	399	1930	7974	838	843
2	9178	2747	1324	2929	3821	8933	2370
3	10290	22969	3247	3369	7301	6036	9864
4	6705	8716	19466	1868	2859	4195	4806
5	2741	3089	4420	9375	941	1065	1327
6	734	1636	1541	1517	3529	508	109
7	1238	2544	1720	1396	714	1140	713

1+ 32869 41906 32116 22383 27139 22715 20032

	1996	1997	1998	1999	2000
1	737	1314	1286	1442	1702
2	2437	2218	3073	2817	5691
3	3637	4180	3752	4831	5071
4	8385	2479	3427	2840	4970
5	1758	4182	1375	1895	1549
6	552	535	1639	773	1003
7	211	128	232	1607	386

1+ 17717 15037 14785 16205 20372

Summaries for ages 1,7 2,7 2,6 4,5

	1982	1983	1984	1985	1986	1987	1988
1,7	41181	32104	26341	23950	25051	23263	23705
2,7	37957	29993	22679	22409	22267	21006	22117
2,6	31835	26963	20001	20312	18577	19463	21440
4,5	14410	8335	9002	7755	5119	7722	7228

	1989	1990	1991	1992	1993	1994	1995
1,7	32869	41906	32116	22383	27139	22715	20032
2,7	30886	41701	31717	20453	19165	21877	19189
2,6	29648	39157	29997	19057	18451	20736	18476
4,5	9446	11804	23886	11242	3800	5260	6133

	1996	1997	1998	1999	2000
1,7	17717	15037	14785	16205	20372
2,7	16980	13722	13498	14763	18669
2,6	16769	13594	13266	13156	18283
4,5	10143	6661	4803	4735	6519

SSB AT THE START OF THE SPAWNING SEASON -MALES AND FEMALES (MT) (using SSB mean weights)

	1982	1983	1984	1985	1986	1987	1988
1	218	143	248	60	108	87	61
2	2326	1174	993	2765	1608	2465	2629
3	3630	5002	2764	4445	6762	4801	6729
4	5197	3283	4945	3039	2857	4768	3877
5	6421	3100	1821	3204	1308	1365	2102
6	820	3633	1483	763	1390	554	442
7	5296	2513	2229	1672	2991	1221	567
1+	23908	18848	14484	15947	17024	15262	16406
	1989	1990	1991	1992	1993	1994	1995
1	77	22	42	205	848	32	33
2	4241	732	349	784	1029	3279	854
3	8868	11771	1527	1723	3516	4815	8171
4	5481	5872	13262	1238	1876	3149	3810
5	2284	2372	3221	6871	738	665	1066
6	599	1327	1255	1173	2808	370	87
7	1012	2104	1430	1101	580	831	567
1+	22561	24200	21088	13096	11396	13141	14587
	1996	1997	1998	1999	2000		
1	29	51	50	56	66		
2	891	812	1123	1035	2087		
3	2887	3431	3063	4005	4225		
4	7074	2102	2919	2395	4221		
5	1379	3411	1182	1610	1325		
6	465	444	1407	656	860		
7	177	106	199	1364	331		
1+	12901	10357	9943	11121	13114		

Retrospective Analysis of F, SSB and N

Fishing Mortality																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
1993	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.06	1.11	1.14								
1994	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.92	1.04	1.10	0.89	1.64							
1995	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.10	0.91	1.79	0.70						
1996	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.11	0.94	1.98	0.98	0.70					
1997	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.11	0.94	2.02	1.08	0.91	0.67				
1998	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.11	0.94	2.04	1.13	1.02	0.89	0.78			
1999	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.11	0.94	2.04	1.12	1.01	0.87	0.70	0.79		
2000	0.64	0.91	0.96	1.10	1.05	1.26	1.01	0.95	0.93	1.05	1.11	0.94	2.04	1.12	1.01	0.88	0.70	0.77	0.73	
Spawning Stock Biomass																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
1993	23908	18848	14484	15947	17023	15260	16400	22533	24139	20952	12768	10594								
1994	23908	18848	14484	15948	17024	15265	16414	22595	24275	21225	13334	11534	13060							
1995	23908	18848	14484	15948	17024	15264	16409	22573	24229	21141	13253	11810	14602	16863						
1996	23908	18848	14484	15947	17024	15263	16407	22564	24206	21099	13134	11568	13839	16120	14855					
1997	23908	18848	14484	15947	17024	15263	16406	22562	24202	21091	13105	11462	13393	15258	13770	9667				
1998	23908	18848	14484	15947	17024	15262	16406	22561	24200	21087	13095	11388	13110	14520	12739	9535	7238			
1999	23908	18848	14484	15947	17024	15262	16406	22561	24200	21088	13096	11398	13147	14601	12925	10361	9517	9615		
2000	23908	18848	14484	15947	17024	15262	16406	22561	24200	21088	13096	11396	13141	14587	12901	10357	9943	11121	13114	
Population Numbers Age: 1																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	7769	7539	10463	7004	10157	12533	25094	4349	3608	6694	7386	7259	00							
1994	7769	7539	10464	7006	10165	12548	25298	4306	4147	6835	7063	7135	15539	00						
1995	7769	7539	10464	7005	10163	12543	25227	4321	4043	7235	7773	8576	5293	1808	00					
1996	7769	7539	10464	7004	10162	12539	25205	4304	4028	7020	6902	9873	4328	1375	1109	00				
1997	7769	7539	10464	7004	10161	12538	25199	4303	4022	7006	6495	9730	3932	1872	1384	651	00			
1998	7769	7539	10464	7004	10161	12538	25197	4302	4021	6990	6409	9258	3354	3035	1733	1818	2933	00		
1999	7769	7539	10464	7004	10161	12538	25198	4302	4021	6992	6412	9341	3321	3426	2879	3325	4290	6565	00	
2000	7769	7539	10464	7004	10161	12538	25198	4302	4021	6992	6411	9327	3325	3386	3020	4745	4498	9549	5656	00
Population Numbers Age: 2																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	10891	6281	6160	8545	5690	8292	10224	20540	3556	2948	5476	6047	5943							
1994	10892	6281	6160	8545	5691	8299	10236	20707	3521	3389	5591	5782	5840	12721						
1995	10892	6281	6160	8545	5691	8297	10232	20649	3533	3304	5919	6364	7020	4333	1480					
1996	10891	6281	6160	8545	5690	8296	10229	20630	3520	3291	5743	5651	8083	3543	1126	908				
1997	10891	6281	6160	8545	5690	8296	10228	20626	3519	3287	5732	5317	7965	3218	1533	1133	533			
1998	10891	6281	6160	8545	5690	8296	10228	20624	3518	3286	5718	5247	7579	2745	2485	1419	1488	2401		
1999	10891	6281	6160	8545	5690	8296	10228	20625	3518	3286	5720	5250	7647	2718	2805	2357	2722	3512	5374	
2000	10891	6281	6160	8545	5690	8296	10228	20625	3518	3286	5720	5249	7635	2721	2773	2473	3885	3683	7817	4630
Population Numbers Age: 3																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	5359	7112	3933	4307	6101	4470	5969	7900	16337	2646	2009	4167	4813							
1994	5359	7112	3933	4307	6102	4471	5974	7910	16474	2616	2370	4261	4597	4730						
1995	5359	7112	3933	4307	6101	4471	5972	7907	16426	2627	2301	4529	5073	5696	3295					
1996	5359	7112	3933	4307	6101	4471	5972	7904	16411	2616	2290	4385	4489	6566	2648	844				
1997	5359	7112	3933	4307	6101	4471	5971	7904	16408	2615	2286	4376	4216	6470	2382	1177	873			
1998	5359	7112	3933	4307	6101	4471	5971	7903	16406	2614	2286	4365	4159	6153	1995	1957	1107	1119		
1999	5359	7112	3933	4307	6101	4471	5971	7903	16406	2614	2286	4367	4160	6209	1973	2218	1875	2129	2868	
2000	5359	7112	3933	4307	6101	4471	5971	7903	16406	2614	2286	4367	4160	6200	1975	2192	1969	3081	3008	6312
Population Numbers Age: 4																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	3026	2262	3202	1797	1616	2507	2377	2950	4402	9580	946	1102	1604							
1994	3026	2262	3202	1797	1617	2507	2378	2955	4410	9692	922	1397	1681	2515						
1995	3026	2262	3202	1797	1616	2507	2377	2953	4407	9653	930	1341	1900	2904	3621					
1996	3026	2262	3202	1797	1616	2507	2377	2953	4405	9641	921	1332	1782	2427	4333	1546				
1997	3026	2262	3202	1797	1616	2507	2377	2953	4404	9638	920	1329	1775	2203	4255	1328	517			
1998	3026	2262	3202	1797	1616	2507	2377	2953	4404	9637	919	1328	1766	2156	3996	1011	1155	467		
1999	3026	2262	3202	1797	1616	2507	2377	2953	4404	9637	920	1328	1767	2158	4041	993	1369	1096	1234	

2000	3026	2262	3202	1797	1616	2507	2377	2953	4404	9637	920	1328	1767	2157	4033	995	1348	1174	2013	2024
Population Numbers Age: 5																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	1796	1223	780	1142	456	483	673	906	879	1457	3366	298	190							
1994	1796	1223	780	1142	456	483	673	907	883	1463	3458	279	432	265						
1995	1796	1223	780	1142	456	483	673	907	882	1461	3426	285	386	445	1180					
1996	1796	1223	780	1142	456	483	673	907	881	1459	3416	278	379	348	789	1790				
1997	1796	1223	780	1142	456	483	673	907	881	1459	3413	277	376	342	606	1725	666			
1998	1796	1223	780	1142	456	483	673	907	881	1459	3413	277	375	335	567	1513	406	388		
1999	1796	1223	780	1142	456	483	673	907	881	1459	3413	277	375	336	569	1551	391	564	385	
2000	1796	1223	780	1142	456	483	673	907	881	1459	3413	277	375	336	568	1544	393	546	449	803
Population Numbers Age: 6																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	170	822	382	214	333	125	97	158	303	278	337	780	117							
1994	170	822	382	214	333	125	97	158	304	281	342	855	101	69						
1995	170	822	382	214	333	125	97	158	304	280	340	829	107	31	179					
1996	170	822	382	214	333	125	97	158	303	280	339	821	101	25	101	313				
1997	170	822	382	214	333	125	97	158	303	280	338	819	100	23	95	163	604			
1998	170	822	382	214	333	125	97	158	303	280	338	818	100	22	89	131	430	170		
1999	170	822	382	214	333	125	97	158	303	280	338	818	100	22	90	132	461	157	220	
2000	170	822	382	214	333	125	97	158	303	280	338	818	100	22	90	132	455	159	206	176
Population Numbers Age: 7																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	541	305	260	216	315	150	63	104	187	154	131	62	219							
1994	541	305	260	216	315	150	63	104	188	156	133	68	117	35						
1995	541	305	260	216	315	150	63	104	188	155	133	66	124	73	42					
1996	541	305	260	216	315	150	63	104	188	155	132	65	117	60	22	49				
1997	541	305	260	216	315	150	63	104	188	155	132	65	116	54	20	18	76			
1998	541	305	260	216	315	150	63	104	188	155	132	65	116	53	19	14	22	169		
1999	541	305	260	216	315	150	63	104	188	155	132	65	116	53	19	14	24	207	135	
2000	541	305	260	216	315	150	63	104	188	155	132	65	116	53	19	14	23	209	53	102
Age 2 + stock size (N)																				
Terminal Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1993	21784	18004	14717	16222	14512	16027	19402	32559	25665	17062	12265	12456	12887							
1994	21784	18004	14717	16223	14514	16036	19421	32741	25779	17597	12616	12642	12768	20335						
1995	21784	18004	14717	16222	14513	16033	19415	32678	25739	17480	13048	13414	14610	13482	9798					
1996	21784	18004	14717	16222	14513	16031	19410	32656	25708	17441	12841	12532	14951	12968	9018	5449				
1997	21784	18004	14717	16222	14512	16031	19410	32651	25702	17432	12822	12183	14549	12310	8891	5544	3268			
1998	21784	18004	14717	16222	14512	16031	19409	32649	25700	17429	12806	12100	14094	11465	9151	6046	4608	4715		
1999	21784	18004	14717	16222	14512	16031	19409	32649	25700	17429	12808	12105	14166	11496	9497	7266	6842	7665	10216	
2000	21784	18004	14717	16222	14512	16031	19409	32649	25700	17429	12808	12104	14153	11489	9459	7351	8073	8850	13545	14048