

Appendix III. Initial ADAPT Run.

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 APL Ver. 4.0.03

ADAPT_W Ver. 3.0

Workspace size = 16000000

USA Total CAA Numbers x 10⁶

	1	2	3	4	5	6	7	8	9	10
1967.00	137	424	229	209	131	270	389	50	12	10
1968.00	15	1392	277	181	397	267	465	356	25	9
1969.00	71	582	398	234	301	310	217	215	130	29
1970.00	6	494	190	493	296	152	128	79	51	32
1971.00	155	233	410	328	333	222	136	69	26	30
1972.00	8	1001	65	165	262	209	126	56	32	24
1973.00	37	351	1301	294	77	47	36	20	5	6
1974.00	35	429	147	750	79	18	9	6	3	0
1975.00	45	646	118	112	610	46	17	9	6	1
1976.00	75	531	249	47	49	209	10	3	3	1
1977.00	597	579	83	71	21	18	50	3	1	0
1978.00	270	1222	138	26	43	6	8	32	1	1
1979.00	7	1174	423	58	16	17	6	5	7	0
1980.00	343	230	363	185	22	6	8	1	1	4
1981.00	62	1169	34	68	47	5	1	1	0	0
1982.00	53	669	110	7	30	19	2	0	1	0
1983.00	33	267	59	29	1	7	7	0	0	0
1984.00	19	185	133	40	28	2	4	2	1	0
1985.00	30	563	84	51	27	14	1	2	1	0
1986.00	41	247	225	49	38	16	8	0	0	0
1987.00	51	224	135	181	45	18	6	2	0	0
1988.00	79	502	111	62	127	35	9	2	1	0
1989.00	27	460	166	108	81	181	29	8	2	0
1990.00	13	571	221	89	38	43	82	29	15	4
1991.00	6	462	180	102	65	33	23	21	10	3
1992.00	1	547	220	94	88	56	27	17	14	4
1993.00	2	384	244	101	89	51	35	17	6	2
1994.00	2	423	176	73	85	71	37	19	6	2
1995.00	59	465	134	53	38	84	92	56	17	3
1996.00	6	620	161	71	79	171	100	29	6	2
1997.00	11	317	637	89	49	64	72	17	3	0
1998.00	0	628	146	331	59	31	32	16	6	2
1999.00	5	176	395	128	228	82	35	20	5	0
2000.00	4	445	55	129	161	177	44	15	3	1
2001.00	1	194	495	60	103	129	136	27	5	0
2002.00										

Herring Winter Catch Per Tow 1992-2002

	2	3	4	5	6	7	8
1992.00	7.70	13.23	8.19	4.40	1.36	0.53	0.00
1993.00	0.32	16.17	17.00	9.78	5.78	0.71	0.00
1994.00	0.08	0.52	1.16	1.24	1.01	0.27	0.12
1995.00	0.07	0.84	0.99	4.89	6.09	3.77	0.87
1996.00	74.57	6.57	3.60	4.11	14.30	6.82	1.35
1997.00	1.76	6.98	1.72	6.99	17.12	14.62	4.83
1998.00	1.68	13.92	28.46	6.49	3.76	2.35	0.53
1999.00	0.24	6.48	8.34	26.47	7.78	4.17	1.71
2000.00	47.82	3.96	5.51	5.30	3.10	0.42	0.08
2001.00	5.97	38.02	4.56	9.46	8.83	6.37	0.79
2002.00	0.93	3.07	40.80	7.78	9.59	6.97	2.02

Spring survey index for 1968-2002

	2	3	4	5	6	7	8
1968.25	1.54	8.70	3.44	3.57	2.89	4.50	1.35
1969.25	0.12	1.32	0.50	1.00	1.74	4.06	1.76
1970.25	3.85	1.48	1.04	0.83	0.55	0.43	0.04
1971.25	0.20	0.45	0.50	0.21	0.22	0.15	0.05
1972.25	0.47	0.94	0.48	0.57	0.32	0.02	0.02
1973.25	0.07	2.27	3.46	0.57	1.15	0.57	0.12
1974.25	0.03	0.10	4.44	0.76	0.19	0.07	0.04
1975.25	0.04	0.10	0.04	0.83	0.08	0.04	0.01
1976.25	0.04	0.23	0.06	0.12	0.31	0.23	0.02
1977.25	0.06	0.12	0.38	0.13	0.07	0.23	0.01
1978.25	0.12	1.99	0.33	0.30	0.05	0.05	0.19
1979.25	4.53	0.37	1.12	0.81	0.24	0.12	0.17
1980.25	0.11	1.46	3.71	0.68	0.08	0.11	0.01
1981.25	0.02	0.01	0.51	1.34	0.19	0.06	0.03
1982.25	0.40	0.05	0.05	0.05	0.04	0.01	0.00
1983.25	0.15	0.03	0.06	0.01	0.05	0.09	0.00
1984.25	1.93	0.41	0.30	0.14	0.01	0.02	0.01
1985.25	1.95	0.94	0.42	0.48	0.11	0.02	0.02
1986.25	1.69	27.17	3.37	1.17	0.56	0.41	0.00
1987.25	1.30	2.13	3.83	0.23	0.14	0.00	0.00
1988.25	3.23	3.97	3.49	3.30	0.31	0.01	0.00
1989.25	1.66	1.66	2.89	1.99	1.37	0.13	0.00
1990.25	2.97	2.38	2.67	1.16	0.16	0.00	0.00
1991.25	4.58	6.81	10.91	0.96	0.30	0.06	0.00
1992.25	11.00	15.99	6.50	2.05	0.58	0.19	0.00
1993.25	7.24	32.70	25.61	5.72	0.91	0.07	0.00
1994.25	4.35	3.38	12.11	11.00	3.31	0.52	0.04
1995.25	6.06	3.77	3.23	11.66	2.84	0.52	0.01
1996.25	40.91	8.48	5.06	2.80	4.48	2.52	0.64
1997.25	21.28	33.05	5.70	2.68	2.42	1.42	0.35
1998.25	4.68	10.74	27.77	5.88	1.58	0.83	0.17
1999.25	2.35	16.35	14.38	42.77	7.06	2.92	0.90
2000.25	15.11	3.42	5.03	4.97	3.67	0.80	0.19
2001.25	5.01	19.21	1.91	2.68	2.87	2.54	0.51
2002.00	5.99	2.05	13.44	2.40	1.72	1.17	0.38

Index Type and Model Form

ID#	Label	Age	Index Type	Model Form
1	Herring Winter Catch Per Tow 1992-2002	2	Abundance	Proportional
2	Herring Winter Catch Per Tow 1992-2002	3	Abundance	Proportional
3	Herring Winter Catch Per Tow 1992-2002	4	Abundance	Proportional
4	Herring Winter Catch Per Tow 1992-2002	5	Abundance	Proportional
5	Herring Winter Catch Per Tow 1992-2002	6	Abundance	Proportional
6	Herring Winter Catch Per Tow 1992-2002	7	Abundance	Proportional
7	Herring Winter Catch Per Tow 1992-2002	8	Abundance	Proportional
8	Spring survey index for 1968-2002	2	Abundance	Proportional
9	Spring survey index for 1968-2002	3	Abundance	Proportional
10	Spring survey index for 1968-2002	4	Abundance	Proportional
11	Spring survey index for 1968-2002	5	Abundance	Proportional
12	Spring survey index for 1968-2002	6	Abundance	Proportional
13	Spring survey index for 1968-2002	7	Abundance	Proportional
14	Spring survey index for 1968-2002	8	Abundance	Proportional

Index Inclusion

ID# on same line have common catchability

- 1
- 2
- 3

4
5
6
7
8
9
10
11
12
13
14

VPA setup

Plus Group : No plus group

Population

	1	2	3	4	5	6	7	8	9	10
2002.00	(5000)	(5000)			3000	2000	1000			
F ratios										

	1	2	3	4	5	6	7	8	9	10
1967.00									1.00	*****
1968.00									1.00	*****
1969.00									1.00	*****
1970.00									1.00	*****
1971.00									1.00	*****
1972.00									1.00	*****
1973.00									1.00	*****
1974.00									1.00	*****
1975.00									1.00	*****
1976.00									1.00	*****
1977.00									1.00	*****
1978.00									1.00	*****
1979.00									1.00	*****
1980.00									1.00	*****
1981.00									1.00	*****
1982.00									1.00	*****
1983.00									1.00	*****
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1985.00									1.00	*****
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1993.00									1.00	*****
1994.00									1.00	*****
1995.00									1.00	*****
1996.00									1.00	*****
1997.00									1.00	*****
1998.00									1.00	*****
1999.00									1.00	*****
2000.00									1.00	*****
2001.00		**wtd**		1.00	1.00	1.00				
2001.00			**wtd**	1.00	1.00	1.00				
2001.00				1.00	1.00	1.00	**wtd**			
2001.00				1.00	1.00	1.00		**wtd**		
2001.00				1.00	1.00	1.00			**wtd**	
2001.00									1.00	*****

Natural Mortality

	1	2	3	4	5	6	7	8	9	10
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1967.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1968.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1969.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1970.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1971.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1972.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1973.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1974.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1975.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1976.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1977.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1978.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1979.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1980.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1981.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1982.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1983.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1984.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1985.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1986.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1987.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1988.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1989.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1990.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1991.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1992.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1993.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1994.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1995.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1996.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1997.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1998.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
1999.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
2000.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
2001.00	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)

Virtual Population Analysis using initial values

Population Numbers	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1798	1805	1161	1540	1287	176	56	51
1968.00	2627	4186	1918	1266	1290	833	1018	704	99	36
1969.00	2067	2137	2178	1320	874	700	442	418	259	58
1970.00	1396	1628	1227	1426	870	446	296	169	151	96
1971.00	7652	1138	889	834	726	447	229	128	68	78
1972.00	1173	6125	722	361	389	296	168	67	43	32
1973.00	993	953	4114	533	148	87	58	27	6	7
1974.00	1639	779	466	2201	174	53	29	15	4	1
1975.00	1004	1310	256	249	1129	72	27	16	7	1
1976.00	1269	781	497	104	104	381	18	7	4	1
1977.00	3545	971	170	184	43	41	126	6	2	1
1978.00	2701	2365	280	65	88	17	17	59	2	1
1979.00	396	1968	847	106	29	34	8	7	19	1
1980.00	2309	319	568	316	36	10	12	1	1	10
1981.00	1328	1582	58	143	94	10	3	3	0	1
1982.00	1070	1032	265	17	57	36	4	1	1	0
1983.00	1053	828	252	118	8	19	12	1	0	0
1984.00	2846	832	438	153	71	5	10	3	1	0
1985.00	1247	2313	515	239	89	33	2	4	1	0
1986.00	1168	994	1388	346	150	48	15	1	1	0
1987.00	1823	919	591	934	239	89	25	5	0	1
1988.00	2047	1446	552	363	602	156	56	15	2	0
1989.00	2187	1605	734	352	241	379	96	38	11	1

1990.00	2123	1766	901	452	191	125	149	52	23	7
1991.00	2276	1727	934	539	289	122	63	49	18	6
1992.00	1586	1859	999	602	350	178	70	31	21	6
1993.00	2004	1298	1031	620	408	207	96	33	11	5
1994.00	4443	1639	718	625	417	255	124	47	12	4
1995.00	15426	3636	962	430	446	264	144	68	21	4
1996.00	5032	12576	2557	667	304	331	141	37	7	2
1997.00	7454	4114	9737	1949	482	178	119	28	5	0
1998.00	7123	6093	3082	7397	1515	351	88	34	7	2
1999.00	19739	5832	4422	2392	5757	1187	259	44	13	1
2000.00	6142	16157	4616	3264	1843	4508	898	180	18	7
2001.00	6108	5025	12826	3730	2556	1364	3531	695	134	12
2002.00	5000	5000	3939	10054	3000	2000	1000	2768	545	105

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.214	0.403	0.375	0.254	0.254
1968.00	0.007	0.453	0.173	0.171	0.412	0.432	0.689	0.800	0.326	0.326
1969.00	0.039	0.355	0.224	0.217	0.473	0.660	0.763	0.821	0.791	0.791
1970.00	0.005	0.405	0.187	0.476	0.466	0.466	0.639	0.716	0.460	0.460
1971.00	0.023	0.255	0.700	0.562	0.695	0.778	1.034	0.890	0.557	0.557
1972.00	0.008	0.198	0.104	0.690	1.297	1.435	1.645	2.202	1.632	1.632
1973.00	0.042	0.516	0.426	0.917	0.829	0.895	1.135	1.580	1.978	1.978
1974.00	0.024	0.913	0.424	0.467	0.678	0.478	0.420	0.515	1.355	1.355
1975.00	0.051	0.770	0.696	0.674	0.886	1.177	1.205	1.050	1.641	1.641
1976.00	0.068	1.327	0.791	0.682	0.729	0.906	0.961	0.803	0.959	0.959
1977.00	0.205	1.042	0.767	0.542	0.750	0.674	0.564	0.695	0.361	0.361
1978.00	0.117	0.827	0.771	0.583	0.761	0.518	0.745	0.905	0.719	0.719
1979.00	0.018	1.042	0.785	0.895	0.899	0.808	1.659	1.325	0.509	0.509
1980.00	0.178	1.503	1.177	1.008	1.092	1.136	1.288	1.280	0.717	0.717
1981.00	0.053	1.587	1.028	0.730	0.778	0.783	0.849	0.642	0.308	0.308
1982.00	0.056	1.211	0.605	0.566	0.872	0.893	1.043	0.705	1.359	1.359
1983.00	0.035	0.437	0.298	0.312	0.191	0.469	1.108	0.421	0.831	0.831
1984.00	0.007	0.280	0.405	0.342	0.577	0.576	0.645	0.870	3.408	3.408
1985.00	0.027	0.311	0.198	0.267	0.408	0.604	0.741	0.939	1.221	1.221
1986.00	0.039	0.319	0.196	0.168	0.326	0.458	0.855	0.529	0.461	0.461
1987.00	0.031	0.311	0.288	0.239	0.231	0.259	0.287	0.702	0.684	0.684
1988.00	0.044	0.478	0.250	0.208	0.263	0.282	0.198	0.169	0.844	0.844
1989.00	0.014	0.378	0.286	0.411	0.461	0.733	0.406	0.281	0.257	0.257
1990.00	0.007	0.437	0.313	0.245	0.247	0.477	0.920	0.896	1.152	1.152
1991.00	0.003	0.347	0.239	0.232	0.285	0.355	0.514	0.656	0.928	0.928
1992.00	0.001	0.389	0.276	0.189	0.323	0.422	0.539	0.876	1.280	1.280
1993.00	0.001	0.392	0.300	0.198	0.272	0.313	0.505	0.838	0.853	0.853
1994.00	0.000	0.333	0.314	0.137	0.255	0.367	0.400	0.592	0.841	0.841
1995.00	0.004	0.152	0.166	0.147	0.098	0.425	1.158	2.121	2.006	2.006
1996.00	0.001	0.056	0.072	0.125	0.334	0.825	1.432	1.745	4.868	4.868
1997.00	0.002	0.089	0.075	0.052	0.119	0.501	1.061	1.106	0.729	0.729
1998.00	0.000	0.121	0.054	0.051	0.044	0.103	0.503	0.738	1.768	1.768
1999.00	0.000	0.034	0.104	0.061	0.045	0.079	0.163	0.670	0.472	0.472
2000.00	0.001	0.031	0.013	0.044	0.101	0.044	0.056	0.099	0.186	0.186
2001.00	0.000	0.043	0.043	0.018	0.045	0.110	0.043	0.043	0.043	0.043

LAMBDA 1.00000E-2
 RSS 6.41053E2
 NPFI 6.41053E2

Parameters
 8.00637E0 7.60090E0 6.90776E0

LAMBDA 1.00000E-3
 RSS 6.17042E2
 NPFI 6.17042E2

Parameters
 6.93510E0 7.00363E0 6.79881E0

LAMBDA 1.00000E-4
 RSS 6.15639E2
 NPFI 6.15639E2

Parameters
 6.61876E0 6.84056E0 6.76905E0

LAMBDA 1.00000E-5
 RSS 6.15598E2
 NPFI 6.15598E2

Parameters
 6.56623E0 6.80548E0 6.76283E0

LAMBDA 1.00000E-5
 RSS 6.15597E2
 NPFI 6.15597E2

Parameters
 6.55943E0 6.79885E0 6.76199E0

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.00001

LAMBDA 1.00000E-2
 RSS 6.15597E2
 NPFI 6.15597E2

Parameters
 6.55943E0 6.79885E0 6.76199E0 -7.46704E0 -5.69737E0 -5.23259E0
 -4.63987E0 -4.31706E0 -4.44733E0 -4.62808E0 -7.23062E0 -6.12161E0
 -5.48995E0 -5.35359E0 -5.49276E0 -5.59022E0 -6.23013E0

LAMBDA 1.00000E-3
 RSS 6.15597E2
 NPFI 6.15597E2

Parameters
 6.55861E0 6.79761E0 6.76190E0 -7.46673E0 -5.69701E0 -5.23226E0
 -4.63957E0 -4.31681E0 -4.44716E0 -4.62784E0 -7.23052E0 -6.12149E0
 -5.48984E0 -5.35349E0 -5.49268E0 -5.59016E0 -6.23005E0

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.00001

Estimated VPA (biased)

Population Numbers

	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1798	1805	1161	1540	1287	176	56	51
1968.00	2627	4186	1918	1266	1290	833	1018	704	99	36
1969.00	2067	2137	2178	1320	874	700	442	418	259	58
1970.00	1396	1628	1227	1426	870	446	296	169	151	96
1971.00	7652	1138	889	834	726	447	229	128	68	78
1972.00	1173	6125	722	361	389	296	168	67	43	32
1973.00	993	953	4114	533	148	87	58	27	6	7
1974.00	1639	779	466	2201	174	53	29	15	4	1
1975.00	1004	1310	256	249	1129	72	27	16	7	1
1976.00	1269	781	497	104	104	381	18	7	4	1
1977.00	3545	971	170	184	43	41	126	6	2	1
1978.00	2701	2365	280	65	88	17	17	59	2	1
1979.00	396	1968	847	106	29	34	8	7	19	1

1980.00	2309	319	568	316	36	10	12	1	1	10
1981.00	1328	1582	58	143	94	10	3	3	0	1
1982.00	1070	1032	265	17	57	36	4	1	1	0
1983.00	1053	828	252	118	8	19	12	1	0	0
1984.00	2846	832	438	153	71	5	10	3	1	0
1985.00	1247	2313	515	239	89	33	2	4	1	0
1986.00	1168	994	1388	346	150	48	15	1	1	0
1987.00	1823	919	591	934	239	89	25	5	0	1
1988.00	2047	1446	552	363	602	156	56	15	2	0
1989.00	2187	1605	734	352	241	379	96	38	11	1
1990.00	2121	1766	901	452	191	125	149	52	23	7
1991.00	2256	1725	934	539	289	122	63	49	18	6
1992.00	1543	1842	998	602	350	178	70	31	21	6
1993.00	1632	1263	1018	619	408	207	96	33	11	5
1994.00	2862	1335	689	614	416	254	124	47	12	4
1995.00	8857	2342	713	406	437	264	144	68	21	4
1996.00	4581	7198	1499	463	284	324	141	37	7	2
1997.00	4449	3745	5335	1082	315	162	113	27	5	0
1998.00	2016	3633	2780	3793	806	214	75	29	7	2
1999.00	9023	1650	2409	2144	2807	606	147	33	9	1
2000.00	2705	7383	1193	1616	1641	2093	422	89	10	4
2001.00	6108	2211	5643	927	1207	1198	1554	306	59	5
2002.00	5000	5000	1635	4174	705	896	864	1149	226	43

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.214	0.403	0.375	0.254	0.254
1968.00	0.007	0.453	0.173	0.171	0.412	0.432	0.689	0.800	0.326	0.326
1969.00	0.039	0.355	0.224	0.217	0.473	0.660	0.763	0.821	0.791	0.791
1970.00	0.005	0.405	0.187	0.476	0.466	0.466	0.639	0.716	0.460	0.460
1971.00	0.023	0.255	0.700	0.562	0.695	0.778	1.034	0.890	0.557	0.557
1972.00	0.008	0.198	0.104	0.690	1.297	1.435	1.645	2.202	1.632	1.632
1973.00	0.042	0.516	0.426	0.917	0.829	0.895	1.135	1.580	1.978	1.978
1974.00	0.024	0.913	0.424	0.467	0.678	0.478	0.420	0.515	1.355	1.355
1975.00	0.051	0.770	0.696	0.674	0.886	1.177	1.205	1.050	1.641	1.641
1976.00	0.068	1.327	0.791	0.682	0.729	0.906	0.961	0.803	0.959	0.959
1977.00	0.205	1.042	0.767	0.542	0.750	0.674	0.564	0.695	0.361	0.361
1978.00	0.117	0.827	0.771	0.583	0.761	0.518	0.745	0.905	0.719	0.719
1979.00	0.018	1.042	0.785	0.895	0.899	0.808	1.659	1.325	0.509	0.509
1980.00	0.178	1.503	1.177	1.008	1.092	1.136	1.288	1.280	0.717	0.717
1981.00	0.053	1.587	1.028	0.730	0.778	0.783	0.849	0.642	0.308	0.308
1982.00	0.056	1.211	0.605	0.566	0.872	0.893	1.043	0.705	1.359	1.359
1983.00	0.035	0.437	0.298	0.312	0.191	0.469	1.108	0.421	0.831	0.831
1984.00	0.007	0.280	0.405	0.342	0.577	0.576	0.645	0.870	3.408	3.408
1985.00	0.027	0.311	0.198	0.267	0.408	0.604	0.741	0.939	1.221	1.221
1986.00	0.039	0.319	0.196	0.168	0.326	0.458	0.855	0.529	0.461	0.461
1987.00	0.031	0.311	0.288	0.239	0.231	0.259	0.287	0.702	0.684	0.684
1988.00	0.044	0.478	0.250	0.208	0.263	0.282	0.198	0.169	0.844	0.844
1989.00	0.014	0.378	0.286	0.411	0.461	0.733	0.406	0.281	0.257	0.257
1990.00	0.007	0.437	0.313	0.245	0.247	0.477	0.920	0.896	1.152	1.152
1991.00	0.003	0.348	0.239	0.232	0.285	0.355	0.514	0.656	0.928	0.928
1992.00	0.001	0.394	0.277	0.189	0.323	0.422	0.539	0.876	1.280	1.280
1993.00	0.001	0.405	0.305	0.199	0.272	0.313	0.505	0.838	0.853	0.853
1994.00	0.001	0.427	0.329	0.140	0.255	0.368	0.400	0.592	0.841	0.841
1995.00	0.007	0.246	0.231	0.156	0.100	0.427	1.162	2.121	2.006	2.006
1996.00	0.001	0.100	0.126	0.185	0.362	0.854	1.446	1.767	4.894	4.894
1997.00	0.003	0.098	0.141	0.095	0.187	0.566	1.162	1.142	0.757	0.757
1998.00	0.000	0.211	0.060	0.101	0.085	0.174	0.621	0.931	2.058	2.058
1999.00	0.001	0.125	0.199	0.068	0.094	0.161	0.307	1.021	0.753	0.753
2000.00	0.002	0.069	0.052	0.092	0.115	0.098	0.122	0.212	0.381	0.381
2001.00	0.000	0.102	0.102	0.073	0.098	0.126	0.102	0.102	0.102	0.102

APPROXIMATE STATISTICS ASSUMING LINEARITY NEAR SOLUTION

ORTHOGONALITY OFFSET..... 0.001063
 MEAN SQUARE RESIDUALS 2.072718

Parameter	Est.	Std. Err.	Rel. Err.	Bias	Rel. Bias
N[2002 5]	7.05E2	3.84E2	0.545	7.07E1	0.100
N[2002 6]	8.96E2	4.61E2	0.514	5.96E1	0.067
N[2002 7]	8.64E2	4.24E2	0.490	5.21E1	0.060
q ID#[1]	5.72E-4	2.57E-4	0.449	5.27E-5	0.092
q ID#[2]	3.36E-3	1.52E-3	0.453	3.23E-4	0.096
q ID#[3]	5.34E-3	2.41E-3	0.451	5.35E-4	0.100
q ID#[4]	9.66E-3	4.32E-3	0.447	1.00E-3	0.104
q ID#[5]	1.33E-2	5.94E-3	0.445	1.35E-3	0.101
q ID#[6]	1.17E-2	5.19E-3	0.443	1.11E-3	0.095
q ID#[7]	9.78E-3	4.77E-3	0.488	1.04E-3	0.106
q ID#[8]	7.24E-4	1.78E-4	0.246	2.01E-5	0.028
q ID#[9]	2.20E-3	5.42E-4	0.247	6.29E-5	0.029
q ID#[10]	4.13E-3	1.02E-3	0.246	1.24E-4	0.030
q ID#[11]	4.73E-3	1.16E-3	0.246	1.50E-4	0.032
q ID#[12]	4.12E-3	1.01E-3	0.245	1.27E-4	0.031
q ID#[13]	3.73E-3	9.29E-4	0.249	1.11E-4	0.030
q ID#[14]	1.97E-3	5.21E-4	0.264	6.10E-5	0.031

VPA using analytical bias adjusted parameters (linear scale)

Population Numbers	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1798	1805	1161	1540	1287	176	56	51
1968.00	2627	4186	1918	1266	1290	833	1018	704	99	36
1969.00	2067	2137	2178	1320	874	700	442	418	259	58
1970.00	1396	1628	1227	1426	870	446	296	169	151	96
1971.00	7652	1138	889	834	726	447	229	128	68	78
1972.00	1173	6125	722	361	389	296	168	67	43	32
1973.00	993	953	4114	533	148	87	58	27	6	7
1974.00	1639	779	466	2201	174	53	29	15	4	1
1975.00	1004	1310	256	249	1129	72	27	16	7	1
1976.00	1269	781	497	104	104	381	18	7	4	1
1977.00	3545	971	170	184	43	41	126	6	2	1
1978.00	2701	2365	280	65	88	17	17	59	2	1
1979.00	396	1968	847	106	29	34	8	7	19	1
1980.00	2309	319	568	316	36	10	12	1	1	10
1981.00	1328	1582	58	143	94	10	3	3	0	1
1982.00	1070	1032	265	17	57	36	4	1	1	0
1983.00	1053	828	252	118	8	19	12	1	0	0
1984.00	2846	832	438	153	71	5	10	3	1	0
1985.00	1247	2313	515	239	89	33	2	4	1	0
1986.00	1168	994	1388	346	150	48	15	1	1	0
1987.00	1823	919	591	934	239	89	25	5	0	1
1988.00	2047	1446	552	363	602	156	56	15	2	0
1989.00	2187	1605	734	352	241	379	96	38	11	1
1990.00	2121	1766	901	452	191	125	149	52	23	7
1991.00	2255	1725	934	539	289	122	63	49	18	6
1992.00	1541	1841	997	602	350	178	70	31	21	6
1993.00	1612	1261	1017	619	408	207	96	33	11	5
1994.00	2779	1319	688	614	416	254	124	47	12	4
1995.00	8513	2274	700	405	437	264	144	68	21	4
1996.00	4408	6916	1443	453	283	324	141	37	7	2
1997.00	4287	3603	5104	1037	307	161	113	27	5	0
1998.00	1858	3500	2664	3604	768	207	75	29	7	2
1999.00	8461	1521	2300	2049	2652	575	141	33	9	1
2000.00	2525	6923	1087	1527	1563	1966	397	84	9	3
2001.00	6108	2063	5267	841	1134	1134	1450	285	55	5
2002.00	5000	5000	1515	3866	635	836	812	1064	210	40

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.214	0.403	0.375	0.254	0.254
1968.00	0.007	0.453	0.173	0.171	0.412	0.432	0.689	0.800	0.326	0.326
1969.00	0.039	0.355	0.224	0.217	0.473	0.660	0.763	0.821	0.791	0.791
1970.00	0.005	0.405	0.187	0.476	0.466	0.466	0.639	0.716	0.460	0.460
1971.00	0.023	0.255	0.700	0.562	0.695	0.778	1.034	0.890	0.557	0.557
1972.00	0.008	0.198	0.104	0.690	1.297	1.435	1.645	2.202	1.632	1.632
1973.00	0.042	0.516	0.426	0.917	0.829	0.895	1.135	1.580	1.978	1.978
1974.00	0.024	0.913	0.424	0.467	0.678	0.478	0.420	0.515	1.355	1.355
1975.00	0.051	0.770	0.696	0.674	0.886	1.177	1.205	1.050	1.641	1.641
1976.00	0.068	1.327	0.791	0.682	0.729	0.906	0.961	0.803	0.959	0.959
1977.00	0.205	1.042	0.767	0.542	0.750	0.674	0.564	0.695	0.361	0.361
1978.00	0.117	0.827	0.771	0.583	0.761	0.518	0.745	0.905	0.719	0.719
1979.00	0.018	1.042	0.785	0.895	0.899	0.808	1.659	1.325	0.509	0.509
1980.00	0.178	1.503	1.177	1.008	1.092	1.136	1.288	1.280	0.717	0.717
1981.00	0.053	1.587	1.028	0.730	0.778	0.783	0.849	0.642	0.308	0.308
1982.00	0.056	1.211	0.605	0.566	0.872	0.893	1.043	0.705	1.359	1.359
1983.00	0.035	0.437	0.298	0.312	0.191	0.469	1.108	0.421	0.831	0.831
1984.00	0.007	0.280	0.405	0.342	0.577	0.576	0.645	0.870	3.408	3.408
1985.00	0.027	0.311	0.198	0.267	0.408	0.604	0.741	0.939	1.221	1.221
1986.00	0.039	0.319	0.196	0.168	0.326	0.458	0.855	0.529	0.461	0.461
1987.00	0.031	0.311	0.288	0.239	0.231	0.259	0.287	0.702	0.684	0.684
1988.00	0.044	0.478	0.250	0.208	0.263	0.282	0.198	0.169	0.844	0.844
1989.00	0.014	0.378	0.286	0.411	0.461	0.733	0.406	0.281	0.257	0.257
1990.00	0.007	0.437	0.313	0.245	0.247	0.477	0.920	0.896	1.152	1.152
1991.00	0.003	0.348	0.239	0.232	0.285	0.355	0.514	0.656	0.928	0.928
1992.00	0.001	0.394	0.277	0.189	0.323	0.422	0.539	0.876	1.280	1.280
1993.00	0.001	0.406	0.305	0.199	0.272	0.313	0.505	0.838	0.853	0.853
1994.00	0.001	0.434	0.330	0.140	0.255	0.368	0.400	0.592	0.841	0.841
1995.00	0.008	0.255	0.235	0.157	0.101	0.427	1.162	2.121	2.006	2.006
1996.00	0.001	0.104	0.131	0.190	0.363	0.855	1.447	1.768	4.896	4.896
1997.00	0.003	0.102	0.148	0.100	0.193	0.570	1.168	1.144	0.759	0.759
1998.00	0.000	0.220	0.062	0.107	0.089	0.181	0.629	0.945	2.077	2.077
1999.00	0.001	0.136	0.209	0.071	0.099	0.170	0.322	1.051	0.778	0.778
2000.00	0.002	0.073	0.057	0.097	0.121	0.105	0.131	0.225	0.403	0.403
2001.00	0.000	0.109	0.109	0.081	0.105	0.134	0.109	0.109	0.109	0.109

Herring Winter Catch Per Tow 1992-2002

Age : 2

Ln calibration constant : -7.46673

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.04182	0.05203	1.98979	7.51876
1993.00	-1.14413	-0.32585	-0.81829	7.14089
1994.00	-2.51331	-0.27038	-2.24293	7.19635
1995.00	-2.61456	0.29189	-2.90645	7.75862
1996.00	4.31175	1.41485	2.89690	8.88158
1997.00	0.56594	0.76143	-0.19549	8.22816
1998.00	0.51927	0.73111	-0.21184	8.19784
1999.00	-1.42628	-0.05818	-1.36810	7.40855
2000.00	3.86737	1.44021	2.42717	8.90694
2001.00	1.78685	0.23445	1.55239	7.70118
2002.00	-0.07246	1.05046	-1.12293	8.51719

Average squared residual : 3.45599

Herring Winter Catch Per Tow 1992-2002

Age : 3

Ln calibration constant : -5.69701

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.58238	1.20825	1.37413	6.90526
1993.00	2.78337	1.22817	1.55520	6.92518
1994.00	-0.65220	0.83855	-1.49075	6.53556
1995.00	-0.17459	0.87217	-1.04676	6.56918
1996.00	1.88318	1.61525	0.26793	7.31226
1997.00	1.94318	2.88493	-0.94175	8.58194
1998.00	2.63313	2.23313	0.40000	7.93014
1999.00	1.86821	2.08992	-0.22171	7.78693
2000.00	1.37506	1.38695	-0.01190	7.08396
2001.00	3.63799	2.94118	0.69682	8.63818
2002.00	1.12168	1.70263	-0.58095	7.39964

Average squared residual : 0.87418

Herring Winter Catch Per Tow 1992-2002
Age : 4
Ln calibration constant : -5.23226

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.10339	1.16805	0.93534	6.40030
1993.00	2.83346	1.19627	1.63719	6.42852
1994.00	0.14479	1.18818	-1.04339	6.42043
1995.00	-0.01339	0.77424	-0.78763	6.00649
1996.00	1.28143	0.90632	0.37512	6.13857
1997.00	0.54412	1.75445	-1.21032	6.98670
1998.00	3.34842	3.00873	0.33969	8.24099
1999.00	2.12057	2.43829	-0.31772	7.67055
2000.00	1.70613	2.15568	-0.44955	7.38793
2001.00	1.51699	1.59984	-0.08285	6.83210
2002.00	3.70873	3.10439	0.60434	8.33664

Average squared residual : 0.69640

Herring Winter Catch Per Tow 1992-2002
Age : 5
Ln calibration constant : -4.63957

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	1.48115	1.21829	0.26286	5.85786
1993.00	2.28075	1.37183	0.90892	6.01140
1994.00	0.21777	1.39024	-1.17247	6.02981
1995.00	1.58664	1.44126	0.14538	6.08083
1996.00	1.41347	1.01081	0.40266	5.65038
1997.00	1.94481	1.11404	0.83077	5.75361
1998.00	1.86995	2.05192	-0.18196	6.69149
1999.00	3.27617	3.30028	-0.02411	7.93985
2000.00	1.66778	2.76320	-1.09542	7.40277
2001.00	2.24697	2.45653	-0.20957	7.09610
2002.00	2.05219	1.91904	0.13314	6.55861

Average squared residual : 0.40351

Herring Winter Catch Per Tow 1992-2002
Age : 6
Ln calibration constant : -4.31681

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	0.30557	0.86622	-0.56065	5.18303

1993.00	1.75432	1.01769	0.73663	5.33450
1994.00	0.00568	1.22232	-1.21664	5.53913
1995.00	1.80601	1.25757	0.54844	5.57438
1996.00	2.66041	1.46360	1.19681	5.78041
1997.00	2.84019	0.77196	2.06824	5.08877
1998.00	1.32538	1.04962	0.27576	5.36643
1999.00	2.05183	2.08984	-0.03801	6.40665
2000.00	1.13160	3.32938	-2.19779	7.64619
2001.00	2.17839	2.77130	-0.59290	7.08811
2002.00	2.26114	2.48080	-0.21966	6.79761

Average squared residual : 1.24140

Herring Winter Catch Per Tow 1992-2002

Age : 7

Ln calibration constant : -4.44716

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	-0.63111	-0.19656	-0.43455	4.25061
1993.00	-0.34348	0.11349	-0.45697	4.56065
1994.00	-1.32539	0.37465	-1.70004	4.82182
1995.00	1.32800	0.52415	0.80385	4.97132
1996.00	1.91990	0.50050	1.41940	4.94767
1997.00	2.68247	0.27951	2.40296	4.72667
1998.00	0.85484	-0.12403	0.97887	4.32314
1999.00	1.42782	0.54508	0.88274	4.99224
2000.00	-0.87443	1.59828	-2.47271	6.04545
2001.00	1.85107	2.90114	-1.05007	7.34830
2002.00	1.94139	2.31460	-0.37322	6.76177

Average squared residual : 1.89241

Herring Winter Catch Per Tow 1992-2002

Age : 8

Ln calibration constant : -4.62784

Year	Observed	Predicted	Residual	Ln Pop.
1994.00	-2.16282	-0.77238	-1.39045	3.85546
1995.00	-0.14018	-0.40569	0.26551	4.22215
1996.00	0.29877	-1.01821	1.31698	3.60963
1997.00	1.57557	-1.32635	2.90192	3.30149
1998.00	-0.63469	-1.26314	0.62845	3.36470
1999.00	0.53825	-1.12547	1.66371	3.50238
2000.00	-2.48651	-0.14286	-2.34364	4.48498
2001.00	-0.22979	1.09519	-1.32498	5.72303
2002.00	0.70156	2.41892	-1.71736	7.04676

Average squared residual : 2.83554

Spring survey index for 1968-2002

Age : 2

Ln calibration constant : -7.23052

Year	Observed	Predicted	Residual	Ln Pop.
1968.25	0.43224	0.94562	-0.51339	8.17614
1969.25	-2.12863	0.29802	-2.42666	7.52854
1970.25	1.34802	0.01331	1.33471	7.24383
1971.25	-1.60594	-0.30741	-1.29854	6.92311
1972.25	-0.75290	1.39013	-2.14302	8.62064
1973.25	-2.70755	-0.55017	-2.15738	6.68035

1974.25	-3.65738	-0.85034	-2.80704	6.38018
1975.25	-3.26492	-0.29508	-2.96984	6.93544
1976.25	-3.13041	-0.95186	-2.17854	6.27866
1977.25	-2.83191	-0.66274	-2.16917	6.56778
1978.25	-2.10210	0.28103	-2.38313	7.51155
1979.25	1.51119	0.04359	1.46760	7.27410
1980.25	-2.17772	-1.89210	-0.28561	5.33842
1981.25	-3.95284	-0.31104	-3.64181	6.91948
1982.25	-0.90609	-0.64443	-0.26166	6.58609
1983.25	-1.87797	-0.67039	-1.20758	6.56013
1984.25	0.65856	-0.62622	1.28477	6.60430
1985.25	0.66921	0.38815	0.28106	7.61867
1986.25	0.52615	-0.45857	0.98471	6.77195
1987.25	0.26236	-0.53464	0.79701	6.69588
1988.25	1.17208	-0.12335	1.29543	7.10716
1989.25	0.50555	0.00581	0.49974	7.23633
1990.25	1.08900	0.08653	1.00247	7.31705
1991.25	1.52194	0.08550	1.43644	7.31602
1992.25	2.39804	0.13985	2.25819	7.37036
1993.25	1.97977	-0.24097	2.22074	6.98955
1994.25	1.46990	-0.19096	1.66086	7.03956
1995.25	1.80232	0.41651	1.38581	7.64703
1996.25	3.71144	1.57615	2.13529	8.80667
1997.25	3.05772	0.92314	2.13458	8.15366
1998.25	1.54281	0.86459	0.67821	8.09511
1999.25	0.85586	0.09689	0.75898	7.32740
2000.25	2.71540	1.60923	1.10617	8.83975
2001.25	1.61195	0.39528	1.21668	7.62580
2002.00	1.79083	1.28667	0.50415	8.51719

Average squared residual : 2.96779

Spring survey index for 1968-2002

Age : 3

Ln calibration constant : -6.12149

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	2.16341	1.34407	0.81934	7.46556
1969.25	0.27960	1.45889	-1.17929	7.58038
1970.25	0.38893	0.89438	-0.50545	7.01587
1971.25	-0.79629	0.44375	-1.24004	6.56525
1972.25	-0.05922	0.38411	-0.44333	6.50560
1973.25	0.81868	2.04418	-1.22550	8.16567
1974.25	-2.26240	-0.13442	-2.12798	5.98707
1975.25	-2.34758	-0.80018	-1.54740	5.32131
1976.25	-1.48678	-0.16140	-1.32537	5.96009
1977.25	-2.12779	-1.22981	-0.89798	4.89168
1978.25	0.69029	-0.72803	1.41833	5.39346
1979.25	-0.99101	0.37351	-1.36453	6.49500
1980.25	0.38069	-0.12330	0.50399	5.99819
1981.25	-4.44817	-2.36758	-2.08059	3.75391
1982.25	-2.96423	-0.74331	-2.22093	5.37818
1983.25	-3.62684	-0.71832	-2.90852	5.40317
1984.25	-0.89624	-0.18998	-0.70626	5.93151
1985.25	-0.06219	0.02327	-0.08546	6.14476
1986.25	3.30201	1.01506	2.28695	7.13655
1987.25	0.75730	0.13909	0.61821	6.26058
1988.25	1.37869	0.07878	1.29991	6.20027
1989.25	0.50634	0.35559	0.15075	6.47708
1990.25	0.86748	0.55344	0.31404	6.67493
1991.25	1.91835	0.60788	1.31047	6.72937
1992.25	2.77204	0.66459	2.10746	6.78608

1993.25	3.48725	0.67750	2.80975	6.79899
1994.25	1.21929	0.28180	0.93750	6.40329
1995.25	1.32731	0.34004	0.98728	6.46153
1996.25	2.13773	1.10938	1.02835	7.23087
1997.25	3.49814	2.37521	1.12293	8.49670
1998.25	2.37396	1.74375	0.63020	7.86524
1999.25	2.79401	1.56569	1.22832	7.68718
2000.25	1.22926	0.89950	0.32976	7.02100
2001.25	2.95561	2.44131	0.51430	8.56280
2002.00	0.71920	1.27815	-0.55894	7.39964

Average squared residual : 1.87527

Spring survey index for 1968-2002

Age : 4

Ln calibration constant : -5.48984

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	1.23689	1.56085	-0.32396	7.05069
1969.25	-0.69917	1.59158	-2.29074	7.08142
1970.25	0.03517	1.60372	-1.56855	7.09356
1971.25	-0.68458	1.04554	-1.73013	6.53538
1972.25	-0.74087	0.17784	-0.91871	5.66768
1973.25	1.24008	0.50860	0.73148	5.99844
1974.25	1.48978	2.03984	-0.55007	7.52968
1975.25	-3.20153	-0.18957	-3.01196	5.30027
1976.25	-2.87884	-1.06112	-1.81772	4.42872
1977.25	-0.95581	-0.45870	-0.49711	5.03114
1978.25	-1.10624	-1.51874	0.41250	3.97109
1979.25	0.11288	-1.09875	1.21163	4.39109
1980.25	1.31038	-0.03531	1.34569	5.45453
1981.25	-0.67668	-0.75698	0.08029	4.73286
1982.25	-3.04282	-2.84876	-0.19406	2.64108
1983.25	-2.75514	-0.84361	-1.91153	4.64623
1984.25	-1.19073	-0.59585	-0.59488	4.89399
1985.25	-0.86488	-0.12868	-0.73620	5.36115
1986.25	1.21346	0.26417	0.94929	5.75401
1987.25	1.34315	1.23964	0.10351	6.72948
1988.25	1.25105	0.30260	0.94845	5.79244
1989.25	1.06063	0.22041	0.84022	5.71025
1990.25	0.98065	0.51179	0.46887	6.00163
1991.25	2.38922	0.69224	1.69698	6.18208
1992.25	1.87254	0.81324	1.05930	6.30308
1993.25	3.24299	0.83901	2.40399	6.32884
1994.25	2.49386	0.84569	1.64816	6.33553
1995.25	1.17350	0.42763	0.74588	5.91746
1996.25	1.62109	0.55249	1.06860	6.04233
1997.25	1.74082	1.42306	0.31776	6.91290
1998.25	3.32402	2.67586	0.64816	8.16570
1999.25	2.66614	2.11377	0.55237	7.60361
2000.25	1.61466	1.82513	-0.21047	7.31497
2001.25	0.64558	1.27389	-0.62830	6.76373
2002.00	2.59829	2.84680	-0.24851	8.33664

Average squared residual : 1.46897

Spring survey index for 1968-2002

Age : 5

Ln calibration constant : -5.35349

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----

1968.25	1.27290	1.65592	-0.38302	7.00941
1969.25	0.00419	1.25092	-1.24673	6.60441
1970.25	-0.18284	1.24859	-1.43143	6.60208
1971.25	-1.56590	1.00965	-2.57555	6.36314
1972.25	-0.56651	0.23602	-0.80254	5.58951
1973.25	-0.56352	-0.61064	0.04712	4.74285
1974.25	-0.26971	-0.41191	0.14220	4.94158
1975.25	-0.18284	1.40411	-1.58695	6.75760
1976.25	-2.15675	-0.94137	-1.21539	4.41212
1977.25	-2.00842	-1.82359	-0.18483	3.52990
1978.25	-1.20065	-1.11935	-0.08129	4.23414
1979.25	-0.21505	-2.24408	2.02903	3.10941
1980.25	-0.37848	-2.10678	1.72829	3.24671
1981.25	0.29617	-1.04963	1.34580	4.30386
1982.25	-3.01798	-1.58586	-1.43212	3.76763
1983.25	-4.72170	-3.38490	-1.33681	1.96860
1984.25	-1.94771	-1.28542	-0.66229	4.06807
1985.25	-0.73002	-1.01784	0.28782	4.33565
1986.25	0.15649	-0.47405	0.63054	4.87944
1987.25	-1.47666	0.01717	-1.49383	5.37067
1988.25	1.19247	0.93120	0.26127	6.28469
1989.25	0.68808	-0.03251	0.72059	5.32098
1990.25	0.14885	-0.21303	0.36188	5.14046
1991.25	-0.04239	0.19309	-0.23548	5.54658
1992.25	0.71950	0.37353	0.34597	5.72702
1993.25	1.74383	0.53984	1.20399	5.89333
1994.25	2.39781	0.56246	1.83535	5.91595
1995.25	2.45619	0.65224	1.80395	6.00573
1996.25	1.03001	0.15649	0.87352	5.50998
1997.25	0.98753	0.30332	0.68421	5.65681
1998.25	1.77132	1.26679	0.50453	6.62028
1999.25	3.75573	2.51294	1.24279	7.86643
2000.25	1.60404	1.97062	-0.36657	7.32411
2001.25	0.98440	1.66799	-0.68359	7.02148
2002.00	0.87489	1.20512	-0.33024	6.55861

Average squared residual : 1.24849

Spring survey index for 1968-2002

Age : 6

Ln calibration constant : -5.49268

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	1.05994	1.07408	-0.01413	6.56675
1969.25	0.55555	0.84308	-0.28753	6.33576
1970.25	-0.60148	0.44039	-1.04187	5.93307
1971.25	-1.50238	0.36520	-1.86758	5.85788
1972.25	-1.14917	-0.20979	-0.93938	5.28289
1973.25	0.14254	-1.30000	1.44254	4.19268
1974.25	-1.66919	-1.69132	0.02214	3.80135
1975.25	-2.50226	-1.55364	-0.94861	3.93903
1976.25	-1.16059	0.17359	-1.33419	5.66627
1977.25	-2.63946	-1.99591	-0.64355	3.49677
1978.25	-3.07046	-2.85474	-0.21572	2.63794
1979.25	-1.42047	-2.23134	0.81087	3.26134
1980.25	-2.48891	-3.54105	1.05214	1.95163
1981.25	-1.66284	-3.46082	1.79798	2.03186
1982.25	-3.20893	-2.19554	-1.01338	3.29713
1983.25	-2.92062	-2.69628	-0.22435	2.79640
1984.25	-4.34281	-4.01161	-0.33119	1.48107
1985.25	-2.23213	-2.20860	-0.02352	3.28407
1986.25	-0.58322	-1.77742	1.19420	3.71526

1987.25	-1.95829	-1.12225	-0.83603	4.37042
1988.25	-1.15964	-0.56551	-0.59413	4.92717
1989.25	0.31693	0.21169	0.10523	5.70437
1990.25	-1.85790	-0.83626	-1.02164	4.65642
1991.25	-1.20131	-0.82596	-0.37535	4.66672
1992.25	-0.55026	-0.46524	-0.08502	5.02744
1993.25	-0.09003	-0.28635	0.19632	5.20633
1994.25	1.19547	-0.09550	1.29097	5.39718
1995.25	1.04289	-0.07498	1.11787	5.41770
1996.25	1.50049	0.02430	1.47620	5.51698
1997.25	0.88311	-0.59532	1.47843	4.89736
1998.25	0.45938	-0.21980	0.67918	5.27288
1999.25	1.95487	0.82367	1.13120	6.31635
2000.25	1.30144	2.07904	-0.77760	7.57172
2001.25	1.05372	1.51384	-0.46012	7.00652
2002.00	0.54482	1.30493	-0.76011	6.79761

Average squared residual : 0.88803

Spring survey index for 1968-2002

Age : 7

Ln calibration constant : -5.59016

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	1.50488	1.11296	0.39192	6.70312
1969.25	1.40118	0.26139	1.13980	5.85155
1970.25	-0.83425	-0.10876	-0.72549	5.48140
1971.25	-1.92964	-0.46538	-1.46426	5.12478
1972.25	-3.72140	-0.92703	-2.79438	4.66314
1973.25	-0.55513	-1.86758	1.31245	3.72259
1974.25	-2.71507	-2.37356	-0.34152	3.21660
1975.25	-3.14656	-2.64854	-0.49802	2.94163
1976.25	-1.48017	-2.97427	1.49410	2.61589
1977.25	-1.47011	-0.94450	-0.52561	4.64566
1978.25	-2.97397	-2.98494	0.01096	2.60523
1979.25	-2.09557	-3.95508	1.85951	1.63509
1980.25	-2.24526	-3.45677	1.21151	2.13339
1981.25	-2.81175	-4.90250	2.09075	0.68766
1982.25	-4.64599	-4.60616	-0.03983	0.98400
1983.25	-2.38380	-3.43981	1.05601	2.15036
1984.25	-4.03419	-3.50654	-0.52765	2.08362
1985.25	-3.85375	-4.92663	1.07287	0.66354
1986.25	-0.88455	-3.17320	2.28865	2.41696
1988.25	-4.32754	-1.66350	-2.66404	3.92666
1989.25	-2.04253	-1.17621	-0.86632	4.41395
1990.25	-6.26590	-0.86561	-5.40029	4.72455
1991.25	-2.85077	-1.61974	-1.23103	3.97042
1992.25	-1.66866	-1.52438	-0.14427	4.06578
1993.25	-2.72114	-1.20580	-1.51533	4.38436
1994.25	-0.66359	-0.91826	0.25467	4.67190
1995.25	-0.65105	-0.95926	0.30822	4.63090
1996.25	0.92287	-1.05404	1.97691	4.53612
1997.25	0.34889	-1.20398	1.55288	4.38618
1998.25	-0.18392	-1.47222	1.28829	4.11795
1999.25	1.07045	-0.72474	1.79519	4.86542
2000.25	-0.22540	0.37468	-0.60008	5.96484
2001.25	0.93232	1.68276	-0.75044	7.27292
2002.00	0.15572	1.17161	-1.01589	6.76177

Average squared residual : 2.58143

Spring survey index for 1968-2002

Age : 8
 Ln calibration constant : -6.23005

Year	Observed	Predicted	Residual	Ln Pop.
1968.25	0.30025	0.07704	0.22321	6.30709
1969.25	0.56406	-0.44926	1.01333	5.78079
1970.25	-3.11903	-1.33012	-1.78891	4.89993
1971.25	-2.98578	-1.65017	-1.33562	4.57989
1972.25	-3.79869	-2.63102	-1.16768	3.59903
1973.25	-2.11362	-3.39542	1.28181	2.83463
1974.25	-3.21638	-3.68721	0.47083	2.54284
1975.25	-4.54690	-3.79059	-0.75631	2.43946
1976.25	-3.82585	-4.59280	0.76696	1.63725
1977.25	-4.24750	-4.70908	0.46159	1.52097
1978.25	-1.65078	-2.43338	0.78260	3.79667
1979.25	-1.76902	-4.71486	2.94584	1.51519
1980.25	-4.97623	-6.35891	1.38267	-0.12886
1981.25	-3.51661	-5.42347	1.90687	0.80658
1982.25	-6.81245	-6.55563	-0.25681	-0.32558
1983.25	-6.90776	-6.33387	-0.57389	-0.10382
1984.25	-4.84089	-5.32799	0.48710	0.90206
1985.25	-3.74651	-5.06493	1.31842	1.16512
1988.25	-9.21034	-3.58733	-5.62301	2.64272
1992.25	-5.62682	-3.06423	-2.56259	3.16582
1993.25	-7.13090	-2.97821	-4.15269	3.25184
1994.25	-3.17486	-2.57257	-0.60229	3.65748
1995.25	-4.32754	-2.58820	-1.73934	3.64185
1996.25	-0.44863	-3.11209	2.66346	3.11796
1997.25	-1.06334	-3.26412	2.20077	2.96594
1998.25	-1.74698	-3.14818	1.40121	3.08187
1999.25	-0.10148	-3.03291	2.93144	3.19714
2000.25	-1.65810	-1.84800	0.18990	4.38205
2001.25	-0.66787	-0.58241	-0.08546	5.64764
2002.00	-0.96653	0.81671	-1.78324	7.04676

Average squared residual : 3.74689

Work file G:\Mike\5zdir\VPA\NoPlusFinalRuns\USA_1968-2002noplus10avg9.aw3 saved

Appendix III Final ADAPT Run.

THURSDAY, FEBRUARY 13, 2003 9:07:24.940 PM

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 APL Ver. 4.0.03

ADAPT_W Ver. 3.0

Workspace size = 16000000

Complex Total CAA Numbers x 10⁶

	1	2	3	4	5	6	7	8	9	10
1967.00	137	424	229	209	131	270	389	50	12	10
1968.00	15	1392	277	181	397	267	465	356	25	9
1969.00	71	582	398	234	301	310	217	215	130	29
1970.00	6	494	190	493	296	152	128	79	51	32
1971.00	155	233	410	328	333	222	136	69	26	30
1972.00	8	1001	65	165	262	209	126	56	32	24
1973.00	37	351	1301	294	77	47	36	20	5	6
1974.00	35	429	147	750	79	18	9	6	3	0
1975.00	45	646	118	112	610	46	17	9	6	1
1976.00	75	531	249	47	49	209	10	3	3	1
1977.00	597	579	83	71	21	18	50	3	1	0
1978.00	270	1222	138	26	43	6	8	32	1	1
1979.00	7	1174	423	58	16	17	6	5	7	0
1980.00	343	230	363	185	22	6	8	1	1	4
1981.00	62	1169	34	68	47	5	1	1	0	0
1982.00	53	669	110	7	30	19	2	0	1	0
1983.00	33	267	59	29	1	7	7	0	0	0
1984.00	19	185	133	40	28	2	4	2	1	0
1985.00	30	563	84	51	27	14	1	2	1	0
1986.00	41	247	225	49	38	16	8	0	0	0
1987.00	51	224	135	181	45	18	6	2	0	0
1988.00	79	502	111	62	127	35	9	2	1	0
1989.00	27	460	166	108	81	181	29	8	2	0
1990.00	13	571	221	89	38	43	82	29	15	4
1991.00	6	462	180	102	65	33	23	21	10	3
1992.00	1	547	220	94	88	56	27	17	14	4
1993.00	2	384	244	101	89	51	35	17	6	2
1994.00	2	423	176	73	85	71	37	19	6	2
1995.00	59	465	134	53	38	84	92	56	17	3
1996.00	6	620	161	71	79	171	100	29	6	2
1997.00	11	317	637	89	49	64	72	17	3	0
1998.00	0	628	146	331	59	31	32	16	6	2
1999.00	5	176	395	128	228	82	35	20	5	0
2000.00	4	445	55	129	161	177	44	15	3	1
2001.00	1	194	495	60	103	129	136	27	5	0
2002.00	44	252	115	260	85	70	72	34	3	0
2003.00										

1-US fall 1967-1984

	2	3	4	5	6	7	8
1967.83	0.07	0.13	0.36	0.19	0.59	0.40	0.01
1968.83	0.02	0.06	0.06	0.05	0.37	0.11	0.00
1969.83	0.02	0.04	0.06	0.04	0.06	0.10	0.00
1970.83	0.03	0.03	0.07	0.06	0.11	0.01	0.00
1971.83	0.02	0.31	0.26	0.58	0.34	0.02	0.00
1972.83	0.13	0.06	0.08	0.06	0.06	0.05	0.02
1973.83	0.00	0.04	0.00	0.00	0.00	0.00	0.00
1974.83	0.00	0.00	0.06	0.01	0.01	0.00	0.01

1975.83	0.01	0.00	0.02	0.10	0.05	0.03	0.03
1976.83	0.00	0.00	0.01	0.01	0.07	0.01	0.00
1977.83	0.01	0.00	0.01	0.00	0.00	0.01	0.00
1978.83	0.01	0.06	0.08	0.16	0.01	0.02	0.08
1979.83	0.01	0.02	0.00	0.00	0.00	0.00	0.00
1980.83	0.00	0.01	0.00	0.00	0.00	0.00	0.00
1981.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1982.83	0.00	0.01	0.01	0.03	0.02	0.00	0.00
1983.83	0.04	0.04	0.02	0.00	0.01	0.02	0.00
1984.83	0.01	0.12	0.15	0.15	0.05	0.21	0.17

2-US fall 1985-2002

	2	3	4	5	6	7	8
1985.83	0.03	0.05	0.99	0.31	0.32	0.05	0.16
1986.83	0.02	0.43	0.23	0.19	0.06	0.00	0.00
1987.83	2.02	3.83	3.01	0.39	0.22	0.03	0.01
1988.83	1.02	3.56	4.54	1.77	0.19	0.06	0.00
1989.83	1.40	4.32	4.02	2.01	2.11	0.25	0.09
1990.83	2.60	8.92	1.90	0.42	0.09	0.05	0.00
1991.83	2.70	11.55	5.44	0.86	0.17	0.02	0.00
1992.83	2.24	25.44	16.56	9.99	1.78	0.45	0.00
1993.83	0.35	1.80	6.79	6.09	1.47	0.29	0.01
1994.83	0.63	1.03	4.11	3.63	2.97	0.89	0.23
1995.83	0.58	7.80	8.81	23.60	20.96	7.17	0.75
1996.83	10.81	6.72	6.75	2.83	6.27	3.21	0.80
1997.83	1.82	17.38	4.65	4.16	4.30	3.61	0.65
1998.83	1.60	2.84	8.36	2.82	2.10	2.02	0.60
1999.83	0.22	2.86	2.81	5.22	1.20	0.81	0.31
2000.83	1.10	1.01	4.19	6.79	5.18	1.69	0.64
2001.83	0.30	8.50	1.61	2.57	4.56	5.02	1.25
2002.83	2.45	6.19	37.45	9.80	10.00	7.54	3.32

3-US Spring 1968-1984

	2	3	4	5	6	7	8
1968.25	1.54	8.70	3.44	3.57	2.89	4.50	1.35
1969.25	0.12	1.32	0.50	1.00	1.74	4.06	1.76
1970.25	3.85	1.48	1.04	0.83	0.55	0.43	0.04
1971.25	0.20	0.45	0.50	0.21	0.22	0.15	0.05
1972.25	0.47	0.94	0.48	0.57	0.32	0.02	0.02
1973.25	0.07	2.27	3.46	0.57	1.15	0.57	0.12
1974.25	0.03	0.10	4.44	0.76	0.19	0.07	0.04
1975.25	0.04	0.10	0.04	0.83	0.08	0.04	0.01
1976.25	0.04	0.23	0.06	0.12	0.31	0.23	0.02
1977.25	0.06	0.12	0.38	0.13	0.07	0.23	0.01
1978.25	0.12	1.99	0.33	0.30	0.05	0.05	0.19
1979.25	4.53	0.37	1.12	0.81	0.24	0.12	0.17
1980.25	0.11	1.46	3.71	0.68	0.08	0.11	0.01
1981.25	0.02	0.01	0.51	1.34	0.19	0.06	0.03
1982.25	0.40	0.05	0.05	0.05	0.04	0.01	0.00
1983.25	0.15	0.03	0.06	0.01	0.05	0.09	0.00
1984.25	1.93	0.41	0.30	0.14	0.01	0.02	0.01

4-US Spring 1985-2002

	2	3	4	5	6	7	8
1985.25	1.95	0.94	0.42	0.48	0.11	0.02	0.02
1986.25	1.69	27.17	3.37	1.17	0.56	0.41	0.00
1987.25	1.30	2.13	3.83	0.23	0.14	0.00	0.00
1988.25	3.23	3.97	3.49	3.30	0.31	0.01	0.00
1989.25	1.66	1.66	2.89	1.99	1.37	0.13	0.00
1990.25	2.97	2.38	2.67	1.16	0.16	0.00	0.00
1991.25	4.58	6.81	10.91	0.96	0.30	0.06	0.00
1992.25	11.00	15.99	6.50	2.05	0.58	0.19	0.00
1993.25	7.24	32.70	25.61	5.72	0.91	0.07	0.00

1994.25	4.35	3.38	12.11	11.00	3.31	0.52	0.04
1995.25	6.06	3.77	3.23	11.66	2.84	0.52	0.01
1996.25	40.91	8.48	5.06	2.80	4.48	2.52	0.64
1997.25	21.28	33.05	5.70	2.68	2.42	1.42	0.35
1998.25	4.68	10.74	27.77	5.88	1.58	0.83	0.17
1999.25	2.35	16.35	14.38	42.77	7.06	2.92	0.90
2000.25	15.11	3.42	5.03	4.97	3.67	0.80	0.19
2001.25	5.01	19.21	1.91	2.68	2.87	2.54	0.51
2002.25	5.99	2.05	13.44	2.40	1.72	1.17	0.38

5-US Winter 1992-2002

	2	3	4	5	6	7	8
1992.00	7.70	13.23	8.19	4.40	1.36	0.53	0.00
1993.00	0.32	16.17	17.00	9.78	5.78	0.71	0.00
1994.00	0.08	0.52	1.16	1.24	1.01	0.27	0.12
1995.00	0.07	0.84	0.99	4.89	6.09	3.77	0.87
1996.00	74.57	6.57	3.60	4.11	14.30	6.82	1.35
1997.00	1.76	6.98	1.72	6.99	17.12	14.62	4.83
1998.00	1.68	13.92	28.46	6.49	3.76	2.35	0.53
1999.00	0.24	6.48	8.34	26.47	7.78	4.17	1.71
2000.00	47.82	3.96	5.51	5.30	3.10	0.42	0.08
2001.00	5.97	38.02	4.56	9.46	8.83	6.37	0.79
2002.00	0.93	3.07	40.80	7.78	9.59	6.97	2.02

6a-US larval 1971-1988 (weighted mean)

	3	4	5	6	7	8	9	10
1971.83	89.70							
1972.83	81.40							
1973.83	355.20							
1974.83	304.50							
1975.83	55.90							
1976.83	2.20							
1977.83	19.20							
1978.83	2.40							
1979.83	6.00							
1980.83	1.90							
1981.83	29.70							
1982.83	18.20							
1983.83	3.70							
1984.83	2.30							
1985.83	95.40							
1986.83	60.40							
1987.83	31.40							
1988.83	184.90							

Fishery Midyr Wts at age

	3	4	5	6	7	8	9	10
1971.83	0.12	0.18	0.23	0.33	0.29	0.29	0.33	0.33
1972.83	0.12	0.19	0.23	0.27	0.31	0.36	0.27	0.29
1973.83	0.11	0.17	0.23	0.26	0.29	0.33	0.34	0.26
1974.83	0.11	0.17	0.20	0.23	0.25	0.27	0.29	0.29
1975.83	0.10	0.17	0.19	0.23	0.27	0.27	0.30	0.29
1976.83	0.11	0.18	0.21	0.21	0.26	0.28	0.32	0.33
1977.83	0.10	0.16	0.19	0.22	0.23	0.26	0.30	0.29
1978.83	0.12	0.19	0.23	0.26	0.27	0.28	0.32	0.35
1979.83	0.09	0.20	0.26	0.28	0.18	0.33	0.33	0.31
1980.83	0.10	0.17	0.27	0.32	0.34	0.24	0.31	0.39
1981.83	0.11	0.19	0.23	0.29	0.32	0.34	0.47	0.30
1982.83	0.13	0.19	0.25	0.27	0.30	0.32	0.34	0.42
1983.83	0.14	0.22	0.22	0.31	0.35	0.37	0.39	0.40
1984.83	0.13	0.18	0.23	0.26	0.31	0.34	0.31	0.40
1985.83	0.14	0.18	0.20	0.23	0.28	0.27	0.29	0.29
1986.83	0.12	0.17	0.22	0.23	0.25	0.26	0.30	0.29

1987.83	0.09	0.14	0.18	0.22	0.23	0.23	0.25	0.27
1988.83	0.09	0.13	0.16	0.19	0.23	0.24	0.25	0.29

6b-US larval 1971-1988 (weighted mean)

	3	4	5	6	7	8	9	10
1989.83	454.30							
1990.83	394.10							
1991.83	354.20							
1992.83	577.10							
1993.83	397.60							
1994.83	610.00							

Fishery Midyr Wts at age

	3	4	5	6	7	8	9	10
1989.83	0.10	0.14	0.17	0.20	0.24	0.25	0.24	0.31
1990.83	0.10	0.15	0.18	0.19	0.21	0.23	0.24	0.26
1991.83	0.09	0.13	0.17	0.19	0.21	0.23	0.23	0.24
1992.83	0.09	0.13	0.15	0.18	0.20	0.22	0.23	0.26
1993.83	0.10	0.13	0.16	0.18	0.21	0.24	0.26	0.28
1994.83	0.09	0.12	0.14	0.16	0.18	0.21	0.24	0.26

7-CAN larval 1987-1995 mean

	3	4	5	6	7	8	9	10
1987.83	22.00							
1988.83	6.50							
1989.83	7.40							
1990.83	10.20							
1991.83	3.30							
1992.83	12.60							
1993.83	30.80							
1994.83	52.90							
1995.83	47.30							

Fishery Midyr Wts at age

	3	4	5	6	7	8	9	10
1987.83	0.09	0.14	0.18	0.22	0.23	0.23	0.25	0.27
1988.83	0.09	0.13	0.16	0.19	0.23	0.24	0.25	0.29
1989.83	0.10	0.14	0.17	0.20	0.24	0.25	0.24	0.31
1990.83	0.10	0.15	0.18	0.19	0.21	0.23	0.24	0.26
1991.83	0.09	0.13	0.17	0.19	0.21	0.23	0.23	0.24
1992.83	0.09	0.13	0.15	0.18	0.20	0.22	0.23	0.26
1993.83	0.10	0.13	0.16	0.18	0.21	0.24	0.26	0.28
1994.83	0.09	0.12	0.14	0.16	0.18	0.21	0.24	0.26
1995.83	0.10	0.12	0.14	0.16	0.17	0.19	0.22	0.26

8-US acoustic 1999-2002

	3	4	5	6	7	8	9	10
1999.83*****								
2000.83*****								
2001.83*****								
2002.83*****								

Fishery Midyr Wts at age

	3	4	5	6	7	8	9	10
1999.83	0.08	0.11	0.14	0.16	0.18	0.20	0.29	0.30
2000.83	0.11	0.13	0.16	0.17	0.20	0.21	0.29	0.30
2001.83	0.10	0.13	0.15	0.17	0.19	0.21	0.29	0.30
2002.83	0.09	0.13	0.15	0.17	0.18	0.20	0.22	0.21

9-CAN spring BT 86-92,95-02

	2	3	4	5	6	7	8
1986.12	1.82	9.68	0.38	0.42	0.00	0.00	0.00

1987.12	0.81	0.09	0.04	0.00	0.00	0.00	0.00
1988.12	0.40	0.23	0.45	1.44	0.61	0.48	0.03
1989.12	67.94	3.98	0.32	0.13	0.06	0.00	0.00
1990.12	36.12	1.80	0.21	0.06	0.00	0.00	0.00
1991.12	39.35	50.30	25.36	1.86	0.63	0.09	0.00
1992.12	8.79	14.50	11.64	8.75	3.45	1.24	0.03
1995.12	1.74	38.59	1.52	4.34	1.51	0.36	0.01
1996.12	32.01	3.71	2.62	3.13	4.72	2.13	0.30
1997.12	21.48	168.13	16.18	19.29	27.54	21.46	9.75
1998.12	1.47	6.38	11.31	4.03	2.22	1.36	0.36
1999.12	0.60	16.23	25.88	110.93	62.08	37.12	18.83
2000.12	467.14	29.91	11.11	8.37	4.84	0.92	0.32
2001.12	2.04	203.91	33.50	56.65	44.04	30.34	4.96
2002.12	0.02	3.34	12.85	1.85	2.05	1.32	0.46

Index Type and Model Form

ID#	Label	Age Group(s)	Index Type	Model Form
1	1-US fall 1967-1984		2	Abundance Proportional
2	1-US fall 1967-1984		3	Abundance Proportional
3	1-US fall 1967-1984		4	Abundance Proportional
4	1-US fall 1967-1984		5	Abundance Proportional
5	1-US fall 1967-1984		6	Abundance Proportional
6	1-US fall 1967-1984		7	Abundance Proportional
7	1-US fall 1967-1984		8	Abundance Proportional
8	2-US fall 1985-2002		2	Abundance Proportional
9	2-US fall 1985-2002		3	Abundance Proportional
10	2-US fall 1985-2002		4	Abundance Proportional
11	2-US fall 1985-2002		5	Abundance Proportional
12	2-US fall 1985-2002		6	Abundance Proportional
13	2-US fall 1985-2002		7	Abundance Proportional
14	2-US fall 1985-2002		8	Abundance Proportional
15	3-US Spring 1968-1984		2	Abundance Proportional
16	3-US Spring 1968-1984		3	Abundance Proportional
17	3-US Spring 1968-1984		4	Abundance Proportional
18	3-US Spring 1968-1984		5	Abundance Proportional
19	3-US Spring 1968-1984		6	Abundance Proportional
20	3-US Spring 1968-1984		7	Abundance Proportional
21	3-US Spring 1968-1984		8	Abundance Proportional
22	4-US Spring 1985-2002		2	Abundance Proportional
23	4-US Spring 1985-2002		3	Abundance Proportional
24	4-US Spring 1985-2002		4	Abundance Proportional
25	4-US Spring 1985-2002		5	Abundance Proportional
26	4-US Spring 1985-2002		6	Abundance Proportional
27	4-US Spring 1985-2002		7	Abundance Proportional
28	4-US Spring 1985-2002		8	Abundance Proportional
29	5-US Winter 1992-2002		2	Abundance Proportional
30	5-US Winter 1992-2002		3	Abundance Proportional
31	5-US Winter 1992-2002		4	Abundance Proportional
32	5-US Winter 1992-2002		5	Abundance Proportional
33	5-US Winter 1992-2002		6	Abundance Proportional
34	5-US Winter 1992-2002		7	Abundance Proportional
35	5-US Winter 1992-2002		8	Abundance Proportional
36	6a-US larval 1971-1988 (weighted mean)	3 4 5 6 7 8 9 10	Biomass	Proportional
37	6b-US larval 1971-1988 (weighted mean)	3 4 5 6 7 8 9 10	Biomass	Proportional
38	7-CAN larval 1987-1995 mean	3 4 5 6 7 8 9 10	Biomass	Proportional
39	8-US acoustic 1999-2002	3 4 5 6 7 8 9 10	Biomass	Proportional
40	9-CAN spring BT 86-92,95-02		2	Abundance Proportional
41	9-CAN spring BT 86-92,95-02		3	Abundance Proportional
42	9-CAN spring BT 86-92,95-02		4	Abundance Proportional
43	9-CAN spring BT 86-92,95-02		5	Abundance Proportional
44	9-CAN spring BT 86-92,95-02		6	Abundance Proportional
45	9-CAN spring BT 86-92,95-02		7	Abundance Proportional
46	9-CAN spring BT 86-92,95-02		8	Abundance Proportional

Index Inclusion

ID# on same line have common catchability

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Index Intrinsic Weighting

ID# on same line have common weighting

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VPA setup

Plus Group : No plus group

Population

	1	2	3	4	5	6	7	8	9	10
2002.00	(2000)									
2003.00	(2000)		4000	3000	2000	1000	1000			
F ratios	1	2	3	4	5	6	7	8	9	10
1967.00							1.00	1.00	1.00	**wtd**
1968.00							1.00	1.00	1.00	**wtd**
1969.00							1.00	1.00	1.00	**wtd**
1970.00							1.00	1.00	1.00	**wtd**
1971.00							1.00	1.00	1.00	**wtd**
1972.00							1.00	1.00	1.00	**wtd**
1973.00							1.00	1.00	1.00	**wtd**
1974.00							1.00	1.00	1.00	**wtd**
1975.00							1.00	1.00	1.00	**wtd**
1976.00							1.00	1.00	1.00	**wtd**
1977.00							1.00	1.00	1.00	**wtd**
1978.00							1.00	1.00	1.00	**wtd**
1979.00							1.00	1.00	1.00	**wtd**
1980.00							1.00	1.00	1.00	**wtd**
1981.00							1.00	1.00	1.00	**wtd**
1982.00							1.00	1.00	1.00	**wtd**
1983.00							1.00	1.00	1.00	**wtd**

Population Numbers

	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1800	1810	1159	1489	1245	171	35	33
1968.00	2624	4185	1918	1268	1294	831	976	670	95	19
1969.00	2065	2135	2178	1321	875	703	441	384	232	55
1970.00	1394	1627	1225	1426	870	447	299	168	123	74
1971.00	7634	1136	888	832	725	447	230	130	67	55
1972.00	1171	6110	720	361	388	296	168	68	45	31
1973.00	993	951	4101	531	148	86	58	27	7	8
1974.00	1638	779	464	2191	173	52	28	15	5	1
1975.00	1004	1310	256	248	1121	72	26	15	7	1
1976.00	1269	782	496	105	103	374	18	6	4	1
1977.00	3544	971	170	184	43	40	121	5	2	1
1978.00	2704	2364	280	65	88	17	17	54	2	1
1979.00	399	1971	846	106	30	33	8	6	16	1
1980.00	2308	321	571	316	36	10	12	1	1	7
1981.00	1336	1581	60	145	94	10	3	3	0	0
1982.00	1085	1038	264	18	58	35	4	1	1	0
1983.00	1069	841	256	118	9	21	12	1	1	0
1984.00	2855	846	448	157	71	6	11	3	1	0
1985.00	1259	2321	526	248	92	32	3	5	1	0
1986.00	1171	1004	1394	355	157	51	14	2	2	0
1987.00	1827	922	600	939	247	94	27	5	1	1
1988.00	2047	1450	554	370	606	162	61	17	2	1
1989.00	2193	1604	737	354	247	382	101	41	12	1
1990.00	2120	1771	900	454	192	129	152	56	26	8
1991.00	2253	1724	938	539	291	123	67	51	21	8
1992.00	1522	1839	997	606	350	180	71	34	22	8
1993.00	1393	1246	1015	619	411	207	97	34	13	6
1994.00	1954	1139	675	612	415	257	124	48	13	6
1995.00	5948	1598	553	395	436	263	146	68	22	5
1996.00	4764	4817	891	333	275	323	141	39	7	3
1997.00	5545	3896	3385	585	209	155	112	27	6	0
1998.00	3373	4530	2903	2198	399	127	69	28	7	3
1999.00	6389	2761	3143	2245	1501	273	76	28	9	1
2000.00	5921	5227	2102	2217	1723	1024	150	30	6	3
2001.00	6308	4844	3878	1672	1699	1265	679	83	11	2
2002.00	2000	5163	3791	2729	1315	1298	920	433	44	5
2003.00	2000	1598	4000	3000	2000	1000	1000	688	324	33

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.223	0.419	0.389	0.442	0.416
1968.00	0.007	0.453	0.173	0.170	0.410	0.434	0.732	0.863	0.344	0.761
1969.00	0.039	0.355	0.224	0.217	0.472	0.655	0.767	0.938	0.941	0.867
1970.00	0.005	0.405	0.187	0.476	0.466	0.465	0.631	0.723	0.598	0.650
1971.00	0.023	0.256	0.701	0.564	0.695	0.777	1.025	0.866	0.567	0.905
1972.00	0.008	0.199	0.104	0.692	1.307	1.437	1.639	2.106	1.488	1.728
1973.00	0.042	0.517	0.427	0.920	0.835	0.913	1.138	1.554	1.502	1.287
1974.00	0.024	0.913	0.426	0.470	0.684	0.485	0.436	0.518	1.270	0.542
1975.00	0.051	0.770	0.696	0.678	0.897	1.205	1.245	1.141	1.672	1.278
1976.00	0.068	1.325	0.792	0.681	0.737	0.932	1.028	0.878	1.224	1.022
1977.00	0.205	1.042	0.763	0.543	0.748	0.689	0.597	0.813	0.424	0.603
1978.00	0.116	0.827	0.771	0.578	0.762	0.515	0.780	1.027	1.019	0.970
1979.00	0.018	1.040	0.785	0.895	0.882	0.811	1.632	1.522	0.663	1.101
1980.00	0.179	1.479	1.168	1.010	1.091	1.081	1.302	1.201	1.083	1.277
1981.00	0.052	1.589	0.976	0.716	0.781	0.781	0.751	0.660	0.271	0.682
1982.00	0.055	1.198	0.607	0.508	0.837	0.901	1.037	0.550	1.469	1.031
1983.00	0.034	0.429	0.292	0.313	0.164	0.434	1.135	0.416	0.520	1.054
1984.00	0.007	0.275	0.394	0.332	0.582	0.463	0.566	0.928	3.105	0.743
1985.00	0.027	0.310	0.194	0.257	0.390	0.613	0.505	0.720	1.493	0.728
1986.00	0.039	0.315	0.196	0.163	0.309	0.428	0.881	0.282	0.287	0.760

1987.00	0.031	0.310	0.284	0.237	0.223	0.242	0.260	0.749	0.264	0.332
1988.00	0.044	0.477	0.249	0.204	0.261	0.270	0.181	0.150	0.978	0.193
1989.00	0.014	0.378	0.284	0.408	0.448	0.724	0.382	0.252	0.223	0.335
1990.00	0.007	0.436	0.313	0.244	0.245	0.456	0.894	0.800	0.934	0.876
1991.00	0.003	0.348	0.237	0.232	0.283	0.351	0.479	0.617	0.718	0.566
1992.00	0.001	0.394	0.277	0.188	0.324	0.418	0.529	0.763	1.098	0.692
1993.00	0.001	0.412	0.306	0.199	0.270	0.313	0.497	0.808	0.635	0.583
1994.00	0.001	0.522	0.337	0.140	0.256	0.364	0.400	0.575	0.775	0.471
1995.00	0.011	0.384	0.308	0.161	0.101	0.427	1.132	2.130	1.802	1.482
1996.00	0.001	0.153	0.221	0.268	0.376	0.859	1.450	1.589	5.835	1.635
1997.00	0.002	0.094	0.232	0.184	0.298	0.603	1.183	1.153	0.557	1.149
1998.00	0.000	0.166	0.057	0.181	0.179	0.314	0.699	0.979	2.162	0.873
1999.00	0.001	0.073	0.149	0.065	0.183	0.400	0.714	1.384	0.846	0.892
2000.00	0.001	0.099	0.029	0.066	0.109	0.211	0.391	0.801	0.763	0.469
2001.00	0.000	0.045	0.151	0.040	0.069	0.119	0.249	0.437	0.700	0.276
2002.00	0.024	0.055	0.034	0.111	0.074	0.061	0.090	0.090	0.090	0.090

LAMBDA 1.00000E-2
 RSS 7.86832E2
 NPFI 7.86832E2

Parameters
 8.29405E0 8.00637E0 7.60090E0 6.90776E0 6.90776E0

LAMBDA 1.00000E-3
 RSS 7.05692E2
 NPFI 7.05692E2

Parameters
 7.02722E0 6.20535E0 7.92684E0 5.61114E0 5.76001E0

LAMBDA 1.00000E-4
 RSS 6.97951E2
 NPFI 6.97951E2

Parameters
 6.98825E0 6.08334E0 7.70755E0 5.36968E0 5.52235E0

LAMBDA 1.00000E-5
 RSS 6.95648E2
 NPFI 6.95648E2

Parameters
 6.97929E0 6.03800E0 7.63251E0 5.33981E0 5.49973E0

LAMBDA 1.00000E-5
 RSS 6.94903E2
 NPFI 6.94903E2

Parameters
 6.97611E0 6.02034E0 7.60899E0 5.33357E0 5.49667E0

LAMBDA 1.00000E-5
 RSS 6.94667E2
 NPFI 6.94667E2

Parameters
 6.97501E0 6.01448E0 7.60164E0 5.33168E0 5.49581E0

LAMBDA 1.00000E-5
 RSS 6.94593E2
 NPFI 6.94593E2

Parameters
 6.97465E0 6.01262E0 7.59934E0 5.33109E0 5.49555E0

LAMBDA 1.00000E-5
 RSS 6.94570E2
 NPFI 6.94570E2

Parameters
 6.97453E0 6.01203E0 7.59861E0 5.33091E0 5.49547E0

LAMBDA 1.00000E-5
 RSS 6.94563E2
 NPFI 6.94563E2

Parameters
 6.97450E0 6.01185E0 7.59839E0 5.33085E0 5.49544E0

LAMBDA 1.00000E-5
 RSS 6.94560E2
 NPFI 6.94560E2

Parameters
 6.97449E0 6.01179E0 7.59832E0 5.33083E0 5.49543E0

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.00001
 RELATIVE CHANGE IN EACH PARAMETER LESS THAN 0.00001

LAMBDA 1.00000E-2
 RSS 6.94560E2
 NPFI 6.94560E2

Parameters
 6.97449E0 6.01179E0 7.59832E0 5.33083E0 5.49543E0 -1.12648E1
 -9.85447E0 -8.72095E0 -8.35651E0 -7.50457E0 -7.18076E0 -6.97986E0
 -7.21699E0 -5.31461E0 -4.67431E0 -4.59818E0 -4.52000E0 -4.61259E0
 -4.69301E0 -8.54856E0 -7.12842E0 -6.18135E0 -5.81252E0 -5.72533E0
 -5.37330E0 -5.86172E0 -5.72062E0 -4.93300E0 -4.62739E0 -4.70840E0
 -5.07557E0 -5.60577E0 -6.34483E0 -7.05224E0 -5.31888E0 -4.88754E0
 -4.28792E0 -3.98071E0 -4.12466E0 -4.14393E0 -1.36018E0 9.40678E-1
 -2.46360E0 1.68094E1 -5.87556E0 -4.79538E0 -5.34079E0 -5.24915E0
 -4.82073E0 -4.56542E0 -4.52768E0

LAMBDA 1.00000E-3
 RSS 6.94560E2
 NPFI 6.94560E2

Parameters
 6.97448E0 6.01177E0 7.59829E0 5.33083E0 5.49543E0 -1.12648E1
 -9.85447E0 -8.72095E0 -8.35651E0 -7.50457E0 -7.18076E0 -6.97986E0
 -7.21699E0 -5.31460E0 -4.67431E0 -4.59818E0 -4.52000E0 -4.61259E0
 -4.69301E0 -8.54856E0 -7.12842E0 -6.18135E0 -5.81252E0 -5.72533E0
 -5.37330E0 -5.86172E0 -5.72062E0 -4.93299E0 -4.62739E0 -4.70840E0
 -5.07556E0 -5.60577E0 -6.34483E0 -7.05223E0 -5.31888E0 -4.88754E0
 -4.28792E0 -3.98071E0 -4.12466E0 -4.14392E0 -1.36018E0 9.40678E-1
 -2.46360E0 1.68094E1 -5.87556E0 -4.79538E0 -5.34079E0 -5.24914E0
 -4.82073E0 -4.56542E0 -4.52767E0

ORTHOGONALITY OFFSET LESS THAN 0.001
 RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.00001
 RELATIVE CHANGE IN EACH PARAMETER LESS THAN 0.00001

Estimated VPA (biased)

Population Numbers

	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1800	1810	1159	1489	1245	171	35	33
1968.00	2624	4185	1918	1268	1294	831	976	670	95	19
1969.00	2065	2135	2178	1321	875	703	441	384	232	55
1970.00	1394	1627	1225	1426	870	447	299	168	123	74
1971.00	7634	1136	888	832	725	447	230	130	67	55
1972.00	1171	6110	720	361	388	296	168	68	45	31
1973.00	993	951	4101	531	148	86	58	27	7	8
1974.00	1638	779	464	2191	173	52	28	15	5	1
1975.00	1004	1310	256	248	1121	72	26	15	7	1
1976.00	1269	782	496	105	103	374	18	6	4	1
1977.00	3544	971	170	184	43	40	121	5	2	1
1978.00	2704	2364	280	65	88	17	17	54	2	1
1979.00	399	1971	846	106	30	33	8	6	16	1
1980.00	2308	321	571	316	36	10	12	1	1	7
1981.00	1336	1581	60	145	94	10	3	3	0	0
1982.00	1085	1038	264	18	58	35	4	1	1	0
1983.00	1069	841	256	118	9	21	12	1	1	0
1984.00	2855	846	448	157	71	6	11	3	1	0
1985.00	1259	2321	526	248	92	32	3	5	1	0
1986.00	1171	1004	1394	355	157	51	14	2	2	0
1987.00	1827	922	600	939	247	94	27	5	1	1
1988.00	2047	1450	554	370	606	162	61	17	2	1
1989.00	2193	1604	737	354	247	382	101	41	12	1
1990.00	2120	1771	900	454	192	129	152	56	26	8
1991.00	2250	1724	938	539	291	123	67	51	21	8
1992.00	1518	1837	997	606	350	180	71	34	22	8
1993.00	1383	1242	1013	619	411	207	97	34	13	6
1994.00	1874	1130	673	611	415	257	124	48	13	6
1995.00	5307	1533	546	393	434	263	146	68	22	5
1996.00	3656	4292	837	327	273	322	141	39	7	3
1997.00	3028	2988	2956	541	204	153	111	27	6	0
1998.00	1215	2469	2160	1847	363	123	68	27	7	3
1999.00	6378	994	1457	1637	1214	243	73	27	8	1
2000.00	1197	5217	656	838	1225	789	126	28	5	3
2001.00	1935	977	3870	488	570	858	487	63	9	2
2002.00	2000	1583	625	2723	346	374	586	276	28	3
2003.00	2000	1598	1069	408	1995	207	244	415	196	20

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.223	0.419	0.389	0.442	0.416
1968.00	0.007	0.453	0.173	0.170	0.410	0.434	0.732	0.863	0.344	0.761
1969.00	0.039	0.355	0.224	0.217	0.472	0.655	0.767	0.938	0.941	0.867
1970.00	0.005	0.405	0.187	0.476	0.466	0.465	0.631	0.723	0.598	0.650
1971.00	0.023	0.256	0.701	0.564	0.695	0.777	1.025	0.866	0.567	0.905
1972.00	0.008	0.199	0.104	0.692	1.307	1.437	1.639	2.106	1.488	1.728
1973.00	0.042	0.517	0.427	0.920	0.835	0.913	1.138	1.554	1.502	1.287
1974.00	0.024	0.913	0.426	0.470	0.684	0.485	0.436	0.518	1.270	0.542
1975.00	0.051	0.770	0.696	0.678	0.897	1.205	1.245	1.141	1.672	1.278
1976.00	0.068	1.325	0.792	0.681	0.737	0.932	1.028	0.878	1.224	1.022
1977.00	0.205	1.042	0.763	0.543	0.748	0.689	0.597	0.813	0.424	0.603
1978.00	0.116	0.827	0.771	0.578	0.762	0.515	0.780	1.027	1.019	0.970
1979.00	0.018	1.040	0.785	0.895	0.882	0.811	1.632	1.522	0.663	1.101
1980.00	0.179	1.479	1.168	1.010	1.091	1.081	1.302	1.201	1.083	1.277
1981.00	0.052	1.589	0.976	0.716	0.781	0.781	0.751	0.660	0.271	0.682
1982.00	0.055	1.198	0.607	0.508	0.837	0.901	1.037	0.550	1.469	1.031
1983.00	0.034	0.429	0.292	0.313	0.164	0.434	1.135	0.416	0.520	1.054
1984.00	0.007	0.275	0.394	0.332	0.582	0.463	0.566	0.928	3.105	0.743
1985.00	0.027	0.310	0.194	0.257	0.390	0.613	0.505	0.720	1.493	0.728
1986.00	0.039	0.315	0.196	0.163	0.309	0.428	0.881	0.282	0.287	0.760
1987.00	0.031	0.310	0.284	0.237	0.223	0.242	0.260	0.749	0.264	0.332

1988.00	0.044	0.477	0.249	0.204	0.261	0.270	0.181	0.150	0.978	0.193
1989.00	0.014	0.378	0.284	0.408	0.448	0.724	0.382	0.252	0.223	0.335
1990.00	0.007	0.436	0.313	0.244	0.245	0.456	0.894	0.800	0.934	0.876
1991.00	0.003	0.348	0.238	0.232	0.283	0.351	0.479	0.617	0.718	0.566
1992.00	0.001	0.395	0.277	0.188	0.324	0.418	0.529	0.763	1.098	0.692
1993.00	0.001	0.413	0.306	0.199	0.270	0.313	0.497	0.808	0.635	0.583
1994.00	0.001	0.527	0.339	0.140	0.256	0.364	0.400	0.575	0.775	0.471
1995.00	0.012	0.405	0.312	0.162	0.101	0.427	1.134	2.130	1.803	1.484
1996.00	0.002	0.173	0.237	0.273	0.379	0.864	1.452	1.598	5.842	1.638
1997.00	0.004	0.124	0.270	0.200	0.306	0.611	1.200	1.156	0.565	1.164
1998.00	0.000	0.327	0.077	0.220	0.199	0.325	0.717	1.020	2.200	0.898
1999.00	0.001	0.216	0.353	0.090	0.231	0.460	0.759	1.490	0.938	0.956
2000.00	0.004	0.099	0.096	0.185	0.157	0.283	0.485	0.916	0.948	0.575
2001.00	0.001	0.246	0.152	0.144	0.221	0.181	0.367	0.619	0.949	0.405
2002.00	0.024	0.192	0.226	0.111	0.315	0.230	0.144	0.144	0.144	0.144

APPROXIMATE STATISTICS ASSUMING LINEARITY NEAR SOLUTION

ORTHOGONALITY OFFSET..... 0.000017
 MEAN SQUARE RESIDUALS 1.105987

Parameter	Est.	Std. Err.	Rel. Err.	Bias	Rel. Bias
N[2003 3]	1.07E3	7.11E2	0.665	2.13E2	0.199
N[2003 4]	4.08E2	2.10E2	0.515	4.40E1	0.108
N[2003 5]	1.99E3	5.42E2	0.272	4.85E1	0.024
N[2003 6]	2.07E2	8.28E1	0.401	1.16E1	0.056
N[2003 7]	2.44E2	1.01E2	0.414	1.41E1	0.058
q ID#[1]	1.28E-5	3.99E-6	0.311	6.20E-7	0.048
q ID#[2]	5.25E-5	2.05E-5	0.391	4.01E-6	0.076
q ID#[3]	1.63E-4	5.49E-5	0.336	9.23E-6	0.057
q ID#[4]	2.35E-4	1.04E-4	0.444	2.32E-5	0.099
q ID#[5]	5.51E-4	2.17E-4	0.395	4.28E-5	0.078
q ID#[6]	7.61E-4	3.23E-4	0.425	6.86E-5	0.090
q ID#[7]	9.30E-4	6.30E-4	0.677	2.13E-4	0.229
q ID#[8]	7.34E-4	2.52E-4	0.343	4.26E-5	0.058
q ID#[9]	4.92E-3	1.69E-3	0.343	2.90E-4	0.059
q ID#[10]	9.33E-3	2.18E-3	0.234	2.53E-4	0.027
q ID#[11]	1.01E-2	2.58E-3	0.256	3.37E-4	0.033
q ID#[12]	1.09E-2	3.46E-3	0.317	5.54E-4	0.051
q ID#[13]	9.93E-3	4.22E-3	0.425	8.89E-4	0.090
q ID#[14]	9.16E-3	6.28E-3	0.686	2.14E-3	0.234
q ID#[15]	1.94E-4	7.48E-5	0.386	1.44E-5	0.074
q ID#[16]	8.02E-4	2.22E-4	0.277	3.07E-5	0.038
q ID#[17]	2.07E-3	6.26E-4	0.303	9.48E-5	0.046
q ID#[18]	2.99E-3	9.16E-4	0.306	1.40E-4	0.047
q ID#[19]	3.26E-3	8.00E-4	0.245	9.81E-5	0.030
q ID#[20]	4.64E-3	1.46E-3	0.314	2.28E-4	0.049
q ID#[21]	2.85E-3	8.78E-4	0.308	1.35E-4	0.048
q ID#[22]	3.28E-3	5.47E-4	0.167	3.75E-5	0.011
q ID#[23]	7.20E-3	1.36E-3	0.189	1.21E-4	0.017
q ID#[24]	9.78E-3	1.74E-3	0.177	1.47E-4	0.015
q ID#[25]	9.02E-3	1.89E-3	0.210	1.95E-4	0.022
q ID#[26]	6.25E-3	1.38E-3	0.221	1.52E-4	0.024
q ID#[27]	3.68E-3	1.80E-3	0.491	4.39E-4	0.120
q ID#[28]	1.76E-3	1.34E-3	0.765	5.12E-4	0.292
q ID#[29]	8.65E-4	5.15E-4	0.595	1.48E-4	0.171
q ID#[30]	4.90E-3	1.39E-3	0.283	1.84E-4	0.038
q ID#[31]	7.54E-3	1.96E-3	0.260	2.44E-4	0.032
q ID#[32]	1.37E-2	3.10E-3	0.226	3.30E-4	0.024
q ID#[33]	1.87E-2	5.88E-3	0.315	9.12E-4	0.049
q ID#[34]	1.62E-2	6.14E-3	0.380	1.14E-3	0.071
q ID#[35]	1.59E-2	7.25E-3	0.457	1.63E-3	0.103

q ID#[36]	2.57E-1	7.88E-2	0.307	1.21E-2	0.047
q ID#[37]	2.56E0	2.32E-1	0.090	1.04E-2	0.004
q ID#[38]	8.51E-2	2.61E-2	0.307	4.00E-3	0.047
q ID#[39]	2.00E7	4.66E6	0.234	3.19E5	0.016
q ID#[40]	2.81E-3	1.65E-3	0.588	4.76E-4	0.169
q ID#[41]	8.27E-3	3.98E-3	0.481	9.44E-4	0.114
q ID#[42]	4.79E-3	2.48E-3	0.517	6.37E-4	0.133
q ID#[43]	5.25E-3	3.54E-3	0.675	1.19E-3	0.227
q ID#[44]	8.06E-3	5.53E-3	0.686	1.90E-3	0.235
q ID#[45]	1.04E-2	7.56E-3	0.727	2.73E-3	0.263
q ID#[46]	1.08E-2	9.42E-3	0.872	4.09E-3	0.378

VPA using analytical bias adjusted parameters (linear scale)

Population Numbers

	1	2	3	4	5	6	7	8	9	10
1967.00	5263	2809	1800	1810	1159	1489	1245	171	35	33
1968.00	2624	4185	1918	1268	1294	831	976	670	95	19
1969.00	2065	2135	2178	1321	875	703	441	384	232	55
1970.00	1394	1627	1225	1426	870	447	299	168	123	74
1971.00	7634	1136	888	832	725	447	230	130	67	55
1972.00	1171	6110	720	361	388	296	168	68	45	31
1973.00	993	951	4101	531	148	86	58	27	7	8
1974.00	1638	779	464	2191	173	52	28	15	5	1
1975.00	1004	1310	256	248	1121	72	26	15	7	1
1976.00	1269	782	496	105	103	374	18	6	4	1
1977.00	3544	971	170	184	43	40	121	5	2	1
1978.00	2704	2364	280	65	88	17	17	54	2	1
1979.00	399	1971	846	106	30	33	8	6	16	1
1980.00	2308	321	571	316	36	10	12	1	1	7
1981.00	1336	1581	60	145	94	10	3	3	0	0
1982.00	1085	1038	264	18	58	35	4	1	1	0
1983.00	1069	841	256	118	9	21	12	1	1	0
1984.00	2855	846	448	157	71	6	11	3	1	0
1985.00	1259	2321	526	248	92	32	3	5	1	0
1986.00	1171	1004	1394	355	157	51	14	2	2	0
1987.00	1827	922	600	939	247	94	27	5	1	1
1988.00	2047	1450	554	370	606	162	61	17	2	1
1989.00	2193	1604	737	354	247	382	101	41	12	1
1990.00	2120	1771	900	454	192	129	152	56	26	8
1991.00	2250	1724	938	539	291	123	67	51	21	8
1992.00	1518	1837	997	606	350	180	71	34	22	8
1993.00	1382	1242	1013	619	411	207	97	34	13	6
1994.00	1871	1130	673	611	415	257	124	48	13	6
1995.00	5276	1530	546	392	434	263	146	68	22	5
1996.00	3602	4266	835	327	273	321	141	38	7	3
1997.00	2981	2944	2935	539	204	153	111	27	6	0
1998.00	1183	2431	2124	1830	361	123	68	27	7	3
1999.00	6270	968	1426	1607	1200	242	73	27	8	1
2000.00	1117	5129	635	812	1201	778	125	28	5	3
2001.00	1616	911	3798	470	549	838	477	62	9	2
2002.00	2000	1322	571	2664	331	357	570	269	27	3
2003.00	2000	1598	856	364	1946	195	229	402	189	19

Fishing Mortality

	1	2	3	4	5	6	7	8	9	10
1967.00	0.029	0.182	0.151	0.136	0.132	0.223	0.419	0.389	0.442	0.416
1968.00	0.007	0.453	0.173	0.170	0.410	0.434	0.732	0.863	0.344	0.761
1969.00	0.039	0.355	0.224	0.217	0.472	0.655	0.767	0.938	0.941	0.867
1970.00	0.005	0.405	0.187	0.476	0.466	0.465	0.631	0.723	0.598	0.650
1971.00	0.023	0.256	0.701	0.564	0.695	0.777	1.025	0.866	0.567	0.905
1972.00	0.008	0.199	0.104	0.692	1.307	1.437	1.639	2.106	1.488	1.728
1973.00	0.042	0.517	0.427	0.920	0.835	0.913	1.138	1.554	1.502	1.287
1974.00	0.024	0.913	0.426	0.470	0.684	0.485	0.436	0.518	1.270	0.542

1975.00	0.051	0.770	0.696	0.678	0.897	1.205	1.245	1.141	1.672	1.278
1976.00	0.068	1.325	0.792	0.681	0.737	0.932	1.028	0.878	1.224	1.022
1977.00	0.205	1.042	0.763	0.543	0.748	0.689	0.597	0.813	0.424	0.603
1978.00	0.116	0.827	0.771	0.578	0.762	0.515	0.780	1.027	1.019	0.970
1979.00	0.018	1.040	0.785	0.895	0.882	0.811	1.632	1.522	0.663	1.101
1980.00	0.179	1.479	1.168	1.010	1.091	1.081	1.302	1.201	1.083	1.277
1981.00	0.052	1.589	0.976	0.716	0.781	0.781	0.751	0.660	0.271	0.682
1982.00	0.055	1.198	0.607	0.508	0.837	0.901	1.037	0.550	1.469	1.031
1983.00	0.034	0.429	0.292	0.313	0.164	0.434	1.135	0.416	0.520	1.054
1984.00	0.007	0.275	0.394	0.332	0.582	0.463	0.566	0.928	3.105	0.743
1985.00	0.027	0.310	0.194	0.257	0.390	0.613	0.505	0.720	1.493	0.728
1986.00	0.039	0.315	0.196	0.163	0.309	0.428	0.881	0.282	0.287	0.760
1987.00	0.031	0.310	0.284	0.237	0.223	0.242	0.260	0.749	0.264	0.332
1988.00	0.044	0.477	0.249	0.204	0.261	0.270	0.181	0.150	0.978	0.193
1989.00	0.014	0.378	0.284	0.408	0.448	0.724	0.382	0.252	0.223	0.335
1990.00	0.007	0.436	0.313	0.244	0.245	0.456	0.894	0.800	0.934	0.876
1991.00	0.003	0.348	0.238	0.232	0.283	0.351	0.479	0.617	0.718	0.566
1992.00	0.001	0.395	0.277	0.188	0.324	0.418	0.529	0.763	1.098	0.692
1993.00	0.001	0.414	0.306	0.199	0.270	0.313	0.497	0.808	0.635	0.583
1994.00	0.001	0.527	0.339	0.140	0.256	0.364	0.400	0.575	0.775	0.471
1995.00	0.012	0.406	0.313	0.162	0.101	0.427	1.134	2.130	1.803	1.484
1996.00	0.002	0.174	0.238	0.273	0.379	0.864	1.452	1.598	5.842	1.639
1997.00	0.004	0.126	0.272	0.201	0.306	0.611	1.200	1.157	0.565	1.164
1998.00	0.000	0.334	0.079	0.222	0.200	0.326	0.718	1.022	2.202	0.900
1999.00	0.001	0.222	0.363	0.091	0.234	0.463	0.761	1.495	0.943	0.960
2000.00	0.004	0.100	0.100	0.192	0.160	0.288	0.491	0.923	0.959	0.582
2001.00	0.001	0.266	0.155	0.150	0.230	0.186	0.375	0.632	0.966	0.414
2002.00	0.024	0.235	0.250	0.114	0.330	0.242	0.149	0.149	0.149	0.149

1-US fall 1967-1984

Age : 2

Ln calibration constant : -11.26485

Year	Observed	Predicted	Residual	Ln Pop.
1967.83	-2.68092	-3.64084	0.83812	7.62401
1968.83	-3.80317	-3.46755	-0.29303	7.79729
1969.83	-3.76360	-4.05963	0.25847	7.20522
1970.83	-3.48024	-4.37290	0.77940	6.89194
1971.83	-4.18646	-4.60807	0.36812	6.65677
1972.83	-2.06593	-2.87799	0.70902	8.38685
1973.83	-7.26443	-5.00234	-1.97507	6.26251
1974.83	-8.51719	-5.52982	-2.60832	5.73503
1975.83	-4.89285	-4.89233	-0.00045	6.37251
1977.83	-5.09947	-5.41729	0.27750	5.84755
1978.83	-4.53751	-4.34948	-0.16417	6.91536
1979.83	-4.43122	-4.70753	0.24126	6.55731
1982.83	-5.65499	-5.48012	-0.15268	5.78472
1983.83	-3.31044	-5.05224	1.52079	6.21261
1984.83	-4.68855	-4.91884	0.20107	6.34601

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 3

Ln calibration constant : -9.85447

Year	Observed	Predicted	Residual	Ln Pop.
1967.83	-2.04176	-2.64983	0.38549	7.20464
1968.83	-2.80511	-2.60502	-0.12685	7.24944
1969.83	-3.32424	-2.52007	-0.50981	7.33439
1970.83	-3.40521	-3.06484	-0.21578	6.78963

1971.83	-1.17798	-3.81346	1.67079	6.04100
1972.83	-2.82852	-3.52773	0.44327	6.32673
1973.83	-3.14191	-2.05589	-0.68850	7.79858
1974.83	-5.99146	-4.23314	-1.11471	5.62132
1975.83	-6.31997	-5.05206	-0.80380	4.80240
1976.83	-8.51719	-4.46987	-2.56584	5.38459
1977.83	-6.90776	-5.51746	-0.88139	4.33700
1978.83	-2.75829	-5.02424	1.43652	4.83022
1979.83	-3.80317	-3.93138	0.08128	5.92309
1980.83	-5.08321	-4.64365	-0.27866	5.21082
1981.83	-5.95224	-6.73873	0.49860	3.11574
1982.83	-4.33514	-4.94740	0.38815	4.90706
1983.83	-3.23399	-4.71545	0.93918	5.13902
1984.83	-2.12444	-4.24136	1.34204	5.61310

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 4

Ln calibration constant : -8.72095

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1967.83	-1.01971	-1.49839	0.36290	7.22256
1968.83	-2.89498	-1.88335	-0.76695	6.83760
1969.83	-2.74731	-1.88101	-0.65677	6.83994
1970.83	-2.62970	-2.01936	-0.46272	6.70159
1971.83	-1.35829	-2.63085	0.96477	6.09011
1972.83	-2.58362	-3.57383	0.75071	5.14712
1973.83	-5.44914	-3.37587	-1.57182	5.34509
1974.83	-2.76939	-1.58511	-0.89785	7.13585
1975.83	-4.19971	-3.93488	-0.20078	4.78608
1976.83	-4.41455	-4.80188	0.29365	3.91907
1977.83	-4.94766	-4.12142	-0.62640	4.59953
1978.83	-2.51331	-5.19315	2.03169	3.52780
1979.83	-6.43775	-4.96449	-1.11693	3.75646
1981.83	-6.07485	-4.50317	-1.19154	4.21778
1982.83	-5.08321	-6.39271	0.99278	2.32825
1983.83	-3.80766	-4.37727	0.43184	4.34368
1984.83	-1.91257	-4.10668	1.66343	4.61427

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 5

Ln calibration constant : -8.35651

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1967.83	-1.65339	-1.57713	-0.04514	6.77937
1968.83	-2.91139	-1.69740	-0.71865	6.65910
1969.83	-3.25450	-2.13944	-0.66009	6.21707
1970.83	-2.78709	-2.14023	-0.38293	6.21628
1971.83	-0.54697	-2.51291	1.16379	5.84360
1972.83	-2.76780	-3.64674	0.52031	4.70977
1973.83	-6.16582	-4.22042	-1.15163	4.13608
1974.83	-4.66705	-3.93547	-0.43307	4.42104
1975.83	-2.25666	-2.24467	-0.00709	6.11184
1976.83	-4.29036	-4.49771	0.12275	3.85880
1977.83	-6.07485	-5.37400	-0.41489	2.98251
1978.83	-1.85470	-4.68207	1.67373	3.67444
1981.83	-8.51719	-4.62496	-2.30411	3.73155
1982.83	-3.52337	-5.15533	0.96608	3.20118

1983.83	-6.50229	-6.45066	-0.03056	1.90585
1984.83	-1.87471	-4.74899	1.70150	3.60752

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 6

Ln calibration constant : -7.50457

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1967.83	-0.52442	-0.54916	0.01649	6.95541
1968.83	-0.98430	-1.30752	0.21540	6.19705
1969.83	-2.78547	-1.65902	-0.75070	5.84555
1970.83	-2.23213	-1.95334	-0.18579	5.55123
1971.83	-1.08501	-2.21266	0.75150	5.29191
1972.83	-2.81842	-3.17157	0.23535	4.33300
1973.83	-7.60090	-3.97491	-2.41647	3.52966
1974.83	-5.20301	-4.11276	-0.72657	3.39181
1975.83	-2.96423	-4.39970	0.95664	3.10487
1976.83	-2.67510	-2.51866	-0.10425	4.98591
1977.83	-6.31997	-4.54292	-1.18428	2.96165
1978.83	-4.27587	-5.27658	0.66690	2.22799
1981.83	-7.26443	-6.03935	-0.81643	1.46522
1982.83	-3.82585	-4.85369	0.68499	2.65088
1983.83	-4.21991	-5.00605	0.52391	2.49853
1984.83	-3.00983	-6.21094	2.13331	1.29364

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 7

Ln calibration constant : -7.18076

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1967.83	-0.92256	-0.56768	-0.21971	6.61308
1968.83	-2.16718	-1.07066	-0.67885	6.11010
1969.83	-2.29363	-1.89399	-0.24742	5.28678
1970.83	-4.31250	-2.17021	-1.32630	5.01056
1971.83	-4.01184	-2.75919	-0.77552	4.42158
1972.83	-3.03447	-3.58154	0.33869	3.59923
1973.83	-6.11930	-4.23644	-1.16568	2.94433
1974.83	-5.40368	-4.36835	-0.64097	2.81241
1975.83	-3.45144	-5.10477	1.02358	2.07600
1976.83	-4.72170	-5.33402	0.37909	1.84675
1977.83	-4.54690	-3.04876	-0.92750	4.13201
1978.83	-3.87762	-5.18330	0.80835	1.99747
1981.83	-8.51719	-6.93739	-0.97806	0.24338
1982.83	-5.65499	-6.90901	0.77636	0.27176
1983.83	-3.83506	-5.82520	1.23210	1.35556
1984.83	-1.54646	-5.42605	2.40186	1.75471

Average squared residual : 1.02292

1-US fall 1967-1984

Age : 8

Ln calibration constant : -6.97986

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1967.83	-4.55638	-2.32850	-0.99855	4.65136
1972.83	-4.07454	-4.68053	0.27161	2.29932

1973.83	-7.26443	-5.14936	-0.94798	1.83050
1974.83	-4.84089	-4.85863	0.00795	2.12123
1975.83	-3.63819	-5.38885	0.78466	1.59100
1976.83	-9.21034	-6.04401	-1.41916	0.93585
1977.83	-8.11173	-6.18283	-0.86454	0.79703
1978.83	-2.47456	-4.00133	0.68431	2.97853
1981.83	-8.51719	-6.69563	-0.81643	0.28423
1982.83	-5.71383	-7.52071	0.80985	-0.54085
1983.83	-6.90776	-7.42933	0.23377	-0.44947
1984.83	-1.75736	-6.78749	2.25453	0.19237

Average squared residual : 1.02292

2-US fall 1985-2002

Age : 2

Ln calibration constant : -7.21699

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.83	-3.37553	0.10970	-2.55115	7.32669
1986.83	-3.78981	-0.73317	-2.23742	6.48381
1987.83	0.70424	-0.81354	1.11100	6.40344
1988.83	0.01597	-0.49960	0.37739	6.71738
1989.83	0.33511	-0.31588	0.47652	6.90111
1990.83	0.95520	-0.26523	0.89334	6.95176
1991.83	0.99429	-0.21913	0.88821	6.99785
1992.83	0.80844	-0.19496	0.73447	7.02203
1993.83	-1.03761	-0.60146	-0.31926	6.61553
1994.83	-0.45460	-0.79026	0.24570	6.42672
1995.83	-0.53683	-0.38384	-0.11199	6.83315
1996.83	2.38001	0.83789	1.12881	8.05488
1997.83	0.60103	0.51601	0.06224	7.73299
1998.83	0.46775	0.15686	0.22757	7.37385
1999.83	-1.50103	-0.66014	-0.61552	6.55685
2000.83	0.09613	1.09484	-0.73104	8.31182
2001.83	-1.20098	-0.70316	-0.36440	6.51383
2002.83	0.89739	-0.17579	0.78556	7.04120

Average squared residual : 1.02292

2-US fall 1985-2002

Age : 3

Ln calibration constant : -5.31460

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.83	-2.93935	0.62370	-2.59745	5.93830
1986.83	-0.83910	1.59718	-1.77604	6.91179
1987.83	1.34344	0.68021	0.48349	5.99481
1988.83	1.27046	0.62982	0.46702	5.94443
1989.83	1.46416	0.88576	0.42165	6.20037
1990.83	2.18785	1.06241	0.82044	6.37702
1991.83	2.44646	1.16594	0.93349	6.48055
1992.83	3.23621	1.19428	1.48856	6.50888
1993.83	0.58629	1.18608	-0.43724	6.50068
1994.83	0.02966	0.74956	-0.52481	6.06417
1995.83	2.05411	0.56314	1.08691	5.87774
1996.83	1.90475	1.05333	0.62068	6.36794
1997.83	2.85539	2.28660	0.41465	7.60120
1998.83	1.04525	2.13304	-0.79300	7.44764
1999.83	1.05117	1.51041	-0.33478	6.82501
2000.83	0.01134	0.92562	-0.66651	6.24022
2001.83	2.13978	2.65461	-0.37530	7.96921

2002.83 1.82353 0.76963 0.76829 6.08423

Average squared residual : 1.02291

2-US fall 1985-2002

Age : 4

Ln calibration constant : -4.67431

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.83	-0.01157	0.45870	-0.50559	5.13301
1986.83	-1.46924	0.89569	-2.54259	5.57000
1987.83	1.10081	1.80720	-0.75945	6.48151
1988.83	1.51262	0.90273	0.65571	5.57704
1989.83	1.39021	0.68904	0.75384	5.36336
1990.83	0.64359	1.07543	-0.46428	5.74974
1991.83	1.69367	1.25659	0.46992	5.93090
1992.83	2.80706	1.41007	1.50193	6.08438
1993.83	1.91575	1.42244	0.53037	6.09675
1994.83	1.41418	1.45771	-0.04680	6.13202
1995.83	2.17583	0.99788	1.26644	5.67219
1996.83	1.90990	0.72384	1.27515	5.39816
1997.83	1.53788	1.28735	0.26935	5.96166
1998.83	2.12315	2.49867	-0.40374	7.17298
1999.83	1.03454	2.48571	-1.56019	7.16002
2000.83	1.43301	1.73702	-0.32684	6.41133
2001.83	0.47834	1.22964	-0.80773	5.90395
2002.83	3.62293	2.97688	0.69459	7.65119

Average squared residual : 1.02291

2-US fall 1985-2002

Age : 5

Ln calibration constant : -4.59818

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.83	-1.17215	-0.56410	-0.59463	4.03407
1986.83	-1.68740	0.03458	-1.68397	4.63276
1987.83	-0.95011	0.55904	-1.47583	5.15722
1988.83	0.56877	1.42662	-0.83892	6.02480
1989.83	0.69694	0.37236	0.31742	4.97053
1990.83	-0.85590	0.29280	-1.12335	4.89098
1991.83	-0.15117	0.67556	-0.80849	5.27374
1992.83	2.30206	0.82468	1.44478	5.42285
1993.83	1.80681	1.03013	0.75953	5.62831
1994.83	1.28868	1.05254	0.23093	5.65072
1995.83	3.16118	1.22602	1.89245	5.82420
1996.83	1.04183	0.53167	0.49889	5.12985
1997.83	1.42513	0.29981	1.10048	4.89799
1998.83	1.03663	0.96445	0.07059	5.56263
1999.83	1.65263	2.14575	-0.48224	6.74393
2000.83	1.91501	2.21659	-0.29493	6.81477
2001.83	0.94554	1.39833	-0.44279	5.99650
2002.83	2.28258	0.82013	1.43017	5.41830

Average squared residual : 1.02291

2-US fall 1985-2002

Age : 6

Ln calibration constant : -4.52000

Year	Observed	Predicted	Residual	Ln Pop.
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1985.83	-1.13538	-1.72036	0.45970	2.79963
1986.83	-2.83191	-1.10775	-1.35490	3.41224
1987.83	-1.53201	-0.34053	-0.93631	4.17946
1988.83	-1.66654	0.17491	-1.44707	4.69491
1989.83	0.74726	0.65963	0.06886	5.17963
1990.83	-2.41800	-0.20416	-1.73970	4.31583
1991.83	-1.79517	-0.16161	-1.28370	4.35839
1992.83	0.57835	0.15886	0.32965	4.67885
1993.83	0.38737	0.38813	-0.00060	4.90813
1994.83	1.08769	0.56049	0.41429	5.08049
1995.83	3.04271	0.53260	1.97253	5.05259
1996.83	1.83586	0.37023	1.15174	4.89022
1997.83	1.45820	-0.16168	1.27295	4.35831
1998.83	0.74122	-0.14388	0.69554	4.37611
1999.83	0.18465	0.42706	-0.19049	4.94706
2000.83	1.64463	1.74965	-0.08253	6.26965
2001.83	1.51658	1.91790	-0.31537	6.43789
2002.83	2.30247	1.04836	0.98552	5.56836

Average squared residual : 1.02292

2-US fall 1985-2002

Age : 7

Ln calibration constant : -4.61259

Year	Observed	Predicted	Residual	Ln Pop.
1985.83	-3.04073	-4.01665	0.57071	0.59594
1986.83	-5.47267	-2.84855	-1.53456	1.76404
1987.83	-3.43579	-1.68934	-1.02130	2.92325
1988.83	-2.77740	-0.82480	-1.14186	3.78779
1989.83	-1.40364	-0.48104	-0.53953	4.13155
1990.83	-3.07478	-0.49766	-1.50707	4.11493
1991.83	-3.78981	-0.97193	-1.64787	3.64066
1992.83	-0.78812	-0.95322	0.09655	3.65937
1993.83	-1.23066	-0.61706	-0.35883	3.99553
1994.83	-0.12172	-0.28974	0.09826	4.32285
1995.83	1.97053	-0.73510	1.58223	3.87749
1996.83	1.16661	-1.03740	1.28889	3.57519
1997.83	1.28343	-1.06490	1.37328	3.54769
1998.83	0.70344	-1.15299	1.08563	3.45960
1999.83	-0.21456	-1.12148	0.53036	3.49111
2000.83	0.52360	-0.34632	0.50872	4.26627
2001.83	1.61373	1.10465	0.29771	5.71724
2002.83	2.01965	1.47464	0.31872	6.08723

Average squared residual : 1.02292

2-US fall 1985-2002

Age : 8

Ln calibration constant : -4.69301

Year	Observed	Predicted	Residual	Ln Pop.
1985.83	-1.85726	-3.83244	0.78334	0.86057
1987.83	-5.05146	-3.90084	-0.45632	0.79217
1989.83	-2.43497	-1.34520	-0.43219	3.34781
1990.83	-6.16582	-1.49069	-1.85412	3.20231
1991.83	-7.13090	-1.44238	-2.25602	3.25063
1993.83	-5.25910	-1.99403	-1.29490	2.69898
1994.83	-1.45672	-1.45919	0.00098	3.23382
1995.83	-0.28316	-2.40612	0.84195	2.28689

1996.83	-0.21704	-2.53444	0.91906	2.15857
1997.83	-0.42327	-2.52435	0.83327	2.16866
1998.83	-0.50650	-2.39590	0.74932	2.29711
1999.83	-1.17022	-2.79173	0.64308	1.90128
2000.83	-0.45303	-2.29127	0.72903	2.40174
2001.83	0.22010	-1.22317	0.57239	3.46984
2002.83	1.19963	0.64202	0.22115	5.33503

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 2

Ln calibration constant : -8.54856

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	0.43224	-0.37249	0.53183	8.17607
1969.25	-2.12863	-1.02134	-0.73179	7.52722
1970.25	1.34802	-1.30564	1.75377	7.24293
1971.25	-1.60594	-1.62739	0.01417	6.92117
1972.25	-0.75290	0.06950	-0.54351	8.61807
1973.25	-2.70755	-1.87001	-0.55352	6.67855
1974.25	-3.65738	-2.16811	-0.98424	6.38045
1975.25	-3.26492	-1.61331	-1.09153	6.93525
1976.25	-3.13041	-2.26852	-0.56961	6.28005
1977.25	-2.83191	-1.98073	-0.56254	6.56784
1978.25	-2.10210	-1.03727	-0.70373	7.51129
1979.25	1.51119	-1.27233	1.83959	7.27623
1980.25	-2.17772	-3.19694	0.67359	5.35162
1981.25	-3.95284	-1.63006	-1.53510	6.91850
1982.25	-0.90609	-1.95317	0.69200	6.59539
1983.25	-1.87797	-1.97141	0.06176	6.57715
1984.25	0.65856	-1.92714	1.70885	6.62142

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 3

Ln calibration constant : -7.12842

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	2.16341	0.33744	1.68368	7.46586
1969.25	0.27960	0.45186	-0.15884	7.58028
1970.25	0.38893	-0.11434	0.46405	7.01409
1971.25	-0.79629	-0.56467	-0.21356	6.56375
1972.25	-0.05922	-0.62521	0.52189	6.50321
1973.25	0.81868	1.03388	-0.19843	8.16230
1974.25	-2.26240	-1.14425	-1.03101	5.98417
1975.25	-2.34758	-1.80650	-0.49891	5.32192
1976.25	-1.48678	-1.16874	-0.29326	5.95969
1977.25	-2.12779	-2.23282	0.09684	4.89560
1978.25	0.69029	-1.73482	2.23612	5.39360
1979.25	-0.99101	-0.63399	-0.32920	6.49443
1980.25	0.38069	-1.12393	1.38737	6.00449
1981.25	-4.44817	-3.33045	-1.03061	3.79798
1982.25	-2.96423	-1.75313	-1.11672	5.37530
1983.25	-3.62684	-1.70423	-1.77278	5.42419
1984.25	-0.89624	-1.17105	0.25339	5.95737

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 4
 Ln calibration constant : -6.18135

Year	Observed	Predicted	Residual	Ln Pop.
1968.25	1.23689	0.87109	0.30816	7.05244
1969.25	-0.69917	0.90042	-1.34753	7.08177
1970.25	0.03517	0.91208	-0.73872	7.09343
1971.25	-0.68458	0.35160	-0.87291	6.53295
1972.25	-0.74087	-0.51666	-0.18888	5.66469
1973.25	1.24008	-0.18644	1.20174	5.99491
1974.25	1.48978	1.34311	0.12356	7.52446
1975.25	-3.20153	-0.88592	-1.95072	5.29543
1976.25	-2.87884	-1.75142	-0.94977	4.42993
1977.25	-0.95581	-1.15101	0.16444	5.03034
1978.25	-1.10624	-2.20249	0.92351	3.97886
1979.25	0.11288	-1.78994	1.60298	4.39141
1980.25	1.31038	-0.72820	1.71735	5.45316
1981.25	-0.67668	-1.43220	0.63647	4.74915
1982.25	-3.04282	-3.44254	0.33673	2.73881
1983.25	-2.75514	-1.53989	-1.02376	4.64147
1984.25	-1.19073	-1.25880	0.05735	4.92255

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 5
 Ln calibration constant : -5.81252

Year	Observed	Predicted	Residual	Ln Pop.
1968.25	1.27290	1.20044	0.06031	7.01296
1969.25	0.00419	0.79418	-0.65756	6.60669
1970.25	-0.18284	0.79004	-0.80980	6.60256
1971.25	-1.56590	0.55039	-1.76155	6.36291
1972.25	-0.56651	-0.22888	-0.28104	5.58364
1973.25	-0.56352	-1.07593	0.42651	4.73659
1974.25	-0.26971	-0.87885	0.50704	4.93366
1975.25	-0.18284	0.93530	-0.93071	6.74781
1976.25	-2.15675	-1.41007	-0.62153	4.40245
1977.25	-2.00842	-2.28018	0.22620	3.53234
1978.25	-1.20065	-1.57987	0.31565	4.23265
1979.25	-0.21505	-2.68751	2.05801	3.12501
1980.25	-0.37848	-2.56495	1.81996	3.24756
1981.25	0.29617	-1.51202	1.50509	4.30050
1982.25	-3.01798	-2.00977	-0.83920	3.80274
1983.25	-4.72170	-3.69559	-0.85411	2.11693
1984.25	-1.94771	-1.75156	-0.16327	4.06096

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 6
 Ln calibration constant : -5.72533

Year	Observed	Predicted	Residual	Ln Pop.
1968.25	1.05994	0.83916	0.22968	6.56449
1969.25	0.55555	0.61625	-0.06314	6.34158
1970.25	-0.60148	0.21138	-0.84561	5.93671
1971.25	-1.50238	0.13340	-1.70168	5.85874
1972.25	-1.14917	-0.44310	-0.73452	5.28223
1973.25	0.14254	-1.55000	1.76073	4.17533

1974.25	-1.66919	-1.93642	0.27800	3.78891
1975.25	-2.50226	-1.80573	-0.72459	3.91960
1976.25	-1.16059	-0.08289	-1.12112	5.64244
1977.25	-2.63946	-2.24811	-0.40711	3.47722
1978.25	-3.07046	-3.08270	0.01274	2.64263
1979.25	-1.42047	-2.46721	1.08891	3.25812
1980.25	-2.48891	-3.73230	1.29348	1.99303
1981.25	-1.66284	-3.69131	2.11019	2.03403
1982.25	-3.20893	-2.43582	-0.80425	3.28951
1983.25	-2.92062	-2.85901	-0.06410	2.86633
1984.25	-4.34281	-4.04712	-0.30760	1.67821

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 7

Ln calibration constant : -5.37330

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	1.50488	1.27731	0.18497	6.65061
1969.25	1.40118	0.47432	0.75335	5.84761
1970.25	-0.83425	0.11916	-0.77492	5.49245
1971.25	-1.92964	-0.24128	-1.37229	5.13202
1972.25	-3.72140	-0.70733	-2.44983	4.66597
1973.25	-0.55513	-1.65299	0.89234	3.72030
1974.25	-2.71507	-2.19192	-0.42522	3.18138
1975.25	-3.14656	-2.45915	-0.55872	2.91414
1976.25	-1.48017	-2.81425	1.08434	2.55905
1977.25	-1.47011	-0.77906	-0.56168	4.59424
1978.25	-2.97397	-2.80766	-0.13517	2.56563
1979.25	-2.09557	-3.72490	1.32431	1.64840
1980.25	-2.24526	-3.24886	0.81572	2.12444
1981.25	-2.81175	-4.57860	1.43609	0.79470
1982.25	-4.64599	-4.38405	-0.21290	0.98924
1983.25	-2.38380	-3.24338	0.69867	2.12992
1984.25	-4.03419	-3.17414	-0.69904	2.19915

Average squared residual : 1.02292

3-US Spring 1968-1984

Age : 8

Ln calibration constant : -5.86172

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1968.25	0.30025	0.38043	-0.06633	6.24215
1969.25	0.56406	-0.19444	0.62749	5.66727
1970.25	-3.11903	-0.97002	-1.77781	4.89170
1971.25	-2.98578	-1.25899	-1.42852	4.60273
1972.25	-3.79869	-2.22489	-1.30196	3.63683
1973.25	-2.11362	-3.01373	0.74463	2.84799
1974.25	-3.21638	-3.32424	0.08923	2.53747
1975.25	-4.54690	-3.49277	-0.87205	2.36895
1976.25	-3.82585	-4.30081	0.39292	1.56091
1977.25	-4.24750	-4.47704	0.18990	1.38467
1978.25	-1.65078	-2.17182	0.43104	3.68990
1979.25	-1.76902	-4.46138	2.22731	1.40033
1980.25	-4.97623	-5.93780	0.79547	-0.07608
1981.25	-3.51661	-5.07893	1.29246	0.78278
1982.25	-6.81245	-5.96747	-0.69902	-0.10576
1983.25	-6.90776	-5.95415	-0.78889	-0.09243
1984.25	-4.84089	-5.01512	0.14413	0.84660

Average squared residual : 1.02292

4-US Spring 1985-2002

Age : 2

Ln calibration constant : -5.72062

Year	Observed	Predicted	Residual	Ln Pop.
1985.25	0.66921	1.90158	-1.91059	7.62220
1986.25	0.52615	1.06216	-0.83100	6.78278
1987.25	0.26234	0.97851	-1.11030	6.69913
1988.25	1.17208	1.38931	-0.33678	7.10993
1989.25	0.50555	1.51549	-1.56576	7.23612
1990.25	1.08900	1.59983	-0.79196	7.32045
1991.25	1.52194	1.59497	-0.11323	7.31560
1992.25	2.39804	1.64649	1.16516	7.36711
1993.25	1.97977	1.25071	1.13031	6.97133
1994.25	1.46990	1.12790	0.53022	6.84852
1995.25	1.80232	1.46314	0.52584	7.18376
1996.25	3.71144	2.55059	1.79971	8.27122
1997.25	3.05772	2.20053	1.32894	7.92115
1998.25	1.54281	1.95915	-0.64547	7.67977
1999.25	0.85586	1.07740	-0.34346	6.79802
2000.25	2.71540	2.76444	-0.07603	8.48506
2001.25	1.61195	1.05189	0.86829	6.77251
2002.25	1.79083	1.54818	0.37618	7.26880

Average squared residual : 1.02291

4-US Spring 1985-2002

Age : 3

Ln calibration constant : -4.93299

Year	Observed	Predicted	Residual	Ln Pop.
1985.25	-0.06219	1.23380	-1.74245	6.16679
1986.25	3.30201	2.20820	1.47061	7.14119
1987.25	0.75730	1.34230	-0.78653	6.27529
1988.25	1.37869	1.27163	0.14395	6.20462
1989.25	0.50634	1.54826	-1.40085	6.48125
1990.25	0.86748	1.74164	-1.17530	6.67463
1991.25	1.91835	1.80131	0.15735	6.73431
1992.25	2.77204	1.85250	1.23632	6.78549
1993.25	3.48725	1.86132	2.18605	6.79432
1994.25	1.21929	1.44358	-0.30155	6.37658
1995.25	1.32731	1.24198	0.11473	6.17498
1996.25	2.13773	1.68821	0.60437	6.62121
1997.25	3.49814	2.94092	0.74918	7.87392
1998.25	2.37396	2.67551	-0.40543	7.60850
1999.25	2.79401	2.21288	0.78133	7.14588
2000.25	1.22926	1.47909	-0.33589	6.41208
2001.25	2.95561	3.24015	-0.38256	8.17314
2002.25	0.71920	1.39845	-0.91324	6.33145

Average squared residual : 1.02292

4-US Spring 1985-2002

Age : 4

Ln calibration constant : -4.62739

Year	Observed	Predicted	Residual	Ln Pop.
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1985.25	-0.86488	0.77059	-2.33478	5.39798
1986.25	1.21346	1.15318	0.08605	5.78057
1987.25	1.34315	2.10781	-1.09161	6.73520
1988.25	1.25105	1.18414	0.09552	5.81153
1989.25	1.06063	1.08872	-0.04010	5.71611
1990.25	0.98065	1.37972	-0.56969	6.00710
1991.25	2.38922	1.55430	1.19193	6.18169
1992.25	1.87254	1.68185	0.27222	6.30924
1993.25	3.24299	1.70070	2.20175	6.32809
1994.25	2.49386	1.70210	1.13030	6.32949
1995.25	1.17350	1.25472	-0.11595	5.88211
1996.25	1.62109	1.04502	0.82239	5.67241
1997.25	1.74082	1.56630	0.24914	6.19369
1998.25	3.32402	2.78897	0.76383	7.41636
1999.25	2.66614	2.70067	-0.04930	7.32806
2000.25	1.61466	2.00730	-0.56052	6.63469
2001.25	0.64558	1.47635	-1.18598	6.10374
2002.25	2.59829	3.20426	-0.86507	7.83165

Average squared residual : 1.02291

4-US Spring 1985-2002

Age : 5

Ln calibration constant : -4.70840

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.25	-0.73002	-0.33203	-0.47630	4.37637
1986.25	0.15649	0.21966	-0.07560	4.92806
1987.25	-1.47666	0.69415	-2.59793	5.40254
1988.25	1.19247	1.58359	-0.46808	6.29199
1989.25	0.68808	0.63793	0.06002	5.34633
1990.25	0.14885	0.44043	-0.34895	5.14882
1991.25	-0.04239	0.84526	-1.06230	5.55365
1992.25	0.71950	1.01811	-0.35737	5.72651
1993.25	1.74383	1.19256	0.65974	5.90095
1994.25	2.39781	1.20662	1.42557	5.91502
1995.25	2.45619	1.29046	1.39510	5.99885
1996.25	1.03001	0.75745	0.32620	5.46584
1997.25	0.98753	0.48293	0.60388	5.19133
1998.25	1.77132	1.08555	0.82070	5.79394
1999.25	3.75573	2.28551	1.75950	6.99390
2000.25	1.60404	2.31322	-0.84871	7.02161
2001.25	0.98440	1.53224	-0.65563	6.24063
2002.25	0.87489	1.00836	-0.15973	5.71675

Average squared residual : 1.02291

4-US Spring 1985-2002

Age : 6

Ln calibration constant : -5.07556

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.25	-2.23213	-1.80426	-0.48355	3.27131
1986.25	-0.58322	-1.29890	0.80882	3.77667
1987.25	-1.95829	-0.63982	-1.49005	4.43574
1988.25	-1.15964	-0.10784	-1.18867	4.96772
1989.25	0.31693	0.63994	-0.36505	5.71551
1990.25	-1.85790	-0.37920	-1.67114	4.69637
1991.25	-1.20131	-0.39781	-0.90806	4.67775
1992.25	-0.55026	-0.03834	-0.57854	5.03723
1993.25	-0.09003	0.13006	-0.24873	5.20562

1994.25	1.19547	0.33190	0.97595	5.40746
1995.25	1.04289	0.34086	0.79339	5.41643
1996.25	1.50049	0.43154	1.20806	5.50711
1997.25	0.88311	-0.24692	1.27709	4.82864
1998.25	0.45938	-0.39485	0.96541	4.68071
1999.25	1.95487	0.25427	1.92191	5.32983
2000.25	1.30144	1.47431	-0.19536	6.54988
2001.25	1.05372	1.58332	-0.59853	6.65889
2002.25	0.54482	0.74198	-0.22281	5.81754

Average squared residual : 1.02291

4-US Spring 1985-2002

Age : 7

Ln calibration constant : -5.60577

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.25	-3.85375	-4.60105	0.38904	1.00472
1986.25	-0.88455	-3.21467	1.21305	2.39110
1988.25	-4.32754	-1.59677	-1.42163	4.00900
1989.25	-2.04253	-1.13642	-0.47172	4.46935
1990.25	-6.26590	-0.85659	-2.81606	4.74918
1991.25	-2.85077	-1.57124	-0.66612	4.03453
1992.25	-1.66866	-1.52334	-0.07565	4.08243
1993.25	-2.72114	-1.20614	-0.78870	4.39963
1994.25	-0.66359	-0.93486	0.14122	4.67091
1995.25	-0.65105	-0.95460	0.15803	4.65117
1996.25	0.92287	-1.07270	1.03888	4.53307
1997.25	0.34889	-1.24627	0.83044	4.35950
1998.25	-0.18392	-1.61448	0.74474	3.99128
1999.25	1.07045	-1.55861	1.36868	4.04716
2000.25	-0.22540	-0.94217	0.37315	4.66360
2001.25	0.93232	0.44010	0.25625	6.04587
2002.25	0.15572	0.68124	-0.27358	6.28701

Average squared residual : 1.02292

4-US Spring 1985-2002

Age : 8

Ln calibration constant : -6.34483

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1985.25	-3.74651	-4.95047	0.45942	1.39436
1988.25	-9.21034	-3.58742	-2.14564	2.75741
1992.25	-5.62682	-3.06044	-0.97930	3.28439
1993.25	-7.13090	-3.06138	-1.55288	3.28345
1994.25	-3.17486	-2.66150	-0.19589	3.68333
1995.25	-4.32754	-2.70651	-0.61857	3.63832
1996.25	-0.44863	-3.14355	1.02835	3.20128
1997.25	-1.06334	-3.38948	0.88763	2.95535
1998.25	-1.74698	-3.34009	0.60791	3.00474
1999.25	-0.10148	-3.46350	1.28291	2.88133
2000.25	-1.65810	-3.29573	0.62490	3.04910
2001.25	-0.66787	-2.39983	0.66089	3.94500
2002.25	-0.96653	-0.81003	-0.05972	5.53480

Average squared residual : 1.02292

5-US Winter 1992-2002

Age : 2

Ln calibration constant : -7.05223

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.04182	0.46362	0.84832	7.51586
1993.00	-1.14413	0.07246	-0.65395	7.12469
1994.00	-2.51331	-0.02191	-1.33919	7.03032
1995.00	-2.61456	0.28266	-1.55733	7.33489
1996.00	4.31175	1.31223	1.61232	8.36446
1997.00	0.56594	0.95003	-0.20646	8.00226
1998.00	0.51927	0.75940	-0.12908	7.81163
1999.00	-1.42628	-0.15025	-0.68590	6.90198
2000.00	3.86737	1.50750	1.26849	8.55974
2001.00	1.78685	-0.16822	1.05090	6.88402
2002.00	-0.07246	0.31468	-0.20810	7.36691

Average squared residual : 1.02292

5-US Winter 1992-2002

Age : 3

Ln calibration constant : -5.31888

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.58238	1.58584	1.14654	6.90472
1993.00	2.78337	1.60200	1.35919	6.92088
1994.00	-0.65220	1.19236	-2.12221	6.51124
1995.00	-0.17459	0.98422	-1.33324	6.30310
1996.00	1.88318	1.41150	0.54268	6.73038
1997.00	1.94318	2.67259	-0.83921	7.99147
1998.00	2.63313	2.35896	0.31544	7.67784
1999.00	1.86821	1.96530	-0.11170	7.28418
2000.00	1.37506	1.16728	0.23905	6.48616
2001.00	3.63799	2.94217	0.80057	8.26105
2002.00	1.12168	1.11912	0.00294	6.43800

Average squared residual : 1.02291

5-US Winter 1992-2002

Age : 4

Ln calibration constant : -4.88754

Year	Observed	Predicted	Residual	Ln Pop.
1992.00	2.10339	1.51863	0.73004	6.40617
1993.00	2.83346	1.54027	1.61448	6.42781
1994.00	0.14479	1.52707	-1.72570	6.41461
1995.00	-0.01339	1.08506	-1.37135	5.97260
1996.00	1.28143	0.90308	0.47235	5.79062
1997.00	0.54412	1.40616	-1.07621	6.29370
1998.00	3.34842	2.63372	0.89226	7.52126
1999.00	2.12057	2.51295	-0.48987	7.40049
2000.00	1.70613	1.84343	-0.17141	6.73097
2001.00	1.51699	1.30231	0.26802	6.18985
2002.00	3.70873	3.02190	0.85747	7.90944

Average squared residual : 1.02291

5-US Winter 1992-2002

Age : 5

Ln calibration constant : -4.28792

Year	Observed	Predicted	Residual	Ln Pop.
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1992.00	1.48115	1.56947	-0.12732	5.85739
1993.00	2.28075	1.73055	0.79316	6.01847
1994.00	0.21777	1.74102	-2.19592	6.02894
1995.00	1.58664	1.78622	-0.28771	6.07414
1996.00	1.41347	1.32274	0.13079	5.61067
1997.00	1.94481	1.02985	1.31900	5.31777
1998.00	1.86995	1.60573	0.38091	5.89365
1999.00	3.27617	2.81373	0.66666	7.10165
2000.00	1.66778	2.82285	-1.66514	7.11077
2001.00	2.24697	2.05794	0.27250	6.34586
2002.00	2.05219	1.55747	0.71318	5.84539

Average squared residual : 1.02292

5-US Winter 1992-2002

Age : 6

Ln calibration constant : -3.98071

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1992.00	0.30557	1.21099	-0.92254	5.19170
1993.00	1.75432	1.35315	0.40876	5.33385
1994.00	0.00568	1.56769	-1.59154	5.54840
1995.00	1.80601	1.59255	0.21750	5.57325
1996.00	2.66041	1.79230	0.88452	5.77301
1997.00	2.84019	1.05067	1.82336	5.03137
1998.00	1.32538	0.83130	0.50342	4.81201
1999.00	2.05183	1.51412	0.54787	5.49483
2000.00	1.13160	2.68996	-1.58782	6.67066
2001.00	2.17839	2.77344	-0.60630	6.75414
2002.00	2.26114	1.94424	0.32289	5.92495

Average squared residual : 1.02292

5-US Winter 1992-2002

Age : 7

Ln calibration constant : -4.12466

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1992.00	-0.63111	0.14012	-0.64747	4.26478
1993.00	-0.34348	0.44915	-0.66543	4.57381
1994.00	-1.32539	0.69627	-1.69724	4.82093
1995.00	1.32800	0.85999	0.39291	4.98465
1996.00	1.91990	0.82129	0.92232	4.94595
1997.00	2.68247	0.58475	1.76109	4.70941
1998.00	0.85484	0.09580	0.63724	4.22046
1999.00	1.42782	0.16217	1.06255	4.28683
2000.00	-0.87443	0.71020	-1.33034	4.83486
2001.00	1.85107	2.06285	-0.17780	6.18752
2002.00	1.94139	2.24846	-0.25779	6.37312

Average squared residual : 1.02291

5-US Winter 1992-2002

Age : 8

Ln calibration constant : -4.14392

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1994.00	-2.16282	-0.26683	-1.45942	3.87709
1995.00	-0.14018	0.07691	-0.16711	4.22084
1996.00	0.29877	-0.49320	0.60961	3.65072

1997.00	1.57557	-0.84949	1.86666	3.29443
1998.00	-0.63469	-0.83417	0.15355	3.30975
1999.00	0.53825	-0.84016	1.06102	3.30376
2000.00	-2.48651	-0.81579	-1.28602	3.32813
2001.00	-0.22979	0.00589	-0.18141	4.14981
2002.00	0.70156	1.47699	-0.59688	5.62092

Average squared residual : 1.02291

6a-US larval 1971-1988 (weighted mean)

Age : 3 4 5 6 7 8 9 10

Ln calibration constant : -1.36018

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1971.83	4.49647	4.44668	0.04020	5.80686
1972.83	4.39938	3.75137	0.52317	5.11155
1973.83	5.87268	4.44183	1.15520	5.80201
1974.83	5.71867	4.24916	1.18641	5.60934
1975.83	4.02356	3.49022	0.43060	4.85040
1976.83	0.78846	2.98878	-1.77644	4.34896
1977.83	2.95491	2.49334	0.37265	3.85352
1978.83	0.87547	2.34429	-1.18586	3.70447
1979.83	1.79176	2.59765	-0.65063	3.95782
1980.83	0.64185	2.44657	-1.45704	3.80674
1981.83	3.39115	1.95135	1.16242	3.31152
1982.83	2.90142	2.04783	0.68915	3.40800
1983.83	1.30833	2.49340	-0.95676	3.85357
1984.83	0.83291	2.83496	-1.61636	4.19513
1985.83	4.55808	3.24366	1.06120	4.60384
1986.83	4.10099	3.89358	0.16745	5.25376
1987.83	3.44681	3.83148	-0.31056	5.19165
1988.83	5.21982	3.77656	1.16522	5.13673

Average squared residual : 1.02292

6b-US larval 1971-1988 (weighted mean)

Age : 3 4 5 6 7 8 9 10

Ln calibration constant : 0.94068

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1989.83	6.11876	6.02656	0.43771	5.08588
1990.83	5.97660	6.04791	-0.33851	5.10723
1991.83	5.86986	6.08567	-1.02453	5.14499
1992.83	6.35802	6.15556	0.96112	5.21489
1993.83	5.98545	6.28175	-1.40664	5.34107
1994.83	6.41346	6.12470	1.37086	5.18402

Average squared residual : 1.02292

7-CAN larval 1987-1995 mean

Age : 3 4 5 6 7 8 9 10

Ln calibration constant : -2.46360

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1987.83	3.09104	2.72805	0.41510	5.19165
1988.83	1.87180	2.67313	-0.91637	5.13673
1989.83	2.00148	2.62228	-0.70992	5.08588
1990.83	2.32239	2.64363	-0.36736	5.10723
1991.83	1.19392	2.68139	-1.70102	5.14499
1992.83	2.53370	2.75128	-0.24882	5.21489

1993.83	3.42751	2.87747	0.62902	5.34107
1994.83	3.96840	2.72042	1.42715	5.18402
1995.83	3.85651	2.56911	1.47223	5.03271

Average squared residual : 1.02292

8-US acoustic 1999-2002

Age : 3 4 5 6 7 8 9 10

Ln calibration constant : 16.80939

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1999.83	22.90097	22.73123	0.51033	5.92184
2000.83	23.01524	22.76641	0.74813	5.95702
2001.83	23.31557	23.15446	0.48439	6.34507
2002.83	22.46329	23.04291	-1.74268	6.23352

Average squared residual : 1.02293

9-CAN spring BT 86-92,95-02

Age : 2

Ln calibration constant : -5.87556

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1986.12	0.59675	0.97424	-0.17512	6.84979
1987.12	-0.21504	0.88984	-0.51257	6.76540
1988.12	-0.90667	1.32236	-1.03408	7.19792
1989.12	4.21862	1.43565	1.29106	7.31120
1990.12	3.58685	1.52753	0.95534	7.40309
1991.12	3.67242	1.51126	1.00259	7.38682
1992.12	2.17335	1.56890	0.28041	7.44446
1995.12	0.55453	1.38679	-0.38610	7.26235
1996.12	3.46609	2.44415	0.47409	8.31970
1997.12	3.06719	2.08777	0.45437	7.96333
1998.12	0.38282	1.87278	-0.69121	7.74834
1999.12	-0.51563	0.97652	-0.69223	6.85208
2000.12	6.14663	2.64834	1.62291	8.52389
2001.12	0.71185	0.95494	-0.11277	6.83049
2002.12	-3.89438	1.44426	-2.47667	7.31982

Average squared residual : 1.02291

9-CAN spring BT 86-92,95-02

Age : 3

Ln calibration constant : -4.79538

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1986.12	2.26972	2.39723	-0.07232	7.19261
1987.12	-2.45133	1.54277	-2.26549	6.33816
1988.12	-1.46889	1.46756	-1.66557	6.26294
1989.12	1.38023	1.74883	-0.20907	6.54421
1990.12	0.58728	1.94596	-0.77065	6.74134
1991.12	3.91795	1.99581	1.09025	6.79119
1992.12	2.67436	2.05211	0.35295	6.84749
1995.12	3.65300	1.44622	1.25170	6.24160
1996.12	1.31190	1.88260	-0.32371	6.67798
1997.12	5.12473	3.13966	1.12595	7.93504
1998.12	1.85247	2.84918	-0.56534	7.64456
1999.12	2.78715	2.42241	0.20688	7.21779
2000.12	3.39809	1.65522	0.98857	6.45060
2001.12	5.31769	3.42347	1.07442	8.21885

2002.12 1.20620 1.59147 -0.21853 6.38686

Average squared residual : 1.02292

9-CAN spring BT 86-92,95-02

Age : 4

Ln calibration constant : -5.34079

Year	Observed	Predicted	Residual	Ln Pop.
1986.12	-0.96985	0.48698	-0.76722	5.82777
1987.12	-3.26721	1.45127	-2.48491	6.79206
1988.12	-0.78780	0.52330	-0.69047	5.86409
1989.12	-1.12745	0.45439	-0.83305	5.79518
1990.12	-1.57363	0.72400	-1.21001	6.06479
1991.12	3.23336	0.89711	1.23035	6.23790
1992.12	2.45423	1.01886	0.75592	6.35964
1995.12	0.42183	0.58838	-0.08771	5.92916
1996.12	0.96180	0.39309	0.29950	5.73388
1997.12	2.78355	0.90491	0.98935	6.24570
1998.12	2.42570	2.13012	0.15566	7.47091
1999.12	3.25349	2.02494	0.64699	7.36573
2000.12	2.40740	1.34397	0.56004	6.68475
2001.12	3.51154	0.80773	1.42392	6.14852
2002.12	2.55348	2.53131	0.01167	7.87210

Average squared residual : 1.02292

9-CAN spring BT 86-92,95-02

Age : 5

Ln calibration constant : -5.24914

Year	Observed	Predicted	Residual	Ln Pop.
1986.12	-0.85633	-0.25490	-0.24252	4.99425
1987.12	-6.85186	0.20839	-2.84689	5.45753
1988.12	0.36732	1.10273	-0.29654	6.35187
1989.12	-2.04534	0.18141	-0.89789	5.43056
1990.12	-2.85825	-0.04253	-1.13538	5.20661
1991.12	0.62269	0.36725	0.10300	5.61639
1992.12	2.16896	0.54542	0.65466	5.79457
1995.12	1.46769	0.78886	0.27372	6.03800
1996.12	1.14051	0.29201	0.34214	5.54115
1997.12	2.95959	0.00794	1.19019	5.25708
1998.12	1.39491	0.59665	0.32188	5.84579
1999.12	4.70894	1.80079	1.17265	7.04993
2000.12	2.12493	1.81883	0.12343	7.06797
2001.12	4.03693	1.04621	1.20594	6.29535
2002.12	0.61294	0.53450	0.03163	5.78364

Average squared residual : 1.02292

9-CAN spring BT 86-92,95-02

Age : 6

Ln calibration constant : -4.82073

Year	Observed	Predicted	Residual	Ln Pop.
1988.12	-0.49309	0.20814	-0.29850	5.02887
1989.12	-2.87412	1.01489	-1.65546	5.83562
1990.12	-5.41283	-0.03907	-2.28748	4.78166
1991.12	-0.46195	-0.07139	-0.16625	4.74933
1992.12	1.23813	0.29683	0.40069	5.11755

1995.12	0.40911	0.67725	-0.11414	5.49798
1996.12	1.55109	0.82465	0.30923	5.64537
1997.12	3.31562	0.11334	1.36314	4.93406
1998.12	0.79906	-0.07174	0.37068	4.74899
1999.12	4.12840	0.59490	1.50412	5.41563
2000.12	1.57625	1.79196	-0.09182	6.61269
2001.12	3.78510	1.88769	0.80768	6.70842
2002.12	0.71946	1.05267	-0.14184	5.87339

Average squared residual : 1.02292

9-CAN spring BT 86-92,95-02

Age : 7

Ln calibration constant : -4.56542

Year	Observed	Predicted	Residual	Ln Pop.
-----	-----	-----	-----	-----
1988.12	-0.73576	-0.50684	-0.09575	4.05858
1989.12	-5.67146	-0.02036	-2.36370	4.54506
1991.12	-2.41081	-0.44261	-0.82324	4.12281
1992.12	0.21797	-0.38816	0.25353	4.17725
1995.12	-1.03183	0.25916	-0.53998	4.82458
1996.12	0.75682	0.18235	0.24028	4.74777
1997.12	3.06627	-0.02396	1.29256	4.54145
1998.12	0.30444	-0.45496	0.31764	4.11045
1999.12	3.61418	-0.39363	1.67635	4.17179
2000.12	-0.07814	0.18724	-0.11100	4.75266
2001.12	3.41231	1.55411	0.77723	6.11952
2002.12	0.27476	1.76637	-0.62390	6.33178

Average squared residual : 1.02292

9-CAN spring BT 86-92,95-02

Age : 8

Ln calibration constant : -4.52767

Year	Observed	Predicted	Residual	Ln Pop.
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1988.12	-3.45883	-1.72473	-0.66229	2.80294
1992.12	-3.47030	-1.11805	-0.89837	3.40962
1995.12	-5.19064	-0.58644	-1.75845	3.94123
1996.12	-1.20912	-1.09269	-0.04447	3.43499
1997.12	2.27701	-1.39600	1.40280	3.13167
1998.12	-1.02429	-1.36433	0.12987	3.16335
1999.12	2.93562	-1.42668	1.66606	3.10099
2000.12	-1.14112	-1.33348	0.07346	3.19420
2001.12	1.60223	-0.47617	0.79379	4.05150
2002.12	-0.78720	1.05191	-0.70240	5.57958

Average squared residual : 1.02292

Work file G:\Mike\5zdir\VPA\2003 reruns\Complex_final_fit.aw3 saved