

WHAM figures and tables

WHAM Tables

Estimate Std. Error

stock 1 B-H a 7.6469371524 2.6285213811 stock 1 B-H b 0.0001935657 0.0001484956 stock 1 NAA
sigma (age 1) 0.8591246240 0.1209342667 stock 1 NAA
sigma (ages 2-6+) 0.5993253549 0.0605848812 index 1 fully selected q 2.0498014331 0.3122786277 index
2 fully selected q 0.5043565226 0.0569483201 95\% CI lower 95\% CI upper stock 1 B-H a 3.898518e+00
1.499945e+01 stock 1 B-H b 4.303496e-05 8.706332e-04 stock 1 NAA
sigma (age 1) 6.519844e-01 1.132075e+00 stock 1 NAA
sigma (ages 2-6+) 4.916047e-01 7.306499e-01 index 1 fully selected q 1.520543e+00 2.762770e+00 index 2
fully selected q 4.042231e-01 6.292793e-01 Estimate stock 1 B-H a 7.647 stock 1 B-H b 1.936
*times*10⁻⁴ stock 1 NAA
sigma (age 1) 0.859 stock 1 NAA
sigma (ages 2-6+) 0.599 index 1 fully selected q 2.050 index 2 fully selected q 0.504 Std. Error stock 1 B-H
a 2.629 stock 1 B-H b 1.485
*times*10⁻⁴ stock 1 NAA
sigma (age 1) 0.121 stock 1 NAA
sigma (ages 2-6+) 0.061 index 1 fully selected q 0.312 index 2 fully selected q 0.057 95\% CI lower stock 1
B-H a 3.899 stock 1 B-H b 4.303
*times*10⁻⁵ stock 1 NAA
sigma (age 1) 0.652 stock 1 NAA
sigma (ages 2-6+) 0.492 index 1 fully selected q 1.521 index 2 fully selected q 0.404 95\% CI upper stock 1
B-H a 14.999 stock 1 B-H b 8.706
*times*10⁻⁴ stock 1 NAA
sigma (age 1) 1.132 stock 1 NAA
sigma (ages 2-6+) 0.731 index 1 fully selected q 2.763 index 2 fully selected q 0.629

Table 1. Parameter estimates, standard errors, and confidence intervals. Rounded to 3 decimal places.

	Estimate	Std. Error	95% CI lower	95% CI upper
stock 1 B-H a	7.647	2.629	3.899	14.999
stock 1 B-H b	1.936×10^{-4}	1.485×10^{-4}	4.303×10^{-5}	8.706×10^{-4}
stock 1 NAA σ (age 1)	0.859	0.121	0.652	1.132
stock 1 NAA σ (ages 2-6+)	0.599	0.061	0.492	0.731
index 1 fully selected q	2.050	0.312	1.521	2.763
index 2 fully selected q	0.504	0.057	0.404	0.629
index 3 fully selected q	0.281	0.045	0.206	0.384
index 4 fully selected q	0.006	0.001	0.004	0.009
index 5 fully selected q	0.050	0.010	0.035	0.074
fleet 1 a_{50} (Block 1)	2.195	0.102	2.000	2.399
fleet 1 1/slope (increasing) (Block 1)	0.280	0.029	0.228	0.343
index 1 a_{50} (Block 2)	1.834	0.125	1.598	2.088
index 1 1/slope (increasing) (Block 2)	0.196	0.028	0.147	0.260
index 2 a_{50} (Block 3)	2.148	0.102	1.953	2.351
index 2 1/slope (increasing) (Block 3)	0.312	0.028	0.261	0.373
index 3 a_{50} (Block 4)	1.325	0.215	0.951	1.795
index 3 1/slope (increasing) (Block 4)	0.418	0.182	0.174	0.948
index 4 a_{50} (Block 5)	1.500	—	—	—
index 4 1/slope (increasing) (Block 5)	0.100	—	—	—
index 5 a_{50} (Block 6)	1.500	—	—	—
index 5 1/slope (increasing) (Block 6)	0.100	—	—	—
fleet 1 age comp, logistic-normal: σ	8.978	0.626	7.831	10.294

Table 1. Parameter estimates, standard errors, and confidence intervals. Rounded to 3 decimal places. *(continued)*

	Estimate	Std. Error	95% CI lower	95% CI upper
index 1 age comp, logistic-normal: σ	2.651	0.290	2.140	3.284
index 2 age comp, logistic-normal: σ	2.418	0.198	2.060	2.839
index 3 age comp, logistic-normal: σ	3.089	0.225	2.678	3.563
Ecov CPI: μ	-0.336	0.164	-0.658	-0.015
Ecov CPI: σ	0.885	0.108	0.697	1.123
Ecov CPI: AR1 ρ	0.104	0.171	-0.230	0.417

Abundance at age

Table 2. Abundance at age (1000s) for stock 1 in region 1.

	1	2	3	4	5	6+
1973	33968	22677	44660	21601	12726	13646
1974	25895	16781	12469	21924	9831	8650
1975	46523	9973	4218	2979	4522	3090
1976	13193	31738	3163	860	698	2485
1977	65774	11874	13439	1071	420	1421
1978	59326	51328	6641	2960	354	711
1979	45352	30606	18963	2122	664	320
1980	48281	37801	15266	5052	508	230
1981	80224	67137	17438	4125	1310	275
1982	45687	106325	33867	6442	1457	532
1983	30012	64260	66233	8914	2042	308
1984	22520	16222	20500	10928	2228	1285
1985	25225	13448	5986	2386	1272	488
1986	8047	22479	7625	1452	349	122
1987	15541	4760	7514	1457	360	172
1988	66155	8741	2204	1370	350	190
1989	11564	102607	9718	737	150	25
1990	8213	13620	71332	5485	300	21
1991	8579	4705	15546	8643	509	96
1992	3113	1789	2818	4859	789	35
1993	7251	1821	1156	1414	352	35
1994	9169	3748	669	526	459	205
1995	3162	6619	1241	322	122	180
1996	4854	3309	4242	716	131	117
1997	10145	4106	4251	1518	167	123
1998	8416	11834	2133	1008	237	56
1999	8578	5303	5871	643	241	81
2000	3960	8049	3544	1282	113	48
2001	6282	2516	4000	898	201	86
2002	3006	5543	2116	841	178	15

Table 2. Abundance at age (1000s) for stock 1 in region 1. (*continued*)

	1	2	3	4	5	6+
2003	5829	1135	1990	853	187	45
2004	3588	1338	722	683	288	125
2005	19515	1987	583	263	250	79
2006	11185	11767	1071	162	59	86
2007	3548	6306	3988	376	52	76
2008	9678	1792	3905	1862	214	63
2009	11331	5324	1875	2231	460	87
2010	6638	8081	4371	1713	1326	284
2011	15484	3896	3753	2669	1210	721

Fishing mortality at age by region

Table 3. Total fishing mortality at age in region 1.

	1	2	3	4	5	6+
1973	0.008	0.201	0.572	0.603	0.604	0.604
1974	0.021	0.506	1.442	1.521	1.524	1.524
1975	0.021	0.497	1.416	1.493	1.496	1.496
1976	0.010	0.245	0.697	0.735	0.736	0.736
1977	0.016	0.390	1.110	1.171	1.173	1.173
1978	0.018	0.434	1.238	1.306	1.308	1.308
1979	0.022	0.522	1.488	1.569	1.572	1.572
1980	0.014	0.348	0.993	1.047	1.049	1.049
1981	0.009	0.215	0.613	0.646	0.647	0.647
1982	0.014	0.332	0.946	0.997	0.999	0.999
1983	0.016	0.392	1.116	1.177	1.179	1.179
1984	0.027	0.648	1.848	1.949	1.952	1.952
1985	0.027	0.663	1.890	1.993	1.997	1.997
1986	0.020	0.483	1.377	1.452	1.455	1.455
1987	0.017	0.399	1.137	1.199	1.201	1.201
1988	0.024	0.576	1.641	1.731	1.734	1.734
1989	0.016	0.386	1.101	1.161	1.163	1.163

Table 3. Total fishing mortality at age in region 1. (*continued*)

	1	2	3	4	5	6+
1990	0.022	0.536	1.529	1.612	1.615	1.615
1991	0.024	0.584	1.664	1.755	1.758	1.758
1992	0.021	0.516	1.469	1.550	1.552	1.552
1993	0.011	0.260	0.740	0.781	0.782	0.782
1994	0.016	0.378	1.078	1.137	1.139	1.139
1995	0.005	0.125	0.356	0.375	0.376	0.376
1996	0.006	0.151	0.429	0.452	0.453	0.453
1997	0.009	0.221	0.629	0.663	0.664	0.664
1998	0.008	0.202	0.577	0.609	0.609	0.609
1999	0.009	0.210	0.599	0.632	0.633	0.633
2000	0.009	0.218	0.621	0.655	0.656	0.657
2001	0.014	0.334	0.953	1.005	1.006	1.006
2002	0.009	0.223	0.634	0.669	0.670	0.670
2003	0.009	0.211	0.602	0.635	0.636	0.636
2004	0.013	0.315	0.898	0.947	0.948	0.948
2005	0.009	0.208	0.591	0.624	0.625	0.625
2006	0.005	0.109	0.310	0.327	0.328	0.328
2007	0.004	0.099	0.281	0.296	0.297	0.297
2008	0.004	0.095	0.272	0.287	0.287	0.287
2009	0.003	0.072	0.206	0.218	0.218	0.218
2010	0.001	0.027	0.077	0.082	0.082	0.082
2011	0.001	0.036	0.101	0.107	0.107	0.107

Fishing mortality at age by fleet

Table 4. Total fishing mortality at age in fleet 1.

	1	2	3	4	5	6+
1973	0.008	0.201	0.572	0.603	0.604	0.604
1974	0.021	0.506	1.442	1.521	1.524	1.524
1975	0.021	0.497	1.416	1.493	1.496	1.496
1976	0.010	0.245	0.697	0.735	0.736	0.736

Table 4. Total fishing mortality at age in fleet 1. (*continued*)

	1	2	3	4	5	6+
1977	0.016	0.390	1.110	1.171	1.173	1.173
1978	0.018	0.434	1.238	1.306	1.308	1.308
1979	0.022	0.522	1.488	1.569	1.572	1.572
1980	0.014	0.348	0.993	1.047	1.049	1.049
1981	0.009	0.215	0.613	0.646	0.647	0.647
1982	0.014	0.332	0.946	0.997	0.999	0.999
1983	0.016	0.392	1.116	1.177	1.179	1.179
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1985	0.027	0.663	1.890	1.993	1.997	1.997
1986	0.020	0.483	1.377	1.452	1.455	1.455
1987	0.017	0.399	1.137	1.199	1.201	1.201
1988	0.024	0.576	1.641	1.731	1.734	1.734
1989	0.016	0.386	1.101	1.161	1.163	1.163
1990	0.022	0.536	1.529	1.612	1.615	1.615
1991	0.024	0.584	1.664	1.755	1.758	1.758
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1993	0.011	0.260	0.740	0.781	0.782	0.782
1994	0.016	0.378	1.078	1.137	1.139	1.139
1995	0.005	0.125	0.356	0.375	0.376	0.376
1996	0.006	0.151	0.429	0.452	0.453	0.453
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1999	0.009	0.210	0.599	0.632	0.633	0.633
2000	0.009	0.218	0.621	0.655	0.656	0.657
2001	0.014	0.334	0.953	1.005	1.006	1.006
2002	0.009	0.223	0.634	0.669	0.670	0.670
2003	0.009	0.211	0.602	0.635	0.636	0.636
2004	0.013	0.315	0.898	0.947	0.948	0.948
2005	0.009	0.208	0.591	0.624	0.625	0.625
2006	0.005	0.109	0.310	0.327	0.328	0.328
2007	0.004	0.099	0.281	0.296	0.297	0.297

Table 4. Total fishing mortality at age in fleet 1. (*continued*)

	1	2	3	4	5	6+
2008	0.004	0.095	0.272	0.287	0.287	0.287
2009	0.003	0.072	0.206	0.218	0.218	0.218
2010	0.001	0.027	0.077	0.082	0.082	0.082
2011	0.001	0.036	0.101	0.107	0.107	0.107