

WHAM figures and tables

WHAM Tables

Estimate Std. Error

stock 1 B-H a 14.8861458 6.61736684 stock 1 mean log(B-H b) intercept -6.9679814 0.65753489 stock 1 NAA

sigma (age 1) 0.6936111 0.11328541 stock 1 NAA

sigma (ages 2-6+) 0.5957565 0.05962691 index 1 fully selected q 2.0324395 0.31102429 index 2 fully selected q 0.5010862 0.05680419 95\% CI lower 95\% CI upper stock 1 B-H a 6.2286800 35.5769339 stock 1 mean log(B-H b) intercept -8.2567261 -5.6792367 stock 1 NAA

sigma (age 1) 0.5036071 0.9553010 stock 1 NAA

sigma (ages 2-6+) 0.4896384 0.7248735 index 1 fully selected q 1.5056434 2.7430452 index 2 fully selected q 0.4012485 0.6257498 Estimate Std. Error stock 1 B-H a 14.886 6.617 stock 1 mean log(B-H b) intercept -6.968 0.658 stock 1 NAA

sigma (age 1) 0.694 0.113 stock 1 NAA

sigma (ages 2-6+) 0.596 0.060 index 1 fully selected q 2.032 0.311 index 2 fully selected q 0.501 0.057 95\% CI lower 95\% CI upper stock 1 B-H a 6.229 35.577 stock 1 mean log(B-H b) intercept -8.257 -5.679 stock 1 NAA

sigma (age 1) 0.504 0.955 stock 1 NAA

sigma (ages 2-6+) 0.490 0.725 index 1 fully selected q 1.506 2.743 index 2 fully selected q 0.401 0.626

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	14.886	6.617	6.229	35.577
stock 1 mean log(B-H b) intercept	-6.968	0.658	-8.257	-5.679
stock 1 NAA σ (age 1)	0.694	0.113	0.504	0.955
stock 1 NAA σ (ages 2-6+)	0.596	0.060	0.490	0.725
index 1 fully selected q	2.032	0.311	1.506	2.743
index 2 fully selected q	0.501	0.057	0.401	0.626
index 3 fully selected q	0.279	0.045	0.204	0.381
index 4 fully selected q	0.006	0.001	0.004	0.009
index 5 fully selected q	0.050	0.010	0.034	0.073
fleet 1 a_{50} (Block 1)	2.193	0.102	1.997	2.397
fleet 1 1/slope (increasing) (Block 1)	0.280	0.029	0.228	0.343
index 1 a_{50} (Block 2)	1.832	0.125	1.596	2.086
index 1 1/slope (increasing) (Block 2)	0.195	0.028	0.146	0.258
index 2 a_{50} (Block 3)	2.144	0.102	1.948	2.348
index 2 1/slope (increasing) (Block 3)	0.311	0.029	0.260	0.372
index 3 a_{50} (Block 4)	1.322	0.216	0.947	1.793
index 3 1/slope (increasing) (Block 4)	0.428	0.185	0.179	0.965
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	9.039	0.624	7.895	10.348

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	2.643	0.288	2.135	3.272
index 2 age comp, logistic-normal: σ	2.455	0.197	2.098	2.872
index 3 age comp, logistic-normal: σ	3.062	0.223	2.654	3.533
Ecov CPI: μ	-0.329	0.163	-0.649	-0.009
Ecov CPI: σ	0.878	0.107	0.692	1.115
Ecov CPI: AR1 ρ	0.108	0.170	-0.225	0.419
stock 1 Recruitment Ecov: CPI β_1	1.030	0.272	0.497	1.563

Abundance at age

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

	1	2	3	4	5	6+
1973	33378	22560	45506	21535	12511	13476
1974	18470	16631	12423	22423	9703	8221
1975	40368	9028	4278	2996	4673	3001
1976	15709	30714	3096	864	696	2550
1977	62758	12610	13162	1059	418	1425
1978	55098	50989	6833	2944	350	707
1979	49565	29751	19111	2176	670	327
1980	51352	38710	14954	5092	518	234
1981	88714	66794	17615	4120	1329	282
1982	47954	107988	33764	6505	1470	540
1983	31233	64853	65989	9011	2073	316
1984	24578	16392	20430	10856	2245	1296
1985	26233	13792	5996	2354	1247	488
1986	6905	22820	7536	1433	335	119
1987	10956	4566	7701	1415	354	161
1988	64904	8058	2252	1415	344	190
1989	12122	104276	9453	740	151	25
1990	8188	14030	71778	5445	302	22
1991	8425	4725	15804	8660	510	96
1992	3456	1802	2806	4871	809	36
1993	7979	1865	1152	1399	358	37
1994	10117	3797	681	529	459	209
1995	3421	6725	1268	329	125	184
1996	4405	3389	4166	716	133	118
1997	11356	3951	4321	1522	169	125
1998	8093	11791	2072	1005	238	55
1999	10651	5342	6047	650	248	85
2000	3793	8461	3541	1304	116	49
2001	5160	2533	4126	891	202	85
2002	3171	5369	2179	865	181	15

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

	1	2	3	4	5	6+
2003	6185	1155	2002	873	192	46
2004	3650	1360	719	682	291	127
2005	20011	1985	582	262	248	79
2006	11568	12030	1087	162	60	87
2007	3242	6336	3940	375	52	75
2008	11548	1762	3879	1840	214	65
2009	11583	5662	1889	2248	459	88
2010	5661	8129	4463	1701	1289	279
2011	12134	3585	3773	2672	1186	675

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	0.570	0.601	0.602	0.602
1974	0.021	0.513	1.454	1.533	1.535	1.535
1975	0.021	0.507	1.437	1.515	1.518	1.518
1976	0.010	0.249	0.706	0.744	0.745	0.745
1977	0.016	0.393	1.113	1.174	1.176	1.176
1978	0.018	0.435	1.234	1.301	1.303	1.303
1979	0.022	0.524	1.486	1.567	1.569	1.569
1980	0.014	0.348	0.986	1.040	1.042	1.042
1981	0.009	0.215	0.609	0.642	0.643	0.643
1982	0.014	0.329	0.934	0.985	0.986	0.986
1983	0.016	0.393	1.113	1.174	1.175	1.176
1984	0.027	0.653	1.853	1.954	1.957	1.957
1985	0.028	0.663	1.879	1.981	1.984	1.984
1986	0.020	0.486	1.379	1.454	1.457	1.457
1987	0.017	0.401	1.138	1.200	1.202	1.202
1988	0.025	0.590	1.672	1.763	1.765	1.765
1989	0.016	0.383	1.085	1.144	1.146	1.146

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

	1	2	3	4	5	6+
1990	0.022	0.533	1.512	1.594	1.597	1.597
1991	0.024	0.577	1.636	1.725	1.727	1.727
1992	0.021	0.515	1.460	1.539	1.542	1.542
1993	0.011	0.260	0.737	0.777	0.778	0.778
1994	0.016	0.373	1.058	1.115	1.117	1.117
1995	0.005	0.123	0.347	0.366	0.367	0.367
1996	0.006	0.152	0.432	0.456	0.456	0.456
1997	0.009	0.220	0.623	0.657	0.658	0.658
1998	0.009	0.205	0.583	0.614	0.615	0.615
1999	0.008	0.204	0.578	0.609	0.610	0.610
2000	0.009	0.214	0.607	0.640	0.641	0.641
2001	0.014	0.327	0.928	0.978	0.980	0.980
2002	0.009	0.221	0.626	0.660	0.661	0.661
2003	0.009	0.208	0.591	0.623	0.624	0.624
2004	0.013	0.315	0.894	0.942	0.944	0.944
2005	0.009	0.209	0.591	0.624	0.625	0.625
2006	0.004	0.107	0.303	0.320	0.320	0.320
2007	0.004	0.100	0.283	0.298	0.299	0.299
2008	0.004	0.096	0.274	0.289	0.289	0.289
2009	0.003	0.071	0.202	0.213	0.213	0.213
2010	0.001	0.027	0.077	0.081	0.081	0.081
2011	0.002	0.036	0.103	0.109	0.109	0.109

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	0.570	0.601	0.602	0.602
1974	0.021	0.513	1.454	1.533	1.535	1.535
1975	0.021	0.507	1.437	1.515	1.518	1.518
1976	0.010	0.249	0.706	0.744	0.745	0.745

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

	1	2	3	4	5	6+
1977	0.016	0.393	1.113	1.174	1.176	1.176
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1984	0.027	0.653	1.853	1.954	1.957	1.957
1985	0.028	0.663	1.879	1.981	1.984	1.984
1986	0.020	0.486	1.379	1.454	1.457	1.457
1987	0.017	0.401	1.138	1.200	1.202	1.202
1988	0.025	0.590	1.672	1.763	1.765	1.765
1989	0.016	0.383	1.085	1.144	1.146	1.146
1990	0.022	0.533	1.512	1.594	1.597	1.597
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1996	0.006	0.152	0.432	0.456	0.456	0.456
1997	0.009	0.220	0.623	0.657	0.658	0.658
1998	0.009	0.205	0.583	0.614	0.615	0.615
1999	0.008	0.204	0.578	0.609	0.610	0.610
2000	0.009	0.214	0.607	0.640	0.641	0.641
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2005	0.009	0.209	0.591	0.624	0.625	0.625
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2007	0.004	0.100	0.283	0.298	0.299	0.299

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

	1	2	3	4	5	6+
2008	0.004	0.096	0.274	0.289	0.289	0.289
2009	0.003	0.071	0.202	0.213	0.213	0.213
2010	0.001	0.027	0.077	0.081	0.081	0.081
2011	0.002	0.036	0.103	0.109	0.109	0.109